Stormwater Pollution Prevention Plan

Crossgates Rapp Road Residential Development

Rapp Road
Town of Guilderland
Albany County, New York

February 6, 2019
Last Revised: February 14, 2020

THE Chazen COMPANIES®

Proud to Be Employee Owned

Engineers
Land Surveyors
Planners
Environmental & Safety Professionals
Landscape Architects

Prepared for:

Rapp Road Development, LLC
4 Clinton Square
Syracuse, NY 13202

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Prepared by:

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HUDSON VALLEY • CAPITAL DISTRICT • NORTH COUNTRY • WESTCHESTER • NASHVILLE, TN
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Chazen Engineering Consultants, LLC (Tennessee)

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PREPARER OF THE SWPPP

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person(s) who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that false statements made herein are punishable as a Class A misdemeanor pursuant to Section 29.45 of the Penal Law."

Name[1]: Roger Keating, PE

Title: Director

Date: February 14, 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 Crossgates Rapp Road Residential Development (the "Project"), Town of Guilderland, Albany County, NY. 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 at the start of construction.

This SWPPP has been developed in accordance with the "New York State Department of Environmental Conservation (NYSDEC) State Pollution Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity" General Permit Number GP-0-20-001, effective January 29, 2020 through January 28, 2025. The SWPPP and accompanying plans identify and detail stormwater management, pollution prevention, and erosion and sediment control measures necessary during and following completion of construction.

This SWPPP and the accompanying plans entitled "Crossgates Rapp Road Residential Development" 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 residential/commercial development project completed on behalf of Rapp Road Development, LLC.

1.1 Project Description

Rapp Road Development, LLC is proposing a mixed-use development on 18 acres of land west of the existing Crossgates Mall north of NYS Route 20 and west of Rapp Road. A location map of the site has been provided in Appendix G, as Figure 1.

This type of project is included in Table 2 of Appendix B of GP-0-20-001, and the project site is not located in one of the watersheds listed in Appendix C of GP-0-20-001. Therefore, this SWPPP includes post-construction stormwater management practices, as well as erosion and sediment controls.

The Project is located within the Town of Guilderland, a regulated, traditional land-use control Municipal Separate Stormwater Sewer System (MS4). Therefore, an MS4 SWPPP Acceptance Form is required to accompany NOIs submitted to the NYSDEC.

Runoff from the project site will discharge to a closed drainage system that ultimately discharges to the Normanskill, which is not included in the list of Section 303(d) water bodies included in Appendix E of GP-0-20-001.

Project construction activities will consist primarily of site grading, paving, building construction, and the installation of storm drainage, water supply, sewage collection, and public utility infrastructure necessary to support the proposed development. 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).
- Town of Guilderland General Legislation, Chapter 241 Stormwater Management, Article II Stormwater Management and Erosion and Sediment Control.

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

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

Infiltration basins, bioretention and underground infiltration chambers will be used to manage and treat stormwater runoff generated by the proposed development.

Pre- and post-development surface runoff rates have been evaluated for the 1-, 10-, and 100-year 24-hour storm events. Comparison of pre- and post-development watershed conditions demonstrates that the peak rate of runoff from the project site will not be increased.

The post-construction stormwater management practice(s) will be privately owned by Rapp Road 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.

1.3 Conclusion

The Project is subject to the requirements of the Town of Guilderland's regulated MS4, and this SWPPP has been prepared in conformance with the current Design Manual and SSESC. As such, GP-0-20-001 coverage will be effective five (5) business days from the date the NYSDEC receives the electronically submitted eNOI and signed "MS4 SWPPP Acceptance" form, or ten (10) business days from the date the NYSDEC receives the complete paper NOI and signed "MS4 SWPPP Acceptance" form.

2.0 SWPPP IMPLEMENTATION RESPONSIBILITIES

A summary of the responsibilities and obligations of all parties involved with compliance with the NYSDEC SPDES General Permit GP-0-20-001 conditions is outlined in the subsequent sections. For a complete listing of the definitions, responsibilities, and obligations, refer to the SPDES General Permit GP-0-20-001 presented in Appendix A.

2.1 Definitions

1. "General SPDES Permit" means a SPDES permit issued pursuant to 6 NYCRR Part 750-1.21 authorizing a category of discharges.

2. "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).

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

4. "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.

5. "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.

6. "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.

7. "Trained Contractor" means an employee from a contracting (construction) company, identified in Part III.A.6., 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, identified in Part III.A.6.,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, meeting the non-numeric effluent limitations in Part I.B.1.(a)-(f) of the SPDES General Permit and 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. Practices must be designed to meet the applicable sizing criteria in Part I.C.2.a., b., c. or d. of GP-0-20-001.

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 electronic version of the NOI (eNOI) along with the MS4 SWPPP acceptance form using the NYSDEC's website (http://www.dec.ny.gov/chemical/43133.html) or submit the signed NOI along with the MS4 SWPPP acceptance form to the following:

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

   Stormwater Information Center
   Town of Guilderland
   5209 Western Turnpike
   PO Box 339
   Guilderland, NY 12084
   Attn: Ken D'Arpino, Stormwater Control Officer

7. Pay the required initial and annual fees upon receipt of invoices from NYSDEC. These invoices are generally issued in the fall of each year. The initial fee is calculated as $110.00 per acre disturbed plus $675.00 per acre of net increase in impervious cover, and the annual fee is $110.00.

8. 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.

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

10. 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.

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

12. 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 NYSDEC.

13. 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.

14. Maintain at the construction site a copy of: General Permit (GP-0-20-001); NOI; NOI Acknowledgement Letter; SWPPP with accompanying figures, exhibits, and plans; MS4 SWPPP Acceptance Form; inspection reports; Spill Prevention, Countermeasures, Cleanup ("SPCC") Plan; and all documentation in accordance with Part I.F.8.a.-d of GP-0-20-001 necessary to demonstrate eligibility with the general permit. These items shall be maintained on site until all disturbed areas have achieved final stabilization and the NOT has been submitted to the NYSDEC. Place documents in a secure location that must be accessible during normal business hours to an individual performing a compliance inspection.

15. 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.

16. 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

    Stormwater Information Center
    Town of Guilderland
    5209 Western Turnpike
    PO Box 339
    Guilderland, NY 12084
    Attn: Ken D'Arpino, Stormwater Control Officer

17. 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.

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

19. The NOI, SWPPP, and inspection reports required by GP-0-20-001 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.

20. 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.

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 Town of Guilderland 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 5.4 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 Town of Guilderland's 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 Town of Guilderland 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 that shall include/address the items listed in Part IV.C.4.a-k of GP-0-20-001. 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, PE
The Chazen Companies
547 River Street
Troy, NY 12180
Phone: (518) 273-0055
Fax: (518) 273-8391

2. Owner/Operator:

James Soos
Pyramid Management Group, LLC
4 Clinton Square
Syracuse, NY 13202
Phone: (315) 422-7000
Fax:

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 Town of Guilderland's Transit Oriented Development District ("TOD") adopted in early 2018 by the Town Board. Pursuant to the TOD, "Multiple-Family Dwelling, which may include ground floor uses that are a permitted use, site plan use or special use permit in the GB District" are the only uses that are allowed at the Project site west of Rapp Road.

The overall site is moderately sloping, with slopes ranging from 0 to 12%, with the exception of the western portion of the site at the existing berm, which is relatively steep with slopes up to 67%. In general, the project site slopes west to east, originating at the existing berm, and discharging at existing flared end sections along Rapp Road. Site elevations range from approximately 281 feet above mean sea level to 317 feet above MSL.

3.2 Soils and Groundwater

The United States Department of Agriculture (USDA) Web Soil Survey (http://websoilsurvey.nrcs.usda.gov/app/) was used to obtain surficial soil conditions for the study area. Soil data as provided by the SCS is presented in Table 1.

Table 1: USDA Soil Data

Map Symbol & Description	Hydrologic Soil Group	Permeability (inches/hour)	Erosion Factor K	Depth to Water Table (inches)	Depth to Bedrock (inches)
CoC – Colonie loamy fine sand, rolling	A	1.98 – 19.98	.24	>80	>80
CoD – Colonie loamy fine sand, hilly	A	1.98 – 19.98	.24	> 80	>80
EnA – Elnora loamy fine sand, 0 to 3 percent slopes	A/D	1.98 – 5.95	.10	18 - 24	>80
Gr – Granby loamy fine sand	A/D	5.95 – 19.98	.10	0	>80
St – Stafford loamy fine sand	A/D	1.98 – 19.98	.15	6 - 18	>80
Ud - Udipsamments, smoothed	-	19.98	.02	>80	>80

Upon review of the soil data presented in Table 1, the project site does not contain soils with a soil slope phase of E or F and/or soils with a map unit name that is inclusive of 25% or greater slope.

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

- Type A Soils: Soils having a high infiltration rate and low runoff potential when thoroughly wet. These soils consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a moderate 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.

Soil borings were performed at various locations across the site by Aztech Environmental and witnessed by the Chazen Companies in January 2018. The logs for the soil borings are included in Appendix L. 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 identified in Appendix C of GP-0-20-001.

3.4 Receiving Water Bodies

The nearest natural classified water body into which runoff from the project site will discharge is the tributary to the Normans Kill.

The Normans Kill is classified by NYSDEC as a Class B water course, and is not included in the Section 303(d) list of impaired waters found in Appendix E of GP-0-20-001.

3.5 Aquifer Designation

The project site is located over the Albany Pine Bush aquifer. The US EPA has not designated this aquifer as a Sole Source aquifer. This aquifer is listed as a principal supply aquifer in the NYSDEC Technical and Operational Guidance Series (TOGS) 2.1.3 (1980), Primary and Principle Aquifer Determinations, Table 1, 1990; and in the Atlas of Eleven Selected Aquifers in New York, U.S. Geological Survey in cooperation with the NYS Department of Health, 1982.

3.6 Wetlands

A search on the NYSDEC Environmental Resource Mapper on December 17, 2018, 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), Town of Guilderland, New York, Community Panel Number 36001C0178D, the project site lies within Flood Zone X, area determined to be outside the 0.2% annual chance floodplain.

3.8 Listed, Endangered, or Threatened Species

An ecological assessment report entitled “Vegetation Wildlife and Soil Conditions Report, Rapp Road Residential Project” dated August 2018, as prepared by B. Laing Associates, indicates that as the site is currently disturbed and lacks any characteristics significant in Albany Pine Bush habitats, no significant impacts are anticipated as a result of the project. In addition, the project is consistent with the goals and

objectives of the Albany Pine Bush 2017 Management Plan. For further information, please refer to the ecological assessment.

3.9 Historic Places

A search on the New York State Cultural Resource Information System (CRIS) database, performed on December 17, 2018, revealed that the property is not located within an archeologically sensitive area, and is not located on or immediately 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. A copy of the NYSOPRHP documentation, in accordance with part I.F.8. of GP-0-20-001, is provided in Appendix G, as Figure 3A.

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/). 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	2.21
10-year	3.74
100-year	6.34

These values were used to evaluate the pre- and post-development stormwater runoff characteristics.

4.0 CONSTRUCTION SEQUENCE

This project has not received written approval from the Town of Guilderland allowing the disturbance of more than five acres of land at any one time. Therefore, if the Contractor's construction sequence requires the disturbance of more than five acres at any one time, written approval must be obtained from NYSDEC prior to disturbing more than five acres at once.

The "Erosion and Sediment Control Plan" in the accompanying drawings identifies the major construction activities that are the subject of this SWPPP. The order (or sequence) in which the major activities are expected to begin is presented on the accompanying drawings, though each activity will not necessarily be completed before the next begins. In addition, these activities could occur in a different order if necessary to maintain adequate erosion and sediment control. If this is the case, the contractor shall notify the Owner's/Operator's Engineer overseeing the implementation of the SWPPP.

The Contractor will be responsible for implementing the erosion and sediment control measures identified on the plans. The Contractor may designate these tasks to certain subcontractors as they see fit, but the ultimate responsibility for implementing these controls and ensuring their proper function remains with the Contractor.

Refer to the accompanying plans for details and specifications regarding the construction sequencing schedule.

5.0 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:

- NYSDEC SPDES General Permit for Stormwater Discharges From Construction Activity, Permit No. GP-0-20-001 (effective January 29, 2020 through January 28, 2025)
- New York State Standards and Specifications for Erosion and Sediment Control, NYSDEC (November 2016)
- Town of Guilderland General Legislation, Chapter 241 Stormwater Management, Article II Stormwater Management and Erosion and Sediment Control.

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.

5.1 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.

5.1.1 Stabilized Construction Entrance

Prior to construction, stabilized construction entrance(s) 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 entrance(s). The intent is to trap dust and mud that would otherwise be carried off-site by construction traffic.

The entrance(s) 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.

5.1.2 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.

5.1.3 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.

5.1.4 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.

5.1.5 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.

5.1.6 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.

5.1.7 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.

storm events will be performed by the Contractor(s) and maintenance will be performed as needed.

5.2 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.

5.2.1 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.

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.

5.3 Other Pollutant Controls

Other necessary pollutant controls are listed below:

5.3.1 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.

5.3.2 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.

5.3.3 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.

5.4 Construction Housekeeping Practices

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

5.4.1 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.

5.4.2 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.

5.4.3 Detergents

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

5.4.4 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 Material Safety Data Sheets (MSDS) 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.

5.4.5 Concrete Wash Areas

Concrete trucks will be allowed to wash out or discharge surplus concrete or drum wash water on the site, but only in specifically designated diked and impervious washout areas, which have been prepared to prevent contact between the concrete wash and stormwater. Waste generated from concrete wash water shall not be allowed to flow into drainage ways, inlets, receiving waters, or highway right of ways, or any location other than the designated concrete wash areas. Proper signage designating the “Concrete Wash Areas” shall be placed near the facility. Concrete wash areas shall be located at minimum 100 linear feet from drainage ways, inlets, and surface waters.

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 wash area is to include removal of hardened concrete. Facility shall have sufficient volume to contain all the concrete waste resulting from washout and a minimum freeboard of 12 inches. Facility shall not be filled beyond 95% capacity and shall be cleaned out once 75% full unless a new facility is constructed. The Contractor will be responsible for seeing that these procedures are followed.

Sawcut Portland Cement Concrete (PCC) slurry shall not be allowed to enter drainage ways, inlets, and/or surface waters. Sawcut residue should not be left on the surface of pavement or be allowed to flow over and off pavement.

The Project may require the use of multiple concrete wash areas. All concrete wash areas will be located in an area where the likelihood of the area contributing to stormwater discharges is negligible. If required, additional BMPs must be implemented to prevent concrete wastes from contributing to stormwater discharges.

5.4.6 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.

6.0 STORMWATER MANAGEMENT PLANNING

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.

6.1 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 K provides a description of each green infrastructure planning measure, along with a project specific evaluation.

6.2 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.

6.2.1 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), minimum R_v = 0.2
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.

6.2.2 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 of the Design Manual. Water quality volume calculations for each of the proposed practices are presented in Table B of Appendix K.

6.3 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.

6.3.1 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.

6.3.2 Methodology

In order to reduce the required WQv, a site specific evaluation must be performed to determine the most practical means of reducing runoff volume. The Design Manual strongly encourages implementation of a combination of RR techniques and standard SMPs with RRv capacity. The following Table demonstrates a summary of the RRv practices being applied, and both the water quality and runoff reduction volumes they provide. The RR Technique(s) have been designed in accordance with Chapter 5 of the Design Manual. The standard SMP(s) with RRv capacity have been designed in accordance with Chapter 6 of the Design Manual. Refer to the contract drawings for practice dimensions, material specifications, and installation details. Practice specific calculations are presented in Table E of Appendix K.

Table 3: Summary of RR Techniques and Standard SMPs with RRv Capacity

RR Technique or Standard SMP with RRv Capacity	NYSDEC Design Variant	Pretreatment Volume Required (% of WQv)	Pretreatment Volume Provided (CF)	WQv Required (CF)	WQv Provided (CF)	RRv Capacity	RRv Provided (CF)
Infiltration Basin	I-2	100	13,576	13,590	29,530	100%	29,530
Underground Infiltration System	I-4	100	9,190	8,620	9,190	100%	9,190
Bioretention (without underdrain)	F-5	25	163	650	1,358	100%	543
						Total WQv Provided (CF)	**40,078**
						Total RRv Provided (CF)	**39,263**

6.3.3 Application of Standard Stormwater Management Practices (SMPs) with RRv Capacity

The standard SMPs with RRv capacity, described in the following section, have been incorporated into the stormwater management plan for this project. Design calculations for each measure have been included in Table E of Appendix K.

6.3.3.1 Infiltration Basin (I-2)

Infiltration practices reduce runoff volume, remove fine sediment and associated pollutants, recharge groundwater, and provide partial attenuation of peak flows for storm events equal to or less than the design storm. Infiltration practices are appropriate for small drainage areas, but can also be used for larger multiple lot applications, in contrast to rain gardens and dry wells, which are primarily intended for single lots.

Infiltration basins are stormwater impoundments designed to capture and infiltrate the water quality volume over several days, but do not retain a permanent pool. Infiltration basins can be designed as off-line devices to infiltrate the water quality volume and bypass larger flows to downstream flood control facilities or as combined infiltration/flood control facilities by providing detention above the infiltration zone. The bottom of an infiltration basin typically contains vegetation to increase the infiltration capacity of the basin, allow for vegetative uptake, and reduce soil erosion and scouring of the basin.

Soil testing data consisting of deep test pits and falling head permeability tests in support of the design of the proposed infiltration basin(s) has been provided on the accompanying plans.

The Infiltration Basin(s) (I-2) was/were designed according to the criteria set forth in Section 6.3 “Stormwater Infiltration” of the Design Manual.

6.3.3.2 Underground Infiltration System (I-4)

Most proprietary underground infiltration systems operate similarly to traditional infiltration basins (NYSDEC design variant I-2). These practices reduce runoff volume, remove fine sediment and associated pollutants, recharge groundwater, and provide partial attenuation of peak flows for storm events equal

to or less than the design storm. Infiltration practices are appropriate for small drainage areas, but can also be used for larger multiple lot applications, in contrast to rain gardens and dry wells, which are primarily intended for single lots.

Proprietary underground infiltration systems are designed to capture and infiltrate the water quality volume, but do not retain a permanent pool. These systems are typically designed to infiltrate the water quality volume as well as to provide detention above the infiltration zone to attenuate peak volumes of larger storm events to meet flood control requirements.

Soil testing data consisting of deep test pits and falling head permeability tests in support of the design of the proposed underground infiltration system(s) has been provided on the accompanying plans.

6.3.3.3 Bioretention (F-5)

Bioretention filters are shallow landscaped depressions commonly located in parking lot islands or within small pockets in residential areas that receive stormwater runoff. Stormwater flows into the bioretention area, ponds on the surface, and is gradually infiltrated into the soil bed. Pollutants are removed by a number of processes, such as adsorption, filtration, volatilization, ion exchange, and decomposition. Filtered runoff can either be allowed to infiltrate into the surrounding soil, functioning as an infiltration basin or rainwater garden or collected by an under drain system and discharged to the storm sewer system or directly to receiving waters, functioning like a surface sand filter. Runoff from larger storms is generally diverted past the bioretention area to the stormwater collection and conveyance system.

The Bioretention filter (F-5) was designed according to the criteria set forth in Section 6.4 “Stormwater Filtering Systems” of the Design Manual.

6.3.4 RRv Performance Summary

According to Section 3.6 of the Design Manual, “If the RRv calculated in this step is greater than or equal to the WQv calculated in Step 2, the designer has met the RRv requirement and may proceed to Step 6.” A summary of the RRv provided is presented in the following table:

Table 4: Summary of RRv Provided

RRv Required = WQv Required (CF)	RRv Provided (CF)	% RRv Provided
22,860	39,263	100

As indicated in the above table, the RRv provided is greater than the RRv required for the project site. As such, the design can proceed to Step 6.

6.4 Step 6 - Apply Volume and Peak Rate Control

This report presents the pre-development and post-development features and conditions associated with the rate of surface water runoff within the study area. For both cases, the drainage patterns, drainage structures, soil types, and ground cover types are considered in this study.

6.4.1 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.

6.4.2 Methodology

In order to demonstrate that the NYSDEC detention requirements are being met, the Design Manual requires that a hydrologic and hydraulic analysis of the pre- 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, reaches, and ponds are represented by hexagons, squares, and triangles, respectively, on the watershed routing diagrams provided with the computations included in Appendix I and Appendix J.

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 Table 8.

Table 5: Design Events

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

6.4.3 Description of Design Points

The study area consists of an overall watershed that encompasses approximately 16.259 acres and partially contains the 19.68 acre project site. 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: The southern portion of the site discharges to a low area located at the southern edge of site, at the property line and Westmere Terrace. Runoff flows to one of two catch basins in Westmere Terrace, entering the Town of Guilderland storm sewer system.
- Design Point 2: On-site runoff flows east overland, reaching an existing flared end section, discharging into an existing 24” HDPE storm line. The storm line is part of Town of Guilderland storm sewer system and flows east underneath Rapp Road.

6.4.4 Pre-development Watershed Conditions

The pre-development project site is covered predominantly by woods and grass, with areas of compacted dirt and tree removal from previous disturbance. Analysis of pre-development conditions considered existing drainage patterns, soil types, ground cover, and topography. The Pre-Development Watershed Delineation Map has been provided in Appendix G, as Figure 5.

The results of the computer modeling used to analyze the overall watershed under pre-development conditions are presented in Appendix I. A summary of the pre-development watershed runoff rates at each design point is presented in Table 9.

6.4.5 Post-development Watershed Conditions

The post-development project site is covered predominantly by grass, buildings and pavement. The analysis of post-development conditions considered existing drainage patterns, soil types, ground cover to remain, 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 Figure 5.

The results of the computer modeling used to analyze the overall watershed under post-development conditions are presented in Appendix J. A summary of the post-development watershed runoff rates at each design point is presented in Table 9.

There are numerous locations and methods for providing controls of off-site discharge of stormwater from the 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.

6.4.6 Performance Summary

A comparison of the pre- and post-development watershed conditions was performed for all design points and storm events evaluated herein. For all design points and design storms, 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 adjacent or downstream properties or receiving water courses.

The results of the computer modeling used to analyze the pre- and post-development watersheds are presented in Appendix I and Appendix J, respectively. The following Table summarizes the results of this analysis.

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

Pre- vs. Post-Development Discharge Rate (cfs)						
Design Point (DP)	**1-year 24-hour storm event**		**10-year 24-hour storm event**		**100-year 24-hour storm event**	
	Pre	**Post**	**Pre**	**Post**	**Pre**	**Post**
1	0.01	0.00	0.74	0.39	4.57	2.69
2	4.76	1.22	17.78	8.28	45.57	20.77

7.0 INSPECTIONS, MAINTENANCE, AND REPORTING

7.1 Inspection and Maintenance Requirements

7.1.1 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.

7.1.2 Construction Phase Inspections and Maintenance

A Qualified Inspector/Qualified Professional, as defined in Appendix A of the General Permit GP-0-20-001, 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.

7.1.3 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 NYSDEC Region 4 stormwater contact person and the Town of Guilderland in writing.

7.1.4 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 NYSDEC Region 4 stormwater contact person and the Town of Guilderland 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 NYSDEC.

7.1.5 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.

7.2 Reporting Requirements

7.2.1 Inspection and Maintenance Reports

Inspection/maintenance reports shall be prepared prior to and during construction in accordance with the schedule outlined herein and in the SPDES General Permit GP-0-20-001 Part IV.C. The reports shall be prepared to identify and document the maintenance of the erosion and sediment control measures. A sample inspection form is provided in Appendix D.

Specifically, each inspection 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 water body.

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.

All inspection reports shall be signed by the *Qualified Inspector*/*Qualified Professional*. Pursuant to Part II.C.2 of GP-0-20-001, the inspection reports shall be maintained on site with the SWPPP.

7.2.2 Site Log Book

The Owner/Operator shall retain a copy of the SWPPP required by GP-0-20-001 at the construction site from the date of initiation of construction activities to the date of final stabilization.

During construction, the Owner's/Operator's Engineer shall maintain a record of all SWPPP inspection reports at the site in the Site Log Book. The Site Log Book shall be maintained on-site and made available to the permitting authority, if necessary.

7.2.3 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. This period may be extended by the NYSDEC, at its sole discretion, at any time upon written notification.

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

Appendix A:
NYSDEC SPDES General Permit GP-0-20-001

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NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SPDES GENERAL PERMIT
FOR STORMWATER DISCHARGES

From

CONSTRUCTION ACTIVITY

Permit No. GP- 0-20-001

Issued Pursuant to Article 17, Titles 7, 8 and Article 70

of the Environmental Conservation Law

Effective Date: January 29, 2020 Expiration Date: January 28, 2025

John J. Ferguson

Chief Permit Administrator

1-23-20

Authorized Signature Date

Address: NYS DEC
Division of Environmental Permits
625 Broadway, 4th Floor
Albany, N.Y. 12233-1750

PREFACE

Pursuant to Section 402 of the Clean Water Act ("CWA"), stormwater *discharges* from certain *construction activities* are unlawful unless they are authorized by a *National Pollutant Discharge Elimination System ("NPDES")* permit or by a state permit program. New York administers the approved State Pollutant Discharge Elimination System (SPDES) program with permits issued in accordance with the New York State Environmental Conservation Law (ECL) Article 17, Titles 7, 8 and Article 70.

An *owner or operator* of a *construction activity* that is eligible for coverage under this permit must obtain coverage prior to the *commencement of construction activity*. Activities that fit the definition of "*construction activity*", as defined under 40 CFR 122.26(b)(14)(x), (15)(i), and (15)(ii), constitute construction of a *point source* and therefore, pursuant to ECL section 17-0505 and 17-0701, the *owner or operator* must have coverage under a SPDES permit prior to *commencing construction activity*. The *owner or operator* cannot wait until there is an actual *discharge* from the *construction site* to obtain permit coverage.

***Note: The italicized words/phrases within this permit are defined in Appendix A.**

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
SPDES GENERAL PERMIT FOR STORMWATER DISCHARGES FROM CONSTRUCTION ACTIVITIES

Table of Contents

Part 1. PERMIT COVERAGE AND LIMITATIONS

A. Permit Application

This permit authorizes stormwater *discharges* to *surface waters of the State* from the following *construction activities* identified within 40 CFR Parts 122.26(b)(14)(x), 122.26(b)(15)(i) and 122.26(b)(15)(ii), provided all of the eligibility provisions of this permit are met:

1. *Construction activities* involving soil disturbances of one (1) or more acres; including disturbances of less than one acre that are part of a *larger common plan of development or sale* that will ultimately disturb one or more acres of land; excluding *routine maintenance activity* that is performed to maintain the original line and grade, hydraulic capacity or original purpose of a facility;

2. *Construction activities* involving soil disturbances of less than one (1) acre where the Department has determined that a *SPDES* permit is required for stormwater *discharges* based on the potential for contribution to a violation of a *water quality standard* or for significant contribution of *pollutants* to *surface waters of the State.*

3. *Construction activities* located in the watershed(s) identified in Appendix D that involve soil disturbances between five thousand (5,000) square feet and one (1) acre of land.

B. Effluent Limitations Applicable to Discharges from Construction Activities

*Discharge*s authorized by this permit must achieve, at a minimum, the effluent limitations in Part I.B.1. (a) – (f) of this permit. These limitations represent the degree of effluent reduction attainable by the application of best practicable technology currently available.

1. Erosion and Sediment Control Requirements - The *owner or operator* must select, design, install, implement and maintain control measures to *minimize* the *discharge* of *pollutants* and prevent a violation of the *water quality standards*. The selection, design, installation, implementation, and maintenance of these control measures must meet the non-numeric effluent limitations in Part I.B.1.(a) – (f) of this permit and be in accordance with the New York State Standards and Specifications for Erosion and Sediment Control, dated November 2016, using sound engineering judgment. Where control measures are not designed in conformance with the design criteria included in the technical standard, the *owner or operator* must include in the *Stormwater Pollution Prevention Plan* ("SWPPP") the reason(s) for the

deviation or alternative design and provide information which demonstrates that the deviation or alternative design is *equivalent* to the technical standard.

a. **Erosion and Sediment Controls.** Design, install and maintain effective erosion and sediment controls to *minimize* the *discharge* of *pollutants* and prevent a violation of the *water quality standards*. At a minimum, such controls must be designed, installed and maintained to:

   (i) *Minimize* soil erosion through application of runoff control and soil stabilization control measure to *minimize pollutant discharge*s;

   (ii) Control stormwater *discharge*s, including both peak flowrates and total stormwater volume, to *minimize* channel and *streambank* erosion and scour in the immediate vicinity of the *discharge* points;

   (iii) *Minimize* the amount of soil exposed during *construction activity*;

   (iv) *Minimize* the disturbance of *steep slopes*;

   (v) *Minimize* sediment *discharge*s from the site;

   (vi) Provide and maintain *natural buffer*s around surface waters, direct stormwater to vegetated areas and maximize stormwater infiltration to reduce *pollutant discharge*s, unless *infeasible*;

   (vii) *Minimize* soil compaction. Minimizing soil compaction is not required where the intended function of a specific area of the site dictates that it be compacted;

   (viii) Unless *infeasible*, preserve a sufficient amount of topsoil to complete soil restoration and establish a uniform, dense vegetative cover; and

   (ix) *Minimize* dust. On areas of exposed soil, *minimize* dust through the appropriate application of water or other dust suppression techniques to control the generation of pollutants that could be discharged from the site.

b. **Soil Stabilization**. In areas where soil disturbance activity has temporarily or permanently ceased, the application of soil stabilization measures must be initiated by the end of the next business day and completed within fourteen (14) days from the date the current soil disturbance activity ceased. For construction sites that *directly discharge* to one of the 303(d) segments

listed in Appendix E or is located in one of the watersheds listed in Appendix C, the application of soil stabilization measures must be initiated by the end of the next business day and completed within seven (7) days from the date the current soil disturbance activity ceased. See Appendix A for definition of *Temporarily Ceased*.

c. **Dewatering**. *Discharge*s from *dewatering* activities, including *discharge*s from *dewatering* of trenches and excavations, must be managed by appropriate control measures.

d. **Pollution Prevention Measures**. Design, install, implement, and maintain effective pollution prevention measures to *minimize* the *discharge* of *pollutants* and prevent a violation of the *water quality standards*. At a minimum, such measures must be designed, installed, implemented and maintained to:

(i) *Minimize* the *discharge* of *pollutants* from equipment and vehicle washing, wheel wash water, and other wash waters. This applies to washing operations that use clean water only. Soaps, detergents and solvents cannot be used;

(ii) *Minimize* the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste, hazardous and toxic waste, and other materials present on the site to precipitation and to stormwater. Minimization of exposure is not required in cases where the exposure to precipitation and to stormwater will not result in a *discharge* of *pollutants*, or where exposure of a specific material or product poses little risk of stormwater contamination (such as final products and materials intended for outdoor use) ; and

(iii) Prevent the *discharge* of *pollutants* from spills and leaks and implement chemical spill and leak prevention and response procedures.

e. **Prohibited *Discharges*.** The following *discharge*s are prohibited:

(i) Wastewater from washout of concrete;

(ii) Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds and other construction materials;

(iii) Fuels, oils, or other *pollutants* used in vehicle and equipment operation and maintenance;

(iv) Soaps or solvents used in vehicle and equipment washing; and

(v) Toxic or hazardous substances from a spill or other release.

f. Surface Outlets. When discharging from basins and impoundments, the outlets shall be designed, constructed and maintained in such a manner that sediment does not leave the basin or impoundment and that erosion at or below the outlet does not occur.

C. Post-construction Stormwater Management Practice Requirements

1. The *owner or operator* of a *construction activity* that requires post-construction stormwater management practices pursuant to Part III.C. of this permit must select, design, install, and maintain the practices to meet the *performance criteria* in the New York State Stormwater Management Design Manual ("Design Manual"), dated January 2015, using sound engineering judgment. Where post-construction stormwater management practices ("SMPs") are not designed in conformance with the *performance criteria* in the Design Manual, the *owner or operator* must include in the SWPPP the reason(s) for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is *equivalent* to the technical standard.

2. The *owner or operator* of a *construction activity* that requires post-construction stormwater management practices pursuant to Part III.C. of this permit must design the practices to meet the applicable *sizing criteria* in Part I.C.2.a., b., c. or d. of this permit.

a. Sizing Criteria for New Development

(i) Runoff Reduction Volume ("RRv"): Reduce the total Water Quality Volume ("WQv") by application of RR techniques and standard SMPs with RRv capacity. The total WQv shall be calculated in accordance with the criteria in Section 4.2 of the Design Manual.

(ii) Minimum RRv and Treatment of Remaining Total WQv: Construction activities that cannot meet the criteria in Part I.C.2.a.(i) of this permit due to site limitations shall direct runoff from all newly constructed impervious areas to a RR technique or standard SMP with RRv capacity unless infeasible. The specific site limitations that prevent the reduction of 100% of the WQv shall be documented in the SWPPP.

For each impervious area that is not directed to a RR technique or standard SMP with RRv capacity, the SWPPP must include documentation which demonstrates that all options were considered and for each option explains why it is considered infeasible.

In no case shall the runoff reduction achieved from the newly constructed impervious areas be less than the Minimum RRv as calculated using the criteria in Section 4.3 of the Design Manual. The remaining portion of the total WQv that cannot be reduced shall be treated by application of standard SMPs.

(iii) Channel Protection Volume ("Cpv"): Provide 24 hour extended detention of the post-developed 1-year, 24-hour storm event; remaining after runoff reduction. The Cpv requirement does not apply when:
(1) Reduction of the entire Cpv is achieved by application of runoff reduction techniques or infiltration systems, or
(2) The site discharges directly to tidal waters, or fifth order or larger streams.

(iv) *Overbank* Flood Control Criteria ("Qp"): Requires storage to attenuate the post-development 10-year, 24-hour peak discharge rate (Qp) to predevelopment rates. The Qp requirement does not apply when:
(1) the site discharges directly to tidal waters or fifth order or larger streams, or
(2) A downstream analysis reveals that *overbank* control is not required.

(v) Extreme Flood Control Criteria ("Qf"): Requires storage to attenuate the post-development 100-year, 24-hour peak discharge rate (Qf) to predevelopment rates. The Qf requirement does not apply when:
(1) the site discharges directly to tidal waters or fifth order or larger streams, or
(2) A downstream analysis reveals that *overbank* control is not required.

b. *Sizing Criteria* for *New Development* in Enhanced Phosphorus Removal Watershed

(i) Runoff Reduction Volume (RRv): Reduce the total Water Quality Volume (WQv) by application of RR techniques and standard SMPs with RRv capacity. The total WQv is the runoff volume from the 1-year, 24 hour design storm over the post-developed watershed and shall be

calculated in accordance with the criteria in Section 10.3 of the Design Manual.

(ii) Minimum RRv and Treatment of Remaining Total WQv: *Construction activities* that cannot meet the criteria in Part I.C.2.b.(i) of this permit due to *site limitations* shall direct runoff from all newly constructed *impervious areas* to a RR technique or standard SMP with RRv capacity unless *infeasible*. The specific *site limitations* that prevent the reduction of 100% of the WQv shall be documented in the SWPPP. For each *impervious area* that is not directed to a RR technique or standard SMP with RRv capacity, the SWPPP must include documentation which demonstrates that all options were considered and for each option explains why it is considered *infeasible.*

In no case shall the runoff reduction achieved from the newly constructed *impervious areas* be less than the Minimum RRv as calculated using the criteria in Section 10.3 of the Design Manual. The remaining portion of the total WQv that cannot be reduced shall be treated by application of standard SMPs.

(iii) Channel Protection Volume (Cpv): Provide 24 hour extended detention of the post-developed 1-year, 24-hour storm event; remaining after runoff reduction. The Cpv requirement does not apply when:
(1) Reduction of the entire Cpv is achieved by application of runoff reduction techniques or infiltration systems, or
(2) The site *discharge*s directly to tidal waters, or fifth order or larger streams.

(iv) *Overbank* Flood Control Criteria (Qp): Requires storage to attenuate the post-development 10-year, 24-hour peak *discharge* rate (Qp) to predevelopment rates. The Qp requirement does not apply when:
(1) the site *discharge*s directly to tidal waters or fifth order or larger streams, or
(2) A downstream analysis reveals that *overbank* control is not required.

(v) Extreme Flood Control Criteria (Qf): Requires storage to attenuate the post-development 100-year, 24-hour peak *discharge* rate (Qf) to predevelopment rates. The Qf requirement does not apply when:
(1) the site *discharge*s directly to tidal waters or fifth order or larger streams, or
(2) A downstream analysis reveals that *overbank* control is not required.

c. Sizing Criteria for Redevelopment Activity

(i) Water Quality Volume (WQv): The WQv treatment objective for *redevelopment activity* shall be addressed by one of the following options. *Redevelopment activities* located in an Enhanced Phosphorus Removal Watershed (see Part III.B.3. and Appendix C of this permit) shall calculate the WQv in accordance with Section 10.3 of the Design Manual. All other *redevelopment activities* shall calculate the WQv in accordance with Section 4.2 of the Design Manual.

(1) Reduce the existing *impervious cover* by a minimum of 25% of the total disturbed, *impervious area*. The Soil Restoration criteria in Section 5.1.6 of the Design Manual must be applied to all newly created pervious areas, or

(2) Capture and treat a minimum of 25% of the WQv from the disturbed, *impervious area* by the application of standard SMPs; or reduce 25% of the WQv from the disturbed, *impervious area* by the application of RR techniques or standard SMPs with RRv capacity., or

(3) Capture and treat a minimum of 75% of the WQv from the disturbed, *impervious area* as well as any additional runoff from tributary areas by application of the alternative practices discussed in Sections 9.3 and 9.4 of the Design Manual., or

(4) Application of a combination of 1, 2 and 3 above that provide a weighted average of at least two of the above methods. Application of this method shall be in accordance with the criteria in Section 9.2.1(B) (IV) of the Design Manual.

If there is an existing post-construction stormwater management practice located on the site that captures and treats runoff from the *impervious area* that is being disturbed, the WQv treatment option selected must, at a minimum, provide treatment equal to the treatment that was being provided by the existing practice(s) if that treatment is greater than the treatment required by options 1 – 4 above.

(ii) Channel Protection Volume (Cpv): Not required if there are no changes to hydrology that increase the *discharge* rate from the project site.

(iii) *Overbank* Flood Control Criteria (Qp): Not required if there are no changes to hydrology that increase the *discharge* rate from the project site.

(iv) Extreme Flood Control Criteria (Qf): Not required if there are no changes to hydrology that increase the *discharge* rate from the project site

d. Sizing Criteria for Combination of Redevelopment Activity and New Development

Construction projects that include both New Development and Redevelopment Activity shall provide post-construction stormwater management controls that meet the sizing criteria calculated as an aggregate of the Sizing Criteria in Part I.C.2.a. or b. of this permit for the New Development portion of the project and Part I.C.2.c of this permit for Redevelopment Activity portion of the project.

D. Maintaining Water Quality

The Department expects that compliance with the conditions of this permit will control *discharge*s necessary to meet applicable *water quality standards*. It shall be a violation of the *ECL* for any discharge to either cause or contribute to a violation of *water quality standards* as contained in Parts 700 through 705 of Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York, such as:

1. There shall be no increase in turbidity that will cause a substantial visible contrast to natural conditions;

2. There shall be no increase in suspended, colloidal or settleable solids that will cause deposition or impair the waters for their best usages; and

3. There shall be no residue from oil and floating substances, nor visible oil film, nor globules of grease.

If there is evidence indicating that the stormwater *discharge*s authorized by this permit are causing, have the reasonable potential to cause, or are contributing to a violation of the *water quality standards*; the *owner or operator* must take appropriate corrective action in accordance with Part IV.C.5. of this general permit and document in accordance with Part IV.C.4. of this general permit. To address the *water quality standard* violation the *owner or operator* may need to provide additional information, include and implement appropriate controls in the SWPPP to correct the problem, or obtain an individual SPDES permit.

If there is evidence indicating that despite compliance with the terms and conditions of this general permit it is demonstrated that the stormwater *discharge*s authorized by this permit are causing or contributing to a violation of *water quality standards*, or if the Department determines that a modification of the permit is necessary to prevent a violation of *water quality standards*, the authorized *discharge*s will no longer be eligible for coverage under this permit. The Department may require the *owner or operator* to obtain an individual SPDES permit to continue discharging.

E. Eligibility Under This General Permit

1. This permit may authorize all *discharges* of stormwater from *construction activity* to *surface waters of the State* and *groundwaters* except for ineligible *discharges* identified under subparagraph F. of this Part.

2. Except for non-stormwater *discharges* explicitly listed in the next paragraph, this permit only authorizes stormwater *discharge*s; including stormwater runoff, snowmelt runoff, and surface runoff and drainage, from *construction activities*.

3. Notwithstanding paragraphs E.1 and E.2 above, the following non-stormwater discharges are authorized by this permit: those listed in 6 NYCRR 750-1.2(a)(29)(vi), with the following exception: "Discharges from firefighting activities are authorized only when the firefighting activities are emergencies/unplanned"; waters to which other components have not been added that are used to control dust in accordance with the SWPPP; and uncontaminated *discharge*s from *construction site* de-watering operations. All non-stormwater discharges must be identified in the SWPPP. Under all circumstances, the *owner or operator* must still comply with *water quality standards* in Part I.D of this permit.

4. The *owner or operator* must maintain permit eligibility to *discharge* under this permit. Any *discharges* that are not compliant with the eligibility conditions of this permit are not authorized by the permit and the *owner or operator* must either apply for a separate permit to cover those ineligible *discharges* or take steps necessary to make the *discharge* eligible for coverage.

F. Activities Which Are Ineligible for Coverage Under This General Permit

All of the following are **not** authorized by this permit:

1. *Discharge*s after *construction activities* have been completed and the site has undergone *final stabilization*;

2. *Discharge*s that are mixed with sources of non-stormwater other than those expressly authorized under subsection E.3. of this Part and identified in the SWPPP required by this permit;

3. *Discharges* that are required to obtain an individual SPDES permit or another SPDES general permit pursuant to Part VII.K. of this permit;

4. *Construction activities* or *discharges* from *construction activities* that may adversely affect an *endangered or threatened species* unless the *owner or*

operator has obtained a permit issued pursuant to 6 NYCRR Part 182 for the project or the Department has issued a letter of non-jurisdiction for the project. All documentation necessary to demonstrate eligibility shall be maintained on site in accordance with Part II.D.2 of this permit;

5. *Discharges* which either cause or contribute to a violation of *water quality standards* adopted pursuant to the *ECL* and its accompanying regulations;

6. *Construction activities* for residential, commercial and institutional projects:

   a. Where the *discharge*s from the *construction activities* are tributary to waters of the state classified as AA or AA-s; and

   b. Which are undertaken on land with no existing *impervious cover*; and

   c. Which disturb one (1) or more acres of land designated on the current United States Department of Agriculture ("USDA") Soil Survey as Soil Slope Phase "D", (provided the map unit name is inclusive of slopes greater than 25%), or Soil Slope Phase "E" or "F" (regardless of the map unit name), or a combination of the three designations.

7. *Construction activities* for linear transportation projects and linear utility projects:

   a. Where the *discharge*s from the *construction activities* are tributary to waters of the state classified as AA or AA-s; and

   b. Which are undertaken on land with no existing *impervious cover*; and

   c. Which disturb two (2) or more acres of land designated on the current USDA Soil Survey as Soil Slope Phase "D" (provided the map unit name is inclusive of slopes greater than 25%), or Soil Slope Phase "E" or "F" (regardless of the map unit name), or a combination of the three designations.

8. *Construction activities* that have the potential to affect an *historic property*, unless there is documentation that such impacts have been resolved. The following documentation necessary to demonstrate eligibility with this requirement shall be maintained on site in accordance with Part II.D.2 of this permit and made available to the Department in accordance with Part VII.F of this permit:

   a. Documentation that the *construction activity* is not within an archeologically sensitive area indicated on the sensitivity map, and that the *construction activity* is not located on or immediately adjacent to a property listed or determined to be eligible for listing on the National or State Registers of Historic Places, and that there is no new permanent building on the *construction site* within the following distances from a building, structure, or object that is more than 50 years old, or if there is such a new permanent building on the *construction site* within those parameters that NYS Office of Parks, Recreation and Historic Preservation (OPRHP), a Historic Preservation Commission of a Certified Local Government, or a qualified preservation professional has determined that the building, structure, or object more than 50 years old is not historically/archeologically significant.

      - 1-5 acres of disturbance - 20 feet
      - 5-20 acres of disturbance - 50 feet
      - 20+ acres of disturbance - 100 feet, or

   b. DEC consultation form sent to OPRHP, and copied to the NYS DEC Agency Historic Preservation Officer (APO), and
      (i) the State Environmental Quality Review (SEQR) Environmental Assessment Form (EAF) with a negative declaration or the Findings Statement, with documentation of OPRHP's agreement with the resolution; or
      (ii) documentation from OPRHP that the *construction activity* will result in No Impact; or
      (iii) documentation from OPRHP providing a determination of No Adverse Impact; or
      (iv) a Letter of Resolution signed by the owner/operator, OPRHP and the DEC APO which allows for this *construction activity* to be eligible for coverage under the general permit in terms of the State Historic Preservation Act (SHPA); or

   c. Documentation of satisfactory compliance with Section 106 of the National Historic Preservation Act for a coterminous project area:

      (i) No Affect
      (ii) No Adverse Affect
      (iii) Executed Memorandum of Agreement, or

   d. Documentation that:

      (i) SHPA Section 14.09 has been completed by NYS DEC or another state agency.

9. *Discharge*s from *construction activities* that are subject to an existing SPDES individual or general permit where a SPDES permit for *construction activity* has been terminated or denied; or where the *owner or operator* has failed to renew an expired individual permit.

Part II. PERMIT COVERAGE

A. How to Obtain Coverage

1. An *owner or operator* of a *construction activity* that is not subject to the requirements of a regulated, traditional land use control MS4 must first prepare a SWPPP in accordance with all applicable requirements of this permit and then submit a completed Notice of Intent (NOI) to the Department to be authorized to discharge under this permit.

2. An *owner or operator* of a *construction activity* that is subject to the requirements of a *regulated, traditional land use control MS4* must first prepare a SWPPP in accordance with all applicable requirements of this permit and then have the SWPPP reviewed and accepted by the *regulated, traditional land use control MS4* prior to submitting the NOI to the Department. The *owner or operator* shall have the "MS4 SWPPP Acceptance" form signed in accordance with Part VII.H., and then submit that form along with a completed NOI to the Department.

3. The requirement for an *owner or operator* to have its SWPPP reviewed and accepted by the *regulated, traditional land use control MS4* prior to submitting the NOI to the Department does not apply to an *owner or operator* that is obtaining permit coverage in accordance with the requirements in Part II.F. (Change of *Owner or Operator*) or where the *owner or operator* of the *construction activity* is the *regulated, traditional land use control MS4* . This exemption does not apply to *construction activities* subject to the New York City Administrative Code.

B. Notice of Intent (NOI) Submittal

1. Prior to December 21, 2020, an owner or operator shall use either the electronic (eNOI) or paper version of the NOI that the Department prepared. Both versions of the NOI are located on the Department's website (http://www.dec.ny.gov/). The paper version of the NOI shall be signed in accordance with Part VII.H. of this permit and submitted to the following address:

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

2. Beginning December 21, 2020 and in accordance with EPA's 2015 NPDES Electronic Reporting Rule (40 CFR Part 127), the *owner or operator* must submit the NOI electronically using the *Department's* online NOI.

3. The *owner or operator* shall have the SWPPP preparer sign the "SWPPP Preparer Certification" statement on the NOI prior to submitting the form to the Department.

4. As of the date the NOI is submitted to the Department, the *owner or operator* shall make the NOI and SWPPP available for review and copying in accordance with the requirements in Part VII.F. of this permit.

C. Permit Authorization

1. An *owner or operator* shall not *commence construction activity* until their authorization to *discharge* under this permit goes into effect.

2. Authorization to *discharge* under this permit will be effective when the *owner or operator* has satisfied all of the following criteria:

   a. project review pursuant to the State Environmental Quality Review Act ("SEQRA") have been satisfied, when SEQRA is applicable. See the Department's website (http://www.dec.ny.gov/) for more information,

   b. where required, all necessary Department permits subject to the *Uniform Procedures Act ("UPA")* (see 6 NYCRR Part 621), or the equivalent from another New York State agency, have been obtained, unless otherwise notified by the Department pursuant to 6 NYCRR 621.3(a)(4). *Owners or operators* of *construction activities* that are required to obtain *UPA* permits

must submit a preliminary SWPPP to the appropriate DEC Permit Administrator at the Regional Office listed in Appendix F at the time all other necessary *UPA* permit applications are submitted. The preliminary SWPPP must include sufficient information to demonstrate that the *construction activity* qualifies for authorization under this permit,

   c. the final SWPPP has been prepared, and

   d. a complete NOI has been submitted to the Department in accordance with the requirements of this permit.

3. An *owner or operator* that has satisfied the requirements of Part II.C.2 above will be authorized to *discharge* stormwater from their *construction activity* in accordance with the following schedule:

   a. For *construction activities* that are not subject to the requirements of a *regulated, traditional land use control MS4*:

      (i) Five (5) business days from the date the Department receives a complete electronic version of the NOI (eNOI) for *construction activities* with a SWPPP that has been prepared in conformance with the design criteria in the technical standard referenced in Part III.B.1 and the *performance criteria* in the technical standard referenced in Parts III.B., 2 or 3, for *construction activities* that require post-construction stormwater management practices pursuant to Part III.C.; or

      (ii) Sixty (60) business days from the date the Department receives a complete NOI (electronic or paper version) for *construction activities* with a SWPPP that has not been prepared in conformance with the design criteria in technical standard referenced in Part III.B.1. or, for *construction activities* that require post-construction stormwater management practices pursuant to Part III.C., the *performance criteria* in the technical standard referenced in Parts III.B., 2 or 3, or;

      (iii) Ten (10) business days from the date the Department receives a complete paper version of the NOI for *construction activities* with a SWPPP that has been prepared in conformance with the design criteria in the technical standard referenced in Part III.B.1 and the *performance criteria* in the technical standard referenced in Parts III.B., 2 or 3, for *construction activities* that require post-construction stormwater management practices pursuant to Part III.C.

b. For *construction activities* that are subject to the requirements of a *regulated, traditional land use control MS4*:

(i) Five (5) business days from the date the Department receives both a complete electronic version of the NOI (eNOI) and signed "*MS4* SWPPP Acceptance" form, or

(ii) Ten (10) business days from the date the Department receives both a complete paper version of the NOI and signed "MS4 SWPPP Acceptance" form.

4. Coverage under this permit authorizes stormwater *discharges* from only those areas of disturbance that are identified in the NOI. If an *owner or operator* wishes to have stormwater *discharges* from future or additional areas of disturbance authorized, they must submit a new NOI that addresses that phase of the development, unless otherwise notified by the Department. The *owner or operator* shall not *commence construction activity* on the future or additional areas until their authorization to *discharge* under this permit goes into effect in accordance with Part II.C. of this permit.

D. General Requirements For Owners or Operators With Permit Coverage

1. The *owner or operator* shall 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 Department in accordance with Part V. of this permit. This includes any changes made to the SWPPP pursuant to Part III.A.4. of this permit.

2. The *owner or operator* shall maintain a copy of the General Permit (GP-0-20-001), NOI, *NOI Acknowledgment Letter*, SWPPP, MS4 SWPPP Acceptance form, inspection reports, responsible contractor's or subcontractor's certification statement (see Part III.A.6.), and all documentation necessary to demonstrate eligibility with this permit at the *construction site* until all disturbed areas have achieved *final stabilization* and the NOT has been submitted to the Department. The documents must be maintained in a secure location, such as a job trailer, on-site construction office, or mailbox with lock. The secure location must be accessible during normal business hours to an individual performing a compliance inspection.

3. The *owner or operator* of a *construction activity* shall not disturb greater than five (5) acres of soil at any one time without prior written authorization from the Department or, in areas under the jurisdiction of a *regulated, traditional land*

use control MS4, the *regulated, traditional land use control MS4* (provided the *regulated, traditional land use control MS4* is not the *owner or operator* of the *construction activity*). At a minimum, the *owner or operator* must comply with the following requirements in order to be authorized to disturb greater than five (5) acres of soil at any one time:

a. The *owner or operator* shall have a *qualified inspector* conduct **at least** two (2) site inspections in accordance with Part IV.C. of this permit every seven (7) calendar days, for as long as greater than five (5) acres of soil remain disturbed. The two (2) inspections shall be separated by a minimum of two (2) full calendar days.

b. In areas where soil disturbance activity has temporarily or permanently ceased, the application of soil stabilization measures must be initiated by the end of the next business day and completed within seven (7) days from the date the current soil disturbance activity ceased. The soil stabilization measures selected shall be in conformance with the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, dated November 2016.

c. The *owner or operator* shall prepare a phasing plan that defines maximum disturbed area per phase and shows required cuts and fills.

d. The *owner or operator* shall install any additional site-specific practices needed to protect water quality.

e. The *owner or operator* shall include the requirements above in their SWPPP.

4. In accordance with statute, regulations, and the terms and conditions of this permit, the Department may suspend or revoke an *owner's or operator's* coverage under this permit at any time if the Department determines that the SWPPP does not meet the permit requirements or consistent with Part VII.K..

5. Upon a finding of significant non-compliance with the practices described in the SWPPP or violation of this permit, the Department may order an immediate stop to all activity at the site until the non-compliance is remedied. The stop work order shall be in writing, describe the non-compliance in detail, and be sent to the *owner or operator*.

6. For *construction activities* that are subject to the requirements of a *regulated, traditional land use control MS4*, the *owner or operator* shall notify the

regulated, traditional land use control MS4 in writing of any planned amendments or modifications to the post-construction stormwater management practice component of the SWPPP required by Part III.A. 4. and 5. of this permit. Unless otherwise notified by the *regulated, traditional land use control MS4*, the *owner or operator* shall have the SWPPP amendments or modifications reviewed and accepted by the *regulated, traditional land use control MS4* prior to commencing construction of the post-construction stormwater management practice.

E. Permit Coverage for Discharges Authorized Under GP-0-15-002

1. Upon renewal of SPDES General Permit for Stormwater Discharges from *Construction Activity* (Permit No. GP-0-15-002), an *owner or operator* of *a construction activity* with coverage under GP-0-15-002, as of the effective date of GP- 0-20-001, shall be authorized to *discharge* in accordance with GP- 0-20-001, unless otherwise notified by the Department.

   An *owner or operator* may continue to implement the technical/design components of the post-construction stormwater management controls provided that such design was done in conformance with the technical standards in place at the time of initial project authorization. However, they must comply with the other, non-design provisions of GP-0-20-001.

F. Change of Owner or Operator

1. When property ownership changes or when there is a change in operational control over the construction plans and specifications, the original *owner or operator* must notify the new *owner or operator*, in writing, of the requirement to obtain permit coverage by submitting a NOI with the Department. For *construction activities* subject to the requirements of a *regulated, traditional land use control MS4,* the original *owner or operator* must also notify the MS4, in writing, of the change in ownership at least 30 calendar days prior to the change in ownership.

2. Once the new *owner or operator* obtains permit coverage, the original *owner or operator* shall then submit a completed NOT with the name and permit identification number of the new *owner or operator* to the Department at the address in Part II.B.1. of this permit. If the original *owner or operator* maintains ownership of a portion of the *construction activity* and will disturb soil, they must maintain their coverage under the permit.

3. Permit coverage for the new *owner or operator* will be effective as of the date the Department receives a complete NOI, provided the original *owner or*

operator was not subject to a sixty (60) business day authorization period that has not expired as of the date the Department receives the NOI from the new *owner or operator*.

Part III. STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

A. General SWPPP Requirements

1. A SWPPP shall be prepared and implemented by the *owner or operator* of each *construction activity* covered by this permit. The SWPPP must document the selection, design, installation, implementation and maintenance of the control measures and practices that will be used to meet the effluent limitations in Part I.B. of this permit and where applicable, the post-construction stormwater management practice requirements in Part I.C. of this permit. The SWPPP shall be prepared prior to the submittal of the NOI. The NOI shall be submitted to the Department prior to the *commencement of construction activity*. A copy of the completed, final NOI shall be included in the SWPPP.

2. The SWPPP shall describe the erosion and sediment control practices and where required, post-construction stormwater management practices that will be used and/or constructed to reduce the *pollutants* in stormwater *discharges* and to assure compliance with the terms and conditions of this permit. In addition, the SWPPP shall identify potential sources of pollution which may reasonably be expected to affect the quality of stormwater *discharges*.

3. All SWPPPs that require the post-construction stormwater management practice component shall be prepared by a *qualified professional* that is knowledgeable in the principles and practices of stormwater management and treatment.

4. The *owner or operator* must keep the SWPPP current so that it at all times accurately documents the erosion and sediment controls practices that are being used or will be used during construction, and all post-construction stormwater management practices that will be constructed on the site. At a minimum, the *owner or operator* shall amend the SWPPP, including construction drawings:

   a. whenever the current provisions prove to be ineffective in minimizing *pollutants* in stormwater *discharges* from the 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*;

c. to address issues or deficiencies identified during an inspection by the *qualified inspector,* the Department or other regulatory authority; and

d. to document the final construction conditions.

5. The Department may notify the *owner or operator* at any time that the SWPPP does not meet one or more of the minimum requirements of this permit. The notification shall be in writing and identify the provisions of the SWPPP that require modification. Within fourteen (14) calendar days of such notification, or as otherwise indicated by the Department, the *owner or operator* shall make the required changes to the SWPPP and submit written notification to the Department that the changes have been made. If the *owner or operator* does not respond to the Department's comments in the specified time frame, the Department may suspend the *owner's or operator's* coverage under this permit or require the *owner or operator* to obtain coverage under an individual SPDES permit in accordance with Part II.D.4. of this permit.

6. Prior to the *commencement of construction activity*, the *owner or operator* must identify the contractor(s) and subcontractor(s) that will be responsible for installing, constructing, repairing, replacing, inspecting and maintaining the erosion and sediment control practices included in the SWPPP; and the contractor(s) and subcontractor(s) that will be responsible for constructing the post-construction stormwater management practices included in the SWPPP. The *owner or operator* shall have each of the contractors and subcontractors identify at least one person from their company that will be responsible for implementation of the SWPPP. This person shall be known as the *trained contractor.* The *owner or operator* shall ensure that at least one *trained contractor* is on site on a daily basis when soil disturbance activities are being performed.

   The *owner or operator* shall have each of the contractors and subcontractors identified above sign a copy of the following certification statement below before they commence any *construction activity*:

   "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 the *owner or operator* must comply with

the terms and conditions of the most current version of the New York State Pollutant Discharge Elimination System ("SPDES") general permit for stormwater *discharge*s from *construction activities* and 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"

In addition to providing the certification statement above, the certification page must also identify the specific elements of the SWPPP that each contractor and subcontractor will be responsible for and include the name and title of the person providing the signature; the name and title of the *trained contractor* responsible for SWPPP implementation; the name, address and telephone number of the contracting firm; the address (or other identifying description) of the site; and the date the certification statement is signed. The *owner or operator* shall attach the certification statement(s) to the copy of the SWPPP that is maintained at the *construction site*. If new or additional contractors are hired to implement measures identified in the SWPPP after construction has commenced, they must also sign the certification statement and provide the information listed above.

7. For projects where the Department requests a copy of the SWPPP or inspection reports, the *owner or operator* shall submit the documents in both electronic (PDF only) and paper format within five (5) business days, unless otherwise notified by the Department.

B. Required SWPPP Contents

1. Erosion and sediment control component - All SWPPPs prepared pursuant to this permit shall include erosion and sediment control practices designed in conformance with the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, dated November 2016. Where erosion and sediment control practices are not designed in conformance with the design criteria included in the technical standard, the *owner or operator* must demonstrate *equivalence* to the technical standard. At a minimum, the erosion and sediment control component of the SWPPP shall include the following:

   a. Background information about the scope of the project, including the location, type and size of project

b. A site map/construction drawing(s) for the project, including a general location map. At a minimum, the site map shall show the total site area; all improvements; areas of disturbance; areas that will not be disturbed; existing vegetation; on-site and adjacent off-site surface water(s); floodplain/floodway boundaries; wetlands and drainage patterns that could be affected by the *construction activity*; existing and final contours ; locations of different soil types with boundaries; material, waste, borrow or equipment storage areas located on adjacent properties; and location(s) of the stormwater *discharge*(s);

c. A description of the soil(s) present at the site, including an identification of the Hydrologic Soil Group (HSG);

d. A construction phasing plan and sequence of operations describing the intended order of *construction activities*, including clearing and grubbing, excavation and grading, utility and infrastructure installation and any other activity at the site that results in soil disturbance;

e. A description of the minimum erosion and sediment control practices to be installed or implemented for each *construction activity* that will result in soil disturbance. Include a schedule that identifies the timing of initial placement or implementation of each erosion and sediment control practice and the minimum time frames that each practice should remain in place or be implemented;

f. A temporary and permanent soil stabilization plan that meets the requirements of this general permit and the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, dated November 2016, for each stage of the project, including initial land clearing and grubbing to project completion and achievement of *final stabilization*;

g. A site map/construction drawing(s) showing the specific location(s), size(s), and length(s) of each erosion and sediment control practice;

h. The dimensions, material specifications, installation details, and operation and maintenance requirements for all erosion and sediment control practices. Include the location and sizing of any temporary sediment basins and structural practices that will be used to divert flows from exposed soils;

i. A maintenance inspection schedule for the contractor(s) identified in Part III.A.6. of this permit, to ensure continuous and effective operation of the erosion and sediment control practices. The maintenance inspection

schedule shall be in accordance with the requirements in the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, dated November 2016;

j. A description of the pollution prevention measures that will be used to control litter, construction chemicals and construction debris from becoming a *pollutant* source in the stormwater *discharges*;

k. A description and location of any stormwater *discharges* associated with industrial activity other than construction at the site, including, but not limited to, stormwater *discharges* from asphalt plants and concrete plants located on the *construction site*; and

l. Identification of any elements of the design that are not in conformance with the design criteria in the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, dated November 2016. Include the reason for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is *equivalent* to the technical standard.

2. Post-construction stormwater management practice component – The *owner or operator* of any construction project identified in Table 2 of Appendix B as needing post-construction stormwater management practices shall prepare a SWPPP that includes practices designed in conformance with the applicable *sizing criteria* in Part I.C.2.a., c. or d. of this permit and the *performance criteria* in the technical standard, New York State Stormwater Management Design Manual dated January 2015

   Where post-construction stormwater management practices are not designed in conformance with the *performance criteria* in the technical standard, the *owner or operator* must include in the SWPPP the reason(s) for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is *equivalent* to the technical standard.

   The post-construction stormwater management practice component of the SWPPP shall include the following:

   a. Identification of all post-construction stormwater management practices to be constructed as part of the project. Include the dimensions, material specifications and installation details for each post-construction stormwater management practice;

b. A site map/construction drawing(s) showing the specific location and size of each post-construction stormwater management practice;

c. A Stormwater Modeling and Analysis Report that includes:
   (i) Map(s) showing pre-development conditions, including watershed/subcatchments boundaries, flow paths/routing, and design points;

   (ii) Map(s) showing post-development conditions, including watershed/subcatchments boundaries, flow paths/routing, design points and post-construction stormwater management practices;

   (iii) Results of stormwater modeling (i.e. hydrology and hydraulic analysis) for the required storm events. Include supporting calculations (model runs), methodology, and a summary table that compares pre and post-development runoff rates and volumes for the different storm events;

   (iv) Summary table, with supporting calculations, which demonstrates that each post-construction stormwater management practice has been designed in conformance with the *sizing criteria* included in the Design Manual;

   (v) Identification of any *sizing criteria* that is not required based on the requirements included in Part I.C. of this permit; and

   (vi) Identification of any elements of the design that are not in conformance with the *performance criteria* in the Design Manual. Include the reason(s) for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is *equivalent* to the Design Manual;

d. Soil testing results and locations (test pits, borings);

e. Infiltration test results, when required; and

f. An operations and maintenance plan that includes inspection and maintenance schedules and actions to ensure continuous and effective operation of each post-construction stormwater management practice. The plan shall identify the entity that will be responsible for the long term operation and maintenance of each practice.

3. Enhanced Phosphorus Removal Standards - All construction projects identified in Table 2 of Appendix B that are located in the watersheds identified in Appendix C shall prepare a SWPPP that includes post-construction stormwater management practices designed in conformance with the applicable *sizing criteria* in Part I.C.2. b., c. or d. of this permit and the *performance criteria,* Enhanced Phosphorus Removal Standards included in the Design Manual. At a minimum, the post-construction stormwater management practice component of the SWPPP shall include items 2.a - 2.f. above.

C. Required SWPPP Components by Project Type

Unless otherwise notified by the Department, *owners or operators* of *construction activities* identified in Table 1 of Appendix B are required to prepare a SWPPP that only includes erosion and sediment control practices designed in conformance with Part III.B.1 of this permit. *Owners or operators* of the *construction activities* identified in Table 2 of Appendix B shall prepare a SWPPP that also includes post-construction stormwater management practices designed in conformance with Part III.B.2 or 3 of this permit.

Part IV. INSPECTION AND MAINTENANCE REQUIREMENTS

A. General Construction Site Inspection and Maintenance Requirements

1. The *owner or operator* must ensure that all erosion and sediment control practices (including pollution prevention measures) and all post-construction stormwater management practices identified in the SWPPP are inspected and maintained in accordance with Part IV.B. and C. of this permit.

2. The terms of this permit shall not be construed to prohibit the State of New York from exercising any authority pursuant to the ECL, common law or federal law, or prohibit New York State from taking any measures, whether civil or criminal, to prevent violations of the laws of the State of New York or protect the public health and safety and/or the environment.

B. Contractor Maintenance Inspection Requirements

1. The *owner or operator* of each *construction activity* identified in Tables 1 and 2 of Appendix B shall have a *trained contractor* 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 condition 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.

2. 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 *trained contractor* can stop conducting the maintenance inspections. The *trained contractor* shall begin conducting the maintenance inspections in accordance with Part IV.B.1. of this permit as soon as soil disturbance activities resume.

3. For construction sites where soil disturbance activities have been shut down with partial project completion, the *trained contractor* can stop conducting the maintenance inspections if 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.

C. Qualified Inspector Inspection Requirements

The *owner or operator* shall have a *qualified inspector* conduct site inspections in conformance with the following requirements:

[Note: The *trained contractor* identified in Part III.A.6. and IV.B. of this permit **cannot** conduct the *qualified inspector* site inspections unless they meet the *qualified inspector* qualifications included in Appendix A. In order to perform these inspections, the *trained contractor* would have to be a:

- licensed Professional Engineer,
- Certified Professional in Erosion and Sediment Control (CPESC),
- New York State Erosion and Sediment Control Certificate Program holder
- 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].

1. A *qualified inspector* shall conduct site inspections for all *construction activities* identified in Tables 1 and 2 of Appendix B, with the exception of:

   a. the construction of a single family residential subdivision with 25% or less *impervious cover* at total site build-out that involves a soil disturbance of one (1) or more acres of land but less than five (5) acres and is not located

in one of the watersheds listed in Appendix C and not directly discharging to one of the 303(d) segments listed in Appendix E;

   b. the construction of a single family home that involves a soil disturbance of one (1) or more acres of land but less than five (5) acres and is not located in one of the watersheds listed in Appendix C and not directly discharging to one of the 303(d) segments listed in Appendix E;

   c. construction on agricultural property that involves a soil disturbance of one (1) or more acres of land but less than five (5) acres; and

   d. *construction activities* located in the watersheds identified in Appendix D that involve soil disturbances between five thousand (5,000) square feet and one (1) acre of land.

2. Unless otherwise notified by the Department, the *qualified inspector* shall conduct site inspections in accordance with the following timetable:

   a. For construction sites where soil disturbance activities are on-going, the *qualified inspector* shall conduct a site inspection at least once every seven (7) calendar days.

   b. For construction sites where soil disturbance activities are on-going and the *owner or operator* has received authorization in accordance with Part II.D.3 to disturb greater than five (5) acres of soil at any one time, the *qualified inspector* shall conduct at least two (2) site inspections every seven (7) calendar days. The two (2) inspections shall be separated by a minimum of two (2) full calendar days.

   c. 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 *qualified inspector* shall conduct a site inspection at least once every thirty (30) calendar days. The *owner or operator* shall notify the DOW Water (SPDES) Program contact at the Regional Office (see contact information in Appendix F) or, in areas under the jurisdiction of a *regulated, traditional land use control MS4,* the *regulated, traditional land use control MS4* (provided the *regulated, traditional land use control MS4* is not the *owner or operator* of the *construction activity*) in writing prior to reducing the frequency of inspections.

d. For construction sites where soil disturbance activities have been shut down with partial project completion, the *qualified inspector* can stop conducting inspections if 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 *owner or operator* shall notify the DOW Water (SPDES) Program contact at the Regional Office (see contact information in Appendix F) or, in areas under the jurisdiction of a *regulated, traditional land use control MS4,* the *regulated, traditional land use control MS4* (provided the *regulated, traditional land use control MS4* is not the *owner or operator* of the *construction activity*) in writing prior to the shutdown. If soil disturbance activities are not resumed within 2 years from the date of shutdown, the *owner or operator* shall have the *qualified inspector* perform a final inspection and certify that all disturbed areas have achieved *final stabilization,* and all temporary, structural erosion and sediment control measures have been removed*;* and that all post-construction stormwater management practices have been constructed in conformance with the SWPPP by signing the "*Final Stabilization*" and "Post-Construction Stormwater Management Practice" certification statements on the NOT. The *owner or operator* shall then submit the completed NOT form to the address in Part II.B.1 of this permit.

e. For construction sites that directly *discharge* to one of the 303(d) segments listed in Appendix E or is located in one of the watersheds listed in Appendix C, the *qualified inspector* shall conduct at least two (2) site inspections every seven (7) calendar days. The two (2) inspections shall be separated by a minimum of two (2) full calendar days.

3. At a minimum, the *qualified inspector* shall inspect all erosion and sediment control practices and pollution prevention measures to ensure integrity and effectiveness, all post-construction stormwater management practices under construction to ensure that they are constructed in conformance with the SWPPP, all areas of disturbance that have not achieved *final stabilization,* all points of *discharge* to natural surface waterbodies located within, or immediately adjacent to, the property boundaries of the *construction site*, and all points of *discharge* from the *construction site*.

4. The *qualified inspector* shall prepare an inspection report subsequent to each and every inspection. At a minimum, the inspection report shall include and/or address the following:

a. Date and time of inspection;

b. Name and title of person(s) performing inspection;

c. A description of the weather and soil conditions (e.g. dry, wet, saturated) at the time of the inspection;

d. 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;

e. 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;

f. Identification of all erosion and sediment control practices and pollution prevention measures that need repair or maintenance;

g. 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;

h. 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;

i. 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;

j. 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);

k. Identification and status of all corrective actions that were required by previous inspection; and

l. Digital photographs, with date stamp, that clearly show the condition of all practices that have been identified as needing corrective actions. The *qualified inspector* 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* 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* shall attach 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.

5. Within one business day of the completion of an inspection, the *qualified inspector* shall notify the *owner or operator* and appropriate contractor or subcontractor identified in Part III.A.6. of this permit of any corrective actions that need to be taken. The contractor or subcontractor shall begin implementing the corrective actions within one business day of this notification and shall complete the corrective actions in a reasonable time frame.

6. All inspection reports shall be signed by the *qualified inspector.* Pursuant to Part II.D.2. of this permit, the inspection reports shall be maintained on site with the SWPPP.

Part V. TERMINATION OF PERMIT COVERAGE

A. Termination of Permit Coverage

1. An *owner or operator* that is eligible to terminate coverage under this permit must submit a completed NOT form to the address in Part II.B.1 of this permit. The NOT form shall be one which is associated with this permit, signed in accordance with Part VII.H of this permit.

2. An *owner or operator* may terminate coverage when one or more the following conditions have been met:

   a. Total project completion - All *construction activity* identified in the SWPPP has been completed; and all areas of disturbance have achieved *final stabilization*; and all temporary, structural erosion and sediment control measures have been removed; and all post-construction stormwater management practices have been constructed in conformance with the SWPPP and are operational;

   b. Planned shutdown with partial project completion - All soil disturbance activities have ceased; and all areas disturbed as of the project shutdown date have achieved *final stabilization*; and all temporary, structural erosion and sediment control measures have been removed; 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;

   c. A new *owner or operator* has obtained coverage under this permit in accordance with Part II.F. of this permit.

   d. The *owner or operator* obtains coverage under an alternative SPDES general permit or an individual SPDES permit.

3. For *construction activities* meeting subdivision 2a. or 2b. of this Part, the *owner or operator* shall have the *qualified inspector* perform a final site inspection prior to submitting the NOT. The *qualified inspector* shall, by signing the "*Final Stabilization*" and "Post-Construction Stormwater Management Practice certification statements on the NOT, certify that all the requirements in Part V.A.2.a. or b. of this permit have been achieved.

4. For *construction activities* that are subject to the requirements of a *regulated, traditional land use control MS4* and meet subdivision 2a. or 2b. of this Part, the *owner or operator* shall have the *regulated, traditional land use control MS4* sign the "MS4 Acceptance" statement on the NOT in accordance with the requirements in Part VII.H. of this permit. The *regulated, traditional land use control MS4* official, by signing this statement, has determined that it is acceptable for the *owner or operator* to submit the NOT in accordance with the requirements of this Part. The *regulated, traditional land use control MS4* can make this determination by performing a final site inspection themselves or by accepting the *qualified inspector*'s final site inspection certification(s) required in Part V.A.3. of this permit.

5. For *construction activities* that require post-construction stormwater management practices and meet subdivision 2a. of this Part, the *owner or operator* must, prior to submitting the NOT, ensure one of the following:

   a. the post-construction stormwater management practice(s) and any right-of-way(s) needed to maintain such practice(s) have been deeded to the municipality in which the practice(s) is located,

b. an executed maintenance agreement is in place with the municipality that will maintain the post-construction stormwater management practice(s),

c. for post-construction stormwater management practices that are privately owned, the *owner or operator* has a mechanism 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,

d. for post-construction stormwater management practices that are owned by a public or private institution (e.g. school, university, hospital), government agency or authority, or public utility; the *owner or operator* has policy and procedures in place that ensures operation and maintenance of the practices in accordance with the operation and maintenance plan.

Part VI. REPORTING AND RETENTION RECORDS

A. Record Retention

The *owner or operator* shall retain a copy of the NOI, NOI Acknowledgment Letter, SWPPP, MS4 SWPPP Acceptance form and any inspection reports that were prepared in conjunction with this permit for a period of at least five (5) years from the date that the Department receives a complete NOT submitted in accordance with Part V. of this general permit.

B. Addresses

With the exception of the NOI, NOT, and MS4 SWPPP Acceptance form (which must be submitted to the address referenced in Part II.B.1 of this permit), all written correspondence requested by the Department, including individual permit applications, shall be sent to the address of the appropriate DOW Water (SPDES) Program contact at the Regional Office listed in Appendix F.

Part VII. STANDARD PERMIT CONDITIONS

A. Duty to Comply

The *owner or operator* must comply with all conditions of this permit. All contractors and subcontractors associated with the project must comply with the terms of the SWPPP. Any non-compliance with this permit constitutes a violation of the Clean Water

Act (CWA) and the ECL and is grounds for an enforcement action against the *owner or operator* and/or the contractor/subcontractor; permit revocation, suspension or modification; or denial of a permit renewal application. Upon a finding of significant non-compliance with this permit or the applicable SWPPP, the Department may order an immediate stop to all *construction activity* at the site until the non-compliance is remedied. The stop work order shall be in writing, shall describe the non-compliance in detail, and shall be sent to the *owner or operator*.

If any human remains or archaeological remains are encountered during excavation, the *owner or operator* must immediately cease, or cause to cease, all *construction activity* in the area of the remains and notify the appropriate Regional Water Engineer (RWE). *Construction activity* shall not resume until written permission to do so has been received from the RWE.

B. Continuation of the Expired General Permit

This permit expires five (5) years from the effective date. If a new general permit is not issued prior to the expiration of this general permit, an *owner or operator* with coverage under this permit may continue to operate and *discharge* in accordance with the terms and conditions of this general permit, if it is extended pursuant to the State Administrative Procedure Act and 6 NYCRR Part 621, until a new general permit is issued.

C. Enforcement

Failure of the *owner or operator,* its contractors, subcontractors, agents and/or assigns to strictly adhere to any of the permit requirements contained herein shall constitute a violation of this permit. There are substantial criminal, civil, and administrative penalties associated with violating the provisions of this permit. Fines of up to $37,500 per day for each violation and imprisonment for up to fifteen (15) years may be assessed depending upon the nature and degree of the offense.

D. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for an *owner or operator* in an enforcement action that it would have been necessary to halt or reduce the *construction activity* in order to maintain compliance with the conditions of this permit.

E. Duty to Mitigate

The *owner or operator* and its contractors and subcontractors shall take all reasonable steps to *minimize* or prevent any *discharge* in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

F. Duty to Provide Information

The *owner or operator* shall furnish to the Department, within a reasonable specified time period of a written request, all documentation necessary to demonstrate eligibility and any information to determine compliance with this permit or to determine whether cause exists for modifying or revoking this permit, or suspending or denying coverage under this permit, in accordance with the terms and conditions of this permit. The NOI, SWPPP and inspection reports required by this permit are public documents that the *owner or operator* must make available for review and copying by any person within five (5) business days of the *owner or operator* receiving a written request by any such person to review these documents. Copying of documents will be done at the requester's expense.

G. Other Information

When the *owner or operator* becomes aware that they failed to submit any relevant facts, or submitted incorrect information in the NOI or in any of the documents required by this permit , or have made substantive revisions to the SWPPP (e.g. the scope of the project changes significantly, the type of post-construction stormwater management practice(s) changes, there is a reduction in the sizing of the post-construction stormwater management practice, or there is an increase in the disturbance area or *impervious area*), which were not reflected in the original NOI submitted to the Department, they shall promptly submit such facts or information to the Department using the contact information in Part II.A. of this permit. Failure of the *owner or operator* to correct or supplement any relevant facts within five (5) business days of becoming aware of the deficiency shall constitute a violation of this permit.

H. Signatory Requirements

1. All NOIs and NOTs shall be signed as follows:

   a. For a corporation these forms shall be signed by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means:

   (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal 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 these forms shall be signed by a general partner or the proprietor, respectively; or

   c. For a municipality, State, Federal, or other public agency these forms 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).

2. The SWPPP and other information requested by the Department shall be signed by a person described in Part VII.H.1. of this permit or by a duly authorized representative of that person. A person is a duly authorized representative only if:

   a. The authorization is made in writing by a person described in Part VII.H.1. of this permit;

   b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field,

superintendent, position of *equivalent* responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position) and,

c. The written authorization shall include the name, title and signature of the authorized representative and be attached to the SWPPP.

