CITYWIDE GREEN INFRASTRUCTURE EVALUATION

PATERSON CONTRACT RFP 2022-62
GREEN INFRASTRUCTURE FEASIBILITY STUDY

City of Paterson, NJ

PROJECT NO.: 31407120.001
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LIST OF ACRONYMS

BMP	Best Management Practice
CSO	Combined Sewer Overflow
CSS	Combined Sewer System
FEMA	Federal Emergency Management Agency
GIS	Geographic Information Systems
GI	Green Infrastructure
LTCP	Long Term Control Plan
NJDEP	New Jersey Department of Environmental Protection
NJPDES	New Jersey Pollution Discharge Elimination System
PVSC	Passaic Valley Sewerage Commission
ROW	Right-of-way

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1 EXECUTIVE SUMMARY

1.1 EXECUTIVE SUMMARY

WSP was engaged by the City of Paterson to perform a Citywide Green Infrastructure Evaluation study in support of the City's Long Term Control Plan (LTCP). The LTCP was prepared as one of the requirements of the City's New Jersey Pollution Discharge Elimination System (NJPDES) for its Combined Sewer Overflow facilities (CSOs). The City's wastewater system includes 19 active CSOs to the Passaic River, 4,760 acres of combined sewersheds, and approximately 529 acres of separated sewersheds. Wastewater collected by the city is conveyed to Passaic Valley Sewerage Commission (PVSC) for treatment.

One of the goals of the LTCP is to reduce flows to the CSOs through the use of green infrastructure (GI), specifically to capture 2.5% (or 75 acres) of impervious cover within the City by the year 2060. During this study, WSP evaluated 95 concept plans that capture 51.0 acres (2,222,219 sf) of impervious area within GI. The GI Techniques included in the evaluation and plans are bioretention systems (also known as rain gardens), porous pavement, and planters. The techniques are designed to at a minimum capture and retain or infiltrate the New Jersey stormwater quality storm (1.25" of rainfall depth). The presented GI projects have the potential to remove approximately 59.6 million gallons (7.97 million CF) of runoff annually. Probable cost of constructions was estimated for each project as well.

The scope of work for this study was for the evaluation of GI on certain private and public properties, and not evaluation within the roadway right-of-way (ROW). The LTCP does discuss the potential for implementation of bioswales within the ROW, which could be incorporated into the municipality's regular road improvements projects to help meet the LTCP's 2.5% of impervious area treatment.

This report provides details and information to be used for the implementation, planning and construction of these projects as outlined in the LTCP and as required by the City's NJPDES permit. The report provides a ranking system to support the decisions process on project implementation, which includes costs, runoff volume reduction, and sewershed.

In addition to the reduction of flows from the CSOs, the proposed GI techniques have the potential to reduce localized flooding from small storm events and improve runoff water quality.

The concept plans presented herein are conceptual and will require further engineering and design effort to be construction and implementation ready.

2 INTRODUCTION

2.1 INTRODUCTION

The Citywide Green Infrastructure Evaluation study is prepared in support of the City's Long Term Control Plan (LTCP) which was prepared as one of the requirements of the City's New Jersey Pollution Discharge Elimination System (NJPDES) for its Combined Sewer Overflow facilities (CSOs). The LTCP outlined several goals for reducing CSOs; however, this study focuses on reducing flows to the CSOs through green infrastructure (GI).

This report provides the process for selecting, evaluating, and analyzing sites to meet the LTCP goal. An initial desktop review created a list of approximately 200 sites that included city-owned, schools, tax-exempt and other public properties (county or state). From that list, 95 sites were developed into concept plans that included stormwater management calculations, and probable cost of construction for each site. The City has a specific interest to participate in the Green Schoolyards programs and is already a participant in the Children and Nature Network; therefore, public school properties was an important factor in selecting sites.

The concept plans presented herein capture 51.0 acres of impervious area and include a variety of GI Techniques such as bioretention systems, porous pavement, and planters. The techniques are designed to at a minimum capture and retain or infiltrate the New Jersey stormwater quality storm (1.25" rainfall depth).

2.2 BACKGROUND

Wastewater collected by the city is conveyed to Passaic Valley Sewerage Commission (PVSC) for treatment. The City's wastewater system had 28 CSOs which originated from PVSC regulators, of these CSOs, only 19 remain in service; the others were either abandoned or consolidated with other systems or CSOs. The City's CSOs discharge to the Passaic River during high flow events. Of the City's wastewater system, 4,760 acres are combined sewersheds, and approximately 529 acres are separated sewersheds. A map of the City's CSOs and sewersheds is provided as Figure 1. See Appendix A for the full sewershed map to scale.

2.3 STUDY GOALS AND LONG-TERM GOALS

The main goal of this study is largely driven by the PVSC's LTCP dated October 2020, especially Appendix N, which is specific to the City of Paterson. The LTCP sets a goal that 2.5% that the City's impervious area (or 75 acres) shall be managed by GI (Table ES-2 on page 5 of the LTCP, and page 24 of the LTCP Appendix N). The LTCP also notes a Capital Cost of $29.3 million for GI, and to be operational by 2060 (Table ES-3 of the LTCP.) This provides the city approximately three decades to get GI projects implemented and functioning.

A second goal of this study is to support the City's mission of participation in the Green Schoolyards America (GSA) program and advance the Children and Nature Network. The GSA Program supports redeveloping asphalt and impervious school yards to provide nature access to students. They provide a variety or support services to help districts implement these changes. The Children and Nature Network aims to make nature more equitable to all children and has support services and literature specifically geared towards schoolyards. During the process of the study, it was noticed that most school playgrounds are impervious surface, with little to no greenery to enhance children's outdoor learning and playing experiences. Coordinating with the GSA Program and the Children and Nature Network during project implementation can enhance the final constructed product.

2.4 COLLABORATORS

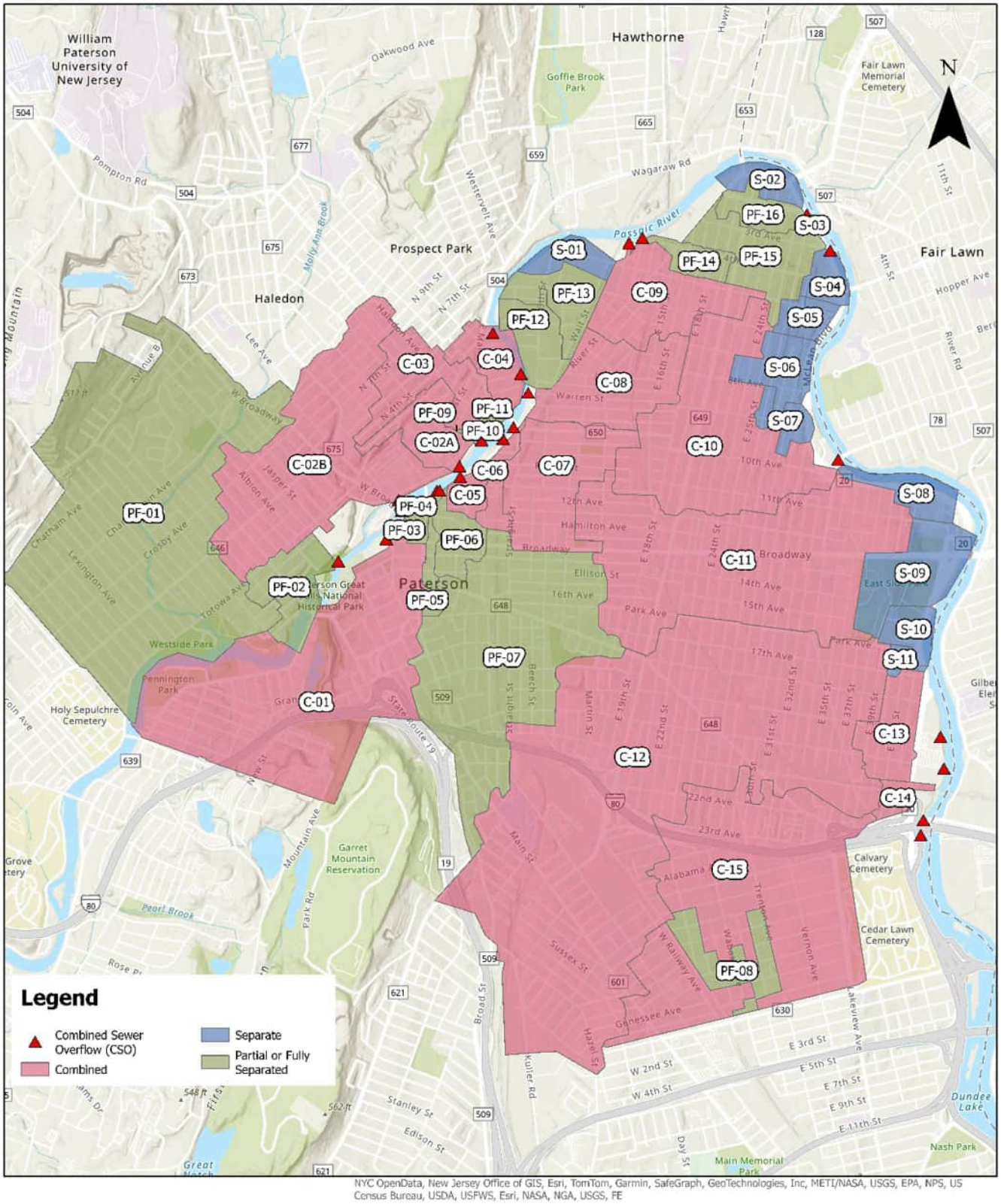
This study is the result of a successful team of WSP and Rutgers Cooperative Extension Water Resources Program (RCE WRP or referred to as "Rutgers") along with essential feedback and guidance from the City's Engineering Department and Passaic River Coalition.

Rutgers provided support and collaboration from the first stages of data collection through the concept development process. The technical work for this GI study began with a desktop analysis, where the Rutgers team members utilized a combination of their own ArcGIS database and publicly available data to develop a list of sites across the City according to the ownership types scoped for this study – public land, City-owned buildings, parks, Churches and other tax-exempt, schools, and other government buildings. This list was reviewed by members of WSP, the City and Passaic River Coalition, and narrowed down to 198 for site investigations.

Prior to performing the site investigations, the Rutgers and WSP teams worked together to develop a checklist of items to look for at each site that was used in the Fulcrum App (as discussed later in the report). Representatives of both Rutgers and WSP conducted the 198 site investigations over the course of three weeks beginning on July 17th, 2023. The efficiency of this data collection phase was without a doubt impacted by the expertise and passion held by all team members.

Following the site assessments, the Rutgers team utilized detailed processes and calculation spreadsheets, developed from their own previous GI assessments experience, to begin evaluating the sites that advanced to concept development. During the concept development phase, both Rutgers and WSP collaborated to 'get every last drop' of stormwater runoff possible into various GI BMPs. Additionally, during the concept phase, the City's Engineering Department and Passaic River Coalition provided guidance and information to the team such as recent, ongoing, or future projects that may impact the designs. This resulted in the 95 concept plans presented herein.

Figure 1 – Site Locations Map - Sewersheds and CSOs



3 METHODOLOGY

3.1 INTRODUCTION

This section provides an overview of the methods used for analyzing the concept sites for GI feasibility. The first step in this process was to perform a desktop analysis of publicly available GIS data for the initial site selections. After the preliminary sites were reviewed, field investigations were conducted to further determine site suitability for GI. Next, the concept plans were developed for the selected sites based on the gathered data in order to map out potential locations and sizes of the proposed GI. As part of the concept design phase, runoff calculations were performed to evaluate the effectiveness of the proposed GI in stormwater management and concept-level cost estimates were created to assess the probable construction costs of the proposed GI. After the concepts were drafted, a ranking and prioritization matrix was developed to organize the concept designs based on the evaluated information, facilitating decision-making for future GI implementation in accordance with the City's LTCP.

3.2 DESKTOP ANALYSIS

The team began the desktop analysis by gathering GIS data from publicly available sources of the City of Paterson. The GIS data included, but was not limited to, right-of-way, tax lot information (including ownership), and sewershed. This information was overlaid on available aerial photography to understand visual site conditions, such as impervious and vegetation covering. Using this information, the team selected 198 sites to perform the field site assessments. Sites selected were limited to one of the following ownership types:

- City-owned
- School district-owned
- Other government owned
- Tax exempt properties (non-profits)

A detailed database was developed of the sites and used as a foundation for the next step, field investigation/site assessments.

3.3 SCOPE OF WORK

The scope of work of this study did not include right-of-way assessments for the potential implementation of green streets, bump outs or other GI features within the right-of-way. This type of analysis would require a more detailed study and could be explored in the future.

3.4 FIELD INVESTIGATION / SITE ASSESSMENTS

After completing the desktop analysis, the selected 198 sites were assessed in the field using the Fulcrum app. The Fulcrum app was selected for its flexible format which allows for the creation of custom inspection forms, suited specifically to the project. Using the mobile Fulcrum app to record site conditions, all sites were assessed to determine their suitability for GI. The suitability of each site was determined based on the following questions:

1. Are there suitable locations for GI to underdrain to?

   An answer of 'yes' indicated that there was a catch basin on site or along the curb line closest to the property being assessed that was within reasonable distance (roughly 20 feet) to the potential management area. An answer of 'maybe' was used if the catch basin was across the street from the site or if the catch basin was located at a distance further than approximately 20 feet. Manholes within a reasonable proximity to the potential management areas were also considered a 'maybe' because it could be either a storm or sanitary manhole. Even if it was marked as a storm or sanitary manhole, the labeling was not trusted because manhole covers are

sometimes switched around as they are lost or broken (in some cases manhole covers are designed with text on the exterior noting the municipality, sewer authority, or storm/sanitary use). An answer of 'no' indicated that there were no catch basins located on or near the site where GI could be installed.

2. Does the building have internal drainage or downspouts on the exterior?

   An answer of 'yes' indicated that roof leaders were visible on the outside of the building and that the flow discharged openly on the property. An answer of 'maybe' indicated that the roof leaders were visible, but that their outlet was unknown due to an obstruction (such as a bush or garden) or that they went down underground and the outlet could not be determined. An answer of 'no' indicated that the roof leaders were not visible on the outside of the building.

3. Is there open/grass space available near potential drainage areas?

   An answer of 'yes' indicated there was a clear amount of space for a bioretention system relative to the approximate amount of impervious area draining to the area in question. On the other hand, an answer of 'no' would indicate that space is very limited. If it's not explicitly clear whether a bioretention system will fit in the area being evaluated, then 'maybe' was selected, allowing the site to be evaluated at the concept development stage and the runoff calculations would be used to determine whether or not a bioretention system would be feasible.

4. Is there excessive paved areas that could be depaved?

   An answer of 'yes' indicated that there were paved areas not being used for parking and in poor condition that could be converted to grass or another pervious land cover. An answer of 'maybe' indicated that there were possible areas for depaving, contingent on further investigation to determine if the owner required the areas to remain paved. An answer of 'no' indicated that the are did not have pavement on site or that the pavement needed to remain in use.

5. Is there old pavement in low traffic areas?

   An answer of 'yes' indicated that the pavement was in poor condition and not in the drive aisle. An answer of 'maybe' indicated that the pavement was either 1) in bad condition, but not in a low traffic area or 2) in a low traffic area but in good condition. In both 'maybe' cases, the implementation of porous pavement was possible, but not ideal. An answer of 'no' indicated that there was either no pavement on site, or that it was in good condition with significant traffic, making the site not recommended for the implementation of porous pavement.

6. Is the parking lot sloped perpendicular to parking aisles (making it ideal for interception of stormwater)?

   An answer of 'yes' indicated that the parking lot was sloped in a manner that guided runoff towards parking spaces instead of the drive aisle. This is the ideal opportunity for porous pavement because the runoff could be captured by installing porous pavement in the parking spaces. An answer of 'maybe' indicated that the slope was parallel or not directly perpendicular to the parking spaces, meaning that the stormwater runoff flowed through the parking spaces at an angle that was parallel (where the flow passes from one parking space to the next adjacent space) or diagonal. An answer of 'no' indicated that the paved area was sloped so that stormwater runoff flowed away from the parking spaces and into the drive aisle. See Figure 2 for clarification on flow direction.

Figure 2 - Parking lot stormwater runoff flow direction.

'Yes' – flow is perpendicular to parking spaces.

7. Is there applicable reuse for captured stormwater and a location to capture it from?

   An answer of 'yes' indicated that there was an existing use for stormwater captured in a cistern to be reused on site. Examples of possible reuses include but are not limited to grass athletic field maintenance, garden watering, or vehicle/equipment washing. In addition to having a reason to reuse the stormwater collected in a cistern, a 'yes' indicated that there was enough space for an appropriately sized cistern and a roof leader that could be easily connected to the cistern. An answer of 'maybe' indicated that there was a possibility that there was enough space for a cistern to fit, a roof leader was visible, and that there were viable options for reuse. An answer of 'no' indicated that space was limited, no leader connections were available, and there was no clear reason for reuse.

8. Are roof leaders located near large pervious areas?

   An answer of 'yes' indicated that roof leaders discharged into open grass, or other pervious land cover, where a bioretention system could be implemented. An answer of 'maybe' indicated that roof leaders discharges into grass areas that might be large enough, relative to the roof drainage area, to fit a bioretention system. An answer of 'no' indicated that there were no roof leaders, the roof leaders did not discharge into open grass area, or that the area was clearly not large enough to fit a bioretention system.

9. Are there driveways, parking lots, or other areas that would be suitable to be redone for grass pavers?

   An answer of 'yes' indicated that there were areas suitable for grass pavers. Grass pavers were considered applicable in small driveways and parking lots, walking paths, and sidewalks that did not have a steep slope. An answer of 'maybe' indicated that there were potential opportunities for grass pavers, but that further analysis would be required during the concept development phase. An answer of 'no' indicated that there were no paved areas to be converted to grass pavers or that grass pavers were already utilized on site.

10. Is there a possibility for other types of GI to be utilized on site (tree pits/beds, downspout planter boxes, etc)?

    This section addressed opportunities for tree pits, downspout planter boxes, and other types of GI not mentioned in the previous questions. These GI BMPs were not considered until the final question in the site assessment form because they function in limited cases. For example, tree pits are typically installed along a roadway and downspout planter boxes treat small rooftop drainage areas. An answer of 'yes' indicated that the questions above

did not fully capture all of the possible opportunities for GI on the site. An answer of 'maybe' indicated that the GI mentioned in the comments of the site assessment form might be possible given the site conditions. An answer of 'no' indicated that there were no other GI BMPs to be considered for the site.

All together, these questions determined what impervious areas can be reduced, what they can be replaced with, and how stormwater can be captured on site. See Appendix B: Site Assessments for an example of a completed site assessment form (N-04 John F Kennedy High School).

Once the potential for all green infrastructure solutions was determined, each site was given a ranking from 1 to 5 according to the matrix in Table 3-1. Although the feasibility and impact categories were qualitative approximations, it was critical to complete this evaluation prior to performing any hydrologic and hydraulic assessments to eliminate sites with GI space limitations. To see all responses to the completed site inspection forms, refer to Appendix B: Site Assessments.

At the end of a site assessment, the site was given a ranking of 5 when there was a clear opportunity for GI. Specifically, the site scored a 5 when most of the stormwater runoff from the impervious areas on a larger site could easily be captured by bioretention systems and/or porous pavement. Conversely, a site scored a ranking of 1 when it was clear that there would be significant difficulties capturing stormwater runoff from impervious areas due to space constraints.

Table 3-1 Site Ranking Guidance

RATING	FEASIBILITY	IMPACT
1	Not at all feasible	No impact
2	One/Two small GI feasible	Limited impact
3	Cumulative impact of multiple small or one large GI is somewhat feasible	Moderate impact
4	Cumulative impact of multiple small or one large GI is feasible	Significant impact
5	Multiple large GI is feasible	Major impact

3.5 CONCEPT PLAN DEVELOPMENT

Following the site inspections, the total list of 198 sites was reduced to 97 sites with GI suitability rankings of 3, 4, or 5 for concept development. Of these 97 total sites, 40 were tax exempt, 30 were public property, and 27 were school district owned. See Table 3-2 for a breakdown on the concepts developed per ward. Although the 97 sites were spread throughout all 6 wards, they were concentrated in the downtown area to target the city's CSOs with the largest volumes. As the concept plans were developed, two sites were removed after re-evaluating the site conditions and feasibility for GI, bringing the final number for concept development to 95 sites.

Table 3-2 Sites Advanced to Concept Development

RANKING	WARD						TOTAL
	1	2	3	4	5	6	
3	19	8	8	11	8	3	57
4	7	4	3	5	6	2	27
5	3	5	3	0	1	1	13
Total	**29**	**17**	**14**	**16**	**15**	**6**	**97**

Each site advanced to concept development was analyzed using the information collected during the site inspection, which was supplemented by LiDAR contour data, to determine the location and size of the proposed GI. Site features such as retaining walls, steep slopes, existing trees and vegetation, existing infrastructure, and the 100-year floodplain also impacted the location of GI. Overall, the driving idea throughout the concept development phase was to utilize existing features where possible, such as low points or parking spaces, while avoiding the disturbance of essential features, such as trees and retaining walls. GI, such as bioretention systems and porous pavement, were also located in optimal areas with little to no slopes to avoid the financial cost of earthwork.

The proposed bioretention systems were placed near the impervious areas they are trying to capture or treat. For example, the bioretention systems located in Pennington Park were placed adjacent to the pavilion so that the roof runoff collected by the roof leaders can easily flow into the bioretention system. This is also a good practice because when runoff is captured close to its impervious source, the runoff will be treated before the pollutants can reach a water body or infiltrate in undesired areas. For sites where the bioretention systems were located further from the impervious sources, bioswales were utilized to simultaneously treat and convey runoff in transit to the bioretention systems.

Porous pavement was proposed in parking spaces, athletic courts, and in areas where heavy vehicles would be less likely to travel. The existing slope was utilized as much as possible, but in a few cases, such as L-03 Dr. Hani Awadallah School, the proposed porous pavement would require regrading to allow the capture area to flow into the parking spaces.

Cisterns and downspout planter boxes were proposed for sites with limited space for larger GI such as bioretention systems or where roof leaders did not flow out onto porous pavement. However, it is important to note that cisterns require winterizing to prevent damage and ensure their long-term functionality.

Across the 95 concepts developed, the installation of 132,799 sf of bioretention, 407,905 sf of porous pavement, and 343 planter boxes, will result in an annual volume reduction of 59.61 Mgal, achieving 1.72% (51.0 acres) impervious area treated for the City.

3.6 RUNOFF CALCULATIONS

3.6.1 HOW TO SIZE GI

The first step of the runoff calculations was to determine the size and placement of the GI on site. This was accomplished using two procedures based on whether the 1) drainage area or 2) the GI size was the limiting factor. A rainfall depth of 1.5 inches was used for these calculations instead of the water quality storm (1.25 in over 2 hours) to add a minor factor of safety to the GI size.

1) Drainage area controls the volume and methods of capture = "GI can capture and treat **all** of the DA"

   Example: Grace Buckley Park

   Drainage Area: 5,832 sf → 1,460 sf rain garden

$$GI\ Area = \frac{Volume}{depth}$$

$$GI\ Area = \frac{\left(1.5\ in * \frac{1\ ft}{12\ in}\right) * 5{,}832\ sf}{0.5\ ft} \approx 1{,}460\ sf$$

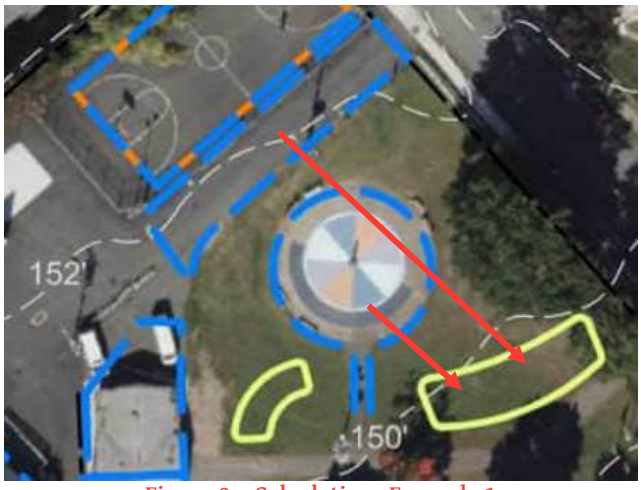


Figure 3 – Calculations Example 1

There is more space to make the rain garden bigger, but it can already manage the runoff from the contributing drainage area that flows towards that low point.

2) Ground space limits the volume and methods of capture = "GI can capture and treat **part** of the DA"

Example: Holy Tabernacle Apostolic Church

Roof Drainage Area: 1,500 sf→ 375 sf rain garden

$$GI\ Area = \frac{Volume}{storage\ depth} = \frac{DA * Rainfall\ (in)}{storage\ depth}$$

$$GI\ Area = \frac{\left(1.5\ in * \frac{1\ ft}{12\ in}\right) * 1{,}500\ sf}{0.5\ ft} \approx 375\ sf$$

Max Rain Garden Area: 200 sf → 750 sf drainage area

Rearrange the equation above and solve for the Max DA that the GI can handle

$$Max\ DA = \frac{200\ sf}{1.5\ in * \frac{1\ ft}{12\ in} * \frac{1}{0.5\ ft}} \approx 750\ sf$$

Figure 4 – Calculations Example 2

The 200 sf rain garden controls, so only half of the roof area draining in the direction of the parking lot is able to be managed.

3.6.2 WATER QUALITY AND QUANTITY CALCULATIONS

Once the GI was sized appropriate to the site conditions, the next step was to calculate the following:

- existing annual loads from the impervious cover
- water quality storm runoff volume and annual runoff volume
- TSS removal potential
- maximum volume reduction potential
- peak discharge reduction potential

ANNUAL LOADS FROM IMPERVIOUS COVER

The annual pollutant loads from impervious surfaces was calculated using the tables and procedures outlined in the NJ Stormwater BMP Manual Chapter 3. To simplify the calculations, the land cover type for every site was assumed to be commercial, with the following loads:

Land Cover	TP Load (lbs/acre/yr)	TN Load (lbs/acre/yr)	TSS Load (lbs/acre/yr)
Commercial	2.1	22	200

These pollutant loads were multiplied by the impervious area on each site to generate the existing annual pollutant loads.

RUNOFF VOLUME FROM IMPERVIOUS COVER

The existing runoff volume from impervious cover was calculated simply: $rainfall\ depth * Impervious\ area$. The annual rainfall of 47.6 inches was sourced from the NOAA National Centers for Environmental Information New Jersey State Climate Summary (2022).

GROUNDWATER RECHARGE POTENTIAL

The groundwater recharge potential was calculated using the potential management area, annual rainfall amount, and a factor of 0.95. A recharge rate of 95% was used for this conceptual level calculation considering the 2-year design storm. Further groundwater analysis would be required for full design and implementation.

TSS REMOVAL POTENTIAL

The TSS removal potential was calculated for each GI method utilizing the methods outlined in the NJ Stormwater BMP Manual Chapter 3. However, the TSS removal rate was chosen for the 2-year storm, rather than the water quality storm. With this in mind, the removal rates are as follows:

	Rain Garden / Pervious Pavement	Downspout Planter Boxes	Bioswales
TSS Removal Rate	95%	80%	68%

MAXIMUM VOLUME REDUCTION POTENTIAL

For the BMP calculations, the SCS Runoff Method was used to calculate the maximum volume reduction potential for the 2-year storm, where the 2-year rainfall event was 3.47 inches over 24 hours, adjusted for the NJDEP 2023 factors. Storms exceeding the 2-year storm were not analyzed per the scope of the study.

PEAK DISCHARGE REDUCTION POTENTIAL

The peak discharge reduction potential was calculated using the SCS Runoff Method. The time to peak was approximated because it was generating a peak value that was far too high compared to the results from HydroCAD. The approximation worked well within the range of rainfall values and typical drainage areas for conceptual level calculations.

See Appendix D for the full list of equations used.

3.7 PROBABLE COST OF CONSTRUCTION

Concept level cost estimates were developed to determine the probable cost of construction associated with implementing the proposed GI. The cost estimates serve as a crucial support for the concept plans, and provide validation for the overall feasibility of the GI study. The team's approach to determining these costs was based on an evaluation of average bid prices, current market values, and vendor prices, reflecting the dynamic nature of the construction industry.

The following table is a summary of the unit costs for each GI used to determine the construction costs:

Description	Units	Unit Price
Bioretention System	SF	$ 25.00
Porous Pavement	SF	$ 16.00
Planter Box	EA	$ 1,600.00
Tree Filter Box	EA	$ 13,200.00
Cistern	EA	$ 1,600.00

The bioretention systems and porous pavement were measured in square footage of area of the proposed GI, whereas the planters, tree filter boxes, and cisterns were quantified as individual items.

CONTINGENCIES

Mobilization is often represented as a percentage of the overall project cost. Mobilization costs encompass activities such as site preparation, deployment of personnel, equipment, and necessary resources, securing permits, and establishing temporary facilities. Generally, mobilization costs tend to be under 10% and as low as 2% of the total project costs. For simpler and shorter-duration projects, the percentage may be lower, while larger or more complex projects may require a higher mobilization percentage to account for additional coordination and logistics. For the purpose of the feasibility study, a mobilization percentage of 3% was chosen.

Given the project's status in the concept development phase, a percentage of 1% for soil erosion sediment control and a substantial contingency of 30% were factored into the cost estimate. The high contingency accounts for the inherent uncertainties and potential changes that may arise as the project progresses from the conceptual stage to more detailed planning and execution, providing a robust financial buffer to address unforeseen developments. In locations where regrading was significant and necessary for effective GI implementation, such as sites L-03 and Q-04, the estimate included an additional line item for Regrading costs.

SOURCES

Unit costs for common construction items such as asphalt, stone of various sizes, geotextile fabric, seed mixture, and excavation were based on the latest available bid price reports from New Jersey Department of Transportation (NJDOT). Bid prices can vary across different industries, regions, and types of projects; for this study, 2020-2021 bid prices from North Jersey – specifically densely populated cities – were chosen for greater accuracy in determining costs.

RSMeans was also used to verify and support unit costs. The online tool provides a comprehensive database of construction costs, including labor, materials, equipment, and overhead. Users can input project details, such as location, type of construction, and project size, to generate accurate cost estimates. For the study, Cost Data for "Commercial New Construction" was set to the City of Paterson, using costs released in 2023.

Vendor quotes were also utilized in the cost estimating process, specifically for commercially available items such as cisterns, downspout planter boxes, and tree filter boxes. These direct quotes provided real-time and accurate information on the current market prices of materials or equipment and enabled price comparison to choose the most cost-effective items.

LINE ITEM COST BREAKDOWN

When analyzing costs for each line item, each GI system was broken down into the following components and units:

Description	Components	Unit
Bioretention System	• Excavation, unclassified • Soil Bed: Bioengineered Soil Mix, 24" min. • Excavation, unclassified • 1/2" to 1-1/2" dia. crushed, washed stone, 6" thick • Geotextile Filter Fabric • Vegetation – Seeding, Native Plants	Square Feet
Porous Paving System	• Excavation, unclassified • Surface Course: - Porous Pavement, 4" thick • Choker Course: - AASHTO No. 57 crushed, washed stone • Storage Bed: - 3/4" crushed, washed stone - 1-1/2" crushed, washed stone - Pea gravel • Geotextile Filter Fabric	Square Feet
Planter Boxes	• Planter Box • Concrete Pad • Planting Soil • Native Plants	Each
Tree Filter Box	• Excavation, unclassified • Bioengineered Soil Mix, 36" min. • Underdrain Pipe • Overflow Pipe • Concrete Vault • Grate • Crushed stone • Tree	Each
Cistern	• Cistern Tank • Concrete Pad • Crushed Stone	Each

PERMITTING COSTS

Soil Conservation District certification of plans for qualifying projects exceeding 5,000 square feet of disturbance is a prerequisite to local construction permits and requires an application fee. This fee covers administrative expenses associated with permit processing, inspections, and monitoring to ensure compliance with erosion control measures. Permitting fees are detailed in Section 7.2 of the report.

EXCLUSIONS

The study and construction cost estimate excluded survey fees and design fees to simplify the cost estimation process. This decision aimed to focus on construction-related expenses, providing a clear picture of the primary costs associated with implementing GI systems.

As projects move forward into design and implementation, it will be necessary to obtain quotes from qualified surveyors and consider the scope and specifications of the survey to determine the surveying costs for a particular project. The cost estimate also did not account for soil borings and percolation tests. These assessments are necessary for understanding the soil composition and drainage characteristics of the site, key factors that influence the construction process. It is essential to acknowledge that these tests will be necessary in the later stages of the project to ensure accurate designs and compliance with environmental regulations. The cost of surveying and investigative assessments varies based on factors such as the complexity and size of the project, the level of detail required in the design, the expertise of the design professionals, and the scope of services provided.

FUTURE ESCALATIONS

GI projects are often long-term investments, so future escalations of costs must be considered in planning. Future escalation considers the potential increase in costs associated with materials, labor, and maintenance over the life of the project. Furthermore, GI systems require ongoing maintenance to ensure their effectiveness, which is discussed in detail in Section 6 Operation and Maintenance Of Green Infrastructure.

The cost estimates for the feasibility study do not incorporate an escalation rate, primarily due to the unpredictability of various factors influencing its timing. Escalation rates, which account for the anticipated increase in costs over time, can be affected by variables such as inflation, market conditions, and unforeseen economic changes. Although these factors are challenging to predict accurately, it is essential for the City of Paterson to be cognizant of the year in which these cost projections were calculated. To ensure realistic and up-to-date financial planning for future funding needs, the city should apply appropriate contingencies and escalation rates for new construction as per the Construction Cost Estimating Guidelines available on the official website for the state of New Jersey. This proactive approach can help the city track potential cost changes and manage budgetary considerations as the project progresses.

3.8 RANKING AND PRIORITIZATION

The goal of the Ranking and Prioritization (R&P) Matrix is to organize the concept designs based on a variety of factors, such as location, sewershed/CSO outfall, size of the project, green infrastructure type, estimated construction costs, runoff volume reduction, and cost per acre of treatment. Each factor analyzed is given a ranking (1 through 5) and percentage that provides a weighted rank for each project. Projects with higher ratings hit more of the long-term goals and critical factors than lower ranked projects.

During the development of the R&P Matrix, these criteria were combined or eliminated to only analyze the features that aligned with the Long-Term Control Plan (LTCP) and would aid in decision-making through the years of implementation. Care was taken to not 'double dip,' or analyze the same factor twice. An example of double dipping was in the overlap between size of the project, GI type, and volume reduction. These three criteria were simplified to volume reduction because larger sized sites had the capacity to include larger GI and capture more volume.

Refer to Appendix G for the full Ranking and Prioritization Matrix.

3.8.1 PERCENTAGE BREAKDOWN AND CATEGORIES

The final categories for the R&P matrix are:

50% - CSO Status/Sewershed Status

1 = not in combined sewer area
3 = in partially separated sewer area
5 = in combined sewer area

CSO Status/Sewershed Status was given the highest weight since the goal of this study is to identify GI projects that help meet the goal of the LTCP of implementation of GI to treat 2.5% of the impervious area within the CSO areas.

The category given the next highest weight is the Cost per Acre of Treatment. This category was found to be important since the concept designs developed in this report need to be cost effective.

15% - Cost per acre of Treatment

1 = Over $325,001
2 = $275,001 to $325,000
3 = $225,001 to $275,000
4 = $175,001 to $225,000
5 = $1,000 to $175,000

The following categories related to flooding, volume reduction, and feasibility are all given equal weight in the R&P because they are important, but not driving factors in the study.

10% - Flood Prone Area

1 = not in a flood prone area
4 = other reported flood area
5 = in an area that contributes to CSO 025 or CSO 030

10% - Volume Reduction (gallons per storm)

1 = 1 to 20,000
2 = 20,001 to 40,000
3 = 40,001 to 60,000
4 = 60,001 to 80,000
5 = 80,001 or more

10% - Feasibility: ease of construction, operation and maintenance

1 = difficult in both categories
2 = difficult in 1 categories
3 = average difficulty
4 = easy in 1 categories
5 = easy in both categories

Lastly, the extra incentives category is only weighted 5% because it is based on additional benefits a site has to offer, rather than the most significant goal of the study.

5% - Extra Incentives: schools, parks, and other sites highly visible to the public

1 = NA
5 = Applicable

3.8.2 CSO STATUS/SEWERSHED STATUS

The dominant category in the matrix is the sewershed status, set to a weight of 50%. This category drives the results of the R&P matrix because the goal of this study is to support the goal of the LTCP to reduce the volume of runoff entering the CSOs by capturing and treating 2.5% of the impervious cover within the City. Reducing the runoff volume entering the combined sewers during rain events is beneficial to the long-term goal of reducing CSO discharges from the 19 active overflow discharge points to the Passaic River because it reduces the instances of flow overtopping the weirs in the controlled discharge points. Therefore, to ensure that the sites targeted by this study are in fact connected to a CSO, combined sewersheds are prioritized over partially and fully separated sewersheds. Partially separated sewersheds are given a rating of 3 (instead of a rating of 1 for fully separated sewersheds) because the limits of the separation are not fully known.

3.8.3 COST PER ACRE OF TREATMENT

The cost per acre of treatment is the cost per acre of treated impervious area. This category elevates sites that are cost effective for the impervious area captured and treated.

$$Cost\ per\ acre\ of\ treatment = \frac{Total\ Site\ Cost\ (\$)}{Impervious\ Area\ Treated\ (acres)}$$

The limits of each rank for the cost per acre of treatment was determined by evaluating the high and low ends of all the concept designs and dividing the range into even sections.

Rank	Cost per acre of Treatment	No. of Sites
1	> $325,000	29
2	$275,001 to $325,000	11
3	$225,001 to $275,000	18
4	$175,001 to $225,000	32
5	< $175,000	5

3.8.4 FLOOD PRONE AREA

Areas prone to frequent flooding are also emphasized in this study because of the increase in frequency of higher-intensity storms. By installing GI near areas susceptible to flooding, the city will be more resilient to storms and the runoff from highly impervious areas will have an opportunity to infiltrate back into the ground, rather than flowing through the city's sewers and adding to the flow volume ending up at the treatment plants. It is important to note that GI should not be located directly in flooding areas, but in areas directly upstream of them, to reduce the volume of water reaching the flood prone areas. While these proposed GI systems will not eliminate all flooding issues, they are expected to provide some benefits, especially for smaller more frequent storm events.

Flood prone areas fell into two categories: 1) areas within sewersheds contributing to CSO-025 or CSO-030 and 2) areas within the 100-yr floodplain. For the first category, the LTCP [1] noted areas contributing to CSO-025 and CSO-030 as extremely flood prone, so those areas were given the highest rating of 5. Following these areas, sites that are located within the 100-yr floodplain were given a rating of 4. All other sites were not considered to be located in significant flood zones.

3.8.5 VOLUME REDUCTION

The amount of volume reduction provided by GI has a measurable positive impact on CSO's, supporting the LTCP, by reducing nuisance flooding, treating stormwater runoff, and promoting groundwater infiltration. Even though the volume reduction is a small portion of the total amount generated by the city as a whole, the community will benefit from reduced flooding from typical nuisance storms (small volume storms, such as the water quality storm of 1.25 inches of precipitation over 2 hours).

The rank for volume reduction is based on the following scale:

Rank	Volume Reduction	No. of Sites
1	< 20,000	27
2	20,001 to 40,000	29
3	40,001 to 60,000	13
4	60,001 to 80,000	11
5	>80,000	15

The limits of the volume reduction ranges were determined by analyzing of all of the volume reduction values for the concept designs and developing five ranges that provide a reasonable and expected distribution. The range for rank 3 was then compared to the average value of 45,724 gallons per storm, making sure the average was within its limits. The quantity of rank 5 sites increased in comparison to the rank 4 sites because the larger sites, such as JFK High School and Pennington Park, are significantly larger than the typical site size.

3.8.6 FEASIBILITY

Feasibility was assessed in two areas: 1) ease of construction and 2) ease of operation and maintenance. By evaluating these two aspects of feasibility, each concept design is evaluated in the short-term and long-term, where the short term considers the difficulty to construct or install the GI, and the long-term considers the difficulty or ease of maintaining the GI. This is an important aspect of the R&P, despite only being weighted 10%, because it will slightly boost or reduce the rank of sites in proximity to one another, providing clear direction to prioritize more feasible sites.

[1] See pages 25 and 30 in Appendix N of the PVSC Treatment District Regional LTCP: *Selection and Implementation of Alternatives Report for City of Paterson*, prepared by the Passaic Valley Sewerage Commission.

Construction was determined to be easy (or more feasible) if improvements were already planned for that site because the GI could be added into an existing project. Construction was determined to be difficult (or less feasible) when construction windows were limited, such as schools where construction could only occur when school is not in session, or if there were existing limitations, such as a retaining wall or single access road.

Operation and maintenance was considered easy when site conditions were optimal, such as gentle slopes and easy access points. Operation and maintenance was considered difficult when surrounding slopes were steep and access points were limited.

3.8.7 EXTRA INCENTIVES

Schools, parks, and other highly visible locations are incentivized and given a 5% weight in the R&P Matrix. Schools are special locations because the City of Paterson is a participant in the Cities Connecting Children through Nature (CCCN) initiative, led by the Children and Nature Network and the National League of Cities. The goal of this initiative is to provide children with equitable access to the benefits of nature. Therefore, all schools examined through the concept development process received extra attention to find opportunities to install rain gardens, planter boxes, and other types of GI that provide natural benefits. They also received a small 5% boost in the matrix.

In addition to schools, parks are also given extra consideration because parks provide benefits to the surrounding communities. Outlined in the Paterson Parks Vision Report (2021), Paterson has goals to 1) upgrade existing parks 2) add new parks and recreational facilities and 3) enhance the City's environmental and public health. The addition of GI to existing parks ties in with goals 1 and 3.

Beyond just schools and parks, a handful of additional sites were elevated due to their level of visibility to the residents and visitors of Paterson. These sites include:

- N-01 Brooks Sloate Terrace
- P-01 Paterson City Council
- Q-03 Court House Plaza

3.8.8 SUMMARY

The purpose of the R&P matrix is to convey which sites offer the greatest benefits to the City and how efficient they are at doing so. As a result, the City can prioritize and implement the sites that rank the highest, within the limits of their budget. Based solely on the current site ranking, the top five sites are:

- K-01 Barnet Medical Arts Parking Lot 1
- A-08 Pennington Park
- K-06 Paterson Public School 26
- A-01 College Achieve Paterson Charter School (Elementary Campus)
- A-02 International High School

While these sites might be listed as the top five, the R&P matrix can be updated and sorted as priorities change and evolve through the years. In this way, the matrix gives flexibility for the City to plan and prioritize both short-term and long-term projects to meet not only the current conditions within the City, but to also adapt to future circumstances as well.

4 RECOMMENDED GI PROJECTS

4.1 INTRODUCTION

Detailed concept plans and calculations for each project are provided in Appendix A. This section provides an overview and summary of the projects, including impervious area treated, annual runoff reduction, and sewershed impact. Detailed project information by CSO Sewershed is discussed further in this section and includes probable cost of construction. Detailed cost estimates, support information, and explanations are provided for in Section 3.5 and Appendix E.

See Table 4-1 below for an overall citywide summary of the concept plans presented in this study.

Table 4-1 City of Paterson Overall Green Infrastructure Project Summary

CSO SEWERSHED	TOTAL IMPERVIOUS AREA MANAGED (ACRES)	TOTAL ANNUAL RUNOFF REDUCTION (MGAL/YR)	NO. OF BIORETENTION SYSTEM PROJECTS	NO. OF POROUS PAVEMENT PROJECTS	NO. OF PLANTER PROJECTS
C-01	7.332	8.491	8	10	5
C-02A	0.520	0.590	3	2	1
C-02B	3.056	3.636	3	5	0
C-03	0.605	0.742	2	4	0
C-04	1.064	1.282	1	2	1
C-05	0.183	0.191	0	1	1
C-06	0.384	0.472	0	1	0
C-07	2.450	3.008	4	5	1
C-08	0.324	0.398	0	1	0
C-10	0.415	0.456	1	1	1
C-11	4.963	5.712	9	9	2
C-12	6.251	7.235	7	9	3
C-15	3.509	3.935	4	6	5
PF-01	7.362	8.712	5	6	1
PF-02	0.068	0.038	1	0	1
PF-06	1.705	2.094	0	2	0
PF-07	7.667	9.201	11	11	4
PF-16	0.760	0.776	1	1	1
S-08	0.676	0.745	1	1	1
S-09	1.719	1.893	1	2	1
TOTALS	**51.015**	**59.607**	**62**	**79**	**29**

Figure 1.0 in Appendix A provides a citywide overview of the location of all the concept plans discussed in this report.

4.2 SEWERSHED C-01

Sewershed C-01 intersects Ward 2 and Ward 5 in the west side of the City and south of the Passaic River. The combined sewer collects runoff from approximately 423 acres and connects to CSO-001, with 62% of that area being impervious surfaces. There are nine schools and five parks within this area.

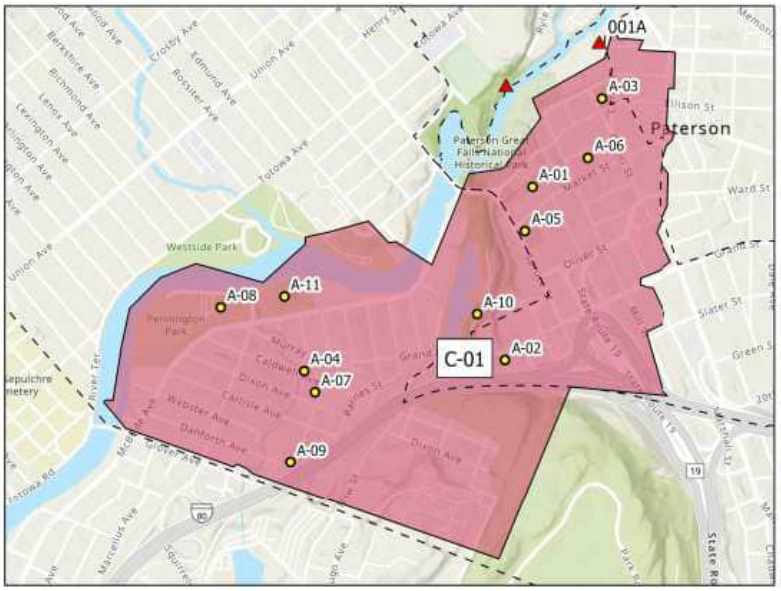


Figure 5: Sewershed C-01, Site IDs, and CSO Outfall

Table 4-2 Sewershed C-01 Site List

SITE ID	SITE NAME	IMPERVIOUS AREA MANAGED		PROBABLE COST OF CONSTRUCTION
		ACRES	SF	
A-01	College Achieve Paterson Charter School (Elementary Campus)	0.956	41,660	$192,785
A-02	International High School	1.020	44,415	$220,115
A-03	Lou Costello Memorial Park	0.306	13,310	$79,800
A-04	Our Lady of Pompei Church	0.168	7,300	$28,640
A-05	Paterson Museum	0.750	32,650	$167,920
A-06	Paterson Public School No. 2	0.946	41,220	$275,345
A-07	Paterson Public School No. 7	0.482	21,000	$89,440
A-08	Pennington Park	1.524	66,390	$479,930
A-09	St. Bonaventure's Roman Catholic Church	0.499	21,750	$138,750
A-10	Upper Raceway Park	0.528	23,000	$207,850
A-11	Veteran's Memorial Park	0.153	6,680	$57,775
TOTALS		**7.332**	**319,375**	**$1,938,350**

4.3 SEWERSHED C-02A

Sewershed C-02A is located in Ward 1 north of the Passaic River. The combined sewer collects runoff from approximately 48 acres and culminates at CSO-017, with 79% of that area being impervious surfaces. There are two schools and zero parks in this area.

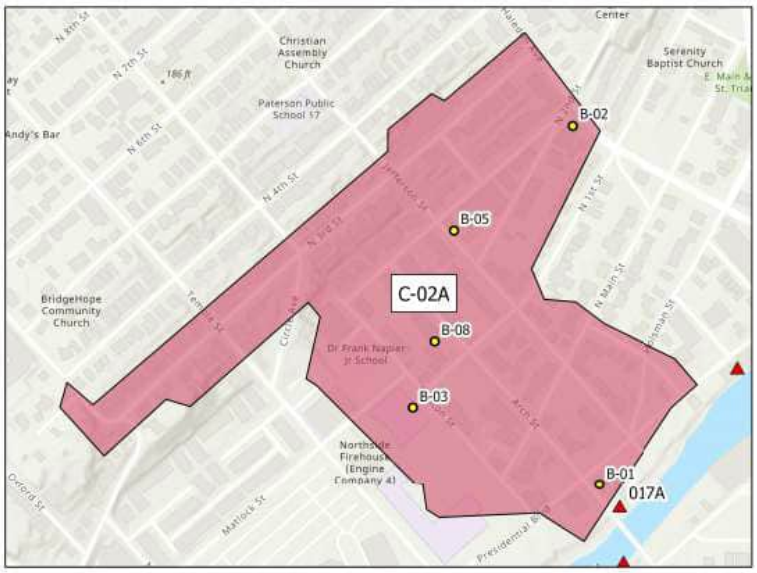


Figure 6: Sewershed C-02A, Site IDs, and CSO Outfall

Table 4-3 Sewershed C-02A Site List

SITE ID	SITE NAME	IMPERVIOUS AREA MANAGED		CONSTRUCTION COST
		ACRES	SF	
B-01	Arch St Parking Lot	0.052	2,275	$10,810
B-02	Church of Jesus Christ	0.039	1,690	$38,950
B-03	Dr Frank Napier Jr. School of Technology	0.267	11,640	$99,050
B-05	Northside Community Chapel Church	0.122	5,336	$25,580
B-08	CAMP Youth Development Program	0.039	1,704	$14,375
TOTALS		**0.520**	**22,645**	**$188,765**

4.4 SEWERSHED C-02B

Sewershed C-02B is located in Ward 1 north of the Passaic River. The combined sewer collects runoff from approximately 290 acres and culminated at CSO-016, with 81% of that area being impervious surfaces. There are three schools and zero parks in this area.

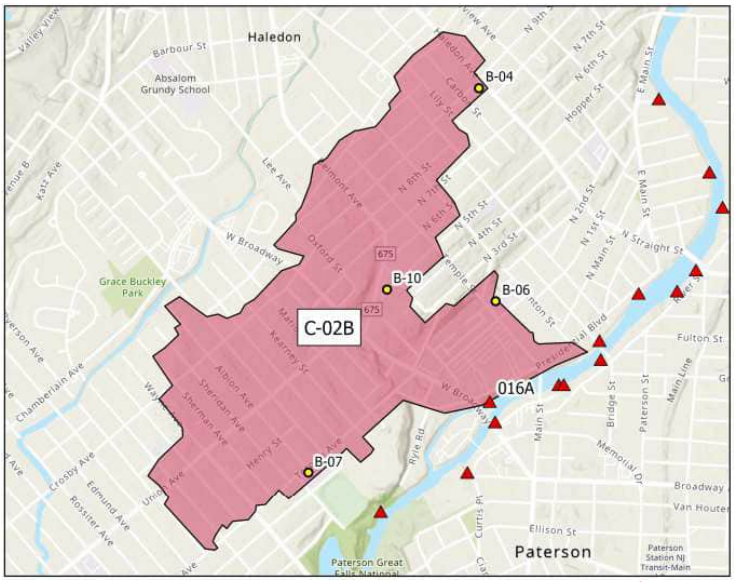


Figure 7: Sewershed C-02B, Site IDs, and CSO Outfall

Table 4-4 Sewershed C-02B Site List

SITE ID	SITE NAME	IMPERVIOUS AREA MANAGED		CONSTRUCTION COST
		ACRES	SF	
B-04	Faith Soul Saving Station	0.528	23,015	$109,475
B-06	Paterson Free Public Library (Northside)	0.409	17,818	$76,530
B-07	Paterson Public School No. 5	0.844	36,750	$198,890
B-09	St. Mary Help of Christians Roman Catholic Church	0.780	34,025	$145,790
B-10	Belmont Senior Apartments	0.494	21,515	$83,090
TOTALS		**3.056**	**133,123**	**$613,775**

4.5 SEWERSHED C-03

Sewershed C-03 is located in Ward 1 north of the Passaic River. The combined sewer collects runoff from approximately 77 acres and culminates at CSO-032, with 44% of that area being impervious surfaces. There are two schools and one park in this area.

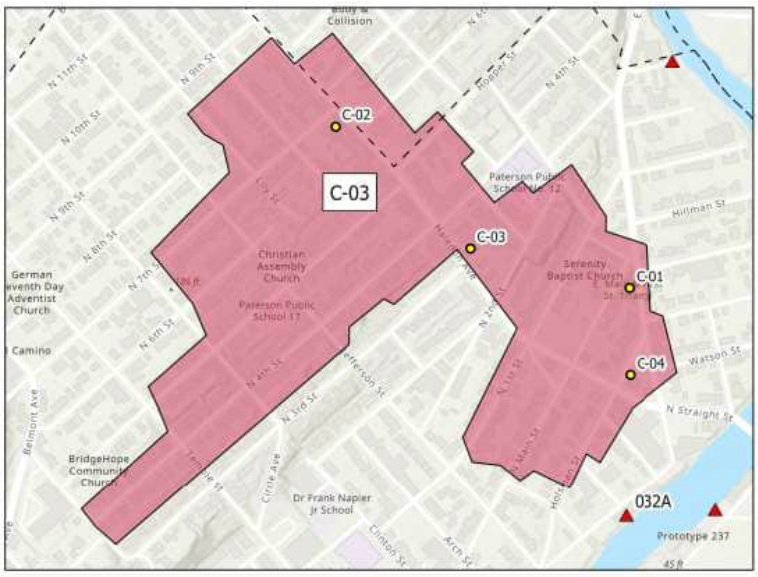


Figure 8: Sewershed C-03, Site IDs, and CSO Outfall

Table 4-5 Sewershed C-03 Site List

SITE ID	SITE NAME	IMPERVIOUS AREA MANAGED		CONSTRUCTION COST
		ACRES	SF	
C-01	Cobb Park	0.043	1,860	$40,850
C-02	Gilmore Memorial Christian	0.166	7,245	$39,080
C-03	Gilmore Memorial Tabernacle	0.233	10,170	$40,030
C-04	Holy Tabernacle Apostolic Church	0.163	7,083	$35,550
TOTALS		**0.605**	**26,358**	**$155,501**

4.6 SEWERSHED C-04

Sewershed C-04 is located in Ward 1 north of the Passaic River. The combined sewer collects runoff from approximately 43 acres and culminates at CSO-021, with 62% of that area being impervious surfaces. There is one school and zero parks in this area.

Figure 9: Sewershed C-04, Site IDs, and CSO Outfall

Table 4-6 Sewershed C-04 Site List

SITE ID	SITE NAME	IMPERVIOUS AREA MANAGED		CONSTRUCTION COST
		ACRES	SF	
D-01	Christ Temple Baptist Church	0.580	25,245	$126,530
D-02	Paterson Public School #12	0.484	21,100	$94,640
TOTALS		**1.064**	**46,345**	**$221,170**

4.7 SEWERSHED C-05

Sewershed C-05 is located in Ward 1 south of the Passaic River. The combined sewer collects runoff from approximately 15 acres and culminates at CSO-005, with 82% of that area being impervious surfaces. There are zero schools and zero parks in this area.

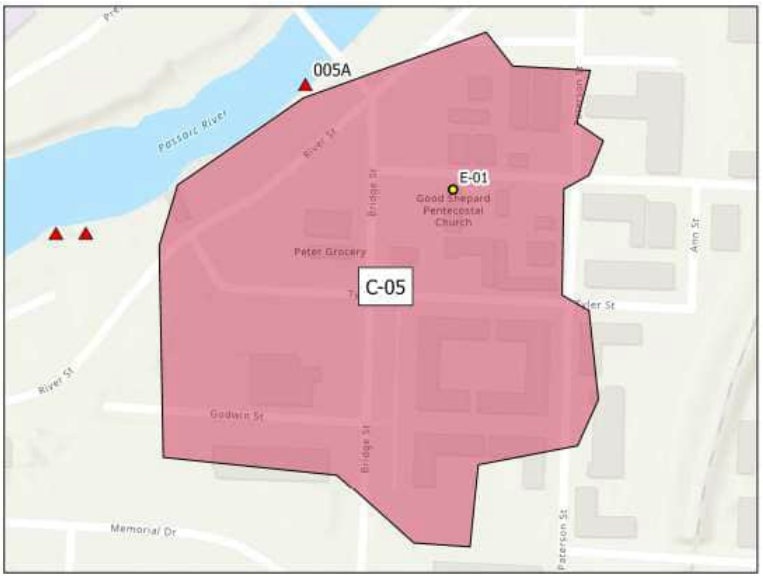


Figure 10: Sewershed C-04, Site IDs, and CSO Outfall

Table 4-7 Sewershed C-05 Site List

SITE ID	SITE NAME	IMPERVIOUS AREA MANAGED		CONSTRUCTION COST
		ACRES	SF	
E-01	Iglesia Pentecostal El Buen Pastor (Church)	0.183	7,992	$37,020
TOTALS		**0.183**	**7,992**	**$37,020**

4.8 SEWERSHED C-06

Sewershed C-06 intersects Ward 1 and Ward 4 south of the Passaic River. The combined sewer collects runoff from approximately 22 acres and culminates at CSO-006, with 82% of that area being impervious surfaces. There are zero schools and one park in this area. The Main Line railroad crosses through the southern half of the sewershed.

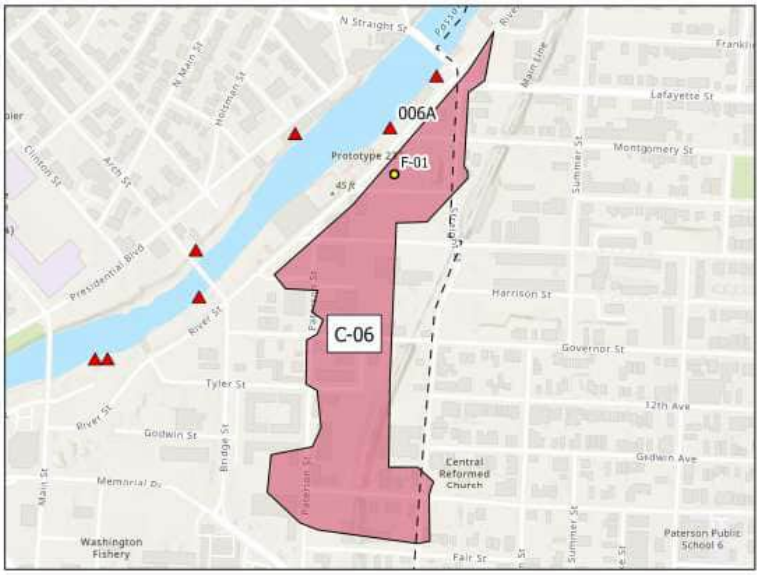


Figure 11: Sewershed C-06, Site IDs, and CSO Outfall

Table 4-8 Sewershed C-06 Site List

SITE ID	SITE NAME	IMPERVIOUS AREA MANAGED		CONSTRUCTION COST
		ACRES	SF	
F-01	Dog Park Lawrence St	0.384	16,732	$65,800
TOTALS		**0.384**	**16,732**	**$65,800**

4.9 SEWERSHED C-07

Sewershed C-07 is located south of the Passaic River with most of its area located in Ward 4 except for a sliver on the west side intersecting Ward 1. The combined sewer collects runoff from approximately 121 acres and culminates at CSO-007, with 81% of that area being impervious surfaces. There is one school and two parks in this area. The Main Line railroad crosses through the western edge of this area.

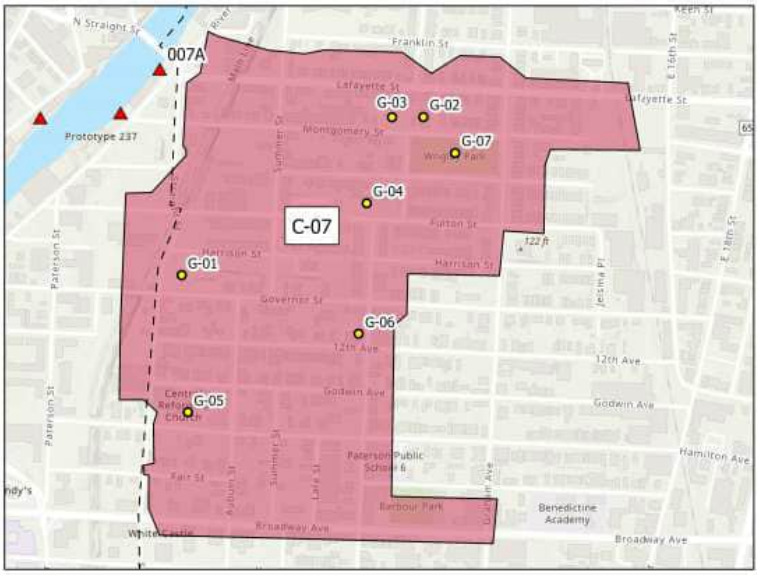


Figure 12: Sewershed C-07, Site IDs, and CSO Outfall

Table 4-9 Sewershed C-07 Site List

SITE ID	SITE NAME	IMPERVIOUS AREA MANAGED		CONSTRUCTION COST
		ACRES	SF	
G-01	Freedom Village Apartments	0.854	37,185	$292,980
G-02	Grace Gospel Church	0.062	2,710	$22.900
G-03	Grace Gospel Church Parking Lot	0.149	6,480	$25,110
G-04	Mercer St & Fulton St Public Land	0.358	15,590	$134,500
G-05	New Life Evangelist Center	0.274	11,915	$86,740
G-06	Second Baptist Church	0.451	19,635	$105,240
G-07	Wrigley Park	0.304	13,225	$277,490
TOTALS		**2.450**	**106,740**	**$944,960**

4.10 SEWERSHED C-08

Sewershed C-08 is located in the center of Ward 4, with a sliver at the north end peeking into Ward 3. The combined sewer collects runoff from approximately 111 acres and culminates at CSO-010, with 87% of that area being impervious surfaces. There is one school and zero parks in this area.

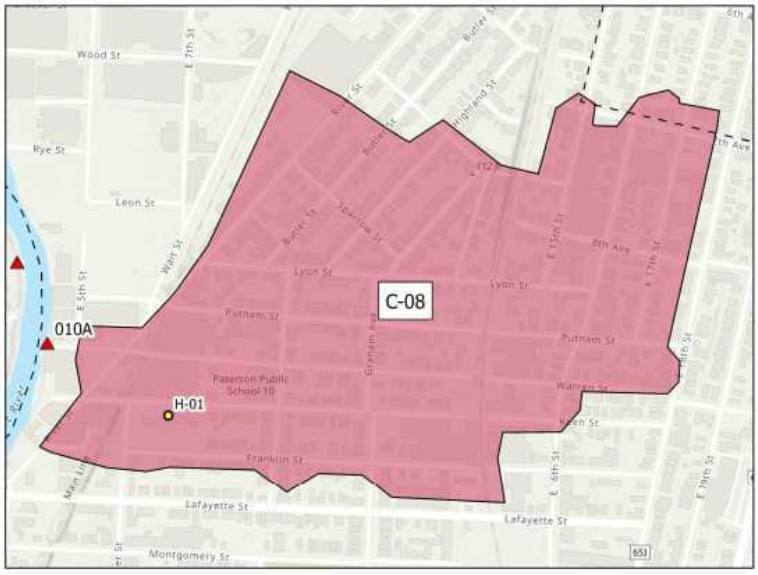


Figure 13: Sewershed C-08, Site IDs, and CSO Outfall

Table 4-10 Sewershed C-08 Site List

SITE ID	SITE NAME	IMPERVIOUS AREA MANAGED		CONSTRUCTION COST
		ACRES	SF	
H-01	Nathan Barnert Residence	0.324	14,125	$86,270
TOTALS		**0.324**	**14,125**	**$86,270**

4.11 SEWERSHED C-10

Sewershed C-10 is located on the eastern side of Ward 4 and overlaps into Ward 3. The combined sewer collects runoff from approximately 257 acres and culminates at CSO-025, with 86% of that area being impervious surfaces. There is one school and one park in this area. The Main Line railroad crosses through the western edge of the sewershed.

Figure 14: Sewershed C-10, Site IDs, and CSO Outfall

Table 4-11 Sewershed C-10 Site List

SITE ID	SITE NAME	IMPERVIOUS AREA MANAGED		CONSTRUCTION COST
		ACRES	SF	
J-01	Paterson Public School No. 21	0.415	18,065	$208,310
TOTALS		**0.415**	**18,065**	**$208,310**

4.12 SEWERSHED C-11

Sewershed C-11 intersects Wards 3, 4, and 5, spanning from Graham Avenue to East Side Park. The combined sewer collects runoff from approximately 412 acres and culminates at CSO-025, with 79% of that area being impervious surfaces. There are seven schools and zero parks in this area.

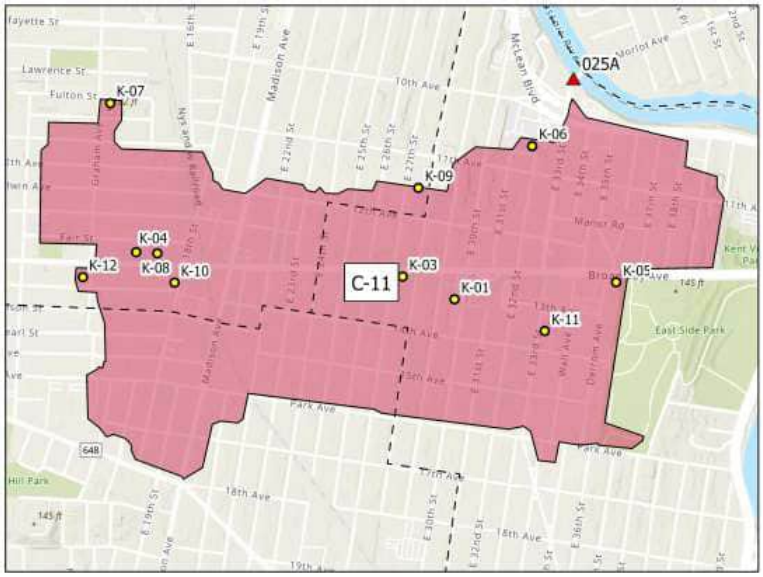


Figure 15: Sewershed C-11, Site IDs, and CSO Outfall

Table 4-12 Sewershed C-11 Site List

SITE ID	SITE NAME	IMPERVIOUS AREA MANAGED		CONSTRUCTION COST
		ACRES	SF	
K-01	Barnet Medical Arts Parking Lot 1	1.299	56,574	$254,900
K-03	Faith Chapel Reformed Church	0.084	3,660	$34,925
K-04	Love of Jesus Paterson	0.687	29,910	$152,158
K-05	Manara College	0.067	2,935	$23,845
K-06	Paterson Public School 26	0.903	39,334	$266,195
K-07	Paterson Adult Day Center	0.346	15,055	$89,955
K-08	Radio Vision Cristiana	0.449	19,580	$94,770
K-09	Rosa L. Parks School of Fine & Performing Arts	0.167	7,290	$40,290
K-10	St. Paul's Episcopal Church	0.348	15,140	$104,895
K-11	St. Therese Roman Catholic Church	0.342	14,880	$61,880
K-12	United Presbyterian Church	0.272	11,840	$64,320
TOTALS		**4.963**	**216,198**	**$1,188,133**

4.13 SEWERSHED C-12

Sewershed C-12 intersects Wards 3, 5, and 6, spanning area both above and below Route 80. The combined sewer collects runoff from approximately 1,031 acres and culminates at CSO-027, with 86% of that area being impervious surfaces. There are ten schools and four parks in this area. Saint Joseph's Medical Center is located at the southwest corner of this sewershed.

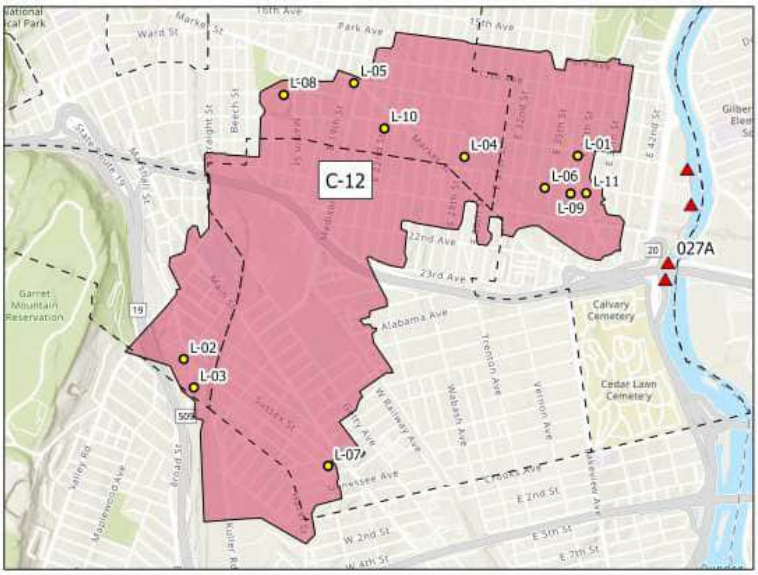


Figure 16: Sewershed C-12, Site IDs, and CSO Outfall

Table 4-13 Sewershed C-12 Site List

SITE ID	SITE NAME	IMPERVIOUS AREA MANAGED		CONSTRUCTION COST
		ACRES	SF	
L-01	Amidstad Park	0.021	900	$7,715
L-02	Brandes Field Playground	0.339	14,750	$71,800
L-03	Dr. Hani Awadallah School	0.804	35,035	$314,093
L-04	Dr. Martin Luther King Jr. Public School	0.960	41,815	$252,055
L-05	Full Service Community Center	0.137	5,955	$28,210
L-06	GBCA Paterson Head Start	0.739	32,200	$176,350
L-07	Maurice J. Brick Residence	0.539	23,475	$158,660
L-08	Paterson Public School 15	1.891	82,370	$529,320
L-09	Paterson Public School 20	0.308	13,396	$67,760
L-10	Paterson Public School 24	0.424	18,475	$162,660
L-11	Vreeland Park	0.090	3,925	$26,910
TOTALS		**6.251**	**272,296**	**$1,836,303**

4.14 SEWERSHED C-15

Sewershed C-15 is located in the eastern half of Ward 6 and the southern tip of Ward 3. The combined sewer collects runoff from approximately 427 acres and culminates at CSO-031, with 78% of that area being impervious surfaces. There are three schools and zero parks in this area. A notable feature in this area are the Calvary and Cedar Lawn cemeteries.

Figure 17: Sewershed C-15, Site IDs, and CSO Outfall

Table 4-14 Sewershed C-15 Site List

SITE ID	SITE NAME	IMPERVIOUS AREA MANAGED		CONSTRUCTION COST
		ACRES	SF	
M-01	Heritage at Alexander Hamilton	0.399	17,390	$82,010
M-02	Kingdom Hall of Jehovah's Witnesses	0.318	13,870	$74,350
M-03	Paterson Art & Science Charter School	0.365	15,890	$82,740
M-04	Paterson Public School 25	1.303	56,745	$249,020
M-05	St. George Syro Malabar Catholic Church	0.618	26,900	$125,320
M-06	United Islamic Center (Mosque)	0.506	22,055	$105,130
TOTALS		**3.509**	**152,850**	**$892,260**

4.15 SEWERSHED PF-01

Sewershed PF-01 is located in Ward 2 and Ward 1 north of the Passaic River. The partially separated sewer collects runoff from approximately 680 acres, with 63% of that area being impervious surfaces. There are five schools and two parks in this area. Molly Ann Brook, Westside Park, John F Kennedy High School, and Brooks Sloate Terrace are significant features of this sewershed.

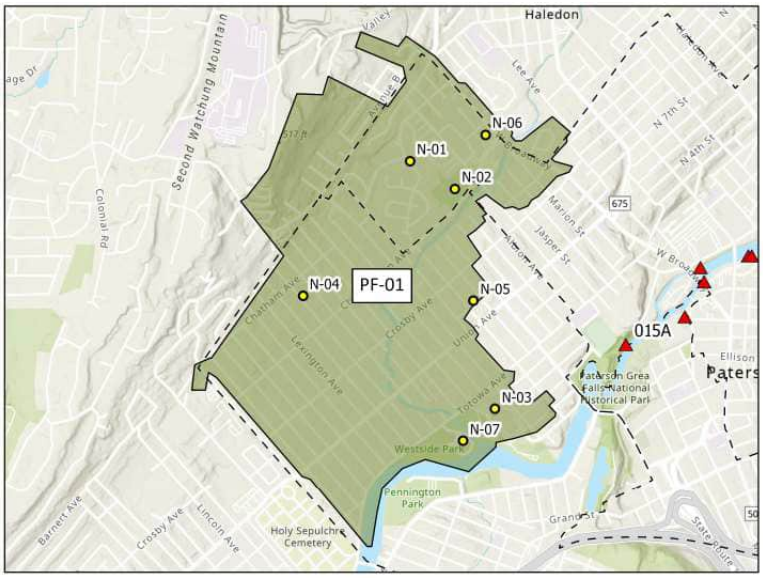


Figure 18: Sewershed PF-01, Site IDs, and CSO Outfall

Table 4-15 Sewershed PF-01 Site List

SITE ID	SITE NAME	IMPERVIOUS AREA MANAGED		CONSTRUCTION COST
		ACRES	SF	
N-01	Brooks Sloate Terrace	1.271	55,355	$322,700
N-02	Grace Buckley Park	0.607	26,432	$225,850
N-03	John F Kennedy High School	2.370	103,265	$580,530
N-04	Paterson Public School No. 27	0.580	25,075	$103,920
N-05	Paterson Public School 19	0.020	701	$73,015
N-06	St. Gerard Majella Roman Catholic Church	1.072	46,700	$528,430
N-07	Westside Park	1.450	63,165	$592,465
TOTALS		**7.362**	**320,693**	**$2,426,910**

4.16 SEWERSHED PF-02

Sewershed PF-02 is located in Wards 1 and 2 north of the Passaic River. The partially separated sewer collects runoff from approximately 58 acres, with 66% of that area being impervious surfaces. There are zero schools and one park in this area. The significant features of this sewershed include Hinchlife Stadium and the Great Falls Park.

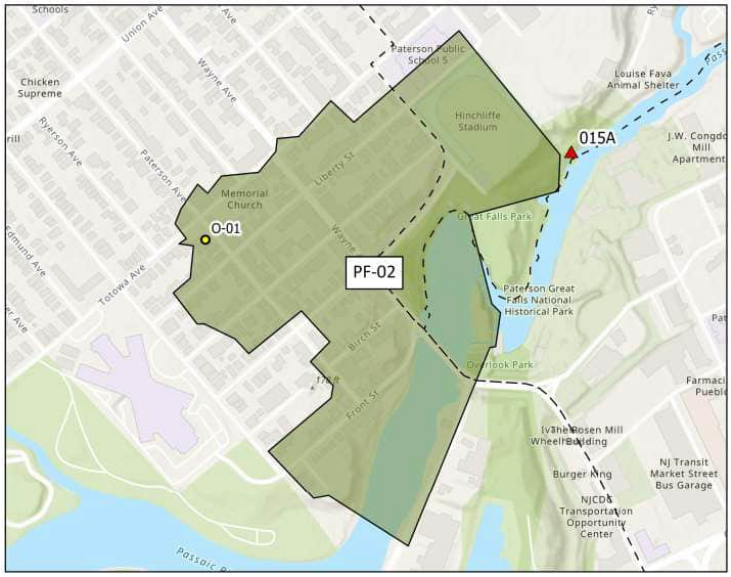


Figure 19: Sewershed PF-02, Site IDs, and CSO Outfall

Table 4-16 Sewershed PF-02 Site List

SITE ID	SITE NAME	IMPERVIOUS AREA MANAGED		CONSTRUCTION COST
		ACRES	SF	
O-01	Iglesia Nuevo Nacimiento 'New Birth' (Church)	0.068	2,975	$28,070
TOTALS		**0.068**	**2,975**	**$28,070**

4.17 SEWERSHED PF-06

Sewershed PF-06 is located in Ward 1 south of the Passaic River. The partially separated sewer collects runoff from approximately 32 acres, with 89% of that area being impervious surfaces. There are two schools and zero parks in this area. Significant locations in this sewershed are the Memorial Drive safety complex and Passaic County Community College.

Figure 20: Sewershed PF-06, Site IDs, and CSO Outfall

Table 4-17 Sewershed PF-06 Site List

SITE ID	SITE NAME	IMPERVIOUS AREA MANAGED		CONSTRUCTION COST
		ACRES	SF	
P-01	Paterson City Council	0.078	3,405	$15,470
P-02	Dr. Frank X. Graves Public Safety Complex	1.627	70,875	$501,110
TOTALS		**1.705**	**74,280**	**$516,580**

4.18 SEWERSHED PF-07

Sewershed PF-07 is located mostly in Ward 5, but also intersects with Wards 1, 4, and 6. The partially separated sewer collects runoff from approximately 336 acres, with 92% of that area being impervious surfaces. There are eleven schools and two parks in this area. Notable locations in this sewershed are the Paterson Station for NJ Transit and Bergen County Line, Sandy Hill Park, and the Center City Mall.

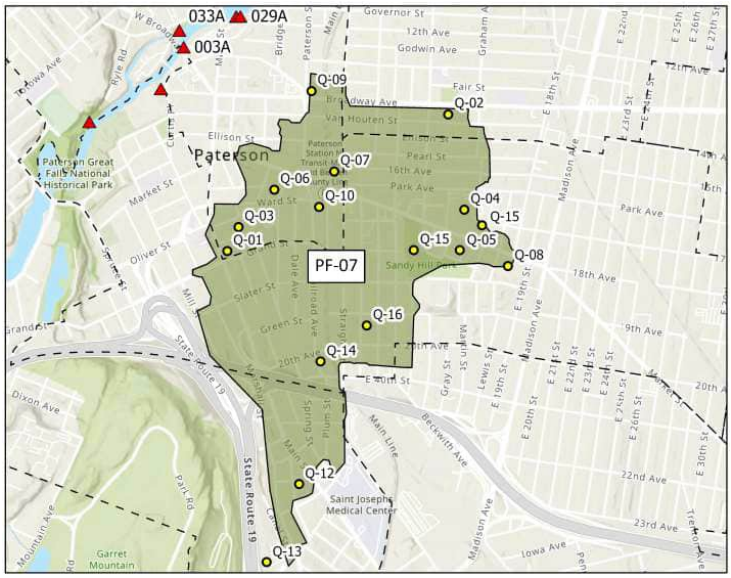


Figure 21: Sewershed PF-07, Site IDs, and CSO Outfall

Table 4-18 Sewershed PF-07 Site List

SITE ID	SITE NAME	IMPERVIOUS AREA MANAGED		CONSTRUCTION COST
		ACRES	SF	
Q-01	Cathedral of St. John the Baptist	0.234	10,175	$86,035
Q-02	Christian Fellowship Center	0.106	4,610	$23,210
Q-03	Court House Plaza	0.101	4,420	$45,400
Q-04	Eastside High School	2.257	98,320	$487,090
Q-05	Greater Bible Way Church	0.538	23,425	$115,295
Q-06	Internal Revenue Service (IRS) Taxpayer Assistance Center	0.190	8,272	$74,720
Q-07	Memorial Day School Georgette Hauser Campus	0.157	6,836	$37,760
Q-08	New Roberto Clemente School	0.770	33,525	$267,175
Q-09	Our Lady of Victories Roman Catholic Church	0.283	12,310	$63,345
Q-10	Park Railroad Ave	0.041	1,805	$15,430
Q-12	Paterson Public School 8	0.310	13,570	$77,910
Q-13	Paterson Public Works Department	0.390	16,955	$68,290
Q-14	Railroad Ave Open Space	0.298	12,985	$101,395
Q-15	Roberto Clemente Park	0.919	40,040	$204,520
Q-16	St. Anthony of Padua Roman Catholic Church	1.164	50,710	$320,030
TOTALS		**7.667**	**333,989**	**$1,987,605**

4.19 SEWERSHED PF-16

Sewershed PF-16 is located at the northern tip of Ward 3. The partially separated sewer collects runoff from approximately 28 acres, with 94% of that area being impervious surfaces. There is one school and zero parks in this area.

Figure 22: Sewershed PF-16, Site IDs, and CSO Outfall

Table 4-19 Sewershed PF-16 Site List

SITE ID	SITE NAME	IMPERVIOUS AREA MANAGED		CONSTRUCTION COST
		ACRES	SF	
S-01	Paterson Public School 18	0.760	33,118	$182,720
TOTALS		**0.760**	**33,118**	**$182,720**

4.20 SEWERSHED S-08

Sewershed S-08 is located in Ward 3 north of Broadway Avenue. The fully separated sewer collects runoff from approximately 33 acres, with 50% of that area being impervious surfaces. There are zero schools and zero parks in this area.

Figure 23: Sewershed S-08, Site IDs, and CSO Outfall

Table 4-20 Sewershed S-08 Site List

SITE ID	SITE NAME	IMPERVIOUS AREA MANAGED		CONSTRUCTION COST
		ACRES	SF	
T-01	The Church of Jesus Christ of Latter-day Saints	0.676	29,425	$137,880
TOTALS		**0.676**	**29,425**	**$147,375**

4.21 SEWERSHED S-09

Sewershed S-09 is located in the easternmost edge of Ward 3. The fully separated sewer collects runoff from approximately 82 acres, with 37% of that area being impervious surfaces. There is one school and two parks in this area. A significant location in this sewershed is Christopher Columbus Park.

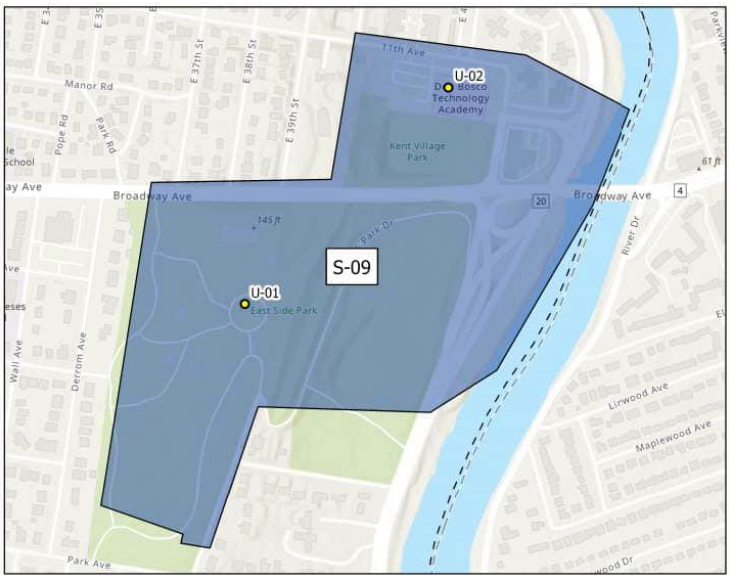


Figure 24: Sewershed S-09, Site IDs, and CSO Outfall

Table 4-21 Sewershed S-09 Site List

SITE ID	SITE NAME	IMPERVIOUS AREA MANAGED		CONSTRUCTION COST
		ACRES	SF	
U-01	Christopher Columbus Park	1.045	45,520	$443,500
U-02	Paterson STEAM High School	0.674	29,375	$214,190
TOTALS		**1.719**	**74,895**	**$657,690**

5 GREEN INFRASTRUCTURE OPTIONS

5.1 INTRODUCTION

A green infrastructure feasibility analysis was performed to address the requirements laid out in the LTCP and the city's scope of work. The analyses for the study were performed in accordance with NJAC 7:8 Stormwater Management regulations and the current NJ Stormwater BMP manual.

The following subsections provide a discussion of New Jersey accepted GI systems proposed in this study to address the city's goal to reduce CSO's through GI implementation. While the main goal of these GI systems is to reduce CSO's, they have benefits to the City of Paterson and surrounding nature resources.

The benefits of GI fall into three categories: environmental, social, and economic; all of which work toward a sustainable stormwater management practice. Environmental advances include improvement in air quality and reductions in pollutant loadings, carbon emissions, and suspended solids. Other ecological benefits include enhanced groundwater recharge, improved wildlife habitat, and reduced surface and basement flooding. Social enhancements to the City of Paterson encompass improvements in aesthetics and quality of life, increases in recreational opportunities, promotion of urban green spaces, and reduction of heat island effects. Economic factors include improvements in property values, rent/lease pricing, as well as increased retail sales, the creation of green job opportunities, the optimization of gray infrastructure which can lead to reduced maintenance costs in traditional systems, and a reduction in water treatment or pumping requirements and energy usage for heating and cooling. As opposed to traditional systems which mainly focus on economics, GI utilization incorporates benefits to all three categories into a sustainable network which improves the community's well-being.

In addition to stormwater treatment and total suspended solids (TSS) removal, many GI practices reduce the amount of nutrients that enter the discharge point waterbodies via vegetative uptake, infiltration, filtering, and a variety of biological and physical mechanisms. When these excess nutrients, such as nitrogen and phosphorus, enter the discharge point waterbody it can lead to abundant algal blooms and hypoxic or *dead-zones* which lack basic benthic activity, vegetation, and result in fish-kills. In 2020 the New Jersey Department of Environmental Protection (NJDEP) announced that the Passaic River was under advisory due to cyanobacterial harmful algae blooms (HABs) due to an excessive discharge of nitrogen and phosphorus. GI nutrient removal rates are dependent upon the practice selection, implementation, and site conditions. It may be beneficial to consider BMPs which strongly reduce nutrient loading rates in regions which discharge a large volume of stormwater to designated advisory areas based on the NJDEP to reduce risk of algal blooms in addition to the implementation of effective stormwater management.

5.2 BIORETENTION SYSTEMS

Small-scale bioretention systems, such as rain gardens and bioswales, are GI stormwater management facilities which address stormwater quality and quantity impacts of land development. The systems consist of a soil bed planted with vegetation; it can be an underdrain system, or runoff can infiltrate into the subsoil via vertical permeation. Pollutant treatment occurs through the settling process, infiltration, biological uptake, and filtration by the vegetation. The systems remove a wide range of pollutants including suspended solids, nutrients, metals, hydrocarbons, and bacteria. The TSS removal rate is 80-90% and nutrient removal rates are up to 90% dependent upon the vegetation selected and soil bed depth.

Types of small-scale bioretention systems include rain gardens, stormwater planters, downspout planter boxes, street trenches, bioswales, and enhanced and continuous tree filter boxes. Small-scale bioretention systems manage stormwater runoff close to its source, their small scale and versatile nature allows for flexible applicability, size, and location, thereby granting their incorporation into sites with space limitations.

Refer to Section 6.2.1 for the operation and maintenance of small-scale bioretention systems.

Figure 25 - Bioretention System Section View (Source: Canyon Region Water Authority)

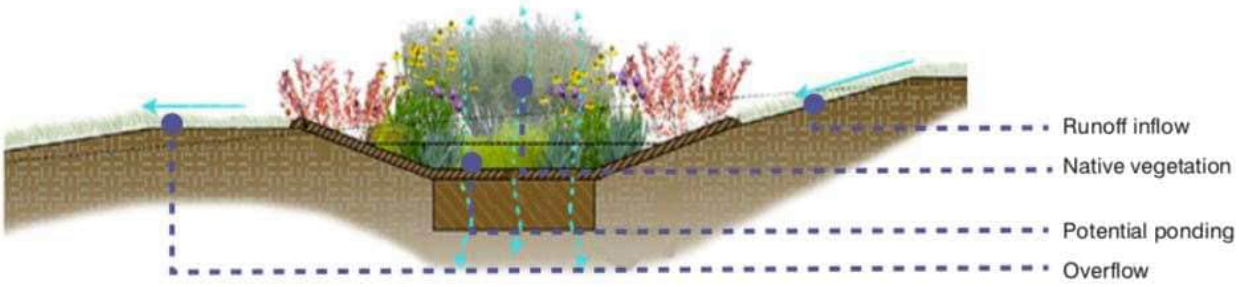


Table 5-1 Green Infrastructure Technology: Bioretention Systems

ADVANTAGES	DISADVANTAGES
Reduces stormwater runoff quantity Treats pollutants such as suspended solids, nutrients, metals, hydrocarbons, and bacteria Recharges groundwater TSS Removal Rate: 80-90% Maximum Drain Time: 72 hours Reduced Surface Ponding Flexible Application / Location Wide Variety of Shapes and Sizes to Accommodate Space Limitations Improved Air Quality Reduced Carbon Emissions Reduced Heat Island Effect Community Aesthetic Improvement Maintenance can be easily performed by municipal Department of Public Work's (DPW) with already on-hand maintenance equipment Life Expectancy: 30 years Nutrient Removal Rates: Average 90% Phosphorus Removal Rate: 60% Nitrogen Removal Rate: 30%	Prohibited in areas where high pollutant or sediment loading is anticipated. Increased operation and maintenance requirements. Design limitations where there is high groundwater or poor infiltration rates into the subsoil.

