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STORMWATER POLLUTION PREVENTION PLAN

for

The Seventy-Six

76 Second Avenue
City of Albany
Albany County, New York

Issued: June 2020
Last Revised: November 2020

Prepared for:

South End Development, LLC
45 Hudson Avenue, #213
Albany, NY 12201

Prepared by:

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Chazen Project No. 32019.00

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PREPARER OF THE SWPPP

"I hereby certify that the Stormwater Pollution Prevention Plan (SWPPP) for this project has been prepared in accordance with the terms and conditions of the City of Albany. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of this permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings."

Name and Title[1]: Roger Keating, P.E. - Director

Date: Issued: November 2020

[1] *This is a signature of a New York State licensed Professional Engineer employed by The Chazen Companies that is duly authorized to sign and seal Stormwater Pollution Prevention Plans (SWPPPs), NOIs, and NOTs prepared under their direct supervision. Refer to Appendix H for the Chazen Certifying Professionals Letter.*

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1.0 EXECUTIVE SUMMARY

This Stormwater Pollution Prevention Plan (SWPPP) has been prepared for major activities associated with construction of The Seventy-Six in the City of Albany. This SWPPP includes the elements necessary to comply with the national baseline general permit for construction activities enacted by the U.S. Environmental Protection Agency (EPA) under the National Pollutant Discharge Elimination System (NPDES) program and all local governing agency requirements. This SWPPP must be implemented and permit coverage must be obtained prior to the commencement of construction activity.

The project site is located within the Combined Sewer Overlay District. Combined sewer means that both stormwater runoff and sanitary sewage are conveyed through a single pipe network. Runoff from the project site currently discharges to the Central Sewer District combined sewer system. Construction activities that discharge to a combined sewer network are not required to obtain coverage under the New York State Department of Environmental Conservation (NYSDEC) State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity, GP-0-20-001. However, in accordance with the City of Albany *Unified Sustainable Development Ordinance* (USDO), in effect as of June 1, 2017, Section 375-4(F)(11) – Stormwater Management of the USDO, "All development and redevelopment within the City with a proposed area of disturbance greater than or equal to 1/4-acre in size shall comply with the latest version of the NYSDEC Stormwater Management Design Manual." As such, the stormwater management approach for this project has incorporated a combination of green roofs and the GreenBlue Urban ArborSystem for filtration, subsurface rainwater harvesting tanks for storage, and a final polishing treatment system to accommodate reuse of 100% of rainfall that falls on a 1.95-acre portion of the project site for site irrigation or internal greywater applications. The remaining 0.28-acres consists of minor impervious surfaces and greenspace at the outer perimeter of the site that cannot be captured due to steep slopes or elevation that is too low for conveyance to the rainwater harvesting tanks.

This SWPPP and the accompanying plans entitled "The Seventy-Six" have been submitted as a set. These engineering drawings are considered an integral part of this SWPPP. Therefore, this SWPPP is not considered complete without them. References made herein to "the plans" or to a specific "sheet" refer to these drawings.

This report considers the impacts associated with the intended development with the purpose of:

1. Maintaining existing drainage patterns as much as possible while continuing the conveyance of upland watershed runoff;
2. Controlling increases in the rate of stormwater runoff resulting from the proposed development so as not to adversely alter downstream conditions; and
3. Mitigating potential stormwater quality impacts and preventing soil erosion and sedimentation resulting from stormwater runoff generated both during and after construction.

The analysis and design completed and documented in this report is intended to be part of the application made for a mixed-use redevelopment project with an increase in impervious area completed on behalf of the Owner/Operator.

1.1 Project Description

South End Development, LLC is proposing a multi-phase redevelopment project with an increase in impervious area. The first phase will include construction of three 6-8 story mixed-use buildings, two subsurface parking levels, a pedestrian plaza, landscaping, and associated utility improvements. A Site Location Map has been provided in Appendix G, as Figure 1.

Runoff from the project site will ultimately discharge to the Hudson River, which is not included in the list of Section 303(d) water bodies.

Project construction activities will consist primarily of site grading, paving, building construction, and the installation of storm drainage, water supply, sanitary sewer, and public utility infrastructure necessary to support the proposed redevelopment project with an increase in impervious area. Construction phase pollutant sources anticipated at the site are disturbed (exposed) soil, vehicle fuels and lubricants, chemicals associated with building construction, and building materials. Without adequate control there is the potential for each type of pollutant to be transported by stormwater.

1.2 Stormwater Pollution Controls

The stormwater pollution controls outlined herein have been designed and evaluated in accordance with the following standards and guidelines:

- New York State Stormwater Management Design Manual, dated January 2015 (Design Manual).
- New York State Standards and Specifications for Erosion and Sediment Control, dated November 2016 (SSESC).
- City of Albany Unified Sustainable Development Ordinance (USDO), effective June 1, 2017.
- City of Albany Code Chapter 133 - Stormwater Management and Erosion Control.
- SPDES Discharge Permit NY0025747 for City of Albany Combined Sewer Overflows, expires December 31, 2023.

Stormwater quality will be enhanced through the implementation of temporary and permanent erosion and sediment control measures, the proposed stormwater management practices, and other construction-phase pollution controls outlined herein.

The proposed stormwater management approach consisting of pipes and on-site stormwater management practices will adequately collect, treat, and convey the stormwater runoff.

Green roofs, GreenBlue Urban ArborSystems, and a rainwater harvesting system will be used to manage and treat stormwater runoff generated by the proposed redevelopment project with an increase in impervious area.

The post-construction stormwater management practice(s) will be privately owned by the South End Development, LLC. Deed restrictions will be in place, which require operation and maintenance of the practice(s) in accordance with the operation and maintenance plan.

2.0 SWPPP IMPLEMENTATION RESPONSIBILITIES

A summary of the responsibilities and obligations of all parties involved is outlined in the subsequent sections.

2.1 Definitions

1. "Owner" or "Operator" means the person, persons, or legal entity which owns or leases the property on which the *construction activity* is occurring; and/or an entity that has operational control over the construction plans and specifications, including the ability to make modifications to the plans and specifications. There may be occasions during the course of a project in which there are multiple Owners/Operators, all of which will need to file and maintain the appropriate SWPPP documents and plans, including without limitation, the Notice of Intent (NOI) and Notice of Termination (NOT).

2. "Owner's/Operator's Engineer" means the person or entity retained by an Owner/Operator to design and oversee the implementation of the SWPPP.

3. "Contractor" means the person or entity identified as such in the construction contract with the Owner/Operator. The term "Contractor" shall also include the Contractor's authorized representative, as well as any and all subcontractors retained by the Contractor.

4. "Qualified Inspector" means a person that is knowledgeable in the principles and practices of erosion and sediment control, such as licensed Professional Engineer, Certified Professional in Erosion and Sediment Control (CPESC), Registered Landscape Architect, or other Department endorsed individual(s).

   It can also mean someone working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect, provided that person has training in the principles and practices of erosion and sediment control. Training in the principles and practices of erosion and sediment control means that an individual working under the direct supervision of the licensed Professional Engineer or Registered Landscape Architect has received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity. After receiving the initial training, the individual working under the direct supervision of the licensed Professional Engineer or Registered Landscape Architect shall receive four (4) hours of training every three (3) years.

   It can also mean a person that meets the *Qualified Professional* qualifications in addition to the *Qualified Inspector* qualifications.

   Note: Inspections of any post-construction stormwater management practices that include structural components, such as a dam for an impoundment, shall be performed by a licensed Professional Engineer.

5. "Qualified Professional" means a person that is knowledgeable in the principles and practices of stormwater management and treatment, such as a licensed Professional Engineer, Registered Landscape Architect, or other Department endorsed individual(s). Individuals preparing SWPPPs

that require the post-construction stormwater management practice component must have an understanding of the principles of hydrology, water quality management practice design, water quantity control design, and, in many cases, the principles of hydraulics. All components of the SWPPP that involve the practice of engineering, as defined by the NYS Education Law (see Article 145), shall be prepared by, or under the direct supervision of, a professional engineer licensed to practice in the State of New York.

6. "Trained Contractor" means an employee from a contracting (construction) company, that has received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity. After receiving the initial training, the *Trained Contractor* shall receive four (4) hours of training every three (3) years.

   It can also mean an employee from a contracting (construction) company, that meets the *Qualified Inspector* qualifications (e.g. licensed Professional Engineer, Certified Professional in Erosion and Sediment Control (CPESC), Registered Landscape Architect, or someone working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect, provided they have received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity.

   The "Trained Contractor(s)" will be responsible for the day to day implementation of the SWPPP.

2.2 Owner's/Operator's Responsibilities

1. Ensure that control measures are selected, designed, installed, implemented and maintained to minimize the discharge of pollutants and prevent a violation of the water quality standards, in accordance with the New York State Standards and Specifications for Erosion and Sediment Control, dated November 2016.

2. Ensure that practices are selected, designed, installed, and maintained to meet the performance criteria in the Design Manual.

3. Retain the services of a "Qualified Inspector" or "Qualified Professional" as defined under Section 2.1, to provide the services outlined in Section 2.5 "Qualified Inspector's/Qualified Professional's Responsibilities."

4. Retain the services of a "Qualified Professional," as defined under Section 2.1, to provide the services outlined in Section 2.3 "Owner's/Operator's Engineers Responsibilities."

5. Have an authorized corporate officer sign the completed NOI. A copy of the completed NOI is included in Appendix B.

6. Submit the NOI to the City of Albany for permitting.

7. Prior to the commencement of construction activity, identify the contractor(s) and subcontractor(s) that will be responsible for implementing the erosion and sediment control measures and stormwater management practices described in this SWPPP. Have each of these contractors and subcontractors identify at least one "Trained Contractor", as defined under Section 2.1 that will be

responsible for the implementation of the SWPPP. Ensure that the Contractor has at least one "Trained Contractor" on site on a daily basis when soil disturbance activities are being performed.

8. Schedule a pre-construction meeting which shall include the City of Albany representative, Owner's/Operator's Engineer, Contractor, and their sub-contractors to discuss responsibilities as they relate to the implementation of this SWPPP.

9. Retain the services of an independent certified materials testing and inspection firm operating under the direction of a licensed Professional Engineer to perform regular tests, inspections, and certifications of the construction materials used in the construction of all post-construction stormwater management practices.

10. Retain the services of a NYS licensed land surveyor to perform an as-built topographic survey of the completed post-construction stormwater management facilities.

11. Require the Contractor to fully implement the SWPPP prepared for the site by the Owner/Operator's Engineer to ensure that the provisions of the SWPPP are implemented from the commencement of construction activity until all areas of disturbance have achieved final stabilization and the Notice of Termination (NOT) has been submitted to the City f Albany.

12. Forward a copy of the NOI Acknowledgement Letter received from the regulatory agency to the Owner's/Operator's Engineer for project records, and to the Contractor for display at the construction site.

13. Maintain a copy of the NOI, SWPPP, inspection reports, Spill Prevention, Countermeasures, Cleanup ("SPCC") Plan, and all documentation until all disturbed areas have achieved final stabilization and the NOT has been submitted to the City of Albany. Place documents in a secure location that must be accessible during normal business hours to an individual performing a compliance inspection.

14. Prior to submitting a Notice of Termination, ensure for post-construction stormwater management practice(s) that are privately owned, the Owner/Operator has a deed restriction in place that requires operation and maintenance of the practice(s) in accordance with the operation and maintenance plan.

15. Submit a Notice of Termination (NOT) form (see Appendix B) within 48 hours of receipt of the Owner's/Operator's Engineer's certification of final site stabilization to the following:

    NOTICE OF TERMINATION
    NYS DEC, Bureau of Water Permits
    625 Broadway, 4th Floor
    Albany, New York 12233-3505

    City of Albany
    10 North Enterprise Drive
    Albany, NY 12204

16. Request and receive all SWPPP records from the Owner's/Operator's Engineer and archive those records for a minimum of five (5) years after the NOT is filed.

17. Implement the Post-Construction Inspections and Maintenance procedures outlined in Appendix F.

18. The NOI, SWPPP, and inspection reports are public documents that the Owner/Operator must make available for review and copying by any person within five (5) business days of the Owner/Operator receiving a written request by any such person to review the NOI, SWPPP, or inspection reports. Copying of documents will be done at the requester's expense.

19. The Owner/Operator must keep the SWPPP current at all times. At a minimum, the Owner/Operator shall amend the SWPPP:

    a) Whenever the current provisions prove to be ineffective in minimizing pollutants in stormwater discharges from the project site;

    b) Whenever there is a change in design, construction, or operation at the construction site that has or could have an effect on the discharge of pollutants; and

    c) To address issues or deficiencies identified during an inspection by the "Qualified Inspector," the Department, or other Regulatory Authority.

    d) To document the final construction conditions.

2.3 Owner's/Operator's Engineer's Responsibilities

1. Prepare the SWPPP using good engineering practices, best management practices, and in compliance with all federal, state, and local regulatory requirements.

2. Prepare the Notice of Intent (NOI) form (see Appendix B), sign the "SWPPP Preparer Certification" section of the NOI, and forward to Owner/Operator for signature.

3. Provide copies of the SWPPP to the City of Albany once all signatures and attachments are complete.

4. Enter Contractor's information in Section 2.5 "SWPPP Participants" once a Contractor is selected by the Owner/Operator.

5. Update the SWPPP each time there is a significant modification to the pollution prevention measures or a change of the principal Contractor working on the project who may disturb site soil.

2.4 Contractor's Responsibilities

1. Sign the SWPPP Contractor's Certification Form contained within Appendix C and forward to the Owner's/Operator's Engineer for inclusion in the Site Log Book.

2. Identify at least one Trained Contractor that will be responsible for implementation of this SWPPP. Ensure that at least one Trained Contractor is on site on a daily basis when soil disturbance activities are being performed. The Trained Contractor shall inspect the erosion and sediment control practices and pollution prevention measures being implemented within the active work area daily to ensure that they are being maintained in effective operating conditions at all times. If deficiencies are identified, the contractor shall begin implementing corrective actions within one business day and shall complete the corrective actions in a reasonable time frame.

3. Provide the names and addresses of all subcontractors working on the project site. Require all subcontractors who will be involved with construction activities that will result in soil disturbance to identify at least one Trained Contractor that will be on site on a daily basis when soil disturbance activities are being performed; and to sign a copy of the Subcontractor's Certification Form contained within Appendix C, then forward to the Owner's/Operator's Engineer for inclusion into the Site Log Book. This information must be retained as part of the Site Log Book.

4. Maintain a Spill Prevention and Response Plan in accordance with requirements outlined in Section 5 of this SWPPP. This plan shall be provided to the Owner's/Operator's Engineer for inclusion in the Site Log Book, prior to mobilization on-site.

5. Participate in a pre-construction meeting which shall include the City of Albany representative, Owner/Operator, Owner's/Operator's Engineer, and all subcontractors to discuss responsibilities as they relate to the implementation of this SWPPP.

6. If Contractor plans on utilizing adjacent properties for material, waste, borrow, or equipment storage areas, or if Contractor plans to engage in industrial activity other than construction (such as operating asphalt and/or concrete plants) at the site, Contractor shall submit appropriate documentation to the Owner's/Operator's Engineer so that the SWPPP can be modified accordingly.

7. Implement site stabilization, erosion and sediment control measures, and other requirements of the SWPPP.

8. In accordance with the requirements in the most current version of the NYS Standards and Specifications for Erosion and Sediment Control, conduct inspections of erosion and sediment control measures installed at the site to ensure that they remain in effective operating condition at all times. Prepare and retain written documentation of inspections as well as of all repairs/maintenance activities performed. This information must be retained as part of the Site Log Book.

9. Begin implementing corrective actions within one (1) business day of receipt of notification by the Qualified Inspector/Qualified Professional that deficiencies exist with the erosion and sediment control measures employed at the site. Corrective actions shall be completed within a reasonable time frame.

10. Maintain a record of the date(s) and location(s) that soil restoration is performed in accordance with the accompanying plans and NYSDEC Division of Water's publication "Deep-Ripping and Decompaction," dated April 2008. A copy of this is publication is provided in Appendix E. The record that is to be maintained shall be a copy of the overall site grading plan delineating the area(s) and date(s) that the soil was restored.

11. Upon completion of all construction at the site, the contractor responsible for overall SWPPP Compliance shall sign the certification on their Contractor Certification Form indicating that: a.) all temporary erosion and sediment control measures have been removed from the site, b.) the on-site soils disturbed by construction activity have been restored in accordance with the SWPPP and the NYSDEC Division of Water's publication "Deep-Ripping and Decompaction," and c.) all permanent stormwater management practices required by the SWPPP have been installed in accordance with the contract documents.

2.5 Qualified Inspector's/Qualified Professional's Responsibilities

1. Participate in a pre-construction meeting with the City of Albany representative, Owner/Operator, Contractor, and their subcontractors to discuss responsibilities as they relate to the implementation of this SWPPP.

2. Conduct an initial assessment of the site prior to the commencement of construction and certify in an inspection report that the appropriate erosion and sediment control measures described within this SWPPP have been adequately installed and implemented to ensure overall preparedness of the site.

3. Provide on-site inspections to determine compliance with the SWPPP. Site inspections shall occur at an interval of at least once every seven calendar days. A written inspection report shall be provided to the Owner/Operator and general contractor within one business day of the completion of the inspection, with any deficiencies identified. A sample inspection form is provided in Appendix D.

4. Prepare an inspection report subsequent to each and every inspection. Sign all inspection reports and maintain on site with the SWPPP.

5. Notify the owner/operator and appropriate contractor or subcontractor of any corrective actions that need to be taken.

6. Prepare a construction Site Log Book to be used as a record of all inspection reports generated throughout the duration of construction. Ensure that the construction Site Log Book is maintained and kept up-to-date throughout the duration of construction.

7. Review the Contractor's SWPPP records on a periodic basis to ensure compliance with the requirements for daily reports, soil restoration, inspections, and maintenance logs.

8. Based on the as-built survey and material testing certifications performed by others, perform evaluations of the completed stormwater management practices to determine whether they were constructed in accordance with this SWPPP.

9. Conduct a final site assessment and prepare a certification letter to the Owner/Operator indicating that, upon review of the material testing and inspection reports prepared by the firm retained by the Owner/Operator, review of the completed topographic survey, and evaluation of the completed stormwater management facilities, the stormwater management facilities have been constructed substantially in accordance with the contract documents and should function as designed.

10. Prepare the Notice of Termination (NOT). Sign the NOT Certifications VI (Final Stabilization) and VII (Post-construction Stormwater Management Practices), and forward the NOT to the Owner/Operator for signature on Certification VIII (Owner/Operator Certification).

11. Transfer the SWPPP documents, along with all NOI's, permit certificates, NOT's, construction Site Log Book, and written records required by the General Permit to the Owner/Operator for archiving.

2.6 SWPPP Participants

1. Owner's/Operator's Engineer:

Roger Keating, P.E. - Director
The Chazen Companies
547 River Street
Troy, NY 12180
Phone: (518) 273-0055
Fax: (518) 273-8391

2. Owner/Operator:

Corey Jones, CEO, Founder
South End Development, LLC
45 Hudson Avenue, #213
Albany, NY 12201
Phone: 803-280-0601

3. Contractor[2]:

Name and Title: _____

Company Name: _____

Mailing Address: _____

_____

Phone: _____

Fax: _____

[2] *Contractor's information to be entered once the Contractor has been selected.*

3.0 SITE CHARACTERISTICS

3.1 Land Use and Topography

The project site is located within the Residential-Townhouse (R-T) and Mixed-Use Neighborhood Edge (MU-NE) zoning districts. Application have been submitted to rezone the project site as Mixed-Use Campus/Institutional (MU-CI). Mixed-used developments are a permitted use within this district.

The overall site is moderately sloping, with slopes ranging from 0 to 50 percent. Site elevations range from approximately 62 feet above mean sea level (MSL) to 118 feet MSL. The northern portion of the site is higher in elevation than the southern. The northern half of the site slopes down towards Scott Street. The southern half of the site slopes down towards Krank Street.

3.2 Soils and Groundwater

The US Department of Agriculture (USDA) Web Soil Survey (http://websoilsurvey.nrcs.usda.gov/app/) was used to obtain surficial soil conditions for the study area, as follows:

Table 1: USDA Soil Data

Map Symbol & Description	Hydrologic Soil Group	Permeability (inches/hour)	Erosion Factor K	Depth to Water Table (feet)	Depth to Bedrock (feet)
Ut – Urban land-Udorthents complex, 0 to 8 percent slopes	-	0.06 to 5.95	-	3.0 – 6.0	> 6.67
Ur – Urban land	-	-	-	-	-
HuE – Hudson silt loam, 25 to 45 percent slopes	C/D	0.06 to 0.20	0.49	1.5 – 2.0	> 6.67

The Soil Conservation Service defines the hydrologic soil groups as follows:

- Type C Soils: Soils having a low infiltration rate when thoroughly wet and consisting chiefly of soils with a layer that impedes downward movement of water and soils with moderately fine-to-fine texture. These soils have a low rate of water transmission.
- Type D Soils: Soils having a very low infiltration rate and high runoff potential when thoroughly wet. These soils consist chiefly of clays that have high shrink-swell potential, soils that have a permanent high water table, soils that have a clay pan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very low rate of water transmission.

The soils map for the study area is presented in Appendix G, as Figure 2.

3.3 Watershed Designation

The project site is not located in a restricted watershed.

3.4 Receiving Water Bodies

The nearest natural classified water course into which runoff from the project site will discharge is the Hudson River.

The watercourse is classified by NYSDEC as a Class C water course, and is not included in the Section 303(d) list of impaired waters.

3.5 Aquifer Designation

The project site is not located over a US EPA designated Sole Source aquifer; nor is it located over a Primary or Principal aquifer listed in the NYSDEC Technical and Operational Guidance Series (TOGS) 2.1.3 (1980).

3.6 Wetlands

A search on the NYSDEC Environmental Resource Mapper on June 11, 2020, determined that no regulated wetlands are located on or in the vicinity of the project site.

3.7 Flood Plains

According to the National Flood Insurance Program Flood Insurance Rate Map (FIRM), City of Albany, New York, Community Panel Number 36001C0194D, the project site lies within Flood Zone X, areas determined to be outside 500-year floodplain.

3.8 Listed, Endangered, or Threatened Species

A search was performed on the NYSDEC Environmental Resource Mapper on June 11, 2020, and determined that the project site does not contain any threatened or endangered species, or critical habitat. An Environmental Resource Map has been provided in Appendix G, as Figure 4.

3.9 Historic Places

A search on the New York State Cultural Resource Information System (CRIS) database revealed the construction activity is located within an archeologically sensitive area and is located adjacent to a property listed or determined to be eligible for listing on the National or State Registers of Historic Places. A printout of the historic places screening map is presented in Appendix G, as Figure 3.

As such, NYSOPRHP coordination has been initiated and a Phase 1A Literature Search and Sensitivity Assessment was conducted in May 2020 by Hudson Valley Cultural Resource Consultants, LTD. A Phase 1B Archaeological Field Reconnaissance Survey was performed in June 2020 and determined that there are no impact archaeological deposits located within the study area. These reports will be submitted to NYSOPRHP for review. A copy of the NYSOPRHP documentation, will be provided in Appendix G, upon receipt.

3.10 Rainfall Data

Rainfall data utilized in the modeling and analysis was obtained from the Cornell University online Extreme Precipitation in New York & New England website (http://precip.eas.cornell.edu/). The standard SCS/NRCS rainfall distributions were applied to evaluate the pre- and post-development stormwater runoff characteristics. Rainfall data specific to the portion of Albany County under consideration, for various 24-hour storm events, is presented in the following Table:

Table 2: Rainfall Data

Storm Event Return Period	24-Hour Rainfall (inches)
1-year	2.24
10-year	3.82
25-year	4.72
100-year	6.54

4.0 CONSTRUCTION-PHASE POLLUTION CONTROL

The SWPPP and accompanying plans identify the temporary and permanent erosion and sediment control measures that have been incorporated into the design of this project. These measures will be implemented during construction, to minimize soil erosion and control sediment transport off-site, and after construction, to control the quality and quantity of stormwater runoff from the developed site.

Erosion control measures, designed to minimize soil loss, and sediment control measures, intended to retain eroded soil and prevent it from reaching water bodies or adjoining properties, have been developed in accordance with the following documents:

- New York State Standards and Specifications for Erosion and Sediment Control, NYSDEC (November 2016)

The SWPPP and accompanying plans outline the construction scheduling for implementing the erosion and sediment control measures. These documents include limitations on the duration of soil exposure, criteria and specifications for placement and installation of the erosion and sediment control measures, a maintenance schedule, and specifications for the implementation of erosion and sediment control practices and procedures.

Temporary and permanent erosion and sediment control measures that shall be applied during construction generally include:

1. Minimizing soil erosion and sedimentation by stabilization of disturbed areas and by removing sediment from construction site discharges.
2. Preservation of existing vegetation to the greatest extent practical. Following the completion of construction activities in any portion of the site, permanent vegetation shall be established on all exposed soils.
3. Site preparation activities to minimize the area and duration of soil disruption.
4. Establishment of permanent traffic corridors to ensure that “routes of convenience” are avoided.

The following requirements shall apply to construction during winter conditions:

1. Demolition of buildings and associated utilities may occur during winter conditions (between November 15th to the following April 1st). Buildings will be demolished in a controlled manner, with all debris being removed from the site daily.
2. Snow shall be cleared and stored in a manner that will not affect construction activities, or damage erosion and sediment control practices. Excessive snow will be removed from the site if hindering the construction work area.
3. Drainage structures shall be kept open and free of snow and ice dams. All debris, ice dams, or debris from plowing operations, that restrict the flow of runoff and meltwater, shall be removed.
4. Soil stockpiles shall be protected by the use of established vegetation, anchored straw mulch, rolled stabilization matting, or other durable covering. (Note: if straw mulch alone is used for temporary stabilization, it shall be applied at double the standard rate of 2 tons per acre. Other manufactured mulches shall be applied at double the manufacturer's recommended rate.)