3. All inspection reports shall be signed by the *qualified inspector* that performs the inspection.

4. The MS4 SWPPP Acceptance form shall be signed by the principal executive officer or ranking elected official from the *regulated, traditional land use control MS4,* or by a duly authorized representative of that person.

   It shall constitute a permit violation if an incorrect and/or improper signatory authorizes any required forms, SWPPP and/or inspection reports.

I. Property Rights

The issuance of this permit does not convey any property rights of any sort, nor any exclusive privileges, nor does it authorize any injury to private property nor any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations. *Owners or operators* must obtain any applicable conveyances, easements, licenses and/or access to real property prior to *commencing construction activity*.

J. Severability

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit shall not be affected thereby.

K. Requirement to Obtain Coverage Under an Alternative Permit

1. The Department may require any owner or operator authorized by this permit to apply for and/or obtain either an individual SPDES permit or another SPDES general permit. When the Department requires any discharger authorized by a general permit to apply for an individual SPDES permit, it shall notify the discharger in writing that a permit application is required. This notice shall

include a brief statement of the reasons for this decision, an application form, a statement setting a time frame for the owner or operator to file the application for an individual SPDES permit, and a deadline, not sooner than 180 days from owner or operator receipt of the notification letter, whereby the authorization to discharge under this general permit shall be terminated. Applications must be submitted to the appropriate Permit Administrator at the Regional Office. The Department may grant additional time upon demonstration, to the satisfaction of the Department, that additional time to apply for an alternative authorization is necessary or where the Department has not provided a permit determination in accordance with Part 621 of this Title.

2. When an individual SPDES permit is issued to a discharger authorized to *discharge* under a general SPDES permit for the same *discharge*(s), the general permit authorization for outfalls authorized under the individual SPDES permit is automatically terminated on the effective date of the individual permit unless termination is earlier in accordance with 6 NYCRR Part 750.

L. Proper Operation and Maintenance

The *owner or operator* shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the *owner or operator* to achieve compliance with the conditions of this permit and with the requirements of the SWPPP.

M. Inspection and Entry

The *owner or operator* shall allow an authorized representative of the Department, EPA, applicable county health department, or, in the case of a *construction site* which *discharges* through an *MS4*, an authorized representative of the *MS4* receiving the discharge, upon the presentation of credentials and other documents as may be required by law, to:

1. Enter upon the owner's or operator's premises where a regulated facility or activity is located or conducted or where records must be kept under the conditions of this permit;

2. Have access to and copy at reasonable times, any records that must be kept under the conditions of this permit; and

3. Inspect at reasonable times any facilities or equipment (including monitoring and control equipment), practices or operations regulated or required by this permit.

4. Sample or monitor at reasonable times, for purposes of assuring permit compliance or as otherwise authorized by the Act or ECL, any substances or parameters at any location.

N. Permit Actions

This permit may, at any time, be modified, suspended, revoked, or renewed by the Department in accordance with 6 NYCRR Part 621. The filing of a request by the *owner or operator* for a permit modification, revocation and reissuance, termination, a notification of planned changes or anticipated noncompliance does not limit, diminish and/or stay compliance with any terms of this permit.

O. Definitions

Definitions of key terms are included in Appendix A of this permit.

P. Re-Opener Clause

1. If there is evidence indicating potential or realized impacts on water quality due to any stormwater discharge associated with construction activity covered by this permit, the owner or operator of such discharge may be required to obtain an individual permit or alternative general permit in accordance with Part VII.K. of this permit or the permit may be modified to include different limitations and/or requirements.

2. Any Department initiated permit modification, suspension or revocation will be conducted in accordance with 6 NYCRR Part 621, 6 NYCRR 750-1.18, and 6 NYCRR 750-1.20.

Q. Penalties for Falsification of Forms and Reports

In accordance with 6NYCRR Part 750-2.4 and 750-2.5, any person who knowingly makes any false material statement, representation, or certification in any application, record, report or other document filed or required to be maintained under this permit, including reports of compliance or noncompliance shall, upon conviction, be punished in accordance with ECL §71-1933 and or Articles 175 and 210 of the New York State Penal Law.

R. Other Permits

Nothing in this permit relieves the *owner or operator* from a requirement to obtain any other permits required by law.

APPENDIX A – Acronyms and Definitions

Acronyms

APO – Agency Preservation Officer
BMP – Best Management Practice
CPESC – Certified Professional in Erosion and Sediment Control
Cpv – Channel Protection Volume
CWA – Clean Water Act (or the Federal Water Pollution Control Act, 33 U.S.C. §1251 et seq)
DOW – Division of Water
EAF – Environmental Assessment Form
ECL - Environmental Conservation Law
EPA – U. S. Environmental Protection Agency
HSG – Hydrologic Soil Group
MS4 – Municipal Separate Storm Sewer System
NOI – Notice of Intent
NOT – Notice of Termination
NPDES – National Pollutant Discharge Elimination System
OPRHP – Office of Parks, Recreation and Historic Places
Qf – Extreme Flood
Qp – Overbank Flood
RRv – Runoff Reduction Volume
RWE – Regional Water Engineer
SEQR – State Environmental Quality Review
SEQRA - State Environmental Quality Review Act
SHPA – State Historic Preservation Act
SPDES – State Pollutant Discharge Elimination System
SWPPP – Stormwater Pollution Prevention Plan
TMDL – Total Maximum Daily Load
UPA – Uniform Procedures Act
USDA – United States Department of Agriculture
WQv – Water Quality Volume

Definitions

All definitions in this section are solely for the purposes of this permit.

Agricultural Building – a structure designed and constructed to house farm implements, hay, grain, poultry, livestock or other horticultural products; excluding any structure designed, constructed or used, in whole or in part, for human habitation, as a place of employment where agricultural products are processed, treated or packaged, or as a place used by the public.

Agricultural Property –means the land for construction of a barn, *agricultural building*, silo, stockyard, pen or other structural practices identified in Table II in the "Agricultural Management Practices Catalog for Nonpoint Source Pollution in New York State" prepared by the Department in cooperation with agencies of New York Nonpoint Source Coordinating Committee (dated June 2007).

Alter Hydrology from Pre to Post-Development Conditions - means the post-development peak flow rate(s) has increased by more than 5% of the pre-developed condition for the design storm of interest (e.g. 10 yr and 100 yr).

Combined Sewer - means a sewer that is designed to collect and convey both "sewage" and "stormwater".

Commence (Commencement of) Construction Activities - means the initial disturbance of soils associated with clearing, grading or excavation activities; or other construction related activities that disturb or expose soils such as demolition, stockpiling of fill material, and the initial installation of erosion and sediment control practices required in the SWPPP. See definition for "*Construction Activity(ies)*" also.

Construction Activity(ies) - means any clearing, grading, excavation, filling, demolition or stockpiling activities that result in soil disturbance. Clearing activities can include, but are not limited to, logging equipment operation, the cutting and skidding of trees, stump removal and/or brush root removal. Construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of a facility.

Construction Site – means the land area where *construction activity(ies)* will occur. See definition for "*Commence (Commencement of) Construction Activities"* and "*Larger Common Plan of Development or Sale" also.*

Dewatering – means the act of draining rainwater and/or groundwater from building foundations, vaults or excavations/trenches.

Direct Discharge (to a specific surface waterbody) - means that runoff flows from a *construction site* by overland flow and the first point of discharge is the specific surface waterbody, or runoff flows from a *construction site* to a separate storm sewer system

and the first point of discharge from the separate storm sewer system is the specific surface waterbody.

Discharge(s) - means any addition of any pollutant to waters of the State through an outlet or *point source*.

Embankment –means an earthen or rock slope that supports a road/highway.

Endangered or Threatened Species – see 6 NYCRR Part 182 of the Department's rules and regulations for definition of terms and requirements.

Environmental Conservation Law (ECL) - means chapter 43-B of the Consolidated Laws of the State of New York, entitled the Environmental Conservation Law.

Equivalent (Equivalence) – means that the practice or measure meets all the performance, longevity, maintenance, and safety objectives of the technical standard and will provide an equal or greater degree of water quality protection.

Final Stabilization - means that all soil disturbance activities have ceased and a uniform, perennial vegetative cover with a density of eighty (80) percent over the entire pervious surface has been established; or other equivalent stabilization measures, such as permanent landscape mulches, rock rip-rap or washed/crushed stone have been applied on all disturbed areas that are not covered by permanent structures, concrete or pavement.

General SPDES permit - means a SPDES permit issued pursuant to 6 NYCRR Part 750-1.21 and Section 70-0117 of the ECL authorizing a category of discharges.

Groundwater(s) - means waters in the saturated zone. The saturated zone is a subsurface zone in which all the interstices are filled with water under pressure greater than that of the atmosphere. Although the zone may contain gas-filled interstices or interstices filled with fluids other than water, it is still considered saturated.

Historic Property – means any building, structure, site, object or district that is listed on the State or National Registers of Historic Places or is determined to be eligible for listing on the State or National Registers of Historic Places.

Impervious Area (Cover) - means all impermeable surfaces that cannot effectively infiltrate rainfall. This includes paved, concrete and gravel surfaces (i.e. parking lots, driveways, roads, runways and sidewalks); building rooftops and miscellaneous impermeable structures such as patios, pools, and sheds.

Infeasible – means not technologically possible, or not economically practicable and achievable in light of best industry practices.

Larger Common Plan of Development or Sale - means a contiguous area where multiple separate and distinct *construction activities* are occurring, or will occur, under one plan. The term "plan" in "larger common plan of development or sale" is broadly defined as any announcement or piece of documentation (including a sign, public notice or hearing, marketing plan, advertisement, drawing, permit application, State Environmental Quality Review Act (SEQRA) environmental assessment form or other documents, zoning request, computer design, etc.) or physical demarcation (including boundary signs, lot stakes, surveyor markings, etc.) indicating that *construction activities* may occur on a specific plot.

For discrete construction projects that are located within a larger common plan of development or sale that are at least 1/4 mile apart, each project can be treated as a separate plan of development or sale provided any interconnecting road, pipeline or utility project that is part of the same "common plan" is not concurrently being disturbed.

Minimize – means reduce and/or eliminate to the extent achievable using control measures (including best management practices) that are technologically available and economically practicable and achievable in light of best industry practices.

Municipal Separate Storm Sewer (MS4) - a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains):

(i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to surface waters of the State*;*
(ii) Designed or used for collecting or conveying stormwater;
(iii) Which is not a *combined sewer*; and
(iv) Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2.

National Pollutant Discharge Elimination System (NPDES) - means the national system for the issuance of wastewater and stormwater permits under the Federal Water Pollution Control Act (Clean Water Act).

Natural Buffer –means an undisturbed area with natural cover running along a surface water (e.g. wetland, stream, river, lake, etc.).

New Development – means any land disturbance that does not meet the definition of Redevelopment Activity included in this appendix.

New York State Erosion and Sediment Control Certificate Program – a certificate program that establishes and maintains a process to identify and recognize individuals who are capable of developing, designing, inspecting and maintaining erosion and sediment control plans on projects that disturb soils in New York State. The certificate program is administered by the New York State Conservation District Employees Association.

NOI Acknowledgment Letter - means the letter that the Department sends to an owner or operator to acknowledge the Department's receipt and acceptance of a complete Notice of Intent. This letter documents the owner's or operator's authorization to discharge in accordance with the general permit for stormwater discharges from *construction activity*.

Nonpoint Source - means any source of water pollution or pollutants which is not a discrete conveyance or *point source* permitted pursuant to Title 7 or 8 of Article 17 of the Environmental Conservation Law (see ECL Section 17-1403).

Overbank –means flow events that exceed the capacity of the stream channel and spill out into the adjacent floodplain.

Owner or Operator - means the person, persons or legal entity which owns or leases the property on which the *construction activity* is occurring; an entity that has operational control over the construction plans and specifications, including the ability to make modifications to the plans and specifications; and/or an entity that has day-to-day operational control of those activities at a project that are necessary to ensure compliance with the permit conditions.

Performance Criteria – means the design criteria listed under the "Required Elements" sections in Chapters 5, 6 and 10 of the technical standard, New York State Stormwater Management Design Manual, dated January 2015. It does not include the Sizing Criteria (i.e. WQv, RRv, Cpv, Qp and Qf) in Part I.C.2. of the permit.

Point Source - means any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, vessel or other floating craft, or landfill leachate collection system from which *pollutants* are or may be discharged.

Pollutant - means dredged spoil, filter backwash, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand and industrial, municipal, agricultural waste and ballast discharged into water; which may cause or might reasonably be expected to cause pollution of the waters of the state in contravention of the standards or guidance values adopted as provided in 6 NYCRR Parts 700 et seq .

Qualified Inspector - means a person that is knowledgeable in the principles and practices of erosion and sediment control, such as a licensed Professional Engineer, Certified Professional in Erosion and Sediment Control (CPESC), Registered Landscape Architect, New York State Erosion and Sediment Control Certificate Program holder 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.

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.

Redevelopment Activity(ies) – means the disturbance and reconstruction of existing impervious area, including impervious areas that were removed from a project site within five (5) years of preliminary project plan submission to the local government (i.e. site plan, subdivision, etc.).

Regulated, Traditional Land Use Control MS4 - means a city, town or village with land use control authority that is authorized to discharge under New York State DEC's

SPDES General Permit For Stormwater Discharges from Municipal Separate Stormwater Sewer Systems (MS4s) or the City of New York's Individual SPDES Permit for their Municipal Separate Storm Sewer Systems (NY-0287890).

Routine Maintenance Activity - means *construction activity* that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of a facility, including, but not limited to:

- Re-grading of gravel roads or parking lots,
- Cleaning and shaping of existing roadside ditches and culverts that maintains the approximate original line and grade, and hydraulic capacity of the ditch,
- Cleaning and shaping of existing roadside ditches that does not maintain the approximate original grade, hydraulic capacity and purpose of the ditch if the changes to the line and grade, hydraulic capacity or purpose of the ditch are installed to improve water quality and quantity controls (e.g. installing grass lined ditch),
- Placement of aggregate shoulder backing that stabilizes the transition between the road shoulder and the ditch or *embankment*,
- Full depth milling and filling of existing asphalt pavements, replacement of concrete pavement slabs, and similar work that does not expose soil or disturb the bottom six (6) inches of subbase material,
- Long-term use of equipment storage areas at or near highway maintenance facilities,
- Removal of sediment from the edge of the highway to restore a previously existing sheet-flow drainage connection from the highway surface to the highway ditch or *embankment*,
- Existing use of Canal Corp owned upland disposal sites for the canal, and
- Replacement of curbs, gutters, sidewalks and guide rail posts.

Site limitations – means site conditions that prevent the use of an infiltration technique and or infiltration of the total WQv. Typical site limitations include: seasonal high groundwater, shallow depth to bedrock, and soils with an infiltration rate less than 0.5 inches/hour. The existence of site limitations shall be confirmed and documented using actual field testing (i.e. test pits, soil borings, and infiltration test) or using information from the most current United States Department of Agriculture (USDA) Soil Survey for the County where the project is located.

Sizing Criteria – means the criteria included in Part I.C.2 of the permit that are used to size post-construction stormwater management control practices. The criteria include; Water Quality Volume (WQv), Runoff Reduction Volume (RRv), Channel Protection Volume (Cpv), *Overbank* Flood (Qp), and Extreme Flood (Qf).

State Pollutant Discharge Elimination System (SPDES) - means the system established pursuant to Article 17 of the ECL and 6 NYCRR Part 750 for issuance of permits authorizing discharges to the waters of the state.

Steep Slope – means land area designated on the current United States Department of Agriculture ("USDA") Soil Survey as Soil Slope Phase "D", (provided the map unit name is inclusive of slopes greater than 25%) , or Soil Slope Phase E or F, (regardless of the map unit name), or a combination of the three designations.

Streambank – as used in this permit, means the terrain alongside the bed of a creek or stream. The bank consists of the sides of the channel, between which the flow is confined.

Stormwater Pollution Prevention Plan (SWPPP) – means a project specific report, including construction drawings, that among other things: describes the construction activity(ies), identifies the potential sources of pollution at the *construction site*; describes and shows the stormwater controls that will be used to control the pollutants (i.e. erosion and sediment controls; for many projects, includes post-construction stormwater management controls); and identifies procedures the *owner or operator* will implement to comply with the terms and conditions of the permit. See Part III of the permit for a complete description of the information that must be included in the SWPPP.

Surface Waters of the State - shall be construed to include lakes, bays, sounds, ponds, impounding reservoirs, springs, rivers, streams, creeks, estuaries, marshes, inlets, canals, the Atlantic ocean within the territorial seas of the state of New York and all other bodies of surface water, natural or artificial, inland or coastal, fresh or salt, public or private (except those private waters that do not combine or effect a junction with natural surface waters), which are wholly or partially within or bordering the state or within its jurisdiction. Waters of the state are further defined in 6 NYCRR Parts 800 to 941.

Temporarily Ceased – means that an existing disturbed area will not be disturbed again within 14 calendar days of the previous soil disturbance.

Temporary Stabilization - means that exposed soil has been covered with material(s) as set forth in the technical standard, New York Standards and Specifications for Erosion and Sediment Control, to prevent the exposed soil from eroding. The materials can include, but are not limited to, mulch, seed and mulch, and erosion control mats (e.g. jute twisted yarn, excelsior wood fiber mats).

Total Maximum Daily Loads (TMDLs) - A TMDL is the sum of the allowable loads of a single pollutant from all contributing point and *nonpoint source*s. It is a calculation of the maximum amount of a pollutant that a waterbody can receive on a daily basis and still meet *water quality standards*, and an allocation of that amount to the pollutant's sources. A TMDL stipulates wasteload allocations (WLAs) for *point source* discharges, load allocations (LAs) for *nonpoint source*s, and a margin of safety (MOS).

Trained Contractor - means an employee from the contracting (construction) company, identified in Part III.A.6., 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, identified in Part III.A.6., that meets the *qualified inspector* qualifications (e.g. licensed Professional Engineer, Certified Professional in Erosion and Sediment Control (CPESC), Registered Landscape Architect, New York State Erosion and Sediment Control Certificate Program holder, 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* is responsible for the day to day implementation of the SWPPP.

Uniform Procedures Act (UPA) Permit - means a permit required under 6 NYCRR Part 621 of the Environmental Conservation Law (ECL), Article 70.

Water Quality Standard - means such measures of purity or quality for any waters in relation to their reasonable and necessary use as promulgated in 6 NYCRR Part 700 et seq.

APPENDIX B – Required SWPPP Components by Project Type

Table 1
Construction Activities that Require the Preparation of a SWPPP That Only Includes Erosion and Sediment Controls

The following construction activities that involve soil disturbances of one (1) or more acres of land, but less than five (5) acres: • Single family home not located in one of the watersheds listed in Appendix C or not *directly discharging* to one of the 303(d) segments listed in Appendix E • Single family residential subdivisions with 25% or less impervious cover at total site build-out and not located in one of the watersheds listed in Appendix C and not directly discharging to one of the 303(d) segments listed in Appendix E • Construction of a barn or other *agricultural building*, silo, stock yard or pen.
The following construction activities that involve soil disturbances between five thousand (5000) square feet and one (1) acre of land: All construction activities located in the watersheds identified in Appendix D that involve soil disturbances between five thousand (5,000) square feet and one (1) acre of land.
The following construction activities that involve soil disturbances of one (1) or more acres of land: • Installation of underground, linear utilities; such as gas lines, fiber-optic cable, cable TV, electric, telephone, sewer mains, and water mains • Environmental enhancement projects, such as wetland mitigation projects, stormwater retrofits and stream restoration projects • Pond construction • Linear bike paths running through areas with vegetative cover, including bike paths surfaced with an impervious cover • Cross-country ski trails and walking/hiking trails • Sidewalk, bike path or walking path projects, surfaced with an impervious cover, that are not part of residential, commercial or institutional development; • Sidewalk, bike path or walking path projects, surfaced with an impervious cover, that include incidental shoulder or curb work along an existing highway to support construction of the sidewalk, bike path or walking path. • Slope stabilization projects • Slope flattening that changes the grade of the site, but does not significantly change the runoff characteristics

Table 1 (Continued) Construction Activities that Require the Preparation of a SWPPP That Only Includes Erosion and Sediment Controls

The following construction activities that involve soil disturbances of one (1) or more acres of land:

- Spoil areas that will be covered with vegetation
- Vegetated open space projects (i.e. recreational parks, lawns, meadows, fields, downhill ski trails) excluding projects that *alter hydrology from pre to post development* conditions,
- Athletic fields (natural grass) that do not include the construction or reconstruction of *impervious area* and do not *alter hydrology from pre to post development* conditions
- Demolition project where vegetation will be established, and no redevelopment is planned
- Overhead electric transmission line project that does not include the construction of permanent access roads or parking areas surfaced with *impervious cover*
- Structural practices as identified in Table II in the "Agricultural Management Practices Catalog for Nonpoint Source Pollution in New York State", excluding projects that involve soil disturbances of greater than five acres and construction activities that include the construction or reconstruction of impervious area
- Temporary access roads, median crossovers, detour roads, lanes, or other temporary impervious areas that will be restored to pre-construction conditions once the construction activity is complete

Table 2
Construction Activities that Require the Preparation of a SWPPP That Includes Post-construction Stormwater Management Practices

The following construction activities that involve soil disturbances of one (1) or more acres of land:

- Single family home located in one of the watersheds listed in Appendix C or *directly discharging* to one of the 303(d) segments listed in Appendix E
- Single family home that disturbs five (5) or more acres of land
- Single family residential subdivisions located in one of the watersheds listed in Appendix C or *directly discharging* to one of the 303(d) segments listed in Appendix E
- Single family residential subdivisions that involve soil disturbances of between one (1) and five (5) acres of land with greater than 25% impervious cover at total site build-out
- Single family residential subdivisions that involve soil disturbances of five (5) or more acres of land, and single family residential subdivisions that involve soil disturbances of less than five (5) acres that are part of a larger common plan of development or sale that will ultimately disturb five or more acres of land
- Multi-family residential developments; includes duplexes, townhomes, condominiums, senior housing complexes, apartment complexes, and mobile home parks
- Airports
- Amusement parks
- Breweries, cideries, and wineries, including establishments constructed on agricultural land
- Campgrounds
- Cemeteries that include the construction or reconstruction of impervious area (>5% of disturbed area) or *alter the hydrology from pre to post development* conditions
- Commercial developments
- Churches and other places of worship
- Construction of a barn or other *agricultural building* (e.g. silo) and structural practices as identified in Table II in the "Agricultural Management Practices Catalog for Nonpoint Source Pollution in New York State" that include the construction or reconstruction of *impervious area*, excluding projects that involve soil disturbances of less than five acres.
- Golf courses
- Institutional development; includes hospitals, prisons, schools and colleges
- Industrial facilities; includes industrial parks
- Landfills
- Municipal facilities; includes highway garages, transfer stations, office buildings, POTW's, water treatment plants, and water storage tanks
- Office complexes
- Playgrounds that include the construction or reconstruction of impervious area
- Sports complexes
- Racetracks; includes racetracks with earthen (dirt) surface
- Road construction or reconstruction, including roads constructed as part of the construction activities listed in Table 1

Table 2 (Continued)

CONSTRUCTION ACTIVITIES THAT REQUIRE THE PREPARATION OF A SWPPP THAT INCLUDES POST-CONSTRUCTION STORMWATER MANAGEMENT PRACTICES

The following construction activities that involve soil disturbances of one (1) or more acres of land:

- Parking lot construction or reconstruction, including parking lots constructed as part of the construction activities listed in Table 1
- Athletic fields (natural grass) that include the construction or reconstruction of impervious area (>5% of disturbed area) or *alter the hydrology from pre to post development* conditions
- Athletic fields with artificial turf
- Permanent access roads, parking areas, substations, compressor stations and well drilling pads, surfaced with *impervious cover,* and constructed as part of an over-head electric transmission line project, wind-power project, cell tower project, oil or gas well drilling project, sewer or water main project or other linear utility project
- Sidewalk, bike path or walking path projects, surfaced with an impervious cover, that are part of a residential, commercial or institutional development
- Sidewalk, bike path or walking path projects, surfaced with an impervious cover, that are part of a highway construction or reconstruction project
- All other construction activities that include the construction or reconstruction of *impervious area* or *alter the hydrology from pre to post development* conditions, and are not listed in Table 1

APPENDIX C – Watersheds Requiring Enhanced Phosphorus Removal

Watersheds where *owners or operators* of construction activities identified in Table 2 of Appendix B must prepare a SWPPP that includes post-construction stormwater management practices designed in conformance with the Enhanced Phosphorus Removal Standards included in the technical standard, New York State Stormwater Management Design Manual ("Design Manual").

- Entire New York City Watershed located east of the Hudson River - Figure 1
- Onondaga Lake Watershed - Figure 2
- Greenwood Lake Watershed -Figure 3
- Oscawana Lake Watershed – Figure 4
- Kinderhook Lake Watershed – Figure 5

Figure 1 - New York City Watershed East of the Hudson

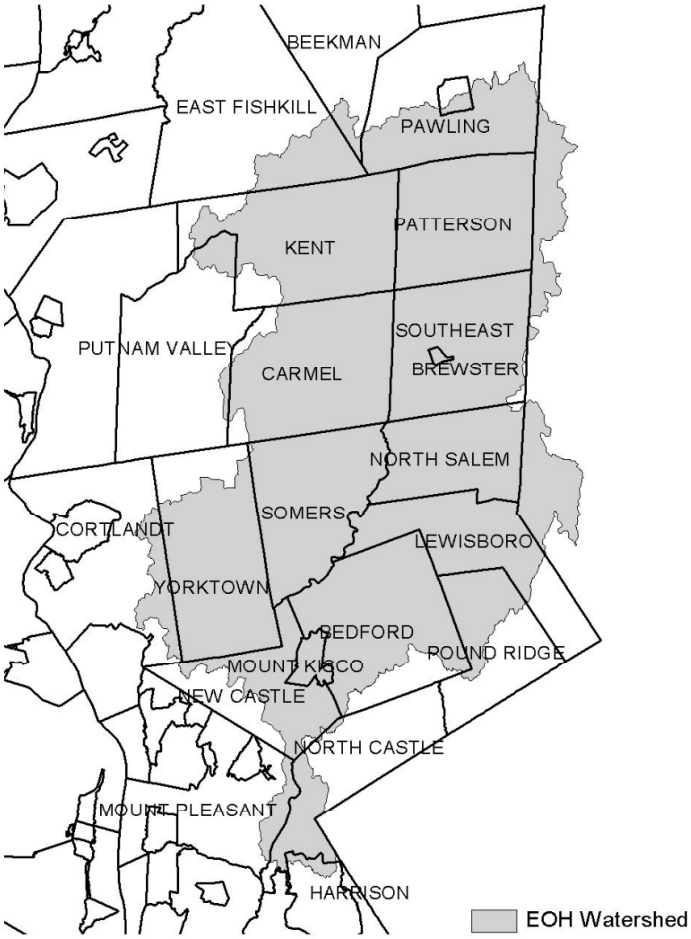


Figure 2 - Onondaga Lake Watershed

Figure 3 - Greenwood Lake Watershed

Figure 4 - Oscawana Lake Watershed

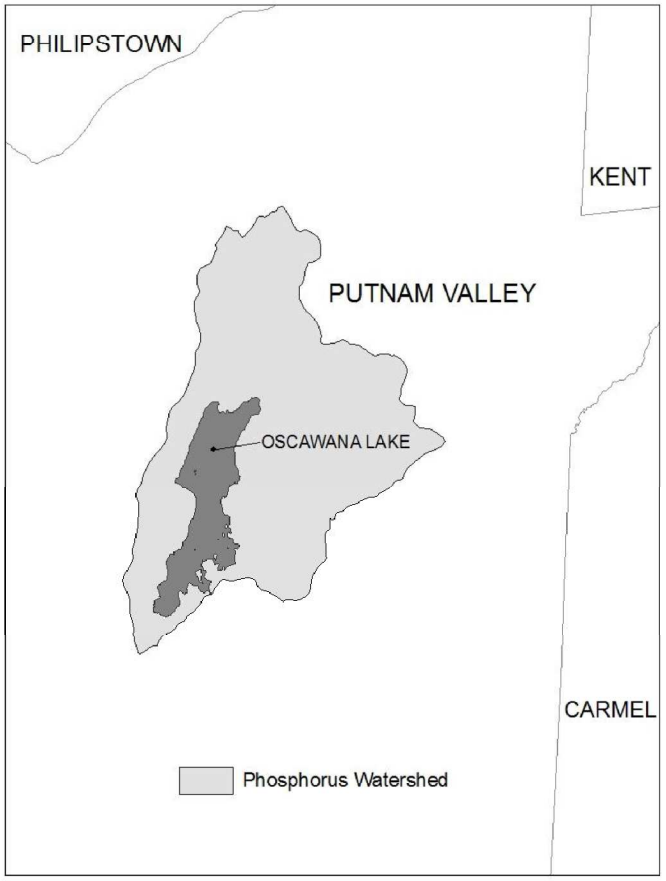
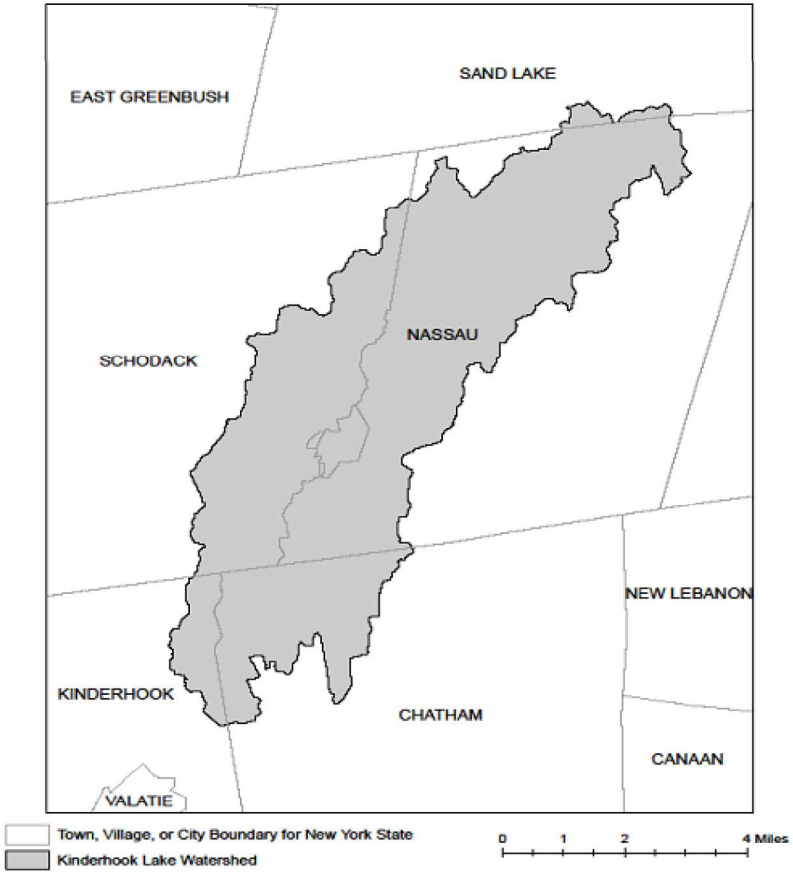


Figure 5 - Kinderhook Lake Watershed



APPENDIX D – Watersheds with Lower Disturbance Threshold

Watersheds where *owners or operators* of construction activities that involve soil disturbances between five thousand (5000) square feet and one (1) acre of land must obtain coverage under this permit.

Entire New York City Watershed that is located east of the Hudson River - See Figure 1 in Appendix C

APPENDIX E – 303(d) Segments Impaired by Construction Related Pollutant(s)

List of 303(d) segments impaired by pollutants related to *construction activity* (e.g. silt, sediment or nutrients). The list was developed using "The Final New York State 2016 Section 303(d) List of Impaired Waters Requiring a TMDL/Other Strategy" dated November 2016. *Owners or operators* of single family home and single family residential subdivisions with 25% or less total impervious cover at total site build-out that involve soil disturbances of one or more acres of land, but less than 5 acres, and *directly discharge* to one of the listed segments below shall prepare a SWPPP that includes post-construction stormwater management practices designed in conformance with the New York State Stormwater Management Design Manual ("Design Manual"), dated January 2015.

COUNTY	WATERBODY	POLLUTANT
Albany	Ann Lee (Shakers) Pond, Stump Pond	Nutrients
Albany	Basic Creek Reservoir	Nutrients
Allegany	Amity Lake, Saunders Pond	Nutrients
Bronx	Long Island Sound, Bronx	Nutrients
Bronx	Van Cortlandt Lake	Nutrients
Broome	Fly Pond, Deer Lake, Sky Lake	Nutrients
Broome	Minor Tribs to Lower Susquehanna (north)	Nutrients
Broome	Whitney Point Lake/Reservoir	Nutrients
Cattaraugus	Allegheny River/Reservoir	Nutrients
Cattaraugus	Beaver (Alma) Lake	Nutrients
Cattaraugus	Case Lake	Nutrients
Cattaraugus	Linlyco/Club Pond	Nutrients
Cayuga	Duck Lake	Nutrients
Cayuga	Little Sodus Bay	Nutrients
Chautauqua	Bear Lake	Nutrients
Chautauqua	Chadakoin River and tribs	Nutrients
Chautauqua	Chautauqua Lake, North	Nutrients
Chautauqua	Chautauqua Lake, South	Nutrients
Chautauqua	Findley Lake	Nutrients
Chautauqua	Hulburt/Clymer Pond	Nutrients
Clinton	Great Chazy River, Lower, Main Stem	Silt/Sediment
Clinton	Lake Champlain, Main Lake, Middle	Nutrients
Clinton	Lake Champlain, Main Lake, North	Nutrients
Columbia	Kinderhook Lake	Nutrients
Columbia	Robinson Pond	Nutrients
Cortland	Dean Pond	Nutrients

Dutchess	Fall Kill and tribs	Nutrients
Dutchess	Hillside Lake	Nutrients
Dutchess	Wappingers Lake	Nutrients
Dutchess	Wappingers Lake	Silt/Sediment
Erie	Beeman Creek and tribs	Nutrients
Erie	Ellicott Creek, Lower, and tribs	Silt/Sediment
Erie	Ellicott Creek, Lower, and tribs	Nutrients
Erie	Green Lake	Nutrients
Erie	Little Sister Creek, Lower, and tribs	Nutrients
Erie	Murder Creek, Lower, and tribs	Nutrients
Erie	Rush Creek and tribs	Nutrients
Erie	Scajaquada Creek, Lower, and tribs	Nutrients
Erie	Scajaquada Creek, Middle, and tribs	Nutrients
Erie	Scajaquada Creek, Upper, and tribs	Nutrients
Erie	South Branch Smoke Cr, Lower, and tribs	Silt/Sediment
Erie	South Branch Smoke Cr, Lower, and tribs	Nutrients
Essex	Lake Champlain, Main Lake, South	Nutrients
Essex	Lake Champlain, South Lake	Nutrients
Essex	Willsboro Bay	Nutrients
Genesee	Bigelow Creek and tribs	Nutrients
Genesee	Black Creek, Middle, and minor tribs	Nutrients
Genesee	Black Creek, Upper, and minor tribs	Nutrients
Genesee	Bowen Brook and tribs	Nutrients
Genesee	LeRoy Reservoir	Nutrients
Genesee	Oak Orchard Cr, Upper, and tribs	Nutrients
Genesee	Tonawanda Creek, Middle, Main Stem	Nutrients
Greene	Schoharie Reservoir	Silt/Sediment
Greene	Sleepy Hollow Lake	Silt/Sediment
Herkimer	Steele Creek tribs	Silt/Sediment
Herkimer	Steele Creek tribs	Nutrients
Jefferson	Moon Lake	Nutrients
Kings	Hendrix Creek	Nutrients
Kings	Prospect Park Lake	Nutrients
Lewis	Mill Creek/South Branch, and tribs	Nutrients
Livingston	Christie Creek and tribs	Nutrients
Livingston	Conesus Lake	Nutrients
Livingston	Mill Creek and minor tribs	Silt/Sediment
Monroe	Black Creek, Lower, and minor tribs	Nutrients
Monroe	Buck Pond	Nutrients
Monroe	Cranberry Pond	Nutrients

303(d) Segments Impaired by Construction Related Pollutant(s)

Monroe	Lake Ontario Shoreline, Western	Nutrients
Monroe	Long Pond	Nutrients
Monroe	Mill Creek and tribs	Nutrients
Monroe	Mill Creek/Blue Pond Outlet and tribs	Nutrients
Monroe	Minor Tribs to Irondequoit Bay	Nutrients
Monroe	Rochester Embayment - East	Nutrients
Monroe	Rochester Embayment - West	Nutrients
Monroe	Shipbuilders Creek and tribs	Nutrients
Monroe	Thomas Creek/White Brook and tribs	Nutrients
Nassau	Beaver Lake	Nutrients
Nassau	Camaans Pond	Nutrients
Nassau	East Meadow Brook, Upper, and tribs	Silt/Sediment
Nassau	East Rockaway Channel	Nutrients
Nassau	Grant Park Pond	Nutrients
Nassau	Hempstead Bay	Nutrients
Nassau	Hempstead Lake	Nutrients
Nassau	Hewlett Bay	Nutrients
Nassau	Hog Island Channel	Nutrients
Nassau	Long Island Sound, Nassau County Waters	Nutrients
Nassau	Massapequa Creek and tribs	Nutrients
Nassau	Milburn/Parsonage Creeks, Upp, and tribs	Nutrients
Nassau	Reynolds Channel, west	Nutrients
Nassau	Tidal Tribs to Hempstead Bay	Nutrients
Nassau	Tribs (fresh) to East Bay	Nutrients
Nassau	Tribs (fresh) to East Bay	Silt/Sediment
Nassau	Tribs to Smith/Halls Ponds	Nutrients
Nassau	Woodmere Channel	Nutrients
New York	Harlem Meer	Nutrients
New York	The Lake in Central Park	Nutrients
Niagara	Bergholtz Creek and tribs	Nutrients
Niagara	Hyde Park Lake	Nutrients
Niagara	Lake Ontario Shoreline, Western	Nutrients
Niagara	Lake Ontario Shoreline, Western	Nutrients
Oneida	Ballou, Nail Creeks and tribs	Nutrients
Onondaga	Harbor Brook, Lower, and tribs	Nutrients
Onondaga	Ley Creek and tribs	Nutrients
Onondaga	Minor Tribs to Onondaga Lake	Nutrients
Onondaga	Ninemile Creek, Lower, and tribs	Nutrients
Onondaga	Onondaga Creek, Lower, and tribs	Nutrients
Onondaga	Onondaga Creek, Middle, and tribs	Nutrients

303(d) Segments Impaired by Construction Related Pollutant(s)

Onondaga	Onondaga Lake, northern end	Nutrients
Onondaga	Onondaga Lake, southern end	Nutrients
Ontario	Great Brook and minor tribs	Silt/Sediment
Ontario	Great Brook and minor tribs	Nutrients
Ontario	Hemlock Lake Outlet and minor tribs	Nutrients
Ontario	Honeoye Lake	Nutrients
Orange	Greenwood Lake	Nutrients
Orange	Monhagen Brook and tribs	Nutrients
Orange	Orange Lake	Nutrients
Orleans	Lake Ontario Shoreline, Western	Nutrients
Orleans	Lake Ontario Shoreline, Western	Nutrients
Oswego	Lake Neatahwanta	Nutrients
Oswego	Pleasant Lake	Nutrients
Putnam	Bog Brook Reservoir	Nutrients
Putnam	Boyd Corners Reservoir	Nutrients
Putnam	Croton Falls Reservoir	Nutrients
Putnam	Diverting Reservoir	Nutrients
Putnam	East Branch Reservoir	Nutrients
Putnam	Lake Carmel	Nutrients
Putnam	Middle Branch Reservoir	Nutrients
Putnam	Oscawana Lake	Nutrients
Putnam	Palmer Lake	Nutrients
Putnam	West Branch Reservoir	Nutrients
Queens	Bergen Basin	Nutrients
Queens	Flushing Creek/Bay	Nutrients
Queens	Jamaica Bay, Eastern, and tribs (Queens)	Nutrients
Queens	Kissena Lake	Nutrients
Queens	Meadow Lake	Nutrients
Queens	Willow Lake	Nutrients
Rensselaer	Nassau Lake	Nutrients
Rensselaer	Snyders Lake	Nutrients
Richmond	Grasmere Lake/Bradys Pond	Nutrients
Rockland	Congers Lake, Swartout Lake	Nutrients
Rockland	Rockland Lake	Nutrients
Saratoga	Ballston Lake	Nutrients
Saratoga	Dwaas Kill and tribs	Silt/Sediment
Saratoga	Dwaas Kill and tribs	Nutrients
Saratoga	Lake Lonely	Nutrients
Saratoga	Round Lake	Nutrients
Saratoga	Tribs to Lake Lonely	Nutrients

303(d) Segments Impaired by Construction Related Pollutant(s)

Schenectady	Collins Lake	Nutrients
Schenectady	Duane Lake	Nutrients
Schenectady	Mariaville Lake	Nutrients
Schoharie	Engleville Pond	Nutrients
Schoharie	Summit Lake	Nutrients
Seneca	Reeder Creek and tribs	Nutrients
St.Lawrence	Black Lake Outlet/Black Lake	Nutrients
St.Lawrence	Fish Creek and minor tribs	Nutrients
Steuben	Smith Pond	Nutrients
Suffolk	Agawam Lake	Nutrients
Suffolk	Big/Little Fresh Ponds	Nutrients
Suffolk	Canaan Lake	Silt/Sediment
Suffolk	Canaan Lake	Nutrients
Suffolk	Flanders Bay, West/Lower Sawmill Creek	Nutrients
Suffolk	Fresh Pond	Nutrients
Suffolk	Great South Bay, East	Nutrients
Suffolk	Great South Bay, Middle	Nutrients
Suffolk	Great South Bay, West	Nutrients
Suffolk	Lake Ronkonkoma	Nutrients
Suffolk	Long Island Sound, Suffolk County, West	Nutrients
Suffolk	Mattituck (Marratooka) Pond	Nutrients
Suffolk	Meetinghouse/Terrys Creeks and tribs	Nutrients
Suffolk	Mill and Seven Ponds	Nutrients
Suffolk	Millers Pond	Nutrients
Suffolk	Moriches Bay, East	Nutrients
Suffolk	Moriches Bay, West	Nutrients
Suffolk	Peconic River, Lower, and tidal tribs	Nutrients
Suffolk	Quantuck Bay	Nutrients
Suffolk	Shinnecock Bay and Inlet	Nutrients
Suffolk	Tidal tribs to West Moriches Bay	Nutrients
Sullivan	Bodine, Montgomery Lakes	Nutrients
Sullivan	Davies Lake	Nutrients
Sullivan	Evens Lake	Nutrients
Sullivan	Pleasure Lake	Nutrients
Tompkins	Cayuga Lake, Southern End	Nutrients
Tompkins	Cayuga Lake, Southern End	Silt/Sediment
Tompkins	Owasco Inlet, Upper, and tribs	Nutrients
Ulster	Ashokan Reservoir	Silt/Sediment
Ulster	Esopus Creek, Upper, and minor tribs	Silt/Sediment
Warren	Hague Brook and tribs	Silt/Sediment

303(d) Segments Impaired by Construction Related Pollutant(s)

Warren	Huddle/Finkle Brooks and tribs	Silt/Sediment
Warren	Indian Brook and tribs	Silt/Sediment
Warren	Lake George	Silt/Sediment
Warren	Tribs to L.George, Village of L George	Silt/Sediment
Washington	Cossayuna Lake	Nutrients
Washington	Lake Champlain, South Bay	Nutrients
Washington	Tribs to L.George, East Shore	Silt/Sediment
Washington	Wood Cr/Champlain Canal and minor tribs	Nutrients
Wayne	Port Bay	Nutrients
Westchester	Amawalk Reservoir	Nutrients
Westchester	Blind Brook, Upper, and tribs	Silt/Sediment
Westchester	Cross River Reservoir	Nutrients
Westchester	Lake Katonah	Nutrients
Westchester	Lake Lincolndale	Nutrients
Westchester	Lake Meahagh	Nutrients
Westchester	Lake Mohegan	Nutrients
Westchester	Lake Shenorock	Nutrients
Westchester	Long Island Sound, Westchester (East)	Nutrients
Westchester	Mamaroneck River, Lower	Silt/Sediment
Westchester	Mamaroneck River, Upper, and minor tribs	Silt/Sediment
Westchester	Muscoot/Upper New Croton Reservoir	Nutrients
Westchester	New Croton Reservoir	Nutrients
Westchester	Peach Lake	Nutrients
Westchester	Reservoir No.1 (Lake Isle)	Nutrients
Westchester	Saw Mill River, Lower, and tribs	Nutrients
Westchester	Saw Mill River, Middle, and tribs	Nutrients
Westchester	Sheldrake River and tribs	Silt/Sediment
Westchester	Sheldrake River and tribs	Nutrients
Westchester	Silver Lake	Nutrients
Westchester	Teatown Lake	Nutrients
Westchester	Titicus Reservoir	Nutrients
Westchester	Truesdale Lake	Nutrients
Westchester	Wallace Pond	Nutrients
Wyoming	Java Lake	Nutrients
Wyoming	Silver Lake	Nutrients

APPENDIX F – List of NYS DEC Regional Offices

Region	Covering the following counties:	DIVISION OF ENVIRONMENTAL PERMITS (DEP) Permit Administrators	DIVISION OF WATER (DOW) Water (SPDES) Program
1	Nassau and Suffolk	50 Circle Road Stony Brook, NY 11790 Tel. (631) 444-0365	50 Circle Road Stony Brook, NY 11790-3409 Tel. (631) 444-0405
2	Bronx, Kings, New York, Queens and Richmond	1 Hunters Point Plaza, 47-40 21st St. Long Island City, NY 11101-5407 Tel. (718) 482-4997	1 Hunters Point Plaza, 47-40 21st St. Long Island City, NY 11101-5407 Tel. (718) 482-4933
3	Dutchess, Orange, Putnam, Rockland, Sullivan, Ulster and Westchester	21 South Putt Corners Road New Paltz, NY 12561-1696 Tel. (845) 256-3059	100 Hillside Avenue, Suite 1w White Plains, NY 10603 Tel. (914) 428 - 2505
4	Albany, Columbia, Delaware, Greene, Montgomery, Otsego, Rensselaer, Schenectady and Schoharie	1150 North Westcott Road Schenectady, NY 12306-2014 Tel. (518) 357-2069	1130 North Westcott Road Schenectady, NY 12306-2014 Tel. (518) 357-2045
5	Clinton, Essex, Franklin, Fulton, Hamilton, Saratoga, Warren and Washington	1115 State Route 86, Po Box 296 Ray Brook, NY 12977-0296 Tel. (518) 897-1234	232 Golf Course Road Warrensburg, NY 12885-1172 Tel. (518) 623-1200
6	HERKIMER, JEFFERSON, LEWIS, ONEIDA AND ST. LAWRENCE	STATE OFFICE BUILDING 317 WASHINGTON STREET WATERTOWN, NY 13601-3787 TEL. (315) 785-2245	STATE OFFICE BUILDING 207 GENESEE STREET UTICA, NY 13501-2885 TEL. (315) 793-2554
7	BROOME, CAYUGA, CHENANGO, CORTLAND, MADISON, ONONDAGA, OSWEGO, TIOGA AND TOMPKINS	615 ERIE BLVD. WEST SYRACUSE, NY 13204-2400 TEL. (315) 426-7438	615 ERIE BLVD. WEST SYRACUSE, NY 13204-2400 TEL. (315) 426-7500
8	CHEMUNG, GENESEE, LIVINGSTON, MONROE, ONTARIO, ORLEANS, SCHUYLER, SENECA, STEUBEN, WAYNE AND YATES	6274 EAST AVON-LIMA ROADAVON, NY 14414-9519 TEL. (585) 226-2466	6274 EAST AVON-LIMA RD. AVON, NY 14414-9519 TEL. (585) 226-2466
9	ALLEGANY, CATTARAUGUS, CHAUTAUQUA, ERIE, NIAGARA AND WYOMING	270 MICHIGAN AVENUE BUFFALO, NY 14203-2999 TEL. (716) 851-7165	270 MICHIGAN AVENUE BUFFALO, NY 14203-2999 TEL. (716) 851-7070

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Appendix B:
NYSDEC Forms

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0644089821

NOTICE OF INTENT

New York State Department of Environmental Conservation
Division of Water
625 Broadway, 4th Floor
Albany, New York 12233-3505

NYR ☐☐☐☐☐☐
(for DEC use only)

Stormwater Discharges Associated with Construction Activity Under State Pollutant Discharge Elimination System (SPDES) General Permit # GP-0-20-001

All sections must be completed unless otherwise noted. Failure to complete all items may result in this form being returned to you, thereby delaying your coverage under this General 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 identifying 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)

Owner/Operator Contact Person Last Name (NOT CONSULTANT)

Owner/Operator Contact Person First Name

Owner/Operator Mailing Address

City

State ☐☐ Zip ☐☐☐☐☐ - ☐☐☐☐

Phone (Owner/Operator) ☐☐☐ - ☐☐☐ - ☐☐☐☐

Fax (Owner/Operator) ☐☐☐ - ☐☐☐ - ☐☐☐☐

Email (Owner/Operator)

FED TAX ID ☐☐ - ☐☐☐☐☐☐☐ (not required for individuals)

Project Site Information

Project/Site Name

Street Address (NOT P.O. BOX)

Side of Street
○ **North** ○ **South** ○ **East** ○ **West**

City/Town/Village (THAT ISSUES BUILDING PERMIT)

State N Y Zip - County DEC Region

Name of Nearest Cross Street

Distance to Nearest Cross Street (Feet)

Project In Relation to Cross Street
○ **North** ○ **South** ○ **East** ○ **West**

Tax Map Numbers
Section-Block-Parcel

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)

Y Coordinates (Northing) 4

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

Post-Development Future Land Use

- ○ SINGLE FAMILY HOME
- ○ SINGLE FAMILY SUBDIVISION — Number of Lots
- ○ 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

***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 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**
.	.	.	.

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**
%	%	%	%

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

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

Start Date / / - **End Date** / /

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

Name

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-0-20-001? ○ **Yes** ○ **No**

11. Is this project located in one of the Watersheds identified in Appendix C of GP-0-20-001? ○ **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

Contact Name (Last, Space, First)

Mailing Address

City

State Zip -

Phone - -

Fax - -

Email

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 the GP-0-20-001. 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.

First Name **MI**

Last Name

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 the 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) Requirements

Important: Completion 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**
- ○ **Preservation of Buffers**
- ○ **Reduction of Clearing and 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 requirements 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

			.			
			.			**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 Tables 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)

	Total Contributing Area (acres)		Total Contributing Impervious Area(acres)
RR Techniques (Area Reduction)			
○ 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 (Volume Reduction)			
○ Vegetated Swale (RR-5)			___.___
○ Rain Garden (RR-6)			___.___
○ Stormwater Planter (RR-7)			___.___
○ Rain Barrel/Cistern (RR-8)			___.___
○ Porous Pavement (RR-9)			___.___
○ Green Roof (RR-10)			___.___
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)			___.___
○ 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

. **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 SMPs 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 2 the total impervious area that contributes runoff to each practice selected.

Note: Use Tables 1 and 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). ☐☐☐.☐☐☐

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

☐☐☐.☐☐☐ **CFS**

Post-development

☐☐☐.☐☐☐ **CFS**

Total Extreme Flood Control Criteria (Qf)

Pre-Development

☐☐☐.☐☐☐ **CFS**

Post-development

☐☐☐.☐☐☐ **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 and Maintenance Plan for the post-construction stormwater management practice(s) been developed? ○ **Yes** ○ **No**

If Yes, Identify the entity responsible for the long term Operation and Maintenance

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.

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 general permit for stormwater runoff from construction activities, please indicate the former SPDES number assigned. [N][Y][R][ ][ ][ ][ ][ ][ ]

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 the 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 general 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 general 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 general permit for which this NOI is being submitted.

Print First Name **MI**

Print Last Name

Owner/Operator Signature

Date / /

NYS Department of Environmental Conservation
Division of Water
625 Broadway, 4th Floor
Albany, New York 12233-3505

MS4 Stormwater Pollution Prevention Plan (SWPPP) Acceptance Form

for

Construction Activities Seeking Authorization Under SPDES General Permit

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

I. Project Owner/Operator Information
1. Owner/Operator Name: Rapp Road Development, LLC
2. Contact Person: James Soos
3. Street Address: 4 Clinton Square
4. City/State/Zip: Syracuse, NY 13202
II. Project Site Information
5. Project/Site Name: Crossgates Rapp Road Residential Development
6. Street Address: Rapp Road
7. City/State/Zip: Town of Guilderland, NY 12203
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:
12. MS4 SPDES Permit Identification Number: NYR20A _____
13. Contact Person:
14. Street Address:
15. City/State/Zip:
16. Telephone Number:

MS4 SWPPP Acceptance Form - continued

V. Certification Statement - MS4 Official (principal executive officer or ranking elected official) 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 General 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

(NYS DEC - MS4 SWPPP Acceptance Form - January 2015)

New York State Department of Environmental Conservation
Division of Water
625 Broadway, 4th Floor
Albany, New York 12233-3505
(NOTE: Submit completed form to address above)

NOTICE OF TERMINATION for Storm Water Discharges Authorized under the SPDES General Permit for Construction Activity

Please indicate your permit identification number: NYR ___ ___ ___ ___ ___ ___

I. Owner or Operator Information

1. Owner/Operator Name:

2. Street Address:

3. City/State/Zip:

4. Contact Person: | 4a.Telephone:

4b. Contact Person E-Mail:

II. Project Site Information

5. Project/Site Name:

6. Street Address:

7. City/Zip:

8. County:

III. Reason for Termination

9a. □ All disturbed areas have achieved final stabilization in accordance with the general permit and SWPPP. ***Date final stabilization completed** (month/year): _____

9b. □ Permit coverage has been transferred to new owner/operator. Indicate new owner/operator's permit identification number: NYR ___ ___ ___ ___ ___ ___
(Note: Permit coverage can not be terminated by owner identified in I.1. above until new owner/operator obtains coverage under the general permit)

9c. □ Other (Explain on Page 2)

IV. Final Site Information:

10a. Did this construction activity require the development of a SWPPP that includes post-construction stormwater management practices? □ yes □ no (If no, go to question 10f.)

10b. Have all post-construction stormwater management practices included in the final SWPPP been constructed? □ yes □ no (If no, explain on Page 2)

10c. Identify the entity responsible for long-term operation and maintenance of practice(s)?

_____

NOTICE OF TERMINATION for Storm Water Discharges Authorized under the SPDES General Permit for Construction Activity - continued

10d. Has the entity responsible for long-term operation and maintenance been given a copy of the operation and maintenance plan required by the general permit? □ yes □ no

10e. 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).

□ For 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, university or hospital), 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.

10f. Provide the total area of impervious surface (i.e. roof, pavement, concrete, gravel, etc.) constructed within the disturbance area? _____ (acres)

11. Is this 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 9c. and 10b., if applicable)

VI. MS4 Acceptance - MS4 Official (principal executive officer or ranking elected official) or Duly Authorized Representative (Note: Not required when 9b. is checked -transfer of coverage)

I have determined that it is acceptable for the owner or operator of the construction project identified in question 5 to submit the Notice of Termination at this time.

Printed Name:

Title/Position:

Signature:	Date:

NOTICE OF TERMINATION for Storm Water Discharges Authorized under the SPDES General Permit for Construction Activity - continued

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 general 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:

(NYS DEC Notice of Termination - January 2015)

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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)

Crossgates Rapp Road Residential Development
Rapp Road, Town of Guilderland, 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 the *owner or operator* must comply with the terms and conditions of the most current version of the New York State Pollutant Discharge Elimination System ("SPDES") general permit for stormwater *discharges* from *construction activities* and 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)

Crossgates Rapp Road Residential Development
Rapp Road, Town of Guilderland, 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 the *owner or operator* must comply with the terms and conditions of the most current version of the New York State Pollutant Discharge Elimination System ("SPDES") general permit for stormwater *discharges* from *construction activities* and 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

Crossgates Rapp Road Residential Development
Rapp Road
Town of Guilderland, Albany County, New York

A Qualified Inspector[1] shall prepare an inspection report subsequent to each and every inspection, as required in Part IV.C of the SPDES General Permit GP-0-20-001. 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. Identify any discharges of sediment from the construction site. Use additional sheets if necessary.

Description of Discharge Point	Condition of Runoff	Sediment Discharge Noted
		yes / no Estimated Quantity:
		yes / no Estimated Quantity:
		yes / no Estimated Quantity:
		yes / no Estimated Quantity:

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)
Stabilized construction entrance						
Temporary parking areas						
Construction vehicle wash areas						
Silt fence						
Temporary swales and berms						
Stone check dams						
Slope protection measures						
Dewatering operations						
Sediment traps						
Inlet protection measures						
Soil stockpiles						
Dust control measures						
Pavement sweeping						
Other:						
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:*

Photo Log

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.

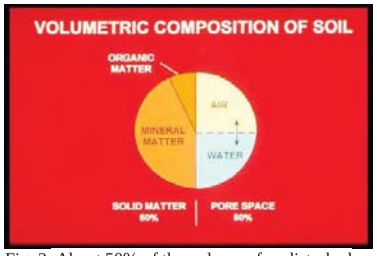

Fig. 2. About 50% of the volume of undisturbed loam surface soil is pore space, when soil is in good condition for plant growth. Brady, 2002.

Recommended Application of Practice

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

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).

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

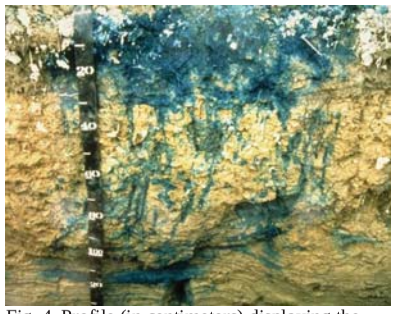

Fig. 4. Profile (in centimeters) displaying the infiltration test result of the natural undisturbed horizons of a soil in Hydrologic Soil Group C.

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.

Resources

Publications:

- American Society of Agricultural Engineers. 1971. *Compaction of Agricultural Soils.* ASAE.
- Brady, N.C., and R.R. Weil. 2002. *The Nature and Properties of Soils. 13th ed.* Pearson Education, Inc.
- Baver, L.D. 1948. *Soil Physics.* John Wiley & Sons.
- Carpachi, N. 1987 (1995 fifth printing). *Excavation and Grading Handbook, Revised. 2nd ed.* Craftsman Book Company
- Ellis, B. (Editor). 1997. Safe & Easy Lawn Care: The Complete Guide to Organic Low Maintenance Lawn. Houghton Mifflin.
- Harpstead, M.I., T.J. Sauer, and W.F. Bennett. 2001. *Soil Science Simplified. 4th ed.* Iowa State University Press.
- Magdoff, F., and H. van Es. 2000. *Building Soils for Better Crops. 2nd ed.* Sustainable Agricultural Networks
- McCarthy, D.F. 1993. *Essentials of Soil Mechanics and Foundations, Basic Geotechnics 4th ed.* Regents/Prentice Hall.
- Plaster, E.J. 1992. *Soil Science & Management. 3rd ed.* Delmar Publishers.
- Union Gas Limited, Ontario, Canada. 1984. *Rehabilitation of Agricultural Lands, Dawn-Kerwood Loop Pipeline; Technical Report.* Ecological Services for Planning, Ltd.; Robinson, Merritt & Devries, Ltd. and Smith, Hoffman Associates, Ltd.
- US Department of Agriculture in cooperation with Cornell University Agricultural Experiment Station. Various years. *Soil Survey of (various names) County, New York.* USDA.

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 (i.e., intense storms, thunder storms, cloud burst, etc.) 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. Grassed Swales

Swale maintenance will include periodic mowing, occasional spot reseeding and weed control to keep grass cover dense and vigorous. Resultant yard waste shall be collected and disposed of off-site. Application of fertilizers and pesticides should be restricted or limited.

g. Rip-rap Dissipation structures

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

h. 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. BIORETENTION FILTERS

a. Inspection

Bioretention filters should be inspected periodically for the first few months after construction and then on a monthly basis. Bioretention filters should be inspected after all major storm events. Items to check for include (but are not limited to):

i. Checking embankments for subsidence, erosion, cracking, undesirable tree and shrub growth and the presence of burrowing animals.

ii. Check inlet for erosion.

iii. Evidence of standing water (i.e. does it dewater between storms).

iv. Health and vigor of vegetation (trees, shrubs, grass, flowers, mulch).

v. Accumulation of sediment or yard waste.

vi. Evidence of clogging at inlets or outlets.

vii. Condition of the overflow spillway.

viii. Ensure grass is well established.

ix. Grass height not greater than six inches.

b. Mowing

Mow grass areas within bioretention facility to ensure that grass height does not exceed 6-inches. Undesirable trees and shrubs should be removed. Resultant yard wastes shall be collected and disposed of off-site

c. Debris, Trash and Litter Control

Removal of debris and litter shall be accomplished during mowing operations. Inlet structures should be cleared of all debris and litter.

d. Structural Repairs and Replacement

Components of the bioretention filter, which require repair or replacement, should be addressed immediately following identification. This includes treating and or replacing diseased trees and shrub, fertilizing as necessary, replacing mulch where bare spots appear, and filter beds.

e. Erosion and Sediment Control

Sources of sedimentation, specifically eroded areas in upland drainage areas, should be stabilized immediately upon identification. Stabilization should be with vegetative practices or other erosion control practices when vegetative measures do not prove effective.

Soil slumpage, erosion of the embankments or around inlets/outlets, and cracking should be stabilized and repaired immediately upon identification.

f. Sediment Removal

Sediments that accumulate in the bioretention filter should be removed annually to prevent clogging of inlet or outlet structures. Disposal of material removed from bioretention filter shall be in accordance with local, state, and federal guidelines.

3. INFILTRATION BASINS

a. Inspections

Infiltration Basins should be inspected periodically for the first few months after construction and then on an annual basis. Infiltration Basins should be inspected after major storm events to ensure inlets and outlets remain clear. Items to check for include (but are not limited to):

i. Differential settlement of embankments.

ii. Cracking, erosion, or seepage through embankments.

iii. Evidence of clogging at inlets or outlets.

iv. Erosion of the bottom surface/flow path through the basin.

v. Brush, shrub, or tree growth on embankments.

vi. Lack of vigor and density of grass turf within the basin.

b. Mowing

The side slopes, embankments, inlets, and overflow spillways of the detention basins should be mowed at least three times a year and resultant yard wastes collected and disposed of off-site.

c. Debris and Litter Control

Removal of debris and litter should be accomplished during mowing operations. Inlet and outlet structures should be cleared of all debris and litter.

d. Structural repairs and Replacement

Components of the infiltration basin, which require repair or replacement, should be addressed immediately following identification.

e. Erosion Control

Sources of sedimentation, specifically eroded areas in upland drainage areas, should be stabilized immediately upon identification. Stabilization should be with vegetative practices or other erosion control practices when vegetative measures do not prove effective.

Soil slumpage, erosion of the basin embankment or around inlets/outlets, and cracking should be stabilized and repaired immediately upon identification. Repair, replacement, or addition of rip-rap aprons, channels or embankments should be pursued as required.

f. Sediment removal

Sediments, which accumulate in the infiltration basin, should be removed immediately to prevent clogging.

4. UNDERGROUND INFILTRATION SYSTEM

a. Inspections

Underground infiltration systems should be inspected periodically for the first few months after construction and then on an annual basis. Underground infiltration systems should be inspected after major storm events to ensure inlets and outlets remain clear. Items to check for include (but are not limited to):

i. Measure the sediment buildup at each riser.

ii. Inspect each header, all laterals, inlets, and outlet pipes for sediment build up, obstructions or other problems. Cracking, erosion or seepage through embankments.

Refer to the attached Stormtech "Isolator Row Operations and Maintenance Manual" for the manufacturer's inspection and maintenance requirements.

b. Debris and Litter Control

Inlet and outlet structures should be cleared of all debris and litter.

c. Structural repairs and Replacement

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

d. Sedimentation Control

Sources of sedimentation, specifically eroded areas in upland drainage areas, should be stabilized immediately upon identification. Stabilization should be with vegetative practices or other erosion control practices when vegetative measures do not prove effective.

e. Sediment removal

Sediments, which accumulate in the underground infiltration system, should be removed when it reaches 4% of the pipe diameter to prevent clogging of the outlet. A typical clean-out cycle should be between 5 to 10 years with more frequent cleanings near inlet and outlet structures. The unit may require cleaning in the event of a spill of a toxic or foreign substance. Disposal of material from the underground infiltration systems shall be in accordance with local, state, and federal guidelines.

Underground infiltration systems are confined space environment and only properly trained personnel possessing the necessary safety equipment should enter the systems to perform maintenance or inspection.

StormTech®
Detention • Retention • Water Quality
An ADS company

Isolator® Row O&M Manual

THE MOST **ADVANCED** NAME IN WATER MANAGEMENT SOLUTIONS™

ADS®

THE ISOLATOR® ROW

INTRODUCTION

An important component of any Stormwater Pollution Prevention Plan is inspection and maintenance. The StormTech Isolator Row is a technique to inexpensively enhance Total Suspended Solids (TSS) and Total Phosphorus (TP) removal with easy access for inspection and maintenance.

THE ISOLATOR ROW

The Isolator Row is a row of StormTech chambers, either SC-160, SC-310, SC-310-3, SC-740, DC-780, MC-3500 or MC-4500 models, that is surrounded with filter fabric and connected to a closely located manhole for easy access. The fabric-wrapped chambers provide for settling and filtration of sediment as storm water rises in the Isolator Row and ultimately passes through the filter fabric. The open bottom chambers and perforated sidewalls (SC-310, SC- 310-3 and SC-740 models) allow storm water to flow both vertically and horizontally out of the chambers. Sediments are captured in the Isolator Row protecting the storage areas of the adjacent stone and chambers from sediment accumulation.

A woven geotextile fabric is placed between the stone and the Isolator Row chambers. The woven geotextile provides a media for stormwater filtration, a durable surface for maintenance, prevents scour of the underlying stone and remains intact during high pressure jetting. A non-woven fabric is placed over the chambers to provide a filter media for flows passing through the perforations in the sidewall of the chamber. The non-woven fabric is not required over the SC-160, DC-780, MC-3500 or MC-4500 models as these chambers do not have perforated side walls.

The Isolator Row is typically designed to capture the “first flush” and offers the versatility to be sized on a volume basis or flow rate basis. An upstream manhole provides access to the Isolator Row and typically includes a high flow weir. When flow rates or volumes exceed the Isolator Row weir capacity the water will flow over the weir and discharge through a manifold to the other chambers.

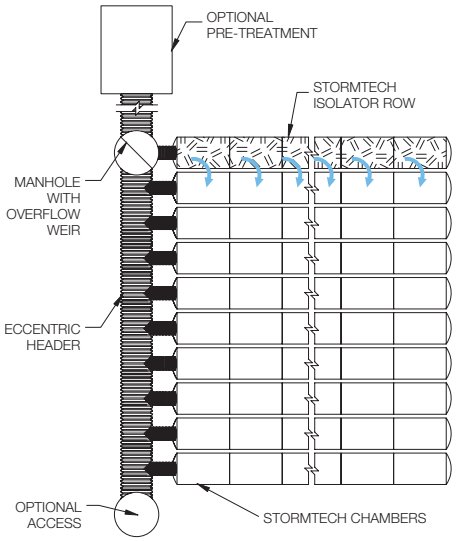
Another acceptable design uses one open grate inlet structure. Using a “high/low” design (low invert elevation on the Isolator Row and a higher invert elevation on the manifold) an open grate structure can provide the advantages of the Isolator Row by creating a differential between the Isolator Row and manifold thus allowing for settlement in the Isolator Row.

The Isolator Row may be part of a treatment train system. The design of the treatment train and selection of pretreatment devices by the design engineer is often driven by regulatory requirements. Whether pretreatment is used or not, the Isolator Row is recommended by StormTech as an effective means to minimize maintenance requirements and maintenance costs.

Note: See the StormTech Design Manual for detailed information on designing inlets for a StormTech system, including the Isolator Row.

Looking down the Isolator Row from the manhole opening, woven geotextile is shown between the chamber and stone base.

StormTech Isolator Row with Overflow Spillway (not to scale)



ISOLATOR ROW INSPECTION/MAINTENANCE

INSPECTION

The frequency of inspection and maintenance varies by location. A routine inspection schedule needs to be established for each individual location based upon site specific variables. The type of land use (i.e. industrial, commercial, residential), anticipated pollutant load, percent imperviousness, climate, etc. all play a critical role in determining the actual frequency of inspection and maintenance practices.

At a minimum, StormTech recommends annual inspections. Initially, the Isolator Row should be inspected every 6 months for the first year of operation. For subsequent years, the inspection should be adjusted based upon previous observation of sediment deposition.

The Isolator Row incorporates a combination of standard manhole(s) and strategically located inspection ports (as needed). The inspection ports allow for easy access to the system from the surface, eliminating the need to perform a confined space entry for inspection purposes.

If upon visual inspection it is found that sediment has accumulated, a stadia rod should be inserted to determine the depth of sediment. When the average depth of sediment exceeds 3 inches throughout the length of the Isolator Row, clean-out should be performed.

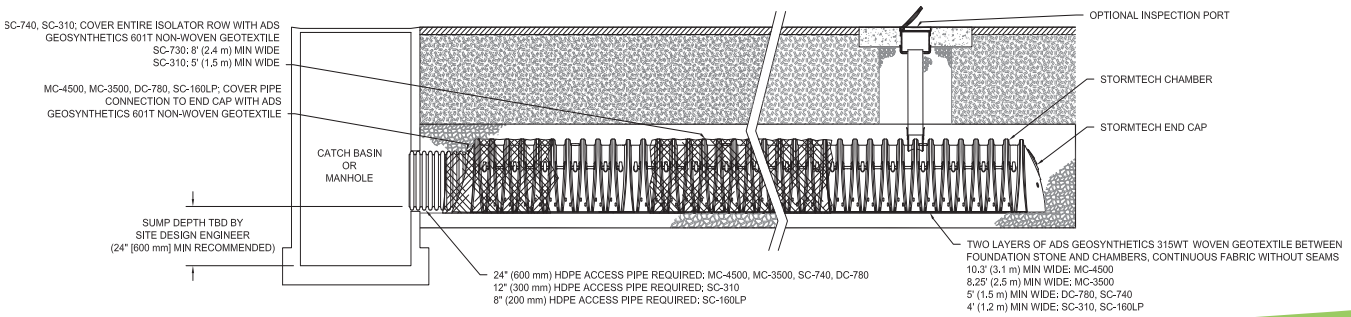
MAINTENANCE

The Isolator Row was designed to reduce the cost of periodic maintenance. By "isolating" sediments to just one row, costs are dramatically reduced by eliminating the need to clean out each row of the entire storage bed. If inspection indicates the potential need for maintenance, access is provided via a manhole(s) located on the end(s) of the row for cleanout. If entry into the manhole is required, please follow local and OSHA rules for a confined space entries.

Maintenance is accomplished with the JetVac process. The JetVac process utilizes a high pressure water nozzle to propel itself down the Isolator Row while scouring and suspending sediments. As the nozzle is retrieved, the captured pollutants are flushed back into the manhole for vacuuming. Most sewer and pipe maintenance companies have vacuum/JetVac combination vehicles. Selection of an appropriate JetVac nozzle will improve maintenance efficiency. Fixed nozzles designed for culverts or large diameter pipe cleaning are preferable. Rear facing jets with an effective spread of at least 45" are best. Most JetVac reels have 400 feet of hose allowing maintenance of an Isolator Row up to 50 chambers long. **The JetVac process shall only be performed on StormTech Isolator Rows that have AASHTO class 1 woven geotextile (as specified by StormTech) over their angular base stone.**

StormTech Isolator Row (not to scale)

Note: Non-woven fabric is only required over the inlet pipe connection into the end cap for SC-160LP, DC-780, MC-3500 and MC-4500 chamber models and is not required over the entire Isolator Row.



ISOLATOR ROW STEP BY STEP MAINTENANCE PROCEDURES

STEP 1

Inspect Isolator Row for sediment.

A) Inspection ports (if present)
   i. Remove lid from floor box frame
   ii. Remove cap from inspection riser
   iii. Using a flashlight and stadia rod,measure depth of sediment and record results on maintenance log.
   iv. If sediment is at or above 3 inch depth, proceed to Step 2. If not, proceed to Step 3.

B) All Isolator Rows
   i. Remove cover from manhole at upstream end of Isolator Row
   ii. Using a flashlight, inspect down Isolator Row through outlet pipe
      1. Mirrors on poles or cameras may be used to avoid a confined space entry
      2. Follow OSHA regulations for confined space entry if entering manhole
   iii. If sediment is at or above the lower row of sidewall holes (approximately 3 inches), proceed to Step 2. If not, proceed to Step 3.

STEP 2

Clean out Isolator Row using the JetVac process.

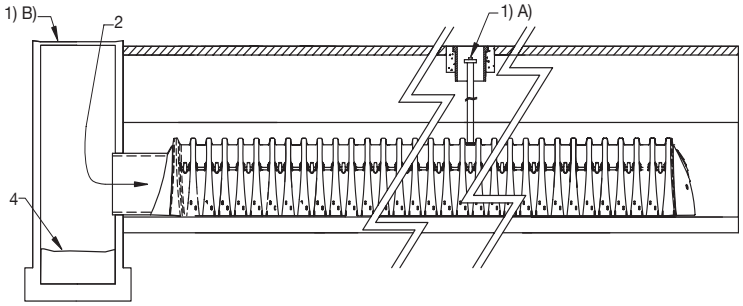
A) A fixed floor cleaning nozzle with rear facing nozzle spread of 45 inches or more is preferable
B) Apply multiple passes of JetVac until backflush water is clean
C) Vacuum manhole sump as required

STEP 3

Replace all caps, lids and covers, record observations and actions.

STEP 4

Inspect & clean catch basins and manholes upstream of the StormTech system.