5.3 POROUS PAVING SYSTEMS

A porous or pervious paving system is a GI system used to address land development impacts, stormwater runoff quality, and stormwater runoff quantity. The system consists of durable, permeable surface course which allows water to move through it freely. The surface course is placed over a transition layer and a storage bed of open-graded aggregate. The two main types of pervious paving systems are underdrain systems, connecting to existing stormwater pipes, and systems designed to infiltrate into the subsoil. Permeable surface courses have a variety of benefits including improved traction, reduced noise, and reduced surface ponding. Additionally, the surface course improves runoff quality as there is a biofilm micro-ecosystem in the system that filters and degrades pollutants.

Common types of surface courses include permeable asphalt, permeable concrete, grid pavers, and permeable interlocking pavers. The moist environment in sub-layers results in an increased temperature compared to traditional asphalt, making the system more frost-resistant, which can significantly reduce de-icing requirements and costs. Pervious paving systems have additional contributory drainage areas such as an impervious driving lane where stormwater runoff flows onto pervious parking spaces. One disadvantage is that due to the potential for groundwater contamination, the use of pervious paving systems designed to infiltrate into subsoil is prohibited in areas with high pollutant or sediment loading.

Refer to Section 6.2.2 for the operation and maintenance of porous pavement.

Figure 26 - Types of Porous Pavement (Source: MDPI)

Table 5-2 Green Infrastructure Technology: Porous Paving System

ADVANTAGES	DISADVANTAGES
Reduces stormwater runoff quantity Biofilm micro-ecosystem increases stormwater runoff quality and treats pollutants Recharges groundwater TSS Removal Rate: 80% Frost-resistant nature reduces de-icing requirements / cost Improved Air Quality Reduced Carbon Emissions Reduced Heat Island Effect Improved Traction Reduced Noise Reduced Surface Ponding Reduced Icing Asphalt or concrete repairs can be made with standard asphalt or concrete not to exceed 10% of the surface area. Life Expectancy: 30 years Capital Cost ($/acre): typically low compared to other GI practices Nutrient Removal Rates: up to 90% Phosphorus Removal Rate: 60% Nitrogen Removal Rate: 50%	Maintenance personnel may require training to perform inspections. Prohibited in areas where high pollutant or sediment loading is anticipated. Capital cost may be elevated due to specialized equipment required for installation and an initial materials cost ~20-25% greater than traditional asphalt. Increased operation and maintenance requirements.

5.4 PLANTER BOXES

Downspout planter boxes are wooden or concrete boxes with plants installed at the base of the downspout, providing an opportunity for runoff reuse. Planter boxes are smaller in stature, however they intercept stormwater runoff from impervious structures directed towards grey infrastructure, which can become overwhelmed in large storm events, to boxes with reasonable storage capacity. Downspout planters are retrofitted with overflow pipes, a mechanism designed to act as a discharge for the water when the capacity is satisfied thereby slowly introducing water back into the system. To maximize performance, multiple planter boxes can be utilized at one downspout location for larger buildings or impervious areas.

Refer to Section 6.2.3 for the operation and maintenance of planter boxes.

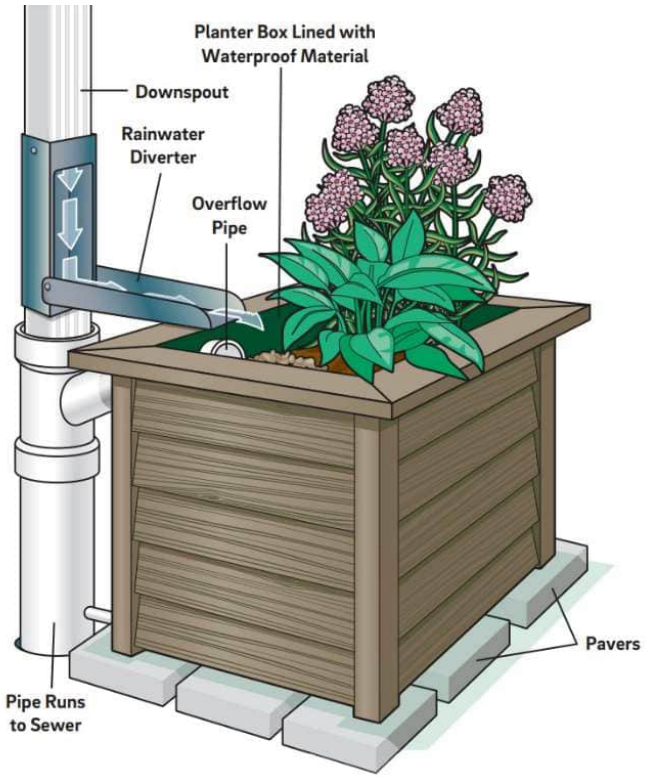


Figure 27 - Downspout Planter Box Diagram (Source: Philadelphia Water Department)

Table 5-3 Green Infrastructure Technology: Planter Boxes

ADVANTAGES	DISADVANTAGES
Reduction in Stormwater Runoff Volume	Issues of stormwater runoff volume may not be completely resolved in sites with high peak flows.
Minimizes Surface Flooding / Ponding	Planters may limit open sidewalk area.
Reduced risk and costs from environmental damage due to surface & basement sewage flooding	Low pathogen reduction in stormwater quality.
Resource sustainability	Does not infiltrate runoff back into the groundwater.
Re-utilization of water	
Size Flexibility	
Planters can operate in parallel to address large flows	
Improved Air Quality	
Reduced Carbon Emissions	
Reduced Heat Island Effect	
Community Aesthetic Improvements	

5.5 TREE FILTER BOX

Tree filter boxes are small-scale infiltration systems composed of of a structural container lined with geotextile filter fabric, stone/gravel, and engineered soil media in which the tree is placed. Stormwater runoff enters the tree filter box through inlet structures such as grates, curb cuts, or channels and is treated via filtration through plant and soil media, then goes through the process of evapotranspiration. In some systems, an underdrain system is installed beneath the soil media to collect and convey treated stormwater. This typically consists of perforated pipes that allow filtered water to be collected and directed to the storm sewer system or another appropriate discharge point. Discharge of stored runoff also occurs through infiltration into the surrounding permeable soil.

Tree filter boxes are a type of Stormwater Manufactured Treatment Device (MTD), defined by NJDEP as engineered systems designed to treat stormwater runoff to remove pollutants. For tree filter boxes to be considered "green infrastructure" according to the NJDEP Stormwater Management rules, N.J.A.C. 7:8, it must meet the following GI definition: (1) the MTD must either infiltrate stormwater into the subsoil and/or (2) treat stormwater runoff through filtration by vegetation or soil. Other key requirements specified in N.J.A.C. 7:8 include that the MTD must have a contributory drainage area of 2.5 acres or less, and the maximum treatment flow rate for the MTD should be calculated based on the NJ Water Quality Design Storm, which is defined as 1.25 inches of rainfall in 2 hours.

Due to their minimal above-grade footprint and compact design, tree filter boxes are most often used in urban areas, parking lots, and public spaces. However, challenges to installation may arise from underground constraints such as existing utilities, root systems of nearby trees, bedrock, subsurface infrastructure, and high groundwater levels. Tree species are chosen based on their ability to tolerate inundation and drought in urban settings, their capacity to absorb pollutants from stormwater, and their overall suitability for the local climate and soil conditions.

Refer to Section 6.2.4 for the operation and maintenance of tree filter boxes.

Figure 28 - Tree Filter Boxes (Source: Contech Engineered Solutions)

Table 5-4 Green Infrastructure Technology: Tree Filter Box

ADVANTAGES	DISADVANTAGES
Stormwater Treatment: High TSS Removal Rate: ~80% High Phosphorus Removal Rate Medium Nitrogen Removal Rate High Metal, Oil, Grease & Pathogen Removal Rate Minimizes Surface Flooding / Ponding Very small footprint Ideal for highly urban areas Re-utilization of water Can operate in series to address large flows. Construction costs may decrease if pre-manufactured boxes are considered. Uplift property value Improved Air Quality Reduced Carbon Emission Reduced Heat Island Effect Community Aesthetic Improvements	Issues of stormwater runoff volume may not be completely resolved in sites with high peak flows Trees may be sensitive and require heightened maintenance upon planting Require a certain amount of space for installation, which may not be available in densely built urban areas Storage Capacity is limited, but increases via tree filter boxes in series Root system development may require time

5.6 CISTERNS

Cisterns are rainwater harvesting systems that capture rainwater, typically from rooftops. The captured water can be repurposed for watering gardens, washing vehicles, or a variety of other non-potable uses.

Rainwater harvesting is a sustainable GI practice which comes in several shapes and sizes for regions with high impervious cover and limited space. Systems often harvest rainwater in the spring, summer, and fall and require minimal maintenance to become winterized during coder months. When flows are low, rainwater harvesting systems can redirect water from the system to the original discharge area.

Cisterns are stormwater facilities that temporarily store stormwater runoff from clean rooftops, cisterns can be indoors or outdoors, and above or below grade. Cisterns or rain barrels can be paired with other GI practices to improve storage capacity and efficiency. Cisterns need a defined purpose to be useful, as a full cistern serves no purpose during a storm event. Most often, rainwater harvesting systems are paired with a small-scale bioretention system with vegetation such as a rain garden, bioswale, or stormwater planter to capture overflow once a system has reached its capacity.

Refer to Section 6.2.5 for the operation and maintenance of cisterns.

Figure 29 - 600 Gallon Vertical Cistern (Source: RainHarvest Systems)

Table 5-5 Green Infrastructure Technology: Rainwater Harvesting Systems

ADVANTAGES	DISADVANTAGES
Reduces Stormwater Runoff Minimizes Surface Flooding / Ponding Resource sustainability Potential re-utilization of water for watering gardens, washing vehicles, and other non-potable uses Rainwater harvesting is available in a variety of shapes and sizes Cisterns / rain barrels can be placed indoors or outdoors, and above or below grade Life Expectancy: 20-50 years depending upon material type Minimize land disturbance Very low maintenance required	If not maintained properly mosquitos may accumulate due to resting water. Sediment and other pollutants that enter the rain barrel / cistern tank may require cleaning upon settling to the bottom to maintain the design volume. Addresses stormwater quantity not quality. Required winterization. If not used, tank fills with water and does not provide water quality control.

6 OPERATION AND MAINTENANCE OF GREEN INFRASTRUCTURE

6.1 INTRODUCTION

This section focuses on how to operate and maintain the GI systems presented in the concept plans and provide recommendations for sustainable urban planning and environmental care. These sustainable systems not only help address urbanization's negative impacts, but also bring benefits like stormwater management, biodiversity conservation, and air quality improvements. Understanding how to properly maintain GI systems is essential to how well these features perform over time. This section explains key considerations, best practices, and challenges related to the operation and maintenance of GI solutions presented in this report. Additional maintenance guidance can be found at https://www.njstormwater.org/maintenance_guidance.htm.

6.2 GENERAL OPERATION AND MAINTENANCE

Example operation and maintenance manuals from various resources for the features discussed herein are provided in Appendix E. Site specific operation and maintenance instructions should be developed for each project and owner.

6.2.1 BIORETENTION SYSTEMS

Regular maintenance is crucial for the optimal performance of bioretention systems, which are designed to manage stormwater and promote water quality. General maintenance, operation, and inspection applicable to rain gardens, bioretention swales, and bioretention basins include but are not limited to:

- All structural components must be inspected, at least once annually, for cracking, subsidence, spalling, erosion and deterioration.
- Components expected to receive and/or trap debris and sediment must be inspected for clogging at least four times annually, as well as after every storm exceeding 1 inch of rainfall.
- Sediment removal must take place when all runoff has drained from the planting bed and the basin is dry.
- Disposal of debris, trash, sediment and other waste material must be done at suitable disposal/recycling sites and in compliance with all applicable local, state and federal waste regulations.
- Stormwater BMPs may not be used for stockpiling of plowed snow and ice, compost, or any other material.
- Bi-weekly inspections are required when establishing/restoring vegetation.
- A minimum of one inspection during the growing season and one inspection during the nongrowing season is required to ensure the health, density and diversity of the vegetation.
- Mowing/trimming of vegetation must be performed on a regular schedule based on specific site conditions; perimeter grass should be mowed at least once a month during growing season.
- Grasses within the small-scale bioretention system must be carefully maintained with lightweight equipment, such as a hand-held line trimmer, in order to maintain the permeability of the system.
- Vegetative cover must be maintained at 85%; damage must be addressed through replanting in accordance with the original specifications.
- Vegetated areas must be inspected at least once annually for erosion, scour and unwanted growth; any unwanted growth should be removed with minimum disruption to the remaining vegetation.
- All use of fertilizers, pesticides, mechanical treatments and other means to ensure optimum vegetation health must not compromise the intended purpose of the bioretention system.

- The planting bed should be inspected at least twice annually to determine if the permeability of the bed has decreased. If the bioretention system fails to drain the Water Quality Design Storm within 72 hours, corrective action must be taken and the maintenance manual revised accordingly to prevent similar failures in the future.

A detailed, written log of all preventative and corrective maintenance performed must be kept, including a record of all inspections and copies of maintenance-related work orders.

6.2.2 POROUS PAVING SYSTEMS

Porous, or permeable, pavement is designed to allow water to pass through its surface, which plays a crucial role in stormwater management, runoff reduction, and prevention of water pollution. Maintenance of porous pavement is vital in ensuring its long-term effectiveness in addressing environmental challenges and preserving the permeability of the surface. Key maintenance items include:

- The surface course must be inspected after every storm exceeding 1 inch of rainfall. If mud or sediment is tracked onto the surface course, it must be removed as soon as possible. Removal should take place when all runoff has drained from the surface course.
- The surface course must be inspected, at least once annually, for cracking, subsidence, spalling, erosion, deterioration and unwanted vegetation. Remedial measures must be taken as soon as possible. Herbicides must not be applied.
- The surface course of a pervious paving system must be vacuum swept, not power swept, at least four times per year. Vacuum sweeping must be followed by either air blowing or high-pressure power washing performed in accordance with the specifications recommended for the particular type of system. All dislodged material must be promptly removed.
    - The first annual maintenance must be performed in the spring.
    - Maintenance must additionally be performed in the autumn, after the fallen leaves are collected and removed.
- Each spring, after the last snow or ice event, the infiltration rate of the surface course must be tested in accordance with the methods of either ASTM C1701 or C1781, as corresponds to the post-construction test performed for the system.
- Corrective action must be immediately taken to restore the infiltration capacity of the pervious paving system under the following scenarios:
    - Standing water is observed on the surface course; or
    - The testing methods above show an infiltration rate of 20 inches per hour or less for a system designed for quantity control or 6.4 or less for a system designed for water quality control only.
- Disposal of debris, trash, sediment and other waste material must be done at suitable disposal/recycling sites and in compliance with all applicable local, state and federal waste regulations.
- Under no circumstances may any sealants or coatings be applied to pervious paving systems, except for those approved by the manufacturer to improve surface course resistance to de-icing chemicals or refresh traffic striping.
- Over the lifetime of the surface course, no more than 10% of its surface area may be patched with impervious material such as bituminous asphalt or concrete. All patching must be recorded in the maintenance manual for future reference to prevent exceedance of this maximum.
- The approximate drain time for the maximum design storm runoff volume below the top of the surface course must be indicated in the maintenance manual. If the actual drain time is significantly different from the design drain time, the components and groundwater levels must be evaluated, and appropriate measures taken to return the pervious paving system to minimum and maximum drain time requirements. If the system fails to drain the maximum design storm volume within 72 hours, corrective action must be taken.
- Cold Weather Maintenance:
    - Care must be taken when removing snow from the surface as pervious paving surfaces may be dragged by snowplows/loader buckets set too low to the ground or not equipped with a rubber blade guard.
    - Sand, grit or cinders may not be used for snow/ice removal.

A detailed, written log of all preventative and corrective maintenance performed must be kept, including a record of all inspections and copies of maintenance-related work orders.

6.2.3 PLANTER BOXES

Downspout planter boxes require regular maintenance to ensure optimal performance and promote healthy growth of the plants they contain. Key maintenance tasks include:

- Water vegetation immediately after planting and weekly during initial establishment if it does not rain.
- If plants appear to be wilting, water 2-3 times per week until they return to good health.
- Keep the overflow cap (atrium grate) free and clear of debris such as dead leaves or trash. Check it after storms. Keep soil and debris off of the top of the stone mulch so floatable material does not clog the overflow device.
- Remove weeds as needed.
- Check drainage of planter after rainstorms to make sure that the planter drains and/or water evaporates within 24 hours. If water is not draining, ensure that the underdrain valve is open sufficiently. The underdrain valve is located at the rear side of the planter near the bottom. The underdrain valve should be left in a position so there is approximately 1/8" opening - this should allow the planter to drain slowly over time.
- Check the downspout connection (diverter or downspout elbow) to the planter to ensure it has not been disconnected.
- Inspect plants to evaluate health and replace if necessary.
- Cut back or remove dead vegetation in fall.
- Check to ensure that roof gutters leading to the downspout are free of leaves and other debris.
- Check to ensure that downspout leading to the planter is properly connected to roof gutter.
- In wintertime, check to make sure that overflow is clear of debris and snow. Periodically inspect planter to ensure ice is not accumulating.
- Follow any additional manufacturer guidelines and recommendations on operation and maintenance.

By incorporating these maintenance practices into a routine schedule, users can enhance the longevity of the planter box, promote healthy plant growth, and ensure efficient rainwater management. Additional information on maintenance and operation of these are available through a variety of local resources such as The Watershed Institute (thewatershed.org), and Rain Check by the Philadelphia Water Department (pwdraincheck.org).

6.2.4 TREE FILTER BOX

Tree boxes, structures designed to accommodate trees in urban or confined spaces, require regular maintenance to ensure the health of the trees and the overall functionality of the system. Maintenance tasks include:

- Provide trees enough water, especially in dry conditions. Keep the soil moist but well-drained.
- Put a layer of mulch around the tree base to keep the soil damp, control weeds, and manage soil temperature.
- Remove weeds often to prevent them from competing with trees for water and nutrients.
- Trim and prune trees as needed to keep their shape and remove damaged branches.
- If the soil lacks nutrients, consider fertilizing to help trees grow.
- Check the soil regularly for compaction and drainage issues, as compacted soil can limit root growth and water absorption.
- Monitor tree health for signs of pests or diseases.
- Examine the tree box structure, including the container and surroundings, for structural damage. Fix any problems to keep the box stable.
- Care should be adjusted based on seasons and environmental conditions throughout the year.
- Spread public awareness and encourage responsible behavior and discourage actions that harm trees.
- Mulch should be replaced regularly to keep it effective in controlling weeds, retaining moisture, and regulating temperature.
- Ensure proper drainage in the tree box to avoid waterlogging, which can harm tree roots. Fix drainage issues promptly.

- Periodically inspect the tree box grate for any signs of damage, such as bent or broken bars, and replace as needed.

By performing these simple tasks, tree boxes can improve the urban landscape and contribute to community well-being. Regular attention to these factors ensures success in planting trees in confined urban spaces.

6.2.5 CISTERNS

Cisterns require regular maintenance to function properly and remain in good condition. General maintenance, operation and inspection applicable cisterns include but are not limited to:

- Cisterns must be inspected at least four times annually and after every storm event exceeding 1 inch of rainfall.
- All structural components must be inspected for cracking, subsidence, spalling, erosion and deterioration at least once annually.
- Disposal of debris, trash, sediment and other waste material must be done at suitable disposal/recycling sites and in compliance with all applicable local, state and federal waste regulations.
- Access points for maintenance are required on all cisterns; these access points must be clearly identified in the maintenance plan. In addition, any special training required for maintenance personnel to perform specific tasks must be included in the plan.
- All pretreatment options must be cleaned regularly to ensure that the cistern is operating as intended and flow is not being directed away from the cistern due to the buildup of debris.
- If applicable: All pumps, controls and alarms must be inspected at least annually and maintained in accordance with the manufacturer's requirements. Should a component fail, corrective action must be taken immediately. The maintenance logbook must include a section to record all maintenance information regarding pumps, controls and alarms.
- Follow any additional manufacturer guidelines and recommendations on operation and maintenance.

A detailed, written log of all preventative and corrective maintenance performed must be kept, including a record of all inspections and copies of maintenance-related work orders.

7 FUTURE PLANNING AND CONSIDERATIONS

7.1 TRAINING AND EDUCATION

In order to ensure these systems function as designed for their intended life expectancy, education on their maintenance and operation is paramount. A plan should be in place, whether through the site owner or City, to perform routine inspections and maintenance of these systems to meet the goals of the LTCP. Whoever will be performing routine maintenance should be trained accordingly, such as landscapers on rain gardens and bioretention systems. Unfortunately, there have been situations where the native plantings of bioretention systems are mowed down not only reducing their efficacy but also resulting in the loss of the native plantings.

Additionally, installation of different types of signage can help with maintenance and public perception of these features. Educational signage, especially at public schools and parks, brings attention to the general public of the functionality and importance of these systems. Signage such as, "NO MOWING ZONE", "STORMWATER FACILITY", or "POROUS PAVEMENT AREA", can alert maintenance personnel.

7.2 PERMITTING

There is limited permitting expected with these projects. The most likely permits to be required are discussed below. This is provided for planning and information purposes and does not relieve future due diligence and planning of appropriate permitting and environmental impacts.

7.2.1 SOIL CONSERVATION DISTRICT

For projects exceeding 5,000 square feet of site disturbance, certification from the Hudson-Essex-Passaic Soil Conservation District will be required. Fees for these permits are based on the type of project and area of disturbance. For the concepts presented herein, and based on the current district fee table, WSP estimated these costs to range from $775 up to $1,125 for projects exceeding 1 acre but less than 2 acres. As part of the Soil Conservation District (SCD) permit, if the project is disturbing 1 or more acre it will also be required to apply for the NJDEP 5G3 Stormwater General Construction Permit, where required this fee is expected to be $450.

In addition to the permit fees, the application will require site plans, inclusive of soil erosion and sediment control, and stormwater and erosion control calculations, prepared by a professional engineer licensed in the state of New Jersey. Review period for these permits is 30 days.

7.2.2 NJDEP FLOOD HAZARD AREA

Some of the concept plans presented herein are located within the 100-year flood plain, triggering compliance with the NJDEP Flood Hazard Area Control Act Rules. However, based on this early preliminary concept, work within the flood hazard area can be covered under one of the permits by rule, such as: Permit-by-Rule 8 - Construction at or Below Grade in a Fluvial Flood Hazard Area; Permit-by-Rule 40 - Milling, Repaving, and/or Resurfacing of a Lawfully Existing Pavement. Activities performed in accordance with the Permits-by-rule may be performed without prior approval from the Department.

Based on our current understanding of the rules and the level of concept planning, more advanced permitting is not anticipated at this time. However, the plans and rules should be re-reviewed at the time of planned implementation as regulations can change over time.

8 CONCLUSION

The goal of this study was to assess parks, schools, tax exempt properties, and public land for the implementation of GI in order to manage 2.5% (or 75 acres) of the impervious cover within the City according to the LTCP to reduce flows to the CSOs. After the evaluation of 198 site locations, 95 concept plans were prepared, achieving 1.72% (or 51.1 acres) of the total impervious area required to be captured.

Although this does not meet the goal of 2.5% of impervious area managed, there are still many opportunities within the City to continue analyzing for the implementation of GI. Even the LTCP recognized the issue of limited space for GI within parcels across the city, stating "The dichotomy considered was management of approximately two-thirds of the runoff volume with ROW BMPs (bioswale). The remaining third of this volume is proposed for management in on-site areas."[2] Considering this 1:2 ratio of on-site GI to ROW GI, the concepts developed within this study exceed the goal of 0.83% for on-site GI.

In addition to the implementation of ROW bioswales, the City can also assess residential and commercial areas which combine to make up 73% of the City's footprint.[3] By finding more opportunities for GI throughout the City, the City is acting on best practice, as GI is the most effective when implemented throughout the area of concern to capture rainfall where it lands, rather than where it flows to.

As the City implements the concepts developed in this GI study or as priorities change and evolve over time, the R&P matrix can be updated and sorted to best serve the City's needs. In this way, the matrix gives flexibility for the City to plan and prioritize both short-term and long-term projects to meet not only the current conditions within Paterson, but to also adapt to future circumstances as well.

[2] See page 53 in Appendix N of the PVSC Treatment District Regional LTCP: *Selection and Implementation of Alternatives Report for City of Paterson*, prepared by the Passaic Valley Sewerage Commission.

[3] See page 4 in Appendix N of the PVSC Treatment District Regional LTCP: *Selection and Implementation of Alternatives Report for City of Paterson*, prepared by the Passaic Valley Sewerage Commission.

9 REFERENCES

Passaic Valley Sewerage Commission. (2020). *Selection and Implementation of Alternatives for Long Term Control Planning for Combined Sewer Systems – Regional Report.*

Passaic Valley Sewerage Commission. (2020). *Selection and Implementation of Alternatives for Long Term Control Planning for Combined Sewer Systems – Appendix N Selection and Implementation of Alternatives Report for City of Paterson.*

NJ Stormwater Best Management Practices Manual, (2004-2024). https://dep.nj.gov/stormwater/bmp-manual/

NJ Stormwater Management Rules N.J.A.C 7:8 (2023). https://dep.nj.gov/wp-content/uploads/rules/rules/njac7_8.pdf

Rutgers Green Infrastructure Guidance Manual for New Jersey (2015). http://water.rutgers.edu/Green_Infrastructure_Guidance_Manual/2015-03-31_Manual.compressed.pdf

NJ Flood Hazard Area Control Act Rules N.J.A.C 7:13 (2023). https://dep.nj.gov/wp-content/uploads/rules/rules/njac7_13.pdf

GIS/CAD Data

- Parcels: New Jersey Office of GIS: https://njogis-newjersey.opendata.arcgis.com/documents/d543ddcc1e6844319ffa826fee52fccf/about
- Impervious cover: https://gisdata-njdep.opendata.arcgis.com/documents/6f76b90deda34cc98aec255e2defdb45/about
- Flood lines: https://www.arcgis.com/home/item.html?id=300f228c6d7e4d8fb204e5a35bfd3ef2
- CSOs: https://njdep.maps.arcgis.com/apps/Viewer/index.html?appid=70dd49de342949ca933e840d0c530fc7
- Contours: LiDAR

APPENDIX

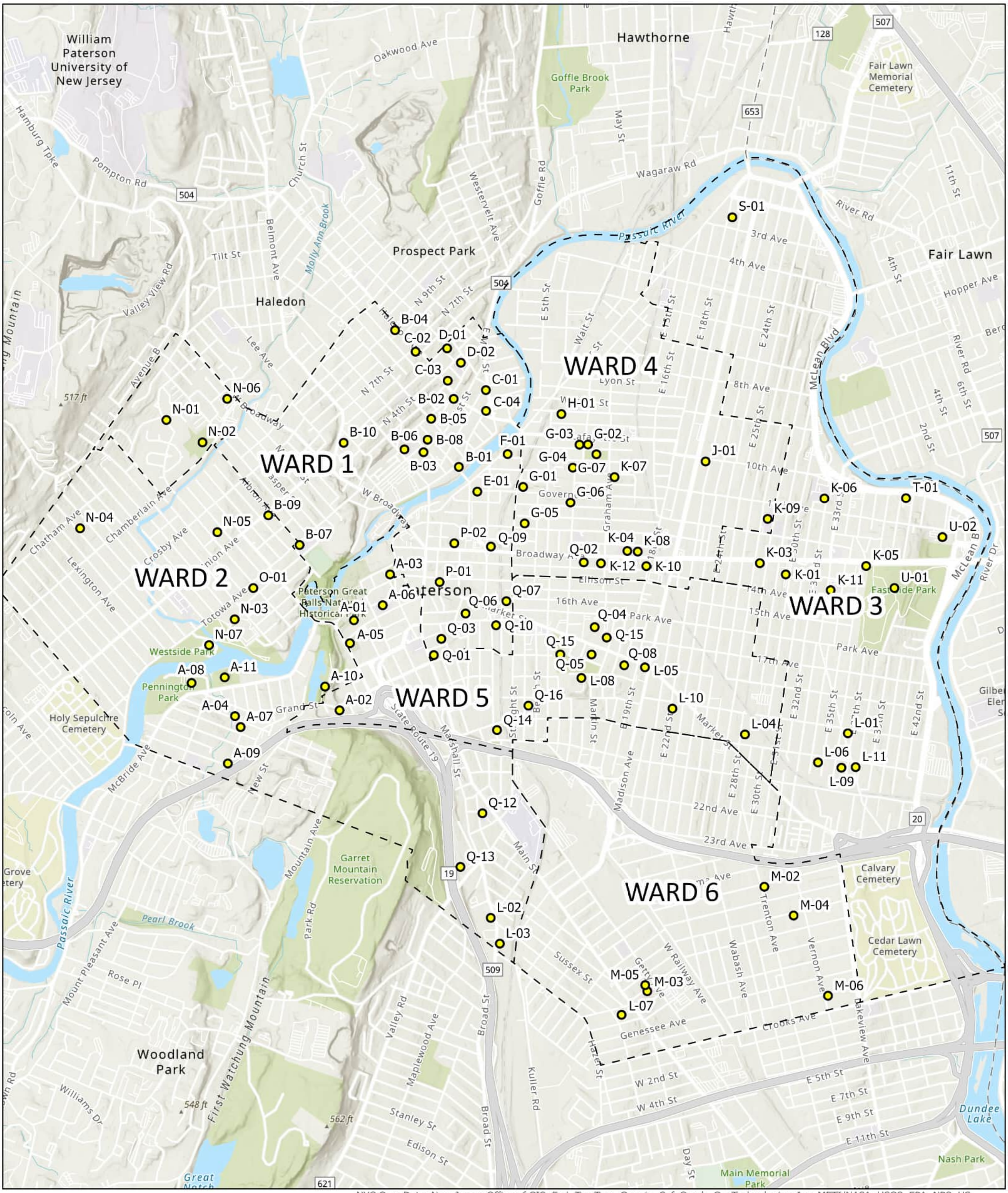
A MAPS

DATE: 03/11/2024

CITYWIDE GREEN INFRASTRUCTURE EVALUATION

FIGURE 1.0 SITE LOCATIONS MAP

N



NYC OpenData, New Jersey Office of GIS, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, USFWS, Esri, NASA, NGA, USGS MA

LEGEND

- Proposed BMP - Site Locations
- Paterson Wards

0 0.13 0.25 0.5 0.75 1 Miles

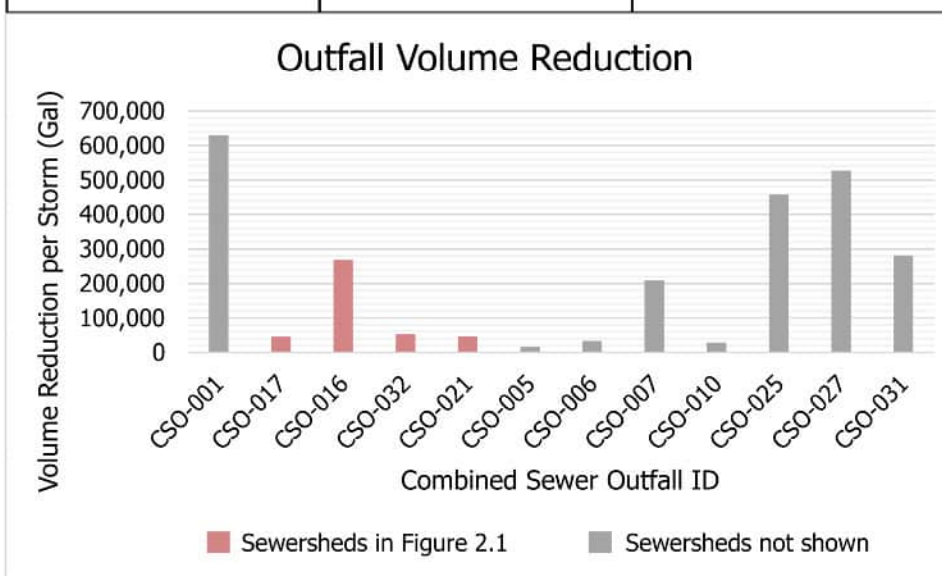
DATE: 03/11/2024

CITYWIDE GREEN INFRASTRUCTURE EVALUATION
FIGURE 2.1 VOLUME REDUCTIONS PER OUTFALL

N

Sewersheds C-02A, C-02B, C-03, C-04 Outfall Load Reduction

Sewershed	Outfall	Load Reduction per Storm (Gallons)
C-02A	CSO-017	45,690
C-02B	CSO-016	268,770
C-03	CSO-032	53,170
C-04	CSO-021	91,770



0 312.5 625 1,250 1,875 2,500 Feet

Esri, NASA, NGA, USGS, FEMA, Esri Community Maps Contributors, New Jersey Office of GIS, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, USFWS, NYC OpenData, New Jersey Office of GIS, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, USDA, USFWS

Legend

- Proposed BMP - Site Locations
- Combined Sewer Overflow (CSO)
- Paterson Wards
- Separate
- Partial or Fully Separated
- Combined

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WSP

DATE: 03/11/2024

CITYWIDE GREEN INFRASTRUCTURE EVALUATION
FIGURE 2.2 VOLUME REDUCTIONS PER OUTFALL

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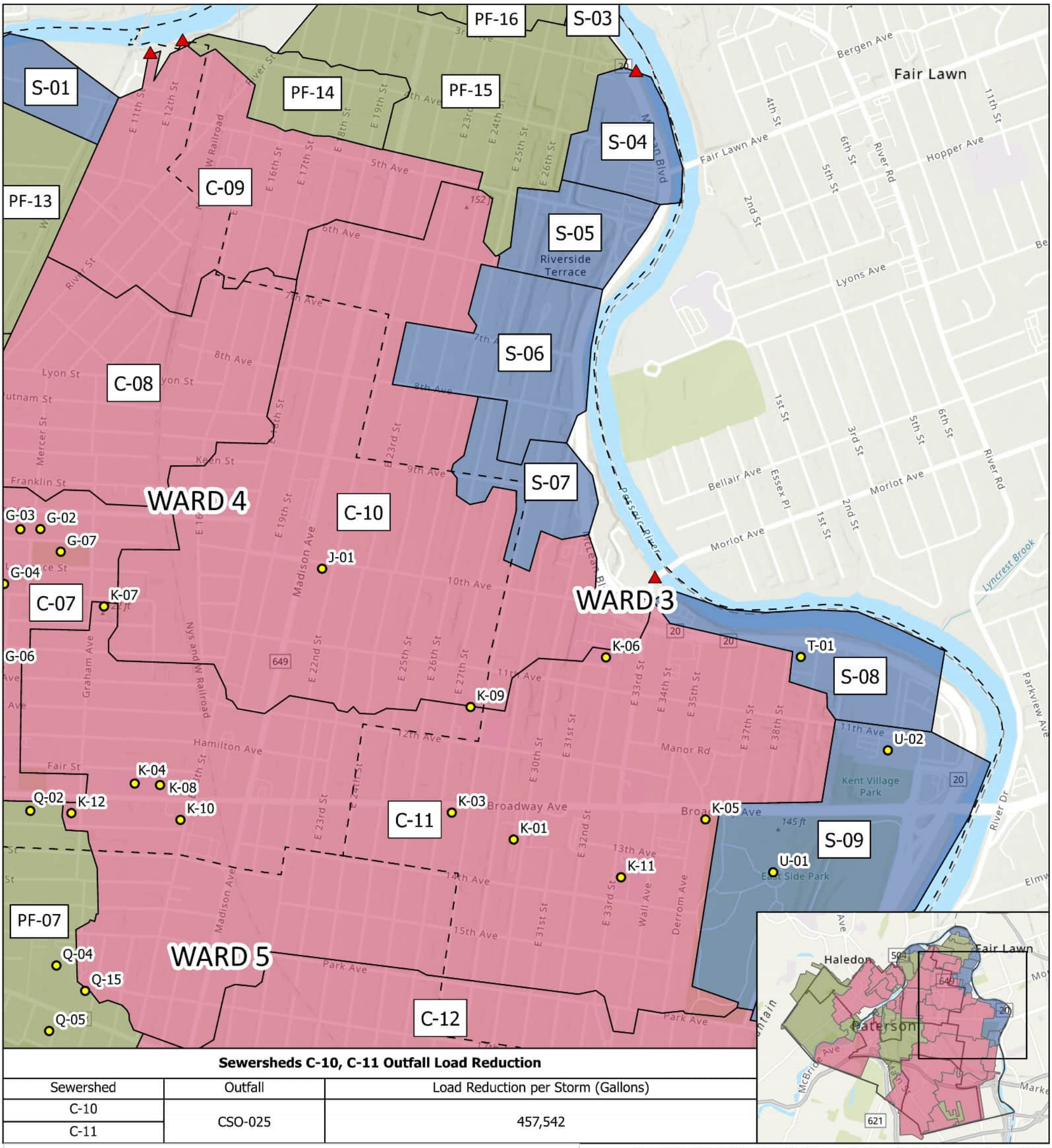
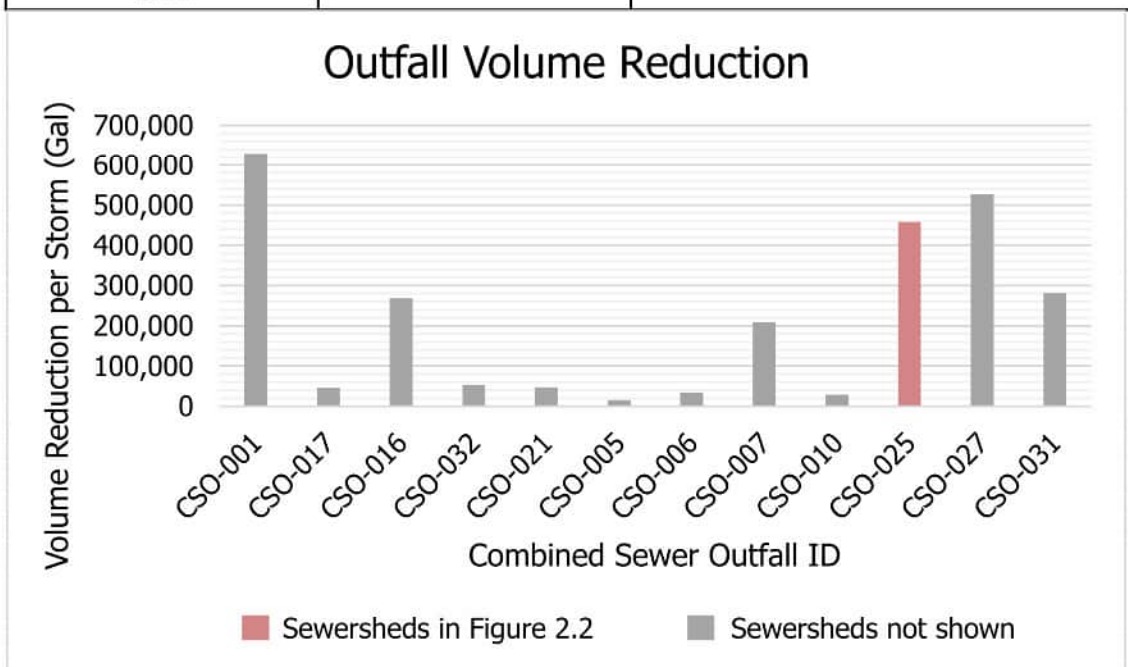


Sewersheds C-10, C-11 Outfall Load Reduction

Sewershed	Outfall	Load Reduction per Storm (Gallons)
C-10	CSO-025	457,542
C-11		



0 325 650 1,300 1,950 2,600 Feet

Legend

- Proposed BMP - Site Locations
- Combined Sewer Overflow (CSO)
- Paterson Wards
- Separate
- Partial or Fully Separated
- Combined

CITY OF PATERSON FOUNDED 1792 NEW JERSEY

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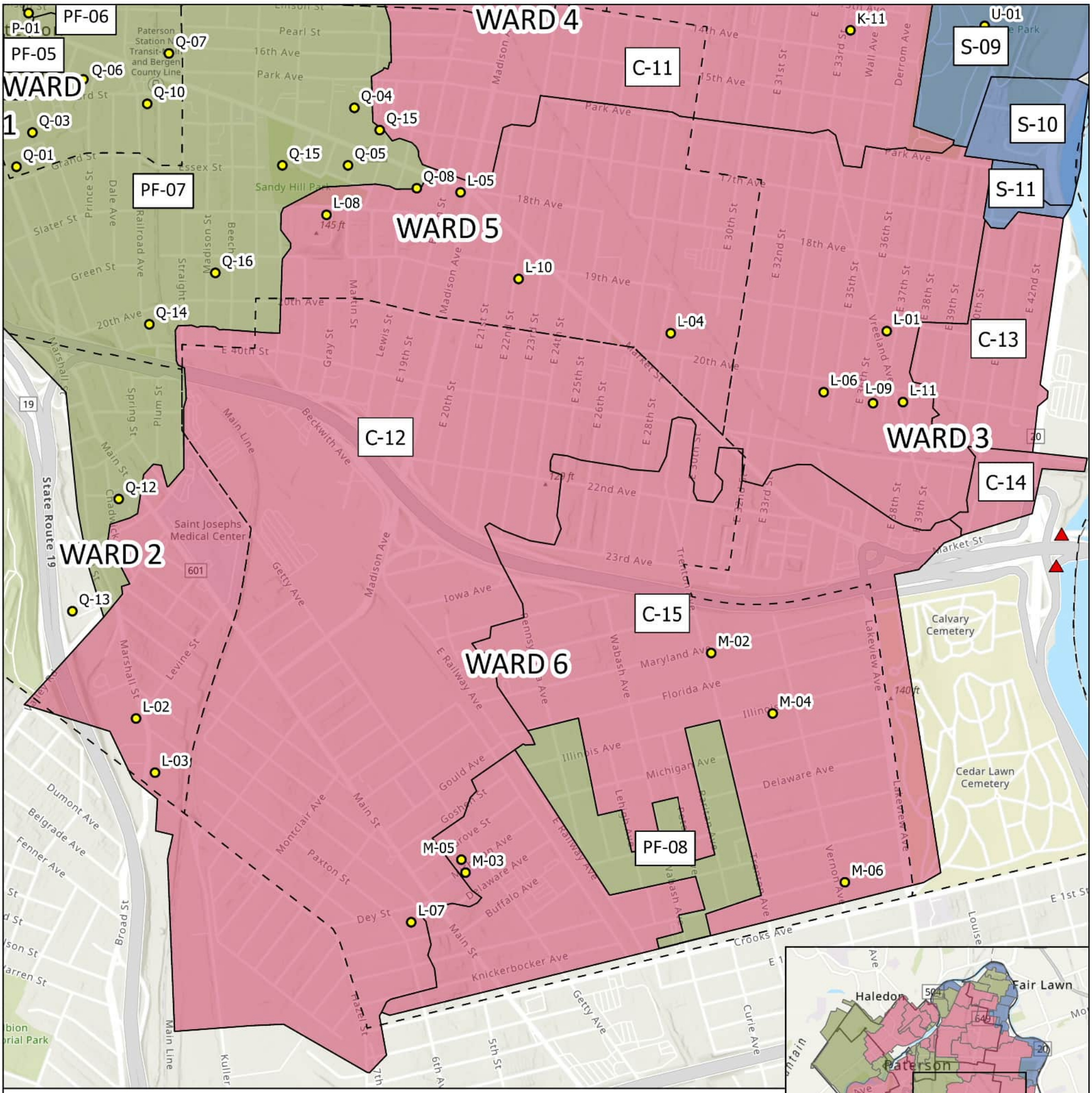
DATE: 03/11/2023

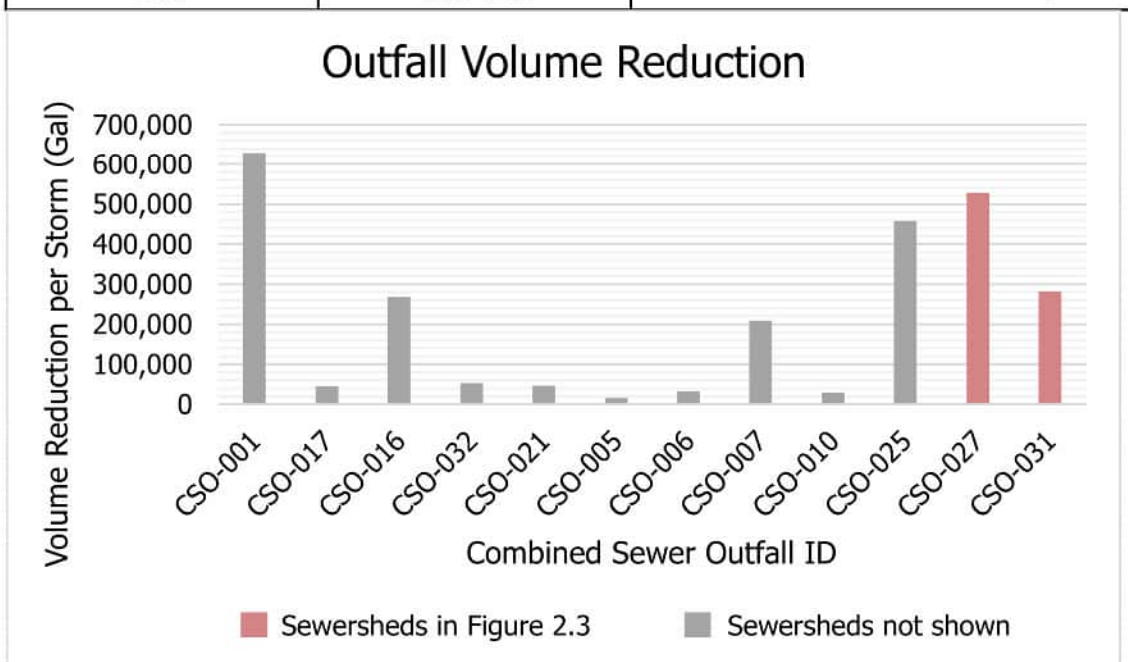
CITYWIDE GREEN INFRASTRUCTURE EVALUATION
FIGURE 2.3 VOLUME REDUCTIONS PER OUTFALL

N



Sewersheds C-10, C-11 Outfall Load Reduction

Sewershed	Outfall	Load Reduction per Storm (Gallons)
C-12	CSO-027	527,700
C-15	CSO-031	281,750



0 380 760 1,520 2,280 3,040 Feet

Legend

- Proposed BMP - Site Locations
- Combined Sewer Overflow (CSO)
- Paterson Wards
- Separate
- Partial or Fully Separated
- Combined

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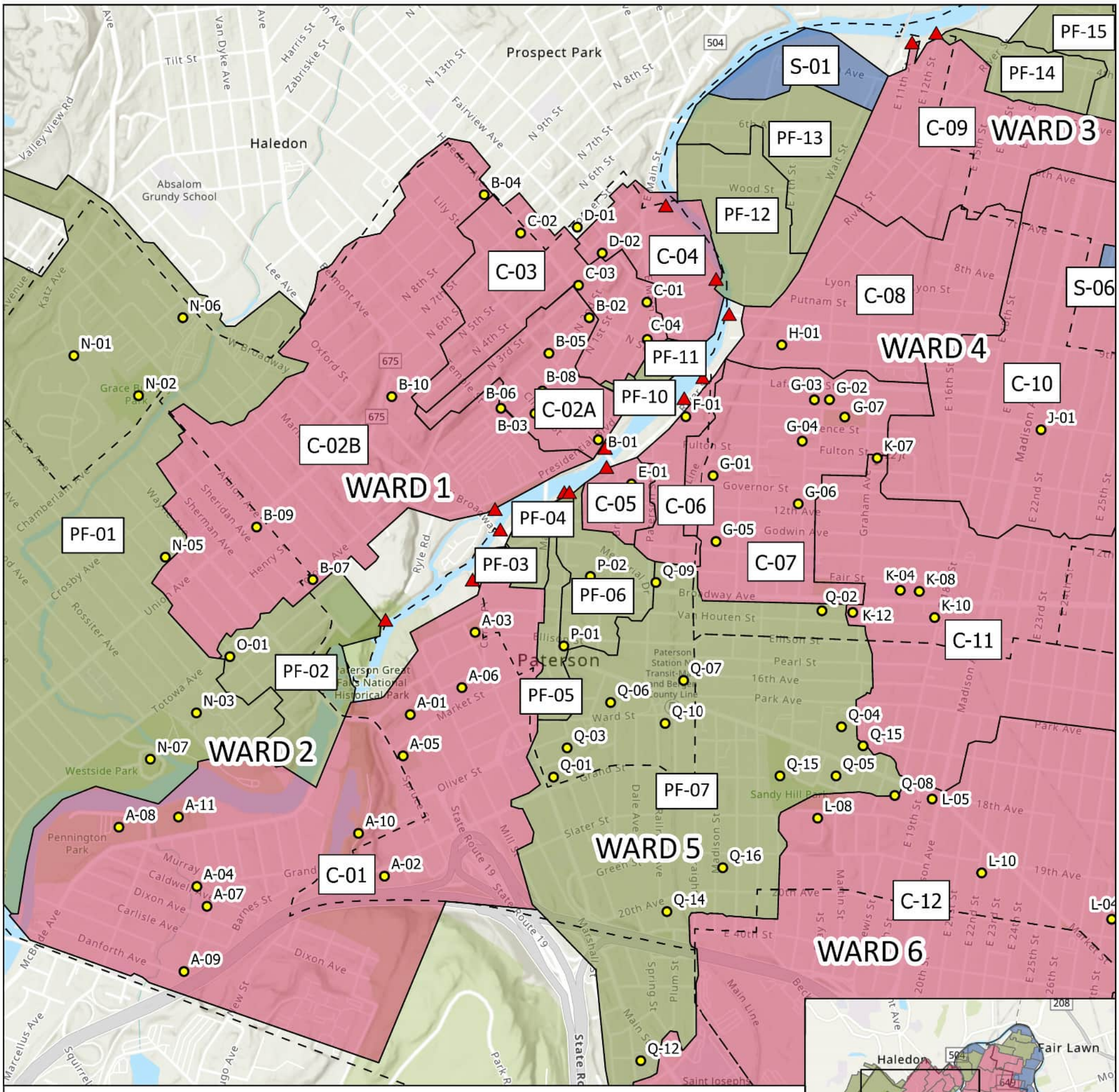
DATE: 03/11/2024

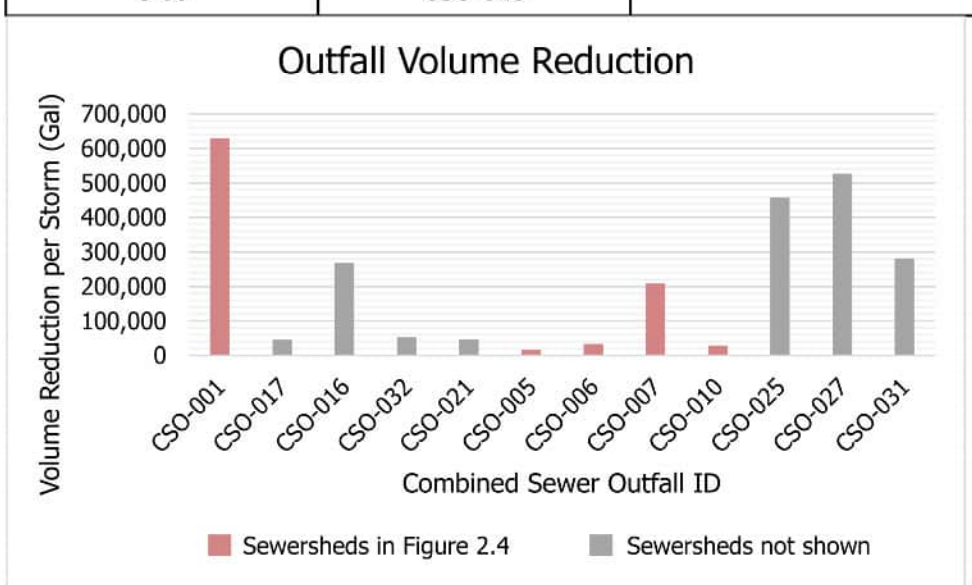
CITYWIDE GREEN INFRASTRUCTURE EVALUATION
FIGURE 2.4 VOLUME REDUCTIONS PER OUTFALL

N



Sewersheds C-02A, C-02B, C-03, C-04 Outfall Load Reduction

Sewershed	Outfall	Load Reduction per Storm (Gallons)
C-01	CSO-001	629,620
C-05	CSO-005	16,120
C-06	CSO-006	33,760
C-07	CSO-007	208,650
C-08	CSO-010	28,500



Legend

- Proposed BMP - Site Locations
- Combined Sewer Overflow (CSO)
- Paterson Wards
- Separate
- Partial or Fully Separated
- Combined

0 440 880 1,760 2,640 3,520 Feet

CITY OF PATERSON FOUNDED 1792 NEW JERSEY

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DATE: 03/11/2024

CITYWIDE GREEN INFRASTRUCTURE EVALUATION

FIGURE 3.0 IMPERVIOUS SURFACE AREA

N

WARD 1

WARD 2

WARD 3

WARD 4

WARD 5

WARD 6

NYC OpenData, New Jersey Office of GIS, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, USFWS, Esri, NASA, NGA, USGS

Legend

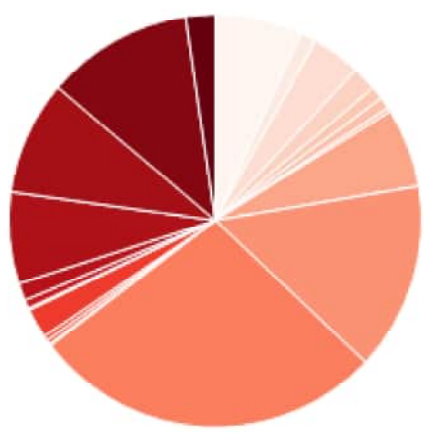
- Paterson Wards

Impervious Surface (%)

- 5.0%
- 5.1% - 10.0%
- 10.1% - 15.0%
- 15.1% - 20.0%
- 20.1% - 25.0%
- 25.1% - 30.0%
- 30.1% - 35.0%
- 35.1% - 40.0%
- 40.1% - 45.0%
- 45.1% - 50.0%
- 50.1% - 55.0%
- 55.1% - 60.0%
- 60.1% - 65.0%
- 65.1% - 70.0%
- 70.1% - 75.0%
- 75.1% - 80.0%
- 80.1% - 85.0%
- 85.1% - 90.0%
- 90.1% - 95.0%
- 95.1% - 100.0%

0 0.13 0.25 0.5 0.75 1 Miles

City of Paterson Impervious Surface Area
(% of Total Area)



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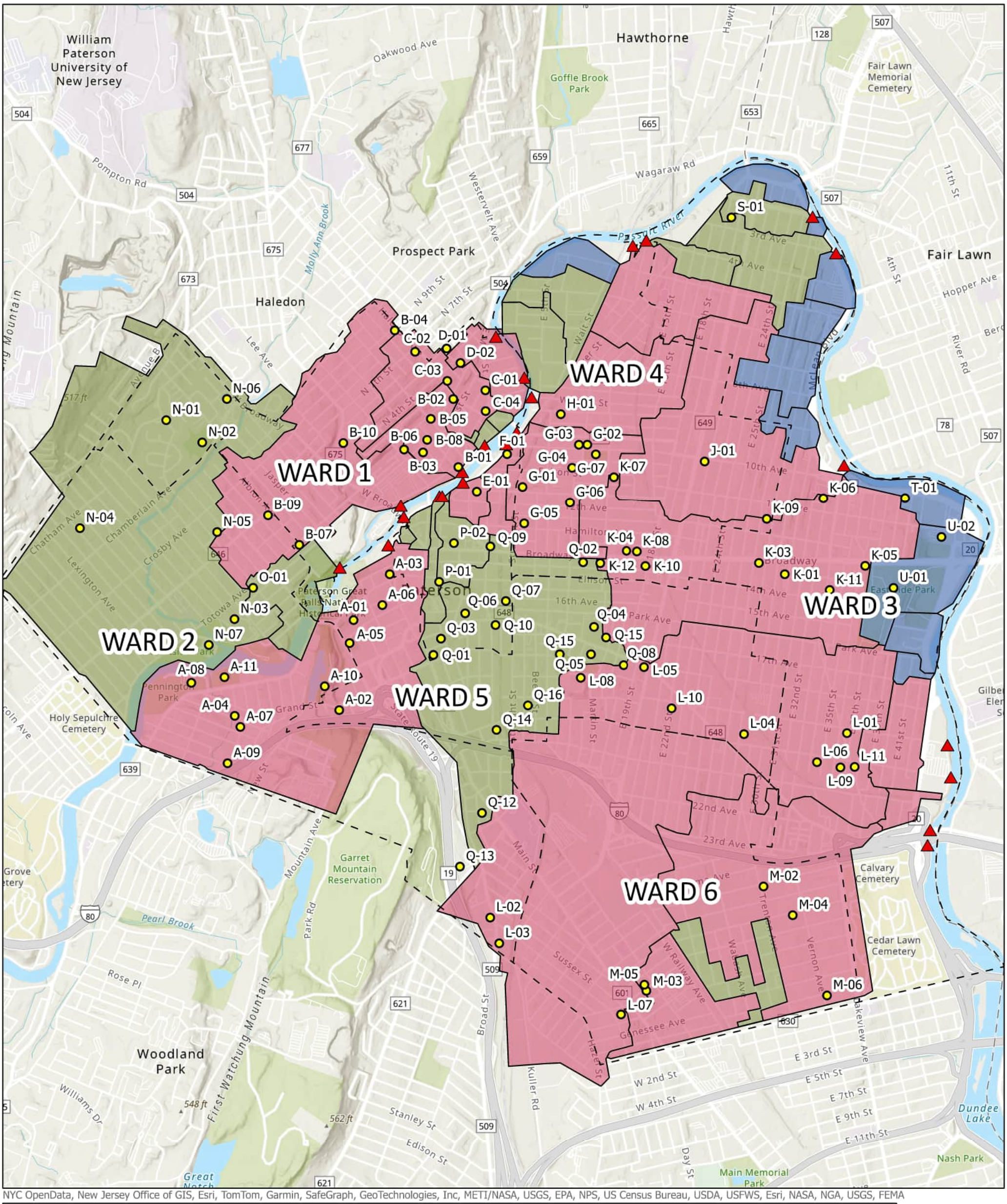
DATE: 07/10/2024

CITYWIDE GREEN INFRASTRUCTURE EVALUATION
FIGURE 4.0 TOTAL COST & VOLUME REDUCED MAP

N



NYC OpenData, New Jersey Office of GIS, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, USFWS, Esri, NASA, NGA, USGS, FEMA

City of Paterson Ward: Number of Sites, Cost, and Volume Reduction Summary						
	Ward 1	Ward 2	Ward 3	Ward 4	Ward 5	Ward 6
Number of Sites	26	16	13	16	15	6
Total Cost	$2,838,140	$3,059,638	$1,881,355	$1,809,255	$3,438,445	$870,120
Total CSO Volume Reduction per Storm (Gallons)	390,760	424,655	328,400	457,950	635,130	285,260

LEGEND

- Proposed BMP - Site Locations
- Combined Sewer Overflow (CSO)
- Paterson Wards
- Partial or Fully Separated
- Separate
- Combined

0 0.13 0.25 0.5 0.75 1 Miles

CITY OF PATERSON FOUNDED 1792 NEW JERSEY

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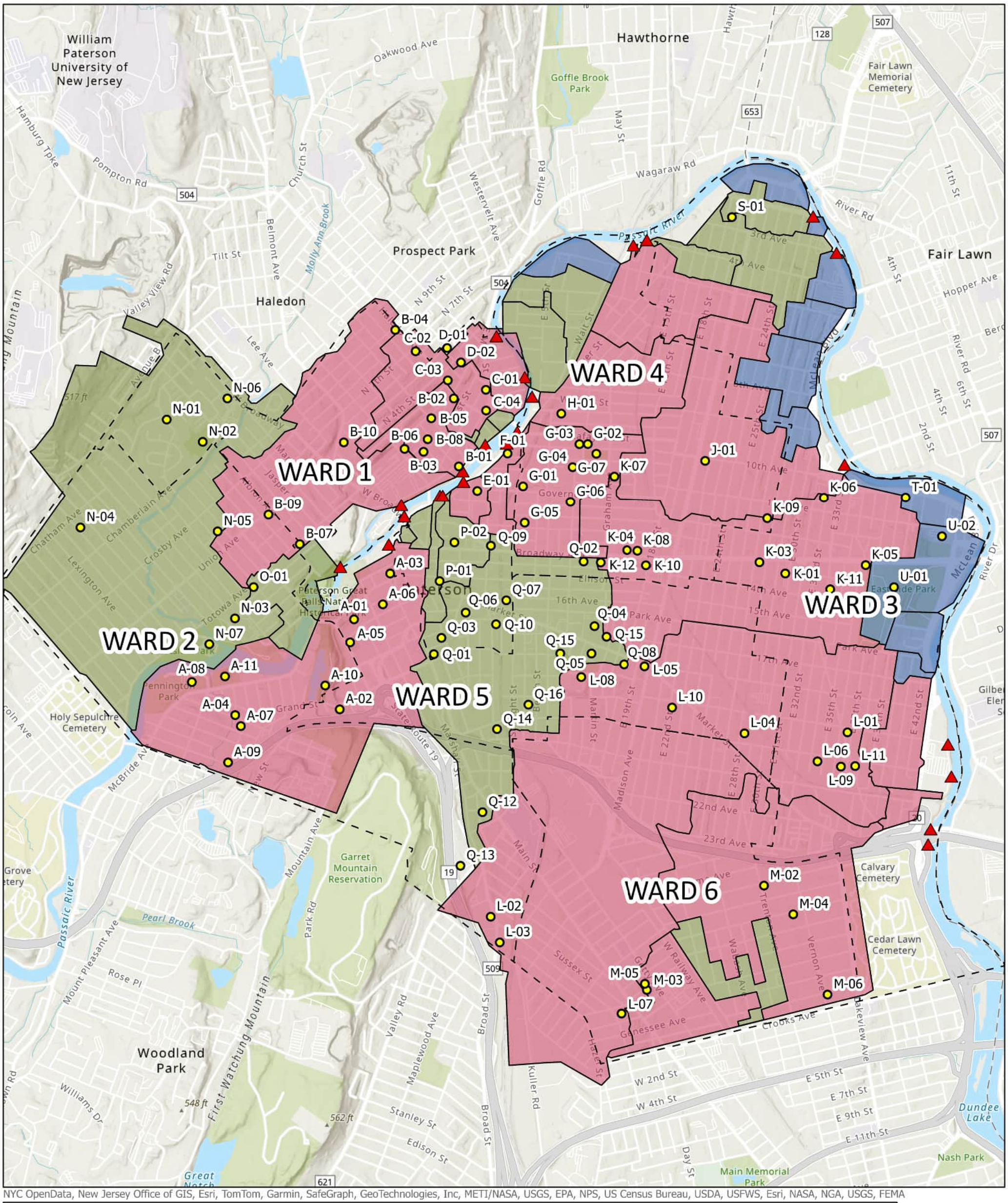
DATE: 03/11/2024

CITYWIDE GREEN INFRASTRUCTURE EVALUATION
FIGURE 4.0 TOTAL COST & VOLUME REDUCED MAP

N



NYC OpenData, New Jersey Office of GIS, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, USFWS, Esri, NASA, NGA, USGS, FEMA

City of Paterson Ward: Number of Sites, Cost, and Volume Reduction Summary						
	Ward 1	Ward 2	Ward 3	Ward 4	Ward 5	Ward 6
Number of Sites	26	16	13	16	15	6
Total Cost	$2,670,700	$2,831,163	$1,750,370	$1,706,840	$3,260,785	$885,780
Total CSO Volume Reduction per Storm (Gallons)	390,760	424,655	328,400	457,950	635,130	285,260

LEGEND

- Proposed BMP - Site Locations
- Combined Sewer Overflow (CSO)
- Paterson Wards
- Partial or Fully Separated
- Separate
- Combined

0 0.13 0.25 0.5 0.75 1 Miles

CITY OF PATERSON FOUNDED 1792 NEW JERSEY

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APPENDIX

B SITE ASSESSMENTS

SITE ASSESSMENTS
Paterson Green Infrastructure Study
City of Paterson

CityWide Green Infrastructure

Last Updated: 3/14/2024

Site ID	Site Name	Plan ID	Ownership Subtype	Address (if applicable)	Ward	Site Ranking	Suitable Underdrain	Downspout Status	GI Potential: Bioretention System?	GI Potential: Depaving?	Old Pavement in low traffic area?	Pavement sloped toward ideal spot?	Rainwater Harvesting Use?	Roofleader Disconnection?	Grass Pavers?	Other GI?	Comments / Notes
70	College Achieve Paterson Charter School (Elementary Campus)	A-01	Other Schools	21 Market St, Paterson, New Jersey, 07501	5	3	Yes	Internal	No	No	No	Yes	No	No	No	Yes	Some possibilities for GI. Mainly porous pavement.
68	International High School	A-02	School District	200 Grand St, Paterson, New Jersey, 07501	5	4	Yes	Internal, External	Yes	No	Yes	No	No	No	No	No	Lots of area to turn into bioretention systems
65	Lou Costello Memorial Park	A-03	Public Property	49-69 ELLISON ST	5	4	Yes	External	Yes	No	No	No	No	No	No	No	Large enough spaces for multiple bioretention systems
49	Our Lady of Pompei Church	A-04	Church and Charitable Property	157 Caldwell Ave, Paterson, New Jersey, 07501	2	3	Yes	External	Maybe	No	No	Yes	Yes	Yes	No	Yes	Planters will work easily, but pervious pavement will require parking lot redesign
71	Paterson Museum	A-05	Public Property	2 Market Street, Paterson, New Jersey, 07501	5	3	Yes	External	Maybe	No	Yes	Yes	No	No	No	No	Mainly porous pavement, one possibility for disconnected downspouts and bioretention
67	Paterson Public School No. 2	A-06	School District	22 Passaic St, Paterson, New Jersey, 07501	5	3	Maybe	External	Maybe	No	No	No	No	No	No	Yes	Some possibility for porous pavement and planter beds.
48	Paterson Public School No. 7	A-07	School District	106 Ramsey St, Paterson, New Jersey, 07501	2	3	Yes	External	Maybe	Yes	Maybe	Yes	No	Maybe	No	Maybe	Great opportunity for depaving
47	Pennington Park	A-08	Public Property	268 McBride Ave, Paterson, New Jersey, 07501	2	3	Yes	External	Yes	No	Yes	Yes	Maybe	Yes	No	Yes	Plenty of space for larger GI to potentially divert flow from McBride, but it is largely pervious now expect for the parking lot which could be made into pervious pavement
52	St. Bonaventure's Roman Catholic Church	A-09	Church and Charitable Property	174 Ramsey St, Paterson, NJ 07501	2	5	Yes	External	No	Yes	Yes	Yes	Yes	Yes	Yes	No	Lots of opportunities to easily construct GI, downside is it's already mostly pervious
69	Upper Raceway Park	A-10	Public Property	169 Grand St, Paterson, New Jersey, 07501	2	3	Yes	External	Yes	Maybe	Yes	Yes	No	No	No	No	Feasible, minimal opportunities. Miss most of the runoff from the side of the pool, first parking area, and driveway
46	Veterans Memorial Park	A-11	Public Property	286 McBride Ave, Paterson, New Jersey, 07501	2	4	Yes	External	Yes	No	Yes	No	No	No	No	No	Veterans park bioretention is very feasible and could provide benefit. Firehouse appears to have a tank or underground storage existing on site. Small bioswale in existing ditch possible.
93	Arch St Parking Lot	B-01	Public Property	216 Presidential Blvd, Paterson, New Jersey, 07522	1	3	No	External	Yes	No	Yes	No	No	No	No	No	Large grassy area at the corner of the road with potential for bioretention
28	Church of Jesus Christ	B-02	Church and Charitable Property	29 Haledon Ave, Paterson, New Jersey, 07522	1	3	No	External	Yes	No	Yes	No	No	No	No	No	RG and PP
32	Dr. Frank Napier Jr. School of Technology	B-03	School District	55 Clinton St, Paterson, New Jersey, 07522	1	3	No	Internal	Yes	No	Yes	No	No	No	No	No	Good area for both rain gardens and pervious parking
31	Northside Community Chapel Church	B-05	Church and Charitable Property	96 Jefferson St, Paterson, New Jersey, 07522	1	4	Yes	External	Yes	No	Yes	No	No	No	No	No	green space and pervious possible
30	CAMP Youth Development Program	B-08	Church and Charitable Property	13-15 N 1st St, Paterson, New Jersey, 07522	1	3	Yes	External	No	No	Yes	No	No	No	No	No	Small space, pervious pavement not much room for green bioretention system
25	Faith Soul Saving Station	B-04	Church and Charitable Property	173 Haledon Ave, Paterson, New Jersey, 07522	1	5	Yes	External	Yes	No	Yes	No	No	No	No	No	many RG opportunities and good parking lot
192	Paterson Free Public Library (Northside)	B-06	Other Exempt	60 Temple St, Paterson, NJ 07522	1	4	Yes	External	Yes	No	No	No	No	No	No	No	Lots of potential for pervious as well as bioretention systems along
41	Paterson Public School No. 5	B-07	School District	414 Totowa Ave, Paterson, New Jersey, 07502	1	3	Yes	Internal	Yes	No	Yes	Yes	No	No	No	No	School, big space for potential projects
76	St. Mary Help of Christians Roman Catholic Church	B-09	Church and Charitable Property	410 Union Ave, Paterson, New Jersey, 07502	2	3	No	External	No	No	Yes	Yes	No	Yes	No	Yes	Feasible to install planter boxes and pervious pavement
190	Belmont Senior Apartments	B-10	Public Property	95 Cliff St, Paterson, New Jersey, 07522	1	3	Yes	Internal	No	No	Yes	Yes	No	No	No	No	Big site, good amount of green space
19	Cobb Park	C-01	Public Property	172 N Main St, Paterson, New Jersey, 07522	1	3	No	Internal	Yes	No	No	No	No	No	No	No	RG potential near side where sunlight hits
24	Gilmore Memorial Christian	C-02	Church and Charitable Property	127 Haledon Ave, Paterson, New Jersey, 07522	1	4	Yes	External	Yes	No	No	No	No	No	No	No	good amount of RG opportunities and PP
26	Gilmore Memorial Tabernacle	C-03	Church and Charitable Property	60 Haledon Ave, Paterson, New Jersey, 07522	1	3	Yes	External	Yes	No	Yes	No	No	No	No	No	PP possible , maybe RG
20	Holy Tabernacle Apostolic Church	C-04	Church and Charitable Property	80 Holsman St, Paterson, New Jersey, 07522	1	3	No	External	Yes	No	Yes	Maybe	No	No	No	No	Large grassy area and pervious pavement potential
23	Christ Temple Baptist Church	D-01	Church and Charitable Property	30 Hopper St, Paterson, New Jersey, 07522	1	3	Yes	Internal	Yes	No	Yes	No	No	No	No	No	Possible RG
21	Paterson Public School #12	D-02	School District	214 N 4th St, Paterson, New Jersey, 07522	1	4	Maybe	Internal	Yes	No	Yes	No	No	No	No	No	2 RG and 1 PP
16	Iglesia Pentecostal El Buen Pastor (Church)	E-01	Church and Charitable Property	10 Governor St, Paterson, New Jersey, 07501	1	3	Maybe	External	Maybe	Yes	Yes	No	No	No	No	No	Decent site with options on how GI can be incorporated
18	Dog Park Lawrence St	F-01	Public Property	36 Straight St, Paterson, New Jersey, 07501	1	4	No	Internal	Yes	No	No	No	No	No	No	No	enough green space for a rain garden but dog activity might interfere after construction
195	Freedom Village Apartments	G-01	Public Property	69 Straight St, Paterson, New Jersey, 07501	4	3	Maybe	External	Yes	No	No	No	No	No	No	No	Bioretention potential towards back of the building but no possibility for pervious

CityWide Green Infrastructure

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Site ID	Site Name	Plan ID	Ownership Subtype	Address (if applicable)	Ward	Site Ranking	Suitable Underdrain	Downspout Status	GI Potential: Bioretention System?	GI Potential: Depaving?	Old Pavement in low traffic area?	Pavement sloped toward ideal spot?	Rainwater Harvesting Use?	Roofleader Disconnection?	Grass Pavers?	Other GI?	Comments / Notes
115	Grace Gospel Church	G-02	Church and Charitable Property	139 Montgomery St, Paterson, New Jersey, 07501	4	4	No	External	Yes	No	No	No	No	No	No	No	Multiple areas for a bioretention system in a public and open area.
116	Grace Gospel Church Parking Lot	G-03	Church and Charitable Property	127 Montgomery St, Paterson, New Jersey, 07501	4	3	No	External	Yes	No	Yes	Yes	No	No	No	No	Potential for both pervious parking and a bioretention system to be put in
119	Mercer St & Fulton St Public Land	G-04	Public Property	161 Fulton St, Paterson, New Jersey, 07501	4	3	No	External	Yes	Yes	No	No	No	No	No	No	Nice and large area for a bioretention system
125	New Life Evangelist Center	G-05	Church and Charitable Property	153 Hamilton Ave, Paterson, New Jersey, 07501	4	3	No	External	Yes	No	No	No	No	No	No	No	large potential for bio retention due to grassy areas available
124	Second Baptist Church	G-06	Church and Charitable Property	72 Carroll Street, Paterson, New Jersey, 07501	4	3	No	External	Maybe	No	Yes	No	No	No	No	No	Potential for bioretention, but limited grassy areas
118	Wrigley Park	G-07	Public Property	118-132 GRAHAM AVE	4	4	Yes,Maybe	External	Yes	No	No	No	No	No	No	No	Large area for a bioretention system in a public place
114	Nathan Barnert Residence	H-01	Public Property	64 Keen St, Paterson, New Jersey, 07524	4	4	Yes	Internal	Yes	No	Yes	Yes	No	No	No	No	Multiple opportunities for GI and a bioretrntion system in the center of the site.
179	Paterson Public School No. 21	J-01	School District	322 10th Ave, Paterson, New Jersey, 07514	4	3	Yes	External	Yes	No	Yes	No	No	No	No	No	Potential for both a bioretention and pervious pavement
193	Barnet Medical Arts Parking Lot 1	K-01	Other Exempt	533 E 29th St, Paterson, New Jersey, 07504	3	4	Yes	External	Maybe	Yes	Yes	Yes	No	No	Yes	No	Feasible, big lot can all be captured
176	Faith Chapel Reformed Church	K-03	Church and Charitable Property	618 Broadway, Paterson, New Jersey, 07514	3	3	Yes	External	Yes	No	No	No	No	No	No	No	Good area for bioretention systems in grassy areas surrounding site.
129	Love of Jesus Paterson	K-04	Church and Charitable Property	405 Broadway, Paterson, New Jersey, 07501	4	3	No	Internal	Yes	No	Yes	Yes	No	No	No	No	Good large area of grass in front of building and potential for pervious parking.
170	Manara College	K-05	Other Exempt	139 Derrom Ave, Paterson, New Jersey, 07504	3	5	Yes	External	Yes	No	No	No	No	Yes	No	No	Most site runoff will drain into rain gardens, which have a nice open area
180	Paterson Public School 26	K-06	School District	1 E 32nd St, Paterson, New Jersey, 07514	3	3	Yes	External	Yes	Yes	Yes	No	No	Maybe	No	Yes	Weird paved areas around side of building, plenty of areas for depaving at minimum, lots of space providing opportunities for GI, roof leaders not visible for most of the building.
120	Paterson Adult Day Center	K-07	Public Property	195 20th Avenue, Paterson, New Jersey, 07501	4	3	Maybe	Internal	Yes	No	No	No	No	No	No	No	Large grassy area for bioretention with roof drainage
130	Radio Vision Cristiana	K-08	Church and Charitable Property	421 Broadway, Paterson, New Jersey, 07501	4	3	No	External	Yes	No	Yes	Yes	No	No	No	No	Good area for rain garden and pervious parking
178	Rosa L. Parks School of Fine & Performing Arts	K-09	School District	397 12th Ave, Paterson, New Jersey, 07514	4	4	Yes	Internal	Yes	No	Yes	Maybe	No	No	No	No	Inside corner of site has a great place for a bioretention with a catch basin as well and a lot of other sloping grassy areas.
133	St. Paul's Episcopal Church	K-10	Church and Charitable Property	449 Van Houten St, Paterson, New Jersey, 07501	4	3	Yes	External	Yes	No	No	No	No	No	No	No	Good but small areas for GI
171	St. Therese Roman Catholic Church	K-11	Church and Charitable Property	80 13th Avenue, Paterson, New Jersey, 07504	3	3	Maybe	Internal	Maybe	No	Yes	Yes	No	Maybe	No	Yes	Lack of existing inlets to connect to limits feasibility. Plenty of Gi Opportunities with pervious pavement and rain gardens
138	United Presbyterian Church	K-12	Church and Charitable Property	375 Van Houten St, Paterson, New Jersey, 07501	4	4	No	Internal	Yes	No	No	No	No	No	No	No	Good, large and sunny areas for rain gardens.
168	Amidstad Park	L-01	Public Property	336 19th Ave, Paterson, New Jersey, 07504	3	3	Maybe	External	No	No	No	No	No	No	No	No	Not a lot of area to treat, but rain gardens feasible and in good spot
160	Brandes Field Playground	L-02	Public Property	430 Marshall St, Paterson, New Jersey, 07503	2	5	Yes	External	Yes	Yes	No	No	No	No	Yes	No	Plenty of depaving, opportunity for bioretention, community hub
161	Dr. Hani Awadallah School	L-03	School District	27 Hazel St, Paterson, New Jersey, 07503	2	5	Yes	External	Yes	No	Yes	Yes	No	Yes	No	No	Lots of roof leaders can be disconnected, looks like storm flows out into small stream by railroad tracks so may not be connected to the overall city drainage
184	Dr. Martin Luther King Jr. Public School	L-04	School District	851 E 28th St, Paterson, New Jersey, 07513	5	3	Yes	Internal	Yes	No	No	No	No	No	Yes	No	Large grassy areas near the back side of the school with large potential for bioretention.
148	Full Service Community Center	L-05	Other Exempt	512 Market St, Paterson, New Jersey, 07501	5	3	No	Internal	Yes	No	No	No	No	No	No	No	Small but good areas for bioretention.
165	GBCA Paterson Head Start	L-06	School District	604 20th Ave, Paterson, New Jersey, 07504	3	4	Yes	External	No	No	Yes	Yes	Maybe	Yes	No	Yes	Pervious pavement and planter boxes. Lots of downspouts to disconnect.
191	Maurice J. Brick Residence	L-07	Other Exempt	70 Dey St, Paterson, New Jersey, 07503	6	3	Yes	External	Maybe	No	Yes	Yes	Maybe	Maybe	No	Yes	Possible bioretention in front grass where flagpole isn't, pervious pavement in back parking lot, cistern for water reuse and planter boxes to capture roof area
153	Paterson Public School 15	L-08	School District	98 Oak St, Paterson, New Jersey, 07501	5	3	Yes	Internal	Yes	No	No	No	No	No	No	No	Small potential for GI
166	Paterson Public School 20	L-09	School District	492 E 37th St, Paterson, New Jersey, 07504	3	3	Maybe	Internal	No	Yes	Yes	No	No	Maybe	No	Yes	Roof leaders only visible on front building, opportunities for pervious pavement but not ideal slope
151	Paterson Public School 24	L-10	School District	50 19th Ave, Paterson, New Jersey, 07513	5	3	Yes	Internal	Yes	No	Yes	No	No	Maybe	No	No	Roof leaders not visible, pervious pavement feasible for parking lot, rain garden in back fenced in area feasible and at low point
167	Vreeland Park	L-11	Public Property	670-678 20TH AVE	3	3	Maybe	External	Yes	No	No	No	No	No	No	No	Small but feasible, not a lot of pervious to collect

CityWide Green Infrastructure

Last Updated: 3/14/2024

Site ID	Site Name	Plan ID	Ownership Subtype	Address (if applicable)	Ward	Site Ranking	Suitable Underdrain	Downspout Status	GI Potential: Bioretention System?	GI Potential: Depaving?	Old Pavement in low traffic area?	Pavement sloped toward ideal spot?	Rainwater Harvesting Use?	Roofleader Disconnection?	Grass Pavers?	Other GI?	Comments / Notes
164	Heritage at Alexander Hamilton	M-01	Public Property	238-260 23RD AVE	3	3	Yes	External	Maybe	No	Yes	Maybe	No	Yes	No	Yes	Smaller paved areas for pervious pavement, planter boxes and smaller, very feasible
105	Kingdom Hall of Jehovah's Witnesses	M-02	Church and Charitable Property	209 Trenton Ave, Paterson, New Jersey, 07503	6	3	No	External	Yes	No	No	No	No	Yes	No	Yes	Planter boxes are small fix, plus smaller rain garden is feasible
103	Paterson Art & Science Charter School	M-03	Church and Charitable Property	30 Michigan Ave, Paterson, New Jersey, 07503	6	4	Yes	Internal	Yes	Maybe	Yes	Yes	No	No	Maybe	No	Feasible, pervious pavement and rain gardens are reasonably placed
102	Paterson Public School 25	M-04	School District	287 Trenton Ave, Paterson, New Jersey, 07503	6	5	No	External	Yes	Yes	Yes	No	No	Yes	Maybe	Yes	Lots of space and very feasible, big and small GO
104	St. George Syro Malabar Catholic Church	M-05	Church and Charitable Property	408 Getty Ave, Paterson, New Jersey, 07503	6	4	No	External	Yes	No	Yes	No	No	Maybe	No	Yes	Feasible pervious pavement and rain garden are bigger solutions, plus planter boxes for all of roof area. Very feasible.
97	United Islamic Center (Mosque)	M-06	Church and Charitable Property	408 Knickerbocker Ave, Paterson, New Jersey, 07503	6	3	No	External	Maybe	No	Maybe	Maybe	No	Yes	No	Yes	Smaller areas for GI, trees to contend with, pervious pavement unsure where parking spots are, but overall good and slightly feasible
188	Brooks Sloate Terrace	N-01	Other Exempt	311 Redwood Ave, Paterson, New Jersey, 07522	1	3	Maybe	External	Maybe	No	No	No	No	No	No	No	some green space available, but since the entire location is very built it could be hard avoiding utilities
81	Grace Buckley Park	N-02	Public Property	385 Chamberlain Ave, Paterson, New Jersey, 07502	1	5	Maybe	Internal	Yes	No	Yes	Maybe	No	No	No	No	opportunities for rain gardens and porous pavement throughout the park
44	John F Kennedy High School	N-03	School District	244 Totowa Ave, Paterson, New Jersey, 07502	2	5	Yes	Internal	Yes	Yes	Yes	Yes	Maybe	Maybe	Yes	Yes	Lots of pervious, multiple GI opportunities
42	Paterson Public School No. 27	N-04	School District	228 Richmond Ave, Paterson, New Jersey, 07502	2	4	Yes	External	Maybe	Yes	Yes	No	Maybe	No	No	Maybe	Some solutions very feasible, others less feasible but will have more volume managed
3	Paterson Public School 19	N-05	School District	23 James St, Paterson, New Jersey, 07502	2	3	Yes	External	No	Yes	No	No	Yes	Yes	No	Yes	Potential to depave but may be difficult due to raised site
83	St. Gerard Majella Roman Catholic Church	N-06	Church and Charitable Property	501 W Broadway, Paterson, New Jersey, 07522	1	5	Maybe	External	Yes	No	No	No	No	No	No	No	a rain garden could most likely be installed on the green space next to the downspout
45	Westside Park	N-07	Public Property	114-242 TOTOWA AVE	2	5	Maybe	External	Yes	Yes	Yes	Maybe	No	No	No	No	Lots of space, easy to construct, multiple large areas for bioretention, possible permitting requirements, lots of pavement can be removed or replaced with pervious
79	Iglesia Nuevo Nacimiento 'New Birth' (Church)	O-01	Church and Charitable Property	314 Totowa Ave, Paterson, New Jersey, 07502	2	3	No	External	Yes	Maybe	No	No	Yes	Yes	No	Yes	Feasible, planter boxes and rain garden
57	Paterson City Council	P-01	Public Property	151 Market St, Paterson, New Jersey, 07505	1	3	Yes	Internal	Yes,Maybe	No	No	No	No	No	No	No	Some tree planter opportunities
196	Dr. Frank X. Graves Public Safety Complex	P-02	Public Property	93 Broadway, Paterson, New Jersey, 07505	1	3	Yes	Internal	Maybe	Yes	Yes	No	No	No	No	No	Some porous pavement and depaver opportunities
62	Cathedral of St. John the Baptist	Q-01	Church and Charitable Property	381 Grand St, Paterson, New Jersey, 07505	1	3	No	External	Yes	No	No	No	No	No	No	No	some green space and downspouts available for a rain garden, yet there are lights and trees that could be in the way when excavating
136	Christian Fellowship Center	Q-02	Church and Charitable Property	349 Van Houten St, Paterson, New Jersey, 07501	4	3	Yes	External	Yes	No	Yes	No	No	No	No	No	Good area for rain garden or other bioretention system.
63	Court House Plaza	Q-03	Public Property	74 Hamilton St, Paterson, New Jersey, 07505	1	3	Maybe	Internal	Yes	No	No	No	No	No	No	No	some free green space for a potiential rain garden or even bioswale, but there's a lot of exisiting paths and garden beds already
144	Eastside High School	Q-04	School District	150 Park Ave, Paterson, New Jersey, 07501	5	4	No	Internal	Yes	No	No	No	No	No	No	No	Large areas of grass with high potential for green infrastructure.
142	Greater Bible Way Church	Q-05	Church and Charitable Property	14 Southard St, Paterson, New Jersey, 07501	5	4	No	External	Yes	No	Yes	No	No	No	No	No	Good potential for a bioretention in the front as well as some pervious parking.
58	Internal Revenue Service (IRS) Taxpayer Assistance Center	Q-06	Public Property	100 Hamilton Plz, Paterson, New Jersey, 07505	1	4	Maybe	Internal	Yes	No	No	No	No	No	No	No	a decent amount of green space available for a rain garden, as long as trees and electric lines aren't in the way
10	Memorial Day School Georgette Hauser Campus	Q-07	Other Schools	15 Crosby Pl, Paterson, New Jersey, 07501	1	3	Yes	External	Yes	No	Yes	No	No	No	No	No	Small area of grass available and space for pervious as well
146	New Roberto Clemente School	Q-08	School District	482 Market St, Paterson, New Jersey, 07501	5	4	Yes	Internal	Yes	No	No	No	No	No	No	No	Good areas with good potential for rain gardens with adjacent drainage.
14	Our Lady of Victories Roman Catholic Church	Q-09	Church and Charitable Property	100 Fair St, Paterson, New Jersey, 07505	1	3	No	External	Yes	No	Yes	No	No	No	No	No	Medium potential for bioretention in the front side of the building
75	Park Railroad Ave	Q-10	Public Property	254 Market St, Paterson, New Jersey, 07505	1	4	Maybe	Internal	Yes	No	No	No	No	No	No	No	enough green space for a rain garden, just need to avoid the existing memorial and plants
157	Paterson Public School 8	Q-12	School District	25 Chadwick St, Paterson, New Jersey, 07503	2	3	Yes	Internal	Yes	Yes	Yes	No	No	No	No	No	Feasible pavement and bioretention
159	Paterson Public Works Department	Q-13	Public Property	72-80 N Barclay St, Paterson, New Jersey, 07503	2	4	Yes	External	Yes	Yes,Maybe	Yes	Yes	Yes	Maybe	No	Maybe	Easy to do (feasible with DPW cooperation), multiple solutions
5	Railroad Ave Open Space	Q-14	Public Property	207 Railroad Ave, Paterson, New Jersey, 07501	5	3	No	External	Yes	No	No	No	No	No	No	No	Good sunny and large area for a bioretention system to be put in.
141	Roberto Clemente Park	Q-15	Public Property	Parkway & Rose St, Paterson, New Jersey, 07501	5	5	Yes	External	Yes	No	No	No	No	No	No	No	Lots of grassy areas and lots of botential for bioretention along with potential for grass pavers where the pavement is as well.