5. In areas where soil disturbance activity has temporarily or permanently ceased, the application of soil stabilization measures shall be initiated by the end of the next business day and completed within three (3) days. Rolled erosion control blankets shall be used on all slopes 3 horizontal to 1 vertical or steeper.
6. To ensure adequate stabilization of disturbed soil in advance of a melt event, areas of disturbed soil shall be stabilized at the end of each work day, unless work will resume within 24 hours in the same area, no precipitation is forecast, or the work is in disturbed areas that collect and retain runoff, such as open utility trenches, foundation excavations, or water management areas.
7. Any portions of the site that will not be disturbed during winter conditions, shall be prepared for temporary winter shutdown, meaning all disturbed areas having exposed soils shall have temporary seed, fertilizer, and mulch applied to establish temporary stabilization. Once winter conditions arrive (snowfall), no land disturbance shall occur in shutdown areas.

4.1 Temporary Erosion and Sediment Control Measures

The temporary erosion and sediment control measures described in the following sections are included as part of the construction documents.

4.1.1 Stabilized Construction Access

Prior to construction, stabilized construction access(es) will be installed, per accompanying plans, to reduce the tracking of sediment onto public roadways.

Construction traffic must enter and exit the site at the stabilized construction access(es). The intent is to trap dust and mud that would otherwise be carried off-site by construction traffic.

The access(es) shall be maintained in a condition, which will control tracking of sediment onto public rights-of-way or streets. When necessary, additional aggregate will be placed atop the filter fabric to assure the minimum thickness is maintained. All sediment and/or soil spilled, dropped, or washed onto public rights-of-way must be removed immediately. Periodic inspection and needed maintenance shall be provided after each substantial rainfall event.

4.1.2 Dust Control

Water trucks shall be used as needed during construction to reduce dust generated on-site. Dust control must be provided by the Contractor(s) to a degree that is acceptable to the Owner, and in compliance with the applicable local and state dust control requirements.

4.1.3 Temporary Soil Stockpile

Materials, such as topsoil, will be temporarily stockpiled (if necessary) on the site during the construction process. Stockpiles shall be located in an area away from storm drainage, water bodies and/or courses, and will be properly protected from erosion by a surrounding silt fence barrier.

4.1.4 Silt Fencing

Prior to the initiation of and during construction activities, a geotextile filter fabric (or silt fence) will be established downgradient of all disturbed areas. These barriers may extend into non-impact areas to provide adequate protection of adjacent lands.

Clearing and grubbing will be performed only as necessary for the installation of the sediment control barrier. To facilitate effectiveness of the silt fencing, daily inspections and inspections immediately after significant storm events will be performed by the Contractor(s). Maintenance of the fence will be performed as needed.

4.1.5 Temporary Seeding

For areas undergoing clearing, grading, and disturbance as part of construction activities, where work has temporarily ceased, temporary soil stabilization measures must be initiated by the end of the next business day and completed within fourteen (14) days from the date the soil disturbance activity has temporarily ceased.

4.1.1 Manufactured Insert Inlet Protection

Install insert inlet protection beneath the grate of all catch basins, to prevent sediment from entering the catch basins and storm sewer system. Remove sediment accumulation and repair or replace insert as necessary to ensure proper function.

4.1.2 Filter Fabric Drop Inlet Protection

Install filter fabric or silt fence with wooden stakes at the perimeter of existing or proposed catch basins located in lawn areas, to prevent sediment from entering the catch basins and storm sewer system. Remove sediment accumulation and repair or replace fabric as necessary to ensure proper function.

4.1.3 Erosion Control Blanket

Erosion control blankets shall be installed in accordance with manufacturer's requirements on all slopes exceeding 3:1. Erosion control blankets provide temporary erosion protection, rapid vegetative establishment, and long-term erosion resistance to shear stresses generated by high runoff flow velocities associated with steep slopes.

4.1.4 Temporary Dewatering Operations

Dewatering will be used to intercept sediment-laden stormwater or pumped groundwater and allow it to settle out of the pumped discharge prior to being discharged from the site. Water from dewatering operations shall be treated to eliminate the discharge of sediment and other pollutants. Water resulting from dewatering operations shall be directed to temporary sediment traps or dewatering devices. Temporary sediment traps and dewatering bags will be provided, installed, and maintained at downgradient locations to control sediment deposits to downstream surfaces.

4.2 Permanent Erosion and Sediment Control Measures

The permanent erosion and sediment control measures described in the following sections are included as part of the construction documents.

4.2.1 Establishment of Permanent Vegetation

Disturbed areas that will be vegetated must be seeded in accordance with the contract documents. The type of seed, mulch, and maintenance measures as described in the contract documents shall also be followed.

Permanent soil stabilization measures must be initiated by the end of the next business day and completed within fourteen (14) days from the date the soil disturbance activity has permanently ceased.

Final site stabilization is achieved when all soil-disturbing activities at the site have been completed and a uniform, perennial vegetative cover with a density of 80 percent has been established or equivalent stabilization measures (such as the use of mulches or geotextiles) have been employed on all unpaved areas and areas not covered by permanent structures.

4.3 Other Pollutant Controls

Other necessary pollutant controls are listed below:

4.3.1 Solid and Liquid Waste Disposal

No solid or liquid waste materials, including building materials, shall be discharged from the site with stormwater. All solid waste, including disposable materials incidental to any construction activities, must be collected and placed in containers. The containers shall be emptied periodically by a licensed trash disposal service and hauled away from the site.

Substances that have the potential for polluting surface and/or groundwater must be controlled by whatever means necessary in order to ensure that they do not discharge from the site. As an example, special care must be exercised during equipment fueling and servicing operations. If a spill occurs, it must be contained and disposed of so that it will not flow from the site or enter groundwater, even if this requires removal, treatment, and disposal of soil. In this regard, potentially polluting substances should be handled in a manner consistent with the impact they represent.

4.3.2 Sanitary Facilities

Temporary sanitary facilities will be provided by the Contractor throughout the construction phase. They must be utilized by all construction personnel and will be serviced by a licensed commercial Contractor. These facilities must comply with state and local sanitary or septic system regulations.

4.3.3 Water Source

Non-stormwater components of site discharge must be clean water. Water used for construction, which discharges from the site, must originate from a public water supply or private well approved by the Health Department. Water used for construction that does not originate from an approved public supply must not discharge from the site; such water can be retained in temporary ponds/sediment traps until it infiltrates and/or evaporates.

4.4 Construction Housekeeping Practices

During the construction phase, the Contractor(s) will implement the following measures:

4.4.1 Material Stockpiles

Material resulting from clearing and grubbing operations that will be stockpiled on-site, must be adequately protected with downgradient erosion and sediment controls.

4.4.2 Equipment Cleaning and Maintenance

The Contractor(s) will designate areas for equipment cleaning, maintenance, and repair. The Contractor(s) and subcontractor(s) will utilize those areas. The areas will be protected by a temporary perimeter berm.

4.4.3 Detergents

The use of detergents for large-scale washing is prohibited (i.e., vehicles, buildings, pavement surfaces, etc.)

4.4.4 Spill Prevention and Response

A Spill Prevention and Response Plan shall be developed for the site by the Contractor(s). The plan shall detail the steps required in the event of an accidental spill and shall identify contact names and phone numbers of people and agencies that must be notified.

The plan shall include Safety Data Sheets (SDS) for all materials to be stored on-site. All workers on-site will be required to be trained on safe handling and spill prevention procedures for all materials used during construction. Regular tailgate safety meetings shall be held and all workers that are expected on the site during the week shall be required to attend.

4.4.5 Concrete Washout Areas

A temporary concrete washout area shall be provided for every project where concrete will be poured or otherwise formed on-site and shall consist of an excavated or above-ground lined construction pit where concrete trucks or equipment can be washed out after their loads have been discharged. Waste generated from concrete wash water that shall not be allowed to flow into drainage ways, inlets, receiving waters, highway right-of-way, or any location other than the designated concrete washout area(s). Proper signage shall be placed adjacent to the facility to designate the “Concrete Washout Area”. Locate the facility a minimum of 100-feet from drainage swales, storm drain inlets, wetlands, streams, and other surface waters. Prevent surface water from entering the washout area.

The hardened residue from the concrete wash areas will be disposed of in the same manner as other non-hazardous construction waste materials. Maintenance of the washout area shall include removal of hardened material when 75% of the storage capacity is filled, and a minimum freeboard of 12 inches shall be maintained. The Contractor will be responsible for seeing that these procedures are followed. The project may require the use of multiple concrete washout areas based on the frequency of concrete pours.

4.4.6 Material Storage

Construction materials shall be stored in a dedicated staging area. The staging area shall be located in an area that prevents negative impacts of construction materials on stormwater quality.

Chemicals, paints, solvents, fertilizers, and other toxic material must be stored in waterproof containers. Except during application, the contents must be kept in trucks or within storage facilities. Runoff containing such material must be collected, removed from the site, treated, and disposed of at an approved solid waste or chemical disposal facility.

5.0 STORMWATER MANAGEMENT PLANNING

5.1 Applicable Stormwater Requirements

5.1.1 City of Albany Requirements

In accordance with the City of Albany *Unified Sustainable Development Ordinance* (USDO), adopted on June 1, 2017, Section 375-4(F)(11) – Stormwater Management, "All development and redevelopment within the City with a proposed area of disturbance greater than or equal to 1/4-acre in size shall comply with the latest version of the NYSDEC Stormwater Management Design Manual." This section continues to indicate "The maximum allowable design peak-flow stormwater discharge into the combined sewer system shall be limited to the calculated peak-flow discharge of the 10-year storm for un-developed site conditions, as determined by a Professional Engineer, and to be reviewed and accepted by the Department of Water and Water Supply." In summary, the City Regulations require that the hydraulic modeling consider the existing condition to be the un-developed state of the property. Stormwater detention facilities must then be applied to detain the runoff to a peak-flow discharge that is less than or equal to the peak rate from the 10-year storm un-developed site condition. This requirement can also be achieved by implementing practices on-site for reuse and/or disconnection of flow from the combined sewer.

5.1.2 NYSDEC Requirements

Chapter 3 of the Design Manual outlines a six-step planning process for site planning and selection of stormwater management practices that must be implemented for both new development and redevelopment projects. This process is intended to develop a design that maintains pre-construction hydrologic conditions through the application of environmentally sound development principles, as well as treatment and control of runoff discharges from the site. The following sections outline the step-by-step process and how it has been applied to this project.

The goals of this Stormwater Management Plan are to analyze the peak rate of runoff under pre- and post-development conditions, to maintain the pre-development rate of runoff in order to minimize impacts to adjacent or downstream properties, and to minimize the impact to the quality of runoff exiting the site.

The Design Manual provides both water quality and water quantity objectives to be met by projects requiring a "Full SWPPP". These objectives will be met by applying stormwater control practices to limit peak runoff rates and improve the quality of runoff leaving the developed site.

5.2 STEP 1 – Site Planning

During the Site Planning process, the project site is evaluated for implementation of the green infrastructure planning measures identified in Table 3.1 of the Design Manual, in order to preserve natural resources and reduce impervious cover. Table A of Appendix I provides a description of each green infrastructure planning measure, along with a project specific evaluation.

5.3 STEP 2 - Determine Water Quality Treatment Volume (WQv)

Stormwater runoff from impervious surfaces is recognized as a significant contributor of pollution that can adversely affect the quality of receiving water bodies. Therefore, treatment of stormwater runoff is

important since most runoff related water quality contaminants are transported from land, particularly the impervious surfaces, during the initial stages of storm events.

5.3.1 NYSDEC Requirements for New Development

The Design Manual requires that water quality treatment be provided for the initial flush of runoff from every storm. The NYSDEC refers to the amount of runoff to be treated as the "Water Quality Volume" (WQv). Section 4.2 of the Design Manual defines the Water Quality Volume as follows:

$$WQv = \frac{[(P)(R_V)(A)]}{12}$$

Where: P = 90% Rainfall Event Number
R_v = 0.05 + 0.009 (I)
I = Impervious Cover (Percent)
A = Contributing Area in Acres

This definition ensures that, all other things being equal, the Water Quality Volume will increase along with the impervious cover percentage.

5.3.2 NYSDEC Requirements for Redevelopment Projects

Chapter 9 of the Design Manual outlines alternative WQv treatment objectives for redevelopment projects.

According to Section 9.2.1.B.II., redevelopment activities can achieve the water quality treatment objective if 25% of the water quality volume associated with the disturbed, impervious area is captured and treated by implementation of standard SMPs or reduced by application of RR techniques. In this case, 100% of any new impervious area must be treated. This project will implement green roofs, GreenBlue Urban ArborSystems, and a rainwater harvesting system to meet the water quality objective.

5.3.3 Methodology

The Water Quality Volume equation has been applied to the drainage area tributary to each of the stormwater quality practices proposed for this project. The practices have been sized to accommodate the Water Quality Volume, as per the performance criteria presented in Chapter 6 and Chapter 9 of the Design Manual. Water quality volume calculations for each of the proposed practices are presented in Table B of Appendix I.

5.4 STEP 3 – Apply Runoff Reduction Techniques and Standard SMPs with RRv Capacity to Reduce Total WQv

Land use change and development in the watershed increases the volume of runoff. As such, reductions in the amount of runoff from new development, accomplished through the implementation of a stormwater management plan for the site, will play an important role in the success or failure of the watershed-wide stormwater management plan. Runoff reduction techniques can be applied to manage, reduce, and treat stormwater, while maintaining and restoring natural hydrology through infiltration, evapo-transpiration, and the capture and reuse of stormwater. Volume reduction techniques by themselves typically are not sufficient to provide adequate attenuation of stormwater runoff, but they can decrease the size of the peak runoff rate reduction facilities.

5.4.1 NYSDEC Requirements for New Development

The Design Manual states that runoff reduction shall be achieved through infiltration, groundwater recharge, reuse, recycle, and/or evaporation/evapotranspiration of 100-percent of the post-development water quality volume to replicate pre-development hydrology. Runoff control techniques provide treatment in a distributed manner before runoff reaches the collection system, by maintaining pre-construction infiltration, peak runoff flow, discharge volume, as well as minimizing concentrated flow. This can be accomplished by applying a combination of Runoff Reduction Techniques, standard Stormwater Management Practices (SMPs) with RRv capacity, and good operation and maintenance.

5.4.2 NYSDEC Requirements for Redevelopment

Section 3.2 of the Design Manual indicates, "Although encouraged, meeting the RRv criteria is not required for redevelopment activities that meet the criteria in Chapter 9 of this manual." This project involves the reconstruction of existing impervious area on a site that has inadequate space for controlling stormwater runoff from the reconstructed area which renders implementation of many RR techniques and SMPs infeasible.

Although not required, GreenBlue Urban ArborSystems are proposed for this project and will provide both WQv and RRv at the site. In addition, the project site will utilize green roofs for treatment and rainwater harvesting for storage and reuse. However, WQv credit is not being applied for those systems.

5.4.3 Methodology

In order to reduce the required WQv and meet the RRv criteria, a site specific evaluation must be performed to determine the most practical means of reducing runoff volume by application of a combination of RR techniques and standard SMPs with RRv capacity.

5.4.4 Application of RR Techniques

The following Table demonstrates a summary of the RR techniques being applied for this project, and both the water quality and runoff reduction volumes they provide. The RR Techniques have been designed in accordance with Chapter 5 of the Design Manual. Refer to the contract drawings for practice dimensions, material specifications, and installation details.

Table 3: Summary of RR Techniques being Applied

RR Technique	NYSDEC Design Variant	RRv Capacity	WQv Required (CF)	RRv Provided (CF)	WQv Provided[1] (CF)	Total WQv Treated[2] (CF)
GreenBlue Urban ArborSystem	ALT	100%	6,230	6,230	0	6,230

Footnotes:
[1]*WQv Provided = WQV Required - RRv Provided*
[2]*Total WQv Treated = WQV Provided + RRv Provided*
[3]*Credit for WQv within the green roofs and cisterns have not been taken*

5.4.5 RRv Performance Summary

A summary of the RRv provided is presented in the following table:

Table 4: RRv Summary

RRv Required = WQv Required (CF)	RRv Provided (CF)	% RRv Provided
6,230	6,230	100%

As indicated in the above table, the RRv provided is equal to the RRv required for the project site. Refer to Appendix I, Table C for a project specific evaluation of each RR technique and standard SMP with RRv capacity, demonstrating why these practices have been applied or are infeasible.

5.5 STEP 4 – Determine the Minimum RRv Required

As previously discussed, the RRv provided is greater than the RRv required for this project. As such, the runoff reduction volume criteria has been met, and minimum RRv is not applicable.

5.6 STEP 6 - Apply Volume and Peak Rate Control

5.6.1 NYSDEC Requirements for New Development

Chapter 4 of the Design Manual requires that projects meet three separate stormwater quantity criteria:

1. The Channel Protection (CPv) requirement is designed to protect stream channels from erosion. This is accomplished by providing 24 hours of extended detention for the 1-year, 24-hour storm event. The Manual defines the CPv detention time as the center of mass detention time through each stormwater management practice.

2. The Overbank Flood Control (Qp) requirement is designed to prevent an increase in the frequency and magnitude of flow events that exceed the bank-full capacity of a channel, and therefore must spill over into the floodplain. This is accomplished by providing detention storage to ensure that, at each design point, the post-development 10-year 24-hour peak discharge rate does not exceed the corresponding pre-development rate.

3. The Extreme Flood Control (Qf) requirement is designed to prevent the increased risk of flood damage from large storm events, to maintain the boundaries of the pre-development 100-year floodplain, and to protect the physical integrity of stormwater management practices. This is accomplished by providing detention storage to ensure that, at each design point, the post-development 100-year 24-hour peak discharge rate does not exceed the corresponding pre-development rate.

5.6.2 City of Albany Requirements

In accordance with Section 375-4(F)(11) – Stormwater Management of the City of Albany USDO, "All development and redevelopment within the City with a proposed area of disturbance greater than or equal to 1/4-acre in size shall comply with the latest version of the NYSDEC Stormwater Management Design Manual." ." As such, the stormwater management approach for this project has incorporated a combination of green roofs and the GreenBlue Urban ArborSystem for filtration, subsurface rainwater harvesting tanks for storage, and a final polishing treatment system to accommodate reuse of 100% of rainfall that falls on a 1.95-acre portion of the project site for site irrigation or internal greywater applications. The remaining 0.28-acres consists of minor impervious surfaces and greenspace at the outer perimeter of the site that cannot be captured due to steep slopes or elevation that is too low for conveyance to the rainwater harvesting tanks.

Additionally, in accordance with the City of Albany SPDES Discharge Permit NY0025747 for the combined sewer system, the project is proposing extension of an off-site separate storm sewer that will connect to an existing 60" RCP storm relief sewer located at the intersection of Seymour Street and Benjamin Street, in preparation for future separation by the City of Albany. This separate storm sewer extension is in alignment with the Best Management Practices defined in the permit. Although this infrastructure will be separate, it ultimately connects upgradient of the combined sewer flow regulator. This extension will disconnect significant portions of stormwater runoff at Krank, Odell, Seymour and Benjamin Streets from the current undersized combined sewer infrastructure. In addition, the project is aiming to achieve net zero water sustainability goals. To support this design, the on-site stormwater management practices have been designed to adequately store the full 100-year storm volume associated with the 1.95-acre area being captured for reuse in site irrigation and greywater applications. This system will be monitored with advanced sensors that will balance water reuse with controlled release to ensure that adequate storage capacity is available for average monthly rainfall.

5.6.3 Methodology

In order to demonstrate that the City of Albany detention requirements are being met, the Design Manual requires that a hydrologic and hydraulic analysis of the un-developed and post-development conditions be performed using the Natural Resources Conservation Service Technical Release 20 (TR-20) and Technical Release 55 (TR-55) methodologies. HydroCAD, developed by HydroCAD Software Solutions LLC of Tamworth, New Hampshire, is a Computer-Aided-Design (CAD) program for analyzing the hydrologic and hydraulic characteristics of a given watershed and associated stormwater management facilities. HydroCAD uses the TR-20 algorithms and TR-55 methods to create and route runoff hydrographs.

HydroCAD has the capability of computing hydrographs (which represent discharge rates characteristic of specified watershed conditions, precipitation, and geologic factors) combining hydrographs and routing flows though pipes, streams and ponds. HydroCAD can also calculate the center of mass detention time for various hydraulic features. Documentation for HydroCAD can be found on their website: http://www.hydrocad.net/.

For this analysis, the watershed and drainage system was broken down into a network consisting of two types of components as described below:

1. Subcatchment: A relatively homogeneous area of land, which produces a volume and rate of runoff unique to that area.

2. Pond: Natural or man-made impoundment, which temporarily stores stormwater runoff and empties in a manner determined by its geometry and the hydraulic structure located at its outlets.

Subcatchments, and ponds are represented by hexagons, and triangles, respectively, on the watershed routing diagrams provided with the computations included in Appendix I.

The analysis of hydrologic and hydraulic conditions and proposed stormwater management facilities, servicing the study area, was performed by dividing the tributary watershed into relatively homogeneous subcatchments. The separation of the watershed into subcatchments was dictated by watershed conditions, methods of collection, conveyance, and points of discharge. Watershed characteristics for each subcatchment were then assessed from United States Geological Service (USGS) 7.5-minute topographic maps, aerial photographs, a topographical survey, soil surveys, site investigations, and land use maps.

Proposed stormwater management facilities were designed and evaluated in accordance with the Design Manual and local regulatory requirements. The hydrologic and hydraulic analysis considered the SCS, Type II 24-hour storm events identified in the following table.

Table 5: Design Events

Facility	24-hour Storm Event
Storm Sewer	10-year
Rainwater Harvesting System	100-year
Flood Conditions	100-year

5.6.4 Description of Design Points

The study areas consist of an overall watershed that encompass approximately 2.22-acres. The overall watershed was broken down into smaller watersheds, or subcatchments to allow for analysis of runoff conditions at several locations throughout the study area. Each of these locations was defined as a Design Point (DP) in order to compare the effects resulting from stormwater management facilities proposed as part of the project. Descriptions of each of the selected design points are provided below.

- Design Point 1 (DP-1): Existing 60” RCP storm relief sewer at the intersection of Benjamin Street and Seymour Street. A separate storm sewer will be constructed within Seymour Street for discharge to the existing storm relief sewer.

5.6.5 Un-Developed Watershed Conditions

The pre-development project site is covered predominantly by a mix of buildings, pavement, concrete walks, lawn, and brush.

In accordance with the City of Albany Regulations and for the purpose of the hydraulic models, the site was assumed to be > 75% Grass cover, Good for Type D soils. Analysis of un-developed conditions considered existing drainage patterns, soil types, and topography. The Un-developed Watershed Delineation Map has been provided in Appendix G, as Figure 5.

The results of the computer modeling used to analyze the overall watersheds under un-developed condition is presented in Appendix J. A summary of the un-developed watershed runoff rates at the design point is presented in Table 6.

5.6.6 Post-development Watershed Conditions

The post-development project site is covered predominantly by a mix of lawn, buildings, pavement, and concrete walks.

The analysis of post-development conditions considered existing drainage patterns, soil types, planned site development, site grading and, stormwater management facilities proposed as part of site improvements. The Post-Development Watershed Delineation Map has been provided in Appendix G, as Figures 6.

The results of the computer modeling used to analyze the overall watershed under post-development condition is presented in Appendix K. A summary of the post-development watershed runoff rates at the design point is presented in Table 6.

There are numerous locations and methods for providing controls of off-site discharge of stormwater from each project site. Each has been designed to provide the above quantity controls by attenuating stormwater runoff and releasing runoff to off-site locations at a rate equal to or less than that which existed prior to development of the site. Each device is detailed on the accompanying plans.

5.6.7 Performance Summary

A comparison of the pre- and post-development watershed conditions was performed for all design points and storm events evaluated herein for each of the project Sites. This comparison demonstrates that the peak rate of runoff will not be increased. Therefore, the project will not have a significant adverse impact on the combined sewer system. The following Table summarizes the results of this analysis.

Table 6: Summary of Un-developed and Post-Development Peak Discharge Rates

	Un-developed vs. Post-Development Discharge Rate (cfs)							
Design Point (DP)	**1-year-24 hour storm event**		**10-year 24-hour storm event**		**25-year 24-hour storm event**		**100-year 24-hour storm event**	
	Undeveloped	**Post**	**Undeveloped**	**Post**	**Undeveloped**	**Post**	**Undeveloped**	**Post**
DP-1	2.81	0.73	7.52	1.39	7.52*	1.76	7.52*	2.50

**For the 25- and 100-year storm events, the 10-year undeveloped rate represents the maximum allowed discharge at each design point.*

6.0 INSPECTIONS, MAINTENANCE, AND REPORTING

6.1 Inspection and Maintenance Requirements

6.1.1 Pre-Construction Inspection and Certification

Prior to the commencement of construction, the Qualified Inspector/Qualified Professional shall conduct an assessment of the site and certify that the appropriate erosion and sediment control measures have been adequately installed and implemented. The Contractor shall contact the Qualified Inspector/Qualified Professional once the erosion and sediment control measures have been installed.

6.1.2 Construction Phase Inspections and Maintenance

A Qualified Inspector/Qualified Professional, shall conduct regular site inspections between the time this SWPPP is implemented and final site stabilization. Site inspections shall occur at an interval of at least once every seven (7) calendar days.