SAMPLE MAINTENANCE LOG

Date	Stadia Rod Readings		Sediment Depth (1)–(2)	Observations/Actions	Inspector
	Fixed point to chamber bottom (1)	Fixed point to top of sediment (2)			
3/15/11	6.3 ft	none		New installation. Fixed point is CI frame at grade	DJM
9/24/11		6.2	0.1 ft	Some grit felt	SM
6/20/13		5.8	0.5 ft	Mucky feel, debris visible in manhole and in Isolator Row, maintenance due	NV
7/7/13	6.3 ft		0	System jetted and vacuumed	DJM

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An ADS company

Advanced Drainage Systems, Inc.
4640 Trueman Blvd., Hilliard, OH 43026
1-800-821-6710 www.ads-pipe.com

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Appendix G:
Figures

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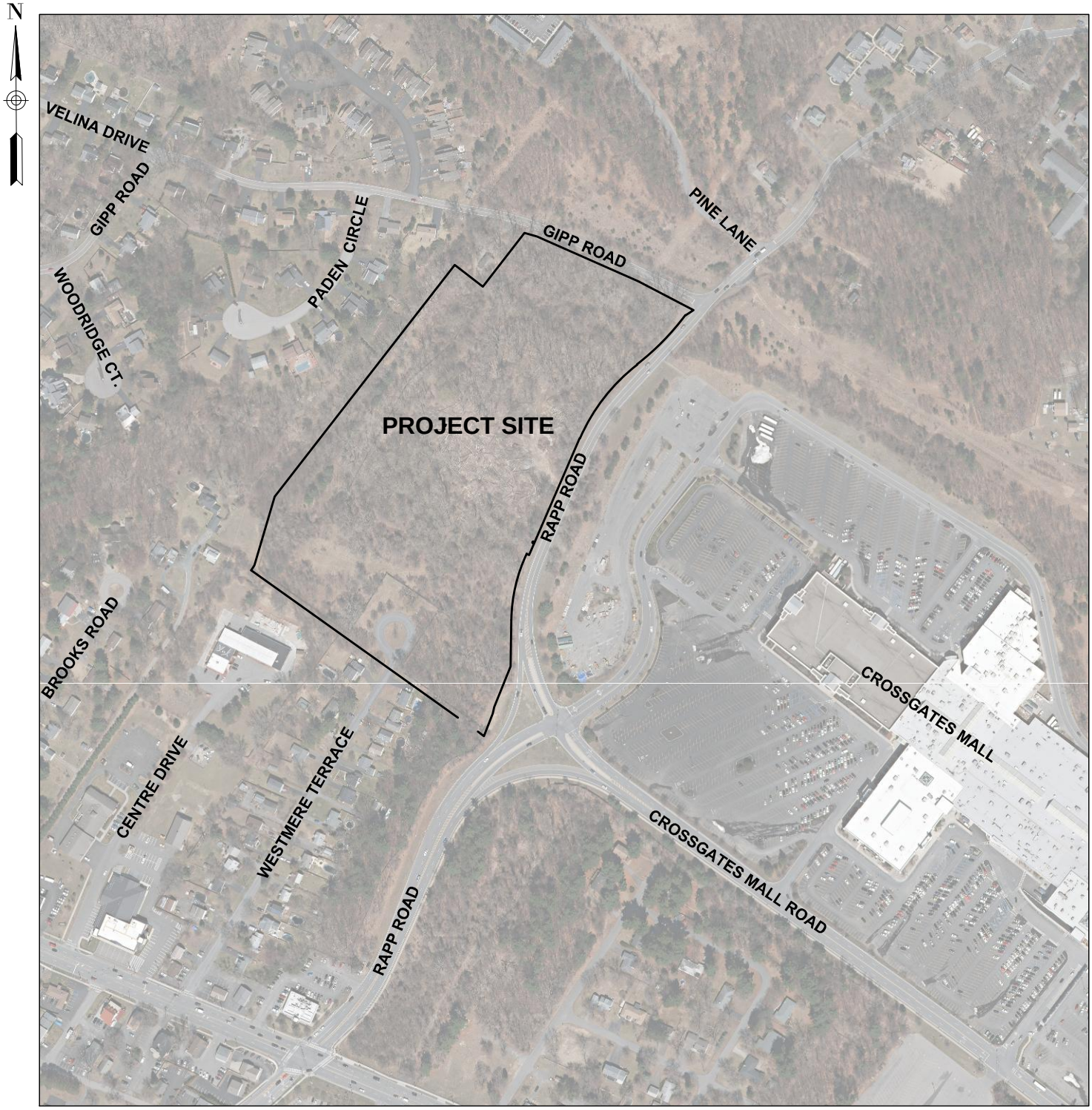

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White Plains, NY 10601
Phone: (914) 997-8510
Tennessee Offices:
2416 21st Ave S. Nashville, TN 37212
427 E. 5th St. Chattanooga, TN 37403

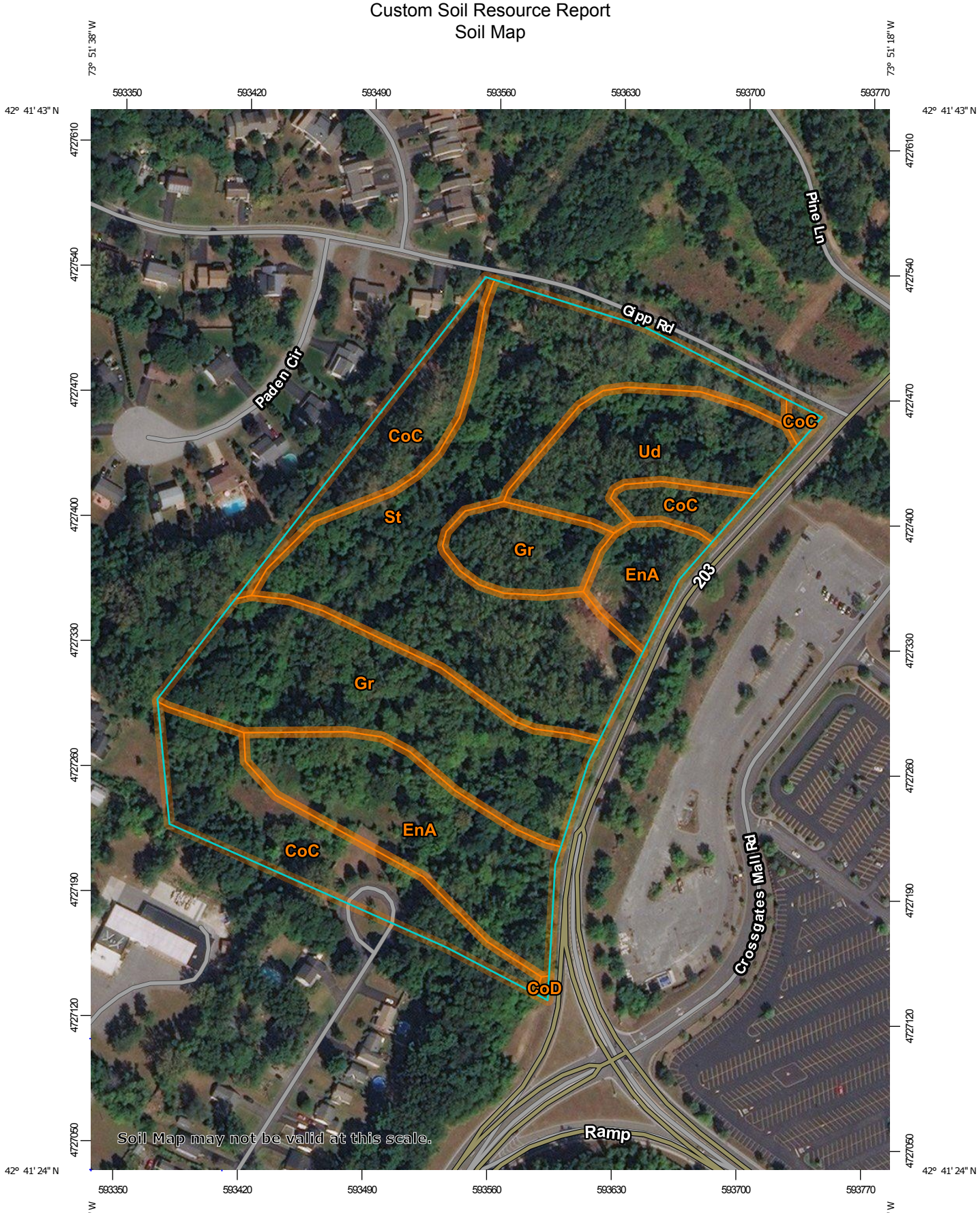
RAPP ROAD RESIDENTIAL DEVELOPMENT

SITE LOCATION MAP

TOWN OF GUILDERLAND, ALBANY COUNTY, NEW YORK

drawn	checked
CR	RK
date	scale
02/06/19	1"=400'
project no.	
317AI.00	
sheet no.	
FIG 1	

Custom Soil Resource Report
Soil Map



Map Scale: 1:2,890 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 40 80 160 240

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

FIGURE 3

LEGEND

LPC Landmarks

National Register Building Sites (View)

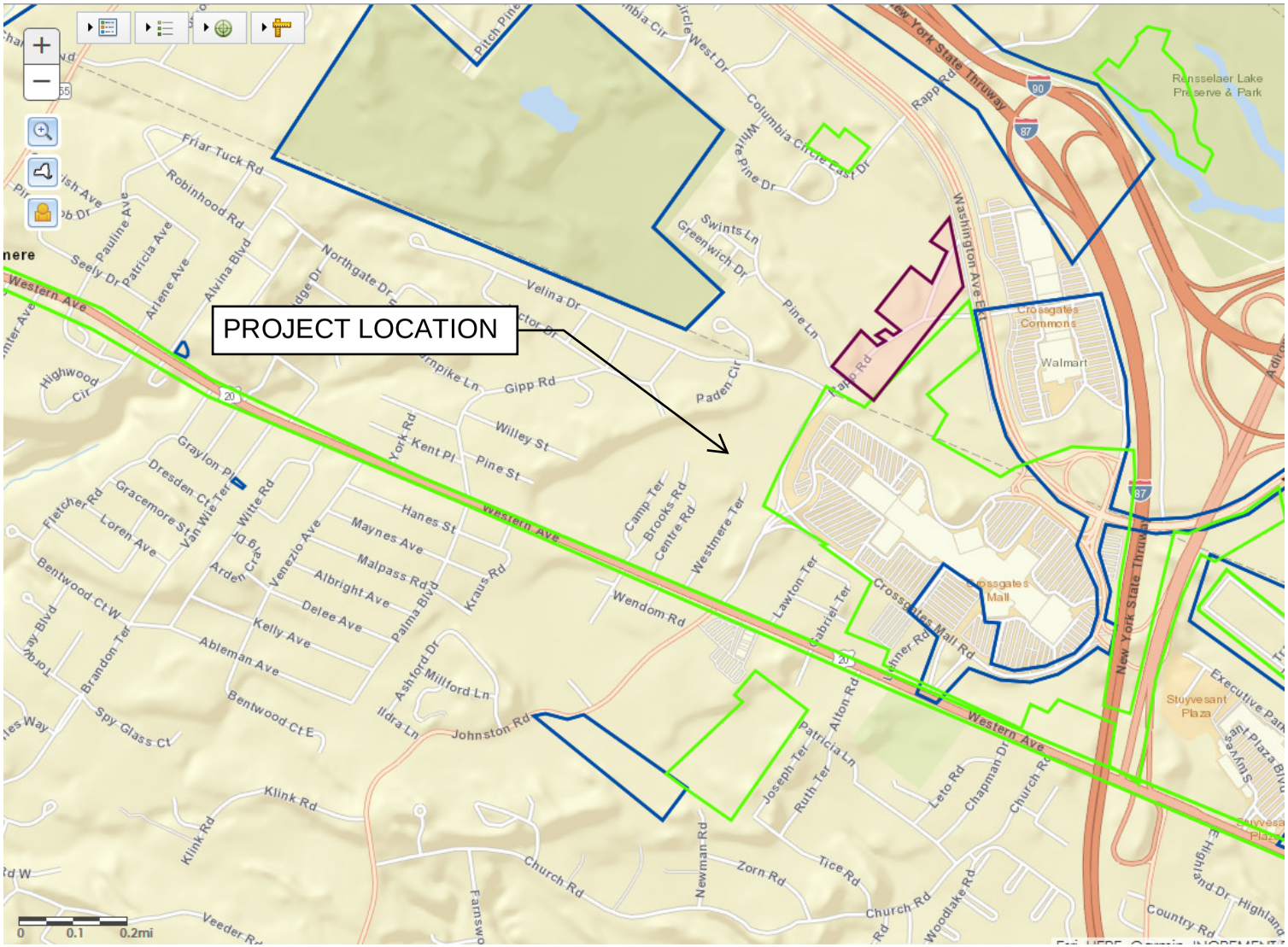
USN Building Districts (View)

Survey Building Areas (View)

Survey Archaeology Areas (View)

LPC Historic Districts

Consultation Projects (View)



NEW YORK STATE OF OPPORTUNITY. | Parks, Recreation and Historic Preservation

ANDREW M. CUOMO
Governor

ERIK KULLESEID
Acting Commissioner

March 11, 2019

Kenneth Kovalchik
Town Planner
Town of Guilderland
PO Box 339
Guilderland, NY 12084-0339
(via email)

Re: SEQRA/DEC
Proposed Rapp Road Apartments/Townhomes/New Construction
Gipp and Rapp Roads, Guilderland, Albany County
19PR01578

Dear Mr. Kovalchik:

Thank you for requesting the comments of the Office of Parks, Recreation and Historic Preservation (OPRHP) as part of your SEQRA process. These comments are those of the Division for Historic Preservation and relate only to Historic/Cultural resources. They do not include potential environmental impacts to New York State Parkland that may be involved in or near your project. Such impacts must be considered as part of the environmental review of the project pursuant to the State Environmental Quality Review Act (New York Environmental Conservation Law Article 8) and its implementing regulations (6 NYCRR Part 617).

Our office has assessed both the archaeological and historical impacts that might be associated with this action. Based upon this review, it is the OPRHP's opinion that the project, as submitted, will not impact cultural resources in or eligible for inclusion in the State and National Register of Historic Places.

If I can be of any further assistance, I can be reached at john.bonafide@parks.ny.gov or (518) 268-2166.

Sincerely,

John A. Bonafide
Director,
Technical Preservation Services Bureau
Agency Historic Preservation Officer

Figure 4

December 17, 2018

1:9,028

0 0.1 0.2 0.4 mi

0 0.175 0.35 0.7 km

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

NYS Department of Environmental Conservation
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SWPPP FIGURE

0 1 2 3
ORIGINAL SCALE IN INCHES

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Nashville Tennessee Office: 1705 Division Street, Nashville, Tennessee 37203, Phone: (615) 953-4909
☐ North Country Office: 20 Elm Street (Suite 110), Glens Falls, New York 12801, Phone: (518) 812-0513
☐ Westchester NY Office: 1 North Broadway, Suite 803, White Plains, New York 10601, Phone: (914) 997-8510
Chattanooga Tennessee Office: 427 E. 5TH ST. (Suite 201), Chattanooga, Tennessee 37403, Phone: (423) 241-6575

rev.	date	description

CROSSGATES RAPP ROAD RESIDENTIAL DEVELOPMENT

PRE-DEVELOPMENT WATERSHED DELINEATION MAP

TOWN OF GUILDERLAND, ALBANY COUNTY, NY

designed	checked
SM	RK
date	scale
02/06/19	1"=50'
project no.	
317AI.00	
sheet no.	
FIG.5	

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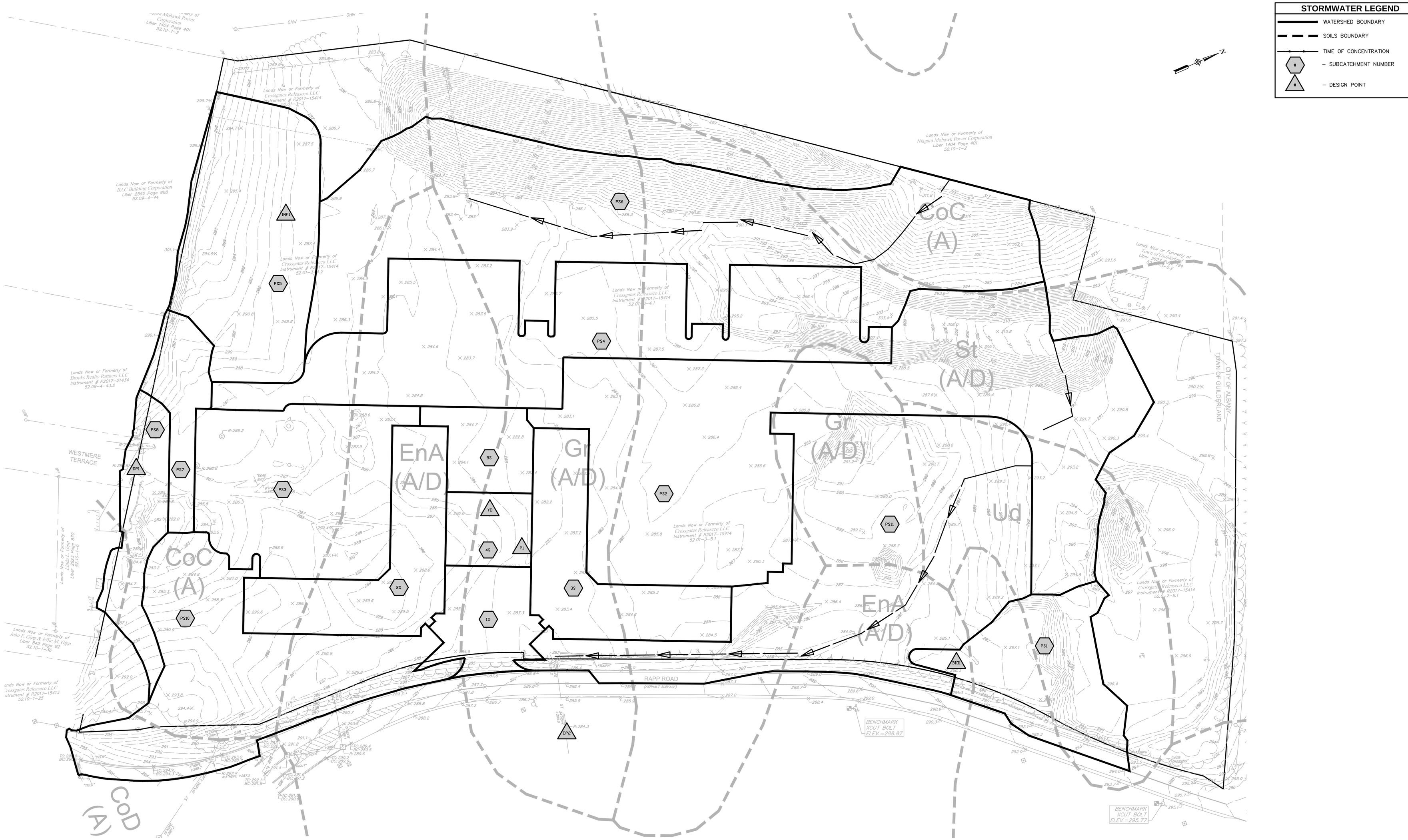
Xref's Attached: XBASE_ENG_317AI-00; XSTORM_317AI-00
Date Printed: Feb 06, 2019, 8:57am



SWPPP FIGURE

0 1 2 3
ORIGINAL SCALE IN INCHES

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427 E. 5TH ST. (Suite 201)
Chattanooga, Tennessee 37403
Phone: (423) 241-6575

rev.	date	description

CROSSGATES RAPP ROAD RESIDENTIAL DEVELOPMENT

POST-DEVELOPMENT WATERSHED DELINEATION MAP

TOWN OF GUILDERLAND, ALBANY COUNTY, NY

designed	checked
SM	RK
date	scale
02/06/19	1"=50'
project no.	
317AI.00	
sheet no.	
FIG.6	

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Date Printed: Feb 06, 2019, 9:04am

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Appendix H:
Chazen Certifying Professionals Letter

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THE Chazen COMPANIES®
Civil Engineers
Land Surveyors
Planners
Environmental & Safety Professionals
Landscape Architects
Transportation Planners & Engineers
Proud to be Employee Owned

HUDSON VALLEY OFFICE
21 Fox Street
Poughkeepsie, NY 12601
P: 845.454.3980 or 888.539.9073
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:
Pre-Development Stormwater Modeling

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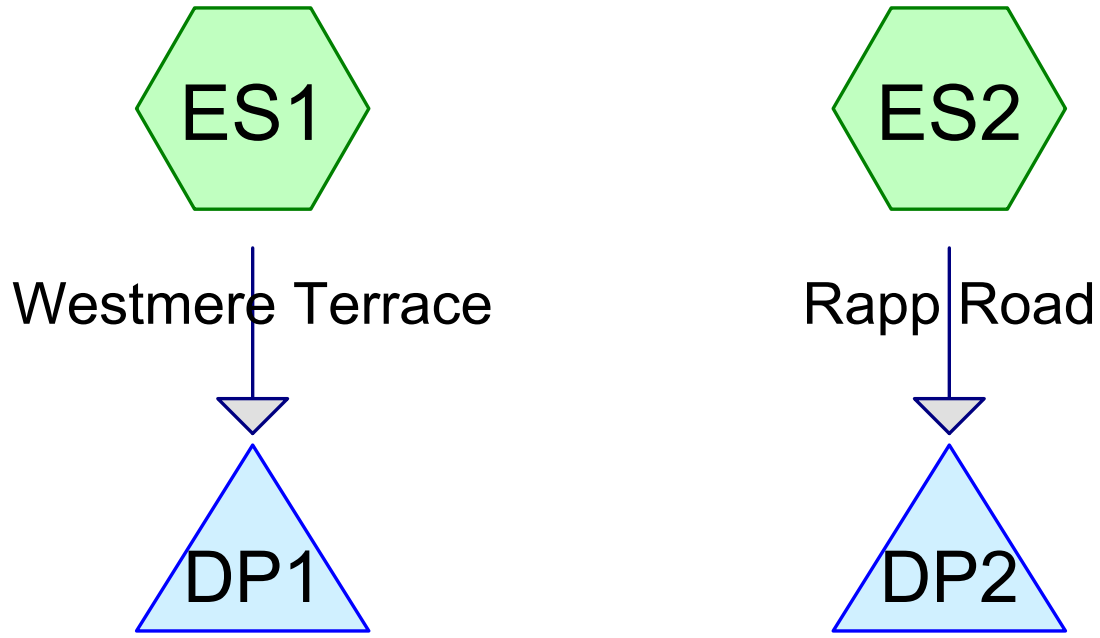

Subcat Reach Pond Link

Routing Diagram for 317AI.00_predvlp
Prepared by The Chazen Companies, Printed 2/6/2019

Summary for Subcatchment ES1: Westmere Terrace

Runoff = 0.00 cfs @ 23.99 hrs, Volume= 0.002 af, Depth= 0.01"

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-year Rainfall=2.21"

Area (sf)	CN	Description
9,605	98	Paved parking, HSG A
24,608	49	50-75% Grass cover, Fair, HSG A
39,472	43	Woods/grass comb., Fair, HSG A
73,685	52	Weighted Average
64,080	45	86.96% Pervious Area
9,605	98	13.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.3	100	0.0182	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.59"
3.4	94	0.0044	0.46		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
14.7	194	Total			

Summary for Subcatchment ES2: Rapp Road

Runoff = 4.94 cfs @ 12.25 hrs, Volume= 0.549 af, Depth= 0.45"

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-year Rainfall=2.21"

	Area (sf)	CN	Description
	4,328	98	Paved roads w/curbs & sewers, HSG A
	18,567	49	50-75% Grass cover, Fair, HSG A
	3,787	98	Paved roads w/curbs & sewers, HSG D
	15,258	30	Meadow, non-grazed, HSG A
	12,016	78	Meadow, non-grazed, HSG D
	104,825	83	Brush, Poor, HSG D
*	9,639	94	Compacted Dirt, HSG D
	98,265	43	Woods/grass comb., Fair, HSG A
	366,925	82	Woods/grass comb., Fair, HSG D
	633,610	74	Weighted Average
	625,495	74	98.72% Pervious Area
	8,115	98	1.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.7	100	0.0572	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.59"
2.8	193	0.0519	1.14		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.0	70	0.0284	1.18		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.5	342	0.0321	1.25		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.5	118	0.0253	0.80		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	88	0.0137	9.13	28.69	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Corrugated PE, smooth interior
26.7	911	Total			

Summary for Pond DP1: Westmere Terrace

Inflow Area = 1.692 ac, 13.04% Impervious, Inflow Depth = 0.01" for 1-year event
Inflow = 0.00 cfs @ 23.99 hrs, Volume= 0.002 af
Primary = 0.00 cfs @ 23.99 hrs, Volume= 0.002 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 DP2: Rapp Road

Inflow Area = 14.546 ac, 1.28% Impervious, Inflow Depth = 0.45" for 1-year event
Inflow = 4.94 cfs @ 12.25 hrs, Volume= 0.549 af
Primary = 4.94 cfs @ 12.25 hrs, Volume= 0.549 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 Subcatchment ES1: Westmere Terrace

Runoff = 0.32 cfs @ 12.13 hrs, Volume= 0.045 af, Depth= 0.32"

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-year Rainfall=3.74"

Area (sf)	CN	Description
9,605	98	Paved parking, HSG A
24,608	49	50-75% Grass cover, Fair, HSG A
39,472	43	Woods/grass comb., Fair, HSG A
73,685	52	Weighted Average
64,080	45	86.96% Pervious Area
9,605	98	13.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.3	100	0.0182	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.59"
3.4	94	0.0044	0.46		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
14.7	194	Total			

Summary for Subcatchment ES2: Rapp Road

Runoff = 18.45 cfs @ 12.22 hrs, Volume= 1.707 af, Depth= 1.41"

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-year Rainfall=3.74"

	Area (sf)	CN	Description
	4,328	98	Paved roads w/curbs & sewers, HSG A
	18,567	49	50-75% Grass cover, Fair, HSG A
	3,787	98	Paved roads w/curbs & sewers, HSG D
	15,258	30	Meadow, non-grazed, HSG A
	12,016	78	Meadow, non-grazed, HSG D
	104,825	83	Brush, Poor, HSG D
*	9,639	94	Compacted Dirt, HSG D
	98,265	43	Woods/grass comb., Fair, HSG A
	366,925	82	Woods/grass comb., Fair, HSG D
	633,610	74	Weighted Average
	625,495	74	98.72% Pervious Area
	8,115	98	1.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.7	100	0.0572	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.59"
2.8	193	0.0519	1.14		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.0	70	0.0284	1.18		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.5	342	0.0321	1.25		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.5	118	0.0253	0.80		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	88	0.0137	9.13	28.69	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Corrugated PE, smooth interior
26.7	911	Total			

Summary for Pond DP1: Westmere Terrace

Inflow Area = 1.692 ac, 13.04% Impervious, Inflow Depth = 0.32" for 10-year event
Inflow = 0.32 cfs @ 12.13 hrs, Volume= 0.045 af
Primary = 0.32 cfs @ 12.13 hrs, Volume= 0.045 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 DP2: Rapp Road

Inflow Area = 14.546 ac, 1.28% Impervious, Inflow Depth = 1.41" for 10-year event
Inflow = 18.45 cfs @ 12.22 hrs, Volume= 1.707 af
Primary = 18.45 cfs @ 12.22 hrs, Volume= 1.707 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 Subcatchment ES1: Westmere Terrace

Runoff = 2.90 cfs @ 12.09 hrs, Volume= 0.207 af, Depth= 1.47"

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-year Rainfall=6.34"

Area (sf)	CN	Description
9,605	98	Paved parking, HSG A
24,608	49	50-75% Grass cover, Fair, HSG A
39,472	43	Woods/grass comb., Fair, HSG A
73,685	52	Weighted Average
64,080	45	86.96% Pervious Area
9,605	98	13.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.3	100	0.0182	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.59"
3.4	94	0.0044	0.46		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
14.7	194	Total			

Summary for Subcatchment ES2: Rapp Road

Runoff = 47.28 cfs @ 12.20 hrs, Volume= 4.210 af, Depth= 3.47"

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-year Rainfall=6.34"

	Area (sf)	CN	Description
	4,328	98	Paved roads w/curbs & sewers, HSG A
	18,567	49	50-75% Grass cover, Fair, HSG A
	3,787	98	Paved roads w/curbs & sewers, HSG D
	15,258	30	Meadow, non-grazed, HSG A
	12,016	78	Meadow, non-grazed, HSG D
	104,825	83	Brush, Poor, HSG D
*	9,639	94	Compacted Dirt, HSG D
	98,265	43	Woods/grass comb., Fair, HSG A
	366,925	82	Woods/grass comb., Fair, HSG D
	633,610	74	Weighted Average
	625,495	74	98.72% Pervious Area
	8,115	98	1.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.7	100	0.0572	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.59"
2.8	193	0.0519	1.14		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.0	70	0.0284	1.18		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.5	342	0.0321	1.25		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.5	118	0.0253	0.80		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	88	0.0137	9.13	28.69	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Corrugated PE, smooth interior
26.7	911	Total			

Summary for Pond DP1: Westmere Terrace

Inflow Area = 1.692 ac, 13.04% Impervious, Inflow Depth = 1.47" for 100-year event
Inflow = 2.90 cfs @ 12.09 hrs, Volume= 0.207 af
Primary = 2.90 cfs @ 12.09 hrs, Volume= 0.207 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 DP2: Rapp Road

Inflow Area = 14.546 ac, 1.28% Impervious, Inflow Depth = 3.47" for 100-year event
Inflow = 47.28 cfs @ 12.20 hrs, Volume= 4.210 af
Primary = 47.28 cfs @ 12.20 hrs, Volume= 4.210 af, Atten= 0%, Lag= 0.0 min

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

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Appendix J:
Post-Development Stormwater Modeling

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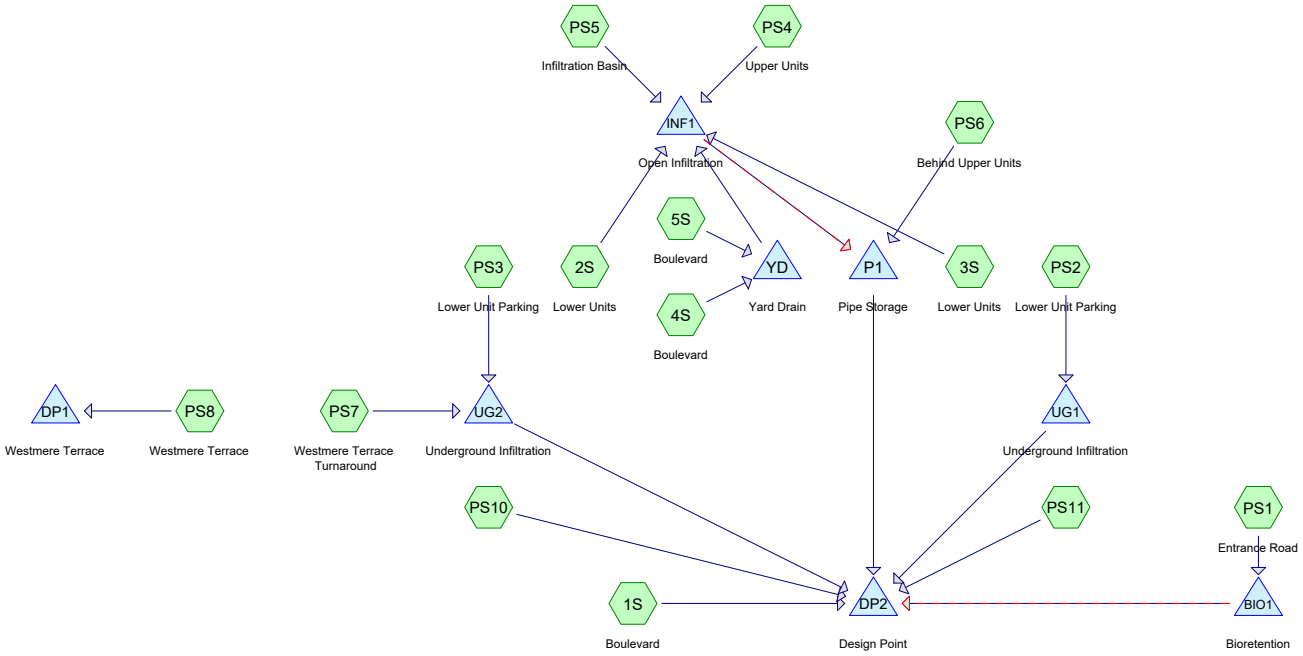

Subcat Reach Pond Link

Routing Diagram for 317AI-00_Post-Development
Prepared by The Chazen Companies, Printed 2/6/2019
HydroCAD® 10.00-21 s/n 00927 © 2018 HydroCAD Software Solutions LLC

Summary for Subcatchment 1S: Boulevard

Runoff = 0.79 cfs @ 11.97 hrs, Volume= 0.038 af, Depth= 1.51"

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-year Rainfall=2.21"

Area (sf)	CN	Description
3,470	80	>75% Grass cover, Good, HSG D
9,835	98	Paved roads w/curbs & sewers, HSG D
13,305	93	Weighted Average
3,470	80	26.08% Pervious Area
9,835	98	73.92% Impervious Area

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

Summary for Subcatchment 2S: Lower Units

Runoff = 1.86 cfs @ 11.97 hrs, Volume= 0.100 af, Depth= 1.98"

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-year Rainfall=2.21"

Area (sf)	CN	Description
21,656	98	Roofs, HSG D
4,646	98	Roofs, HSG A
26,302	98	Weighted Average
26,302	98	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: Lower Units

Runoff = 1.86 cfs @ 11.97 hrs, Volume= 0.100 af, Depth= 1.98"

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-year Rainfall=2.21"

Area (sf)	CN	Description
26,301	98	Roofs, HSG D
26,301	98	100.00% Impervious Area

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

Summary for Subcatchment 4S: Boulevard

Runoff = 0.51 cfs @ 11.97 hrs, Volume= 0.025 af, Depth= 1.51"

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-year Rainfall=2.21"

Area (sf)	CN	Description
2,449	80	>75% Grass cover, Good, HSG D
6,125	98	Paved roads w/curbs & sewers, HSG D
8,574	93	Weighted Average
2,449	80	28.56% Pervious Area
6,125	98	71.44% Impervious Area

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

Summary for Subcatchment 5S: Boulevard

Runoff = 0.60 cfs @ 11.97 hrs, Volume= 0.029 af, Depth= 1.43"

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-year Rainfall=2.21"

Area (sf)	CN	Description
3,559	80	>75% Grass cover, Good, HSG D
6,970	98	Paved roads w/curbs & sewers, HSG D
10,529	92	Weighted Average
3,559	80	33.80% Pervious Area
6,970	98	66.20% Impervious Area

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

Summary for Subcatchment PS1: Entrance Road

Runoff = 1.03 cfs @ 11.98 hrs, Volume= 0.048 af, Depth= 0.90"

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-year Rainfall=2.21"

Area (sf)	CN	Description
6,984	98	Paved roads w/curbs & sewers, HSG D
2,014	78	Meadow, non-grazed, HSG D
19,034	80	>75% Grass cover, Good, HSG D
28,032	84	Weighted Average
21,048	80	75.09% Pervious Area
6,984	98	24.91% Impervious Area

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

Summary for Subcatchment PS10:

Runoff = 0.00 cfs @ 24.01 hrs, Volume= 0.001 af, Depth= 0.01"

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-year Rainfall=2.21"

Area (sf)	CN	Adj	Description
1,986	98		Unconnected pavement, HSG A
1,761	98		Unconnected pavement, HSG D
12,796	80		>75% Grass cover, Good, HSG D
39,625	39		>75% Grass cover, Good, HSG A
56,168	52	51	Weighted Average, UI Adjusted
52,421	49	49	93.33% Pervious Area
3,747	98	98	6.67% Impervious Area
3,747			100.00% Unconnected

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

Summary for Subcatchment PS11:

Runoff = 1.81 cfs @ 12.00 hrs, Volume= 0.093 af, Depth= 0.61"

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-year Rainfall=2.21"

Area (sf)	CN	Adj	Description
5,803	98		Unconnected pavement, HSG D
4,860	39		>75% Grass cover, Good, HSG A
69,805	80		>75% Grass cover, Good, HSG D
80,468	79	78	Weighted Average, UI Adjusted
74,665	77	77	92.79% Pervious Area
5,803	98	98	7.21% Impervious Area
5,803			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	81	0.0742	0.25		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.59"
2.4	585	0.3422	4.09		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.8	666	Total			

Summary for Subcatchment PS2: Lower Unit Parking

Runoff = 6.44 cfs @ 11.98 hrs, Volume= 0.308 af, Depth= 1.28"

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-year Rainfall=2.21"

Area (sf)	CN	Description
68,595	98	Unconnected pavement, HSG D
26,074	80	>75% Grass cover, Good, HSG D
31,645	82	Woods/grass comb., Fair, HSG D
126,314	90	Weighted Average
57,719	81	45.69% Pervious Area
68,595	98	54.31% Impervious Area
68,595		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	16	0.0484	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.59"
1.8	48	0.4205	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.59"
0.7	65	0.0487	1.54		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.1	508	0.0050	4.03	4.95	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Corrugated PE, smooth interior
6.4	637	Total			

Summary for Subcatchment PS3: Lower Unit Parking

Runoff = 2.64 cfs @ 11.97 hrs, Volume= 0.128 af, Depth= 1.51"

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-year Rainfall=2.21"

Area (sf)	CN	Description
9,262	98	Paved parking, HSG D
29,041	98	Paved parking, HSG A
3,263	80	>75% Grass cover, Good, HSG D
2,709	39	>75% Grass cover, Good, HSG A
44,275	93	Weighted Average
5,972	61	13.49% Pervious Area
38,303	98	86.51% Impervious Area

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

Summary for Subcatchment PS4: Upper Units

Runoff = 5.31 cfs @ 11.97 hrs, Volume= 0.270 af, Depth= 1.78"

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-year Rainfall=2.21"

Area (sf)	CN	Description
27,551	98	Roofs, HSG D
37,407	98	Paved parking, HSG D
7,052	98	Paved parking, HSG A
1,048	39	>75% Grass cover, Good, HSG A
6,168	80	>75% Grass cover, Good, HSG D
79,226	96	Weighted Average
7,216	74	9.11% Pervious Area
72,010	98	90.89% Impervious Area

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

Summary for Subcatchment PS5: Infiltration Basin

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

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-year Rainfall=2.21"

Area (sf)	CN	Description
31,936	39	>75% Grass cover, Good, HSG A
14,123	43	Woods/grass comb., Fair, HSG A
46,059	40	Weighted Average
46,059	40	100.00% Pervious Area

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

Summary for Subcatchment PS6: Behind Upper Units

Runoff = 0.34 cfs @ 12.19 hrs, Volume= 0.050 af, Depth= 0.22"

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-year Rainfall=2.21"

Area (sf)	CN	Description
30,261	43	Woods/grass comb., Fair, HSG A
28,841	82	Woods/grass comb., Fair, HSG D
13,609	39	>75% Grass cover, Good, HSG A
46,304	80	>75% Grass cover, Good, HSG D
119,015	66	Weighted Average
119,015	66	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	100	0.1600	0.16		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.59"
0.2	26	0.1923	2.19		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
8.8	498	0.0181	0.94		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
19.4	624	Total			

Summary for Subcatchment PS7: Westmere Terrace Turnaround

Runoff = 0.00 cfs @ 15.22 hrs, Volume= 0.001 af, Depth= 0.04"

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 1-year Rainfall=2.21"

Area (sf)	CN	Description
3,058	98	Paved parking, HSG A
8,182	39	>75% Grass cover, Good, HSG A
11,240	55	Weighted Average
8,182	39	72.79% Pervious Area
3,058	98	27.21% Impervious Area

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

Summary for Subcatchment PS8: Westmere Terrace

Runoff = 0.00 cfs @ 24.01 hrs, Volume= 0.000 af, Depth= 0.01"

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-year Rainfall=2.21"

Area (sf)	CN	Description
1,173	98	Paved parking, HSG A
7,519	39	>75% Grass cover, Good, HSG A
2,246	80	>75% Grass cover, Good, HSG D
3,839	43	Woods/grass comb., Fair, HSG A
14,777	51	Weighted Average
13,604	47	92.06% Pervious Area
1,173	98	7.94% Impervious Area

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

Summary for Pond BIO1: Bioretention

Inflow Area = 0.644 ac, 24.91% Impervious, Inflow Depth = 0.90" for 1-year event
Inflow = 1.03 cfs @ 11.98 hrs, Volume= 0.048 af
Outflow = 0.05 cfs @ 13.47 hrs, Volume= 0.023 af, Atten= 95%, Lag= 89.4 min
Primary = 0.05 cfs @ 13.47 hrs, Volume= 0.023 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 285.61' @ 13.47 hrs Surf.Area= 2,313 sf Storage= 1,230 cf
Flood Elev= 286.50' Surf.Area= 3,634 sf Storage= 3,010 cf

Plug-Flow detention time= 341.6 min calculated for 0.023 af (47% of inflow)
Center-of-Mass det. time= 211.2 min (1,055.8 - 844.6)

Volume	Invert	Avail.Storage	Storage Description
#1	284.00'	221 cf	**Pretreatment (Prismatic)**Listed below (Recalc)
#2	281.00'	884 cf	**Bioretention Filter (Prismatic)**Listed below (Recalc) 2,948 cf Overall x 30.0% Voids
#3	285.50'	1,905 cf	**Bioretention Ponding (Prismatic)**Listed below (Recalc)
		3,010 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
284.00	123	0	0
284.50	215	85	85
285.00	332	137	221

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
281.00	737	0	0
285.00	737	2,948	2,948

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
285.50	1,027	0	0
286.00	2,013	760	760
286.50	2,565	1,145	1,905

Device	Routing	Invert	Outlet Devices
#1	Primary	285.50'	**10.0" Vert. Orifice/Grate** C= 0.600
#2	Secondary	286.00'	**5.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.05 cfs @ 13.47 hrs HW=285.61' TW=0.00' (Dynamic Tailwater)
↑**1=Orifice/Grate** (Orifice Controls 0.05 cfs @ 1.13 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=281.00' TW=0.00' (Dynamic Tailwater)
↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond DP1: Westmere Terrace

Inflow Area = 0.339 ac, 7.94% Impervious, Inflow Depth = 0.01" for 1-year event
Inflow = 0.00 cfs @ 24.01 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 24.01 hrs, Volume= 0.000 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 DP2: Design Point

Inflow Area = 15.514 ac, 40.55% Impervious, Inflow Depth = 0.16" for 1-year event
Inflow = 2.56 cfs @ 11.99 hrs, Volume= 0.213 af
Primary = 2.56 cfs @ 11.99 hrs, Volume= 0.213 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 INF1: Open Infiltration

Inflow Area = 4.522 ac, 69.91% Impervious, Inflow Depth = 1.39" for 1-year event
Inflow = 10.13 cfs @ 11.97 hrs, Volume= 0.523 af
Outflow = 0.22 cfs @ 15.21 hrs, Volume= 0.465 af, Atten= 98%, Lag= 194.4 min
Discarded = 0.22 cfs @ 15.21 hrs, Volume= 0.465 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 282.74' @ 15.21 hrs Surf.Area= 4,703 sf Storage= 15,788 cf
Flood Elev= 287.50' Surf.Area= 22,442 sf Storage= 90,750 cf

Plug-Flow detention time= 789.6 min calculated for 0.465 af (89% of inflow)
Center-of-Mass det. time= 734.3 min (1,511.0 - 776.7)

Volume	Invert	Avail.Storage	Storage Description
#1	280.00'	13,576 cf	**Pretreatment (Prismatic)**Listed below (Recalc) -Impervious
#2	281.00'	77,174 cf	**Infiltration Basin (Prismatic)**Listed below (Recalc)
		90,750 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
280.00	2,027	0	0
281.00	3,014	2,521	2,521
282.00	4,101	3,558	6,078
283.00	5,289	4,695	10,773
283.50	5,921	2,803	13,576

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
281.00	2,618	0	0
282.00	3,772	3,195	3,195
283.00	5,026	4,399	7,594
283.50	5,691	2,679	10,273
284.00	13,269	4,740	15,013
285.00	15,764	14,517	29,530
286.00	18,360	17,062	46,592
287.00	21,056	19,708	66,300
287.50	22,442	10,875	77,174

Device	Routing	Invert	Outlet Devices
#1	Primary	285.00'	**12.0" Round Culvert** L= 179.8' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 285.00' / 282.50' S= 0.0139 '/' Cc= 0.900 n= 0.012 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	287.00'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#3	Discarded	281.00'	**2.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.22 cfs @ 15.21 hrs HW=282.74' (Free Discharge)
3=Exfiltration (Exfiltration Controls 0.22 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=280.00' TW=281.20' (Dynamic Tailwater)
1=Culvert (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=280.00' TW=281.20' (Dynamic Tailwater)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond P1: Pipe Storage

Inflow Area = 7.254 ac, 43.58% Impervious, Inflow Depth = 0.08" for 1-year event
Inflow = 0.34 cfs @ 12.19 hrs, Volume= 0.050 af
Outflow = 0.31 cfs @ 12.25 hrs, Volume= 0.050 af, Atten= 7%, Lag= 3.9 min
Primary = 0.31 cfs @ 12.25 hrs, Volume= 0.050 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 281.45' @ 12.25 hrs Surf.Area= 0.010 ac Storage= 0.002 af
Flood Elev= 286.00' Surf.Area= 0.000 ac Storage= 0.024 af

Plug-Flow detention time= 6.3 min calculated for 0.050 af (100% of inflow)
Center-of-Mass det. time= 6.4 min (956.5 - 950.1)

Volume	Invert	Avail.Storage	Storage Description
#1	281.20'	0.024 af	**24.0" Round Pipe Storage** L= 335.0'

Device	Routing	Invert	Outlet Devices
#1	Primary	281.20'	**24.0" Round Culvert** L= 91.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 281.20' / 280.00' S= 0.0132 '/' Cc= 0.900 n= 0.012 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=0.31 cfs @ 12.25 hrs HW=281.45' TW=0.00' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.31 cfs @ 1.36 fps)

Summary for Pond UG1: Underground Infiltration

Inflow Area = 2.900 ac, 54.31% Impervious, Inflow Depth = 1.28" for 1-year event
Inflow = 6.44 cfs @ 11.98 hrs, Volume= 0.308 af
Outflow = 0.47 cfs @ 11.74 hrs, Volume= 0.308 af, Atten= 93%, Lag= 0.0 min
Discarded = 0.47 cfs @ 11.74 hrs, Volume= 0.308 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 283.14' @ 12.59 hrs Surf.Area= 10,253 sf Storage= 5,381 cf
Flood Elev= 286.87' Surf.Area= 10,303 sf Storage= 22,455 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 87.4 min (906.7 - 819.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	282.25'	9,044 cf	**82.25'W x 124.66'L x 3.50'H Field A** 35,886 cf Overall - 13,277 cf Embedded = 22,609 cf x 40.0% Voids
#2A	282.75'	13,277 cf	**ADS_StormTech SC-740 +Cap** x 289 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 17 Rows of 17 Chambers
#3	284.19'	135 cf	**4.00'D x 2.68'H Vertical Cone/Cylinder** x 4
#4	287.00'	61 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
		22,515 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
287.00	67	0	0
287.50	175	61	61

Device	Routing	Invert	Outlet Devices
#1	Primary	283.69'	**18.0" Vert. Orifice/Grate** C= 0.600
#2	Discarded	282.25'	**2.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.47 cfs @ 11.74 hrs HW=282.31' (Free Discharge)
↑└**2=Exfiltration** (Exfiltration Controls 0.47 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=282.25' TW=0.00' (Dynamic Tailwater)
↑└**1=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond UG2: Underground Infiltration

Inflow Area = 1.274 ac, 74.50% Impervious, Inflow Depth = 1.21" for 1-year event
Inflow = 2.64 cfs @ 11.97 hrs, Volume= 0.129 af
Outflow = 0.18 cfs @ 12.61 hrs, Volume= 0.129 af, Atten= 93%, Lag= 38.3 min
Discarded = 0.09 cfs @ 12.20 hrs, Volume= 0.121 af
Primary = 0.09 cfs @ 12.61 hrs, Volume= 0.008 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 284.60' @ 12.61 hrs Surf.Area= 1,920 sf Storage= 2,612 cf
Flood Elev= 288.00' Surf.Area= 6,576 sf Storage= 6,348 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 257.7 min (1,062.6 - 804.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	282.54'	1,700 cf	**34.75'W x 53.46'L x 3.50'H Field A** 6,502 cf Overall - 2,251 cf Embedded = 4,251 cf x 40.0% Voids
#2A	283.04'	2,251 cf	**ADS_StormTech SC-740 +Cap** x 49 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 7 Rows of 7 Chambers
#3	284.47'	162 cf	**4.00'D x 2.58'H Vertical Cone/Cylinder** x 5
#4	287.05'	2,234 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
		6,348 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
287.05	48	0	0
288.00	4,656	2,234	2,234

Device	Routing	Invert	Outlet Devices
#1	Discarded	282.54'	**2.000 in/hr Exfiltration over Surface area**
#2	Primary	284.47'	**15.0" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.09 cfs @ 12.20 hrs HW=284.47' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.09 cfs)

Primary OutFlow Max=0.09 cfs @ 12.61 hrs HW=284.60' TW=0.00' (Dynamic Tailwater)
↑—**2=Orifice/Grate** (Orifice Controls 0.09 cfs @ 1.25 fps)

Summary for Pond YD: Yard Drain

Inflow Area = 0.439 ac, 68.55% Impervious, Inflow Depth = 1.46" for 1-year event
Inflow = 1.11 cfs @ 11.97 hrs, Volume= 0.053 af
Outflow = 1.10 cfs @ 11.98 hrs, Volume= 0.053 af, Atten= 1%, Lag= 0.6 min
Primary = 1.10 cfs @ 11.98 hrs, Volume= 0.053 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 285.33' @ 11.98 hrs Surf.Area= 116 sf Storage= 64 cf
Flood Elev= 287.98' Surf.Area= 520 sf Storage= 144 cf

Plug-Flow detention time= 2.1 min calculated for 0.053 af (100% of inflow)
Center-of-Mass det. time= 2.1 min (808.2 - 806.1)

Volume	Invert	Avail.Storage	Storage Description
#1	287.75'	49 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
#2	284.69'	95 cf	**12.0" Round Pipe Storage** L= 120.7'
		144 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
287.75	132	0	0
287.90	520	49	49

Device	Routing	Invert	Outlet Devices
#1	Primary	284.69'	**12.0" Round Culvert** L= 69.1' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 284.69' / 284.34' S= 0.0051 '/' Cc= 0.900 n= 0.012 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.10 cfs @ 11.98 hrs HW=285.33' TW=282.11' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 1.10 cfs @ 2.94 fps)

Summary for Subcatchment 1S: Boulevard

Runoff = 1.49 cfs @ 11.97 hrs, Volume= 0.075 af, Depth= 2.96"

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-year Rainfall=3.73"

Area (sf)	CN	Description
3,470	80	>75% Grass cover, Good, HSG D
9,835	98	Paved roads w/curbs & sewers, HSG D
13,305	93	Weighted Average
3,470	80	26.08% Pervious Area
9,835	98	73.92% Impervious Area

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

Summary for Subcatchment 2S: Lower Units

Runoff = 3.19 cfs @ 11.97 hrs, Volume= 0.176 af, Depth= 3.50"

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-year Rainfall=3.73"

Area (sf)	CN	Description
21,656	98	Roofs, HSG D
4,646	98	Roofs, HSG A
26,302	98	Weighted Average
26,302	98	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: Lower Units

Runoff = 3.19 cfs @ 11.97 hrs, Volume= 0.176 af, Depth= 3.50"

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-year Rainfall=3.73"

Area (sf)	CN	Description
26,301	98	Roofs, HSG D
26,301	98	100.00% Impervious Area

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

Summary for Subcatchment 4S: Boulevard

Runoff = 0.96 cfs @ 11.97 hrs, Volume= 0.049 af, Depth= 2.96"

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-year Rainfall=3.73"

Area (sf)	CN	Description
2,449	80	>75% Grass cover, Good, HSG D
6,125	98	Paved roads w/curbs & sewers, HSG D
8,574	93	Weighted Average
2,449	80	28.56% Pervious Area
6,125	98	71.44% Impervious Area

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

Summary for Subcatchment 5S: Boulevard

Runoff = 1.15 cfs @ 11.97 hrs, Volume= 0.058 af, Depth= 2.86"

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 10-year Rainfall=3.73"

Area (sf)	CN	Description
3,559	80	>75% Grass cover, Good, HSG D
6,970	98	Paved roads w/curbs & sewers, HSG D
10,529	92	Weighted Average
3,559	80	33.80% Pervious Area
6,970	98	66.20% Impervious Area

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

Summary for Subcatchment PS1: Entrance Road

Runoff = 2.43 cfs @ 11.97 hrs, Volume= 0.114 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-year Rainfall=3.73"

Area (sf)	CN	Description
6,984	98	Paved roads w/curbs & sewers, HSG D
2,014	78	Meadow, non-grazed, HSG D
19,034	80	>75% Grass cover, Good, HSG D
28,032	84	Weighted Average
21,048	80	75.09% Pervious Area
6,984	98	24.91% Impervious Area

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

Summary for Subcatchment PS10:

Runoff = 0.31 cfs @ 12.02 hrs, Volume= 0.031 af, Depth= 0.29"

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-year Rainfall=3.73"

Area (sf)	CN	Adj	Description
1,986	98		Unconnected pavement, HSG A
1,761	98		Unconnected pavement, HSG D
12,796	80		>75% Grass cover, Good, HSG D
39,625	39		>75% Grass cover, Good, HSG A
56,168	52	51	Weighted Average, UI Adjusted
52,421	49	49	93.33% Pervious Area
3,747	98	98	6.67% Impervious Area
3,747			100.00% Unconnected

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

Summary for Subcatchment PS11:

Runoff = 5.18 cfs @ 12.00 hrs, Volume= 0.258 af, Depth= 1.67"

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-year Rainfall=3.73"

Area (sf)	CN	Adj	Description
5,803	98		Unconnected pavement, HSG D
4,860	39		>75% Grass cover, Good, HSG A
69,805	80		>75% Grass cover, Good, HSG D
80,468	79	78	Weighted Average, UI Adjusted
74,665	77	77	92.79% Pervious Area
5,803	98	98	7.21% Impervious Area
5,803			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	81	0.0742	0.25		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.59"
2.4	585	0.3422	4.09		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.8	666	Total			

Summary for Subcatchment PS2: Lower Unit Parking

Runoff = 12.99 cfs @ 11.97 hrs, Volume= 0.644 af, Depth= 2.66"

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-year Rainfall=3.73"

Area (sf)	CN	Description
68,595	98	Unconnected pavement, HSG D
26,074	80	>75% Grass cover, Good, HSG D
31,645	82	Woods/grass comb., Fair, HSG D
126,314	90	Weighted Average
57,719	81	45.69% Pervious Area
68,595	98	54.31% Impervious Area
68,595		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	16	0.0484	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.59"
1.8	48	0.4205	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.59"
0.7	65	0.0487	1.54		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.1	508	0.0050	4.03	4.95	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Corrugated PE, smooth interior
6.4	637	Total			

Summary for Subcatchment PS3: Lower Unit Parking

Runoff = 4.96 cfs @ 11.97 hrs, Volume= 0.251 af, Depth= 2.96"

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-year Rainfall=3.73"

Area (sf)	CN	Description
9,262	98	Paved parking, HSG D
29,041	98	Paved parking, HSG A
3,263	80	>75% Grass cover, Good, HSG D
2,709	39	>75% Grass cover, Good, HSG A
44,275	93	Weighted Average
5,972	61	13.49% Pervious Area
38,303	98	86.51% Impervious Area

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

Summary for Subcatchment PS4: Upper Units

Runoff = 9.39 cfs @ 11.97 hrs, Volume= 0.496 af, Depth= 3.27"

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 10-year Rainfall=3.73"

Area (sf)	CN	Description
27,551	98	Roofs, HSG D
37,407	98	Paved parking, HSG D
7,052	98	Paved parking, HSG A
1,048	39	>75% Grass cover, Good, HSG A
6,168	80	>75% Grass cover, Good, HSG D
79,226	96	Weighted Average
7,216	74	9.11% Pervious Area
72,010	98	90.89% Impervious Area

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

Summary for Subcatchment PS5: Infiltration Basin

Runoff = 0.00 cfs @ 18.22 hrs, Volume= 0.003 af, Depth= 0.03"

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-year Rainfall=3.73"

Area (sf)	CN	Description
31,936	39	>75% Grass cover, Good, HSG A
14,123	43	Woods/grass comb., Fair, HSG A
46,059	40	Weighted Average
46,059	40	100.00% Pervious Area

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

Summary for Subcatchment PS6: Behind Upper Units

Runoff = 2.55 cfs @ 12.14 hrs, Volume= 0.211 af, Depth= 0.93"

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-year Rainfall=3.73"

Area (sf)	CN	Description
30,261	43	Woods/grass comb., Fair, HSG A
28,841	82	Woods/grass comb., Fair, HSG D
13,609	39	>75% Grass cover, Good, HSG A
46,304	80	>75% Grass cover, Good, HSG D
119,015	66	Weighted Average
119,015	66	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	100	0.1600	0.16		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.59"
0.2	26	0.1923	2.19		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
8.8	498	0.0181	0.94		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
19.4	624	Total			

Summary for Subcatchment PS7: Westmere Terrace Turnaround

Runoff = 0.14 cfs @ 12.00 hrs, Volume= 0.009 af, Depth= 0.43"

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-year Rainfall=3.73"

Area (sf)	CN	Description
3,058	98	Paved parking, HSG A
8,182	39	>75% Grass cover, Good, HSG A
11,240	55	Weighted Average
8,182	39	72.79% Pervious Area
3,058	98	27.21% Impervious Area

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

Summary for Subcatchment PS8: Westmere Terrace

Runoff = 0.08 cfs @ 12.02 hrs, Volume= 0.008 af, Depth= 0.29"

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-year Rainfall=3.73"

Area (sf)	CN	Description
1,173	98	Paved parking, HSG A
7,519	39	>75% Grass cover, Good, HSG A
2,246	80	>75% Grass cover, Good, HSG D
3,839	43	Woods/grass comb., Fair, HSG A
14,777	51	Weighted Average
13,604	47	92.06% Pervious Area
1,173	98	7.94% Impervious Area

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

Summary for Pond BIO1: Bioretention

Inflow Area = 0.644 ac, 24.91% Impervious, Inflow Depth = 2.13" for 10-year event
Inflow = 2.43 cfs @ 11.97 hrs, Volume= 0.114 af
Outflow = 1.24 cfs @ 12.06 hrs, Volume= 0.089 af, Atten= 49%, Lag= 5.2 min
Primary = 1.02 cfs @ 12.06 hrs, Volume= 0.087 af
Secondary = 0.22 cfs @ 12.06 hrs, Volume= 0.002 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 286.07' @ 12.06 hrs Surf.Area= 3,159 sf Storage= 2,009 cf
Flood Elev= 286.50' Surf.Area= 3,634 sf Storage= 3,010 cf

Plug-Flow detention time= 159.7 min calculated for 0.089 af (78% of inflow)
Center-of-Mass det. time= 71.6 min (891.2 - 819.6)

Volume	Invert	Avail.Storage	Storage Description
#1	284.00'	221 cf	**Pretreatment (Prismatic)**Listed below (Recalc)
#2	281.00'	884 cf	**Bioretention Filter (Prismatic)**Listed below (Recalc) 2,948 cf Overall x 30.0% Voids
#3	285.50'	1,905 cf	**Bioretention Ponding (Prismatic)**Listed below (Recalc)
		3,010 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
284.00	123	0	0
284.50	215	85	85
285.00	332	137	221

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
281.00	737	0	0
285.00	737	2,948	2,948

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
285.50	1,027	0	0
286.00	2,013	760	760
286.50	2,565	1,145	1,905

Device	Routing	Invert	Outlet Devices
#1	Primary	285.50'	**10.0" Vert. Orifice/Grate** C= 0.600
#2	Secondary	286.00'	**5.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=1.02 cfs @ 12.06 hrs HW=286.07' TW=0.00' (Dynamic Tailwater)
↑**1=Orifice/Grate** (Orifice Controls 1.02 cfs @ 2.57 fps)

Secondary OutFlow Max=0.22 cfs @ 12.06 hrs HW=286.07' TW=0.00' (Dynamic Tailwater)
↑**2=Broad-Crested Rectangular Weir** (Weir Controls 0.22 cfs @ 0.62 fps)

Summary for Pond DP1: Westmere Terrace

Inflow Area = 0.339 ac, 7.94% Impervious, Inflow Depth = 0.29" for 10-year event
Inflow = 0.08 cfs @ 12.02 hrs, Volume= 0.008 af
Primary = 0.08 cfs @ 12.02 hrs, Volume= 0.008 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 DP2: Design Point

Inflow Area = 15.514 ac, 40.55% Impervious, Inflow Depth = 0.64" for 10-year event
Inflow = 12.31 cfs @ 12.02 hrs, Volume= 0.830 af
Primary = 12.31 cfs @ 12.02 hrs, Volume= 0.830 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 INF1: Open Infiltration

Inflow Area = 4.522 ac, 69.91% Impervious, Inflow Depth = 2.54" for 10-year event
Inflow = 17.89 cfs @ 11.97 hrs, Volume= 0.957 af
Outflow = 0.56 cfs @ 13.77 hrs, Volume= 0.899 af, Atten= 97%, Lag= 108.1 min
Discarded = 0.56 cfs @ 13.77 hrs, Volume= 0.899 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 283.92' @ 13.77 hrs Surf.Area= 12,061 sf Storage= 27,579 cf
Flood Elev= 287.50' Surf.Area= 22,442 sf Storage= 90,750 cf

Plug-Flow detention time= 900.8 min calculated for 0.899 af (94% of inflow)
Center-of-Mass det. time= 865.6 min (1,629.3 - 763.7)

Volume	Invert	Avail.Storage	Storage Description
#1	280.00'	13,576 cf	**Pretreatment (Prismatic)**Listed below (Recalc) -Impervious
#2	281.00'	77,174 cf	**Infiltration Basin (Prismatic)**Listed below (Recalc)
		90,750 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
280.00	2,027	0	0
281.00	3,014	2,521	2,521
282.00	4,101	3,558	6,078
283.00	5,289	4,695	10,773
283.50	5,921	2,803	13,576

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
281.00	2,618	0	0
282.00	3,772	3,195	3,195
283.00	5,026	4,399	7,594
283.50	5,691	2,679	10,273
284.00	13,269	4,740	15,013
285.00	15,764	14,517	29,530
286.00	18,360	17,062	46,592
287.00	21,056	19,708	66,300
287.50	22,442	10,875	77,174

Device	Routing	Invert	Outlet Devices
#1	Primary	285.00'	**12.0" Round Culvert** L= 179.8' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 285.00' / 282.50' S= 0.0139 '/' Cc= 0.900 n= 0.012 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	287.00'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#3	Discarded	281.00'	**2.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.56 cfs @ 13.77 hrs HW=283.92' (Free Discharge)
└**3=Exfiltration** (Exfiltration Controls 0.56 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=280.00' TW=281.20' (Dynamic Tailwater)
└**1=Culvert** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=280.00' TW=281.20' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond P1: Pipe Storage

Inflow Area = 7.254 ac, 43.58% Impervious, Inflow Depth = 0.35" for 10-year event
Inflow = 2.55 cfs @ 12.14 hrs, Volume= 0.211 af
Outflow = 2.49 cfs @ 12.17 hrs, Volume= 0.211 af, Atten= 3%, Lag= 2.0 min
Primary = 2.49 cfs @ 12.17 hrs, Volume= 0.211 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 281.95' @ 12.17 hrs Surf.Area= 0.015 ac Storage= 0.008 af
Flood Elev= 286.00' Surf.Area= 0.000 ac Storage= 0.024 af

Plug-Flow detention time= 4.1 min calculated for 0.211 af (100% of inflow)
Center-of-Mass det. time= 4.1 min (891.6 - 887.5)

Volume	Invert	Avail.Storage	Storage Description
#1	281.20'	0.024 af	**24.0" Round Pipe Storage** L= 335.0'

Device	Routing	Invert	Outlet Devices
#1	Primary	281.20'	**24.0" Round Culvert** L= 91.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 281.20' / 280.00' S= 0.0132 '/' Cc= 0.900 n= 0.012 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=2.49 cfs @ 12.17 hrs HW=281.95' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 2.49 cfs @ 2.32 fps)

Summary for Pond UG1: Underground Infiltration

Inflow Area = 2.900 ac, 54.31% Impervious, Inflow Depth = 2.66" for 10-year event
Inflow = 12.99 cfs @ 11.97 hrs, Volume= 0.644 af
Outflow = 1.01 cfs @ 12.53 hrs, Volume= 0.644 af, Atten= 92%, Lag= 33.5 min
Discarded = 0.47 cfs @ 11.50 hrs, Volume= 0.580 af
Primary = 0.53 cfs @ 12.53 hrs, Volume= 0.064 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 284.01' @ 12.53 hrs Surf.Area= 10,253 sf Storage= 12,510 cf
Flood Elev= 286.87' Surf.Area= 10,303 sf Storage= 22,455 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 193.7 min (992.1 - 798.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	282.25'	9,044 cf	**82.25'W x 124.66'L x 3.50'H Field A** 35,886 cf Overall - 13,277 cf Embedded = 22,609 cf x 40.0% Voids
#2A	282.75'	13,277 cf	**ADS_StormTech SC-740 +Cap** x 289 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 17 Rows of 17 Chambers
#3	284.19'	135 cf	**4.00'D x 2.68'H Vertical Cone/Cylinder** x 4
#4	287.00'	61 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
		22,515 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
287.00	67	0	0
287.50	175	61	61

Device	Routing	Invert	Outlet Devices
#1	Primary	283.69'	**18.0" Vert. Orifice/Grate** C= 0.600
#2	Discarded	282.25'	**2.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.47 cfs @ 11.50 hrs HW=282.31' (Free Discharge)
↑└**2=Exfiltration** (Exfiltration Controls 0.47 cfs)

Primary OutFlow Max=0.53 cfs @ 12.53 hrs HW=284.01' TW=0.00' (Dynamic Tailwater)
↑└**1=Orifice/Grate** (Orifice Controls 0.53 cfs @ 1.93 fps)

Summary for Pond UG2: Underground Infiltration

Inflow Area = 1.274 ac, 74.50% Impervious, Inflow Depth = 2.45" for 10-year event
Inflow = 5.08 cfs @ 11.97 hrs, Volume= 0.260 af
Outflow = 3.78 cfs @ 12.03 hrs, Volume= 0.260 af, Atten= 26%, Lag= 3.5 min
Discarded = 0.09 cfs @ 11.91 hrs, Volume= 0.158 af
Primary = 3.69 cfs @ 12.03 hrs, Volume= 0.101 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 285.49' @ 12.03 hrs Surf.Area= 1,920 sf Storage= 3,607 cf
Flood Elev= 288.00' Surf.Area= 6,576 sf Storage= 6,348 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 181.6 min (970.9 - 789.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	282.54'	1,700 cf	**34.75'W x 53.46'L x 3.50'H Field A** 6,502 cf Overall - 2,251 cf Embedded = 4,251 cf x 40.0% Voids
#2A	283.04'	2,251 cf	**ADS_StormTech SC-740 +Cap** x 49 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 7 Rows of 7 Chambers
#3	284.47'	162 cf	**4.00'D x 2.58'H Vertical Cone/Cylinder** x 5
#4	287.05'	2,234 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
		6,348 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
287.05	48	0	0
288.00	4,656	2,234	2,234

Device	Routing	Invert	Outlet Devices
#1	Discarded	282.54'	**2.000 in/hr Exfiltration over Surface area**
#2	Primary	284.47'	**15.0" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.09 cfs @ 11.91 hrs HW=284.53' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.09 cfs)

Primary OutFlow Max=3.69 cfs @ 12.03 hrs HW=285.49' TW=0.00' (Dynamic Tailwater)
↑—**2=Orifice/Grate** (Orifice Controls 3.69 cfs @ 3.44 fps)

Summary for Pond YD: Yard Drain

Inflow Area = 0.439 ac, 68.55% Impervious, Inflow Depth = 2.90" for 10-year event
Inflow = 2.12 cfs @ 11.97 hrs, Volume= 0.106 af
Outflow = 2.11 cfs @ 11.97 hrs, Volume= 0.106 af, Atten= 0%, Lag= 0.2 min
Primary = 2.11 cfs @ 11.97 hrs, Volume= 0.106 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 285.69' @ 11.97 hrs Surf.Area= 0 sf Storage= 95 cf
Flood Elev= 287.98' Surf.Area= 520 sf Storage= 144 cf

Plug-Flow detention time= 1.7 min calculated for 0.106 af (100% of inflow)
Center-of-Mass det. time= 1.7 min (788.6 - 786.9)

Volume	Invert	Avail.Storage	Storage Description
#1	287.75'	49 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
#2	284.69'	95 cf	**12.0" Round Pipe Storage** L= 120.7'
		144 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
287.75	132	0	0
287.90	520	49	49

Device	Routing	Invert	Outlet Devices
#1	Primary	284.69'	**12.0" Round Culvert** L= 69.1' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 284.69' / 284.34' S= 0.0051 '/' Cc= 0.900 n= 0.012 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.11 cfs @ 11.97 hrs HW=285.69' TW=283.00' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 2.11 cfs @ 2.69 fps)

Summary for Subcatchment 1S: Boulevard

Runoff = 2.66 cfs @ 11.97 hrs, Volume= 0.140 af, Depth= 5.50"

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-year Rainfall=6.32"

Area (sf)	CN	Description
3,470	80	>75% Grass cover, Good, HSG D
9,835	98	Paved roads w/curbs & sewers, HSG D
13,305	93	Weighted Average
3,470	80	26.08% Pervious Area
9,835	98	73.92% Impervious Area

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

Summary for Subcatchment 2S: Lower Units

Runoff = 5.44 cfs @ 11.97 hrs, Volume= 0.306 af, Depth= 6.08"

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-year Rainfall=6.32"

Area (sf)	CN	Description
21,656	98	Roofs, HSG D
4,646	98	Roofs, HSG A
26,302	98	Weighted Average
26,302	98	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: Lower Units

Runoff = 5.44 cfs @ 11.97 hrs, Volume= 0.306 af, Depth= 6.08"

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-year Rainfall=6.32"

Area (sf)	CN	Description
26,301	98	Roofs, HSG D
26,301	98	100.00% Impervious Area

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

Summary for Subcatchment 4S: Boulevard

Runoff = 1.72 cfs @ 11.97 hrs, Volume= 0.090 af, Depth= 5.50"

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-year Rainfall=6.32"

Area (sf)	CN	Description
2,449	80	>75% Grass cover, Good, HSG D
6,125	98	Paved roads w/curbs & sewers, HSG D
8,574	93	Weighted Average
2,449	80	28.56% Pervious Area
6,125	98	71.44% Impervious Area

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

Summary for Subcatchment 5S: Boulevard

Runoff = 2.08 cfs @ 11.97 hrs, Volume= 0.108 af, Depth= 5.38"

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-year Rainfall=6.32"

Area (sf)	CN	Description
3,559	80	>75% Grass cover, Good, HSG D
6,970	98	Paved roads w/curbs & sewers, HSG D
10,529	92	Weighted Average
3,559	80	33.80% Pervious Area
6,970	98	66.20% Impervious Area

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

Summary for Subcatchment PS1: Entrance Road

Runoff = 4.94 cfs @ 11.97 hrs, Volume= 0.241 af, Depth= 4.50"

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-year Rainfall=6.32"

Area (sf)	CN	Description
6,984	98	Paved roads w/curbs & sewers, HSG D
2,014	78	Meadow, non-grazed, HSG D
19,034	80	>75% Grass cover, Good, HSG D
28,032	84	Weighted Average
21,048	80	75.09% Pervious Area
6,984	98	24.91% Impervious Area

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

Summary for Subcatchment PS10:

Runoff = 2.98 cfs @ 11.99 hrs, Volume= 0.148 af, Depth= 1.38"

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-year Rainfall=6.32"

Area (sf)	CN	Adj	Description
1,986	98		Unconnected pavement, HSG A
1,761	98		Unconnected pavement, HSG D
12,796	80		>75% Grass cover, Good, HSG D
39,625	39		>75% Grass cover, Good, HSG A
56,168	52	51	Weighted Average, UI Adjusted
52,421	49	49	93.33% Pervious Area
3,747	98	98	6.67% Impervious Area
3,747			100.00% Unconnected

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

Summary for Subcatchment PS11:

Runoff = 11.75 cfs @ 11.99 hrs, Volume= 0.595 af, Depth= 3.86"

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 100-year Rainfall=6.32"

Area (sf)	CN	Adj	Description
5,803	98		Unconnected pavement, HSG D
4,860	39		>75% Grass cover, Good, HSG A
69,805	80		>75% Grass cover, Good, HSG D
80,468	79	78	Weighted Average, UI Adjusted
74,665	77	77	92.79% Pervious Area
5,803	98	98	7.21% Impervious Area
5,803			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	81	0.0742	0.25		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.59"
2.4	585	0.3422	4.09		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.8	666	Total			

Summary for Subcatchment PS2: Lower Unit Parking

Runoff = 24.11 cfs @ 11.97 hrs, Volume= 1.246 af, Depth= 5.16"

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-year Rainfall=6.32"

Area (sf)	CN	Description
68,595	98	Unconnected pavement, HSG D
26,074	80	>75% Grass cover, Good, HSG D
31,645	82	Woods/grass comb., Fair, HSG D
126,314	90	Weighted Average
57,719	81	45.69% Pervious Area
68,595	98	54.31% Impervious Area
68,595		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	16	0.0484	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.59"
1.8	48	0.4205	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.59"
0.7	65	0.0487	1.54		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.1	508	0.0050	4.03	4.95	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Corrugated PE, smooth interior
6.4	637	Total			

Summary for Subcatchment PS3: Lower Unit Parking

Runoff = 8.86 cfs @ 11.97 hrs, Volume= 0.466 af, Depth= 5.50"

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-year Rainfall=6.32"

Area (sf)	CN	Description
9,262	98	Paved parking, HSG D
29,041	98	Paved parking, HSG A
3,263	80	>75% Grass cover, Good, HSG D
2,709	39	>75% Grass cover, Good, HSG A
44,275	93	Weighted Average
5,972	61	13.49% Pervious Area
38,303	98	86.51% Impervious Area

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

Summary for Subcatchment PS4: Upper Units

Runoff = 16.24 cfs @ 11.97 hrs, Volume= 0.886 af, Depth= 5.85"

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-year Rainfall=6.32"

Area (sf)	CN	Description
27,551	98	Roofs, HSG D
37,407	98	Paved parking, HSG D
7,052	98	Paved parking, HSG A
1,048	39	>75% Grass cover, Good, HSG A
6,168	80	>75% Grass cover, Good, HSG D
79,226	96	Weighted Average
7,216	74	9.11% Pervious Area
72,010	98	90.89% Impervious Area

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

Summary for Subcatchment PS5: Infiltration Basin

Runoff = 0.69 cfs @ 12.01 hrs, Volume= 0.053 af, Depth= 0.60"

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-year Rainfall=6.32"

Area (sf)	CN	Description
31,936	39	>75% Grass cover, Good, HSG A
14,123	43	Woods/grass comb., Fair, HSG A
46,059	40	Weighted Average
46,059	40	100.00% Pervious Area

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

Summary for Subcatchment PS6: Behind Upper Units

Runoff = 8.19 cfs @ 12.13 hrs, Volume= 0.610 af, Depth= 2.68"

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-year Rainfall=6.32"

Area (sf)	CN	Description
30,261	43	Woods/grass comb., Fair, HSG A
28,841	82	Woods/grass comb., Fair, HSG D
13,609	39	>75% Grass cover, Good, HSG A
46,304	80	>75% Grass cover, Good, HSG D
119,015	66	Weighted Average
119,015	66	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	100	0.1600	0.16		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.59"
0.2	26	0.1923	2.19		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
8.8	498	0.0181	0.94		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
19.4	624	Total			

Summary for Subcatchment PS7: Westmere Terrace Turnaround

Runoff = 0.77 cfs @ 11.98 hrs, Volume= 0.037 af, Depth= 1.71"

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 100-year Rainfall=6.32"

Area (sf)	CN	Description
3,058	98	Paved parking, HSG A
8,182	39	>75% Grass cover, Good, HSG A
11,240	55	Weighted Average
8,182	39	72.79% Pervious Area
3,058	98	27.21% Impervious Area

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

Summary for Subcatchment PS8: Westmere Terrace

Runoff = 0.78 cfs @ 11.99 hrs, Volume= 0.039 af, Depth= 1.38"

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-year Rainfall=6.32"

Area (sf)	CN	Description
1,173	98	Paved parking, HSG A
7,519	39	>75% Grass cover, Good, HSG A
2,246	80	>75% Grass cover, Good, HSG D
3,839	43	Woods/grass comb., Fair, HSG A
14,777	51	Weighted Average
13,604	47	92.06% Pervious Area
1,173	98	7.94% Impervious Area

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

Summary for Pond BIO1: Bioretention

Inflow Area = 0.644 ac, 24.91% Impervious, Inflow Depth = 4.50" for 100-year event
Inflow = 4.94 cfs @ 11.97 hrs, Volume= 0.241 af
Outflow = 4.37 cfs @ 12.01 hrs, Volume= 0.216 af, Atten= 11%, Lag= 2.2 min
Primary = 1.74 cfs @ 12.01 hrs, Volume= 0.173 af
Secondary = 2.63 cfs @ 12.01 hrs, Volume= 0.042 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 286.36' @ 12.01 hrs Surf.Area= 3,476 sf Storage= 2,655 cf
Flood Elev= 286.50' Surf.Area= 3,634 sf Storage= 3,010 cf

Plug-Flow detention time= 98.3 min calculated for 0.216 af (89% of inflow)
Center-of-Mass det. time= 45.1 min (843.5 - 798.4)

Volume	Invert	Avail.Storage	Storage Description
#1	284.00'	221 cf	**Pretreatment (Prismatic)**Listed below (Recalc)
#2	281.00'	884 cf	**Bioretention Filter (Prismatic)**Listed below (Recalc) 2,948 cf Overall x 30.0% Voids
#3	285.50'	1,905 cf	**Bioretention Ponding (Prismatic)**Listed below (Recalc)
		3,010 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
284.00	123	0	0
284.50	215	85	85
285.00	332	137	221

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
281.00	737	0	0
285.00	737	2,948	2,948

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
285.50	1,027	0	0
286.00	2,013	760	760
286.50	2,565	1,145	1,905

Device	Routing	Invert	Outlet Devices
#1	Primary	285.50'	**10.0" Vert. Orifice/Grate** C= 0.600
#2	Secondary	286.00'	**5.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=1.74 cfs @ 12.01 hrs HW=286.36' TW=0.00' (Dynamic Tailwater)
↑—**1=Orifice/Grate** (Orifice Controls 1.74 cfs @ 3.19 fps)

Secondary OutFlow Max=2.62 cfs @ 12.01 hrs HW=286.36' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 2.62 cfs @ 1.47 fps)

Summary for Pond DP1: Westmere Terrace

Inflow Area = 0.339 ac, 7.94% Impervious, Inflow Depth = 1.38" for 100-year event
Inflow = 0.78 cfs @ 11.99 hrs, Volume= 0.039 af
Primary = 0.78 cfs @ 11.99 hrs, Volume= 0.039 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 DP2: Design Point

Inflow Area = 15.514 ac, 40.55% Impervious, Inflow Depth = 2.02" for 100-year event
Inflow = 40.60 cfs @ 12.02 hrs, Volume= 2.611 af
Primary = 40.60 cfs @ 12.02 hrs, Volume= 2.611 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 INF1: Open Infiltration

Inflow Area = 4.522 ac, 69.91% Impervious, Inflow Depth = 4.64" for 100-year event
Inflow = 31.40 cfs @ 11.97 hrs, Volume= 1.750 af
Outflow = 1.21 cfs @ 13.43 hrs, Volume= 1.692 af, Atten= 96%, Lag= 87.5 min
Discarded = 0.77 cfs @ 13.43 hrs, Volume= 1.580 af
Primary = 0.44 cfs @ 13.43 hrs, Volume= 0.112 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 285.37' @ 13.43 hrs Surf.Area= 16,730 sf Storage= 49,150 cf
Flood Elev= 287.50' Surf.Area= 22,442 sf Storage= 90,750 cf

Plug-Flow detention time= 834.4 min calculated for 1.692 af (97% of inflow)
Center-of-Mass det. time= 813.7 min (1,570.4 - 756.7)

Volume	Invert	Avail.Storage	Storage Description
#1	280.00'	13,576 cf	**Pretreatment (Prismatic)**Listed below (Recalc) -Impervious
#2	281.00'	77,174 cf	**Infiltration Basin (Prismatic)**Listed below (Recalc)
		90,750 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
280.00	2,027	0	0
281.00	3,014	2,521	2,521
282.00	4,101	3,558	6,078
283.00	5,289	4,695	10,773
283.50	5,921	2,803	13,576

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
281.00	2,618	0	0
282.00	3,772	3,195	3,195
283.00	5,026	4,399	7,594
283.50	5,691	2,679	10,273
284.00	13,269	4,740	15,013
285.00	15,764	14,517	29,530
286.00	18,360	17,062	46,592
287.00	21,056	19,708	66,300
287.50	22,442	10,875	77,174

Device	Routing	Invert	Outlet Devices
#1	Primary	285.00'	**12.0" Round Culvert** L= 179.8' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 285.00' / 282.50' S= 0.0139 '/' Cc= 0.900 n= 0.012 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	287.00'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#3	Discarded	281.00'	**2.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.77 cfs @ 13.43 hrs HW=285.37' (Free Discharge)
└**3=Exfiltration** (Exfiltration Controls 0.77 cfs)

Primary OutFlow Max=0.44 cfs @ 13.43 hrs HW=285.37' TW=281.69' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 0.44 cfs @ 1.64 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=280.00' TW=281.20' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond P1: Pipe Storage

Inflow Area = 7.254 ac, 43.58% Impervious, Inflow Depth = 1.19" for 100-year event
Inflow = 8.19 cfs @ 12.13 hrs, Volume= 0.722 af
Outflow = 8.11 cfs @ 12.15 hrs, Volume= 0.722 af, Atten= 1%, Lag= 1.1 min
Primary = 8.11 cfs @ 12.15 hrs, Volume= 0.722 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 282.68' @ 12.15 hrs Surf.Area= 0.014 ac Storage= 0.019 af
Flood Elev= 286.00' Surf.Area= 0.000 ac Storage= 0.024 af

Plug-Flow detention time= 3.0 min calculated for 0.722 af (100% of inflow)
Center-of-Mass det. time= 3.0 min (857.7 - 854.7)

Volume	Invert	Avail.Storage	Storage Description
#1	281.20'	0.024 af	**24.0" Round Pipe Storage** L= 335.0'

Device	Routing	Invert	Outlet Devices
#1	Primary	281.20'	**24.0" Round Culvert** L= 91.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 281.20' / 280.00' S= 0.0132 '/' Cc= 0.900 n= 0.012 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=8.11 cfs @ 12.15 hrs HW=282.67' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 8.11 cfs @ 3.26 fps)

Summary for Pond UG1: Underground Infiltration

Inflow Area = 2.900 ac, 54.31% Impervious, Inflow Depth = 5.16" for 100-year event
Inflow = 24.11 cfs @ 11.97 hrs, Volume= 1.246 af
Outflow = 8.66 cfs @ 12.09 hrs, Volume= 1.247 af, Atten= 64%, Lag= 7.0 min
Discarded = 0.48 cfs @ 11.94 hrs, Volume= 0.763 af
Primary = 8.19 cfs @ 12.09 hrs, Volume= 0.483 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 285.37' @ 12.09 hrs Surf.Area= 10,303 sf Storage= 20,804 cf
Flood Elev= 286.87' Surf.Area= 10,303 sf Storage= 22,455 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 147.7 min (927.7 - 780.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	282.25'	9,044 cf	**82.25'W x 124.66'L x 3.50'H Field A** 35,886 cf Overall - 13,277 cf Embedded = 22,609 cf x 40.0% Voids
#2A	282.75'	13,277 cf	**ADS_StormTech SC-740 +Cap** x 289 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 17 Rows of 17 Chambers
#3	284.19'	135 cf	**4.00'D x 2.68'H Vertical Cone/Cylinder** x 4
#4	287.00'	61 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
		22,515 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
287.00	67	0	0
287.50	175	61	61

Device	Routing	Invert	Outlet Devices
#1	Primary	283.69'	**18.0" Vert. Orifice/Grate** C= 0.600
#2	Discarded	282.25'	**2.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.48 cfs @ 11.94 hrs HW=284.21' (Free Discharge)
↑└**2=Exfiltration** (Exfiltration Controls 0.48 cfs)

Primary OutFlow Max=8.19 cfs @ 12.09 hrs HW=285.37' TW=0.00' (Dynamic Tailwater)
↑└**1=Orifice/Grate** (Orifice Controls 8.19 cfs @ 4.63 fps)

Summary for Pond UG2: Underground Infiltration

Inflow Area = 1.274 ac, 74.50% Impervious, Inflow Depth = 4.73" for 100-year event
Inflow = 9.61 cfs @ 11.97 hrs, Volume= 0.502 af
Outflow = 8.88 cfs @ 12.00 hrs, Volume= 0.502 af, Atten= 8%, Lag= 1.8 min
Discarded = 0.14 cfs @ 12.00 hrs, Volume= 0.195 af
Primary = 8.74 cfs @ 12.00 hrs, Volume= 0.307 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 287.28' @ 12.00 hrs Surf.Area= 3,099 sf Storage= 4,256 cf
Flood Elev= 288.00' Surf.Area= 6,576 sf Storage= 6,348 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 121.9 min (897.4 - 775.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	282.54'	1,700 cf	**34.75'W x 53.46'L x 3.50'H Field A** 6,502 cf Overall - 2,251 cf Embedded = 4,251 cf x 40.0% Voids
#2A	283.04'	2,251 cf	**ADS_StormTech SC-740 +Cap** x 49 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 7 Rows of 7 Chambers
#3	284.47'	162 cf	**4.00'D x 2.58'H Vertical Cone/Cylinder** x 5
#4	287.05'	2,234 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
		6,348 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
287.05	48	0	0
288.00	4,656	2,234	2,234

Device	Routing	Invert	Outlet Devices
#1	Discarded	282.54'	**2.000 in/hr Exfiltration over Surface area**
#2	Primary	284.47'	**15.0" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.14 cfs @ 12.00 hrs HW=287.28' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.14 cfs)

Primary OutFlow Max=8.74 cfs @ 12.00 hrs HW=287.28' TW=0.00' (Dynamic Tailwater)
↑—**2=Orifice/Grate** (Orifice Controls 8.74 cfs @ 7.12 fps)

Summary for Pond YD: Yard Drain

Inflow Area = 0.439 ac, 68.55% Impervious, Inflow Depth = 5.44" for 100-year event
Inflow = 3.80 cfs @ 11.97 hrs, Volume= 0.199 af
Outflow = 3.82 cfs @ 11.96 hrs, Volume= 0.199 af, Atten= 0%, Lag= 0.0 min
Primary = 3.82 cfs @ 11.96 hrs, Volume= 0.199 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 286.82' @ 11.96 hrs Surf.Area= 0 sf Storage= 95 cf
Flood Elev= 287.98' Surf.Area= 520 sf Storage= 144 cf

Plug-Flow detention time= 3.6 min calculated for 0.199 af (100% of inflow)
Center-of-Mass det. time= 3.6 min (773.9 - 770.3)

Volume	Invert	Avail.Storage	Storage Description
#1	287.75'	49 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
#2	284.69'	95 cf	**12.0" Round Pipe Storage** L= 120.7'
		144 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
287.75	132	0	0
287.90	520	49	49

Device	Routing	Invert	Outlet Devices
#1	Primary	284.69'	**12.0" Round Culvert** L= 69.1' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 284.69' / 284.34' S= 0.0051 '/' Cc= 0.900 n= 0.012 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=3.80 cfs @ 11.96 hrs HW=286.81' TW=284.31' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 3.80 cfs @ 4.84 fps)

Appendix K:
Project Evaluation and Design Calculations

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Appendix K - 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.		The proposed site layout has been designed to limit land disturbance to the greatest extent practical. The project does not propose permanent conservation of this area at this time.
	Preservation of Buffers	Define, delineate and preserve naturally vegetated buffers along perennial streams, rivers, shorelines and wetlands.		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.		Clearing and grading will be limited to the area of disturbance and will be minimized to the greatest extent practical. The limits of all proposed clearing will be demarcated in the field with orange construction fencing, prior to construction, to prevent unnecessary removal of trees.
	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.		The site layout has been designed to avoid sensitive resource areas to the greatest extent practical. The site design protects the existing buffer on the western portion of the site as part of a previously approved special use permit.
	Open Space Design	Use clustering, conservation design or open space design to reduce impervious cover, preserve more open space and protect water resources.		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.		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		Roadway widths and lengths have been minimized to the greatest extent practical. All new roadways and parking areas will be constructed to the Town of Guilderland standards and the boulevard will be the minimum width necessary for fire protection.