CityWide Green Infrastructure

Last Updated: 3/14/2024

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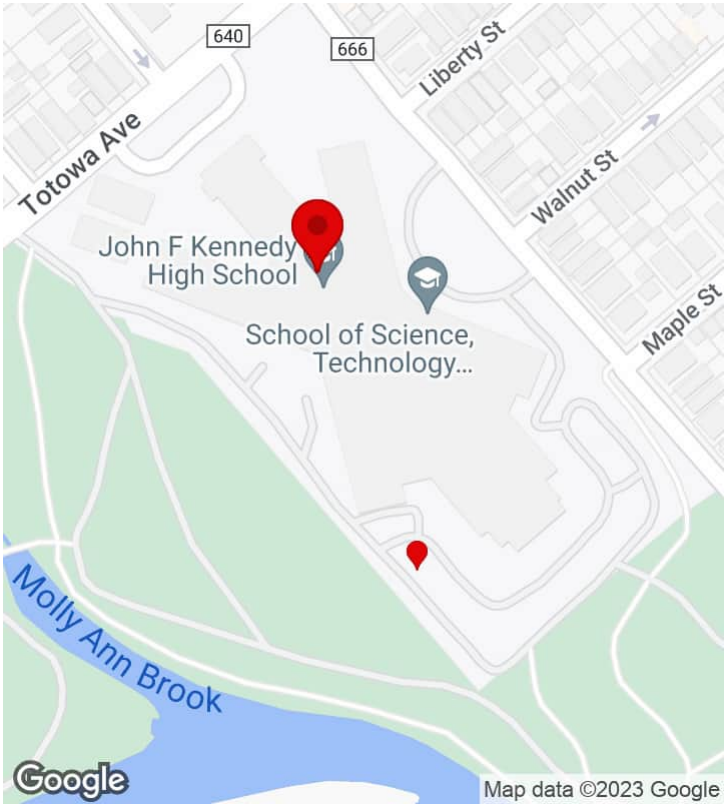
155	St. Anthony of Padua Roman Catholic Church	Q-16	Church and Charitable Property	159 Madison St, Paterson, New Jersey, 07501	5	4	Yes	External	Yes	No	Yes	No	No	No	No	No	Large grassy areas that can be usee.
107	Paterson Public School 18	S-01	School District	37 E 18th St, Paterson, New Jersey, 07524	3	3	Yes	External	Yes	Yes	No	No	No	No	No	Yes	Rain garden and planter boxes are feasible but smaller
181	The Church of Jesus Christ of Latter-day Saints	T-01	Church and Charitable Property	26 E 39th St, Paterson, New Jersey, 07514	3	5	Yes	External	Yes	No	Yes	No	No	Yes	No	Yes	Large treatment area, multiple areas for rain garden (back area at top of hill is supplemental), feasible
169	Christopher Columbus Park	U-01	Public Property	1 E Park Dr, Paterson, NJ 07504	3	5	Yes	External	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Lots of space and very feasible larger GI opportunities
182	Paterson STEAM High School	U-02	School District	764 11th Ave, Paterson, New Jersey, 07514	3	4	Maybe	Internal	Maybe	No	Yes	No	No	Maybe	No	No	No visible roof leaders, but good opportunity for rain garden and pervious pavement

Paterson GI Site Inspections

John F Kennedy High School, 244 Totowa Ave, Paterson, New Jersey, 07502

7/18/2023, 3:27:32 PM UTC



CREATED

7/10/2023, 6:10:18 PM UTC
by Peyton Taylor

UPDATED

7/18/2023, 3:27:32 PM UTC
by Peyton Taylor

STATUS

Inspection Complete

LOCATION

40.914925, -74.187772

Name	John F Kennedy High School
Address	244 Totowa Ave, Paterson, New Jersey, 07502
Proof of Address	

Background

Ward	2

General Info

Date	July 18, 2023
Inspector Name	Peyton and Karmyn
Subtype (ownership)	School District

Existing Stormwater Structures

Are there suitable locations (CB/MH/other) for GI to underdrain to? [Y/N/Maybe]	Yes

If yes, add at least 1 photo/sketch of structure location(s)

Underdrain Photo

If external, add at least 1 photo/sketch of structure location(s)

Does the building primarily have internal drainage or downspouts on the exterior? [Internal/External]	Internal

Roof Drainage Photo

Potential GI Solutions

Bioretention Systems

Is there open/grass space available near potential drainage areas? [Y/N/Maybe]	Yes

Description and Photos of Bioretention Locations (4 Items)

Description and Photos of Bioretention Locations - 1. Back grass are near trailers

Select "+Record" at the bottom right of the screen. This is the first potential location. Add up to 5 photos for this location within the site. Label as desired in the "Bioretention Photo Description". Select "Save" at the top right. Select "+ Record" to repeat this process for another location within the site.

Bioretention Photos

Bioretention Photo Description	Back grass are near trailers

Description and Photos of Bioretention Locations - 2. Grass area in one way drop off island at side of school. Add cutouts into asphalt curb

Select "+Record" at the bottom right of the screen. This is the first potential location. Add up to 5 photos for this location within the site. Label as desired in the "Bioretention Photo Description". Select "Save" at the top right. Select "+ Record" to repeat this process for another location within the site.

Bioretention Photos

Bioretention Photo Description	Grass area in one way drop off island at side of school. Add cutouts into asphalt curb

Description and Photos of Bioretention Locations - 3. Large area can be used for bioretention pond or storage. Minor regrading needed. Can connect roof leaders that are internal. Add swale next to sidewalk to catch runoff that runs towards roadway.

Select "+Record" at the bottom right of the screen. This is the first potential location. Add up to 5 photos for this location within the site. Label as desired in the "Bioretention Photo Description". Select "Save" at the top right. Select "+ Record" to repeat this process for another location within the site.

Bioretention Photos

Bioretention Photo Description	Large area can be used for bioretention pond or storage. Minor regrading needed. Can connect roof leaders that are internal. Add swale next to sidewalk to catch runoff that runs towards roadway.

Description and Photos of Bioretention Locations - 4. Add rain garden or biodetention to fill in spot near parking lot and remove paved walkway on top of small hill. Match bioretention/rg on the other sidewalk

Select "+Record" at the bottom right of the screen. This is the first potential location. Add up to 5 photos for this location within the site. Label as desired in the "Bioretention Photo Description". Select "Save" at the top right. Select "+ Record" to repeat this process for another location within the site.

Bioretention Photos

Bioretention Photo Description	Add rain garden or biodetention to fill in spot near parking lot and remove paved walkway on top of small hill. Match bioretention/rg on the other sidewalk

Depaving

Is there excessive paved areas that could be depaved? [Y/N/Maybe]	Yes

Description and Photos of Depaving Locations (1 Item)

Description and Photos of Depaving Locations - 1. See grass pavers section

Select "+Record" at the bottom right of the screen. This is the first potential location. Add up to 5 photos for this location within the site. Label as desired in the "Bioretention Photo Description". Select "Save" at the top right. Select "+ Record" to repeat this process for another location within the site.

Depaving Photos

Depaving Photo Description	See grass pavers section

Pervious Pavement

Is there old pavement in low traffic areas? [Y/N/maybe]	Yes

Description and Photos of Pervious Pavement Locations (3 Items)

Description and Photos of Pervious Pavement Locations - 1. Back parking lot

Select "+Record" at the bottom right of the screen. This is the first potential location. Add up to 5 photos for this location within the site. Label as desired in the "Bioretention Photo Description". Select "Save" at the top right. Select "+ Record" to repeat this process for another location within the site.

Pervious Pavement Photos

Pervious Pavement Photo Description	Back parking lot

Description and Photos of Pervious Pavement Locations - 2. Side parking aisle by entrance slopes to back corner

Select "+Record" at the bottom right of the screen. This is the first potential location. Add up to 5 photos for this location within the site. Label as desired in the "Bioretention Photo Description". Select "Save" at the top right. Select "+ Record" to repeat this process for another location within the site.

Pervious Pavement Photos

Pervious Pavement Photo Description	Side parking aisle by entrance slopes to back corner

Description and Photos of Pervious Pavement Locations - 3. Pavement is new, but could be redone once expired

Select "+Record" at the bottom right of the screen. This is the first potential location. Add up to 5 photos for this location within the site. Label as desired in the "Bioretention Photo Description". Select "Save" at the top right. Select "+ Record" to repeat this process for another location within the site.

Pervious Pavement Photos

Pervious Pavement Photo Description	Pavement is new, but could be redone once expired
Is the parking lot sloped perpendicular to parking isles (making it idea for interception of stormwater)? [Y/N/Maybe]	Yes

Description and Photos of Parking Lot Slope (1 Item)

Description and Photos of Parking Lot Slope - 1. Slopes to back corner, steeper at the end

Pervious Pavement Photos

Pervious Pavement Photo Description	Slopes to back corner, steeper at the end

Rainwater Harvesting

Is there applicable reuse for captured stormwater and a location to capture it from? [Y/N/maybe]	Maybe

Description and Photos of Rainwater Harvesting Locations (1 Item)

Description and Photos of Rainwater Harvesting Locations - 1. Can use rainwater to maintain grounds

Select "+Record" at the bottom right of the screen. This is the first potential location. Add up to 5 photos for this location within the site. Label as desired in the "Bioretention Photo Description". Select "Save" at the top right. Select "+ Record" to repeat this process for another location within the site.

Rainwater Harvesting Photos

Rainwater Harvesting Photo Description	Can use rainwater to maintain grounds

Roof Leader Disconnection

Are roof leaders located near large pervious areas? [Y/N/maybe]	Maybe

Description and Photos of Roof Leader Disconnection Locations (1 Item)

Description and Photos of Roof Leader Disconnection Locations - 1. Roof leaders internal

Select "+Record" at the bottom right of the screen. This is the first potential location. Add up to 5 photos for this location within the site. Label as desired in the "Bioretention Photo Description". Select "Save" at the top right. Select "+ Record" to repeat this process for another location within the site.

Roof Leader Disconnection Photos

Roof Leader Disconnection Photo Description	Roof leaders internal

Grass Pavers

Are there driveways, parking lots, or other areas that would be suitable to be redone for grass pavers? [Y/N/Maybe]	Yes

Description and Photos of Grass Pavers Locations (1 Item)

Description and Photos of Grass Pavers Locations - 1. Remove asphalt, replace with pavers or grass

Select "+Record" at the bottom right of the screen. This is the first potential location. Add up to 5 photos for this location within the site. Label as desired in the "Bioretention Photo Description". Select "Save" at the top right. Select "+ Record" to repeat this process for another location within the site.

Grass Paver Photos




Grass Pavers Photo Description	Remove asphalt, replace with pavers or grass

Other GI Opportunities

Is there a possibility for other types of GI to be utilized on site (Tree Pits/Beds, Downspout Planter Boxes, etc.)? [Y/N/Maybe]	Yes

Description and Photos of Other GI Locations (2 Items)

Description and Photos of Other GI Locations - 1. Green roof

Select "+Record" at the bottom right of the screen. This is the first potential location. Add up to 5 photos for this location within the site. Label as desired in the "Bioretention Photo Description". Select "Save" at the top right. Select "+ Record" to repeat this process for another location within the site.

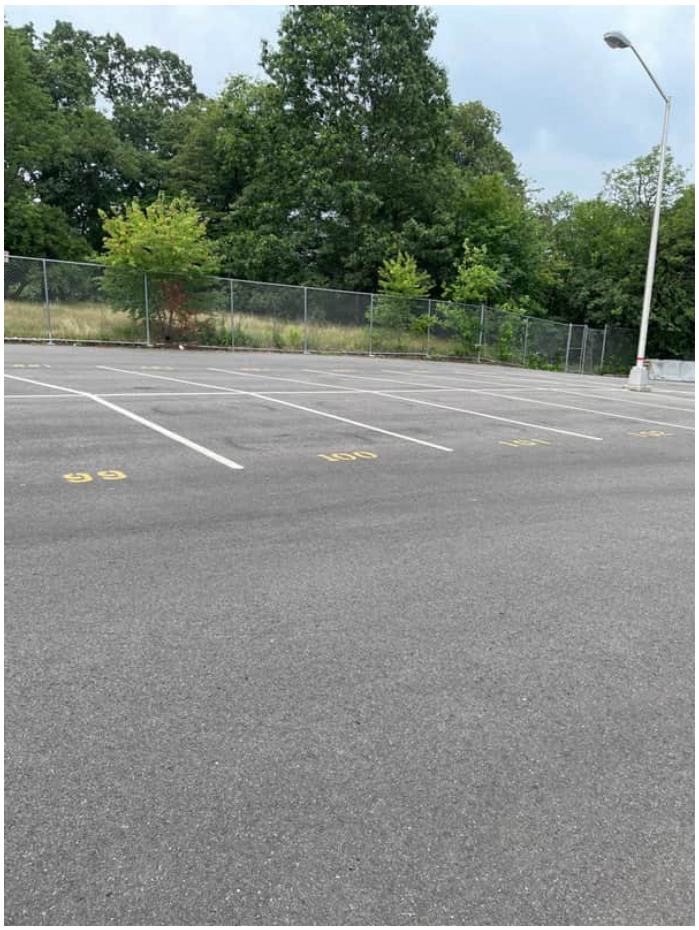
Other GI Photos

Other GI Photo Description	Green roof

Description and Photos of Other GI Locations - 2. Underground storage under parking aisle along gate wall

Select "+Record" at the bottom right of the screen. This is the first potential location. Add up to 5 photos for this location within the site. Label as desired in the "Bioretention Photo Description". Select "Save" at the top right. Select "+ Record" to repeat this process for another location within the site.

Other GI Photos



Other GI Photo Description	Underground storage under parking aisle along gate wall

Site GI Ranking

Predicted site rating for GI (prior to site visit) (1-5 ranking, 5 being the highest)	0
Overall site potential for GI (after site visit) (1-5 ranking, 5 being the highest)	5
Reasoning for ranking	Lots of pervious, multiple GI opportunities

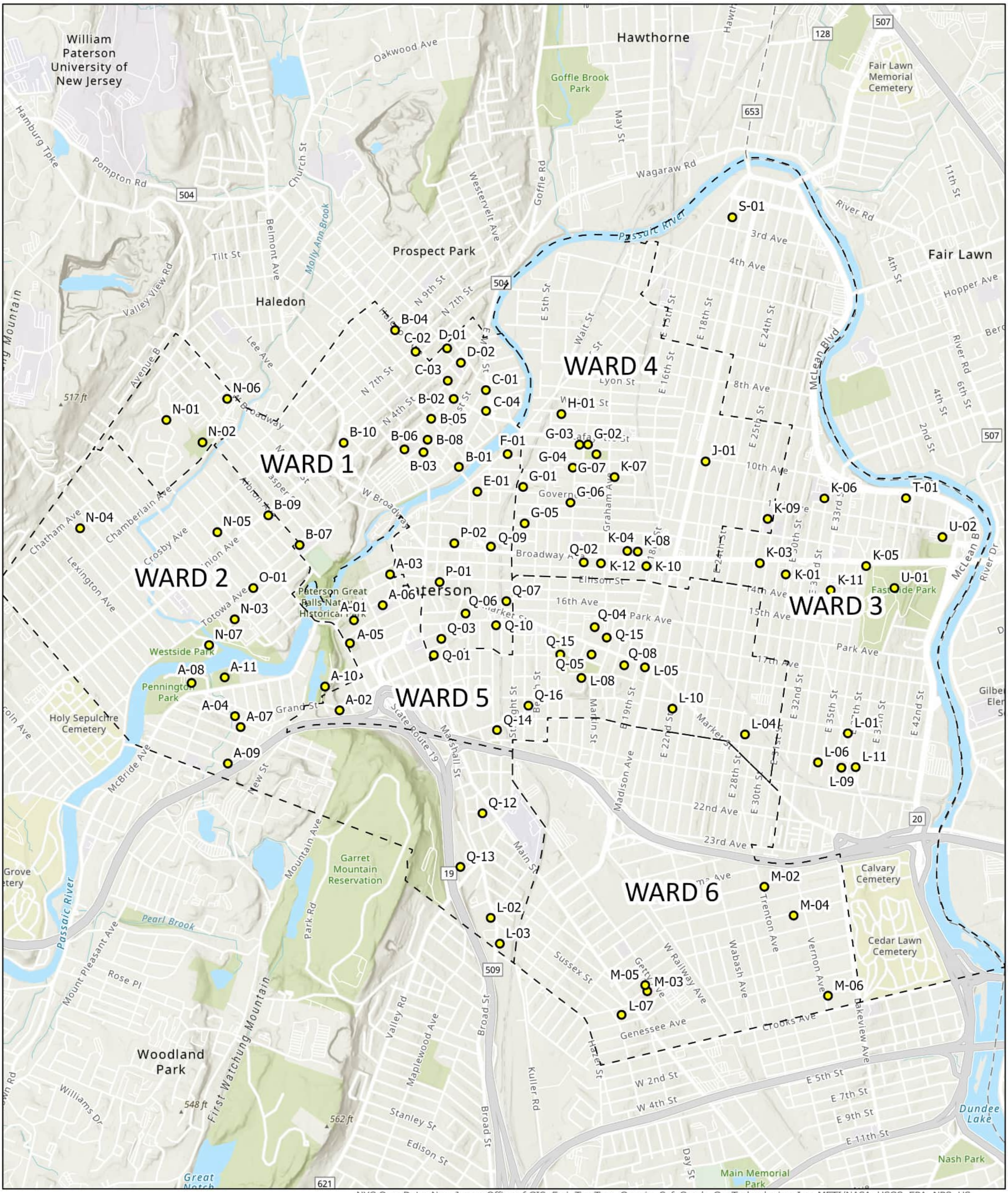
APPENDIX

C CONCEPT PLANS

DATE: 03/11/2024

CITYWIDE GREEN INFRASTRUCTURE EVALUATION

FIGURE 1.0 SITE LOCATIONS MAP



NYC OpenData, New Jersey Office of GIS, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, USFWS, Esri, NASA, NGA, USGS MA

LEGEND

- Proposed BMP - Site Locations
- Paterson Wards

0 0.13 0.25 0.5 0.75 1 Miles

CITY OF PATERSON FOUNDED 1792 NEW JERSEY

RUTGERS New Jersey Agricultural Experiment Station

wsp

Sewershed C-01

Site A-01: COLLEGE ACHIEVE PATERSON CHARTER SCHOOL – ELEMENTARY CAMPUS

Sewershed	C-01
Site Area	136,104 sq. ft.
Address	21 Market Street, Paterson, NJ 07502
Block and Lot	Block 4609, Lot 6, 9, 10, 11, 12, 13
Soil Type	HSG N/A

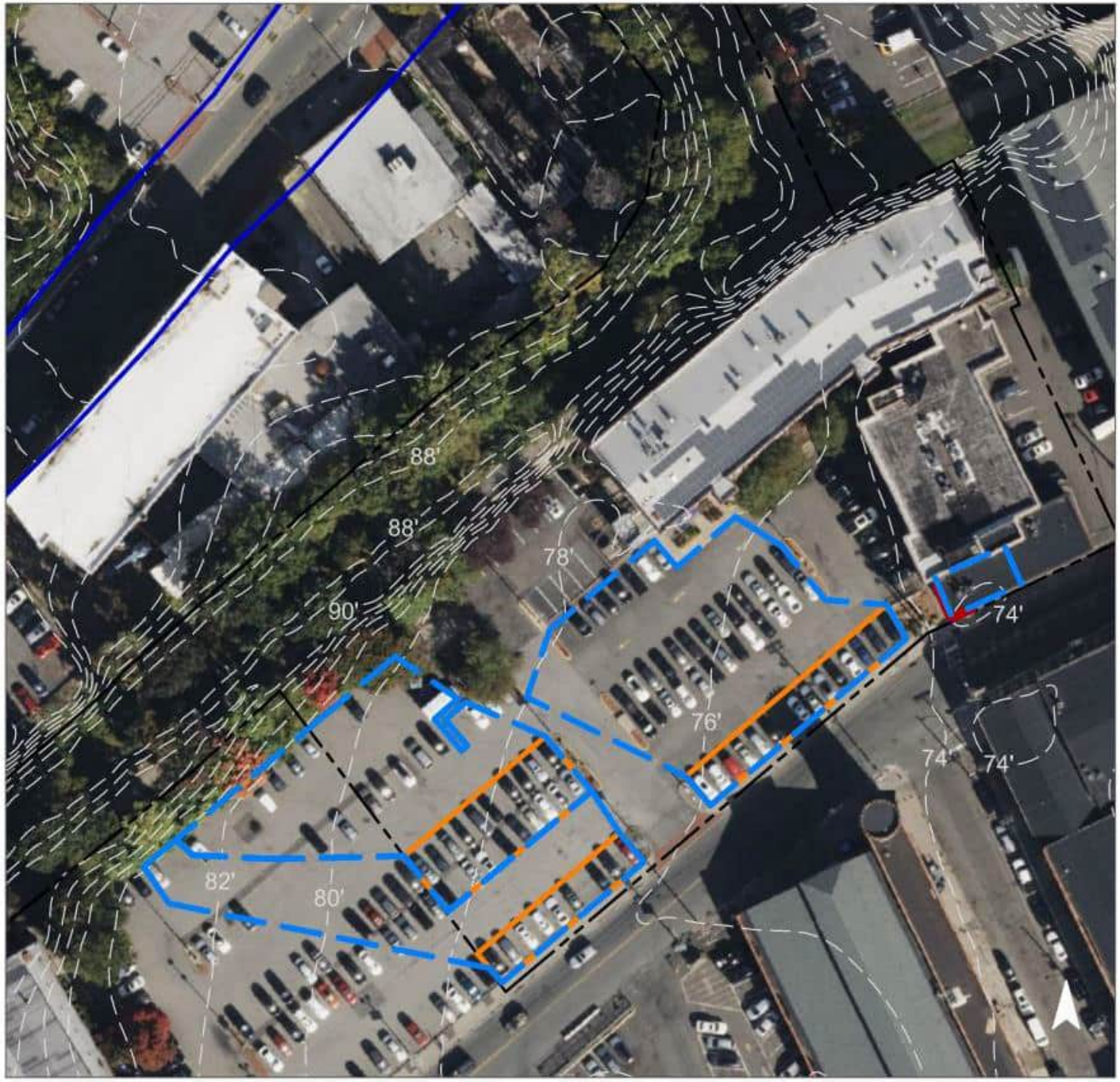
Parking stalls in the parking lot on the southern portion site can be retrofitted with pervious parking to capture water from the parking lot. Five planter boxes can be installed along the southwest of the building to filter water from the downspouts of the building, collecting stormwater runoff generated by the roof. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

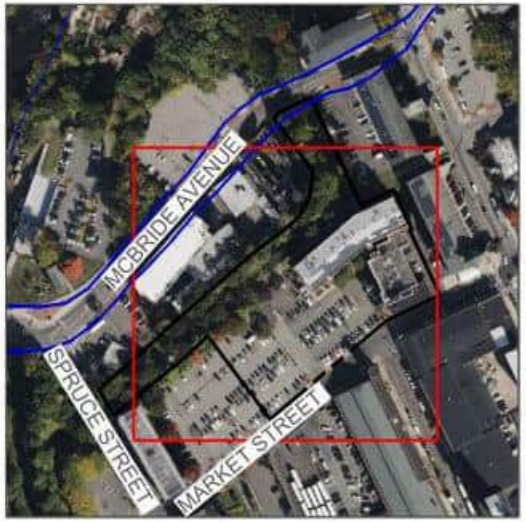
Impervious Cover		Existing Loads from Impervious Cover (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
77	104,364	5.0	52.7	479.2	0.081 Mgal	10,871 CF	3.10 Mgal	413,979 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 pavement	40,785	1.150	179	82,280	3.09	8,385	$134,160
Planter boxes	875	n/a	3	n/a	n/a	5 (2'x6' box)	$8,000
Site Totals	**41,660**	**1.150**	**182**	**82,280**	**3.09**	**8,445**	**$192,785**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site A-01: COLLEGE ACHIEVE PATERSON CHARTER SCHOOL – ELEMENTARY CAMPUS





College Achieve Paterson Charter School - Elementary Campus

- pervious pavement
- planter box
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS
- 100-yr Floodplain

0 40' 80'

Site A-02: INTERNATIONAL HIGH SCHOOL

Sewershed	C-01
Site Area	202,553 sq. ft.
Address	200 Grand Street Paterson, NJ 07501
Block and Lot	Block 5205, Lot 1
Soil Type	HSG D

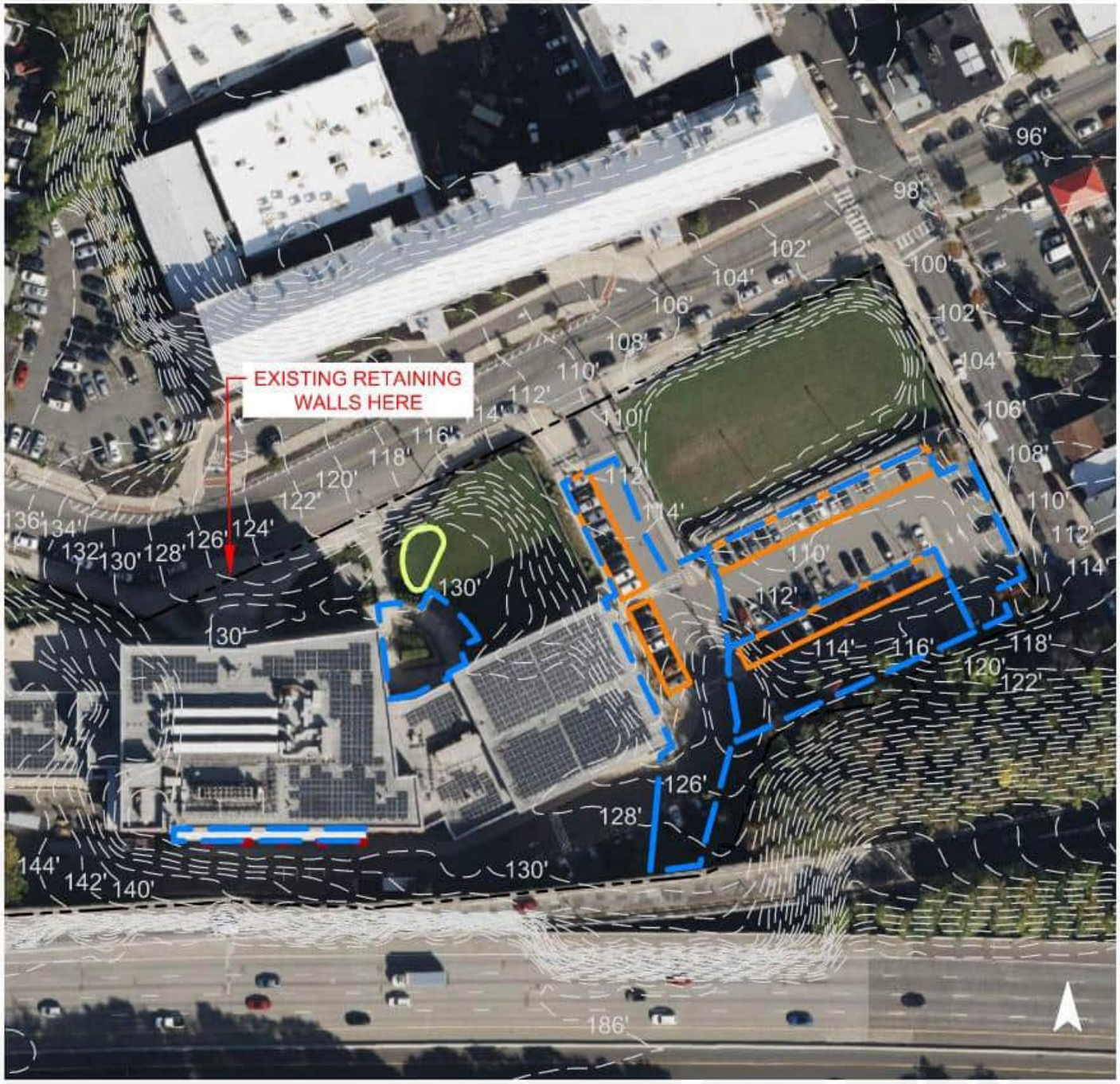
Two rows in the parking lot on the east side of the site can be repaved with pervious parking to capture water from the parking lot. A rain garden can be constructed beside the northeast staircase along Grand Street to collect runoff from above. Five planter boxes can be installed to filter water from the downspouts on the southern side of the site. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
82	165,383	8.0	83.5	759.3	0.129 Mgal	17,227 CF	4.91 Mgal	656,019 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	2,935	0.083	13	5,920	0.22	775	$19,375
Pervious pavement	40,480	1.141	177	81,670	3.07	8,290	$132,640
Planter boxes	1,000	n/a	3	n/a	n/a	5 (2'x6' box)	$8,000
Site Totals	**44,415**	**1.224**	**193**	**87,590**	**3.29**	**8,310**	**$220,115**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site A-02: INTERNATIONAL HIGH SCHOOL

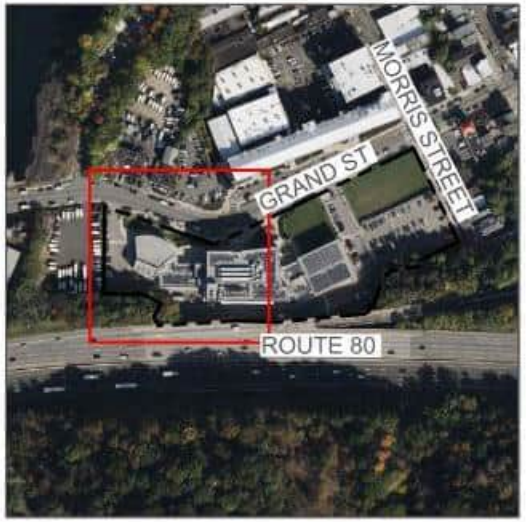


International High School

- bioretention system
- pervious pavement
- planter box
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 50' 100'

Site A-02: INTERNATIONAL HIGH SCHOOL



International High School

- pervious pavement
- planter box
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 30' 60'

Site A-03: LOU COSTELLO MEMORIAL PARK

Sewershed	C-01
Site Area	35,425 sq. ft.
Address	49 Ellison Street Paterson, NJ 07505
Block and Lot	Block 4604, Lot 1
Soil Type	HSG N/A

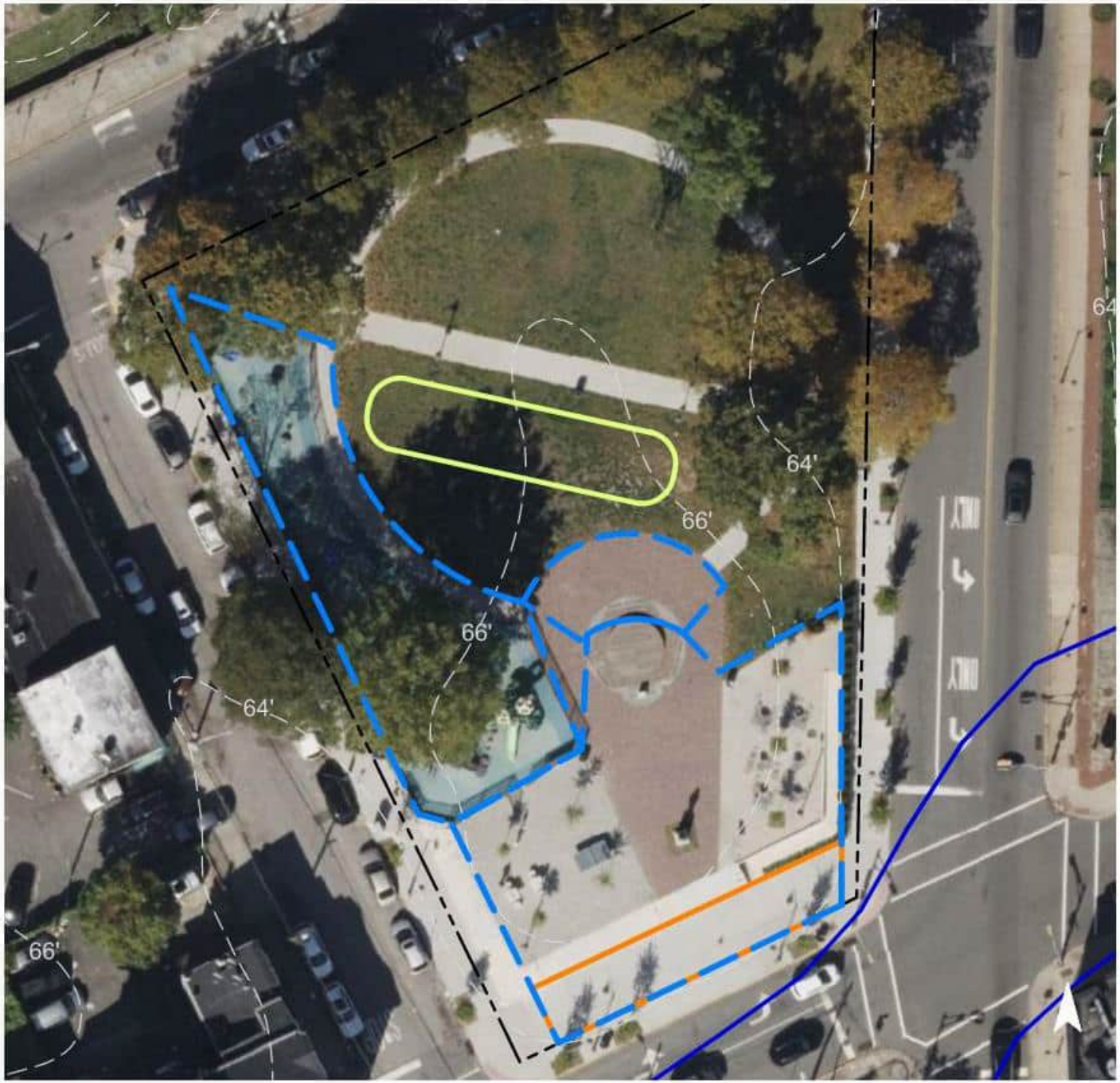
A bioretention system can be installed north of the memorial to capture, treat and infiltrate water from the impervious area adjacent to the open space. The concrete path south of the park can be converted to pervious pavement to infiltrate stormwater runoff from the site. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

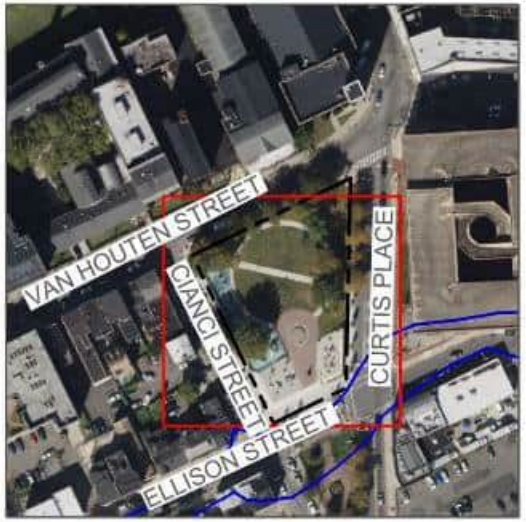
Impervious Cover		Existing Loads from Impervious Cover (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
82	5,443	0.3	2.7	25.0	0.004 Mgal	567 CF	0.16 Mgal	21,590 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	5,925	0.167	27	11,950	0.45	1,480	$37,000
Pervious Pavement	7,385	0.208	32	14,900	0.56	1,320	$21,120
Site Totals	**13,310**	**0.375**	**59**	**26,850**	**1.01**	**2,800**	**$79,800**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site A-03: LOU COSTELLO MEMORIAL PARK





Lou Costello Memorial Park

- bioretention system
- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS
- 100-yr Floodplain

Note: Existing park grades are to be modified.

0 20' 40'

Site A-04: OUR LADY OF POMPEI CHURCH

Sewershed	C-01
Site Area	16,800 sq. ft.
Address	70 Murray Avenue Paterson, NJ 07501
Block and Lot	Block 4917, Lot 20,21
Soil Type	HSG N/A

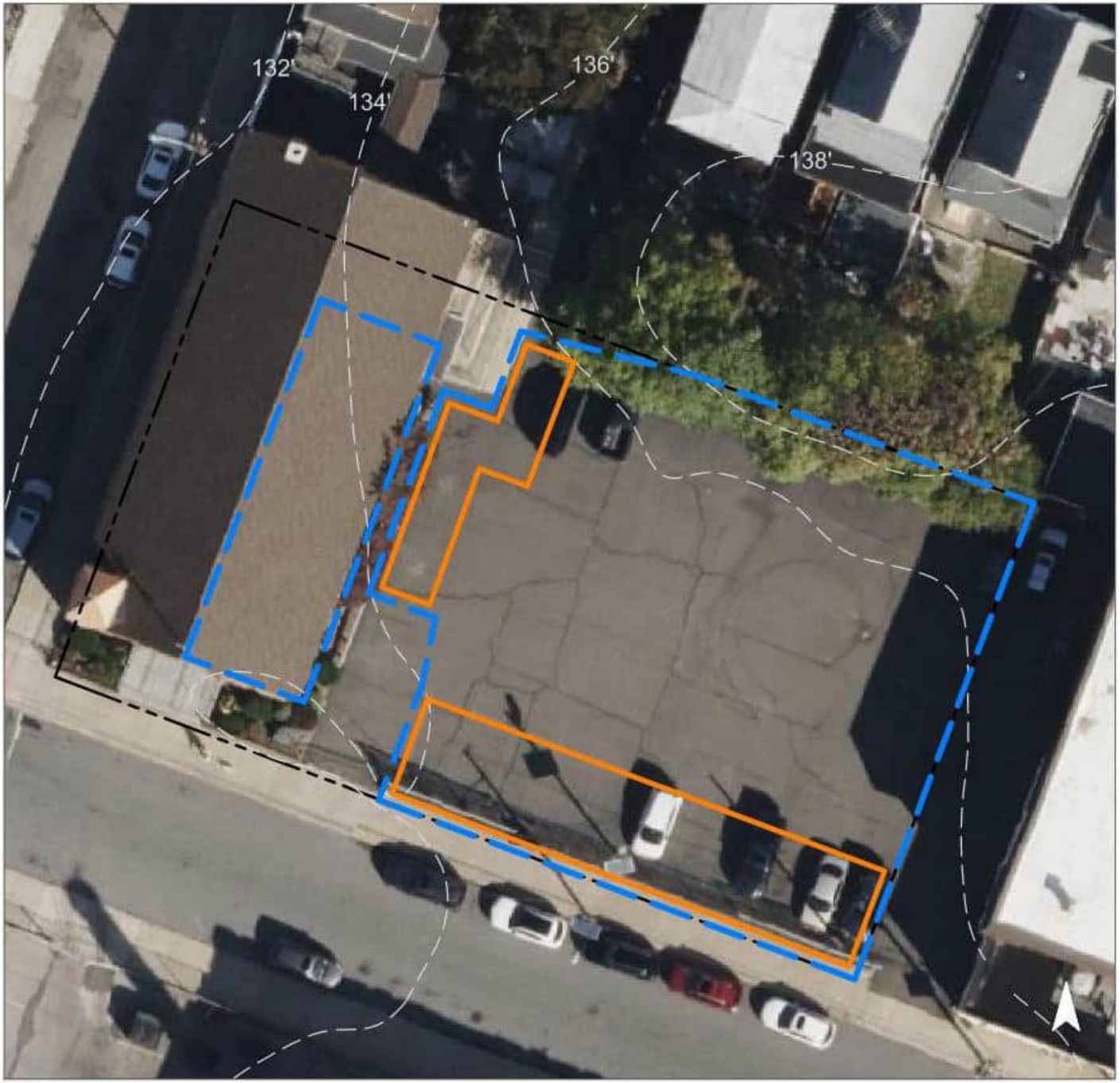
The current pavement in the parking lot to the east of the building can be converted to pervious pavement to capture and infiltrate stormwater runoff from both the roof of the church and the church parking lot. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
94	15,755	0.8	8.0	72.3	0.012 Mgal	1,641 CF	0.43 Mgal	57,768 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 pavement	7,300	0.190	32	14,730	0.55	1,305	$ 20,880
Site Totals	**7,300**	**0.190**	**32**	**14,730**	**0.55**	**1,305**	**$ 28,640**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site A-04: OUR LADY OF POMPEI CHURCH



Our Lady of Pompei Church

- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 15' 30'

Site A-05: PATERSON MUSEUM

Sewershed	C-01
Site Area	62,588 sq. ft.
Address	2 Market Street Paterson, NJ 07501
Block and Lot	Block 4701, Lot 1
Soil Type	HSG N/A

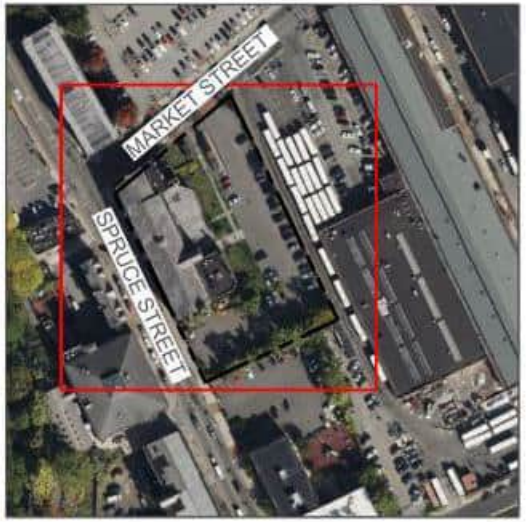
The eastern parking stalls in the parking lot can be paved with pervious pavement to capture water from the parking lot. Five planter boxes can be installed to filter water from the downspouts of the northeastern side of the building. Three bioretention systems can be installed to capture, treat, and infiltrate runoff from the rooftop area. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
84	52,582	2.5	26.6	241.4	0.041 Mgal	5,477 CF	2.21 Mgal	295,806 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	6,360	0.179	29	12,830	0.48	1,590	$39,750
Pervious pavement	25,425	0.717	110	51,290	1.93	4,640	$74,240
Planter boxes	865	n/a	3	n/a	n/a	5 (2'X6' box)	$8,000
Site Totals	**32,650**	**0.896**	**142**	**64,120**	**2.41**	**6,290**	**$167,920**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site A-05: PATERSON MUSEUM



Paterson Museum

- bioretention system
- pervious pavement
- planter box
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 30' 60'

Site A-06: PATERSON PUBLIC SCHOOL NO. 2

Sewershed	C-01
Site Area	80,874 sq. ft.
Address	22 Passaic Street Paterson, NJ 07501
Block and Lot	Block 4608, Lot 1, 2, 3, 15, 16, 17, 18, 19, 20, 21 22
Soil Type	HSG N/A

The impervious asphalt areas utilized for parking and open space can be converted to pervious pavement to capture and infiltrate stormwater from the lot areas in addition to roof leader runoff. Planter boxes can be installed to filter water from the downspouts on the corner of Passaic Street and Mill Street. Three bioretention systems can be installed in existing impervious open space to capture, treat, and infiltrate roof leader and impervious runoff. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
92	74,573	3.6	37.7	342.4	0.058 Mgal	7,768 CF	2.21 Mgal	295,806 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	5,270	0.149	23	10,630	0.40	1,355	$33,375
Pervious pavement	32,905	0.927	144	66,390	2.49	8,930	$142,880
Planter boxes	3,045	n/a	11	n/a	n/a	15 (2'x6' box)	$24,000
Site Totals	**41,220**	**1.076**	**178**	**77,020**	**2.89**	**10,445**	**$275,345**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site A-06: PATERSON PUBLIC SCHOOL NO. 2

Paterson Public School No. 2

- bioretention system
- pervious pavement
- planter box
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS
- 100-yr Floodplain

Note: Open space lot slope is to be modified.

0 30' 60'

Site A-07: PATERSON PUBLIC SCHOOL NO. 7

Sewershed	C-01
Site Area	48,724 sq. ft.
Address	106 Ramsey Street Paterson, NJ 07501
Block and Lot	Block 4915, Lot 17
Soil Type	HSG N/A

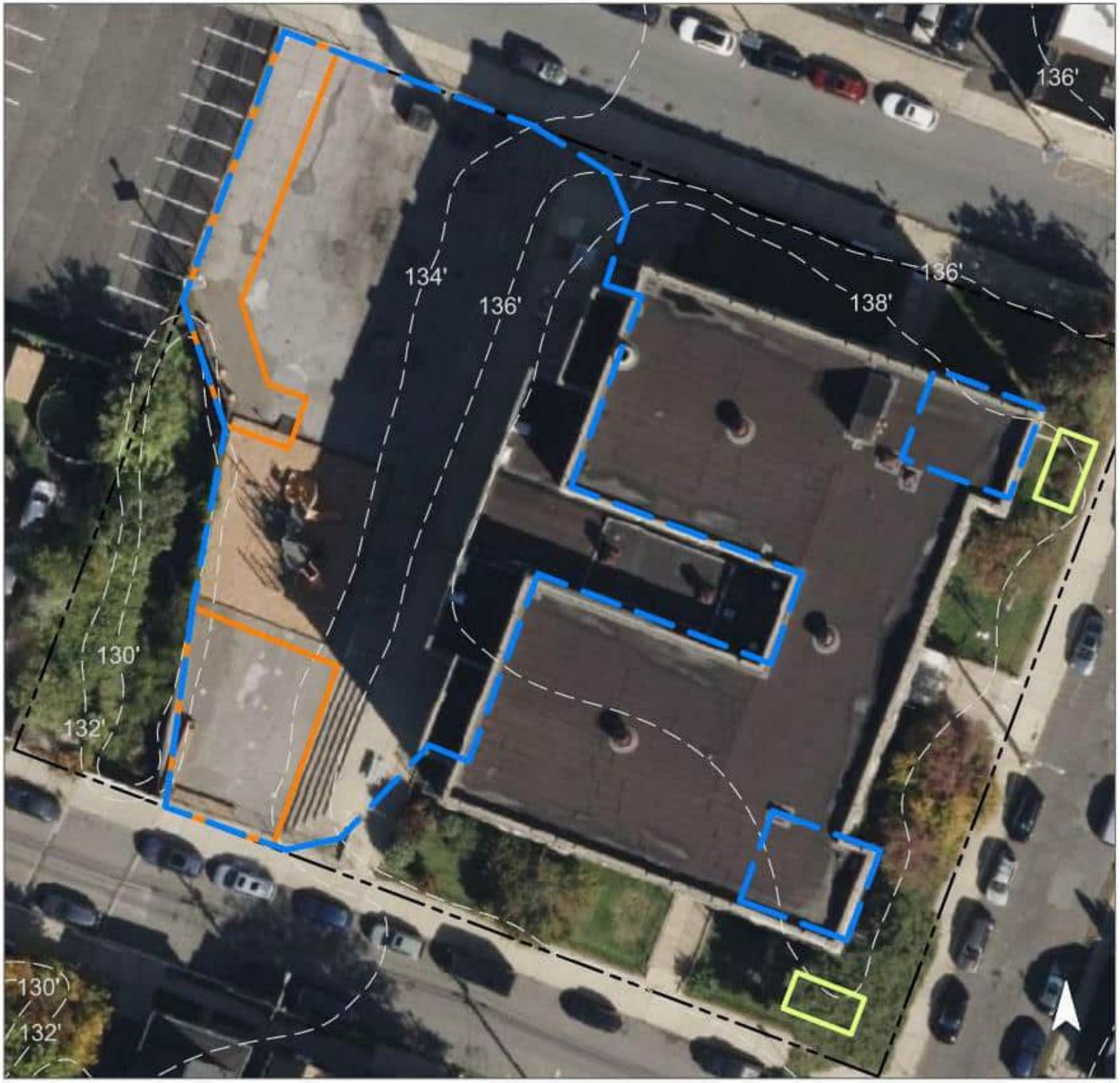
To effectively manage stormwater runoff from the roof of the school, two rain gardens can be constructed in the grass areas adjacent to the school's entrance. A portion of the school's parking lot can be turned into porous pavement. These retention systems will serve the purpose of capturing and treating 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 (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
87	42,527	2.1	21.5	195.3	0.033 Mgal	4,430 CF	1.17 Mgal	155,932 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	1,500	0.039	6	3,030	0.11	380	$ 9,500
Pervious pavement	19,500	0.508	86	39,340	1.48	3,480	$ 55,680
Site Totals	**21,000**	**0.547**	**92**	**42,370**	**1.59**	**3,860**	**$ 89,440**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site A-07: PATERSON PUBLIC SCHOOL NO. 7



Paterson Public School No. 7

- bioretention system
- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 20' 40'

Site A-08: PENNINGTON PARK

Sewershed	C-01
Site Area	965,276 sq. ft.
Address	300 McBride Avenue Paterson, NJ 07501
Block and Lot	Block 5004, Lot 2
Soil Type	HSG N/A

To improve the effectiveness of the stormwater management system, 2 rain gardens can be implemented adjacent to the gazebo in the park, the basketball courts can be converted to pervious pavement, and the low point of the parking lot could be transformed into pervious pavement. These systems capture, treat, and allow natural infiltration of 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 (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
41	394,626	19.0	199.3	1,811.9	0.307 Mgal	41,107 CF	10.82 Mgal	1,446,962 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	5,720	0.149	25	11,540	0.43	1,430	$ 35,750
Pervious pavement	60,670	1.581	264	122,400	4.60	19,600	$ 313,600
Site Totals	**66,390**	**1.730**	**289**	**133,940**	**5.03**	**21,030**	**$ 479,930**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site A-08: PENNINGTON PARK

Pennington Park

- bioretention system
- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS
- 100-yr Floodplain

0 50' 100'

Site A-09: ST. BONAVENTURE'S ROMAN CATHOLIC CHURCH

Sewershed	C-01
Site Area	156,199 sq. ft.
Address	174 Ramsey Street Paterson, NJ 07501
Block and Lot	Block 5105, Lot 25
Soil Type	HSG N/A

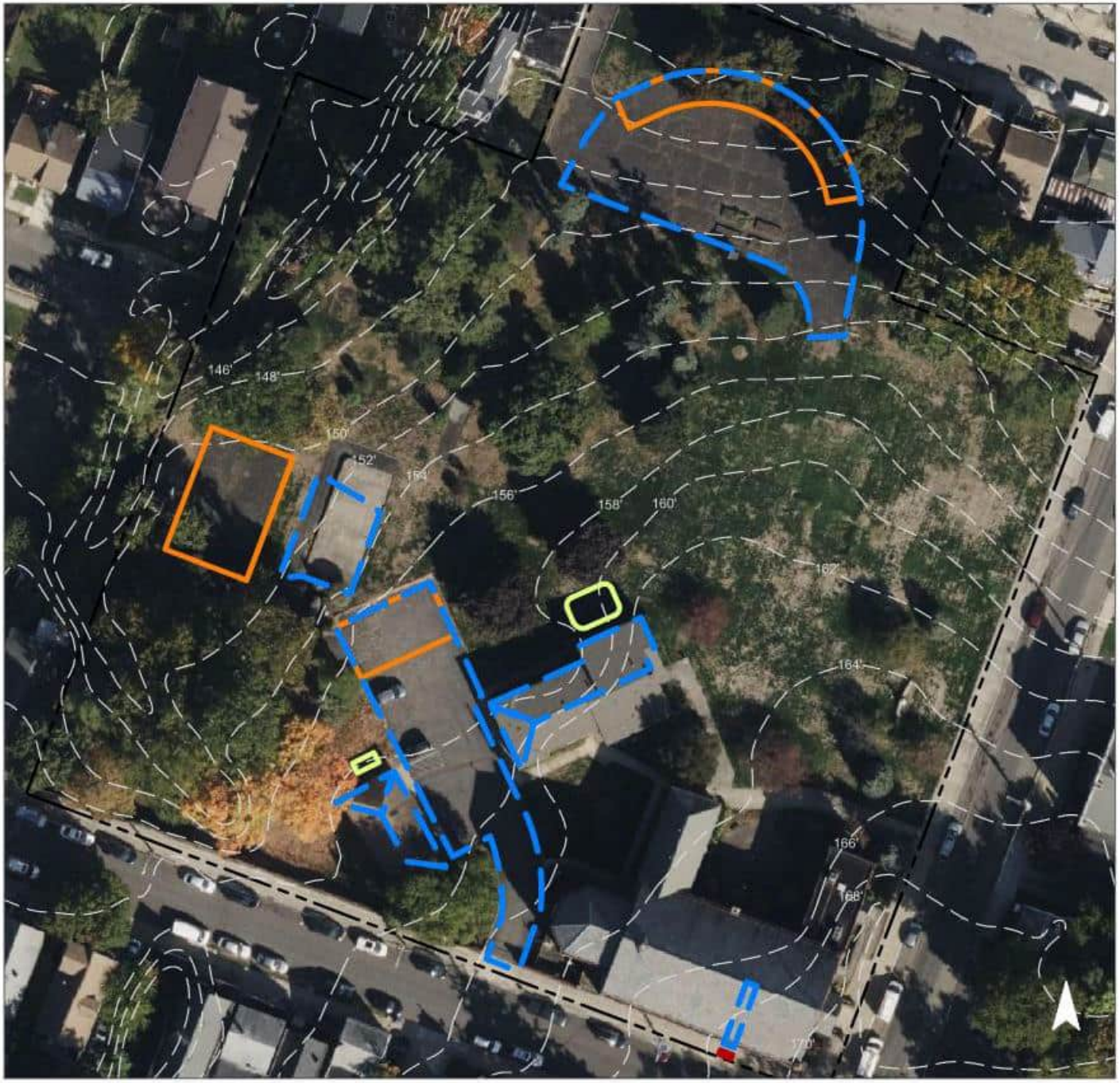
Two rain gardens can be installed in the grass areas behind the two office buildings church to capture, treat, and infiltrate stormwater runoff from the roof. Porous pavement can also be installed at the end of the main parking lot where there elevation is the lowest and in two paved areas at the west and north sides of the site. 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 (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
29	45,497	2.2	23.0	208.9	0.035 Mgal	4,739 CF	1.25 Mgal	166,822 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	1,520	0.040	6	3,070	0.12	380	$ 9,500
Pervious pavement	20,080	0.523	87	40,510	1.52	5,600	$ 89,600
Planter box	150	n/a	0	n/a	n/a	1 (box)	$ 1,600
Site Totals	**21,750**	**0.563**	**93**	**43,580**	**1.64**	**5,980**	**$ 138,750**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site A-09: ST. BONAVENTURE'S ROMAN CATHOLIC CHURCH



St Bonaventure's Roman Catholic Church

- bioretention system
- pervious pavement
- planter box
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS
- 100-yr Floodplain

0 35' 70'

Site A-10: UPPER RACEWAY PARK

Sewershed	C-01
Site Area	753,011 sq. ft.
Address	70 Spruce Street Paterson, NJ 07501
Block and Lot	Block 4802, Lot 27, 28
Soil Type	HSG N/A

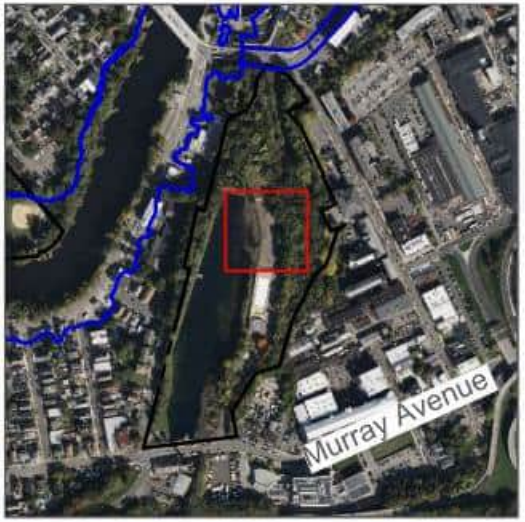
Pervious pavement can be installed along the east and west edges of the parking lot to capture, treat, and infiltrate stormwater runoff. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
13	753,011	4.7	49.3	448.2	0.076 Mgal	4,739 CF	1.25 Mgal	166,822 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 Pavement	23,000	0.599	101	46,400	1.74	9,505	$ 152,080
Site Totals	**23,000**	**0.599**	**101**	**46,400**	**1.74**	**9,505**	**$ 207,850**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site A-10: UPPER RACEWAY PARK



Upper Raceway Park

- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS
- 100-yr Floodplain

0 25' 50'

Site A-11: VETERAN'S MEMORIAL PARK

Sewershed	C-01
Site Area	965,276 sq. ft.
Address	300 McBride Avenue Paterson, NJ 07501
Block and Lot	Block 5004, Lot 2
Soil Type	HSG N/A

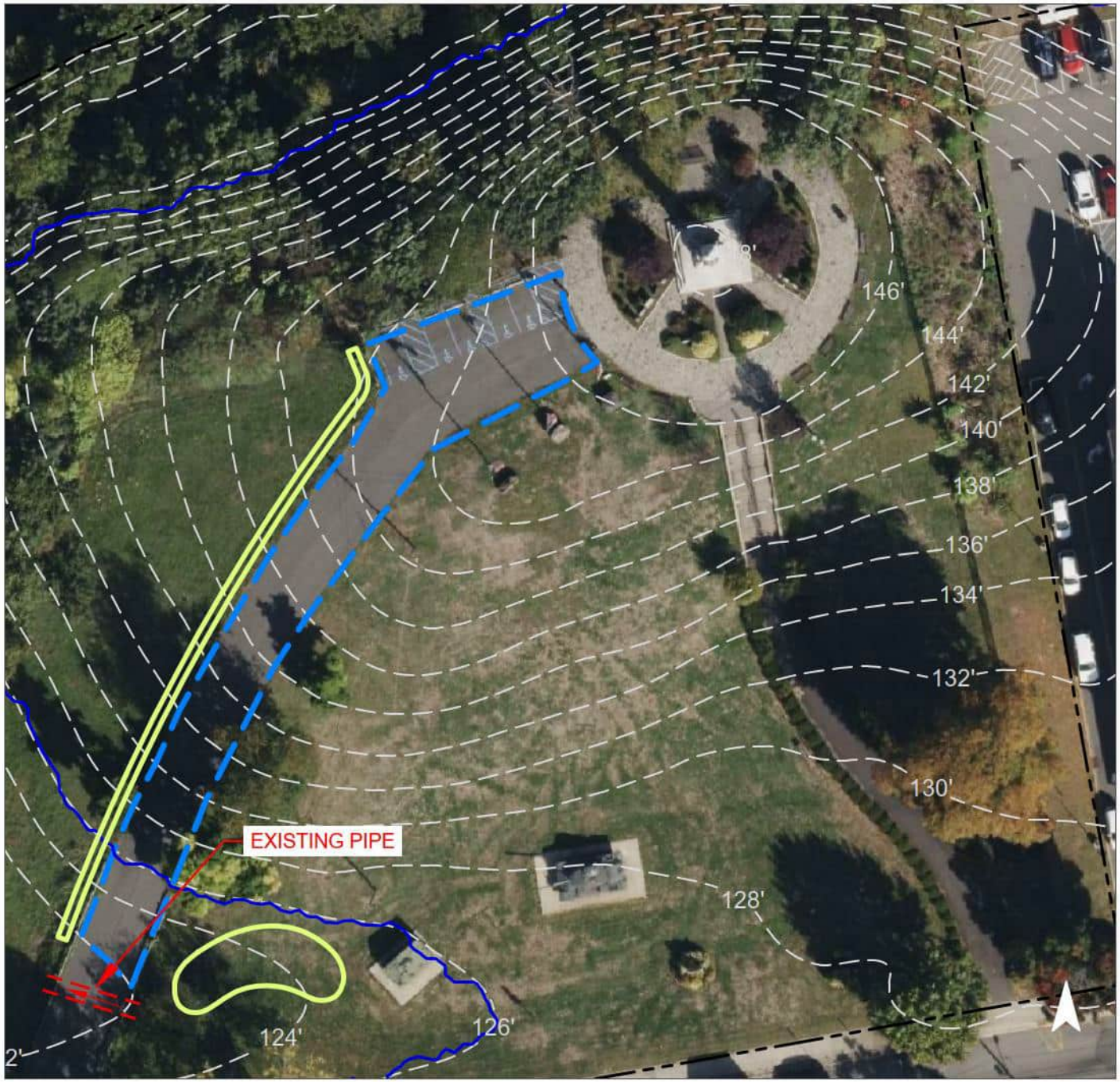
To enhance the sustainable stormwater management system, a rain garden and a bioswale can be installed. They would be installed where the elevation starts sloping down on a hill with runoff coming from the driveway. These installments have the same purpose of capturing, treating, and infiltrating stormwater 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 (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
41	394,626	19.0	199.3	1,811.9	0.307 Mgal	41,107 CF	10.82 Mgal	1,446,962 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	6,680	0.141	25	10,740	0.32	1,685	$ 42,125
Site Totals	**6,680**	**0.141**	**25**	**10,740**	**0.32**	**1,685**	**$ 57,775**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site A-11: VETERAN'S MEMORIAL PARK



Veterans Memorial Park

- bioretention system
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS
- 100-yr Floodplain

0 25' 50'

Sewershed C-02A

Site B-01: ARCH ST PARKING LOT

Sewershed	C-02
Site Area	8,212 sq. ft.
Address	216 Presidential Blvd Paterson, NJ 07522
Block and Lot	Block 220, Lot 1, 16, 17
Soil Type	HSG A

The existing impervious surface entrance to the parking lot can be converted to porous pavement to manage stormwater runoff from the site. 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 (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
70	5,768	0.3	2.9	26.5	0.004 Mgal	601 CF	0.17 Mgal	22,881 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 pavement	2,275	0.064	10	4,590	0.17	490	$7,840
Site Totals	**2,275**	**0.064**	**10**	**4,590**	**0.17**	**490**	**$10,810**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site B-01: ARCH ST PARKING LOT

Arch Street Parking Lot

- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

Note: Site is located within the 100-year floodplain.

0 10' 20'

Site B-02: CHURCH OF JESUS CHRIST

Sewershed	C-02
Site Area	9,460 sq. ft.
Address	29 Haledon Ave Paterson, NJ 07522
Block and Lot	Block 207, Lot 12
Soil Type	HSG A

Downspout planter boxes can be placed along the eastern and western boundaries of the building to collect and treat stormwater runoff generated by the rooftop. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
90	8,551	0.4	4.3	39.3	0.007 Mgal	891 CF	0.25 Mgal	33,920 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 *
Downspout Planter	1,690	n/a	6	n/a	n/a	18 (2'x6' box)	$28,800
Site Totals	**1,690**	**n/a**	**6**	**n/a**	**n/a**	**216**	**$38,950**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site B-02: CHURCH OF JESUS CHRIST

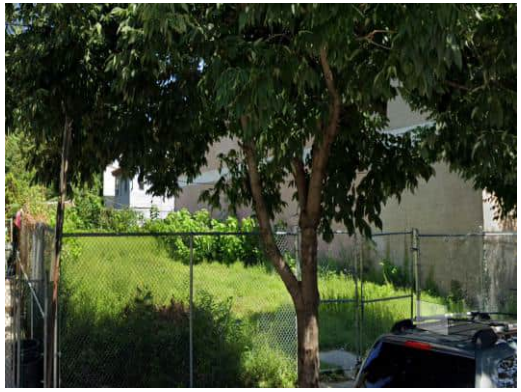
Church of Jesus Christ

- planter box
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 10' 20'

Site B-03: DR. FRANK NAPIER JR. SCHOOL OF TECHNOLOGY

Sewershed	C-02
Site Area	132,650 sq. ft.
Address	47 Clinton St Paterson, NJ 07522
Block and Lot	Block 201, Lot 41, 43
Soil Type	HSG A



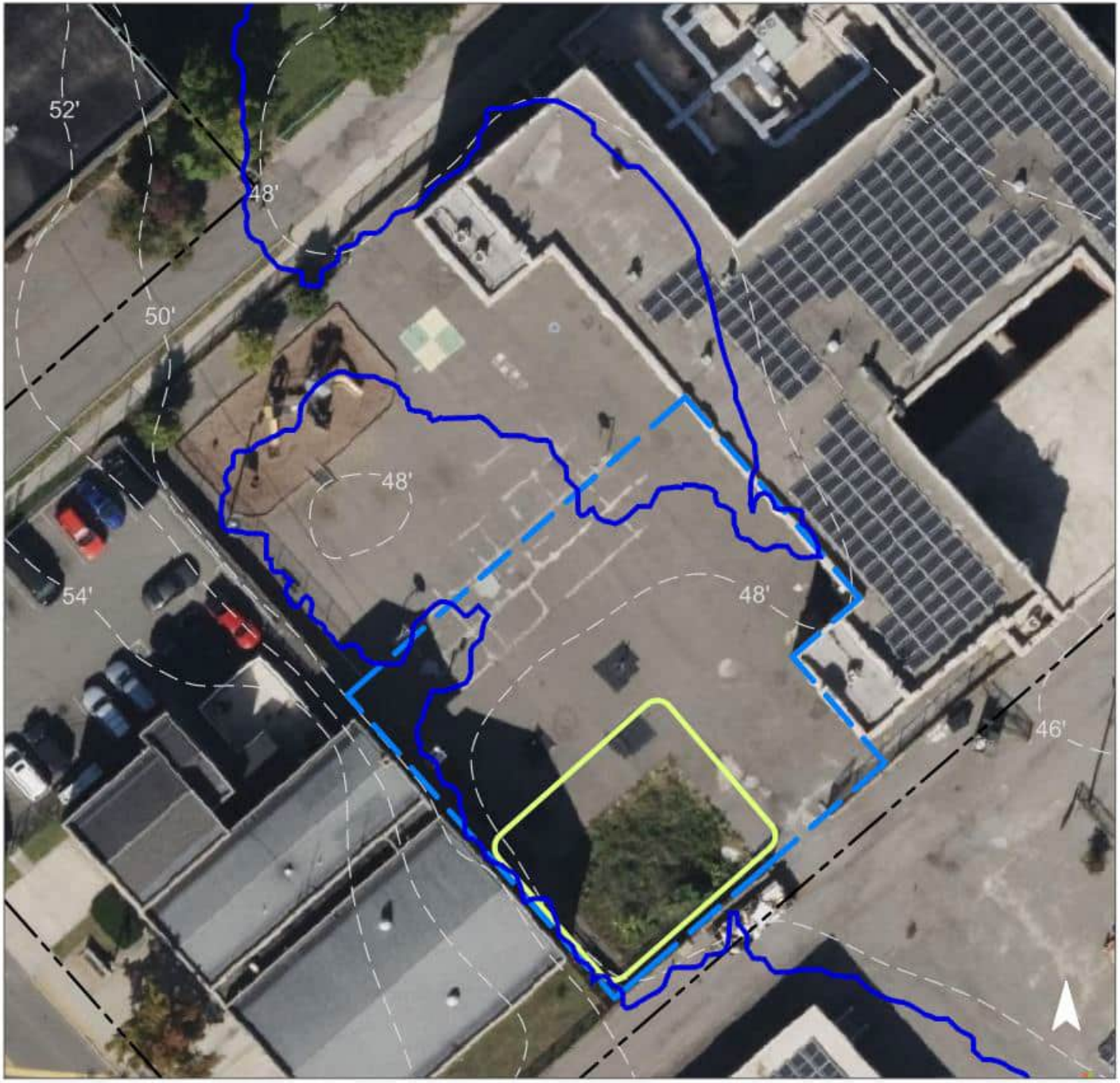
A rain garden can be installed in the grass area of the field southwest of the building to capture, treat, and infiltrate stormwater runoff from the roof. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

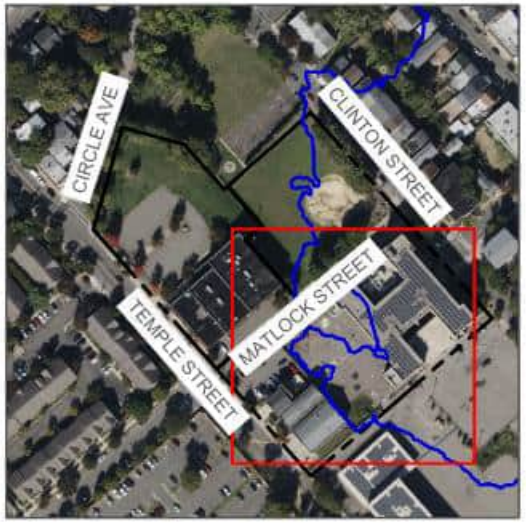
Impervious Cover		Existing Loads from Impervious Cover (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
95	126,018	6.1	63.6	578.6	0.098 Mgal	13,127 CF	3.74 Mgal	499,870 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	11,640	0.328	51	23,480	0.88	2,930	$73,250
Site Totals	**11,640**	**0.328**	**51**	**23,480**	**0.88**	**2,930**	**$99,050**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site B-03: DR. FRANK NAPIER JR. SCHOOL OF TECHNOLOGY





Dr. Frank Napier Jr. School of Technology

- bioretention system
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS
- 100-yr Floodplain

0 20' 40'

Site B-05: NORTHSIDE COMMUNITY CHAPEL CHURCH

Sewershed	C-02
Site Area	9,295 sq. ft.
Address	96 Jefferson St Paterson, NJ 07522
Block and Lot	Block 206, Lot 10, 11
Soil Type	HSG A

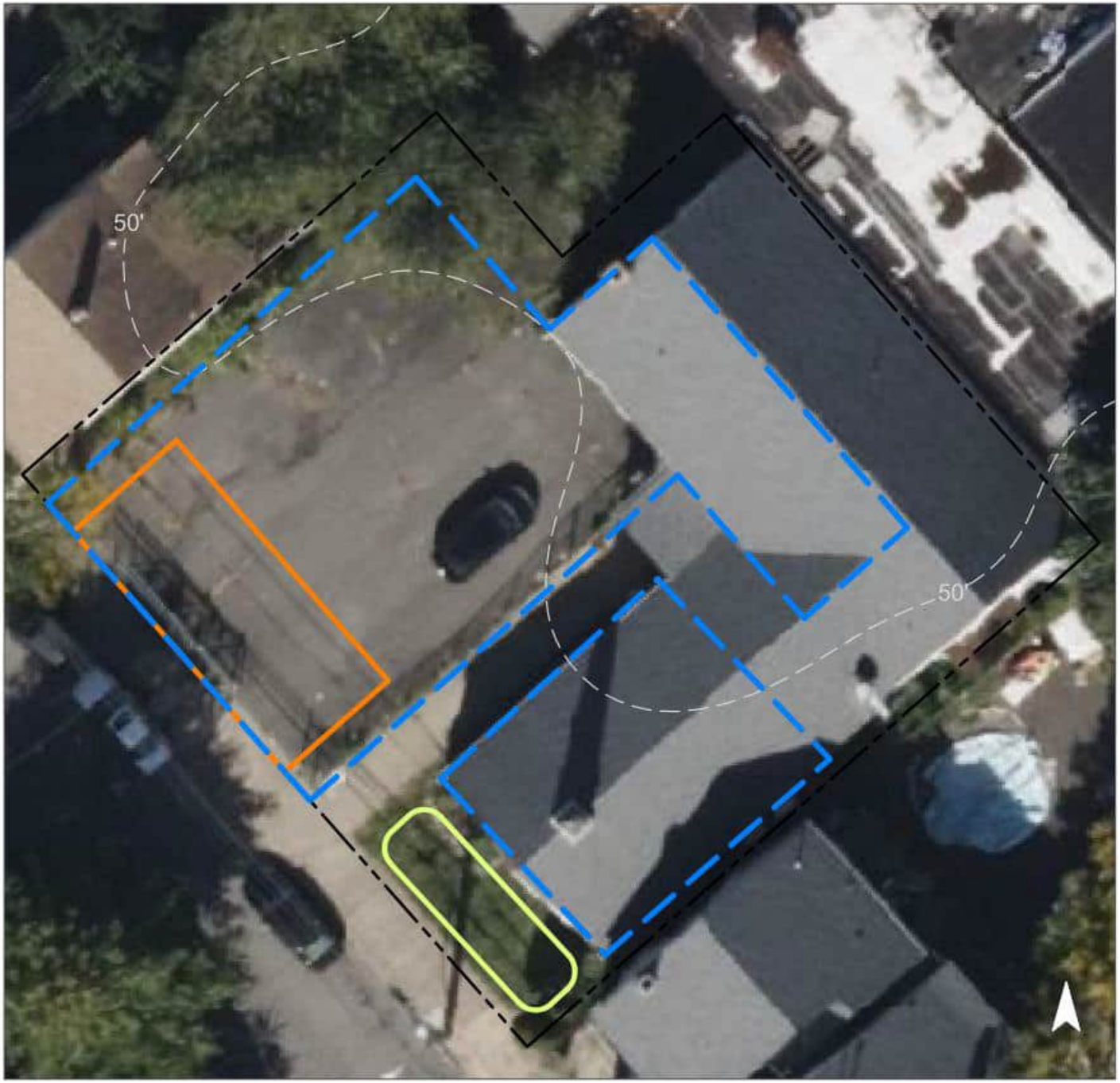
Impervious surface in the parking lot to the west of the building can be converted to porous pavement to capture and infiltrate stormwater runoff from the parking lot. A rain garden can be installed in the grass area near the southwest of the building to capture, treat, and infiltrate stormwater runoff from the roof. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
97	8,990	0.4	4.5	41.3	0.007 Mgal	936 CF	0.27 Mgal	35,662 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	1,080	0.030	4	2,180	0.08	270	$6,750
Pervious pavement	4,256	0.120	19	8,590	0.32	760	$12,160
Site Totals	**5,336**	**0.150**	**23**	**10,770**	**0.40**	**1,030**	**$25,580**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site B-05: NORTHSIDE COMMUNITY CHAPEL CHURCH



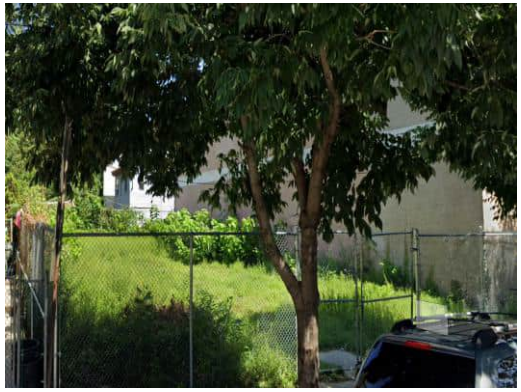
Northside Community Chapel Church

- bioretention system
- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 10' 20'

Site B-08: CHRIST METHODIST CHURCH CAMP YOUTH DEVELOPMENT

Sewershed	C-16
Site Area	10,524 sq. ft.
Address	13-15 North 1st St Paterson, NJ 07522
Block and Lot	Block 204, Lot 14, 15, 16, 17
Soil Type	HSG A



A rain garden can be installed in the grass area of the field behind the building to capture, treat, and infiltrate stormwater runoff from the roof. 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 (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
50	5,262	0.3	2.7	24.2	0.004 Mgal	548 CF	0.16 Mgal	20,873 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	1,704	0.048	8	3,440	0.13	425	$10,625
Site Totals	**1,704**	**0.048**	**8**	**3,440**	**0.13**	**425**	**$14,375**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site B-08: CHRIST METHODIST CHURCH CAMP YOUTH DEVELOPMENT

Christ Methodist Church

- bioretention system
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

Note: Site is located within the 100-year floodplain.