The purpose of site inspections is to assess performance of pollutant controls. Based on these inspections, the Qualified Inspector/Qualified Professional will decide whether it is necessary to modify this SWPPP, add or relocate sediment barriers, or whatever else may be needed in order to prevent pollutants from leaving the site via stormwater runoff. The general contractor has the duty to cause pollutant control measures to be repaired, modified, maintained, supplemented, or whatever else is necessary in order to achieve effective pollutant control.

Examples of particular items to evaluate during site inspections are listed below. This list is not intended to be comprehensive. During each inspection the inspector must evaluate overall pollutant control system performance as well as particular details of individual system components. Additional factors should be considered as appropriate to the circumstances.

1. Locations where vehicles enter and exit the site must be inspected for evidence of off-site sediment tracking. A stabilized construction entrance will be constructed where vehicles enter and exit. This entrance will be maintained or supplemented as necessary to prevent sediment from leaving the site on vehicles.
2. Sediment barriers must be inspected and, if necessary, they must be enlarged or cleaned in order to provide additional capacity. All material from behind sediment barriers will be stockpiled on the up slope side. Additional sediment barriers must be constructed as needed.
3. Inspections will evaluate disturbed areas and areas used for storing materials that are exposed to rainfall for evidence of, or the potential for, pollutants entering the drainage system. If necessary, the materials must be covered or original covers must be repaired or supplemented. Also, protective berms must be constructed, if needed, in order to contain runoff from material storage areas.
4. Grassed areas will be inspected to confirm that a healthy stand of grass is maintained. The site has achieved final stabilization once all areas are covered with building foundation or pavement, or have a stand of grass with at least 80 percent density. The density of 80 percent or greater must be maintained to be considered as stabilized. Areas must be watered, fertilized, and reseeded as needed to achieve this goal.

5. All discharge points must be inspected to determine whether erosion control measures are effective in preventing significant impacts to receiving waters.

The inspection reports must be completed entirely and additional remarks should be included if needed to fully describe a situation. An important aspect of the inspection report is the description of additional measures that need to be taken to enhance plan effectiveness. The inspection report must identify whether the site was in compliance with the SWPPP at the time of inspection and specifically identify all incidents of non-compliance.

Within one (1) business day of the completion of an inspection, the *Qualified Inspector/Qualified Professional* shall notify the Owner/Operator and appropriate contractor or subcontractor of any corrective actions that need to be taken. The contractor or subcontractor shall begin implementing the corrective actions within one (1) business day of the notification and shall complete the corrective actions in a reasonable time frame.

In addition to the inspections performed by the *Qualified Inspector/Qualified Professional*, the Contractor shall perform routine inspections that include a visual check of all erosion and sediment control measures. All inspections and maintenance shall be performed in accordance with the inspection and maintenance schedule provided on the accompanying plans. Sediment removed from erosion and sediment control measures will be exported from the site, stockpiled for later use, or used immediately for general non-structural fill.

It is the responsibility of the general contractor to assure the adequacy of site pollutant discharge controls. Actual physical site conditions or contractor practices could make it necessary to install more structural controls than are shown on the accompanying plans. (For example, localized concentrations of runoff could make it necessary to install additional sediment barriers, sediment traps, etc.) Assessing the need for additional controls and implementing them or adjusting existing controls will be a continuing aspect of this SWPPP until the site achieves final stabilization.

6.1.3 Temporary Suspension of Construction Activities

For construction sites where soil disturbance activities have been temporarily suspended (e.g. Winter shutdown) and temporary stabilization measures have been applied to all disturbed areas, the frequency of Qualified Inspector/Qualified Professional inspections can be reduced to once every 30 calendar days. Prior to reducing the frequency of inspections, the Owner/Operator shall notify the City of Albany in writing.

6.1.4 Partial Project Completion

For construction sites where soil disturbance activities have been shut down with partial project completion, all areas disturbed as of the project shutdown date have achieved final stabilization, and all post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SWPPP and are operational, the inspections by the Qualified Inspector/Qualified Professional can stop. Prior to the shutdown, the Owner/Operator shall notify the City of Albany in writing.

If soil disturbance activities have not resumed within two years from the date of shutdown, a Notice of Termination (NOT) shall be properly completed and submitted to the City of Albany.

6.1.5 Post-Construction Inspections and Maintenance

Inspections and maintenance of final stabilization measures and post-construction stormwater management practices shall be performed in accordance with Appendix F, once all disturbed areas are stabilized and all stormwater management systems are in place and operable.

6.2 Reporting Requirements

6.2.1 Inspection Reports

Inspection reports shall be prepared for the duration of construction, as outlined herein, and shall be signed by the *Qualified Inspector* or *Qualified Professional*. A sample inspection form is provided in Appendix D.

At a minimum, each inspection report shall record the following information:

1. Date and time of inspection.
2. Name and title of person(s) performing inspection.
3. A description of the weather and soil conditions (e.g. dry, wet, saturated) at the time of the inspection.
4. A description of the condition of the runoff at all points of discharge from the construction site. This shall include identification of any discharges of sediment from the construction site. Include discharges from conveyance systems (i.e. pipes, culverts, ditches, etc.) and overland flow.
5. A description of the condition of all natural surface waterbodies located within, or immediately adjacent to, the property boundaries of the construction site which receive runoff from disturbed areas. This shall include identification of any discharges of sediment to the surface waterbody.
6. Identification of all erosion and sediment control practices and pollution prevention measures that need repair or maintenance.
7. Identification of all erosion and sediment control practices and pollution prevention measures that were not installed properly or are not functioning as designed and need to be reinstalled or replaced.
8. Description and sketch of areas with active soil disturbance activity, areas that have been disturbed but are inactive at the time of the inspection, and areas that have been stabilized (temporary and/or final) since the last inspection.
9. Indication of the current phase of construction of all post-construction stormwater management practices and identification of all construction that is not in conformance with the SWPPP and technical standards.
10. Corrective action(s) that must be taken to install, repair, replace or maintain erosion and sediment control practices and pollution prevention measures; and to correct deficiencies identified with the construction of the post-construction stormwater management practice(s).
11. Identification and status of all corrective actions that were required by previous inspection.
12. Color photographs, with date stamp, that clearly show the condition of all practices that have been identified as needing corrective actions. The *Qualified Inspector/Qualified Professional* shall attach paper color copies of the digital photographs to the inspection report being maintained onsite within seven (7) calendar days of the date of the inspection. The *Qualified Inspector/Qualified*

Professional shall also take digital photographs, with date stamp, that clearly show the condition of the practice(s) after the corrective action has been completed. The *Qualified Inspector/Qualified Professional* shall attach the paper color copies of the digital photographs to the inspection report that documents the completion of the corrective action work within seven (7) calendar days of that inspection.

6.2.2 Site Log Book

The Owner/Operator shall retain a copy of the General Permit, NOI, NOI Acknowledgment Letter, MS4 SWPPP Acceptance Form (if applicable), inspection reports, contractor and subcontractor certification forms, and all documentation necessary to demonstrate eligibility under the permit, at the construction site from commencement of construction activity until the date that all areas of disturbance have achieved final stabilization and the Notice of Termination has been submitted to the City of Albany.

The Site Log Book shall be maintained on-site in a secure location (i.e. job trailer, on-site construction office, or mailbox with lock) and must be accessible during normal business hours to an individual performing a compliance inspection.

6.2.3 Post Construction Records and Archiving

Following construction, the Owner/Operator shall retain copies of the SWPPP, the complete construction Site Log Book, and records of all data used to complete the NOI to be covered by this permit, for a period of at least five years from the date that the site is finally stabilized.

Records shall be maintained of all post construction inspections and maintenance work performed in accordance with the requirements outlined in Appendix F.

Appendix A:
Stormwater Management System Maintenance Agreement

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STORMWATER MANAGEMENT SYSTEM MAINTENANCE AGREEMENT
The Seventy-Six

THIS AGREEMENT ("Agreement") is made and entered into on the

___day of ____, 2020, by and between

South End Development, LLC, with an address at ***45 Hudson Avenue, #213***, Albany, New York 12201 (hereinafter referred to as the "Facility Owner"), and

CITY OF ALBANY, a municipal corporation with an address at 24 Eagle Street, Albany, New York 12207 (hereinafter referred to as the "City").

WITNESSETH:

WHEREAS, the Facility Owner is the owner of the subject parcel of land in the City of Albany, County of Albany and State of New York as more particularly located at ***76 Second Avenue***, Albany New York.

WHEREAS, the City and the Facility Owner desire that the stormwater management system be built in accordance with the approved project documents and thereafter be maintained, cleaned, repaired, replaced and continued in perpetuity in order to ensure optimum performance of the components; and

WHEREAS, the City has requested this legally binding and enforceable maintenance agreement from the Facility Owner; and

WHEREAS, the Facility Owner is representing the following design documents, with their City approved revisions, as containing all necessary information to construct, operate and maintain the stormwater management system for the lifetime of the facility:

a. Plan set submitted to the City representing a stormwater management system including stormwater collection, conveyance and storage using structures designed and specified by ***The Chazen Companies***, Consulting Engineers, sealed by Roger Keating, P.E., as the Engineer of Record. The plan sheets showing features associated with the stormwater management system are listed below.

Sheet#	Date	Drawing Title
C-001	***11/03/20***	*Notes & Legends*
C-110	***11/03/20***	*Master Plan*
C-111	***11/03/20***	*Alternate Master Plan*
C-112	***11/03/20***	*Phase 1 Master Plan*
C-120	***11/03/20***	*Demolition Plan*
C-125	***11/03/20***	*Demolition & Site Layout Plan*
C-130	***11/03/20***	*Site Layout Plan*
C-140	***11/03/20***	*Grading & Drainage Plan*
C-145	***11/03/20***	*Grading, Drainage, Erosion & Sediment Control Plan*
C-150	***11/03/20***	*Erosion and Sediment Control Plan*
C-160	***11/03/20***	*Utility Plan*
C-165	***11/03/20***	*Utility & Lighting Plan*
C-170	***11/03/20***	*Lighting Plan*
C-180	***11/03/20***	*Landscaping Plan*
C-185	***11/03/20***	*Landscaping & Plant Schedules*
C-190	***11/03/20***	*Offsite Improvements*
C-191	***11/03/20***	*Delivery Truck Maneuvering Plan*
C-192	***11/03/20***	*Garbage Truck Maneuvering Plan*
C-193	***11/03/20***	*Leonard St & Seymour St Profile*
C-194	***11/03/20***	*Krank St Profile*
C-195	***11/03/20***	*Construction Access Plan*
C-500	***11/03/20***	*Erosion & Sediment Control Details*
C-501	***11/03/20***	*Site Details*

C-502	***11/03/20***	*Site Details*
C-503	***11/03/20***	*Storm Sewer Details*
C-504	***11/03/20***	*Stormwater Management Details*
C-505	***11/03/20***	*Water System Details*
C-506	***11/03/20***	*Sanitary Sewer System Details*
C-507	***11/03/20***	*Landscaping Details & Notes*
C-508	***11/03/20***	*Work Zone Traffic Control Details & Notes*
C-509	***11/03/20***	*Retaining Wall Details*

b. "***Stormwater Pollution Prevention Plan: The Seventy-Six***" prepared by **The Chazen Companies**, *547 River Street, Troy, New York*, last revised ***November 2020.***

IN CONSIDERATION THEREOF, the parties agree as follow:

1. The Facility Owner shall be responsible for maintaining the storm water facility in a manner to prevent silt from becoming tributary to the City's storm water drainage system.

2. Operation and maintenance, including inspection and cleaning of the full storm water drainage system, shall be the responsibility of the Facility Owner.

3. In the event the Facility Owner fails to maintain the system in a manner to control storm water the City may order the system cleaned and bill the Facility Owner the full cost of this work at labor cost (direct labor plus 50% salary burden) and materials (at cost) if work is performed by the Department of Water & Water Supply; or the cost of a subcontractor plus 10% of the subcontractor's bill if the Department of Water & Water Supply obtains a subcontractor to perform the work. Invoices are payable to the Department of Water & Water Supply within ten (10) business days from the date of invoice. In the event payment for costs is not received within said ten (10) day period, the Department of Water & Water Supply shall have the right to file a lien in the amount of the invoice, together with reasonable costs of collection incurred in connection therewith, against the property of the Facility Owner.

4. The City has the right to access the premises for periodic inspections and to perform any maintenance of the stormwater system.

5. The Facility Owner shall disclose this Agreement to any successor or assignees in interest.

6. This Agreement is binding on the Facility Owner and any successor or assignees in interest hereof.

7. Facility Owner agrees to defend, indemnify, and save harmless the CITY and its officers, employees and agents, from and against all claims, actions, causes of action, injuries, damages, losses, liabilities, and expenses (including, without limitation, reasonable attorney's fees and court costs) arising out of, or in consequence of, any negligent or intentional act or omission of Facility Owner to the extent of its or their responsibility for such claims, actions, causes of action, injuries, damages, losses, liabilities, and expenses. The provisions of this Article shall survive any termination or expiration of this Agreement.

[Signatures on next page]

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be signed by their duly authorized officers as of the day and year first above written.

CITY OF ALBANY, NEW YORK

BY: _____

KATHY M. SHEEHAN
MAYOR, CITY OF ALBANY

SOUTH END DEVELOPMENT, LLC

BY:

COREY JONES
CEO, FOUNDER

STATE OF NEW YORK)
) ss.:
COUNTY OF ALBANY)

On the _ day of_____ , 2020, before me the undersigned, a Notary Public in and for said State, personally appeared_____ , personally known to me or proved to me on the basis of satisfactory evidence to be the individual whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his capacity, and that by his signature on the instrument, the individual, or person upon behalf of which the individual acted, executed the instrument.

_____
Notary Public

STATE OF NEW YORK)
) ss.:
COUNTY OF ALBANY)

On the _ day of_____ , 2020, before me the undersigned, a Notary Public in and for said State, personally appeared_____ , personally known to me or proved to me on the basis of satisfactory evidence to be the individual whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his capacity, and that by his signature on the instrument, the individual, or person upon behalf of which the individual acted, executed the instrument.

_____
Notary Public

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Appendix B:
City of Albany Forms

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CITY OF ALBANY
DEPARTMENT OF WATER & WATER SUPPLY
10 NORTH ENTERPRISE DRIVE
ALBANY, NEW YORK 12204
TELEPHONE (518) 434-5300
FAX (518) 434-5332

KATHY M. SHEEHAN
MAYOR

JOSEPH E. COFFEY, JR
COMMISSIONER

AWD ____ (for Department of Water use only)

NOTICE OF INTENT

Stormwater Discharges Associated With Construction Activities Under Rezone Albany

All sections must be completed unless otherwise noted. Failer to complete all items may result in this form being returned to you, thereby delaying your coverage under this Permit. Applicants must read and understand the conditions of the permit and prepare a Stormwater Pollution Prevention Plan prior to submitting this NOI. Applicants are responsible for identifing and obtaining other DEC permits that may be required.

-IMPORTANT-

RETURN THIS FORM TO THE ADDRESS ABOVE
OWNER/OPERATOR MUST SIGN FORM

Owner/Operator Information

Owner/Operator (Company Name/Private Owner Name/Municipality Name)
South End Development, LLC

Owner/Operator Contact Person Last Name (NOT CONSULTANT)
Jones

Owner/Operator Contact Person First Name
Corey

Owner/Operator Mailing Address
45 Hudson Ave #213

City
Albany

State
NY

Zip
12201 -

Phone (Owner/Operator)
803 - 280 - 0601

Fax (Owner/Operator)
 - -

Email (Owner/Operator)
cjones@southenddevelopment.com

FED TAX ID
 - (not required for individuals)

Project Site Information

Project/Site Name

The Seventy-Six, Mixed-Use Redevelopment

Street Address (NOT P.O. BOX)

76 Second Avenue

Side of Street

○ **North** ◉ **South** ○ **East** ○ **West**

City/Town/Village (THAT ISSUES BUILDING PERMIT)

Albany

State: N Y

Zip: 12201 –

County: Albany

Name of Nearest Cross Street

Krank Street

Distance to Nearest Cross Street (Feet)

0

Project In Relation to Cross Street

○ **North** ○ **South** ○ **East** ◉ **West**

Tax Map Numbers
Section-Block-Parcel

76.72-4-20.1

Tax Map Numbers

1. Provide the Geographic Coordinates for the project site in NYTM Units. To do this you must go to the NYSDEC Stormwater Interactive Map on the DEC website at:

www.dec.ny.gov/imsmaps/stormwater/viewer.htm

Zoom into your Project Location such that you can accurately click on the centroid of your site. Once you have located your project site, go to the tool boxes on the top and choose "i" (identify). Then click on the center of your site and a new window containing the X, Y coordinates in UTM will pop up. Transcribe these coordinates into the boxes below. For problems with the interactive map use the help function.

X Coordinates (Easting)

737642

Y Coordinates (Northing)

4263847

2. What is the nature of this construction project?

○ **New Construction**

◉ **Redevelopment with increase in impervious area**

○ **Redevelopment with no increase in impervious area**

3. Select the predominant land use for both pre and post development conditions.
SELECT ONLY ONE CHOICE FOR EACH

Pre-Development Existing Land Use

- ○ FOREST
- ○ PASTURE/OPEN LAND
- ○ CULTIVATED LAND
- ○ SINGLE FAMILY HOME
- ○ SINGLE FAMILY SUBDIVISION
- ○ TOWN HOME RESIDENTIAL
- ◉ MULTIFAMILY RESIDENTIAL
- ○ INSTITUTIONAL/SCHOOL
- ○ INDUSTRIAL
- ○ COMMERCIAL
- ○ ROAD/HIGHWAY
- ○ RECREATIONAL/SPORTS FIELD
- ○ BIKE PATH/TRAIL
- ○ LINEAR UTILITY
- ○ PARKING LOT
- ◉ OTHER

Single/2-Family Residential

Post-Development Future Land Use

- ○ SINGLE FAMILY HOME
- ○ SINGLE FAMILY SUBDIVISION
- ○ TOWN HOME RESIDENTIAL
- ◉ MULTIFAMILY RESIDENTIAL
- ○ INSTITUTIONAL/SCHOOL
- ○ INDUSTRIAL
- ○ COMMERCIAL
- ○ MUNICIPAL
- ○ ROAD/HIGHWAY
- ○ RECREATIONAL/SPORTS FIELD
- ○ BIKE PATH/TRAIL
- ○ LINEAR UTILITY (water, sewer, gas, etc.)
- ○ PARKING LOT
- ○ CLEARING/GRADING ONLY
- ○ DEMOLITION, NO REDEVELOPMENT
- ○ WELL DRILLING ACTIVITY *(Oil, Gas, etc.)
- ○ OTHER

Number of Lots

*** Note** : for gas well drilling, non-high volume hydraulic fractured wells only

4. In accordance with the larger common plan of development or sale, enter the total project site area; the total area to be disturbed; existing impervious area to be disturbed (for redevelopment activities); and the future impervious area constructed within the existing impervious area to be disturbed (for redevelopment disturbed area). (Round to the nearest tenth of an acre).

Total Site Area	**Total Area To Be Disturbed**	**Existing Impervious Area To Be Disturbed**	**Future Impervious Area Within Disturbed Area**
2.2	2.2	0.7	1.3

5. Do you plan to disturb more than 5 acres of soil at any one time? ○ **Yes** ◉ **No**

6. Indicate the percentage of each Hydrologic Soil Group (HSG) at the site.

A	**B**	**C**	**D**
0 %	0 %	0 %	100 %

7. Is this a phased project? ◉ **Yes** ○ **No**

8. Enter the planned start and end dates of the disturbance activities.

Start Date 01 / 01 / 2021 - **End Date** 10 / 31 / 2022

9. Identify the nearest surface waterbody(ies) to which construction site runoff will discharge.

Name

Hudson River

9a. Type of waterbody identified in Question 9?

- ○ Wetland / State Jurisdiction On Site (Answer 9b)
- ○ Wetland / State Jurisdiction Off Site
- ○ Wetland / Federal Jurisdiction On Site (Answer 9b)
- ○ Wetland / Federal Jurisdiction Off Site
- ○ Stream / Creek On Site
- ○ Stream / Creek Off Site
- ○ River On Site
- ◪ River Off Site
- ○ Lake On Site
- ○ Lake Off Site
- ○ Other Type On Site
- ○ Other Type Off Site

9b. How was the wetland identified?

- ○ Regulatory Map
- ○ Delineated by Consultant
- ○ Delineated by Army Corps of Engineers
- ○ Other (identify)

10. Has the surface waterbody(ies) in question 9 been identified as a 303(d) segment in Appendix E of GP-0-15-002? ○ **Yes** ◉ **No**

11. Is this project located in one of the Watersheds identified in Appendix C of GP-0-15-002? ○ **Yes** ◉ **No**

12. Is the project located in one of the watershed areas associated with AA and AA-S classified waters? ○ **Yes** ◉ **No**
If no, skip question 13.

13. Does this construction activity disturb land with no existing impervious cover and where the Soil Slope Phase is identified as an E or F on the USDA Soil Survey? ○ **Yes** ○ **No**
If Yes, what is the acreage to be disturbed?

.

14. Will the project disturb soils within a State regulated wetland or the protected 100 foot adjacent area? ○ **Yes** ◉ **No**

15. Does the site runoff enter a separate storm sewer system (including roadside drains, swales, ditches, culverts, etc)? ○ **Yes** ◉ **No** ○ **Unknown**

16. What is the name of the municipality/entity that owns the separate storm sewer system?

17. Does any runoff from the site enter a sewer classified as a Combined Sewer? ◉ **Yes** ○ **No** ○ **Unknown**

18. Will future use of this site be an agricultural property as defined by the NYS Agriculture and Markets Law? ○ **Yes** ◉ **No**

19. Is this property owned by a state authority, state agency, federal government or local government? ○ **Yes** ◉ **No**

20. Is this a remediation project being done under a Department approved work plan? (i.e. CERCLA, RCRA, Voluntary Cleanup Agreement, etc.) ○ **Yes** ◉ **No**

21. Has the required Erosion and Sediment Control component of the SWPPP been developed in conformance with the current NYS Standards and Specifications for Erosion and Sediment Control (aka Blue Book)? ◉ **Yes** ○ **No**

22. Does this construction activity require the development of a SWPPP that includes the post-construction stormwater management practice component (i.e. Runoff Reduction, Water Quality and Quantity Control practices/techniques)? ◉ **Yes** ○ **No**
If No, skip questions 23 and 27-39.

23. Has the post-construction stormwater management practice component of the SWPPP been developed in conformance with the current NYS Stormwater Management Design Manual? ◉ **Yes** ○ **No**

24. The Stormwater Pollution Prevention Plan (SWPPP) was prepared by:

- ☑ **Professional Engineer (P.E.)**
- ○ **Soil and Water Conservation District (SWCD)**
- ○ **Registered Landscape Architect (R.L.A)**
- ○ **Certified Professional in Erosion and Sediment Control (CPESC)**
- ○ **Owner/Operator**
- ○ **Other**

SWPPP Preparer

The Chazen Companies

Contact Name (Last, Space, First)

Keating, Roger

Mailing Address

547 River Street

City

Troy

State

NY

12180 -

Phone

518 273 - 0055

Fax

518 - 273 - 8391

Email

rkeating@chazencompanies.com

SWPPP Preparer Certification

I hereby certify that the Stormwater Pollution Prevention Plan (SWPPP) for this project has been prepared in accordance with the terms and conditions of Rezone Albany. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of this permit and the laws of the Stae of New York and could subject me to criminal, civil and/or administrative proceedings.

First Name

Roger

MI

E

Last Name

Keating

Signature

Date

/ /

25. Has a construction sequence schedule for the planned management practices been prepared? ◉ Yes ○ No

26. Select all of the erosion and sediment control practices that will be employed on this project site.

Temporary Structural

- ○ Check Dams
- ○ Construction Road Stabilization
- ✔ Dust Control
- ○ Earth Dike
- ○ Level Spreader
- ○ Perimeter Dike/Swale
- ○ Pipe Slope Drain
- ○ Portable Sediment Tank
- ○ Rock Dam
- ○ Sediment Basin
- ✔ Sediment Traps
- ✔ Silt Fence
- ✔ Stabilized Construction Entrance
- ✔ Storm Drain Inlet Protection
- ○ Straw/Hay Bale Dike
- ○ Temporary Access Waterway Crossing
- ○ Temporary Stormdrain Diversion
- ○ Temporary Swale
- ○ Turbidity Curtain
- ✔ Water Bars

Biotechnical

- ○ Brush Matting
- ○ Wattling

Vegetative Measures

- ○ Brush Matting
- ○ Dune Stabilization
- ○ Grassed Waterway
- ✔ Mulching
- ○ Protecting Vegetation
- ○ Recreation Area Improvement
- ✔ Seeding
- ○ Sodding
- ○ Straw/Hay Bale Dike
- ○ Streambank Protection
- ○ Temporary Swale
- ✔ Topsoiling
- ○ Vegetating Waterways

Permanent Structural

- ○ Debris Basin
- ○ Diversion
- ○ Grade Stabilization Structure
- ✔ Land Grading
- ○ Lined Waterway (Rock)
- ○ Paved Channel (Concrete)
- ○ Paved Flume
- ✔ Retaining Wall
- ○ Riprap Slope Protection
- ○ Rock Outlet Protection
- ○ Streambank Protection

Other

Post Construction Stormwater Management Practice (SMP) Requirments

Important: Completetion of Questions 27-39 is not required if response to Question 22 is No.