Reduction of Impervious Cover	**Sidewalk Reduction**	Minimize sidewalk lengths and widths to reduce site impervious area		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 new driveways are proposed as part of this project.
	Cul-de-sac Reduction	Minimize the number of cul-de-sacs and incorporate landscaped areas to reduce their impervious cover.		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.		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.		On-site parking has been allocated to provide a sufficient number of spaces for the intended use.

Appendix K - 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); min Rv = 0.2
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)
UG1	1.10	2.900	1.575	54	0.54	0.144	6,270
BIO1	1.10	0.644	0.160	25	0.28	0.017	740
UG2	1.10	1.274	0.950	75	0.73	0.085	3,700
INF1	1.10	4.522	3.161	70	0.68	0.282	12,280
Total							22,990

Appendix K - Table C
Practice Specific Sizing Calculation Worksheet

BIORETENTION FILTER NO. 1 (BIO1)

Determine Required Water Quality Volume

WQv = (P/12) * Rv * A

where: WQv = Water Quality Volume (acre-feet)
P = 1-year 24-hour design storm (inches)
Rv = 0.05 + 0.009 (I); min Rv = 0.2
I = Impervious Cover (%) within the drainage area contributing to the SWM practice
A = Drainage area (square feet) contributing to the SWM practice

Required WQv =	**740**	**CF**

**Value taken from Appendix K - Table B*

Calculate Required Filter Bed Area

Af=(WQv)*(df)/[(k)*(hf+df)*(tf)]

where: Af = Surface area of filter bed (SF)
WQv = Required Water Quality Volume (CF)
df = Filter bed depth (ft)
k = Coefficient of permeability of filter media (ft/day)
hf = Average height of water above filter bed (ft)
tf = Design filter bed drain time (days)

SMP ID	WQv (cubic feet)	df (feet)	k (ft/day)	hf (feet)	tf (days)	Minimum Af (sq-ft)	Provided Af (sq-ft)
BIO1	740.0	4	0.5	0.5	2.0	658	737

Calculate Provided Water Quality Volume

Provided WQv = Vf + Vs + Vp

where: Vf = Volume of Filter (CF) = Af * df * n-filter
Vs = Volume of Stone Drainage Course (CF) = Af * ds * n-stone
Vp = Volume of Ponding (CF)

df =	4	ft
n-filter =	0.30	
ds =	1.00	ft
n-stone =	0.40	

Vf =	884	CF
Vs =	295	CF
Vp =	**514**	**CF**

**Value taken directly from HydroCAD*

Provided WQv =	**1,693**	**CF**

Calculate Provided Runoff Reduction Volume

Using Underdrains?	No	
RRv Available =	677	CF
RRv Applied =	**677**	**CF**

Appendix L:
Boring Logs

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TEST BORING LOG

THE Chazen COMPANIES
547 River Street
Troy, New York 12180
Phn: (518) 273-0055
Fax: (518) 273-8391

PROJECT: Rapp Road Residential Development
LOCATION: Rapp Road Guilderland, NY
CLIENT: Pyramid Management Group, LLC
PROJECT NO.: 317AI.00

Test Boring No.: **SB1**
Total Depth: 27 ft.

Contractor: Aztech Environmental
Drill Rig: 3230DT
Driller: Derek Fennell
Inspector: Dean Anderson

Start Date: 23-Jan-2018
Finish Date: 23-Jan-2018
El. Datum: NAVD-88
G.S. Elevation: 292.5

Northing: See Figure
Easting:
Latitude: -
Longitude: -

Borehole Dia.: 3.5 in.
Water Depth: 21 ft.
Bedrock Depth: n/a ft.
Sample Hammer: Automatic

Depth (Ft)	Elevation (Ft)	Sample No.	SPT Blows	Recovery(in)	Groundwater	Group Symbol	Stratum Descriptions:	Field Notes, Comments:
		SS-1	1	14		SP	Poorly Graded Sand (SP): Mostly fine Sand, orange, moist	4" Topsoil
1	291.5		2				(Glaciofuvial Deposits)	3" Frost
			2					
2	290.5		2					
3	289.5							
4	288.5							
5	287.5							
		SS-2	4	14		SP	Poorly Graded Sand (SP): Mostly fine Sand, orange, moist	
6	286.5		4					
			4					
7	285.5		5					
8	284.5							
9	283.5							
10	282.5							
		SS-3	5	14		SP	Poorly Graded Sand (SP): Mostly fine Sand, light brown, moist	
11	281.5		7					
			7					
12	280.5		7					
13	279.5							
14	278.5							
15	277.5							
		SS-4	1	12		SP	Poorly Graded Sand (SP): Mostly fine Sand, brown, moist	
16	276.5		3					
			3					
17	275.5		4					
18	274.5							
19	273.5							
20	272.5							
		SS-5	2	16		SP	Poorly Graded Sand (SP): Mostly fine Sand, brown, saturated	

METHODS: **HA**- Hollow Stem Auger, **RWH**- Rotary Wash, **SSA**- Solid Stem Auger, **DC**-Diamond Core, **DP**-Direct Push

SAMPLE TYPES: **SS-Split Spoon, RC-Bedrock Core, GS-Geoprobe Sleeve, ST-Shelby Tube**

STANDARD 1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.

NOTES: 2. Test Boring Log Page 1: 0 - 20 feet. Each subsequent page: Additional 25 feet.

3. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.

ADDITIONAL NOTES:

DRILLING INFORMATION

Method:	DP	0 to	25.0
Method:			

	Sample	Core
Type	SS	
Int Diam.	3.25	
Weight	140 lb	
Fall	30"	

TEST BORING LOG

THE Chazen COMPANIES
547 River Street
Troy, New York 12180
Phn: (518) 273-0055
Fax: (518) 273-8391

PROJECT: Rapp Road Residential Development
LOCATION: Rapp Road Guilderland, NY
CLIENT: Pyramid Management Group, LLC
PROJECT NO.: 317AI.00

Test Boring No.: **SB1**
Total Depth: 27 ft.

Depth (Ft)	Elevation (Ft)	Sample No.	SPT Blows	Recovery(in)	Groundwater	Group Symbol	Stratum Descriptions:	Field Notes, Comments:
21	271.5		3	20	▼			
			3					
22	270.5		5					
23	269.5							
24	268.5							
25	267.5	SS-6	1	20		SP	Poorly Graded Sand (SP): Mostly fine Sand, grey, saturated	
26	266.5		6					
			9					
27	265.5		11					
							Boring Terminated at 27 feet	
28	264.5							
29	263.5							
30	262.5							
31	261.5							
32	260.5							
33	259.5							
34	258.5							
35	257.5							
36	256.5							
37	255.5							
38	254.5							
39	253.5							
40	252.5							
41	251.5							
42	250.5							
43	249.5							
44	248.5							
45	247.5							

ADDITIONAL NOTES:

TEST BORING LOG

THE Chazen COMPANIES
547 River Street
Troy, New York 12180
Phn: (518) 273-0055
Fax: (518) 273-8391

PROJECT: Rapp Road Residential Development
LOCATION: Rapp Road Guilderland, NY
CLIENT: Pyramid Management Group, LLC
PROJECT NO.: 317AI.00

Test Boring No.: **SB2**
Total Depth: 17 ft.

Contractor: Aztech Environmental
Drill Rig: 3230DT
Driller: Derek Fennell
Inspector: Dean Anderson

Start Date: 25-Jan-2018
Finish Date: 25-Jan-2018
El. Datum: NAVD-88
G.S. Elevation: 289.0

Northing: See Figure
Easting:
Latitude: -
Longitude: -

Borehole Dia.: 3.5 in.
Water Depth: 17 ft.
Bedrock Depth: n/a ft.
Sample Hammer: Automatic

Depth (Ft)	Elevation (Ft)	Sample No.	SPT Blows	Recovery(in)	Groundwater	Group Symbol	Stratum Descriptions:	Field Notes, Comments:
		SS-1	2	12		SP	Poorly Graded Sand (SP): Mostly fine Sand, brown, moist	4" Topsoil
1	288		2				(Glaciofuvial Deposits)	8" Frost
			2					
2	287		2					
3	286							
4	285							
5	284							
		SS-2	2	18		SP	Poorly Graded Sand (SP): Mostly fine Sand, brown/orange, moist	
6	283		2					
			2					
7	282		3					
8	281							
9	280							
10	279							
		SS-3	3	20		SP	Poorly Graded Sand (SP): Mostly fine Sand, light brown, moist	
11	278		2					
			3					
12	277		4					
13	276							
14	275							
15	274							
		SS-4	4	24		SP	Poorly Graded Sand (SP): Mostly fine Sand, light brown, mottled, moist	High water level
16	273		2					
			3					
17	272		4		▼			
							Boring Terminated at 17 feet	
18	271							
19	270							
20	269							

METHODS: **HA**- Hollow Stem Auger, **RWH**- Rotary Wash, **SSA**- Solid Stem Auger, **DC**-Diamond Core, **DP**-Direct Push

SAMPLE TYPES: **SS-Split Spoon, RC-Bedrock Core, GS-Geoprobe Sleeve, ST-Shelby Tube**

STANDARD 1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.

NOTES: 2. Test Boring Log Page 1: 0 - 20 feet. Each subsequent page: Additional 25 feet.

3. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.

ADDITIONAL NOTES:

DRILLING INFORMATION

Method:	DP	0 to	15.0
Method:			

	Sample	Core
Type	SS	
Int Diam.	3.25	
Weight	140 lb	
Fall	30"	

TEST BORING LOG

THE Chazen COMPANIES
547 River Street
Troy, New York 12180
Phn: (518) 273-0055
Fax: (518) 273-8391

PROJECT: Rapp Road Residential Development
LOCATION: Rapp Road Guilderland, NY
CLIENT: Pyramid Management Group, LLC
PROJECT NO.: 317AI.00

Test Boring No.: **SB3**
Total Depth: 27 ft.

Contractor: Aztech Environmental
Drill Rig: 3230DT
Driller: Derek Fennell
Inspector: Dean Anderson

Start Date: 23-Jan-2018
Finish Date: 23-Jan-2018
El. Datum: NAVD-88
G.S. Elevation: 287.0

Northing: See Figure
Easting:
Latitude: -
Longitude: -

Borehole Dia.: 3.5 in.
Water Depth: 11 ft.
Bedrock Depth: n/a ft.
Sample Hammer: Automatic

Depth (Ft)	Elevation (Ft)	Sample No.	SPT Blows	Recovery(in)	Groundwater	Group Symbol	Stratum Descriptions:	Field Notes, Comments:
		SS-1	3	18			Poorly Graded Sand (SP): Mostly fine Sand, brown, moist	4" Topsoil
1	286		4				(Glaciofluvial Deposits)	3" Frost
			6					
2	285		7					
3	284							
4	283							
5	282							
		SS-2	3	18			Poorly Graded Sand (SP): Mostly fine Sand, tan, moist	
6	281		4					
			3					
7	280		5					
8	279							
9	278							
10	277							
		SS-3	4	16		SP	Poorly Graded Sand (SP): Mostly fine Sand, tan, moist	
			1		▼			Approximate Sub-Stratum Change
11	276		2			SM	Silty Sand (SM): Mostly fine Sand, little Silt, trace Clay, saturated, tan	
			2					
12	275							
13	274							
14	273							
15	272							
		SS-4	10	18		SM	Silty Sand (SM): Mostly fine Sand, little Silt, grey, saturated	
16	271		10					
			10					
17	270		14					
18	269							
								Approximate Sub-Stratum Change
19	268							
20	267							
		SS-5	1	24		SP	Poorly Graded Sand (SP): Mostly fine Sand, trace Silt, grey, saturated	

METHODS: **HA**- Hollow Stem Auger, **RWH**- Rotary Wash, **SSA**- Solid Stem Auger, **DC**-Diamond Core, **DP**-Direct Push

SAMPLE TYPES: **SS-Split Spoon, RC-Bedrock Core, GS-Geoprobe Sleeve, ST-Shelby Tube**

STANDARD 1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.

NOTES: 2. Test Boring Log Page 1: 0 - 20 feet. Each subsequent page: Additional 25 feet.

3. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.

ADDITIONAL NOTES:

DRILLING INFORMATION

Method:	DP	0 to	25.0
Method:			

	Sample	Core
Type	SS	
Int Diam.	3.25	
Weight	140 lb	
Fall	30"	

TEST BORING LOG

THE Chazen COMPANIES
547 River Street
Troy, New York 12180
Phn: (518) 273-0055
Fax: (518) 273-8391

PROJECT: Rapp Road Residential Development
LOCATION: Rapp Road Guilderland, NY
CLIENT: Pyramid Management Group, LLC
PROJECT NO.: 317AI.00

Test Boring No.: **SB3**
Total Depth: 27 ft.

Depth (Ft)	Elevation (Ft)	Sample No.	SPT Blows	Recovery(in)	Groundwater	Group Symbol	Stratum Descriptions:	Field Notes, Comments:
21	266		1					
			1					
22	265		2					
23	264							
24	263							
25	262	SS-6	1	24		SP	Poorly Graded Sand (SP): Mostly fine Sand, dark brown/grey, saturated	
26	261		1					
			1					
27	260		4					
							Boring Terminated at 27 feet	
28	259							
29	258							
30	257							
31	256							
32	255							
33	254							
34	253							
35	252							
36	251							
37	250							
38	249							
39	248							
40	247							
41	246							
42	245							
43	244							
44	243							
45	242							

ADDITIONAL NOTES:

TEST BORING LOG

THE Chazen COMPANIES
547 River Street
Troy, New York 12180
Phn: (518) 273-0055
Fax: (518) 273-8391

PROJECT: Rapp Road Residential Development
LOCATION: Rapp Road Guilderland, NY
CLIENT: Pyramid Management Group, LLC
PROJECT NO.: 317AI.00

Test Boring No.: **SB4**
Total Depth: 17 ft.

Contractor: Aztech Environmental
Drill Rig: 3230DT
Driller: Derek Fennell
Inspector: Dean Anderson

Start Date: 24-Jan-2018
Finish Date: 24-Jan-2018
El. Datum: NAVD-88
G.S. Elevation: 284.0

Northing: See Figure
Easting:
Latitude: -
Longitude: -

Borehole Dia.: 3.5 in.
Water Depth: 13 ft.
Bedrock Depth: n/a ft.
Sample Hammer: Automatic

Depth (Ft)	Elevation (Ft)	Sample No.	SPT Blows	Recovery(in)	Groundwater	Group Symbol	Stratum Descriptions:	Field Notes, Comments:
		SS-1	8	18		SP	Poorly Graded Sand (SP): Mostly fine Sand, brown to orange, moist	4" Topsoil
1	283		3				(Glaciofluvial Deposits)	8" Frost
			1					
2	282		2					
3	281							
4	280							
5	279							
		SS-2	3	18		SP	Poorly Graded Sand (SP): Mostly fine Sand, orange to grey, moist	
6	278		3					
			4					
7	277		6					
8	276							
9	275							
10	274							
		SS-3	2	18		SP	Poorly Graded Sand (SP): Mostly fine Sand, brown/orange, moist	
11	273		2					
			2					
12	272		3					
13	271				▼			
14	270							
15	269							
		SS-4	1	18		SP	Poorly Graded Sand (SP): Mostly fine Sand, brown, saturated	
16	268		1					
			1					
17	267		1					
							Boring Terminated at 17 feet	
18	266							
19	265							
20	264							

METHODS: **HA**- Hollow Stem Auger, **RWH**- Rotary Wash, **SSA**- Solid Stem Auger, **DC**-Diamond Core, **DP**-Direct Push

SAMPLE TYPES: **SS-Split Spoon, RC-Bedrock Core, GS-Geoprobe Sleeve, ST-Shelby Tube**

STANDARD 1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.

NOTES: 2. Test Boring Log Page 1: 0 - 20 feet. Each subsequent page: Additional 25 feet.

3. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.

ADDITIONAL NOTES:

DRILLING INFORMATION

Method:	DP	0 to 15.0
Method:		

	Sample	Core
Type	SS	
Int Diam.	3.25	
Weight	140 lb	
Fall	30"	

TEST BORING LOG

THE Chazen COMPANIES
547 River Street
Troy, New York 12180
Phn: (518) 273-0055
Fax: (518) 273-8391

PROJECT: Rapp Road Residential Development
LOCATION: Rapp Road Guilderland, NY
CLIENT: Pyramid Management Group, LLC
PROJECT NO.: 317AI.00

Test Boring No.: **SB5**
Total Depth: 17 ft.

Contractor: Aztech Environmental
Drill Rig: 3230DT
Driller: Derek Fennell
Inspector: Dean Anderson

Start Date: 23-Jan-2018
Finish Date: 23-Jan-2018
El. Datum: NAVD-88
G.S. Elevation: 289.0

Northing: See Figure
Easting:
Latitude: -
Longitude: -

Borehole Dia.: 3.5 in.
Water Depth: 16.5 ft.
Bedrock Depth: n/a ft.
Sample Hammer: Automatic

Depth (Ft)	Elevation (Ft)	Sample No.	SPT Blows	Recovery(in)	Groundwater	Group Symbol	Stratum Descriptions:	Field Notes, Comments:
		SS-1	1	10		SP	Poorly Graded Sand (SP): Mostly fine Sand, orange, moist	4" Topsoil
1	288		2				(Glaciofluvial Deposits)	3" Frost
			1					
2	287		1					
3	286							
4	285							
5	284							
		SS-2	10	16		SP	Poorly Graded Sand (SP): Mostly fine Sand, brown, moist	
6	283		3					
			3					
7	282		4					
8	281							
9	280							
10	279							
		SS-3	6	14		SP	Poorly Graded Sand (SP): Mostly fine Sand, brown, moist	
11	278		5					
			6					
12	277		7					
13	276							
14	275							
15	274							
		SS-4	4	16		SP	Poorly Graded Sand (SP): Mostly fine Sand, trace Silt, brown, moist to	
16	273		3				saturated	
			2		▼			
17	272		2					
							Boring Terminated at 17 feet	
18	271							
19	270							
20	269							

METHODS: **HA**- Hollow Stem Auger, **RWH**- Rotary Wash, **SSA**- Solid Stem Auger, **DC**-Diamond Core, **DP**-Direct Push

SAMPLE TYPES: **SS-Split Spoon, RC-Bedrock Core, GS-Geoprobe Sleeve, ST-Shelby Tube**

STANDARD 1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.

NOTES: 2. Test Boring Log Page 1: 0 - 20 feet. Each subsequent page: Additional 25 feet.

3. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.

ADDITIONAL NOTES:

DRILLING INFORMATION

Method:	DP	0 to	15.0
Method:			

	Sample	Core
Type	SS	
Int Diam.	3.25	
Weight	140 lb	
Fall	30"	

TEST BORING LOG

THE Chazen COMPANIES
547 River Street
Troy, New York 12180
Phn: (518) 273-0055
Fax: (518) 273-8391

PROJECT: Rapp Road Residential Development
LOCATION: Rapp Road Guilderland, NY
CLIENT: Pyramid Management Group, LLC
PROJECT NO.: 317AI.00

Test Boring No.: **SB6**
Total Depth: 27 ft.

Contractor: Aztech Environmental
Drill Rig: 3230DT
Driller: Derek Fennell
Inspector: Dean Anderson

Start Date: 25-Jan-2018
Finish Date: 25-Jan-2018
El. Datum: NAVD-88
G.S. Elevation: 286.0

Northing: See Figure
Easting:
Latitude: -
Longitude: -

Borehole Dia.: 3.5 in.
Water Depth: 13 ft.
Bedrock Depth: n/a ft.
Sample Hammer: Automatic

Depth (Ft)	Elevation (Ft)	Sample No.	SPT Blows	Recovery(in)	Groundwater	Group Symbol	Stratum Descriptions:	Field Notes, Comments:
		SS-1	27	20		SP-	Poorly Graded Sand w/ Gravel & Silt (SP-SM): Mostly fine Sand, little Gravel,	4" Topsoil
1	285		37			SM	few Silt, brown, dry (Glaciofluvial Deposits)	16" Frost
			6					
2	284		7			SP	Poorly Graded Sand (SP): Mostly fine Sand, trace Silt, orange, moist	
3	283							
4	282							
5	281							
		SS-2	5	16		SP	Poorly Graded Sand (SP): Mostly fine Sand, trace Silt, orange, moist	
6	280		3					
			4					
7	279		4					
8	278							
9	277							
10	276							
		SS-3	1	18		SP	Poorly Graded Sand (SP): Mostly fine Sand, trace Silt, orange, moist	
11	275		1					
			2					
12	274		2					
13	273				▼			
14	272							
15	271							
		SS-4	2	24		SP	Poorly Graded Sand (SP): Mostly fine Sand, trace Silt, grey, saturated	
16	270		4					
			5					
17	269		6					
18	268							
19	267							
20	266							
		SS-5	2	24		SP	Poorly Graded Sand (SP): Mostly fine Sand, trace Silt, grey, saturated	

METHODS: **HA**- Hollow Stem Auger, **RWH**- Rotary Wash, **SSA**- Solid Stem Auger, **DC**-Diamond Core, **DP**-Direct Push

SAMPLE TYPES: **SS-Split Spoon, RC-Bedrock Core, GS-Geoprobe Sleeve, ST-Shelby Tube**

STANDARD 1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.

NOTES: 2. Test Boring Log Page 1: 0 - 20 feet. Each subsequent page: Additional 25 feet.

3. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.

ADDITIONAL NOTES:

DRILLING INFORMATION

Method:	DP	0 to	25.0
Method:			
		Sample	Core
Type		SS	
Int Diam.		3.25	
Weight		140 lb	
Fall		30"	

TEST BORING LOG

THE Chazen COMPANIES
547 River Street
Troy, New York 12180
Phn: (518) 273-0055
Fax: (518) 273-8391

PROJECT: Rapp Road Residential Development
LOCATION: Rapp Road Guilderland, NY
CLIENT: Pyramid Management Group, LLC
PROJECT NO.: 317AI.00

Test Boring No.: **SB6**
Total Depth: 27 ft.

Depth (Ft)	Elevation (Ft)	Sample No.	SPT Blows	Recovery(in)	Groundwater	Group Symbol	Stratum Descriptions:	Field Notes, Comments:
21	265		3					
			4					
22	264		2					
23	263							
24	262							
25	261	SS-6	2	24		SP	Poorly Graded Sand (SP): Mostly fine Sand, trace Silt, grey, saturated	
26	260		3					
			1					
27	259		1					
							Boring Terminated at 27 feet	
28	258							
29	257							
30	256							
31	255							
32	254							
33	253							
34	252							
35	251							
36	250							
37	249							
38	248							
39	247							
40	246							
41	245							
42	244							
43	243							
44	242							
45	241							

ADDITIONAL NOTES:

TEST BORING LOG

THE Chazen COMPANIES
547 River Street
Troy, New York 12180
Phn: (518) 273-0055
Fax: (518) 273-8391

PROJECT: Rapp Road Residential Development
LOCATION: Rapp Road Guilderland, NY
CLIENT: Pyramid Management Group, LLC
PROJECT NO.: 317AI.00

Test Boring No.: **SB8**
Total Depth: 27 ft.

Contractor: Aztech Environmental
Drill Rig: 3230DT
Driller: Derek Fennell
Inspector: Dean Anderson

Start Date: 23-Jan-2018
Finish Date: 23-Jan-2018
El. Datum: NAVD-88
G.S. Elevation: 285.0

Northing: See Figure
Easting: See Figure
Latitude: -
Longitude: -

Borehole Dia.: 3.5 in.
Water Depth: 13 ft.
Bedrock Depth: n/a ft.
Sample Hammer: Automatic

Depth (Ft)	Elevation (Ft)	Sample No.	SPT Blows	Recovery(in)	Groundwater	Group Symbol	Stratum Descriptions:	Field Notes, Comments:
		SS-1	1	10		SP	Poorly Graded Sand (SP): Mostly fine Sand, orange, moist	4" Topsoil
1	284		1				(Fill)	Few Brick Fragments
			2					6" Frost
2	283		1					
								Appximate Strata Change
3	282						(Glaciofluvial Deposits)	
4	281							
5	280							
		SS-2	4	20		SP	Poorly Graded Sand (SP): Mostly fine Sand, grey, moist	
6	279		2					
			4					
7	278		2					
8	277							
9	276							
10	275							
		SS-3	3	16		SP	Poorly Graded Sand (SP): Mostly fine Sand, grey, moist	
11	274		2					
			3					
12	273		2					
13	272				▼			
14	271							
15	270							
		SS-4	2	18		SP	Poorly Graded Sand (SP): Mostly fine Sand, brown, saturated	
16	269		3					
			1					
17	268		4					
18	267							
19	266							
20	265							
		SS-5	1	20		SP	Poorly Graded Sand (SP): Mostly fine Sand, grey, saturated	Running Sands

METHODS: **HA**- Hollow Stem Auger, **RWH**- Rotary Wash, **SSA**- Solid Stem Auger, **DC**-Diamond Core, **DP**-Direct Push

SAMPLE TYPES: **SS-Split Spoon, RC-Bedrock Core, GS-Geoprobe Sleeve, ST-Shelby Tube**

STANDARD 1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.

NOTES: 2. Test Boring Log Page 1: 0 - 20 feet. Each subsequent page: Additional 25 feet.

3. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.

ADDITIONAL NOTES:

DRILLING INFORMATION

Method:	DP	0 to	25.0
Method:			

	Sample	Core
Type	SS	
Int Diam.	3.25	
Weight	140 lb	
Fall	30"	

TEST BORING LOG

THE Chazen COMPANIES
547 River Street
Troy, New York 12180
Phn: (518) 273-0055
Fax: (518) 273-8391

PROJECT: Rapp Road Residential Development
LOCATION: Rapp Road Guilderland, NY
CLIENT: Pyramid Management Group, LLC
PROJECT NO.: 317AI.00

Test Boring No.: **SB8**
Total Depth: 27 ft.

Depth (Ft)	Elevation (Ft)	Sample No.	SPT Blows	Recovery(in)	Groundwater	Group Symbol	Stratum Descriptions:	Field Notes, Comments:
21	264		4					
			2					
22	263		3					
23	262							
24	261							
25	260							
		SS-6	2	24		SP	Poorly Graded Sand (SP): Mostly fine Sand, grey, saturated	
26	259		2					
			4					
27	258		1					
							Boring Terminated at 27 feet	
28	257							
29	256							
30	255							
31	254							
32	253							
33	252							
34	251							
35	250							
36	249							
37	248							
38	247							
39	246							
40	245							
41	244							
42	243							
43	242							
44	241							
45	240							

ADDITIONAL NOTES:

TEST BORING LOG

THE Chazen COMPANIES
547 River Street
Troy, New York 12180
Phn: (518) 273-0055
Fax: (518) 273-8391

PROJECT: Rapp Road Residential Development
LOCATION: Rapp Road Guilderland, NY
CLIENT: Pyramid Management Group, LLC
PROJECT NO.: 317AI.00

Test Boring No.: **SB7**
Total Depth: 27 ft.

Contractor: Aztech Environmental
Drill Rig: 3230DT
Driller: Derek Fennell
Inspector: Dean Anderson

Start Date: 22-Jan-2018
Finish Date: 22-Jan-2018
El. Datum: NAVD-88
G.S. Elevation: 289.0

Northing: See Figure
Easting:
Latitude: -
Longitude: -

Borehole Dia.: 3.5 in.
Water Depth: 16 ft.
Bedrock Depth: n/a ft.
Sample Hammer: Automatic

Depth (Ft)	Elevation (Ft)	Sample No.	SPT Blows	Recovery(in)	Groundwater	Group Symbol	Stratum Descriptions:	Field Notes, Comments:
		SS-1	4	16		SP	Poorly Graded Sand (SP): Mostly fine Sand, brown/orange, moist	3" Topsoil
1	288		3				(Glaciofluvial Deposits)	6" Frost
			3					
2	287		3					
3	286							
4	285							
5	284							
		SS-2	8	16		SP	Poorly Graded Sand (SP): Mostly fine Sand, orange, moist	
6	283		6					
			6					
7	282		7					
8	281							
9	280							
10	279							
		SS-3	4	18		SP-SM	Poorly Graded Sand w/ Silt (SP-SM): Mostly fine Sand, few Silt, orange to brown, moist	
11	278		6					
			6					
12	277		7					
13	276							
14	275							
15	274							
		SS-4	3	20		SP	Poorly Graded Sand (SP): Mostly fine Sand, trace Silt, grey, moist to saturated	
16	273		1		▼			
			2					
17	272		2					
18	271							
19	270							
20	269							
		SS-5	3	18		SP	Poorly Graded Sand (SP): Mostly fine Sand, trace Silt, grey, saturated	

METHODS: **HA**- Hollow Stem Auger, **RWH**- Rotary Wash, **SSA**- Solid Stem Auger, **DC**-Diamond Core, **DP**-Direct Push

SAMPLE TYPES: **SS-Split Spoon, RC-Bedrock Core, GS-Geoprobe Sleeve, ST-Shelby Tube**

STANDARD 1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.

NOTES: 2. Test Boring Log Page 1: 0 - 20 feet. Each subsequent page: Additional 25 feet.

3. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.

ADDITIONAL NOTES:

DRILLING INFORMATION

Method:	DP	0 to	25.0
Method:			

	Sample	Core
Type	SS	
Int Diam.	3.25	
Weight	140 lb	
Fall	30"	

TEST BORING LOG

THE Chazen COMPANIES
547 River Street
Troy, New York 12180
Phn: (518) 273-0055
Fax: (518) 273-8391

PROJECT: Rapp Road Residential Development
LOCATION: Rapp Road Guilderland, NY
CLIENT: Pyramid Management Group, LLC
PROJECT NO.: 317AI.00

Test Boring No.: **SB7**
Total Depth: 27 ft.

Depth (Ft)	Elevation (Ft)	Sample No.	SPT Blows	Recovery(in)	Groundwater	Group Symbol	Stratum Descriptions:	Field Notes, Comments:
21	268		3					
			3					
22	267		6					
23	266							
24	265							
25	264	SS-6	2	18		SP	Poorly Graded Sand (SP): Mostly fine Sand, trace Silt, grey, saturated	
26	263		2					
			5					
27	262		12					
							Boring Terminated at 27 feet	
28	261							
29	260							
30	259							
31	258							
32	257							
33	256							
34	255							
35	254							
36	253							
37	252							
38	251							
39	250							
40	249							
41	248							
42	247							
43	246							
44	245							
45	244							

ADDITIONAL NOTES:

TEST BORING LOG

THE Chazen COMPANIES
547 River Street
Troy, New York 12180
Phn: (518) 273-0055
Fax: (518) 273-8391

PROJECT: Rapp Road Residential Development
LOCATION: Rapp Road Guilderland, NY
CLIENT: Pyramid Management Group, LLC
PROJECT NO.: 317AI.00

Test Boring No.: **SB9**
Total Depth: 22 ft.

Contractor: Aztech Environmental
Drill Rig: 3230DT
Driller: Derek Fennell
Inspector: Dean Anderson

Start Date: 23-Jan-2018
Finish Date: 23-Jan-2018
El. Datum: NAVD-88
G.S. Elevation: 283.5

Northing: See Figure
Easting:
Latitude: -
Longitude: -

Borehole Dia.: 3.5 in.
Water Depth: 11.5 ft.
Bedrock Depth: n/a ft.
Sample Hammer: Automatic

Depth (Ft)	Elevation (Ft)	Sample No.	SPT Blows	Recovery(in)	Groundwater	Group Symbol	Stratum Descriptions:	Field Notes, Comments:
		SS-1	2	12		SP	Poorly Graded Sand (SP): Mostly fine Sand, black to orange, moist	6" Topsoil
			4				(Glaciofluvial Deposits)	8" Frost
1	282.5		4					
			2					
2	281.5							
3	280.5							
4	279.5							
5	278.5							
		SS-2	4	14		SP	Poorly Graded Sand (SP): Mostly fine Sand, grey, moist	
6	277.5		3					
			3					
7	276.5		4					
8	275.5							
9	274.5							
10	273.5							
		SS-3	2	12		SP	Poorly Graded Sand (SP): Mostly fine Sand, brown, moist to saturated	
11	272.5		1					
			2		▼			
12	271.5		1					
13	270.5							
14	269.5							
15	268.5							
		SS-4	2	16		SP	Poorly Graded Sand (SP): Mostly fine Sand, brown/grey, saturated	
16	267.5		1					
			1					
17	266.5		2					
18	265.5							
19	264.5							
20	263.5							
		SS-5	2	24		SP	Poorly Graded Sand (SP): Mostly fine Sand, grey, saturated	

METHODS: **HA**- Hollow Stem Auger, **RWH**- Rotary Wash, **SSA**- Solid Stem Auger, **DC**-Diamond Core, **DP**-Direct Push

SAMPLE TYPES: **SS-Split Spoon, RC-Bedrock Core, GS-Geoprobe Sleeve, ST-Shelby Tube**

STANDARD 1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.

NOTES: 2. Test Boring Log Page 1: 0 - 20 feet. Each subsequent page: Additional 25 feet.

3. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.

ADDITIONAL NOTES:

DRILLING INFORMATION

Method:	DP	0 to	20.0
Method:			
		Sample	Core
Type		SS	
Int Diam.		3.25	
Weight		140 lb	
Fall		30"	

TEST BORING LOG

THE Chazen COMPANIES
547 River Street
Troy, New York 12180
Phn: (518) 273-0055
Fax: (518) 273-8391

PROJECT: Rapp Road Residential Development
LOCATION: Rapp Road Guilderland, NY
CLIENT: Pyramid Management Group, LLC
PROJECT NO.: 317AI.00

Test Boring No.: **SB9**
Total Depth: 22 ft.

Depth (Ft)	Elevation (Ft)	Sample No.	SPT Blows	Recovery(in)	Groundwater	Group Symbol	Stratum Descriptions:	Field Notes, Comments:
21	263		1					
			3					
22	262		1					
							Boring Terminated at 22 feet	
23	261							
24	260							
25	259							
26	258							
27	257							
28	256							
29	255							
30	254							
31	253							
32	252							
33	251							
34	250							
35	249							
36	248							
37	247							
38	246							
39	245							
40	244							
41	243							
42	242							
43	241							
44	240							
45	239							

ADDITIONAL NOTES:

TEST BORING LOG

THE Chazen COMPANIES
547 River Street
Troy, New York 12180
Phn: (518) 273-0055
Fax: (518) 273-8391

PROJECT: Rapp Road Residential Development
LOCATION: Rapp Road Guilderland, NY
CLIENT: Pyramid Management Group, LLC
PROJECT NO.: 317AI.00

Test Boring No.: **SB10**
Total Depth: 27 ft.

Contractor: Aztech Environmental
Drill Rig: 3230DT
Driller: Derek Fennell
Inspector: Dean Anderson

Start Date: 25-Jan-2018
Finish Date: 25-Jan-2018
El. Datum: NAVD-88
G.S. Elevation: 283.0

Northing: See Figure
Easting:
Latitude: -
Longitude: -

Borehole Dia.: 3.5 in.
Water Depth: 9 ft.
Bedrock Depth: n/a ft.
Sample Hammer: Automatic

Depth (Ft)	Elevation (Ft)	Sample No.	SPT Blows	Recovery(in)	Groundwater	Group Symbol	Stratum Descriptions:	Field Notes, Comments:
		SS-1	3	20		SP	Poorly Graded Sand (SP): Mostly fine Sand, brown/orange to light brown, moist (Glaciofluvial Deposits)	6" Topsoil 8" Frost
1	282		1					
			1					
2	281		2					
3	280							
4	279							
5	278							
		SS-2	6	18		SP	Poorly Graded Sand (SP): Mostly fine Sand, grey, moist	
6	277		4					
			4					
7	276		4					
8	275							
9	274				▼			
10	273							
		SS-3	2	18		SP	Poorly Graded Sand (SP): Mostly fine Sand, brown, saturated	
11	272		1					
12	271							
13	270							
14	269							
15	268	SS-4	4	24		SP	Poorly Graded Sand (SP): Mostly fine Sand, brown, saturated	
			5					
16	267		6					
			7					
17	266							
18	265							
19	264							
20	263							
		SS-5	1	20		SP	Poorly Graded Sand (SP): Mostly fine Sand, brown, saturated	Running Sands @ 20 feet

METHODS: **HA**- Hollow Stem Auger, **RWH**- Rotary Wash, **SSA**- Solid Stem Auger, **DC**-Diamond Core, **DP**-Direct Push

SAMPLE TYPES: **SS-Split Spoon, RC-Bedrock Core, GS-Geoprobe Sleeve, ST-Shelby Tube**

STANDARD 1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.

NOTES: 2. Test Boring Log Page 1: 0 - 20 feet. Each subsequent page: Additional 25 feet.

3. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.

ADDITIONAL NOTES:

DRILLING INFORMATION

Method:	DP	0 to	25.0
Method:			

	Sample	Core
Type	SS	
Int Diam.	3.25	
Weight	140 lb	
Fall	30"	

TEST BORING LOG

THE Chazen COMPANIES
547 River Street
Troy, New York 12180
Phn: (518) 273-0055
Fax: (518) 273-8391

PROJECT: Rapp Road Residential Development
LOCATION: Rapp Road Guilderland, NY
CLIENT: Pyramid Management Group, LLC
PROJECT NO.: 317AI.00

Test Boring No.: **SB10**
Total Depth: 27 ft.

Depth (Ft)	Elevation (Ft)	Sample No.	SPT Blows	Recovery(in)	Groundwater	Group Symbol	Stratum Descriptions:	Field Notes, Comments:
21	262		1					
			1					
22	261							
23	260							
24	259							Approximate Sub-Stratum Change
25	258	SS-6	3	20		SM	Silty Sand (SM): Mostly fine Sand, little Silt, grey, saturated	
26	257		9					
			7					
27	256		9					
							Boring Terminated at 27 feet	
28	255							
29	254							
30	253							
31	252							
32	251							
33	250							
34	249							
35	248							
36	247							
37	246							
38	245							
39	244							
40	243							
41	242							
42	241							
43	240							
44	239							
45	238							

ADDITIONAL NOTES:

TEST BORING LOG

THE Chazen COMPANIES
547 River Street
Troy, New York 12180
Phn: (518) 273-0055
Fax: (518) 273-8391

PROJECT: Rapp Road Residential Development
LOCATION: Rapp Road Guilderland, NY
CLIENT: Pyramid Management Group, LLC
PROJECT NO.: 317AI.00

Test Boring No.: **SB11**
Total Depth: 52 ft.

Contractor: Aztech Environmental
Drill Rig: 3230DT
Driller: Derek Fennell
Inspector: Dean Anderson

Start Date: 24-Jan-2018
Finish Date: 24-Jan-2018
El. Datum: NAVD-88
G.S. Elevation: 286.0

Northing: See Figure
Easting:
Latitude: -
Longitude: -

Borehole Dia.: 3.5 in.
Water Depth: 11.5 ft.
Bedrock Depth: n/a ft.
Sample Hammer: Automatic

Depth (Ft)	Elevation (Ft)	Sample No.	SPT Blows	Recovery(in)	Groundwater	Group Symbol	Stratum Descriptions:	Field Notes, Comments:
		SS-1	1	18		SP	Poorly Graded Sand (SP): Mostly fine Sand, orange to brown, moist	4" Topsoil
1	285		4				(Glaciofluvial Deposits)	6" Frost
			2					
2	284		2					
3	283							
4	282							
5	281							
		SS-2	6	18		SP	Poorly Graded Sand (SP): Mostly fine Sand, trace Silt, orange/brown, moist	
6	280		5					
			6					
7	279		6					
8	278							
9	277							
10	276							
		SS-3	5	18		SP	Poorly Graded Sand (SP): Mostly fine Sand, trace Silt, orange/brown, moist to	
11	275		3				saturated	
			3		▼			
12	274		4					
13	273							
14	272							
15	271							
		SS-4	2	20		SP	Poorly Graded Sand (SP): Mostly fine Sand, brown, saturated	
16	270		2					
			2					
17	269		2					
18	268							
19	267							
20	266							
		SS-5	2	24		SP	Poorly Graded Sand (SP): Mostly fine Sand, brown, saturated	Running Sands @ 20 feet

METHODS: **HA**- Hollow Stem Auger, **RWH**- Rotary Wash, **SSA**- Solid Stem Auger, **DC**-Diamond Core, **DP**-Direct Push

SAMPLE TYPES: **SS-Split Spoon, RC-Bedrock Core, GS-Geoprobe Sleeve, ST-Shelby Tube**

STANDARD 1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.

NOTES: 2. Test Boring Log Page 1: 0 - 20 feet. Each subsequent page: Additional 25 feet.

3. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.

ADDITIONAL NOTES:

DRILLING INFORMATION

Method:	DP	0 to	50.0
Method:			

	Sample	Core
Type	SS	
Int Diam.	3.25	
Weight	140 lb	
Fall	30"	

TEST BORING LOG

THE Chazen COMPANIES
547 River Street
Troy, New York 12180
Phn: (518) 273-0055
Fax: (518) 273-8391

PROJECT: Rapp Road Residential Development
LOCATION: Rapp Road Guilderland, NY
CLIENT: Pyramid Management Group, LLC
PROJECT NO.: 317AI.00

Test Boring No.: **SB11**
Total Depth: 52 ft.

Depth (Ft)	Elevation (Ft)	Sample No.	SPT Blows	Recovery(in)	Groundwater	Group Symbol	Stratum Descriptions:	Field Notes, Comments:
21	265		1					
			1					
22	264		4					
23	263							
24	262							
25	261							
		SS-6	2	12		SP	Poorly Graded Sand (SP): Mostly fine Sand, brown, saturated	
26	260		2					
			6					
27	259		4					
28	258							
29	257							
30	256							
		SS-7	3	18		SP	Poorly Graded Sand (SP): Mostly fine Sand, brown, saturated	
31	255		3					
			4					
32	254		5					
33	253							
34	252							
35	251							
		SS-8	3	14		SP	Poorly Graded Sand (SP): Mostly fine Sand, trace Silt, brown, saturated	
36	250		5					
			8					
37	249		10					
38	248							
39	247							
40	246							
		SS-9	2	14		SP	Poorly Graded Sand (SP): Mostly fine Sand, grey, saturated	
41	245		2					
			2					
42	244		2					
43	243							
44	242							
45	241							
		SS-10	6	24		SP	Poorly Graded Sand (SP): Mostly fine Sand, grey, saturated	

ADDITIONAL NOTES:

TEST BORING LOG

THE Chazen COMPANIES
547 River Street
Troy, New York 12180
Phn: (518) 273-0055
Fax: (518) 273-8391

PROJECT: Rapp Road Residential Development
LOCATION: Rapp Road Guilderland, NY
CLIENT: Pyramid Management Group, LLC
PROJECT NO.: 317AI.00

Test Boring No.: **SB11**
Total Depth: 52 ft.

Depth (Ft)	Elevation (Ft)	Sample No.	SPT Blows	Recovery(in)	Groundwater	Group Symbol	Stratum Descriptions:	Field Notes, Comments:
46	240		7					
			5					
47	239		3					
48	238							
49	237							
50	236	SS-11	6	24		SP	Poorly Graded Sand (SP): Mostly fine Sand, grey, saturated	
51	235		5					
			7					
52	234		4					
							Boring Terminated at 52 feet	
53	233							
54	232							
55	231							
56	230							
57	229							
58	228							
59	227							
60	226							
61	225							
62	224							
63	223							
64	222							
65	221							
66	220							
67	219							
68	218							
69	217							
70	216							

ADDITIONAL NOTES:

TEST BORING LOG

THE Chazen COMPANIES
547 River Street
Troy, New York 12180
Phn: (518) 273-0055
Fax: (518) 273-8391

PROJECT: Rapp Road Residential Development
LOCATION: Rapp Road Guilderland, NY
CLIENT: Pyramid Management Group, LLC
PROJECT NO.: 317AI.00

Test Boring No.: **SB12**
Total Depth: 17 ft.

Contractor: Aztech Environmental
Drill Rig: 3230DT
Driller: Derek Fennell
Inspector: Dean Anderson

Start Date: 29-Jan-2018
Finish Date: 29-Jan-2018
El. Datum: NAVD-88
G.S. Elevation: 285.0

Northing: See Figure
Easting:
Latitude: -
Longitude: -

Borehole Dia.: 3.5 in.
Water Depth: 13 ft.
Bedrock Depth: n/a ft.
Sample Hammer: Automatic

Depth (Ft)	Elevation (Ft)	Sample No.	SPT Blows	Recovery(in)	Groundwater	Group Symbol	Stratum Descriptions:	Field Notes, Comments:
		SS-1	1	12		SP	Poorly Graded Sand (SP): Mostly fine Sand, orange, moist	4" Topsoil
1	284		1				(Glaciofluvial Deposits)	3" Frost
			1					
2	283		4					
3	282							
4	281							
5	280							
		SS-2	6	20		SP	Poorly Graded Sand (SP): Mostly fine Sand, orange, moist	
6	279		6					
			7					
7	278		8					
8	277							
9	276							
10	275							
		SS-3	3	20		SP	Poorly Graded Sand (SP): Mostly fine Sand, orange/grey, moist	
11	274		3					
			3					
12	273		5					
13	272				▼			
14	271							
15	270							
		SS-4	5	20		SP	Poorly Graded Sand (SP): Mostly fine Sand, grey, saturated	
16	269		4					
			6					
17	268		7					
							Boring Termination at 17 feet	
18	267							
19	266							
20	265							

METHODS: **HA**- Hollow Stem Auger, **RWH**- Rotary Wash, **SSA**- Solid Stem Auger, **DC**-Diamond Core, **DP**-Direct Push

SAMPLE TYPES: **SS-Split Spoon, RC-Bedrock Core, GS-Geoprobe Sleeve, ST-Shelby Tube**

STANDARD 1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.

NOTES: 2. Test Boring Log Page 1: 0 - 20 feet. Each subsequent page: Additional 25 feet.

3. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.

ADDITIONAL NOTES:

DRILLING INFORMATION

Method:	DP	0 to	15.0
Method:			
		Sample	Core
Type		SS	
Int Diam.		3.25	
Weight		140 lb	
Fall		30"	

TEST BORING LOG

THE Chazen COMPANIES
547 River Street
Troy, New York 12180
Phn: (518) 273-0055
Fax: (518) 273-8391

PROJECT: Rapp Road Residential Development
LOCATION: Rapp Road Guilderland, NY
CLIENT: Pyramid Management Group, LLC
PROJECT NO.: 317AI.00

Test Boring No.: **SB13**
Total Depth: 27 ft.

Contractor: Aztech Environmental
Drill Rig: 3230DT
Driller: Derek Fennell
Inspector: Dean Anderson

Start Date: 22-Jan-2018
Finish Date: 22-Jan-2018
El. Datum: NAVD-88
G.S. Elevation: 285.0

Northing: See Figure
Easting:
Latitude: -
Longitude: -

Borehole Dia.: 3.5 in.
Water Depth: 13 ft.
Bedrock Depth: n/a ft.
Sample Hammer: Automatic

Depth (Ft)	Elevation (Ft)	Sample No.	SPT Blows	Recovery(in)	Groundwater	Group Symbol	Stratum Descriptions:	Field Notes, Comments:
		SS-1	13	14		SP	Poorly Graded Sand w/ Gravel (SP): Mostly fine Sand, little Gravel, trace Silt, brown, moist (Glaciofluvial Deposits)	6" Topsoil 8" Frost
1	284		12					
			14					
2	283		17					
3	282							
4	281							
5	280							
		SS-2	7	24		SP	Poorly Graded Sand (SP): Mostly fine Sand, mottling, tan, moist	
6	279		5					
			6					
7	278		7					
8	277							
9	276							
10	275							
		SS-3	4	24		SP	Poorly Graded Sand (SP): Mostly fine Sand, grey, moist	
11	274		4					
			5					
12	273		6					
13	272				▼			
14	271							
15	270							
		SS-4	4	12		SP	Poorly Graded Sand (SP): Mostly fine Sand, grey, saturated	
16	269		5					
			6					
17	268		5					
18	267							
19	266							
20	265							
		SS-5	2	24		SP	Poorly Graded Sand (SP): Mostly fine Sand, grey, saturated	

METHODS: **HA**- Hollow Stem Auger, **RWH**- Rotary Wash, **SSA**- Solid Stem Auger, **DC**-Diamond Core, **DP**-Direct Push

SAMPLE TYPES: **SS-Split Spoon, RC-Bedrock Core, GS-Geoprobe Sleeve, ST-Shelby Tube**

STANDARD 1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.

NOTES: 2. Test Boring Log Page 1: 0 - 20 feet. Each subsequent page: Additional 25 feet.

3. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.

ADDITIONAL NOTES:

DRILLING INFORMATION

Method:	DP	0 to	25.0
Method:			

	Sample	Core
Type	SS	
Int Diam.	3.25	
Weight	140 lb	
Fall	30"	

TEST BORING LOG

THE Chazen COMPANIES
547 River Street
Troy, New York 12180
Phn: (518) 273-0055
Fax: (518) 273-8391

PROJECT: Rapp Road Residential Development
LOCATION: Rapp Road Guilderland, NY
CLIENT: Pyramid Management Group, LLC
PROJECT NO.: 317AI.00

Test Boring No.: **SB13**
Total Depth: 27 ft.

Depth (Ft)	Elevation (Ft)	Sample No.	SPT Blows	Recovery(in)	Groundwater	Group Symbol	Stratum Descriptions:	Field Notes, Comments:
21	264		4					
			6					
22	263		7					
23	262							
24	261							
25	260	SS-6	1	20		SP	Poorly Graded Sand (SP): Mostly fine Sand, grey, saturated	
26	259		1					
			2					
27	258		1					
							Boring Terminated at 27 feet	
28	257							
29	256							
30	255							
31	254							
32	253							
33	252							
34	251							
35	250							
36	249							
37	248							
38	247							
39	246							
40	245							
41	244							
42	243							
43	242							
44	241							
45	240							

ADDITIONAL NOTES:

TEST BORING LOG

THE Chazen COMPANIES
547 River Street
Troy, New York 12180
Phn: (518) 273-0055
Fax: (518) 273-8391

PROJECT: Rapp Road Residential Development
LOCATION: Rapp Road Guilderland, NY
CLIENT: Pyramid Management Group, LLC
PROJECT NO.: 317AI.00

Test Boring No.: **SB14**
Total Depth: 27 ft.

Contractor: Aztech Environmental
Drill Rig: 3230DT
Driller: Derek Fennell
Inspector: Dean Anderson

Start Date: 22-Jan-2018
Finish Date: 22-Jan-2018
El. Datum: NAVD-88
G.S. Elevation: 290.5

Northing: See Figure
Easting:
Latitude: -
Longitude: -

Borehole Dia.: 3.5 in.
Water Depth: 13 ft.
Bedrock Depth: n/a ft.
Sample Hammer: Automatic

Depth (Ft)	Elevation (Ft)	Sample No.	SPT Blows	Recovery(in)	Groundwater	Group Symbol	Stratum Descriptions:	Field Notes, Comments:
		SS-1	4	16		SP	Poorly Graded Sand (SP): Mostly fine Sand, brown/orange, moist	4" Topsoil
1	289.5		4				(Glaciofluvial Deposits)	6" Frost
			4					
2	288.5		3					
		SS-2	3	12		SP	Poorly Graded Sand (SP): Mostly fine Sand, brown/orange, moist	
3	287.5		8					
			12					
4	286.5		14					
		SS-3	8	14		SP	Poorly Graded Sand (SP): Mostly fine Sand, brown/orange, moist	
5	285.5		4					
			5					
6	284.5		8					
		SS-4	5	14		SP-SM	Poorly Graded Sand w/ Silt (SP-SM): Mostly fine Sand, few Silt, dark brown to tan, moist	
7	283.5		6					
			6					
8	282.5		7					
		SS-5	5	24		SP-SM	Poorly Graded Sand w/ Silt (SP-SM): Mostly fine Sand, few Silt, grey/brown, mottling, moist	
9	281.5		6					
			7					
10	280.5		6					
11	279.5							
12	278.5							
13	277.5				▼			
14	276.5							
15	275.5							
		SS-6	1	20		SP	Poorly Graded Sand (SP): Mostly fine Sand, grey/brown, saturated	
16	274.5		1					
			2					
17	273.5		4					
18	272.5							
19	271.5							Approximate Sub-Stratum Change
20	270.5							
		SS-7	4	18		SM	Silty Sand (SM): Mostly fine Sand, little Silt, grey, saturated	

METHODS: **HA**- Hollow Stem Auger, **RWH**- Rotary Wash, **SSA**- Solid Stem Auger, **DC**-Diamond Core, **DP**-Direct Push

SAMPLE TYPES: **SS-Split Spoon, RC-Bedrock Core, GS-Geoprobe Sleeve, ST-Shelby Tube**

STANDARD 1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.

NOTES: 2. Test Boring Log Page 1: 0 - 20 feet. Each subsequent page: Additional 25 feet.

3. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.

ADDITIONAL NOTES:

DRILLING INFORMATION

Method:	DP	0 to	25.0
Method:			

	Sample	Core
Type	SS	
Int Diam.	3.25	
Weight	140 lb	
Fall	30"	

TEST BORING LOG

THE Chazen COMPANIES
547 River Street
Troy, New York 12180
Phn: (518) 273-0055
Fax: (518) 273-8391

PROJECT: Rapp Road Residential Development
LOCATION: Rapp Road Guilderland, NY
CLIENT: Pyramid Management Group, LLC
PROJECT NO.: 317AI.00

Test Boring No.: **SB14**
Total Depth: 27 ft.

Depth (Ft)	Elevation (Ft)	Sample No.	SPT Blows	Recovery(in)	Groundwater	Group Symbol	Stratum Descriptions:	Field Notes, Comments:
21	269.5		9					
			10					
22	268.5		11					
23	267.5							
24	266.5							
25	265.5	SS-8	7	20		SM	Silty Sand (SM): Mostly fine Sand, little Silt, grey, saturated	
26	264.5		7					
			8					
27	263.5		8					
							Boring Terminated at 27 feet	
28	262.5							
29	261.5							
30	260.5							
31	259.5							
32	258.5							
33	257.5							
34	256.5							
35	255.5							
36	254.5							
37	253.5							
38	252.5							
39	251.5							
40	250.5							
41	249.5							
42	248.5							
43	247.5							
44	246.5							
45	245.5							

ADDITIONAL NOTES:

TEST BORING LOG

THE Chazen COMPANIES
547 River Street
Troy, New York 12180
Phn: (518) 273-0055
Fax: (518) 273-8391

PROJECT: Rapp Road Residential Development
LOCATION: Rapp Road Guilderland, NY
CLIENT: Pyramid Management Group, LLC
PROJECT NO.: 317AI.00

Test Boring No.: **SB15**
Total Depth: 17 ft.

Contractor: Aztech Environmental
Drill Rig: 3230DT
Driller: Derek Fennell
Inspector: Dean Anderson

Start Date: 25-Jan-2018
Finish Date: 25-Jan-2018
El. Datum: NAVD-88
G.S. Elevation: 288.0

Northing: See Figure
Easting:
Latitude: -
Longitude: -

Borehole Dia.: 3.5 in.
Water Depth: 13 ft.
Bedrock Depth: n/a ft.
Sample Hammer: Automatic

Depth (Ft)	Elevation (Ft)	Sample No.	SPT Blows	Recovery(in)	Groundwater	Group Symbol	Stratum Descriptions:	Field Notes, Comments:
		SS-1	4	16		SP	Poorly Graded Sand (SP): Mostly fine Sand, brown, wet	No Topsoil
1	287		5				(Glaciofluvial Deposits)	6" Frost
			5					
2	286		6					
3	285							
4	284							
5	283							
		SS-2	5	18		SP	Poorly Graded Sand (SP): Mostly fine Sand, light brown, moist	
6	282		5					
			5					
7	281		6					
8	280							
9	279							
10	278							
		SS-3	5	18		SP	Poorly Graded Sand (SP): Mostly fine Sand, grey, moist	
11	277		3					
			3					
12	276		5					
13	275				▼			
14	274							
15	273							
		SS-4		22		SP	Poorly Graded Sand (SP): Mostly fine Sand, brown, saturated	
16	272		1					
17	271							
							Boring Terminated at 17 feet	
18	270							
19	269							
20	268							

METHODS: **HA**- Hollow Stem Auger, **RWH**- Rotary Wash, **SSA**- Solid Stem Auger, **DC**-Diamond Core, **DP**-Direct Push

SAMPLE TYPES: **SS-Split Spoon, RC-Bedrock Core, GS-Geoprobe Sleeve, ST-Shelby Tube**

STANDARD 1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.

NOTES: 2. Test Boring Log Page 1: 0 - 20 feet. Each subsequent page: Additional 25 feet.

3. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.

ADDITIONAL NOTES:

DRILLING INFORMATION

Method:	DP	0 to	15.0
Method:			

	Sample	Core
Type	SS	
Int Diam.	3.25	
Weight	140 lb	
Fall	30"	

TEST BORING LOG

THE Chazen COMPANIES
547 River Street
Troy, New York 12180
Phn: (518) 273-0055
Fax: (518) 273-8391

PROJECT: Rapp Road Residential Development
LOCATION: Rapp Road Guilderland, NY
CLIENT: Pyramid Management Group, LLC
PROJECT NO.: 317AI.00

Test Boring No.: **SB16**
Total Depth: 27 ft.

Contractor: Aztech Environmental
Drill Rig: 3230DT
Driller: Derek Fennell
Inspector: Dean Anderson

Start Date: 22-Jan-2018
Finish Date: 22-Jan-2018
El. Datum: NAVD-88
G.S. Elevation: 286.0

Northing: See Figure
Easting: See Figure
Latitude: -
Longitude: -

Borehole Dia.: 3.5 in.
Water Depth: 13 ft.
Bedrock Depth: n/a ft.
Sample Hammer: Automatic

Depth (Ft)	Elevation (Ft)	Sample No.	SPT Blows	Recovery(in)	Groundwater	Group Symbol	Stratum Descriptions:	Field Notes, Comments:
		SS-1	2	20		SP	Poorly Graded Sand (SP): Mostly fine Sand, trace Gravel, brown to grey, moist	3" Topsoil
1	285		2				(Glaciofluvial Deposits)	6" Frost
			2					
2	284		7					
		SS-2	6	12		SP	Poorly Graded Sand (SP): Mostly fine Sand, tan/grey, moist	
3	283		7					
			7					
4	282		2					
		SS-3	8	18		SP	Poorly Graded Sand (SP): Mostly fine Sand, grey, moist	
5	281		8					
			9					
6	280		10					
		SS-4	8	18		SP	Poorly Graded Sand (SP): Mostly fine Sand, grey, moist	
7	279		6					
			6					
8	278		8					
		SS-5	4	16		SP	Poorly Graded Sand (SP): Mostly fine Sand, grey, moist	
9	277		3					
			3					
10	276		4					
11	275							
12	274							
13	273				▼			
14	272							Approximate Sub-Stratum Change
15	271							
		SS-6	3	18		SM	Silty Sand (SM): Mostly fine Sand, little Silt, grey, saturated	
16	270		3					
			3					
17	269		3					
18	268							
19	267							
20	266							
		SS-7	2	24		SM	Silty Sand (SM): Mostly fine Sand, little Silt, grey, saturated	

METHODS: **HA**- Hollow Stem Auger, **RWH**- Rotary Wash, **SSA**- Solid Stem Auger, **DC**-Diamond Core, **DP**-Direct Push

SAMPLE TYPES: **SS-Split Spoon, RC-Bedrock Core, GS-Geoprobe Sleeve, ST-Shelby Tube**

STANDARD 1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.

NOTES: 2. Test Boring Log Page 1: 0 - 20 feet. Each subsequent page: Additional 25 feet.

3. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.

ADDITIONAL NOTES:

DRILLING INFORMATION

Method:	DP	0 to	25.0
Method:			

	Sample	Core
Type	SS	
Int Diam.	3.25	
Weight	140 lb	
Fall	30"	

TEST BORING LOG

THE Chazen COMPANIES
547 River Street
Troy, New York 12180
Phn: (518) 273-0055
Fax: (518) 273-8391

PROJECT: Rapp Road Residential Development
LOCATION: Rapp Road Guilderland, NY
CLIENT: Pyramid Management Group, LLC
PROJECT NO.: 317AI.00

Test Boring No.: **SB16**
Total Depth: 27 ft.

Depth (Ft)	Elevation (Ft)	Sample No.	SPT Blows	Recovery(in)	Groundwater	Group Symbol	Stratum Descriptions:	Field Notes, Comments:
21	265		3					
			3					
22	264		4					
23	263							
24	262							
25	261	SS-8	6	20		SM	Silty Sand (SM): Mostly fine Sand, little Silt, grey, saturated	
26	260		7					
			6					
27	259		10					
							Boring Terminated at 27 feet	
28	258							
29	257							
30	256							
31	255							
32	254							
33	253							
34	252							
35	251							
36	250							
37	249							
38	248							
39	247							
40	246							
41	245							
42	244							
43	243							
44	242							
45	241							

ADDITIONAL NOTES:

TEST BORING LOG

THE Chazen COMPANIES
547 River Street
Troy, New York 12180
Phn: (518) 273-0055
Fax: (518) 273-8391

PROJECT: Rapp Road Residential Development
LOCATION: Rapp Road Guilderland, NY
CLIENT: Pyramid Management Group, LLC
PROJECT NO.: 317AI.00

Test Boring No.: **SB17**
Total Depth: 17 ft.

Contractor: Aztech Environmental
Drill Rig: 3230DT
Driller: Derek Fennell
Inspector: Dean Anderson

Start Date: 25-Jan-2018
Finish Date: 25-Jan-2018
El. Datum: NAVD-88
G.S. Elevation: 285.0

Northing: See Figure
Easting:
Latitude: -
Longitude: -

Borehole Dia.: 3.5 in.
Water Depth: 11 ft.
Bedrock Depth: n/a ft.
Sample Hammer: Automatic

Depth (Ft)	Elevation (Ft)	Sample No.	SPT Blows	Recovery(in)	Groundwater	Group Symbol	Stratum Descriptions:	Field Notes, Comments:
		SS-1	2	18		SP	Poorly Graded Sand (SP): Mostly fine Sand, light brown, moist	6" Topsoil
1	284		2				(Glaciofluvial Deposits)	8" Frost
			2					
2	283		2					
3	282							
4	281							
5	280							
		SS-2	4	24		SP	Poorly Graded Sand (SP): Mostly fine Sand, grey, moist	
6	279		2					
			2					
7	278		3					
8	277							
9	276							Approximate Sub-Stratum Change
10	275							
		SS-3	2	20		SM	Poorly Graded Sand (SP): Mostly fine Sand, brown, moist to saturated	
11	274		2		▼			
			2					
12	273		1					
13	272							
14	271							
15	270							
		SS-4	2	24		SP-SM	Poorly Graded Sand w/ Silt (SP-SM): Mostly fine Sand, few Silt, brown,	
16	269		4				saturated	
			11					
17	268		9					
							Boring Terminated at 17 feet	
18	267							
19	266							
20	265							

METHODS: **HA**- Hollow Stem Auger, **RWH**- Rotary Wash, **SSA**- Solid Stem Auger, **DC**-Diamond Core, **DP**-Direct Push

SAMPLE TYPES: **SS-Split Spoon, RC-Bedrock Core, GS-Geoprobe Sleeve, ST-Shelby Tube**

STANDARD 1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.

NOTES: 2. Test Boring Log Page 1: 0 - 20 feet. Each subsequent page: Additional 25 feet.

3. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.

ADDITIONAL NOTES:

DRILLING INFORMATION

Method:	DP	0 to	15.0
Method:			

	Sample	Core
Type	SS	
Int Diam.	3.25	
Weight	140 lb	
Fall	30"	

TEST BORING LOG

THE Chazen COMPANIES
547 River Street
Troy, New York 12180
Phn: (518) 273-0055
Fax: (518) 273-8391

PROJECT: Rapp Road Residential Development
LOCATION: Rapp Road Guilderland, NY
CLIENT: Pyramid Management Group, LLC
PROJECT NO.: 317AI.00

Test Boring No.: **SB18**
Total Depth: 27 ft.

Contractor: Aztech Environmental
Drill Rig: 3230DT
Driller: Derek Fennell
Inspector: Dean Anderson

Start Date: 25-Jan-2018
Finish Date: 25-Jan-2018
El. Datum: NAVD-88
G.S. Elevation: 287.0

Northing: See Figure
Easting:
Latitude: -
Longitude: -

Borehole Dia.: 3.5 in.
Water Depth: 12 ft.
Bedrock Depth: n/a ft.
Sample Hammer: Automatic

Depth (Ft)	Elevation (Ft)	Sample No.	SPT Blows	Recovery(in)	Groundwater	Group Symbol	Stratum Descriptions:	Field Notes, Comments:
		SS-1	2	12		SP	Poorly Graded Sand (SP): Mostly fine Sand, brown, moist	2" Topsoil
1	286		2					3" Frost
			2					
2	285		3					
3	284							
4	283							
5	282							
		SS-2	6	18		SP	Poorly Graded Sand (SP): Mostly fine Sand, light brown/orange, moist	
6	281		6					
			7					
7	280		8					
8	279							
9	278							
10	277							
		SS-3	5	20		SP	Poorly Graded Sand (SP): Mostly fine Sand, light brown, moist to saturated	
11	276		4					
			4					
12	275		3		▼			
13	274							
14	273							
15	272							
		SS-4	1	14		SP	Poorly Graded Sand (SP): Mostly fine Sand, brown/grey, saturated	
16	271		1					
			2					
17	270		3					
18	269							
19	268							Approximate Sub-Stratum Change
20	267							
		SS-5	7	18		SM	Silty Sand (SM): Mostly fine Sand, little Silt, brown, saturated	

METHODS: **HA**- Hollow Stem Auger, **RWH**- Rotary Wash, **SSA**- Solid Stem Auger, **DC**-Diamond Core, **DP**-Direct Push

SAMPLE TYPES: **SS-Split Spoon, RC-Bedrock Core, GS-Geoprobe Sleeve, ST-Shelby Tube**

STANDARD 1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.

NOTES: 2. Test Boring Log Page 1: 0 - 20 feet. Each subsequent page: Additional 25 feet.

3. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.

ADDITIONAL NOTES:

DRILLING INFORMATION

Method:	DP	0 to	25.0
Method:			

	Sample	Core
Type	SS	
Int Diam.	3.25	
Weight	140 lb	
Fall	30"	

TEST BORING LOG

THE Chazen COMPANIES
547 River Street
Troy, New York 12180
Phn: (518) 273-0055
Fax: (518) 273-8391

PROJECT: Rapp Road Residential Development
LOCATION: Rapp Road Guilderland, NY
CLIENT: Pyramid Management Group, LLC
PROJECT NO.: 317AI.00

Test Boring No.: **SB18**
Total Depth: 27 ft.

Depth (Ft)	Elevation (Ft)	Sample No.	SPT Blows	Recovery(in)	Groundwater	Group Symbol	Stratum Descriptions:	Field Notes, Comments:
21	266		7					
			7					
22	265		7					
23	264							
24	263							
25	262	SS-6	3	20		SM	Silty Sand (SM): Mostly fine Sand, little Silt, brown, saturated	
26	261		3					
			6					
27	260		8					
							Boring Terminated at 27 feet	
28	259							
29	258							
30	257							
31	256							
32	255							
33	254							
34	253							
35	252							
36	251							
37	250							
38	249							
39	248							
40	247							
41	246							
42	245							
43	244							
44	243							
45	242							

ADDITIONAL NOTES:

TEST BORING LOG

THE Chazen COMPANIES
547 River Street
Troy, New York 12180
Phn: (518) 273-0055
Fax: (518) 273-8391

PROJECT: Rapp Road Residential Development
LOCATION: Rapp Road Guilderland, NY
CLIENT: Pyramid Management Group, LLC
PROJECT NO.: 317AI.00

Test Boring No.: **SB19**
Total Depth: 27 ft.

Contractor: Aztech Environmental
Drill Rig: 3230DT
Driller: Derek Fennell
Inspector: Dean Anderson

Start Date: 25-Jan-2018
Finish Date: 25-Jan-2018
El. Datum: NAVD-88
G.S. Elevation: 287.0

Northing: See Figure
Easting: See Figure
Latitude: -
Longitude: -

Borehole Dia.: 3.5 in.
Water Depth: 13 ft.
Bedrock Depth: n/a ft.
Sample Hammer: Automatic

Depth (Ft)	Elevation (Ft)	Sample No.	SPT Blows	Recovery(in)	Groundwater	Group Symbol	Stratum Descriptions:	Field Notes, Comments:
		SS-1	1	20		SP	Poorly Graded Sand (SP): Mostly fine Sand, brown, moist	2" Topsoil
1	286		1					3" Frost
			1					
2	285		1					
3	284							
4	283							
5	282							
		SS-2	8	16		SP	Poorly Graded Sand (SP): Mostly fine Sand, brown, moist	
6	281		5					
			6					
7	280		7					
8	279							
9	278							
10	277							
		SS-3	2	16		SP	Poorly Graded Sand (SP): Mostly fine Sand, brown/orange, moist	
11	276		2					
			3					
12	275		3					
13	274				▼			
14	273							
15	272							
		SS-4	3	20		SP	Poorly Graded Sand (SP): Mostly fine Sand, brown, saturated	
16	271		3					
			4					
17	270		3					
18	269							
19	268							
20	267							
		SS-5	2	24		SP	Poorly Graded Sand (SP): Mostly fine Sand, brown, saturated	

METHODS: **HA**- Hollow Stem Auger, **RWH**- Rotary Wash, **SSA**- Solid Stem Auger, **DC**-Diamond Core, **DP**-Direct Push

SAMPLE TYPES: **SS-Split Spoon, RC-Bedrock Core, GS-Geoprobe Sleeve, ST-Shelby Tube**

STANDARD 1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.

NOTES: 2. Test Boring Log Page 1: 0 - 20 feet. Each subsequent page: Additional 25 feet.

3. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.

ADDITIONAL NOTES:

DRILLING INFORMATION

Method:	DP	0 to	25.0
Method:			

	Sample	Core
Type	SS	
Int Diam.	3.25	
Weight	140 lb	
Fall	30"	

TEST BORING LOG

THE Chazen COMPANIES
547 River Street
Troy, New York 12180
Phn: (518) 273-0055
Fax: (518) 273-8391

PROJECT: Rapp Road Residential Development
LOCATION: Rapp Road Guilderland, NY
CLIENT: Pyramid Management Group, LLC
PROJECT NO.: 317AI.00

Test Boring No.: **SB19**
Total Depth: 27 ft.

Depth (Ft)	Elevation (Ft)	Sample No.	SPT Blows	Recovery(in)	Groundwater	Group Symbol	Stratum Descriptions:	Field Notes, Comments:
21	266		2					
			2					
22	265		4					
23	264							
24	263							
25	262							
		SS-6	2	24		SP	Poorly Graded Sand (SP): Mostly fine Sand, grey/brown, saturated	
26	261		2					
			2					
27	260		4					
							Boring Terminated at 27 feet	
28	259							
29	258							
30	257							
31	256							
32	255							
33	254							
34	253							
35	252							
36	251							
37	250							
38	249							
39	248							
40	247							
41	246							
42	245							
43	244							
44	243							
45	242							

ADDITIONAL NOTES:

TEST BORING LOG

THE Chazen COMPANIES
547 River Street
Troy, New York 12180
Phn: (518) 273-0055
Fax: (518) 273-8391

PROJECT: Rapp Road Residential Development
LOCATION: Rapp Road Guilderland, NY
CLIENT: Pyramid Management Group, LLC
PROJECT NO.: 317AI.00

Test Boring No.: **SB20**
Total Depth: 17 ft.

Contractor: Aztech Environmental
Drill Rig: 3230DT
Driller: Derek Fennell
Inspector: Dean Anderson

Start Date: 26-Jan-2018
Finish Date: 26-Jan-2018
El. Datum: NAVD-88
G.S. Elevation: 290.5

Northing: See Figure
Easting:
Latitude: -
Longitude: -

Borehole Dia.: 3.5 in.
Water Depth: 13 ft.
Bedrock Depth: n/a ft.
Sample Hammer: Automatic

Depth (Ft)	Elevation (Ft)	Sample No.	SPT Blows	Recovery(in)	Groundwater	Group Symbol	Stratum Descriptions:	Field Notes, Comments:
		SS-1	2	16		SP	Poorly Graded Sand (SP): Mostly fine Sand, brown to orange, moist	6" Topsoil
1	289.5		1				(Glaciofluvial Deposits)	6" Frost
			1					
2	288.5		2					
3	287.5							
4	286.5							
5	285.5							
		SS-2	4	18		SP	Poorly Graded Sand (SP): Mostly fine Sand, grey/orange, moist	
6	284.5		5					
			5					
7	283.5		6					
8	282.5							
9	281.5							
10	280.5							
		SS-3	4			SP	Poorly Graded Sand (SP): Mostly fine Sand, grey/brown, moist	
11	279.5		3					
			3					
12	278.5		4					
13	277.5				▼			
14	276.5							
15	275.5							
		SS-4	1			SP	Poorly Graded Sand (SP): Mostly fine Sand, brown, saturated	
16	274.5		1					
			1					
17	273.5		1					
							Boring Terminated at 15 feet	
18	272.5							
19	271.5							
20	270.5							

METHODS: **HA**- Hollow Stem Auger, **RWH**- Rotary Wash, **SSA**- Solid Stem Auger, **DC**-Diamond Core, **DP**-Direct Push

SAMPLE TYPES: **SS-Split Spoon, RC-Bedrock Core, GS-Geoprobe Sleeve, ST-Shelby Tube**

STANDARD 1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.