0 10' 20'

Sewershed C-02B

Site B-04: FAITH SOUL SAVING STATION

Sewershed	C-16
Site Area	46,095 sq. ft.
Address	173 Haledon Ave Paterson, NJ 07522
Block and Lot	Block 502, Lot 1, 2, 16, 17
Soil Type	HSG D

Rain gardens can be installed in the grass area facing Haledon Avenue and the grass patch along North 9th Street to capture, treat, and infiltrate stormwater runoff from the roof. Impervious surface in the eastern portion of the parking lot can be converted to porous pavement to capture and infiltrate stormwater runoff from the parking lot. 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 (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
83	38,161	1.8	19.3	175.2	0.030 Mgal	3,975 CF	1.13 Mgal	151,373 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	3,700	0.104	15	7,470	0.28	925	$23,125
Pervious pavement	19,315	0.544	84	38,970	1.46	3,615	$57,840
Site Totals	**23,015**	**0.648**	**99**	**46,440**	**1.74**	**4,540**	**$109,475**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site B-04: FAITH SOUL SAVING STATION

Faith Soul Saving Station

- bioretention system
- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 20' 40'

Site B-06: PATERSON FREE PUBLIC LIBRARY NORTHSIDE BRANCH LIBRARY

Sewershed	C-02
Site Area	67,272 sq. ft.
Address	60 Temple St Paterson, NJ 07522
Block and Lot	Block 201, Lot 1
Soil Type	HSG A

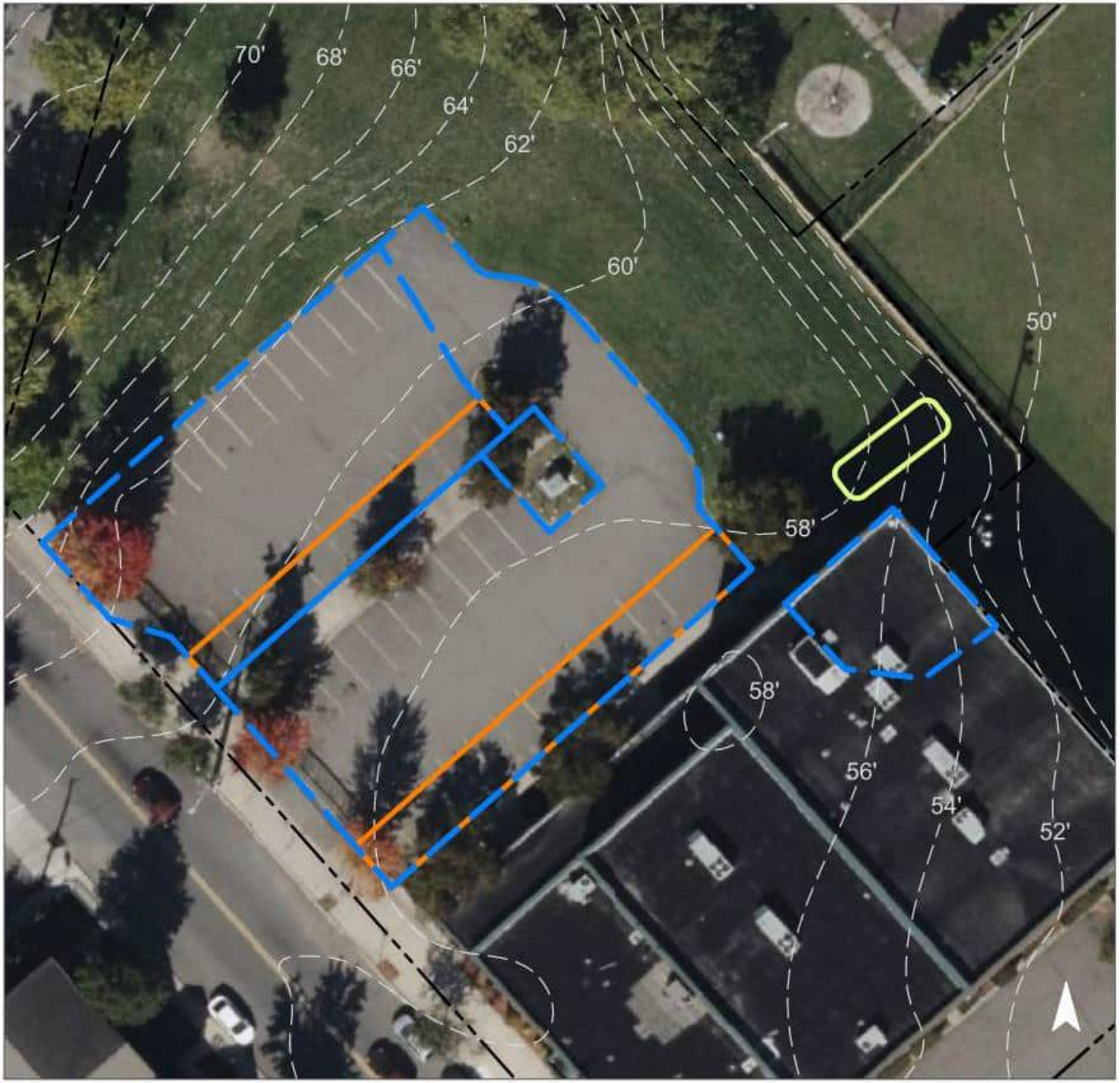
A rain garden can be installed in the grass area to the north of the building to capture, treat, and infiltrate stormwater runoff from the roof. Parking spaces near the side entrance of the building towards the west can be converted to porous pavement to capture and infiltrate stormwater runoff from the parking lot. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

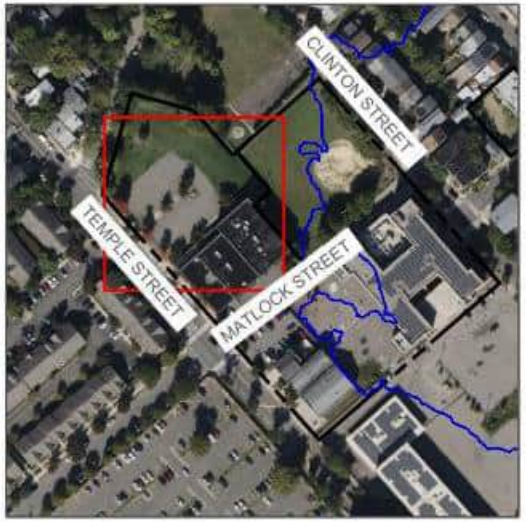
Impervious Cover		Existing Loads from Impervious Cover (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
62	41,965	2.0	21.2	192.7	0.033 Mgal	4,371 CF	1.25 Mgal	166,460 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	1,365	0.038	6	2,750	0.10	340	$8,500
Pervious pavement	16,549	0.466	72	33,380	1.25	2,955	$47,280
Site Totals	**17,914**	**0.504**	**78**	**36,130**	**1.35**	**3,295**	**$76,530**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site B-06: PATERSON FREE PUBLIC LIBRARY NORTHSIDE BRANCH LIBRARY





Paterson Free Public Library - Northside Branch Library

- bioretention system
- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS
- 100-yr Floodplain

0 20' 40'

Site B-07: PATERSON PUBLIC SCHOOL NO. 5

Sewershed	C-16
Site Area	103,615 sq. ft.
Address	414 Totowa Ave Paterson, NJ 07502
Block and Lot	Block 802, Lot 1
Soil Type	HSG D

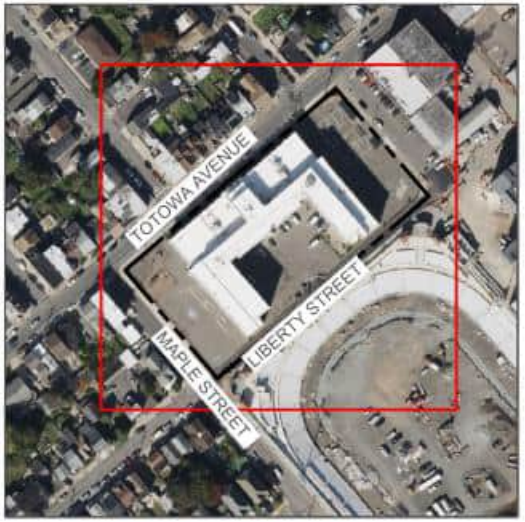
A rain garden can be installed northeast of the school to capture, treat, and infiltrate runoff generated from the impervious pavement yard adjacent to the building. Various parking area and school yard impervious cover can be converted to porous pavement to collect, infiltrate, and manage stormwater 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 (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
100	102,579	4.9	51.8	471.0	0.080 Mgal	10,685 CF	3.04 Mgal	406,896 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	5,920	0.167	27	11,950	0.45	1,480	$37,000
Pervious pavement	30,830	0.869	135	62,200	2.34	6,720	$107,520
Site Totals	**36,750**	**1.036**	**162**	**74,150**	**2.79**	**8,200**	**$198,890**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site B-07: PATERSON PUBLIC SCHOOL NO. 5



Paterson Public School No. 5

- bioretention system
- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 40' 80'

Site B-09: ST. MARY HELP OF CHRISTIANS ROMAN CATHOLIC CHURCH

Sewershed	C-02
Site Area	65,000 sq. ft.
Address	410 Union Avenue Paterson, NJ 07502
Block and Lot	Block 917, Lot 3,4,9,10,11,12,13,14
Soil Type	HSG D

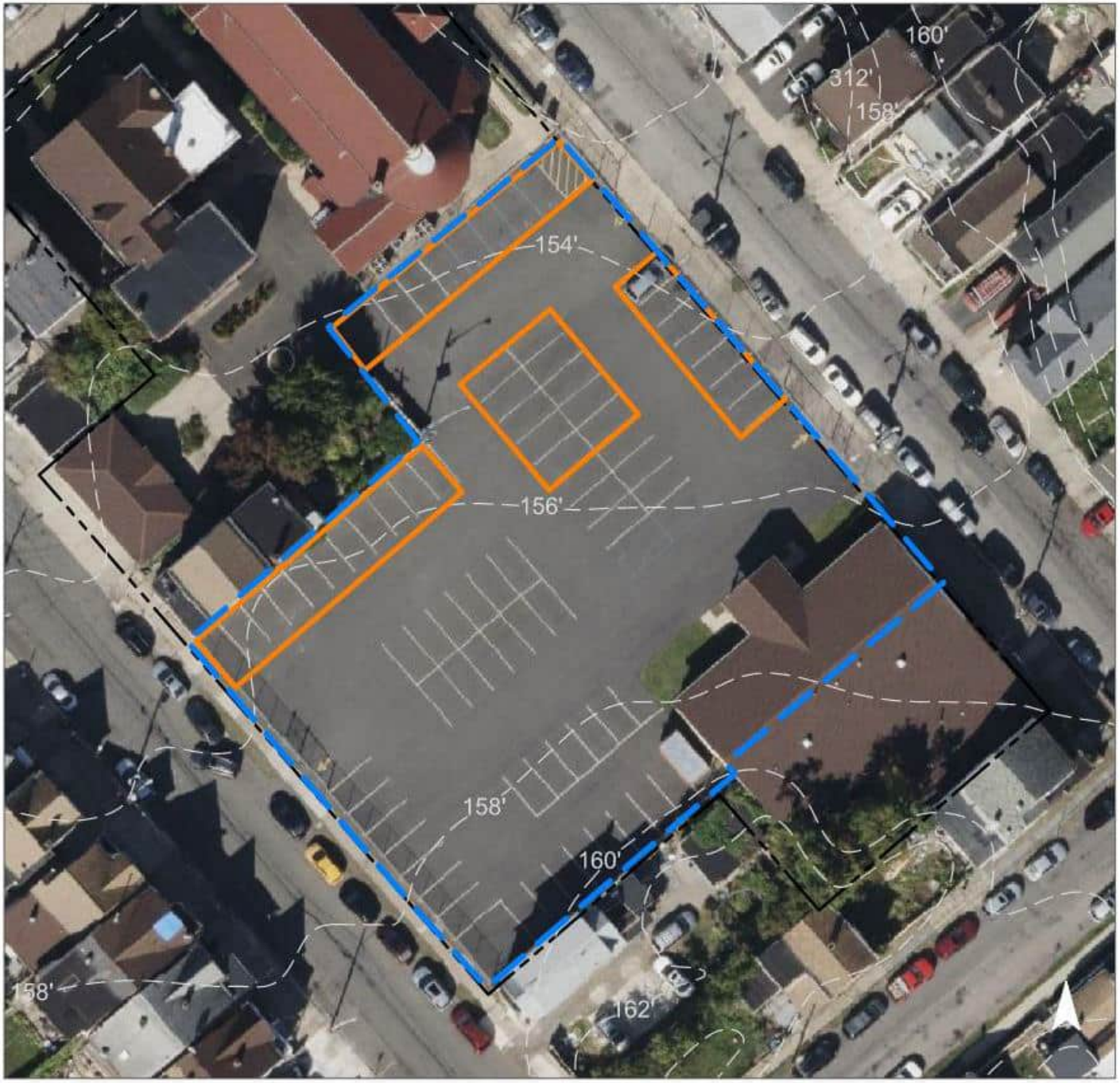
Parking spaces in the parking lot to the west of the building can be converted to porous pavement to capture and infiltrate stormwater runoff from the roof of the building adjacent to the church. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

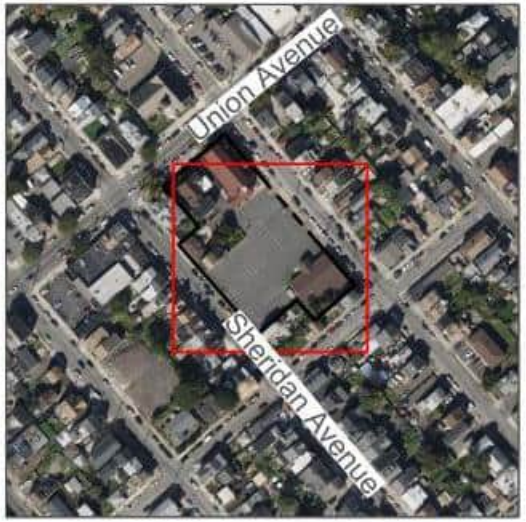
Impervious Cover		Existing Loads from Impervious Cover (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
97	63,240	3.0	31.9	290.4	0.049 Mgal	6,588 CF	1.73 Mgal	231,880 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 pavement	34,025	0.887	148	68,640	2.58	6,615	$ 105,840
Site Totals	**34,025**	**0.887**	**148**	**68,640**	**2.58**	**6,615**	**$ 145,790**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site B-09: ST. MARY HELP OF CHRISTIANS ROMAN CATHOLIC CHURCH





St Mary Help of Christians Roman Catholic Church

- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 30' 60'

Site B-10: BELMONT SENIOR HOME APARTMENTS

Sewershed	C-11
Site Area	88,992 sq. ft.
Address	95 Cliff St Paterson, NJ 07522
Block and Lot	Block 602, Lot 1
Soil Type	HSG D

Impervious cover facing Belmont Ave can be converted to pervious pavement to capture and infiltrate stormwater runoff from the impervious coverage on site. Proposed pervious pavement is recommended for the back portion of parking aisles due to the existing retaining wall structure along Belmont Ave. 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 (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
79	70,304	3.4	35.5	322.8	0.055 Mgal	7,323 CF	1.93 Mgal	257,781 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 pavement	21,515	0.561	93	43,410	1.63	3,840	$61,440
Site Totals	**21,515**	**0.561**	**93**	**43,410**	**1.63**	**3,840**	**$83,090**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site B-10: BELMONT SENIOR HOME APARTMENTS

Belmont Senior Home Apartments

- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 30' 60'

Sewershed
C-03

Site C-01: COBB PARK

Sewershed	C-03
Site Area	12,221 sq. ft.
Address	172 N Main St, Paterson, New Jersey, 07522
Block and Lot	Block 113, Lot 1
Soil Type	HSG A

Impervious surface of the walking path in the park can be converted to pervious pavement to manage stormwater runoff. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
71	8,630	0.4	4.4	39.6	0.007 Mgal	899 CF	0.26 Mgal	34,233 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 pavement	1,860	0.052	8	3,750	0.14	1,860	$29,760
Site Totals	**1,860**	**0.052**	**8**	**3,750**	**0.14**	**1,860**	**$40,850**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site C-01: COBB PARK

Cobb Park

- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS
- 100-yr Floodplain

0 10' 20'

Site C-02: GILMORE MEMORIAL CHRISTIAN

Sewershed	C-03
Site Area	23,951 sq. ft.
Address	127 Haledon Ave Paterson, NJ 07522
Block and Lot	Block 503, Lot 1, 59, 60, 61
Soil Type	HSG N/A - D

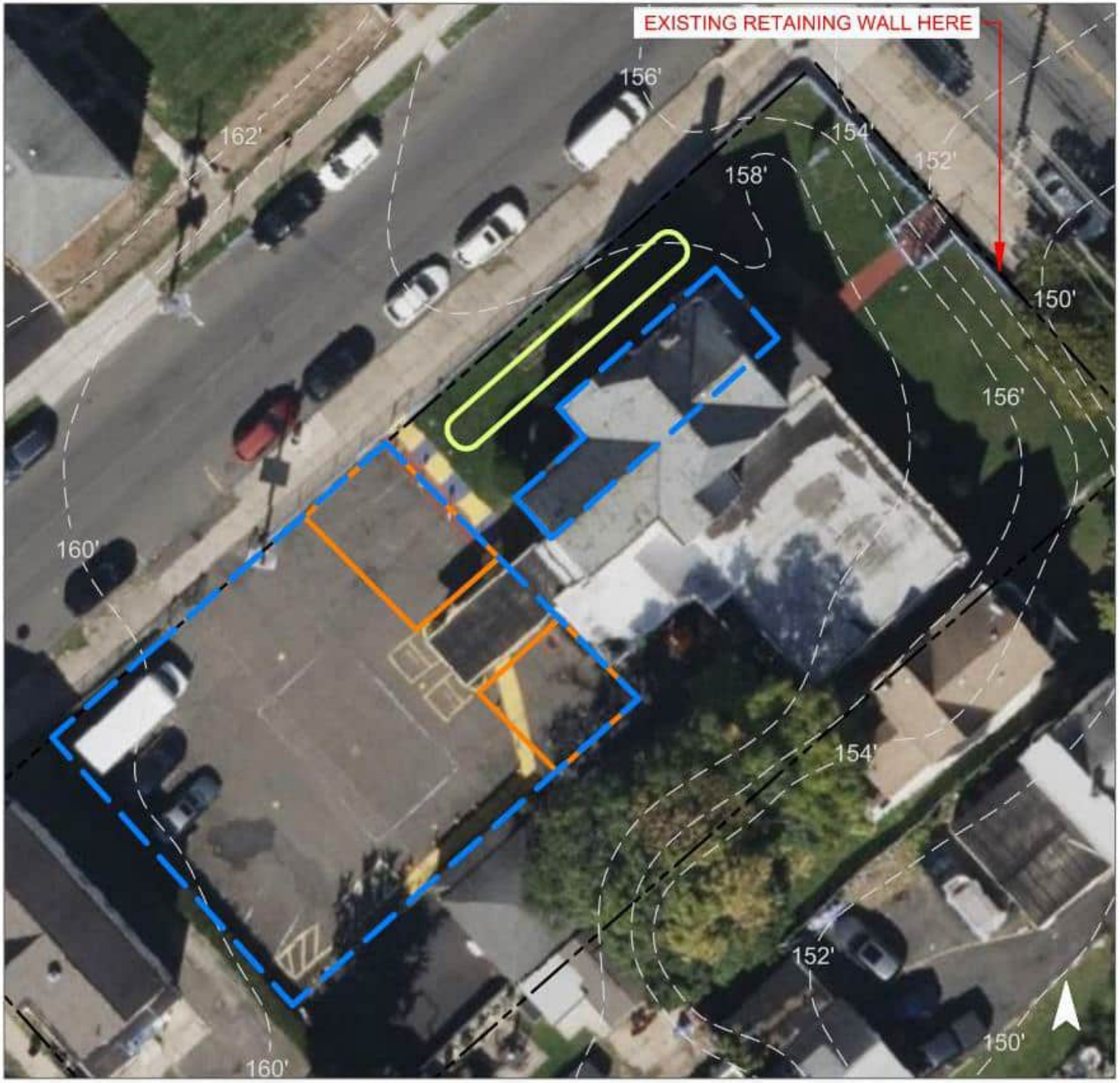
A rain garden can be installed in the grass area to the east entrance of the building to capture, treat, and infiltrate stormwater runoff from the sidewalk. A portion of the parking lot can be converted to porous pavement to capture and infiltrate stormwater runoff. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

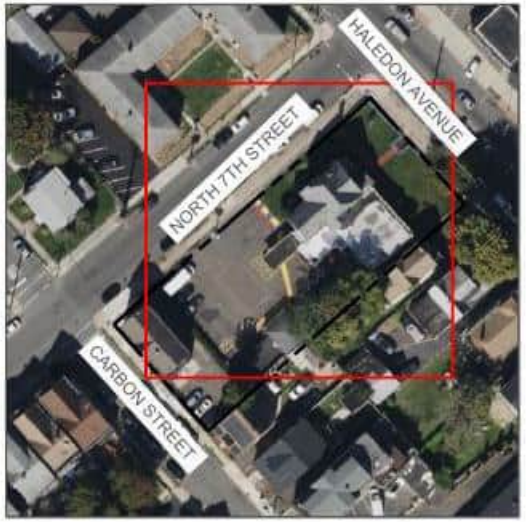
Impervious Cover		Existing Loads from Impervious Cover (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
84	20,230	1.0	10.2	92.9	0.016 Mgal	2,107 CF	0.60 Mgal	80,248 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	950	0.027	4	1,910	0.11	420	$10,500
Pervious pavement	6,295	0.177	27	12,700	0.48	1,150	$18,400
Site Totals	**7,245**	**0.204**	**31**	**14,610**	**0.55**	**1,570**	**$39,080**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site C-02: GILMORE MEMORIAL CHRISTIAN





Gilmore Memorial Christian

- bioretention system
- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 15' 30'

Site C-03: GILMORE MEMORIAL TABERNACLE

Sewershed	C-03
Site Area	29,326 sq ft.
Address	60 Haledon Ave Paterson, NJ 07522
Block and Lot	Block 110, Lot 16, 17, 18, 19, 20
Soil Type	HSG A – N/A

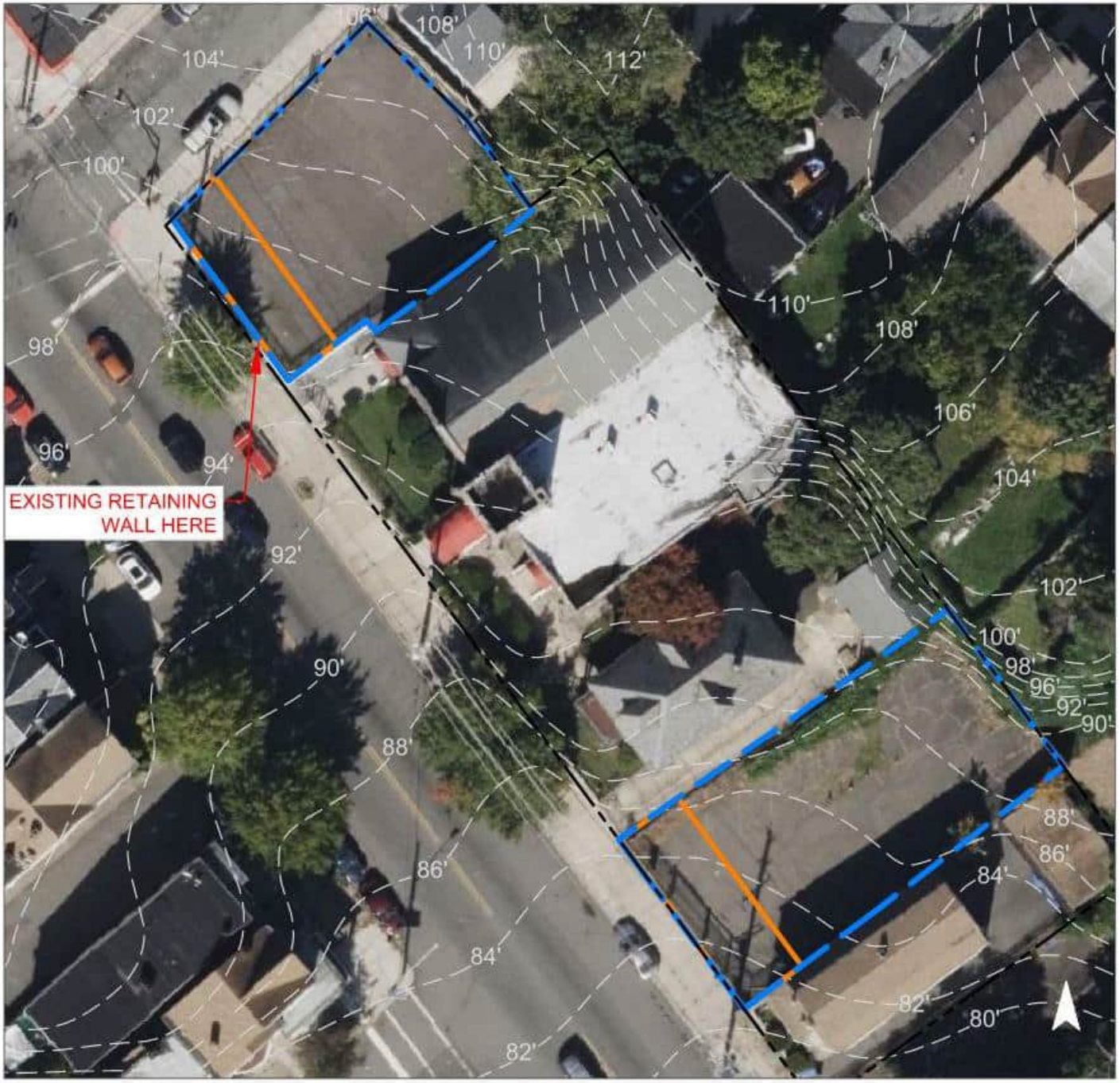
Impervious surface in the southwestern portions of the parking lot, where the elevations are lowest, can be converted to pervious pavement to help capture and infiltrate stormwater runoff. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
93	27,273	1.3	13.8	125.2	0.021 Mgal	2,841 CF	0.81 Mgal	108,184 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 pavement	10,170	0.287	44	20,520	0.77	1,860	$29,600
Site Totals	**10,170**	**0.287**	**44**	**20,520**	**0.77**	**1,860**	**$40,030**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site C-03: GILMORE MEMORIAL TABERNACLE



Gilmore Memorial Tabernacle

- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 20' 40'

Site C-04: HOLY TABERNACLE APOSTOLIC CHURCH

Sewershed	C-03
Site Area	13,712 sq. ft.
Address	80 Holsman St Paterson, NJ 07522
Block and Lot	Block 114, Lot 1, 3, 4, 5
Soil Type	HSG A

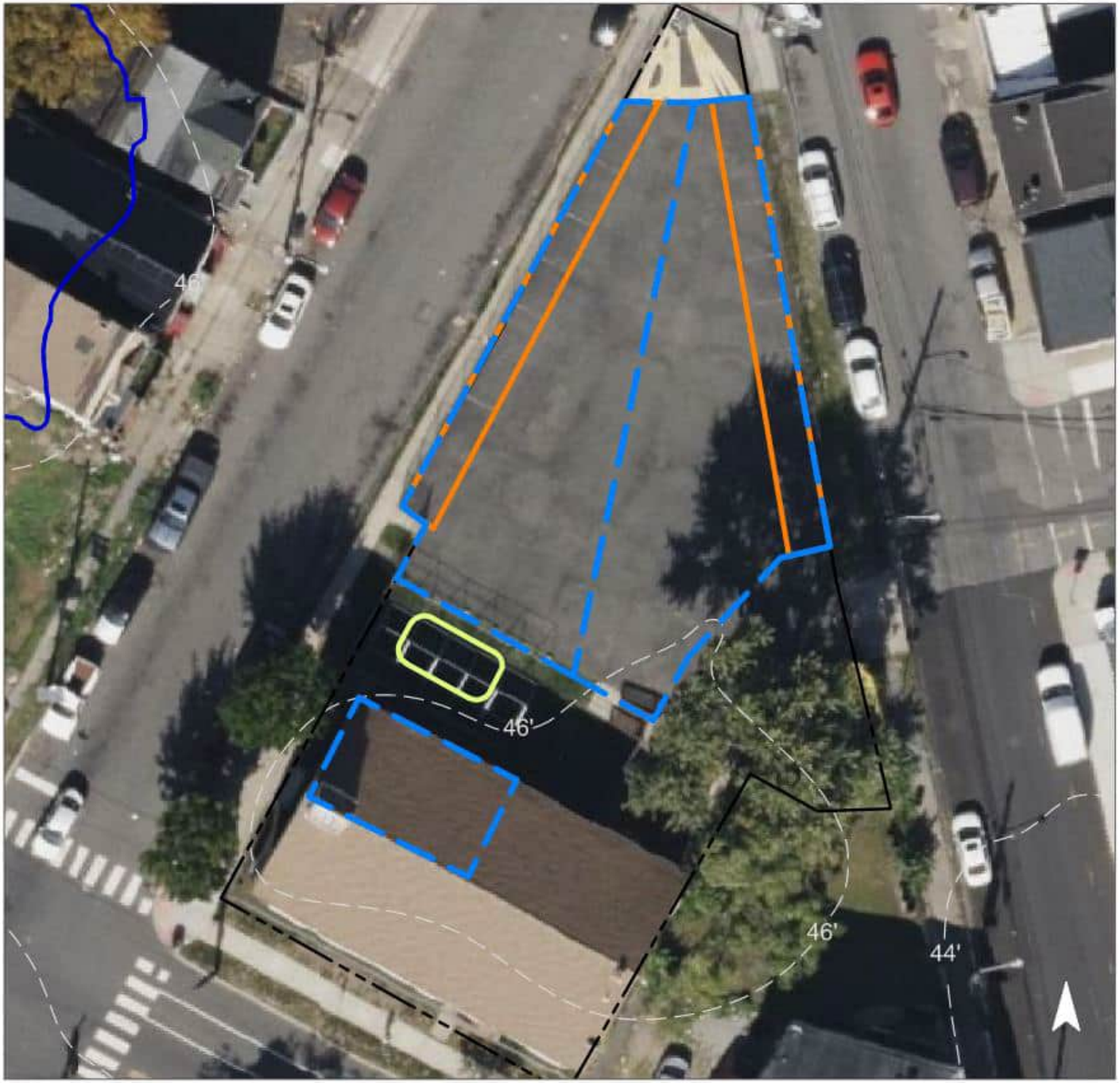
A rain garden can be installed in the grass area to the west of the building to capture, treat, and infiltrate stormwater runoff generated from the roof. The western and eastern portions of the parking lot can be converted to pervious pavement to manage stormwater runoff. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
85	11,679	0.6	5.9	53.6	0.009 Mgal	1,217 CF	0.35 Mgal	46,326 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	753	0.021	4	1,520	0.06	200	$5,000
Pervious pavement	6,330	0.178	29	12,770	0.41	1,330	$21,280
Site Totals	**7,083**	**0.199**	**32**	**14,290**	**0.54**	**1,530**	**$35,550**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site C-04: HOLY TABERNACLE APOSTOLIC CHURCH



Holy Tabernacle Apostolic Church

- bioretention system
- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS
- 100-yr Floodplain

0 15' 30'

Sewershed C-04

Site D-01: CHRIST TEMPLE BAPTIST CHURCH

Sewershed	C-04
Site Area	59,780 sq. ft.
Address	30 Hopper St Paterson, NJ 07522
Block and Lot	Block 107, Lot 1,2,3,4,5,6,7,8
Soil Type	HSG N/A

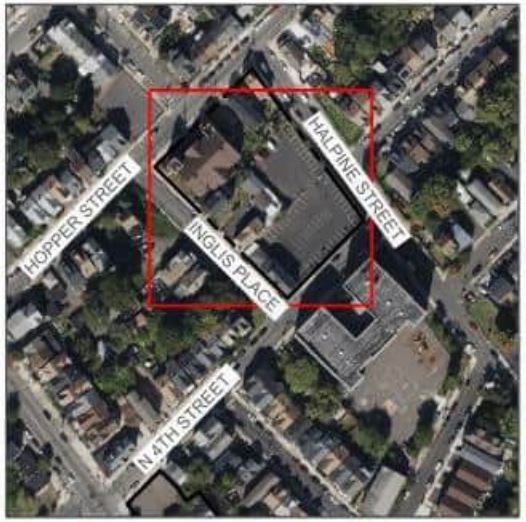
A rain garden can be installed in the grass between the building and Inglis Place to capture, treat, and infiltrate stormwater runoff from the rooftop. Downspout planter boxes can be placed along Inglis Place, southwest of the church to collect and treat stormwater runoff generated from the rooftop. The lowest elevations of the parking area along Halpine and North 4th Street can be converted to pervious pavement to manage stormwater runof. 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 (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
83	49,617	2.4	25.1	227.8	0.039 Mgal	5,168 CF	1.47 Mgal	196,816 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	990	0.028	4	2,000	0.08	260	$6,500
Pervious pavement	23,395	0.659	103	47,200	1.77	5,015	$80,240
Downspout Planter	860	n/a	3	n/a	n/a	4 (2'x6' box)	$6,400
Site Totals	**25,245**	**0.687**	**110**	**49,200**	**1.85**	**5,324**	**$126,530**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site D-01: CHRIST TEMPLE BAPTIST CHURCH



Christ Temple Baptist Church

- bioretention system
- captured drainage area
- pervious pavement
- planter box
- property line
- 2020 Aerial: NJOIT, OGIS

0 25' 50'

Site D-02: PATERSON PUBLIC SCHOOL #12

Sewershed	C-04
Site Area	55,415 sq. ft.
Address	214 North 4th St Paterson, NJ 07522
Block and Lot	Block 109, Lot 1
Soil Type	HSG N/A

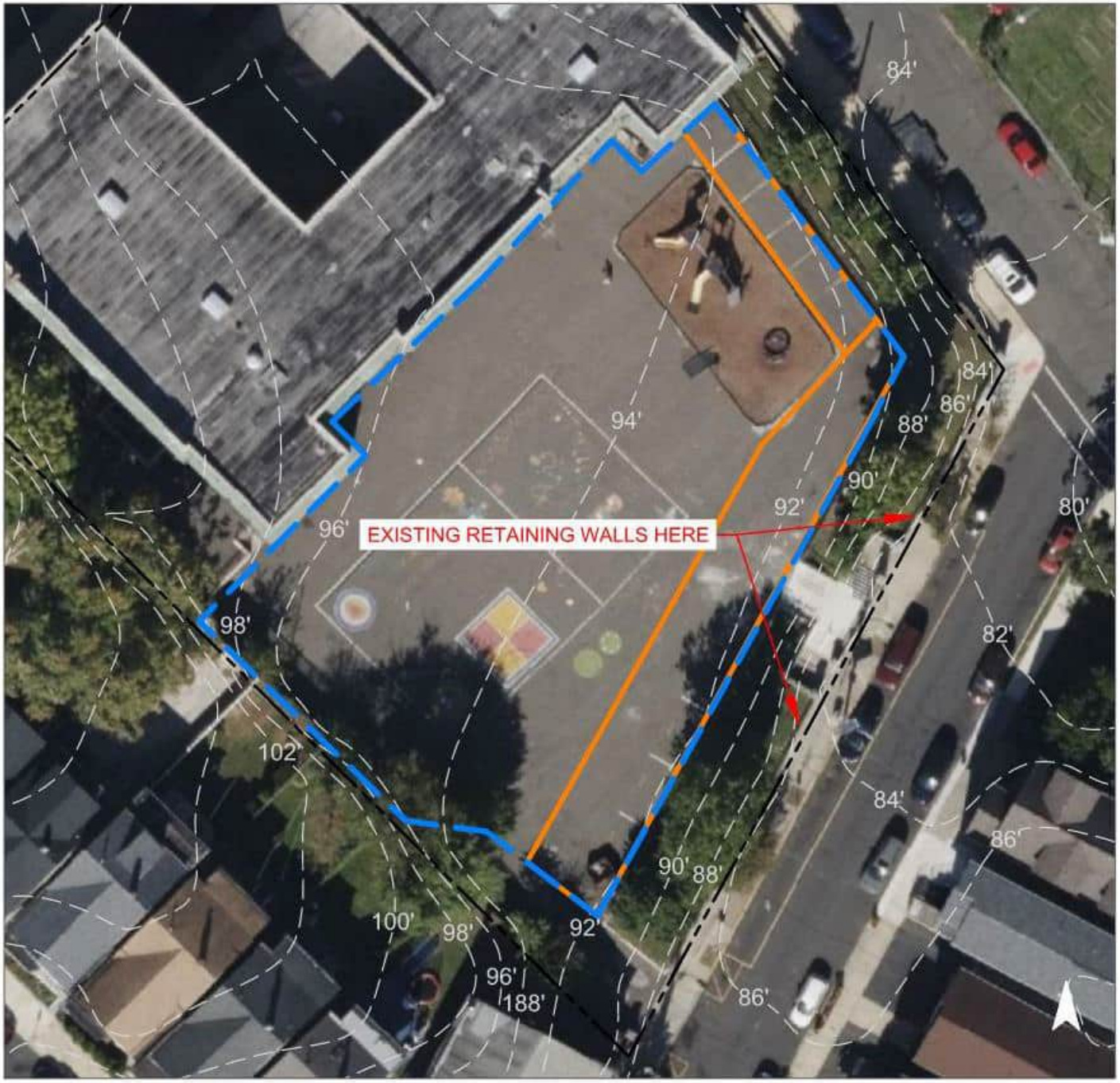
The blacktop area along North 2nd Street at the lowest elevation can be converted to porous pavement to capture and infiltrate stormwater runoff from the parking lot. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

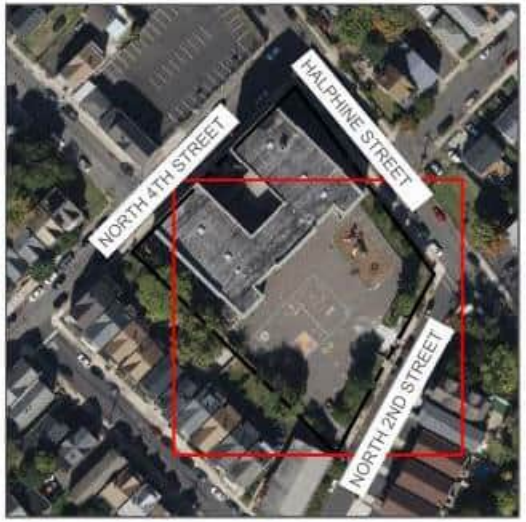
Impervious Cover		Existing Loads from Impervious Cover (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
93	51,658	2.5	26.1	237.2	0.040 Mgal	5,381 CF	1.53 Mgal	204,911 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 pavement	21,100	0.595	91	42,570	1.60	4,310	$68,960
Site Totals	**21,100**	**0.595**	**91**	**42,570**	**1.60**	**4,310**	**$94,640**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site D-02: PATERSON PUBLIC SCHOOL #12





Paterson Public School No. 12

- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 15' 30'

Sewershed
C-05

Site E-01: IGLESIA PENTECOSTAL EL BUEN PASTOR

Sewershed	C-05
Site Area	12,499 sq. ft.
Address	10 Governor St Paterson, NJ 07522
Block and Lot	Block 3703, Lot 3,4,5
Soil Type	HSG N/A

Impervious surface in the parking lot at the front entrance can be converted to porous pavement to capture and infiltrate stormwater runoff from the parking lot. Four downspout planter boxes can be placed along the side entrances of the building to allow for rooftop runoff treatment and infiltration. 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 (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
93	11,624	0.6	5.9	53.4	0.009 Mgal	1,211 CF	0.32 Mgal	42,622 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 pavement	7,322	0.191	32	14,770	0.56	1,310	$20,960
Downspout Planter	670	n/a	3	n/a	n/a	4 (2'x6' box)	$6,400
Site Totals	**7,992**	**0.191**	**35**	**14,770**	**0.56**	**1,358**	**$37,020**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site E-01: IGLESIA PENTECOSTAL EL BUEN PASTOR

Iglesia Pentecostal El Buen Pastor

- pervious pavement
- planter box
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 10' 20'

Sewershed
C-06

Site F-01: DOG PARK LAWRENCE ST

Sewershed	C-06
Site Area	60,393
Address	36 Straight St Paterson, NJ 07522
Block and Lot	Block 3105, Lot 1
Soil Type	HSG N/A

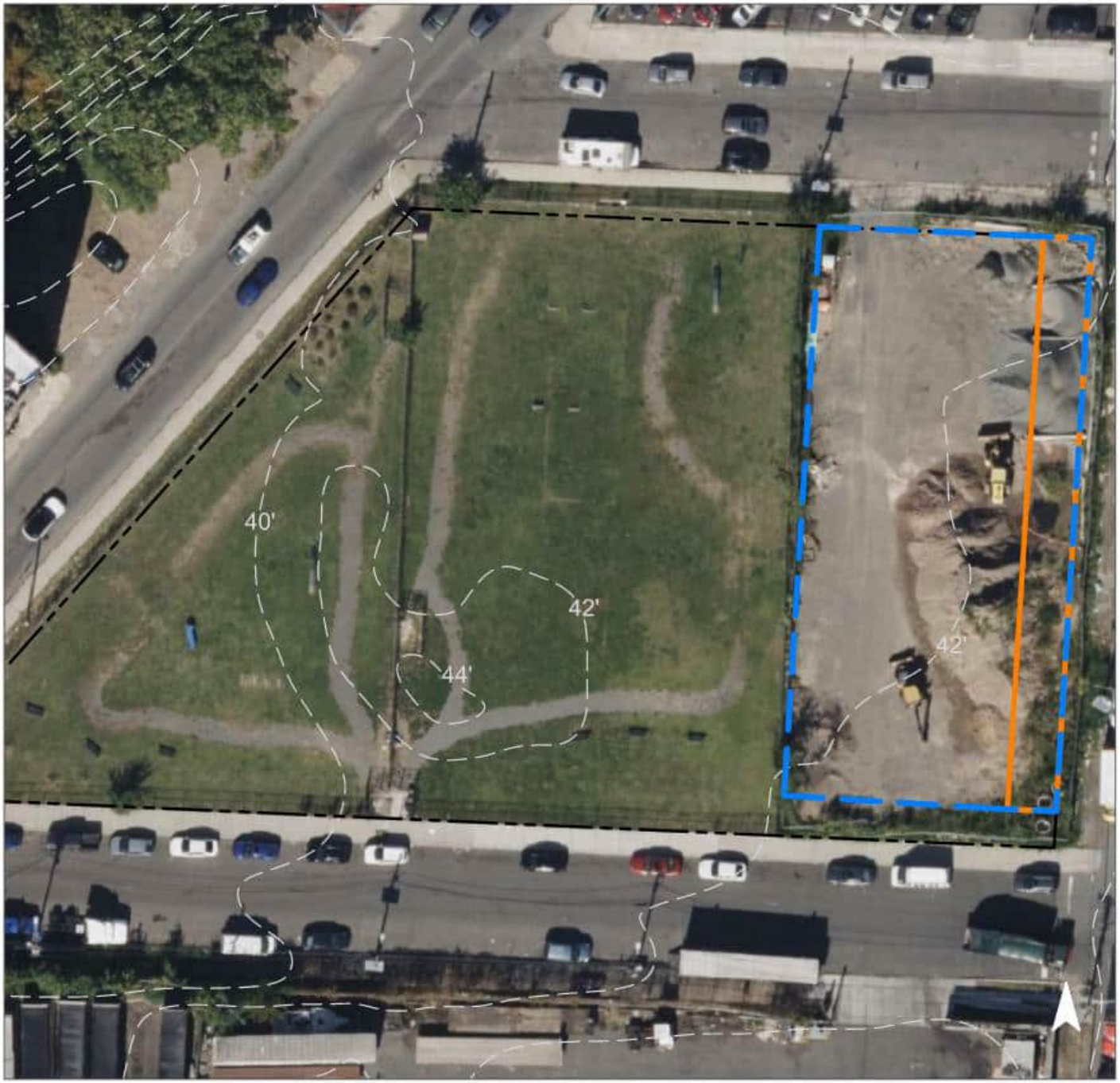
Parking spaces can be converted to pervious pavement capture and infiltrate stormwater runoff. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
37	22,346	1.1	11.3	102.6	0.017 Mgal	2,328 CF	0.66 Mgal	88,637 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 pavement	16,732	0.472	72	33,760	1.27	2,995	$47,920
Site Totals	**16,732**	**0.472**	**72**	**33,760**	**1.27**	**2,995**	**$65,800**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site F-01: DOG PARK LAWRENCE ST



Dog Park Lawrence St

- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

Note: Site is located within the 100-year floodplain.

0 25' 50'

Sewershed
C-07

Site G-01: FREEDOM VILLAGE APARTMENTS

Sewershed	C-07
Site Area	91.281 sq. ft.
Address	69 Straight Street Paterson, NJ 07501
Block and Lot	Block 3113, Lot 1, 2, 13, 14, 15
Soil Type	HSG N/A

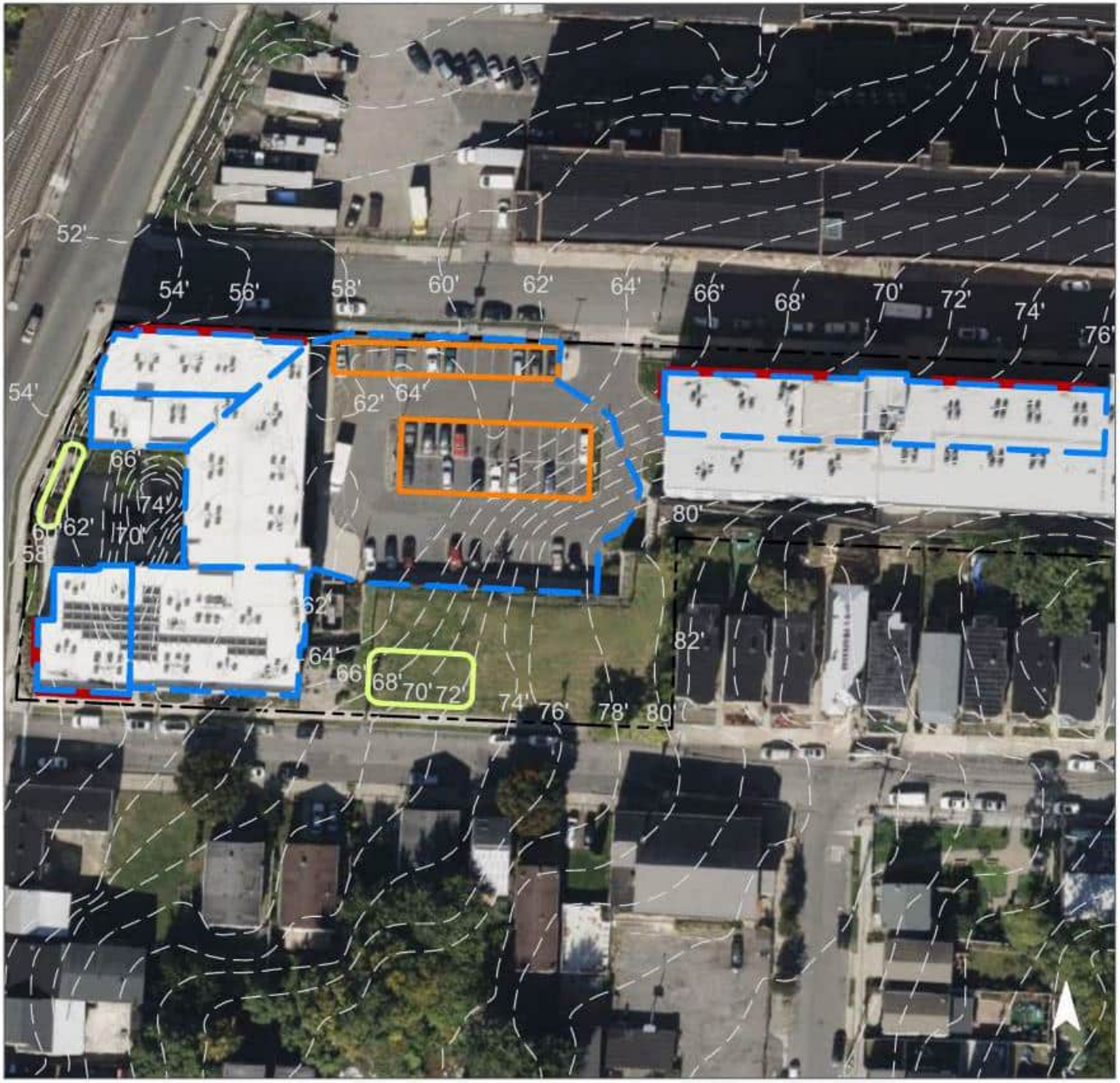
Parking spaces in the parking lot can be converted to porous pavement to capture and infiltrate stormwater runoff from the parking lot. Two rain gardens can be installed in the grass areas to capture, treat, and infiltrate stormwater runoff from the roof. Additionally, planter boxes can be installed adjacent to downspouts to divert and filter water. A lack of existing soil data suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
97	88,932	4.3	44.9	408.3	0.069 Mgal	9,264 CF	2.64 Mgal	352,762 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	7,720	0.218	34	15,570	0.59	1,950	$48,750
Pervious pavement	26,150	1.048	114	52,760	1.98	4,670	$74,720
Planter box	11,925	n/a	43	n/a	n/a	56 (2'X6' box)	$89,600
Site Totals	**37,185**	**1.048**	**191**	**68,330**	**2.57**	**7,292**	**$292,980**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site G-01: FREEDOM VILLAGE APARTMENTS



Freedom Village

- bioretention system
- pervious pavement
- planter box
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS
- 100-yr Floodplain

0 40' 80'

Site G-02: GRACE GOSPEL CHURCH

Sewershed	C-07
Site Area	14,960 sq. ft.
Address	139 Montgomery Street Paterson, NJ 07501
Block and Lot	Block 3201, Lot 30
Soil Type	HSG N/A

A rain garden can be installed in the grass area between the two buildings to capture, treat, and infiltrate stormwater runoff from the roof. Two rain gardens can be installed in the grass areas between the buildings to capture, treat, and infiltrate stormwater runoff from the roof. A lack of existing soil data suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
					For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
%	sq. ft.	TP	TN	TSS				
64	9,616	0.5	4.9	44.2	0.007 Mgal	1,002 CF	0.29 Mgal	38,144 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	2,710	0.076	11	5,470	0.21	680	$17,00
Site Totals	**2,710**	**0.076**	**11**	**5,470**	**0.21**	**680**	**$22,990**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site G-02: GRACE GOSPEL CHURCH

Grace Gospel Church

- bioretention system
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 15' 30'

Site G-03: GRACE GOSPEL CHURCH PARKING LOT

Sewershed	C-07
Site Area	12,407 sq. ft.
Address	127 Montgomery Street Paterson, NJ 07501
Block and Lot	Block 3109, Lots 21 & 22
Soil Type	HSG N/A

The southern portion of the parking lot can be converted to porous pavement to capture and infiltrate stormwater runoff from the parking area. A lack of existing soil data suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
43	5,296	0.3	2.7	24.3	0.004 Mgal	552 CF	0.16 Mgal	21,007 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 pavement	6,480	0.183	29	13,080	0.49	1,160	$18,560
Site Totals	**6,480**	**0.183**	**29**	**13,080**	**0.49**	**1,160**	**$25,110**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site G-03: GRACE GOSPEL CHURCH PARKING LOT

Grace Gospel Parking Lot

- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 15' 30'

Site G-04: MERCER ST & FULTON ST PUBLIC LAND

Sewershed	C-07
Site Area	28,450 sq. ft.
Address	161 Fulton Street Paterson, NJ 07501
Block and Lot	Block 3111, Lots 18, 19. 20, 21.01 - 25.02
Soil Type	HSG N/A

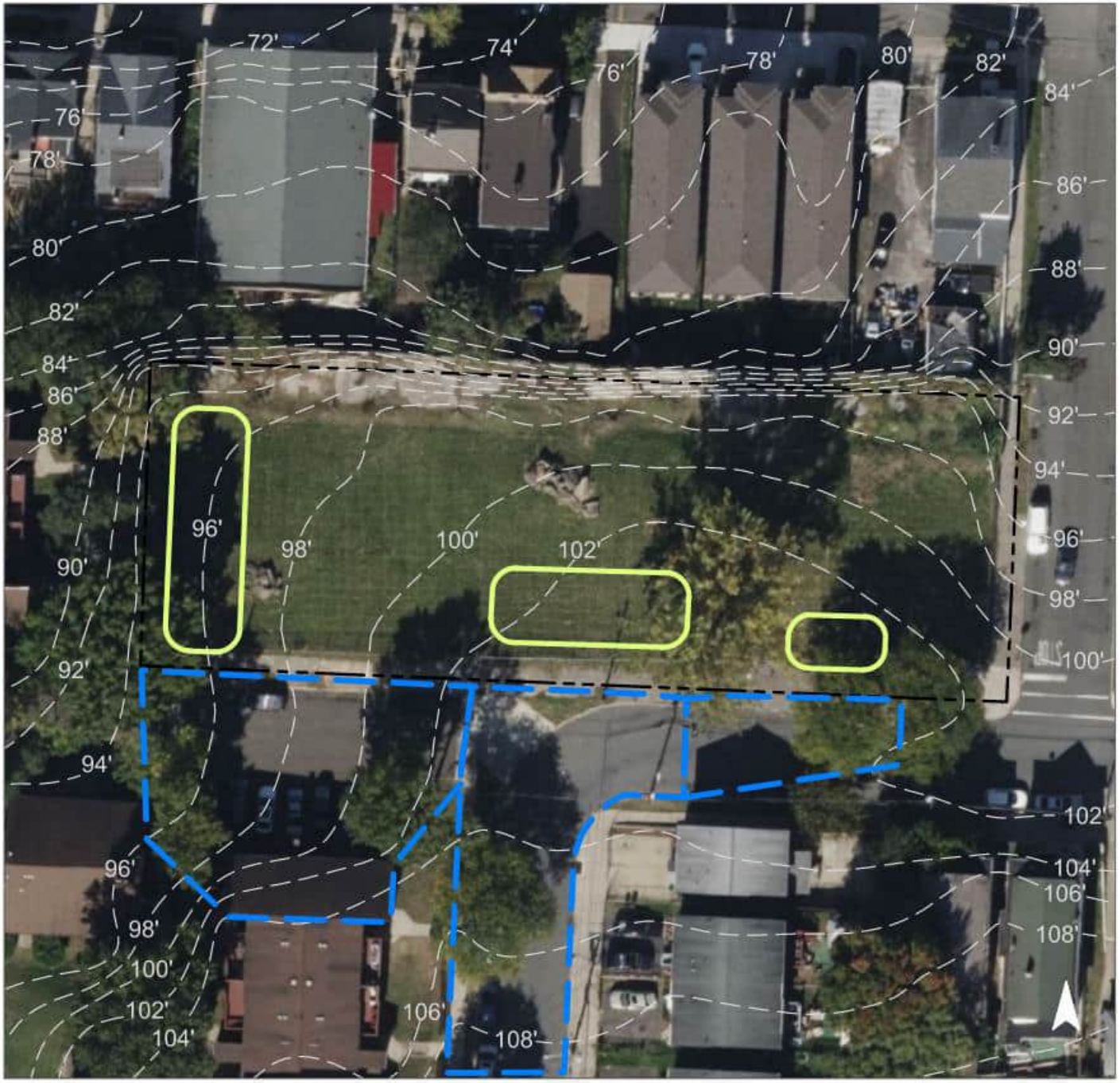
Rain gardens can be installed in the open grass area capture, treat, and infiltrate stormwater runoff from the pavement and roadway by creating inlets to direct water into them. A lack of existing soil data suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
6	1,569	0.1	0.8	7.2	0.001 Mgal	163 CF	0.05 Mgal	6,224 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	15,590	0.439	68	31,450	1.18	3,920	$98,000
Site Totals	**15,590**	**0.439**	**68**	**31,450**	**1.18**	**3,920**	**$134,500**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site G-04: MERCER ST & FULTON ST PUBLIC LAND



Mercer St. & Fulton St. Public Land

- bioretention system
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 25' 50'

Site G-05: NEW LIFE EVANGELIST CENTER

Sewershed	C-07
Site Area	31,046 sq. ft.
Address	153 Hamilton Avenue Paterson, NJ 07501
Block and Lot	Block 3606, Lots 4, 13, 14
Soil Type	HSG N/A

Rain gardens can be installed in the grass areas near the entrance of the building to capture, treat, and infiltrate stormwater runoff from the roof. Pavement to the west of the building can be converted to porous pavement to capture and infiltrate stormwater runoff from the parking lot and roof. A lack of existing soil data suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
64	19,801	1.0	10.0	90.9	0.015 Mgal	2,063 CF	0.59 Mgal	78,544 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	6,300	0.178	27	12,710	0.48	1,580	$39,500
Pervious pavement	5,615	0.158	25	11,320	0.43	1,540	$24,640
Site Totals	**11,915**	**0.336**	**51**	**24,030**	**0.91**	**3,120**	**$86,740**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site G-05: NEW LIFE EVANGELIST CENTER

New Life Evangelist Center

- bioretention system
- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 20' 40'

Site G-06: SECOND BAPTIST CHURCH

Sewershed	C-07
Site Area	29,025 sq. ft.
Address	72 Carroll Street Paterson, NJ 07501
Block and Lot	Block 3603, Lots 16, 18, 19, 20, 21
Soil Type	HSG N/A

Parking spaces in the parking lot to the north and west of the building can be converted to porous pavement to capture and infiltrate stormwater runoff from the parking lot and roof of building. A lack of existing soil data suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
97	28,202	1.4	14.2	129.5	0.022 Mgal	2,938 CF	0.84 Mgal	111,867 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 pavement	19,635	0.553	86	39,610	1.49	4,795	$76,720
Site Totals	**19,635**	**0.553**	**86**	**39,610**	**1.49**	**4,795**	**$105,240**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site G-06: SECOND BAPTIST CHURCH

Second Baptist Church

- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 15' 30'

Site G-07: WRIGLEY PARK

Sewershed	C-07
Site Area	99,711 sq. ft.
Address	Montgomery St & Mercer St Paterson, NJ 07501
Block and Lot	Block 3214, Lots 1, 2, 3
Soil Type	HSG N/A

The basketball court in the park can be converted to porous pavement to capture and infiltrate stormwater runoff from the court. A lack of existing soil data suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
39	38,678	1.9	19.5	177.6	0.030 Mgal	4,029 CF	1.15 Mgal	153,424 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 pavement	13,225	0.373	57	26,680	1.00	12,615	$201,840
Site Totals	**13,225**	**0.373**	**57**	**26,680**	**1.00**	**12,615**	**$277,490**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site G-07: WRIGLEY PARK

Wrigley Park

- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 20' 40'

Sewershed
C-08

Site H-01: NATHAN BARNERT RESIDENCE

Sewershed	C-08
Site Area	76,234 sq. ft.
Address	64 Keen Street Paterson, NJ 07524
Block and Lot	Block 3010, Lot 1
Soil Type	HSG N/A

A rain garden can be installed in the grass area near the entrance of the building between existing trees to capture, treat, and infiltrate stormwater runoff from the parking lot. The western parking spaces of the parking lot can be converted to porous pavement to capture and infiltrate stormwater runoff from the parking lot. A lack of existing soil data suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
51	39,221	1.9	19.8	180.1	0.031 Mgal	4,086 CF	1.16 Mgal	155,577 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	6,250	0.176	27	12,610	0.47	1,560	$39,000
Pervious pavement	7,875	0.222	34	15,890	0.60	1,490	$23,840
Site Totals	**14,125**	**0.398**	**61**	**28,500**	**1.07**	**3,050**	**$86,270**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site H-01: NATHAN BARNERT RESIDENCE

Nathan Barnert Residence

- bioretention system
- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

Notes: Rain garden is to be located in open space between trees. Parking lot slope is to be modified.

0 30' 60'

Sewershed C-10

Site J-01: PATERSON PUBLIC SCHOOL NO. 21

Sewershed	C-10
Site Area	71,750 sq. ft.
Address	322 10th Street Paterson, NJ 07514
Block and Lot	Block 3316, Lots 1, 2, 3, 15, 16
Soil Type	HSG N/A

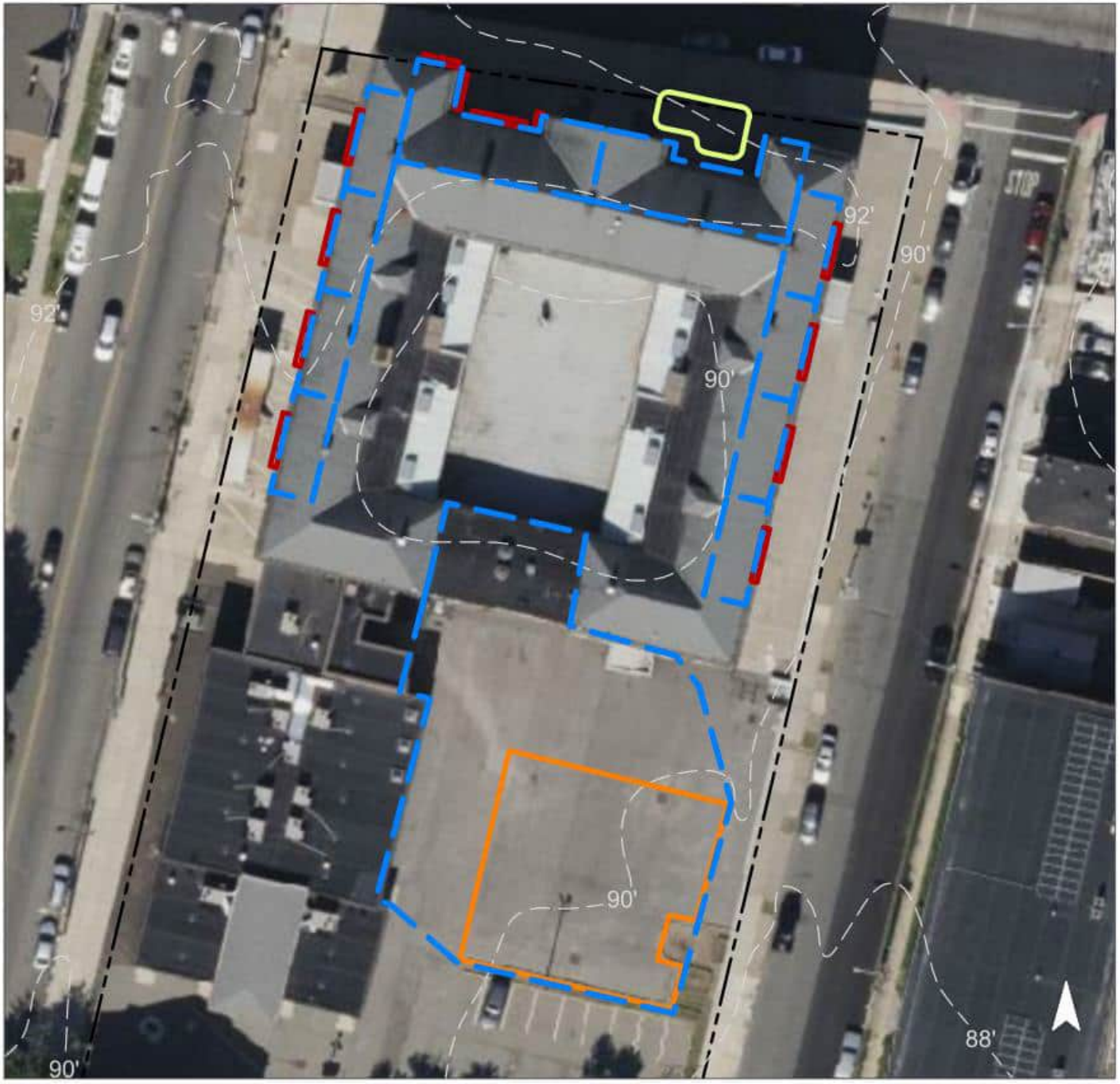
A portion of the playground can be converted to porous pavement to capture and infiltrate stormwater runoff from the surrounding impervious surfaces. A rain garden can be installed around the building to capture, treat, and infiltrate stormwater runoff from the pavement and roof by depaving excessively paved areas. Planter boxes can be installed at the base of downspouts along the building that provide an opportunity to beneficially reuse rooftop runoff. A lack of existing soil data suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
100	71,517	3.4	36.1	328.4	0.056 Mgal	7,450 CF	2.12 Mgal	283,683 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	3,225	0.091	13	6,510	0.24	850	$21,250
Pervious pavement	12,935	0.365	57	26,100	0.98	4,935	$78,960
Planter box	5,360	n/a	19	n/a	n/a	32 (2'X6' box)	$51,200
Site Totals	**18,065**	**0.456**	**90**	**32,610**	**1.22**	**6,169**	**$208,310**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site J-01: PATERSON PUBLIC SCHOOL NO. 21



Paterson Public School No. 21

- bioretention system
- pervious pavement
- planter box
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 25' 50'

Sewershed C-11

Site K-01: BARNET MEDICAL ARTS PARKING LOT 1

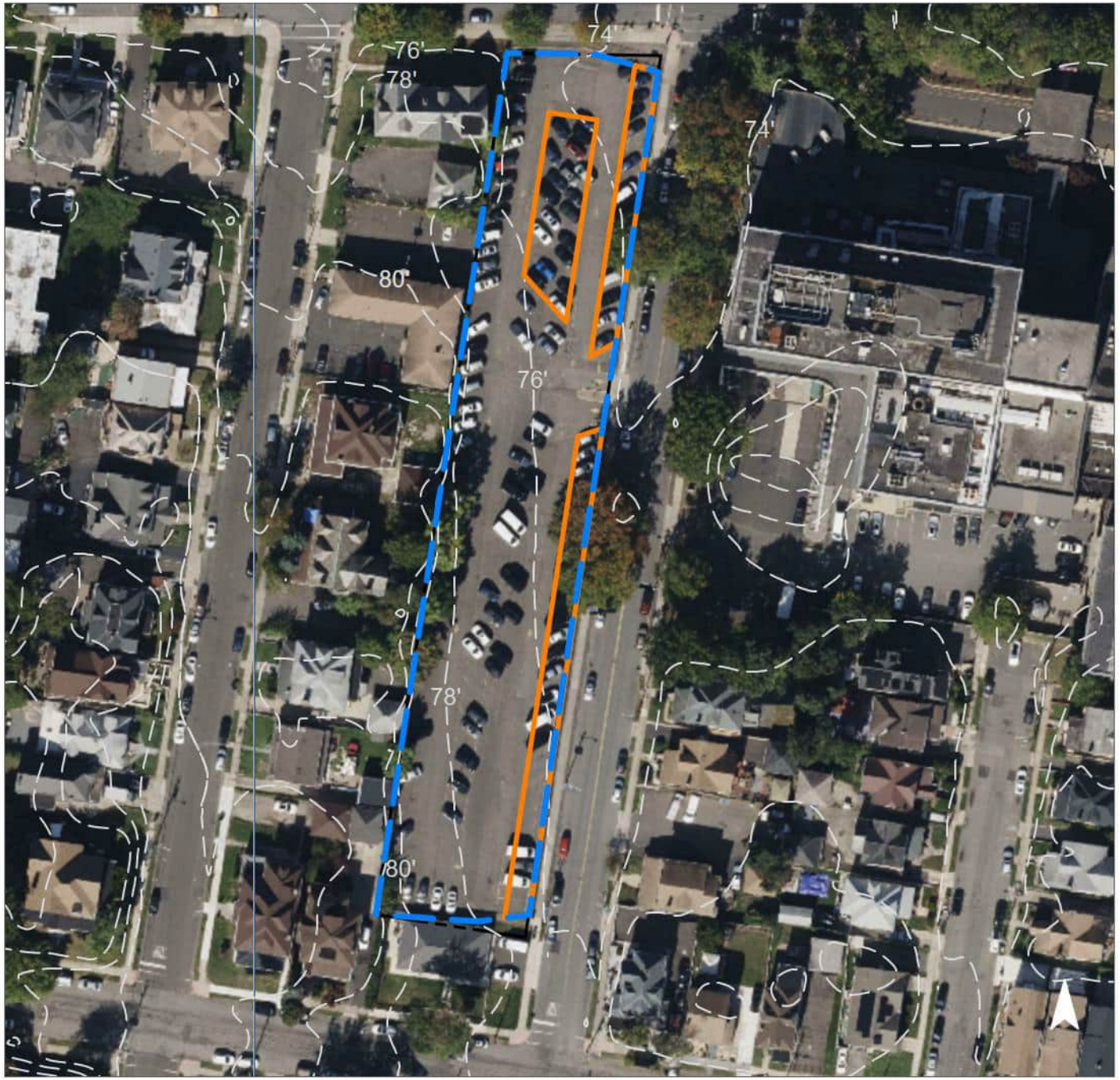
Sewershed	C-11
Site Area	57,398 sq. ft.
Address	533 E 29th Street, Paterson, New Jersey, 07504
Block and Lot	Block 8502, Lot 2
Soil Type	HSG N/A

Parking spaces in the northern and eastern portions of the parking lot can be converted to porous pavement to capture and infiltrate stormwater runoff from the parking lot. 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 (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
97	57,299	2.8	28.9	263.1	0.044 Mgal	5,969 CF	1.57 Mgal	210,096 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 pavement	56,574	1.474	247	114,140	4.29	11,754	$188,080
Site Totals	**56,574**	**1.474**	**247**	**114,140**	**4.29**	**11,754**	**$254,900**

Site K-01: BARNET MEDICAL ARTS PARKING LOT 1



Barnet Medical Arts Parking Lot 1

- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 50' 100'

Site K-03: FAITH CHAPEL REFORMED CHURCH

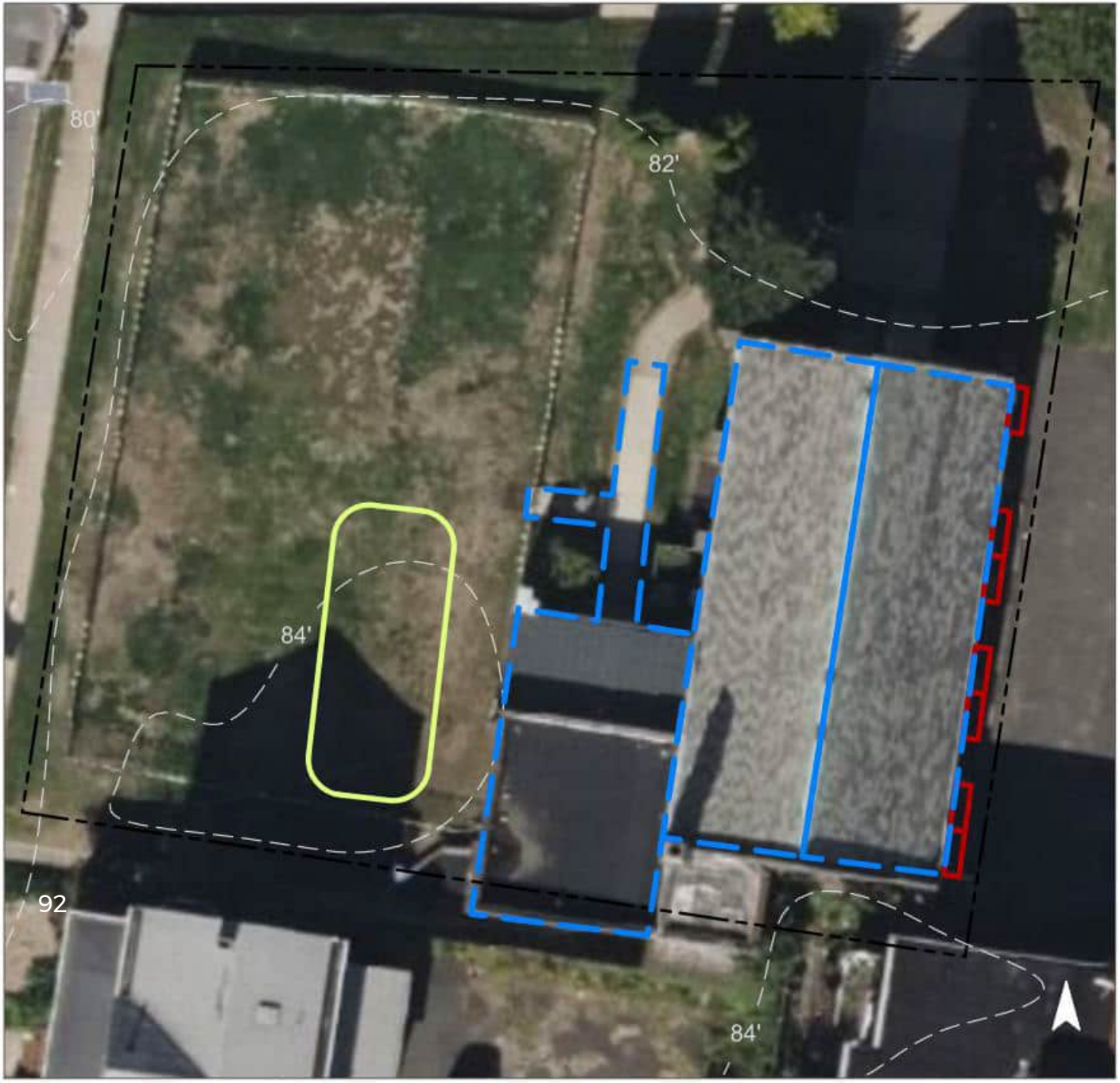
Sewershed	C-11
Site Area	13,438 sq. ft.
Address	618 Broadway, Paterson, New Jersey, 07514
Block and Lot	Block 3808, Lot 1
Soil Type	HSG N/A

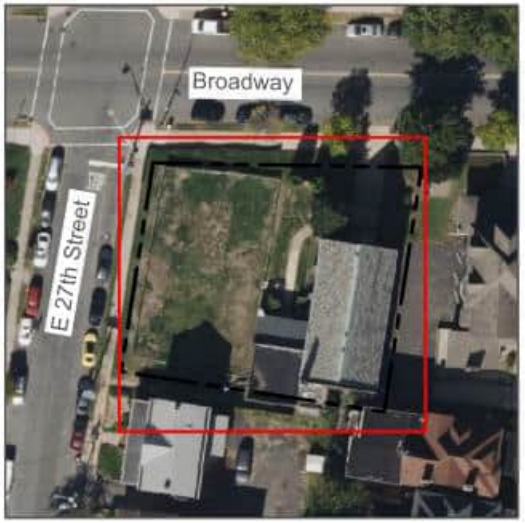
To enhance the sustainable stormwater management system, a rain garden can be installed on the western portion of the site and downspout planters can be installed along the eastern side of the building to collect runoff from the rooftop. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
38	5,106	0.2	2.6	23.4	0.004 Mgal	532 CF	0.14 Mgal	18,724 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	2,315	0.060	10	4,670	0.18	585	$14,625
Downspout Planter	1,345	n/a	5	n/a	n/a	7 (2'x6' box)	$11,200
Site Totals	**3,660**	**0.060**	**15**	**4,670**	**0.18**	**669**	**$34,925**

Site K-03: FAITH CHAPEL REFORMED CHURCH





Faith Chapel Reformed Church

- bioretention system
- planter box
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 10' 20'

Site K-04: LOVE OF JESUS PATERSON

Sewershed	C-11
Site Area	65,484 sq. ft.
Address	385 Broadway Paterson, NJ 07501
Block and Lot	Block 3511, Lots 4, 5
Soil Type	HSG N/A

Parking spaces in the parking lot to the west of the building can be converted to porous pavement to capture and infiltrate stormwater runoff from the parking lot. Rain gardens can be installed in the grass area near the south entrance of the building to capture, treat, and infiltrate stormwater runoff from the paved area by adding trench drains. A lack of existing soil data suggests that more soil testing would be required before determining the soil's suitability.

Impervious Cover		Existing Loads from Impervious Cover (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
91	59,413	2.9	30.0	272.8	0.046 Mgal	6,189 CF	1.76 Mgal	235,672 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	4,290	0.121	19	8,650	0.33	1,115	$27,875
Pervious pavement	25,620	0.722	112	51,690	1.94	5,265	$84,240
Site Totals	**29,910**	**0.843**	**131**	**60,340**	**2.27**	**6,380**	**$152,185**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site K-04: LOVE OF JESUS PATERSON

Love of Jesus Paterson

- bioretention system
- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 25' 50'

Site K-05: MANARA COLLEGE

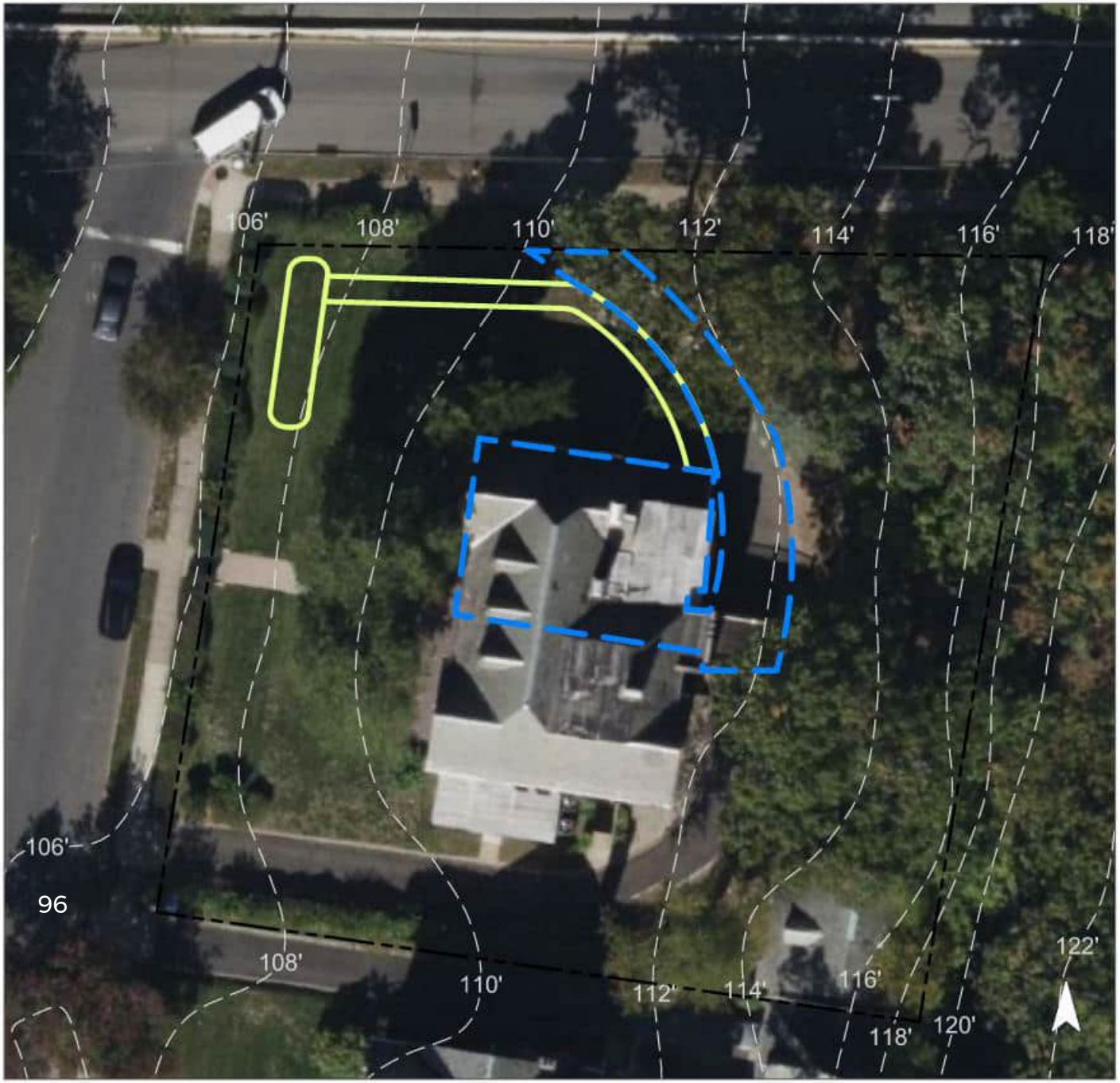
Sewershed	C-11
Site Area	21,685 sq. ft.
Address	139 Derrom Avenue, Paterson, New Jersey, 07504
Block and Lot	Block 8510, Lot 1
Soil Type	HSG N/A

A rain garden can be installed in the grass area adjacent of the building to capture, treat, and infiltrate stormwater runoff from the roof and the driveway. To efficiently treat and guide water from the building's external rooftop leaders and driveway to the rain garden, a bioswale can be installed along the edge of the right of way. 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 (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
45	9,738	0.5	4.9	44.7	0.008 Mgal	1,014 CF	0.27 Mgal	35,706 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	2,935	0.051	10	2,260	0.23	705	$17,625
Site Totals	**2,935**	**0.051**	**10**	**2,260**	**0.23**	**705**	**$23,845**

Site K-05: MANARA COLLEGE



Manara College

- bioretention system
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 15' 30'

Site K-06: PATERSON PUBLIC SCHOOL 26

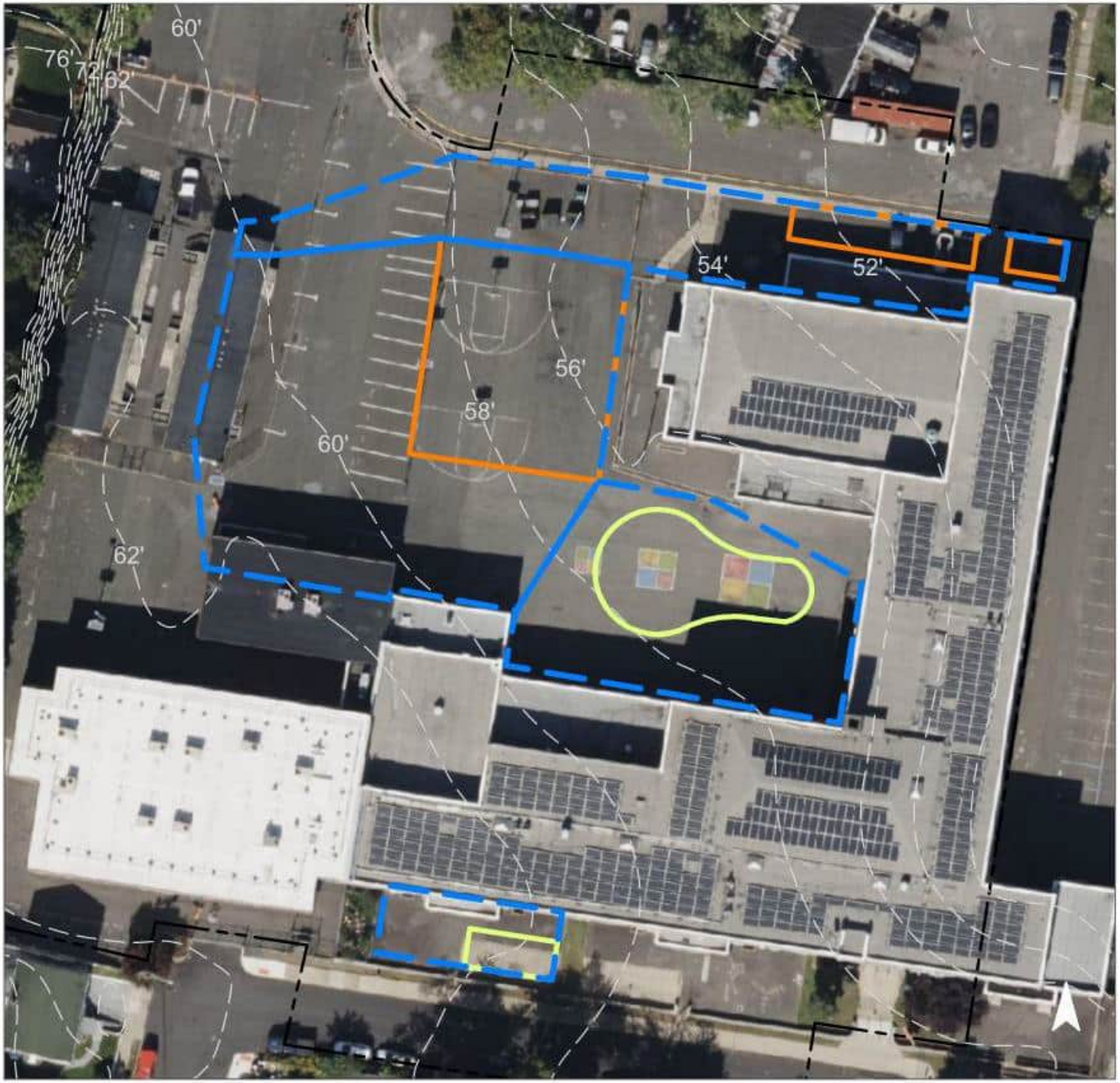
Sewershed	C-11
Site Area	167,630 sq. ft.
Address	1 E 32nd Street, Paterson, New Jersey, 07514
Block and Lot	Block 8309, Lot 2, 3, 6, 29
Soil Type	HSG N/A

To effectively manage runoff from the roofs and parking lot of the school, the current pavement adjacent to the school can be converted to porous pavement to capture and infiltrate stormwater. To capture and treat impervious runoff and bring a green atmosphere to the courtyard area in the center of the school lot and the southern entrance way of the school, rain gardens can be installed. 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 (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
99	165,954	8.0	83.8	762.0	0.129 Mgal	17,287 CF	4.55 Mgal	608,497 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	10,900	0.284	48	21,990	0.83	2,725	$54,500
Pervious pavement	28,434	0.741	124	57,360	2.16	7,840	$68,125
Site Totals	**39,334**	**1.025**	**172**	**79,350**	**2.99**	**10,565**	**$266,195**

Site K-06: PATERSON PUBLIC SCHOOL 26



Paterson Public School 26

- pervious pavement
- bioretention system
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS
- 100-yr Floodplain

0 30' 60'

Site K-07: PATERSON ADULT DAY CENTER

Sewershed	C-11
Site Area	52,508 sq. ft.
Address	163 Rosa Parks Boulevard Paterson, NJ 07501
Block and Lot	Block 3210, Lot 1
Soil Type	HSG N/A

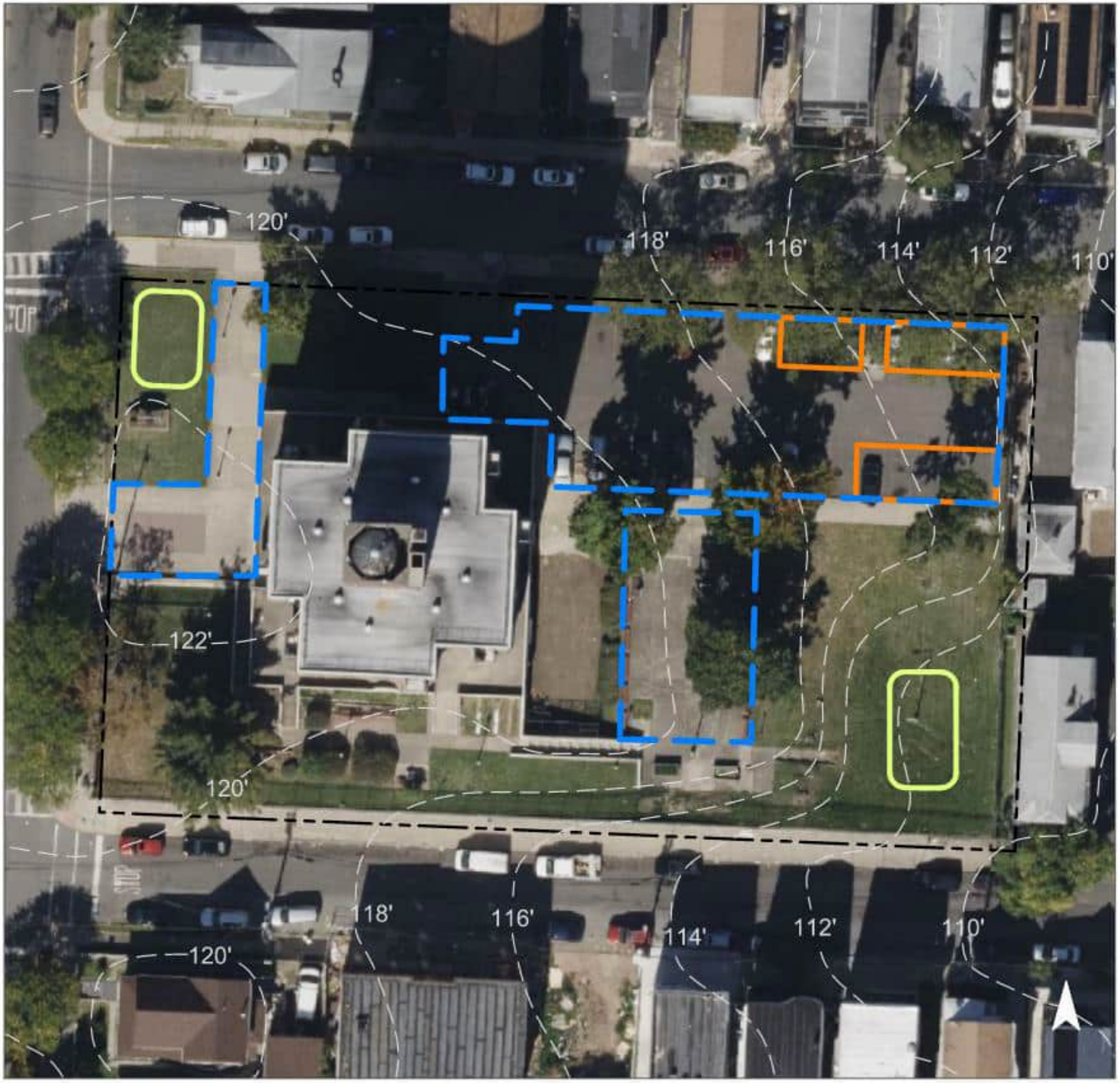
Rain gardens can be installed in the grass area near the entrance of the building and near runoff from of the patio to capture, treat, and infiltrate stormwater runoff from the pavement. Parking spaces in the parking lot can be converted to porous pavement to capture and infiltrate stormwater runoff from the parking lot. A lack of existing soil data suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

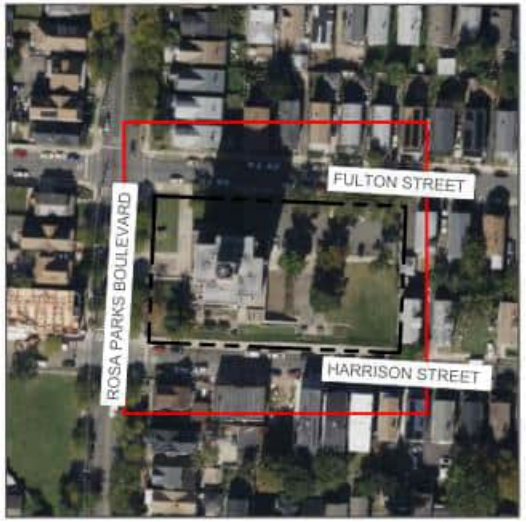
Impervious Cover		Existing Loads from Impervious Cover (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
64	33,400	1.6	16.9	153.4	0.026 Mgal	3,479 CF	0.99 Mgal	132,487 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	5,755	0.162	25	11,610	0.44	1,445	$36,125
Pervious pavement	9,300	0.262	40	18,760	0.71	1,840	$29,440
Site Totals	**15,055**	**0.424**	**65**	**30,370**	**1.15**	**3,285**	**$89,955**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site K-07: PATERSON ADULT DAY CENTER





Paterson Adult Day Care

- bioretention system
- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 25' 50'

Site K-08: RADIO VISION CRISTIANA

Sewershed	C-11
Site Area	31,052 sq. ft.
Address	419 Broadway Paterson, NJ 07501
Block and Lot	Block 3511, Lots 7, 11, 12
Soil Type	HSG N/A

Parking spaces in the parking lot north, west, and southeast of the building can be converted to porous pavement to capture and infiltrate stormwater runoff from the parking lot and roof. A lack of existing soil data suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
94	29,341	1.4	14.8	134.7	0.023 Mgal	3,056 CF	0.87 Mgal	116,388 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 pavement	19,580	0.552	86	39,500	1.48	4,380	$70,080
Site Totals	**19,580**	**0.552**	**86**	**33,500**	**1.48**	**4,380**	**$94,770**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site K-08: RADIO VISION CRISTIANA

Radio Vision Cristiana

- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 20' 40'

Site K-09: ROSA L. PARKS SCHOOL OF FINE & PERFORMING ARTS

Sewershed	C-11
Site Area	84,000 sq. ft.
Address	413 12th Avenue Paterson, NJ 07514
Block and Lot	Block 3409, Lot 5
Soil Type	HSG N/A

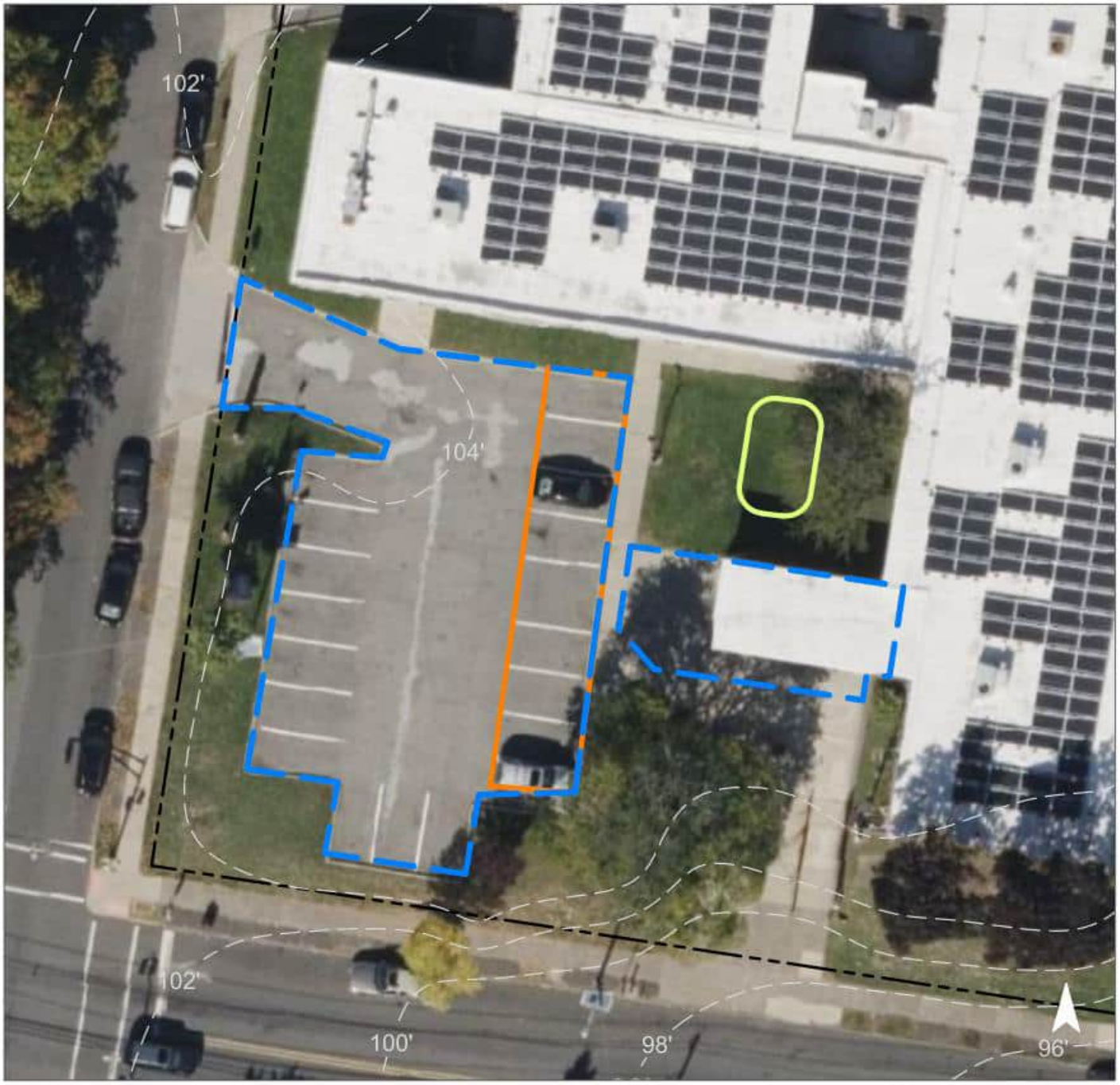
A rain garden can be installed in the grass area near the entrance of the building to capture, treat, and infiltrate stormwater runoff from the pavement. Parking spaces in the parking lot can be converted to porous pavement to capture and infiltrate stormwater runoff from the parking lot. A lack of existing soil data suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
89	75,021	3.6	37.9	344.4	0.058 Mgal	7,815 CF	2.23 Mgal	297,583 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	1,205	0.034	6	2,430	0.09	300	$7,500
Pervious pavement	6,085	0.172	27	12,270	0.46	1,365	$21,840
Site Totals	**7,290**	**0.206**	**33**	**14,700**	**0.55**	**1,665**	**$40,290**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site K-09: ROSA L. PARKS SCHOOL OF FINE & PERFORMING ARTS



Rosa L. Parks Arts High School

- bioretention system
- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 15' 30'

Site K-10: ST. PAUL'S EPISCOPAL CHURCH

Sewershed	C-11
Site Area	39,067 sq. ft.
Address	451 Van Houten Street Paterson, NJ 07501
Block and Lot	Block 4202, Lot 7, 8, 9, 10, 11
Soil Type	HSG N/A