27. Identify all site planning practices that were used to prepare the final site plan/layout for the project.

- ◯ Preservation of Undisturbed Areas
- ◯ Preservations of Buffers
- ◯ Reduction of Clearing & Grading
- ◯ Locating Development in Less Sensitive Areas
- ◯ Roadway Reduction
- ◯ Sidewalk Reduction
- ◯ Driveway Reduction
- ◯ Cul-de-sac Reduction
- ◯ Building Footprint Reduction
- ✔ Parking Reduction

27a. Indicate which of the following soil restoration criteria was used to address the requirements in Section 5.1.6 ("Soil Restoration") of the Design Manual (2010 version).

✔ All disturbed areas will be restored in accordance with the Soil Restoration requirments in Table 5.3 of the Design Manual (see page 5-22).

◯ Compacted areas were considered as impervious cover when calculating the WQv Required, and the compacted areas were assigned a post construction Hydrologic Soil Group (HSG) designation that is one level less permeable than existing conditions for the hydrology analysis.

28. Provide the total Water Quality Volume (WQv) required for this project (based on final site plan/layout).

Total WQv Required

0 . 143 **acre-feet**

29. Identify the RR techniques (Area Reduction), RR techniques(Volume Reduction) and Standard SMPs with RRv Capacity in Table 1 (See Page 9) that were used to reduce the Total WQv Required (#28).

Also, provide in Table 1 the total impervious area that contributes runoff to each technique/practice selected. For the Area Reduction Techniques, provide the total contributing area (includes pervious area) and, if applicable, the total impervious area that contributes runoff to the technique/practice.

Note: Redevelopment projects shall use Table 1 and 2 to identify the SMPs used to treat and/or reduce the WQv required. If runoff reduction techniques will not be used to reduce the required WQv, skip to question 33a after identifying the SMPs

Table 1 - Runoff Reduction (RR) Techniques and Standard Stormwater Management Practices (SMPs)

RR Techniques (Area Reduction)	Total Contributing Area (acres)		Total Contributing Impervious Area (acres)	
○ Conservation of Natural Areas (RR-1)		and/or		
○ Sheetflow to Riparian Buffers/Filters Strips (RR-2)		and/or		
○ Tree Planting/Tree Pit (RR-3)		and/or		
○ Disconnection of Rooftop Runoff (RR-4)		and/or		
RR Techniques (Area Reduction)				
○ Vegetated Swale (RR-5)				
○ Rain Garden (RR-6)				
○ Stormwater Planter (RR-7)				
☑ Rain Barrel/Cistern (RR-8)			0.437	
○ Porous Pavement (RR-9)				
☑ Green Roof (RR-10)			0.012	
Standard SMPs with RRv Capacity				
○ Infiltration Trench (I-1)				
○ Infiltration Basin (I-2)				
○ Dry Well (I-3)				
○ Underground Infiltration System (I-4)				
☑ Bioretention (F-5)			0.922	
○ Dry Swale (O-1)				
Standard SMPs				
○ Micropool Extended Detention (P-1)				
○ Wet Pond (P-2)				
○ Wet Extended Detention (P-3)				
○ Multiple Pond System (P-4)				
○ Pocket Pond (P-5)				
○ Surface Sand Filter (F-1)				
○ Underground Sand Filter (F-2)				
○ Perimeter Sand Filter (F-3)				
○ Organic Filter (F-4)				
○ Shallow Wetland (W-1)				
○ Extended Detention Wetland (W-2)				
○ Pond/Wetland System (W-3)				
○ Pocket Wetland (W-4)				
○ Wet Swale (O-2)				

Table 2 - Alternative SMPs (Do Not Include Practices Being Used For Pretreatment Only)

Alternative SMP	Total Contributing Impervious Area (acres)
○ Hydrodynamic	.
○ Wet Vault	.
○ Media Filter	.
○ Other	.

Provide the name and manufacturer of the Alternative SMPs (i.e. proprietary practice (s)) being used for WQv treatment.

Name

Manufacturer

Note: Redevelopment projects which do not use RR techniques, shall use questions 28, 29, 33 and 33a to provide SMPs, used, total WQv required and total WQv provided for the project.

30. Indicate the Total RRv provided by the RR techniques (Area/Volume Reduction) and Standard SMPs with RRv capacity identified in question 29.

Total RRv provided

0 . 143 **acre-feet**

31. Is the Total RRv provided (#30) greater than or equal to the total WQv required (#28).

● **Yes** ○ **No**

If Yes, go to question 36.
If No, go to question 32.

32. Provide the Minimum RRv required based on HSG.
[Minimum RRv Required = (P)(0.95)(Ai)/12, Ai=(S)(Aic)]

Minimum RRv Required

. **acre-feet**

32a. Is the Total RRv provided (#30) greater than or equal to the Minimum RRv Required (#32)?

○ **Yes** ○ **No**

If Yes, go to question 33.

Note : Use the space provided in question #39 to summarize the specific site limitations and justification for not reducing 100% of WQv required (#28). A detailed evaluation of the specific site limitations and justification for not reducing 100% of the WQv required (#28) must also be included in the SWPPP.

If No, sizing criteria has not been met, so NOI can not be processed. SWPPP preparer must modify design to meet sizing **criteria.**

33. Identify the Standard SMP's in Table 1 and, if applicable, the Alternative SMPs in Table 2 that were used to treat the remaining total WQv (=Total WQv Required in 28 - Total RRv Provided in 30).

Also, provide in Table 1 and Table 2 the total impervious area that contributes runoff to each practice selected.

Note: Use Table 1 and Table 2 to identify the SMPs used on Redevelopment projects.

33a Indicate the Total WQv provided (i.e. WQv treated) by the SMPs identified in question #33 and Standard SMPs with RRv Capacity identified in Question #29.

WQv Provided

[ ] . [ ] **acre-feet**

Note: For the Standard SMPs with RRv capacity, the WQv provided by each practice = the WQv calculated using the contributing drainage area to the practice - RRv provided by the practice. (See Table 3.5 in Design Manual)

34. Provide the sum of the Total RRv provided (#30) and the WQv provided (#33a). [ ] . [ ] **acre-feet**

35. Is the sum of the RRv provided (#30) and the WQv provided (#33a) greater than or equal to the total WQv required (#28)? ◉ **Yes** ○ **No**

If Yes, go to question 36.
If No, sizing criteria has not been met, so NOI can not be processed. SWPPP preparer must modify design to meet sizing criteria.

36. Provide the total Channel Protection Storage Volume (CPv) required and provided or select waiver (36a), if applicable.

CPv Required

[ ] . [ ] **acre-feet**

CPv Provided

[ ] . [ ] **acre-feet**

36a. The need to provide channel protection has been waived because:

○ Site discharges directly to tidal waters or a fifth order or larger stream.

◉ Reduction of the total CPv is achieved on site through runoff reduction techniques or infiltration systems.

37. Provide the Overbank Flood (Qp) and Extreme Flood (Qf) control criteria or select waiver (37a), if applicable.

Total Overbank Flood Control Criteria (Qp)

Pre-Development

7 . 52 **CFS**

Post-Development

1 . 39 **CFS**

Total Extreme Flood Control Criteria (Qf)

Pre-Development

7 . 52 **CFS**

Post-Development

2 . 50 **CFS**

37a. The need to meet the Qp and Qf criteria has been waived because:

◯ Site discharges directly to tidal waters or a fifth order or larger stream.

◯ Downstream analysis reveals that the Qp and Qf controls are not required.

38. Has a long term Operation & Maintenance Plan for the post construction stormwater management practice (s) been developed? ◉ Yes ◯ No

If yes, identify the entity resonsible for the long term Operation & Maintenance.

South End Development, LLC

39. Use this space to summarize the specific site limitations and justification for not reducing 100% of WQv required (#28). (See Question #32a). This space can also be used for other pertinent project information.

The proposed stormwater management practices (GreenBlue Urban ArborSystem and Green Roof Systems) will capture 1.95 acres of the project site, provide treatment, and store runoff in a rainwater harvesting tank for reuse for site irrigation and internal greywater applications. The remaining 0.28 acres, consisting of minor impervious surfaces (portions of public sidewalks and driveways) and greenspace that cannot be captured due to steep roadway topography will discharge to the new separate storm sewer system.

40. Identify other DEC permits, existing and new, that are required for this project/facility.

- ◯ Air Pollution Control
- ◯ Coastal Erosion
- ◯ Hazardous Waste
- ◯ Long Island Wells
- ◯ Mined Land Reclamation
- ◯ Solid Waste
- ◯ Navigable Waters Protection/Article 15
- ◯ Water Quality Certificate
- ◯ Dam Safety
- ◯ Water Supply
- ◯ Freshwater Wetlands/Article 24
- ◯ Tidal Wetlands
- ◯ Wild, Scenic and Recreational Rivers
- ◯ Stream Bed or Bank Protection / Article 15
- ◯ Endangered or Threatened Species(Incidental Take Permit)
- ◯ Individual SPDES
- ◯ SPDES Multi-Sector GP N Y R
- ◯ Other
- ✔ None

41. Does this project require a US Army Corps of Engineers Wetland Permit? ◯ **Yes** ◉ **No**
If Yes, Indicate Size of Impact. .

42. Is this project subject to the requirements of a regulated, traditional land use control MS4? ◯ **Yes** ◉ **No**
(If No, skip question 43)

43. Has the "MS4 SWPPP Acceptance" form been signed by the principal executive officer or ranking elected official and submitted along with this NOI? ◯ **Yes** ◉ **No**

44. If this NOI is being submitted for the purpose of continuing or transferring coverage under a permit for stormwater runoff from construction activities, please indicate the former SPDES number assigned. AWD

Owner/Operator Certification

I have read or been advised of the permit conditions and believe that I understand them. I also understand that, under the terms of this permit, there may be reporting requirements. I hereby certify that this document and the corresponding documents were prepared under my direction or supervision. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. I further understand that coverage under the permit will be identified in the acknowledgment that I will receive as a result of submitting this NOI and can be as long as sixty (60) business days as provided for in the permit. I also understand that, by submitting this NOI, I am acknowledging that the SWPPP has been developed and will be implemented as the first element of construction, and agreeing to comply with all the terms and conditions of the permit for which this NOI is being submitted.

Print First Name

Corey

MI

Print Last Name

Jones

Owner/Operator Signature

Date

/ /

CITY OF ALBANY
DEPARTMENT OF WATER & WATER SUPPLY
10 NORTH ENTERPRISE DRIVE
ALBANY, NEW YORK 12204
TELEPHONE (518) 434-5300
FAX (518) 434-5332

KATHY M. SHEEHAN
MAYOR

JOSEPH E. COFFEY, JR., P.E.
COMMISSIONER

Stormwater Pollution Prevention Plan (SWPPP) Acceptance Form

for

Construction Activities Seeking Authorization Under Rezone Albany

*(NOTE: Attach Completed Form to Notice Of Intent and Submit to Address Above)

I. Project Owner/Operator Information
1. Owner/Operator Name: South End Development
2. Contact Person: Corey Jones
3. Street Address: 45 Hudson Avenue #213
4. City/State/Zip: Albany, NY 12201
II. Project Site Information
5. Project/Site Name: The Seventy-Six, Mixed-Use Redevelopment
6. Street Address: 76 Second Avenue
7. City/State/Zip: Albany, NY 12202
III. Stormwater Pollution Prevention Plan (SWPPP) Review and Acceptance Information
8. SWPPP Reviewed by:
9. Title/Position:
10. Date Final SWPPP Reviewed and Accepted:
IV. Regulated MS4 Information
11. Name of MS4: City of Albany
12. MS4 SPDES Permit Identification Number: NYR20A464
13. Contact Person: Peter Beck
14. Street Address: 10 N. Enterprise Dr.
15. City/State/Zip: Albany, NY 12204
16. Telephone Number: 518-434-5300

MS4 SWPPP Acceptance Form - continued

V. Certification Statement - MS4 Official (City of Albany Stormwater Program Manager) or Duly Authorized Representative

I hereby certify that the final Stormwater Pollution Prevention Plan (SWPPP) for the construction project identified in question 5 has been reviewed and meets the substantive requirements in the SPDES Permit For Stormwater Discharges from Municipal Separate Storm Sewer Systems (MS4s).
Note: The MS4, through the acceptance of the SWPPP, assumes no responsibility for the accuracy and adequacy of the design included in the SWPPP. In addition, review and acceptance of the SWPPP by the MS4 does not relieve the owner/operator or their SWPPP preparer of responsibility or liability for errors or omissions in the plan.

Printed Name:

Title/Position:

Signature:

Date:

VI. Additional Information

(City of Albany Department of Water & Water Supply - MS4 SWPPP Acceptance Form - September 2017)

CITY OF ALBANY
DEPARTMENT OF WATER & WATER SUPPLY
10 NORTH ENTERPRISE DRIVE
ALBANY, NEW YORK 12204
TELEPHONE (518) 434-5300
FAX (518) 434-5332

KATHY M. SHEEHAN
MAYOR

JOSEPH E. COFFEY, JR., P.E.
COMMISSIONER

(NOTE: Submit Completed Form To Address Above)

NOTICE OF TERMINATION

Please indicate your permit identification number: AWD

I. Owner or Operator Information:

1. Owner/Operator Name: South End Development, LLC

2. Street Address: 45 Hudson Avenue #213

3. City/State/Zip: Albany, NY 12201

4. Contact Person: Corey Jones | 5. Telephone: 803-280-0601

6. Contact Person E-Mail: cjones@southenddevelopment.com

II. Project Site Information:

7. Project/Site Name: The Seventy-Six, Mixed-Use Redevelopment

8. Street Address: 76 Second Avenue

9. City/Zip: Albany 12202

10. County: Albany

III. Reason for Termination:

11. All disturbed areas have achieved final stabilization in accordance with the permit and SWPPP.
    * **Date final stabilization completed** (month/year)_____

12. Permit coverage has been transferred to new owner/operator. Indicate new owner/operator's permit identification number: AWD
    (Note: Permit coverage can not be terminated by owner identified in I.1. above until new owner/operator obtains coverage under the general permit)

13. Other (Explain on Page 2)

IV. Final Site Information:

14. Did this construction activity require the development of a SWPPP that includes post construction stormwater management practices? yes no (If no, go to question 19.)

15. Have all post construction stormwater management practices included in the final SWPPP been constructed? yes no (If no, explain on Page 2)

16. Identify the entity responsible for long-term operation and maintenance of practice(s)?

_____

NOTICE OF TERMINATION

17. Has the entity responsible for longterm operation and maintenance been given a copy of the operation and maintenance plan required by the permit? yes no

18. Indicate the method used to ensure long term operation and maintenance of the post construction stormwater management practice(s):
Post construction stormwater management practice(s) and any right-of-way(s) needed to maintain practice(s) have been deeded to the municipality.
Executed maintenance agreement is in place with the municipality that will maintain the post construction stormwater management practice(s).
Post construction stormwater management practices that are privately owned, a mechanism is in place that requires operation and maintenance of the practice(s) in accordance with the operation and maintenance plan, such as a deed covenant in the owner or operator's deed of record.
For post construction stormwater management practices that are owned by a public or private institution (e.g. school, government agency or authority, or public utility; policy and procedures are in place that ensures operation and maintenance of the practice(s) in accordance with the operation and maintenance plan.

19. Total area of impervious surface (i.e. roof, pavement, concrete, gravel, etc.) constructed within the disturbance area? _____
(acres)

20. Is the project subject to the requirements of a regulated, traditional land use control MS4? yes no
(If Yes, complete section VI - "MS4 Acceptance" statement

V. Additional Information/Explanation:
(Use this section to answer questions 13. and 15., if applicable)

VI. MS4 Acceptance - MS4 Official (City of Albany Stormwater Program Manager) or Duly Authorized Representative: (Note: Not required when 12. is checked - transfer of coverage)

I have determined that it is acceptable for the owner or operator of the construction project identified in question 7 to submit the Notice of Termination at this time.

Printed Name:

Title/Position:

Signature:	Date:

NOTICE OF TERMINATION

VII. Qualified Inspector Certification - Final Stabilization:	
I hereby certify that all disturbed areas have achieved final stabilization as defined in the current version of the permit, and that all temporary, structural erosion and sediment control measures have been removed. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.	
Printed Name:	
Title/Position:	
Signature:	Date:
VIII. Qualified Inspector Certification - Post construction Stormwater Management Practice(s):	
I hereby certify that all post-construction stormwater management practices have been constructed in conformance with the SWPPP. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.	
Printed Name:	
Title/Position:	
Signature:	Date:
IX. Owner or Operator Certification:	
I hereby certify that this document was prepared by me or under my direction or supervision. My determination, based upon my inquiry of the person(s) who managed the construction activity, or those persons directly responsible for gathering the information, is that the information provided in this document is true, accurate and complete. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.	
Printed Name:	
Title/Position:	
Signature:	Date:

(City of Albany Department of Water & Water Supply Notice of Termination - September 2017)

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Appendix C:
Contractor's Certification Form
Subcontractor's Certification Form

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Stormwater Pollution Prevention Plan
Contractor Certification Statement
(Responsible for overall SWPPP Compliance)

The Seventy-Six
76 Second Avenue, City of Albany, Albany County, New York

This is to certify that the following contracting firm will be responsible for installing, constructing, repairing, inspecting and/or maintaining the erosion and sediment control practices and post-construction stormwater management control practices required by the SWPPP.

Contracting Firm Information

Name: _____

Address: _____

Telephone & Fax: _____

Trained Contractor(s) [1] **Responsible for SWPPP Implementation (**Provide name, title, and date of last training)

_____

_____

Prior to commencement of construction activity, the following certification shall be issued:

I hereby certify under penalty of law that I understand and agree to comply with the terms and conditions of the SWPPP and agree to implement any corrective actions identified by the *qualified inspector* during a site inspection. I also understand that it is unlawful for any person to cause or contribute to a violation of *water quality standards*. Furthermore, I am aware that there are significant penalties for submitting false information, that I do not believe to be true, including the possibility of fine and imprisonment for knowing violations.

Printed Name: _____

Title/Position: _____

Signature: _____ Date: _____

Upon completion of construction activities, the following certification shall be issued, prior to issuance of the NOT:

I hereby certify that that all permanent stormwater management practices required by the SWPPP have been installed in accordance with the contract documents. I further certify that all temporary erosion and sediment control measures have been removed from the site, and that the on-site soils disturbed by construction activity have been restored in accordance with the SWPPP and the NYSDEC Division of Water's publication "Deep-Ripping and Decompaction".

Printed Name: _____

Title/Position: _____

Signature: _____ Date: _____

[1] "Trained Contractor" means an employee from a contracting (construction) company that has received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity. After receiving the initial training, the "trained contractor" shall receive four (4) hours of training every three (3) years. It can also mean an employee from the contracting (construction) company that meets the "qualified inspector" qualifications (e.g. licensed Professional Engineer, Certified Professional in Erosion and Sediment Control (CPESC), Registered Landscape Architect, or someone working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect, provided they have received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity). The "Trained Contractor" will be responsible for the day to day implementation of the SWPPP.

[2] Signatory Requirements:

a. For a corporation, this form shall be signed by (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principle business function, or any other person who performs similar policy or decision-making functions for the corporation; or (ii) the manager of one or more manufacturing, production or operating facilities, provided the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

b. For a partnership or sole proprietorship, this form shall be signed by a general partner or the proprietor, respectively.

c. For a municipality, State, Federal, or other public agency, this form shall be signed by either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g. Regional Administrators of EPA).

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Stormwater Pollution Prevention Plan
Subcontractor Certification Statement
(whose work involves soil disturbance)

The Seventy-Six
76 Second Avenue, City of Albany, Albany County, New York

Each Subcontractor whose work will involve soil disturbance of any kind is required to complete and sign this Certification Statement before commencing any construction activity at the site. This completed Certification Statement(s) shall be maintained at the construction site in the Site Log Book.

Subcontracting Firm Information

Name: _____

Address: _____

_____

Telephone & Fax: _____

Trained Contractor(s)[2] Responsible for SWPPP Implementation (Provide name, title, and date of last training)

_____

_____

Prior to commencement of construction activities, the following certification shall be issued:

I hereby certify under penalty of law that I understand and agree to comply with the terms and conditions of the SWPPP and agree to implement any corrective actions identified by the *qualified inspector* during a site inspection. I also understand that it is unlawful for any person to cause or contribute to a violation of *water quality standards*. Furthermore, I am aware that there are significant penalties for submitting false information, that I do not believe to be true, including the possibility of fine and imprisonment for knowing violations.

Printed Name: _____

Title/Position: _____

Signature: _____ Date: _____

[2] "Trained Contractor" means an employee from a contracting (construction) company that has received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity. After receiving the initial training, the "trained contractor" shall receive four (4) hours of training every three (3) years. It can also mean an employee from the contracting (construction) company that meets the "qualified inspector" qualifications (e.g. licensed Professional Engineer, Certified Professional in Erosion and Sediment Control (CPESC), Registered Landscape Architect, or someone working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect, provided they have received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity). The "Trained Contractor" will be responsible for the day to day implementation of the SWPPP.

[2] Signatory Requirements:

a. For a corporation, this form shall be signed by (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principle business function, or any other person who performs similar policy or decision-making functions for the corporation; or (ii) the manager of one or more manufacturing, production or operating facilities, provided the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

b. For a partnership or sole proprietorship, this form shall be signed by a general partner or the proprietor, respectively.

c. For a municipality, State, Federal, or other public agency, this form shall be signed by either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g. Regional Administrators of EPA).

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Appendix D:
SWPPP Inspection Report
(Sample Form)

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Stormwater Pollution Prevention Plan
Inspection Report

The Seventy-Six
76 Second Avenue
City of Albany, Albany County, New York

A Qualified Inspector[1] shall prepare an inspection report subsequent to each and every inspection. All sections of this report are to be completed.

1. Inspection Information

Inspection number: _____

Date and Time of Inspection: _____

Weather Conditions: _____

Soil Conditions (e.g. dry, wet, saturated): _____

2. Inspector Information

Qualified Inspector[1]

Printed Name: _____ Date: _____

Signature: _____

Qualified Professional[1]

Printed Name _____ Date: _____

Signature: _____

3. On the included site plan, provide a sketch of areas that are disturbed at the time of the inspection and areas that have been stabilized (temporary and/or final) since the last inspection. Provide additional descriptions below if necessary.

_____

_____

_____

_____

[1] A Qualified Inspector means a person that is knowledgeable in the principles and practices of erosion and sediment control, such as licensed Professional Engineer, Certified Professional in Erosion and Sediment Control (CPESC), Registered Landscape Architect, or other Department endorsed individual(s). It can also mean someone working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect, provided that person has training in the principles and practices of erosion and sediment control. Training in the principles and practices of erosion and sediment control means that the individual working under the direct supervision of the licensed Professional Engineer or Registered Landscape Architect has received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity. After receiving the initial training, the individual working under the direct supervision of the licensed Professional Engineer or Registered Landscape Architect shall receive four (4) hours of training every three (3) years. It can also mean a person that meets the Qualified Professional qualifications in addition to the Qualified Inspector qualifications. Note: Inspections of any post-construction stormwater management practices that include structural components, such as a dam for an impoundment, shall be performed by a licensed Professional Engineer.

4. **In the following table, provide a description of the condition of the runoff at all points of discharge from the construction site, including conveyance systems (pipes, culverts, ditches, etc.) and overland flow. Provide a description of the condition of all natural surface waterbodies located within the property boundaries of the construction site which receive runoff from disturbed areas. Identify any discharges of sediment from the construction site. Use additional sheets if necessary.**

Description of Discharge Point/Adjacent Natural Surface Waterbodies	Condition of Runoff	Sediment Discharge Noted
		Yes / No
		Yes / No
		Yes / No
		Yes / No

5. **For all discharge points where sediment discharge has been noted in the above table, provide detailed corrective actions that are required. Use additional sheets if necessary.**

6. In the following table, provide checkmarks in the appropriate columns to indicate the condition of all erosion and sediment control practices at the site.

Erosion & Sediment Control Practice	Not Applicable	Functioning as Designed	Needs Repair or Maintenance	Not Installed Properly	Date Deficiency First Reported (If Applicable)	Deficiency Corrected? Y/N (If Applicable)
Temporary Erosion & Sediment Control Practices						
Stabilized construction entrance						
Silt fence						
Inlet protection measures						
Soil stockpiles						
Dust control measures						
Pavement sweeping						
Temporary stabilization						
Dewatering operations						
Slope protection measures						
Temporary parking areas						
Concrete washout						
Temporary swales and berms						
Stone check dams						
Sediment traps						
Fiber Roll						
Other:						
Permanent Erosion & Sediment Control Practices						
Rock outlet protection						
Permanent turf reinforcement						
Permanent stabilization						
Other:						

7. For all erosion and sediment control practices identified in the above table as "needs repair or maintenance" or "not installed properly", provide detailed corrective actions that are required. Use additional sheets if necessary.

8. In the following table, indicate the current phase of construction of all post-construction stormwater management practices and identify all construction that is not in conformance with the SWPPP and technical standards.

SWM Practice	Current Phase of Construction	Items not in conformance with the SWPPP

9. For all post-construction stormwater management practices which are identified in the above table as including "items not in conformance with the SWPPP", provide detailed corrective action(s) that are required to correct the deficiencies. Use additional sheets if necessary.