NOTES: 2. Test Boring Log Page 1: 0 - 20 feet. Each subsequent page: Additional 25 feet.

3. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.

ADDITIONAL NOTES:

DRILLING INFORMATION

Method:	DP	0 to	15.0
Method:			
		Sample	Core
Type		SS	
Int Diam.		3.25	
Weight		140 lb	
Fall		30"	

TEST BORING LOG

THE Chazen COMPANIES
547 River Street
Troy, New York 12180
Phn: (518) 273-0055
Fax: (518) 273-8391

PROJECT: Rapp Road Residential Development
LOCATION: Rapp Road Guilderland, NY
CLIENT: Pyramid Management Group, LLC
PROJECT NO.: 317AI.00

Test Boring No.: **SB21**
Total Depth: 17 ft.

Contractor: Aztech Environmental
Drill Rig: 3230DT
Driller: Derek Fennell
Inspector: Dean Anderson

Start Date: 26-Jan-2018
Finish Date: 26-Jan-2018
El. Datum: NAVD-88
G.S. Elevation: 293.0

Northing: See Figure
Easting:
Latitude: -
Longitude: -

Borehole Dia.: 3.5 in.
Water Depth: 16 ft.
Bedrock Depth: n/a ft.
Sample Hammer: Automatic

Depth (Ft)	Elevation (Ft)	Sample No.	SPT Blows	Recovery(in)	Groundwater	Group Symbol	Stratum Descriptions:	Field Notes, Comments:
		SS-1	9	18		SP	Poorly Graded Sand (SP): Mostly fine Sand, orange, moist	6" Topsoil
1	292		5				(Glaciofluvial Deposits)	8" Frost
			6					
2	291		5					
3	290							
4	289							
5	288							
		SS-2	5	18		SP	Poorly Graded Sand (SP): Mostly fine Sand, orange, moist	
6	287		5					
			4					
7	286		4					
8	285							
9	284							
10	283							
		SS-3	6	18		SP	Poorly Graded Sand (SP): Mostly fine Sand, brown/grey, moist	
11	282		5					
			5					
12	281		5					
13	280							
14	279							
15	278							
		SS-4	3	18		SP	Poorly Graded Sand (SP): Mostly fine Sand, brown/orange, moist to saturated	
16	277		2		▼			
			4					
17	276		2					
							Boring Terminated at 17 feet	
18	275							
19	274							
20	273							

METHODS: **HA**- Hollow Stem Auger, **RWH**- Rotary Wash, **SSA**- Solid Stem Auger, **DC**-Diamond Core, **DP**-Direct Push

SAMPLE TYPES: **SS-Split Spoon, RC-Bedrock Core, GS-Geoprobe Sleeve, ST-Shelby Tube**

STANDARD 1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.

NOTES: 2. Test Boring Log Page 1: 0 - 20 feet. Each subsequent page: Additional 25 feet.

3. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.

ADDITIONAL NOTES:

DRILLING INFORMATION

Method:	DP	0 to	15.0
Method:			
		Sample	Core
Type		SS	
Int Diam.		3.25	
Weight		140 lb	
Fall		30"	

TEST BORING LOG

THE Chazen COMPANIES
547 River Street
Troy, New York 12180
Phn: (518) 273-0055
Fax: (518) 273-8391

PROJECT: Rapp Road Residential Development
LOCATION: Rapp Road Guilderland, NY
CLIENT: Pyramid Management Group, LLC
PROJECT NO.: 317AI.00

Test Boring No.: **SB22**
Total Depth: 17 ft.

Contractor: Aztech Environmental
Drill Rig: 3230DT
Driller: Derek Fennell
Inspector: Dean Anderson

Start Date: 26-Jan-2018
Finish Date: 26-Jan-2018
El. Datum: NAVD-88
G.S. Elevation: 291.0

Northing: See Figure
Easting:
Latitude: -
Longitude: -

Borehole Dia.: 3.5 in.
Water Depth: 13 ft.
Bedrock Depth: n/a ft.
Sample Hammer: Automatic

Depth (Ft)	Elevation (Ft)	Sample No.	SPT Blows	Recovery(in)	Groundwater	Group Symbol	Stratum Descriptions:	Field Notes, Comments:
		SS-1	2	18		SP	Poorly Graded Sand (SP): Mostly fine Sand, brown/orange, moist	6" Topsoil
1	290		1				(Glaciofluvial Deposits)	6" Frost
			3					
2	289		3					
3	288							
4	287							
5	286							
		SS-2	5	18		SP	Poorly Graded Sand (SP): Mostly fine Sand, brown/orange, moist	
6	285		5					
			5					
7	284		7					
8	283							
9	282							
10	281							
		SS-3	6	20		SP	Poorly Graded Sand (SP): Mostly fine Sand, brown/orange, moist	
11	280		4					
			5					
12	279		6					
13	278				▼			
14	277							
15	276							
		SS-4	2	20		SP	Poorly Graded Sand (SP): Mostly fine Sand, brown/orange, moist	
16	275		1					
			2					
17	274		1					
							Boring Terminated at 17 feet	
18	273							
19	272							
20	271							

METHODS: **HA**- Hollow Stem Auger, **RWH**- Rotary Wash, **SSA**- Solid Stem Auger, **DC**-Diamond Core, **DP**-Direct Push

SAMPLE TYPES: **SS-Split Spoon, RC-Bedrock Core, GS-Geoprobe Sleeve, ST-Shelby Tube**

STANDARD 1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.

NOTES: 2. Test Boring Log Page 1: 0 - 20 feet. Each subsequent page: Additional 25 feet.

3. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.

ADDITIONAL NOTES:

DRILLING INFORMATION

Method:	DP	0 to	15.0
Method:			
		Sample	Core
Type		SS	
Int Diam.		3.25	
Weight		140 lb	
Fall		30"	

TEST BORING LOG

THE Chazen COMPANIES
547 River Street
Troy, New York 12180
Phn: (518) 273-0055
Fax: (518) 273-8391

PROJECT: Rapp Road Residential Development
LOCATION: Rapp Road Guilderland, NY
CLIENT: Pyramid Management Group, LLC
PROJECT NO.: 317AI.00

Test Boring No.: **SB23**
Total Depth: 17 ft.

Contractor: Aztech Environmental
Drill Rig: 3230DT
Driller: Derek Fennell
Inspector: Dean Anderson

Start Date: 26-Jan-2018
Finish Date: 26-Jan-2018
El. Datum: NAVD-88
G.S. Elevation: 289.5

Northing: See Figure
Easting:
Latitude: -
Longitude: -

Borehole Dia.: 3.5 in.
Water Depth: 13 ft.
Bedrock Depth: n/a ft.
Sample Hammer: Automatic

Depth (Ft)	Elevation (Ft)	Sample No.	SPT Blows	Recovery(in)	Groundwater	Group Symbol	Stratum Descriptions:	Field Notes, Comments:
		SS-1	2	14		SP	Poorly Graded Sand (SP): Mostly fine Sand, orange, moist	4" Topsoil
1	288.5		1				(Glaciofluvial Deposits)	8" Frost
			2					
2	287.5		1					
3	286.5							
4	285.5							
5	284.5							
		SS-2	7	14		SP	Poorly Graded Sand (SP): Mostly fine Sand, grey, moist	
6	283.5		11					
			7					
7	282.5		9					
8	281.5							
9	280.5							
10	279.5							
		SS-3	3	24		SP	Poorly Graded Sand (SP): Mostly fine Sand, brown/orange, wet	
11	278.5		1					
			2					
12	277.5		2					
13	276.5				▼			
14	275.5							
15	274.5							
		SS-4	1	20		SP	Poorly Graded Sand (SP): Mostly fine Sand, brown, saturated	
16	273.5		3					
			3					
17	272.5		4					
							Boring Terminated at 17 feet	
18	271.5							
19	270.5							
20	269.5							

METHODS: **HA**- Hollow Stem Auger, **RWH**- Rotary Wash, **SSA**- Solid Stem Auger, **DC**-Diamond Core, **DP**-Direct Push

SAMPLE TYPES: **SS-Split Spoon, RC-Bedrock Core, GS-Geoprobe Sleeve, ST-Shelby Tube**

STANDARD 1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.

NOTES: 2. Test Boring Log Page 1: 0 - 20 feet. Each subsequent page: Additional 25 feet.

3. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.

ADDITIONAL NOTES:

DRILLING INFORMATION

Method:	DP	0 to	15.0
Method:			

	Sample	Core
Type	SS	
Int Diam.	3.25	
Weight	140 lb	
Fall	30"	

TEST BORING LOG

THE Chazen COMPANIES
547 River Street
Troy, New York 12180
Phn: (518) 273-0055
Fax: (518) 273-8391

PROJECT: Rapp Road Residential Development
LOCATION: Rapp Road Guilderland, NY
CLIENT: Pyramid Management Group, LLC
PROJECT NO.: 317AI.00

Test Boring No.: **SB24**
Total Depth: 27 ft.

Contractor: Aztech Environmental
Drill Rig: 3230DT
Driller: Derek Fennell
Inspector: Dean Anderson

Start Date: 26-Jan-2018
Finish Date: 26-Jan-2018
El. Datum: NAVD-88
G.S. Elevation: 304.5

Northing: See Figure
Easting:
Latitude: -
Longitude: -

Borehole Dia.: 3.5 in.
Water Depth: n/a ft.
Bedrock Depth: n/a ft.
Sample Hammer: Automatic

Depth (Ft)	Elevation (Ft)	Sample No.	SPT Blows	Recovery(in)	Groundwater	Group Symbol	Stratum Descriptions:	Field Notes, Comments:
		SS-1	6	18		SP	Poorly Graded Sand w/ Gravel (SP): Mostly Sand, little Gravel, trace Silt, brown, moist (Fill)	4" Topsoil
1	303.5		4					4" Frost
			7					3" Asphalt seam at 12"
2	302.5		6					3" Asphalt seam at 20"
3	301.5							
4	300.5							Approximate Strata Change
							(Glaciofluvial Deposits)	Location on a large mound
5	299.5							
		SS-2	5	18		SP	Poorly Graded Sand (SP): Mostly fine Sand, orange/brown, moist	
6	298.5		4					
			4					
7	297.5		3					
8	296.5							
9	295.5							
10	294.5							
		SS-3	1	18		SP	Poorly Graded Sand (SP): Mostly fine Sand, orange/brown, moist	
11	293.5		1					
			5					
12	292.5		2					
13	291.5							
14	290.5							
15	289.5	SS-4	4	18		SP	Poorly Graded Sand (SP): Mostly fine Sand, orange/brown, moist	
			6					
16	288.5		9					
			11					
17	287.5							
18	286.5							
19	285.5							
20	284.5							
		SS-5	3	20		SP	Poorly Graded Sand (SP): Mostly fine Sand, brown/grey, moist	

METHODS: **HA**- Hollow Stem Auger, **RWH**- Rotary Wash, **SSA**- Solid Stem Auger, **DC**-Diamond Core, **DP**-Direct Push

SAMPLE TYPES: **SS-Split Spoon, RC-Bedrock Core, GS-Geoprobe Sleeve, ST-Shelby Tube**

STANDARD 1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.

NOTES: 2. Test Boring Log Page 1: 0 - 20 feet. Each subsequent page: Additional 25 feet.

3. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.

ADDITIONAL NOTES:

DRILLING INFORMATION

Method:	DP	0 to	25.0
Method:			

	Sample	Core
Type	SS	
Int Diam.	3.25	
Weight	140 lb	
Fall	30"	

TEST BORING LOG

THE Chazen COMPANIES
547 River Street
Troy, New York 12180
Phn: (518) 273-0055
Fax: (518) 273-8391

PROJECT: Rapp Road Residential Development
LOCATION: Rapp Road Guilderland, NY
CLIENT: Pyramid Management Group, LLC
PROJECT NO.: 317AI.00

Test Boring No.: **SB24**
Total Depth: 27 ft.

Depth (Ft)	Elevation (Ft)	Sample No.	SPT Blows	Recovery(in)	Groundwater	Group Symbol	Stratum Descriptions:	Field Notes, Comments:
21	283.5		3					
			5					
22	282.5		6					
23	281.5							
24	280.5							
25	279.5	SS-6	3	24		SP	Poorly Graded Sand (SP): Mostly fine Sand, brown, moist	
26	278.5		4					
			4					
27	277.5		5					
							Boring Terminated at 27 feet	
28	276.5							
29	275.5							
30	274.5							
31	273.5							
32	272.5							
33	271.5							
34	270.5							
35	269.5							
36	268.5							
37	267.5							
38	266.5							
39	265.5							
40	264.5							
41	263.5							
42	262.5							
43	261.5							
44	260.5							
45	259.5							

ADDITIONAL NOTES:

TEST BORING LOG

THE Chazen COMPANIES
547 River Street
Troy, New York 12180
Phn: (518) 273-0055
Fax: (518) 273-8391

PROJECT: Rapp Road Residential Development
LOCATION: Rapp Road Guilderland, NY
CLIENT: Pyramid Management Group, LLC
PROJECT NO.: 317AI.00

Test Boring No.: **SB25**
Total Depth: 17 ft.

Contractor: Aztech Environmental
Drill Rig: 3230DT
Driller: Derek Fennell
Inspector: Dean Anderson

Start Date: 26-Jan-2018
Finish Date: 26-Jan-2018
El. Datum: NAVD-88
G.S. Elevation: 288.0

Northing: See Figure
Easting:
Latitude: -
Longitude: -

Borehole Dia.: 3.5 in.
Water Depth: 11 ft.
Bedrock Depth: n/a ft.
Sample Hammer: Automatic

Depth (Ft)	Elevation (Ft)	Sample No.	SPT Blows	Recovery(in)	Groundwater	Group Symbol	Stratum Descriptions:	Field Notes, Comments:
		SS-1	2	14		SP	Poorly Graded Sand (SP): Mostly fine Sand, brown, moist	4" Topsoil
1	287		1				(Glaciofluvial Deposits)	4" Frost
			3					
2	286		2					
3	285							
4	284							
5	283							
		SS-2	15	16		SP	Poorly Graded Sand (SP): Mostly fine Sand, orange/grey, moist	
6	282		11					
			13					
7	281		15					
8	280							
9	279							
10	278							
		SS-3	6	16		SP	Poorly Graded Sand (SP): Mostly fine Sand, brown, saturated	
11	277		6		▼			
			7					
12	276		8					
13	275							
14	274							Approximate Sub-Stratum Change
15	273							
		SS-4	12	20		SM	Silty Sand (SM): Mostly fine Sand, little Silt, brown, saturated	
16	272		12					
			12					
17	271		11					
							Boring Terminated at 17 feet	
18	270							
19	269							
20	268							

METHODS: **HA**- Hollow Stem Auger, **RWH**- Rotary Wash, **SSA**- Solid Stem Auger, **DC**-Diamond Core, **DP**-Direct Push

SAMPLE TYPES: **SS-Split Spoon, RC-Bedrock Core, GS-Geoprobe Sleeve, ST-Shelby Tube**

STANDARD 1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.

NOTES: 2. Test Boring Log Page 1: 0 - 20 feet. Each subsequent page: Additional 25 feet.

3. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.

ADDITIONAL NOTES:

DRILLING INFORMATION

Method:	DP	0 to	15.0
Method:			

	Sample	Core
Type	SS	
Int Diam.	3.25	
Weight	140 lb	
Fall	30"	

TEST BORING LOG

THE Chazen COMPANIES
547 River Street
Troy, New York 12180
Phn: (518) 273-0055
Fax: (518) 273-8391

PROJECT: Rapp Road Residential Development
LOCATION: Rapp Road Guilderland, NY
CLIENT: Pyramid Management Group, LLC
PROJECT NO.: 317AI.00

Test Boring No.: **SB26**
Total Depth: 27 ft.

Contractor: Aztech Environmental
Drill Rig: 3230DT
Driller: Derek Fennell
Inspector: Dean Anderson

Start Date: 26-Jan-2018
Finish Date: 26-Jan-2018
El. Datum: NAVD-88
G.S. Elevation: 293.0

Northing: See Figure
Easting:
Latitude: -
Longitude: -

Borehole Dia.: 3.5 in.
Water Depth: 14 ft.
Bedrock Depth: n/a ft.
Sample Hammer: Automatic

Depth (Ft)	Elevation (Ft)	Sample No.	SPT Blows	Recovery(in)	Groundwater	Group Symbol	Stratum Descriptions:	Field Notes, Comments:
		SS-1	8	16		SP	Poorly Graded Sand (SP): Mostly fine Sand, brown, moist	4" Topsoil
1	292		2				(Fill)	8" Frost
			2					
2	291		1					
								Approximate Strata Change
3	290						(Glaciofluvial Deposits)	
4	289							
5	288							
		SS-2	4	24		SP	Poorly Graded Sand (SP): Mostly Sand, brown to orange, moist	
6	287		2					
			3					
7	286		4					
8	285							
9	284							
10	283							
		SS-3	5	24		SP	Poorly Graded Sand (SP): Mostly Sand, brown/grey, moist	
11	282		4					
			5					
12	281		6					
13	280							
14	279				▼			
15	278							
		SS-4	8	24		SP	Poorly Graded Sand (SP): Mostly Sand, little Silt, brown/grey, saturated	
16	277		10					
			12					
17	276		10					
18	275							
19	274							Approximate Sub-Stratum Change
20	273							
		SS-5	15	24		SM	Silty Sand (SM): Mostly Sand, little Silt, brown/grey, saturated	

METHODS: **HA**- Hollow Stem Auger, **RWH**- Rotary Wash, **SSA**- Solid Stem Auger, **DC**-Diamond Core, **DP**-Direct Push

SAMPLE TYPES: **SS-Split Spoon, RC-Bedrock Core, GS-Geoprobe Sleeve, ST-Shelby Tube**

STANDARD 1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.

NOTES: 2. Test Boring Log Page 1: 0 - 20 feet. Each subsequent page: Additional 25 feet.

3. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.

ADDITIONAL NOTES:

DRILLING INFORMATION

Method:	DP	0 to	25.0
Method:			

	Sample	Core
Type	SS	
Int Diam.	3.25	
Weight	140 lb	
Fall	30"	

TEST BORING LOG

THE Chazen COMPANIES
547 River Street
Troy, New York 12180
Phn: (518) 273-0055
Fax: (518) 273-8391

PROJECT: Rapp Road Residential Development
LOCATION: Rapp Road Guilderland, NY
CLIENT: Pyramid Management Group, LLC
PROJECT NO.: 317AI.00

Test Boring No.: **SB26**
Total Depth: 27 ft.

Depth (Ft)	Elevation (Ft)	Sample No.	SPT Blows	Recovery(in)	Groundwater	Group Symbol	Stratum Descriptions:	Field Notes, Comments:
21	272		17					
			18					
22	271		27					
		SS-6	32	22		SM	Silty Sand (SM): Mostly Sand, little Silt, brown/grey, saturated	Casing refusal at 22 feet
23	270		34					
			22					
24	269		23					
							Boring Terminated at 24 feet	
25	268							
26	267							
27	266							
28	265							
29	264							
30	263							
31	262							
32	261							
33	260							
34	259							
35	258							
36	257							
37	256							
38	255							
39	254							
40	253							
41	252							
42	251							
43	250							
44	249							
45	248							

ADDITIONAL NOTES:

TEST BORING LOG

THE Chazen COMPANIES
547 River Street
Troy, New York 12180
Phn: (518) 273-0055
Fax: (518) 273-8391

PROJECT: Rapp Road Residential Development
LOCATION: Rapp Road Guilderland, NY
CLIENT: Pyramid Management Group, LLC
PROJECT NO.: 317AI.00

Test Boring No.: **SB27**
Total Depth: 27 ft.

Contractor: Aztech Environmental
Drill Rig: 3230DT
Driller: Derek Fennell
Inspector: Dean Anderson

Start Date: 29-Jan-2018
Finish Date: 29-Jan-2018
El. Datum: NAVD-88
G.S. Elevation: 292.5

Northing: See Figure
Easting:
Latitude: -
Longitude: -

Borehole Dia.: 3.5 in.
Water Depth: 15 ft.
Bedrock Depth: n/a ft.
Sample Hammer: Automatic

Depth (Ft)	Elevation (Ft)	Sample No.	SPT Blows	Recovery(in)	Groundwater	Group Symbol	Stratum Descriptions:	Field Notes, Comments:
		SS-1	2	20		SP	Poorly Graded Sand w/ Gravel (SP): Mostly fine Sand, little Gravel, brown, moist (Fill)	3" Topsoil 6" Frost 3" Asphalt seam at 18"
1	291.5		3					
			10					
2	290.5		12					Approximate Strata Change
3	289.5						(Glaciofluvial Deposits)	
4	288.5							
5	287.5							
		SS-2	6	18		SP	Poorly Graded Sand (SP): Mostly fine Sand, yellow, moist-dry	
6	286.5		6					
			8					
7	285.5		10					
8	284.5							Approximate Sub-Stratum Change
9	283.5							
10	282.5							
		SS-3	5	24		SM	Silty Sand (SM): Mostly fine Sand, little Silt, brown/grey to yellow, moist	
11	281.5		2					
			3					
12	280.5		4					
13	279.5							
14	278.5							
					▼			
15	277.5	SS-4	12	18		SM	Silty Sand (SM): Mostly fine Sand, little Silt, brown, saturated	
			9					
16	276.5		7					
			8					
17	275.5							
18	274.5							Approximate Sub-Stratum Change
19	273.5							
20	272.5							
		SS-5	7	24		SP	Poorly Graded Sand (SP): Mostly fine Sand, brown, saturated	

METHODS: **HA**- Hollow Stem Auger, **RWH**- Rotary Wash, **SSA**- Solid Stem Auger, **DC**-Diamond Core, **DP**-Direct Push

SAMPLE TYPES: **SS-Split Spoon, RC-Bedrock Core, GS-Geoprobe Sleeve, ST-Shelby Tube**

STANDARD 1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.

NOTES: 2. Test Boring Log Page 1: 0 - 20 feet. Each subsequent page: Additional 25 feet.

3. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.

ADDITIONAL NOTES:

DRILLING INFORMATION

Method:	DP	0 to	25.0
Method:			

	Sample	Core
Type	SS	
Int Diam.	3.25	
Weight	140 lb	
Fall	30"	

TEST BORING LOG

THE Chazen COMPANIES
547 River Street
Troy, New York 12180
Phn: (518) 273-0055
Fax: (518) 273-8391

PROJECT: Rapp Road Residential Development
LOCATION: Rapp Road Guilderland, NY
CLIENT: Pyramid Management Group, LLC
PROJECT NO.: 317AI.00

Test Boring No.: **SB27**
Total Depth: 27 ft.

Depth (Ft)	Elevation (Ft)	Sample No.	SPT Blows	Recovery(in)	Groundwater	Group Symbol	Stratum Descriptions:	Field Notes, Comments:
21	271.5		3					
			4					
22	270.5		5					
23	269.5							
24	268.5							
25	267.5	SS-6	3	24		SP-SM	Poorly Graded Sand w/ Silt (SP-SM): Mostly fine Sand, few Silt, brown, saturated	
26	266.5		4					
			6					
27	265.5		8				Boring Terminated at 27 feet	
28	264.5							
29	263.5							
30	262.5							
31	261.5							
32	260.5							
33	259.5							
34	258.5							
35	257.5							
36	256.5							
37	255.5							
38	254.5							
39	253.5							
40	252.5							
41	251.5							
42	250.5							
43	249.5							
44	248.5							
45	247.5							

ADDITIONAL NOTES:

TEST BORING LOG

THE Chazen COMPANIES
547 River Street
Troy, New York 12180
Phn: (518) 273-0055
Fax: (518) 273-8391

PROJECT: Rapp Road Residential Development
LOCATION: Rapp Road Guilderland, NY
CLIENT: Pyramid Management Group, LLC
PROJECT NO.: 317AI.00

Test Boring No.: **SB28**
Total Depth: 17 ft.

Contractor: Aztech Environmental
Drill Rig: 3230DT
Driller: Derek Fennell
Inspector: Dean Anderson

Start Date: 29-Jan-2018
Finish Date: 29-Jan-2018
El. Datum: NAVD-88
G.S. Elevation: 287.0

Northing: See Figure
Easting:
Latitude: -
Longitude: -

Borehole Dia.: 3.5 in.
Water Depth: 11.5 ft.
Bedrock Depth: n/a ft.
Sample Hammer: Automatic

Depth (Ft)	Elevation (Ft)	Sample No.	SPT Blows	Recovery(in)	Groundwater	Group Symbol	Stratum Descriptions:	Field Notes, Comments:
		SS-1	10	24		SP	Poorly Graded Sand w/ Gravel (SP): Mostly fine Sand, little Gravel, occasional cobble, brown, moist (Fill)	6" Topsoil 6" Frost
1	286		20					
			21			GP	(14" to 18") Poorly Graded Gravel w/ Sand (GW): Mostly Gravel, some Sand, occasional cobble, brown, moist (Fill)	
2	285		16					
							(18" to 20") 3" Asphalt seam	
3	284					SP	(20" to 24") Poorly Graded Sand w/ Gravel (SP): Mostly Sand, little Gravel, trace Silt, brown, moist (Fill)	Approximate Strata Change
4	283							
5	282							
		SS-2	4	24		SP	Poorly Graded Sand (SP): Mostly fine Sand, yellow to grey, moist (Glaciofluvial Deposits)	
6	281		4					
			4					
7	280		6					
8	279							
9	278							
10	277							
		SS-3	2	18		SP	Poorly Graded Sand (SP): Mostly fine Sand, brown, saturated	
11	276		1					
			1		▼			
12	275		1					
13	274							
14	273							Approximate Sub-Stratum Change
15	272							
		SS-4	4	18		SM	Silty Sand (SM): Mostly fine Sand, little Silt, brown, saturated	
16	271		4					
			6					
17	270		6					
							Boring Terminated at 17 feet	
18	269							
19	268							
20	267							

METHODS: **HA**- Hollow Stem Auger, **RWH**- Rotary Wash, **SSA**- Solid Stem Auger, **DC**-Diamond Core, **DP**-Direct Push

SAMPLE TYPES: **SS-Split Spoon, RC-Bedrock Core, GS-Geoprobe Sleeve, ST-Shelby Tube**

STANDARD 1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.

NOTES: 2. Test Boring Log Page 1: 0 - 20 feet. Each subsequent page: Additional 25 feet.

3. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.

ADDITIONAL NOTES:

DRILLING INFORMATION

Method:	DP	0 to	15.0
Method:			

	Sample	Core
Type	SS	
Int Diam.	3.25	
Weight	140 lb	
Fall	30"	

TEST BORING LOG

THE Chazen COMPANIES
547 River Street
Troy, New York 12180
Phn: (518) 273-0055
Fax: (518) 273-8391

PROJECT: Rapp Road Residential Development
LOCATION: Rapp Road Guilderland, NY
CLIENT: Pyramid Management Group, LLC
PROJECT NO.: 317AI.00

Test Boring No.: **SB29**
Total Depth: 17 ft.

Contractor: Aztech Environmental
Drill Rig: 3230DT
Driller: Derek Fennell
Inspector: Dean Anderson

Start Date: 29-Jan-2018
Finish Date: 29-Jan-2018
El. Datum: NAVD-88
G.S. Elevation: 286.0

Northing: See Figure
Easting:
Latitude: -
Longitude: -

Borehole Dia.: 3.5 in.
Water Depth: 10 ft.
Bedrock Depth: n/a ft.
Sample Hammer: Automatic

Depth (Ft)	Elevation (Ft)	Sample No.	SPT Blows	Recovery(in)	Groundwater	Group Symbol	Stratum Descriptions:	Field Notes, Comments:
		SS-1	1	18		SP	Poorly Graded Sand (SP): Mostly fine Sand, trace plastic, light brown, moist (Fill)	6" Topsoil 3" frost
1	285		1					
			1					
2	284		1					
3	283							Approximate Strata Change
4	282							
5	281							
		SS-2	8	24		SP	Poorly Graded Sand (SP): Mostly fine Sand, light brown to grey, moist	
6	280		9					
			9					
7	279		10					
8	278							
9	277							
10	276				▼			
		SS-3	2	24		SP	Poorly Graded Sand (SP): Mostly fine Sand, light brown, saturated (Glaciofluvial Deposits)	
11	275		1					
12	274							
13	273							
14	272							
15	271	SS-4	4	20		SP	Poorly Graded Sand (SP): Mostly fine Sand, light brown, saturated	
			3					
16	270		2					
			4					
17	269						Boring Terminated at 17 feet	
18	268							
19	267							
20	266							

METHODS: **HA**- Hollow Stem Auger, **RWH**- Rotary Wash, **SSA**- Solid Stem Auger, **DC**-Diamond Core, **DP**-Direct Push

SAMPLE TYPES: **SS-Split Spoon, RC-Bedrock Core, GS-Geoprobe Sleeve, ST-Shelby Tube**

STANDARD 1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.

NOTES: 2. Test Boring Log Page 1: 0 - 20 feet. Each subsequent page: Additional 25 feet.

3. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.

ADDITIONAL NOTES:

DRILLING INFORMATION

Method:	DP	0 to	15.0
Method:			

	Sample	Core
Type	SS	
Int Diam.	3.25	
Weight	140 lb	
Fall	30"	

TEST BORING LOG

THE Chazen COMPANIES
547 River Street
Troy, New York 12180
Phn: (518) 273-0055
Fax: (518) 273-8391

PROJECT: Rapp Road Residential Development
LOCATION: Rapp Road Guilderland, NY
CLIENT: Pyramid Management Group, LLC
PROJECT NO.: 317AI.00

Test Boring No.: **SB30**
Total Depth: 17 ft.

Contractor: Aztech Environmental
Drill Rig: 3230DT
Driller: Derek Fennell
Inspector: Dean Anderson

Start Date: 29-Jan-2018
Finish Date: 29-Jan-2018
El. Datum: NAVD-88
G.S. Elevation: 283.5

Northing: See Figure
Easting:
Latitude: -
Longitude: -

Borehole Dia.: 3.5 in.
Water Depth: 9 ft.
Bedrock Depth: n/a ft.
Sample Hammer: Automatic

Depth (Ft)	Elevation (Ft)	Sample No.	SPT Blows	Recovery(in)	Groundwater	Group Symbol	Stratum Descriptions:	Field Notes, Comments:
		SS-1	1	18		SP	Poorly Graded Sand (SP): Mostly fine Sand, brown to yellow, moist	6" Topsoil
1	282.5		1				(Glaciofluvial Deposits)	3" frost
			1					
2	281.5		3					
3	280.5							
4	279.5							
5	278.5							
		SS-2	2	24		SP	Poorly Graded Sand (SP): Mostly fine Sand, grey, moist	
6	277.5		2					
			1					
7	276.5		2					
8	275.5							
					▼			
9	274.5							
10	273.5							
		SS-3	1	24		SP	Poorly Graded Sand (SP): Mostly fine Sand, brown, saurated	
11	272.5		1					
			1					
12	271.5		4					
13	270.5							
14	269.5							
15	268.5							
		SS-4	5	24		SP	Poorly Graded Sand (SP): Mostly fine Sand, brown, saurated	
16	267.5		4					
			3					
17	266.5		5					
							Boring Terminated at 17 feet	
18	265.5							
19	264.5							
20	263.5							

METHODS: **HA**- Hollow Stem Auger, **RWH**- Rotary Wash, **SSA**- Solid Stem Auger, **DC**-Diamond Core, **DP**-Direct Push

SAMPLE TYPES: **SS-Split Spoon, RC-Bedrock Core, GS-Geoprobe Sleeve, ST-Shelby Tube**

STANDARD 1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.

NOTES: 2. Test Boring Log Page 1: 0 - 20 feet. Each subsequent page: Additional 25 feet.

3. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.

ADDITIONAL NOTES:

DRILLING INFORMATION

Method:	DP	0 to 15.0
Method:		

	Sample	Core
Type	SS	
Int Diam.	3.25	
Weight	140 lb	
Fall	30"	

TEST BORING LOG

THE Chazen COMPANIES
547 River Street
Troy, New York 12180
Phn: (518) 273-0055
Fax: (518) 273-8391

PROJECT: Rapp Road Residential Development
LOCATION: Rapp Road Guilderland, NY
CLIENT: Pyramid Management Group, LLC
PROJECT NO.: 317AI.00

Test Boring No.: **SB31**
Total Depth: 17 ft.

Contractor: Aztech Environmental
Drill Rig: 3230DT
Driller: Derek Fennell
Inspector: Dean Anderson

Start Date: 24-Jan-2018
Finish Date: 24-Jan-2018
El. Datum: NAVD-88
G.S. Elevation: 283.0

Northing: See Figure
Easting:
Latitude: -
Longitude: -

Borehole Dia.: 3.5 in.
Water Depth: 8 ft.
Bedrock Depth: n/a ft.
Sample Hammer: Automatic

Depth (Ft)	Elevation (Ft)	Sample No.	SPT Blows	Recovery(in)	Groundwater	Group Symbol	Stratum Descriptions:	Field Notes, Comments:
		SS-1	1	12		SP	Poorly Graded Sand (SP): Mostly fine Sand, black to tan, moist	4" Topsoil
1	282		2				(Glaciofluvial Deposits)	4" Frost
			3					
2	281		4					
3	280							
4	279							
5	278							
		SS-2	3	20		SP	Poorly Graded Sand (SP): Mostly fine Sand, trace Silt, black to tan, moist	
6	277		3					
			2					
7	276		3					
8	275				▼			
9	274							
10	273							
		SS-3	3	14		SP	Poorly Graded Sand (SP): Mostly fine Sand, grey, saturated	
11	272		2					
			4					
12	271		3					
13	270							
14	269							
15	268							
		SS-4	3	24		SP	Poorly Graded Sand (SP): Mostly fine Sand, grey, saturated	
16	267		3					
			4					
17	266		3					
							Boring Terminated at 17 feet	
18	265							
19	264							
20	263							

METHODS: **HA**- Hollow Stem Auger, **RWH**- Rotary Wash, **SSA**- Solid Stem Auger, **DC**-Diamond Core, **DP**-Direct Push

SAMPLE TYPES: **SS-Split Spoon, RC-Bedrock Core, GS-Geoprobe Sleeve, ST-Shelby Tube**

STANDARD 1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.

NOTES: 2. Test Boring Log Page 1: 0 - 20 feet. Each subsequent page: Additional 25 feet.

3. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.

ADDITIONAL NOTES:

DRILLING INFORMATION

Method:	DP	0 to	15.0
Method:			

	Sample	Core
Type	SS	
Int Diam.	3.25	
Weight	140 lb	
Fall	30"	

TEST BORING LOG

THE Chazen COMPANIES
547 River Street
Troy, New York 12180
Phn: (518) 273-0055
Fax: (518) 273-8391

PROJECT: Rapp Road Residential Development
LOCATION: Rapp Road Guilderland, NY
CLIENT: Pyramid Management Group, LLC
PROJECT NO.: 317AI.00

Test Boring No.: **SB32**
Total Depth: 17 ft.

Contractor: Aztech Environmental
Drill Rig: 3230DT
Driller: Derek Fennell
Inspector: Dean Anderson

Start Date: 24-Jan-2018
Finish Date: 24-Jan-2018
El. Datum: NAVD-88
G.S. Elevation: 284.0

Northing: See Figure
Easting:
Latitude: -
Longitude: -

Borehole Dia.: 3.5 in.
Water Depth: 11 ft.
Bedrock Depth: n/a ft.
Sample Hammer: Automatic

Depth (Ft)	Elevation (Ft)	Sample No.	SPT Blows	Recovery(in)	Groundwater	Group Symbol	Stratum Descriptions:	Field Notes, Comments:
		SS-1	4	20		SP	Poorly Graded Sand (SP): Mostly fine Sand, black to tan, moist	4" Topsoil
1	283		1				(Glaciofluvial Deposits)	6" Frost
			1					
2	282		2					
3	281							
4	280							
5	279							
		SS-2	6	16		SP	Poorly Graded Sand (SP): Mostly fine Sand, tan to grey, moist	
6	278		6					
			6					
7	277		6					
8	276							
9	275							
10	274							
		SS-3	1	20		SP	Poorly Graded Sand (SP): Mostly fine Sand, brown, moist to saturated	
11	273		1		▼			
			1					
12	272		1					
13	271							
14	270							
15	269							
		SS-4	3	18		SP	Poorly Graded Sand (SP): Mostly fine Sand, brown, moist to saturated	
16	268		3					
			4					
17	267		7					
							Boring Terminated at 17 feet	
18	266							
19	265							
20	264							

METHODS: **HA**- Hollow Stem Auger, **RWH**- Rotary Wash, **SSA**- Solid Stem Auger, **DC**-Diamond Core, **DP**-Direct Push

SAMPLE TYPES: **SS-Split Spoon, RC-Bedrock Core, GS-Geoprobe Sleeve, ST-Shelby Tube**

STANDARD 1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.

NOTES: 2. Test Boring Log Page 1: 0 - 20 feet. Each subsequent page: Additional 25 feet.

3. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.

ADDITIONAL NOTES:

DRILLING INFORMATION

Method:	DP	0 to	15.0
Method:			

	Sample	Core
Type	SS	
Int Diam.	3.25	
Weight	140 lb	
Fall	30"	

TEST BORING LOG

THE Chazen COMPANIES
547 River Street
Troy, New York 12180
Phn: (518) 273-0055
Fax: (518) 273-8391

PROJECT: Rapp Road Residential Development
LOCATION: Rapp Road Guilderland, NY
CLIENT: Pyramid Management Group, LLC
PROJECT NO.: 317AI.00

Test Boring No.: **SB33**
Total Depth: 6 ft.

Contractor: Aztech Environmental
Drill Rig: 3230DT
Driller: Derek Fennell
Inspector: Dean Anderson

Start Date: 29-Jan-2018
Finish Date: 29-Jan-2018
El. Datum: NAVD-88
G.S. Elevation: 299.0

Northing: See Figure
Easting:
Latitude: -
Longitude: -

Borehole Dia.: 3.5 in.
Water Depth: 11 ft.
Bedrock Depth: n/a ft.
Sample Hammer: Automatic

Depth (Ft)	Elevation (Ft)	Sample No.	SPT Blows	Recovery(in)	Groundwater	Group Symbol	Stratum Descriptions:	Field Notes, Comments:
		SS-1	3	24		SP	Poorly Graded Sand (SP): Mostly fine Sand, trace Gravel, brown, moist (Fill)	4" Topsoil 4" Frost
1	298		2					
			3					
2	297		4					
		SS-2	8	22		SP	Poorly Graded Sand (SP): Mostly fine Sand, trace Gravel, brown, moist (Fill)	
3	296		9					
			11					
4	295		12					
		SS-3	8	22		SP	Poorly Graded Sand (SP): Mostly fine Sand, trace Gravel, brown, moist (Fill)	
5	294		7					
			5					
6	293		5					
							Boring Terminated at 6 feet	
7	292							
8	291							
9	290							
10	289							
11	288							
12	287							
13	286							
14	285							
15	284							
16	283							
17	282							
18	281							
19	280							
20	279							

METHODS: **HA**- Hollow Stem Auger, **RWH**- Rotary Wash, **SSA**- Solid Stem Auger, **DC**-Diamond Core, **DP**-Direct Push

SAMPLE TYPES: **SS-Split Spoon, RC-Bedrock Core, GS-Geoprobe Sleeve, ST-Shelby Tube**

STANDARD 1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.

NOTES: 2. Test Boring Log Page 1: 0 - 20 feet. Each subsequent page: Additional 25 feet.

3. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.

ADDITIONAL NOTES:

DRILLING INFORMATION

Method:	DP	0 to	4.0
Method:			

	Sample	Core
Type	SS	
Int Diam.	3.25	
Weight	140 lb	
Fall	30"	

Appendix M:
Plan Set Entitled “Rapp Road Residential Development”

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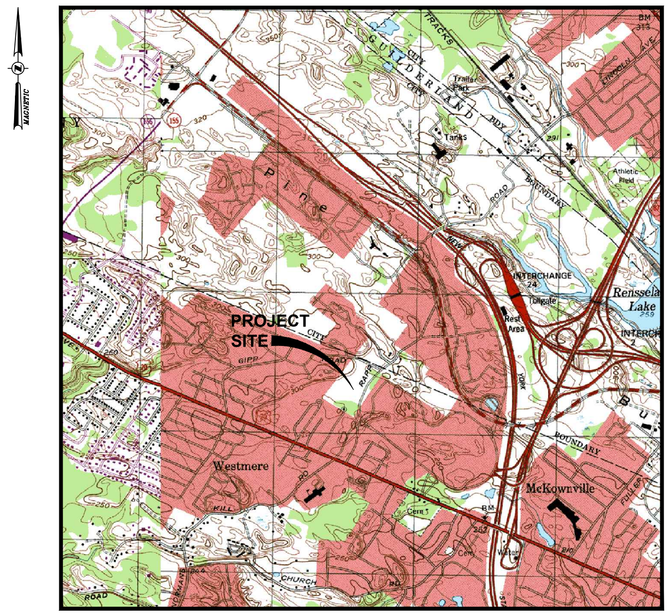
RAPP ROAD
RESIDENTIAL DEVELOPMENT
TOWN OF GUILDERLAND, ALBANY COUNTY, NY
MARCH 11, 2019



LOCATION MAP
SCALE: 1"=1200'

INDEX OF DRAWINGS

PAGE NO.	REV	SHEET NO.	DATE	DESCRIPTION
1	0	G001	03/11/19	TITLE SHEET
2	0	C100	03/11/19	EXISTING CONDITIONS & DEMOLITION PLAN
3	0	C110	XX/XX/XX	PRELIMINARY SUBDIVISION PLAN (NOT INCLUDED)
4	0	C130	03/11/19	SITE PLAN
5	0	C140	03/11/19	GRADING & DRAINAGE PLAN
6	0	C150	03/11/19	EROSION & SEDIMENT CONTROL PLAN
7	0	C160	03/11/19	UTILITY PLAN
8	0	C180	03/11/19	LANDSCAPE & LIGHTING PLAN
9	0	C181	03/11/19	DETAILED LANDSCAPE PLAN
10	0	C530	03/11/19	SITE DETAILS
11	0	C531	03/11/19	SITE DETAILS
12	0	C540	03/11/19	STORM SEWER DETAILS
13	0	C541	03/11/19	STORM SEWER DETAILS
14	0	C550	03/11/19	EROSION & SEDIMENT CONTROL DETAILS
15	0	C560	03/11/19	WATER SYSTEM DETAILS
16	0	C570	03/11/19	SANITARY SEWER SYSTEM DETAILS
17	0	C580	03/11/19	LANDSCAPE DETAILS & NOTES

DEVELOPER / APPLICANT:
RAPP ROAD DEVELOPMENT, LLC
4 CLINTON SQUARE
SYRACUSE, NY
13202

SITE CIVIL ENGINEER AND LANDSCAPE ARCHITECT:
THE CHAZEN COMPANIES
547 RIVER STREET
TROY, NY
12180

TAX MAP INFORMATION:
TOWN OF GUILDERLAND
SECTION 52.01, BLOCK 3, LOT 3
SECTION 52.01, BLOCK 3, LOT 4.1
SECTION 52.01, BLOCK 3, LOT 4.2
SECTION 52.01, BLOCK 3, LOT 5.1
SECTION 52.10, BLOCK 1, LOT 25

AREA:
TOTAL ACREAGE : 19.68 ACRES

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0 1 2 3
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THE Chazen COMPANIES
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Environmental & Safety Professionals
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☐ North Country Office: 20 Elm Street (Suite 110), Glens Falls, New York 12801, Phone: (518) 812-0513
☒ Capital District Office: 547 River Street, Troy, New York 12180, Phone: (518) 273-0055
☐ Westchester NY Office: 1 North Broadway, Suite 803, White Plains, New York 10601, Phone: (914) 997-8510
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rev.	date	description
1	5/21/19	PER CLIENT COMMENTS

RAPP ROAD RESIDENTIAL DEVELOPMENT

TITLE SHEET

TOWN OF GUILDERLAND, ALBANY COUNTY, NEW YORK

designed	checked
SM	RK
date	scale
03/11/19	N.T.S.
project no.	
317AI.00	
sheet no.	
G001	

Drawing Name: Z:\projects\31700-31799\317AI.00 Rapp Road\DWG\00_G001_317AI-00_TITLE.dwg
Xref's Attached: XTB_317AI-00_24x36; XTB_317AI-00_30x42
Date Printed: Feb 14, 2020, 9:29am

SITE LEGEND:

- PROPERTY LINE
- STOCKADE FENCE TO BE RELOCATED
- PROPERTY LINE TO BE REMOVED
- EXISTING FEATURE TO BE REMOVED
- EXISTING PAVEMENT & SIDEWALK TO BE REMOVED
- PAVEMENT SAWCUT LINE

DEMOLITION NOTES:

1. REFER TO REQUIREMENTS OUTLINED IN THE EROSION & SEDIMENTS CONTROL PLANS & NOTES PRIOR TO COMMENCEMENT OF WORK.
2. CONFORM TO APPLICABLE CODE FOR DEMOLITION OF STRUCTURES, SAFETY OF ADJACENT STRUCTURES, DUST CONTROL, RUNOFF CONTROL, AND HAULING, DISPOSAL AND STORAGE OF DEBRIS.
3. PROVIDE, ERECT, AND MAINTAIN TEMPORARY BARRIERS AND SECURITY DEVICES.
4. MAINTAIN EXISTING UTILITIES TO REMAIN IN SERVICE AND PROTECT THEM AGAINST DAMAGE DURING SELECTIVE DEMOLITION OPERATIONS. DO NOT INTERRUPT EXISTING UTILITIES SERVING OPERATING FACILITIES, EXCEPT WHEN AUTHORIZED IN WRITING BY OWNER AND AUTHORITIES HAVING JURISDICTION.
5. NOTIFY ADJACENT OWNERS OF WORK THAT MAY AFFECT THEIR PROPERTY, POTENTIAL NOISE, UTILITY OUTAGE, OR DISRUPTION. COORDINATE WITH OWNER.
6. PREVENT MOVEMENT OR SETTLEMENT OF ADJACENT STRUCTURES. PROVIDE BRACING AND SHORING.
7. LOCATE AND IDENTIFY ALL EXISTING UTILITIES WITHIN THE CONSTRUCTION AREA. DISCONNECT AND SEAL OR CAP OFF UTILITY SERVICES THAT WILL BE AFFECTED BY THIS PROJECT. NOTIFY AFFECTED UTILITY COMPANIES BEFORE STARTING WORK AND COMPLY WITH THEIR REQUIREMENTS. VERIFY THAT UTILITIES HAVE BEEN DISCONNECTED AND CAPPED.
8. DEMOLISH AND REMOVE COMPONENTS IN AN ORDERLY AND CAREFUL MANNER.
9. PROTECT EXISTING FEATURES THAT ARE NOT TO BE DEMOLISHED.
10. CONDUCT OPERATIONS WITH MINIMUM INTERFERENCE TO PUBLIC OR PRIVATE ACCESSES.
11. MAINTAIN EGRESS AND ACCESS AT ALL TIMES. DO NOT CLOSE OR OBSTRUCT ROADWAYS, OR SIDEWALKS WITHOUT PERMITS. COORDINATE W/ AUTHORITY HAVING JURISDICTION.
12. CEASE OPERATIONS IMMEDIATELY IF ADJACENT STRUCTURES APPEAR TO BE IN DANGER. NOTIFY AUTHORITY HAVING JURISDICTION.
13. ROUGH GRADE AND COMPACT AREAS AFFECTED BY DEMOLITION TO MAINTAIN SITE GRADES AND CONTOURS.
14. FIELD VERIFY EXISTING CONDITIONS AND CORRELATE WITH REQUIREMENTS INDICATED ON DEMOLITION PLAN TO DETERMINE EXTENT OF SELECTIVE DEMOLITION REQUIRED.
15. CONDUCT DEMOLITION OPERATIONS AND REMOVE DEBRIS TO ENSURE MINIMUM INTERFERENCE WITH SELECTIVE DEMOLITION OPERATIONS.
16. CONDUCT DEMOLITION OPERATIONS TO PREVENT INJURY TO PEOPLE AND DAMAGE TO ADJACENT BUILDINGS AND FACILITIES TO REMAIN. ENSURE SAFE PASSAGE OF PEOPLE AROUND SELECTIVE DEMOLITION AREA.
17. USE WATER MIST, TEMPORARY ENCLOSURES AND OTHER SUITABLE METHODS TO LIMIT THE SPREAD OF DUST AND DIRT. COMPLY WITH GOVERNING ENVIRONMENTAL PROTECTION REGULATIONS. DO NOT USE WATER WHEN IT MAY DAMAGE EXISTING CONSTRUCTION, SUCH AS CAUSING ICING, FLOODING, AND TRANSPORTING POLLUTANTS.
18. REMOVE AND TRANSPORT DEBRIS IN A MANNER THAT WILL PREVENT SPILLAGE ON ADJACENT SURFACES AND AREAS.
19. CLEAN ADJACENT STRUCTURES AND IMPROVEMENTS OF DUST, DIRT AND DEBRIS CAUSED BY SELECTIVE DEMOLITION OPERATIONS. RETURN ADJACENT AREAS TO CONDITION EXISTING BEFORE START OF SELECTIVE DEMOLITION.
20. PROMPTLY DISPOSE OF DEMOLISHED MATERIALS. ALL DEBRIS RESULTING FROM DEMOLITION ACTIVITIES SHALL BE DISPOSED OF OFF-SITE AT A FACILITY APPROVED TO RECEIVE THE DEBRIS. DO NOT ALLOW DEMOLISHED MATERIALS TO ACCUMULATE ON-SITE. DO NOT BURN DEMOLISHED MATERIALS ON-SITE.

MAP REFERENCE:

1) MAP ENTITLED "ALTA/NSPS LAND TITLE SURVEY – LANDS NOW OR FORMERLY OF CROSSGATES RELEASECO, LLC. EXISTING CONDITIONS", PREPARED BY THE CHAZEN COMPANIES, DATED JANUARY 16, 2018.

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rev.	date	description

RAPP ROAD RESIDENTIAL DEVELOPMENT

EXISTING CONDITIONS & DEMOLITION PLAN

TOWN OF GUILDERLAND, ALBANY COUNTY, NEW YORK

designed	checked
SM	RK
date	scale
03/11/19	1" = 50'
project no.	
317AI.00	
sheet no.	
C100	

Drawing Name: Z:\projects\31700-31799\317AI.00 Rapp Road\DWG\01_C100_317AI-00_EXISTING.dwg
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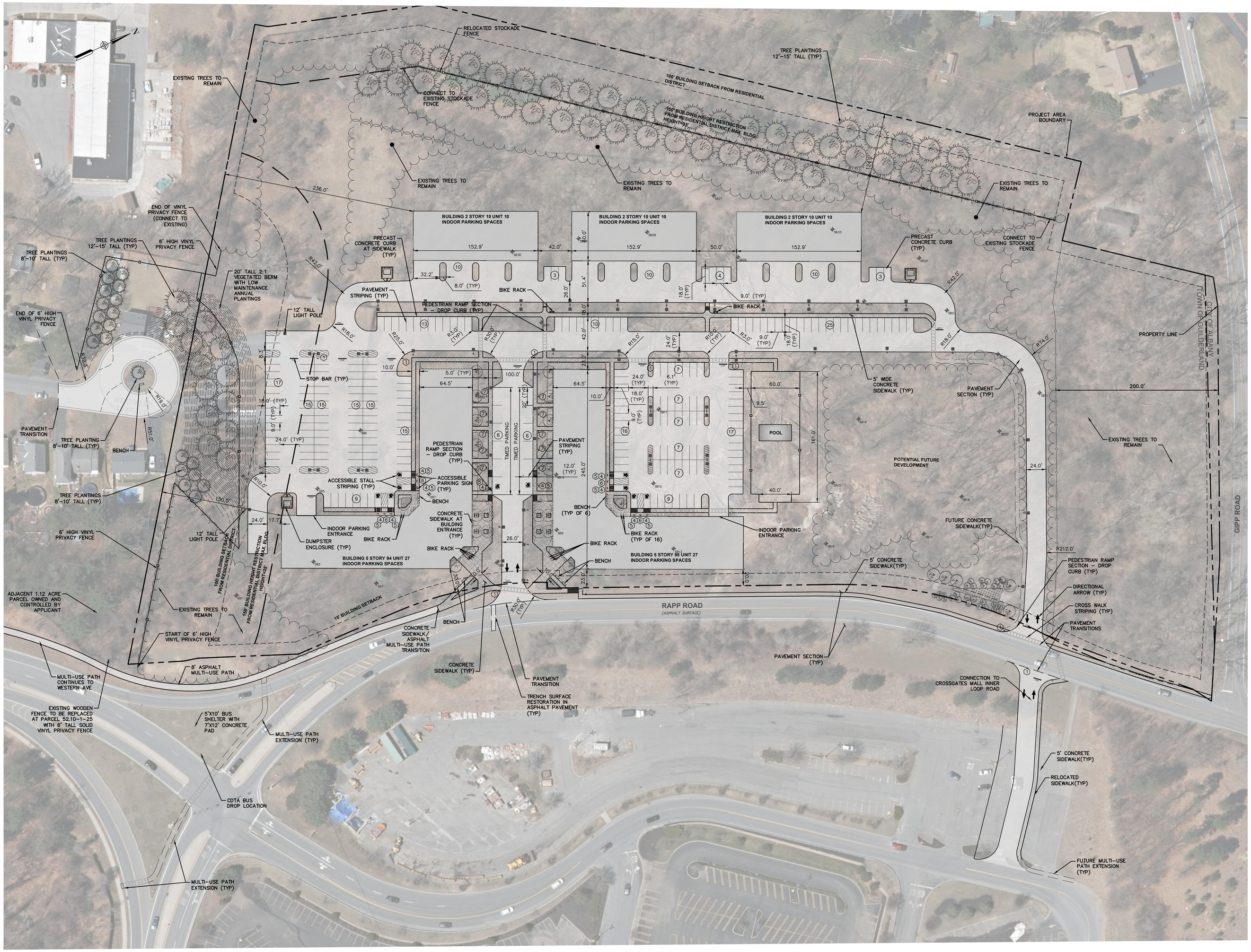

1 **SITE PLAN**
SCALE: 1"=50'

SITE LEGEND:

- PROPERTY LINE
- SETBACK LINE
- 150' BUILDING HEIGHT RESTRICTION LINE
- PROPOSED/RELOCATED STOCKADE FENCE
- BUILDING
- PAVEMENT
- CONCRETE SIDEWALK
- 25 PARKING COUNT

TOWN OF GUILDERLAND ZONING DISTRICT: TRANSIT ORIENTED DEVELOPMENT (TOD)

ZONING REQUIREMENTS:

	REQUIRED	PROPOSED
MINIMUM LOT AREA	25,000 SF	TOTAL AREA = 862,052 SF / 19.79 ACRES TOTAL AREA = 857,261 SF / 19.68 ACRES
MINIMUM BUILDING SETBACKS		
FRONT	15 FT	> 19 FT
SIDE	15 FT	> 195 FT
REAR	15 FT	> 189 FT
MAXIMUM LOT COVERAGE	75 %	31%
PARKING SPACES	1.5 SPACES PER DWELLING 1.5 SPACES X 222 DWELLINGS 333 SPACES REQUIRED	278 SURFACE PARKING SPACES 84 INDOOR PARKING SPACES 362 TOTAL PARKING SPACES (1.63± PER DWELLING)
DENSITY	16 UNITS/ACRE	TOTAL PROJECT AREA = 19.68 ACRES UNIT COUNT = 222 UNITS PROPOSED DENSITY = 222 UNITS/19.68 ACRES PROPOSED DENSITY = 11.3 UNITS/ACRE

FOR SITE PLAN APPROVAL - NOT FOR CONSTRUCTION

0 1 2 3
ORIGINAL SCALE IN INCHES

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rev.	date	description
1	07/02/19	REVISED PER COMMENTS RECEIVED

RAPP ROAD RESIDENTIAL DEVELOPMENT

SITE PLAN

TOWN OF GUILDERLAND, ALBANY COUNTY, NEW YORK

designed	checked
SM	RK
date	scale
03/11/19	1" = 50'
project no.	
317AI.00	
sheet no.	
C130	

Drawing Name: C:\temp\AcPublish_16268\01_C130_317AI-00_SITE.dwg
Xref's Attached: XBASE_ENG_317AI-00; XLAYOUT_317AI-00; XTB_317AI-00_30x42; XLANDSCAPING_317AI-00
Date Printed: Feb 14, 2020, 9:23am

ABBREVIATIONS:
HP HIGH POINT
LP LOW POINT
TC TOP OF CURB
BC BOTTOM OF CURB
ME MATCH EXISTING
FF FINISHED FLOOR
GRADING & DRAINAGE LEGEND:
PROPERTY LINE
BUILDING
PAVEMENT
295 10 FT CONTOUR
291 2 FT CONTOUR
290.50 SPOT GRADE
TREE LINE
SOIL BORING
TEST PIT
WORK LIMIT LINE
INFILTRATION BASIN
BOTTOM ELEVATION= 281.00
EMERGENCY OVERFLOW= 287.00
LIMIT OF DISTURBANCE
(AREA = 11.4± ACRES)
PRETREATMENT FOREBAY
2-STORY BLDG
FFE = 291.57
2-STORY BLDG
FFE = 292.65
2-STORY BLDG
FFE = 293.65
5-STORY BLDG
FFE = 289.29
5-STORY BLDG
FFE = 289.29
UNDERGROUND INFILTRATION SYSTEM
UNDERGROUND INFILTRATION SYSTEM
CONTRACTOR TO STAKE OUT & INSTALL ORANGE CONSTRUCTION FENCING PRIOR TO CONSTRUCTION. SIGNING SHALL BE AFFIXED TO CONSTRUCTION FENCING READING "PROTECTED AREA, DO NOT DISTURB" (TYP)
BIORETENTION BASIN
BOTTOM OF FILTER= 286.00
4' MEDIA DEPTH
AREA OF FILTER= 597 SF
EMERGENCY OVERFLOW= 287.00
RAPP ROAD
Lands Now or Formerly of Niagara Mohawk Power Corporation Liber 1404 Page 401
Lands Now or Formerly of BAC Building Corporation Liber 2552 Page 988
Lands Now or Formerly of Crossgates Releasco LLC

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rev.	date	description

RAPP ROAD RESIDENTIAL DEVELOPMENT

GRADING & DRAINAGE PLAN

TOWN OF GUILDERLAND, ALBANY COUNTY, NEW YORK

designed	checked
SM	RK
date 03/11/19	scale 1" = 30'
project no. 317AI.00	
sheet no. C140	

Drawing Name: Z:\projects\31700–31799\317AI.00 Rapp Road\DWG\02_C140_317AI–00_GRAD.dwg
Xref's Attached: XLAYOUT_317AI–00; XBASE_ENG_317AI–00; XTB_317AI–00_30x42
Date Printed: Feb 14, 2020, 9:24am


EROSION CONTROL LEGEND:
PROPERTY LINE
BUILDING
10 FT CONTOUR
2 FT CONTOUR
TREE LINE
SILT FENCE
FILTER FABRIC DROP INLET PROTECTION
MANUFACTURED INSERT INLET PROTECTION
SPOILS STORAGE AREA
STABILIZED CONSTRUCTION ACCESS
RIPRAP
CONCRETE WASH OUT AREA
END OF SILT FENCE (TYP)
OPEN INFILTRATION BASIN TO BE PROTECTED THROUGHOUT CONSTRUCTION DURATION. HEAVY CONSTRUCTION EQUIPMENT SHALL NOT BE ALLOWED WITHIN THE LIMITS OF THE BASIN TO AVOID OVER COMPACTING EXISTING SOIL
INFILTRATION BASIN
PRETREATMENT FOREBAY
END SECTION WITH STONE LINED APRON
SILT FENCE (TYP)
TEMPORARY OUT OF PAVEMENT FILTER FABRIC DROP INLET PROTECTION
2-STORY BLDG FFE = 291.57
2-STORY BLDG FFE = 292.65
2-STORY BLDG FFE = 293.65
5-STORY BLDG FFE = 289.29
MANUFACTURED INSERT INLET PROTECTION (TYP)
TEMPORARY SOIL STOCKPILE
TOPSOIL AND FILL THAT IS TO REMAIN STOCKPILED ON-SITE FOR PERIODS GREATER THAN 14 DAYS SHALL BE STABILIZED BY SEEDING AND MULCHING
CONTRACTOR TO STAKE OUT & INSTALL ORANGE CONSTRUCTION FENCING PRIOR TO CONSTRUCTION. SIGNING SHALL BE AFFIXED TO CONSTRUCTION FENCING READING "PROTECTED AREA, DO NOT DISTURB" (TYP)
CONCRETE WASHOUT
BIORETENTION AREA
STABILIZED CONSTRUCTION ACCESS
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BENCHMARK XCUT BOLT ELEV.=288.87
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rev.	date	description

RAPP ROAD RESIDENTIAL DEVELOPMENT

EROSION & SEDIMENT CONTROL PLAN

TOWN OF GUILDERLAND, ALBANY COUNTY, NEW YORK

designed	checked
SM	RK
date 03/11/19	scale 1" = 30'
project no. 317AI.00	
sheet no. C150	

Drawing Name: Z:\projects\31700-31799\317AI.00 Rapp Road\DWG\02_C150_317AI-00_ESC.dwg
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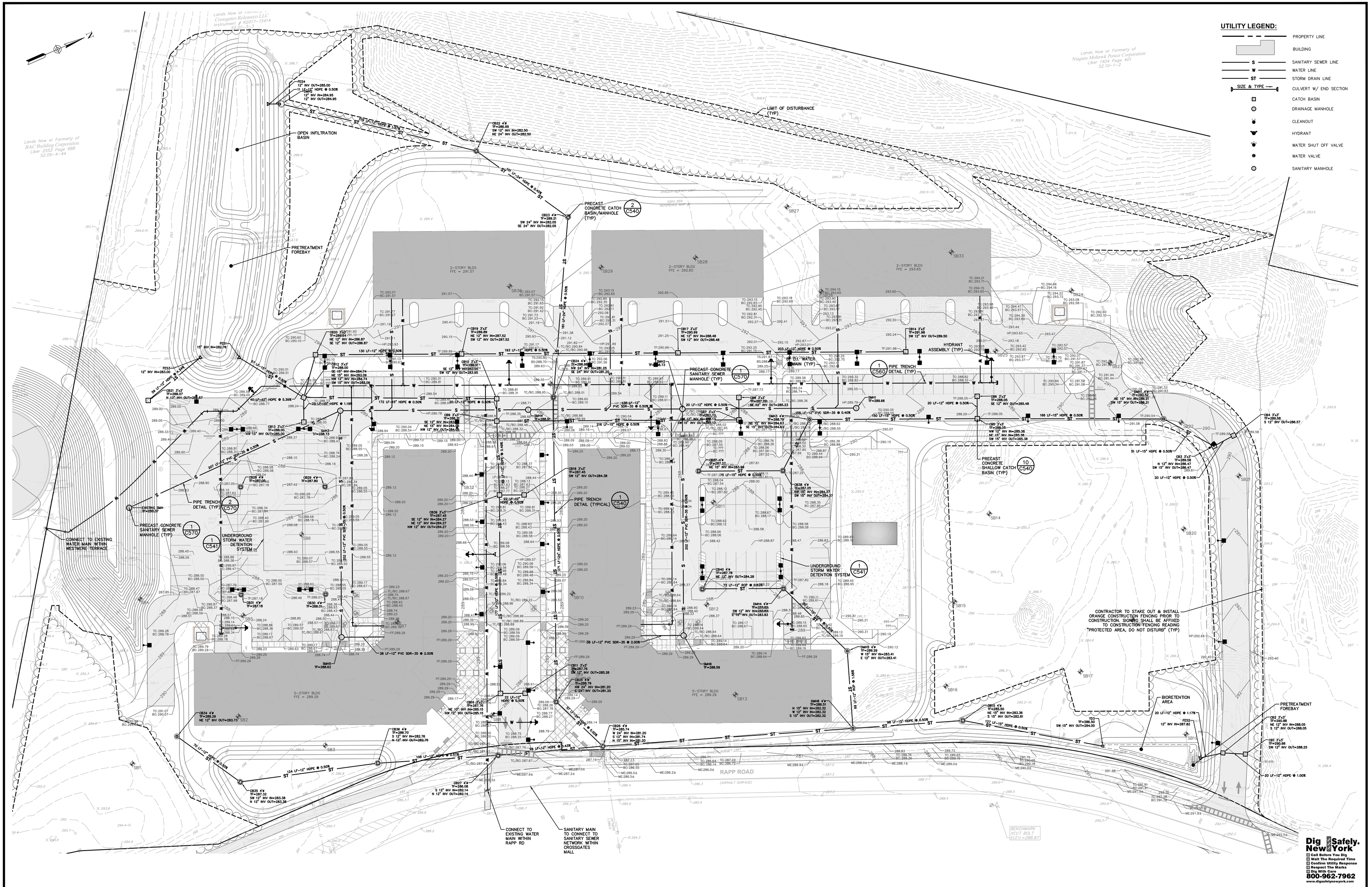

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rev.	date	description

RAPP ROAD RESIDENTIAL DEVELOPMENT

UTILITY PLAN

TOWN OF GUILDERLAND, ALBANY COUNTY, NEW YORK

designed	checked
SM	RK
date	scale
03/11/19	1"=30'
project no.	
317AI.00	
sheet no.	
C160	

Drawing Name: Z:\projects\31700-31799\317AI.00 Rapp Road\DWG\02_C160_317AI-00_UTIL.dwg
Xref's Attached: XLAYOUT_317AI-00; XBASE_ENG_317AI-00; XTB_317AI-00_30x42
Date Printed: Feb 14, 2020, 9:25am

LIGHTING SCHEDULE

KEY	QTY	FIXTURE - MANUFACTURER & MODEL #	WATTAGE	MOUNTING HT	REMARKS
A	13	LINEAR LIGHT PT 12 – LIGMAN LIGHTING	50W	10'	TYPE IV
B	14	LINEAR LIGHT PT 4 – LIGMAN LIGHTING	2x162W	16'	TYPE III
C	38	LINEAR LIGHT PT 12 – SURFACE – LIGMAN LIGHTING	35W	10'	WALL MOUNT – TYPE III
D	15	LINEAR LIGHT PT 4 – LIGMAN LIGHTING	162W	16'	SINGLE FIXURE – TYPE III
E	12	LINEAR LIGHT PT 12 – LIGMAN LIGHTING	2x50W	10'	DOUBLE FIXTURE – TYPE III
F	123	LINEAR LIGHT PT 1 BOLLARD – LIGMAN LIGHTING	16W	3'	TYPE III

PLANT LIST

	QTY	ABRV	BOTANICAL NAME	COMMON NAME	SIZE	COND	SPACING	REMARKS
TREES								
	0	AG	Amelancheir grandiflora 'Autumn Brilliance'	Autumn Brilliance Serviceberry	7'–8'	B&B	As Shown	Multi–Stemp Clump
	0	CL	Carpinus caroliniana	American Hornbeam	2" – 2.5" Cal.	B&B	As Shown	
	0	GT	Gleditsia triacanthos 'cultivar'	Honeylocust	2"–2.5" Cal.	B&B	As Shown	
	0	WP	Pinus strobus	Eastern White Pine	12'–15'	B&B	As Shown	
	0	WP	Pinus sylvestris	Scotch Pine	8'–10'	B&B	As Shown	
	0	SR	Syringa reticulata amurensis japonica	Japanese Tree Lilac	1.75"–2" Cal.	B&B	As Shown	Tree Form
SHRUBS								

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Chattanooga, Tennessee 37403
Phone: (423) 241–6575

rev.	date	description

RAPP ROAD RESIDENTIAL DEVELOPMENT

LANDSCAPING & LIGHTING PLAN

TOWN OF GUILDERLAND, ALBANY COUNTY, NEW YORK

designed	checked
SM	RK
date 03/11/19	scale 1" = 30'
project no. 317AI.00	
sheet no. C180	

Drawing Name: C:\temp\AcPublish_16268\02_C180_317AI-00_LANDP.dwg
Xref's Attached: XLAYOUT_317AI-00; XBASE_ENG_317AI-00; XTB_317AI-00_30x42; XLANDSCAPING_317AI-00; XPHOTOMETRIC_317AI-00
Date Printed: Feb 14, 2020, 9:25am

PLANT LIST

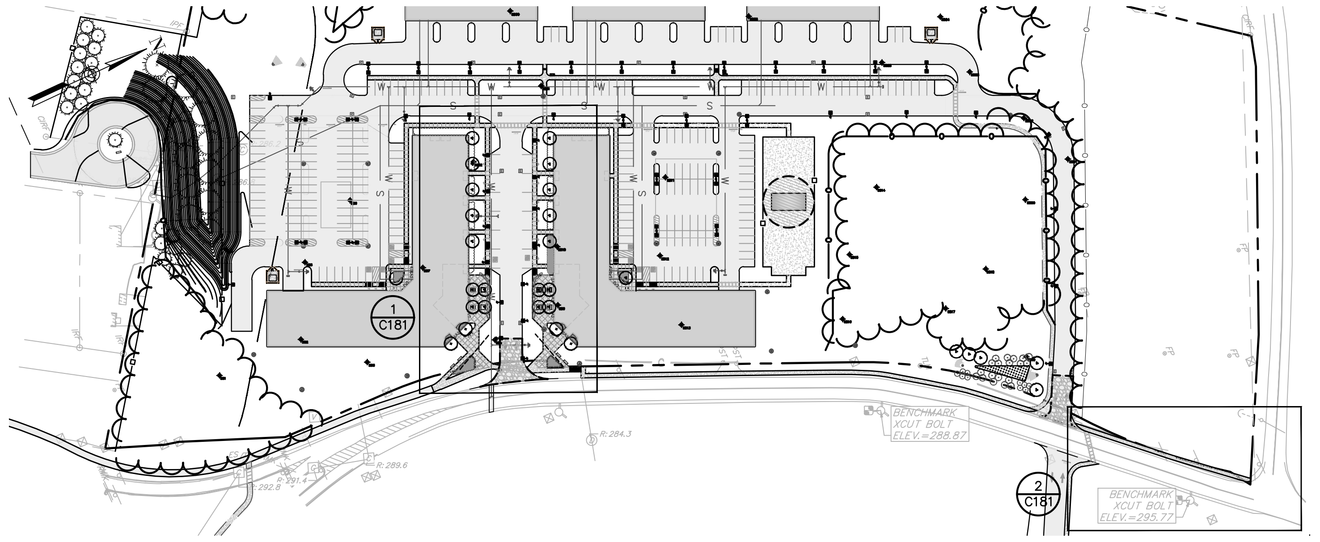
	QTY	ABRV	BOTANICAL NAME	COMMON NAME	SIZE	COND.	SPACING	REMARKS
TREES								
	6	AA	Amelanchier x 'Autumn Brilliance'	Service Berry	2–2.5" cal.	B&B	As Shown	Single Stem; Limb Up 4'
	4	CC	Carpinus caroliniana	Single Stem; Limb Up 6'	3" cal.	B&B	As Shown	
	4	GT	Gleditsia triacanthos inermis	Thornless Honeylocust	3" cal.	B&B	As Shown	
	7	PF	Pinus flexilis 'Vanderwolf's Pyramid'	Limber Pine	5' – 6'	B&B	As Shown	
	10	SR	Syringa reticulata amurensis japonica	Japanese Tree Lilac	2–2.5" cal.	B&B	As Shown	
	4	TC	Tilia cordata	Littleleaf Linden	3" cal.	B&B	As Shown	

NOTE: JAPANESE TREE LILAC IS NOT NATIVE, BUT THRIVES LOCALLY IN THE URBAN ENVIRONMENT WHILE PROVIDING UNIQUE SEASONAL INTEREST.

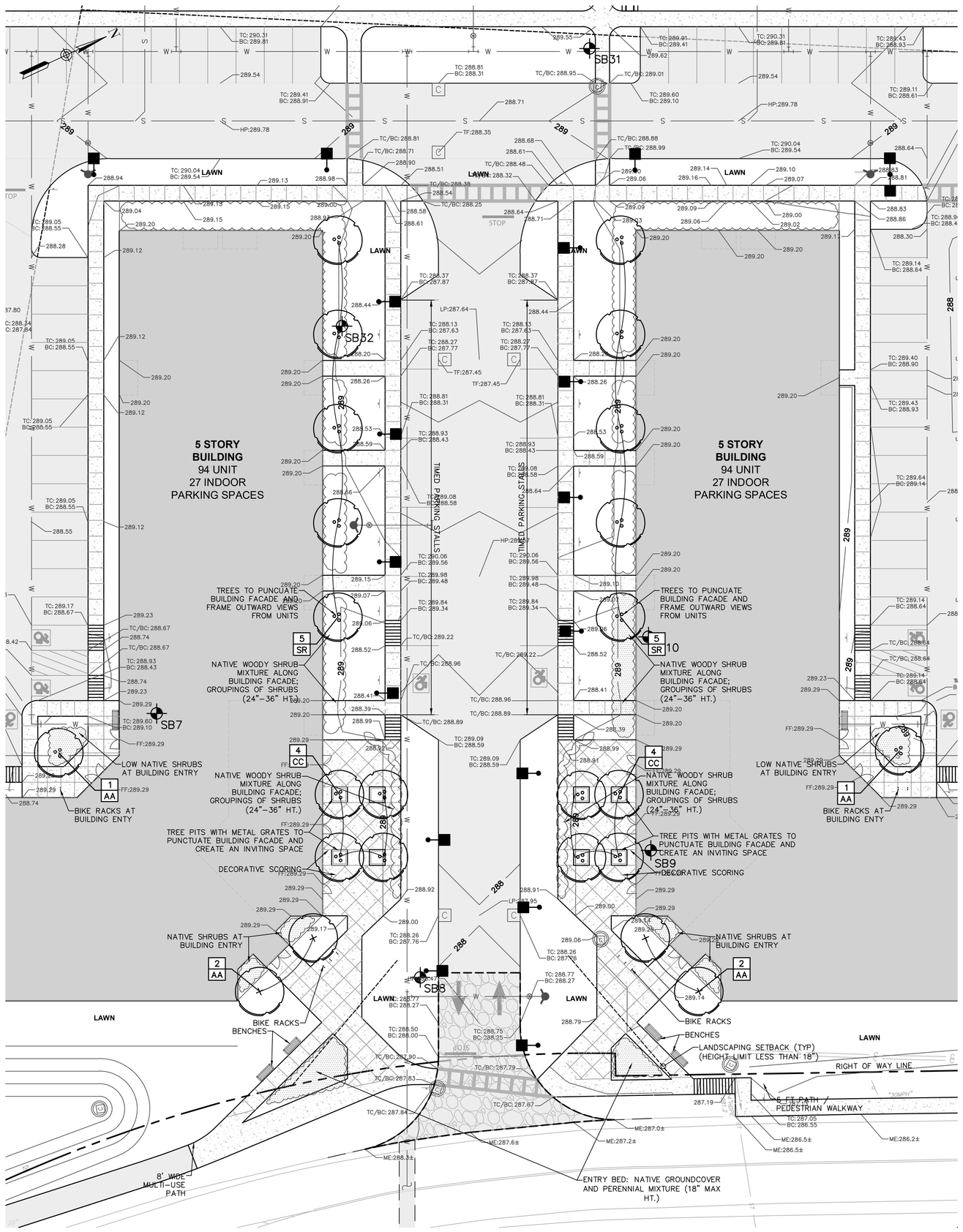
PLANTING PRECEDENTS - NATIVE SHRUB BORDER

SHRUB BORDER

SEASONAL INTEREST

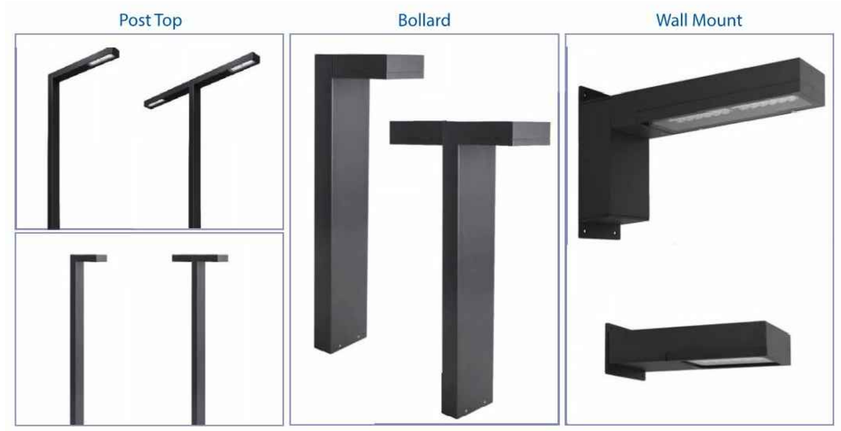


SITE MAP



© 1 **DETAILED STREET PLANTING**
SCALE: 1" = 20'

LIGHTING PRECEDENTS - LIGMAN LINEAR PT COLLECTION



POST TOP LINEAR

POST TOP LINEAR

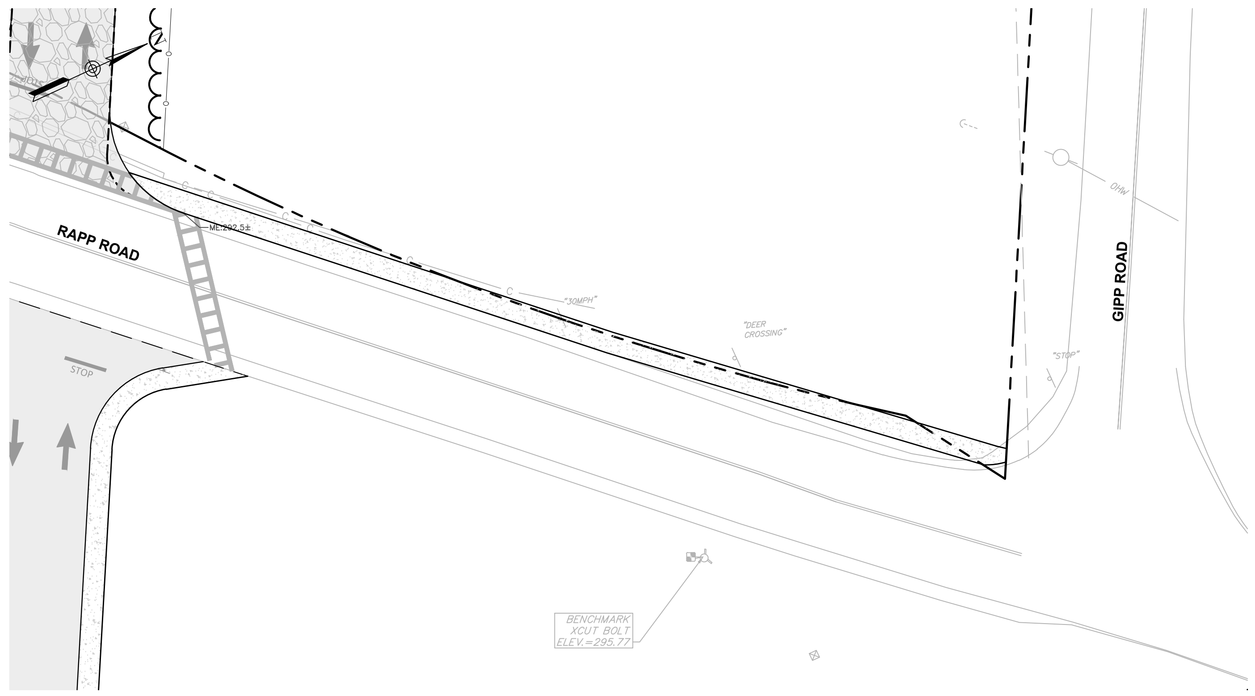
BOLLARD

SITE ELEMENTS PRECEDENTS

CAFE SEATING

LEGEND:

- PROPERTY LINE
- SETBACK LINE
- BUILDING
- ASPHALT PAVEMENT
- DECORATIVE PAVEMENT
- BIKE PATH/WALKWAY
- FENCING
- 3 GT — PLANT QUANTITY / PLANT NAME
- NEW STREET OR ORNAMENTAL TREE
- SHRUB PLANTINGS
- NEW BOLLARD LIGHT
- NEW LIGHT POST AND LUMINAIRE



© 2 **PEDESTIRAN PATH**
SCALE: 1" = 20'

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- ☐ Respect The Marks
- ☐ Dig With Care

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FOR SITE PLAN APPROVAL - NOT FOR CONSTRUCTION

0 1 2 3
ORIGINAL SCALE IN INCHES

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rev.	date	description

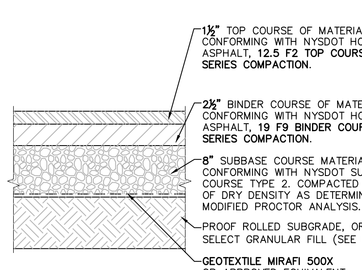
RAPP ROAD RESIDENTIAL DEVELOPMENT

DETAILED LANDSCAPE PLAN

TOWN OF GUILDERLAND, ALBANY COUNTY, NEW YORK

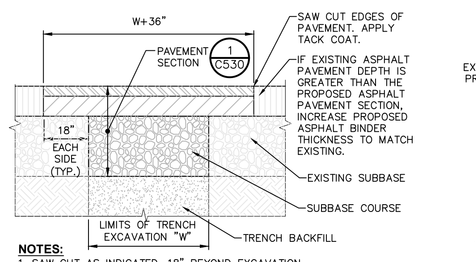
designed	checked
SM	RK
date	scale
03/11/19	1" = 20'
project no.	
317AI.00	
sheet no.	
C181	

Drawing Name: Z:\projects\31700-31799\317AI.00 Rapp Road\DWG\02_C181_317AI-00_LANDP_DETAILED.dwg
Xref's Attached: BASE_ENG_317AI-00; XLAYOUT_317AI-00; XLANDSCAPING_317AI-00; XTB_317AI-00_30x42
Date Printed: Feb 14, 2020, 9:26am



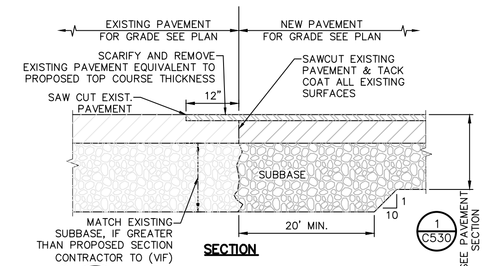
NOTES:
1. MATERIALS AND METHODS OF CONSTRUCTION SHALL BE IN CONFORMANCE WITH THE NEW YORK STATE DEPARTMENT OF TRANSPORTATION (NYSDOT) STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, DATED **"CURRENT VERSION"**, AND ALL ADDENDA THERE TO.
2. SUBBASE MATERIAL SHALL CONFORM WITH **SECTION 304** – SUBBASE COURSE OF THE ABOVE REFERENCED NYSDOT STANDARD SPECIFICATIONS AND THE TYPE CALLED OUT IN THESE DRAWINGS.
3. HOT MIX ASPHALT (HMA) PAVEMENT SHALL CONFORM WITH **SECTION 400**–HOT MIX ASPHALT OF THE ABOVE REFERENCED NYSDOT STANDARD SPECIFICATIONS AND THE TYPE CALLED OUT IN THESE DRAWINGS. ALTHOUGH **SECTION 400** IN ITS ENTIRETY IS REFERENCED, THE HOT MIX ASPHALT (HMA) PAVEMENT(S) SPECIFIED FOR THIS CONTRACT SHALL BE AS SPECIFIED UNDER **SECTION 402**–HOT MIX ASPHALT (HMA) PAVEMENTS.
4. TACK COAT WHEN SPECIFIED OR CALLED OUT IN THESE DRAWINGS OR REQUIRED BY THE REFERENCED SPECIFICATIONS SHALL CONFORM WITH **SECTION 407**–TACK COAT OF THE ABOVE REFERENCED NYSDOT STANDARD SPECIFICATIONS.
5. WHERE IT IS NECESSARY TO PLACE FILL FOR PURPOSES OF BRINGING THE SUBGRADE ELEVATION UP TO A SPECIFIED GRADE, THE FILL MATERIAL PLACED SHALL BE IN CONFORMANCE WITH **SECTION 203**–EXCAVATION AND EMBANKMENT OF THE ABOVE REFERENCED NYSDOT STANDARD SPECIFICATIONS.
6. PAVEMENT SECTION DESIGN IS BASED ON THE GEOTECHNICAL REPORT PREPARED BY THE CHAZEN COMPANIES DATED 02/13/2018..