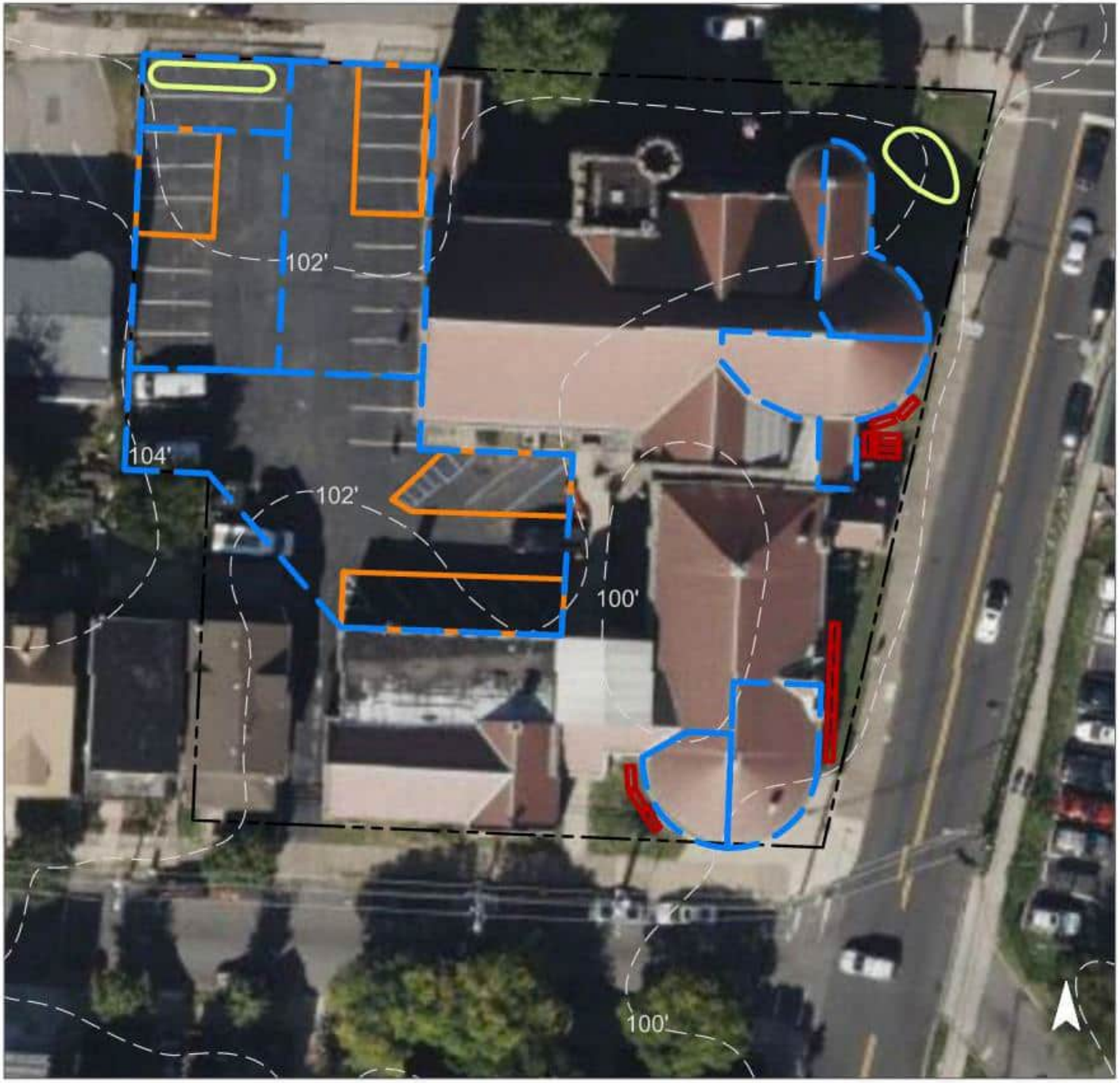
A bioretention systems can be installed, one on the north-eastern side of the site to capture, treat and infiltrate stormwater runoff from the roof. Additionally, planter boxes can be installed adjacent to downspouts to divert and filter water. Parking spaces in the eastern portion of the parking lot can be converted to porous pavement to capture and infiltrate stormwater runoff from the parking area. 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 (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
97	37,735	1.8	19.1	173.3	0.029 Mgal	3,931 CF	1.12 Mgal	149,680 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	1,630	0.046	8	3,290	0.12	415	$10,375
Pervious Pavement	10,955	0.309	48	22,100	0.83	2,800	$44,800
Planter boxes	2,555	n/a	10	n/a	n/a	14 (2'x6' box)	$22,400
Site Totals	**15,140**	**0.355**	**65**	**25,390**	**0.95**	**3,384**	**$104,895**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site K-10: ST. PAUL'S EPISCOPAL CHURCH



St. Paul's Episcopal Church

- bioretention system
- pervious pavement
- planter box
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 20' 40'

Site K-11: ST THERESE ROMAN CATHOLIC CHURCH

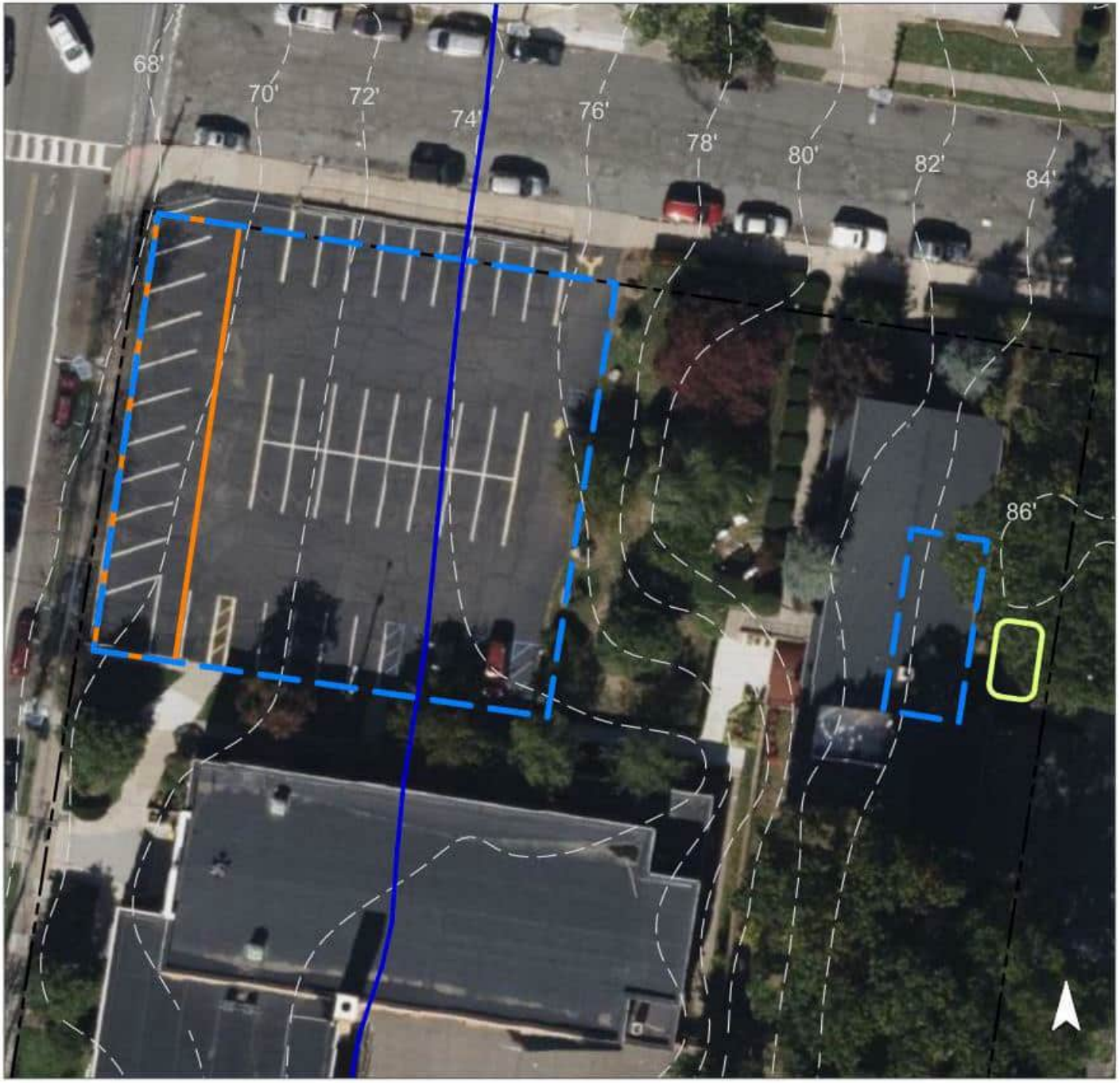
Sewershed	C-11
Site Area	24,709 sq. ft.
Address	209 E 33rd Street, Paterson, New Jersey, 07504
Block and Lot	Block 8506, Lot 1, 2, 3, 4
Soil Type	HSG N/A

To improve the effectiveness of the stormwater management system, a rain garden can be implemented in western entrance of the building and a section of the parking at the lowest elevation could be transformed into pervious pavement. These systems capture, treat, and allow natural infiltration of 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 (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
93	22,975	1.1	11.6	105.5	0.018 Mgal	2,393 CF	0.63 Mgal	84,242 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	960	0.025	4	1,940	0.07	240	$6,000
Pervious pavement	13,920	0.363	61	28,080	1.06	2,485	$39,760
Site Totals	**14,880**	**0.388**	**65**	**30,020**	**1.13**	**2,725**	**$61,880**

Site K-11: ST THERESE ROMAN CATHOLIC CHURCH



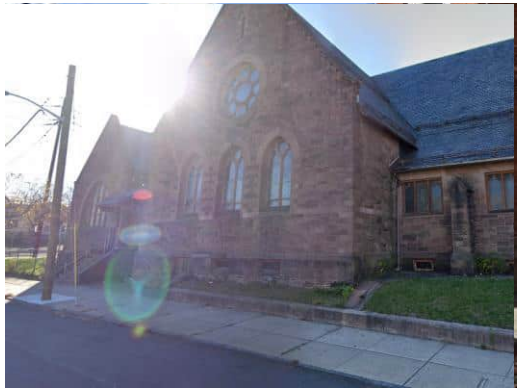
St Therese Roman Catholic Church

- bioretention system
- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS
- 100-yr Floodplain

0 20' 40'

Site K-12: UNITED PRESBYTERIAN CHURCH

Sewershed	C-11
Site Area	45,003 sq. ft.
Address	375 Van Houten Street Paterson, NJ 07501
Block and Lot	Block 4201, Lot 9, 10
Soil Type	HSG N/A



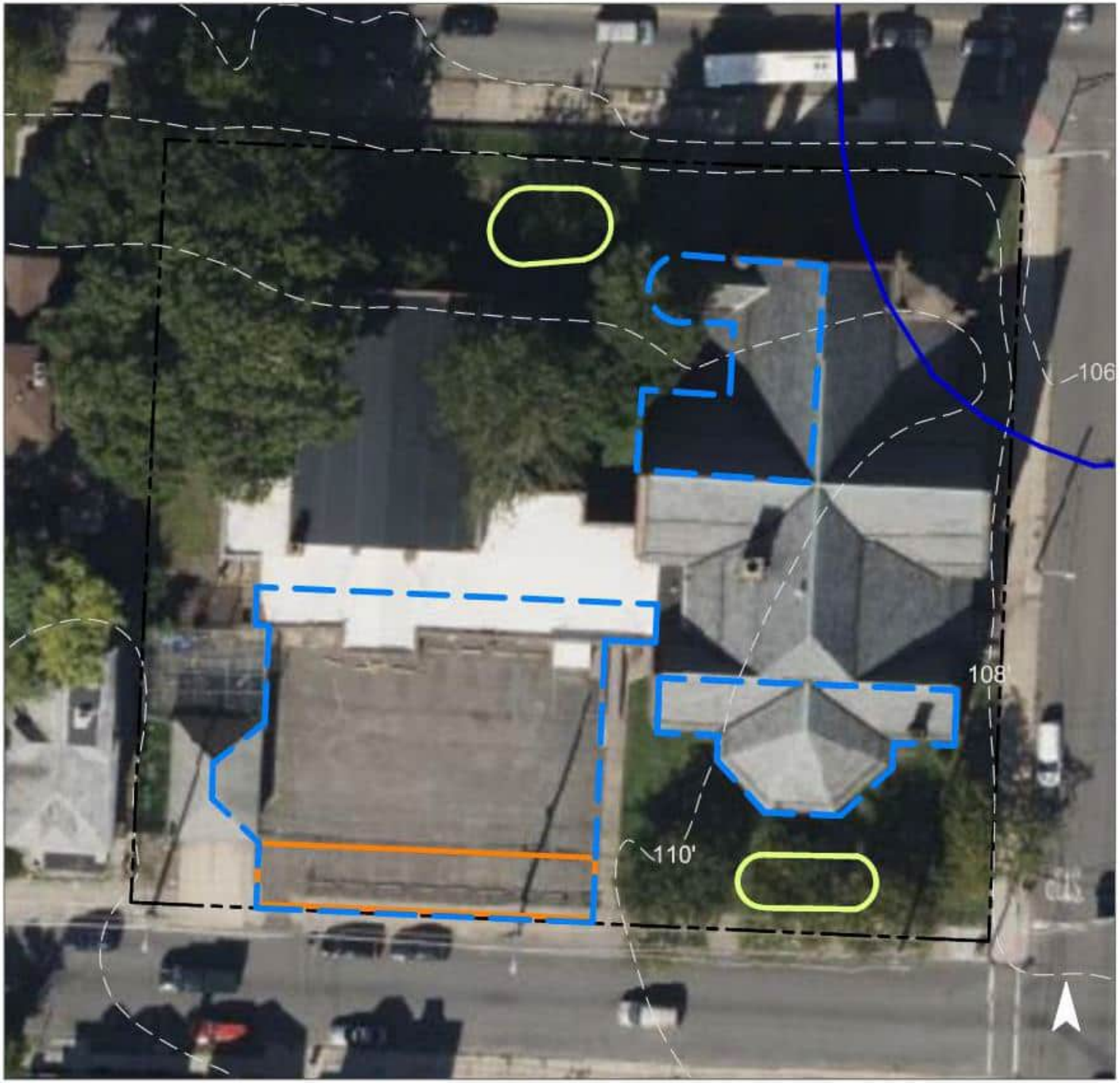
Two bioretention systems can be installed, one on the northern side of the site, and another on the south-eastern side of the site to capture, treat and infiltrate water from the roof. Additionally, the southern portion of the parking lot can be converted to pervious parking to capture and infiltrate water from the rest of the parking lot and roof. 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 (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
70	31,366	1.5	15.8	144.0	0.024 Mgal	3,267 CF	0.93 Mgal	124,418 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	4,000	0.113	17	8,070	0.30	1,000	$25,000
Pervious pavement	7,840	0.221	34	15,820	0.59	1,410	$22,560
Site Totals	**11,840**	**0.334**	**51**	**23,890**	**0.89**	**2,410**	**$64,320**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site K-12: UNITED PRESBYTERIAN CHURCH



United Presbyterian Church

- bioretention system
- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS
- 100-yr Floodplain

0 20' 40'

Sewershed C-12

Site L-01: AMIDSTAD PARK VREELAND AND 19TH TRIANGLE

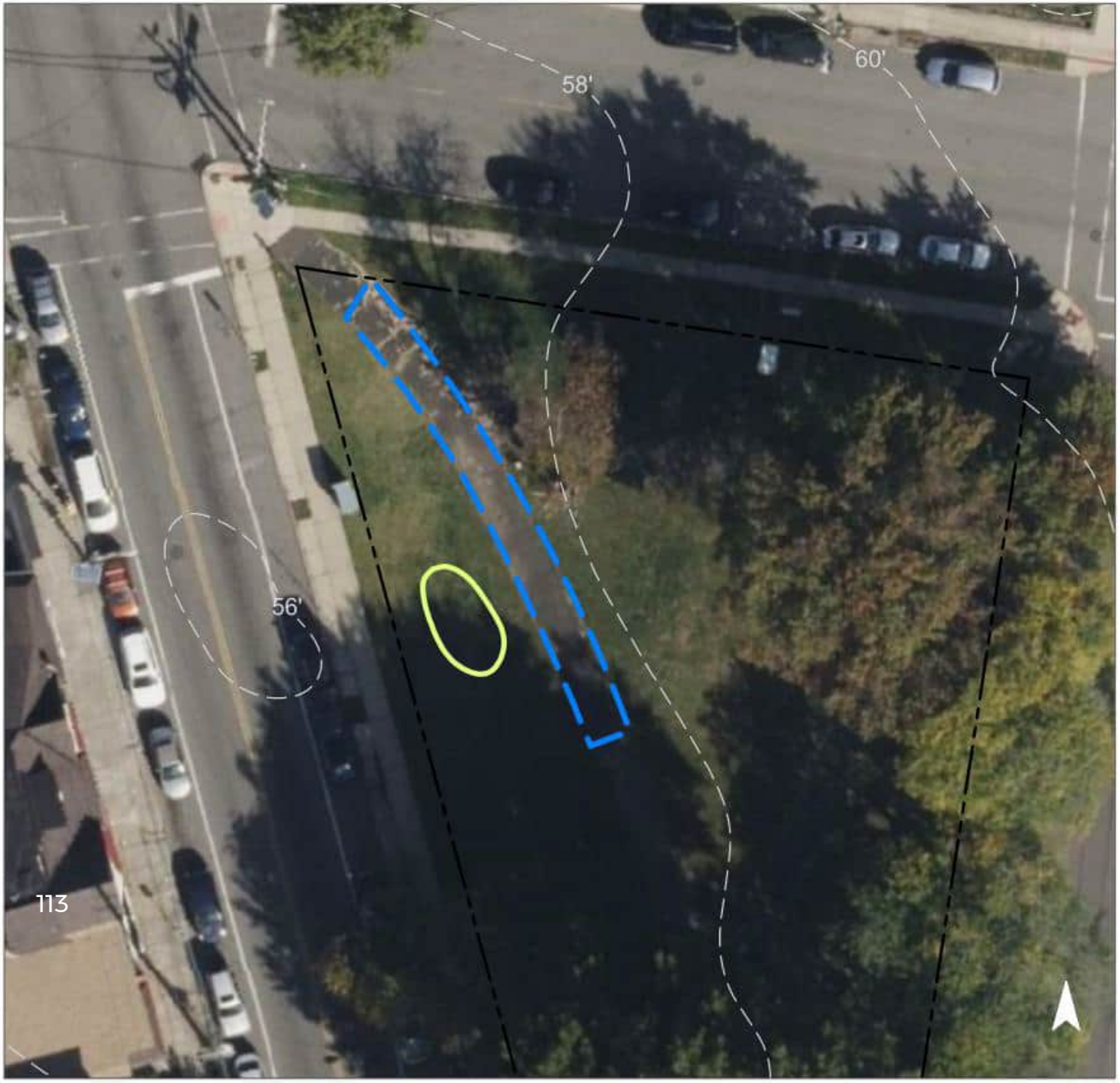
Sewershed	C-12
Site Area	23,872 sq. ft.
Address	336 19th Avenue, Paterson, New Jersey, 07504
Block and Lot	Block 8020, Lot 1
Soil Type	HSG N/A

To enhance the sustainable stormwater management system, a rain garden can be implemented in the park capturing and treating runoff from the walkway. 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 (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
16	3,877	0.2	2.0	17.8	0.003 Mgal	404 CF	0.11 Mgal	14,216 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	900	0.023	4	1,820	0.07	225	$5,625
Site Totals	**900**	**0.023**	**4**	**1,820**	**0.07**	**225**	**$7,715**

Site L-01: AMIDSTAD PARK VREELAND AND 19TH TRIANGLE



Vreeland and 19th Triangle

- bioretention system
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 15' 30'

Site L-02: BRANDES FIELD PLAYGROUND

Sewershed	C-12
Site Area	115,572 sq. ft.
Address	470-486 Marshall Street Paterson, NJ 07503
Block and Lot	Block 5412, Lot 2
Soil Type	HSG N/A

To encourage stormwater management, a rain garden can be established in the grassy areas located to the right of the entrance of the playground and the current parking spaces can be replaced with porous pavement to effectively capture, treat, and infiltrate stormwater runoff originating from the parking lot. 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 (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
33	38,082	1.8	19.2	174.8	3,967 Mgal	3,967 CF	1.04 Mgal	139,634 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	3,000	0.078	13	6,050	0.23	750	$ 18,750
Pervious pavement	11,750	0.306	51	23,700	0.89	2,100	$ 33,600
Site Totals	**14,750**	**0.384**	**65**	**29,750**	**1.12**	**2,850**	**$ 71,800**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site L-02: BRANDES FIELD PLAYGROUND

Brandes Field Playground

- bioretention system
- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 20' 40'

Site L-03: DR. HANI AWADALLAH SCHOOL

Sewershed	C-12
Site Area	152,626 sq. ft.
Address	515 Marshall Street Paterson, NJ 07503
Block and Lot	Block 5409, Lot 10,11,12,13,14,15,16, 17,18,19,20
Soil Type	HSG N/A

To capture and manage stormwater from the roof of the school, rain gardens can be installed where downspouts empty into grassy areas throughout the site. Pervious pavement can also be installed in the 2 rear parking areas to capture and manage stormwater runoff from those areas. 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 (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
					For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
%	sq. ft.	TP	TN	TSS				
98	150,257	7.2	75.9	689.9	0.117 Mgal	15,652 CF	4.12 Mgal	550,942 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	23,410	0.610	103	47,230	1.77	7,200	$ 180,000
Pervious pavement	11,625	0.303	51	23,450	0.88	2,850	$ 45,600
Site Totals	**35,035**	**0.913**	**154**	**70,680**	**2.65**	**10,050**	**$ 314,093**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site L-03: DR. HANI AWADALLAH SCHOOL

Dr. Hani Awadallah School

- bioretention system
- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 50' 100'

Site L-04: DR. MARTIN LUTHER KING JR. PUBLIC SCHOOL

Sewershed	C-12
Site Area	224,134 sq. ft.
Address	851 East 28th Street, Paterson, NJ 07513
Block and Lot	Block 8711, Lot 2
Soil Type	HSG N/A

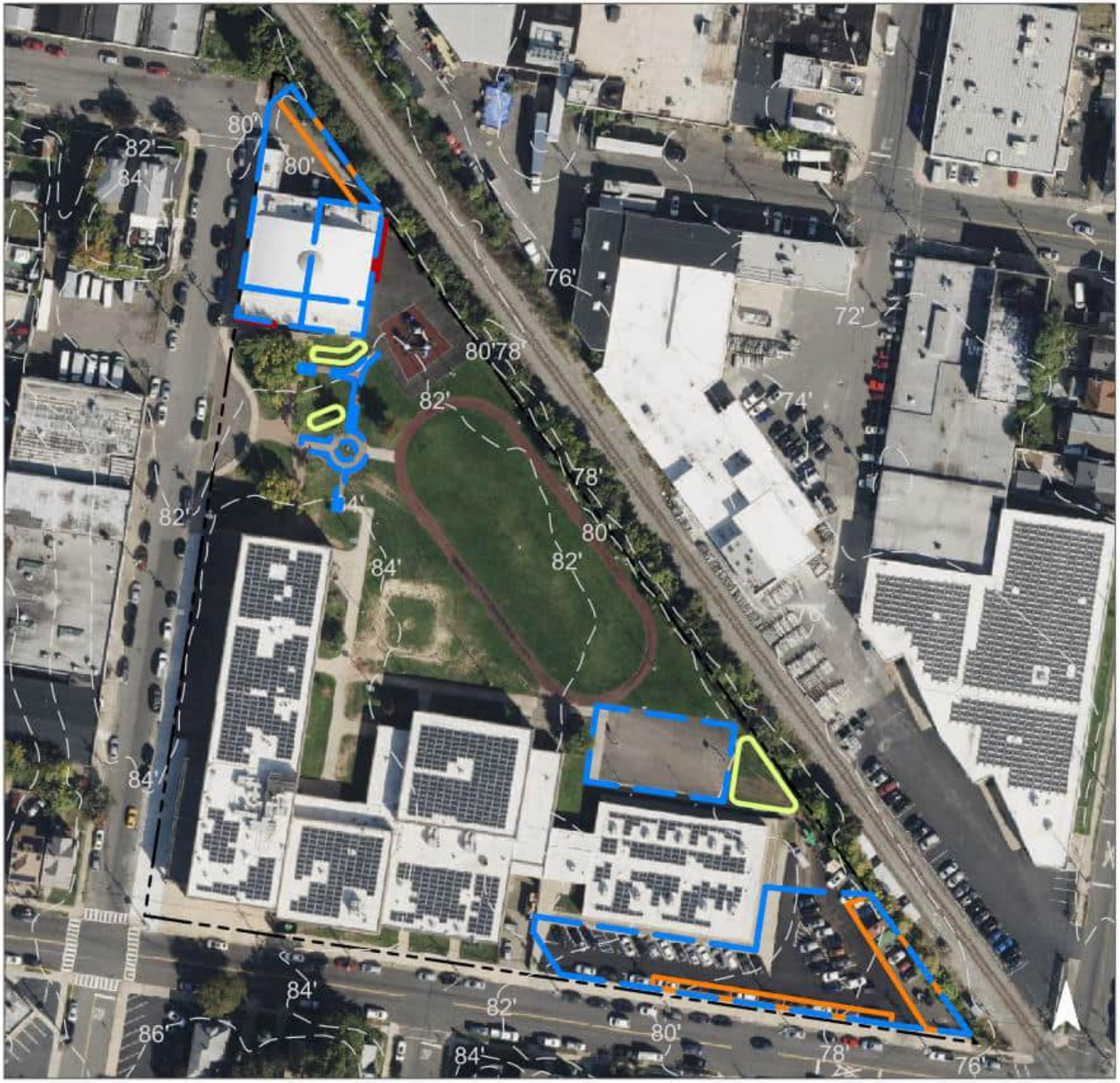
Bioretention systems can be built on the north side of the site and near the basketball court to capture, treat and infiltrate stormwater generated by the adjacent building and runoff from the sidewalk at a known low point. A portion of the parking lots can be converted to pervious pavement to capture and infiltrate water from the northwestern building and southeastern portion of the site. Planter boxes can be placed along the northwestern building to treat runoff from the roof leaders. 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 (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
70	157,825	7.6	79.7	724.6	0.123 Mgal	16,440 CF	4.68 Mgal	626,040 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	9,210	0.260	40	18,580	0.70	2,325	$58,125
Pervious pavement	28,090	0.792	122	56,670	2.13	5,720	$91,520
Planter boxes	4,515	n/a	16	n/a	n/a	21 (2'x6' box)	$33,600
Site Totals	**41,815**	**1.052**	**178**	**75,250**	**2.83**	**8,295**	**$252,055**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site L-04: DR. MARTIN LUTHER KING JR. PUBLIC SCHOOL



Dr. Martin Luther King Jr. Public School

- bioretention system
- pervious pavement
- planter box
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 60' 120'

Site L-05: FULL SERVICE COMMUNITY CENTER

Sewershed	C-12
Site Area	20,666 sq. ft.
Address	512 Market Street Paterson, NJ 07501
Block and Lot	Block 6407, Lot 7
Soil Type	HSG N/A

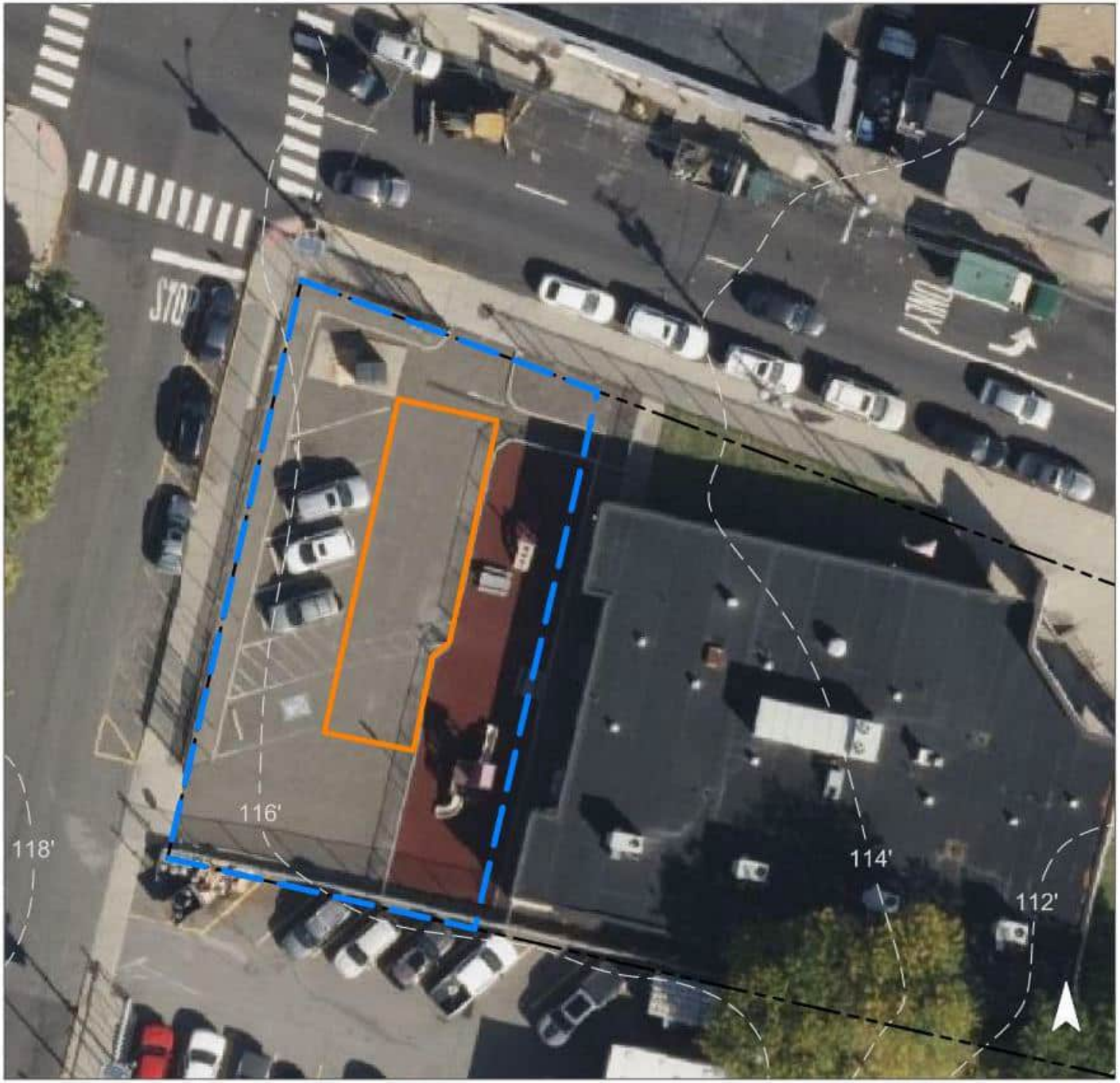
The driving aisle on the western side of the site can be repaved with pervious pavement to capture and infiltrate water from the rest of the parking lot and play area. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

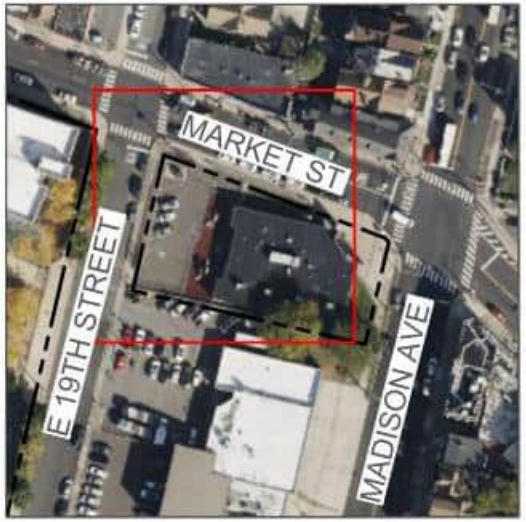
Impervious Cover		Existing Loads from Impervious Cover (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
					For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
%	sq. ft.	TP	TN	TSS				
90	18,502	0.9	9.3	84.9	0.014 Mgal	1,927 CF	0.55 Mgal	73,390 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 pavement	5,955	0.260	40	18,580	0.70	1,285	$20,560
Site Totals	**5,955**	**0.260**	**40**	**18,580**	**0.70**	**1,285**	**$28,210**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site L-05: FULL SERVICE COMMUNITY CENTER





Full Service Community Center

- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

Note: Parking Lot slope is to be modified.

0 15' 30'

Site L-06: GBCA PATERSON HEAD START

Sewershed	C-12
Site Area	55,000 sq. ft.
Address	604 E 37th Street, Paterson, New Jersey, 07504
Block and Lot	Block 8807, Lot 1, 2
Soil Type	HSG N/A

To promote stormwater capture and impervious runoff infiltration portions of the parking area surrounding the building can be converted into porous 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 (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
99	54,318	2.6	27.4	249.4	0.042 Mgal	5,658 CF	1.49 Mgal	199,166 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 pavement	33,200	0.865	145	66,980	2.52	8,122	$130,000
Site Totals	**32,200**	**0.865**	**145**	**66,980**	**2.52**	**8,122**	**$176,350**

Site L-06: GBCA PATERSON HEAD START

GBCA Paterson Head Start

- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 30' 60'

Site L-07: MAURICE J. BRICK RESIDENCE

Sewershed	C-12
Site Area	82,298 sq. ft.
Address	70 Dey Street Paterson, NJ 07503
Block and Lot	Block 6903, Lot 1
Soil Type	HSG N/A

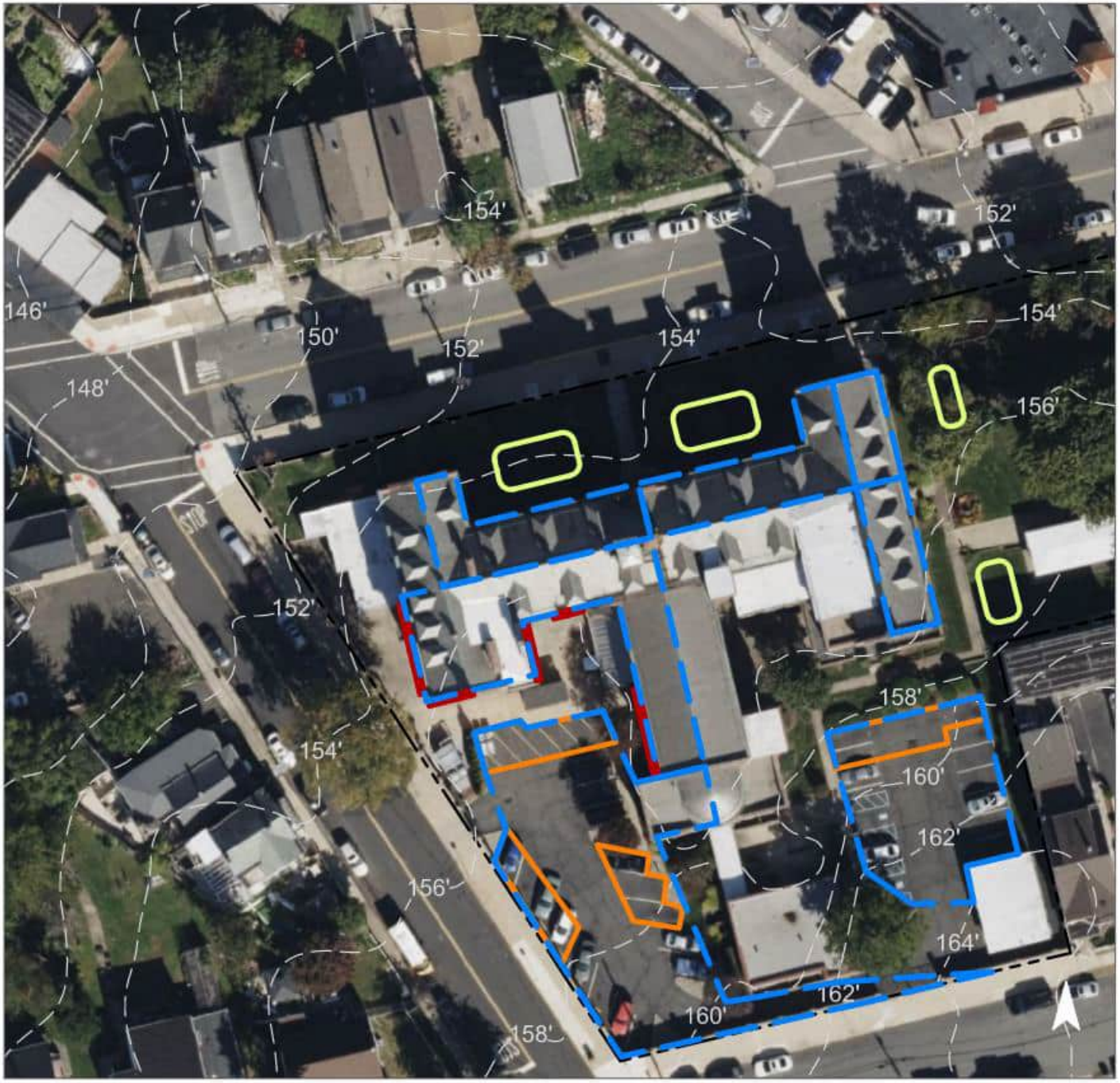
Four bioretention systems can be installed, along the northern and eastern portions of the site, to capture, treat and infiltrate water from the roof of the building. A portion of the parking lots can be repaved with pervious parking to capture and infiltrate water from the rest of the parking lot on the southern sides of the site. Planter boxes can be installed along the southwestern side of the building to treat runoff generated from the rooftop. 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 (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
64	52,280	2.5	26.4	240.0	0.041 Mgal	5,446 CF	1.55 Mgal	207,377 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	6,145	0.173	27	12,390	0.47	1,560	$39,000
Pervious pavement	12,995	0.366	57	26,220	0.99	2,690	$43,040
Planter boxes	4,335	n/a	16	n/a	n/a	21 (2'x6' box)	$33,600
Site Totals	**23,475**	**0.539**	**100**	**38,610**	**1.46**	**4,500**	**$158,660**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site L-07: MAURICE J. BRICK RESIDENCE



Maurice J. Brick Residence

- bioretention system
- pervious pavement
- planter box
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 30' 60'

Site L-08: PATERSON PUBLIC SCHOOL NO. 15

Sewershed	C-12
Site Area	243,778 sq. ft.
Address	98 Oak Street Paterson, NJ 07501
Block and Lot	Block 6307, Lot 46
Soil Type	HSG N/A

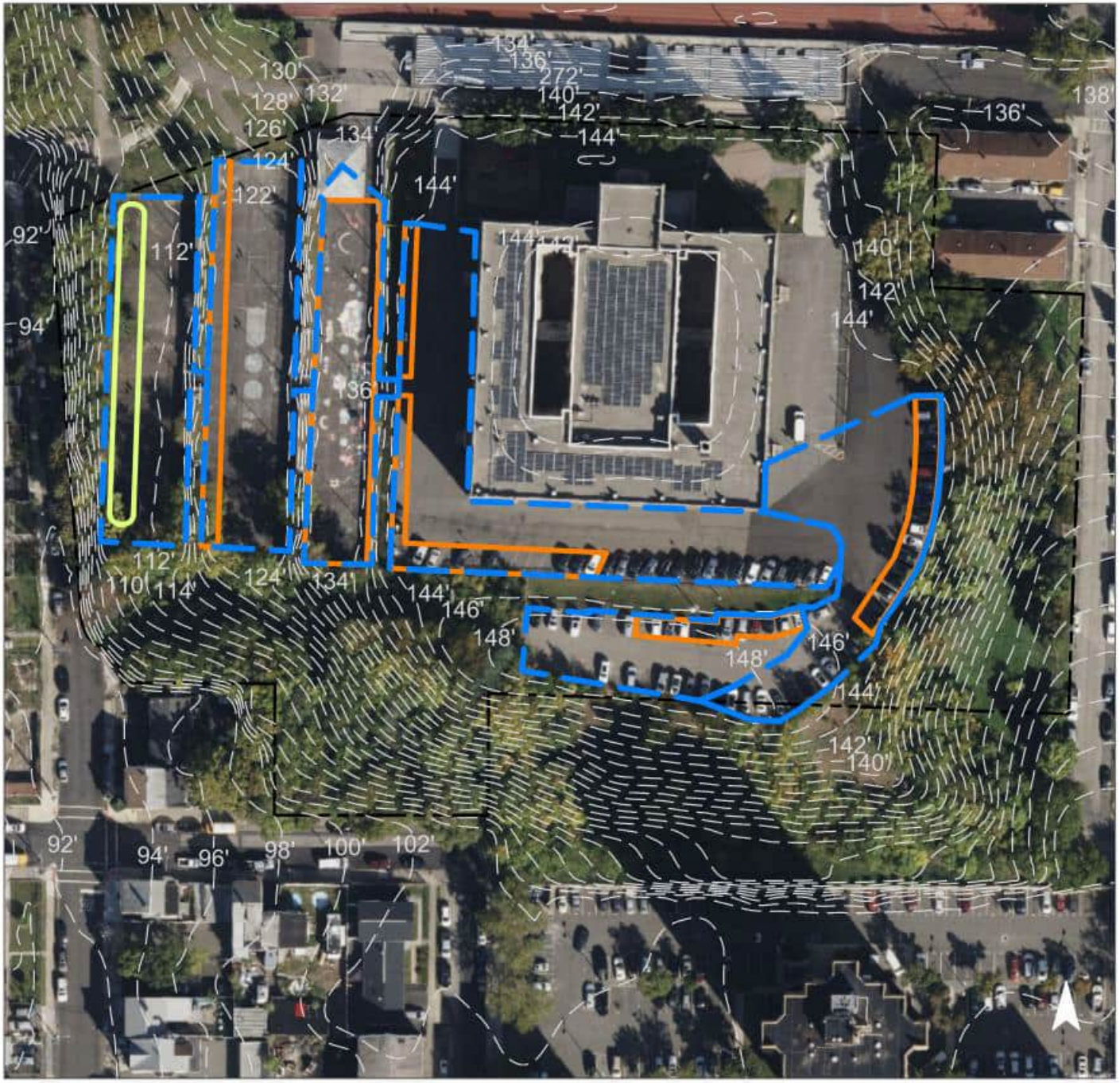
The southern portions of the parking area can be converted to pervious pavement to capture and infiltrate water from the rest of the parking lot. The western impervious open space lot can be retrofitted to intercept water from the driveway areas to infiltrate stormwater runoff. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for green infrastructure

Impervious Cover		Existing Loads from Impervious Cover (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
63	153,725	7.4	77.6	705.8	0.120 Mgal	16,013 CF	4.56 Mgal	609,776 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	12,830	0.362	55	25,880	0.97	3,260	$81,500
Pervious pavement	69,540	1.960	304	140,290	5.27	20,010	$320,160
Site Totals	**82,370**	**2.322**	**359**	**166,170**	**6.24**	**23,270**	**$551,640**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site L-08: PATERSON PUBLIC SCHOOL NO. 15



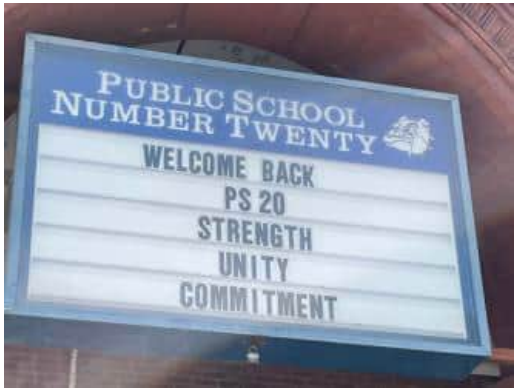
Paterson Public School No. 15

- bioretention system
- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 30' 60'

Site L-09: PATERSON PUBLIC SCHOOL 20

Sewershed	C-12
Site Area	46,613 sq. ft.
Address	492 E 37th Street, Paterson, New Jersey, 07504
Block and Lot	Block 7901, Lot 12, 13, 17, 26
Soil Type	HSG N/A



The current pavement at the entrance of the parking lot seems to be damaged and can be converted to porous pavement to capture and infiltrate stormwater runoff from the parking lot. Downspout planters can be placed along the northern entrance school wall to capture runoff from the rooftop. 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 (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
59	27,469	1.3	13.9	126.1	0.021 Mgal	2,861 CF	0.75 Mgal	100,720 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 pavement	10,530	0.274	46	21,240	0.80	1,885	$30,160
Downspout Planter	2,866	n/a	11	n/a	n/a	12 (2'x6' box)	$19,200
Site Totals	**13,396**	**0.274**	**57**	**21,240**	**0.80**	**2,029**	**$67,760**

Site L-09: PATERSON PUBLIC SCHOOL 20

Paterson Public School No. 20

- pervious pavement
- planter box
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 30' 60'

Site L-10: PATERSON PUBLIC SCHOOL NO. 24

Sewershed	C-12
Site Area	105,877 sq. ft.
Address	50 19th Avenue, Paterson, NJ 07513
Block and Lot	Block 9008, Lot 1
Soil Type	HSG N/A

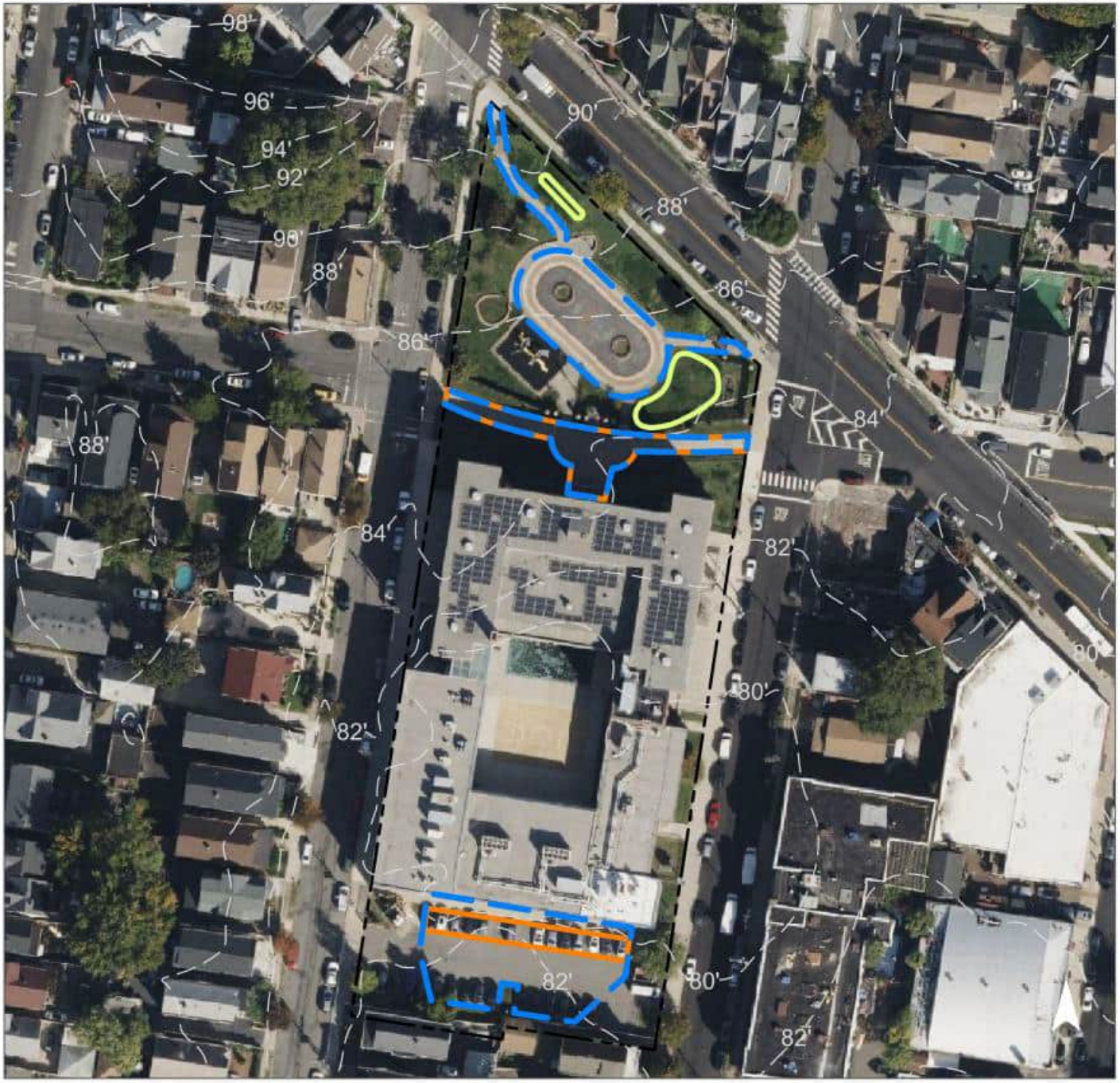
Two bioretention systems can be built on the north side of the site to capture and treat runoff from the impervious walkways and park center. A portion of the southern parking lot and the northern walkway can be converted to pervious pavement to capture and treat stormwater runoff from surrounding impervious surfaces. 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 (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
88	93,421	4.5	47.2	428.9	0.073 Mgal	9,731 CF	2.77 Mgal	370,570 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	6,815	0.192	30	13,750	0.52	1,720	$43,000
Pervious pavement	11,660	0.329	51	23,520	0.88	5,230	$83,680
Site Totals	**18,475**	**0.521**	**81**	**37,270**	**1.40**	**6,950**	**$174,380**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site L-10: PATERSON PUBLIC SCHOOL NO. 24



Paterson Public School No. 24

- bioretention system
- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 50' 100'

Site L-11: VREELAND PARK

Sewershed	C-12
Site Area	13774 sq. ft.
Address	670-678 20th Avenue, Paterson, New Jersey, 07504
Block and Lot	Block 7902, Lot 1
Soil Type	HSG N/A

The park is largely pervious, so runoff from the perimeter sidewalks and roadways can be captured and treated using a rain garden located at the north edge of the park. 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 (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
3	441	0.0	0.2	2.0	0.0 Mgal	46 CF	0.1 Mgal	1,617 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 System	3,925	0.102	17	7,920	0.30	980	$24,500
Site Totals	**3,925**	**0.102**	**17**	**7,920**	**0.30**	**980**	**$33,640**

Site L-11: VREELAND PARK

Vreeland and 20th Triangle

- bioretention system
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 15' 30'

Sewershed C-15

Site M-01: HERITAGE AT ALEXANDER HAMILTON GRANDPARENTS RELATIVE CARE

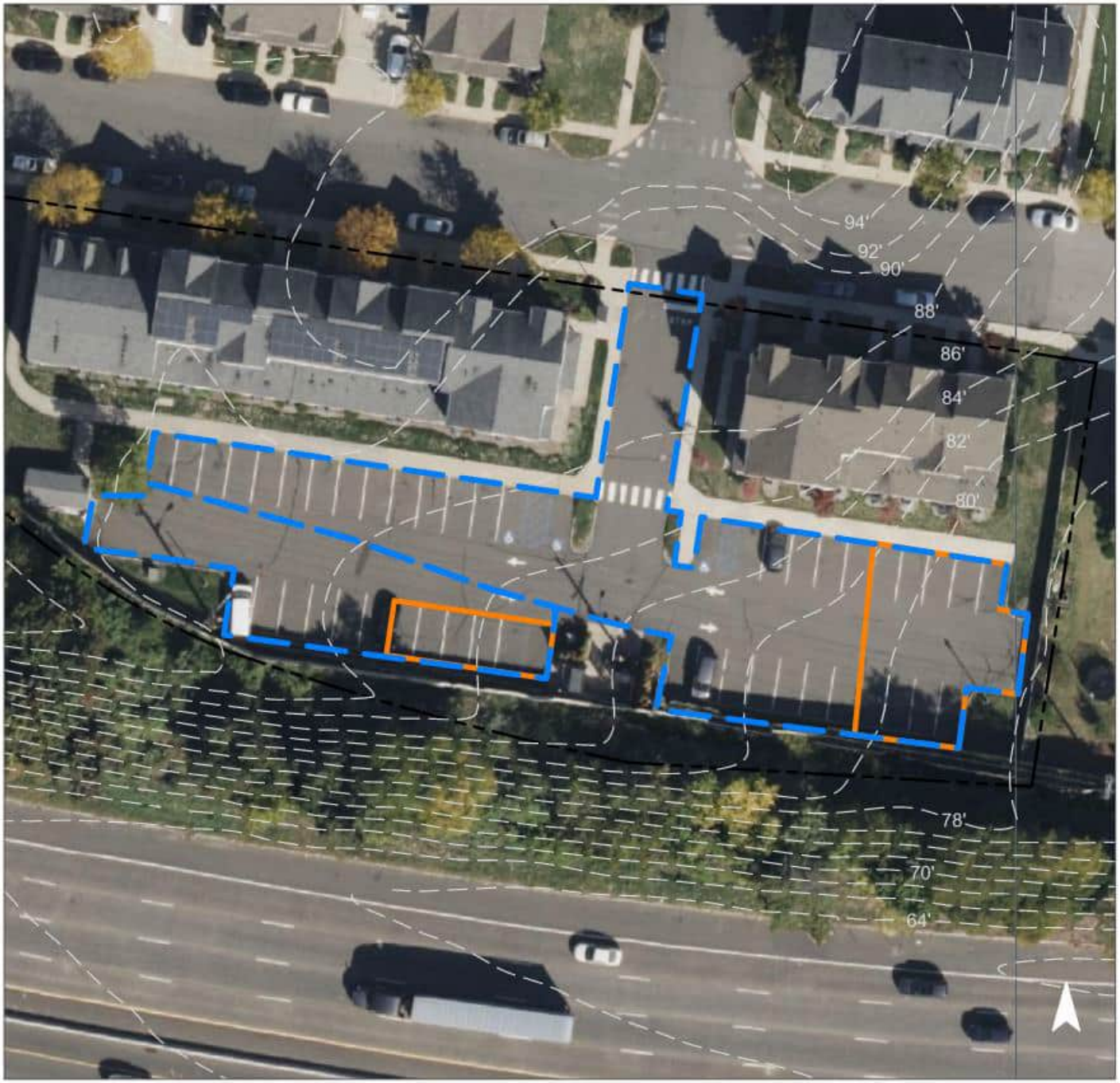
Sewershed	C-15
Site Area	45,764 sq. ft.
Address	238-260 23rd Avenue, Paterson, New Jersey, 07504
Block and Lot	Block 7505.04, Lot 10, 11
Soil Type	HSG N/A

A portion of the pavement at the lowest elevation of the parking lot can be converted into porous pavement to capture and infiltrate stormwater runoff from parking spaces with a higher elevation. 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 (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
89	40,724	2.0	20.6	187.0	0.032 Mgal	4,242 CF	1.12 Mgal	149,321 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 pavement	17,390	0.453	76	35,080	1.32	3,735	$59,760
Site Totals	**17,390**	**0.453**	**76**	**35,080**	**1.32**	**3,735**	**$82,010**

Site M-01: HERITAGE AT ALEXANDER HAMILTON GRANDPARENTS RELATIVE CARE



Heritage at Alexander Hamilton Grandparents Relative Care

- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 25' 50'

Site M-02: KINGDOM HALL OF JEHOVAH'S WITNESSES

Sewershed	C-15
Site Area	27,499 sq. ft.
Address	209 Trenton Avenue Paterson, NJ 07503
Block and Lot	Block 7601, Lot 1, 2, 3
Soil Type	HSG N/A

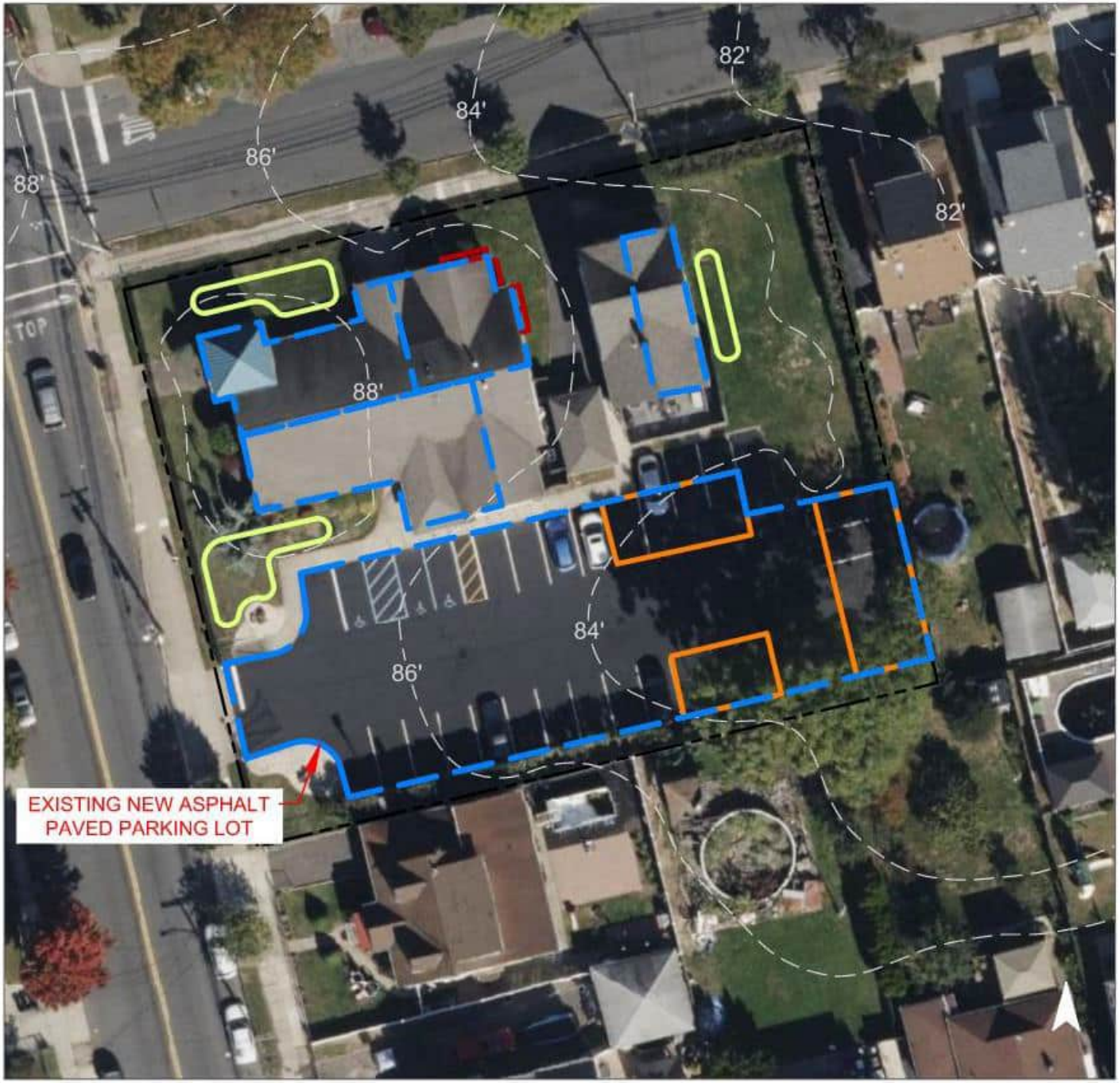
Three bioretention systems can be installed on the north, south, and eastern sides of the building to capture, treat and infiltrate water from the rooftop. Planter boxes can be placed along the northeastern side of the building to collect and treat stormwater runoff generated by the rooftop, directed by roof leaders. The eastern portion of the paved asphalt parking area can be converted to pervious pavement to promote runoff capture and infiltration. 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 (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
70	19,345	0.9	9.8	88.8	0.015 Mgal	2,015 CF	0.57 Mgal	76,734 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	3,475	0.098	15	7,010	0.26	880	$20,000
Pervious Pavement	9,515	0.268	42	19,190	0.72	1,785	$28,560
Planter boxes	880	n/a	3	n/a	n/a	5 (2'x6' box)	$8,000
Site Totals	**13,870**	**0.366**	**60**	**26,200**	**0.98**	**2,725**	**$80,390**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site M-02: KINGDOM HALL OF JEHOVAH'S WITNESSES



Kingdom Hall of Jehovah's Witnesses

- bioretention system
- pervious pavement
- planter box
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 20' 40'

Site M-03: PATERSON ART & SCIENCE CHARTER SCHOOL

Sewershed	C-15
Site Area	42,500 sq. ft.
Address	30 Michigan Avenue Paterson, NJ 07503
Block and Lot	Block 7012, Lot 1, 2, 3, 4, 26
Soil Type	HSG N/A

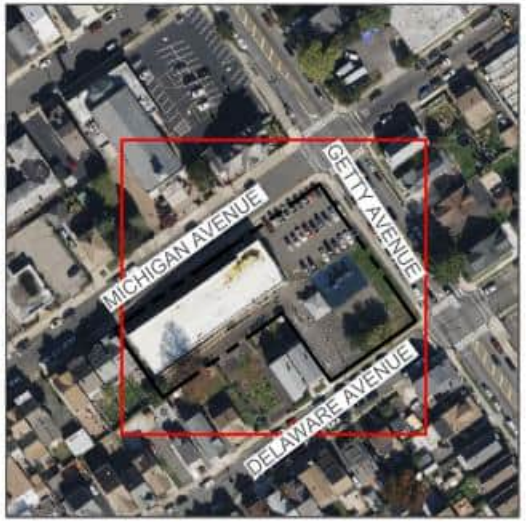
A bioretention system can be built on the eastern side of the site to capture, treat and infiltrate water from the impervious open space area. The eastern parking stalls of the parking lot can be repaved with pervious pavement to capture and infiltrate water from the parking area. A preliminary soil 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 (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
92	38,934	1.9	19.7	178.8	0.030 Mgal	4,056 CF	1.16 Mgal	154,438 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	6,945	0.196	30	14,010	0.53	1,740	$39,975
Pervious pavement	8,945	0.252	40	18,050	0.68	1,620	$23,520
Site Totals	**15,890**	**0.448**	**70**	**32,060**	**1.21**	**3,360**	**$93,775**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site M-03: PATERSON ART & SCIENCE CHARTER SCHOOL



Paterson Art & Science Charter School

- bioretention system
- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 25' 50'

Site M-04: PATERSON PUBLIC SCHOOL NO. 25

Sewershed	C-15
Site Area	213,500 sq. ft.
Address	287 Trenton Avenue, Paterson, NJ 07503
Block and Lot	Block 7607, Lot 1
Soil Type	HSG N/A

Four bioretention systems can be built on this site, with three built on the southern side of the site to capture, treat and infiltrate the water from the roof and playground, one rain garden on the northwestern portion of the site to collect driveway runoff by diverting stormwater with curb cuts and a trench drain. The northeastern open space impervious area can be converted to pervious pavement to infiltrate runoff from the rooftop and existing impervious area. Planter boxes can be placed along the northern portion of the building to collect and treat rooftop 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 (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
54	114,490	5.5	57.8	525.7	0.089 Mgal	11,926 CF	3.40 Mgal	454,144 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	32,370	0.912	141	65,310	2.45	8,145	$203,625
Pervious pavement	17,960	0.506	78	36,230	1.36	3,290	$52,640
Planter boxes	5,160	n/a	19	n/a	n/a	5 (2'x6' box)	$38,400
Site Totals	**55,490**	**1.418**	**238**	**101,540**	**3.81**	**11,723**	**$404,885**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site M-04: PATERSON PUBLIC SCHOOL NO. 25

Paterson Public School No. 25

- bioretention system
- pervious pavement
- planter box
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 50' 100'

Site M-05: ST. GEORGE SYRO MALABAR CATHOLIC CHURCH

Sewershed	C-15
Site Area	44,999 sq. ft.
Address	408 Getty Avenue Paterson, NJ 07503
Block and Lot	Block 7013, Lot 1-3, 11
Soil Type	HSG N/A

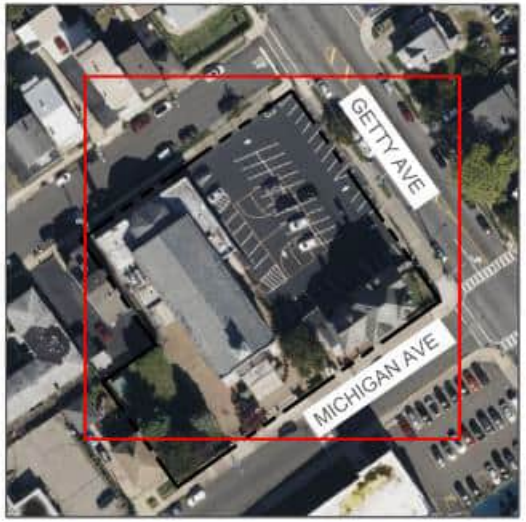
A bioretention system can be built on the south-eastern corner of the site to capture, treat and infiltrate water from the roof. Planter boxes can be installed along the southeastern and southwestern sides of each respective building to treat and manage rooftop runoff. Additionally, two large portions of the parking lot can be repaved with pervious pavement to capture and infiltrate water from the parking lot and roof of the main building. 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 (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
82	36,859	1.8	18.6	169.2	0.029 Mgal	3,839 CF	1.09 Mgal	146,207 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	405	0.011	2	820	0.03	100	$2,500
Pervious pavement	23,830	0.672	105	48,070	1.81	4,240	$67,840
Planter boxes	2,665	n/a	10	n/a	n/a	14 (2'x6' box)	$22,400
Site Totals	**26,900**	**0.683**	**117**	**48,890**	**1.84**	**4,510**	**$126,090**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site M-05: ST. GEORGE SYRO MALABAR CATHOLIC CHURCH



St. George Syro Malabar Catholic Church

- bioretention system
- pervious pavement
- planter box
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 20' 40'

Site M-06: UNITED ISLAMIC CENTER

Sewershed	C-15
Site Area	47,500 sq. ft.
Address	408 Knickerbocker Ave Paterson, NJ 07503
Block and Lot	Block 7706, Lot 1, 2, 13,14, 15, 16, 20, 21
Soil Type	HSG N/A

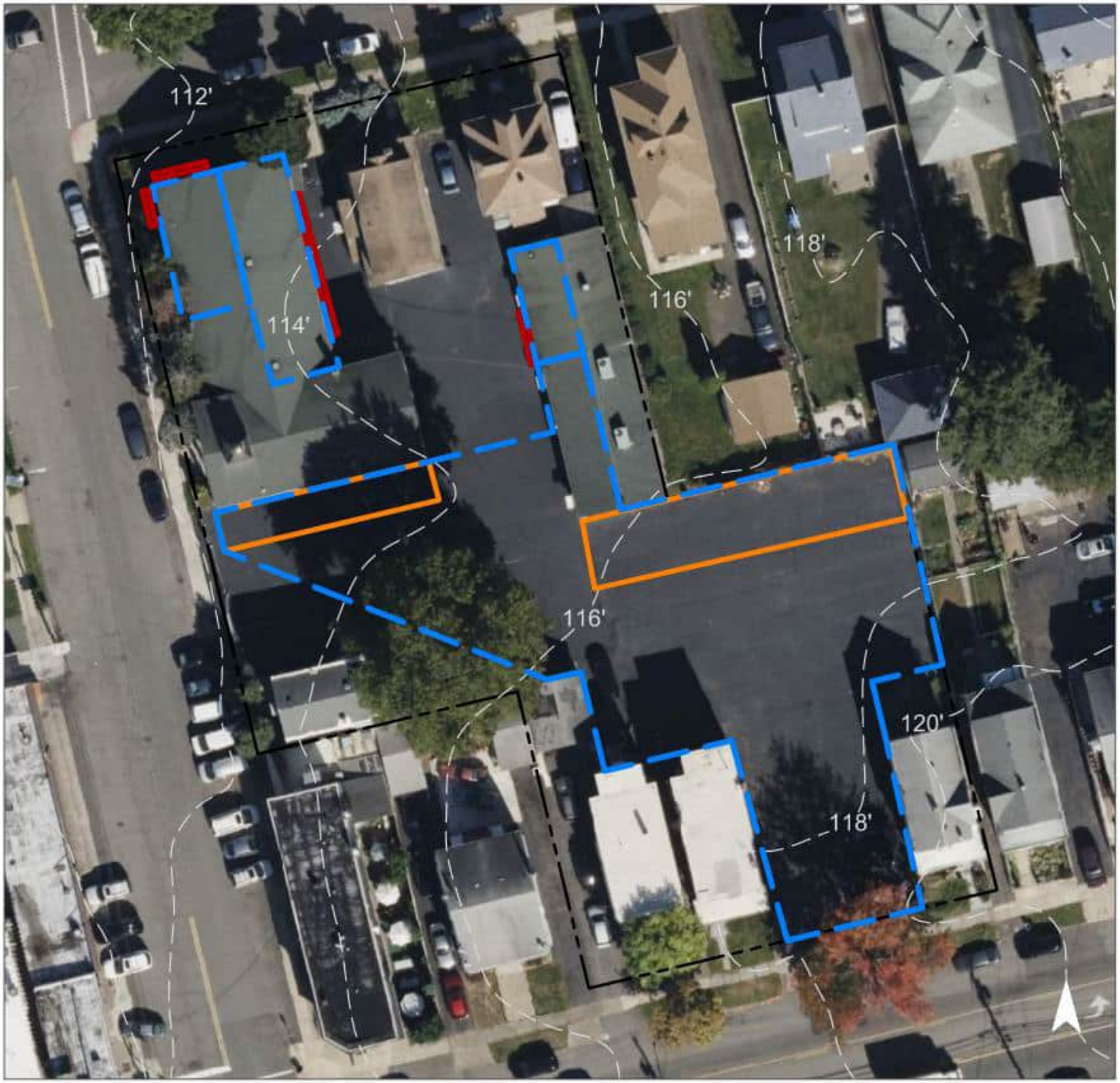
A portion of the parking lot can be retrofitted with pervious pavement to capture and infiltrate water from the rest of the parking lot. Planter boxes can be installed to divert and filter water from the downspouts. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
81	38,258	1.8	19.3	175.7	0.030 Mgal	3,985 CF	1.14 Mgal	151,757 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 pavement	18,825	0.531	82	37,980	1.43	3,390	$54,240
Planter boxes	3,230	n/a	11	n/a	n/a	14 (2'x6' box)	$22,400
Site Totals	**22,055**	**0.531**	**93**	**37,980**	**1.43**	**3,580**	**$105,130**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site M-06: UNITED ISLAMIC CENTER



United Islamic Center

- pervious pavement
- planter box
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 20' 40'

Sewershed PF-01

Site N-01: BROOKS SLOATE TERRACE

Sewershed	PF-01
Site Area	1,184,316 sq. ft.
Address	311 Redwood Ave Paterson, NJ 07522
Block and Lot	Block 1101, Lot 1
Soil Type	HSG N/A

Various sections of impervious parking areas can be converted into pervious pavement to capture and infiltrate stormwater runoff throughout the site. 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 (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
44	523,881	25.3	264.6	2,405.3	0.408 Mgal	54,571 CF	15.54 Mgal	2,078,061 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 pavement	55,355	1.560	241	111,680	4.20	14,890	$238,240
Site Totals	**55,355**	**1.560**	**241**	**111,680**	**4.20**	**14,890**	**$322,700**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site N-01: BROOKS SLOATE TERRACE

Brooks Sloate Terrace

- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 75' 150'

Site N-01: BROOKS SLOATE TERRACE

Brooks Sloate Terrace

- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 20' 40'

Site N-02: GRACE BUCKLEY PARK

Sewershed	PF-01
Site Area	287,414 sq. ft.
Address	385 Chamberlain Ave Paterson, NJ 07522
Block and Lot	Block 1004, Lot 42
Soil Type	HSG N/A

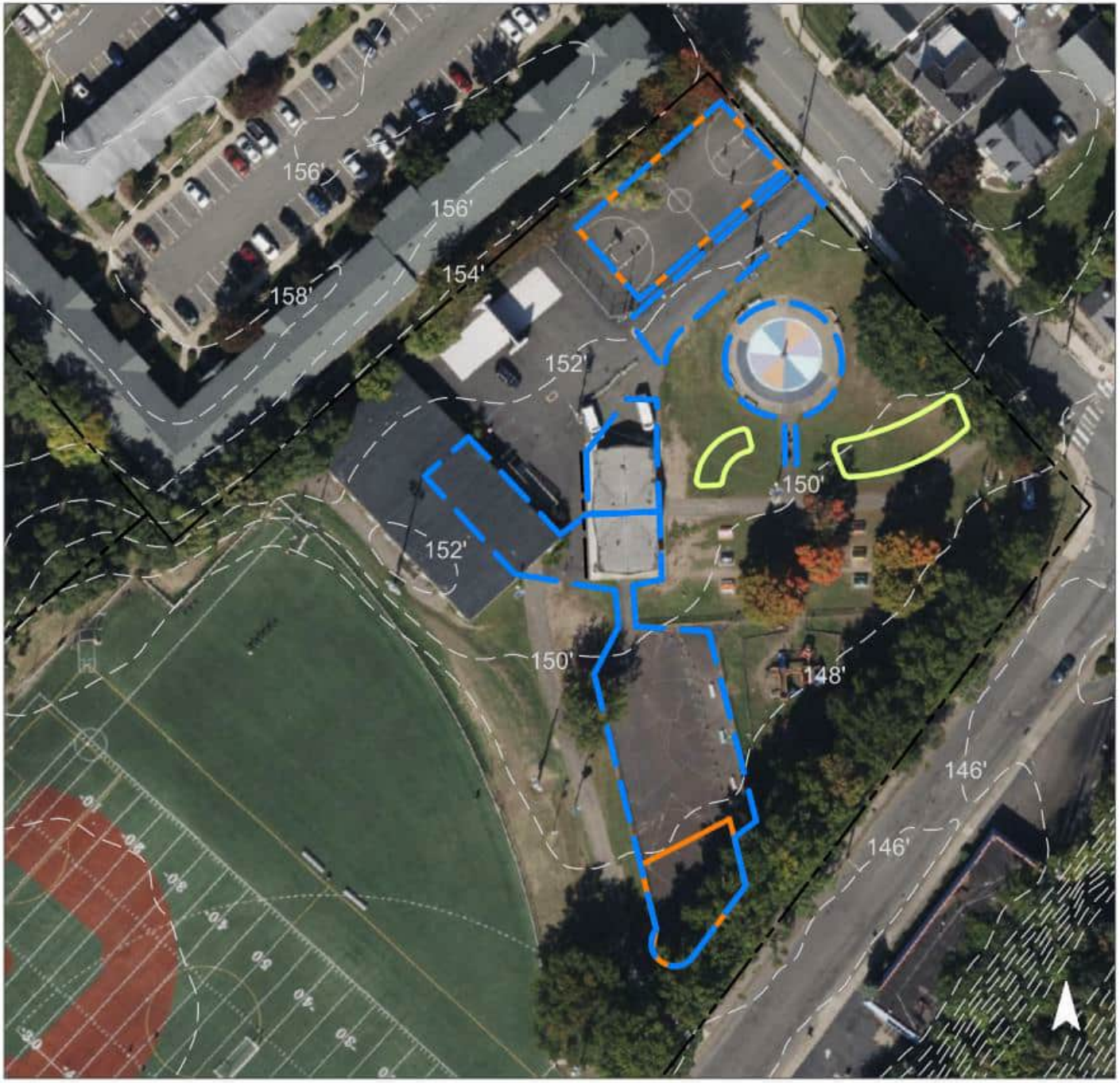
Rain gardens can be installed in the grass areas to the south of the basketball court to capture, treat, and infiltrate stormwater runoff from the pavement and building rooftop. The southern segment of the parking lot closest to Chamberlain Ave and the basketball court area can be converted to pervious pavement to help manage 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 (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
28	81,665	3.9	41.2	375.0	0.064 Mgal	8,507 CF	2.42 Mgal	323,939 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	7,542	0.213	32	15,210	0.57	1,917	$48,000
Pervious pavement	18,890	0.532	82	38,110	1.43	7,260	$116,160
Site Totals	**26,432**	**0.745**	**114**	**53,320**	**2.00**	**9,177**	**$225,850**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site N-02: GRACE BUCKLEY PARK



Grace Buckley Park

- bioretention system
- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 40' 80'

Site N-03: JOHN F KENNEDY HIGH SCHOOL

Sewershed	PF-01
Site Area	427,503 sq. ft.
Address	61-127 Preakness Avenue Paterson, NJ 07522
Block and Lot	Block 1401, Lot 2
Soil Type	HSG D

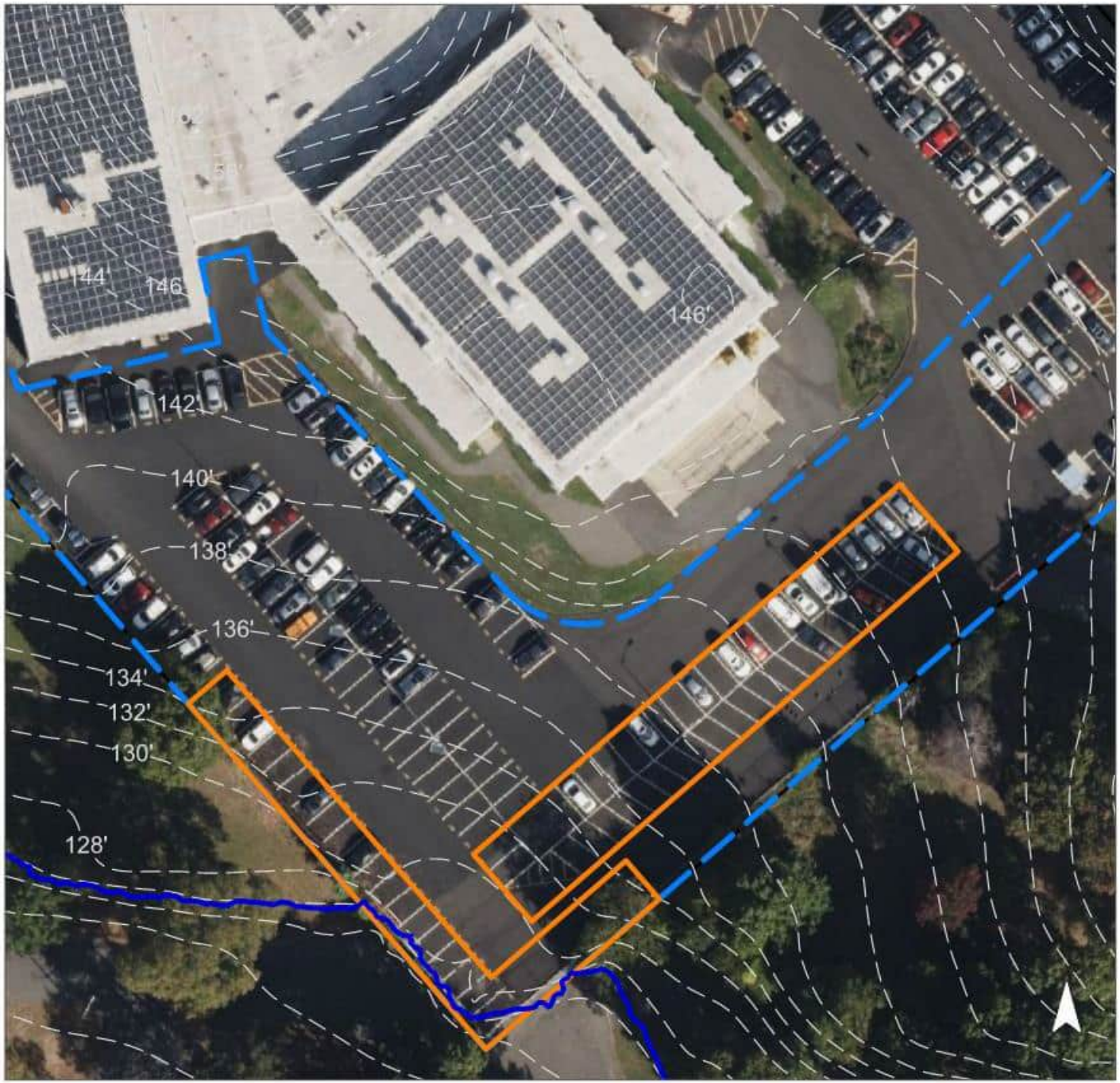
Parking spaces at the back corner of the parking lot where the elevation is the lowest can be converted to porous pavement to capture and infiltrate stormwater runoff from the parking lot. Rain gardens at the northwest end of the site can also be installed to capture and infiltrate runoff from the trailers and driveway. 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 (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
83	356,950	17.2	180.3	1,638.9	0.278 Mgal	37,182 CF	9.79 Mgal	1,308,817 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	34,175	0.890	148	68,940	2.59	8,740	$ 218,500
Pervious pavement	69,090	1.800	302	139,390	5.24	12,760	$ 204,160
Site Totals	**103,265**	**2.690**	**450**	**208,330**	**7.83**	**21,500**	**$ 580,530**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site N-03: JOHN F KENNEDY HIGH SCHOOL



John F Kennedy High School

- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS
- 100-yr Floodplain

0 30' 60'

Site N-03: JOHN F KENNEDY HIGH SCHOOL

John F Kennedy High School

- bioretention system
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS
- 100-yr Floodplain

0 30' 60'

Site N-04: PATERSON PUBLIC SCHOOL NO. 27

Sewershed	C-01
Site Area	130,000 sq. ft.
Address	228 Richmond Avenue Paterson, NJ 07502
Block and Lot	Block 1708, Lot 1,2,9
Soil Type	HSG N/A

For efficient management of stormwater runoff from the roof, installing a rain garden directly west of the school building near where the downspouts are will serve the purpose of capturing, treating, and infiltrating the water. In addition, pervious pavement can be installed at the southeast end of the site to manage stormwater runoff from the paved recreational area. 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 (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
					For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
%	sq. ft.	TP	TN	TSS				
97	125,578	6.1	63.4	576.6	0.098 Mgal	13,081 CF	3.44 Mgal	460,453 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	1,200	0.031	6	2,420	0.09	300	$ 7,500
Pervious pavement	23,875	0.622	105	48,160	1.81	4,265	$ 68,240
Site Totals	**25,075**	**0.653**	**110**	**50,580**	**1.90**	**4,565**	**$ 103,920**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site N-04: PATERSON PUBLIC SCHOOL NO. 27

Paterson Public School No. 27

- bioretention system
- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS
- 100-yr Floodplain

0 40' 80'

Site N-05: PATERSON PUBLIC SCHOOL NO. 19

Sewershed	C-01
Site Area	30,738 sq. ft.
Address	31 James Street Paterson, NJ 07502
Block and Lot	Block 901, Lot 11
Soil Type	HSG D

To infiltrate and capture stormwater from the roof and paved area, a rain garden can be installed south of the church. Planter boxes can also be installed to treat runoff from the roof. 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 (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
100	30,737	1.5	15.5	141.1	0.024 Mgal	3,202 CF	0.84 Mgal	112,702 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	3,900	0.102	17	7,870	0.30	975	$ 24,375
Planter Box	3,110	n/a	11	n/a	n/a	18 (boxes)	$ 28,800
Site Totals	**7,010**	**0.102**	**28**	**7,870**	**0.30**	**1,190**	**$ 73,015**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site N-05: PATERSON PUBLIC SCHOOL NO. 19

Paterson Public School No. 19

- pervious pavement
- bioretention system
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 15' 30'

Site N-06: ST GERARD MAJELLA ROMAN CATHOLIC CHURCH

Sewershed	PF-01
Site Area	97,581 sq. ft.
Address	501 W Broadway Paterson, NJ 07522
Block and Lot	Block 1005, Lot 3
Soil Type	HSG N/A

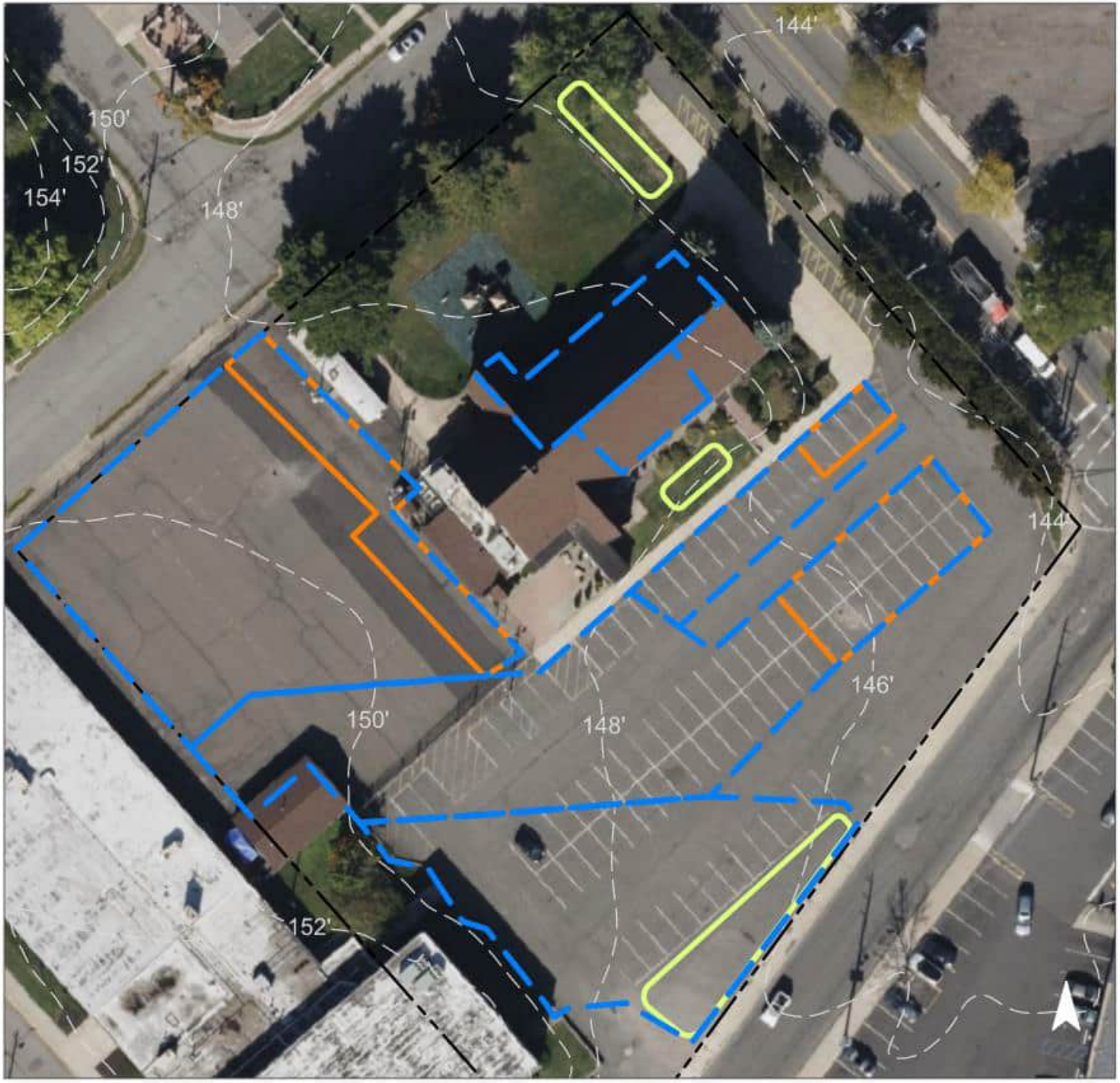
Rain gardens can be installed in the grass area near the southeastern side entrance of the church and the northern front entrance along West Broadway, as well as the southern portion of the parking area to encourage depaving and capture, treat, and infiltrate stormwater runoff from the roof. Parking stalls and portions of the pavement at low elevations points can be converted to pervious pavement to promote runoff treatment and infiltration. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

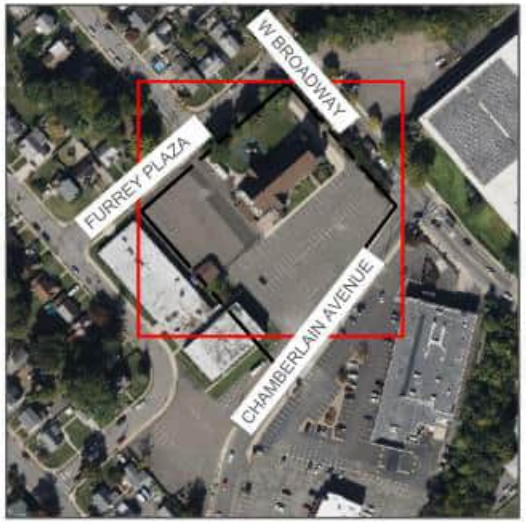
Impervious Cover		Existing Loads from Impervious Cover (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
85	82,639	4.0	41.7	379.4	0.064 Mgal	8,608 CF	2.45 Mgal	327,801 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	11,440	0.322	49	23,080	0.87	2,895	$286,000
Pervious pavement	35,260	0.994	154	71,130	2.67	6,525	$104,400
Site Totals	**46,700**	**1.316**	**203**	**94,210**	**3.54**	**9,420**	**$528,430**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site N-06: ST GERARD MAJELLA ROMAN CATHOLIC CHURCH





Saint Gerard Majella Roman Catholic Church

- bioretention system
- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 25' 50'

Site N-07: WESTSIDE PARK

Sewershed	PF-01
Site Area	1,225,555 sq. ft.
Address	114 Totowa Avenue Paterson, NJ 07502
Block and Lot	Block 1401, Lot 1
Soil Type	HSG D

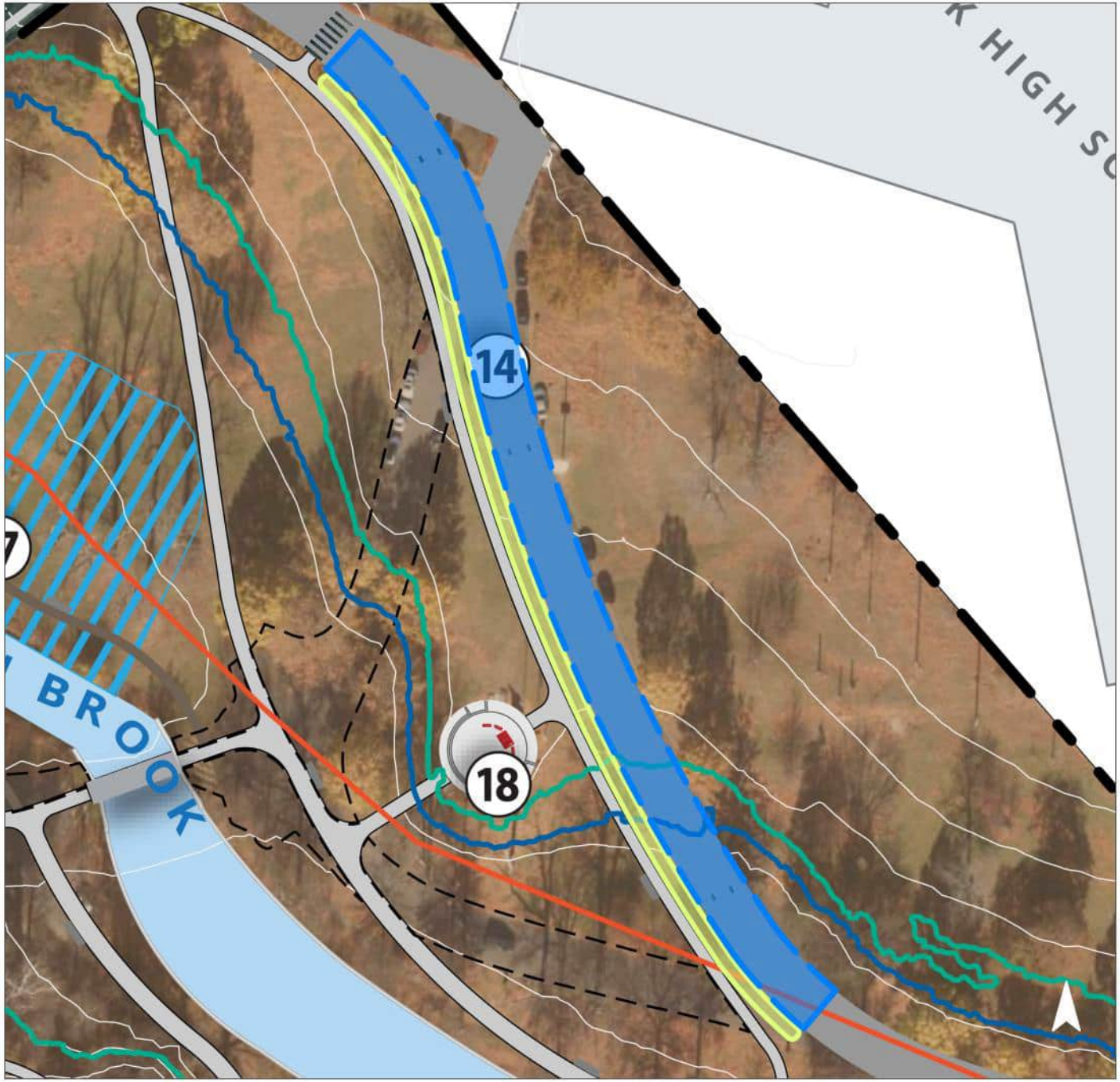
To manage and enhance the treatment of stormwater runoff from the road, 2 bioretention systems can be installed within the grassy area between the road and sidewalk north of Molly Ann Brook. Rain gardens can also be installed adjacent to the tennis courts. Also, converting the basketball court at the southwestern corner of the site and the parking lot at the northeast side of the site to pervious pavement can also help manage and treat 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 (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
24	296,769	14.3	149.9	1,362.6	0.231 Mgal	30,913 CF	8.14 Mgal	1,088,153 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	43,365	1.130	190	87,490	3.29	11,125	$ 278,125
Pervious Pavement	19,80	0.516	86	39,940	1.50	9,580	$ 153,280
Site Totals	**63,165**	**1.646**	**276**	**127,430**	**4.79**	**20,705**	**$ 592,465**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site N-07: WESTSIDE PARK



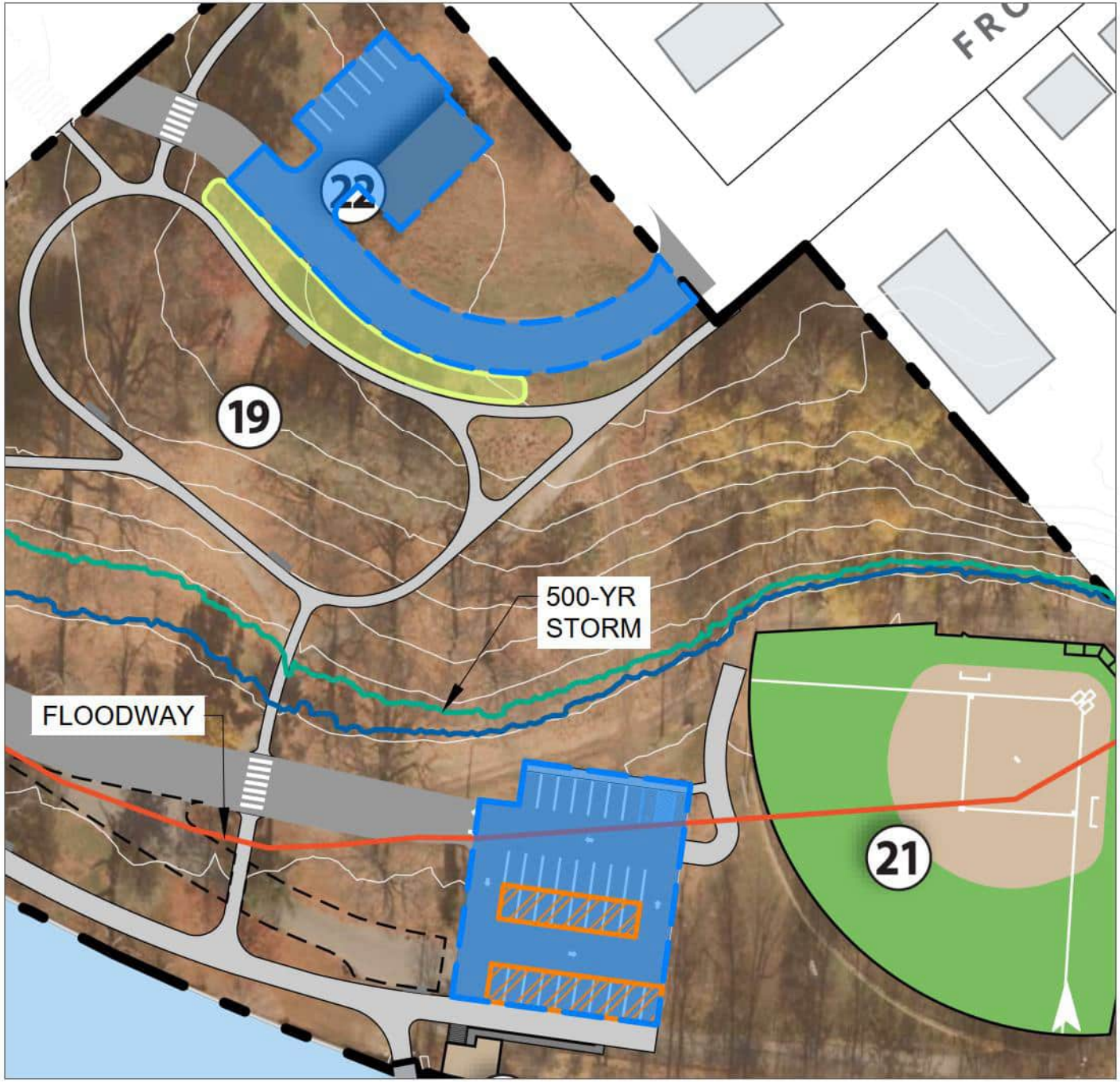
Westside Park

- bioretention system
- captured drainage area
- property line
- 100-yr Floodplain
- 2020 Aerial: NJOIT, OGIS

Background image sourced from "Revitalization of Westside Park in Paterson, New Jersey" concept plan, prepared by NV5.