Photo Log

Date – Item in need of repair or maintenance:	*Date – Corrected Action:*
Date – Item in need of repair or maintenance:	*Date – Corrected Action:*
Date – Item in need of repair or maintenance:	*Date – Corrected Action:*

Photo Log

Date – Item in need of repair or maintenance:	*Date – Corrected Action:*
Date – Item in need of repair or maintenance:	*Date – Corrected Action:*
Date – Item in need of repair or maintenance:	*Date – Corrected Action:*

Appendix E:
NYSDEC “Deep-Ripping and Decompaction,” April 2008

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New York State
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Water

Deep-Ripping and Decompaction

April 2008

Document Prepared by:

John E. Lacey,
Land Resource Consultant and Environmental Compliance Monitor
(Formerly with the Division of Agricultural Protection and Development Services,
NYS Dept. of Agriculture & Markets)

New York State
Department of Environmental Conservation

Alternative Stormwater Management
Deep-Ripping and Decompaction

Description

The two-phase practice of 1) “Deep Ripping;” and 2) “Decompaction” (deep subsoiling), of the soil material as a step in the cleanup and restoration/landscaping of a construction site, helps mitigate the physically induced impacts of soil compression; i.e.: soil compaction or the substantial increase in the bulk density of the soil material.

Deep Ripping and Decompaction are key factors which help in restoring soil pore space and permeability for water infiltration. Conversely, the physical actions of cut-and-fill work, land grading, the ongoing movement of construction equipment and the transport of building materials throughout a site alter the architecture and structure of the soil, resulting in: the mixing of layers (horizons) of soil materials, compression of those materials and diminished soil porosity which, if left unchecked, severely impairs the soil’s water holding capacity and vertical drainage (rainfall infiltration), from the surface downward.

In a humid climate region, compaction damage on a site is virtually guaranteed over the duration of a project. Soil in very moist to wet condition when compacted, will have severely reduced permeability. Figure 1 displays the early stage of the deep-ripping phase (Note that all topsoil was stripped prior to construction access, and it remains stockpiled until the next phase – decompaction – is complete). A heavy-duty tractor is pulling a three-shank ripper on the first of several series of incrementally deepening passes through the construction access corridor's densely compressed subsoil material. Figure 2 illustrates the approximate volumetric composition of a loam surface soil when conditions are good for plant growth, with adequate natural pore space for fluctuating moisture conditions.

Fig. 1. A typical deep ripping phase of this practice, during the first in a series of progressively deeper “rips” through severely compressed subsoil.

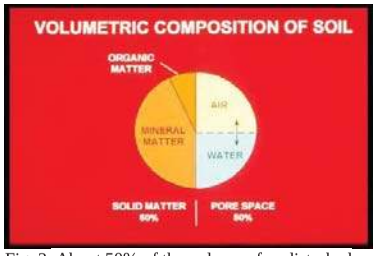

Fig. 2. About 50% of the volume of undisturbed loam surface soil is pore space, when soil is in good condition for plant growth. Brady, 2002.

Recommended Application of Practice

The objective of Deep Ripping and Decompaction is to effectively fracture (vertically and laterallly) through the thickness of the physically compressed subsoil material (see Figure 3), restoring soil porosity and permeability and aiding infiltration to help reduce runoff. Together with topsoil stripping, the “two-phase” practice of Deep Ripping and Decompaction first became established as a “best management practice” through ongoing success on commercial farmlands affected by heavy utility construction right-of-way projects (transmission pipelines and large power lines).

Fig. 3. Construction site with significant compaction of the deep basal till subsoil extends 24 inches below this exposed cut-and-fill work surface.

Soil permeability, soil drainage and cropland productivity were restored. For broader construction application, the two-phase practice of Deep Ripping and Decompaction is best adapted to areas impacted with significant soil compaction, on contiguous open portions of large construction sites and inside long, open construction corridors used as temporary access over the duration of construction. Each mitigation area should have minimal above-and-below-ground obstructions for the easy avoidance and maneuvering of a large tractor and ripping/decompacting implements. Conversely, the complete two-phase practice is not recommended in congested or obstructed areas due to the limitations on tractor and implement movement.

Benefits

Aggressive “deep ripping” through the compressed thickness of exposed subsoil before the replacement/respreading of the topsoil layer, followed by “decompaction,” i.e.: “sub-soiling,” through the restored topsoil layer down into the subsoil, offers the following benefits:

- Increases the project (larger size) area’s direct surface infiltration of rainfall by providing the open site’s mitigated soil condition and lowers the demand on concentrated runoff control structures
- Enhances direct groundwater recharge through greater dispersion across and through a broader surface than afforded by some runoff-control structural measures
- Decreases runoff volume generated and provides hydrologic source control
- May be planned for application in feasible open locations either alone or in

conjunction with plans for structural practices (e.g., subsurface drain line or infiltration basin) serving the same or contiguous areas

- Promotes successful long-term revegetation by restoring soil permeability, drainage and water holding capacity for healthy (rather than restricted) root-system development of trees, shrubs and deep rooted ground cover, minimizing plant drowning during wet periods and burnout during dry periods.

Feasibility/Limitations

The effectiveness of Deep Ripping and Decompaction is governed mostly by site factors such as: the original (undisturbed) soil's hydrologic characteristics; the general slope; local weather/timing (soil moisture) for implementation; the space-related freedom of equipment/implement maneuverability (noted above in **Recommended Application of Practice**), and by the proper selection and operation of tractor and implements (explained below in **Design Guidance**). The more notable site-related factors include:

Soil

In the undisturbed condition, each identified soil type comprising a site is grouped into one of four categories of soil hydrology, Hydrologic Soil Group A, B, C or D, determined primarily by a range of characteristics including soil texture, drainage capability when thoroughly wet, and depth to water table. The natural rates of infiltration and transmission of soil-water through the undisturbed soil layers for Group A is "high" with a low runoff potential while soils in Group B are moderate in infiltration and the transmission of soil-water with a moderate runoff potential, depending somewhat on slope. Soils in Group C have slow rates of infiltration and transmission of soil-water and a moderately high runoff potential influenced by soil texture and slope; while soils in Group D have exceptionally slow rates of infiltration and transmission of soil-water, and high runoff potential.

In Figure 4, the profile displays the undisturbed horizons of a soil in Hydrologic Soil Group C and the naturally slow rate of infiltration through the subsoil. The slow rate of infiltration begins immediately below the topsoil horizon (30 cm), due to the limited amount of macro pores, e.g.: natural subsoil fractures, worm holes and root channels. Infiltration after the construction-induced mixing and compression of such subsoil material is virtually absent; but can be restored back to this natural level with the two-phase practice of deep ripping and decompaction, followed by the permanent establishment of an appropriate, deep taproot

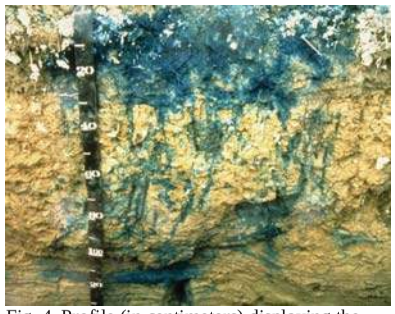

Fig. 4. Profile (in centimeters) displaying the infiltration test result of the natural undisturbed horizons of a soil in Hydrologic Soil Group C.

lawn/ground cover to help maintain the restored subsoil structure. Infiltration after construction-induced mixing and compression of such subsoil material can be notably rehabilitated with the Deep Ripping and Decompaction practice, which prepares the site for the appropriate long-term lawn/ground cover mix including deep taproot plants such as clover, fescue or trefoil, etc. needed for all rehabilitated soils.

Generally, soils in Hydrologic Soil Groups A and B, which respectively may include deep, well-drained, sandy-gravelly materials or deep, moderately well-drained basal till materials, are among the easier ones to restore permeability and infiltration, by deep ripping and decompaction. Among the many different soils in Hydrologic Soil Group C are those unique glacial tills having a natural fragipan zone, beginning about 12 to 18 inches (30 – 45cm), below surface. Although soils in Hydrologic Soil Group C do require a somewhat more carefully applied level of the Deep Ripping and Decompaction practice, it can greatly benefit such affected areas by reducing the runoff and fostering infiltration to a level equal to that of pre-disturbance.

Soils in Hydrologic Soil Group D typically have a permanent high water table close to the surface, influenced by a clay or other highly impervious layer of material. In many locations with clay subsoil material, the bulk density is so naturally high that heavy trafficking has little or no added impact on infiltration; and structural runoff control practices rather than Deep Ripping and Decompaction should be considered.

The information about Hydrologic Soil Groups is merely a general guideline. Site-specific data such as limited depths of cut-and-fill grading with minimal removal or translocation of the inherent subsoil materials (as analyzed in the county soil survey) or, conversely, the excavation and translocation of deeper, unconsolidated substratum or consolidated bedrock materials (unlike the analyzed subsoil horizons' materials referred to in the county soil survey) should always be taken into account.

Sites made up with significant quantities of large rocks, or having a very shallow depth to bedrock, are not conducive to deep ripping and decompation (subsoiling); and other measures may be more practical.

Slope

The two-phase application of 1) deep ripping and 2) decompaction (deep subsoiling), is most practical on flat, gentle and moderate slopes. In some situations, such as but not limited to temporary construction access corridors, inclusion areas that are moderately steep along a project's otherwise gentle or moderate slope may also be deep ripped and decompacted. For limited instances of moderate steepness on other projects, however, the post-construction land use and the relative alignment of the potential ripping and decompaction work in relation to the lay of the slope should be reviewed for safety and practicality. In broad construction areas predominated by moderately steep or steep slopes, the practice is generally not used.

Local Weather/Timing/Soil Moisture

Effective fracturing of compressed subsoil material from the exposed work surface, laterally and vertically down through the affected zone is achieved only when the soil material is moderately dry to moderately moist. Neither one of the two-phases, deep ripping nor decompaction (deep

subsoiling), can be effectively conducted when the soil material (subsoil or replaced topsoil) is in either a “plastic” or “liquid” state of soil consistency. Pulling the respective implements legs through the soil when it is overly moist only results in the “slicing and smearing” of the material or added “squeezing and compression” instead of the necessary fracturing. Ample drying time is needed for a “rippable” soil condition not merely in the material close to the surface, but throughout the material located down to the bottom of the physically compressed zone of the subsoil.

The “poor man’s Atterberg field test” for soil plasticity is a simple “hand-roll” method used for quick, on-site determination of whether or not the moisture level of the affected soil material is low enough for: effective deep ripping of subsoil; respreading of topsoil in a friable state; and final decompaction (deep subsoiling). Using a sample of soil material obtained from the planned bottom depth of ripping, e.g.: 20 - 24 inches below exposed subsoil surface, the sample is hand rolled between the palms down to a 1/8-inch diameter thread. (Use the same test for stored topsoil material before respreading on the site.) If the respective soil sample crumbles apart in segments no greater than 3/8 of an inch long, by the time it is rolled down to 1/8 inch diameter, it is low enough in moisture for deep ripping (or topsoil replacement), and decompaction. Conversely, as shown in Figure 5, if the rolled sample stretches out in increments greater than 3/8 of an inch long before crumbling, it is in a “plastic” state of soil consistency and is too wet for subsoil ripping (as well as topsoil replacement) and final decompaction.

Fig. 5. Augered from a depth of 19 inches below the surface of the replaced topsoil, this subsoil sample was hand rolled to a 1/8-inch diameter. The test shows the soil at this site stretches out too far without crumbling; it indicates the material is in a plastic state of consistence, too wet for final decompaction (deep subsoiling) at this time.

Design Guidance

Beyond the above-noted site factors, a vital requirement for the effective Deep Ripping and Decompaction (deep subsoiling), is implementing the practice in its distinct, two-phase process:

1) Deep rip the affected thickness of exposed subsoil material (see Figure 10 and 11), aggressively fracturing it before the protected topsoil is reapplied on the site (see Figure 12); and

2) Decompact (deep subsoil), simultaneously through the restored topsoil layer and the upper half of the affected subsoil (Figure 13). The second phase, “decompaction,” mitigates the partial recompaction which occurs during the heavy process of topsoil spreading/grading. Prior to deep ripping and decompacting the site, all construction activity, including construction equipment and material storage, site cleanup and trafficking (Figure 14), should be finished; and the site closed off to further disturbance. Likewise, once the practice is underway and the area’s soil permeability and

rainfall infiltration are being restored, a policy limiting all further traffic to permanent travel lanes is maintained.

The other critical elements, outlined below, are: using the proper implements (deep, heavy-duty rippers and subsoilers), and ample pulling-power equipment (tractors); and conducting the practice at the appropriate speed, depth and pattern(s) of movement.

Note that an appropriate plan for the separate practice of establishing a healthy perennial ground cover, with deep rooting to help maintain the restored soil structure, should be developed in advance. This may require the assistance of an agronomist or landscape horticulturist.

Implements

Avoid the use of all undersize implements. The small-to-medium, light-duty tool will, at best, only “scarify” the uppermost surface portion of the mass of compacted subsoil material. The term “chisel plow” is commonly but incorrectly applied to a broad range of implements. While a few may be adapted for the moderate subsoiling of non-impacted soils, the majority are less durable and used for only lighter land-fitting (see Figure 6).

Fig. 6. A light duty chisel implement, not adequate for either the deep ripping or decompaction (deep subsoiling) phase.

Fig. 7. One of several variations of an agricultural ripper. This unit has long, rugged shanks mounted on a steel V-frame for deep, aggressive fracturing through Phase 1.

Use a “heavy duty” agricultural-grade, deep ripper (see Figures 7,9,10 and 11) for the first phase: the lateral and vertical fracturing of the mass of exposed and compressed subsoil, down and through, to the bottom of impact, prior to the replacement of the topsoil layer. (Any oversize rocks which are uplifted to the subsoil surface during the deep ripping phase are picked and removed.) Like the heavy-duty class of implement for the first phase, the decompaction (deep subsoiling) of Phase 2 is conducted with the heavy-duty version of the deep subsoiler. More preferable is the angled-leg variety of deep subsoiler (shown in Figures 8 and 13). It minimizes the inversion of the subsoil and topsoil layers while laterally and vertically fracturing the upper half of the previously ripped subsoil layer and all of the topsoil layer by delivering a momentary, wave-like “lifting and shattering” action up through the soil layers as it is pulled.

Pulling-Power of Equipment
Use the following rule of thumb for tractor horsepower (hp) whenever deep ripping and decompacting a significantly impacted site: For both types of implement, have at least 40 hp of tractor pull available for each mounted shank/ leg.

Using the examples of a 3-shank and a 5-shank implement, the respective tractors should have 120 and 200 hp available for fracturing down to the final depth of 20-to-24 inches per phase. Final depth for the deep ripping in Phase 1 is achieved incrementally by a progressive series of passes (see Depth and Patterns of Movement, below); while for Phase 2, the full operating depth of the deep subsoiler is applied from the beginning.

The operating speed for pulling both types of implement should not exceed 2 to 3 mph. At this slow and managed rate of operating speed, maximum functional performance is sustained by the tractor and the implement performing the soil fracturing. Referring to Figure 8, the implement is the 6-leg version of the deep angled-leg subsoiler. Its two outside legs are "chained up" so that only four legs will be engaged (at the maximum depth), requiring no less than 160 hp, (rather than 240 hp) of pull. The 4-wheel drive, articulated-frame tractor in Figure 8 is 174 hp. It will be decompacting this unobstructed, former construction access area simultaneously through 11 inches of replaced topsoil and the upper 12 inches of the previously deep-ripped subsoil. In constricted areas of Phase 1) Deep Ripping, a medium-size tractor with adequate hp, such as the one in Figure 9 pulling a 3-shank deep ripper, may be more maneuverable.


Fig. 8. A deep, angled-leg subsoiler, ideal for Phase 2 decompaction of after the topsoil layer is graded on top of the ripped subsoil.


Fig. 9. This medium tractor is pulling a 3-shank deep ripper. The severely compacted construction access corridor is narrow, and the 120 hp tractor is more maneuverable for Phase 1 deep ripping (subsoil fracturing), here.

Some industrial-grade variations of ripping implements are attached to power graders and bulldozers. Although highly durable, they are generally not recommended. Typically, the shanks or "teeth" of these rippers are too short and stout; and they are mounted too far apart to achieve the well-distributed type of lateral and vertical fracturing of the soil materials necessary to restore soil permeability and infiltration. In addition, the power graders and bulldozers, as pullers, are far less maneuverable for turns and patterns than the tractor.

Depth and Patterns of Movement
As previously noted both Phase 1 Deep Ripping through significantly compressed, exposed subsoil and Phase 2 Decompaction (deep subsoiling) through the replaced topsoil and upper subsoil need to be performed at maximum capable depth of each implement. With an implement's guide wheels attached, some have a "normal" maximum operating depth of 18 inches, while others may go deeper. In many situations, however, the tractor/implement operator must first remove the guide wheels and other non essential elements from the implement. This adapts the ripper or the deep subsoiler for skillful pulling with its frame only a few inches above surface, while the shanks or legs, fracture the soil material 20-to-24 inches deep.

There may be construction sites where the depth of the exposed subsoil's compression is moderate, e.g.: 12 inches, rather than deep. This can be verified by using a ¾ inch cone penetrometer and a shovel to test the subsoil for its level of compaction, incrementally, every three inches of increasing depth. Once the full thickness of the subsoil's compacted zone is finally "pieced" and there is a significant drop in the psi measurements of the soil penetrometer, the depth/thickness of compaction is determined. This is repeated at several representative locations of the construction site. If the thickness of the site's subsoil compaction is verified as, for example, ten inches, then the Phase 1 Deep Ripping can be correspondingly reduced to the implement's minimum operable depth of 12 inches. However, the Phase 2 simultaneous Decompation (subsoiling) of an 11 inch thick layer of replaced topsoil and the upper subsoil should run at the subsoiling implements full operating depth.


Fig. 10. An early pass with a 3-shank deep ripper penetrating only 8 inches into this worksite's severely compressed subsoil.


Fig. 11. A repeat run of the 3-shank ripper along the same patterned pass area as Fig. 9; here, incrementally reaching 18 of the needed 22 inches of subsoil fracture.

Typically, three separate series (patterns) are used for both the Phase 1 Deep Ripping and the Phase 2 Decompaction on significantly compacted sites. For Phase 1, each series begins with a moderate depth of rip and, by repeat-pass, continues until full depth is reached. Phase 2 applies the full depth of Decompation (subsoiling), from the beginning.

Every separate series (pattern) consists of parallel, forward-and-return runs, with each progressive

pass of the implement's legs or shanks evenly staggered between those from the previous pass. This compensates for the shank or leg-spacing on the implement, e.g., with 24-to-30 inches between each shank or leg. The staggered return pass ensures lateral and vertical fracturing actuated every 12 to 15 inches across the densely compressed soil mass.

Large, Unobstructed Areas
For larger easy areas, use the standard patterns of movement:

- The first series (pattern) of passes is applied lengthwise, parallel with the longest spread of the site; gradually progressing across the site's width, with each successive pass.

- The second series runs obliquely, crossing the first series at an angle of about 45 degrees.

- The third series runs at right angle (or 90 degrees), to the first series to complete the fracturing and shattering on severely compacted sites, and avoid leaving large unbroken blocks of compressed soil material. (In certain instances, the third series may be optional, depending on how thoroughly the first two series loosen the material and eliminate large chunks/blocks of material as verified by tests with a ¾-inch cone penetrometer.)

Fig. 12. Moderately dry topsoil is being replaced on the affected site now that Phase 1 deep ripping of the compressed subsoil is complete.

Fig. 13. The same deep, angled-leg subsoiler shown in Fig. 7 is engaged at maximum depth for Phase 2, decompaction (deep soiling), of the replaced topsoil and the upper subsoil materials.

Corridors
In long corridors of limited width and less maneuverability than larger sites, e.g.: along compacted areas used as temporary construction access, a modified series of pattern passes are used.

- First, apply the same initial lengthwise, parallel series of passes described above.

- A second series of passes makes a broad "S" shaped pattern of rips, continually and gradually alternating the "S" curves between opposite edges inside the compacted corridor.

- The third and final series again uses the broad, alternating S pattern, but it is "flip-flopped" to continually cross the previous S pattern along the corridor's centerline. This final series of the S pattern curves back along the edge areas skipped by the second series.

Maintenance and Cost

Once the two-phase practice of Deep Ripping and Decompation is completed, two items are essential for maintaining a site's soil porosity and permeability for infiltration. They are: planting and maintaining the appropriate ground cover with deep roots to maintain the soil structure (see Figure 15); and keeping the site free of traffic or other weight loads.

Note that site-specific choice of an appropriate vegetative ground-cover seed mix, including the proper seeding ratio of one or more perennial species with a deep taproot system and the proper amount of lime and soil nutrients (fertilizer mix) adapted to the soil-needs, are basic to the final practice of landscaping, i.e: surface tillage, seeding/planting/fertilizing and culti-packing or mulching is applied. The "maintenance" of an effectively deep-ripped and decompacted area is generally limited to the successful perennial (long-term) landscape ground cover; as long as no weight-bearing force of soil compaction is applied.

Fig. 14. The severely compacted soil of a temporary construction yard used daily by heavy equipment for four months; shown before deep ripping, topsoil replacement, and decompaction.

Fig. 15. The same site as Fig. 14 after deep ripping of the exposed subsoil, topsoil replacement, decompaction through the topsoil and upper subsoil and final surface tillage and revegetation to maintain soil permeability and infiltration.

The Deep Ripping and Decompaction practice is, by necessity, more extensive than periodic subsoiling of farmland.The cost of deep ripping and decompacting (deep subsoiling), will vary according to the depth and severity of soil-material compression and the relative amount of tractor and implement time that is required. In some instances, depending on open maneuverability, two-to-three acres of compacted project area may be deep-ripped in one day. In other situations of more severe compaction and - or less maneuverability, as little as one acre may be fully ripped in a day. Generally, if the Phase 1) Deep Ripping is fully effective, the Phase 2) Decompaction should be completed in 2/3 to 3/4 of the time required for Phase 1.

Using the example of two acres of Phase 1) Deep Ripping in one day, at $1800 per day, the net cost is $900 per acre. If the Phase 2) Decompacting or deep subsoiling takes 3/4 the time as Phase 1, it costs $675 per acre for a combined total of $1575 per acre to complete the practice (these figures do not include the cost of the separate practice of topsoil stripping and replacement). Due to the many variables, it must be recognized that cost will be determined by the specific conditions or constraints of the site and the availability of proper equipment.

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Internet Access:

- Examples of implements:

V-Rippers. Access by internet search of *John Deere Ag -New Equipment for 915* (larger-frame model) *V-Rippe*; and, *for 913* (smaller-frame model) *V-Ripper*. Deep, angled-leg subsoiler. Access by internet search of: B*igham Brothers Shear Bolt Paratill-Subsoiler.* http://salesmanual.deere.com/sales/salesmanual/en_NA/primary_tillage/2008/feature/rippers/915v_pattern_frame.html?sbu=ag&link=prodcat Last visited March 08.

- Soils data of USDA Natural Resources Conservation Service. *NRCS Web Soil Survey.* http://websoilsurvey.nrcs.usda.gov/app/ and *USDA-NRCS Official Soil Series Descriptions; View by Name.* http://ortho.ftw.nrcs.usda.gov/cgi-bin/osd/osdname.cgi . *Last visited Jan. 08.*
- Soil penetrometer information. Access by internet searches of: *Diagnosing Soil Compaction using a Penetrometer (soil compaction tester), PSU Extension;* as well as *Dickey-john Soil Compaction Tester.* http://www.dickey-johnproducts.com/pdf/SoilCompactionTest.pdf and http://cropsoil.psu.edu/Extension/Facts/uc178pdf Last visited Sept. 07

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Appendix F:
Post-Construction Inspections and Maintenance

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POST CONSTRUCTION INSPECTIONS AND MAINTENANCE

1. SITE COVER

a. Inspections

Site cover and associated structures and embankments should be inspected periodically for the first few months following construction and then on a biannual basis. Site inspections should also be performed following all major storm events. Items to check for include (but are not limited to):

i. Differential settlement of embankments, cracking or erosion.

ii. Lack of vigor and density of grass turf.

iii. Accumulation of sediments or litter on lawn areas, paved areas, or within catch basin sumps.

iv. Accumulation of pollutants, including oils or grease, in catch basin sumps.

v. Damage or fatigue of storm sewer structures or associated components.

b. Mowing and Sweeping

Vegetated areas and landscaping should be maintained to promote vigorous and dense growth. Lawn areas should be mowed at least three times a year (more frequent mowing may be desired for aesthetic reasons). Resultant yard waste shall be collected and disposed of off-site.

Paved areas should be swept at least twice a year. Additional sweeping may be appropriate in the early spring for removal of deicing materials

c. Debris and Litter Removal

Accumulation of litter and debris should be removed during each mowing or sweep operation.

d. Structural Repair or Replacement

Components of the system which require repair or replacement should be addressed immediately following identification.

e. Catch Basins

The frequency for cleanout of catch basin sumps will depend on the efficiency of mowing, sweeping, and debris and litter removal. Sumps should be cleaned when accumulation of sediments are within six inches of the catch basin outlet pipe.

Disposal of material from catch basins sumps, drainage manholes, and trench drains shall be in accordance with local, state, and federal guidelines.

f. Rip-rap Dissipation structures

Riprap used to dissipate energy from pipe outfalls shall be cleaned or replaced when it becomes overburdened with silt or sediment.

g. Winter Maintenance

To prevent impacts to storm water management facilities, the following winter maintenance limitations, restrictions, or requirements are recommended:

i. Remove snow and ice from inlet structures, basin inlet and outlet structures and away from culvert end sections.

ii. Snow removed from paved areas should not be piled at inlets/outlets of the storm water management basin.

iii. Use of deicing materials should be limited to sand and "environmentally friendly" chemical products. Use of salt mixtures should be kept to a minimum.

iv. Sand used for deicing should be clean, course material free of fines, silt, and clay.

v. Materials used for deicing should be removed during the early spring by sweeping and/ or vacuuming.