1 PAVEMENT SECTION DETAIL
SCALE: NOT TO SCALE



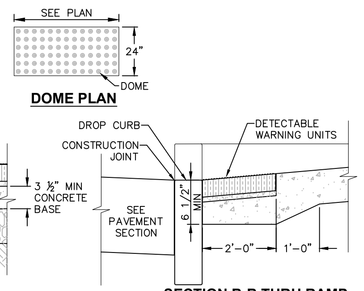
NOTES:
1. SAW CUT AS INDICATED, 18" BEYOND EXCAVATION.
2. FURNISH, PLACE, AND COMPACT SUBBASE.
3. TACK COAT IN ACCORDANCE WITH NYSDOT STANDARD SPEC.
4. FURNISH AND PLACE ASPHALT CONCRETE PAVEMENT AS SPECIFIED.

2 TRENCH SURFACE RESTORATION IN ASPHALT PAVEMENT
SCALE: NOT TO SCALE



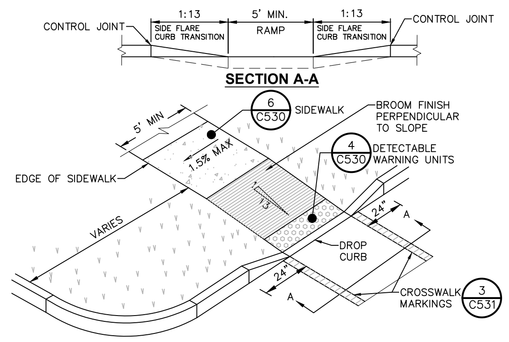
SECTION

3 PAVEMENT TRANSITION DETAIL
SCALE: NOT TO SCALE



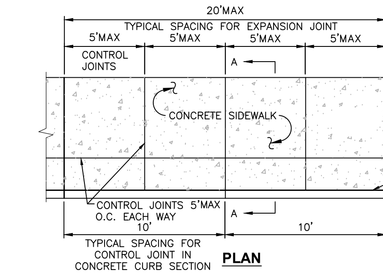
NOTES:
1. DETECTABLE WARNING UNIT SHALL BE ADA COMPLIANT, AND SHALL CONTRAST VISUALLY WITH ADJOINING SURFACES.
2. CAST IRON 2" TERRA PAVING TYPE THREE ADA COMPLIANT WARNING PAVER.
3. COORDINATE W/ OWNER FOR COLOR.

4 DETECTABLE WARNING UNITS FOR RAMPS
SCALE: NOT TO SCALE

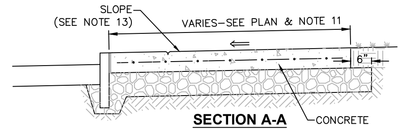


NOTES:
1. ALL WORK SHALL CONFORM WITH THE NYSDOT STANDARD SPECIFICATION FOR CONSTRUCTION AND MATERIALS DATED, **"CURRENT VERSION"**, AND ALL ADDENDA THERE TO; SPECIFICALLY **SECTION 608**– SIDEWALKS, DRIVEWAYS, AND BICYCLE PATHS.
2. SLOPE RAMP AND SIDE FLARES AS INDICATED IN THE PLANS OR AS ORDERED BY THE ENGINEER.
3. DETECTABLE WARNING UNITS SHALL BE PROVIDED ON ALL RAMPS IN ACCORDANCE W/ ADA REQUIREMENTS.

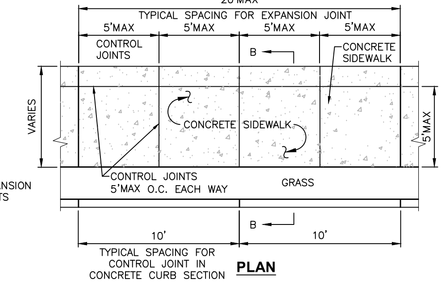
5 PEDESTRIAN RAMP SECTION - DROP CURB
SCALE: NOT TO SCALE



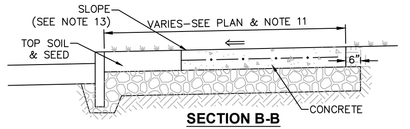
PLAN



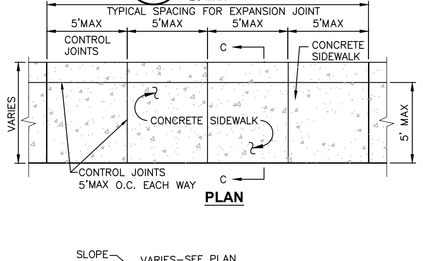
SECTION A-A



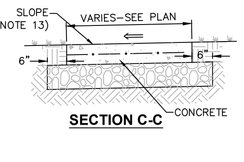
PLAN



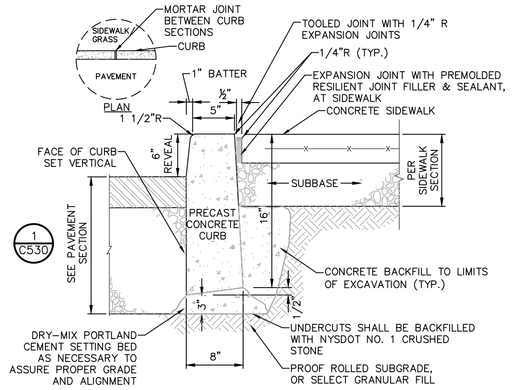
SECTION B-B



PLAN

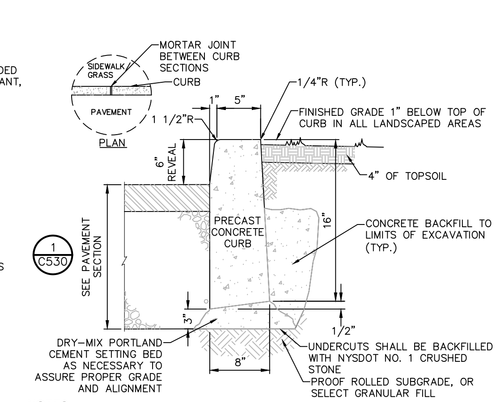


SECTION C-C



NOTES:
1. PRE–CAST CURB TO BE INSTALLED IN ACCORDANCE WITH NYSDOT STANDARD SPECIFICATION **SECTION 609.**
2. CAST IN PLACE CONCRETE CURB MAY BE SUBSTITUTED, WHEN ALTERNATE CONSTRUCTION DETAILS ARE SUBMITTED BY THE CONTRACTOR AND APPROVEDBY THE ENGINEER. ALTERNATE CURB SHALL BE INSTALLED IN ACCORDANCE WITH NYSDOT SPEC **SECTION 609.**

7 PRECAST CONCRETE CURB AT SIDEWALK
SCALE: NOT TO SCALE



NOTES:
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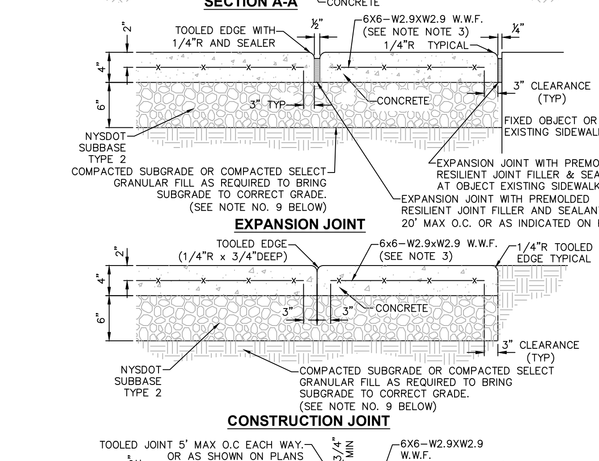
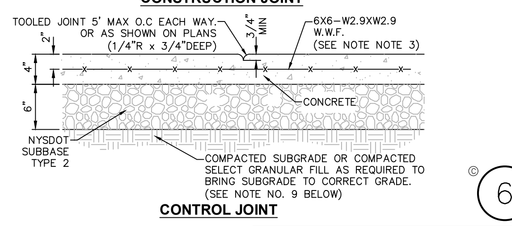
8 PRECAST CONCRETE CURB
SCALE: NOT TO SCALE

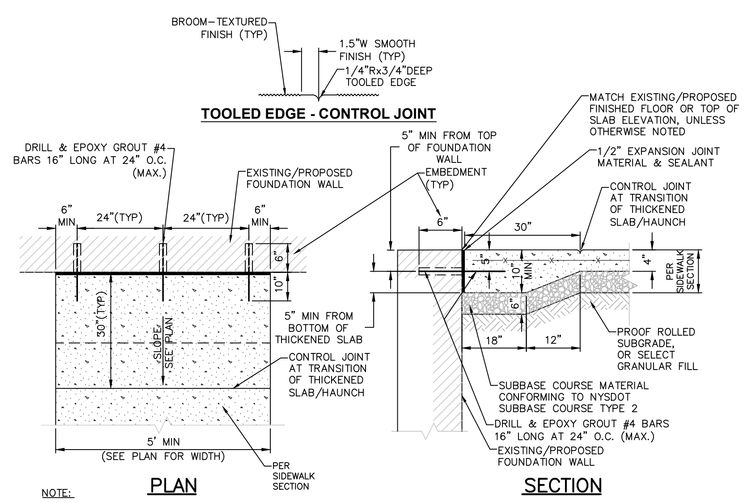


EXPANSION JOINT



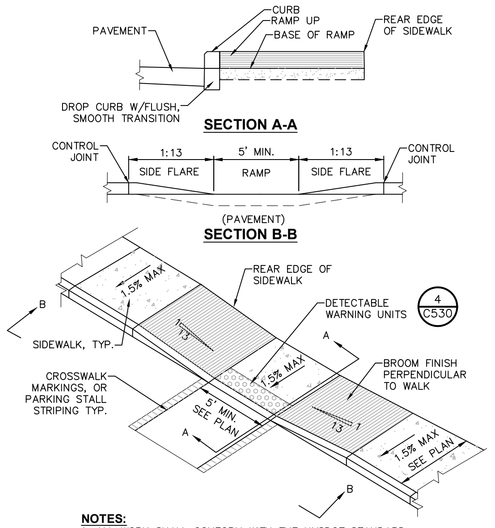
CONSTRUCTION JOINT

CONTROL JOINT



NOTE:
1. THICKENED (HAUNCH) & ADDITIONALLY REINFORCED CONCRETE SIDEWALK ENDS ARE REQUIRED AT ALL EXISTING/PROPOSED BUILDING ENTRANCES.
2. SEE CONCRETE SIDEWALK DETAIL FOR ADDITIONAL DETAILS & NOTES.

10 CONCRETE SIDEWALK AT BUILDING ENTRANCES
SCALE: NOT TO SCALE



NOTES:
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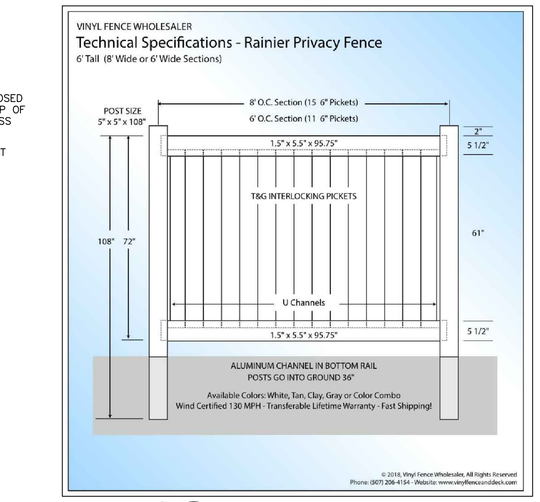
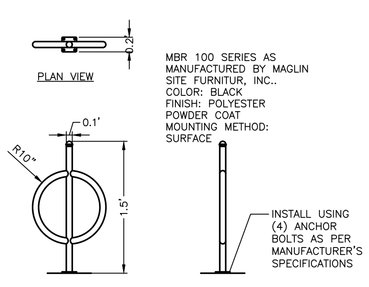
2. SLOPE RAMP AND SIDE FLARES AS INDICATED IN THE PLANS OR AS ORDERED BY THE ENGINEER.
3. DETECTABLE WARNING UNITS SHALL BE PROVIDED ON ALL RAMPS IN ACCORDANCE W/ ADA REQUIREMENTS.

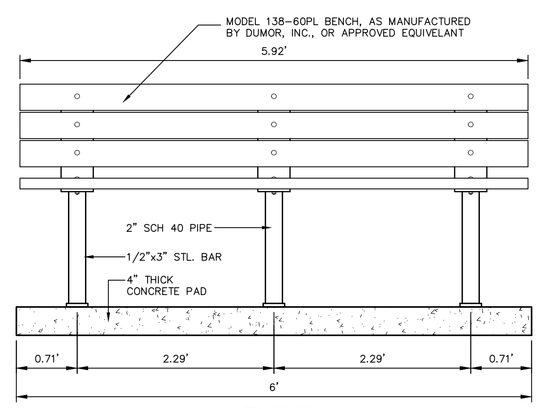
9 PEDESTRIAN RAMP SECTION - DROP CURB
SCALE: NOT TO SCALE



11 PRIVACY FENCING
SCALE: NOT TO SCALE

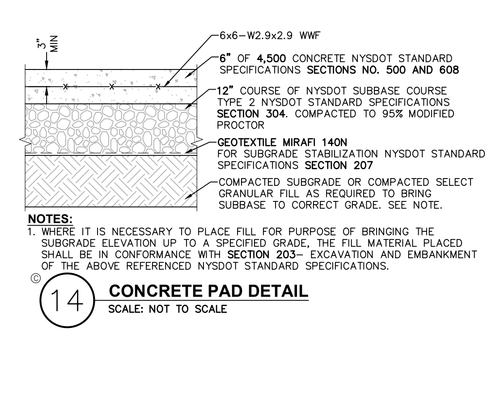


12 BIKE RACK
SCALE: NOT TO SCALE



NOTES:
1. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
2. ALL STEEL MEMBERS COATED W/ ZINC RICH EPOXY THEN FINISHED W/ POLYESTER POWDER COATING.

13 6' PARK BENCH
SCALE: NOT TO SCALE



NOTES:
1. WHERE IT IS NECESSARY TO PLACE FILL FOR PURPOSE OF BRINGING THE SUBGRADE ELEVATION UP TO A SPECIFIED GRADE, THE FILL MATERIAL PLACED SHALL BE IN CONFORMANCE WITH **SECTION 203**– EXCAVATION AND EMBANKMENT OF THE ABOVE REFERENCED NYSDOT STANDARD SPECIFICATIONS.

14 CONCRETE PAD DETAIL
SCALE: NOT TO SCALE

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rev.	date	description

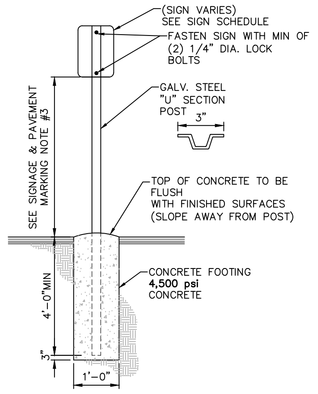
RAPP ROAD RESIDENTIAL DEVELOPMENT

SITE DETAILS

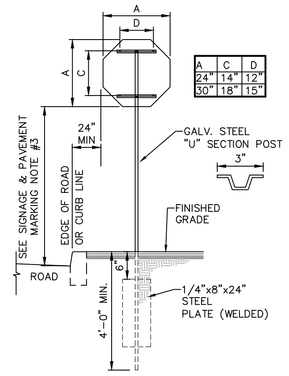
TOWN OF GUILDERLAND, ALBANY COUNTY, NEW YORK

designed	checked
SM	RK
date	scale
03/11/19	AS NOTED
project no.	
317AI.00	
sheet no.	
C530	

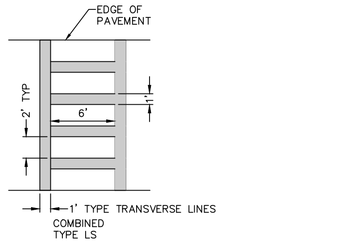
Drawing Name: Z:\projects\31700–31799\317AI.00 Rapp Road\DWG\02_C530_317AI–00_SITE DETAILS.dwg
Xref's Attached: XTB_317AI–00_30x42
Date Printed: Feb 14, 2020, 9:08am



1 **SINGLE POST IN CONCRETE SIGN MOUNTING DETAIL**
SCALE: NOT TO SCALE

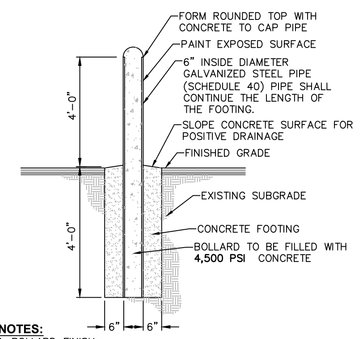


2 **SINGLE POST STOP SIGN MOUNTING DETAIL**
SCALE: NOT TO SCALE



NOTES:
1. ALL CROSS WALK STRIPING SHALL BE WHITE
2. TYPE LS CROSS WALK SHALL BE USED IN HIGH TRAFFIC VOLUME STREET CROSSINGS.

3 **PAVEMENT MARKING DETAIL CROSS WALK STRIPING**
SCALE: NOT TO SCALE



NOTES:
1. BOLLARD FINISH: PREPARE GALVANIZED COATING TO RECEIVE PAINTED FINISH. APPLY (1) COAT OF RUST INHIBITOR PRIMER. APPLY (2) COATS OF GLOSS ENAMEL (COLOR TO BE SELECTED BY THE OWNER.)
2. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF **4,500 PSI @** 28 DAYS.
3. ALL CONCRETE SHALL HAVE A SLUMP OF NO GREATER THAN 4" (WITH A TOLERANCE OF 1").
4. ALL CONCRETE SHALL HAVE A 5% ENTRAINED AIR (WITH A TOLERANCE OF 1%) CONFORMING WITH **ASTM C260**.

4 **STEEL & CONCRETE BOLLARD DETAIL**
SCALE: NOT TO SCALE

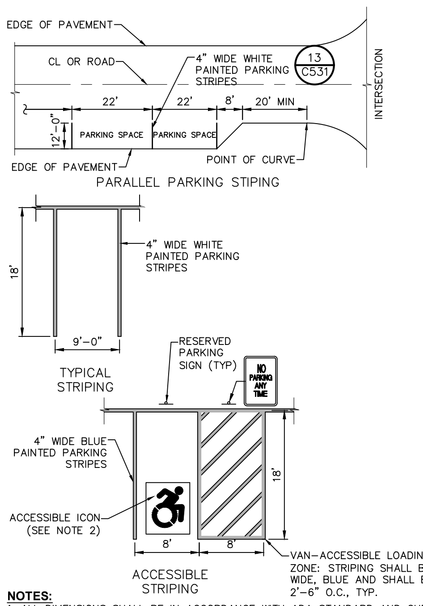
STRIPING NOTES:
1. ALL STRIPING SHALL CONFORM TO THE LATEST EDITION OF THE NYSDOT STANDARD SPECIFICATIONS, **SECTION 640** AND THE "NATIONAL MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" – **2009 EDITION** AND THE "NYS SUPPLEMENT."
2. STRIPE PAVEMENT AS INDICATED ON THE PLANS AND/OR IN ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE AND FEDERAL REQUIREMENTS.
3. STRIPING WORK WILL BE REVIEWED AND ACCEPTED BY THE AUTHORITY HAVING JURISDICTION.
4. COLOR: DRIVE LANE DIVIDERS – WHITE OR AOBE
NO PARKING ZONE WARNINGS – WHITE OR AOBE
PARKING DIVIDERS – WHITE OR AOBE
WALKING LINES – WHITE OR AOBE
ACCESSIBLE PARKING LINES & SYMBOL – BLUE

SIGNAGE NOTES:
1. ALL SIGNS SHALL CONFORM TO THE LATEST EDITION OF THE NYSDOT STANDARD SPECIFICATIONS, **SECTION 645** AND THE "NATIONAL MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" – **2009 EDITION** AND THE "NYS SUPPLEMENT."
2. SIGN MOUNTING HEIGHT SHALL BE A MINIMUM OF 7' MINIMUM MOUNTING HEIGHT MAY BE ADJUSTED ONLY IN ACCORDANCE WITH PROVISIONS OUTLINED IN THE "NATIONAL MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" – **2009 EDITION** AND THE "NYS SUPPLEMENT."
3. SIGN POST SHALL BE IN ACCORDANCE W/ NYSDOT STANDARD SPECS **SECTION 730.**

MUTCD SIGN SCHEDULE

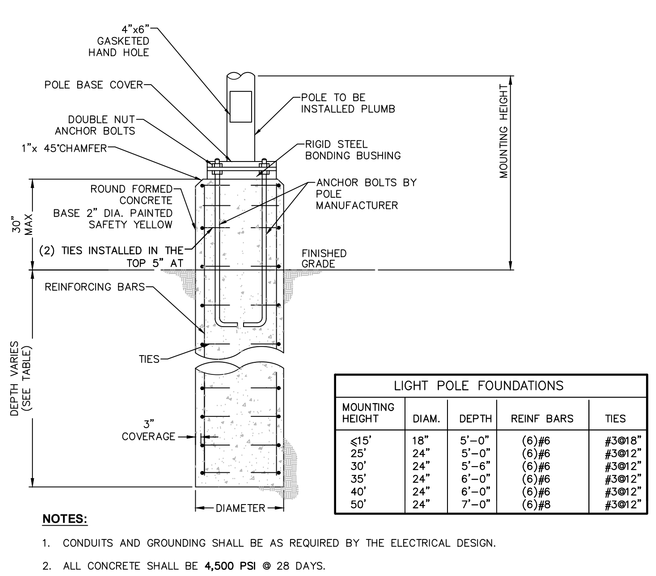
SIGN NO.	SIGN FACE	MUTCD NUMBER	MIN SIZE	COLORS BCK GRND	COLORS LEGEND	MOUNTING
①	STOP	R1-1	30"x30"	RED	WHITE	2 C530
②		W11-2	24"x24"	YELLOW/ FYG	BLACK	1 C530
③		W16-7P	24"x12"	YELLOW/ FYG	BLACK	1 C530
④	RESERVED PARKING	NY R7-8D	12"x18"	WHITE/ BLUE	GREEN/ WHITE	1 C530
⑤	VAN ACCESSIBLE	R7-8P	12"x6"	WHITE	BLUE	1 C530
⑥	NO PARKING ANY TIME	R7-1	12"x18"	WHITE	RED	1 C530
⑦	ONE HOUR PARKING		12"x18"	WHITE	BLACK	1 C530

5 **MUTCD SIGN SCHEDULE**
SCALE: NOT TO SCALE



NOTES:
1. ALL DIMENSIONS SHALL BE IN ACCORDANCE WITH ADA STANDARD AND CURRENT ZONING AND SITE REGULATIONS.
2. PAINTED ACCESSIBLE LOGO TO BE IN ACCORDANCE W/ NEW YORK STATE LAW.
3. SLOPE OF PAVEMENT SURFACE IN ACCESSIBLE PARKING AREA SHALL NOT EXCEED 1.5% IN ANY DIRECTION.
4. SEE PLAN FOR ACTUAL LOCATION OF SIGNAGE

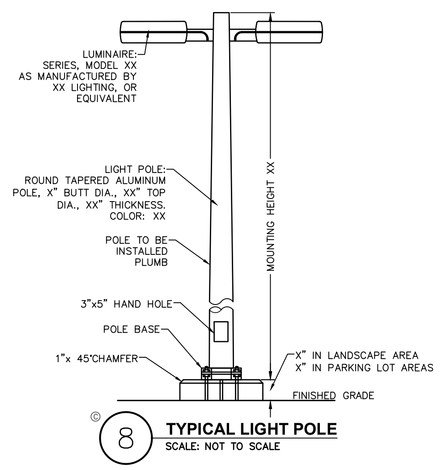
6 **PAVEMENT MARKING DETAIL PARKING STRIPING**
SCALE: NOT TO SCALE



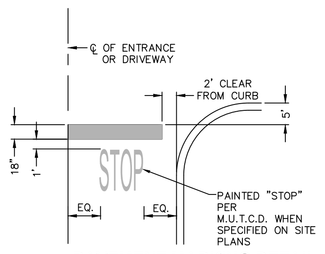
LIGHT POLE FOUNDATIONS				
MOUNTING HEIGHT	DIAM.	DEPTH	REINF BARS	TIES
≤15'	18"	5'-0"	(6)#6	#3@18"
25'	24"	5'-0"	(6)#6	#3@12"
30'	24"	5'-6"	(6)#6	#3@12"
35'	24"	6'-0"	(6)#6	#3@12"
40'	24"	6'-0"	(6)#6	#3@12"
50'	24"	7'-0"	(6)#8	#3@12"

NOTES:
1. CONDUITS AND GROUNDING SHALL BE AS REQUIRED BY THE ELECTRICAL DESIGN.
2. ALL CONCRETE SHALL BE **4,500 PSI @** 28 DAYS.
3. ALL REINFORCING STEEL SHALL BE GRADE 60.
4. DESIGNED FOR **90 MPH** WND WITH FIXTURE AREA OF **13 SF.**
5. FOUNDATION DIAMETER AND REINFORCING CIRCLE SHALL BE COORDINATED WITH ANCHOR BOLT LIMITS.
6. FOUNDATIONS SHALL BE AUGERED INTO UNDISTURBED NATURAL SOIL OR COMPACTED FILL PER SITE GRADING PLANS.

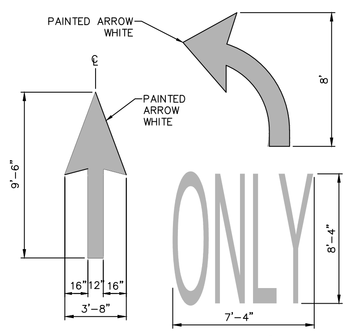
7 **LOT LIGHTING CONCRETE BASE**
SCALE: NOT TO SCALE



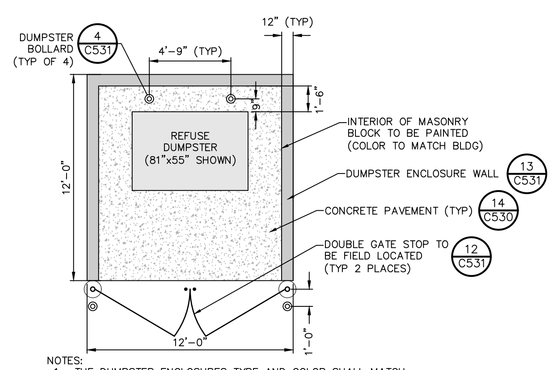
8 **TYPICAL LIGHT POLE**
SCALE: NOT TO SCALE



9 **PAVEMENT MARKING DETAIL STOP BAR**
SCALE: NOT TO SCALE

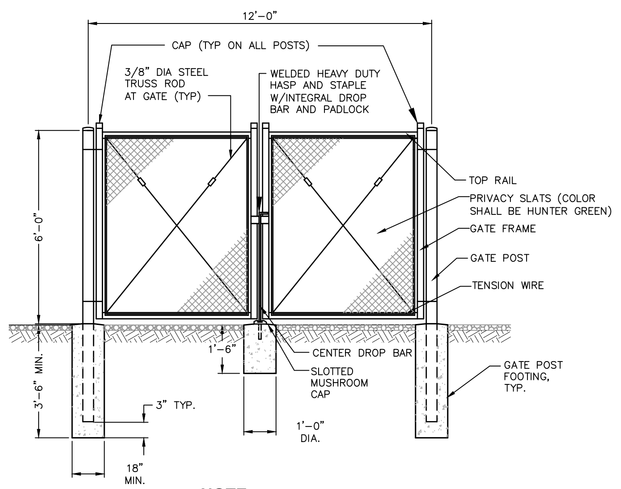


10 **PAVEMENT MARKING DETAIL DIRECTIONAL ARROW**
SCALE: NOT TO SCALE



NOTES:
1. THE DUMPSTER ENCLOSURES TYPE AND COLOR SHALL MATCH BUILDING FINISH.
2. ALL WORK ASSOCIATED WITH THE DUMPSTER ENCLOSURE IS BY THE GENERAL WORK CONTRACTOR.

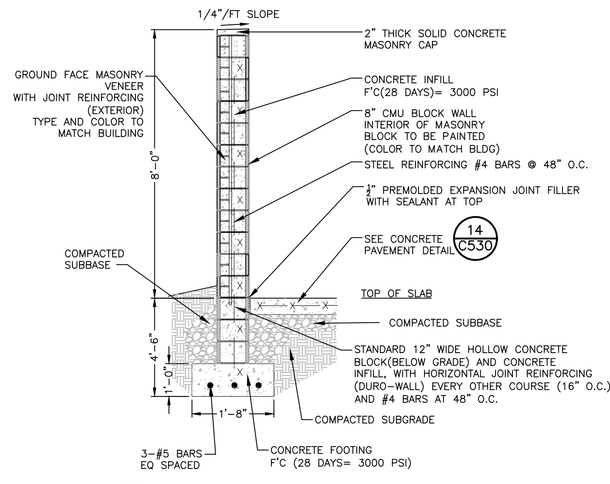
11 **DUMPSTER ENCLOSURE**
SCALE: NOT TO SCALE



GATE POST SCHEDULE	
GATE LEAF SIZE	POST O.D.
UP TO 12'	3"
12' TO 20'	4"

NOTE:
1. GATES ARE TO SWING OUTWARD, MAINTAINING 4" OF CLEARANCE FROM FINISHED GRADE.
2. ALL GATE COMPONENTS SHALL BE VINYL COATED HUNTER GREEN TO MATCH PRIVACY SLATS.

12 **DUMPSTER WIRE SWING GATE, DOUBLE**
SCALE: NOT TO SCALE



NOTE:
1. MASONRY EXTERIOR TYPE AND COLOR SHALL MATCH MAIN BUILDING FINISH.

13 **DUMPSTER ENCLOSURE WALL**
SCALE: NOT TO SCALE

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rev.	date	description

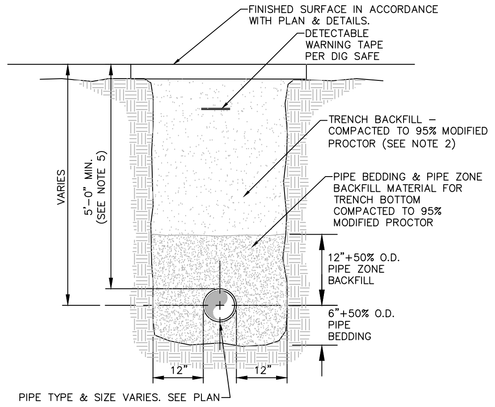
RAPP ROAD RESIDENTIAL DEVELOPMENT

SITE DETAILS

TOWN OF GUILDERLAND, ALBANY COUNTY, NEW YORK

designed	checked
SM	RK
date	scale
03/11/19	AS NOTED
project no.	
317A1.00	
sheet no.	
C531	

Drawing Name: Z:\projects\31700-31799\317A1.00 Rapp Road\DWG\02_C530_317A1-00_SITE DETAILS.dwg
Xref's Attached: XTB_317A1-00_30x42
Date Printed: Feb 14, 2020, 9:08am



PIPE TYPE & SIZE VARIES. SEE PLAN

NOTES:

1. PIPE BEDDING & PIPE ZONE BACKFILL SHALL BE A NATURAL RUN-OF-BANK (R.O.B.) SAND OR A MIXTURE OF CRUSHED STONE AND GRAVEL, FREE OF SOFT, NONDURABLE PARTICLES, ORGANIC MATERIALS AND ELONGATED PARTICLES, AND SHALL BE WELL GRADED FROM FINE TO COARSE PARTICLES. BEDDING GRADATIONS SHALL BE APPROVED BY THE ENGINEER AND SHALL MEET THE FOLLOWING GRADATION REQUIREMENTS:

SIEVE DESIGNATION	% PASSING
1/4"	100%
NO. 60	0–70%
NO. 100	0–10%

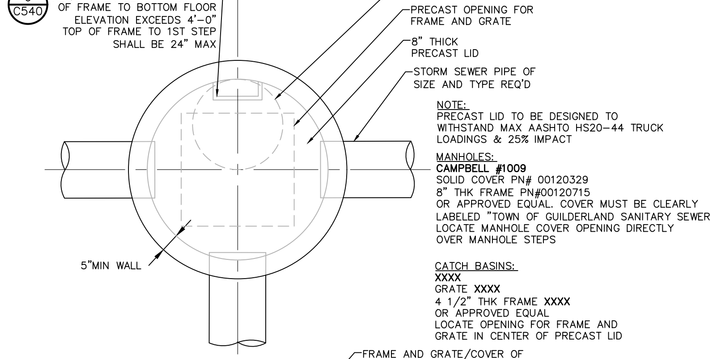
2. TRENCH BACKFILL SHALL BE A NATURAL RUN-OF-BANK (R.O.B.) OR PROCESSED GRAVEL, OR EXCAVATED MATERIAL FREE OF SOFT, NONDURABLE PARTICLES, ORGANIC MATERIALS AND ELONGATED PARTICLES, AND SHALL BE WELL GRADED FROM FINE TO COARSE PARTICLES. TRENCH BACKFILL GRADATIONS SHALL BE APPROVED BY THE ENGINEER AND SHALL MEET THE FOLLOWING GRADATION REQUIREMENTS:

SIEVE DESIGNATION	% PASSING
4"	100%
NO. 40	0–70%
NO. 200	0–15%

IN NON-TRAFFIC UNPAVED AREAS TRENCH BACKFILL CAN BE MATERIALS EXCAVATED FROM THE TRENCH AS APPROVED BY THE ENGINEER AND COMPACTED TO 90% MODIFIED PROCTOR.

3. INSTALL CONTINUOUS DETECTABLE MARKING TAPE DURING BACKFILLING OF TRENCH FOR UNDERGROUND PIPING. LOCATE TAPE 12" BELOW FINISHED GRADE, DIRECTLY OVER PIPING, EXCEPT 6" BELOW SUBGRADE UNDER PAVEMENTS & SLAB.
4. TRENCHING SHALL BE IMPLEMENTED IN ACCORDANCE WITH O.S.H.A. STANDARDS.
5. 5'–0" MIN COVER SHALL BE APPLIED TO WATER MAIN OR SANITARY SEWER FORCE MAINS ONLY.

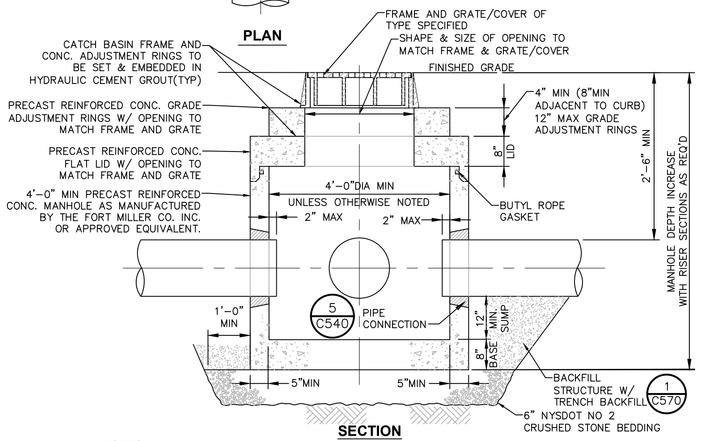
1 PIPE TRENCH DETAIL (TYPICAL)
SCALE: NOT TO SCALE



NOTE:
PRECAST LID TO BE DESIGNED TO WITHSTAND MAX AASHTO HS20–44 TRUCK LOADINGS & 25% IMPACT

MANHOLES:
CAMPBELL #1009
SOLID COVER PN# 00120329
8" THK FRAME PN#00120715
OR APPROVED EQUAL COVER MUST BE CLEARLY LABELED "TOWN OF GUILDERLAND SANITARY SEWER"
LOCATE MANHOLE COVER OPENING DIRECTLY OVER MANHOLE STEPS

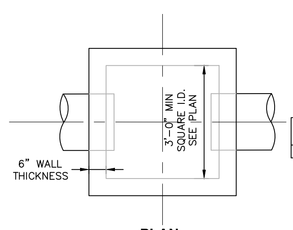
CATCH BASINS:
XXXX
GRATE **XXX**
4 1/2" THK FRAME **XXXX**
OR APPROVED EQUAL
LOCATE OPENING FOR FRAME AND GRATE IN CENTER OF PRECAST LID



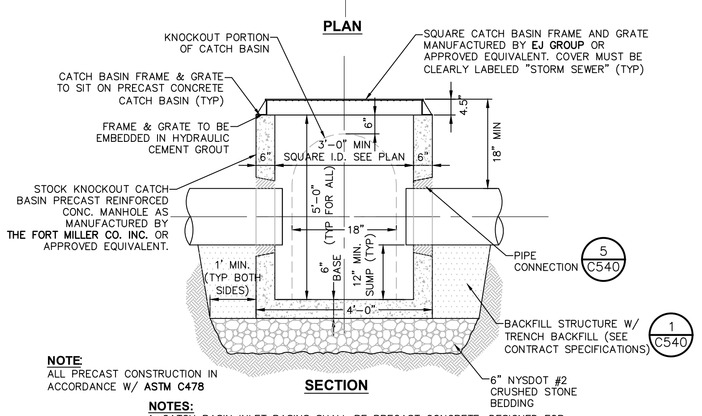
SECTION

NOTES
1. CATCH BASIN SHALL BE PRECAST CONCRETE. DESIGNED FOR HS20–44 VEHICULAR LOADING AND 25% IMPACT.
2. FRAME AND COVER SHALL BE DESIGNED FOR HS20–44 VEHICULAR LOADING & 25% IMPACT.
3. CONCRETE CATCH BASIN LID CLEAR OPENING DIMENSION MUST MATCH FRAME AND GRATE CLEAR OPENING DIMENSION.
4. CATCH BASINS HAVING A DEPTH GREATER THAN 48" FROM FINISHED SURFACE TO THE FLOOR OF THE CONCRETE BASE SHALL BE PROVIDED WITH STEPS.
5. BACKFILL USING TRENCH BACKFILL, COMPACTED IN 6" LIFTS.
6. SUMPS FOR CATCH BASINS SHALL BE 12".
7. ECCENTRIC CONE TOP CAN BE USED FOR MANHOLES DEPTH GREATER THAN 7 FEET.
8. SEE CHART FOR REQUIRED MANHOLES / CATCH BASINS DIAMETERS.
9. ALL PRECAST CONSTRUCTION IN ACCORDANCE W/**ASTM C478**

2 PRECAST CONCRETE CATCH BASIN/MANHOLE DETAIL
SCALE: NOT TO SCALE



NY	FRAME & GRATE PART NUMBER	ACCESSIBLE GRATE OPTION
36"x36"	V–5636	V–5636–80

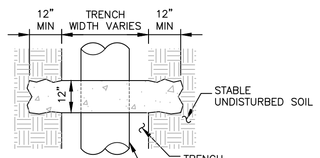


NOTE
ALL PRECAST CONSTRUCTION IN ACCORDANCE W/ **ASTM C478**

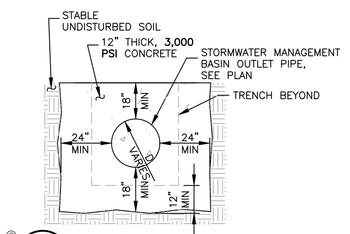
SECTION

NOTES:
1. CATCH BASIN INLET BASINS SHALL BE PRECAST CONCRETE, DESIGNED FOR HS20–44 VEHICULAR LOADING + 25% IMPACT AS MANUFACTURED BY FORT MILLER OR APPROVED EQUAL.
2. CATCH BASIN SHALL NOT HAVE A DEPTH GREATER THAN 60" FROM FINISHED SURFACE.
3. BACKFILL USING TRENCH BACKFILL, COMPACTED IN 6" LIFTS.
4. MAX STORM SEWER PIPE FOR SHALLOW 2' CATCH BASIN IS 15"

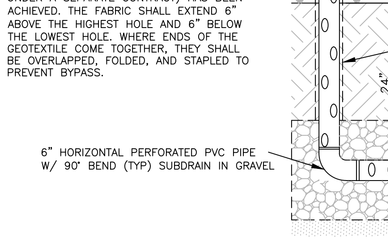
10 PRECAST CONCRETE SHALLOW CATCH BASIN DETAIL
SCALE: NOT TO SCALE



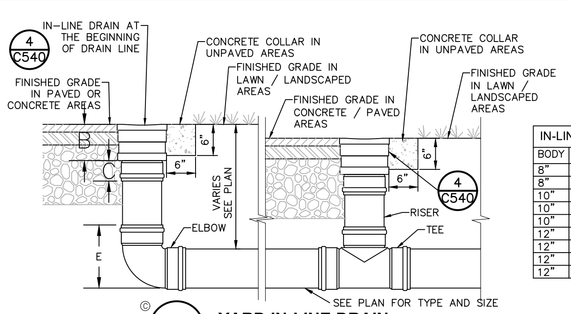
PLAN



13 ANTI-SEEP COLLAR
SCALE: NOT TO SCALE

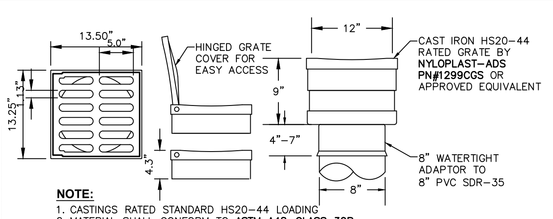


14 INFILTRATION BASINS RISER PIPE
SCALE: NOT TO SCALE



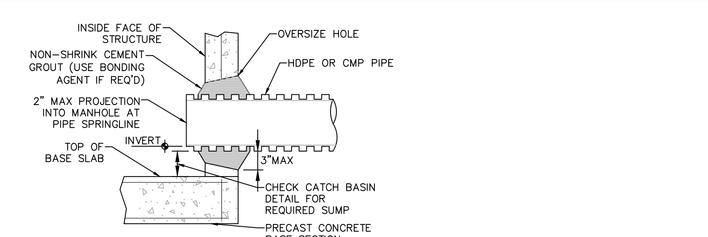
3 YARD IN-LINE DRAIN
SCALE: NOT TO SCALE

IN-LINE DRAIN DIMENSIONS					
BODY	ADAPTOR	B	C	E	MIN INV DEPTH
8"	6"	5.25"	4.21"	12.75"	2'–0"
8"	8"	7.25"	5.25"	13.25"	2'–2"
10"	6"	8.75"	4.21"	12.75"	2'–2"
10"	8"	6.50"	5.25"	13.25"	2'–2"
10"	10"	7.75"	6.08"	21.75"	3'–0"
12"	6"	11.50"	4.21"	12.75"	2'–6"
12"	8"	11.50"	5.25"	13.25"	3'–0"
12"	10"	11.25"	6.08"	21.75"	3'–4"
12"	12"	6.00"	6.45"	23.50"	3'–6"



NOTE:
1. CASTINGS RATED STANDARD HS20–44 LOADING
2. MATERIAL SHALL CONFORM TO **ASTM A48–CLASS 30B**
3. PAINT: CASTINGS TO BE FURNISHED WITH A BLACK PAINT
4. IN–LINE DRAIN BY NYLOPLAST OR APPROVED EQUIVALENT
5. DRAIN AREA = 62.7 SQ. INCH

4 12" IN-LINE DRAIN & GRATE
SCALE: NOT TO SCALE



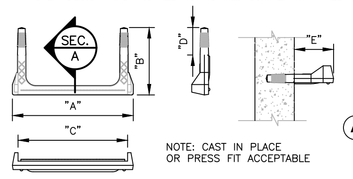
5 PIPE CONNECTION TO DRAINAGE STRUCTURE- CMP OR HDPE CEMENT GROUT SEAL JOINT
SCALE: NOT TO SCALE

ACCEPTABLE MANHOLE STEPS

MANUFACTURER	PATTERN NUMBER	"A" STEP WIDTH	"B" LEG LENGTH	"C" RUNG CLEAR	"D" EMBED–MENT	"E" RUNG CLEAR
M.A. INDUSTRIES INC*	PS2–PF	14 3/4	9 1/4	13 3/4	3 3/8	5 7/8
M.A. INDUSTRIES INC*	PS2–PFS	14 3/4	8 1/4	13 3/4	3 3/8	4 7/8

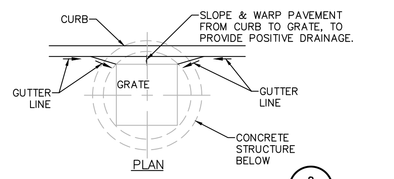
* OR EQUIVALENT

MH STEP DESIGN AND INSTALLATION SHALL COMPLY WITH ALL OSHA REGULATIONS



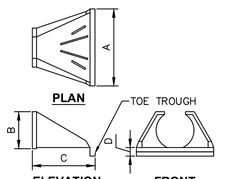
NOTE: CAST IN PLACE OR PRESS FIT ACCEPTABLE

6 COPOLYMER POLYPROPYLENE MH STEP
SCALE: NOT TO SCALE



PLAN

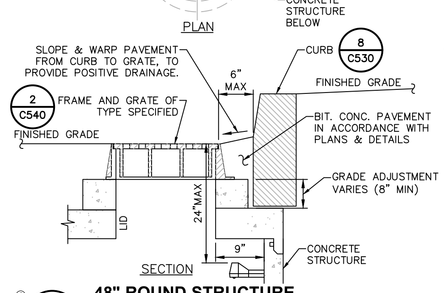
TYPICAL HDPE END SECTION				
PIPE DIA.	END SECTION DIMENSIONS A	B	C	D
12"	42"	14"	34"	6"
15"	42"	17"	34"	6"



ELEVATION FRONT

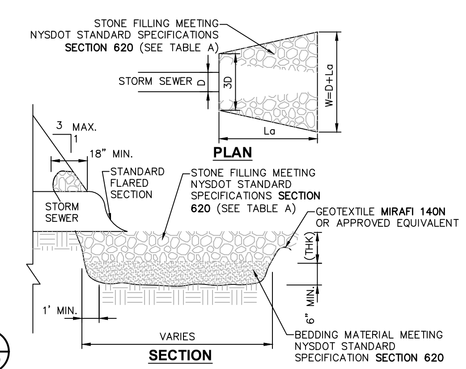
NOTES:
1. SCOPE: THIS SPECIFICATION DESCRIBES 12– THROUGH 36–INCH ADS FLARED END SECTIONS FOR USE IN CULVERT AND DRAINAGE OUTLET APPLICATIONS. FES LARGER THAN 36" SHALL USE CIRCULAR CORRUGATED METAL FLARED END SECTIONS.
2. REQUIREMENTS: THE INVERT OF THE PIPE AND THE END SECTION SHALL BE AT THE SAME ELEVATION. THE ADS FLARED END SECTION SHALL BE HIGH DENSITY POLYETHYLENE MEETING **ASTM D3350** MINIMUM CELL **CLASSIFICATION 213320C**; CONTACT MANUFACTURER FOR ADDITIONAL CELL CLASSIFICATION INFORMATION. WHEN PROVIDED, THE METAL THREADED FASTENING ROD SHALL BE STAINLESS STEEL.
3. INSTALLATION: INSTALLATION SHALL BE IN ACCORDANCE WITH ADS INSTALLATION INSTRUCTIONS AND WITH THOSE ISSUED BY STATE OR LOCAL AUTHORITIES. CONTACT YOUR LOCAL ADS REPRESENTATIVE OR VISIT WWW.ADS–PIPE.COM FOR THE LATEST INSTALLATION INSTRUCTIONS.
4. PROVIDE TRASH RACK ONLY WHERE SPECIFIED ON SITE PLANS.

8 TYPICAL END SECTION - HDPE
SCALE: NOT TO SCALE



7 48" ROUND STRUCTURE PLACEMENT AT CURB
SCALE: NOT TO SCALE

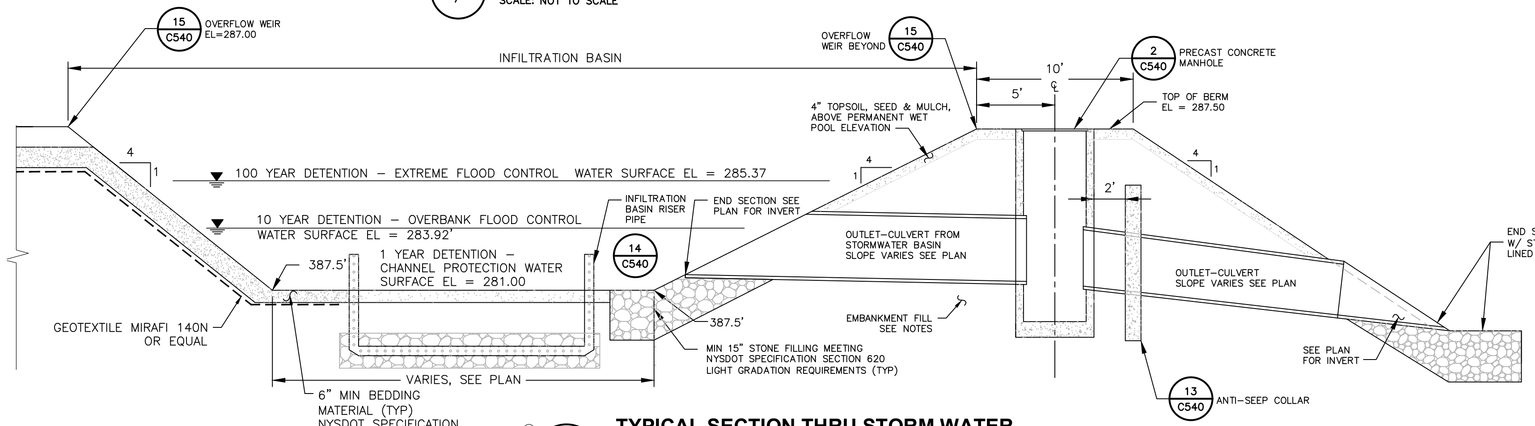
STONE APRON SIZING REQUIREMENT - TABLE "A"						
CULVERT DIA. (D)	CULVERT SLOPE, %	NYSDOT STANDARD STONE FILLING APRON MATERIAL	d50	dMAX	MINIMUM APRON THICKNESS (IN)	MINIMUM OUTLET APRON LENGTH(FT) (Lo)
12"	< 8	LIGHT	6"	9"	18	10
	8–10	MEDIUM	9"–12"	14"–18"	24	10
18"	< 4	LIGHT	6"	9"	18	10
	4–6	MEDIUM	9"–12"	14"–18"	24	12
	6–8	HEAVY	15"–18"	22"–27"	36	12
	8–10	HEAVY	15"–18"	22"–27"	36	18



PLAN

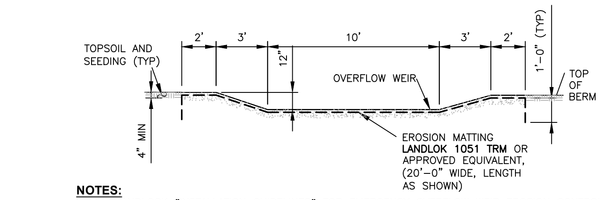
SECTION

9 END SECTION WITH STONE LINED APRON DETAIL
SCALE: NOT TO SCALE

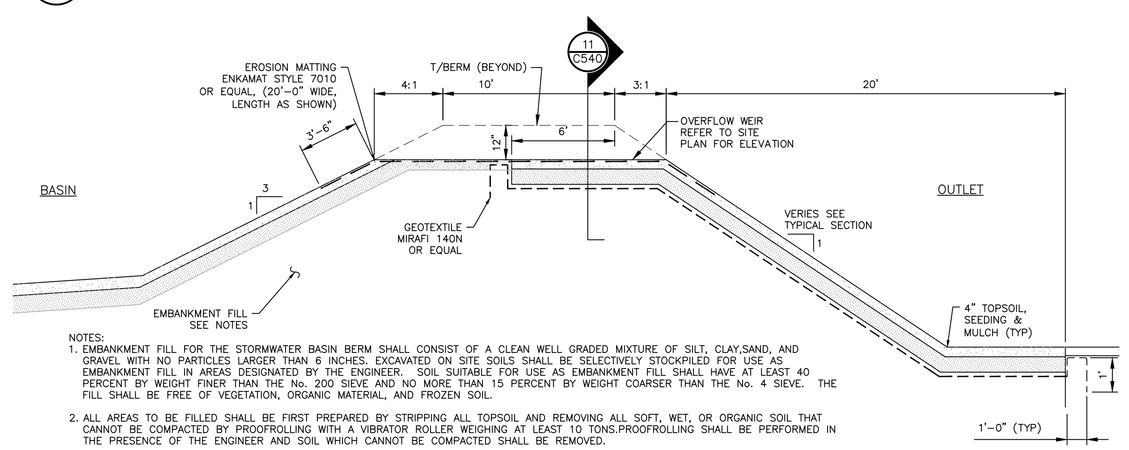


12 TYPICAL SECTION THRU STORM WATER INFILTRATION BASINS (TYPE I-2 POND)
SCALE: NOT TO SCALE

STORM SEWER NOTES:
1. ALL STORM WATER MANAGEMENT STRUCTURES (I.E. CATCH BASIN, ETC.) SHALL BE REGULARLY INSPECTED FOR SEDIMENT ACCUMULATIONS. CATCH BASINS SHALL BE CLEANED WHEN SEDIMENT DEPTH REACHES A MAXIMUM OF 1/2 THE AVAILABLE SUMP DEPTH.
2. IF GROUNDWATER IS ENCOUNTERED DURING CONSTRUCTION ACTIVITIES, THE CONTRACTOR SHALL CONSTRUCT A DEWATERING PIT (A.K.A. SUMP PIT) TO TRAP AND FILTER WATER FOR PUMPING TO A SUITABLE DISCHARGE AREA. THE DEWATERING PIT SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE NEW YORK STATE GUIDELINES FOR URBAN EROSION AND SEDIMENT CONTROL, LATEST EDITION.
3. ALL EROSION CONTROL MEASURES EMPLOYED DURING THE CONSTRUCTION PROCESS SHALL BE AS OUTLINED ON THE EROSION AND SEDIMENT CONTROL PLANS, DETAILS AND NOTES.



16 SECTION THRU STORM WATER BASIN OVER FLOW WEIR
SCALE: NOT TO SCALE



NOTES:
1. EMBANKMENT FILL FOR THE STORMWATER BASIN BERM SHALL CONSIST OF A CLEAN WELL GRADED MIXTURE OF SILT, CLAY,SAND, AND GRAVEL WITH NO PARTICLES LARGER THAN 6 INCHES. EXCAVATED ON SITE SOILS SHALL BE SELECTIVELY STOCKPILED FOR USE AS EMBANKMENT FILL IN AREAS DESIGNATED BY THE ENGINEER. SOIL SUITABLE FOR USE AS EMBANKMENT FILL SHALL HAVE AT LEAST 40 PERCENT BY WEIGHT FINER THAN THE No. 200 SIEVE AND NO MORE THAN 15 PERCENT BY WEIGHT COARSER THAN THE No. 4 SIEVE. THE FILL SHALL BE FREE OF VEGETATION, ORGANIC MATERIAL, AND FROZEN SOIL.
2. ALL AREAS TO BE FILLED SHALL BE FIRST PREPARED BY STRIPPING ALL TOPSOIL AND REMOVING ALL SOFT, WET, OR ORGANIC SOIL THAT CANNOT BE COMPACTED BY PROOFROLLING WITH A VIBRATOR ROLLER WEIGHING AT LEAST 10 TONS.PROOFROLLING SHALL BE PERFORMED IN THE PRESENCE OF THE ENGINEER AND SOIL WHICH CANNOT BE COMPACTED SHALL BE REMOVED.
3. ALL FILL SHALL BE PLACED IN LIFTS NOT EXCEEDING 8 INCHES IN THICKNESS WHEN LOOSE AND SHALL BE COMPACTED TO A DENSITY OF AT LEAST 95 PERCENT OF THE MAXIMUM DRY DENSITY AS DETERMINED IN ACCORDANCE WITH ASTM–1557. ALL FILL SHALL BE PLACED UNDER THE FULL TIME OBSERVATION OF THE ENGINEER.

15 TYPICAL SECTION THRU STORM WATER BASIN OVERFLOW WEIR
SCALE: NOT TO SCALE

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- Wait The Required Time
- Confirm Utility Response
- Respect The Marks
- Dig With Care

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- ☒ Capital District Office: 547 River Street, Troy, New York 12180, Phone: (518) 273–0055
- ☐ Westchester NY Office: 1 North Broadway, Suite 803, White Plains, New York 10601, Phone: (914) 997–8510
- Nashville Tennessee Office: 2416 21st Ave S. (Suite 103), Nashville, Tennessee 37212, Phone: (615) 380–1359
- Chattanooga Tennessee Office: 427 E. 5TH ST. (Suite 201), Chattanooga, Tennessee 37403, Phone: (423) 241–6575

rev.	date	description

RAPP ROAD RESIDENTIAL DEVELOPMENT

STORM SEWER DETAILS

TOWN OF GUILDERLAND, ALBANY COUNTY, NEW YORK

designed	checked
SM	RK
date	scale
03/11/19	AS NOTED
project no.	317A1.00
sheet no.	C540

Drawing Name: Z:\projects\31700–31799\317A1.00 Rapp Road\DWG\02_C540_317A1–00_STORM DETAILS.dwg
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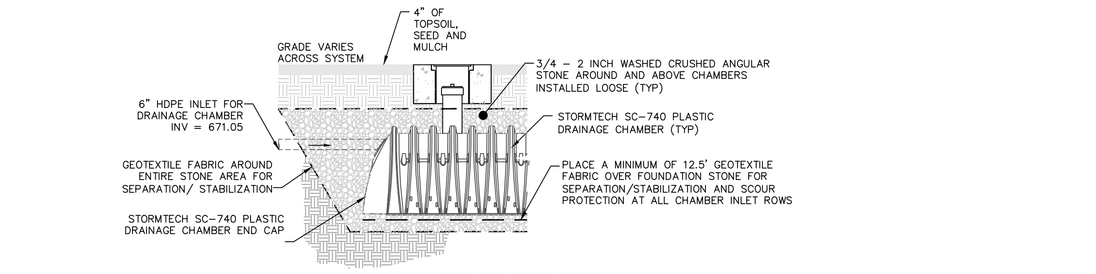
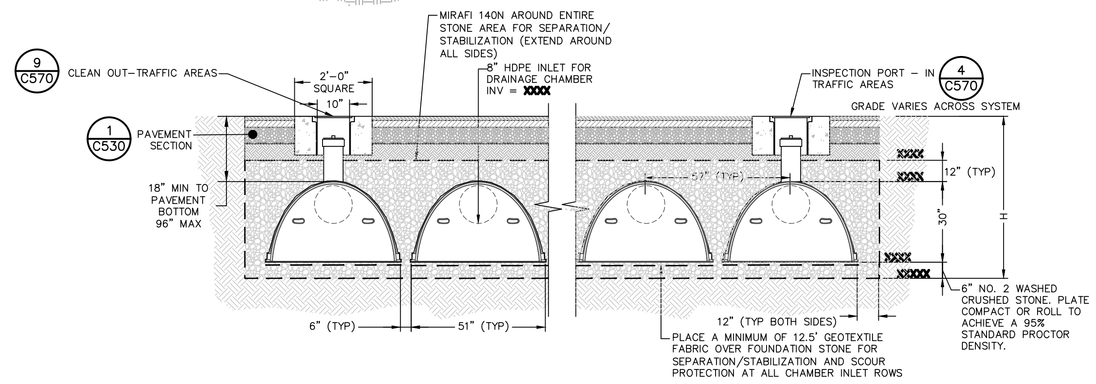
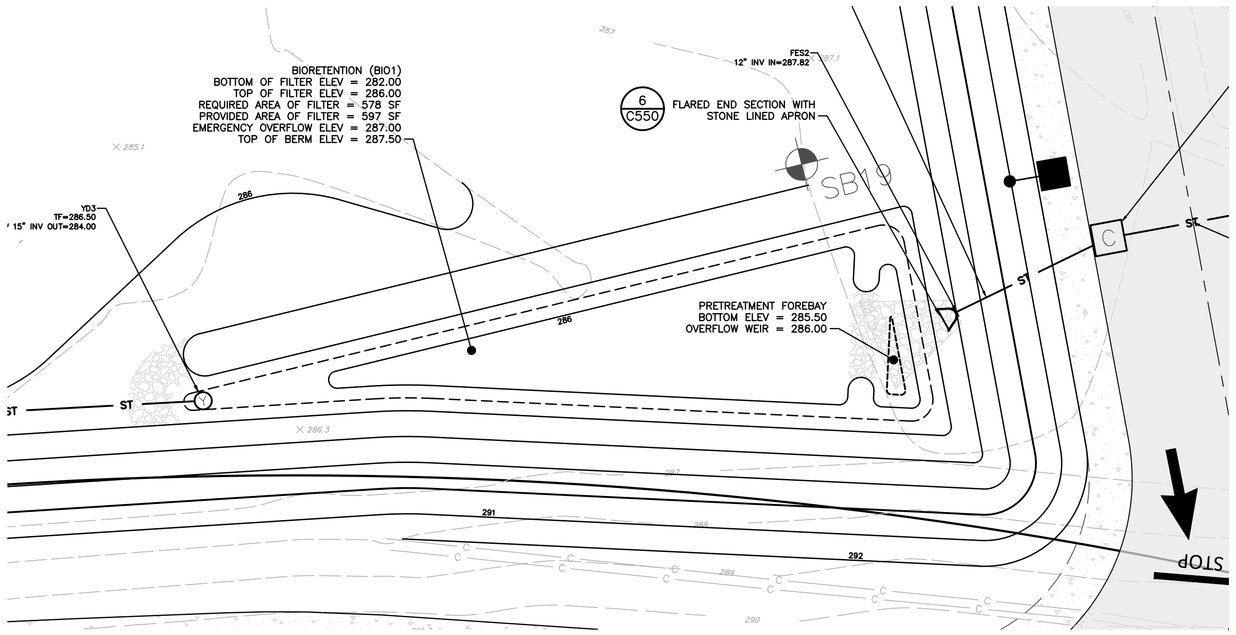
Date Printed: Feb 14, 2020, 9:10am



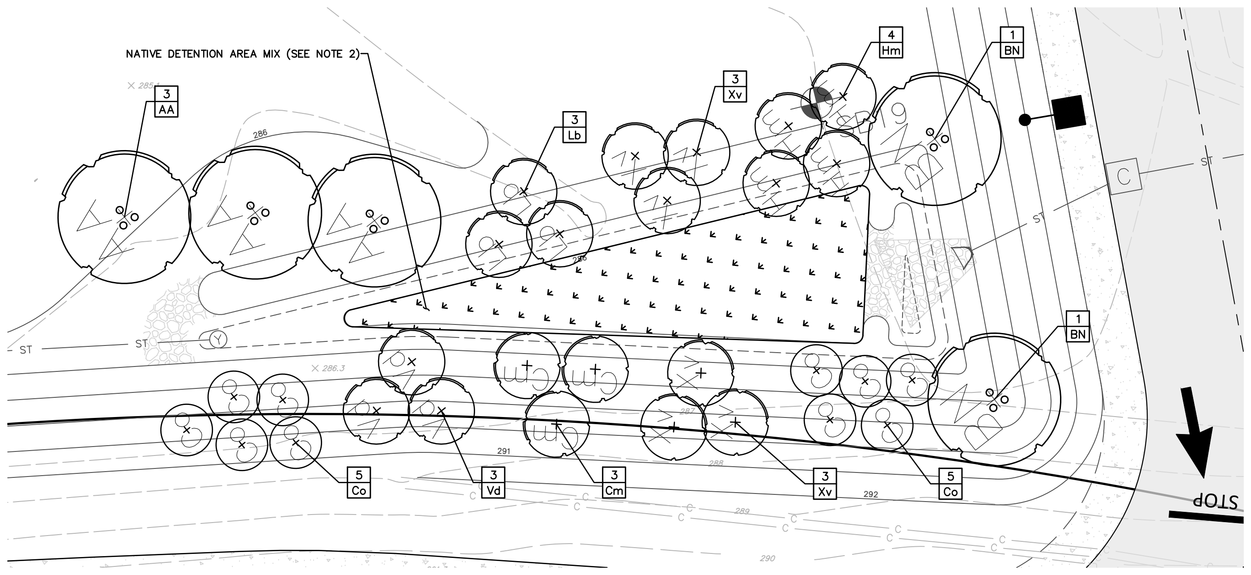


NOTE:
1. SYSTEM REQUIRES 30 STORMWATER CHAMBERS.

1 SUBSURFACE INFILTRATION SYSTEM - TYPICAL CROSS SECTION
SCALE: NOT TO SCALE



2 BIORETENTION SWPPP ID #BIO1 GRADING AND DRAINAGE
SCALE: SCALE-H



3 BIORETENTION SWPPP ID #BIO1 PLANTING
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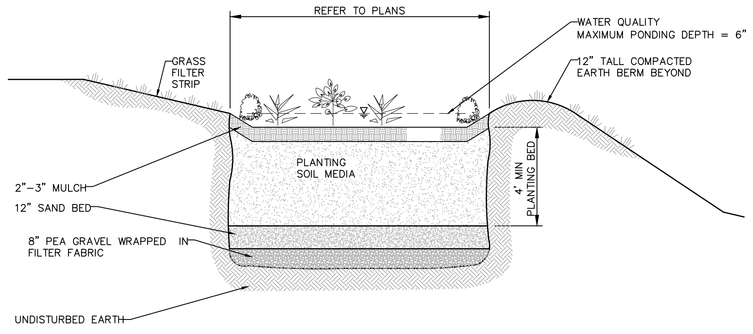

SECTION

4 TYPICAL BIORETENTION DETAIL
SCALE: NOT TO SCALE

MATERIALS SPECIFICATION FOR BIORETENTION

PARAMETERS	SPECIFICATIONS	SIZE	NOTES:
PLANTINGS	SEE YOUR LOCAL NRCS STANDARD SPECIFICATIONS GUIDANCE	N/A	PLANTINGS ARE SITE-SPECIFIC
PLANTING SOILS [4"=DEEP]	SAND 35-60% SILT 30-55% CLAY 10-25%	N/A	USDA SOIL TYPES LOAMY SAND, SANDY LOAM OR LOAM
MULCH	UN COLORED SHREDDED HARDWOOD		AGED 6 MONTHS, MINIMUM
PEA GRAVEL DIAPHRAGM AND CURTAIN DRAIN	PEA GRAVEL: ASTM D 448 ORNAMENTAL STONE: WASHED COBBLES	PEA GRAVEL: NO 6 STONE: 2"-5"	
GEOTEXTILE	CLASS "C" APPARENT OPPENING SIZE (ASTM-D-4751) GRAB TENSILE STREANGTH (ASTM-D-4632) BURST STRENGTH (ASTM-D-4833)	N/A	FOR USE AS NECESSARY BENEATH UNDERDRAINS ONLY
SAND [12"=DEEP]	AASHTO M-6 OR ASTM C-33	0.02" - 0.04"	SAND SUBSTITUTION SUCH AS DIABASE GRAYSTONE #10 ARE NOT ACCEPTABLE. NO CALCIUM CARBONATE OR DOLOMITIC SAND SUBSTITUTE ARE ACCEPTABLE. NO "ROCK DUST" CAN BE USED FOR SAND

NOTES:

1. BIORETENTION FACILITIES SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH "THE NEW YORK STATE STORMWATER MANAGEMENT DESIGN MANUAL", CHAPTER 6.
2. PLANTING SOIL SHALL BE TESTED & MEET THE FOLLOWING CRITERIA:
   - PH RANGE 5.2-7.0
   - ORGANIC MATTER 1.5-4%
   - MAGNESIUM 35 LB/AC
   - PHOSPHOROUS P_2O_5 75LB/AC
   - POTASSIUM K_2O 85/AC
   - SOLUBLE SALTS NOT TO EXCEED 500PPM
3. ROTOTILL 2-3" OF SAND BASE INTO THE BASE OF THE BIORETENTION FACILITY.
4. BACK FILLING OF BIORETENTION FACILITY SHALL BE PLACED IN 12" LIFTS.
5. MAIN COLLECTOR PIPE OF THE UNDER DRAIN SYSTEM SHALL BE CONSTRUCTED AT A MINIMUM SLOPE OF 0.5%. OBSERVATION WELLS OR CLEAN OUT PIPES MUST BE PLACED EVERY 1000SF OF SURFACE AREA.
6. BIORETENTION AREA MAY NOT BE CONSTRUCTED UNTIL ALL CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED.

PLANT LIST

QTY	ABRV	BOTANICAL NAME	COMMON NAME	SIZE	COND	SPACING	REMARKS
TREES							
3	AA	Amelanchelr arborea	Serviceberry	7'-8' Ht.	B&B	As Shown	Multi-Stem
2	BN	Betula nigra	River Birch	7'-8' Ht.	B&B	As Shown	Multi-Stem
SHRUBS							
10	Co	Cepahlanthus occidentalis	Buttonbush	24"-36" Ht.	Cont.	As Shown	
3	Cm	Cornus amomium	Silky Dogwood	24"-36" Ht.	Cont.	As Shown	
4	Hm	Hamamelis virginiana	Witch Hazel	24"-36" Ht.	Cont.	As Shown	
6	Xv	Ilex verticillata	Winterberry	24"-36" Ht.	Cont.	As Shown	
3	Lb	Lindera benzoin	Common Spice Bush	24"-36" Ht.	Cont.	As Shown	
3	Vd	Viburnum dentatum	Arrowood Viburnum	24"-36" Ht.	Cont.	As Shown	

NOTES:

1. ALL PLANT BEDS (TREES/SHRUBS/HERBACEOUS PLANTS) ARE TO INCLUDE 3" DEPTH HARDWOOD MULCH.
2. AREAS NOTED/HATCHED AS NATIVE DETENTION AREA SEED MIX SHALL BE SEEDED WITH THE FOLLOWING & MULCHED (TYP):

   NATIVE DETENTION AREA MIX BY ERNST (OR APPROVED EQUAL):
   Deertongue 'Tioga', Fox Sedge, Virginia Wildrye, Switchgrass 'Shawnee', Autumn Bentgrass, Path Rush, Soft Rush and Pedtop Panicgrass

   SEED RATE - 20 LB PER ACRE, PER MANUFACTURER'S RECOMMENDATIONS

3. ALL DISTURBED AREAS NOT SPECIFICALLY CALLED OUT FOR NEW IMPROVEMENTS SHALL BE TOPSOILED, SEEDED WITH MEADOW SEED MIX BY ERNST (OR APPROVED EQUAL), & MULCHED (TYP)

NATIVE DETENTION AREA MIX (SEE NOTE 2)

Dig Safely. New York
- Call Before You Dig
- Wait The Required Time
- Confirm Utility Response
- Respect The Marks
- Dig With Care

800-962-7962
www.digsafelynewyork.com

FOR SITE PLAN APPROVAL - NOT FOR CONSTRUCTION

0 1 2 3
ORIGINAL SCALE IN INCHES

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- ☒ Capital District Office: 547 River Street, Troy, New York 12180, Phone: (518) 273-0055
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- Nashville Tennessee Office: 2416 21st Ave S. (Suite 103), Nashville, Tennessee 37212, Phone: (615) 380-1359
- Chattanooga Tennessee Office: 427 E. 5TH ST. (Suite 201), Chattanooga, Tennessee 37403, Phone: (423) 241-6575

rev.	date	description

RAPP ROAD RESIDENTIAL DEVELOPMENT

STORM SEWER DETAILS

TOWN OF GUILDERLAND, ALBANY COUNTY, NEW YORK

designed	checked
SM	RK
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03/11/19	AS NOTED
project no.	
317AI.00	
sheet no.	
C541	

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Xref's Attached: XTB_317AI-00_30x42; XBASE_ENG_317AI-00; XLAYOUT_317AI-00; XLANDSCAPING_317AI-00
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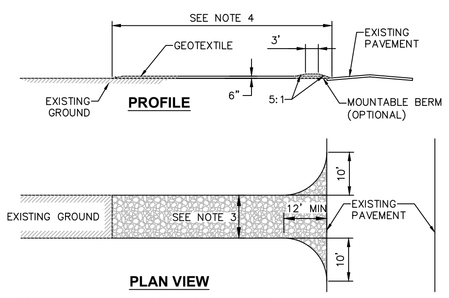
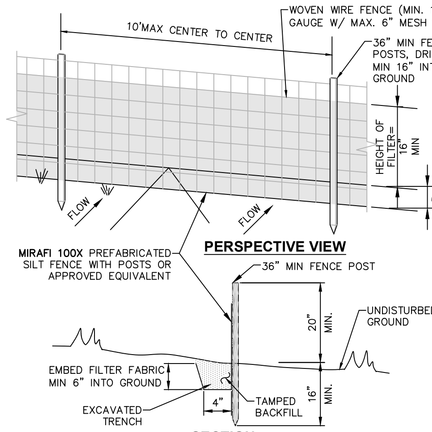


PLAN VIEW

CONSTRUCTION ACCESS SPECIFICATIONS:

1. STONE SIZE – USE 2" STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
2. THICKNESS – NOT LESS THAN SIX (6) INCHES.
3. WIDTH – TWELVE (12) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS. TWENTY FOUR (24) FEET IF SINGLE ENTRANCE TO SITE.
4. LENGTH – NOT LESS THAN 50' (EXCEPT ON A SINGLE RESIDENCE LOT WHERE A 30' MINIMUM LENGTH WOULD APPLY).
5. GEOTEXTILE – WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
6. SURFACE WATER – ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
7. MAINTENANCE – THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
8. WASHING – WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHTS-OF-WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.