0 40' 80'

Site N-07: WESTSIDE PARK



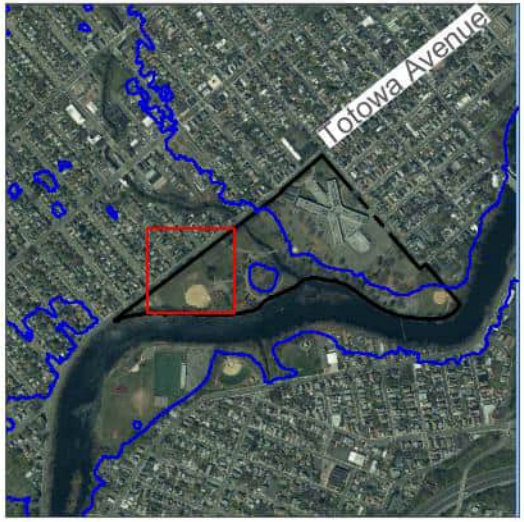
Westside Park

- bioretention system
- pervious pavement
- captured drainage area
- property line
- 100-yr Floodplain
- 2020 Aerial: NJOIT, OGIS

Background image sourced from "Revitalization of Westside Park in Paterson, New Jersey" concept plan, prepared by NV5.

0 40' 80'

Site N-07: WESTSIDE PARK



Westside Park

- bioretention system
- pervious pavement
- captured drainage area
- property line
- 100-yr Floodplain
- 2020 Aerial: NJOIT, OGIS

Background image sourced from "Revitalization of Westside Park in Paterson, New Jersey" concept plan, prepared by NV5.

0 50' 100'

Sewershed
PF-02

Site O-01: IGLESIA NUEVO NACIMIENTO 'NEW BIRTH'

Sewershed	PF-01
Site Area	12,502 sq. ft.
Address	316 Totowa Avenue Paterson, NJ 07502
Block and Lot	Block 1402, Lot 13
Soil Type	HSG D

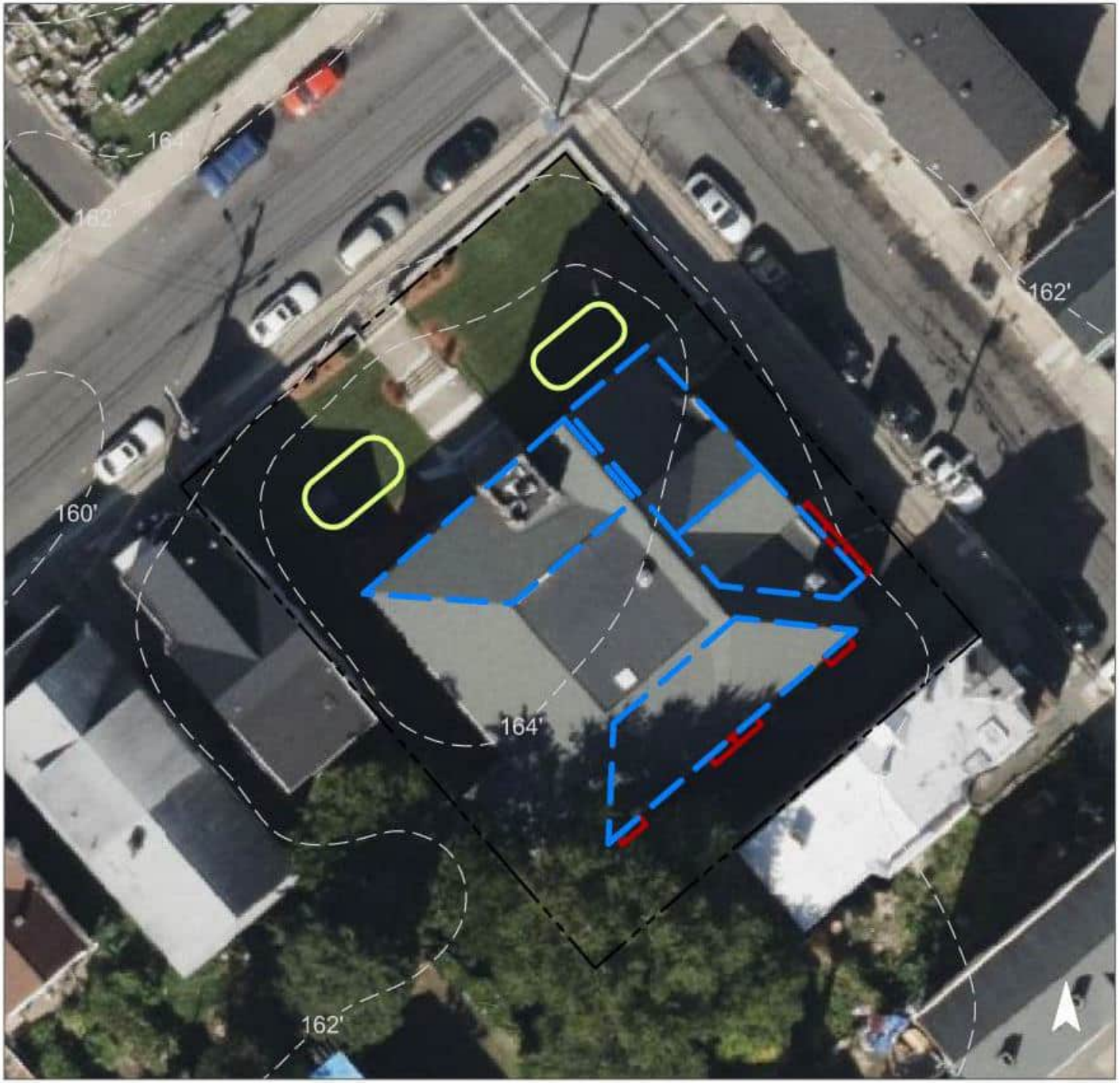
In the grassy areas by the entrance of the church, two rain gardens can be built across from each other. The locations of the rain gardens meet the conditions to capture, treat, and absorb stormwater runoff from the downspouts of the roof. Planter boxes can also be used to treat runoff from the roof. 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 (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
74	9,308	0.4	4.7	42.7	0.007 Mgal	970 CF	0.26 Mgal	34,129 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	1,470	0.038	6	2,960	0.11	370	$ 9,250
Planter box	1,505	n/a	5	n/a	n/a	7 (boxes)	$11,200
Site Totals	**2,975**	**0.038**	**11**	**2,960**	**0.11**	**455**	**$ 28,070**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site O-01: IGLESIA NUEVO NACIMIENTO 'NEW BIRTH'



Iglesia Nuevo Nacimiento 'New Birth'

- bioretention system
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 15' 30'

Sewershed PF-06

Site P-01: PATERSON CITY COUNCIL

Sewershed	PF-07
Site Area	26,818 sq. ft.
Address	151 Market St Paterson, NJ 07505
Block and Lot	Block 4408, Lot 1
Soil Type	HSG N/A

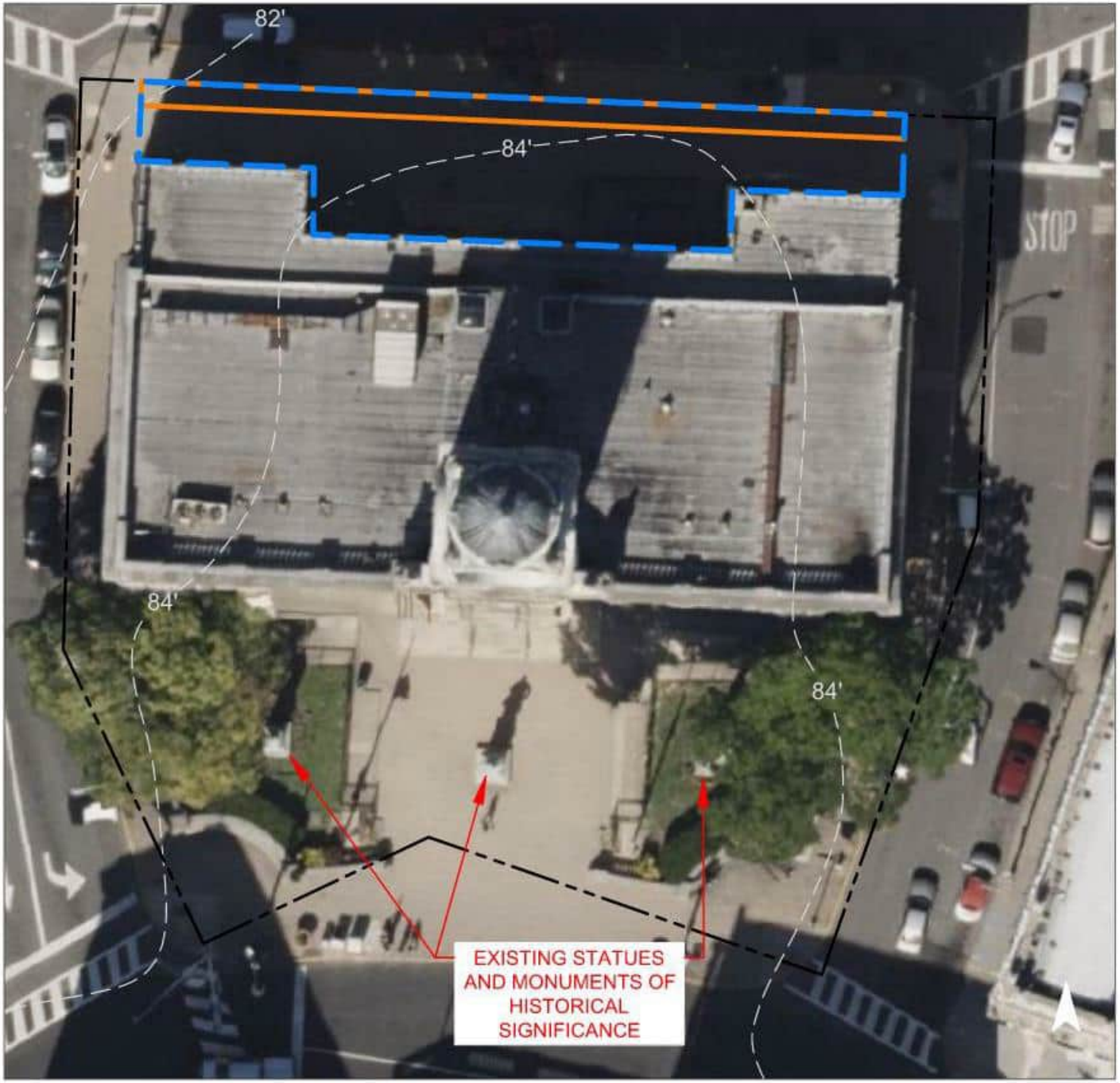
The impervious walkway between City Council and Ellison Street can be converted to pervious pavement to treat and infiltrate stormwater runoff. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

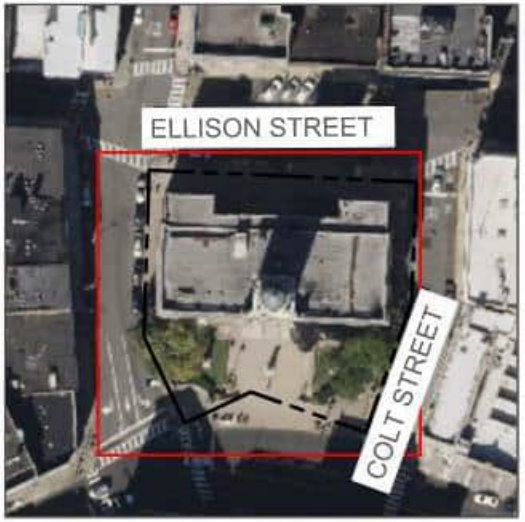
Impervious Cover		Existing Loads from Impervious Cover (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
94	25,143	1.2	12.7	115.4	0.020 Mgal	2,619 CF	0.75 Mgal	99,734 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 Pavement	3,405	0.096	15	6,870	0.26	705	$11,280
Site Totals	**3,405**	**0.096**	**15**	**6,870**	**0.26**	**705**	**$15,470**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site P-01: PATERSON CITY COUNCIL





Paterson City Council

- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 15' 30'

Site P-02: DR. FRANK X. GRAVES, JR. PUBLIC SAFETY COMPLEX

Sewershed	PF-06
Site Area	162,268 sq. ft.
Address	93 Broadway Paterson, NJ 07522
Block and Lot	Block 3709, Lot 2
Soil Type	HSG N/A

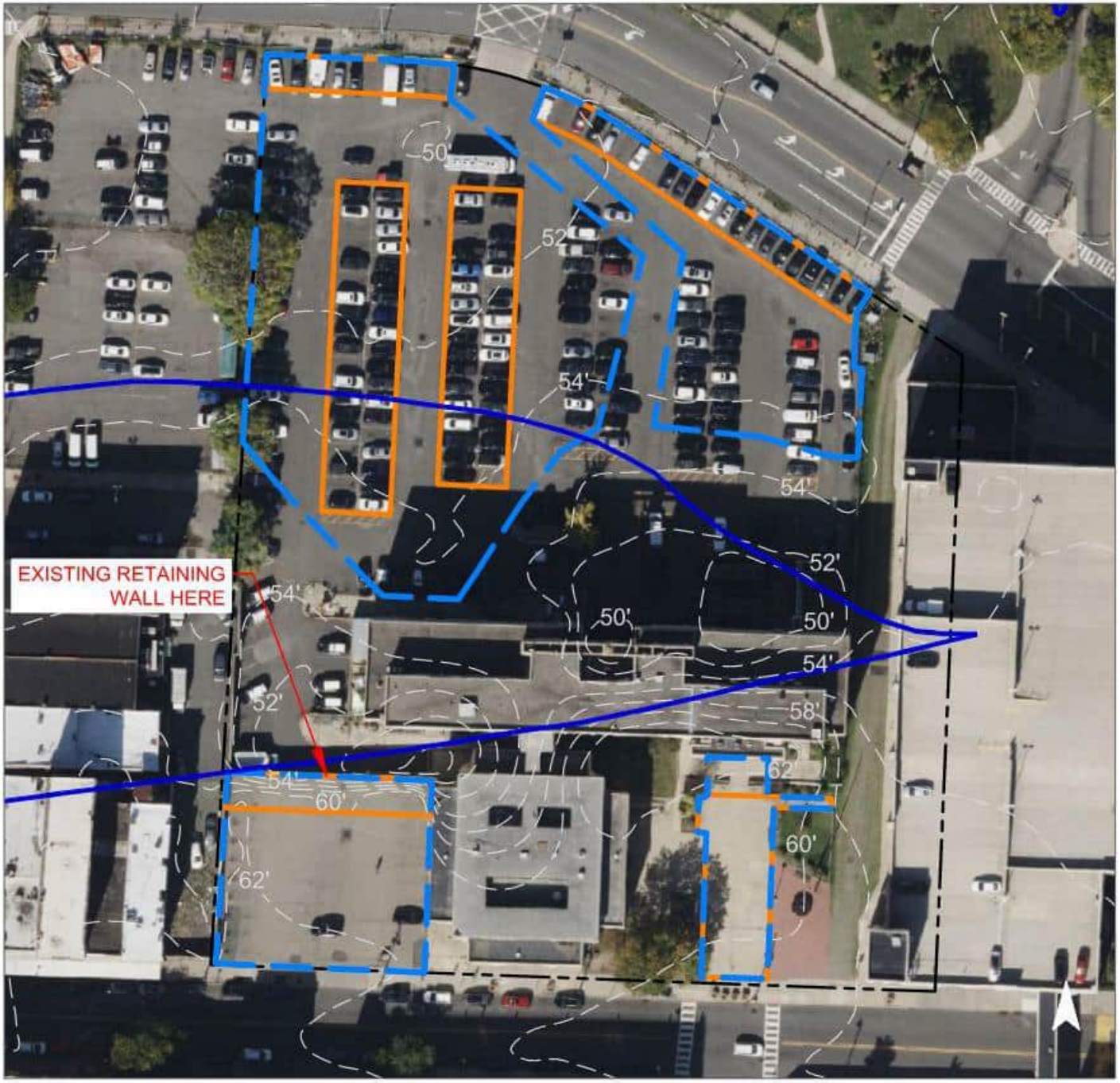
Parking stalls along Memorial Drive, as well as aisles throughout the parking areas, and a portion of concrete walkway near the southern entrance of the building can be converted to porous pavement to manage stormwater runoff. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

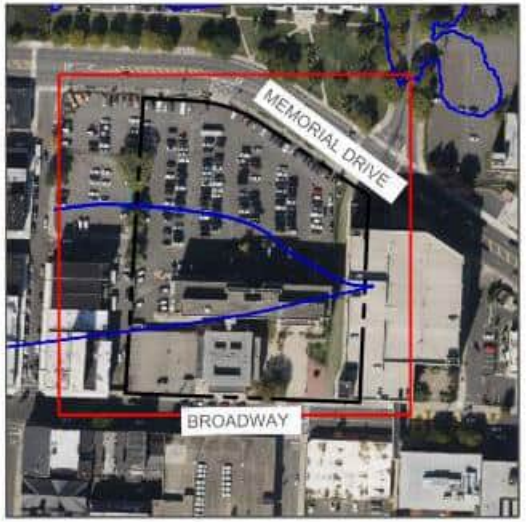
Impervious Cover		Existing Loads from Impervious Cover (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
98	159,791	7.7	80.7	733.7	0.125 Mgal	16,645 CF	4.74 Mgal	633,839 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 pavement	70,875	1.998	310	142,990	5.37	22,800	$364,800
Site Totals	**70,875**	**1.998**	**310**	**142,990**	**5.37**	**22,800**	**$501,110**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site P-02: DR. FRANK X. GRAVES, JR. PUBLIC SAFETY COMPLEX





Dr. Frank X. Graves, Jr. Public Safety Complex

- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS
- 100-yr Floodplain

0 40' 80'

Sewershed PF-07

Site Q-01: CATHEDRAL OF ST. JOHN THE BAPTIST

Sewershed	PF-07
Site Area	54,168 sq. ft.
Address	357 Main St Paterson, NJ 07505
Block and Lot	Block 6217, Lot 1
Soil Type	HSG N/A

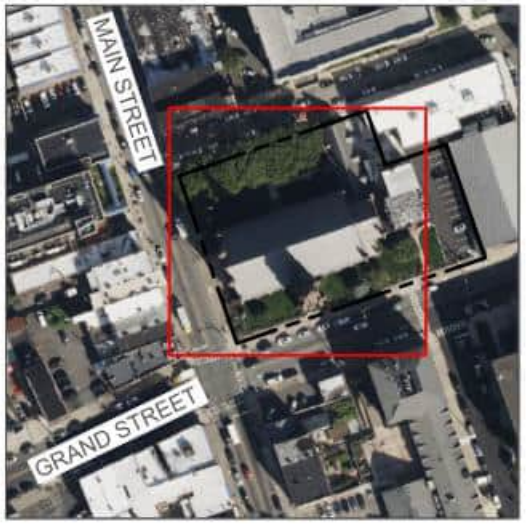
Three rain gardens can be installed in the grass areas along the Main Street and Grand Street entrances the of the cathedral to capture, treat, and infiltrate stormwater runoff from the rooftop. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
84	45,712	2.2	23.1	209.9	0.036 Mgal	4,762 CF	1.36 Mgal	181,324 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	10,175	0.287	44	20,530	0.77	2,545	$63,625
Site Totals	**10,175**	**0.287**	**44**	**20,530**	**0.77**	**2,545**	**$86,035**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site Q-01: CATHEDRAL OF ST. JOHN THE BAPTIST



Cathedral of Saint John the Baptist

- bioretention system
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 20' 40'

Site Q-02: CHRISTIAN FELLOWSHIP CENTER

Sewershed	PF-07
Site Area	24,0.38 sq. ft.
Address	349 Van Houten Street Paterson, NJ 07501
Block and Lot	Block 4201, Lot 13, 14, 15, 16, 17, 18
Soil Type	HSG N/A

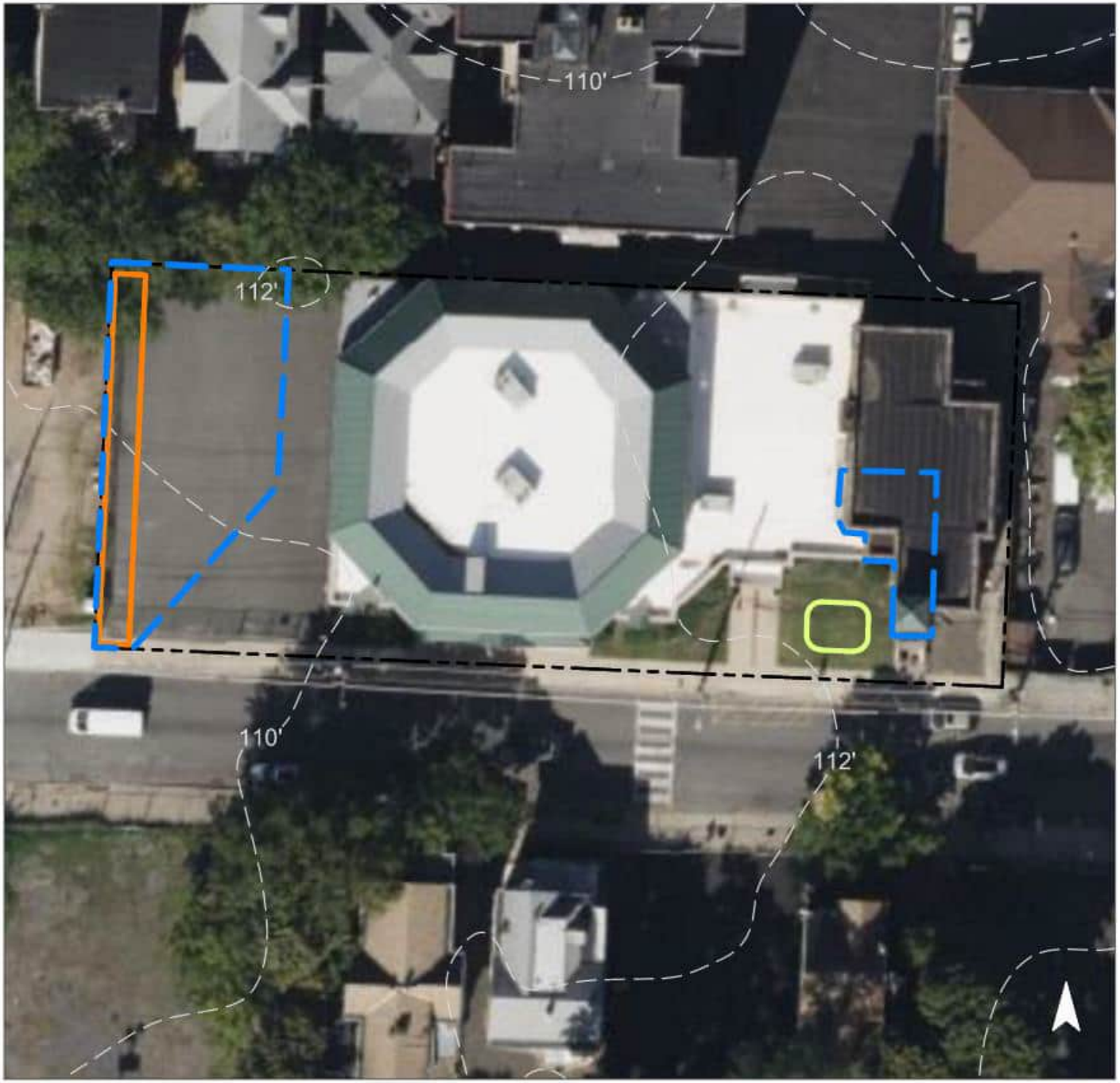
A bioretention system can be installed on the south-eastern side of the site to capture, treat, and infiltrate water from the adjacent roof. Parking spaces can be repaved with pervious pavement to capture and infiltrate water from the rest of the parking lot. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
91	21,963	1.1	11.1	100.8	0.017 Mgal	2,288 CF	0.65 Mgal	87,120 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	745	0.021	4	1,500	0.06	190	$4,750
Pervious pavement	3,865	0.109	17	7,790	0.29	775	$12,400
Site Totals	**4,610**	**0.130**	**21**	**9,290**	**0.35**	**965**	**$23,210**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site Q-02: CHRISTIAN FELLOWSHIP CENTER



Christian Fellowship Center

- bioretention system
- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 20' 40'

Site Q-03: COURT HOUSE PLAZA

Sewershed	PF-07
Site Area	55,371
Address	74 Hamilton St Paterson, NJ 07505
Block and Lot	Block 6218, Lot 2
Soil Type	HSG N/A

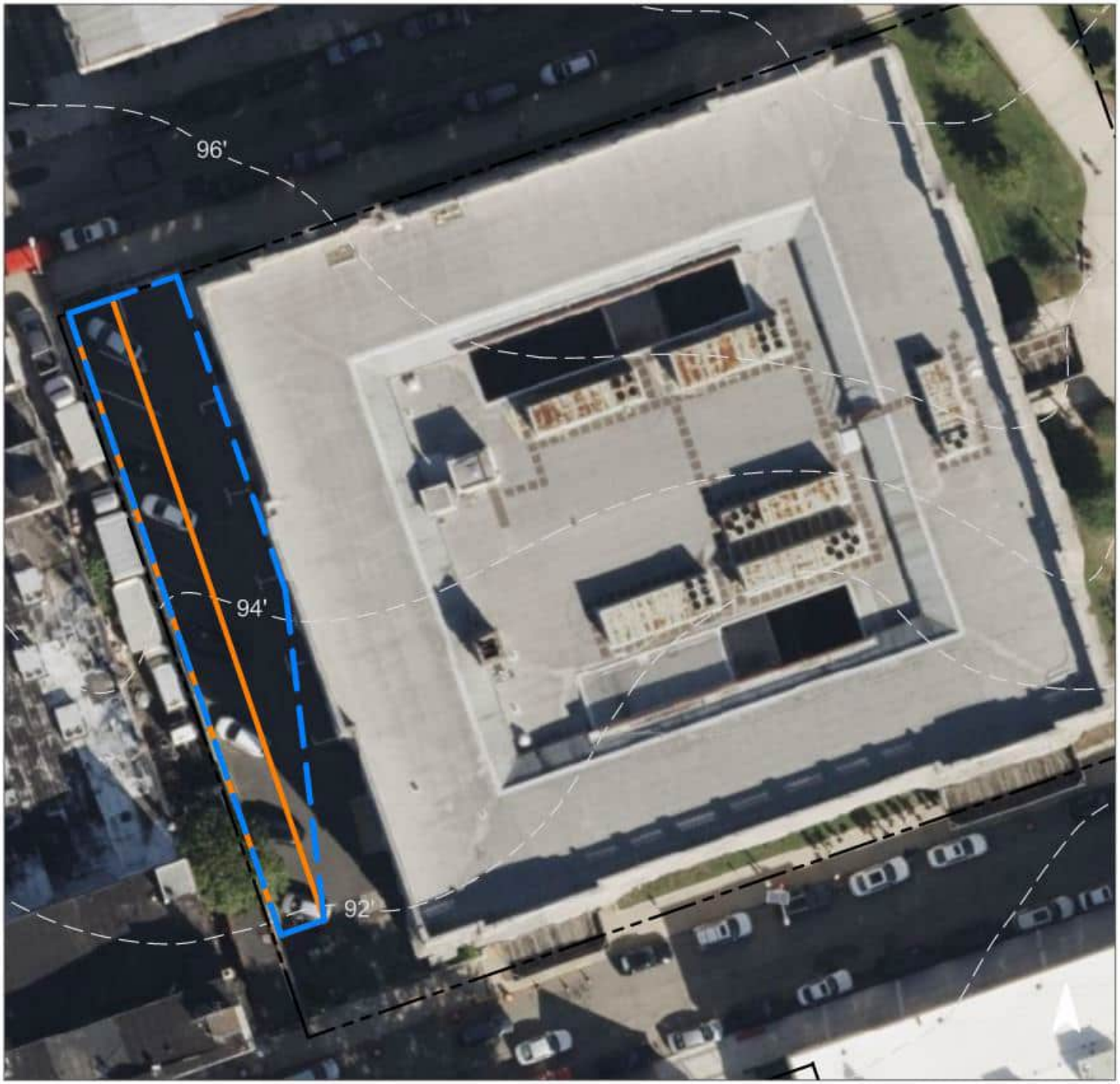
A portion of impervious cover west of the building can be converted to pervious pavement to manage stormwater runoff generated from the driveway and parking area adjacent to the building. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

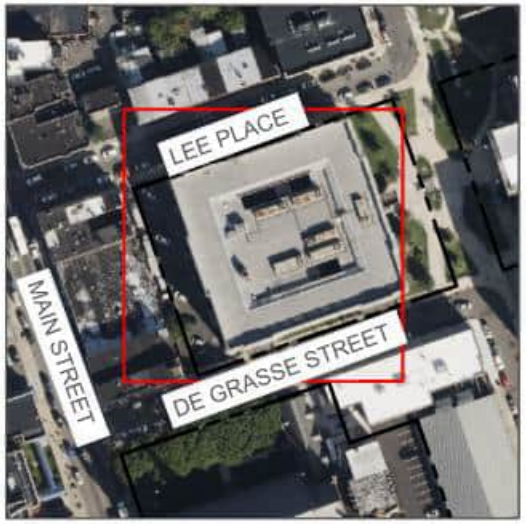
Impervious Cover		Existing Loads from Impervious Cover (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
					For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
%	sq. ft.	TP	TN	TSS				
98	54,254	2.6	27.4	249.1	0.042 Mgal	5,652 CF	1.61 Mgal	215,246 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 pavement	4,420	0.125	19	8,920	0.34	2,065	$33,040
Site Totals	**4,420**	**0.125**	**19**	**8,920**	**0.34**	**2,065**	**$45,400**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site Q-03: COURT HOUSE PLAZA





Court House Plaza

- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 20' 40'

Site Q-04: EASTSIDE HIGH SCHOOL

Sewershed	PF-07
Site Area	305,830 sq. ft.
Address	150 Park Avenue Paterson, NJ 07501
Block and Lot	Block 4101, Lot 6
Soil Type	HSG N/A

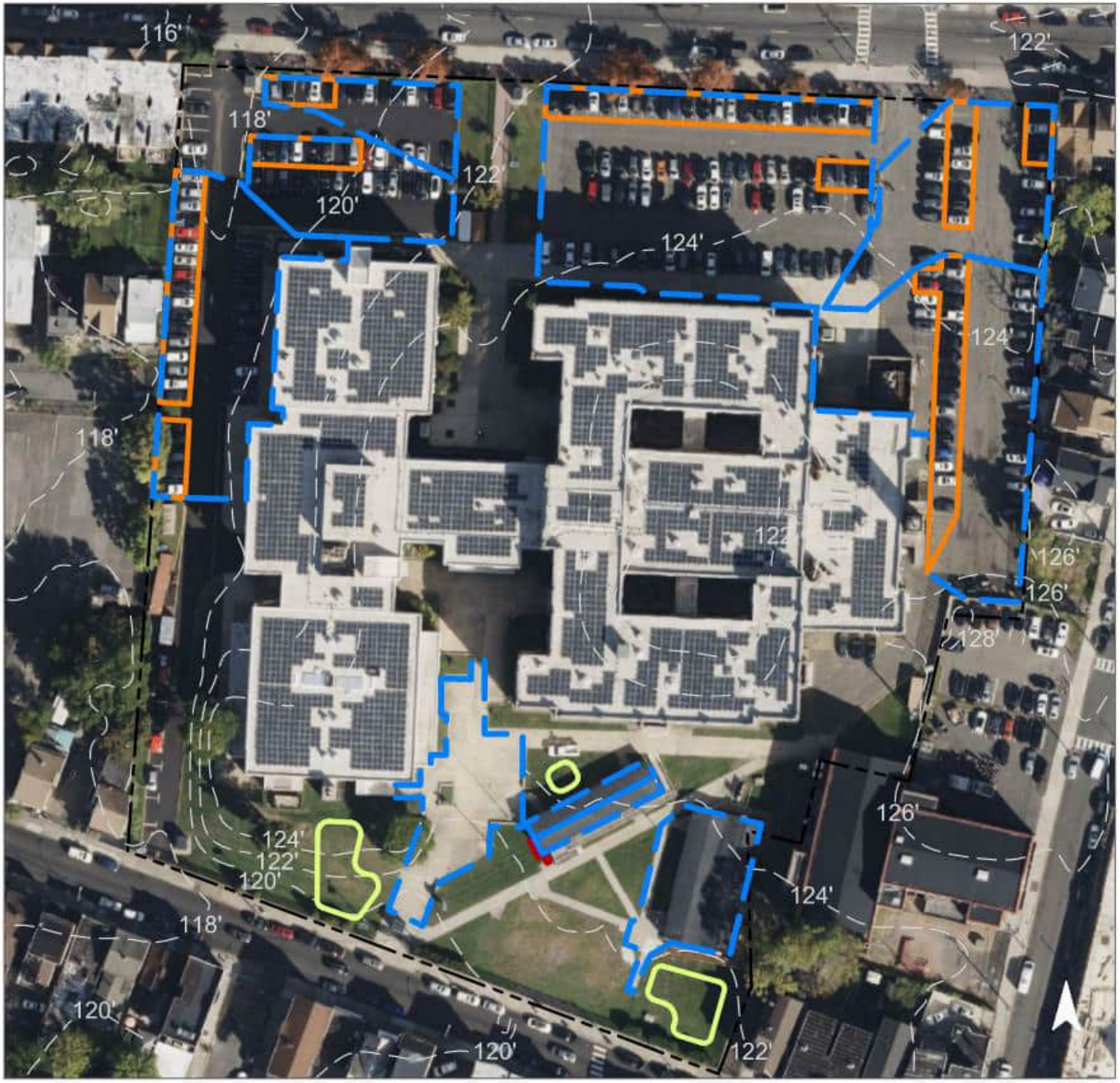
Three bioretention systems can be built on the southern side of the site to capture, treat and infiltrate water from the sidewalk and the modular classrooms. Additionally, multiple portions of the parking lot on the northern, western, and eastern sides of the site can be converted to pervious parking stalls to capture and infiltrate water. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

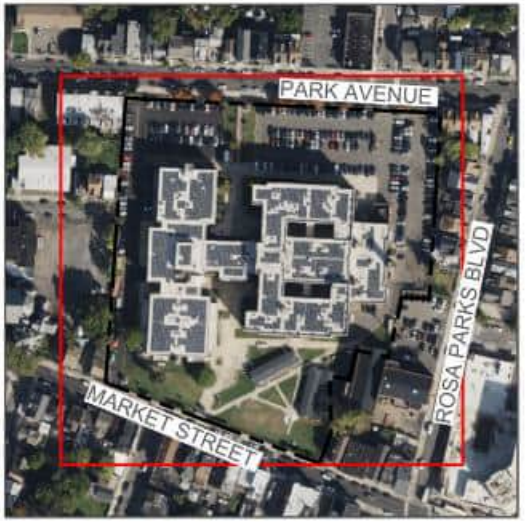
Impervious Cover		Existing Loads from Impervious Cover (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
					For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
%	sq. ft.	TP	TN	TSS				
89	272,928	13.2	137.8	1,253.1	0.213 Mgal	28,430 CF	8.10 Mgal	1,082,614 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	9,850	0.278	44	19,870	0.75	2,810	$70,250
Pervious pavement	87,485	2.466	382	176,500	6.63	17,065	$273,040
Planter boxes	985	n/a	3	n/a	n/a	5 (2'x6' box)	$8,000
Site Totals	**98,320**	**2.744**	**429**	**196,370**	**7.38**	**19,935**	**$487,090**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site Q-04: EASTSIDE HIGH SCHOOL





Eastside High School

- bioretention system
- pervious pavement
- planter box
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 50' 100'

Site Q-05: GREATER BIBLE WAY CHURCH

Sewershed	PF-07
Site Area	30,001 sq. ft.
Address	20 Southard Street Paterson, NJ 07501
Block and Lot	Block 6309, Lot 1-3, 15-17
Soil Type	HSG N/A

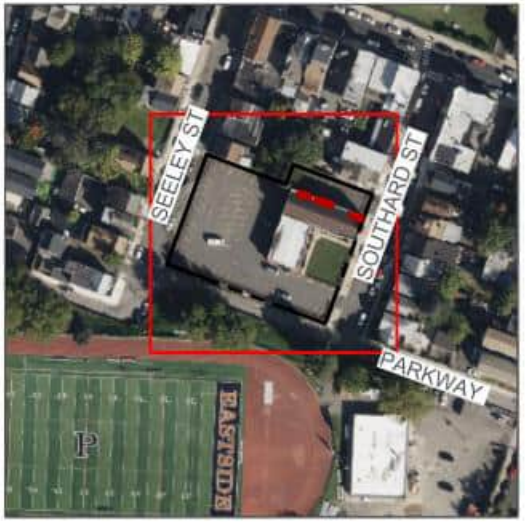
A bioretention system can be built on the eastern side of the site to capture, treat, and infiltrate water from the building. Parking spaces on the northwestern and western sides of the site can be repaved with pervious pavement to capture and infiltrate water from the parking lot and roof. Planter boxes can be installed along the northern side of the building to divert and treat runoff generated by the building. 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 (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
92	27,578	1.3	13.9	126.6	0.021 Mgal	2,873 CF	0.82 Mgal	109,393 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	2,020	0.057	10	4,080	0.49	505	$12,625
Pervious pavement	20,000	0.564	87	40,350	1.52	3,840	$61,440
Planter boxes	1,405	n/a	5	n/a	n/a	7 (2'x6' box)	$11,200
Site Totals	**23,425**	**0.621**	**102**	**44,430**	**1.67**	**4,513**	**$115,295**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site Q-05: GREATER BIBLE WAY CHURCH



Greater Bible Way Church

- bioretention system
- pervious pavement
- planter box
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 20' 40'

Site Q-06: INTERNAL REVENUE SERVICE (IRS) TAXPAYER ASSISTANCE CENTER

Sewershed	PF-07
Site Area	200,538 sq. ft.
Address	100 Hamilton Plz Paterson, NJ 07505
Block and Lot	Block 6204, Lot 1,2,3
Soil Type	HSG N/A

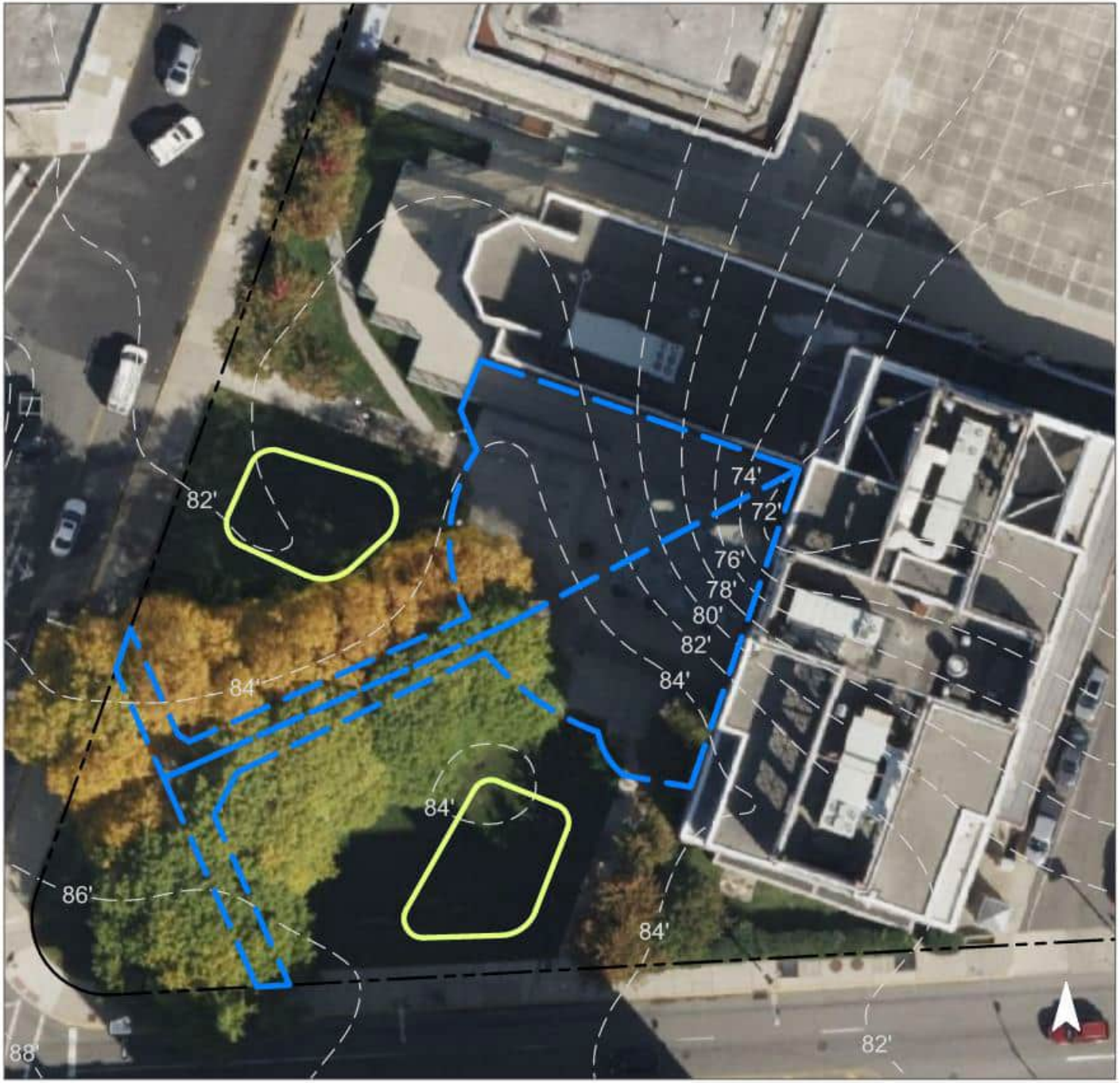
Two rain gardens can be installed in the grass lawn near the intersection of Hamilton and Federal Plaza to capture, treat, and infiltrate stormwater runoff from the sidewalk area near the entrance of the building. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
92	184,153	8.9	93.0	845.5	0.143 Mgal	19,183 CF	5.46 Mgal	730,475 CF

74,720	Impervious Area Treated (sq. ft)	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 system	8,272	0.233	36	16,690	0.63	2,206	$55,250
Site Totals	**8,272**	**0.233**	**36**	**16,690**	**0.63**	**2,206**	**$74,720**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site Q-06: INTERNAL REVENUE SERVICE (IRS) TAXPAYER ASSISTANCE CENTER



Internal Revenue Service (IRS) Taxpayer Assistance Center

- bioretention system
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 20' 40'

Site Q-07: MEMORIAL DAY SCHOOL GEORGETTE HAUSER CAMPUS

Sewershed	PF-07
Site Area	12,810 sq. ft.
Address	15 Crosby Pl Paterson, NJ 07522
Block and Lot	Block 4323, Lot 1, 7, 8
Soil Type	HSG N/A

The eastern parking stalls' impervious cover can be converted to pervious pavement to promote stormwater capture and infiltration. 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 (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
94	12,053	0.6	6.1	55.3	0.009 Mgal	1,256 CF	0.36 Mgal	47,810 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 pavement	6,836	0.193	30	13,790	0.52	1,745	$27,920
Site Totals	**6,836**	**0.193**	**30**	**13,790**	**0.52**	**1,745**	**$37,760**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site Q-07: MEMORIAL DAY SCHOOL GEORGETTE HAUSER CAMPUS

Memorial Day School Georgette Hauser Campus

- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 10' 20'

Site Q-08: NEW ROBERTO CLEMENTE SCHOOL

Sewershed	PF-07
Site Area	152,688 sq. ft.
Address	482 Market Street Paterson, NJ 07501
Block and Lot	Block 6406, Lot 1
Soil Type	HSG N/A

A bioretention system can be installed on the eastern side of the site to capture, treat and infiltrate water from the courtyard by depaving a portion of the area. Additionally, parking stalls on the western portion of the site and the basketball court on the southeastern portion of the site can be converted to pervious pavement to capture and infiltrate remaining water from the parking lot. 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 (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
98	149,911	7.2	75.7	688.3	0.117 Mgal	15,616 CF	4.45 Mgal	594,647 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	6,415	0.181	29	12,940	0.49	1,605	$40,125
Pervious pavement	27,110	0.764	118	54,690	2.06	9,635	$154,160
Site Totals	**33,525**	**0.945**	**147**	**67,630**	**2.55**	**11,240**	**$267,175**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site Q-08: NEW ROBERTO CLEMENTE SCHOOL

New Roberto Clemente School

- bioretention system
- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 30' 60'

Site Q-09: OUR LADY OF VICTORIES ROMAN CATHOLIC CHURCH

Sewershed	PF-07
Site Area	48,322 sq. ft.
Address	159 Broadway Paterson, NJ 07505
Block and Lot	Block 3707, Lot 1, 2, 3, 4, 5
Soil Type	HSG N/A

Two rain gardens can be installed in the grass area near the entrance of the building to capture, treat, and infiltrate stormwater runoff from the rooftop portion along Broadway Street. Downspout planter boxes can be placed in front of the side entrances of the building to allow runoff to be reused for aesthetic vegetative growth and to promote stormwater treatment. The northern pavement areas can be converted to pervious pavement to promote stormwater capture and infiltration . 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 (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
95	45,987	2.2	23.2	211.1	0.036 Mgal	4,790 CF	1.36 Mgal	182,415 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	1,570	0.044	8	3,160	0.12	405	$8,100
Pervious pavement	9,785	0.276	42	19,740	0.74	1,795	$28,720
Downspout Planter	955	n/a	3	n/a	n/a	5 (2'x6' box)	$8,000
Site Totals	**12,310**	**0.320**	**53**	**22,900**	**0.86**	**2,260**	**$63,345**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site Q-09: OUR LADY OF VICTORIES ROMAN CATHOLIC CHURCH

Our Lady of Victories Roman Catholic Church

- bioretention system
- pervious pavement
- planter box
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 20' 40'

Site Q-10: PARK RAILROAD AVE

Sewershed	PF-07
Site Area	50,697 sq. ft.
Address	254 Market St Paterson, NJ 07505
Block and Lot	Block 6212, Lot 1
Soil Type	HSG N/A

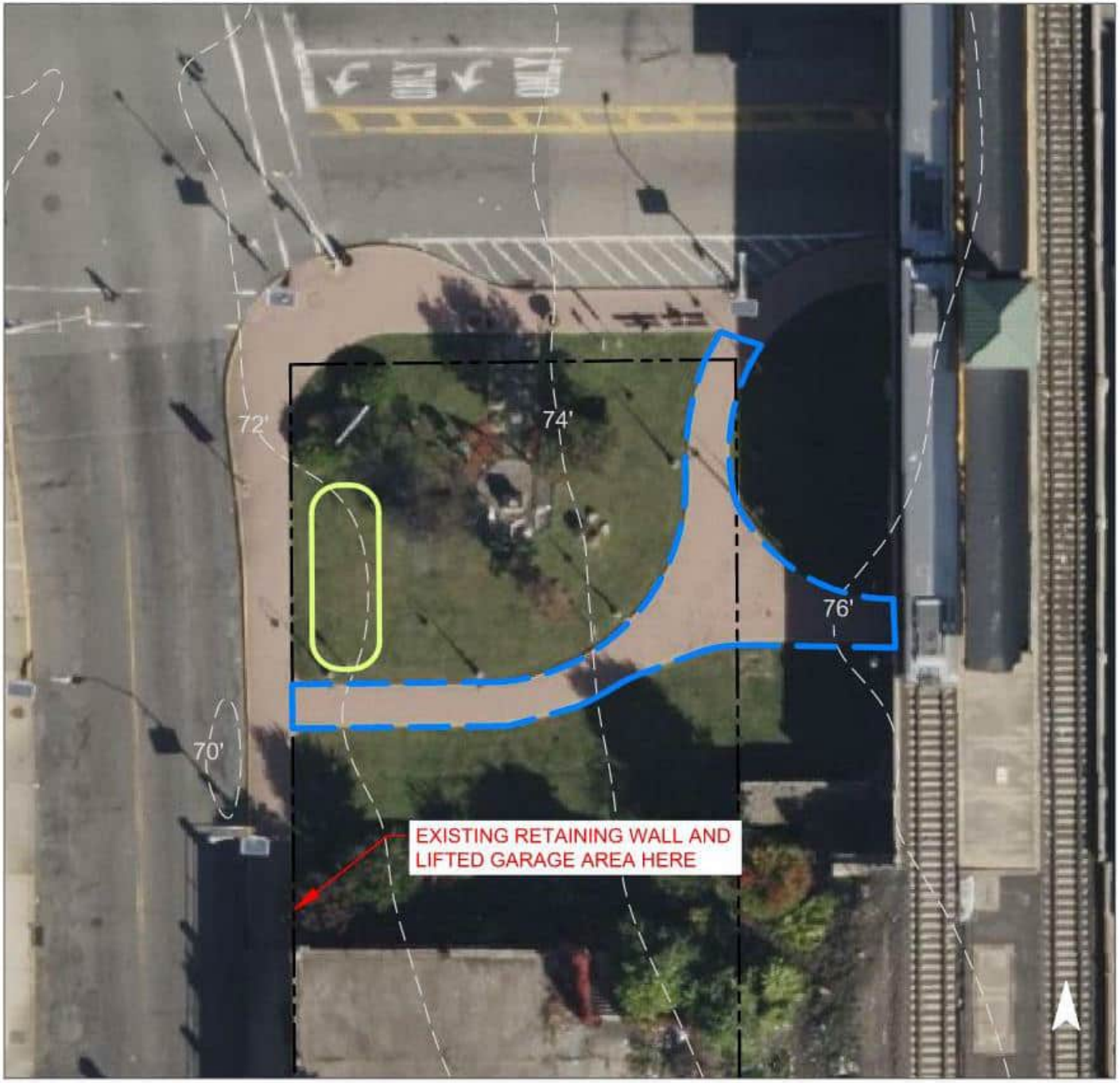
A rain garden can be installed in the grass area adjacent to the impervious path to capture, treat, and infiltrate stormwater runoff near the intersection of Ward Street and Railroad Avenue. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
69	34,922	1.7	17.6	160.3	0.027 Mgal	3,638 CF	1.04 Mgal	138,525 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	1,805	0.051	8	3,640	0.14	450	$11,250
Site Totals	**1,805**	**0.051**	**8**	**3,640**	**0.14**	**450**	**$15,430**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site Q-10: PARK RAILROAD AVE



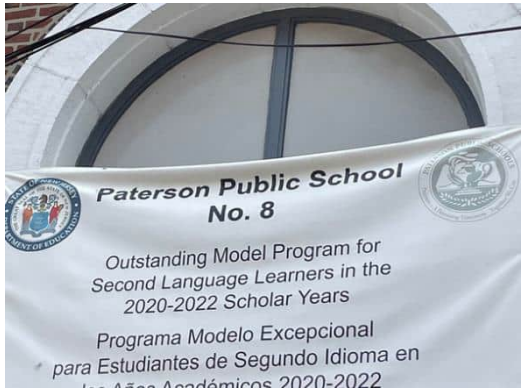
Park Railroad Ave

- bioretention system
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 15' 30'

Site Q-12: PATERSON PUBLIC SCHOOL NO. 8

Sewershed	PF-07
Site Area	60,797 sq. ft.
Address	35 Chadwick Street Paterson, NJ 07503
Block and Lot	Block 5506, Lot 24
Soil Type	HSG N/A



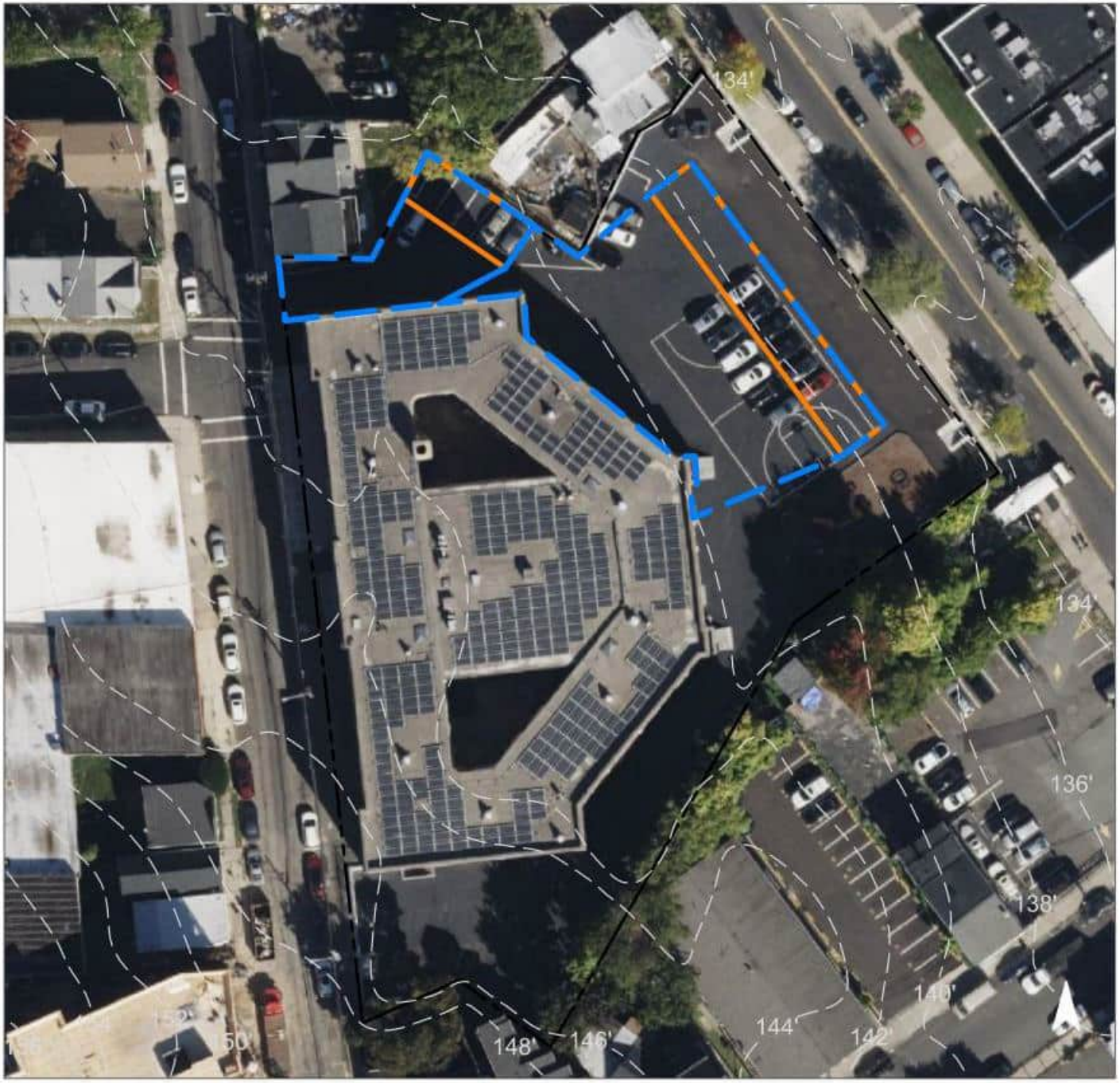
Converting the current pavement next to the basketball court into porous pavement is a viable option for capturing and infiltrating stormwater runoff in this school. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
					For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
%	sq. ft.	TP	TN	TSS				
97	59,153	2.9	29.9	271.6	0.046 Mgal	6,162 CF	1.62 Mgal	216,894 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 pavement	13,570	0.354	59	27,380	1.03	3,550	$ 56,800
Site Totals	**13,570**	**0.354**	**59**	**27,380**	**1.03**	**3,550**	**$ 77,910**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site Q-12: PATERSON PUBLIC SCHOOL NO. 8



Paterson Public School No. 8

- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 30' 60'

Site Q-13: PATERSON PUBLIC WORKS DEPARTMENT

Sewershed	PF-07
Site Area	97,881 sq. ft.
Address	72-80 N Barcly Street Paterson, NJ 07503
Block and Lot	Block 5509, Lot 22
Soil Type	HSG N/A

Pervious pavement can be installed in the parking spots along the building and north fence line to capture, treat, and infiltrate stormwater runoff from the roof and parking lot. 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 (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
77	74,959	3.6	37.9	344.2	0.058 Mgal	7,808 CF	2.06 Mgal	274,850 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 pavement	16,955	0.442	74	34,210	1.29	3,110	$ 49,760
Site Totals	**16,955**	**0.442**	**74**	**34,210**	**1.29**		**$ 68,290**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site Q-13: PATERSON PUBLIC WORKS DEPARTMENT

Paterson Public Works Department

- bioretention system
- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 15' 30'

Site Q-14: RAILROAD AVENUE OPEN SPACE

Sewershed	PF-07
Site Area	68,206 sq. ft.
Address	207 Railroad Avenue Paterson, NJ 07501
Block and Lot	Block 6010, Lot 2
Soil Type	HSG N/A

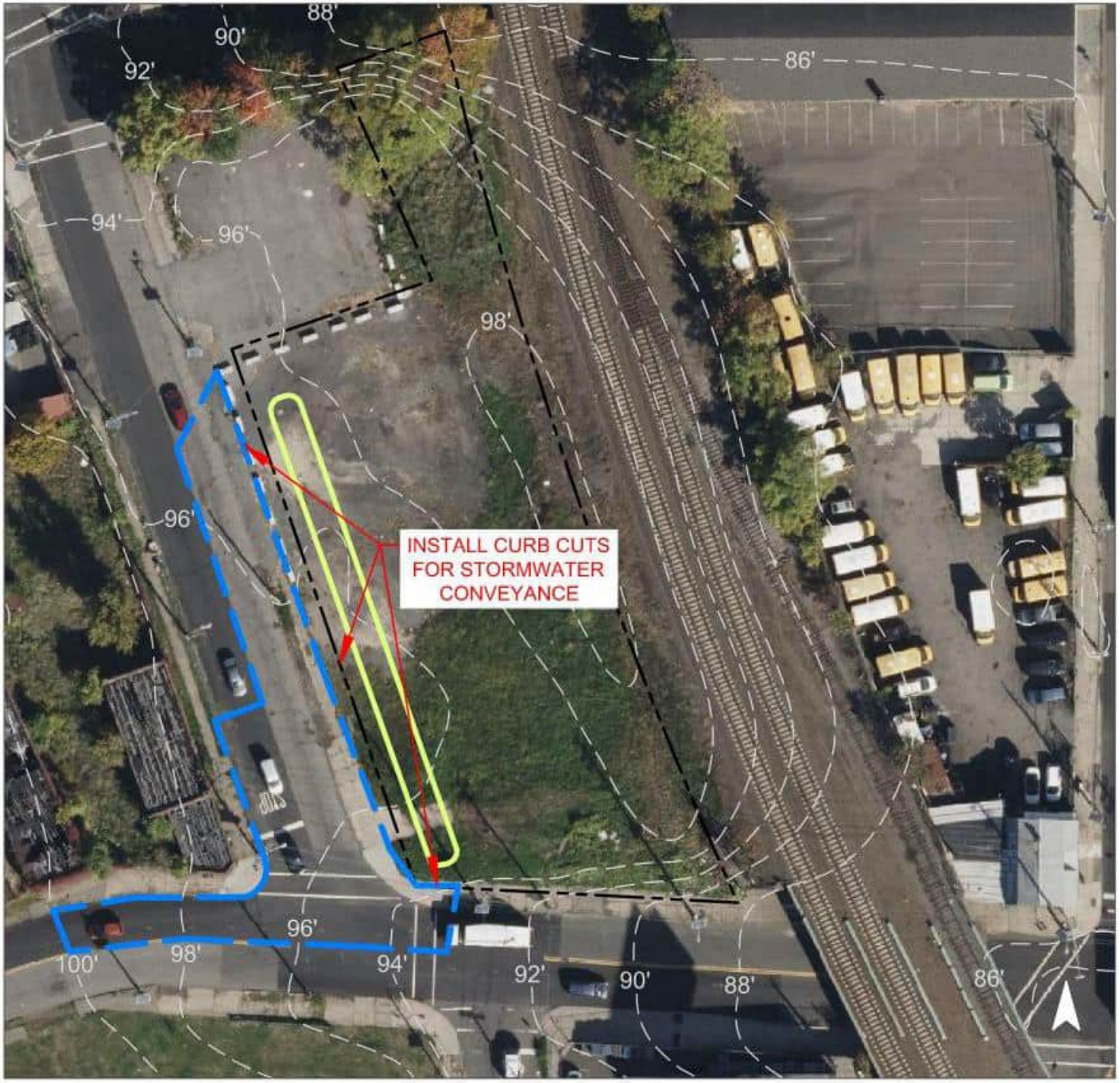
One bioretention system can be built to capture, treat and infiltrate stormwater by diverting roadway runoff via curb cuts for stormwater conveyance. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
51	15,548	0.7	7.9	71.4	0.012 Mgal	1,620 CF	0.46 Mgal	61,674 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	9,016	0.254	40	18,190	0.68	2,295	$73,875
Site Totals	**9,016**	**0.254**	**40**	**18,190**	**0.68**	**2,295**	**$101,395**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site Q-14: RAILROAD AVENUE OPEN SPACE



Railroad Avenue Open Space

- bioretention system
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 30' 60'

Site Q-15: ROBERTO CLEMENTE PARK

Sewershed	PF-07
Site Area	453,813 sq. ft.
Address	Rose Street & Parkway, Paterson, New Jersey 07501
Block and Lot	Block 6307, Lot 38
Soil Type	HSG N/A

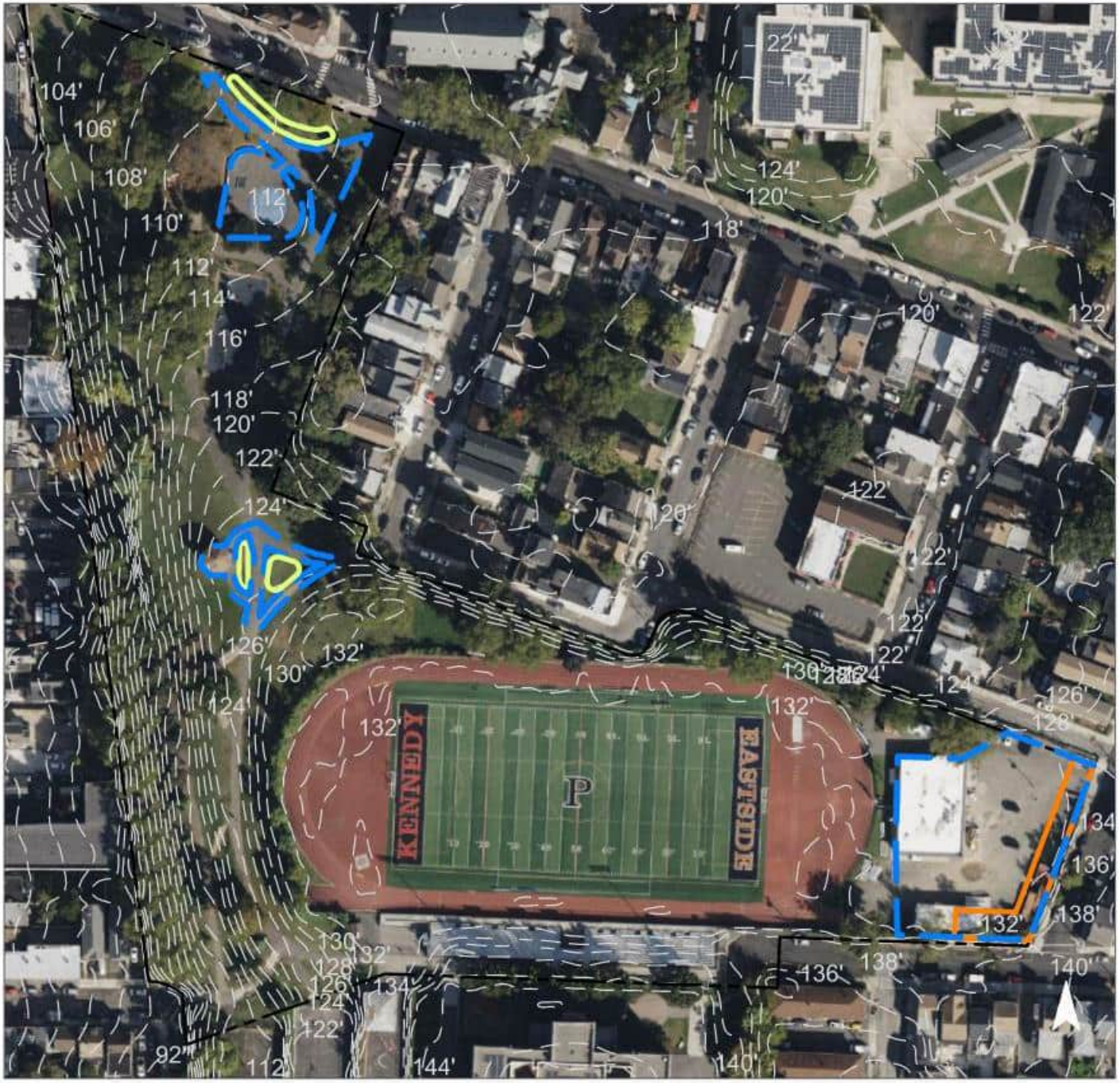
A bioretention systems can be installed to capture, treat and infiltrate water from a gazebo and walkways. A second bioretention system can be installed to capture, treat and infiltrate water from the pathways and play area in the park. Additionally, a portion of the parking lot on the eastern side of the site can be repaved with pervious parking to capture and infiltrate water from the rest of the parking lot. 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 (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
52	236,455	11.4	119.4	1,085.7	0.184 Mgal	24,631 CF	7.02 Mgal	937,938 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	9,670	0.273	42	19,510	0.73	2,450	$61,250
Pervious pavement	30,190	0.851	131	60,910	2.29	5,460	$87,360
Site Totals	**39,860**	**1.124**	**173**	**80,420**	**3.02**	**7,910**	**$204,520**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site Q-15: ROBERTO CLEMENTE PARK



Roberto Clemente Park

- bioretention system
- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 75' 150'

Site Q-16: ST. ANTHONY OF PADUA ROMAN CATHOLIC CHURCH

Sewershed	PF-07
Site Area	79,503 sq. ft.
Address	138 Beech Street Paterson, NJ 07501
Block and Lot	Block 6006, Lot 1-14
Soil Type	HSG N/A

Two bioretention systems can be built on the northern side of the site to capture, treat, and infiltrate stormwater runoff from the roof and impervious driveway. Parking stalls on the southern side of the site can be repaved with pervious pavement to capture and infiltrate water from the roof and parking lot. Planter boxes can be placed along the northern, southern, and western sides of two buildings to collect and treat rooftop generated runoff via roof leaders. 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 (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
89	70,960	3.4	35.8	325.8	0.055 Mgal	7,392 CF	2.11 Mgal	281,475 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	12,275	0.346	53	24,770	0.93	3,140	$78,500
Pervious pavement	32,465	0.915	143	65,490	2.46	6,960	$111,360
Planter boxes	5,970	n/a	22	n/a	n/a	29 (2'x6' box)	$46,400
Site Totals	**50,710**	**1.261**	**218**	**90,260**	**3.39**	**10,450**	**$320,030**

* Site Total includes additional construction incidentals, see detailed cost estimated in Appendix D.