2. RAINWATER HARVESTING

a. Inspection of Conveyance System and Filter

Inspect any gutters, downspouts, drainage pipes, and filters connected to the Rainwater Harvesting System:

i. Accumulation of leaves, sticks, or debris in gutters and downspouts should be removed by hand.

ii. Accumulation of leaves, sticks, or other debris in filter(s) should be cleaned out by hand or by spraying with a hose.

iii. Loose or disconnected junctions between gutters, pipes, or filters should be secured and properly sealed to prevent leaks.

b. Inspection of Storage Tank

When tank is full, inspect for any leaks or blockages. Drain the tank to inspect interior. Visually inspect the inside of the tank without breaking the plant of the opening with any body parts, as this is a confined space:

i. Tanks should be winterized if above ground and not freeze proof. The water level in the tank should be drained down, water should be drained from pipes and pumps and conveyance pipes from the tank should be disconnected.

ii. Full tanks should be drained down before predicted rain events.

iii. Mosquito dunks should be added to the water and insect screens should be installed and sealed on all openings.

iv. Debris, algae, or organic matter accumulated in the tank should be removed by hand, as much as possible.

c. Inspection of Outlets

Examine the outlet pipe(s) and the point at which it overflows onto the ground:

i. Sediment should be removed from valves in areas of slow flow caused by faulty or clogged valves.

ii. Flexible pipe should be added to the end of the outlet pipe to divert flow away and downhill in areas where flow from the outlet is backing up toward the building foundation.

iii. Gravel and/or stone pad should be added to reduce the impact from the water flowing out of the outlet pipe in areas of erosion.

3. GREEN ROOF

a. Inspection of Vegetation and Surface

Visually inspect the surface and vegetation of the practice:

i. Wilting or nutrient-deprived vegetation should be watered or irrigated and dead or dying vegetation pruned or removed. Weeds should be removed by hand and lime should be applied to kill moss.

b. Inspection of Overflows and Drains

Remove the cover and inspect the ports:

i. Debris should be removed by hand or flushed through with a hose.

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Appendix G:
Figures

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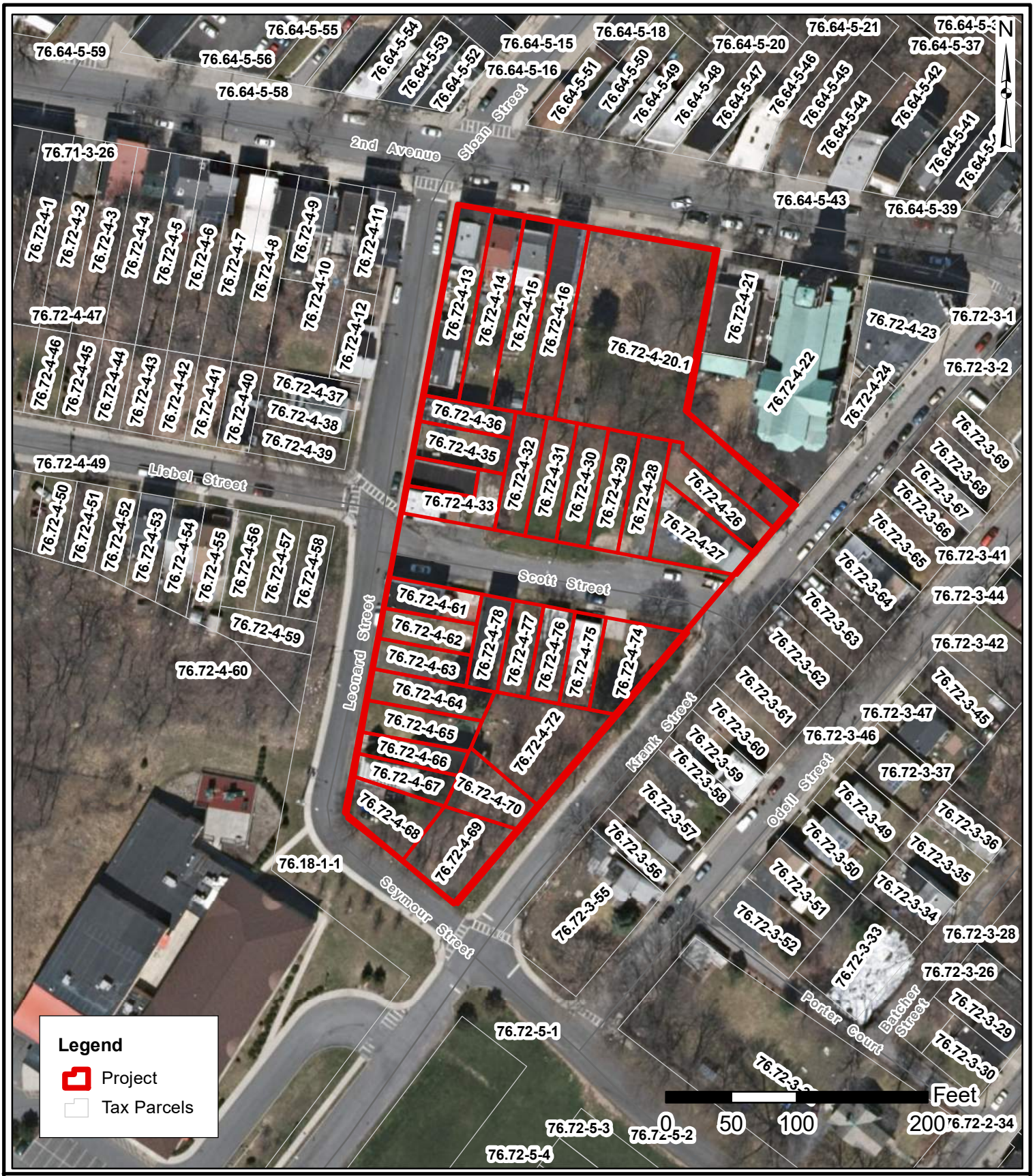

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The Seventy-Six, South End Development LLC

Site Location Map

City of Albany - Albany County, NY

Drawn:	JC
Date:	06/23/2020
Scale:	1 inch = 100 feet
Project:	32019.00
Figure:	1

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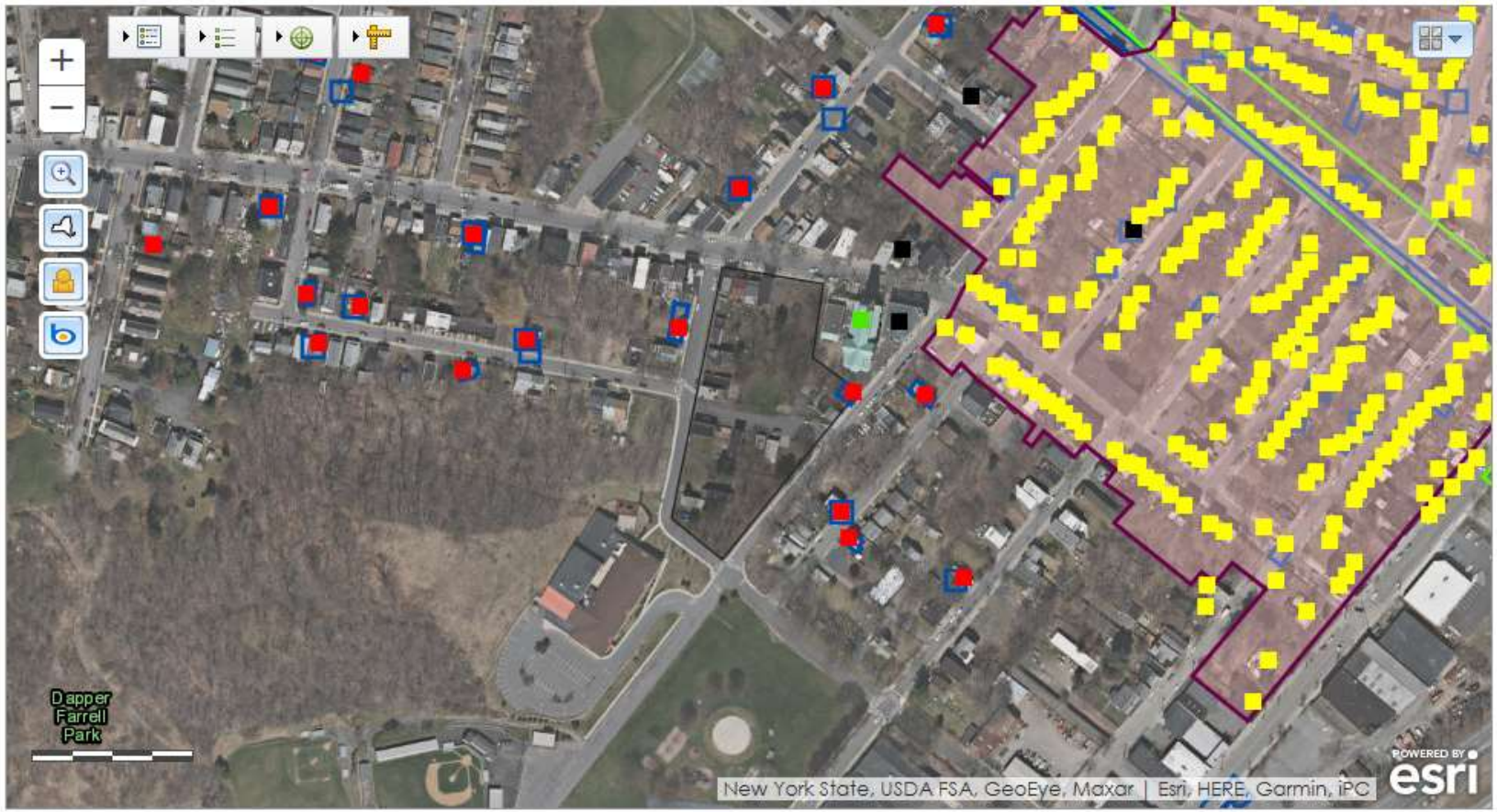
The Seventy-Six, South End Development LLC.

Soils Map

City of Albany - Albany County, NY

Drawn:	JC
Date:	04/29/2020
Scale:	1 inch = 100 feet
Project:	32019.00
Figure:	6

FIG 3



LEGEND

Consultation Projects (View)

Archeologically Sensitive Areas

Survey Building Areas (View)

LPC Historic Districts

LPC Landmarks

USN Building Points (View)

- Eligible
- Listed
- Not Eligible
- Not Eligible - Demolished
- Undetermined

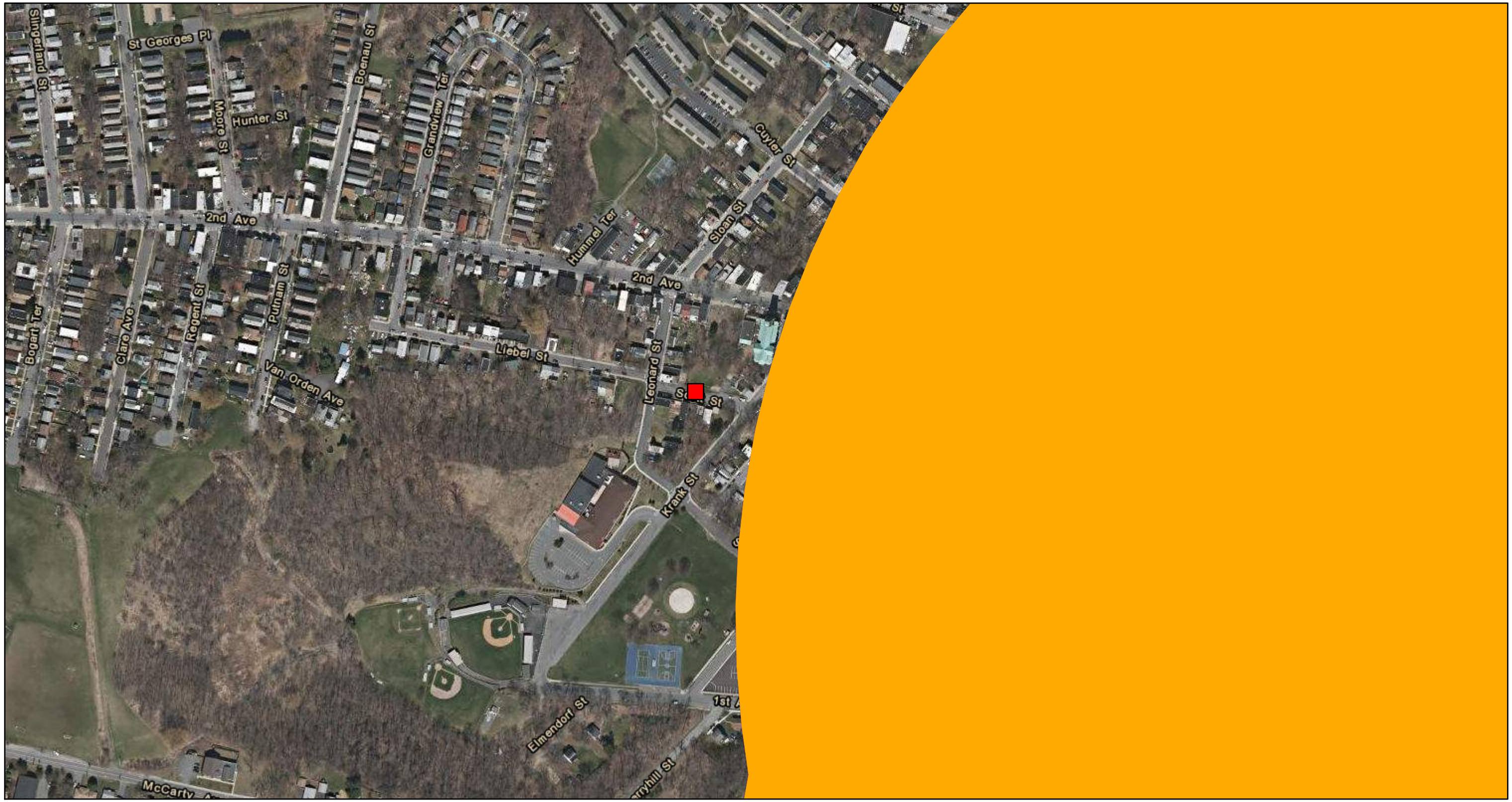
Survey Archaeology Areas (View)

National Register Building Sites (View)

USN Building Districts (View)

Cemeteries

Environmental Resource Mapper



June 10, 2020

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NYS Department of Environmental Conservation
Not a legal document

SWPPP FIGURE - NOT FOR CONSTRUCTION

THE SEVENTY-SIX DEVELOPMENT

UN-DEVELOPED WATRSHED DELINEATION MAP

CITY OF ALBANY, ALBANY COUNTY, NY

sheet no. FIG 5
project no. 32019.00
date 11/03/20
scale 1"=30'
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rev.	date	description

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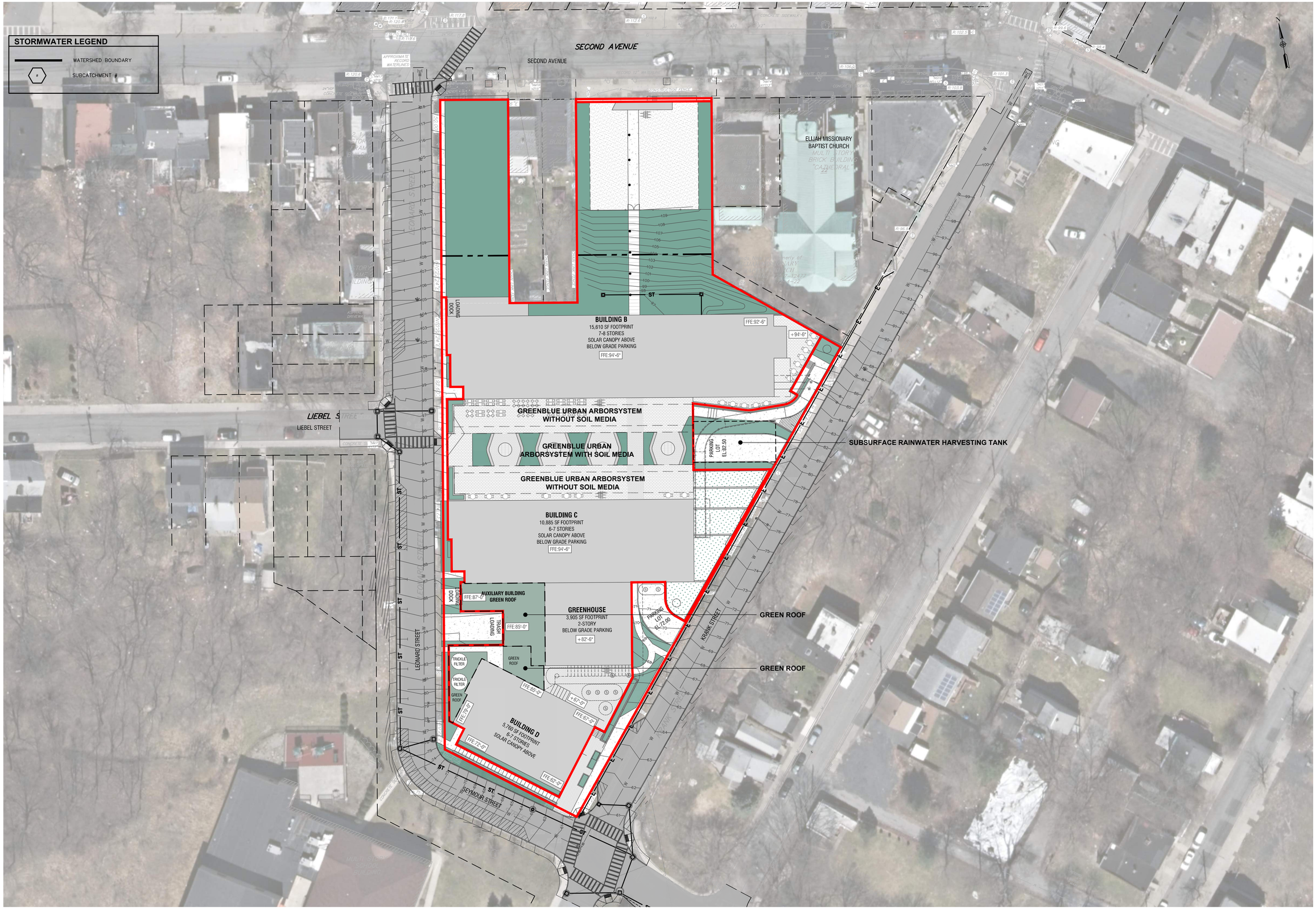

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rev.	date	description

THE SEVENTY-SIX DEVELOPMENT

POST-DEVELOPMENT WATRSHED DELINEATION MAP

CITY OF ALBANY, ALBANY COUNTY, NY

drawn FIG.6	checked SM
date 11/03/20	scale 1"=30'
project no. 32019.00	
sheet no. FIG 6	

Drawing Name: Z:\projects\32000-32099\32019-00 South End Development Albany\DWG\500_FIG4-5_32019-00_PRE-POST MAPS.dwg
Xrefs Attached: XSTORM_32019-00; XBASE_32019-00; XLAYOUT_PH1_32019-00; XCSOOISCONNECT; XAERIAL_32019-00
Date Printed: Nov 03, 2020, 4:25pm

Appendix H:
Chazen Certifying Professionals Letter

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www.chazencompanies.com

January 29, 2020

To Whom it May Concern:

In accordance with the NYSDEC SPDES General Permit GP-0-20-001, part VII.H.2, the New York State licensed Professional Engineers employed by the Chazen Companies and listed on the attachment to this letter are duly authorized to sign and seal Stormwater Pollution Prevention Plan (SWPPPs), NOIs, and NOTs prepared under their direct supervision.

Sincerely,

Richard M. Loewenstein, Jr., P.E.
Chief Executive Officer

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Chazen Professional Engineers duly authorized to sign and seal SWPPPs, NOIs, and NOTs

Name:	Position:	Signature:	Date:
Joseph Lanaro, P.E.	Vice President of Engineering		1/30/2020
James Connors, P.E.	Senior Director		1/30/2020
Christopher Lapine, P.E.	Director	Christopher Lapine	1/31/2020
Roger Keating, P.E.	Director		1/30/2020
Peter Romano, P.E.	Director		1/31/2020
Walter Kubow, P.E.	Manager		1/29/2020
Eric Johnson, P.E.	Director	Eric P. Johnson	1/30/2020
George Cronk, P.E.	Director		1/31/2020
Sean Doty, P.E.	Director		1/31/2020
Michael Flanagan, P.E.	Sr. Project Engineer/Project Manager		1/31/2020
Kyle Ahearn, P.E.	Project Manager		1/31/2020

Appendix I:
Project Evaluation and Design Calculations

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Appendix I - Table A
Step 1 - Evaluation of Green Infrastructure Planning Measures

Group	Practice	Description	Applicable	Project Specific Evaluation
Preservation of Natural Resources	**Preservation of Undisturbed Areas**	Delineate and place into permanent conservation undisturbed forests, native vegetated areas, riparian corridors, wetlands, and natural terrain.	**N/A**	As a Redevelopment Project, the majority of the land in question had been previously cleared or graded for construction of the existing buildings, roadways, etc. As such, this green planning measure does not apply. The proposed site layout has been designed to limit land disturbance to the greatest extent practical.
	Preservation of Buffers	Define, delineate and preserve naturally vegetated buffers along perennial streams, rivers, shorelines and wetlands.	**N/A**	There are no perennial streams, rivers, shorelines, or wetlands on or adjacent to the project site. As such, this green planning measure does not apply.
	Reduction of Clearing and Grading	Limit clearing and grading to the minimum amount needed for roads, driveways, foundations, utilities and stormwater management facilities.	**N/A**	As a Redevelopment Project, the majority of the land in question had been previously cleared or graded for construction of the existing buildings, roadways, etc. Site clearing and grading required for redevelopment will be minor in nature. The limits of all proposed clearing will be demarcated in the field with orange construction fencing, prior to construction.
	Locating Development in Less Sensitive Areas	Avoid sensitive resource areas such as floodplains, steep slopes, erodible soils, wetlands, mature forests and critical habitats by locating development to fit the terrain in areas that will create the least impact.	**N/A**	There are no floodplains, steep slopes, erodible soils, wetlands, mature forests and critical habitats located on the project site. As such, this green planning measure does not apply.
	Open Space Design	Use clustering, conservation design or open space design to reduce impervious cover, preserve more open space and protect water resources.	**No**	The site layout has been designed to maximize open space. Impervious surfaces have been minimized to the greatest extent practical.
	Soil Restoration	Restore the original properties and porosity of the soil by deep till and amendment with compost to reduce the generation of runoff and enhance the runoff reduction performance of practices such as downspout disconnections, grass channels, filter strips, and tree clusters.	**Yes**	Full soil restoration is proposed for all areas of disturbance that will not become hardscape. All areas will be stabilized with seed & mulch, and landscaped areas will be provided.
	Roadway Reduction	Minimize roadway widths and lengths to reduce site impervious area	**N/A**	No new roadways are proposed as part of this project.

Reduction of Impervious Cover	**Sidewalk Reduction**	Minimize sidewalk lengths and widths to reduce site impervious area	**No**	Sidewalk widths and lengths have been minimized to the greatest extent practical.
	Driveway Reduction	Minimize driveway lengths and widths to reduce site impervious area	**No**	Driveway widths and lengths have been minimized to the greatest extent practical.
	Cul-de-sac Reduction	Minimize the number of cul-de-sacs and incorporate landscaped areas to reduce their impervious cover.	**N/A**	No cul-de-sacs are proposed as part of this project.
	Building Footprint Reduction	Reduce the impervious footprint of residences and commercial buildings by using alternate or taller buildings while maintaining the same floor to area ratio.	**N/A**	All new building area has been allocated to efficiently implement the intended use.
	Parking Reduction	Reduce imperviousness on parking lots by eliminating unneeded spaces, providing compact car spaces and efficient parking lanes, minimizing stall dimensions, using porous pavement surfaces in overflow parking areas, and using multi-storied parking decks where appropriate.	**Yes**	On-site parking has been allocated to provide a sufficient number of spaces for the intended use, while providing a reduction from the City standard minimum. On-site parking has been provided below grade to reduce impervious area, reallocate space that would typically be used for an at grade parking lot, and provide adequate parking. In addition, the project is taking advantage of shared parking opportunities and a reduction in stalls due to proximity to transit.

Appendix I - Table B
Step 2 - Determine Water Quality Treatment Volume (WQv)

Section 4.2 of the NYSDEC Stormwater Management Design Manual describes the Water Quality Volume equation as:

WQv = (P x Rv x A) / 12

where: WQv = Water Quality Volume (acre-feet)
P = 90% Rainfall Event Number (inches) (interpolated from Design Manual Fig 4.1)
Rv = 0.05 + 0.009 (I)
I = Impervious Cover (%) within the drainage area contributing to the SMP
A = Drainage area (acres) contributing to the SMP

The following table presents the WQv calculations for each of the proposed stormwater management practices (SMPs).