① STABILIZED CONSTRUCTION ACCESS DETAIL
SCALE: NOT TO SCALE

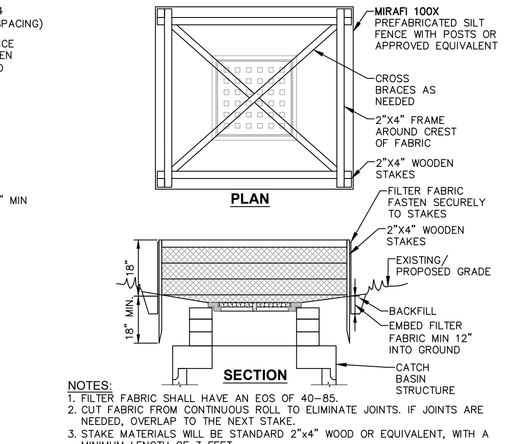


NOTES:

1. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES. POSTS SHALL BE STEEL "T" OR "U" TYPE OR HARDWOOD.
2. FILTER FABRIC TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION. FENCE SHALL BE WOVEN WIRE, 6" MAX MESH OPENING.
3. WHEN TWO SECTIONS OF FILTER FABRIC ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED BY 6" AND FOLDED.
4. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIALS REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.
5. MAXIMUM DRAINAGE AREA FOR OVERLAND FLOW TO A SILT FENCE SHALL NOT EXCEED 1/4 ACRE PER 100 FEET OF FENCE.
6. SILT FENCE SHALL BE USED WHERE EROSION COULD OCCUR IN THE FORM OF SHEET EROSION.
7. SILT FENCE SHALL NOT BE USED WHEN A CONCENTRATION OF WATER IS FLOWING TO THE BARRIER.
8. MAXIMUM ALLOWABLE SLOPE LENGTHS CONTRIBUTING RUN-OFF TO A SILT FENCE ARE:

SLOPE STEEPNESS	MAXIMUM SLOPE LENGTH(FT)
2:1	25
3:1	50
4:1	75
5:1 OR FLATTER	100

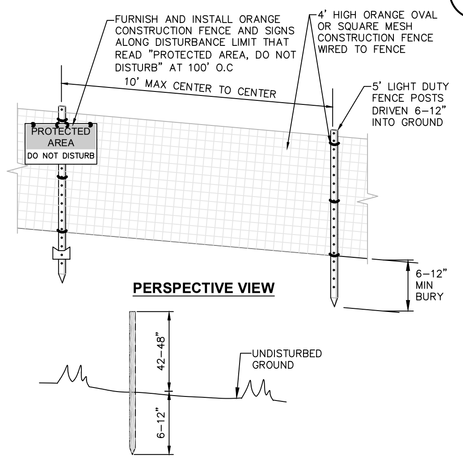
② SILT FENCE INSTALLATION DETAIL
SCALE: NOT TO SCALE



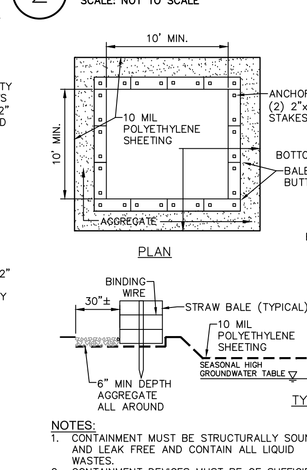
NOTES:

1. FILTER FABRIC SHALL HAVE AN EOS OF 40–85.
2. CUT FABRIC FROM CONTINUOUS ROLL TO ELIMINATE JOINTS. IF JOINTS ARE NEEDED, OVERLAP TO THE NEXT STAKE.
3. STAKE MATERIALS WILL BE STANDARD 2"x4" WOOD OR EQUIVALENT, WITH A MINIMUM LENGTH OF 3 FEET.
4. SPACE STAKES EVENLY AROUND INLET 3 FEET APART AND DRIVE MINIMUM 18" DEEP. SPANS GREATER THAN 3 FEET MAY BE BRIDGED WITH THE USE OF WIRE MESH BEHIND FABRIC FOR SUPPORT.
5. FABRIC SHALL BE EMBEDDED 1 FOOT MINIMUM BELOW GROUND AND BACKFILLED. IT SHALL BE SECURELY FASTENED TO THE STAKES AND FRAME.
6. A 2'x4" WOOD FRAME SHALL BE COMPLETED AROUND THE CREST OF THE FABRIC FOR OVERFLOW STABILITY.
7. MAXIMUM DRAINAGE AREA IS 1 ACRE.
8. INLET PROTECTION SHALL REMAIN IN–PLACE UNTIL SITE HAS BEEN STABILIZED.

③ TEMPORARY OUT OF PAVEMENT FILTER FABRIC DROP INLET PROTECTION DETAIL
SCALE: NOT TO SCALE



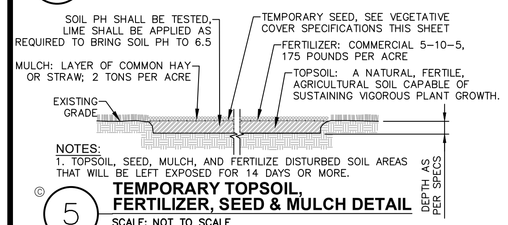
④ TEMPORARY ORANGE CONSTRUCTION FENCE DETAIL
SCALE: NOT TO SCALE



NOTES:

1. CONTAINMENT MUST BE STRUCTURALLY SOUND AND LEAK FREE AND CONTAIN ALL LIQUID WASTES.
2. CONTAINMENT DEVICES MUST BE OF SUFFICIENT QUANTITY OR VOLUME TO COMPLETELY CONTAIN THE LIQUID WASTES GENERATED.
3. WASHOUT MUST BE CLEANED OR NEW FACILITIES CONSTRUCTED AND READY TO USE ONCE WASHOUT IS 75% FULL. THIS INCLUDES REPLACEMENT OF THE 10 MIL POLYETHLENE SHEETING.
4. WASHOUT AREA(S) SHALL BE INSTALLED IN A LOCATION EASILY ACCESSIBLE BY CONCRETE TRUCKS.
5. ONE OR MORE AREAS MAY BE INSTALLED ON THE CONSTRUCTION SITE AND MAY BE RELOCATED AS CONSTRUCTION PROGRESSES.
6. AT LEAST WEEKLY, REMOVE ACCUMULATION OF SAND AND AGGREGATE AND DISPOSE OF PROPERLY.

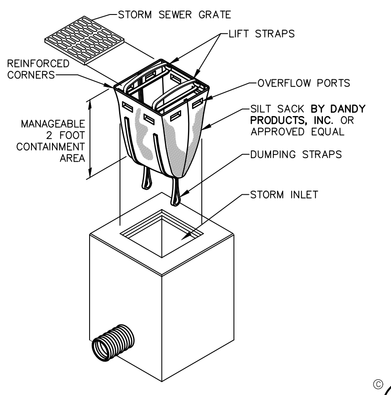
⑥ CONCRETE WASHOUT AREA DETAIL
SCALE: NOT TO SCALE



NOTES:

1. TOPSOIL, SEED, MULCH, AND FERTILIZE DISTURBED SOIL AREAS THAT WILL BE LEFT EXPOSED FOR 14 DAYS OR MORE.

⑤ TEMPORARY TOPSOIL, FERTILIZER, SEED & MULCH DETAIL
SCALE: NOT TO SCALE



⑦ MANUFACTURED INSERT INLET PROTECTION DETAIL
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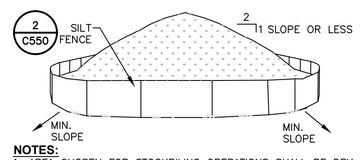

NOTES:

1. AREA CHOSEN FOR STOCKPILING OPERATIONS SHALL BE DRY AND STABLE.
2. MAXIMUM SLOPE OF STOCKPILE SHALL BE 1V:2H.
3. UPON COMPLETION OF SOIL STOCKPILING, EACH PILE SHALL BE SURROUNDED WITH SILT FENCING, THEN STABILIZED WITH VEGETATION OR COVERED.
4. SEE SPECIFICATIONS FOR INSTALLATION OF SILT FENCE.

⑧ TEMPORARY SOIL STOCKPILE DETAIL
SCALE: NOT TO SCALE

SPDES GENERAL PERMIT GP-0-15-002 COMPLIANCE NOTES:

THIS PLAN SET AND THE ACCOMPANYING SWPPP ENTITLED "CROSSGATES RESIDENTIAL DEVELOPMENT" HAVE BEEN SUBMITTED AS A SET. THESE ENGINEERING DRAWINGS ARE CONSIDERED AN INTEGRAL PART OF THE SWPPP, THEREFORE THE PLAN SET IS NOT CONSIDERED COMPLETE WITHOUT THE SWPPP.

1. THIS PROJECT HAS NOT RECEIVED WRITTEN APPROVAL FROM THE TOWN OF GUILDERLAND, ALLOWING THE DISTURBANCE OF MORE THAN FIVE (5) ACRES OF LAND AT ANY ONE TIME. THEREFORE, IF THE CONTRACTOR'S CONSTRUCTION SEQUENCE REQUIRES THE DISTURBANCE OF MORE THAN FIVE ACRES AT ANY ONE TIME, WRITTEN APPROVAL MUST BE OBTAINED FROM NYSDEC PRIOR TO EXCEEDING THE 5 ACRE LIMIT.

CONSTRUCTION SEQUENCING NOTES:

1. PRIOR TO COMMENCING ANY CLEARING, GRUBBING, EARTHWORK ACTIVITIES, ETC.AT THE SITE, THE CONTRACTOR SHALL FLAG THE WORK LIMITS AND SHALL INSTALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES (I.E. SILT FENCES, TREE PROTECTION/BARRIER FENCES, STABILIZED CONSTRUCTION ENTRANCES, STORM DRAIN SEDIMENT FILTERS, DRAINAGE DITCH SEDIMENT FILTERS, ETC.) INDICATED ON THE PROJECT DRAWINGS. TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES MUST BE CONSTRUCTED, STABILIZED, AND FUNCTIONAL BEFORE SITE DISTURBANCE BEGINS WITHIN THEIR TRIBUTARY AREAS.
2. THE CONTRACTOR SHALL CLEAR AND GRUB THE AREA OF THE STORMWATER MANAGEMENT FACILITIES. THIS AREA SHALL NOT EXCEED FIVE (5) ACRES IN EXTENT WITHOUT TEMPORARY STABILIZATION.
3. PRIOR TO COMMENCING CLEARING, GRUBBING AND/OR EARTHWORK ACTIVITIES IN ANY OTHER AREA OF THE SITE, THE CONTRACTOR SHALL INSTALL INLET AND OUTLET PROTECTION MEASURES (RIPRAP OVERFLOW WEIR(S), CULVERT INLET/OUTLET PROTECTION, ETC.) AND SHALL STABILIZE THE AREAS DISTURBED DURING THE CONSTRUCTION OF THE SEDIMENT BASIN.
4. TEMPORARY DIVERSION MEASURES SHALL BE LOCATED IN A MANNER THAT WILL ASSURE THAT THE AREA TRIBUTARY TO EACH DIVERSION DOES NOT EXCEED FIVE (5) ACRES. THESE TEMPORARY DIVERSION MEASURES SHALL BE INSPECTED DAILY AND REPAIRED/STABILIZED AS NECESSARY TO MINIMIZE EROSION.
5. THE CONTRACTOR SHALL COMMENCE SITE CONSTRUCTION ACTIVITIES INCLUDING CLEARING & GRADING OF THE PROPOSED AREA OF DISTURBANCE AS REQUIRED.
6. INSTALL PROTECTIVE MEASURES AT THE LOCATIONS OF ALL GRATE INLETS, CURB INLETS, AND AT THE ENDS OF ALL EXPOSED STORM SEWER PIPES.
7. CONSTRUCT ALL UTILITIES, CURB AND GUTTER, GUTTER INLETS, AREA INLETS, AND STORM SEWER MANHOLES, AS SHOWN ON THE PLANS. INLET PROTECTION MAY BE REMOVED TEMPORARILY FOR THIS CONSTRUCTION. PLACE REQUIRED RIP–RAP AT LOCATIONS SHOWN ON THE PLANS.
8. FINALIZE PAVEMENT SUB–GRADE PREPARATION.
9. REMOVE PROTECTIVE MEASURES AROUND INLETS AND MANHOLES NO MORE THAN 24 HOURS PRIOR TO PLACING STABILIZED BASE COURSE.
10. INSTALL SUB–BASE MATERIAL AS REQUIRED FOR PAVEMENT.
11. PRIOR TO FINALIZING CONSTRUCTION OF THE STORMWATER MANAGEMENT FACILITY, ALL CATCH BASINS AND DRAINAGE LINES SHALL BE CLEANED OF ALL SILT AND SEDIMENT.
12. THE CONTRACTOR SHALL REMOVE ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES AND IMMEDIATELY ESTABLISH PERMANENT VEGETATION ON THE AREAS DISTURBED DURING THEIR REMOVAL.

EROSION AND SEDIMENT CONTROL MEASURES:

1. DAMAGE TO SURFACE WATERS RESULTING FROM EROSION AND SEDIMENTATION SHALL BE MINIMIZED BY STABILIZING DISTURBED AREAS AND BY REMOVING SEDIMENT FROM CONSTRUCTION SITE DISCHARGES.
2. AS MUCH AS IS PRACTICAL, EXISTING VEGETATION SHALL BE PRESERVED. 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 SHALL BE PLANNED TO MINIMIZE THE SCOPE AND DURATION OF SOIL DISRUPTION.
4. PERMANENT TRAFFIC CORRIDORS SHALL BE ESTABLISHED AND "ROUTES OF CONVENIENCE" SHALL BE AVOIDED. STABILIZED CONSTRUCTION ENTRANCES SHALL BE INSTALLED AT ALL POINTS OF ENTRY ONTO THE PROJECT SITE.

MAINTENANCE OF EROSION AND SEDIMENT CONTROL MEASURES:

PERMANENT AND TEMPORARY VEGETATION:
INSPECT ALL AREAS THAT HAVE RECEIVED VEGETATION EVERY SEVEN DAYS & AFTER EVERY RAIN EVENT. ALL AREAS DAMAGED BY EROSION OR WHERE SEED HAS NOT ESTABLISHED SHALL BE REPAIRED AND RESTABILIZED IMMEDIATELY.

STABILIZED CONSTRUCTION ENTRANCE:
INSPECT THE ENTRANCE PAD EVERY SEVEN DAYS & AFTER EVERY RAIN EVENT. CHECK FOR MUD, SEDIMENT BUILD–UP AND PAD INTEGRITY. MAKE DAILY INSPECTIONS DURING WET WEATHER. RESHAPE PAD AS NEEDED FOR DRAINAGE AND RUNOFF CONTROL, WASH AND REPLACE STONE AS NEEDED. THE STONE IN THE ENTRANCE SHOULD BE WASHED OR REPLACED WHENEVER THE ENTRANCE FAILS TO REDUCE MUD BEING CARRIED OFF–SITE BY VEHICLES. IMMEDIATELY REMOVE MUD AND SEDIMENT TRACKED OR WASHED ONTO PUBLIC ROADS BY BRUSHING OR SWEEPING. REMOVE TEMPORARY CONSTRUCTION ENTRANCE AS SOON AS THEY ARE NO LONGER NEEDED TO PROVIDE ACCESS TO THE SITE.

SILT FENCE:
INSPECT FOR DAMAGE EVERY SEVEN DAYS & AFTER EVERY RAIN EVENT. MAKE ALL REPAIRS IMMEDIATELY. REMOVE SEDIMENT FROM THE UP–SLOPE FACE OF THE FENCE BEFORE IT ACCUMULATES TO A HEIGHT EQUAL TO 1/3 THE HEIGHT OF THE FENCE. IF FENCE FABRIC TEARS, BEGINS TO DECOMPOSE, OR IN ANY WAY BECOMES INEFFECTIVE, REPLACE THE AFFECTED SECTION OF FENCE IMMEDIATELY.

SOIL STOCKPILE:
INSPECT SEDIMENT CONTROL BARRIERS (SILT FENCE OR HAY BALE) AND VEGETATION FOR DAMAGE EVERY SEVEN DAYS & AFTER EVERY RAIN EVENT. MAKE ALL REPAIRS IMMEDIATELY. REMOVE SEDIMENT FROM THE UP–SLOPE FACE OF THE SEDIMENT CONTROL BARRIER BEFORE IT ACCUMULATES TO A HEIGHT EQUAL TO 1/3 THE HEIGHT OF THE SEDIMENT CONTROL BARRIER. IF SEDIMENT CONTROL BARRIER TEARS, BEGINS TO DECOMPOSE, OR IN ANYWAY BECOMES INEFFECTIVE, REPLACE THE AFFECTED SECTION OF SEDIMENT CONTROL BARRIER IMMEDIATELY. REVEGETATE DISTURBED AREA TO STABILIZE SOIL STOCK PILE. REMOVE THE SEDIMENT CONTROL BARRIER WHEN THE SOIL STOCKPILE HAS BEEN REMOVED.

DUST CONTROL:
SCHEDULE CONSTRUCTION OPERATIONS TO MINIMIZE THE AMOUNT OF DISTURBED AREAS AT ANY ONE TIME DURING THE COURSE OF WORK. APPLY TEMPORARY SOIL STABILIZATION PRACTICES SUCH AS MULCHING, SEEDING, AND SPRAYING (WATER). STRUCTURAL MEASURES (MULCH, SEEDING) SHALL BE INSTALLED IN DISTURBED AREAS BEFORE SIGNIFICANT BLOWING PROBLEMS DEVELOP. WATER SHALL BE SPRAYED AS NEEDED. REPEAT AS NEEDED, BUT AVOID EXCESSIVE SPRAYING, WHICH COULD CREATE RUNOFF AND EROSION PROBLEMS.

STORM DRAIN INLET PROTECTION:
INSPECT ALL STORM DRAIN INLET PROTECTION DEVICES EVERY SEVEN DAYS & AFTER EVERY RAIN EVENT. MAKE REPAIRS AS NEEDED, REMOVE SEDIMENT FROM THE POOL AREA AS NECESSARY.

DEWATERING PITS:
(IF REQUIRED) -- INSPECT DAILY DURING OPERATION FOR CLOGGING OR OVERFLOW. CLEAR INLET AND DISCHARGE PIPES OF OBSTRUCTIONS. IF A FILTER MATERIAL BECOMES CLOGGED WITH SEDIMENT, PIT SHALL BE DISMANTLED AND CONSTRUCT NEW PITS AS NEEDED.

SNOW AND ICE CONTROL:
PARKING LOTS, ROADWAYS, AND DRIVEWAYS ADJACENT TO WATER QUALITY FILTERS SHALL NOT BE SANDED DURING SNOW EVENTS DUE TO HIGH POTENTIAL FOR CLOGGING FROM SAND IN SURFACE WATER RUNOFF. USE SALT ONLY FOR SNOW AND ICE CONTROL.

GENERAL EROSION AND SEDIMENT CONTROL NOTES:

1. ALL EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE IN STRICT COMPLIANCE WITH "NEW YORK STATE STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENT CONTROL", NOVEMBER 2016.
2. EXCESS SOIL TO BE STOCKPILED WITHIN THE LIMITS OF SITE DISTURBANCE IF NOT USED IMMEDIATELY FOR GRADING PURPOSES. INSTALL SILT FENCE AROUND SOIL STOCKPILES.
3. APPLY SURFACE STABILIZATION AND RESTORATION MEASURES. AREAS UNDERGOING CLEARING OR GRADING AND ANY AREAS DISTURBED BY CONSTRUCTION ACTIVITIES WHERE WORK IS DELAYED, SUSPENDED, OR INCOMPLETE AND WILL NOT BE REDISTURBED FOR 21 DAYS OR MORE SHALL BE STABILIZED WITH TEMPORARY VEGETATIVE COVER WITHIN 14 DAYS AFTER CONSTRUCTION ACTIVITY IN THAT PORTION OF THE SITE HAS CEASED. (SEE SPECIFICATIONS FOR TEMPORARY VEGETATIVE COVER). AREAS UNDERGOING CLEARING OR GRADING AND ANY AREAS DISTURBED BY CONSTRUCTION ACTIVITIES WHERE WORK IS COMPLETE AND WILL NOT BE REDISTURBED SHALL BE STABILIZED AND RESTORED WITH PERMANENT VEGETATIVE COVER AS SOON AS SITE AREAS ARE AVAILABLE AND WITHIN 14 DAYS AFTER WORK IS COMPLETE. (SEE SPECIFICATIONS FOR PERMANENT VEGETATIVE COVER). SEEDING FOR PERMANENT VEGETATIVE COVER SHALL BE WITHIN THE SEASONAL LIMITATIONS. PROVIDE STABILIZATION WITH TEMPORARY VEGETATIVE COVER WITHIN 14 DAYS AFTER WORK IS COMPLETE, FOR SEEDING OUTSIDE PERMITTED SEEDING PERIODS.
4. SEEDED AREAS TO BE MULCHED WITH STRAW OR HAY MULCH IN ACCORDANCE WITH VEGETATIVE COVER SPECIFICATIONS.
5. THE CONTRACTOR IS RESPONSIBLE FOR THE INSTALLATION AND MAINTENANCE OF ALL EROSION AND SEDIMENT CONTROL MEASURES THROUGHOUT THE COURSE OF CONSTRUCTION.
6. THE CONTRACTOR IS RESPONSIBLE FOR CONTROLLING DUST BY SPRINKLING EXPOSED SOIL AREAS PERIODICALLY WITH WATER AS REQUIRED. THE CONTRACTOR IS TO SUPPLY ALL EQUIPMENT AND WATER.
7. WHEN ALL DISTURBED AREAS ARE STABLE, ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED.

TOPSOIL SPECIFICATIONS:

1. EXISTING EXCESS TOPSOIL SHALL BE REMOVED AND STORED IN TOPSOIL STOCKPILES SUFFICIENTLY REMOVED FROM OTHER EXCAVATION OR DISTURBANCE TO AVOID MIXING. SILT FENCE SHALL BE INSTALLED AROUND TOPSOIL STOCKPILE AREAS.

SITE PREPARATION:

1. COMPLETE ROUGH GRADING AND FINAL GRADE, ALLOWING FOR DEPTH OF TOPSOIL TO BE ADDED.
2. SCARIFY ALL COMPACT, SLOWLY PERMEABLE, MEDIUM AND FINE TEXTURED SUBSOIL AREAS. SCARIFY AT APPROXIMATELY RIGHT ANGLES TO THE SLOPE DIRECTION IN SOIL AREAS THAT ARE STEEPER THAN 5%.
3. REMOVE REFUSE, WOODY PLANT PARTS, STONES OVER 3 INCHES IN DIAMETER, AND OTHER LITTER.

APPLICATION AND GRADING:

1. TOPSOIL SHALL BE DISTRIBUTED TO A UNIFORM DEPTH OF 4" OVER THE AREA. IT SHALL NOT BE PLACED WHEN IT IS PARTLY FROZEN, MUDDY, OR ON FROZEN SLOPES OR OVER ICE, SNOW, OR STANDING WATER.
2. TOPSOIL PLACED AND GRADED ON SLOPES STEEPER THAN 5% SHALL BE PROMPTLY FERTILIZED, SEEDED, MULCHED AND STABILIZED BY "TRACKING" WITH SUITABLE EQUIPMENT.
3. FOR TEMPORARY AND PERMANENT COVER, SEE LANDSCAPING DETAILS AND NOTES.

COMPACTION REQUIREMENTS

LOCATION	COMPACTION	TESTING FREQUENCY
PIPE TRENCH BACKFILL (IN PAVED AREAS)	95% ASTM D1557	1 SERIES OF TESTS FOR EACH 150 FT OR LESS OF TRENCH LENGTH. SERIES INCLUDE 3 COMPACTION TESTS SPREAD EVENLY ALONG TRENCH PROFILE.
PIPE TRENCH BACKFILL (IN UNPAVED AREAS)	90% ASTM D1557	1 SERIES OF TESTS FOR EACH 150 FT OR LESS OF TRENCH LENGTH. SERIES INCLUDE 3 COMPACTION TESTS SPREAD EVENLY ALONG TRENCH PROFILE.
PIPE BEDDING AND PIPE ZONE BACKFILL	95% ASTM D1557	1 TEST FOR EACH 150 FT OR LESS OF TRENCH LENGTH.
PAVEMENT SUBBASE AND LAST LIFT OF SELECT GRANULAR FILL (FILL BETWEEN SHEET PILES)	95% ASTM D1557	1 TEST FOR EVERY 2,000 SQ FT, OF LIFT AREA BUT NO FEWER THAN TWO TESTS PER LIFT

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FOR SITE PLAN APPROVAL - NOT FOR CONSTRUCTION

0 1 2 3
ORIGINAL SCALE IN INCHES

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rev.	date	description

RAPP ROAD RESIDENTIAL DEVELOPMENT

EROSION & SEDIMENT CONTROL DETAILS

TOWN OF GUILDERLAND, ALBANY COUNTY, NEW YORK

designed	checked
SM	RK
date	scale
03/11/19	AS NOTED
project no.	
317A1.00	
sheet no.	
C550	

Drawing Name: Z:\projects\31700–31799\317A1.00 Rapp Road\DWG\02_C550_317A1–00_ESC DETAILS.dwg
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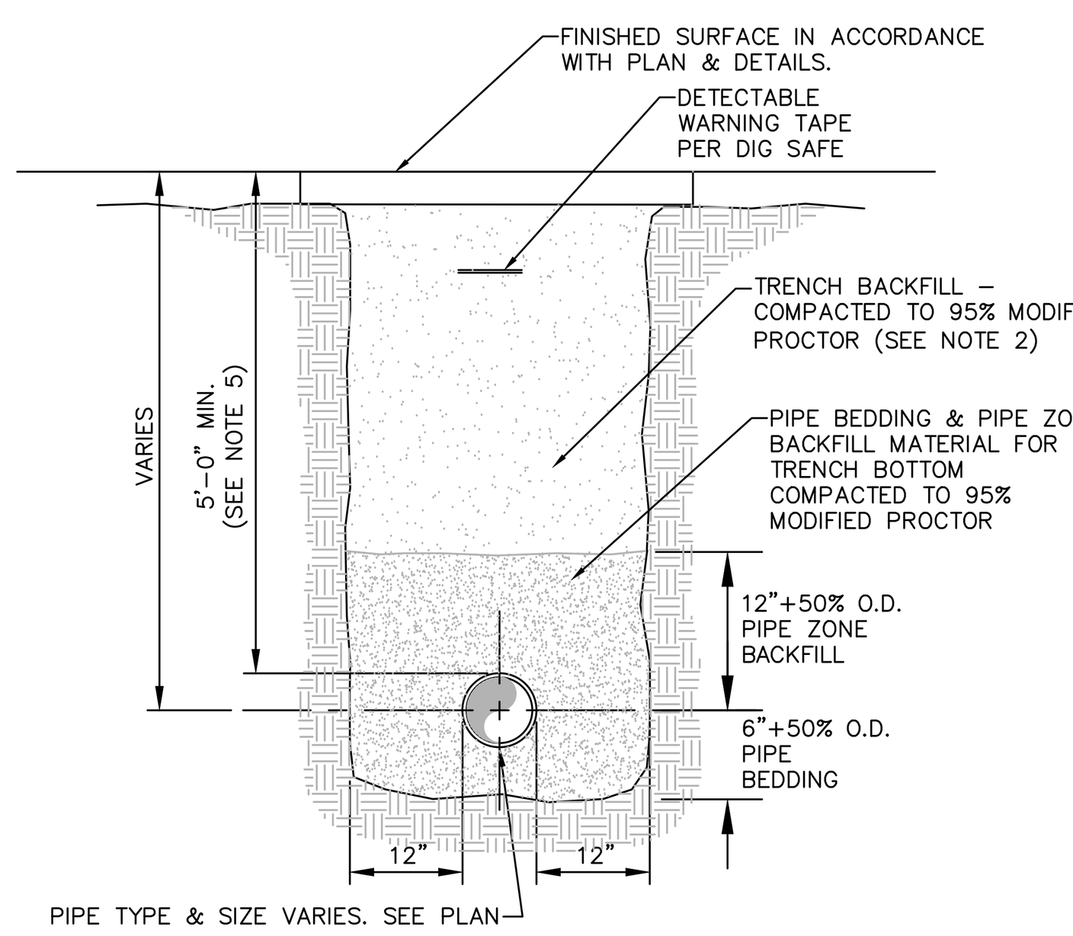


PIPE TYPE & SIZE VARIES. SEE PLAN

NOTES:

1. PIPE BEDDING & PIPE ZONE BACKFILL SHALL BE A NATURAL RUN–OF–BANK (R.O.B.) SAND OR A MIXTURE OF CRUSHED STONE AND GRAVEL, FREE OF SOFT, NONDURABLE PARTICLES, ORGANIC MATERIALS AND ELONGATED PARTICLES, AND SHALL BE WELL GRADED FROM FINE TO COARSE PARTICLES. BEDDING GRADATIONS SHALL BE APPROVED BY THE ENGINEER AND SHALL MEET THE FOLLOWING GRADATION REQUIREMENTS:

SIEVE DESIGNATION	% PASSING
3/4"	100%
NO. 40	0–70%
NO. 200	0–10%

2. TRENCH BACKFILL SHALL BE A NATURAL RUN–OF–BANK (R.O.B.) OR PROCESSED GRAVEL, OR EXCAVATED MATERIAL FREE OF SOFT, NONDURABLE PARTICLES, ORGANIC MATERIALS AND ELONGATED PARTICLES, AND SHALL BE WELL GRADED FROM FINE TO COARSE PARTICLES. TRENCH BACKFILL GRADATIONS SHALL BE APPROVED BY THE ENGINEER AND SHALL MEET THE FOLLOWING GRADATION REQUIREMENTS:

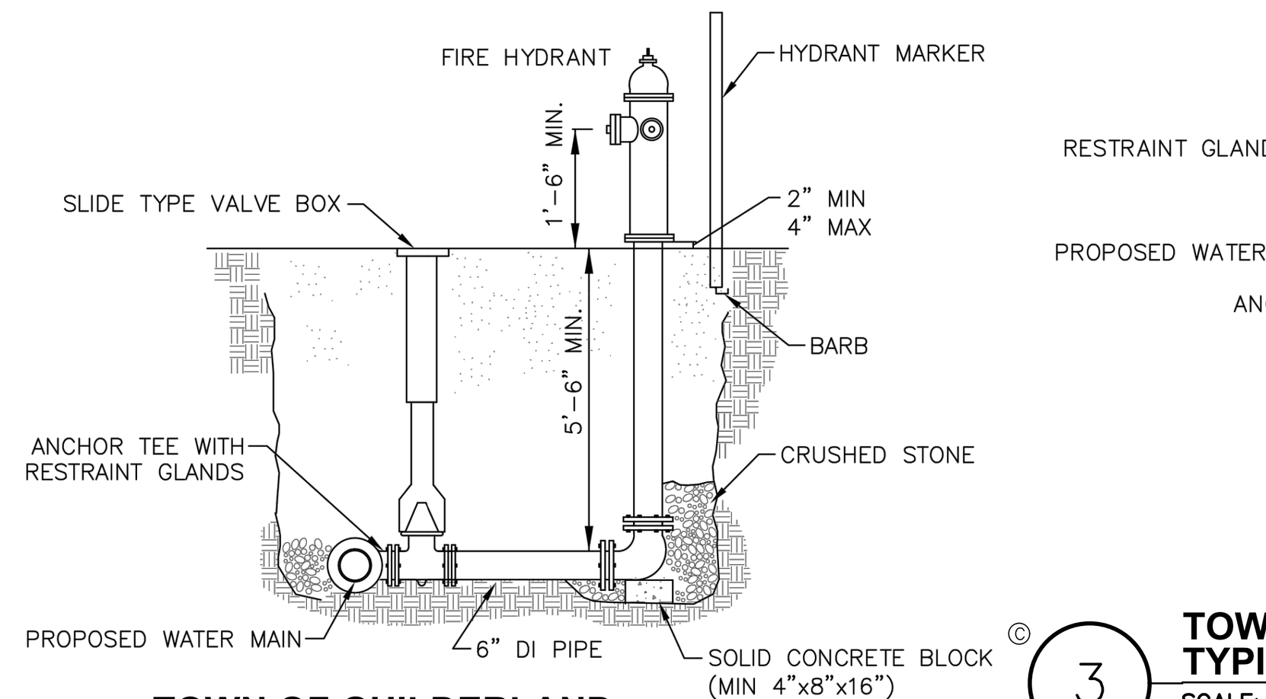
SIEVE DESIGNATION	% PASSING
4"	100%
NO. 40	0–70%
NO. 200	0–10%

   IN NON–TRAFFIC UNPAVED AREAS TRENCH BACKFILL CAN BE MATERIALS EXCAVATED FROM THE TRENCH AS APPROVED BY THE ENGINEER AND COMPACTED TO 90% MODIFIED PROCTOR.

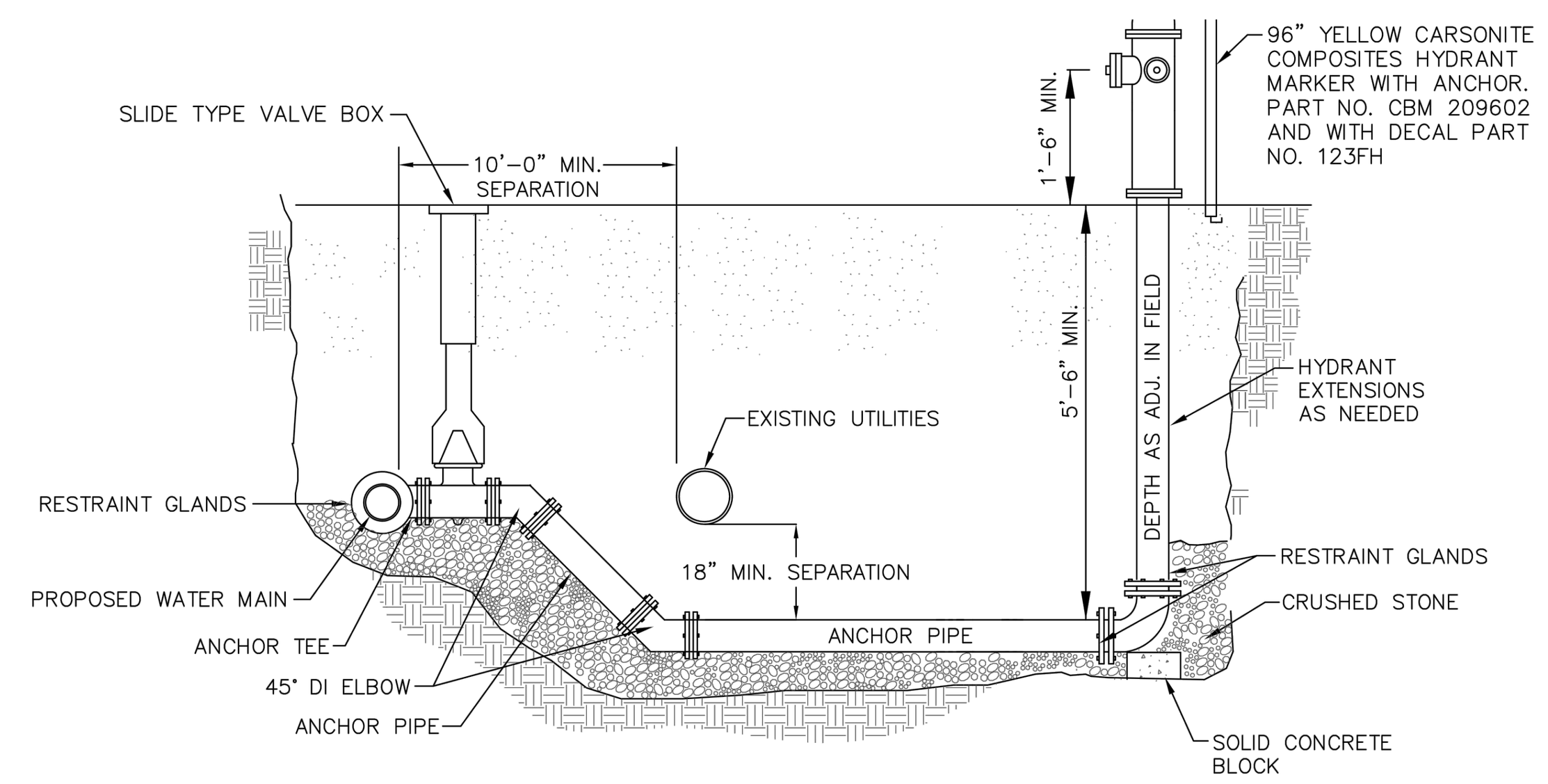
3. INSTALL CONTINUOUS DETECTABLE MARKING TAPE DURING BACKFILLING OF TRENCH FOR UNDERGROUND PIPING. LOCATE TAPE 12" BELOW FINISHED GRADE, DIRECTLY OVER PIPING, EXCEPT 6" BELOW SUBGRADE UNDER PAVEMENTS & SLAB.
4. TRENCHING SHALL BE IMPLEMENTED IN ACCORDANCE WITH O.S.H.A. STANDARDS.
5. 5'–0" MIN COVER SHALL BE APPLIED TO WATER MAIN OR SANITARY SEWER FORCE MAINS ONLY.

1 PIPE TRENCH DETAIL (TYPICAL)
SCALE: NOT TO SCALE

NOTES:
1. DUCTILE IRON WATERMAIN PIPE SHALL CONFORM TO ANSI A21.51 OR AWWA 502 CLASS 2 (52) THICKNESS DESIGNATION, CASTINGS, MARKINGS, TESTING AND INSTALLATION STANDARDS.
2. HYDRANT EXTENSIONS SHALL BE PROVIDED AS NECESSARY AT NO ADDITIONAL COST.
3. AT LOCATIONS OF HIGH GROUNDWATER, HYDRANT DRIP RODS SHALL BE PLUGGED.
4. FIBERGLASS MARKERS SHALL BE 4' WITH HEAVY COIL SPRING AND WITH "L" MOUNTING BRACKET



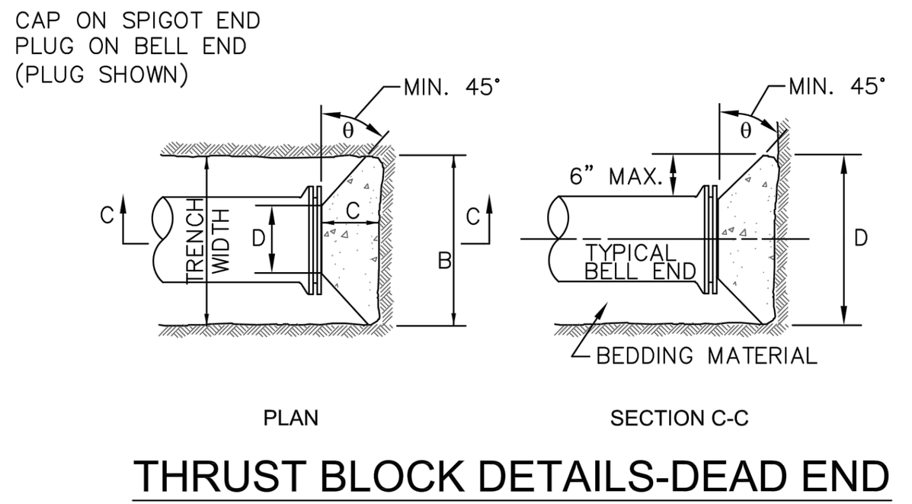
2 TOWN OF GUILDERLAND TYPICAL HYDRANT DETAIL
SCALE: NOT TO SCALE



NOTES:
1. DUCTILE IRON WATERMAIN PIPE SHALL CONFORM TO ANSI A21.51 OR AWWA C502 CLASS 2 (52) THICKNESS DESIGNATION, CASTINGS, MARKINGS, TESTING AND INSTALLATION STANDARDS.
2. HYDRANT EXTENSIONS SHALL BE PROVIDED AS NECESSARY AT NO ADDITIONAL COST.
3. AT LOCATIONS OF HIGH GROUNDWATER, HYDRANT DRIP RODS SHALL BE PLUGGED.

3 TOWN OF GUILDERLAND TYPICAL HYDRANT LEAD CROSSING UTILITIES DETAIL
SCALE: NOT TO SCALE

CAP ON SPIGOT END
PLUG ON BELL END
(PLUG SHOWN)

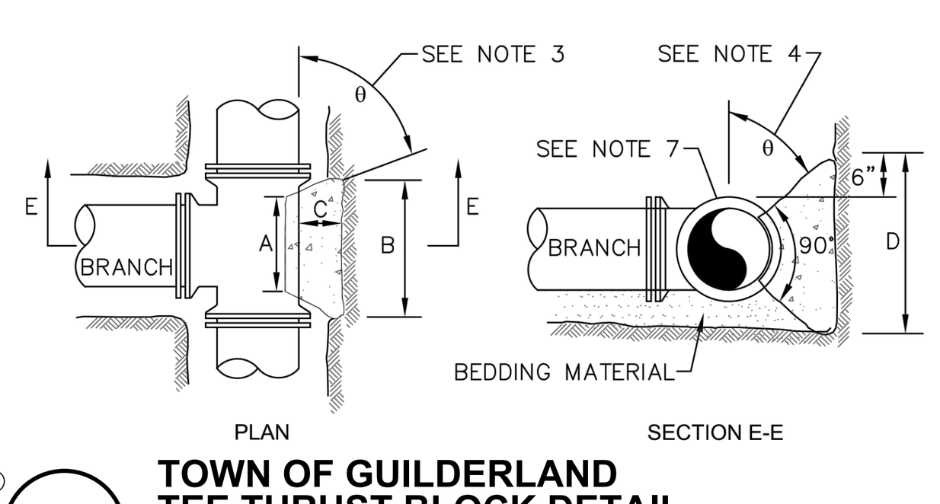


PLAN   SECTION C-C

THRUST BLOCK DETAILS-DEAD END
NTS

1. "A", "B" AND "D" DIMENSIONS SHALL BE AS LARGE AS POSSIBLE WITHOUT INTERFERING WITH THE MECHANICAL JOINTS OR THE BOLTS.
2. "C" DIMENSIONS SHALL BE LARGE ENOUGH TO MAKE ANGLE θ EQUAL TO OR LARGER THAN 45°

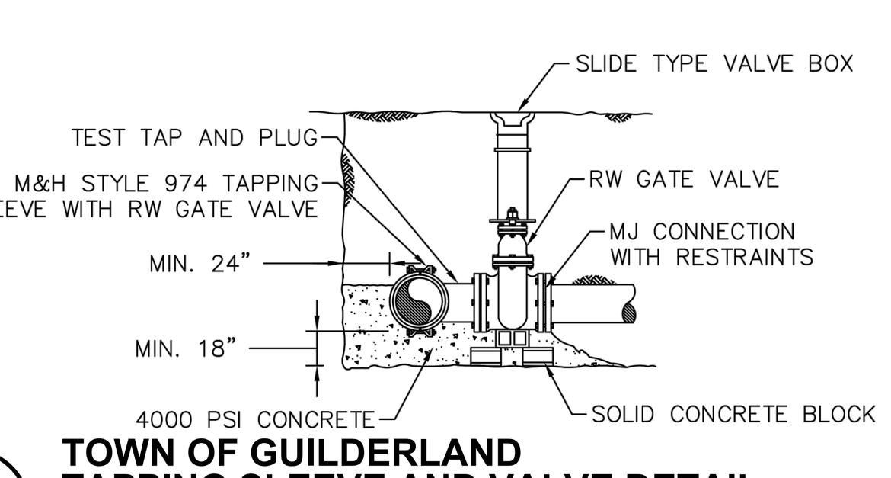
TABLE NO. 1 THRUST BLOCK AREA REQUIRED	
100–150 PSI TEST PRESSURE THRUST AREA REQ'D FT²	
NOMINAL PIPE DIAMETER	DEAD END AND TEES
4	2.0
6	3.0
8	5.0
10	8.0
12	12.0



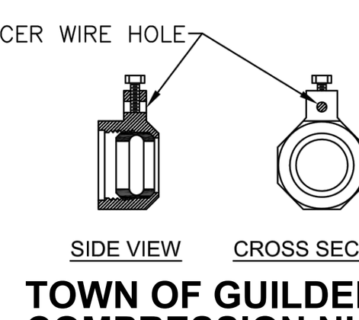
PLAN   SECTION E-E

8 TOWN OF GUILDERLAND TEE THRUST BLOCK DETAIL
SCALE: NOT TO SCALE

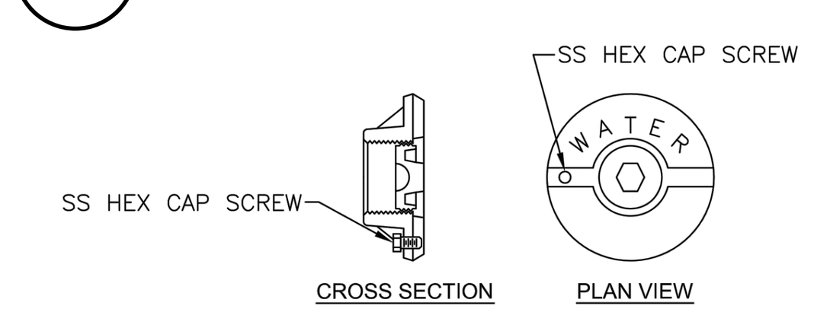
NOTES:
1. TEMPORARILY SUPPORT TAPPING SADDLE AND VALVE AND APPLY STANDARD HYDROSTATIC TEST.
2. IF NO LEAKS, POUR INDICATED PERMENANT CONCRETE BLOCK AND SUPPORT PAD.
3. MAKE TAP, LINE EXTENSION AND BACKFILL.
4. COVER GLANDS AND BOLTS WITH HEAVY POLYETHELENE SHEETING TO KEEP CONCRETE FROM BONDING. TYPICAL WHENEVER BOLTS OR GLANDS MAY BE "WRAPPED–UP" IN CONCRETE.
5. COAT TAPPING SLEEVE AND BOLTS WITH AN APPROVED BITUMASTIC COATING BEFORE POURING CONCRETE. TYPICAL FOR ALL STEEL INCLUDING RODS, COUPLINGS, STRAPS, AND OTHER BURIED STEEL.



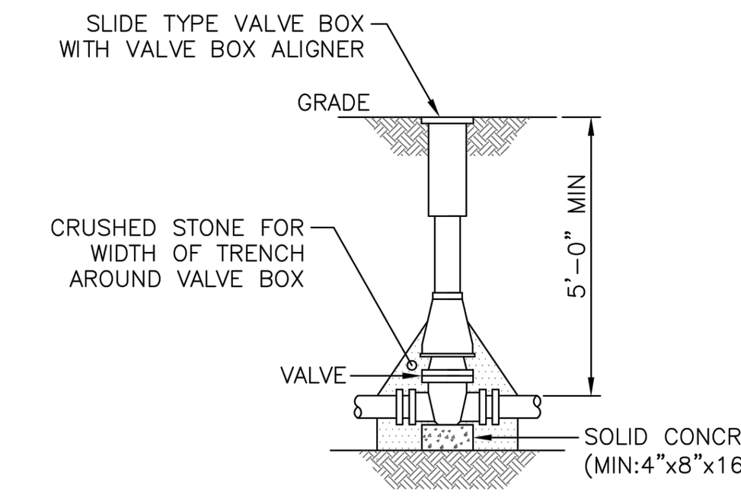
4 TOWN OF GUILDERLAND TAPPING SLEEVE AND VALVE DETAIL
SCALE: NOT TO SCALE



5 TOWN OF GUILDERLAND COMPRESSION NUT DETAIL
SCALE: NOT TO SCALE



6 TOWN OF GUILDERLAND CURB BOX LID DETAIL
SCALE: NOT TO SCALE



NOTES:
1. VALVE BOX SHALL BE CENTERED ON VALVE AND SET ON COMPACTED BACKFILL.
2. USE VALVE BOX ALIGNER.
3. ALL BOLTS AND NUTS SHALL BE 304 SS WITH ANTI–SIEZE PER SPECS

7 TOWN OF GUILDERLAND VALVE DETAIL
SCALE: NOT TO SCALE

OUTLINE SPECIFICATIONS FOR CONSTRUCTION OF WATER DISTRIBUTION SYSTEM

1. INTENTION: THE DECLARED AND ACKNOWLEDGED INTENTION TO SECURE A NEW WATER DISTRIBUTION SYSTEM, COMPLETE, IN ACCORDANCE WITH THE PLANS, SPECIFICATIONS, AND CONTRACT DOCUMENTS. ALL NEW WORK SHALL BE IN ACCORDANCE WITH THE LASTEST EDITION OF "RECOMMENDED STANDARDS FOR WATER WORKS."
2. GENERAL: ALL MATERIALS SHALL BE NEW AND UNUSED. MATERIALS SHALL BE WARRANTED BY THE CONTRACTOR AS TO MATERIALS, WORKMANSHIP, AND ACCURACY OF AS–BUILT DRAWINGS FOR A PERIOD OF ONE YEAR FROM THE DATE OF BENEFICIAL USE OF THE FACILITIES. WORKMANSHIP SHALL BE OF GOOD QUALITY; I.E., MAINS SHALL BE LAID IN A UNIFORM ALIGNMENT, FITTINGS SHALL BE PROPERLY RESTRAINED, TRENCHES SHALL BE PROPERLY EXCAVATED AND BACKFILLED, FIRE HYDRANTS AND VALVE BOXES SHALL BE ADJUSTED TO FINISHED GRADE.
3. SURVEYS: THE UTILITY CONTRACTOR SHALL PROVIDE ALL SURVEYS NECESSARY FOR THE LAYOUT AND CONSTRUCTION OF THE WORK OF HIS CONTRACT.
4. EARTHWORK: EARTHWORK SHALL INCLUDE ALL EXCAVATION, FILL AND BACKFILL (MACHINE), COMPACTION AND ROUGH GRADING OF MATERIALS ENCOUNTERED. NO UNSUITABLE MATERIAL INCLUDING, BUT NOT LIMITED TO, CLAY, MUCK, OR PEAT, REMOVED FROM PIPE TRENCHES ARE TO BE USED FOR BACKFILL. ALL FILL OR BACKFILL SHALL BE EITHER SAND OR SANDY CLAY, FREE FROM ROOTS, TRASH, OR OTHER DEBRIS. ALL OTHER BACKFILL SHALL BE COMPACTED BY MACHINE OPERATION CAREFULLY TO 95% (OUTSIDE OF PAVING), 98% (UNDER PAVING) OF ITS OPTIMUM MOISTURE CONTENT AS DETERMINED BY ASTM D698, LATEST.
5. JOINT RESTRAINT: ALL DIP FITTINGS SHALL BE PROPERLY AND ADEQUATELY RESTRAINED AGAINST LATERAL MOVEMENT AT ALL WATER MAIN TEES, CROSSES, VALVES, BENDS, AND FIRE HYDRANTS. RESTRAINERS SHALL BE MEGA–LUG TYPE FOR MECHANICAL JOINTS AND FIELD LOK GASKETS FOR PUSH JOINTS AND INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.
6. DUCTILE IRON PIPE: DUCTILE IRON PIPES SHALL COMFORM TO ANSI SPECIFICATION A21.50 (AWWA C150) LATEST, CLASS 52 MINIMUM AND SHALL BE ANSI A21.51 (AWWA C151), LATEST CENTRIFUGALLY CAST PIPE. WHEN PIPING RATING IS REDUCED BY THREADING, INCREASE PIPE WEIGHT TO CLASS 53. LAYING LENGTHS SHALL BE 20 FEET, EACH LENGTH CLEARLY MARKED WITH PRESSURE RATING, THICKNESS CLASS, HEIGHT OF PIPE WITHOUT LINING, LENGTH, AND MANUFACTURER. THE PIPE SHALL HAVE DESIGN VALUES OF 60,000 PSI MINIMUM TENSILE STRENGTH, AND 42,000 PSI MINIMUM YIELD STRENGTH. ALL PIPE SHALL BE POLYETHYLENE ENCASED.
7. DUCTILE IRON FITTINGS: DUCTILE IRON FITTINGS SHALL BE C153 CEMENT LINED AND SUITABLE FOR THE TYPE AND CLASS OF PIPE TO WHICH CONNECTED. GASKETS SHALL BE SUITABLE FOR POTABLE AND DOMESTIC WATER SERVICE.
8. HIGH DENSITY POLYETHYLENE PIPE: POLYETHYLENE PIPES AND FITTINGS SHALL COMPLY WITH THE FOLLOWING STANDARDS. STANDARD FOR POLYETHYLENE WATER MAINS (ASTM F714) LATEST, STANDARD SPECIFICATION FOR POLYETHYLENE PLASTIC PIPES AND FITTING MATERIALS (ASTM D3350) LATEST, DIP MMJ ADAPTERS (AWWA C906–99) LATEST, AND (AWWA C906) AND (NSF 61). HIGH DENSITY POLYETHYLENE PIPING COMPONENTS SHALL BE MADE FROM PRESSURE–RATED PE 3408, EXTRA–HIGH MOLECULAR WEIGHT, HIGH–DENSITY POLYETHYLENE. PIPE OUTER DIAMETER (OD) SHALL BE COMPATIBLE WITH STANDARD DUCTILE IRON PIPE SIZES. HDPE PIPES FOR WATER SHALL BE DR 11 AND MANUFACTURED WITH A BLUE LONGITUDINAL COLOR STRIPE PATTERN OF THREE EQUALLY SPACED PAIRS OF COLOR STRIPES EXTRUDED INTO THE PIPE WITH TRACER WIRE. ALL HDPE WATER SERVICES SHALL BE DR 9 WITH SS STIFFENER INSERTS AND TRACER WIRE, CURB STOP, CORP STOP, AND CURB BOX COMPATIBLE WITH HDPE WATER SERVICES.
9. STEEL CASING PIPE: STEEL CASING PIPE, WHEN REQUIRED, SHALL BE OF SIZE INDICATED ON THE DRAWINGS AND SHALL CONFORM TO ASTM A139, WITH A MINIMUM YIELD STRENGTH OF 35,000 PSI.
10. GATE VALVES AND BOXES: GATE VALVES SHALL BE NON–RISING STEM TYPE AND SHALL BE SUITABLE FOR 175 PSI (3"–12") AND 150 PSI (14"–48") WORKING PRESSURE GATE VALVE, WHICH, SHALL BE MECHANICAL JOINT. GATE VALVES SHALL HAVE A 2" OPERATING NUT AND OPEN COUNTER–CLOCKWISE. GATES VALVES SHALL HAVE JOINTS SUITABLE FOR THE TYPE OF MAIN ON WHICH INSTALLED. GATE VALVES 4" AND LARGER SHALL BE IRON BODY, BRONZE FITTED WITH RESILIENT SEAT. VALVES SHALL BE OF DOMESTIC (AMERICAN) MANUFACTURE AND SHALL BE CLOW, KENNEDY VALVE, MUELLER, OR APPROVED EQUAL. VALVE BOXES SHALL BE 5 1/4" DIAMETER, CAST IRON, SLIDING TYPE WITH CENTERING DEVICE, ADJUSTABLE WITH THE WORD "WATER" CAST IN THE COVER. ALL SECTIONS OF THE VALVE BOX SHALL BE INTERCHANGEABLE WITH OLD BUFFALO FOUNDRY BOXES: STYLE #5001. VALVE BOXES SHALL BE BINGHAM AND TAYLOR OR APPROVED EQUAL.
11. CURB STOPS: CURB VALVES SHALL HAVE A COMPRESSION NUT CONNECTION AT THE INLET AND OUTLET AND SHALL BE BALL STYLE CURB STOP FOR HDPE WATER SERVICES. MODEL B44–XXX–TW–Q AS MANUFACTURED BY FORD BALLCORP CORPORATION OR APPROVED EQUAL.
12. CORP STOPS: CORPORATION STOPS SHALL HAVE A COMPRESSION CONNECTION AT THE OUTLET AND SHALL BE COMPLETE WITH A TRACER WIRE HOLE AS MANUFACTURED BY FORD BALLCORP CORPORATION MODEL FB1000–X–TW–Q OR APPROVED EQUAL,
13. CURB BOXES: CURB BOXES SHALL BE TELESCOPIC WITH OPERATING ROD AND SHALL BE MANUFACTURED BY FORD COMPANY MODEL EM2–XX–5X–TW WITH PL LID OR APPROVED EQUAL. FOOT PIECE SHALL BE PROVIDED FOR ALL SERVICES 1.5" AND LARGER. COVERS SHALL HAVE "WATER" CAST IN.
14. FIRE HYDRANTS: FIRE HYDRANTS SHALL BE MANUFACTURED BY CLOW EDDY MODEL F–2640, HYDRANTS SHALL HAVE HOSE NOZZLE WITH NST THREADS WITH 2 1/2" DIAMETER NOZZLES, 4 1/2" PUMPER NOZZLE WITH NST THREADS AND 5 1/4" MAIN VALVE OPENING. LEAD PIPE FROM HYDRANT SHALL BE CONNECTED TO A GUARD VALVE WHICH IS CONNECTED TO AN ANCHOR TEE. FIRE HYDRANTS SHALL BE PAINTED RED WITH 1 1/2" PENTAGON NUT, OPENING COUNTER–CLOCKWISE. ALL HYDRANTS SHALL BE EQUIPPED WITH HYDRANT MARKER MANUFACTURED BY CARSONITE COMPOSITES MODEL #CBM209602. 96" YELLOW WITH ANCHOR ATTACHED WITH DECAL (MODEL #123FH).
15. INSTALLATION: THE MINIMUM COVER OVER TOP OF A POTABLE WATER MAIN SHALL BE 60" MINIMUM. ALL WATER LINES AND APPURTENANCES SHALL BE THOROUGHLY CLEANED OF ALL FOREIGN MATTER BEFORE BEING LOWERED INTO THE TRENCH AND SHALL BE KEPT CLEAN DURING LAYING OPERATIONS BY MEANS OF PLUGS OR OTHER APPROVED METHODS. ALL PIPES SHALL BE CHECK FOR DEFECTS BEFORE BEING LOWERED INTO THE TRENCH. DEFECTIVE PIPES SHALL NOT BE USED. PIPES FOUND TO BE DEFECTIVE AFTER INSTALLATION, SHALL BE REMOVED AND REPLACED WITH A SOUND PIPE AT NO ADDITIONAL EXPENSE TO THE OWNER. THE FULL LENGTH OF EACH SECTION OF PIPE SHALL REST SOLIDLY ON THE PIPE BED, WITH RECESSES EXCAVATED TO ACCOMMODATE THE BELLS AND JOINTS. ALL PIPES THAT HAVE THEIR GRADES OR JOINTS DISTURBED AFTER INSTALLATION, SHALL BE TAKEN UP AND REINSTALLED. THE PIPE SHALL NOT BE LAID IN WATER, OR WHEN TRENCH OR WEATHER CONDITIONS ARE UNSUITABLE FOR THE WORK. ALL JOINTS SHALL BE CLEANED OF ALL FOREIGN MATTER BEFORE MAKING THE JOINT. FITTINGS AT BENDS IN THE PIPE SHALL BE PROPERLY RESTRAINED WITH JOINT RESTRAINERS ADEQUATELY SIZED TO PREVENT MOVEMENT AND DISLOCATING OR BLOWING OFF WHEN THE LINE IS UNDER PRESSURE. SERVICE LATERALS SHALL TERMINATE AT THE POINT WHERE NOTED IN THE DETAILS. CONTRACTOR MUST FIELD VERIFY EXISTING UTILITIES AND INSTALL NEW WATER MAINS OVER OR UNDER THEM MAINTAINING PROPER SEPARATION DISTANCES AND 60" MINIMUM COVER. THERE WILL BE NO ADDITIONAL COMPENSATION TO AVOID EXISTING UTILITIES.
16. PRESSURE TESTING: AFTER ALL PRESSURE PIPE (WATER MAINS, SERVICES, AND FORCE MAINS) ARE LAID, THE JOINTS COMPLETED, AND THE TRENCHES BACKFILLED, THE NEWLY LAID PIPES AND APPURTENANCES SHALL BE SUBJECTED TO A PRESSURE TEST OF 150 PSI OR 1.5 TIMES WORKING PRESSURE (WHICH EVER IS GREATER) FOR A PERIOD OF AT LEAST 2 HOURS. THE ENGINEER MUST BE NOTIFIED AT LEAST 24 HOURS BEFORE A TEST IS TO BE PERFORMED. ANY LEAKS DETECTED SHALL BE CORRECTED AND THE SECTIONS OF THE PIPELINE RETESTED. THE 2 HOUR TEST PERIOD SHALL BEGIN WHEN ALL JOINTS HAVE BEEN DETERMINED TO BE WATER TIGHT. LEAKAGE SHALL BE LIMITED TO THAT ALLOWANCE SET FORTH IN SECTION 4 OF AWWA STANDARD C600. HYDROSTATIC TEST, LEAKAGE TEST, AND BLOW–DOWN (ZEROING OF GAUGE) MUST OCCUR BEFORE SAMPLING FOR BACTERIOLOGICAL TEST. THE MAXIMUM ALLOWABLE PRESSURE LOSS IS 5 PSI REGARDLESS OF THE LENGTH OF PIPE. ALL TESTS SHALL BE CONDUCTED IN THE PRESENCE OF THE PROJECT ENGINEER.
17. DISINFECTION: AFTER COMPLETION OF CONSTRUCTION AND TESTING, THE WATER SYSTEM SHALL BE DISINFECTED WITH CHLORINE IN ACCORDANCE WITH AWWA STANDARD C651. THE AMOUNT OF CHLORINE APPLIED SHALL BE SUFFICIENT TO PROVIDE A DOSAGE OF 25 mg/l OR MORE. THE CHLORINE SOLUTION SHALL REMAIN IN THE SYSTEM FOR A PERIOD OF AT LEAST 24 HOURS, DURING WHICH TIME EVERY VALVE IN THE SYSTEM SHALL BE OPENED AND CLOSED SEVERAL TIMES TO ASSURE CONTACT WITH EVERY SURFACE OF THE SYSTEM. AFTER A 24 HOUR RETENTION PERIOD, FLUSH THE MAIN UNTIL THE MAXIMUM CHLORINE CONCENTRAION IS 1 mg/l. THE CONTRACTOR SHALL OBTAIN ALL BACTERIOLOGICAL CLEARANCES AS REQUIRED BY THE NEW YORK STATE DEPARTMENT OF HEALTH. AFTER BACTERIOLOGICAL CLEARANCES, THE PRESSURE IN THE MAIN SHALL NOT DROP BELOW 20 PSI. A CLEARANCE REPORT SHALL BE SUBMITTED TO THE ENGINEER. IN ANY PROJECT WHERE THE BACTERIOLOGICAL CLEARANCES ARE GREATER THAN 30 DAYS OLD PRIOR TO PLACING A WATER MAIN INTO SERVICE, THE CONTRACTOR MAY BE REQUIRED TO PULL MORE SAMPLES AND OBTAIN MORE BACTERIOLOGICAL CLEARANCES. PRIOR TO INTRODUCING THE CHLORINE SOLUTION, THE LINES SHALL BE THOROUGHLY FLUSHED WITH CLEAN WATER UTILIZING FULL PIPE DIAMETER FLUSHING FOR PIPE UP TO AND INCLUDING 8" DIAMETER. CONTRACTOR SHALL BE REPONSIBLE FOR DECHLORINATION OF THE DISINFECTANT WATER PRIOR TO ANY DISCHARGE TO ANY DITCH OR SURFACE WATERS.
18. BACTERIOLOGICAL SAMPLING: CONTRACTOR SHALL ASSURE THE PROJECT CONSTRUCTION IS COMPLETELY FINISHED PRIOR TO ANY BACTERIOLOGICAL SAMPLING AND TESTING.
19. ABANDONMENT OF EXISTING MAINS AND APPURTENANCES: EXISTING WATER MAINS TO BE ABANDONED IN PLACE SHALL BE PHYSICALLY SEPARATED BY A MINIMUM OF 12" AND A 24" LONG 2500 PSI CONCRETE PLUG INSTALLED. ALL VALVES TO BE ABANDONED SHALL BE CLOSED AND THE ENTIRE VALVE BOX REMOVED.

GENERAL CONSTRUCTION NOTES

1. THE CONTRACTOR SHALL EXAMINE AND VERIFY, IN THE FIELD, ALL CONDITIONS AND DIMENSIONS. DIMENSIONS OF THE EXISTING STRUCTURES SHOWN ON THESE PLANS ARE FOR GENERAL REFERENCE ONLY. THEY HAVE BEEN TAKEN FROM THE ORIGINAL CONSTRUCTION OR SUBSEQUENT REHABILITATION DRAWINGS AND ARE NOT GUARANTEED. THE CONTRACTOR SHALL TAKE ALL SUCH FIELD MEASUREMENTS TO ASSURE PROPER FIT OF THE FINISHED WORK, AND THE CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR THEIR ACCURACY. IF FIELD CONDITIONS AND DIMENSIONS DIFFER FROM THOSE SHOWN ON THE PLANS, THE CONTRACTOR SHALL USE THE FIELD CONDITIONS AND DIMENSIONS AND MAKE THE APPROPRIATE CHANGES TO THOSE SHOWN ON THE PLANS, AS APPROVED BY THE ENGINEER. WHEN SHOP DRAWINGS BASED ON FIELD MEASUREMENTS ARE SUBMITTED FOR APPROVAL, THE FIELD MEASUREMENTS MADE SHALL BE INDICATED ON THE SHOP DRAWINGS SUBMITTED FOR REFERENCE OF THE REVIEWER.
2. THERE SHALL BE NO CLAIM AGAINST THE OWNER MADE BY THE CONTRACTOR FOR WORK PERTAINING TO MODIFICATIONS, AS MAY BE REQUIRED, DUE TO ANY DIFFERENCE BETWEEN ACTUAL FIELD CONDITIONS AND THOSE SHOWN BY THE DETAILS AND DIMENSIONS ON THE CONTRACT PLANS. THE CONTRACTOR WILL BE PAID AT THE UNIT BID PRICE FOR THE ACTUAL QUANTITIES OF MATERIALS USED OR FOR THE WORK PERFORMED, AS INDICATED BY THE VARIOUS ITEMS IN THE CONTRACT. THE CONTRACTOR SHOULD NOTE THAT ADDITIONAL WORK MAY BE REQUIRED AS THE CONTRACT PROGRESSES, WHICH IS NOT SHOWN OR NOTED ON THE PLANS. THIS WORK SHALL BE PERFORMED BY THE CONTRACTOR, AS ORDERED BY THE ENGINEER, AND PAYMENT SHALL BE MADE AT THE BID PRICE FOR THE APPROPRIATE ITEMS. THE CONTRACTOR'S ATTENTION IS DIRECTED TO THE FACT THAT, DUE TO THE NATURE OF REPLACEMENT PROJECTS, THE EXACT EXTENT OF REPLACEMENT WORK CANNOT ALWAYS BE ACCURATELY DETERMINED PRIOR TO THE COMMENCEMENT OF WORK. THESE CONTRACT DOCUMENTS HAVE BEEN PREPARED BASED ON FIELD INSPECTION AND OTHER INFORMATION AVAILABLE AT THE TIME. ACTUAL FIELD CONDITIONS MAY REQUIRE MODIFICATIONS TO CONSTRUCTION DETAILS AND WORK QUANTITIES. THE CONTRACTOR SHALL PERFORM THE WORK IN ACCORDANCE WITH FIELD CONDITIONS.
3. THE CONTRACTOR WILL BE HELD RESPONSIBLE FOR ALL DAMAGE TO THE EXISTING STRUCTURES CAUSED BY HIS OPERATIONS WHICH IS NOT INCLUDED AS PART OF THIS WORK. ALL DAMAGE TO THE EXISTING STRUCTURES WHICH IS NOT PART OF THE INTENDED WORK SHALL BE REPAIRED BY THE CONTRACTOR WITHOUT COST TO THE OWNER, AND TO THE SATISFACTION OF THE ENGINEER. THE CONTRACTOR SHALL CONDUCT HIS REMOVAL OPERATIONS TO THE SATISFACTION OF THE ENGINEER SO AS NOT TO UNDULY DISTURB UNDERLYING MATERIALS WHICH ARE TO REMAIN IN PLACE. THE CONTRACTOR SHALL PERFORM ALL WORK WITH CARE SO THAT ANY MATERIALS WHICH ARE TO REMAIN IN PLACE, OR WHICH ARE TO REMAIN THE PROPERTY OF THE OWNER, WILL NOT BE DAMAGED. IF THE CONTRACTOR DAMAGES ANY MATERIALS WHICH ARE TO REMAIN IN PLACE, OR WHICH ARE TO REMAIN THE PROPERTY OF THE OWNER, THE DAMAGED MATERIAL SHALL BE REPAIRED OR REPLACED IN A MANNER SATISFACTORY TO THE ENGINEER AT THE EXPENSE OF THE CONTRACTOR.
4. WHENEVER ITEMS IN THE CONTRACT REQUIRE MATERIALS TO BE REMOVED AND DISPOSED, THE COST OF SUPPLYING A LEGAL DISPOSAL AREA AND TRANSPORTATION TO THE AREA SHALL BE INCLUDED IN THE PRICE BID.
5. THE CONTRACTOR IS TO VISIT THE SITE BEFORE BIDDING, TO BECOME FAMILIAR WITH THE FIELD CONDITIONS AND TO JUDGE THE EXTENT AND NATURE OF THE WORK TO BE DONE UNDER THIS CONTRACT. NO EXTRA COMPENSATION WILL BE ALLOWED TO THE CONTRACTOR BECAUSE OF THE CONTRACTOR'S FAILURE TO INCLUDE IN THEIR BID ALL ITEMS AND MATERIALS WHICH THEY ARE REQUIRED TO FURNISH IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
6. ALL WORK AREAS AT THE SITE SHALL BE COMPLETELY SECURED, CONFORMING WITH OSHA REGULATIONS, TO THE SATISFACTION OF THE ENGINEER, TO PROTECT THE PUBLIC AND PREVENT UNAUTHORIZED ENTRY. THE COST OF THIS WORK IS TO BE INCLUDED IN THE VARIOUS ITEMS OF THE CONTRACT.
7. IT WILL BE THE CONTRACTOR'S OBLIGATION AND RESPONSIBILITY TO USE METHODS AND EQUIPMENT WHICH WILL INSURE THE SATISFACTORY COMPLETION OF THE REQUIRED WORK WITHIN THE TIME FRAME STIPULATED IN THE CONTRACT.
8. THE CONTRACTOR SHALL PROVIDE SURVEY AND STAKE OUT FOR THIS PROJECT. THE COST FOR THE SURVEY AND STAKE OUT SHALL BE INCLUDED IN THE UNIT PRICES BID FOR VARIOUS ITEMS OF THE CONTRACT.
9. LOCATION OF UTILITIES, PUBLIC AND/OR PRIVATE, INDICATED AS EXISTING AND/OR TO BE CONSTRUCTED AS SHOWN ON THE PLANS ARE APPROXIMATE ONLY. THEIR EXACT LOCATION SHALL BE DETERMINED IN THE FIELD. ADDITIONAL UTILITY LINES, WHETHER ABANDONED OR IN SERVICE, MAY EXIST AND IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO CONDUCT HIS OPERATIONS AND TAKE THE NECESSARY PRECAUTIONS TO PREVENT INTERFERENCE WITH, OR DAMAGE TO, THESE OR OTHER FACILITIES DURING THE COURSE OF CONSTRUCTION.
10. IN THE EVENT THE CONTRACTOR DAMAGES AN EXISTING UTILITY SERVICE CAUSING AN INTERRUPTION IN SAID SERVICE, THEY SHALL IMMEDIATELY COMMENCE WORK TO RESTORE SERVICE AND MAY NOT CEASE THE WORK OPERATION UNTIL SERVICE IS RESTORED.
11. THE CONTRACTOR SHALL CALL DIG SAFELY NEW YORK (DSNY) (1–800–962–7962) A MINIMUM OF THREE WORKING DAYS PRIOR TO ANY EXCAVATION TO HAVE EXISTING UNDERGROUND UTILITIES LOCATED IN THE FIELD. CONTRACTOR WILL BE RESPONSIBLE TO MAINTAIN ALL UTILITY LOCATIONS THROUGHOUT PROJECT.
12. AREAS DISTURBED BY THE CONTRACTOR AS PART OF THE WORK TO BE PERFORMED UNDER THIS CONTRACT, SHALL BE RESTORED TO PRECONSTRUCTION STANDARDS AND TO THE SATISFACTION OF THE ENGINEER. ALL THE DISTURBED GRASS AREAS SHALL BE GRADED AND SEEDED IN A MANNER APPROVED BY THE ENGINEER.
13. IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN ADEQUATE EROSION AND DUST CONTROL AT ALL TIMES. THE CONTRACTOR SHALL SUBMIT, IF REQUIRED, FOR REVIEW TO THE ENGINEER A STORMWATER POLLUTION PREVENTION PLAN (SWPPP).
14. AS–BUILT DRAWINGS: DURING THE DAILY PROGRESS OF WORK, THE CONTRACTOR'S JOB SUPERINTENDENT SHALL RECORD ON THE FIELD SET OF DRAWINGS ALL WORK INSTALLED. ALL PIPING, VALVES, FITTINGS, FIRE HYDRANTS, ETC. SHALL BE LOCATED IN TWO DIRECTIONS. ONE LOCATION SHALL BE REFERENCED PERPENDICULAR TO THE RIGHT OF WAY LINES AND/OR PROPERTY LINES (PREFERABLY BOTH). SIZE, TYPE, AND CLASS OF WATER MAINS, VALVES, FITTINGS, FIRE HYDRANTS, ETC. SHALL BE SHOWN (I.E. 8" CL 52 D.I.P., 6" GATE VALVE). ALL LOCATIONS WHERE THE TOP OF THE WATER MAIN IS LESS THAN 60" DEEP OR MORE THAN 96" DEEP SHALL BE NOTED ON THE AS–BUILTS.
15. CONSTRUCTION WARRANTY AND WARRANTY SECURITY PERIOD: CONTRACTOR SHALL WARRANTY OWNER AGAINST DEFECTS IN MATERIAL AND WORKMANSHIP. THE CONTRACTOR SHALL PROVIDE A WRITTEN AND FULLY ASSIGNABLE WARRANTY THAT THE SYSTEM INSTALLED WILL BE AND REMAIN FREE FROM ALL DEFECTS, LATENT OR OTHERWISE WITH RESPECT TO WORKMANSHIP, MATERIALS, INSTALLATION, AND ACCURACY OF THE AS–BUILT DRAWINGS IN ACCORDANCE WITH THE APPROVED PLANS AND SPECIFICATIONS FOR A PERIOD OF ONE YEAR FROM THE DATE OF THE BENEFICIAL USE OF THE FACILITIES.
16. CLEAN–UP: ALL SURPLUS MATERIALS OF CONSTRUCTION SHALL BE REMOVED FROM THE SITE AND DISPOSED OF BY THE CONTRACTOR AS PART OF THE CONTRACT WITH THE OWNER.
17. PERMITS: THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS REQUIRED FOR PERFORMING WORK UNDER HIS CONTRACT, EXCEPT THAT THE NYSDEC PERMITS, NYSDOH PERMITS, AND WETLAND PERMITS, IF REQUIRED, WILL BE SECURED BY THE OWNER.
18. DEWATERING: THE CONTRACTOR SHALL AT ALL TIME DURINGS CONSTRUCTION PROVIDE AMPLE MEANS AND EQUIPMENT WITH WHICH TO PROMPTLY REMOVE AND DISPOSE OF ALL WATER ENTERING THE TRENCH AND STRUCTURE EXCAVATIONS AND SHALL KEEP SAID EXCAVATIONS ACCEPTABLY DRY, UNTIL THE PIPING AND/OR STRUCTURES TO BE BUILT THEREIN ARE COMPLETED. ALL WATER PUMPED OR DRAINED FROM THE WORK AREA SHALL BE DISPOSED OF IN A MANNER AS TO NOT DAMAGE SEWER, WATER, ELECTRICAL OR ANY OTHER PIPING STRUCTURES OR PROPERTY. NO PIPE SHALL BE LAID IN WATER AND NO WATER SHALL BE ALLOWED TO RISE ABOVE THE BOTTOM OF ANY PIPE WHILE IT IS BEING JOINTED. DEWATERING WITH UP TO A 4" PUMP SHALL BE INCLUDED IN THE CONTRACT PRICE. ADDITIONAL COMPENSATION FOR DEWATERING THAT REQUIRES LARGER PUMPS, WELLPOINTS, OR OTHER METHODS SHALL BE APPROVED BY THE ENGINEER AND THE OWNER PRIOR TO INSTALLATION.
19. CONCRETE: ALL PORTLAND CEMENT CONCRETE MIXES SHALL BE APPROVED IN ADVANCE BY THE ENGINEER. ALL CONCRETE SHALL BE PLACED BEFORE THE INITIAL SET HAS TAKEN PLACE. STALE OR RETEMPERED CONCRETE SHALL NOT BE USED. CONCRETE USED FOR PIPE PLUGS SHALL BE 2500 PSI MINIMUM . CONCRETE USED FOR ALL OTHER PURPOSES SHALL BE 4000 PSI MINIMUM.
20. SEPARATION OF WATER AND SEWER MAINS: A HORIZONTAL SEPARATION OF A MINIMUM OF 10 FEET SHALL BE MAINTAINED BETWEEN PARALLEL WATER MAINS AND SANITARY SEWERS (INCLUDING FORCE MAINS) WHERE PRACTICAL. THE PROJECT ENGINEER MUST APPROVE ANY CROSSINGS WHERE WATER MAINS AND SANITARY SEWERS CROSS WITH LESS THAN 18" VERTICAL CLEARANCE.
21. NEW CONNECTION TO EXISTING MAIN: NEW CONNECTIONS, WHERE NOTED, TO EXISTING MAIN IN SERVICE SHALL BE ACCOMPLISHED BY THE "WET TAP" METHOD UTILIZING FULL CIRCLE STAINLESS STEEL TAPPING SLEEVE AND MECHANICAL JOINT TAPPING VALVE. TAPPING SLEEVE SHALL BE RATED AT 200 PSI, NON–SHOCK WORKING PRESSURE CONFORMING TO AWWA STANDARD C110, LATEST REVISION. ROMAC SST OR JCM 432 STAINLESS STEEL TAPPING SLEEVE WITH DUCTILE IRON FLANGE IS PREFERRED. TAPPING VALVE SHALL BE MECHANICAL JOINT ONE END AND STANDARD FLANGED JOINT ON OTHER END.
22. JOBSITE SAFETY: WHILE ON THE JOBSITE, THE CONTRACTOR SHALL AT ALL TIMES OBSERVE ALL FEDERAL, STATE, AND LOCAL SAFETY RULES, REGULATIONS AND LAWS.