Site Q-16: ST. ANTHONY OF PADUA ROMAN CATHOLIC CHURCH

St. Anthony of Padua Roman Catholic Church

- bioretention system
- pervious pavement
- planter box
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 30' 60'

Sewershed PF-16

Site S-01: PATERSON PUBLIC SCHOOL 18

Sewershed	PF-16
Site Area	60,000 sq. ft.
Address	37 E 18th Street, Paterson, New Jersey, 07524
Block and Lot	Block 2208, Lot 1
Soil Type	HSG N/A

To capture and manage stormwater from the downspouts of roof, a rain garden can be installed the grass area near the entrance of the building and a portion of the parking lot can be turned into porous 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 (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
98	58,817	2.8	29.7	270.1	0.046 Mgal	6,127 CF	1.61 Mgal	215,662 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	5,321	0.139	23	10,730	0.40	1,340	$33,500
Pervious pavement	24,462	0.637	107	49,350	1.85	4,600	$73,60
Downspout Planter	3,335	n/a	12	n/a	n/a	16 (2'x6' box)	$25,600
Site Totals	**33,118**	**0.776**	**142**	**60,080**	**2.25**	**6,132**	**$182,720**

Site S-01: PATERSON PUBLIC SCHOOL 18

Paterson Public School No. 18

- bioretention system
- pervious pavement
- planter box
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS
- 100-yr Floodplain

0 25' 50'

Sewershed
S-08

Site T-01: THE CHURCH OF JESUS CHRIST LATTER-DAY SAINTS

Sewershed	S-08
Site Area	19,851 sq. ft.
Address	26 E 39th Street, Paterson, New Jersey, 07514
Block and Lot	Block 8204, Lot 1, 2, 3, 10
Soil Type	HSG N/A

In the grassy area by the entrance of the church, a rain garden can be built in front of a downspout. Parking spaces where the elevation is the lowest can be converted to porous pavement. The installments meet the conditions to capture and absorb stormwater runoff from the roof and the parking lot. 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 (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
44	8,736	0.4	4.4	40.1	0.007 Mgal	910 CF	0.24 Mgal	32,032 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	5,350	0.139	23	10,790	0.41	1,405	$31,125
Pervious pavement	23,240	0.606	101	46,880	1.76	4,190	$67,040
Downspout Planter	835	n/a	4	n/a	n/a	4 (2'x6' box)	$25,600
Site Totals	**29,425**	**0.745**	**128**	**57,670**	**2.17**	**5,640**	**$147,375**

Site T-01: THE CHURCH OF JESUS CHRIST LATTER-DAY SAINTS

The Church of Jesus Christ of Latter-day Saints

- bioretention system
- pervious pavement
- planter box
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 25' 50'

Sewershed
S-09

Site U-01: CHRISTOPHER COLUMBUS PARK

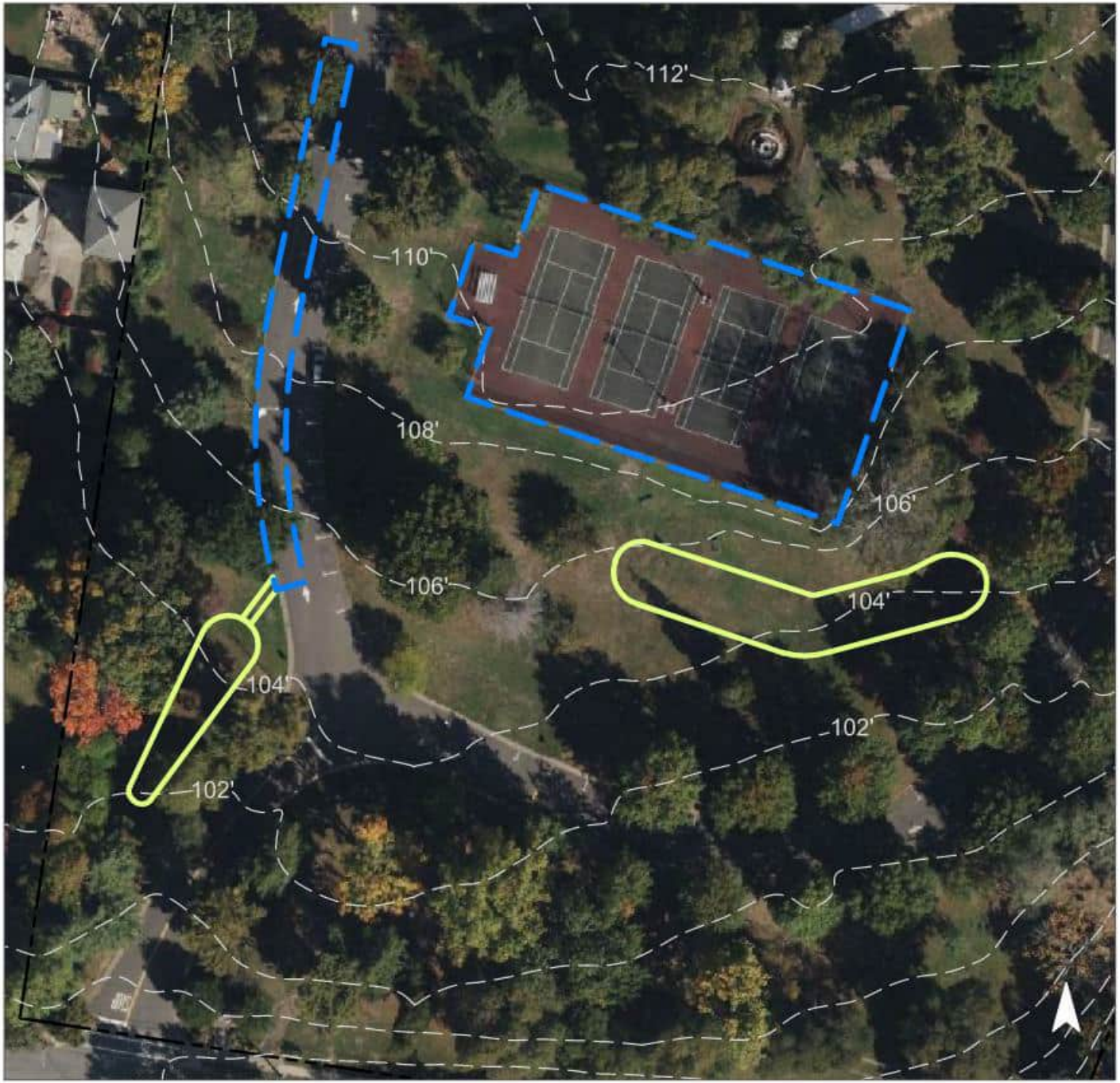
Sewershed	S-09
Site Area	2,402,488 sq. ft.
Address	1 E Park Drive, Paterson, New Jersey, 07504
Block and Lot	Block 8101, Lot 1
Soil Type	HSG N/A

Four rain gardens can be installed in the grass areas at low elavations to capture, treat, and infiltrate stormwater runoff from the roads. In the southern most rain garden, a bioswale can be installed to promote flow from the roadway into the rain garden, encouraging additional treatment. Along the facilities division building downspout planter boxes and pervious pavement can be installed to capture and treat stormwater runoff generated from the building. 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 (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
22	525,326	25.3	265.3	2,412.0	0.409 Mgal	54,721 CF	14.41 Mgal	1,926,195 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 system	41,425	1.073	181	83,570	3.14	11,900	$297,500
Pervious pavement	2,125	0.055	9	4,290	0.16	580	$9,280
Downspout Planter	1,970	n/a	7	n/a	n/a	10 (2'x6' box)	$16,000
Site Totals	**45,520**	**1.128**	**197**	**87,860**	**3.30**	**12,600**	**$443,500**

Site U-01: CHRISTOPHER COLUMBUS PARK

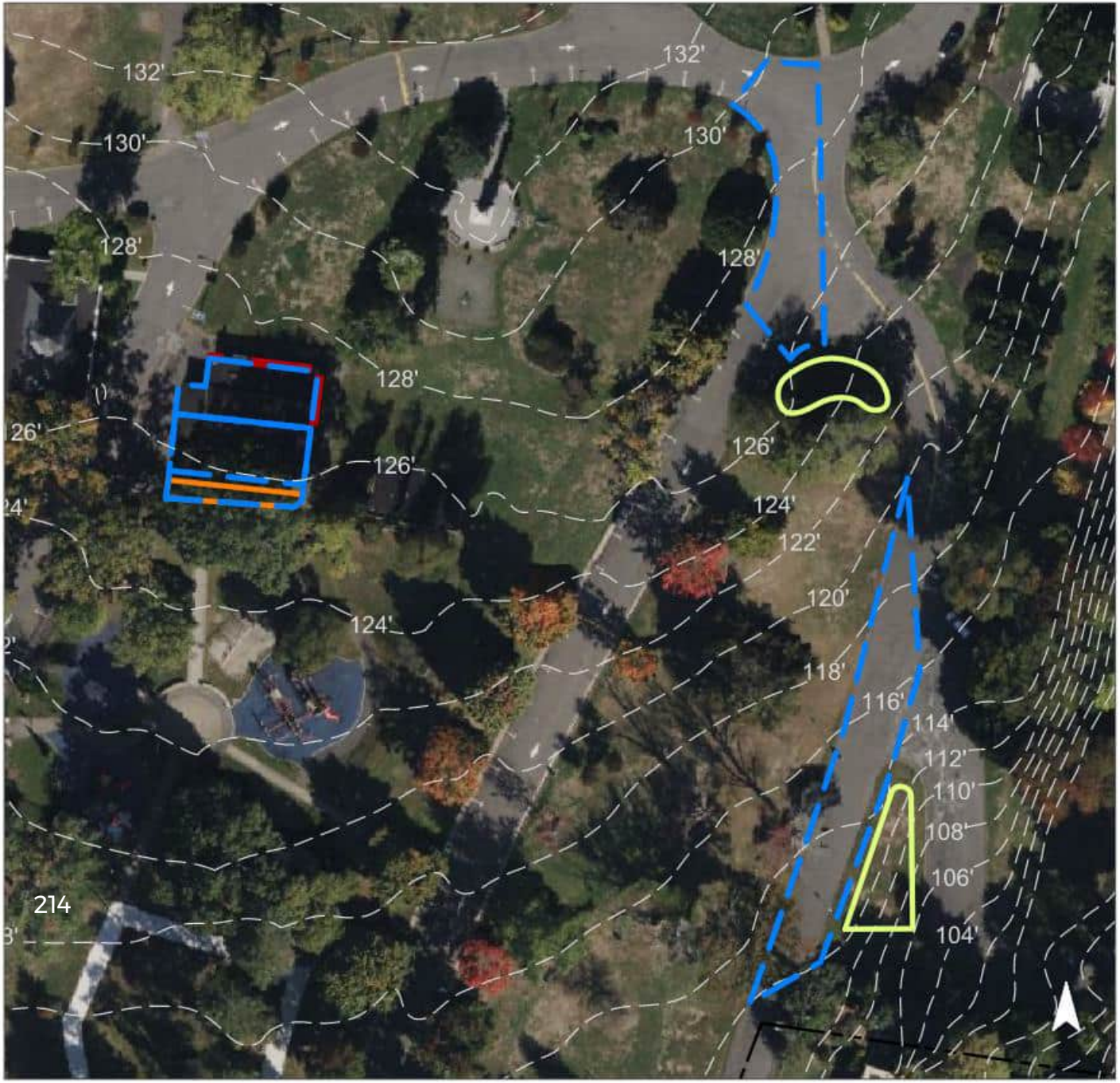


Christopher Columbus Park

- bioretention system
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS
- 100-yr Floodplain

0 40' 80'

Site U-01: CHRISTOPHER COLUMBUS PARK



Christopher Columbus Park

- bioretention system
- pervious pavement
- planter box
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS
- 100-yr Floodplain

0 40' 80'

Site U-02: PATERSON STEAM HIGH SCHOOL

Sewershed	S-09
Site Area	347,582 sq. ft.
Address	764 11th Ave, Paterson, New Jersey, 07514
Block and Lot	Block 8208, Lot 2
Soil Type	HSG N/A

To manage stormwater from the parking lot, converting the current parking aisles where the elevation is the lowest will infiltrate and capture and 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 (IC) (lbs/yr)			Runoff Volume from Impervious Cover			
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm		For an Annual Rainfall of 47.6"	
33	116,250	5.6	58.7	533.7	0.091 Mgal	12,109 CF	3.19 Mgal	426,250 CF

Recommended Green Infrastructure Practices	Impervious Area Treated (sq. ft)	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 pavement	29,375	0.765	128	59,260	2.23	9,730	$155,680
Site Totals	**29,375**	**0.765**	**128**	**59,260**	**2.23**	**9,730**	**$214,190**

Site U-02: PATERSON STEAM HIGH SCHOOL

Paterson STEAM High School

- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 20' 40'

APPENDIX

D HYDROLOGIC AND DRAINAGE CALCULATIONS

Summary of Proposed Green Infrastructure Practices Notes

List of General Abbreviations

BMP	Best Management Practice
I.C. Area	Impervious Cover Area
TP	Total Phosphorus (concentration)
TN	Total Nitrogen (concentration)
TSS	Total Suspended Solids (concentration)

List of Unit Abbreviations

Ac.	Acres
Cu. Ft.	Cubic Feet
CFS	Cubic Feet per Second
Gal	Gallons
Lbs/year	Pounds per Year
Mgal	Million Gallons
SF	Square Feet

Equations

Existing Annual Loads from Impervious Area (Commercial)

TN (lbs/year) = 2.1*Impervious Area (acres)
TP (lbs/year) = 22*Impervious Area (acres)
TSS (lbs/year) = 200*Impervious Area (acres)

Runoff Volumes from Impervious Area

Water Quality (1.25" over 2-hours), (ft^3) = Impervious Area (SF)*(1.25")*(1 foot/12")
Annual (average 47.6"), (ft^3) = Impervious Area (SF)*(47.6")*(1 foot/12")

Recharge Potential (Mgal/year) = $$\frac{(Potential\ Management\ Area\ (ft^2) * \left(47.6\ inches \frac{1\ foot}{12\ inches}\right) * (0.95 * 7.48 \frac{gallons}{ft^3})}{1{,}000{,}000\ gallons/Mgal}$$

TSS Removal Potential for Bioretention Systems & Pervious Pavement (lbs/year) = $(Potential\ Management\ Area\ (ac.) * 200 * 0.95$
TSS Removal Potential for Downpout Planter Boxes (lbs/year) = $(Potential\ Management\ Area\ (ac.) * 200 * 0.80$
TSS Removal Potential for Bioswales (lbs/year) = $(Potential\ Management\ Area\ (ac.) * 200 * 0.68$

SCS Runoff Method $$Q = \frac{(P - 0.2 * S)^2}{P + 0.8 * S} \qquad S = \frac{1000}{CN} - 10$$

Q = Precipitation excess (runoff), (inches)
P = Cumulative precipitation (inches)
S = Potential maximum retention (inches)
CN = SCS Curve Number

Maximum Volume Reduction Potential (Gal/storm) =
2 year rainfall = 3.47" NJDEP Factors 2023

$$\left(\frac{\left(2 - year\ rainfall(inches) - 0.2 * \left(\frac{1000}{98} - 10\right)\right)^2}{\left(2 - year\ rainfall\ (inches) + 0.8 * \left(\frac{1000}{98} - 10\right)\right)} * \frac{Area\ (ft^2)}{\frac{12\ inches}{ft}}\right) * \frac{7.48\ gallons}{ft^3}$$

Peak Discharge Reduction Potential (2-year), (ft^3/s) =

Base Equation:

$$q_p = Peak\ Factor * \frac{AQ}{T_P}$$

where:
Peak Factor = 484
$Q = \frac{(P - 0.2S)^2}{(P + 0.8S)}$
$S = \frac{1000}{CN} - 10$
CN = 98
Time of Concentration = 6 min
Note: Time to Peak (Tp) was linearly adjusted to approximate HydroCAD model

$$q_p = 484 * \left(\frac{Potential\ Management\ Area\ (ft^2)}{\frac{27{,}878{,}400\ ft^2}{1\ mi.^2}}\right) * \frac{\left(\frac{\left(2 - year\ rainfall(inches) - 0.2 * \left(\frac{1000}{98} - 10\right)\right)^2}{\left(2 - year\ rainfall\ (inches) + 0.8 * \left(\frac{1000}{98} - 10\right)\right)}\right)}{\frac{\left(\frac{6}{60}\right) + 1.16)}{1.7}}$$

Conversion

1 Cubic Foot =	7.48	Gallons
1 Cubic Foot =	7.48/1,000,000	Million Gallons
1 Square Mile =	27,878,400	Square Feet

Summary of Proposed Green Infrastructure Practices

Subwatershed/Site Name/Total Site Info/GI Practice	Area (SF)	Block	Lot	I.C. Area (SF)	Existing Annual Loads from I.C. (Commercial) TP (lb/yr)	TN (lb/yr)	TSS (lb/yr)	Runoff Volumes from I.C. Water Quality Storm (1.25" over 2-hours) (cu.ft.)	Annual (avg. 47.6") (cu.ft.)	Runoff Volumes from I.C. Water Quality Storm (1.25" over 2-hours) (Mgal)	Annual (avg. 47.6") (Mgal)	Potential Management Area Area (SF)	Area (ac)	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Max Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Pot. (2-YR Current) (cfs)	Size of BMP
SEWERSHED C-01 SITES	**3,422,830**			**1,393,004**	**67.2**	**703.5**	**6,395.8**	**145,105**	**5,228,386**	**1.085**	**39.11**	**319,375**	**7.33**	**8.491**	**1,386**	**629,620**	**24**	**79,165**
A-01 **College Achieve Paterson Charter School (Elementary Campus)**																		
Pervious pavement												40,785	0.94	1.150	179	82,280	3.09	8,385
Planter box (downspout)												875	0.02	n/a	3	n/a	n/a	5
Total Site Info	136,104	4609	6,9,10, 11, 12	104,364	5.0	52.7	479.2	10,871	413,979	0.081	3.10	**41,660**	**0.96**	**1.150**	**182**	**82,280**	**3.09**	**8,445**
A-02 **International High School**																		
Bioretention system												2,935	0.07	0.083	13	5,920	0.22	775
Pervious pavement												40,480	0.93	1.141	177	81,670	3.07	8,290
Planter box (downspout)												1,000	0.02	n/a	3	n/a	n/a	5
Total Site Info	202,553	5205	1	165,383	8.0	83.5	759.3	17,227	656,019	0.129	4.91	**44,415**	**1.02**	**1.224**	**193**	**87,590**	**3.29**	**9,125**
A-03 **Lou Costello Memorial Park**																		
Bioretention system												5,925	0.14	0.167	27	11,950	0.45	1,480
Pervious pavement												7,385	0.17	0.208	32	14,900	0.56	1,320
Total Site Info	35,425	4604	1	5,443	0.3	2.7	25.0	567	21,590	0.004	0.16	**13,310**	**0.31**	**0.375**	**59**	**26,850**	**1.01**	**2,800**
A-04 **Our Lady of Pompei Church**																		
Pervious pavement												7,300	0.17	0.190	32	14,730	0.55	1,305
Total Site Info	16,800	4917	20, 21	15,755	0.8	8.0	72.3	1,641	57,768	0.012	0.43	**7,300**	**0.17**	**0.190**	**32**	**14,730**	**0.55**	
A-05 **Paterson Museum**																		
Bioretention system												6,360	0.15	0.179	29	12,830	0.48	1,590
Pervious pavement												25,425	0.58	0.717	110	51,290	1.93	4,640
Planter box (downspout)												865	0.02	n/a	3	n/a	n/a	5
Total Site Info	62,588	4701	1	52,582	2.5	26.6	241.4	5,477	208,577	0.041	1.56	**32,650**	**0.75**	**0.896**	**142**	**64,120**	**2.41**	**6,290**
A-06 **Paterson Public School No. 2**																		
Bioretention system												5,270	0.12	0.149	23	10,630	0.40	1,335
Pervious pavement												32,905	0.76	0.927	144	66,390	2.49	8,930
Planter box (downspout)												3,045	0.07	n/a	11	n/a	n/a	15
Total Site Info	80,874	4608	9,20,16,17,18,	74,573	3.6	37.7	342.4	7,768	295,806	0.058	2.21	**41,220**	**0.95**	**1.076**	**178**	**77,020**	**2.89**	**10,445**
A-07 **Paterson Public School No.7**																		
Bioretention systems												1,500	0.03	0.039	6	3,030	0.11	380
Pervious pavement												19,500	0.45	0.508	86	39,340	1.48	3,480
Total Site Info	48,724	4915	17	42,527	2.1	21.5	195.3	4,430	155,932	0.033	1.17	**21,000**	**0.48**	**0.547**	**91**	**42,370**	**1.59**	**3,860**
A-08 **Pennington Park**																		
Bioretention system												5,720	0.13	0.149	25	11,540	0.43	1,430
Pervious pavement												60,670	1.39	1.581	264	122,400	4.60	19,600
Total Site Info	965,276	5004	2	394,626	19.0	199.3	1,811.9	41,107	1,446,962	0.307	10.82	**66,390**	**1.52**	**1.730**	**289**	**133,940**	**5.03**	**21,030**
A-09 **St Bonaventure's Roman Catholic Church**																		
Bioretention system												1,520	0.03	0.040	6	3,070	0.12	380
Pervious pavement												20,080	0.46	0.523	87	40,510	1.52	5,600
Planter box (downspout)												150	0.00	n/a	0	n/a	n/a	1
Total Site Info	156,199	5105	25	45,497	2.2	23.0	208.9	4,739	166,822	0.035	1.25	**21,750**	**0.49**	**0.563**	**93**	**43,580**	**1.64**	**5,980**
A-10 **Upper Raceway Park**																		
Pervious pavement												23,000	0.53	0.599	101	46,400	1.74	9,505
Total Site Info	753,011	4802	27, 28	97,628	4.7	49.3	448.2	10,170	357,969	0.076	2.68	**23,000**	**0.53**	**0.599**	**101**	**46,400**	**1.74**	**9,505**
A-11 **Veterans Memorial Park**																		
Bioretention system												4,100	0.09	0.107	17	8,270	0.31	1,025
Bioswale												2,580	0.06	0.034	8	2,470	0.01	660
Total Site Info	965,276	5004	2	394,626	19.0	199.3	1,811.9	41,107	1,446,962	0.307	10.82	**6,680**	**0.15**	**0.141**	**25**	**10,740**	**0.32**	**1,685**

Summary of Proposed Green Infrastructure Practices

Subwatershed/Site Name/Total Site Info/GI Practice	Area (SF)	Block	Lot	I.C. Area (SF)	Existing Annual Loads from I.C. (Commercial) TP (lb/yr)	TN (lb/yr)	TSS (lb/yr)	Runoff Volumes from I.C. Water Quality Storm (1.25" over 2-hours) (cu.ft.)	Annual (avg. 47.6") (cu.ft.)	Runoff Volumes from I.C. Water Quality Storm (1.25" over 2-hours) (Mgal)	Annual (avg. 47.6") (Mgal)	Potential Management Area Area (SF)	Area (ac)	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Max Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Pot. (2-YR Current) (cfs)	Size of BMP
SEWERSHED C-02A SITES	**170,141**			**154,590**	**7.5**	**78.1**	**709.8**	**16,103**	**613,206**	**0.120**	**4.59**	**22,645**	**0.52**	**0.590**	**98**	**45,690**	**1.71**	**4,893**
B-01 **Parking Lot Arch St 2**																		
Pervious pavement												2,275	0.05	0.064	10	4,590	0.17	490
Total Site Info	8,212	220	17,1,16	5,768	0.3	2.9	26.5	601	22,881	0.004	0.17	**2,275**	**0.05**	**0.064**	**10**	**4,590**	**0.17**	**490**
B-02 **Church of Jesus Christ**																		
Planter box (downspout)												1,690	0.04	n/a	6	3,410	0.13	18
Total Site Info	9,460	207	12	8,551	0.4	4.3	39.3	891	33,920	0.007	0.25	**1,690**	**0.04**	**0.000**	**6**	**3,410**	**0.13**	**18**
B-03 **Dr. Frank Napier Jr. School of Technology**																		
Bioretention system												11,640	0.27	0.328	51	23,480	0.88	2,930
Total Site Info	132,650	201	41, 43	126,018	6.1	63.6	578.6	13,127	499,870	0.098	3.74	**11,640**	**0.27**	**0.328**	**51**	**23,480**	**0.88**	**2,930**
B-05 **Northside Community Chapel Church**																		
Bioretention system												1,080	0.02	0.030	4	2,180	0.08	270
Pervious pavement												4,256	0.10	0.120	19	8,590	0.32	760
Total Site Info	9,295	206	10,11	8,990	0.4	4.5	41.3	936	35,662	0.007	0.27	**5,336**	**0.12**	**0.150**	**23**	**10,770**	**0.40**	**1,030**
B-08 **Christ Methodist Church**																		
Bioretention system												1,704	0.04	0.048	8	3,440	0.13	425
Total Site Info	10,524	204	17,15,14,16	5,262	0.3	2.7	24.2	548	20,873	0.004	0.16	**1,704**	**0.04**	**0.048**	**8**	**3,440**	**0.13**	**425**
SEWERSHED C-02B SITES	**370,974**			**316,249**	**15.2**	**159.7**	**1,452.0**	**32,943**	**1,214,390**	**0.246**	**9.08**	**133,221**	**3.05**	**3.636**	**580**	**268,770**	**10.09**	**23,195**
B-04 **Faith Soul Saving Station**																		
Bioretention system												3,702	0.08	0.104	15	7,470	0.28	925
Pervious pavement												19,315	0.44	0.544	84	38,970	1.46	3,615
Total Site Info	46,095	502	1,17,16,2	38,161	1.8	19.3	175.2	3,975	151,373	0.030	1.13	**23,017**	**0.52**	**0.648**	**99**	**46,440**	**1.74**	**4,540**
B-06 **Northside Branch Library**																		
Bioretention system												1,365	0.03	0.038	6	2,750	0.10	340
Pervious pavement												16,549	0.38	0.466	72	33,380	1.25	2,955
Total Site Info	67,272	201	1	41,965	2.0	21.2	192.7	4,371	166,460	0.033	1.25	**17,914**	**0.41**	**0.504**	**78**	**36,130**	**1.35**	
B-07 **Paterson Public School No. 5**																		
Bioretention system												5,920	0.14	0.167	27	11,950	0.45	1,480
Pervious pavement												30,830	0.71	0.869	135	62,200	2.34	6,720
Total Site Info	103,615	802	1	102,579	4.9	51.8	471.0	10,685	406,896	0.080	3.04	**36,750**	**0.85**	**1.036**	**162**	**74,150**	**2.79**	**8,200**
B-09 **St Mary Help of Christians Roman Catholic Church**																		
Pervious pavement												34,025	0.78	0.887	148	68,640	2.58	6,615
Total Site Info	65,000	917	3, 4, 9-14	63,240	3.0	31.9	290.4	6,588	231,880	0.049	1.73	**34,025**	**0.78**	**0.887**	**148**	**68,640**	**2.58**	**6,615**
B-10 **Belmont Senior Apartments**																		
Pervious pavement												21,515	0.49	0.561	93	43,410	1.63	3,840
Total Site Info	88,992	602	1	70,304	3.4	35.5	322.8	7,323	257,781	0.055	1.93	**21,515**	**0.49**	**0.561**	**93**	**43,410**	**1.63**	**3,840**
SEWERSHED C-03 SITES	**79,210**			**67,813**	**3.3**	**34.2**	**311.4**	**7,064**	**268,990**	**0.053**	**2.01**	**26,358**	**0.60**	**0.742**	**114**	**53,170**	**2.00**	**6,818**
C-01 **Cobb Park**																		
Pervious pavement												1,860	0.04	0.052	8	3,750	0.14	1,858
Total Site Info	12,221	113	1	8,630	0.4	4.4	39.6	899	34,233	0.007	0.26	**1,860**	**0.04**	**0.052**	**8**	**3,750**	**0.14**	**1,858**
C-02 **Gilmore Memorial Christian**																		
Bioretention system												950	0.02	0.027	4	1,910	0.07	420
Pervious pavement												6,295	0.14	0.177	27	12,700	0.48	1,150
Total Site Info	23,951	503	59,1,60,61	20,230	1.0	10.2	92.9	2,107	80,248	0.016	0.60	**7,245**	**0.16**	**0.204**	**30**	**14,610**	**0.55**	**1,570**
C-03 **Gilmore Memorial Tabernacle**																		
Pervious pavement												10,170	0.23	0.287	44	20,520	0.77	1,860
Total Site Info	29,326	110	6, 17, 18, 19, 2	27,273	1.3	13.8	125.2	2,841	108,184	0.021	0.81	**10,170.000**	**0.230**	**0.287**	**44**	**20,520**	**0.77**	**1,860**
C-04 **Holy Tabernacle Apostolic Church**																		
Bioretention system												753	0.02	0.021	4	1,520	0.06	200
Pervious pavement												6,330	0.15	0.178	29	12,770	0.48	1,330
Total Site Info	13,712	114	1, 3, 4, 5	11,679	0.6	5.9	53.6	1,217	46,326	0.009	0.35	**7,083**	**0.17**	**0.199**	**32**	**14,290**	**0.54**	**1,530**

Summary of Proposed Green Infrastructure Practices

Subwatershed/Site Name/Total Site Info/GI Practice	Area (SF)	Block	Lot	I.C. Area (SF)	Existing Annual Loads from I.C. (Commercial) TP (lb/yr)	TN (lb/yr)	TSS (lb/yr)	Runoff Volumes from I.C. Water Quality Storm (1.25" over 2-hours) (cu.ft.)	Annual (avg. 47.6") (cu.ft.)	Runoff Volumes from I.C. Water Quality Storm (1.25" over 2-hours) (Mgal)	Annual (avg. 47.6") (Mgal)	Potential Management Area Area (SF)	Area (ac)	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Max Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Pot. (2-YR Current) (cfs)	Size of BMP
SEWERSHED C-04 SITES	**115,195**			**101,276**	**4.9**	**51.1**	**465.0**	**10,550**	**401,727**	**0.079**	**3.00**	**46,345**	**1.06**	**1.282**	**9,633**	**91,770**	**3.45**	**9,633**
D-01 **Christ Temple Baptist Church**																		
Bioretention system												990	0.02	0.028	4	2,000	0.08	260
Pervious pavement												23,395	0.54	0.659	103	47,200	1.77	5,015
Planter box (downspout)												860	0.02	n/a	3	n/a	n/a	4
Total Site Info	59,780	107	1,2,3,4,5,6,7,8	49,617	2.4	25.1	227.8	5,168	196,816	0.039	1.47	**25,245**	**0.58**	**0.687**	**110**	**49,200**	**1.85**	**5,323**
D-02 **Paterson Public School #12**																		
Pervious pavement												21,100	0.48	0.595	91	42,570	1.60	4,310
Total Site Info	55,415	109	1	51,658	2.5	26.1	237.2	5,381	204,911	0.040	1.53	**21,100**	**0.48**	**0.595**	**91**	**42,570**	**1.60**	**4,310**
SEWERSHED C-05 SITES	**12,499**			**11,624**	**0.6**	**5.9**	**53.4**	**1,211**	**42,622**	**0.009**	**0.32**	**7,992**	**0.19**	**0.191**	**36**	**16,120**	**0.61**	**1,310**
E-01 **Iglesia Pentecostal El Buen Pastor**																		
Pervious pavement												7,322	0.17	0.191	32	14,770	0.56	1,310
Planter box (downspout)												670	0.02	n/a	3	1,350	0.05	4
Total Site Info	12,499	3703	3,5,4	11,624	0.6	5.9	53.4	1,211	42,622	0.009	0.32	**7,992**	**0.19**	**0.191**	**36**	**16,120**	**0.61**	**1,310**
SEWERSHED C-06 SITES	**60,393**			**22,346**	**1.08**	**11.3**	**102.6**	**2,328**	**88,637**	**0.017**	**0.66**	**16,732**	**0.38**	**0.472**	**72**	**33,760**	**1.27**	**2,995**
F-01 **Dog Park Lawrence Street**																		
Pervious pavement												16,732	0.38	0.472	72	33,760	1.27	2,995
Total Site Info	60,393	3105	1	22,346	1.1	11.3	102.6	2,328	88,637	0.017	0.66	**16,732**	**0.38**	**0.472**	**72**	**33,760**	**1.27**	**2,995**
SEWERSHED C-07 SITES	**306,880**			**192,094**	**9.3**	**97.0**	**882.0**	**20,010**	**761,972**	**0.150**	**5.70**	**115,350**	**2.64**	**2.915**	**494**	**208,650**	**7.85**	**33,507**
G-01 **Freedom Village Apartments**																		
Bioretention system												7,720	0.18	0.218	34	15,570	0.59	1,950
Pervious pavement												26,150	0.60	0.737	114	52,760	1.98	4,670
Planter box (downspout)												11,925	0.27	n/a	43	n/a	n/a	56
Total Site Info	91,281	3113	1,2,13-15	88,932	4.3	44.9	408.3	9,264	352,762	0.069	2.64	**45,795**	**1.05**	**0.955**	**191**	**68,330**	**2.57**	**7,292**
G-02 **Grace Gospel Church**																		
Bioretention system												2,710	0.06	0.076	11	5,470	0.21	680
Total Site Info	14,960	3201	30	9,616	0.5	4.9	44.2	1,002	38,144	0.007	0.29	**2,710**	**0.06**	**0.076**	**11**	**5,470**	**0.21**	**680**
G-03 **Grace Gospel Church Parking Lot**																		
Pervious pavement												6,480	0.15	0.183	29	13,080	0.49	1,160
Total Site Info	12,407	3109	21, 22	5,296	0.3	2.7	24.3	552	21,007	0.004	0.16	**6,480**	**0.15**	**0.183**	**29**	**13,080**	**0.49**	**1,160**
G-04 **Mercer St & Fulton St Public Land**																		
Bioretention system												15,590	0.36	0.439	68	31,450	1.18	3,920
Total Site Info	28,450	3111	1-20, 21.01-25.	1,569	0.1	0.8	7.2	163	6,224	0.001	0.05	**15,590**	**0.36**	**0.439**	**68**	**31,450**	**1.18**	**3,920**
G-05 **New Life Evangelist Center**																		
Bioretention system												6,300	0.14	0.178	27	12,710	0.48	1,580
Pervious pavement												5,615	0.13	0.158	25	11,320	0.43	1,540
Total Site Info	31,046	3606	4,13,14	19,801	1.0	10.0	90.9	2,063	78,544	0.015	0.59	**11,915**	**0.27**	**0.336**	**51**	**24,030**	**0.91**	**3,120**
G-06 **Second Baptist Church**																		
Pervious pavement												19,635	0.45	0.553	86	39,610	1.49	4,720
Total Site Info	29,025	3603	16,18-21	28,202	1.4	14.2	129.5	2,938	111,867	0.022	0.84	**19,635**	**0.45**	**0.553**	**86**	**39,610**	**1.49**	**4,720**
G-07 **Wrigley Park**																		
Pervious pavement												13,225	0.30	0.373	57	26,680	1.00	12,615
Total Site Info	99,711	3214	1,2,3	38,678	1.9	19.5	177.6	4,029	153,424	0.030	1.15	**13,225**	**0.30**	**0.373**	**57**	**26,680**	**1.00**	**12,615**

Summary of Proposed Green Infrastructure Practices

Subwatershed/Site Name/Total Site Info/GI Practice	Area (SF)	Block	Lot	I.C. Area (SF)	Existing Annual Loads from I.C. (Commercial) TP (lb/yr)	TN (lb/yr)	TSS (lb/yr)	Runoff Volumes from I.C. Water Quality Storm (1.25" over 2-hours) (cu.ft.)	Annual (avg. 47.6") (cu.ft.)	Runoff Volumes from I.C. Water Quality Storm (1.25" over 2-hours) (Mgal)	Annual (avg. 47.6") (Mgal)	Potential Management Area Area (SF)	Area (ac)	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Max Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Pot. (2-YR Current) (cfs)	Size of BMP
SEWERSHED C-08 SITES	**76,234**			**39,221**	**1.9**	**19.8**	**180.1**	**4,086**	**155,577**	**0.031**	**1.16**	**14,125**	**0.32**	**0.398**	**61**	**28,500**	**1.07**	**3,050**
H-01 **Nathan Barnert Residence**																		
Bioretention system												6,250	0.14	0.176	27	12,610	0.47	1,560
Pervious pavement												7,875	0.18	0.222	34	15,890	0.60	1,490
Total Site Info	76,234	3010	1	39,221	1.9	19.8	180.1	4,086	155,577	0.031	1.16	**14,125**	**0.32**	**0.398**	**61**	**28,500**	**1.07**	**3,050**
SEWERSHED C-10 SITES	**71,750**			**71,517**	**3.4**	**36.1**	**328.4**	**7,450**	**283,683**	**0.056**	**2.12**	**21,520**	**0.49**	**0.456**	**90**	**32,912**	**1.22**	**6,169**
J-01 **Paterson Public School No. 21**																		
Bioretention system												3,225	0.07	0.091	13	6,510	0.24	850
Pervious pavement												12,935	0.30	0.365	57	26,100	0.98	4,935
Planter box (downspout)												5,360	0.12	n/a	19	302	n/a	32
Total Site Info	71,750	3316	1,2,3,15,16	71,517	3.4	36.1	328.4	7,450	283,683	0.056	2.12	**21,520**	**0.49**	**0.456**	**90**	**32,912**	**1.22**	**6,169**
SEWERSHED C-11 SITES	**601,974**			**527,349**	**25.4**	**266.3**	**2,421.3**	**54,932**	**2,013,496**	**0.411**	**15.06**	**216,198**	**4.96**	**5.712**	**938**	**424,630**	**16.11**	**47,837**
K-01 **Barnet Medical Arts Parking Lot 1**																		
Pervious pavement												56,574	1.30	1.474	247	114,140	4.29	11,754
Total Site Info	57,398	8502	2	57,299	2.8	28.9	263.1	5,969	210,096	0.045	1.57	**56,574**	**1.30**	**1.474**	**247**	**114,140**	**4.29**	**11,754**
K-03 **Faith Chapel Reformed Church**																		
Bioretention system												2,315	0.05	0.060	10	4,670	0.18	585
Planter box (downspout)												1,345	0.03	n/a	5	n/a	n/a	7
Total Site Info	13,438	3808	1	5,106	0.2	2.6	23.4	532	18,724	0.004	0.14	**3,660**	**0.08**	**0.060**	**15**	**4,670**	**0.18**	**585**
K-04 **Love of Jesus Paterson**																		
Bioretention system												4,290	0.10	0.121	19	8,650	0.33	1,115
Pervious pavement												25,620	0.59	0.722	112	51,690	1.94	5,265
Total Site Info	65,484	3511	4,5	59,413	2.9	30.0	272.8	6,189	235,672	0.046	1.76	**29,910**	**0.69**	**0.843**	**131**	**60,340**	**2.27**	**6,380**
K-05 **Manara College**																		
Bioretention system												1,005	0.02	0.026	4	2,030	0.08	245
Bioswale												1,930	0.04	0.025	6	230	0.15	460
Total Site Info	21,685	8510	1	9,738	0.5	4.9	44.7	1,014	35,706	0.008	0.27	**2,935**	**0.07**	**0.051**	**10**	**2,260**	**0.23**	**705**
K-06 **Paterson Public School 26**																		
Bioretention system												10,900	0.25	0.284	48	21,990	0.83	2,725
Pervious pavement												28,434	0.65	0.741	124	57,360	2.16	7,840
Total Site Info	167,630	8309	2,3,6,29	165,954	8.0	83.8	762.0	17,287	608,497	0.129	4.55	**39,334**	**0.90**	**1.025**	**172**	**79,350**	**2.99**	**10,565**
K-07 **Paterson Adult Day Center**																		
Bioretention system												5,755	0.13	0.162	25	11,610	0.44	1,445
Pervious pavement												9,300	0.21	0.262	40	18,760	0.71	1,840
Total Site Info	52,508	3210	1	33,400	1.6	16.9	153.4	3,479	132,487	0.026	0.99	**15,055**	**0.34**	**0.424**	**65**	**30,370**	**1.15**	**3,285**
K-08 **Radio Vision Cristiana**																		
Pervious pavement												19,580	0.45	0.552	86	39,500	1.48	4,380
Total Site Info	31,052	3511	7,11,12	29,341	1.4	14.8	134.7	3,056	116,388	0.023	0.87	**19,580**	**0.45**	**0.552**	**86**	**39,500**	**1.48**	**4,380**
K-09 **Rosa L. Parks School of Fine & Performing Arts**																		
Bioretention system												1,205	0.03	0.034	6	2,430	0.09	300
Pervious pavement												6,085	0.14	0.172	27	12,270	0.46	1,365
Total Site Info	84,000	3409	5	75,022	3.6	37.9	344.5	7,815	297,586	0.058	2.23	**7,290**	**0.17**	**0.206**	**32**	**14,700**	**0.55**	**1,665**

Summary of Proposed Green Infrastructure Practices

Subwatershed/Site Name/Total Site Info/GI Practice	Area (SF)	Block	Lot	I.C. Area (SF)	Existing Annual Loads from I.C. (Commercial) TP (lb/yr)	TN (lb/yr)	TSS (lb/yr)	Runoff Volumes from I.C. Water Quality Storm (1.25" over 2-hours) (cu.ft.)	Annual (avg. 47.6") (cu.ft.)	Runoff Volumes from I.C. Water Quality Storm (1.25" over 2-hours) (Mgal)	Annual (avg. 47.6") (Mgal)	Potential Management Area Area (SF)	Area (ac)	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Max Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Pot. (2-YR Current) (cfs)	Size of BMP
SEWERSHED C-11 SITES CONTINUED	**601,974**			**527,349**	**25.4**	**266.3**	**2421.3**	**54,932**	**2,013,496**	**0.411**	**15.06**	**216,198**	**4.96**	**5.712**	**938**	**424,630**	**16.11**	**47,837**
K-10 **St. Paul's Episcopal Church**																		
Bioretention system												1,630	0.04	0.046	8	3,290	0.12	415
Pervious pavement												10,955	0.25	0.309	48	22,100	0.83	2,800
Planter box (downspout)												2,555	0.06	n/a	10	n/a	n/a	14
Total Site Info	39,067	4202	7-11	37,735	1.8	19.1	173.3	3,931	149,680	0.029	1.12	**15,140**	**0.35**	**0.355**	**65**	**25,390**	**0.95**	**3,383**
K-11 **St Therese Roman Catholic Church**																		
Bioretention system												960	0.02	0.025	4	1,940	0.07	240
Pervious pavement												13,920	0.32	0.363	61	28,080	1.06	2,485
Total Site Info	24,709	8506	1,2,3,4	22,975	1.1	11.6	105.5	2,393	84,242	0.018	0.63	**14,880**	**0.34**	**0.388**	**65**	**30,020**	**1.13**	**2,725**
K-12 **United Presbyterian Church**																		
Bioretention system												4,000	0.09	0.113	17	8,070	0.30	1,000
Pervious pavement												7,840	0.18	0.221	34	15,820	0.59	1,410
Total Site Info	45,003	4201	9,10	31,366	1.5	15.8	144.0	3,267	124,418	0.024	0.93	**11,840**	**0.27**	**0.334**	**51**	**23,890**	**0.89**	**2,410**
SEWERSHED C-12 SITES	**1,083,828**			**750,197**	**36.2**	**378.9**	**3,444.4**	**78,146**	**2,893,448**	**0.585**	**21.64**	**273,296**	**6.28**	**7.164**	**1,185**	**527,700**	**19.84**	**68,416**
L-01 **Amistad Park (Vreeland Triangle, 19th Street)**																		
Bioretention system												900	0.02	0.023	4	1,820	0.07	225
Total Site Info	23,872	8020	1	3,877	0.2	2.0	17.8	404	14,216	0.003	0.11	**900**	**0.02**	**0.023**	**4**	**1,820**	**0.07**	**225**
L-02 **Brandes Field Playground**																		
Bioretention system												3,000	0.07	0.078	13	6,050	0.23	750
Pervious pavement												11,750	0.27	0.306	51	23,700	0.89	2,100
Total Site Info	115,572	5412	2	38,082	1.8	19.2	174.8	3,967	139,634	0.030	1.04	**14,750**	**0.34**	**0.384**	**65**	**29,750**	**1.12**	**2,850**
L-03 **Dr. Hani Awadallah School**																		
Bioretention system												23,410	0.54	0.610	103	47,230	1.77	7,200
Pervious pavement												11,625	0.27	0.303	51	23,450	0.88	2,850
Total Site Info	152,626	5409	10-21	150,257	7.2	75.9	689.9	15,652	550,942	0.117	4.12	**35,035**	**0.81**	**0.913**	**154**	**70,680**	**2.65**	**10,050**
L-04 **Dr. Martin Luther King Jr. Public School**																		
Bioretention system												9,210	0.21	0.260	40	18,580	0.70	2,325
Pervious pavement												28,090	0.64	0.792	122	56,670	2.13	5,720
Planter box (downspout)												4,515	0.10	n/a	16	n/a	n/a	21
Total Site Info	224,134	8711	2	157,825	7.6	79.7	724.6	16,440	626,039	0.123	4.68	**41,815**	**0.95**	**1.052**	**178**	**75,250**	**2.83**	**8,297**
L-05 **Full Service Community Center**																		
Pervious pavement												5,955	0.14	0.168	27	12,010	0.45	1,285
Total Site Info	20,666	6407	7	18,502	0.9	9.3	84.9	1,927	73,391	0.014	0.55	**5,955**	**0.14**	**0.168**	**27**	**12,010**	**0.45**	**1,285**
L-06 **GBCA Paterson Head Start**																		
Pervious pavement												33,200	0.76	0.865	145	66,980	2.52	8,122
Total Site Info	55,000	8807	1,2	54,318	2.6	27.4	249.4	5,658	199,166	0.042	1.49	**33,200**	**0.76**	**0.865**	**145**	**66,980**	**2.52**	**8,122**
L-07 **Maurice J. Brick Residence**																		
Bioretention system												6,145	0.14	0.173	27	12,390	0.47	1,560
Pervious pavement												12,995	0.30	0.366	57	26,220	0.99	2,690
Planter box (downspout)												4,335	0.10	n/a	16	n/a	n/a	21
Total Site Info	82,298	6903	1	52,280	2.5	26.4	240.0	5,446	207,377	0.041	1.55	**23,475**	**0.54**	**0.539**	**100**	**38,610**	**1.46**	**4,502**
L-08 **Paterson Public School No. 15**																		
Bioretention system												12,830	0.29	0.362	55	25,880	0.97	3,260
Pervious pavement												69,540	1.60	1.960	304	140,290	5.27	20,010
Total Site Info	243,397	6307	46	153,725	7.4	77.6	705.8	16,013	609,776	0.120	4.56	**82,370**	**1.89**	**2.322**	**359**	**166,170**	**6.24**	**23,270**
L-09 **Paterson Public School 20**																		
Pervious pavement												10,530	0.24	0.274	46	21,240	0.80	1,885
Planter box (downspout)												2,866	0.07	n/a	11	n/a	n/a	12
Total Site Info	46,613	7901	12,13,17,26	27,469	1.3	13.9	126.1	2,861	100,720	0.021	0.75	**13,396**	**0.31**	**0.274**	**56**	**21,240**	**0.80**	**1,885**

Summary of Proposed Green Infrastructure Practices

Subwatershed/Site Name/Total Site Info/GI Practice	Area (SF)	Block	Lot	I.C. Area (SF)	Existing Annual Loads from I.C. (Commercial) TP (lb/yr)	TN (lb/yr)	TSS (lb/yr)	Runoff Volumes from I.C. Water Quality Storm (1.25" over 2-hours) (cu.ft.)	Annual (avg. 47.6") (cu.ft.)	Runoff Volumes from I.C. Water Quality Storm (1.25" over 2-hours) (Mgal)	Annual (avg. 47.6") (Mgal)	Potential Management Area Area (SF)	Area (ac)	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Max Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Pot. (2-YR Current) (cfs)	Size of BMP
SEWERSHED C-12 SITES (CONTINUED)	**1,591,381**			**699,408**	**33.7**	**353.2**	**3,211.2**	**72,855**	**2,774,186**	**0.545**	**20.75**	**104,187**	**2.39**	**2.928**	**454**	**210,190**	**7.90**	**31,997**
L-10 **Paterson Public School No. 24**																		
Bioretention system												6,815	0.16	0.192	30	13,750	0.52	1,720
Pervious pavement												11,660	0.27	0.329	51	23,520	0.88	5,230
Total Site Info	105,877	9008	1	93,421	4.5	47.2	428.9	9,731	370,570	0.073	2.77	**18,475**	**0.43**	**0.521**	**82**	**37,270**	**1.40**	**6,950**
L-11 **Vreeland Park (Vreeland Triangle, 20th Street)**																		
Bioretention system												3,925	0.09	0.102	17	7,920	0.30	980
Total Site Info	13,774	7902	1	441	0.0	0.2	2.0	46	1,617	0.000	0.01	**3,925**	**0.09**	**0.102**	**17**	**7,920**	**0.30**	**980**
SEWERSHED C-15 SITES	**421,763**			**288,610**	**13.9**	**145.8**	**1,325.1**	**30,064**	**1,132,601**	**0.225**	**8.47**	**151,595**	**3.48**	**3.899**	**653**	**281,750**	**10.59**	**29,633**
M-01 **Heritage at Alexander Hamilton GrandParents Relative Care**																		
Pervious pavement												17,390	0.40	0.453	76	35,080	1.32	3,735
Total Site Info	45,764	7505.04	10,11	40,724	2.0	20.6	187.0	4,242	149,321	0.032	1.12	**17,390**	**0.40**	**0.453**	**76**	**35,080**	**1.32**	**3,735**
M-02 **Kingdom Hall of Jehovah's Witnesses**																		
Bioretention system												3,475	0.08	0.098	15	7,010	0.26	880
Pervious pavement												9,515	0.22	0.268	42	19,190	0.72	1,785
Planter box (downspout)												880	0.02	n/a	3	n/a	n/a	5
Total Site Info	27,499	7601	1-3	19,345	0.9	9.8	88.8	2,015	76,734	0.015	0.57	**13,870**	**0.32**	**0.366**	**60**	**26,200**	**0.98**	**2,725**
M-03 **Paterson Art & Science Charter School**																		
Bioretention system												6,945	0.16	0.196	30	14,010	0.53	1,740
Pervious pavement												8,945	0.21	0.252	40	18,050	0.68	1,620
Total Site Info	42,500	7012	1-4, 26	38,934	1.9	19.7	178.8	4,056	154,438	0.030	1.16	**15,890**	**0.37**	**0.448**	**70**	**32,060**	**1.21**	**3,360**
M-04 **Paterson Public School No. 25**																		
Bioretention system												32,370	0.74	0.912	141	65,310	2.45	8,145
Pervious pavement												17,960	0.41	0.506	78	36,230	1.36	3,290
Planter box (downspout)												5,160	0.12	n/a	19	n/a	n/a	24
Total Site Info	213,500	7607	1	114,490	5.5	57.8	525.7	11,926	454,144	0.089	3.40	**55,490**	**1.27**	**1.418**	**238**	**101,540**	**3.81**	**11,723**
M-05 **St. George Syro Malabar Catholic Church**																		
Bioretention system												405	0.01	0.011	2	820	0.03	100
Pervious pavement												23,830	0.55	0.672	105	48,070	1.81	4,240
Planter box (downspout)												2,665	0.06	n/a	10	n/a	n/a	14
Total Site Info	44,999	7013	1-3, 11	36,859	1.8	18.6	169.2	3,839	146,207	0.029	1.09	**26,900**	**0.62**	**0.683**	**116**	**48,890**	**1.84**	**4,508**
M-06 **United Islamic Center**																		
Pervious pavement												18,825	0.43	0.531	82	37,980	1.43	3,390
Planter box (downspout)												3,230	0.07	n/a	11	n/a	n/a	16
Total Site Info	47,500	7706	1,2,13-16,20,2	38,258	1.8	19.3	175.7	3,985	151,757	0.030	1.14	**22,055**	**0.50**	**0.531**	**93**	**37,980**	**1.43**	**3,582**
SEWERSHED PF-01 SITES	**3,383,107**			**1,498,219**	**72.2**	**756.7**	**6,878.9**	**156,064**	**5,699,925**	**1.167**	**42.64**	**327,002**	**6.98**	**8.712**	**1,423**	**653,420**	**24.56**	**81,250**
N-01 **Brooks Sloate Terrace**																		
Pervious pavement												55,355	1.27	1.560	241	111,680	4.20	14,890
Total Site Info	1,184,316	1101	1	523,881	25.3	264.6	2,405.3	54,571	2,078,061	0.408	15.54	**55,355**	**1.27**	**1.560**	**241**	**111,680**	**4.20**	**14,890**
N-02 **Grace Buckley Park**																		
Bioretention system												7,542	0.17	0.213	32	15,210	0.57	1,917
Pervious pavement												18,890	0.43	0.532	82	38,110	1.43	7,260
Total Site Info	287,414	1004	42	81,665	3.9	41.2	375.0	8,507	323,939	0.064	2.42	**26,432**	**0.60**	**0.745**	**114**	**53,320**	**2.00**	**9,177.00**
N-03 **John F Kennedy High School**																		
Bioretention system												34,175	0.78	0.890	148	68,940	2.59	8,740
Pervious pavement												69,090	1.59	1.800	302	139,390	5.24	12,760
Total Site Info	427,503	1401	2	356,950	17.2	180.3	1,638.9	37,182	1,308,817	0.278	9.79	**103,265**	**2.37**	**2.690**	**450**	**208,330**	**7.83**	**21,500**
N-04 **Paterson Public School No. 27**																		
Bioretention system												1,200	0.03	0.031	6	2,420	0.09	300
Pervious pavement												23,875	0.55	0.622	105	48,160	1.81	4,265
Total Site Info	130,000	1708	1, 2, 9	125,578	6.1	63.4	576.6	13,081	460,453	0.098	3.44	**25,075**	**0.58**	**0.653**	**110**	**50,580**	**1.90**	**4,565**

Summary of Proposed Green Infrastructure Practices

Subwatershed/Site Name/Total Site Info/GI Practice	Area (SF)	Block	Lot	I.C. Area (SF)	Existing Annual Loads from I.C. (Commercial) TP (lb/yr)	TN (lb/yr)	TSS (lb/yr)	Runoff Volumes from I.C. Water Quality Storm (1.25" over 2-hours) (cu.ft.)	Annual (avg. 47.6") (cu.ft.)	Runoff Volumes from I.C. Water Quality Storm (1.25" over 2-hours) (Mgal)	Annual (avg. 47.6") (Mgal)	Potential Management Area Area (SF)	Area (ac)	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Max Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Pot. (2-YR Current) (cfs)	Size of BMP
SEWERSHED PF-01 SITES (CONTINUED)	**3,383,107**			**1,498,219**	**72.2**	**756.7**	**6,878.9**	**156,064**	**5,699,925**	**1.167**	**42.64**	**327,002**	**6.98**	**8.712**	**1,423**	**653,420**	**24.56**	**81,250**
N-05 **Public School 19**																		
Bioretention system												3,900	0.09	0.102	17	7,870	0.30	975
Downspout planter box												3,110	0.07	n/a	11	n/a	n/a	18
Total Site Info	30,738	901	11	30,737	1.5	15.5	141.1	3,202	112,702	0.024	0.84	**7,010**	**0.09**	**0.102**	**28**	**7,870**	**0.30**	**993**
N-06 **St Gerard Majella Roman Catholic Church**																		
Bioretention system												11,440	0.26	0.322	49	23,080	0.87	2,895
Pervious pavement												35,260	0.81	0.994	154	71,130	2.67	6,525
Total Site Info	97,581	1005	3	82,639	4.0	41.7	379.4	8,608	327,801	0.064	2.45	**46,700**	**1.07**	**1.316**	**203**	**94,210**	**3.54**	**9,420.00**
N-07 **Westside Park**																		
Bioretention system												43,365	1.00	1.130	190	87,490	3.29	11,125
Pervious pavement												19,800	0.45	0.516	86	39,940	1.50	9,580
Total Site Info	1,225,555	1401	1	296,769	14.3	149.9	1,362.6	30,913	1,088,153	0.231	8.14	**63,165**	**1.00**	**1.646**	**276**	**127,430**	**4.79**	**20,705**
SEWERSHED PF-02 SITES	**12,502**			**9,308**	**0.4**	**4.7**	**42.7**	**970**	**34,129**	**0.007**	**0.26**	**2,975**	**0.03**	**0.038**	**11**	**2,960**	**0.11**	**370**
O-01 **Iglesia Nuevo Nacimiento 'New Birth'**																		
Bioretention system												1,470	0.03	0.038	6	2,960	0.11	370
Downspout planter box												1,505	0.03	n/a	5	n/a	n/a	7
Total Site Info	12,502	1402	13	9,308	0.4	4.7	42.7	970	34,129	0.007	0.26	**2,975**	**0.03**	**0.038**	**11**	**2,960**	**0.11**	**370**
SEWERSHED PF-06 SITES	**189,086**			**184,934**	**8.9**	**93.4**	**849.1**	**19,264**	**733,572**	**0.144**	**5.49**	**74,280**	**1.71**	**2.094**	**325**	**149,860**	**5.63**	**23,505**
P-01 **Paterson City Council**																		
Pervious pavement												3,405	0.08	0.096	15	6,870	0.26	705
Total Site Info	26,818	4408	1	25,143	1.2	12.7	115.4	2,619	99,734	0.020	0.75	**3,405**	**0.08**	**0.096**	**15**	**6,870**	**0.26**	**705**
P-02 **Dr. Frank X. Graves Public Safety Complex**																		
Pervious pavement												70,875	1.63	1.998	310	142,990	5.37	22,800
Total Site Info	162,268	3709	2	159,791	7.7	80.7	733.7	16,645	633,839	0.125	4.74	**70,875**	**1.63**	**1.998**	**310**	**142,990**	**5.37**	**22,800**
SEWERSHED PF-07 SITES	**1,657,289**			**1,306,546**	**63.0**	**659.9**	**5,998.8**	**136,099**	**5,142,400**	**1.018**	**38.47**	**333,809**	**7.67**	**9.084**	**1,451**	**654,650**	**23.88**	**75,237**
Q-01 **Cathedral of St. John the Baptist**																		
Bioretention system												10,175	0.23	0.287	44	20,530	0.77	2,545
Total Site Info	54,168	6217	1	45,712	2.2	23.1	209.9	4,762	181,324	0.036	1.36	**10,175**	**0.23**	**0.287**	**44**	**20,530**	**0.77**	**2,545**
Q-02 **Christian Fellowship Center**																		
Bioretention system												745	0.02	0.021	4	1,500	0.06	190
Pervious pavement												3,865	0.09	0.109	17	7,790	0.29	775
Total Site Info	24,038	4201	13-18	21,963	1.1	11.1	100.8	2,288	87,120	0.017	0.65	**4,610**	**0.11**	**0.130**	**21**	**9,290**	**0.35**	**965**
Q-03 **Court House Plaza**																		
Pervious pavement												4,420	0.10	0.125	19	8,920	0.34	2,065
Total Site Info	55,371	6218	2	54,264	2.6	27.4	249.1	5,652	215,246	0.042	1.61	**4,420**	**0.10**	**0.125**	**19**	**8,920**	**0.34**	**2,065**
Q-04 **Eastside High School**																		
Bioretention system												9,850	0.23	0.278	44	19,870	0.75	2,810
Pervious pavement												87,485	2.01	2.466	382	176,500	6.63	17,065
Planter box (downspout)												985	0.02	n/a	3	n/a	n/a	5
Total Site Info	305,914	4101	6	272,928	13.2	137.8	1,253.1	28,430	1,082,614	0.213	8.10	**98,320**	**2.26**	**2.744**	**429**	**196,370**	**7.38**	**19,935**
Q-05 **Greater Bible Way Church**																		
Bioretention system												2,020	0.05	0.057	10	4,080	0.15	505
Pervious pavement												20,000	0.46	0.564	87	40,350	1.52	3,840
Planter box (downspout)												1,405	0.03	n/a	5	n/a	n/a	7
Total Site Info	30,001	6309	1-3,15-17	27,578	1.3	13.9	126.6	2,873	109,393	0.021	0.82	**23,425**	**0.54**	**0.621**	**102**	**44,430**	**1.67**	**4,513**
Q-06 **Internal Revenue Service (IRS) Taxpayer Assistance Center**																		
Bioretention system												8,272	0.19	0.233	36	16,690	0.63	2,206
Total Site Info	200,538	6204	1,2,3	184,153	8.9	93.0	845.5	19,183	730,475	0.143	5.46	**8,272**	**0.19**	**0.233**	**36**	**16,690**	**0.63**	**2,206**
Q-07 **Memorial Day School Georgette Hauser Campus**																		
Pervious pavement												6,836	0.16	0.193	30	13,790	0.52	1,745
Total Site Info	12,810	4323	1,7,8	12,053	0.6	6.1	55.3	1,256	47,810	0.009	0.36	**6,836**	**0.16**	**0.193**	**30**	**13,790**	**0.52**	**1,745**

Summary of Proposed Green Infrastructure Practices

Subwatershed/Site Name/Total Site Info/GI Practice	Area (SF)	Block	Lot	I.C. Area (SF)	Existing Annual Loads from I.C. (Commercial) TP (lb/yr)	TN (lb/yr)	TSS (lb/yr)	Runoff Volumes from I.C. Water Quality Storm (1.25" over 2-hours) (cu.ft.)	Annual (avg. 47.6") (cu.ft.)	Runoff Volumes from I.C. Water Quality Storm (1.25" over 2-hours) (Mgal)	Annual (avg. 47.6") (Mgal)	Potential Management Area Area (SF)	Area (ac)	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Max Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Pot. (2-YR Current) (cfs)	Size of BMP
SEWERSHED PF-07 SITES (CONTINUED)	**1,657,289**			**1,306,546**	**63.0**	**659.9**	**5,998.8**	**136,099**	**5,142,400**	**1.018**	**38.47**	**333,809**	**7.67**	**9.084**	**1,451**	**654,650**	**23.88**	**75,237**
Q-08 **New Roberto Clemente School**																		
Bioretention system												6,415	0.15	0.181	29	12,940	0.49	1,605
Pervious pavement												27,110	0.62	0.764	118	54,690	2.06	9,635
Total Site Info	152,688	6406	1	149,911	7.2	75.7	688.3	15,616	594,647	0.117	4.45	**33,525**	**0.77**	**0.945**	**146**	**67,630**	**2.55**	**11,240**
Q-09 **Our Lady of Victories Roman Catholic Church**																		
Bioretention system												1,570	0.04	0.044	8	3,160	0.12	405
Pervious pavement												9,785	0.22	0.276	42	19,740	0.74	1,795
Planter box (downspout)												955	0.02	n/a	3	n/a	n/a	5
Total Site Info	48,322	3707	1,2,3,4,5,	45,987	2.2	23.2	211.1	4,790	182,415	0.036	1.36	**12,310**	**0.28**	**0.320**	**53**	**22,900**	**0.12**	**2,260**

APPENDIX

E DETAILED CONSTRUCTION COST ESTIMATES

SEWERSHED C-01

A-01 College Achieve Paterson Charter School - Elementary Campus

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 4,264.80	$ 4,264.80
2	Soil Erosion Sediment Control Permit Application Fee	EACH	1	$ 450.00	$ 450.00
3	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 1,421.60	$ 1,421.60
4	Pervious Pavement	SF	8,385	$ 16.00	$ 134,160.00
5	Downspout Planter Box	EACH	5	$ 1,600.00	$ 8,000.00
6	Contingency (30%)	LS	1	$ 44,488.92	$ 44,488.92

Total Cost:	$ 192,785

A-02 International High School

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 4,810.00	$ 4,810.00
2	Soil Erosion Sediment Control Permit Application Fee	EACH	1	$ 450.00	$ 450.00
3	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 1,610.00	$ 1,610.00
4	Bioretention System	SF	775	$ 25.00	$ 19,375.00
5	Pervious Pavement	SF	8,290	$ 16.00	$ 132,640.00
6	Downspout Planter Box	EACH	5	$ 1,600.00	$ 8,000.00
7	Maintenance and Protection of Traffic (2%)	LS	1	$ 3,200.00	$ 3,200.00
8	Contingency (30%)	LS	1	$ 50,070.00	$ 50,070.00

Total Cost:	$ 220,155

A-03 Lou Costello Memorial Park

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 1,750.00	$ 1,750.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 590.00	$ 590.00
3	Bioretention System	SF	1,480	$ 25.00	$ 37,000.00
4	Pervious Pavement	SF	1,320	$ 16.00	$ 21,120.00
5	Maintenance and Protection of Traffic (2%)	LS	1	$ 1,200.00	$ 1,200.00
6	Contingency (30%)	LS	1	$ 18,140.00	$ 18,140.00

Total Cost:	$ 79,800

A-04 Our Lady of Pompei Church

	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 630.00	$ 630.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 210.00	$ 210.00
3	Pervious Pavement	SF	1,305	$ 16.00	$ 20,880.00
4	Maintenance and Protection of Traffic (2%)	LS	1	$ 400.00	$ 400.00
5	Contingency (30%)	LS	1	$ 6,520.00	$ 6,520.00

Total Cost:	$ 28,640

SEWERSHED C-01

A-05 Paterson Museum

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 3,660.00	$ 3,660.00
2	Soil Erosion Sediment Control Permit Application Fee	EACH	1	$ 450.00	$ 450.00
3	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 1,220.00	$ 1,220.00
4	Bioretention System	SF	1,590	$ 25.00	$ 39,750.00
5	Pervious Pavement	SF	4,640	$ 16.00	$ 74,240.00
6	Downspout Planter Box	EACH	5	$ 1,600.00	$ 8,000.00
7	Maintenance and Protection of Traffic (2%)	LS	1	$ 2,400.00	$ 2,400.00
8	Contingency (30%)	LS	1	$ 38,200.00	$ 38,200.00

Total Cost:	$ 167,920

A-06 Paterson Public School No. 2

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 6,010.00	$ 6,010.00
2	Soil Erosion Sediment Control Permit Application Fee	EACH	1	$ 450.00	$ 450.00
3	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 2,010.00	$ 2,010.00
4	Bioretention System	SF	1,335	$ 25.00	$ 33,375.00
5	Pervious Pavement	SF	8,930	$ 16.00	$ 142,880.00
6	Downspout Planter Box	EACH	15	$ 1,600.00	$ 24,000.00
7	Maintenance and Protection of Traffic (2%)	LS	1	$ 4,000.00	$ 4,000.00
8	Contingency (30%)	LS	1	$ 62,620.00	$ 62,620.00

Total Cost:	$ 275,345

A-07 Paterson Public School No. 7

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 1,960.00	$ 1,960.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 660.00	$ 660.00
3	Bioretention System	SF	380	$ 25.00	$ 9,500.00
4	Pervious Pavement	SF	3,480	$ 16.00	$ 55,680.00
5	Maintenance and Protection of Traffic (2%)	LS	1	$ 1,300.00	$ 1,300.00
6	Contingency (30%)	LS	1	$ 20,340.00	$ 20,340.00

Total Cost:	$ 89,440

A-08 Pennington Park

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 10,490.00	$ 10,490.00
2	Soil Erosion Sediment Control Permit Application Fee	EACH	1	$ 450.00	$ 450.00
3	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 3,500.00	$ 3,500.00
4	Bioretention System	SF	1,430	$ 25.00	$ 35,750.00
5	Pervious Pavement	SF	19,600	$ 16.00	$ 313,600.00
6	Maintenance and Protection of Traffic (2%)	LS	1	$ 7,000.00	$ 7,000.00
7	Contingency (30%)	LS	1	$ 109,140.00	$ 109,140.00

Total Cost:	$ 479,930

SEWERSHED C-01

A-09 St Bonaventure's Roman Catholic Church

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 3,030.00	$ 3,030.00
2	Soil Erosion Sediment Control Permit Application Fee	EACH	1	$ 450.00	$ 450.00
3	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 1,010.00	$ 1,010.00
4	Bioretention System	SF	380	$ 25.00	$ 9,500.00
5	Pervious Pavement	SF	5,600	$ 16.00	$ 89,600.00
6	Downspout Planter Box	EACH	1	$ 1,600.00	$ 1,600.00
7	Maintenance and Protection of Traffic (2%)	LS	1	$ 2,000.00	$ 2,000.00
8	Contingency (30%)	LS	1	$ 31,560.00	$ 31,560.00

Total Cost:	$ 138,750

A-10 Upper Raceway Park

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 4,570.00	$ 4,570.00
2	Soil Erosion Sediment Control Permit Application Fee	EACH	1	$ 450.00	$ 450.00
3	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 1,530.00	$ 1,530.00
4	Pervious Pavement	SF	9,505	$ 16.00	$ 152,080.00
5	Maintenance and Protection of Traffic (2%)	LS	1	$ 3,000.00	$ 3,000.00
6	Contingency (30%)	LS	1	$ 46,220.00	$ 46,220.00

Total Cost:	$ 207,850

A-11 Veterans Memorial Park

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 1,270.00	$ 1,270.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 430.00	$ 430.00
3	Bioretention System	SF	1,685	$ 25.00	$ 42,125.00
4	Maintenance and Protection of Traffic (2%)	LS	1	$ 800.00	$ 800.00
5	Contingency (30%)	LS	1	$ 13,150.00	$ 13,150.00

Total Cost:	$ 57,775

SEWERSHED C-02A

B-01 Arch St. Parking Lot

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 240.00	$ 240.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 80.00	$ 80.00
3	Pervious Pavement	SF	490	$ 16.00	$ 7,840.00
4	Maintenance and Protection of Traffic (2%)	LS	1	$ 200.00	$ 200.00
5	Contingency (30%)	LS	1	$ 2,450.00	$ 2,450.00

Total Cost:	$ 10,810

B-02 Church of Jesus Christ

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 870.00	$ 870.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 290.00	$ 290.00
3	Downspout Planter Box	EACH	18	$ 1,600.00	$ 28,800.00
4	Contingency (30%)	LS	1	$ 8,990.00	$ 8,990.00

Total Cost:	$ 38,950

B-03 Dr. Frank Napier Jr. School of Technology

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 2,200.00	$ 2,200.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 740.00	$ 740.00
3	Bioretention System	SF	2,930	$ 25.00	$ 73,250.00
4	Contingency (30%)	LS	1	$ 22,860.00	$ 22,860.00

Total Cost:	$ 99,050

B-05 Northside Community Chapel Church

	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 570.00	$ 570.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 190.00	$ 190.00
3	Bioretention System	SF	270	$ 25.00	$ 6,750.00
4	Pervious Pavement	SF	760	$ 16.00	$ 12,160.00
5	Contingency (30%)	LS	1	$ 5,910.00	$ 5,910.00

Total Cost:	$ 25,580

B-08 CAMP Youth Development Program, Christ Methodist Church

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 320.00	$ 320.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 110.00	$ 110.00
3	Bioretention System	SF	425	$ 25.00	$ 10,625.00
4	Contingency (30%)	LS	1	$ 3,320.00	$ 3,320.00

Total Cost:	$ 14,375

SEWERSHED C-02B

B-04 Faith Soul Saving Station

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 2,430.00	$ 2,430.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 810.00	$ 810.00
3	Bioretention System	SF	925	$ 25.00	$ 23,125.00
4	Pervious Pavement	SF	3,615	$ 16.00	$ 57,840.00
5	Contingency (30%)	LS	1	$ 25,270.00	$ 25,270.00

Total Cost:	$ 109,475

B-06 Paterson Free Public Library (Northsisde)

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 1,680.00	$ 1,680.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 560.00	$ 560.00
3	Bioretention System	SF	340	$ 25.00	$ 8,500.00
4	Pervious Pavement	SF	2,955	$ 16.00	$ 47,280.00
5	Maintenance and Protection of Traffic (2%)	LS	1	$ 1,100.00	$ 1,100.00
6	Contingency (30%)	LS	1	$ 17,410.00	$ 17,410.00

Total Cost:	$ 76,530

B-07 Paterson Public School No. 5

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 4,340.00	$ 4,340.00
2	Soil Erosion Sediment Control Permit Application Fee	EACH	1	$ 450.00	$ 450.00
3	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 1,450.00	$ 1,450.00
4	Bioretention System	SF	1,480	$ 25.00	$ 37,000.00
5	Pervious Pavement	SF	6,720	$ 16.00	$ 107,520.00
6	Maintenance and Protection of Traffic (2%)	LS	1	$ 2,900.00	$ 2,900.00
7	Contingency (30%)	LS	1	$ 45,230.00	$ 45,230.00

Total Cost:	$ 198,890

B-09 Mary Help of Christians Roman Catholic Church

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 3,180.00	$ 3,180.00
2	Soil Erosion Sediment Control Permit Application Fee	EACH	1	$ 450.00	$ 450.00
3	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 1,060.00	$ 1,060.00
4	Pervious Pavement	SF	6,615	$ 16.00	$ 105,840.00
5	Maintenance and Protection of Traffic (2%)	LS	1	$ 2,100.00	$ 2,100.00
6	Contingency (30%)	LS	1	$ 33,160.00	$ 33,160.00

Total Cost:	$ 145,790

B-10 Belmont Senior Apartments

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 1,850.00	$ 1,850.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 620.00	$ 620.00
3	Pervious Pavement	SF	3,840	$ 16.00	$ 61,440.00
4	Contingency (30%)	LS	1	$ 19,180.00	$ 19,180.00

Total Cost:	$ 83,090

SEWERSHED C-03

C-01 Cobb Park

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 900.00	$ 900.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 300.00	$ 300.00
3	Pervious Pavement	SF	1,860	$ 16.00	$ 29,760.00
4	Maintenance and Protection of Traffic (2%)	LS	1	$ 600.00	$ 600.00
5	Contingency (30%)	LS	1	$ 9,290.00	$ 9,290.00

Total Cost:	$ 40,850

C-02 - Gilmore Memorial Christian

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 870.00	$ 870.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 290.00	$ 290.00
3	Bioretention System	SF	420	$ 25.00	$ 10,500.00
4	Pervious Pavement	SF	1,150	$ 16.00	$ 18,400.00
5	Contingency (30%)	LS	1	$ 9,020.00	$ 9,020.00

Total Cost:	$ 39,080

C-03 Gilmore Memorial Tabernacle

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 890.00	$ 890.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 300.00	$ 300.00
3	Pervious Pavement	SF	1,850	$ 16.00	$ 29,600.00
4	Contingency (30%)	LS	1	$ 9,240.00	$ 9,240.00

Total Cost:	$ 40,030

C-04 Holy Tabernacle Apostolic Church

	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 790.00	$ 790.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 270.00	$ 270.00
3	Bioretention System	SF	200	$ 25.00	$ 5,000.00
4	Pervious Pavement	SF	1,330	$ 16.00	$ 21,280.00
5	Contingency (30%)	LS	1	$ 8,210.00	$ 8,210.00

Total Cost:	$ 35,550

SEWERSHED C-04

D-01 Christ Temple Baptist Church

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 2,800.00	$ 2,800.00
2	Soil Erosion Sediment Control Permit Application Fee	EACH	1	$ 450.00	$ 450.00
3	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 940.00	$ 940.00
4	Bioretention System	SF	260	$ 25.00	$ 6,500.00
5	Pervious Pavement	SF	5,015	$ 16.00	$ 80,240.00
6	Downspout Planter Box	EACH	4	$ 1,600.00	$ 6,400.00
7	Contingency (30%)	LS	1	$ 29,200.00	$ 29,200.00

Total Cost:	$ 126,530

D-02 Paterson Public School No. 12

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 2,070.00	$ 2,070.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 690.00	$ 690.00
3	Pervious Pavement	SF	4,310	$ 16.00	$ 68,960.00
4	Maintenance and Protection of Traffic (2%)	LS	1	$ 1,400.00	$ 1,400.00
5	Contingency (30%)	LS	1	$ 21,520.00	$ 21,520.00

Total Cost:	$ 94,640

SEWERSHED C-05

E-01 Iglesia Pentecostal El Buen Pastor (Church)

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 830.00	$ 830.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 280.00	$ 280.00
3	Pervious Pavement	SF	1,310	$ 16.00	$ 20,960.00
4	Downspout Planter Box	EACH	4	$ 1,600.00	$ 6,400.00
5	Contingency (30%)	LS	1	$ 8,550.00	$ 8,550.00

Total Cost:	$ 37,020

SEWERSHED C-06

F-01 Dog Park Lawrence Street

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 1,440.00	$ 1,440.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 480.00	$ 480.00
3	Pervious Pavement	SF	2,995	$ 16.00	$ 47,920.00
4	Maintenance and Protection of Traffic (2%)	LS	1	$ 1,000.00	$ 1,000.00
5	Contingency (30%)	LS	1	$ 14,960.00	$ 14,960.00

Total Cost:	$ 65,800

SEWERSHED C-07

G-01 Freedom Village Apartments

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 6,400.00	$ 6,400.00
2	Soil Erosion Sediment Control Permit Application Fee	EACH	1	$ 450.00	$ 450.00
3	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 2,140.00	$ 2,140.00
4	Bioretention System	SF	1,950	$ 25.00	$ 48,750.00
5	Pervious Pavement	SF	4,670	$ 16.00	$ 74,720.00
6	Downspout Planter Box	EACH	56	$ 1,600.00	$ 89,600.00
7	Maintenance and Protection of Traffic (2%)	LS	1	$ 4,300.00	$ 4,300.00
8	Contingency (30%)	LS	1	$ 66,620.00	$ 66,620.00

Total Cost:	$ 292,980

G-02 Grace Gospel Church

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 510.00	$ 510.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 170.00	$ 170.00
3	Bioretention System	SF	680	$ 25.00	$ 17,000.00
4	Contingency (30%)	LS	1	$ 5,310.00	$ 5,310.00

Total Cost:	$ 22,990

G-03 Grace Gospel Church Parking Lot

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 560.00	$ 560.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 190.00	$ 190.00
3	Pervious Pavement	SF	1,160	$ 16.00	$ 18,560.00
4	Contingency (30%)	LS	1	$ 5,800.00	$ 5,800.00

Total Cost:	$ 25,110

G-04 Mercer St & Fulton St Public Land

	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 2,940.00	$ 2,940.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 980.00	$ 980.00
3	Bioretention System	SF	3,920	$ 25.00	$ 98,000.00
4	Maintenance and Protection of Traffic (2%)	LS	1	$ 2,000.00	$ 2,000.00
5	Contingency (30%)	LS	1	$ 30,580.00	$ 30,580.00

Total Cost:	$ 134,500

G-05 New Life Evangelist Center

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 1,930.00	$ 1,930.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 650.00	$ 650.00
3	Bioretention System	SF	1,580	$ 25.00	$ 39,500.00
4	Pervious Pavement	SF	1,540	$ 16.00	$ 24,640.00
5	Contingency (30%)	LS	1	$ 20,020.00	$ 20,020.00

Total Cost:	$ 86,740

SEWERSHED C-07

G-06 Second Baptist Church

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 2,310.00	$ 2,310.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 770.00	$ 770.00
3	Pervious Pavement	SF	4,795	$ 16.00	$ 76,720.00
4	Maintenance and Protection of Traffic (2%)	LS	1	$ 1,500.00	$ 1,500.00
5	Contingency (30%)	LS	1	$ 23,940.00	$ 23,940.00

Total Cost:	$ 105,240

G-07 Wrigley Park

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 6,060.00	$ 6,060.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 2,020.00	$ 2,020.00
3	Pervious Pavement	SF	12,615	$ 16.00	$ 201,840.00
4	Maintenance and Protection of Traffic (2%)	LS	1	$ 4,000.00	$ 4,000.00
5	Contingency (30%)	LS	1	$ 63,120.00	$ 63,120.00

Total Cost:	$ 277,490

SEWERSHED C-08

H-01 Nathan Barnert Residence

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 1,890.00	$ 1,890.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 630.00	$ 630.00
3	Bioretention System	SF	1,560	$ 25.00	$ 39,000.00
4	Pervious Pavement	SF	1,490	$ 16.00	$ 23,840.00
5	Maintenance and Protection of Traffic (2%)	LS	1	$ 1,300.00	$ 1,300.00
6	Contingency (30%)	LS	1	$ 19,610.00	$ 19,610.00

Total Cost:	$ 86,270

SEWERSHED C-10

J-01 Paterson Public School No. 21

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 4,550.00	$ 4,550.00
2	Soil Erosion Sediment Control Permit Application Fee	EACH	1	$ 450.00	$ 450.00
3	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 1,520.00	$ 1,520.00
4	Bioretention System	SF	850	$ 25.00	$ 21,250.00
5	Pervious Pavement	SF	4,935	$ 16.00	$ 78,960.00
6	Downspout Planter Box	EACH	32	$ 1,600.00	$ 51,200.00
7	Maintenance and Protection of Traffic (2%)	LS	1	$ 3,000.00	$ 3,000.00
8	Contingency (30%)	LS	1	$ 47,380.00	$ 47,380.00

Total Cost:	$ 208,310

SEWERSHED C-11

K-01 Barnet Medical Arts Parkin Lot 1

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 5,650.00	$ 5,650.00
2	Soil Erosion Sediment Control Permit Application Fee	EACH	1	$ 450.00	$ 450.00
3	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 1,890.00	$ 1,890.00
4	Pervious Pavement	SF	11,755	$ 16.00	$ 188,080.00
5	Contingency (30%)	LS	1	$ 58,830.00	$ 58,830.00

Total Cost:	$ 254,900

K-03 Faith Chapel Reformed Church

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 780.00	$ 780.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 260.00	$ 260.00
3	Bioretention System	SF	585	$ 25.00	$ 14,625.00
4	Downspout Planter Box	EACH	7	$ 1,600.00	$ 11,200.00
5	Contingency (30%)	LS	1	$ 8,060.00	$ 8,060.00

Total Cost:	$ 34,925

K-04 Love of Jesus Paterson

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 3,370.00	$ 3,370.00
2	Soil Erosion Sediment Control Permit Application Fee	EACH	1	$ 450.00	$ 450.00
3	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 1,130.00	$ 1,130.00
4	Bioretention System	SF	1,115	$ 25.00	$ 27,875.00
5	Pervious Pavement	SF	5,265	$ 16.00	$ 84,240.00
6	Contingency (30%)	LS	1	$ 35,120.00	$ 35,120.00

Total Cost:	$ 152,185

K-05 Manara College

	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 530.00	$ 530.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 180.00	$ 180.00
3	Bioretention System	SF	705	$ 25.00	$ 17,625.00
4	Contingency (30%)	LS	1	$ 5,510.00	$ 5,510.00

Total Cost:	$ 23,845

K-06 Paterson Public School 26

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 5,810.00	$ 5,810.00
2	Soil Erosion Sediment Control Permit Application Fee	EACH	1	$ 450.00	$ 450.00
3	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 1,940.00	$ 1,940.00
4	Bioretention System	SF	2,725	$ 25.00	$ 68,125.00
5	Pervious Pavement	SF	7,840	$ 16.00	$ 125,440.00
6	Maintenance and Protection of Traffic (2%)	LS	1	$ 3,900.00	$ 3,900.00
7	Contingency (30%)	LS	1	$ 60,530.00	$ 60,530.00

Total Cost:	$ 266,195

SEWERSHED C-11

K-07 Paterson Adult Day Center

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 1,970.00	$ 1,970.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 660.00	$ 660.00
3	Bioretention System	SF	1,445	$ 25.00	$ 36,125.00
4	Pervious Pavement	SF	1,840	$ 16.00	$ 29,440.00
5	Maintenance and Protection of Traffic (2%)	LS	1	$ 1,300.00	$ 1,300.00
6	Contingency (30%)	LS	1	$ 20,460.00	$ 20,460.00

Total Cost:	$ 89,955

K-08 Radio Vision Cristiana

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 2,110.00	$ 2,110.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 710.00	$ 710.00
3	Pervious Pavement	SF	4,380	$ 16.00	$ 70,080.00
4	Contingency (30%)	LS	1	$ 21,870.00	$ 21,870.00

Total Cost:	$ 94,770

K-09 Rosa L. Parks School of Fine & Performing Arts

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 890.00	$ 890.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 300.00	$ 300.00
3	Bioretention System	SF	300	$ 25.00	$ 7,500.00
4	Pervious Pavement	SF	1,365	$ 16.00	$ 21,840.00
5	Maintenance and Protection of Traffic (2%)	LS	1	$ 600.00	$ 600.00
6	Contingency (30%)	LS	1	$ 9,160.00	$ 9,160.00

Total Cost:	$ 40,290

K-10 St. Paul Episcopal Church

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 2,330.00	$ 2,330.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 780.00	$ 780.00
3	Bioretention System	SF	415	$ 25.00	$ 10,375.00
4	Pervious Pavement	SF	2,800	$ 16.00	$ 44,800.00
5	Downspout Planter Box	EACH	14	$ 1,600.00	$ 22,400.00
6	Contingency (30%)	LS	1	$ 24,210.00	$ 24,210.00

Total Cost:	$ 104,895

K-11 St Therese Roman Catholic Church

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 1,380.00	$ 1,380.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 460.00	$ 460.00
3	Bioretention System	SF	240	$ 25.00	$ 6,000.00
4	Pervious Pavement	SF	2,485	$ 16.00	$ 39,760.00
5	Contingency (30%)	LS	1	$ 14,280.00	$ 14,280.00

Total Cost:	$ 61,880

SEWERSHED C-11

K-12 United Presbyterian Church

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 1,430.00	$ 1,430.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 480.00	$ 480.00
3	Bioretention System	SF	1,000	$ 25.00	$ 25,000.00
4	Pervious Pavement	SF	1,410	$ 16.00	$ 22,560.00
5	Contingency (30%)	LS	1	$ 14,850.00	$ 14,850.00

Total Cost:	$ 64,320

SEWERSHED C-12

L-01 Amidstad Park, Vreeland and 19th Avenue Triangle

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 170.00	$ 170.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 60.00	$ 60.00
3	Bioretention System	SF	225	$ 25.00	$ 5,625.00
4	Maintenance and Protection of Traffic (2%)	LS	1	$ 100.00	$ 100.00
5	Contingency (30%)	LS	1	$ 1,760.00	$ 1,760.00

Total Cost:	$ 7,715

L-02 Brandes Field Playground

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 1,580.00	$ 1,580.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 530.00	$ 530.00
3	Bioretention System	SF	750	$ 25.00	$ 18,750.00
4	Pervious Pavement	SF	2,100	$ 16.00	$ 33,600.00
5	Maintenance and Protection of Traffic (2%)	LS	1	$ 1,000.00	$ 1,000.00
6	Contingency (30%)	LS	1	$ 16,340.00	$ 16,340.00

Total Cost:	$ 71,800

L-03 Dr. Hani Awadallah School

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 6,770.00	$ 6,770.00
2	Soil Erosion Sediment Control Permit Application Fee	EACH	1	$ 450.00	$ 450.00
3	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 2,260.00	$ 2,260.00
4	Bioretention System	SF	7,200	$ 25.00	$ 180,000.00
5	Pervious Pavement	SF	2,850	$ 16.00	$ 45,600.00
6	Regrading	SY	350	$ 8.75	$ 3,062.50
7	Maintenance and Protection of Traffic (2%)	LS	1	$ 4,500.00	$ 4,500.00
8	Contingency (30%)	LS	1	$ 71,450.00	$ 71,450.00

Total Cost:	$ 314,093

L-04 Dr. Martin Luther King Jr. Public School

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 5,500.00	$ 5,500.00
2	Soil Erosion Sediment Control Permit Application Fee	EACH	1	$ 450.00	$ 450.00
3	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 1,840.00	$ 1,840.00
4	Bioretention System	SF	2,325	$ 25.00	$ 58,125.00
5	Pervious Pavement	SF	5,720	$ 16.00	$ 91,520.00
6	Downspout Planter Box	EACH	21	$ 1,600.00	$ 33,600.00
7	Maintenance and Protection of Traffic (2%)	LS	1	$ 3,700.00	$ 3,700.00
8	Contingency (30%)	LS	1	$ 57,320.00	$ 57,320.00

Total Cost:	$ 252,055

SEWERSHED C-12

L-05 Full Service Community Center

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 620.00	$ 620.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 210.00	$ 210.00
3	Pervious Pavement	SF	1,285	$ 16.00	$ 20,560.00
4	Maintenance and Protection of Traffic (2%)	LS	1	$ 400.00	$ 400.00
5	Contingency (30%)	LS	1	$ 6,420.00	$ 6,420.00

Total Cost:	$ 28,210

L-06 GBCA Paterson Head Start

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 3,900.00	$ 3,900.00
2	Soil Erosion Sediment Control Permit Application Fee	EACH	1	$ 450.00	$ 450.00
3	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 1,300.00	$ 1,300.00
4	Pervious Pavement	SF	8,125	$ 16.00	$ 130,000.00
5	Contingency (30%)	LS	1	$ 40,700.00	$ 40,700.00

Total Cost:	$ 176,350

L-07 Maurice J Brick Residence

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 3,470.00	$ 3,470.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 1,160.00	$ 1,160.00
3	Bioretention System	SF	1,560	$ 25.00	$ 39,000.00
4	Pervious Pavement	SF	2,690	$ 16.00	$ 43,040.00
5	Downspout Planter Box	EACH	21	$ 1,600.00	$ 33,600.00
6	Maintenance and Protection of Traffic (2%)	LS	1	$ 2,300.00	$ 2,300.00
7	Contingency (30%)	LS	1	$ 36,090.00	$ 36,090.00

Total Cost:	$ 158,660

L-08 Paterson Public School 15

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 12,050.00	$ 12,050.00
2	Soil Erosion Sediment Control Permit Application Fee	EACH	1	$ 450.00	$ 450.00
3	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 4,020.00	$ 4,020.00
4	Bioretention System	SF	3,260	$ 25.00	$ 81,500.00
5	Pervious Pavement	SF	20,010	$ 16.00	$ 320,160.00
6	Maintenance and Protection of Traffic (2%)	LS	1	$ 8,000.00	$ 8,000.00
7	Contingency (30%)	LS	1	$ 125,460.00	$ 125,460.00

Total Cost:	$ 551,640

SEWERSHED C-12

L-10 Paterson Public School 24

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 3,810.00	$ 3,810.00
2	Soil Erosion Sediment Control Permit Application Fee	EACH	1	$ 450.00	$ 450.00
3	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 1,270.00	$ 1,270.00
4	Bioretention System	SF	1,720	$ 25.00	$ 43,000.00
5	Pervious Pavement	SF	5,230	$ 16.00	$ 83,680.00
6	Maintenance and Protection of Traffic (2%)	LS	1	$ 2,500.00	$ 2,500.00
7	Contingency (30%)	LS	1	$ 39,670.00	$ 39,670.00

Total Cost:	$ 174,380

L-09 Paterson Public School 20

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 1,490.00	$ 1,490.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 500.00	$ 500.00
3	Pervious Pavement	SF	1,885	$ 16.00	$ 30,160.00
4	Downspout Planter Box	EACH	12	$ 1,600.00	$ 19,200.00
5	Maintenance and Protection of Traffic (2%)	LS	1	$ 1,000.00	$ 1,000.00
6	Contingency (30%)	LS	1	$ 15,410.00	$ 15,410.00

Total Cost:	$ 67,760

L-11 Vreeland Park, Vreeland and 20th Avenue Triangle

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 740.00	$ 740.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 250.00	$ 250.00
3	Bioretention System	SF	980	$ 25.00	$ 24,500.00
4	Maintenance and Protection of Traffic (2%)	LS	1	$ 500.00	$ 500.00
5	Contingency (30%)	LS	1	$ 7,650.00	$ 7,650.00

Total Cost:	$ 33,640

SEWERSHED C-15

M-01 Grandparents Relative Care - Heritage at Alexander Hamilton

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 1,800.00	$ 1,800.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 600.00	$ 600.00
3	Pervious Pavement	SF	3,735	$ 16.00	$ 59,760.00
4	Maintenance and Protection of Traffic (2%)	LS	1	$ 1,200.00	$ 1,200.00
5	Contingency (30%)	LS	1	$ 18,650.00	$ 18,650.00

Total Cost:	$ 82,010

M-02 Kingdom Hall of Jehovah's Witnessess

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 1,760.00	$ 1,760.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 590.00	$ 590.00
3	Bioretention System	SF	880	$ 25.00	$ 22,000.00
4	Pervious Pavement	SF	1,785	$ 16.00	$ 28,560.00
5	Downspout Planter Box	EACH	5	$ 1,600.00	$ 8,000.00
6	Maintenance and Protection of Traffic (2%)	LS	1	$ 1,200.00	$ 1,200.00
7	Contingency (30%)	LS	1	$ 18,280.00	$ 18,280.00

Total Cost:	$ 80,390

M-03 Art and Science Paterson Charter School

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 2,050.00	$ 2,050.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 690.00	$ 690.00
3	Bioretention System	SF	1,599	$ 25.00	$ 39,975.00
4	Pervious Pavement	SF	1,470	$ 16.00	$ 23,520.00
5	Downspout Planter Box	EACH	3	$ 1,600.00	$ 4,800.00
6	Maintenance and Protection of Traffic (2%)	LS	1	$ 1,400.00	$ 1,400.00
7	Contingency (30%)	LS	1	$ 21,320.00	$ 21,320.00

Total Cost:	$ 93,755

M-04 Paterson Public School 25

	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 8,840.00	$ 8,840.00
2	Soil Erosion Sediment Control Permit Application Fee	EACH	1	$ 450.00	$ 450.00
3	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 2,950.00	$ 2,950.00
4	Bioretention System	SF	8,145	$ 25.00	$ 203,625.00
5	Pervious Pavement	SF	3,290	$ 16.00	$ 52,640.00
6	Downspout Planter Box	EACH	24	$ 1,600.00	$ 38,400.00
7	Maintenance and Protection of Traffic (2%)	LS	1	$ 5,900.00	$ 5,900.00
8	Contingency (30%)	LS	1	$ 92,080.00	$ 92,080.00

Total Cost:	$ 404,885

SEWERSHED C-15

M-05 St. George Syro Malabar Catholic Church

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 2,790.00	$ 2,790.00
2	Bioretention System	SF	100	$ 25.00	$ 2,500.00
3	Pervious Pavement	SF	4,240	$ 16.00	$ 67,840.00
4	Downspout Planter Box	EACH	14	$ 1,600.00	$ 22,400.00
5	Maintenance and Protection of Traffic (2%)	LS	1	$ 1,900.00	$ 1,900.00
6	Contingency (30%)	LS	1	$ 28,660.00	$ 28,660.00

Total Cost:	$ 126,090

M-06 United Islamic Center (Mosque)

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 2,300.00	$ 2,300.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 770.00	$ 770.00
3	Pervious Pavement	SF	3,390	$ 16.00	$ 54,240.00
4	Downspout Planter Box	EACH	14	$ 1,600.00	$ 22,400.00
5	Maintenance and Protection of Traffic (2%)	LS	1	$ 1,500.00	$ 1,500.00
6	Contingency (30%)	LS	1	$ 23,920.00	$ 23,920.00

Total Cost:	$ 105,130

SEWERSHED PF-01

N-01 Brooks Sloate Terrace

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 7,150.00	$ 7,150.00
2	Soil Erosion Sediment Control Permit Application Fee	EACH	1	$ 450.00	$ 450.00
3	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 2,390.00	$ 2,390.00
4	Pervious Pavement	SF	14,890	$ 16.00	$ 238,240.00
5	Contingency (30%)	LS	1	$ 74,470.00	$ 74,470.00

Total Cost:	$ 322,700

N-02 Grace Buckley Park

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 4,930.00	$ 4,930.00
2	Soil Erosion Sediment Control Permit Application Fee	EACH	1	$ 450.00	$ 450.00
3	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 1,650.00	$ 1,650.00
4	Bioretention System	SF	1,920	$ 25.00	$ 48,000.00
5	Pervious Pavement	SF	7,260	$ 16.00	$ 116,160.00
6	Maintenance and Protection of Traffic (2%)	LS	1	$ 3,300.00	$ 3,300.00
7	Contingency (30%)	LS	1	$ 51,360.00	$ 51,360.00

Total Cost:	$ 225,850

N-03 John F. Kennedy High School

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 12,680.00	$ 12,680.00
2	Soil Erosion Sediment Control Permit Application Fee	EACH	1	$ 450.00	$ 450.00
3	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 4,230.00	$ 4,230.00
4	Bioretention System	SF	8,740	$ 25.00	$ 218,500.00
5	Pervious Pavement	SF	12,760	$ 16.00	$ 204,160.00
6	Maintenance and Protection of Traffic (2%)	LS	1	$ 8,500.00	$ 8,500.00
7	Contingency (30%)	LS	1	$ 132,010.00	$ 132,010.00

Total Cost:	$ 580,530

N-04 Paterson Public School No. 27

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 2,280.00	$ 2,280.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 760.00	$ 760.00
3	Bioretention System	SF	300	$ 25.00	$ 7,500.00
4	Pervious Pavement	SF	4,265	$ 16.00	$ 68,240.00
5	Maintenance and Protection of Traffic (2%)	LS	1	$ 1,500.00	$ 1,500.00
6	Contingency (30%)	LS	1	$ 23,640.00	$ 23,640.00

Total Cost:	$ 103,920

SEWERSHED PF-01

N-05 Paterson Public School No. 19

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 1,600.00	$ 1,600.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 540.00	$ 540.00
3	Bioretention System	SF	975	$ 25.00	$ 24,375.00
4	Downspout Planter Box	EACH	18	$ 1,600.00	$ 28,800.00
5	Maintenance and Protection of Traffic (2%)	LS	1	$ 1,100.00	$ 1,100.00
6	Contingency (30%)	LS	1	$ 16,600.00	$ 16,600.00

Total Cost:	$ 73,015

N-06 St Gerard Majella Roman Catholic Church

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 11,720.00	$ 11,720.00
2	Soil Erosion Sediment Control Permit Application Fee	EACH	1	$ 450.00	$ 450.00
3	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 3,910.00	$ 3,910.00
4	Bioretention System	SF	11,440	$ 25.00	$ 286,000.00
5	Pervious Pavement	SF	6,525	$ 16.00	$ 104,400.00
6	Contingency (30%)	LS	1	$ 121,950.00	$ 121,950.00

Total Cost:	$ 528,430

N-07 Westside Park

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 12,950.00	$ 12,950.00
2	Soil Erosion Sediment Control Permit Application Fee	EACH	1	$ 450.00	$ 450.00
3	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 4,320.00	$ 4,320.00
4	Bioretention System	SF	11,125	$ 25.00	$ 278,125.00
5	Pervious Pavement	SF	9,580	$ 16.00	$ 153,280.00
6	Maintenance and Protection of Traffic (2%)	LS	1	$ 8,600.00	$ 8,600.00
7	Contingency (30%)	LS	1	$ 134,740.00	$ 134,740.00

Total Cost:	$ 592,465

SEWERSHED PF-02

O-01 Iglesia Nuevo Nacimiento 'New Birth' (Church)

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 620.00	$ 620.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 210.00	$ 210.00
3	Bioretention System	SF	370	$ 25.00	$ 9,250.00
4	Downspout Planter Box	EACH	7	$ 1,600.00	$ 11,200.00
5	Maintenance and Protection of Traffic (2%)	LS	1	$ 400.00	$ 400.00
6	Contingency (30%)	LS	1	$ 6,390.00	$ 6,390.00

Total Cost:	$ 28,070.00

SEWERSHED PF-06

P-01 Paterson City Coucil

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 340.00	$ 340.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 120.00	$ 120.00
3	Pervious Pavement	SF	705	$ 16.00	$ 11,280.00
4	Maintenance and Protection of Traffic (2%)	LS	1	$ 200.00	$ 200.00
5	Contingency (30%)	LS	1	$ 3,530.00	$ 3,530.00

Total Cost:	$ 15,470

P-02 Dr. Frank X. Graves Public Safety Complex

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 10,950.00	$ 10,950.00
2	Soil Erosion Sediment Control Permit Application Fee	EACH	1	$ 450.00	$ 450.00
3	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 3,650.00	$ 3,650.00
4	Pervious Pavement	SF	22,800	$ 16.00	$ 364,800.00
5	Maintenance and Protection of Traffic (2%)	LS	1	$ 7,300.00	$ 7,300.00
6	Contingency (30%)	LS	1	$ 113,960.00	$ 113,960.00

Total Cost:	$ 501,110

SEWERSHED PF-07

Q-01 Cathedral of St. John the Baptist

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 1,910.00	$ 1,910.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 640.00	$ 640.00
3	Bioretention System	SF	2,545	$ 25.00	$ 63,625.00
4	Contingency (30%)	LS	1	$ 19,860.00	$ 19,860.00

Total Cost:	$ 86,035

Q-02 Christian Fellowship Center and Outreach

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 520.00	$ 520.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 180.00	$ 180.00
3	Bioretention System	SF	190	$ 25.00	$ 4,750.00
4	Pervious Pavement	SF	775	$ 16.00	$ 12,400.00
5	Contingency (30%)	LS	1	$ 5,360.00	$ 5,360.00