SMP ID	P	A	Impervious Cover	I	Rv	WQv	
	(inches)	(acres)	(acres)	(%)		(acre-feet)	(cubic feet)
Entire Property	1.10	2.223	1.590	72	0.70	0.143	6,230
Total						**0.143**	**6,230**

Appendix I - Table C
Step 3 - Evaluation of Runoff Reduction Techniques and Standard SMPs with RRv Capacity

Design Variant	Practice	Description	Applicable	Project Specific Evaluation/Justification
RR-1	**Conservation of Natural Areas**	Retain the pre-development hydrologic and water quality characteristics of undisturbed natural areas, stream and wetland buffers by restoring and/or permanently conserving these areas on a site.	**N/A**	As a Redevelopment Project, the majority of the land in question had been previously cleared or graded for construction of the existing buildings, roadways, etc. Natural, undisturbed, areas are not available on the project site for conservation.
RR-2	**Sheet flow to Riparian Buffers or Filter Strips**	Undisturbed natural areas such as forested conservation areas and stream buffers or vegetated filter strips and riparian buffers can be used to treat and control stormwater runoff from portions of development.	**N/A**	As a Redevelopment Project, the majority of the land in question had been previously cleared or graded for construction of the existing buildings, roadways, etc. Undisturbed natural areas or areas suitable for vegetated filter strips are not available on the project site.
RR-3	**Tree Planting/ Tree Pit**	Plant or conserve trees to reduce stormwater runoff, increase nutrient uptake, and provide bank stabilization. Trees can be used for applications such as landscaping, stormwater management practice areas, and conservation areas.	**No**	The project proposes the planting of numerous trees throughout the site, in order to reduce stormwater runoff, increase nutrient uptake, and provide bank stabilization. However, credit for these trees will not be taken toward an area reduction in the RRv calculations.
RR-4	**Disconnection of Rooftop Runoff**	Direct runoff from residential rooftop areas and upland overland runoff flow to designated pervious areas to reduce runoff volumes and rates.	**N/A**	Rooftop disconnect is not applicable, since this is a commercial building project.
RR-5	**Vegetated Swale**	The natural drainage paths, or properly designed vegetated channels, can be used instead of constructing underground storm sewers or concrete open channels to increase time of concentration, reduce the peak discharge, and provide infiltration.	**No**	Due to proposed grading and the proposed site layout, constructed vegetated swales are not suitable for the project site. As a Redevelopment Project, natural drainage paths are not available on site.

RR-6	**Rain Garden**	Manage and treat small volumes of stormwater runoff using a conditioned planting soil bed and planting materials to filter runoff stored within a shallow depression.	**No**	Due to the limited tributary area to rain gardens (≤ 1,000SF), these facilities are not feasible for use on the project site.
RR-7	**Stormwater Planter**	Small landscaped stormwater treatment devices that can be designed as infiltration or filtering practices. Stormwater planters use soil infiltration and biogeochemical processes to decrease stormwater quantity and improve water quality.	**No**	The stormwater management approach for this project is intended to provide a more natural aesthetic that is consistent with the wooded surrounding. Since, stormwater planters have significant maintenance considerations and a more structured aesthetic, they have not been proposed for this project.
RR-8	**Rain Barrels/ Cisterns**	Capture and store stormwater runoff to be used for irrigation systems or filtered and reused for non-contact activities.	**Yes**	Rooftop cisterns will be implemented for runoff storage and reuse as irrigation for landscaped areas. However, credit for these cisterns will not be taken toward an area reduction in the RRv calculations.
RR-9	**Porous Pavement**	Pervious types of pavements that provide an alternative to conventional paved surfaces, designed to infiltrate rainfall through the surface, thereby reducing stormwater runoff from a site and providing some pollutant uptake in the underlying soils.	**No**	Porous pavement is not proposed as part of this project due to low permeability of on-site soils, concerns regarding winter maintenance, and concerns regarding the interaction with the below-grade parking structure.
RR-10	**Green Roof**	Capture runoff by a layer of vegetation and soil installed on top of a conventional flat or sloped roof. The rooftop vegetation allows evaporation and evapotranspiration processes to reduce volume and discharge rate of runoff entering conveyance system.	**Yes**	A green roofs will be used on-site atop the Auxilary Building. However, credit for the green roof will not be taken toward an area reduction in the RRv calculations.
	Stream Daylighting	Stream Daylight previously-culverted/piped streams to restore natural habitats, better attenuate runoff by increasing the storage size, promoting infiltration, and help reduce pollutant loads.	**No**	No stream daylighting opportunities are present on this site.

I-1	**Infiltration Trench**	Excavated, stone-filled trenches designed to capture and temporarily store runoff in the stone reservoir to promote infiltration. Can be constructed as sheet flow to a ground surface depression or piped flow discharged directly into the trench.	**No**	Infiltration is not proposed due to poor draining soils and the inclusion of a below-grade parking structure.
I-2	**Infiltration Basin**	Vegetated excavations designed to capture and infiltrate the WQv. Can be designed off-line to bypass larger flows to downstream flood control facilities or as combined infiltration/flood control facilities by providing temporary detention ponding.	**No**	Infiltration is not proposed due to poor draining soils and the inclusion of a below-grade parking structure.
I-3	**Dry Wells**	Underground structures designed to capture, treat, and infiltrate runoff from small drainage areas (rooftop only) that have low sediment or pollutant loadings. Larger stormwater volumes can be bypassed directly to a flood control facility.	**No**	Infiltration is not proposed due to poor draining soils and the inclusion of a below-grade parking structure.
I-4	**Underground Infiltration Systems**	Underground, proprietary systems designed to capture and infiltrate the WQv, reduce runoff, remove fine sediment and associated pollutants, recharge groundwater, and attenuate peak flows.	**No**	Infiltration is not proposed due to poor draining soils and the inclusion of a below-grade parking structure.
F-5	**Bioretention**	Shallow landscaped depressions where stormwater flows into the practice, ponds at the surface, and gradually filters through the media to remove pollutants. Filtered runoff can either infiltrate into the surrounding soil, or be collected by an underdrain system and discharged to the storm sewer system or directly to receiving waters.	**No**	Traditional bioretention is not proposed due to the inclusion of a below-grade parking structure. However, GreenBlue Urban ArborSystems are proposed throughout the site which incorporates the use of bioretention soil media as a filtration practice.
O-1	**Dry Swale**	Designed to temporarily hold the WQv in a pool or series of pools created by permanent check dams. The soil bed consists of native soils or highly permeable fill material, underlain by an underdrain system. Pollutants are removed through sedimentation, nutrient uptake, and infiltration.	**No**	Dry swales are not proposed due to grading and site layout constraints.

Appendix J:
Pre-Development Stormwater Modeling

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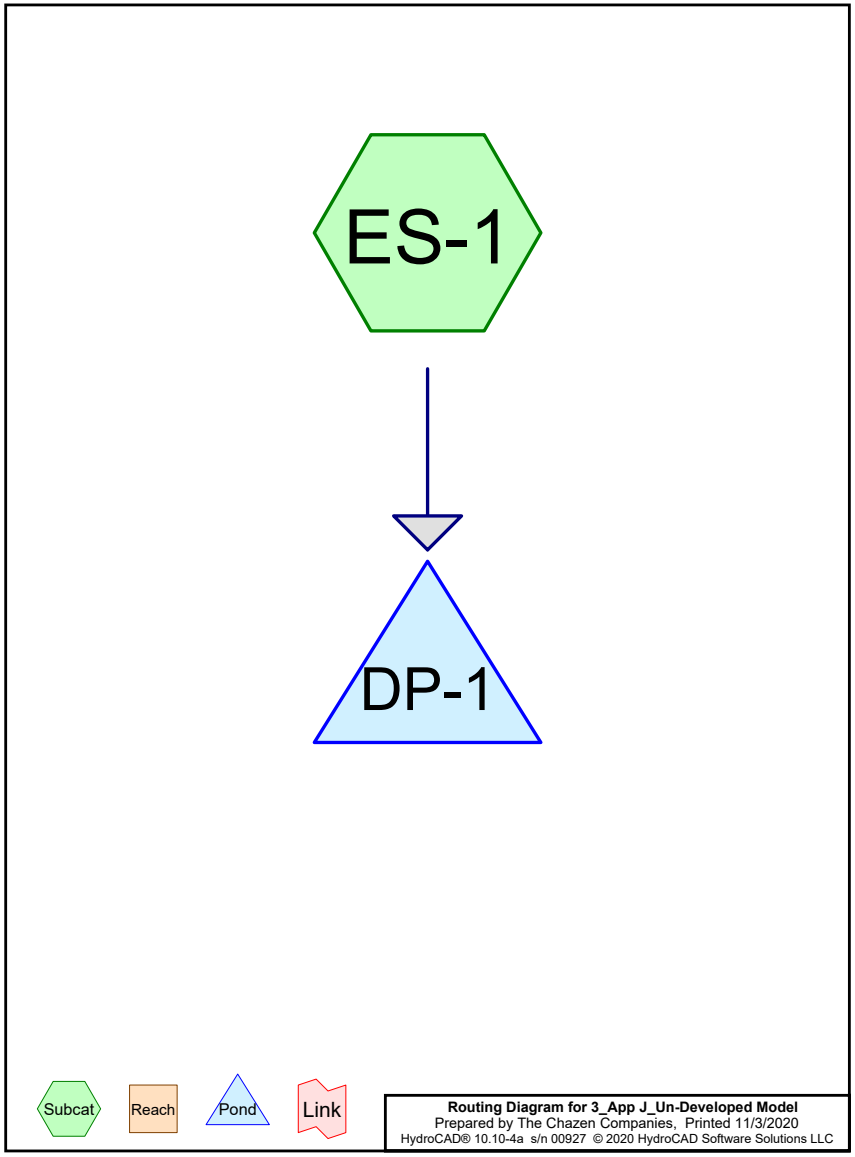

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.223	80	>75% Grass cover, Good, HSG D (ES-1)
2.223	**80**	**TOTAL AREA**

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment ES-1: Runoff Area=96,826 sf 0.00% Impervious Runoff Depth=0.71"
Tc=6.0 min CN=80 Runoff=2.81 cfs 0.132 af

Pond DP-1: Inflow=2.81 cfs 0.132 af
Primary=2.81 cfs 0.132 af

Total Runoff Area = 2.223 ac Runoff Volume = 0.132 af Average Runoff Depth = 0.71"
100.00% Pervious = 2.223 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment ES-1:

Runoff = 2.81 cfs @ 11.98 hrs, Volume= 0.132 af, Depth= 0.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-YR Rainfall=2.24"

Area (sf)	CN	Description
96,826	80	>75% Grass cover, Good, HSG D
96,826		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Pond DP-1:

Inflow Area = 2.223 ac, 0.00% Impervious, Inflow Depth = 0.71" for 1-YR event
Inflow = 2.81 cfs @ 11.98 hrs, Volume= 0.132 af
Primary = 2.81 cfs @ 11.98 hrs, Volume= 0.132 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment ES-1: Runoff Area=96,826 sf 0.00% Impervious Runoff Depth=1.89"
Tc=6.0 min CN=80 Runoff=7.52 cfs 0.351 af

Pond DP-1: Inflow=7.52 cfs 0.351 af
Primary=7.52 cfs 0.351 af

Total Runoff Area = 2.223 ac Runoff Volume = 0.351 af Average Runoff Depth = 1.89"
100.00% Pervious = 2.223 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment ES-1:

Runoff = 7.52 cfs @ 11.97 hrs, Volume= 0.351 af, Depth= 1.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-YR Rainfall=3.82"

Area (sf)	CN	Description
96,826	80	>75% Grass cover, Good, HSG D
96,826		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Pond DP-1:

Inflow Area = 2.223 ac, 0.00% Impervious, Inflow Depth = 1.89" for 10-YR event
Inflow = 7.52 cfs @ 11.97 hrs, Volume= 0.351 af
Primary = 7.52 cfs @ 11.97 hrs, Volume= 0.351 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment ES-1: Runoff Area=96,826 sf 0.00% Impervious Runoff Depth=4.27"
Tc=6.0 min CN=80 Runoff=16.49 cfs 0.791 af

Pond DP-1: Inflow=16.49 cfs 0.791 af
Primary=16.49 cfs 0.791 af

Total Runoff Area = 2.223 ac Runoff Volume = 0.791 af Average Runoff Depth = 4.27"
100.00% Pervious = 2.223 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment ES-1:

Runoff = 16.49 cfs @ 11.97 hrs, Volume= 0.791 af, Depth= 4.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-YR Rainfall=6.54"

Area (sf)	CN	Description
96,826	80	>75% Grass cover, Good, HSG D
96,826		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Pond DP-1:

Inflow Area = 2.223 ac, 0.00% Impervious, Inflow Depth = 4.27" for 100-YR event
Inflow = 16.49 cfs @ 11.97 hrs, Volume= 0.791 af
Primary = 16.49 cfs @ 11.97 hrs, Volume= 0.791 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Appendix K:
Post-Development Stormwater Modeling

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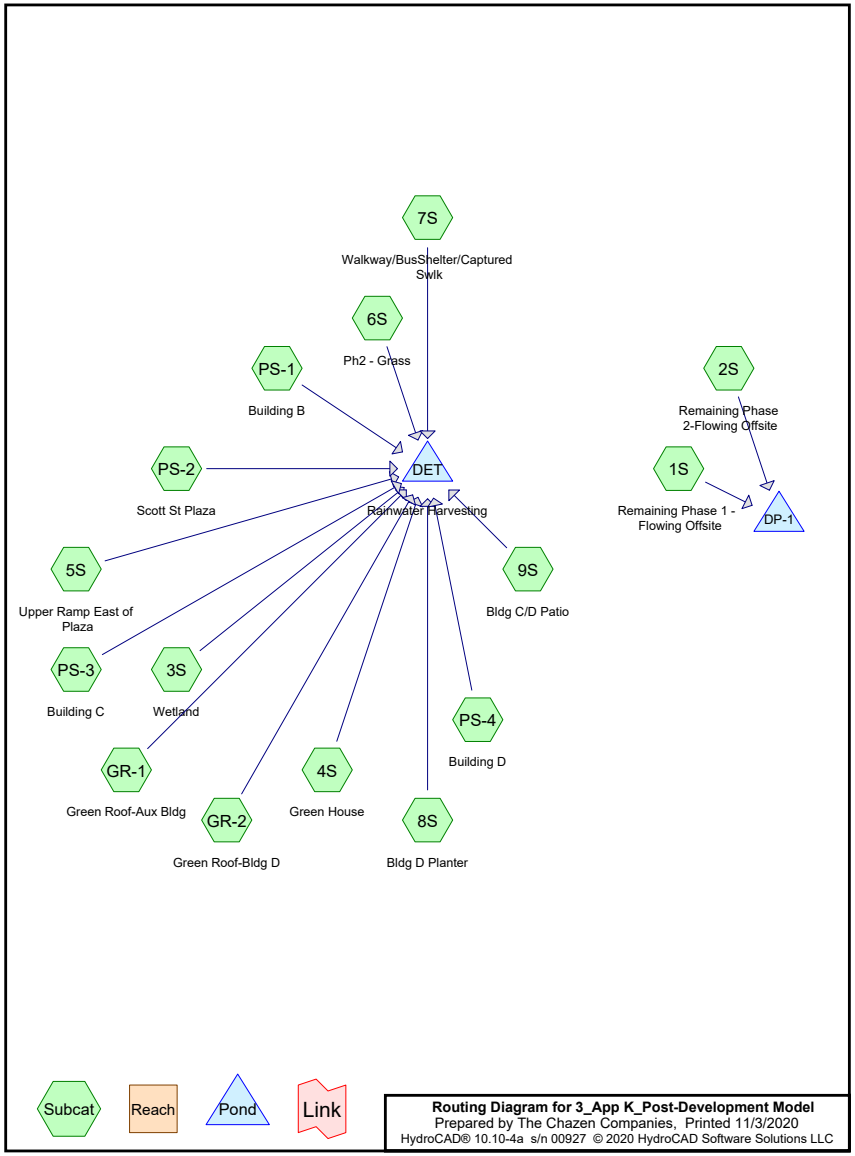

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.556	80	>75% Grass cover, Good, HSG D (1S, 3S, 6S, 8S, PS-2)
0.079	80	Green Roof (GR-1, GR-2)
0.747	98	Paved parking, HSG D (1S, 2S, 3S, 5S, 7S, 8S, 9S, PS-2)
0.835	98	Roofs, HSG D (4S, 7S, PS-1, PS-3, PS-4)
0.012	98	Unconnected roofs, HSG D (GR-2)
2.228	**93**	**TOTAL AREA**

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Remaining Phase 1 - Runoff Area=11,812 sf 72.43% Impervious Runoff Depth=1.54"
Tc=6.0 min CN=93 Runoff=0.72 cfs 0.035 af

Subcatchment 2S: Remaining Phase Runoff Area=227 sf 100.00% Impervious Runoff Depth=2.01"
Tc=6.0 min CN=98 Runoff=0.02 cfs 0.001 af

Subcatchment 3S: Wetland Runoff Area=2,920 sf 11.68% Impervious Runoff Depth=0.81"
Tc=0.0 min CN=82 Runoff=0.12 cfs 0.005 af

Subcatchment 4S: Green House Runoff Area=3,904 sf 100.00% Impervious Runoff Depth=2.01"
Tc=6.0 min CN=98 Runoff=0.28 cfs 0.015 af

Subcatchment 5S: Upper Ramp East of Plaza Runoff Area=400 sf 100.00% Impervious Runoff Depth=2.01"
Tc=6.0 min CN=98 Runoff=0.03 cfs 0.002 af

Subcatchment 6S: Ph2 - Grass Runoff Area=16,597 sf 0.00% Impervious Runoff Depth=0.71"
Tc=6.0 min CN=80 Runoff=0.48 cfs 0.023 af

Subcatchment 7S: Runoff Area=7,485 sf 100.00% Impervious Runoff Depth=2.01"
Tc=6.0 min CN=98 Runoff=0.54 cfs 0.029 af

Subcatchment 8S: Bldg D Planter Runoff Area=341 sf 26.69% Impervious Runoff Depth=0.98"
Tc=6.0 min CN=85 Runoff=0.01 cfs 0.001 af

Subcatchment 9S: Bldg C/D Patio Runoff Area=1,973 sf 100.00% Impervious Runoff Depth=2.01"
Tc=0.0 min CN=98 Runoff=0.17 cfs 0.008 af

Subcatchment GR-1: Green Roof-Aux Bldg Runoff Area=2,233 sf 0.00% Impervious Runoff Depth=0.71"
Tc=6.0 min CN=80 Runoff=0.06 cfs 0.003 af

Subcatchment GR-2: Green Roof-Bldg D Runoff Area=1,699 sf 29.66% Impervious Runoff Depth=0.86"
Tc=6.0 min UI Adjusted CN=83 Runoff=0.06 cfs 0.003 af

Subcatchment PS-1: Building B Runoff Area=15,548 sf 100.00% Impervious Runoff Depth=2.01"
Tc=6.0 min CN=98 Runoff=1.12 cfs 0.060 af

Subcatchment PS-2: Scott St Plaza Runoff Area=15,271 sf 89.84% Impervious Runoff Depth=1.81"
Tc=6.0 min CN=96 Runoff=1.04 cfs 0.053 af

Subcatchment PS-3: Building C Runoff Area=10,885 sf 100.00% Impervious Runoff Depth=2.01"
Tc=6.0 min CN=98 Runoff=0.78 cfs 0.042 af

Subcatchment PS-4: Building D Runoff Area=5,761 sf 100.00% Impervious Runoff Depth=2.01"
Tc=6.0 min CN=98 Runoff=0.41 cfs 0.022 af

Pond DET: Rainwater Harvesting Inflow=4.94 cfs 0.263 af
Primary=4.94 cfs 0.263 af

Pond DP-1: Inflow=0.73 cfs 0.036 af
Primary=0.73 cfs 0.036 af

Total Runoff Area = 2.228 ac Runoff Volume = 0.299 af Average Runoff Depth = 1.61"
28.50% Pervious = 0.635 ac 71.50% Impervious = 1.593 ac

Summary for Subcatchment 1S: Remaining Phase 1 - Flowing Offsite

Runoff = 0.72 cfs @ 11.97 hrs, Volume= 0.035 af, Depth= 1.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-YR Rainfall=2.24"

Area (sf)	CN	Description
3,256	80	>75% Grass cover, Good, HSG D
8,556	98	Paved parking, HSG D
11,812	93	Weighted Average
3,256		27.57% Pervious Area
8,556		72.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 2S: Remaining Phase 2-Flowing Offsite

Runoff = 0.02 cfs @ 11.97 hrs, Volume= 0.001 af, Depth= 2.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-YR Rainfall=2.24"

Area (sf)	CN	Description
227	98	Paved parking, HSG D
227		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 3S: Wetland

Runoff = 0.12 cfs @ 11.90 hrs, Volume= 0.005 af, Depth= 0.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-YR Rainfall=2.24"

Area (sf)	CN	Description
2,579	80	>75% Grass cover, Good, HSG D
341	98	Paved parking, HSG D
2,920	82	Weighted Average
2,579		88.32% Pervious Area
341		11.68% Impervious Area

Summary for Subcatchment 4S: Green House

Runoff = 0.28 cfs @ 11.97 hrs, Volume= 0.015 af, Depth= 2.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-YR Rainfall=2.24"

Area (sf)	CN	Description
3,904	98	Roofs, HSG D
3,904		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 5S: Upper Ramp East of Plaza

Runoff = 0.03 cfs @ 11.97 hrs, Volume= 0.002 af, Depth= 2.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-YR Rainfall=2.24"

Area (sf)	CN	Description
400	98	Paved parking, HSG D
400		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 6S: Ph2 - Grass

Runoff = 0.48 cfs @ 11.98 hrs, Volume= 0.023 af, Depth= 0.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-YR Rainfall=2.24"

Area (sf)	CN	Description
16,597	80	>75% Grass cover, Good, HSG D
16,597		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 7S: Walkway/BusShelter/Captured Swlk

Runoff = 0.54 cfs @ 11.97 hrs, Volume= 0.029 af, Depth= 2.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-YR Rainfall=2.24"

Area (sf)	CN	Description
258	98	Roofs, HSG D
7,227	98	Paved parking, HSG D
7,485	98	Weighted Average
7,485		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 8S: Bldg D Planter

Runoff = 0.01 cfs @ 11.98 hrs, Volume= 0.001 af, Depth= 0.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-YR Rainfall=2.24"

Area (sf)	CN	Description
91	98	Paved parking, HSG D
250	80	>75% Grass cover, Good, HSG D
341	85	Weighted Average
250		73.31% Pervious Area
91		26.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 9S: Bldg C/D Patio

Runoff = 0.17 cfs @ 11.90 hrs, Volume= 0.008 af, Depth= 2.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-YR Rainfall=2.24"

Area (sf)	CN	Description
1,973	98	Paved parking, HSG D
1,973		100.00% Impervious Area

Summary for Subcatchment GR-1: Green Roof-Aux Bldg

Runoff = 0.06 cfs @ 11.98 hrs, Volume= 0.003 af, Depth= 0.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-YR Rainfall=2.24"

Area (sf)	CN	Description
* 2,233	80	Green Roof
2,233		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment GR-2: Green Roof-Bldg D

Runoff = 0.06 cfs @ 11.98 hrs, Volume= 0.003 af, Depth= 0.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-YR Rainfall=2.24"

Area (sf)	CN	Adj	Description
* 1,195	80		Green Roof
504	98		Unconnected roofs, HSG D
1,699	85	83	Weighted Average, UI Adjusted
1,195			70.34% Pervious Area
504			29.66% Impervious Area
504			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PS-1: Building B

Runoff = 1.12 cfs @ 11.97 hrs, Volume= 0.060 af, Depth= 2.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-YR Rainfall=2.24"

Area (sf)	CN	Description
15,548	98	Roofs, HSG D
15,548		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PS-2: Scott St Plaza

Runoff = 1.04 cfs @ 11.97 hrs, Volume= 0.053 af, Depth= 1.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-YR Rainfall=2.24"

Area (sf)	CN	Description
13,720	98	Paved parking, HSG D
1,551	80	>75% Grass cover, Good, HSG D
15,271	96	Weighted Average
1,551		10.16% Pervious Area
13,720		89.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PS-3: Building C

Runoff = 0.78 cfs @ 11.97 hrs, Volume= 0.042 af, Depth= 2.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-YR Rainfall=2.24"

Area (sf)	CN	Description
10,885	98	Roofs, HSG D
10,885		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PS-4: Building D

Runoff = 0.41 cfs @ 11.97 hrs, Volume= 0.022 af, Depth= 2.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-YR Rainfall=2.24"

Area (sf)	CN	Description
5,761	98	Roofs, HSG D
5,761		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Pond DET: Rainwater Harvesting

Inflow Area = 1.952 ac, 71.29% Impervious, Inflow Depth = 1.62" for 1-YR event
Inflow = 4.94 cfs @ 11.97 hrs, Volume= 0.263 af
Primary = 4.94 cfs @ 11.97 hrs, Volume= 0.263 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Pond DP-1:

Inflow Area = 0.276 ac, 72.95% Impervious, Inflow Depth = 1.55" for 1-YR event
Inflow = 0.73 cfs @ 11.97 hrs, Volume= 0.036 af
Primary = 0.73 cfs @ 11.97 hrs, Volume= 0.036 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Remaining Phase 1 - Runoff Area=11,812 sf 72.43% Impervious Runoff Depth=3.04"
Tc=6.0 min CN=93 Runoff=1.36 cfs 0.069 af

Subcatchment 2S: Remaining Phase Runoff Area=227 sf 100.00% Impervious Runoff Depth=3.59"
Tc=6.0 min CN=98 Runoff=0.03 cfs 0.002 af

Subcatchment 3S: Wetland Runoff Area=2,920 sf 11.68% Impervious Runoff Depth=2.05"
Tc=0.0 min CN=82 Runoff=0.30 cfs 0.011 af

Subcatchment 4S: Green House Runoff Area=3,904 sf 100.00% Impervious Runoff Depth=3.59"
Tc=6.0 min CN=98 Runoff=0.49 cfs 0.027 af

Subcatchment 5S: Upper Ramp East of Plaza Runoff Area=400 sf 100.00% Impervious Runoff Depth=3.59"
Tc=6.0 min CN=98 Runoff=0.05 cfs 0.003 af