FOR SITE PLAN APPROVAL - NOT FOR CONSTRUCTION

0 1 2 3
ORIGINAL SCALE IN INCHES

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rev.	date	description

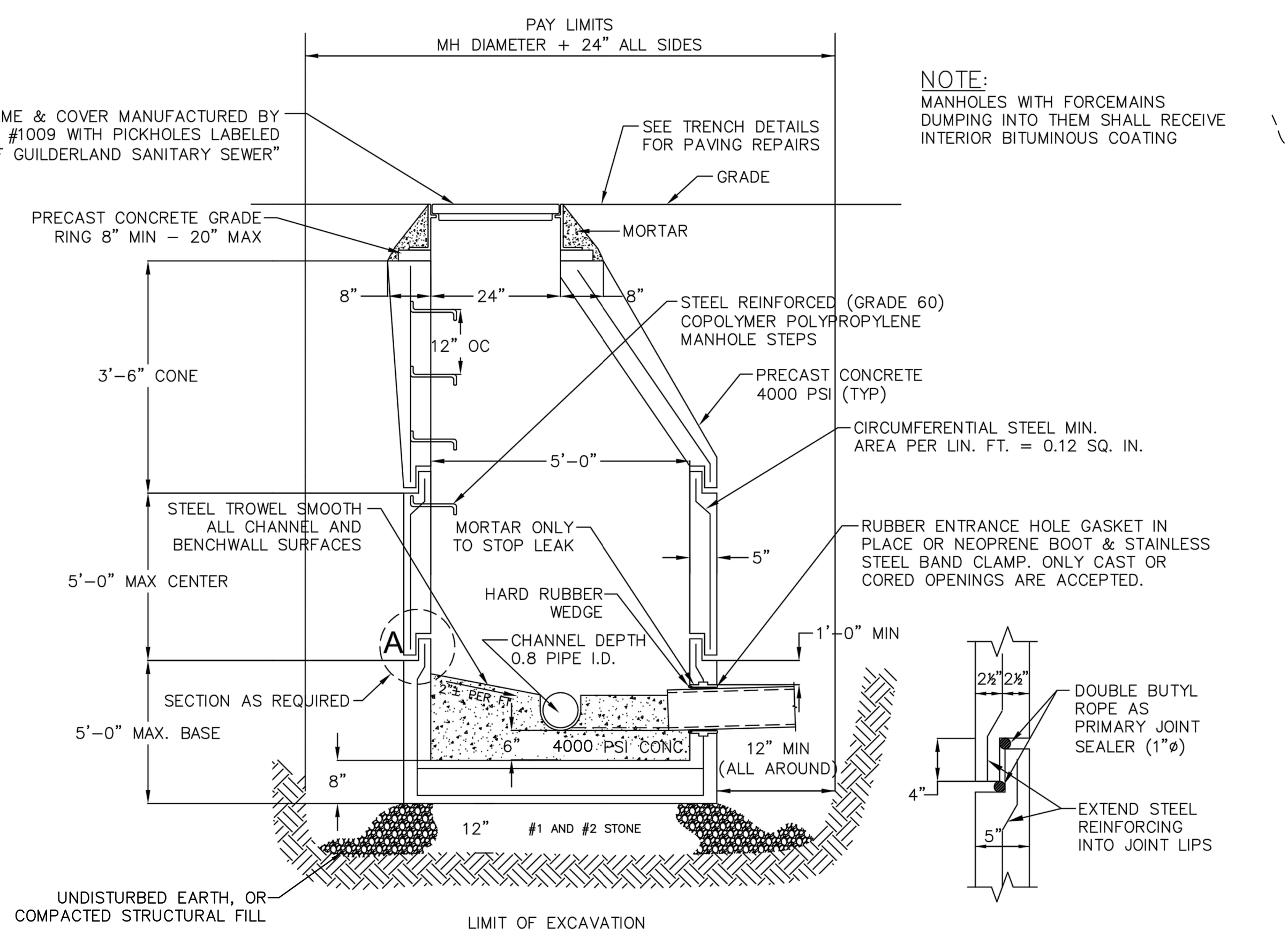
RAPP ROAD RESIDENTIAL DEVELOPMENT

WATER SYSTEM DETAILS

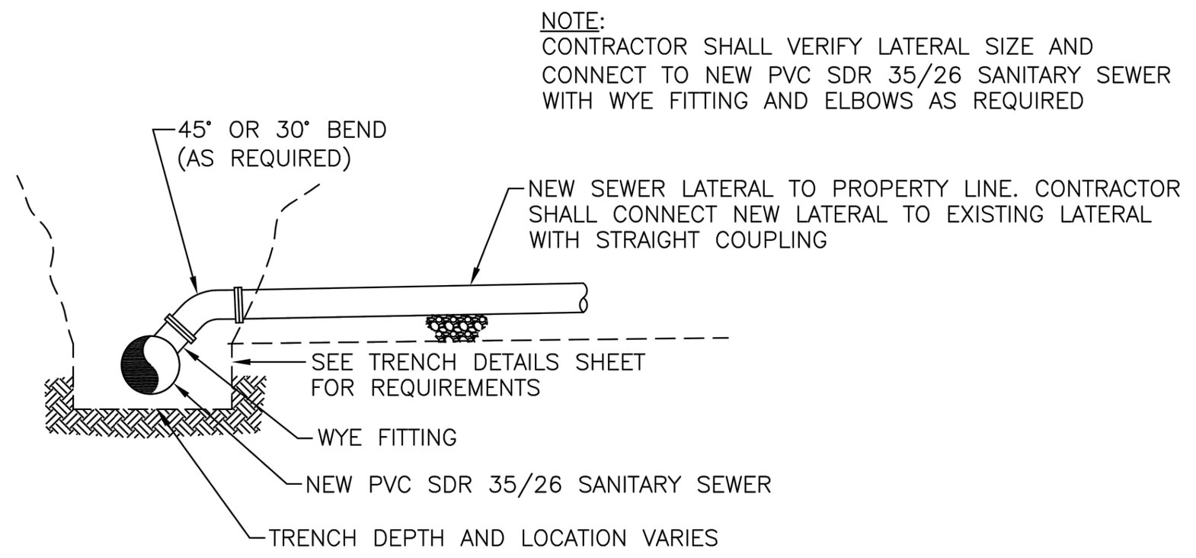
TOWN OF GUILDERLAND, ALBANY COUNTY, NEW YORK

designed	checked
SM	RK
date	scale
03/11/19	AS NOTED
project no.	
317AI.00	
sheet no.	
C560	

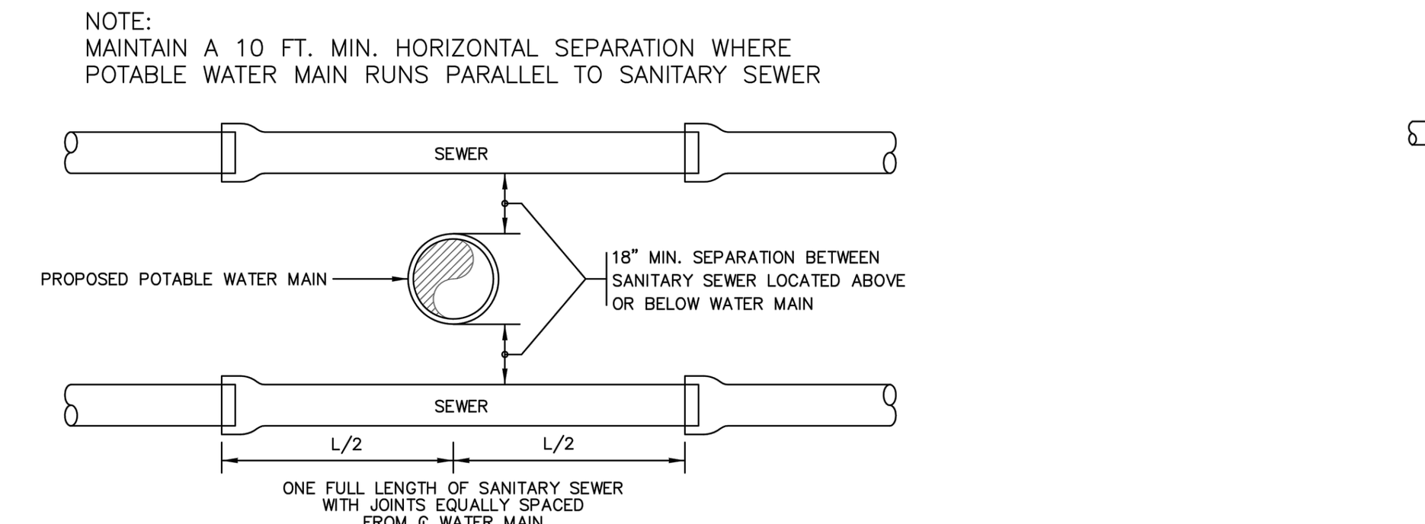
Drawing Name: Z:\projects\31700–31799\317AI.00 Rapp Road\DWG\02_C560_317AI-00_WATER DETAILS.dwg
Xref's Attached: XTB_317AI-00_30x42
Date Printed: Feb 14, 2020, 9:11am



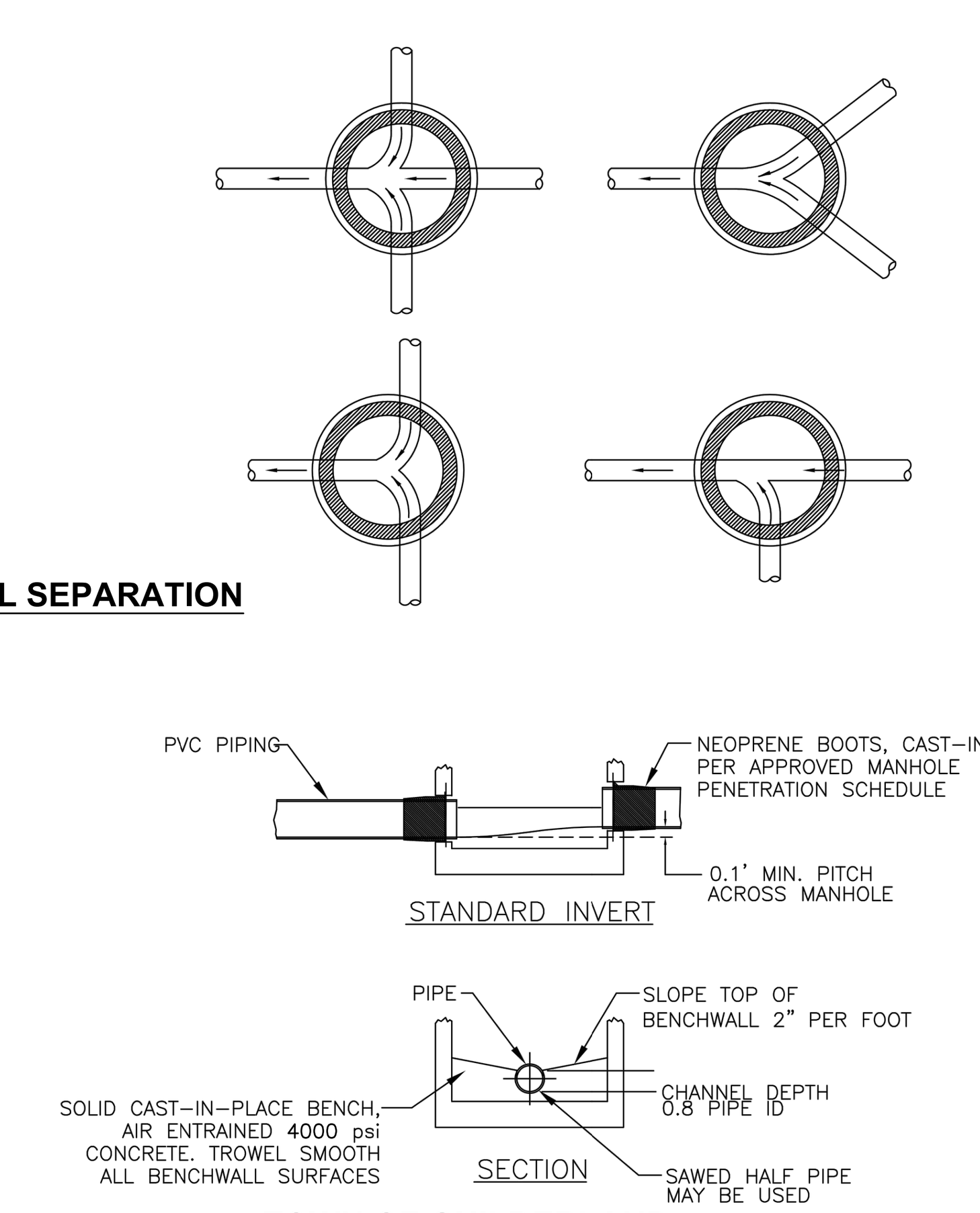
1 **TOWN OF GUILDERLAND TYPICAL MANHOLE DETAIL**
SCALE: NOT TO SCALE



2 **TOWN OF GUILDERLAND TYPICAL SEWER LATERAL CONNECTION DETAIL**
SCALE: NOT TO SCALE

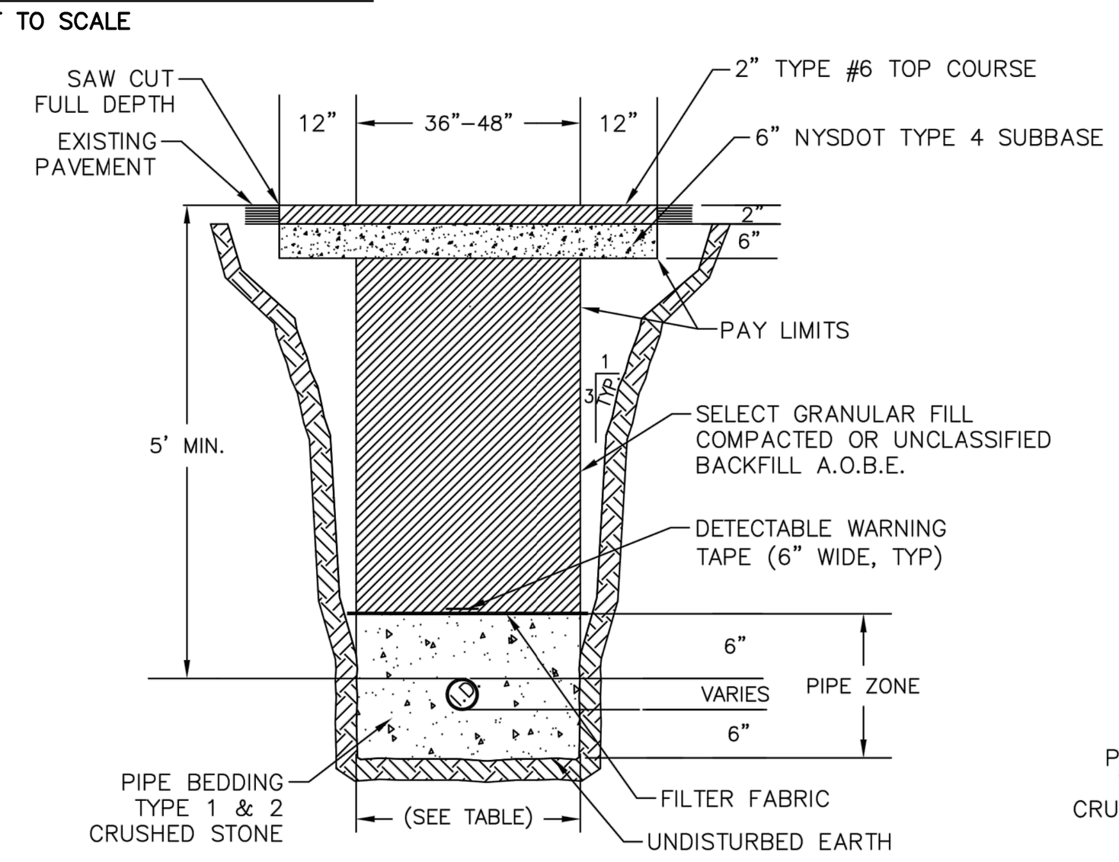


2 **TOWN OF GUILDERLAND TYPICAL SANITARY SEWER & POTABLE WATER MAIN CROSSING WITH 18" VERTICAL SEPARATION**
SCALE: NOT TO SCALE

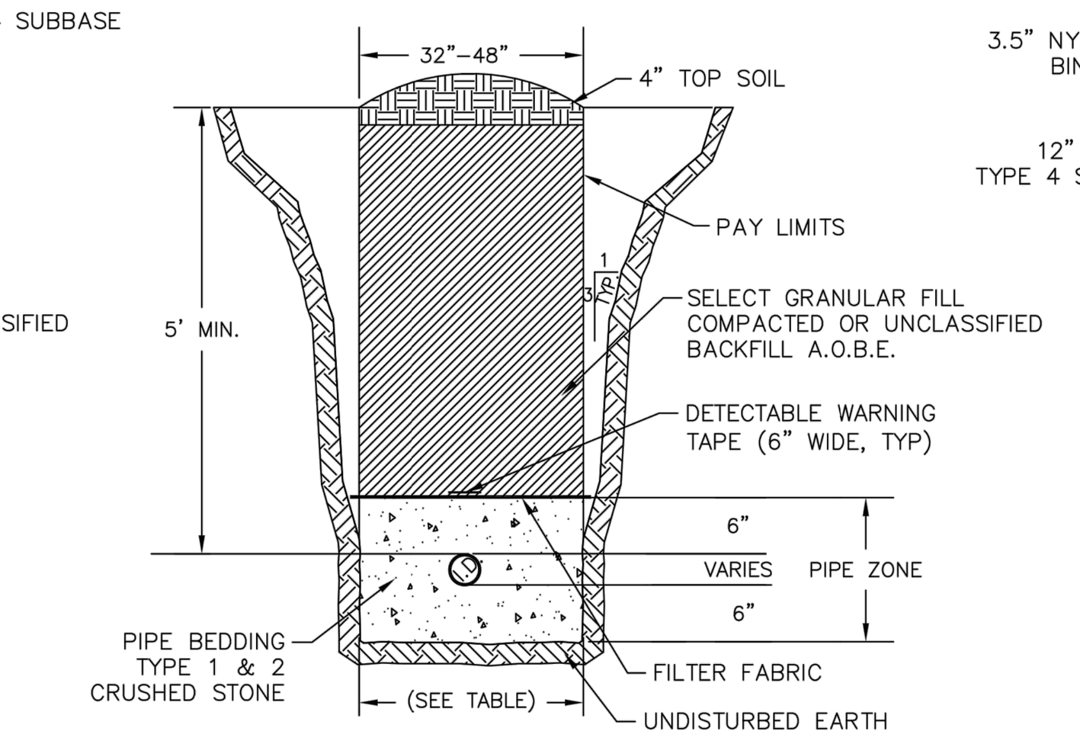


2 **TOWN OF GUILDERLAND TYPICAL MANHOLE BENCHING DETAIL**
SCALE: NOT TO SCALE

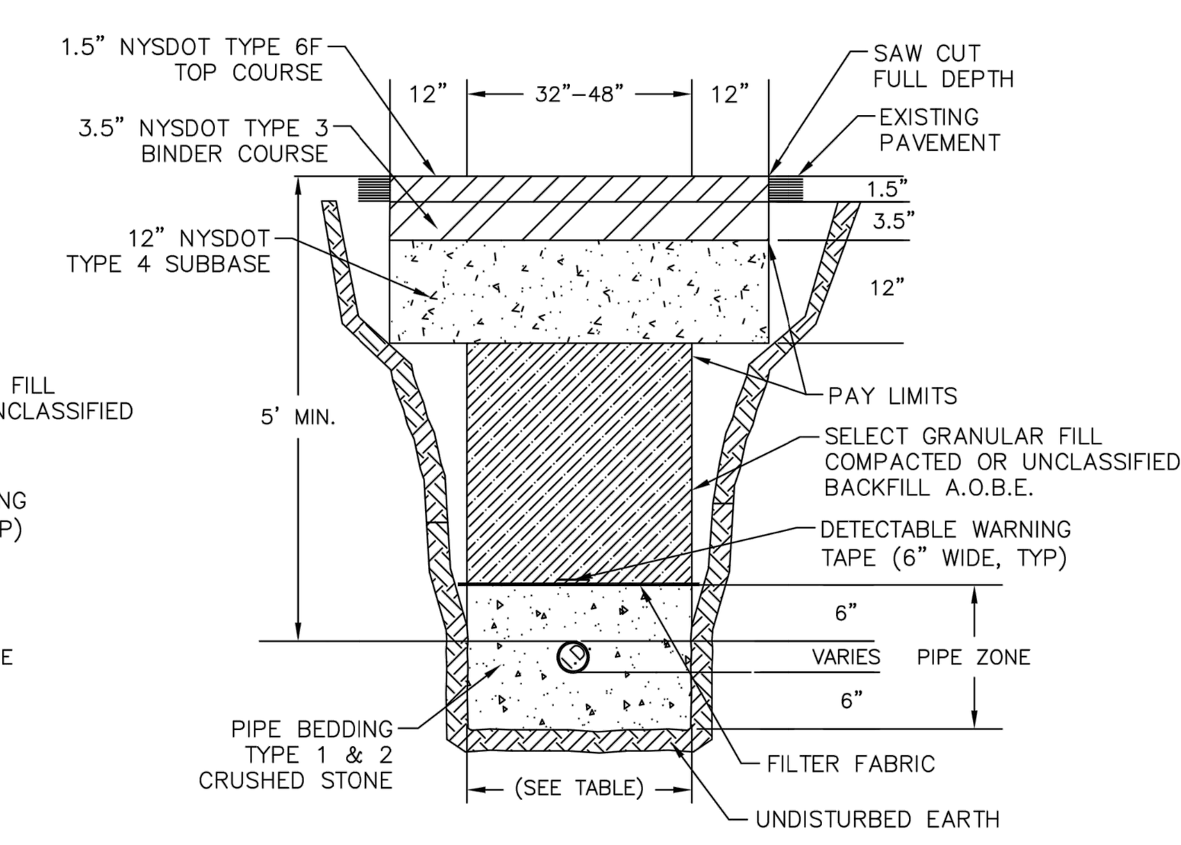
PIPE SIZE I.D. INCHES	MIN. SUGGESTED TRENCH WIDTH FOR AMPLE WORKING SPACE (I.D. PLUS 24 INCHES
I.D.	W MIN.
4	28
6	30
8	32
10	34
12	36



TRENCH IN DRIVEWAYS DETAIL



TRENCH IN EARTH DETAIL



TRENCH IN LOCAL ROADWAYS DETAIL

2 **TOWN OF GUILDERLAND TYPICAL TRENCHING DETAIL**
SCALE: NOT TO SCALE

OUTLINE SPECIFICATIONS FOR CONSTRUCTION OF SEWER COLLECTION SYSTEM

1. INTENTION: THE DECLARED AND ACKNOWLEDGED INTENTION TO SECURE A NEW SEWER COLLECTION SYSTEM, COMPLETE, IN ACCORDANCE WITH THE PLANS, SPECIFICATIONS, AND CONTRACT DOCUMENTS. ALL NEW WORK SHALL BE IN ACCORDANCE WITH THE LASTEST EDITION OF "RECOMMENDED STANDARDS FOR WASTEWATER FACILITIES."
2. GENERAL: ALL MATERIALS SHALL BE NEW AND UNUSED. MATERIALS SHALL BE WARRANTED BY THE CONTRACTOR AS TO MATERIALS, WORKMANSHIP, AND ACCURACY OF AS-BUILT DRAWINGS FOR A PERIOD OF ONE YEAR FROM THE DATE OF BENEFICIAL USE OF THE FACILITIES. WORKMANSHIP SHALL BE OF GOOD QUALITY; I.E., SEWERS SHALL BE LAID TRUE TO LINE AND GRADE, FITTINGS SHALL BE PROPERLY INSTALLED AND RESTRAINED, TRENCHES SHALL BE PROPERLY EXCAVATED AND BACKFILLED, MANHOLES SHALL BE INSTALLED AT LOCATIONS AND TO ELEVATIONS SHOWN ON THE PLANS.
3. SURVEYS: THE UTILITY CONTRACTOR SHALL PROVIDE ALL SURVEYS NECESSARY FOR THE LAYOUT AND CONSTRUCTION OF THE WORK OF HIS CONTRACT.
4. EARTHWORK: EARTHWORK SHALL INCLUDE ALL EXCAVATION, FILL AND BACKFILL (MACHINE), COMPACTION AND ROUGH GRADING OF MATERIALS ENCOUNTERED. NO UNSUITABLE MATERIAL INCLUDING, BUT NOT LIMITED TO, CLAY, MUCK, OR PEAT, REMOVED FROM PIPE TRENCHES ARE TO BE USED FOR BACKFILL. ALL FILL OR BACKFILL SHALL BE EITHER SAND OR SANDY CLAY, FREE FROM ROOTS, TRASH, OR OTHER DEBRIS. ALL OTHER BACKFILL SHALL BE COMPACTED BY MACHINE OPERATION CAREFULLY TO 95% (OUTSIDE OF PAVING), 98% (UNDER PAVING) OF ITS OPTIMUM MOISTURE CONTENT AS DETERMINED BY ASTM D698, LATEST.
5. JOINT RESTRAINT: ALL FORCEMAIN FITTINGS SHALL BE PROPERLY AND ADEQUATELY RESTRAINED AGAINST LATERAL MOVEMENT AT ALL TEES, CROSSES, VALVES, AND BENDS. RESTRAINERS SHALL BE MEGA-LUG TYPE FOR MECHANICAL JOINTS AND INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.
6. HIGH DENSITY POLYETHYLENE PIPE: POLYETHYLENE PIPES AND FITTINGS SHALL COMPLY WITH THE FOLLOWING STANDARDS. STANDARD FOR POLYETHYLENE PIPES (ASTM F714) LATEST, STANDARD SPECIFICATION FOR POLYETHYLENE PLASTIC PIPES AND FITTING MATERIALS (ASTM D3350) LATEST, DIP MMJ ADAPTERS AND FLANGED ASTMD3350-02. HIGH DENSITY POLYETHYLENE PIPING COMPONENTS SHALL BE MADE FROM PRESSURE-RATED PE 3408, EXTRA-HIGH MOLECULAR WEIGHT, HIGH-DENSITY POLYETHYLENE. PIPE OUTER DIAMETER (OD) SHALL BE COMPATIBLE WITH STANDARD DUCTILE IRON PIPE SIZES. HDPE PIPES FOR FORCEMAINS SHALL BE DR 11 AND MANUFACTURED WITH A GREEN LONGITUDINAL COLOR STRIPE PATTERN OF THREE EQUALLY SPACED PAIRS OF COLOR STRIPES EXTRUDED INTO THE PIPE WITH TRACER WIRE.
7. STEEL CASING PIPE: STEEL CASING PIPE, WHEN REQUIRED, SHALL BE OF SIZE INDICATED ON THE DRAWINGS AND SHALL CONFORM TO ASTM A139, WITH A MINIMUM YIELD STRENGTH OF 35,000 PSI.
8. GATE VALVES AND BOXES: GATE VALVES SHALL BE NON-RISING STEM TYPE RESILIENT WEDGE AND SHALL BE SUITABLE FOR 175 PSI (3"-12") AND 150 PSI (14"-48") WORKING PRESSURE GATE VALVE, WHICH, SHALL BE MECHANICAL JOINT. GATE VALVES SHALL HAVE A 2" OPERATING NUT AND OPEN COUNTER-CLOCKWISE. GATES VALVES SHALL HAVE JOINTS SUITABLE FOR THE TYPE OF MAIN ON WHICH INSTALLED. GATE VALVES 4" AND LARGER SHALL BE IRON BODY, BRONZE FITTED WITH RESILIENT SEAT. VALVES SHALL BE OF DOMESTIC (AMERICAN) MANUFACTURE AND SHALL BE CLOW, KENNEDY VALVE, MUELLER, OR APPROVED EQUAL. VALVE BOXES SHALL BE 5 1/4" DIAMETER, CAST IRON, SLIDING TYPE WITH CENTERING DEVICE, ADJUSTABLE WITH THE WORD "SEWER" CAST IN THE COVER. ALL SECTIONS OF THE VALVE BOX SHALL BE INTERCHANGEABLE WITH OLD BUFFALO FOUNDRY BOXES: STYLE #5001. VALVE BOXES SHALL BE BINGHAM AND TAYLOR OR APPROVED EQUAL.
9. MANHOLES: MANHOLE BASES, SECTIONS AND CONES SHALL CONFORM TO THE REQUIREMENTS OF ASTM C478, SPECIFICATIONS FOR PRECAST REINFORCED CONCRETE MANHOLE SECTIONS. CEMENT SHALL MEET THE REQUIREMENTS OF ASTM C150, SPECIFICATIONS FOR PORTLAND CEMENT, TYPE II. CONCRETE SHALL MEET THE MINIMUM REQUIREMENTS FOR CLASS "A" CONCRETE WORK. MINIMUM WALL THICKNESS SHALL BE 1/12 THE INSIDE DIAMETER IN INCHES PLUS ONE (1) INCH. BASES FOR MANHOLES SHALL BE CAST INTEGRALLY WITH THE BOTTOM MANHOLE SECTION. JOINT CONTACT SURFACES SHALL BE FORMED WITH MACHINED CASTINGS; THEY SHALL BE EXACTLY PARALLEL WITH A 2 DEGREE SLOPE AND NOMINAL 1/16 INCH CLEARANCE WITH THE TONGUE EQUIPPED WITH A PROPER RECESS FOR THE INSTALLATION OF AN O-RING RUBBER GASKET, CONFORMING TO ASTM C443. GRADE RINGS SHALL BE USED TO ADJUST FRAME HEIGHT. GRADE RINGS SHALL BE PRECAST CONCRETE DONUTS, BRICKS ARE NOT ACCEPTABLE GRADE RINGS. PRECAST CONCRETE MANHOLES SHALL BE MANUFACTURED BY FORT MILLER OR APPROVED EQUAL.
10. MANHOLE FRAMES AND COVERS: CAST IRON MANHOLE FRAMES AND COVERS. CAST IRON MANHOLE FRAMES AND COVERS SHALL BE AS DETAILED ON DRAWINGS. CASTINGS SHALL MEET THE REQUIREMENTS OF ASTM A48, SPECIFICATIONS FOR GRAY IRON CASTINGS, CLASS NO. 30, OR GRADE 65-45-12, DUCTILE IRON MEETING THE REQUIREMENTS OF ASTM A536, STANDARD SPECIFICATION FOR DUCTILE IRON CASTINGS. IN EITHER CASE, MANHOLE FRAME AND COVER SHALL BE DESIGNED TO WITHSTAND AN HS20-44 LOADING DEFINED IN THE ASSHTO SPECIFICATIONS. FRAMES AND COVERS SHALL BE MACHINED OR GROUND AT TOUCHING SURFACES SO AS TO SEAT FIRMLY AND PREVENT ROCKING. FRAMES AND COVER SHALL BE CAMPBELL 1009 WITH PICKHOLES.
11. FLEXIBLE MANHOLE CONNECTOR: ALL CONNECTIONS BETWEEN SEWER PIPE AND PRE-CAST CONCRETE MANHOLES SHALL BE ACCOMPLISHED BY A FLEXIBLE CONNECTOR, "KOR-N-SEAL", AS MANUFACTURED BY NATIONAL POLLUTION CONTROL SYSTEMS, INC. OR APPROVED EQUAL.
12. POLYVINYL CHLORIDE PIPE: POLYVINYL CHLORIDE SEWER PIPE SHALL CONFORM TO THE REQUIREMENTS OF ASTM D-3034, SDR 35. PIPE SHALL BE CLEARLY MARKED IN 5 FT. INTERVALS OR LESS, INDICATING MANUFACTURERS NAME, NOMINAL SIZE, CELL CLASSIFICATION AND LEGEND. JOINTS SHALL BE PUSH-ON RUBBER GASKETED, CONFORMING TO ASTM D-3034. PIPE INSTALLED DEEPER THAN 11'-0" FROM GRADE TO INVERT OR AOBE SHALL BE HEAVY WALL SDR-26. MAXIMUM DEPTH OF GRAVITY SEWER WITHOUT PRIOR APPROVAL SHALL BE 15 FEET.
13. INSTALLATION: ALL SEWER LINES, MANHOLES, AND APPUR- TENANCIES SHALL BE CONSTRUCTED TO THE DIMENSIONS AND ELEVATIONS INDICATED ON THE DRAWINGS. TRENCHES SHALL BE EXCAVATED TO A WIDTH APPROXIMATELY TWELVE INCHES GREATER THAN THE OUTSIDE DIAMETER OF THE PIPE. EACH SECTION OF PIPE SHALL BE INSPECTED FOR DEFECTS PRIOR TO BEING LOWERED INTO THE TRENCH. THE INSIDE OF EACH BELL AND THE OUTSIDE OF EACH SPIGOT SHALL BE THOROUGHLY CLEANED OF ALL FOREIGN MATTER, PRIOR TO MAKING THE JOINT. ALL SEWER LINES SHALL BE CONSTRUCTED WITH THE SPIGOT ENDS POINTING IN THE DIRECTION OF THE FLOW. BOTH THE BELL AND THE SPIGOT OF EACH JOINT SHALL BE LUBRICATED WITH THE LUBRICANT RECOMMENDED BY THE PIPE MANUFACTURER. ALL SEWER LINES SHALL BE CLEANED OF FOREIGN MATTER AS CONSTRUCTION PROGRESSES, AND SHALL BE IN A CLEAN CONDITION UPON COMPLETION OF CONSTRUCTION OPERATIONS. PIPE MATERIALS SHALL REMAIN THE SAME ON RUNS BETWEEN MANHOLES AND / OR OTHER STRUCTURES. CONTRACTOR SHALL INSTALL STONE BEDDING PER DETAIL AS SHOWN ON THE PLANS. WHERE EXCESSIVE WATER IS PRESENT IN PIPE TRENCHES ADDITIONAL CRUSHED STONE #1 AND #2 SHALL BE PLACED AS REQUIRED BY THE ENGINEER.
14. INSPECTION: EACH SECTION OF THE COMPLETED SEWER SYSTEM SHALL BE INSPECTED FOR PROPER ALIGNMENT. INSPECTION SHALL CONSIST OF "LAMPING" FROM MANHOLE TO MANHOLE. ANY SECTION OF THE SEWER SYSTEM WHICH DOES NOT DISPLAY TRUE, CONCENTRIC ALIGNMENT SHALL BE REINSTALLED AT NO ADDITIONAL EXPENSE TO THE OWNER. DEFLECTION TESTING WITH 5% MANDREL IS ALSO REQUIRED. ANY SECTION NOT PASSING THE MANDREL TEST SHALL BE CORRECTED. A WRITTEN LOG OF INSPECTIONS SHALL BE KEPT INDICATING LOCATION OF TEST, POTENTIAL PROBLEMS IN SEWER, DIPS AND DEPTH OF WATER, SERVICE LOCATIONS, AND OTHER IRREGULARITIES IN THE PIPE LINES. TELEVISION INSPECTION (CCTV) WILL BE REQUIRED ON ALL NEW GRAVITY SEWERS CONSTRUCTED. THIS SERVICE SHALL BE PROVIDED BY THE CONTRACTOR AS A PART OF THIS CONTRACT. THE NEWLY CONSTRUCTED SEWERS SHALL BE TELEVISED IN THE PRESENCE OF THE ENGINEER. A FULL REPORT AS TO THE CONDITION OF PIPE, TYPE, DEPTH, LOCATION OF SERVICES, LENGTH, TYPE, JOINT AND DISTANCE BETWEEN MANHOLES, ETC. SHALL BE FURNISHED TO THE ENGINEER AND OWNER PRIOR TO THE FINAL ACCEPTANCE OF THE SYSTEM. ANY PIPE FOUND TO BE CRACKED, LEAKING OR OTHERWISE DEFECTIVE SHALL BE REMOVED AND REPLACED WITH NEW PIPE AT NO ADDITIONAL COSTS TO THE OWNER. A DVD SHALL BE MADE OF THE TELEVISION INSPECTION AND SUBMITTED TO THE ENGINEER AND THE OWNER.
15. TESTING: AFTER COMPLETION OF CONSTRUCTION, THE SEWER SYSTEM SHALL BE TESTED BY LOW PRESSURE AIR TEST METHOD IN ACCORDANCE WITH "UNI-BELLS" RECOMMENDED PRACTICE FOR LOW PRESSURE AIR TESTING OF INSTALLED SEWER PIPE (UNI-B-6). THIS METHOD OF TESTING SHALL APPLY TO ALL PIPE MATERIALS AND DIAMETERS. IN ADDITION, IF THE AIR TEST ON A SECTION OF SEWER IS MARGINAL (AS TO PASSING), THE ENGINEER CAN ORDER A CORROBORATIVE HYDROSTATIC TEST ON THE SECTION IN QUESTION, AT NO ADDITIONAL COST TO THE OWNER.
16. ABANDONMENT OF EXISTING SEWERS AND APPURTENANCES: EXISTING SEWERS TO BE ABANDONED IN PLACE SHALL BE PHYSICALLY SEPARATED FROM THE MANHOLES AND THE CONTRACTOR SHALL PLUG PIPES CONCRETE PLUG WITH BRICKS AND HYDRAULIC CEMENT. ALL STRUCTURES TO BE ABANDONED SHALL HAVE THEIR TOP SECTIONS REMOVED, CUT HOLES IN THE BOTTOM OF STRUCTURE, BACKFILLED STRUCTURE WITH STONE, SELECT FILL, OR FLOWABLE FILL AOBE.

GENERAL CONSTRUCTION NOTES

1. THE CONTRACTOR SHALL EXAMINE AND VERIFY, IN THE FIELD, ALL CONDITIONS AND DIMENSIONS. DIMENSIONS OF THE EXISTING STRUCTURES SHOWN ON THESE PLANS ARE FOR GENERAL REFERENCE ONLY. THEY HAVE BEEN TAKEN FROM THE ORIGINAL CONSTRUCTION OR SUBSEQUENT REHABILITATION DRAWINGS AND ARE NOT GUARANTEED. THE CONTRACTOR SHALL TAKE ALL SUCH FIELD MEASUREMENTS TO ASSURE PROPER FIT OF THE FINISHED WORK, AND THE CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR THEIR ACCURACY. IF FIELD CONDITIONS AND DIMENSIONS DIFFER FROM THOSE SHOWN ON THE PLANS, THE CONTRACTOR SHALL USE THE FIELD CONDITIONS AND DIMENSIONS AND MAKE THE APPROPRIATE CHANGES TO THOSE SHOWN ON THE PLANS, AS APPROVED BY THE ENGINEER. WHEN SHOP DRAWINGS BASED ON FIELD MEASUREMENTS ARE SUBMITTED FOR APPROVAL, THE FIELD MEASUREMENTS MADE SHALL BE INDICATED ON THE SHOP DRAWINGS SUBMITTED FOR REFERENCE OF THE REVIEWER.
2. THERE SHALL BE NO CLAIM AGAINST THE OWNER MADE BY THE CONTRACTOR FOR WORK PERTAINING TO MODIFICATIONS, AS MAY BE REQUIRED, DUE TO ANY DIFFERENCE BETWEEN ACTUAL FIELD CONDITIONS AND THOSE SHOWN BY THE DETAILS AND DIMENSIONS ON THE CONTRACT PLANS. THE CONTRACTOR WILL BE PAID AT THE UNIT BID PRICE FOR THE ACTUAL QUANTITIES OF MATERIALS USED OR FOR THE WORK PERFORMED, AS INDICATED BY THE VARIOUS ITEMS IN THE CONTRACT. THE CONTRACTOR SHOULD NOTE THAT ADDITIONAL WORK MAY BE REQUIRED AS THE CONTRACT PROGRESSES, WHICH IS NOT SHOWN OR NOTED ON THE PLANS. THIS WORK SHALL BE PERFORMED BY THE CONTRACTOR, AS ORDERED BY THE ENGINEER, AND PAYMENT SHALL BE MADE AT THE BID PRICE FOR THE APPROPRIATE ITEMS. THE CONTRACTOR'S ATTENTION IS DIRECTED TO THE FACT THAT, DUE TO THE NATURE OF REPLACEMENT PROJECTS, THE EXACT EXTENT OF REPLACEMENT WORK CANNOT ALWAYS BE ACCURATELY DETERMINED PRIOR TO THE COMMENCEMENT OF WORK. THESE CONTRACT DOCUMENTS HAVE BEEN PREPARED BASED ON FIELD INSPECTION AND OTHER INFORMATION AVAILABLE AT THE TIME. ACTUAL FIELD CONDITIONS MAY REQUIRE MODIFICATIONS TO CONSTRUCTION DETAILS AND WORK QUANTITIES. THE CONTRACTOR SHALL PERFORM THE WORK IN ACCORDANCE WITH FIELD CONDITIONS.
3. THE CONTRACTOR WILL BE HELD RESPONSIBLE FOR ALL DAMAGE TO THE EXISTING STRUCTURES CAUSED BY HIS OPERATIONS WHICH IS NOT INCLUDED AS PART OF THIS WORK. ALL DAMAGE TO THE EXISTING STRUCTURES WHICH IS NOT PART OF THE INTENDED WORK SHALL BE REPAIRED BY THE CONTRACTOR WITHOUT COST TO THE OWNER, AND TO THE SATISFACTION OF THE ENGINEER. THE CONTRACTOR SHALL CONDUCT HIS REMOVAL OPERATIONS TO THE SATISFACTION OF THE ENGINEER SO AS NOT TO UNDULY DISTURB UNDERLYING MATERIALS WHICH ARE TO REMAIN IN PLACE. THE CONTRACTOR SHALL PERFORM ALL WORK WITH CARE SO THAT ANY MATERIALS WHICH ARE TO REMAIN IN PLACE, OR WHICH ARE TO REMAIN THE PROPERTY OF THE OWNER, WILL NOT BE DAMAGED. IF THE CONTRACTOR DAMAGES ANY MATERIALS WHICH ARE TO REMAIN IN PLACE, OR WHICH ARE TO REMAIN THE PROPERTY OF THE OWNER, THE DAMAGED MATERIAL SHALL BE REPAIRED OR REPLACED IN A MANNER SATISFACTORY TO THE ENGINEER AT THE EXPENSE OF THE CONTRACTOR.
4. WHENEVER ITEMS IN THE CONTRACT REQUIRE MATERIALS TO BE REMOVED AND DISPOSED, THE COST OF SUPPLYING A LEGAL DISPOSAL AREA AND TRANSPORTATION TO THE AREA SHALL BE INCLUDED IN THE PRICE BID.
5. THE CONTRACTOR IS TO VISIT THE SITE BEFORE BIDDING, TO BECOME FAMILIAR WITH THE FIELD CONDITIONS AND TO JUDGE THE EXTENT AND NATURE OF THE WORK TO BE DONE UNDER THIS CONTRACT. NO EXTRA COMPENSATION WILL BE ALLOWED TO THE CONTRACTOR BECAUSE OF THE CONTRACTOR'S FAILURE TO INCLUDE IN THEIR BID ALL ITEMS AND MATERIALS WHICH THEY ARE REQUIRED TO FURNISH IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
6. ALL WORK AREAS AT THE SITE SHALL BE COMPLETELY SECURED, CONFORMING WITH OSHA REGULATIONS, TO THE SATISFACTION OF THE ENGINEER, TO PROTECT THE PUBLIC AND PREVENT UNAUTHORIZED ENTRY. THE COST OF THIS WORK IS TO BE INCLUDED IN THE VARIOUS ITEMS OF THE CONTRACT.
7. IT WILL BE THE CONTRACTOR'S OBLIGATION AND RESPONSIBILITY TO USE METHODS AND EQUIPMENT WHICH WILL INSURE THE SATISFACTORY COMPLETION OF THE REQUIRED WORK WITHIN THE TIME FRAME STIPULATED IN THE CONTRACT.
8. THE CONTRACTOR SHALL PROVIDE SURVEY AND STAKE OUT FOR THIS PROJECT. THE COST FOR THE SURVEY AND STAKE OUT SHALL BE INCLUDED IN THE UNIT PRICES BID FOR VARIOUS ITEMS OF THE CONTRACT.
9. LOCATION OF UTILITIES, PUBLIC AND/OR PRIVATE, INDICATED AS EXISTING AND/OR TO BE CONSTRUCTED AS SHOWN ON THE PLANS ARE APPROXIMATE ONLY. THEIR EXACT LOCATION SHALL BE DETERMINED IN THE FIELD. ADDITIONAL UTILITY LINES, WHETHER ABANDONED OR IN SERVICE, MAY EXIST AND IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO CONDUCT HIS OPERATIONS AND TAKE THE NECESSARY PRECAUTIONS TO PREVENT INTERFERENCE WITH, OR DAMAGE TO, THESE OR OTHER FACILITIES DURING THE COURSE OF CONSTRUCTION.
10. IN THE EVENT THE CONTRACTOR DAMAGES AN EXISTING UTILITY SERVICE CAUSING AN INTERRUPTION IN SAID SERVICE, THEY SHALL IMMEDIATELY COMMENCE WORK TO RESTORE SERVICE AND MAY NOT CEASE THE WORK OPERATION UNTIL SERVICE IS RESTORED.
11. THE CONTRACTOR SHALL CALL DIG SAFELY NEW YORK (DSNY) (1-800-962-7962) A MINIMUM OF THREE WORKING DAYS PRIOR TO ANY EXCAVATION TO HAVE EXISTING UNDERGROUND UTILITIES LOCATED IN THE FIELD. CONTRACTOR WILL BE RESPONSIBLE TO MAINTAIN ALL UTILITY LOCATIONS THROUGHOUT PROJECT.
12. AREAS DISTURBED BY THE CONTRACTOR AS PART OF THE WORK TO BE PERFORMED UNDER THIS CONTRACT, SHALL BE RESTORED TO PRECONSTRUCTION STANDARDS AND TO THE SATISFACTION OF THE ENGINEER. ALL THE DISTURBED GRASS AREAS SHALL BE GRADED AND SEEDED IN A MANNER APPROVED BY THE ENGINEER.
13. IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN ADEQUATE EROSION AND DUST CONTROL AT ALL TIMES. THE CONTRACTOR SHALL SUBMIT, IF REQUIRED, FOR REVIEW TO THE ENGINEER A STORMWATER POLLUTION PREVENTION PLAN (SWPPP).
14. AS-BUILT DRAWINGS: DURING THE DAILY PROGRESS OF WORK, THE CONTRACTOR'S JOB SUPERINTENDENT SHALL RECORD ON THE FIELD SET OF DRAWINGS ALL WORK INSTALLED. ALL PIPING, VALVES, FITTINGS, FIRE HYDRANTS, ETC. SHALL BE LOCATED IN TWO DIRECTIONS. ONE LOCATION SHALL BE REFERENCED PERPENDICULAR TO THE RIGHT OF WAY LINES AND/OR PROPERTY LINES (PREFERABLY BOTH). SIZE, TYPE, AND CLASS OF WATER MAINS, VALVES, FITTINGS, FIRE HYDRANTS, ETC. SHALL BE SHOWN (I.E. 8" CL 52 D.I.P., 6" GATE VALVE). ALL LOCATIONS WHERE THE TOP OF THE WATER MAIN IS LESS THAN 60" DEEP OR MORE THAN 96" DEEP SHALL BE NOTED ON THE AS-BUILTS.
15. CONSTRUCTION WARRANTY AND WARRANTY SECURITY PERIOD: CONTRACTOR SHALL WARRANTY OWNER AGAINST DEFECTS IN MATERIAL AND WORKMANSHIP. THE CONTRACTOR SHALL PROVIDE A WRITTEN AND FULLY ASSIGNABLE WARRANTY THAT THE SYSTEM INSTALLED WILL BE AND REMAIN FREE FROM ALL DEFECTS, LATENT OR OTHERWISE WITH RESPECT TO WORKMANSHIP, MATERIALS, INSTALLATION, AND ACCURACY OF THE AS-BUILT DRAWINGS IN ACCORDANCE WITH THE APPROVED PLANS AND SPECIFICATIONS FOR A PERIOD OF ONE YEAR FROM THE DATE OF THE BENEFICIAL USE OF THE FACILITIES.
16. CLEAN-UP: ALL SURPLUS MATERIALS OF CONSTRUCTION SHALL BE REMOVED FROM THE SITE AND DISPOSED OF BY THE CONTRACTOR AS PART OF THE CONTRACT WITH THE OWNER.
17. PERMITS: THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS REQUIRED FOR PERFORMING WORK UNDER HIS CONTRACT, EXCEPT THAT THE NYSDEC PERMITS, NYSDOH PERMITS, AND WETLAND PERMITS, IF REQUIRED, WILL BE SECURED BY THE OWNER.
18. DEWATERING: THE CONTRACTOR SHALL AT ALL TIME DURINGS CONSTRUCTION PROVIDE AMPLE MEANS AND EQUIPMENT WITH WHICH TO PROMPTLY REMOVE AND DISPOSE OF ALL WATER ENTERING THE TRENCH AND STRUCTURE EXCAVATIONS AND SHALL KEEP SAID EXCAVATIONS ACCEPTABLY DRY, UNTIL THE PIPING AND/OR STRUCTURES TO BE BUILT THEREIN ARE COMPLETED. ALL WATER PUMPED OR DRAINED FROM THE WORK AREA SHALL BE DISPOSED OF IN A MANNER AS TO NOT DAMAGE SEWER, WATER, ELECTRICAL OR ANY OTHER PIPING STRUCTURES OR PROPERTY. NO PIPE SHALL BE LAID IN WATER AND NO WATER SHALL BE ALLOWED TO RISE ABOVE THE BOTTOM OF ANY PIPE WHILE IT IS BEING JOINTED. DEWATERING WITH UP TO A 4" PUMP SHALL BE INCLUDED IN THE CONTRACT PRICE. ADDITIONAL COMPENSATION FOR DEWATERING THAT REQUIRES LARGER PUMPS, WELLPOINTS, OR OTHER METHODS SHALL BE APPROVED BY THE ENGINEER AND THE OWNER PRIOR TO INSTALLATION.
19. CONCRETE: ALL PORTLAND CEMENT CONCRETE MIXES SHALL BE APPROVED IN ADVANCE BY THE ENGINEER. ALL CONCRETE SHALL BE PLACED BEFORE THE INITIAL SET HAS TAKEN PLACE. STALE OR RETEMPERED CONCRETE SHALL NOT BE USED. CONCRETE USED FOR PIPE PLUGS SHALL BE 2500 PSI MINIMUM . CONCRETE USED FOR ALL OTHER PURPOSES SHALL BE 4000 PSI MINIMUM.
20. SEPARATION OF WATER AND SEWER MAINS: A HORIZONTAL SEPARATION OF A MINIMUM OF 10 FEET SHALL BE MAINTAINED BETWEEN PARALLEL WATER MAINS AND SANITARY SEWERS (INCLUDING FORCE MAINS) WHERE PRACTICAL. THE PROJECT ENGINEER MUST APPROVE ANY CROSSINGS WHERE WATER MAINS AND SANITARY SEWERS CROSS WITH LESS THAN 18" VERTICAL CLEARANCE.
21. NEW CONNECTION TO EXISTING MAIN: NEW CONNECTIONS, WHERE NOTED, TO EXISTING MAIN IN SERVICE SHALL BE ACCOMPLISHED BY THE "WET TAP" METHOD UTILIZING FULL CIRCLE STAINLESS STEEL TAPPING SLEEVE AND MECHANICAL JOINT TAPPING VALVE. TAPPING SLEEVE SHALL BE RATED AT 200 PSI, NON-SHOCK WORKING PRESSURE CONFORMING TO AWWA STANDARD C110, LATEST REVISION. ROMAC SST OR JCM 432 STAINLESS STEEL TAPPING SLEEVE WITH DUCTILE IRON FLANGE IS PREFERRED. TAPPING VALVE SHALL BE MECHANICAL JOINT ONE END AND STANDARD FLANGED JOINT ON OTHER END.
22. JOBSITE SAFETY: WHILE ON THE JOBSITE, THE CONTRACTOR SHALL AT ALL TIMES OBSERVE ALL FEDERAL, STATE, AND LOCAL SAFETY RULES, REGULATIONS AND LAWS.

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rev.	date	description

RAPP ROAD RESIDENTIAL DEVELOPMENT

SANITARY SEWER DETAILS

TOWN OF GUILDERLAND, ALBANY COUNTY, NEW YORK

designed	checked
SM	RK
date 03/11/19	scale AS NOTED
project no. 317AI.00	
sheet no. C570	

Drawing Name: Z:\projects\31700-31799\317AI.00 Rapp Road\DWG\02_C570_317AI-00_SEWER DETAILS.dwg
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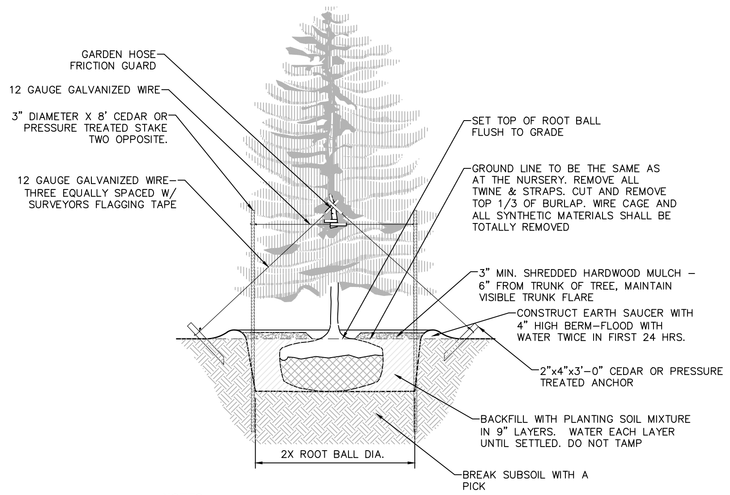
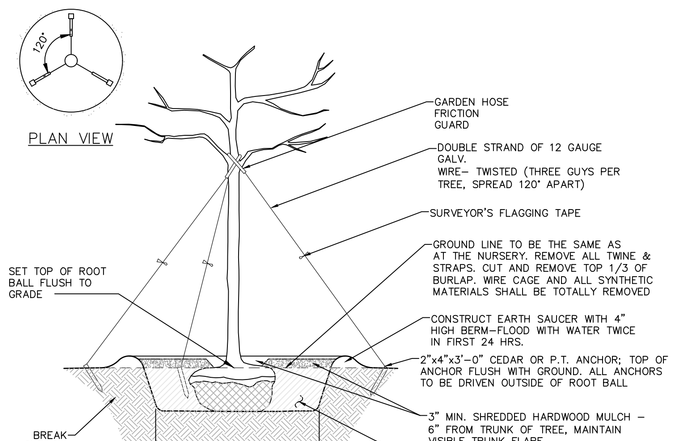


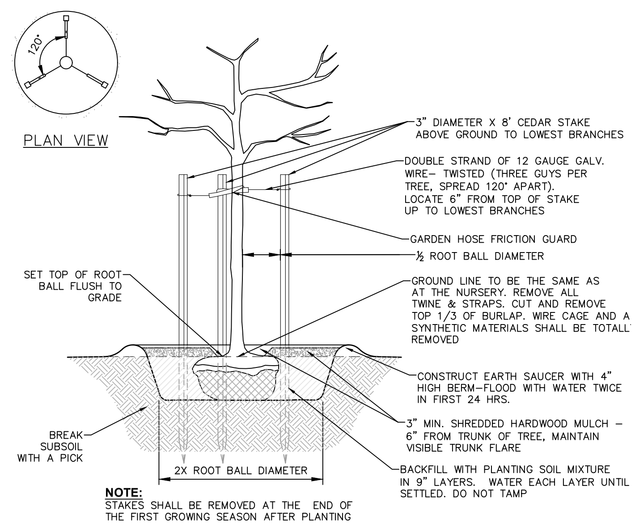
NOTES:
1. SPRAY WITH ANTIDESICCANT IN ACCORDANCE WITH MFG.'S RECOMMENDATIONS.
2. TREES LESS THAN 3" CALIPER SHALL BE STAKED.
3. TREES GREATER THAN 3" CALIPER AND UP SHALL BE GUYED AND ANCHORED.
4. STAKES SHALL BE REMOVED AT THE END OF THE FIRST GROWING SEASON AFTER PLANTING.

EVERGREEN PLANTING DETAIL
SCALE: NOT TO SCALE



NOTE:
STAKES SHALL BE REMOVED AT THE END OF THE FIRST GROWING SEASON AFTER PLANTING

PLANTING AND GUYING DETAILS-FOR TREES 3" CALIPER AND LARGER, BALLED AND BURLAPPED
SCALE: NOT TO SCALE



NOTE:
STAKES SHALL BE REMOVED AT THE END OF THE FIRST GROWING SEASON AFTER PLANTING

PLANTING AND GUYING DETAILS-FOR TREES SMALLER THAN 3" CALIPER, BALLED AND BURLAPPED
SCALE: NOT TO SCALE

LANDSCAPING NOTES:

1. THE LANDSCAPE CONTRACTOR SHALL CAREFULLY COORDINATE CONSTRUCTION ACTIVITIES WITH THAT OF THE EARTHWORK CONTRACTOR AND OTHER SITE DEVELOPMENT.
2. THE CONTRACTOR SHALL VERIFY DRAWING DIMENSIONS WITH ACTUAL FIELD CONDITIONS AND INSPECT RELATED WORK AND ADJACENT SURFACES. THE CONTRACTOR SHALL VERIFY THE ACCURACY OF ALL FINISH GRADES WITHIN THE WORK AREA. THE CONTRACTOR SHALL REPORT TO THE LANDSCAPE ARCHITECT/ENGINEER AND OWNER ALL CONDITIONS WHICH PREVENT PROPER EXECUTION OF THIS WORK.
3. THE EXACT LOCATION OF ALL EXISTING UTILITIES, STRUCTURES AND UNDERGROUND UTILITIES, WHICH MAY NOT BE INDICATED ON THE DRAWINGS, SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL PROTECT EXISTING STRUCTURES AND UTILITY SERVICES AND IS RESPONSIBLE FOR THEIR REPLACEMENT IF DAMAGED.
4. THE CONTRACTOR SHALL KEEP THE PREMISES FREE FROM RUBBISH AND ALL DEBRIS AT ALL TIMES AND SHALL ARRANGE MATERIAL STORAGE SO AS NOT TO INTERFERE WITH THE OPERATION OF THE PROJECT. ALL UNUSED MATERIALS, RUBBISH AND DEBRIS SHALL BE REMOVED FROM THE SITE.
5. NO TREES OR SHRUBS SHALL BE PLANTED ON EXISTING OR PROPOSED UTILITY LINES.
6. QUALITY ASSURANCE:
   A. NOMENCLATURE: PLANT NAMES SHALL CONFORM TO THE LATEST EDITION OF "STANDARDIZED PLANT NAMES" AS ADOPTED BY THE AMERICAN JOINT COMMITTEE ON HORTICULTURAL NOMENCLATURE.
   B. SIZE AND GRADING: PLANT SIZES AND GRADING SHALL CONFORM TO THE LATEST EDITION OF "AMERICAN STANDARD FOR NURSERY STOCK" AS SPONSORED BY THE AMERICAN ASSOCIATION OF NURSERYMEN, INC (AAN), UNLESS OTHERWISE SPECIFIED.
   C. NURSERY SOURCE: OBTAIN FRESHLY DUG, HEALTHY, VIGOROUS PLANTS NURSERY GROWN UNDER CLIMACTIC CONDITIONS SIMILAR TO THOSE IN THE LOCALITY OF THE PROJECT FOR A MINIMUM OF 2 YEARS. PLANTS SHALL HAVE BEEN LINED OUT IN ROWS, ANNUALLY CULTIVATED, SPRAYED, PRUNED AND FERTILIZED IN ACCORDANCE WITH GOOD HORTICULTURAL PRACTICE. ALL PLANTS SHALL HAVE BEEN TRANSPLANTED OR ROOT PRUNED AT LEAST ONCE IN THE PAST 3 YEARS. BALLED AND BURLAPPED PLANTS MUST COME FROM SOIL WHICH WILL HOLD A FIRM ROOT BALL. HEELED IN PLANTS AND PLANTS FROM COLD STORAGE ARE NOT ACCEPTABLE.
   D. SUBSTITUTIONS: DO NOT MAKE SUBSTITUTIONS OF TREES AND/OR SHRUB MATERIALS. IF REQUIRED LANDSCAPE MATERIAL IS NOT OBTAINABLE, SUBMIT PROOF OF NON–AVAILABILITY AND PROPOSAL FOR USE OF EQUIVALENT MATERIAL. WHEN AUTHORIZED, ADJUSTMENTS OF CONTRACT AMOUNT (IF ANY) WILL BE MADE BY CHANGE ORDER.
7. SEEDING & PLANTING SEASONS AND TIMING CONDITIONS:
   A. UNLESS OTHERWISE DIRECTED IN WRITING, SEED LAWNS FROM MARCH 15 TO JUNE 15, AND FROM AUGUST 15 TO OCTOBER 15.
   B. UNLESS OTHERWISE DIRECTED IN WRITING PLANT TREES AND SHRUBS FROM MARCH 15 TO JUNE 1, AND FROM AUGUST 15 TO OCTOBER 30.
   C. AREAS UNDERGOING CLEARING OR GRADING AND ANY AREAS DISTURBED BY CONSTRUCTION ACTIVITIES WHERE LAWNS OR PLANTINGS ARE TO BE ESTABLISHED AND WORK IS COMPLETE, SHALL BE RESTORED WITH PERMANENT VEGETATIVE COVER AS SOON AS SITE AREAS ARE AVAILABLE AND WITHIN 14 DAYS AFTER WORK IS COMPLETE; WORK SHALL BE WITHIN THE SEASONAL LIMITATIONS FOR EACH KIND OF LANDSCAPE WORK REQUIRED. PROVIDE STABILIZATION WITH TEMPORARY VEGETATIVE COVER (TOPSOIL AND TEMPORARY COVER SEED MIX) WITHIN 14 DAYS AFTER WORK IS COMPLETE, FOR SEEDING OUTSIDE PERMITTED SEEDING PERIODS.
8. PRODUCTS:
   A. IMPORTED TOPSOIL: PROVIDE TOPSOIL CONFORMING TO THE FOLLOWING:
      i. LOAM TOPSOIL, WELL DRAINED HOMOGENEOUS TEXTURE AND OF UNIFORM GRADE, WITHOUT THE ADMIXTURE OF SUBSOIL MATERIAL AND FREE OF DENSE MATERIAL, HARDPAN, CLAY, STONES, SOD OR OTHER OBJECTIONABLE MATERIAL.
      ii. CONTAINING NOT LESS THAN 5% NOR MORE THAN 20% ORGANIC MATTER IN THAT PORTION OF A SAMPLING PASSING A 1/4" SIEVE WHEN DETERMINED BY THE WET COMBUSTION METHOD ON A SAMPLE DRIED AT 105°C.
      iii. CONTAINING A PH VALUE WITHIN THE RANGE OF 6.5 TO 7.5 ON THAT PORTION OF THE SAMPLE WHICH PASSES A 1/4" SIEVE.
      iv. CONTAINING THE FOLLOWING WASHED GRADATIONS:

SIEVE DESIGNATION	% PASSING
1"	100
1/4"	97–100
NO 200	20–60

   B. SEED MIXTURE:
   PROVIDE FRESH, CLEAN, NEW–CROP SEED MIXED IN THE PROPORTIONS SPECIFIED FOR SPECIES AND VARIETY, AND CONFORMING TO FEDERAL AND STATE STANDARDS. PROVIDE THE FOLLOWING MIXTURES:
      i. LAWN SEED MIX

      SUN AND PARTIAL SHADE:

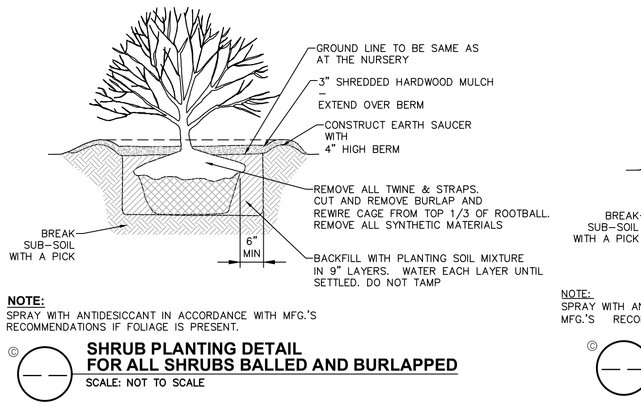
AMOUNT BY: WEIGHT	SPECIES OR VARIETY	MINIMUM % PURITY	GERMINATION
50%	KENTUCKY BLUE GRASS*	95%	80%
20%	PERENNIAL RYE	98%	90%
30%	CREEPING RED FESCUE	97%	85%
100%			

      *MINIMUM 2 (EQUAL PROPORTIONS) VARIETIES AS LISTED IN CORNELL RECOMMENDATIONS FOR TURFGRASS.

      ii. TEMPORARY COVER SEED MIX

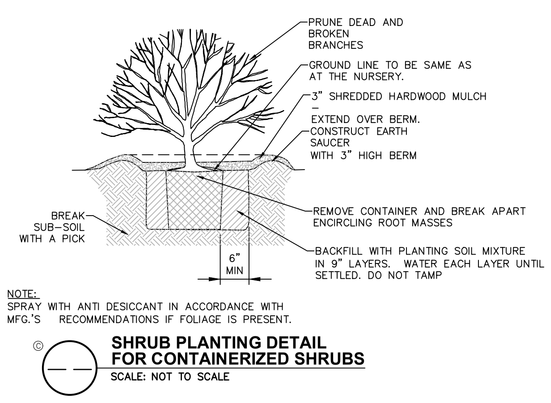
AMOUNT BY: WEIGHT	SPECIES OR VARIETY	MINIMUM % PURITY	GERMINATION
100%	ANNUAL RYEGRASS	98%	90%

   C. LIME: NATURAL LIMESTONE CONTAINING AT LEAST 85% OF TOTAL CARBONATES, GROUND TO SUCH FINENESS THAT AT LEAST 90% PASSES A 10–MESH SIEVE AND AT LEAST 50% PASSES A 100–MESH SIEVE.
   D. FERTILIZER:
      i. FOR STARTER FERTILIZING: COMMERCIAL STARTER FERTILIZER, GRANULAR, NONBURNING PRODUCT CONTAINING 5% NITROGEN, 10% AVAILABLE PHOSPHOROUS, AND 5% WATER SOLUABLE POTASH (5–10–5).
      ii. FOR FINAL FERTILIZING: IF APPLIED IN SPRING SEASON, SHALL BE A SLOW RELEASE COMMERCIAL FERTILIZER, GRANULAR, WITH 3–1–2 NPK. IF APPLIED IN FALL SEASON, SHALL BE AS SPECIFIED IN (8.D.I) ABOVE.
   E. TREES, SHRUBS, GROUND COVERS, PERENNIALS, ANNUALS:
      i. PLANTING SOIL MIXTURE: SHALL BE PREMIXED IN BULK, AND CONTAIN THE FOLLOWING BY VOLUME:
         30 PARTS TOPSOIL
         10 PARTS PEAT
         1 PART BONE MEAL
      ii. PEAT: BROWN TO BLACK IN COLOR, WEED AND SEED FREE, DRIED SPHAGNUM PEAT, CONTAINING NOT MORE THAN 9% MINERAL ON A DRY BASIS AND CONFORMING TO NYSDOT 713–15.
      iii. BONE MEAL: FINELY GROUND, RAW, MINIMUM 4% NITROGEN AND 20% PHOSPHORIC ACID. IT SHALL BE DELIVERED IN SEALED BAGS SHOWING THE MANUFACTURER'S GUARANTEED ANALYSIS.
   F. STAKES: 8 FEET LONG, 3 INCH DIA. CEDAR OR P.T. WOOD STAKES.
   G. HOSE: NEW, 2–PLY GARDEN HOSE NOT LESS THAN 1/2 INCH IN DIAMETER.
   H. WEED CONTROL FABRIC: SOIL CHECK AS MANUFACTURED BY BRIGHTON BYPRODUCTS CO. INC, NEW BRIGHTON, PA; MIRASCAPE OR MIRAFI GEOSYNTHETIC PRODUCTS, NORCROSS, PA, OR APPROVED EQUIVALENT.
   I. MULCH:
      i. LAWN AREAS
      OAT OR WHEAT STRAW, FREE OF WEEDS. AN ALTERNATIVE IS WOOD FIBER CELLULOSE IF HYDROSEEDING IS USED.
      ii. PLANT BED AREAS
      GROUND OR SHREDDED HARDWOOD BARK, UNCOLORED. NO PIECES OVER 2 INCHES GREATEST DIMENSION. FREE FROM SAWDUST.
9. EXECUTION:
   A. LANDSCAPE WORK SHALL BE UNDERTAKEN AS SOON AS SITE AREAS ARE AVAILABLE.
   B. TOPSOIL SHALL BE SPREAD NO LESS THAN 4" OVER SUB–GRADE MATERIAL. SOIL AMENDMENTS SHALL BE THOROUGHLY MIXED INTO THE TOP 4" OF TOPSOIL, FOLLOWING THE SPECIFICATIONS STATED BELOW.
   C. PERFORM FINE GRADING TO FINISHED ELEVATION ONLY IMMEDIATELY PRIOR TO PLANTING. PLANTING AREAS SHALL BE GRADED TO A SMOOTH, EVEN SURFACE, FREE OF DEPRESSIONS OR RIDGES WITH A UNIFORM LOOSE, FINE TEXTURE.
   D. FERTILIZING:
      i. THE SOIL SHALL BE TESTED FOR PH AND LIME ADDED AS NECESSARY. ALL AMENDMENTS SHALL BE CHECKED AND APPROVED BY LANDSCAPE ARCHITECT BEFORE AMENDMENTS ARE MADE.
      ii. APPLY FERTILIZER AT RATE OF 4 LBS/1000 SF FOR LAWN AREAS.
   E. LAWN:
      i. LAWN SEED MIX: SEED AT THE RATE OF 5 TO 6 LBS PER 1,000 SF.
      ii. TEMPORARY COVER SEED MIX: SEED AT THE RATE OF 3 TO 4 LBS PER 1,000 SF.
      iii. TEMPORARY COVER SEED MIX TO BE APPLIED ONLY FOR LATE FALL OR SUMMER SOIL STABILIZATION OUTSIDE ALLOWED SEEDING PERIODS.
   F. ALL SEEDED AREAS SHALL BE PROTECTED FROM EROSION BY ONE OF THE FOLLOWING METHODS:
      i. A UNIFORM BLANKET OF STRAW APPLIED AT A RATE OF 2 TONS/ACRE MIN, TO BE APPLIED ONCE SEEDING IS COMPLETE.
      ii. WOOD FIBER CELLULOSE APPLIED WITH SEED MIX BY A HYDROSEEDER AT A RATE OF 2,000 LBS/ACRE.
   G. ALL SEEDED SLOPES 3:1 OR GREATER SHALL BE PROTECTED FROM EROSION WITH JUTE MESH OR APPROVED EQUAL.
   H. ALL NEWLY PLANTED AREAS SHALL BE KEPT MOIST BY WATERING UNTIL GRASSES AND GROUND COVERS ARE WELL ESTABLISHED. THE LANDSCAPE CONTRACTOR MUST WATER PLANT MATERIAL WHEN NECESSARY FOR 60 DAYS AFTER INSTALLATION.
   I. LAWNS ARE TO BE WARRANTED UNTIL THEY BECOME ESTABLISHED, UNTIL FINAL ACCEPTANCE, AND NOT LESS THAN 60 DAYS AFTER COMPLETION OF ALL WORK. TREES, SHRUBS, GROUND COVERS, AND PERENNIALS SHALL BE WARRANTED AGAINST DEFECTS INCLUDING POOR GROWTH AND DEATH, EXCEPT WHEN RESULTING FROM OWNER NEGLECT, INCIDENTS THAT ARE BEYOND THE CONTROL OF THE LANDSCAPE INSTALLER AND DAMAGE OR ABUSE BY OTHERS, FOR AT LEAST ONE FULL YEAR AFTER PROJECT COMPLETION.



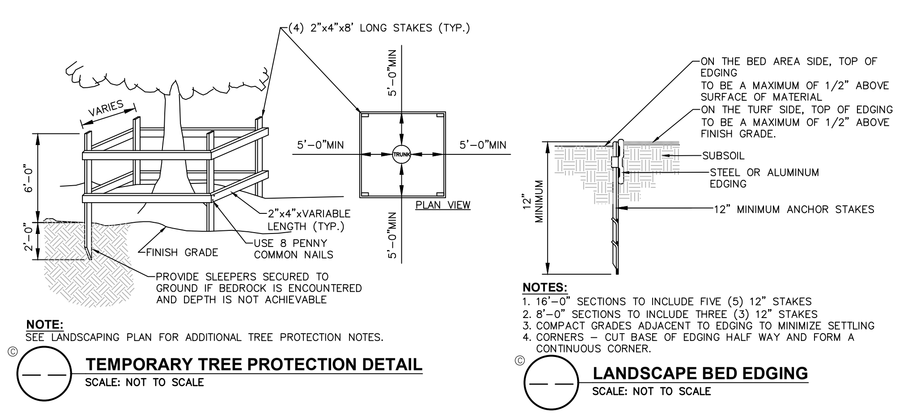
NOTE:
SPRAY WITH ANTIDESICCANT IN ACCORDANCE WITH MFG.'S RECOMMENDATIONS IF FOLIAGE IS PRESENT.

SHRUB PLANTING DETAIL FOR ALL SHRUBS BALLED AND BURLAPPED
SCALE: NOT TO SCALE



NOTE:
SPRAY WITH ANTI DESICCANT IN ACCORDANCE WITH MFG.'S RECOMMENDATIONS IF FOLIAGE IS PRESENT.

SHRUB PLANTING DETAIL FOR CONTAINERIZED SHRUBS
SCALE: NOT TO SCALE

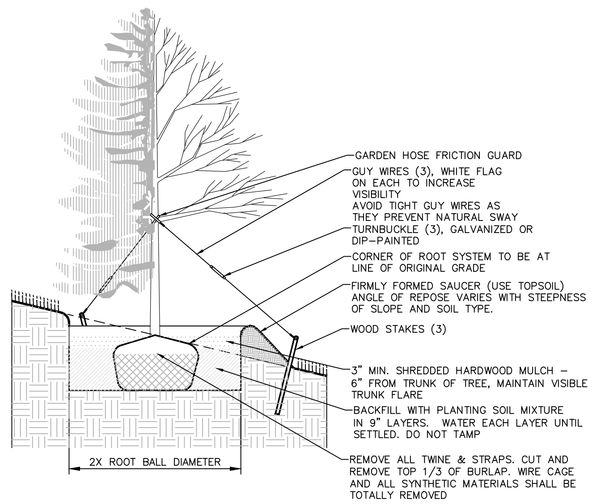


NOTE:
SEE LANDSCAPING PLAN FOR ADDITIONAL TREE PROTECTION NOTES.

TEMPORARY TREE PROTECTION DETAIL
SCALE: NOT TO SCALE

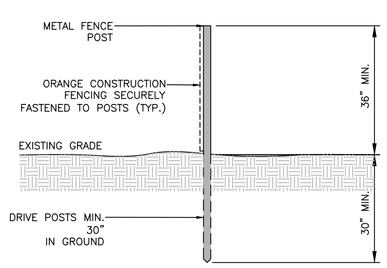
NOTES:
1. 16'–0" SECTIONS TO INCLUDE FIVE (5) 12" STAKES
2. 8'–0" SECTIONS TO INCLUDE THREE (3) 12" STAKES
3. COMPACT GRADES ADJACENT TO EDGING TO MINIMIZE SETTLING
4. CORNERS – CUT BASE OF EDGING HALF WAY AND FORM A CONTINUOUS CORNER.

LANDSCAPE BED EDGING
SCALE: NOT TO SCALE

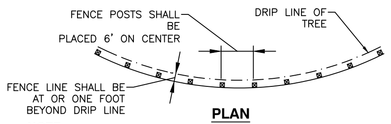


NOTE:
DETAIL SHALL BE UTILIZED FOR DECIDUOUS AND CONIFEROUS TREE PLANTING ON SLOPE.

TREE PLANTING ON SLOPE
SCALE: NOT TO SCALE



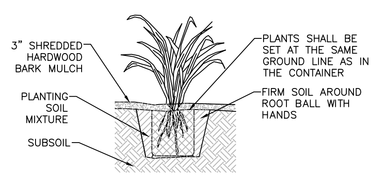
SECTIONAL ELEVATION



PLAN

NOTE:
SEE LANDSCAPING PLAN FOR ADDITIONAL TREE PROTECTION NOTES.

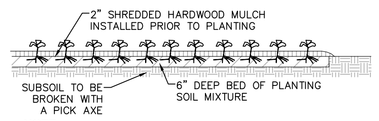
TREE PROTECTION FENCING DETAIL
SCALE: NOT TO SCALE



SECTIONAL ELEVATION

NOTES:
1. SPADED PLANTING SOIL MIX (4"–6" DEPTH), ADD FERTILIZER WHEN MIXING. DO NOT COMPACT AFTER PLANTING.
2. WATER THOROUGHLY AFTER PLANTING.
3. PROVIDE WELL DRAINING SUBSOIL WHEN SOIL IS HEAVY OR COMPACTED.
4. PLANTS SHALL BE REMOVED FROM ALL CONTAINERS WHEN PLANTED, UNLESS OTHERWISE STATED IN THE PLANT SCHEDULE.

CONTAINERIZED PERENNIAL PLANTING
SCALE: NOT TO SCALE



NOTE:
GROUND COVERS SHOULD BE POT OR CONTAINER GROWN.

GROUND COVER/ ANNUAL PLUG PLANTING
SCALE: NOT TO SCALE

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rev.	date	description

RAPP ROAD RESIDENTIAL DEVELOPMENT

LANDSCAPING DETAILS & NOTES

TOWN OF GUILDERLAND, ALBANY COUNTY, NEW YORK

designed	checked
SM	RK
date	scale
03/11/19	AS NOTED
project no.	
317AI.00	
sheet no.	
C580	

Drawing Name: Z:\projects\31700–31799\317AI.00 Rapp Road\DWG\02_C580_317AI–00_LANDSCAPE DETAILS.dwg
Xref's Attached: XTB_317AI–00_30x42
Date Printed: Feb 14, 2020, 9:12am