Total Cost:	$ 23,210

Q-03 Court House Plaza

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 1,000.00	$ 1,000.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 340.00	$ 340.00
3	Pervious Pavement	SF	2,065	$ 16.00	$ 33,040.00
4	Maintenance and Protection of Traffic (2%)	LS	1	$ 700.00	$ 700.00
5	Contingency (30%)	LS	1	$ 10,320.00	$ 10,320.00

Total Cost:	$ 45,400

Q-04 Eastside High School

	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 10,540.00	$ 10,540.00
2	Soil Erosion Sediment Control Permit Application Fee	EACH	1	$ 450.00	$ 450.00
3	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 3,520.00	$ 3,520.00
4	Bioretention System	SF	2,810	$ 25.00	$ 70,250.00
5	Pervious Pavement	SF	17,065	$ 16.00	$ 273,040.00
6	Downspout Planter Box	EACH	5	$ 1,600.00	$ 8,000.00
7	Regrading	SY	400	$ 8.75	$ 3,500.00
8	Maintenance and Protection of Traffic (2%)	LS	1	$ 7,000.00	$ 7,000.00
9	Contingency (30%)	LS	1	$ 110,790.00	$ 110,790.00

Total Cost:	$ 487,090

Q-05 Greater Bible Way Church

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 2,560.00	$ 2,560.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 860.00	$ 860.00
3	Bioretention System	SF	505	$ 25.00	$ 12,625.00
4	Pervious Pavement	SF	3,840	$ 16.00	$ 61,440.00
5	Downspout Planter Box	EACH	7	$ 1,600.00	$ 11,200.00
6	Contingency (30%)	LS	1	$ 26,610.00	$ 26,610.00

Total Cost:	$ 115,295

SEWERSHED PF-07

Q-06 Internal Revenue Service (IRS) Taxpayer Assistance Center

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 1,660.00	$ 1,660.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 560.00	$ 560.00
3	Bioretention System	SF	2,210	$ 25.00	$ 55,250.00
4	Contingency (30%)	LS	1	$ 17,250.00	$ 17,250.00

Total Cost:	$ 74,720

Q-07 Memorial Day School Georgette Hauser Campus

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 840.00	$ 840.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 280.00	$ 280.00
3	Pervious Pavement	SF	1,745	$ 16.00	$ 27,920.00
4	Contingency (30%)	LS	1	$ 8,720.00	$ 8,720.00

Total Cost:	$ 37,760

Q-08 New Roberto Clemente School

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 5,830.00	$ 5,830.00
2	Soil Erosion Sediment Control Permit Application Fee	EACH	1	$ 450.00	$ 450.00
3	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 1,950.00	$ 1,950.00
4	Bioretention System	SF	1,605	$ 25.00	$ 40,125.00
5	Pervious Pavement	SF	9,635	$ 16.00	$ 154,160.00
6	Maintenance and Protection of Traffic (2%)	LS	1	$ 3,900.00	$ 3,900.00
7	Contingency (30%)	LS	1	$ 60,760.00	$ 60,760.00

Total Cost:	$ 267,175

Q-09 Our Lady of Victories Roman Catholic Church

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 1,410.00	$ 1,410.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 470.00	$ 470.00
3	Bioretention System	SF	405	$ 25.00	$ 10,125.00
4	Pervious Pavement	SF	1,795	$ 16.00	$ 28,720.00
5	Downspout Planter Box	EACH	5	$ 1,600.00	$ 8,000.00
6	Contingency (30%)	LS	1	$ 14,620.00	$ 14,620.00

Total Cost:	$ 63,345

Q-10 Park Railroad Ave

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 340.00	$ 340.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 120.00	$ 120.00
3	Bioretention System	SF	450	$ 25.00	$ 11,250.00
4	Maintenance and Protection of Traffic (2%)	LS	1	$ 200.00	$ 200.00
5	Contingency (30%)	LS	1	$ 3,520.00	$ 3,520.00

Total Cost:	$ 15,430

SEWERSHED PF-07

Q-12 Paterson Public School 8

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 1,710.00	$ 1,710.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 570.00	$ 570.00
3	Pervious Pavement	SF	3,550	$ 16.00	$ 56,800.00
4	Maintenance and Protection of Traffic (2%)	LS	1	$ 1,100.00	$ 1,100.00
5	Contingency (30%)	LS	1	$ 17,730.00	$ 17,730.00

Total Cost:	$ 77,910

Q-13 Paterson Public Works Department

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 1,500.00	$ 1,500.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 500.00	$ 500.00
3	Pervious Pavement	SF	3,110	$ 16.00	$ 49,760.00
4	Maintenance and Protection of Traffic (2%)	LS	1	$ 1,000.00	$ 1,000.00
5	Contingency (30%)	LS	1	$ 15,530.00	$ 15,530.00

Total Cost:	$ 68,290

Q-14 Railroad Ave Open Space

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 2,220.00	$ 2,220.00
2	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 740.00	$ 740.00
3	Bioretention System	SF	2,955	$ 25.00	$ 73,875.00
4	Maintenance and Protection of Traffic (2%)	LS	1	$ 1,500.00	$ 1,500.00
5	Contingency (30%)	LS	1	$ 23,060.00	$ 23,060.00

Total Cost:	$ 101,395

Q-15 Roberto Clemente Park

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 4,460.00	$ 4,460.00
2	Soil Erosion Sediment Control Permit Application Fee	EACH	1	$ 450.00	$ 450.00
3	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 1,490.00	$ 1,490.00
4	Bioretention System	SF	2,450	$ 25.00	$ 61,250.00
5	Pervious Pavement	SF	5,460	$ 16.00	$ 87,360.00
6	Maintenance and Protection of Traffic (2%)	LS	1	$ 3,000.00	$ 3,000.00
7	Contingency (30%)	LS	1	$ 46,510.00	$ 46,510.00

Total Cost:	$ 204,520

SEWERSHED PF-07

Q-16 St. Anthony of Padua Roman Catholic Church

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 7,090.00	$ 7,090.00
2	Soil Erosion Sediment Control Permit Application Fee	EACH	1	$ 450.00	$ 450.00
3	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 2,370.00	$ 2,370.00
4	Bioretention System	SF	3,140	$ 25.00	$ 78,500.00
5	Pervious Pavement	SF	6,960	$ 16.00	$ 111,360.00
6	Downspout Planter Box	EACH	29	$ 1,600.00	$ 46,400.00
7	Contingency (30%)	LS	1	$ 73,860.00	$ 73,860.00

Total Cost:	$ 320,030

SEWERSHED PF-16

S-01 Paterson Public School 18

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 3,990.00	$ 3,990.00
2	Soil Erosion Sediment Control Permit Application Fee	EACH	1	$ 450.00	$ 450.00
3	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 1,330.00	$ 1,330.00
4	Bioretention System	SF	1,340	$ 25.00	$ 33,500.00
5	Pervious Pavement	SF	4,600	$ 16.00	$ 73,600.00
6	Downspout Planter Box	EACH	16	$ 1,600.00	$ 25,600.00
7	Maintenance and Protection of Traffic (2%)	LS	1	$ 2,700.00	$ 2,700.00
8	Contingency (30%)	LS	1	$ 41,550.00	$ 41,550.00

Total Cost:	$ 182,720

SEWERSHED S-08

T-01 The Church of Jesus Christ of Latter-day Saints

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 3,260.00	$ 3,260.00
2	Soil Erosion Sediment Control Permit Application Fee	EACH	1	$ 450.00	$ 450.00
3	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 1,090.00	$ 1,090.00
4	Bioretention System	SF	1,405	$ 25.00	$ 35,125.00
5	Pervious Pavement	SF	4,190	$ 16.00	$ 67,040.00
6	Downspout Planter Box	EACH	4	$ 1,600.00	$ 6,400.00
7	Contingency (30%)	LS	1	$ 34,010.00	$ 34,010.00

Total Cost:	$ 147,375

SEWERSHED S-09

U-01 Christopher Columbus Park

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 9,690.00	$ 9,690.00
2	Soil Erosion Sediment Control Permit Application Fee	EACH	1	$ 450.00	$ 450.00
3	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 3,230.00	$ 3,230.00
4	Bioretention System	SF	11,900	$ 25.00	$ 297,500.00
5	Pervious Pavement	SF	580	$ 16.00	$ 9,280.00
6	Downspout Planter Box	EACH	10	$ 1,600.00	$ 16,000.00
7	Maintenance and Protection of Traffic (2%)	LS	1	$ 6,500.00	$ 6,500.00
8	Contingency (30%)	LS	1	$ 100,850.00	$ 100,850.00

Total Cost:	$ 443,500

U-02 Paterson STEAM High School

Item No.	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization (3%)	LS	1	$ 4,680.00	$ 4,680.00
2	Soil Erosion Sediment Control Permit Application Fee	EACH	1	$ 450.00	$ 450.00
3	Soil Erosion Sediment Control Measures (1%)	LS	1	$ 1,560.00	$ 1,560.00
4	Pervious Pavement	SF	9,730	$ 16.00	$ 155,680.00
5	Maintenance and Protection of Traffic (2%)	LS	1	$ 3,100.00	$ 3,100.00
6	Contingency (30%)	LS	1	$ 48,720.00	$ 48,720.00

Total Cost:	$ 214,190

APPENDIX

F DATABASE OF GI PROJECT SITES

SITE ASSESSMENTS
Paterson Green Infrastructure Study
City of Paterson

CityWide Green Infrastructure

Last Updated: 7/10/2024

Site ID	Site Name	Plan ID	Ownership Subtype	Owner	Address (if applicable)	City Sewershed	CSO Outfall Area	Ward	Site Ranking	Recharge Potential [Mgal/yr]	Volume Reduction [gallons/storm]	Total Cost [$]	Impervious Area Treated [sf]	Impervious Area Treated [acres]
70	College Achieve Paterson Charter School (Elementary Campus)	A-01	Other Schools	Other Private	21 Market St, Paterson, New Jersey, 07501	C-01	CSO-001	5	3	1.150	82,280	$ 192,785	41,660	0.956
68	International High School	A-02	School District	BOE	200 Grand St, Paterson, New Jersey, 07501	C-01	CSO-001	5	4	1.224	87,590	$ 220,115	44,415	1.020
65	Lou Costello Memorial Park	A-03	Public Property	City of Paterson	49-69 ELLISON ST	C-01	CSO-001	5	4	0.375	26,850	$ 79,800	13,310	0.306
49	Our Lady of Pompei Church	A-04	Church and Charitable Property	Archdioses	157 Caldwell Ave, Paterson, New Jersey, 07501	C-01	CSO-001	2	3	0.190	14,730	$ 28,640	7,300	0.168
71	Paterson Museum	A-05	Public Property	City of Paterson	2 Market Street, Paterson, New Jersey, 07501	C-01	CSO-001	5	3	0.896	64,120	$ 167,920	32,650	0.750
67	Paterson Public School No. 2	A-06	School District	BOE	22 Passaic St, Paterson, New Jersey, 07501	C-01	CSO-001	5	3	1.076	77,020	$ 275,345	41,220	0.946
48	Paterson Public School No. 7	A-07	School District	BOE	106 Ramsey St, Paterson, New Jersey, 07501	C-01	CSO-001	2	3	0.547	42,370	$ 89,440	21,000	0.482
47	Pennington Park	A-08	Public Property	City of Paterson	268 McBride Ave, Paterson, New Jersey, 07501	C-01	CSO-001	2	3	1.730	133,940	$ 479,930	66,390	1.524
52	St. Bonaventure's Roman Catholic Church	A-09	Church and Charitable Property	Archdioses	174 Ramsey St, Paterson, NJ 07501	C-01	CSO-001	2	5	0.563	43,580	$ 138,750	21,750	0.499
69	Upper Raceway Park	A-10	Public Property	City of Paterson	169 Grand St, Paterson, New Jersey, 07501	C-01	CSO-001	2	3	0.599	46,400	$ 207,850	23,000	0.528
46	Veterans Memorial Park	A-11	Public Property	City of Paterson	286 McBride Ave, Paterson, New Jersey, 07501	C-01	CSO-001	2	4	0.141	10,740	$ 57,775	6,680	0.153
93	Arch St Parking Lot	B-01	Public Property	City of Paterson	216 Presidential Blvd, Paterson, New Jersey, 07522	C-02A	CSO-017	1	3	0.064	4,590	$ 10,810	2,275	0.052
28	Church of Jesus Christ	B-02	Church and Charitable Property	Other Private	29 Haledon Ave, Paterson, New Jersey, 07522	C-02A	CSO-017	1	3	0.000	3,410	$ 38,950	1,690	0.039
32	Dr. Frank Napier Jr. School of Technology	B-03	School District	BOE	55 Clinton St, Paterson, New Jersey, 07522	C-02A	CSO-017	1	3	0.328	23,480	$ 99,050	11,640	0.267
31	Northside Community Chapel Church	B-05	Church and Charitable Property	Other Private	96 Jefferson St, Paterson, New Jersey, 07522	C-02A	CSO-017	1	4	0.150	10,770	$ 25,580	5,336	0.122
30	CAMP Youth Development Program	B-08	Church and Charitable Property	Other Private	13-15 N 1st St, Paterson, New Jersey, 07522	C-02A	CSO-016	1	3	0.048	3,440	$ 14,375	1,704	0.039
25	Faith Soul Saving Station	B-04	Church and Charitable Property	Other Private	173 Haledon Ave, Paterson, New Jersey, 07522	C-02B	CSO-016	1	5	0.648	46,440	$ 109,475	23,015	0.528

SITE ASSESSMENTS
Paterson Green Infrastructure Study
City of Paterson

CityWide Green Infrastructure

Last Updated: 7/10/2024

Site ID	Site Name	Plan ID	Ownership Subtype	Owner	Address (if applicable)	City Sewershed	CSO Outfall Area	Ward	Site Ranking	Recharge Potential [Mgal/yr]	Volume Reduction [gallons/storm]	Total Cost [$]	Impervious Area Treated [sf]	Impervious Area Treated [acres]
192	Paterson Free Public Library (Northside)	B-06	Other Exempt	City of Paterson	60 Temple St, Paterson, NJ 07522	C-02B	CSO-016	1	4	0.504	36,130	$ 76,530	17,818	0.409
41	Paterson Public School No. 5	B-07	School District	BOE	414 Totowa Ave, Paterson, New Jersey, 07502	C-02B	CSO-016	1	3	1.036	74,150	$ 198,890	36,750	0.844
76	St. Mary Help of Christians Roman Catholic Church	B-09	Church and Charitable Property	Archdioses	410 Union Ave, Paterson, New Jersey, 07502	C-02B	CSO-016	2	3	0.887	34,025	$ 145,790	34,025	0.781
190	Belmont Senior Apartments	B-10	Public Property	Other Private	95 Cliff St, Paterson, New Jersey, 07522	C-02B	CSO-016	1	3	0.561	43,410	$ 83,090	21,515	0.494
19	Cobb Park	C-01	Public Property	City of Paterson	172 N Main St, Paterson, New Jersey, 07522	C-03	CSO-032	1	3	0.052	3,750	$ 40,850	1,860	0.043
24	Gilmore Memorial Christian	C-02	Church and Charitable Property	Other Private	127 Haledon Ave, Paterson, New Jersey, 07522	C-03	CSO-032	1	4	0.204	14,610	$ 39,080	7,245	0.166
26	Gilmore Memorial Tabernacle	C-03	Church and Charitable Property	Other Private	60 Haledon Ave, Paterson, New Jersey, 07522	C-03	CSO-032	1	3	0.287	20,520	$ 40,030	10,170	0.233
20	Holy Tabernacle Apostolic Church	C-04	Church and Charitable Property	Other Private	80 Holsman St, Paterson, New Jersey, 07522	C-03	CSO-032	1	3	0.199	14,290	$ 35,550	7,083	0.163
23	Christ Temple Baptist Church	D-01	Church and Charitable Property	Other Private	30 Hopper St, Paterson, New Jersey, 07522	C-04	CSO-021	1	3	0.687	49,200	$ 126,530	25,245	0.580
21	Paterson Public School #12	D-02	School District	BOE	214 N 4th St, Paterson, New Jersey, 07522	C-04	CSO-021	1	4	0.595	42,570	$ 94,640	21,100	0.484
16	Iglesia Pentecostal El Buen Pastor (Church)	E-01	Church and Charitable Property	Other Private	10 Governor St, Paterson, New Jersey, 07501	C-05	CSO-005	1	3	0.191	14,770	$ 37,020	7,992	0.183
18	Dog Park Lawrence St	F-01	Public Property	City of Paterson	36 Straight St, Paterson, New Jersey, 07501	C-06	CSO-006	1	4	0.472	33,760	$ 65,800	16,732	0.384
195	Freedom Village Apartments	G-01	Public Property	Other Private	69 Straight St, Paterson, New Jersey, 07501	C-07	CSO-007	4	3	1.048	68,330	$ 292,980	37,185	0.854
115	Grace Gospel Church	G-02	Church and Charitable Property	Other Private	139 Montgomery St, Paterson, New Jersey, 07501	C-07	CSO-007	4	4	0.076	5,470	$ 22,900	2,710	0.062
116	Grace Gospel Church Parking Lot	G-03	Church and Charitable Property	Other Private	127 Montgomery St, Paterson, New Jersey, 07501	C-07	CSO-007	4	3	0.183	13,080	$ 25,110	6,480	0.149
119	Mercer St & Fulton St Public Land	G-04	Public Property	City of Paterson	161 Fulton St, Paterson, New Jersey, 07501	C-07	CSO-007	4	3	0.439	31,450	$ 134,500	15,590	0.358
125	New Life Evangelist Center	G-05	Church and Charitable Property	Other Private	153 Hamilton Ave, Paterson, New Jersey, 07501	C-07	CSO-007	4	3	0.336	24,030	$ 86,740	11,915	0.274

SITE ASSESSMENTS
Paterson Green Infrastructure Study
City of Paterson

CityWide Green Infrastructure

Last Updated: 7/10/2024

Site ID	Site Name	Plan ID	Ownership Subtype	Owner	Address (if applicable)	City Sewershed	CSO Outfall Area	Ward	Site Ranking	Recharge Potential [Mgal/yr]	Volume Reduction [gallons/storm]	Total Cost [$]	Impervious Area Treated [sf]	Impervious Area Treated [acres]
124	Second Baptist Church	G-06	Church and Charitable Property	Other Private	72 Carroll Street, Paterson, New Jersey, 07501	C-07	CSO-007	4	3	0.553	39,610	$ 105,240	19,635	0.451
118	Wrigley Park	G-07	Public Property	City of Paterson	118-132 GRAHAM AVE	C-07	CSO-007	4	4	0.373	26,680	$ 277,490	13,225	0.304
114	Nathan Barnert Residence	H-01	Public Property	Paterson Housing Authority	64 Keen St, Paterson, New Jersey, 07524	C-08	CSO-010	4	4	0.398	28,500	$ 86,270	14,125	0.324
179	Paterson Public School No. 21	J-01	School District	BOE	322 10th Ave, Paterson, New Jersey, 07514	C-10	CSO-025	4	3	0.456	32,610	$ 208,310	18,065	0.415
193	Barnet Medical Arts Parking Lot 1	K-01	Other Exempt	Other Private	533 E 29th St, Paterson, New Jersey, 07504	C-11	CSO-025	3	4	1.474	114,140	$ 254,900	56,574	1.299
176	Faith Chapel Reformed Church	K-03	Church and Charitable Property	Other Private	618 Broadway, Paterson, New Jersey, 07514	C-11	CSO-025	3	3	0.060	4,670	$ 34,925	3,660	0.084
129	Love of Jesus Paterson	K-04	Church and Charitable Property	Other Private	405 Broadway, Paterson, New Jersey, 07501	C-11	CSO-025	4	3	0.843	60,340	$ 152,158	29,910	0.687
170	Manara College	K-05	Other Exempt	Other Private	139 Derrom Ave, Paterson, New Jersey, 07504	C-11	CSO-025	3	5	0.051	2,260	$ 23,845	2,935	0.067
180	Paterson Public School 26	K-06	School District	BOE	1 E 32nd St, Paterson, New Jersey, 07514	C-11	CSO-025	3	3	1.025	79,350	$ 266,195	39,334	0.903
120	Paterson Adult Day Center	K-07	Public Property	Archdioses	195 20th Avenue, Paterson, New Jersey, 07501	C-11	CSO-025	4	3	0.424	30,370	$ 89,955	15,055	0.346
130	Radio Vision Cristiana	K-08	Church and Charitable Property	Other Private	421 Broadway, Paterson, New Jersey, 07501	C-11	CSO-025	4	3	0.552	33,500	$ 94,770	19,580	0.449
178	Rosa L. Parks School of Fine & Performing Arts	K-09	School District	BOE	397 12th Ave, Paterson, New Jersey, 07514	C-11	CSO-025	4	4	0.206	14,700	$ 40,290	7,290	0.167
133	St. Paul's Episcopal Church	K-10	Church and Charitable Property	Other Private	449 Van Houten St, Paterson, New Jersey, 07501	C-11	CSO-025	4	3	0.355	25,390	$ 104,895	15,140	0.348
171	St. Therese Roman Catholic Church	K-11	Church and Charitable Property	Archdioses	80 13th Avenue, Paterson, New Jersey, 07504	C-11	CSO-025	3	3	0.388	30,020	$ 61,880	14,880	0.342
138	United Presbyterian Church	K-12	Church and Charitable Property	Other Private	375 Van Houten St, Paterson, New Jersey, 07501	C-11	CSO-025	4	4	0.334	23,890	$ 64,320	11,840	0.272
168	Amidstad Park	L-01	Public Property	City of Paterson	336 19th Ave, Paterson, New Jersey, 07504	C-12	CSO-027	3	3	0.023	1,820	$ 7,715	900	0.021
160	Brandes Field Playground	L-02	Public Property	City of Paterson	430 Marshall St, Paterson, New Jersey, 07503	C-12	CSO-027	2	5	0.384	29,750	$ 71,800	14,750	0.339

CityWide Green Infrastructure

Last Updated: 7/10/2024

Site ID	Site Name	Plan ID	Ownership Subtype	Owner	Address (if applicable)	City Sewershed	CSO Outfall Area	Ward	Site Ranking	Recharge Potential [Mgal/yr]	Volume Reduction [gallons/storm]	Total Cost [$]	Impervious Area Treated [sf]	Impervious Area Treated [acres]
161	Dr. Hani Awadallah School	L-03	School District	BOE	27 Hazel St, Paterson, New Jersey, 07503	C-12	CSO-027	2	5	0.893	70,680	$ 314,093	35,035	0.804
184	Dr. Martin Luther King Jr. Public School	L-04	School District	BOE	851 E 28th St, Paterson, New Jersey, 07513	C-12	CSO-027	5	3	1.052	75,250	$ 252,055	41,815	0.960
148	Full Service Community Center	L-05	Other Exempt	City of Paterson	512 Market St, Paterson, New Jersey, 07501	C-12	CSO-027	5	3	0.260	18,580	$ 28,210	5,955	0.137
165	GBCA Paterson Head Start	L-06	School District	Federal Program	604 20th Ave, Paterson, New Jersey, 07504	C-12	CSO-027	3	4	0.865	66,980	$ 176,350	32,200	0.739
191	Maurice J. Brick Residence	L-07	Other Exempt	Paterson Housing Authority	70 Dey St, Paterson, New Jersey, 07503	C-12	CSO-027	6	3	0.539	38,610	$ 158,660	23,475	0.539
153	Paterson Public School 15	L-08	School District	BOE	98 Oak St, Paterson, New Jersey, 07501	C-12	CSO-027	5	3	2.322	166,170	$ 551,640	82,370	1.891
166	Paterson Public School 20	L-09	School District	BOE	492 E 37th St, Paterson, New Jersey, 07504	C-12	CSO-027	3	3	0.274	21,240	$ 67,760	13,396	0.308
151	Paterson Public School 24	L-10	School District	BOE	50 19th Ave, Paterson, New Jersey, 07513	C-12	CSO-027	5	3	0.521	37,270	$ 174,380	18,475	0.424
167	Vreeland Park	L-11	Public Property	City of Paterson	670-678 20TH AVE	C-12	CSO-027	3	3	0.102	7,920	$ 33,640	3,925	0.090
164	Heritage at Alexander Hamilton	M-01	Public Property	Paterson Housing Authority	238-260 23RD AVE	C-15	CSO-031	3	3	0.453	35,080	$ 82,010	17,390	0.399
105	Kingdom Hall of Jehovah's Witnesses	M-02	Church and Charitable Property	Other Private	209 Trenton Ave, Paterson, New Jersey, 07503	C-15	CSO-031	6	3	0.366	26,200	$ 80,390	13,870	0.318
103	Paterson Art & Science Charter School	M-03	Church and Charitable Property	City of Paterson	30 Michigan Ave, Paterson, New Jersey, 07503	C-15	CSO-031	6	4	0.448	32,060	$ 93,755	15,890	0.365
102	Paterson Public School 25	M-04	School District	BOE	287 Trenton Ave, Paterson, New Jersey, 07503	C-15	CSO-031	6	5	1.454	101,540	$ 404,885	56,745	1.303
104	St. George Syro Malabar Catholic Church	M-05	Church and Charitable Property	Other Private	408 Getty Ave, Paterson, New Jersey, 07503	C-15	CSO-031	6	4	0.683	48,890	$ 126,090	26,900	0.618
97	United Islamic Center (Mosque)	M-06	Church and Charitable Property	Other Private	408 Knickerbocker Ave, Paterson, New Jersey, 07503	C-15	CSO-031	6	3	0.531	37,980	$ 105,130	22,055	0.506
188	Brooks Sloate Terrace	N-01	Other Exempt	Other Private	311 Redwood Ave, Paterson, New Jersey, 07522	PF-01	CSO-015A	1	3	1.560	111,680	$ 322,700	55,355	1.271
81	Grace Buckley Park	N-02	Public Property	City of Paterson	385 Chamberlain Ave, Paterson, New Jersey, 07502	PF-01	CSO-015A	1	5	0.745	53,320	$ 225,850	26,432	0.607

CityWide Green Infrastructure

Last Updated: 7/10/2024

Site ID	Site Name	Plan ID	Ownership Subtype	Owner	Address (if applicable)	City Sewershed	CSO Outfall Area	Ward	Site Ranking	Recharge Potential [Mgal/yr]	Volume Reduction [gallons/storm]	Total Cost [$]	Impervious Area Treated [sf]	Impervious Area Treated [acres]
44	John F Kennedy High School	N-03	School District	BOE	244 Totowa Ave, Paterson, New Jersey, 07502	PF-01	CSO-015A	2	5	2.690	208,330	$ 580,530	103,265	2.371
42	Paterson Public School No. 27	N-04	School District	BOE	228 Richmond Ave, Paterson, New Jersey, 07502	PF-01	CSO-015A	2	4	0.653	50,580	$ 103,920	25,075	0.576
3	Paterson Public School 19	N-05	School District	BOE	23 James St, Paterson, New Jersey, 07502	PF-01	CSO-015A	2	3	0.102	7,870	$ 73,015	701	0.016
83	St. Gerard Majella Roman Catholic Church	N-06	Church and Charitable Property	Archdioses	501 W Broadway, Paterson, New Jersey, 07522	PF-01	CSO-015A	1	5	1.316	94,210	$ 528,430	46,700	1.072
45	Westside Park	N-07	Public Property	City of Paterson	114-242 TOTOWA AVE	PF-01	CSO-015A	2	5	1.646	127,430	$ 592,465	63,165	1.450
79	Iglesia Nuevo Nacimiento 'New Birth' (Church)	O-01	Church and Charitable Property	Other Private	314 Totowa Ave, Paterson, New Jersey, 07502	PF-02	CSO-015A	2	3	0.038	2,960	$ 28,070	2,975	0.068
57	Paterson City Council	P-01	Public Property	City of Paterson	151 Market St, Paterson, New Jersey, 07505	PF-06	CSO-029A	1	3	0.096	6,870	$ 15,470	3,405	0.078
196	Dr. Frank X. Graves Public Safety Complex	P-02	Public Property	City of Paterson	93 Broadway, Paterson, New Jersey, 07505	PF-06	CSO-029A	1	3	1.998	142,990	$ 501,110	70,875	1.627
62	Cathedral of St. John the Baptist	Q-01	Church and Charitable Property	Archdioses	381 Grand St, Paterson, New Jersey, 07505	PF-07	CSO-003, CSO-029, CSO-033	1	3	0.287	20,530	$ 86,035	10,175	0.234
136	Christian Fellowship Center	Q-02	Church and Charitable Property	Other Private	349 Van Houten St, Paterson, New Jersey, 07501	PF-07	CSO-003, CSO-029, CSO-033	4	3	0.130	9,290	$ 23,210	4,610	0.106
63	Court House Plaza	Q-03	Public Property	Passaic County	74 Hamilton St, Paterson, New Jersey, 07505	PF-07	CSO-003, CSO-029, CSO-033	1	3	0.125	8,920	$ 45,400	4,420	0.101
144	Eastside High School	Q-04	School District	BOE	150 Park Ave, Paterson, New Jersey, 07501	PF-07	CSO-003, CSO-029, CSO-033	5	4	2.744	196,370	$ 487,090	98,320	2.257
142	Greater Bible Way Church	Q-05	Church and Charitable Property	Other Private	14 Southard St, Paterson, New Jersey, 07501	PF-07	CSO-003, CSO-029, CSO-033	5	4	0.621	44,430	$ 115,295	23,425	0.538
58	Internal Revenue Service (IRS) Taxpayer Assistance Center	Q-06	Public Property	Federal Program	100 Hamilton Plz, Paterson, New Jersey, 07505	PF-07	CSO-003, CSO-029, CSO-033	1	4	0.233	16,690	$ 74,720	8,272	0.190
10	Memorial Day School Georgette Hauser Campus	Q-07	Other Schools	Other Private	15 Crosby Pl, Paterson, New Jersey, 07501	PF-07	CSO-003, CSO-029, CSO-033	1	3	0.193	13,790	$ 37,760	6,836	0.157
146	New Roberto Clemente School	Q-08	School District	BOE	482 Market St, Paterson, New Jersey, 07501	PF-07	CSO-003, CSO-029, CSO-033	5	4	0.945	67,630	$ 267,175	33,525	0.770
14	Our Lady of Victories Roman Catholic Church	Q-09	Church and Charitable Property	Archdioses	100 Fair St, Paterson, New Jersey, 07505	PF-07	CSO-003, CSO-029, CSO-033	1	3	0.320	22,900	$ 63,345	12,310	0.283

CityWide Green Infrastructure

Last Updated: 7/10/2024

Site ID	Site Name	Plan ID	Ownership Subtype	Owner	Address (if applicable)	City Sewershed	CSO Outfall Area	Ward	Site Ranking	Recharge Potential [Mgal/yr]	Volume Reduction [gallons/storm]	Total Cost [$]	Impervious Area Treated [sf]	Impervious Area Treated [acres]
75	Park Railroad Ave	Q-10	Public Property	City of Paterson	254 Market St, Paterson, New Jersey, 07505	PF-07	CSO-003, CSO-029, CSO-033	1	4	0.051	3,640	$ 15,430	1,805	0.041
157	Paterson Public School 8	Q-12	School District	BOE	25 Chadwick St, Paterson, New Jersey, 07503	PF-07	CSO-003, CSO-029, CSO-033	2	3	0.354	27,380	$ 77,910	13,570	0.312
159	Paterson Public Works Department	Q-13	Public Property	City of Paterson	72-80 N Barclay St, Paterson, New Jersey, 07503	PF-07	CSO-003, CSO-029, CSO-033	2	4	0.442	34,210	$ 68,290	16,955	0.389
5	Railroad Ave Open Space	Q-14	Public Property	City of Paterson	207 Railroad Ave, Paterson, New Jersey, 07501	PF-07	CSO-003, CSO-029, CSO-033	5	3	0.366	18,190	$ 101,395	9,016	0.207
141	Roberto Clemente Park	Q-15	Public Property	City of Paterson	Parkway & Rose St, Paterson, New Jersey, 07501	PF-07	CSO-003, CSO-029, CSO-033	5	5	1.129	80,420	$ 204,520	40,040	0.919
155	St. Anthony of Padua Roman Catholic Church	Q-16	Church and Charitable Property	Archdioses	159 Madison St, Paterson, New Jersey, 07501	PF-07	CSO-003, CSO-029, CSO-033	5	4	1.261	90,260	$ 320,030	50,710	1.164
107	Paterson Public School 18	S-01	School District	BOE	37 E 18th St, Paterson, New Jersey, 07524	PF-16	CSO-023A	3	3	0.776	60,080	$ 182,720	33,118	0.760
181	The Church of Jesus Christ of Latter-day Saints	T-01	Church and Charitable Property	Other Private	26 E 39th St, Paterson, New Jersey, 07514	S-08	NA	3	5	0.745	57,670	$ 147,375	29,425	0.676
169	Christopher Columbus Park	U-01	Public Property	City of Paterson	1 E Park Dr, Paterson, NJ 07504	S-09	NA	3	5	1.128	87,860	$ 443,500	45,520	1.045
182	Paterson STEAM High School	U-02	School District	BOE	764 11th Ave, Paterson, New Jersey, 07514	S-09	NA	3	4	0.765	59,260	$ 214,190	29,375	0.674

G RANKING AND PRIORITIZATION MATRIX

RANKING AND PRIORITIZATION MATRIX
Paterson Green Infrastructure Study
City of Paterson

Date: 7/10/2024

Notes:
1. Schools are important to consider because of the Green Schools initiative mentioned in the LTCP
2. Flood prone areas determined using information from the LTCP (page 25 and page 30)
3. Extra Incentives - green schools or park, highly visible to the public,
4. Ease of construction -site has other expected or scheduled improvments, can be implemented by the DPW
5. Ease of O&M - private property is more difficult to maintain (easements)

Rating Dot Key:
- rating ≥ 4
- 4 > rating ≥ 2.5
- 2.5 > rating ≥ 0

				5%	50%	10%	10%	10%	15%	100%
				1 = NA 5 = Applicable	1 = not in combined sewer area 3 = in partially separated sewer area 5 = in combined sewer area	1 = not in a flood prone area 4 = other reported flood area 5 = in an area that contributes to CSO 025 or CSO 030	1 = 1 to 20,000 2 = 20,001 to 40,000 3 = 40,001 to 60,000 4 = 60,001 to 80,000 5 = 80,001 or more	1 = difficult in both categories 2 = difficult in 1 categories 3 = average difficulty 4 = easy in 1 categories 5 = easy in both categories	1 = Over $325,001 2 = $275,001 to $325,000 3 = $225,001 to $275,000 4 = $175,001 to $225,000 5 = $1,000 to $175,000	**1 = lowest** **5 = highest** *[rounded to nearest 0.25]*
Plan ID	**Ward**	**Site Name**	**Ownership**	**Extra Incentives**	**CSO Status/Sewershed Status**	**Flood Prone Area**	**Volume Reduction (Gallons/storm)**	**Feasibility (ease of construction, operation and maintenance)**	**Cost per acre of treatment**	**Rating**
K-01	3	Barnet Medical Arts Parking Lot 1	Other Private	1	5	5	5	3	4	4.50
A-08	2	Pennington Park	City of Paterson	5	5	4	5	3	2	4.25
K-06	3	Paterson Public School 26	BOE	5	5	5	4	2	2	4.25
A-01	5	College Achieve Paterson Charter School (Elem	Other Private	5	5	1	5	2	4	4.25
A-02	5	International High School	BOE	5	5	1	5	2	4	4.25
K-04	4	Love of Jesus Paterson	Other Private	1	5	5	4	3	4	4.25
K-08	4	Radio Vision Cristiana	Other Private	1	5	5	2	3	4	4.25
K-11	3	St. Therese Roman Catholic Church	Archdioses	1	5	5	2	3	4	4.25
B-10	1	Belmont Senior Apartments	Other Private	1	5	5	3	2	5	4.25
A-06	5	Paterson Public School No. 2	BOE	5	5	4	4	2	2	4.00
A-03	5	Lou Costello Memorial Park	City of Paterson	5	5	4	2	2	3	4.00
B-07	1	Paterson Public School No. 5	BOE	5	5	1	4	2	3	4.00
K-07	4	Paterson Adult Day Center	Archdioses	1	5	5	2	3	3	4.00
K-09	4	Rosa L. Parks School of Fine & Performing Arts	BOE	5	5	5	1	2	3	4.00
K-12	4	United Presbyterian Church	Other Private	1	5	5	2	3	3	4.00
L-04	5	Dr. Martin Luther King Jr. Public School	BOE	5	5	1	4	2	3	4.00
A-07	2	Paterson Public School No. 7	BOE	5	5	1	3	2	4	4.00
B-06	1	Paterson Free Public Library (Northside)	City of Paterson	1	5	4	2	3	4	4.00
C-04	1	Holy Tabernacle Apostolic Church	Other Private	1	5	4	1	3	4	4.00
D-02	1	Paterson Public School #12	BOE	5	5	1	3	2	4	4.00
L-02	2	Brandes Field Playground	City of Paterson	5	5	1	2	4	4	4.00
N-04	2	Paterson Public School No. 27	BOE	5	5	1	3	2	4	4.00
C-03	1	Gilmore Memorial Tabernacle	Other Private	1	5	1	2	3	5	4.00
F-01	1	Dog Park Lawrence St	City of Paterson	1	5	1	2	3	5	4.00
B-03	1	Dr. Frank Napier Jr. School of Technology	BOE	5	5	4	2	2	1	3.75
G-01	4	Freedom Village Apartments	Other Private	1	5	4	4	3	1	3.75
J-01	4	Paterson Public School No. 21	BOE	5	5	5	2	2	1	3.75
K-05	3	Manara College	Other Private	5	5	5	1	3	1	3.75
K-10	4	St. Paul's Episcopal Church	Other Private	1	5	5	2	3	2	3.75
L-08	5	Paterson Public School 15	BOE	5	5	1	5	2	2	3.75

RANKING AND PRIORITIZATION MATRIX
Paterson Green Infrastructure Study
City of Paterson

Rating Dot Key:
- rating ≥ 4
- 4 > rating ≥ 2.5
- 2.5 > rating ≥ 0

				5%	50%	10%	10%	10%	15%	100%
				1 = NA 5 = Applicable	1 = not in combined sewer area 3 = in partially separated sewer area 5 = in combined sewer area	1 = not in a flood prone area 4 = other reported flood area 5 = in an area that contributes to CSO 025 or CSO 030	1 = 1 to 20,000 2 = 20,001 to 40,000 3 = 40,001 to 60,000 4 = 60,001 to 80,000 5 = 80,001 or more	1 = difficult in both categories 2 = difficult in 1 categories 3 = average difficulty 4 = easy in 1 categories 5 = easy in both categories	1 = Over $325,001 2 = $275,001 to $325,000 3 = $225,001 to $275,000 4 = $175,001 to $225,000 5 = $1,000 to $175,000	**1 = lowest** **5 = highest** *[rounded to nearest 0.25]*
Plan ID	**Ward**	**Site Name**	**Ownership**	**Extra Incentives**	**CSO Status/Sewershed Status**	**Flood Prone Area**	**Volume Reduction (Gallons/storm)**	**Feasibility (ease of construction, operation and maintenance)**	**Cost per acre of treatment**	**Rating**
M-04	6	Paterson Public School 25	BOE	5	5	1	5	2	2	3.75
L-06	3	GBCA Paterson Head Start	Federal Program	1	5	1	4	3	3	3.75
M-03	6	Paterson Art & Science Charter School	City of Paterson	5	5	1	2	2	3	3.75
A-05	5	Paterson Museum	City of Paterson	1	5	1	4	1	4	3.75
B-01	1	Arch St Parking Lot	City of Paterson	1	5	1	1	3	4	3.75
B-04	1	Faith Soul Saving Station	Other Private	1	5	1	3	3	4	3.75
B-05	1	Northside Community Chapel Church	Other Private	1	5	1	1	3	4	3.75
B-09	2	St. Mary Help of Christians Roman Catholic Chur	Archdioses	1	5	1	2	4	4	3.75
D-01	1	Christ Temple Baptist Church	Other Private	1	5	1	3	3	4	3.75
E-01	1	Iglesia Pentecostal El Buen Pastor (Church)	Other Private	1	5	1	1	3	4	3.75
L-05	5	Full Service Community Center	City of Paterson	1	5	1	1	3	4	3.75
L-09	3	Paterson Public School 20	BOE	5	5	1	2	2	4	3.75
M-01	3	Heritage at Alexander Hamilton	Paterson Housing Authority	1	5	1	2	3	4	3.75
M-05	6	St. George Syro Malabar Catholic Church	Other Private	1	5	1	3	3	4	3.75
M-06	6	United Islamic Center (Mosque)	Other Private	1	5	1	2	3	4	3.75
A-04	2	Our Lady of Pompei Church	Archdioses	1	5	1	1	3	5	3.75
G-03	4	Grace Gospel Church Parking Lot	Other Private	1	5	1	1	3	5	3.75
A-10	2	Upper Raceway Park	City of Paterson	5	5	1	3	3	1	3.50
A-11	2	Veterans Memorial Park	City of Paterson	5	5	4	1	2	1	3.50
C-01	1	Cobb Park	City of Paterson	1	5	4	1	3	1	3.50
K-03	3	Faith Chapel Reformed Church	Other Private	1	5	5	1	3	1	3.50
L-03	2	Dr. Hani Awadallah School	BOE	5	5	1	4	2	1	3.50
L-10	5	Paterson Public School 24	BOE	5	5	1	2	2	1	3.50
A-09	2	St. Bonaventure's Roman Catholic Church	Archdioses	1	5	1	3	3	2	3.50
G-05	4	New Life Evangelist Center	Other Private	1	5	1	2	3	2	3.50
L-07	6	Maurice J. Brick Residence	Paterson Housing Authority	1	5	1	2	3	2	3.50
C-02	1	Gilmore Memorial Christian	Other Private	1	5	1	1	3	3	3.50
G-06	4	Second Baptist Church	Other Private	1	5	1	2	3	3	3.50
H-01	4	Nathan Barnert Residence	Paterson Housing Authority	1	5	1	2	3	3	3.50
M-02	6	Kingdom Hall of Jehovah's Witnesses	Other Private	1	5	1	2	3	3	3.50
B-02	1	Church of Jesus Christ	Other Private	1	5	1	1	4	1	3.25
B-08	1	CAMP Youth Development Program	Other Private	1	5	1	1	4	1	3.25
G-02	4	Grace Gospel Church	Other Private	1	5	1	1	3	1	3.25
G-04	4	Mercer St & Fulton St Public Land	City of Paterson	1	5	1	2	3	1	3.25
G-07	4	Wrigley Park	City of Paterson	1	5	1	2	3	1	3.25
L-01	3	Amidstad Park	City of Paterson	1	5	1	1	4	1	3.25
L-11	3	Vreeland Park	City of Paterson	1	5	1	1	3	1	3.25
N-05	2	Paterson Public School 19	BOE	5	5	1	1	2	1	3.25
N-07	2	Westside Park	City of Paterson	5	3	4	5	4	1	3.25
N-03	2	John F Kennedy High School	BOE	5	3	4	5	2	3	3.25
Q-04	5	Eastside High School	BOE	5	3	1	5	2	4	3.25
P-02	1	Dr. Frank X. Graves Public Safety Complex	City of Paterson	1	3	4	5	3	2	3.00

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Plan ID	**Ward**	**Site Name**	**Ownership**	**Extra Incentives**	**CSO Status/Sewershed Status**	**Flood Prone Area**	**Volume Reduction (Gallons/storm)**	**Feasibility (ease of construction, operation and maintenance)**	**Cost per acre of treatment**	**Rating**
N-01	1	Brooks Sloate Terrace	Other Private	5	3	1	5	3	3	**3.00**
Q-16	5	St. Anthony of Padua Roman Catholic Church	Archdioses	1	3	1	5	3	3	**3.00**
S-01	3	Paterson Public School 18	BOE	5	3	1	4	2	3	**3.00**
Q-15	5	Roberto Clemente Park	City of Paterson	1	3	1	5	3	4	**3.00**
Q-12	2	Paterson Public School 8	BOE	5	3	1	2	2	3	**2.75**
P-01	1	Paterson City Council	City of Paterson	5	3	1	1	3	4	**2.75**
Q-02	4	Christian Fellowship Center	Other Private	1	3	1	1	3	4	**2.75**
Q-05	5	Greater Bible Way Church	Other Private	1	3	1	3	3	4	**2.75**
Q-09	1	Our Lady of Victories Roman Catholic Church	Archdioses	1	3	1	2	3	4	**2.75**
Q-13	2	Paterson Public Works Department	City of Paterson	1	3	1	2	4	4	**2.75**
N-02	1	Grace Buckley Park	City of Paterson	1	3	1	3	3	1	**2.50**
N-06	1	St. Gerard Majella Roman Catholic Church	Archdioses	1	3	1	5	3	1	**2.50**
Q-03	1	Court House Plaza	Passaic County	5	3	1	1	3	1	**2.50**
Q-08	5	New Roberto Clemente School	BOE	5	3	1	4	2	1	**2.50**
Q-07	1	Memorial Day School Georgette Hauser Campu	Other Private	5	3	1	1	2	3	**2.50**
O-01	2	Iglesia Nuevo Nacimiento 'New Birth' (Church)	Other Private	1	3	1	1	3	1	**2.25**
Q-01	1	Cathedral of St. John the Baptist	Archdioses	1	3	1	2	3	1	**2.25**
Q-06	1	Internal Revenue Service (IRS) Taxpayer Assistan	Federal Program	1	3	1	1	3	1	**2.25**
Q-10	1	Park Railroad Ave	City of Paterson	1	3	1	1	3	1	**2.25**
Q-14	5	Railroad Ave Open Space	City of Paterson	1	3	1	1	1	1	**2.00**
U-01	3	Christopher Columbus Park	City of Paterson	5	1	4	5	3	1	**2.00**
U-02	3	Paterson STEAM High School	BOE	5	1	1	3	2	2	**1.75**
T-01	3	The Church of Jesus Christ of Latter-day Saints	Other Private	1	1	1	3	3	4	**1.75**

APPENDIX

H OPERATION AND MAINTENANCE DOCUMENTS

Filterra HC
Owner's Manual

filterra®

Bioretention Systems

CONTECH®
ENGINEERED SOLUTIONS

Table of Contents

Introduction

Thank you for your purchase of the Filterra® HC Bioretention System. Filterra HC is a specially engineered stormwater treatment system incorporating high performance biofiltration media to remove pollutants from stormwater runoff. All components of the system work together to provide a sustainable long-term solution for treating stormwater runoff.

The Filterra HC system has been delivered to you with protection in place to resist intrusion of construction related sediment which can contaminate the biofiltration media and result in inadequate system performance. These protection devices are intended as a best practice and cannot fully prevent contamination. It is the purchaser's responsibility to provide adequate measures to prevent construction related runoff from entering the Filterra HC system.

Included with your purchase is Activation of the Filterra HC system by the manufacturer as well as a 1-year warranty from delivery of the system and 1-year of routine maintenance (mulch replacement, debris removal, and pruning of vegetation) up to twice during the first year after activation.

Design and Installation

Each project presents different scopes for the use of Filterra HC systems. Information and help may be provided to the design engineer during the planning process. Correct Filterra HC box sizing (per local regulations) is essential to predict pollutant removal rates for a given area. The engineer shall submit calculations for approval by the local jurisdiction. The contractor is responsible for the correct installation of Filterra HC units as shown in approved plans. A comprehensive installation manual covering all Filterra configurations is available at www.ContechES.com.

Activation Overview

Activation of the Filterra HC system is a procedure completed by the manufacturer to place the system into working condition. This involves the following items:

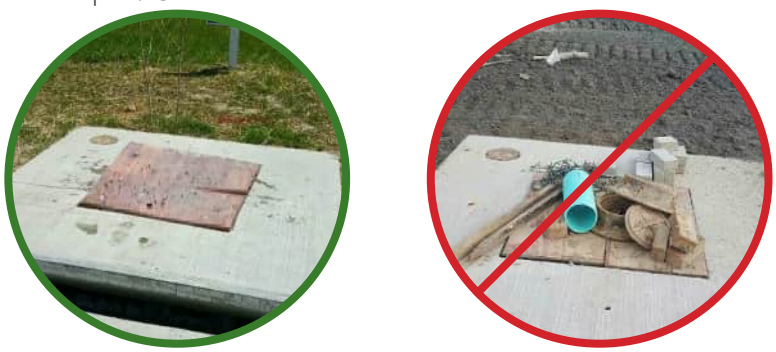
- Removal of construction runoff protection devices
- Planting of the system's vegetation
- Placement of pretreatment mulch layer using mulch certified for use in Filterra HC systems.

Activation MUST be provided by the manufacturer to ensure proper site conditions are met for Activation, proper installation of the vegetation, and use of pretreatment mulch certified for use in Filterra HC systems.

Minimum Requirements

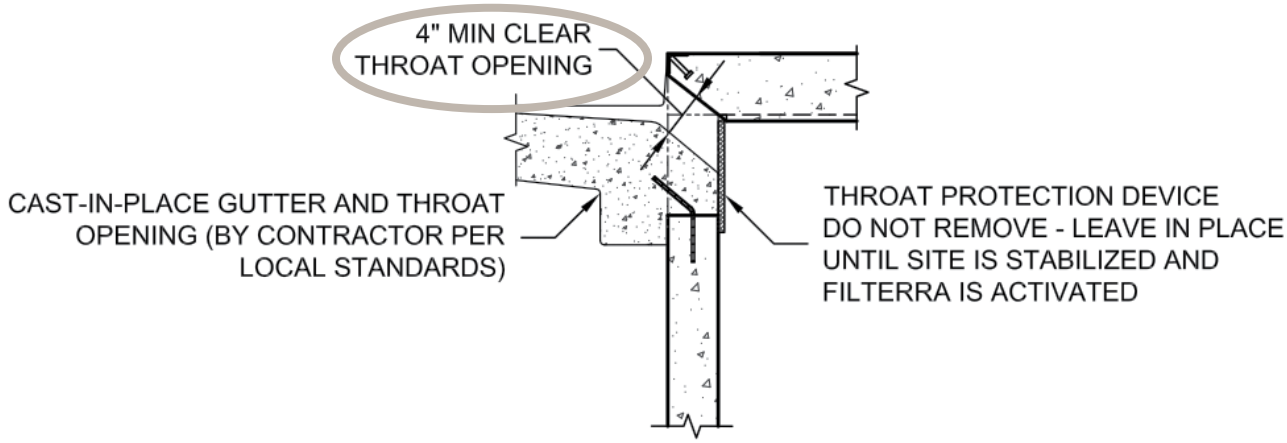
The minimum requirements for Filterra HC Activation are as follows:

1. The site landscaping must be fully stabilized, i.e. full landscaping installed and some grass cover (not just straw and seed) is required to reduce sediment transport. Construction debris and materials should be removed from surrounding area.



2. Final paving must be completed. Final paving ensures that paving materials will not enter and contaminate the Filterra HC system during the paving process, and that the plant will receive runoff from the drainage area, assisting with plant survival for the Filterra HC system.

3. Filterra HC throat opening (if applicable) should be at least 4" in order to ensure adequate capacity for inflow and debris.



An Activation Checklist is included on page 12 to ensure proper conditions are met for Contech to perform the Activation services. A charge of $500.00 will be invoiced for each Activation visit requested by Customer where Contech determines that the site does not meet the conditions required for Activation.

Filterra HC Plant Selection Overview

Plant Lists are available on the Contech website highlighting recommended plants for Filterra systems in your area. Keep in mind that plants are subject to availability due to seasonality and required minimum size for the Filterra HC system. Plants installed in the Filterra HC system are container plants (max 15 gallon) from nursery stock and will be immature in height and spread at Activation.

It is the responsibility of the owner to provide adequate irrigation when necessary to the plant of the Filterra HC system.

The "Planting Requirements for Filterra HC Systems" document is included as an appendix and discusses proper selection and care of the plants within Filterra HC systems.

Warranty Overview

Refer to the Contech Engineered Solutions LLC Stormwater Treatment System LIMITED WARRANTY for further information. The following conditions may void the Filterra HC system's warranty and waive the manufacturer provided Activation and Maintenance services:

- Unauthorized activation or performance of any of the items listed in the activation overview
- Any tampering, modifications or damage to the Filterra HC system or runoff protection devices
- Removal of any Filterra HC system components
- Failure to prevent construction related runoff from entering the Filterra HC system
- Failure to properly store and protect any Filterra HC components (including media and underdrain stone) that may be shipped separately from the vault

Routine Maintenance Guidelines

Routine maintenance is included by the manufacturer on all Filterra HC systems for the first year after activation. This includes a maximum of 2 visits to remove debris, replace pretreatment mulch, and prune the vegetation. More information is provided in the Operations and Maintenance Guidelines. Some Filterra HC systems also contain diversion bypass or outlet bays. Depending on site pollutant loading, these bays may require periodic removal of debris, however this is not included in the first year of maintenance and would likely not be required within the first year of operation.

These services, as well as routine maintenance outside of the included first year, can be provided by certified maintenance providers listed on the Contech website. Training can also be provided to other stormwater maintenance or landscape providers.

Why Maintain?

All stormwater treatment systems require maintenance for effective operation. This necessity is often incorporated in your property's permitting process as a legally binding BMP maintenance agreement. Other reasons to maintain are:

- Avoiding legal challenges from your jurisdiction's maintenance enforcement program.
- Prolonging the expected lifespan the media in the Filterra HC system.
- Avoiding more costly media replacement.
- Helping reduce pollutant loads leaving your property.

Simple maintenance of the Filterra HC is required to continue effective pollutant removal from stormwater runoff before discharge into downstream waters. This procedure will also extend the longevity of the living biofilter system. The Filterra HC system is also subjected to various materials entering the inlet, including trash, silt, leaves, etc. which will be contained above the mulch layer. Too much silt may inhibit the Filterra HC system flow rate, which is the reason for site stabilization before activation. Regular replacement of the mulch stops accumulation of such sediment.

If the system is not maintained on regular intervals, is subject to a catastrophic spill or other event, or subject to unusual pollutant loading, full media bed replacement could be required. Please contact Contech for further evaluation if you feel this may be necessary.

When to Maintain?

Contech includes a 1-year maintenance plan with each system purchase. Annual included maintenance consists of a maximum of two (2) scheduled visits. Additional maintenance may be necessary depending on sediment and trash loading (by Owner or at additional cost). The start of the maintenance plan begins when the system is activated.

Maintenance visits are scheduled seasonally; the spring visit aims to clean up after winter loads including salts and sands while the fall visit helps the system by removing excessive leaf litter.

It has been found that in regions which receive between 30-50 inches of annual rainfall, (2) two visits are generally required; regions with less rainfall often only require (1) one visit per annum. Varying land uses can affect maintenance frequency;

e.g. some fast food restaurants require more frequent trash removal. Contributing drainage areas which are subject to new development wherein the recommended erosion and sediment control measures have not been implemented may require additional maintenance visits.

Some sites may be subjected to extreme sediment or trash loads, requiring more frequent maintenance visits. This is the reason for detailed notes of maintenance actions per unit, helping the Supplier and Owner predict future maintenance frequencies, reflecting individual site conditions.

Owners must promptly notify the (maintenance) Supplier of any damage to the plant(s), which constitute(s) an integral part of the bioretention technology. Owners should also advise other landscape or maintenance contractors to leave all maintenance to the Supplier (i.e. no pruning or fertilizing) during the first year.

Exclusion of Services

Clean up due to major contamination such as oils, chemicals, toxic spills, etc. will result in additional costs and are not covered under the Supplier maintenance contract. Should a major contamination event occur the Owner must block off the outlet pipe of the Filterra HC (where the cleaned runoff drains to, such as drop inlet) and block off the inlet of the Filterra HC. The Supplier should be informed immediately.

Maintenance Visit Summary

Each maintenance visit consists of the following simple tasks (detailed instructions below).

1. Inspection of Filterra HC and surrounding area
2. Removal of tree grate and erosion control stones
3. Removal of debris, trash and mulch
4. Mulch replacement
5. Plant health evaluation & pruning or replacement as necessary
6. Clean area around Filterra HC
7. Complete paperwork

Maintenance Tools, Safety Equipment and Supplies

Ideal tools include camera, bucket, shovel, broom, pruners, hoe/rake, and tape measure. Appropriate Personal Protective Equipment (PPE) should be used in accordance with local or company procedures. This may include impervious gloves where the type of trash is unknown, high visibility clothing and barricades when working near traffic and also safety hats and shoes. A T-Bar or crowbar should be used for moving the tree grates (up to 170 lbs ea.). Most visits require minor trash removal and a full replacement of mulch. See below for actual number of bagged mulch that is required in each media bay size. Mulch should be a double shredded, hardwood variety. Some visits may require additional Filterra engineered soil media for the Filterra HC system, available from the Supplier.

	Available Filterra® HC Media Bay Sizes (feet)	Filter Surface Area (ft^2)	Mulch Volume at 3" Depth (ft^2)	# of 2 ft^2 Mulch Bags
Standard Configuration Filterra and Filterra Biosape Vaults	4x4	16	4	2
	4x6 or 6x4	24	6	3
	4.5x7.83 or 7.83x4.5 (Nominal 4x8/8x4)	35.24	9	5
	6x6	36	9	5
	6x8 or 8x6	48	12	6
	6x10 or 10x6	60	15	8
	6x12 or 12x6	72	18	9
	7x13 or 13x7	91	23	12
	14x8	112	28	14
	16x8	128	32	16
	18x8	144	36	18
	20x8	160	40	20
	22x8	176	44	22
Peak Diversion Filterra Vaults	4x4	16	4	2
	4.5x5.83 or 5.83x4.5 (Nominal 4x6/6x4)	26.24	7	4
	6x6	36	9	5
	6x8	48	12	6
	6x10 or 10x6	60	15	8
	7x10	70	18	9
	8x10.5	84	21	11
	8x12.5	100	25	13
	Custom and/or Filterra Bioscape	Media Area in ft^2	0.25 x (Media Area in ft^2)	0.125 x (Media Area in ft^2)

Maintenance Visit Procedure

Keep sufficient documentation of maintenance actions to predict location specific maintenance frequencies and needs. An example Maintenance Report is included in this manual.

1. Inspection of Filterra HC and surrounding area

- Record individual unit before maintenance with photograph (numbered). Record on Maintenance Report (see example in this document) the following:

Record on Maintenance Report the following:

Standing Water	yes | no
Damage to Box Structure	yes | no
Damage to Grate	yes | no
Is Bypass Clear	yes | no

If yes answered to any of these observations, record with close-up photograph (numbered).

2. Removal of tree grate and erosion control stones

- Remove cast iron grates for access into Filterra HC box.
- Dig out silt (if any) and mulch and remove trash & foreign items.

3. Removal of debris, trash and mulch

Record on Maintenance Report the following:

Silt/Clay	yes | no
Cups/ Bags	yes | no
Leaves	yes | no
Buckets Removed	_____

- After removal of mulch and debris, measure distance from the top of the Filterra engineered media soil to the top of the top slab. Compare the measured distance to the distance shown on the approved Contract Drawings for the system. Add Filterra media (not top soil or other) to bring media up as needed to distance indicated on drawings.

Record on Maintenance Report the following:

Distance to Top of Top Slab (inches)	_____
Inches of Media Added	_____

4. Mulch replacement

- Add double shredded mulch evenly across the entire unit to a depth of 3".
- Refer to Filterra Mulch Specifications for information on acceptable sources.
- Ensure correct repositioning of erosion control stones by the Filterra HC inlet to allow for entry of trash during a storm event.
- Replace Filterra HC grates correctly using appropriate lifting or moving tools, taking care not to damage the plant.

5. Plant health evaluation and pruning or replacement as necessary

- Examine the plant's health and replace if necessary.
- Prune as necessary to encourage growth in the correct directions

Record on Maintenance Report the following:

Height above Grate	_____ (ft)
Width at Widest Point	_____ (ft)
Health	healthy | unhealthy
Damage to Plant	yes | no
Plant Replaced	yes | no

6. Clean area around Filterra HC

- Clean area around unit and remove all refuse to be disposed of appropriately.

7. Complete paperwork

- Deliver Maintenance Report and photographs to appropriate location (normally Contech during maintenance contract period).
- Some jurisdictions may require submission of maintenance reports in accordance with approvals. It is the responsibility of the Owner to comply with local regulations.

Maintenance Checklist

Drainage System Failure	Problem	Conditions to Check	Condition that Should Exist	Actions
Inlet	Excessive sediment or trash accumulation.	Accumulated sediments or trash impair free flow of water into Filterra HC.	Inlet should be free of obstructions allowing free distributed flow of water into Filterra HC HC.	Sediments and/or trash should be removed.
Mulch Cover	Trash and floatable debris accumulation.	Excessive trash and/or debris accumulation.	Minimal trash or other debris on mulch cover.	Trash and debris should be removed and mulch cover raked level. Ensure bark nugget mulch is not used.
Mulch Cover	"Ponding" of water on mulch cover.	"Ponding" in unit could be indicative of clogging due to excessive fine sediment accumulation or spill of petroleum oils.	Stormwater should drain freely and evenly through mulch cover.	Recommend contact manufacturer and replace mulch as a minimum.
Vegetation	Plants not growing or in poor condition.	Soil/mulch too wet, evidence of spill. Incorrect plant selection. Pest infestation. Vandalism to plants.	Plants should be healthy and pest free.	Contact manufacturer for advice.
Vegetation	Plant growth excessive.	Plants should be appropriate to the species and location of Filterra HC.		Trim/prune plants in accordance with typical landscaping and safety needs.
Structure	Structure has visible cracks.	Cracks wider than 1/2 inch or evidence of soil particles entering the structure through the cracks.		Vault should be repaired.
Maintenance is ideally to be performed twice annually.				

Filterra HC Inspection & Maintenance Log

Filterra HC System Size/Model: _____ **Location:** _____

Date	Mulch & Debris Removed	Depth of Mulch Added	Mulch Brand	Height of Vegetation Above Grate	Vegetation Species	Issues with System	Comments
1/1/17	*5 – 5 gal Buckets*	*3″*	*Lowe's Premium Brown Mulch*	*4′*	*Galaxy Magnolia*	*- Standing water in downstream structure*	*- Removed blockage in downstream structure*

Appendix 1 – Filterra® Activation Checklist

Project Name:__________________________________Company:__________________________________

Site Contact Name: ________________________________ Site Contact Phone/Email: ________________________

Site Owner/End User Name:_____________________Site Owner/End User Phone/Email: ________________________

Preferred Activation Date: ______________________________(provide 2 weeks minimum from date this form is submitted)

Site Designation	System Size	Final Pavement / Top Coat Complete	Landscaping Complete / Grass Emerging	Construction materials / Piles / Debris Removed	Throat Opening Measures 4" Min. Height	Plant Species Requested
		☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	
		☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	
		☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	
		☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	
		☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	
		☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	
		☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	
		☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	
		☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	

Attach additional sheets as necessary.

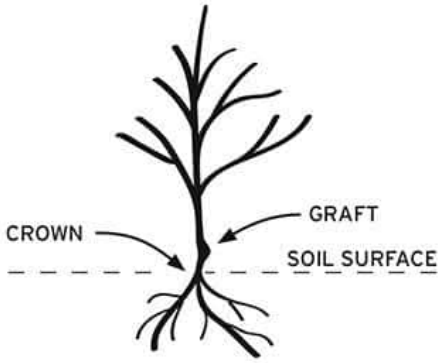
NOTE: A charge of $500.00 will be invoiced for each Activation visit requested by Customer where Contech determines that the site does not meet the conditions required for Activation. ONLY Contech authorized representatives can perform Activation of Filterra HC systems; unauthorized Activations will void the system warranty and waive manufacturer supplied Activation and 1st Year Maintenance.

____ ________________________

Signature Date

Appendix 2 – Planting Requirements for Filterra® HC Systems

Plant Material Selection



- Select plant(s) as specified in the engineering plans and specifications.
- Select plant(s) with full root development but not to the point where root bound.
- Use local nursery container plants only. Ball and burlapped plants are not permitted.
- For precast Filterra HC systems with a tree grate, plant(s) must not have scaffold limbs at least 14 inches from the crown due to spacing between the top of the mulch and the tree grate. Lower branches can be pruned away provided there are sufficient scaffold branches for tree or shrub development.
- For precast Filterra HC systems with a tree grate, at the time of installation, it is required that plant(s) must be at least 6" above the tree grate opening at installation for all Filterra configurations. This DOES NOT apply to Full Grate Cover designs.
- Plant(s) shall not have a mature height greater than 25-30 feet.
- A 7-15 gallon container size shall be used.
- For precast Filterra HC systems, plant(s) should have a single trunk at installation, and pruning may be necessary at activation and maintenance for some of the faster growing species, or species known to produce basal sprouts

Plant Installation

- During transport protect the plant leaves from wind and excessive jostling.
- Prior to removing the plant(s) from the container, ensure the soil moisture is sufficient to maintain the integrity of the root ball. If needed, pre-wet the container plant.
- Cut away any roots which are growing out of the container drain holes. Plants with excessive root growth from the drain holes should be rejected.
- Plant(s) should be carefully removed from the pot by gently pounding on the sides of the container with the fist to loosen root ball. Then carefully slide out. Do not lift plant(s) by trunk as this can break roots and cause soil to fall off. Extract the root ball in a horizontal position and support it to prevent it from breaking apart. Alternatively, the pot can be cut away to minimize root ball disturbance.
- Remove any excess soil from above the root flare after removing plant(s) from container.
- Excavate a hole with a diameter 4" greater than the root ball, gently place the plant(s).
- If plant(s) have any circling roots from being pot bound, gently tease them loose without breaking them.
- If root ball has a root mat on the bottom, it should be shaved off with a knife just above the mat line.
- Plant the tree/shrub/grass with the top of the root ball 1" above surrounding media to allow for settling.
- All plants should have the main stem centered in the tree grate (where applicable) upon completion of installation.
- With all trees/shrubs, remove dead, diseased, crossed/rubbing, sharply crotched branches or branches growing excessively long or in wrong direction compared to majority of branches.
- To prevent transplant shock (especially if planting takes place in the hot season), it may be necessary to prune some of the foliage to compensate for reduced root uptake capacity. This is accomplished by pruning away some of the smaller secondary branches or a main scaffold branch if there are too many. Too much foliage relative to the root ball can dehydrate and damage the plant.
- Plant staking may be required.

Mulch Installation

- Only mulch that has been meeting Contech Engineered Solutions' mulch specifications can be used in the Filterra HC system.
- Mulch must be applied to a depth of 3" evenly over the surface of the media.

Irrigation Requirements

- Each Filterra HC system must receive adequate irrigation to ensure survival of the living system during periods of drier weather.
- Irrigation sources include rainfall runoff from downspouts and/or gutter flow, applied water through the tree grate or in some cases from an irrigation system with emitters installed during construction.
- At Activation: Apply about one (cool climates) to two (warm climates) gallons of water per inch of trunk diameter over the root ball.
- During Establishment: In common with all plants, each Filterra HC plant will require more frequent watering during the establishment period. One inch of applied water per week for the first three months is recommended for cooler climates (2 to 3 inches for warmer climates). If the system is receiving rainfall runoff from the drainage area, then irrigation may not be needed. Inspection of the soil moisture content can be evaluated by gently brushing aside the mulch layer and feeling the soil. Be sure to replace the mulch when the assessment is complete. Irrigate as needed**.
- Established Plants: Established plants have fully developed root systems and can access the entire water column in the media. Therefore, irrigation is less frequent but requires more applied water when performed. For a mature system assume 3.5 inches of available water within the media matrix. Irrigation demand can be estimated as 1" of irrigation demand per week. Therefore, if dry periods exceed 3 weeks, irrigation may be required. It is also important to recognize that plants which are exposed to windy areas and reflected heat from paved surfaces may need more frequent irrigation. Long term care should develop a history which is more site specific.

** Five gallons per square yard approximates 1 inch of water. Therefore, for a 6' by 6' Filterra HC approximately 20-60 gallons of water is needed. To ensure even distribution of water it needs to be evenly sprinkled over the entire surface of the filter bed, with special attention to make sure the root ball is completely wetted. NOTE: if needed, measure the time it takes to fill a five-gallon bucket to estimate the applied water flow rate then calculate the time needed to irrigate the Filterra HC system. For example, if the flow rate of the sprinkler is 5 gallons/minute then it would take 12 minutes to irrigate a 6' by 6' filter.

Notes

filterra®
Bioretention Systems

CONTECH®
ENGINEERED SOLUTIONS

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West Chester, OH 45069
info@conteches.com | 800-338-1122
www.ContechES.com

PDF 1/21

StormVault Biofiltration

(SVBF)

OPERATION & MAINTENANCE MANUAL

Prepared For
Project Name:
Project Location:
Date:

Table of Contents

PROJECT INFORMATION
FOR
STORMVAULT BIOFILTRATION (SVBF) UNITS

Project:

Location:

Subject:

SWTU: **STORMVAULT BIOFILTRATION (SVBF) UNITS**

Model: **SVBFXX-XX**

INTRODUCTION

The ***StormVault BioFiltration*** (***SVBF***) stormwater treatment unit (SWTU), is a bioretention manufactured treatment device (MTD) designed for the treatment of stormwater runoff. Using the proprietary ***Sierra Blend*** engineered bio-soil media, the ***SVBF*** captures and removes pollutants from stormwater including total suspended solids, heavy metals, nutrients, gross solids, trash and debris, and petroleum hydrocarbons. Many of these pollutants are regulated by local, state, and/or federal government(s) who limit the allowable level of pollutants in stormwater runoff discharging from a site. Due to the high hydraulic surface loading rate capacity of the ***Sierra Blend*** bio-soil media, the ***SVBF*** system is able to treat more stormwater in a smaller footprint than conventional bioretention systems.

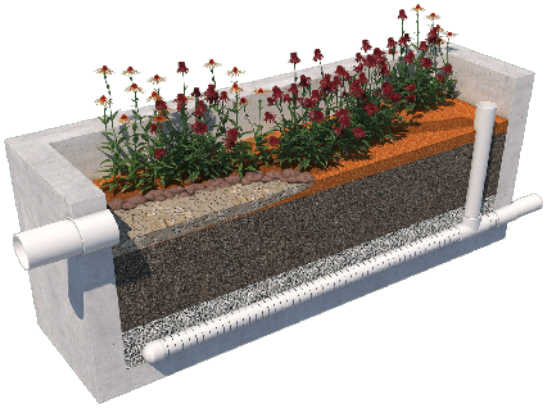
DEPLOYMENT CONFIGURATIONS

The ***SVBF*** comes in many standard sizes and is available in several different deployment configurations. Depending on the deployment configuration, units may have additional parts or chambers that will need to be inspected and maintained. In addition to the standard model featuring only the treatment chamber, other deployment configurations may include an inlet and outlet chamber separated by a high-flow bypass weir, as well as an underground vault model without vegetation. However, inspection and maintenance across all deployment configurations should remain consistent and generally follow the same procedures.

The ***SVBF*** unit consists of a precast concrete vault layered with 3-inches of plant stabilization mulch/media, 18-inches of the ***Sierra Blend*** bio-soil media, and 6-inches of bridging stone above

the underdrain piping, with an internal or external high-flow bypass. Different deployment configurations of the unit are available to better serve the requirements and needs of a specific site. Deployment configurations include a planter box with an open top more suited for shrubs and grasses to better mimic a natural swale, a tree box with or without a grated curb inlet, a tree well consisting of an adjacent tree well with open bottom to promote mature tree root growth, and an underground vault with a subsurface inlet pipe. All of these deployment configurations can be deployed with block-outs in the bottom of the vault to promote infiltration and groundwater recharge.

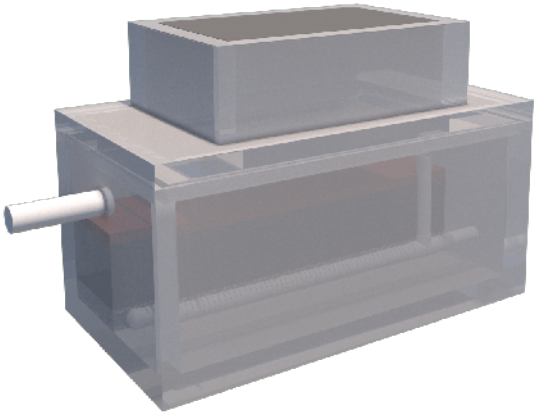
The following illustrations depict the various possible deployment configurations of the ***SVBF*** unit.



Planter Box Model

Tree Box Model

Tree Well Model



Underground Vault Model

OPERATIONS

The ***SVBF*** unit is a non-mechanical, self-operating system that will function anytime there is flow within the drainage system. The plant stabilization mulch/media, the ***Sierra Blend*** bio-soil media, and the bridging stone are arranged in layers within the chamber with stormwater gravity flowing downward through these layers. The plant stabilization mulch/media layer consists of hardwood mulch and/or large stone riprap and serves as pretreatment, removing the trash, debris, and large sediment while increasing moisture retention, erosion control, and flow dissipation across the treatment chamber. The ***Sierra Blend*** bio-soil media treats the stormwater, removing fine and suspended sediment, heavy metals, and nutrients. The bridging stone, the gravel base beneath the ***Sierra Blend*** bio-soil media bed ensures even drainage. Treated stormwater enters an underdrain pipe, infiltrates into the ground, or splits between both.

A system bypass allows the ***SVBF*** unit to continue to operate in high-flow situations without washing out or scouring the pollutants already trapped in the system. After the water quality treatment flow depth is reached, excess flow spills over a bypass weir or overflow pipe and is directly discharged along with treated flows. Flows greater than the water quality treatment flow rate of a unit will cause ponding within the unit.

An external bypass consists of a separate catch basin or other external bypass structure located further downstream from the unit.

INSPECTION

NEW INSTALLATIONS – Jensen recommends a visual inspection of the unit every 6-months or for every 10-inches of rainfall, whichever comes first, but regular inspections during the first two to three years of operation will help to establish a site-specific frequency for future inspections and maintenance. During these regular inspections, light maintenance procedures such as clearing out trash and debris caught in the plant stabilization mulch/media and inlet grates or tending to vegetation can be completed. Clearing out trash and debris will prevent obstructions to the inlets and ensure the unit is operating at its maximum capacity. It is recommended to inspect the system after each major storm event during the first several months of the rainy season.

ONGOING OPERATION – The system should be routinely inspected to ensure that all grates and drains are free of blockage. After several storm events, inspections should look for signs of erosion of or accumulation of sediment in the plant stabilization mulch/media layer. If the plant stabilization mulch/media has been displaced due to flows and the ***Sierra Blend*** bio-soil media layer is visible, or heavy accumulation of sediment is apparent in the plant stabilization mulch/media layer, the steps outlined in the maintenance section should be followed to ensure that the ***SVBF*** unit is able to continue to operate at maximum capacity.

Use the attached Inspection & Maintenance Log in Appendix A, to help determine whether maintenance is needed.

Inspection Equipment

The following is a list of equipment for the simple and effective inspection of ***SVBF*** systems:

- Appropriate clothing (pants and shoes, gloves, safety vest, hard hat, etc.)
- Traffic control equipment (Traffic cones, signage, etc.)
- Manhole hook or crowbar
- Inspection & Maintenance Log or other recording method
- Flashlight
- Tape measure
- Trash grabber
- Shovel, rake, and broom
- Pruners
- Trash can/bag.

Inspection Procedure

All necessary pre-inspection steps including traffic control or pedestrian detours must be carried out. Access to underground, closed top ***SVBF*** units can be reached through the access hatch, grate or manhole frame and cover. When access has been safely established the following inspection procedure should begin:

- Record the date, time, and inspector on the day of inspection as well as the job location and model designation
- Observe and record the level of the scum line if any
- Clean off a section of the scum line on the side wall
- Inspections of the internal components can, in most cases, be accomplished through observations from the ground surface
- Check the inlet structures for any unwanted objects or obstructions and remove them
- Record and photograph any observations in the provided inspection form

- Observe the inside of the ***SVBF*** for trash, debris, or displacement of the plant stabilization mulch/media and ***Sierra Blend*** bio-soil media layers

- Observe the SVBF for "light", "medium", or "heavy" sediment loading within the plant stabilization mulch/media layer

    - For "light" loading, the sediment is difficult to distinguish amongst the plant stabilization mulch/media with the plant stabilization mulch/media appearing new

    - For "medium" loading, the sediment is apparent and may be concentrated in some areas, but the probing of the plant stabilization mulch/media reveals lighter loads beneath the first inch of plant stabilization mulch/media

    - For "heavy" loads, sediment is apparent across the entire top layer as well as beneath the first inch of plant stabilization mulch/media

- Finalize the inspection report with the designated manager to determine required maintenance

- It must be noted that closed top ***SVBF*** units may be considered confined space environments and only properly trained personnel possessing the necessary safety equipment should enter the unit to perform maintenance and/or inspection in adherence with the requirements of a confined space entry permit.

MAINTENANCE

The schedule for the maintenance of the ***SVBF*** unit should be established based on the results of the routine inspections outlined in the previous section.

Maintenance Equipment

In addition to the equipment necessary for inspection, the following equipment is recommended for performing maintenance on the ***SVBF*** unit:

- Traffic control equipment (Traffic cones, signage, etc.)

- Vactor truck as necessary.

Maintenance Indicators

From observations noted during previous inspections, the following items may be indications that the ***SVBF*** unit needs maintenance:

- The visual presence of a scum line on the wall above the plant stabilization mulch/media layer that is higher than the crest of the bypass weir or overflow pipe is a general indicator that the filter bed has operated in bypass mode and the ***Sierra Blend*** bio-soil media may be plugged
- Damage to the concrete structure
- Damaged or missing grates
- Obstruction of the curb inlet or inlet rack
- Water stagnation in the biofiltration chamber more than a full day after a rainfall event
- Invasive vegetation growth
- Excessive trash and debris, especially plastics
- Heavy sediment load present in the plant stabilization mulch/media or top of ***Sierra Blend*** bio-soil media
- Excessive erosion of the plant stabilization mulch/media or ***Sierra Blend*** bio-soil media.

Maintenance Procedure

Cleanout of the ***SVBF*** unit at the end of a wet season is recommended to ensure captured trash, debris, sediment, and invasive vegetation do not compromise the unit's functionality or harm plant housed in it.

The following maintenance activities should be performed during each service:

- Inspection of treatment system and housing structure
- Removal of any material or debris blocking flow into and through the unit
- Removal of trash and debris from plant stabilization mulch/media and visible flow paths
- Raking or replacement of plant stabilization mulch/media layer
    - ***Sierra Blend*** bio-soil media replacement should only be necessary after an oil or chemical spill clean-up or when the filter has become totally occluded with fines or possibly biofouling
- If vegetation is planted:
    - Pruning of vegetation
    - Replacement with new vegetation if current vegetation is in poor health for aesthetic purposes

- Ensure irrigation system is functional
- Disposal of any trash or debris collected.

If the ***Sierra Blend*** bio-soil media appears plugged due to the presence of a prominent scum line on the vault wall above the crest of the bypass:

- Remove the plant stabilization mulch/media layer, which should be replaced if necessary
- Rake the top of the ***Sierra Blend*** bio-soil media in ¼ to ½-inch depth passes until the original ***Sierra Blend*** bio-soil media is observed and to break any cementitious crust that may have formed
- Again, remember to clean off a section of the scum line on the side wall as an operational reset for future indicator measurements

If operations continue to appear to be in bypass condition:

- Replace any ***Sierra Blend*** bio-soil media that was removed and replace plant stabilization mulch/media
- Again, remember to clean off a section of the scum line on the side wall

If bypass events still appear to continue:

- Remove ***Sierra Blend*** bio-soil media as necessary until no more incoming sediment is observed within this media, exposing the underdrain pipe if necessary and replace all ***Sierra Blend*** bio-soil media if necessary
- Wash or replace the underdrain bridging stone layer
- Clean and place new ***Sierra Blend*** bio-soil media and plant stabilization mulch/media.

Replacement of the ***Sierra Blend*** bio-soil media is done either with hand tools or a mini excavator.

CLEANOUT AND DISPOSAL

Cleanout of the unit primarily involves the removal of trash and sediment from the unit. Trash and debris can be removed from the curb inlet, inlet rack, and the biofiltration chamber manually with tools such as rakes, shovels, brooms or by Vactor trucks if required.

- Disposal of material from the ***SVBF*** unit should be in accordance with the local municipality's requirements. Typically, the removed solids can be disposed of in a similar fashion as those materials collected from sump catch basins or manholes

- If any of the unit's parts previously mentioned under the inspection section are damaged or missing, or ***Sierra Blend*** bio-soil media is needed for replacement, please contact Jensen Water Resources

  Jensen Water Resources
  521 Dunn Circle
  Sparks, NV 89431
  Toll Free: (877) 649-0095
  Fax: (775) 440-2013

RECORDS OF OPERATION AND MAINTANACE

The owner shall maintain annual records of the operation and maintenance of the ***SVBF*** unit to document the effective maintenance of this important component of a site's stormwater management program.

The attached Inspection & Maintenance Log in Appendix A, is suggested and should be retained for a minimum period of three years.

Appendix A

Inspection & Maintenance Log

StormVault BioFiltration (SVBF)
ANNUAL RECORD OF OPERATION AND MAINTENANCE

OWNER _____

ADDRESS _____

OWNER'S REPRESENTATIVE _____ **PHONE** _____

SVBF MODEL DESIGNATION _____ **DATE** _____

SITE LOCATION _____

INSPECTIONS:

DATE & INSPECTOR	SCUM LINE LEVEL	INLET AND OUTLET INTEGRITY	STANDING WATER/ TRASH AND DEBRIS	MULCH AND EROSION	CONDITION OF VEGETATION	OBSERVATIONS OF FUNCTION

CLEANOUT:

DATE	SCUM LINE LEVEL	TRASH AND DEBRIS REMOVAL	MULCH MEDIA REPLACED (Y/N)	VEGETATION PRUNED REPLACED (Y/N)	METHOD OF DISPOSAL OF MULCH, MEDIA, TRASH AND DEBRIS, AND VEGETATION	OBSERVATIONS OF FUNCTION

MAINTENANCE:

DATE OF INSPECTION AND OBSERVATIONS: _____

_____

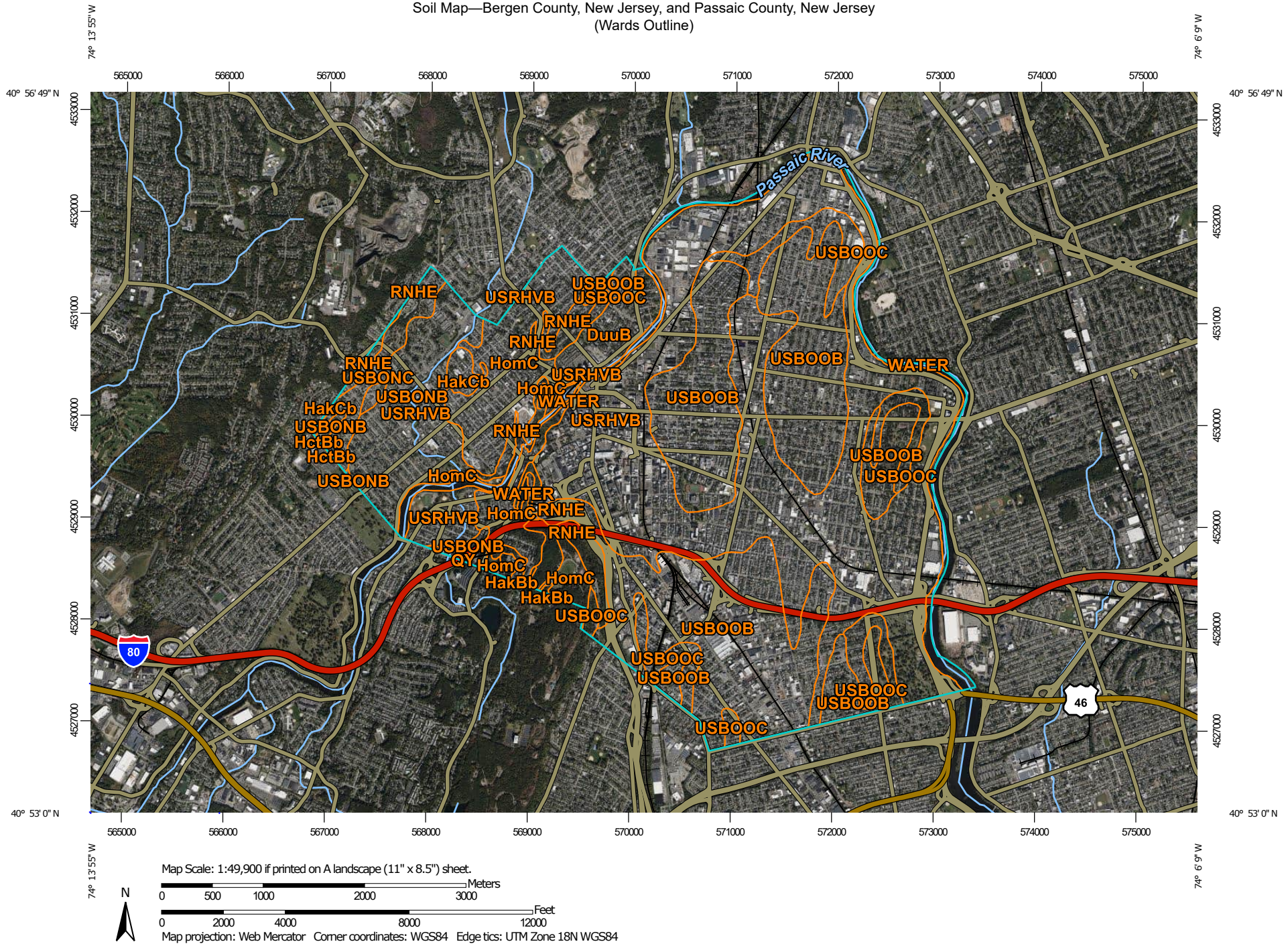
CERTIFICATION: _____ **TITLE:** _____ **DATE:** _____

Appendix B
Site Location Plans

Appendix C
Plan & Profile Drawings

WEB SOIL SURVEY SOIL DATA

Soil Map—Bergen County, New Jersey, and Passaic County, New Jersey
(Wards Outline)



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Bergen County, New Jersey
Survey Area Data: Version 20, Aug 28, 2023

Soil Survey Area: Passaic County, New Jersey
Survey Area Data: Version 18, Aug 29, 2023

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 10, 2022—Oct 16, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
WATER	Water	72.1	1.3%
Subtotals for Soil Survey Area		**72.1**	**1.3%**
Totals for Area of Interest		**5,563.2**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BonCa	Boonton silt loam, 8 to 15 percent slopes, stony	0.4	0.0%
DuuB	Dunellen-Urban land complex, 3 to 8 percent slopes	135.0	2.4%
HakBb	Haledon loam, 0 to 8 percent slopes, very stony	2.7	0.0%
HakCb	Haledon loam, 8 to 15 percent slopes, very stony	29.1	0.5%
HctBb	Hasbrouck silt loam, 0 to 8 percent slopes, very stony	0.0	0.0%
HomC	Holyoke-Rock outcrop complex, 3 to 15 percent slopes	493.9	8.9%
QY	Quarries	2.4	0.0%
RNHE	Rock outcrop-Holyoke complex, 15 to 45 percent slopes	186.7	3.4%
USBONB	Urban land-Boonton complex, 0 to 8 percent slopes	34.2	0.6%
USBONC	Urban land-Boonton complex, 8 to 15 percent slopes	106.3	1.9%
USBOOB	Urban land-Boonton complex, red sandstone lowland, 0 to 8 percent slopes	1,721.8	30.9%
USBOOC	Urban land-Boonton complex, red sandstone lowland, 8 to 15 percent slopes	314.5	5.7%
USRHVB	Urban land-Riverhead complex, 3 to 8 percent slopes	2,377.2	42.7%
WATER	Water	86.9	1.6%
Subtotals for Soil Survey Area		**5,491.1**	**98.7%**
Totals for Area of Interest		**5,563.2**	**100.0%**