Subcatchment 6S: Ph2 - Grass Runoff Area=16,597 sf 0.00% Impervious Runoff Depth=1.89"
Tc=6.0 min CN=80 Runoff=1.29 cfs 0.060 af

Subcatchment 7S: Runoff Area=7,485 sf 100.00% Impervious Runoff Depth=3.59"
Tc=6.0 min CN=98 Runoff=0.93 cfs 0.051 af

Subcatchment 8S: Bldg D Planter Runoff Area=341 sf 26.69% Impervious Runoff Depth=2.30"
Tc=6.0 min CN=85 Runoff=0.03 cfs 0.001 af

Subcatchment 9S: Bldg C/D Patio Runoff Area=1,973 sf 100.00% Impervious Runoff Depth=3.59"
Tc=0.0 min CN=98 Runoff=0.29 cfs 0.014 af

Subcatchment GR-1: Green Roof-Aux Bldg Runoff Area=2,233 sf 0.00% Impervious Runoff Depth=1.89"
Tc=6.0 min CN=80 Runoff=0.17 cfs 0.008 af

Subcatchment GR-2: Green Roof-Bldg D Runoff Area=1,699 sf 29.66% Impervious Runoff Depth=2.13"
Tc=6.0 min UI Adjusted CN=83 Runoff=0.15 cfs 0.007 af

Subcatchment PS-1: Building B Runoff Area=15,548 sf 100.00% Impervious Runoff Depth=3.59"
Tc=6.0 min CN=98 Runoff=1.93 cfs 0.107 af

Subcatchment PS-2: Scott St Plaza Runoff Area=15,271 sf 89.84% Impervious Runoff Depth=3.36"
Tc=6.0 min CN=96 Runoff=1.86 cfs 0.098 af

Subcatchment PS-3: Building C Runoff Area=10,885 sf 100.00% Impervious Runoff Depth=3.59"
Tc=6.0 min CN=98 Runoff=1.35 cfs 0.075 af

Subcatchment PS-4: Building D Runoff Area=5,761 sf 100.00% Impervious Runoff Depth=3.59"
Tc=6.0 min CN=98 Runoff=0.72 cfs 0.040 af

Pond DET: Rainwater Harvesting Inflow=9.22 cfs 0.502 af
Primary=9.22 cfs 0.502 af

Pond DP-1: Inflow=1.39 cfs 0.070 af
Primary=1.39 cfs 0.070 af

Total Runoff Area = 2.228 ac Runoff Volume = 0.572 af Average Runoff Depth = 3.08"
28.50% Pervious = 0.635 ac 71.50% Impervious = 1.593 ac

Summary for Subcatchment 1S: Remaining Phase 1 - Flowing Offsite

Runoff = 1.36 cfs @ 11.97 hrs, Volume= 0.069 af, Depth= 3.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-YR Rainfall=3.82"

Area (sf)	CN	Description
3,256	80	>75% Grass cover, Good, HSG D
8,556	98	Paved parking, HSG D
11,812	93	Weighted Average
3,256		27.57% Pervious Area
8,556		72.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 2S: Remaining Phase 2-Flowing Offsite

Runoff = 0.03 cfs @ 11.97 hrs, Volume= 0.002 af, Depth= 3.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-YR Rainfall=3.82"

Area (sf)	CN	Description
227	98	Paved parking, HSG D
227		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 3S: Wetland

Runoff = 0.30 cfs @ 11.90 hrs, Volume= 0.011 af, Depth= 2.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-YR Rainfall=3.82"

Area (sf)	CN	Description
2,579	80	>75% Grass cover, Good, HSG D
341	98	Paved parking, HSG D
2,920	82	Weighted Average
2,579		88.32% Pervious Area
341		11.68% Impervious Area

Summary for Subcatchment 4S: Green House

Runoff = 0.49 cfs @ 11.97 hrs, Volume= 0.027 af, Depth= 3.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-YR Rainfall=3.82"

Area (sf)	CN	Description
3,904	98	Roofs, HSG D
3,904		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 5S: Upper Ramp East of Plaza

Runoff = 0.05 cfs @ 11.97 hrs, Volume= 0.003 af, Depth= 3.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-YR Rainfall=3.82"

Area (sf)	CN	Description
400	98	Paved parking, HSG D
400		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 6S: Ph2 - Grass

Runoff = 1.29 cfs @ 11.97 hrs, Volume= 0.060 af, Depth= 1.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-YR Rainfall=3.82"

Area (sf)	CN	Description
16,597	80	>75% Grass cover, Good, HSG D
16,597		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 7S: Walkway/BusShelter/Captured Swlk

Runoff = 0.93 cfs @ 11.97 hrs, Volume= 0.051 af, Depth= 3.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-YR Rainfall=3.82"

Area (sf)	CN	Description
258	98	Roofs, HSG D
7,227	98	Paved parking, HSG D
7,485	98	Weighted Average
7,485		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 8S: Bldg D Planter

Runoff = 0.03 cfs @ 11.97 hrs, Volume= 0.001 af, Depth= 2.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-YR Rainfall=3.82"

Area (sf)	CN	Description
91	98	Paved parking, HSG D
250	80	>75% Grass cover, Good, HSG D
341	85	Weighted Average
250		73.31% Pervious Area
91		26.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 9S: Bldg C/D Patio

Runoff = 0.29 cfs @ 11.90 hrs, Volume= 0.014 af, Depth= 3.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-YR Rainfall=3.82"

Area (sf)	CN	Description
1,973	98	Paved parking, HSG D
1,973		100.00% Impervious Area

Summary for Subcatchment GR-1: Green Roof-Aux Bldg

Runoff = 0.17 cfs @ 11.97 hrs, Volume= 0.008 af, Depth= 1.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-YR Rainfall=3.82"

	Area (sf)	CN	Description
*	2,233	80	Green Roof
	2,233		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment GR-2: Green Roof-Bldg D

Runoff = 0.15 cfs @ 11.97 hrs, Volume= 0.007 af, Depth= 2.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-YR Rainfall=3.82"

	Area (sf)	CN	Adj	Description
*	1,195	80		Green Roof
	504	98		Unconnected roofs, HSG D
	1,699	85	83	Weighted Average, UI Adjusted
	1,195			70.34% Pervious Area
	504			29.66% Impervious Area
	504			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PS-1: Building B

Runoff = 1.93 cfs @ 11.97 hrs, Volume= 0.107 af, Depth= 3.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-YR Rainfall=3.82"

Area (sf)	CN	Description
15,548	98	Roofs, HSG D
15,548		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PS-2: Scott St Plaza

Runoff = 1.86 cfs @ 11.97 hrs, Volume= 0.098 af, Depth= 3.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-YR Rainfall=3.82"

Area (sf)	CN	Description
13,720	98	Paved parking, HSG D
1,551	80	>75% Grass cover, Good, HSG D
15,271	96	Weighted Average
1,551		10.16% Pervious Area
13,720		89.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PS-3: Building C

Runoff = 1.35 cfs @ 11.97 hrs, Volume= 0.075 af, Depth= 3.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-YR Rainfall=3.82"

Area (sf)	CN	Description
10,885	98	Roofs, HSG D
10,885		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PS-4: Building D

Runoff = 0.72 cfs @ 11.97 hrs, Volume= 0.040 af, Depth= 3.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-YR Rainfall=3.82"

Area (sf)	CN	Description
5,761	98	Roofs, HSG D
5,761		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Pond DET: Rainwater Harvesting

Inflow Area = 1.952 ac, 71.29% Impervious, Inflow Depth = 3.08" for 10-YR event
Inflow = 9.22 cfs @ 11.97 hrs, Volume= 0.502 af
Primary = 9.22 cfs @ 11.97 hrs, Volume= 0.502 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Pond DP-1:

Inflow Area = 0.276 ac, 72.95% Impervious, Inflow Depth = 3.06" for 10-YR event
Inflow = 1.39 cfs @ 11.97 hrs, Volume= 0.070 af
Primary = 1.39 cfs @ 11.97 hrs, Volume= 0.070 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Remaining Phase 1 - Runoff Area=11,812 sf 72.43% Impervious Runoff Depth=3.92"
Tc=6.0 min CN=93 Runoff=1.72 cfs 0.089 af

Subcatchment 2S: Remaining Phase Runoff Area=227 sf 100.00% Impervious Runoff Depth=4.48"
Tc=6.0 min CN=98 Runoff=0.03 cfs 0.002 af

Subcatchment 3S: Wetland Runoff Area=2,920 sf 11.68% Impervious Runoff Depth=2.83"
Tc=0.0 min CN=82 Runoff=0.41 cfs 0.016 af

Subcatchment 4S: Green House Runoff Area=3,904 sf 100.00% Impervious Runoff Depth=4.48"
Tc=6.0 min CN=98 Runoff=0.60 cfs 0.033 af

Subcatchment 5S: Upper Ramp East of Plaza Runoff Area=400 sf 100.00% Impervious Runoff Depth=4.48"
Tc=6.0 min CN=98 Runoff=0.06 cfs 0.003 af

Subcatchment 6S: Ph2 - Grass Runoff Area=16,597 sf 0.00% Impervious Runoff Depth=2.65"
Tc=6.0 min CN=80 Runoff=1.79 cfs 0.084 af

Subcatchment 7S: Runoff Area=7,485 sf 100.00% Impervious Runoff Depth=4.48"
Tc=6.0 min CN=98 Runoff=1.15 cfs 0.064 af

Subcatchment 8S: Bldg D Planter Runoff Area=341 sf 26.69% Impervious Runoff Depth=3.11"
Tc=6.0 min CN=85 Runoff=0.04 cfs 0.002 af

Subcatchment 9S: Bldg C/D Patio Runoff Area=1,973 sf 100.00% Impervious Runoff Depth=4.48"
Tc=0.0 min CN=98 Runoff=0.36 cfs 0.017 af

Subcatchment GR-1: Green Roof-Aux Bldg Runoff Area=2,233 sf 0.00% Impervious Runoff Depth=2.65"
Tc=6.0 min CN=80 Runoff=0.24 cfs 0.011 af

Subcatchment GR-2: Green Roof-Bldg D Runoff Area=1,699 sf 29.66% Impervious Runoff Depth=2.92"
Tc=6.0 min UI Adjusted CN=83 Runoff=0.20 cfs 0.009 af

Subcatchment PS-1: Building B Runoff Area=15,548 sf 100.00% Impervious Runoff Depth=4.48"
Tc=6.0 min CN=98 Runoff=2.40 cfs 0.133 af

Subcatchment PS-2: Scott St Plaza Runoff Area=15,271 sf 89.84% Impervious Runoff Depth=4.25"
Tc=6.0 min CN=96 Runoff=2.32 cfs 0.124 af

Subcatchment PS-3: Building C Runoff Area=10,885 sf 100.00% Impervious Runoff Depth=4.48"
Tc=6.0 min CN=98 Runoff=1.68 cfs 0.093 af

Subcatchment PS-4: Building D Runoff Area=5,761 sf 100.00% Impervious Runoff Depth=4.48"
Tc=6.0 min CN=98 Runoff=0.89 cfs 0.049 af

Pond DET: Rainwater Harvesting Inflow=11.69 cfs 0.641 af
Primary=11.69 cfs 0.641 af

Pond DP-1: Inflow=1.76 cfs 0.091 af
Primary=1.76 cfs 0.091 af

Total Runoff Area = 2.228 ac Runoff Volume = 0.732 af Average Runoff Depth = 3.94"
28.50% Pervious = 0.635 ac 71.50% Impervious = 1.593 ac

Summary for Subcatchment 1S: Remaining Phase 1 - Flowing Offsite

Runoff = 1.72 cfs @ 11.97 hrs, Volume= 0.089 af, Depth= 3.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-YR Rainfall=4.72"

Area (sf)	CN	Description
3,256	80	>75% Grass cover, Good, HSG D
8,556	98	Paved parking, HSG D
11,812	93	Weighted Average
3,256		27.57% Pervious Area
8,556		72.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 2S: Remaining Phase 2-Flowing Offsite

Runoff = 0.03 cfs @ 11.97 hrs, Volume= 0.002 af, Depth= 4.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-YR Rainfall=4.72"

Area (sf)	CN	Description
227	98	Paved parking, HSG D
227		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 3S: Wetland

Runoff = 0.41 cfs @ 11.90 hrs, Volume= 0.016 af, Depth= 2.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-YR Rainfall=4.72"

Area (sf)	CN	Description
2,579	80	>75% Grass cover, Good, HSG D
341	98	Paved parking, HSG D
2,920	82	Weighted Average
2,579		88.32% Pervious Area
341		11.68% Impervious Area

Summary for Subcatchment 4S: Green House

Runoff = 0.60 cfs @ 11.97 hrs, Volume= 0.033 af, Depth= 4.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-YR Rainfall=4.72"

Area (sf)	CN	Description
3,904	98	Roofs, HSG D
3,904		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 5S: Upper Ramp East of Plaza

Runoff = 0.06 cfs @ 11.97 hrs, Volume= 0.003 af, Depth= 4.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-YR Rainfall=4.72"

Area (sf)	CN	Description
400	98	Paved parking, HSG D
400		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 6S: Ph2 - Grass

Runoff = 1.79 cfs @ 11.97 hrs, Volume= 0.084 af, Depth= 2.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-YR Rainfall=4.72"

Area (sf)	CN	Description
16,597	80	>75% Grass cover, Good, HSG D
16,597		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 7S: Walkway/BusShelter/Captured Swlk

Runoff = 1.15 cfs @ 11.97 hrs, Volume= 0.064 af, Depth= 4.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-YR Rainfall=4.72"

Area (sf)	CN	Description
258	98	Roofs, HSG D
7,227	98	Paved parking, HSG D
7,485	98	Weighted Average
7,485		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 8S: Bldg D Planter

Runoff = 0.04 cfs @ 11.97 hrs, Volume= 0.002 af, Depth= 3.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-YR Rainfall=4.72"

Area (sf)	CN	Description
91	98	Paved parking, HSG D
250	80	>75% Grass cover, Good, HSG D
341	85	Weighted Average
250		73.31% Pervious Area
91		26.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 9S: Bldg C/D Patio

Runoff = 0.36 cfs @ 11.90 hrs, Volume= 0.017 af, Depth= 4.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-YR Rainfall=4.72"

Area (sf)	CN	Description
1,973	98	Paved parking, HSG D
1,973		100.00% Impervious Area

Summary for Subcatchment GR-1: Green Roof-Aux Bldg

Runoff = 0.24 cfs @ 11.97 hrs, Volume= 0.011 af, Depth= 2.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-YR Rainfall=4.72"

	Area (sf)	CN	Description
*	2,233	80	Green Roof
	2,233		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment GR-2: Green Roof-Bldg D

Runoff = 0.20 cfs @ 11.97 hrs, Volume= 0.009 af, Depth= 2.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-YR Rainfall=4.72"

	Area (sf)	CN	Adj	Description
*	1,195	80		Green Roof
	504	98		Unconnected roofs, HSG D
	1,699	85	83	Weighted Average, UI Adjusted
	1,195			70.34% Pervious Area
	504			29.66% Impervious Area
	504			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PS-1: Building B

Runoff = 2.40 cfs @ 11.97 hrs, Volume= 0.133 af, Depth= 4.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-YR Rainfall=4.72"

Area (sf)	CN	Description
15,548	98	Roofs, HSG D
15,548		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PS-2: Scott St Plaza

Runoff = 2.32 cfs @ 11.97 hrs, Volume= 0.124 af, Depth= 4.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-YR Rainfall=4.72"

Area (sf)	CN	Description
13,720	98	Paved parking, HSG D
1,551	80	>75% Grass cover, Good, HSG D
15,271	96	Weighted Average
1,551		10.16% Pervious Area
13,720		89.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PS-3: Building C

Runoff = 1.68 cfs @ 11.97 hrs, Volume= 0.093 af, Depth= 4.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-YR Rainfall=4.72"

Area (sf)	CN	Description
10,885	98	Roofs, HSG D
10,885		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PS-4: Building D

Runoff = 0.89 cfs @ 11.97 hrs, Volume= 0.049 af, Depth= 4.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-YR Rainfall=4.72"

Area (sf)	CN	Description
5,761	98	Roofs, HSG D
5,761		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Pond DET: Rainwater Harvesting

Inflow Area = 1.952 ac, 71.29% Impervious, Inflow Depth = 3.94" for 25-YR event
Inflow = 11.69 cfs @ 11.96 hrs, Volume= 0.641 af
Primary = 11.69 cfs @ 11.96 hrs, Volume= 0.641 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Pond DP-1:

Inflow Area = 0.276 ac, 72.95% Impervious, Inflow Depth = 3.93" for 25-YR event
Inflow = 1.76 cfs @ 11.97 hrs, Volume= 0.091 af
Primary = 1.76 cfs @ 11.97 hrs, Volume= 0.091 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Remaining Phase 1 - Runoff Area=11,812 sf 72.43% Impervious Runoff Depth=5.72"
Tc=6.0 min CN=93 Runoff=2.45 cfs 0.129 af

Subcatchment 2S: Remaining Phase Runoff Area=227 sf 100.00% Impervious Runoff Depth=6.30"
Tc=6.0 min CN=98 Runoff=0.05 cfs 0.003 af

Subcatchment 3S: Wetland Runoff Area=2,920 sf 11.68% Impervious Runoff Depth=4.49"
Tc=0.0 min CN=82 Runoff=0.62 cfs 0.025 af

Subcatchment 4S: Green House Runoff Area=3,904 sf 100.00% Impervious Runoff Depth=6.30"
Tc=6.0 min CN=98 Runoff=0.84 cfs 0.047 af

Subcatchment 5S: Upper Ramp East of Plaza Runoff Area=400 sf 100.00% Impervious Runoff Depth=6.30"
Tc=6.0 min CN=98 Runoff=0.09 cfs 0.005 af

Subcatchment 6S: Ph2 - Grass Runoff Area=16,597 sf 0.00% Impervious Runoff Depth=4.27"
Tc=6.0 min CN=80 Runoff=2.83 cfs 0.136 af

Subcatchment 7S: Runoff Area=7,485 sf 100.00% Impervious Runoff Depth=6.30"
Tc=6.0 min CN=98 Runoff=1.60 cfs 0.090 af

Subcatchment 8S: Bldg D Planter Runoff Area=341 sf 26.69% Impervious Runoff Depth=4.81"
Tc=6.0 min CN=85 Runoff=0.06 cfs 0.003 af

Subcatchment 9S: Bldg C/D Patio Runoff Area=1,973 sf 100.00% Impervious Runoff Depth=6.30"
Tc=0.0 min CN=98 Runoff=0.50 cfs 0.024 af

Subcatchment GR-1: Green Roof-Aux Bldg Runoff Area=2,233 sf 0.00% Impervious Runoff Depth=4.27"
Tc=6.0 min CN=80 Runoff=0.38 cfs 0.018 af

Subcatchment GR-2: Green Roof-Bldg D Runoff Area=1,699 sf 29.66% Impervious Runoff Depth=4.60"
Tc=6.0 min UI Adjusted CN=83 Runoff=0.31 cfs 0.015 af

Subcatchment PS-1: Building B Runoff Area=15,548 sf 100.00% Impervious Runoff Depth=6.30"
Tc=6.0 min CN=98 Runoff=3.33 cfs 0.187 af

Subcatchment PS-2: Scott St Plaza Runoff Area=15,271 sf 89.84% Impervious Runoff Depth=6.07"
Tc=6.0 min CN=96 Runoff=3.24 cfs 0.177 af

Subcatchment PS-3: Building C Runoff Area=10,885 sf 100.00% Impervious Runoff Depth=6.30"
Tc=6.0 min CN=98 Runoff=2.33 cfs 0.131 af

Subcatchment PS-4: Building D Runoff Area=5,761 sf 100.00% Impervious Runoff Depth=6.30"
Tc=6.0 min CN=98 Runoff=1.23 cfs 0.069 af

Pond DET: Rainwater Harvesting Inflow=16.71 cfs 0.928 af
Primary=16.71 cfs 0.928 af

Pond DP-1: Inflow=2.50 cfs 0.132 af
Primary=2.50 cfs 0.132 af

Total Runoff Area = 2.228 ac Runoff Volume = 1.060 af Average Runoff Depth = 5.71"
28.50% Pervious = 0.635 ac 71.50% Impervious = 1.593 ac

Summary for Subcatchment 1S: Remaining Phase 1 - Flowing Offsite

Runoff = 2.45 cfs @ 11.97 hrs, Volume= 0.129 af, Depth= 5.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-YR Rainfall=6.54"

Area (sf)	CN	Description
3,256	80	>75% Grass cover, Good, HSG D
8,556	98	Paved parking, HSG D
11,812	93	Weighted Average
3,256		27.57% Pervious Area
8,556		72.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 2S: Remaining Phase 2-Flowing Offsite

Runoff = 0.05 cfs @ 11.97 hrs, Volume= 0.003 af, Depth= 6.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-YR Rainfall=6.54"

Area (sf)	CN	Description
227	98	Paved parking, HSG D
227		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 3S: Wetland

Runoff = 0.62 cfs @ 11.90 hrs, Volume= 0.025 af, Depth= 4.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-YR Rainfall=6.54"

Area (sf)	CN	Description
2,579	80	>75% Grass cover, Good, HSG D
341	98	Paved parking, HSG D
2,920	82	Weighted Average
2,579		88.32% Pervious Area
341		11.68% Impervious Area

Summary for Subcatchment 4S: Green House

Runoff = 0.84 cfs @ 11.97 hrs, Volume= 0.047 af, Depth= 6.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-YR Rainfall=6.54"

Area (sf)	CN	Description
3,904	98	Roofs, HSG D
3,904		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 5S: Upper Ramp East of Plaza

Runoff = 0.09 cfs @ 11.97 hrs, Volume= 0.005 af, Depth= 6.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-YR Rainfall=6.54"

Area (sf)	CN	Description
400	98	Paved parking, HSG D
400		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 6S: Ph2 - Grass

Runoff = 2.83 cfs @ 11.97 hrs, Volume= 0.136 af, Depth= 4.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-YR Rainfall=6.54"

Area (sf)	CN	Description
16,597	80	>75% Grass cover, Good, HSG D
16,597		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 7S: Walkway/BusShelter/Captured Swlk

Runoff = 1.60 cfs @ 11.97 hrs, Volume= 0.090 af, Depth= 6.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-YR Rainfall=6.54"

Area (sf)	CN	Description
258	98	Roofs, HSG D
7,227	98	Paved parking, HSG D
7,485	98	Weighted Average
7,485		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 8S: Bldg D Planter

Runoff = 0.06 cfs @ 11.97 hrs, Volume= 0.003 af, Depth= 4.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-YR Rainfall=6.54"

Area (sf)	CN	Description
91	98	Paved parking, HSG D
250	80	>75% Grass cover, Good, HSG D
341	85	Weighted Average
250		73.31% Pervious Area
91		26.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 9S: Bldg C/D Patio

Runoff = 0.50 cfs @ 11.90 hrs, Volume= 0.024 af, Depth= 6.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-YR Rainfall=6.54"

Area (sf)	CN	Description
1,973	98	Paved parking, HSG D
1,973		100.00% Impervious Area

Summary for Subcatchment GR-1: Green Roof-Aux Bldg

Runoff = 0.38 cfs @ 11.97 hrs, Volume= 0.018 af, Depth= 4.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-YR Rainfall=6.54"

	Area (sf)	CN	Description
*	2,233	80	Green Roof
	2,233		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment GR-2: Green Roof-Bldg D

Runoff = 0.31 cfs @ 11.97 hrs, Volume= 0.015 af, Depth= 4.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-YR Rainfall=6.54"

	Area (sf)	CN	Adj	Description
*	1,195	80		Green Roof
	504	98		Unconnected roofs, HSG D
	1,699	85	83	Weighted Average, UI Adjusted
	1,195			70.34% Pervious Area
	504			29.66% Impervious Area
	504			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PS-1: Building B

Runoff = 3.33 cfs @ 11.97 hrs, Volume= 0.187 af, Depth= 6.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-YR Rainfall=6.54"

Area (sf)	CN	Description
15,548	98	Roofs, HSG D
15,548		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PS-2: Scott St Plaza

Runoff = 3.24 cfs @ 11.97 hrs, Volume= 0.177 af, Depth= 6.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-YR Rainfall=6.54"

Area (sf)	CN	Description
13,720	98	Paved parking, HSG D
1,551	80	>75% Grass cover, Good, HSG D
15,271	96	Weighted Average
1,551		10.16% Pervious Area
13,720		89.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PS-3: Building C

Runoff = 2.33 cfs @ 11.97 hrs, Volume= 0.131 af, Depth= 6.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-YR Rainfall=6.54"

Area (sf)	CN	Description
10,885	98	Roofs, HSG D
10,885		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PS-4: Building D

Runoff = 1.23 cfs @ 11.97 hrs, Volume= 0.069 af, Depth= 6.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-YR Rainfall=6.54"

Area (sf)	CN	Description
5,761	98	Roofs, HSG D
5,761		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Pond DET: Rainwater Harvesting

Inflow Area = 1.952 ac, 71.29% Impervious, Inflow Depth = 5.71" for 100-YR event
Inflow = 16.71 cfs @ 11.96 hrs, Volume= 0.928 af
Primary = 16.71 cfs @ 11.96 hrs, Volume= 0.928 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Pond DP-1:

Inflow Area = 0.276 ac, 72.95% Impervious, Inflow Depth = 5.73" for 100-YR event
Inflow = 2.50 cfs @ 11.97 hrs, Volume= 0.132 af
Primary = 2.50 cfs @ 11.97 hrs, Volume= 0.132 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs