NOTE:
This SWPPP was prepared in accordance with City of Albany Unified Sustainable Development Ordinance (USDO). This SWPPP must be kept on the job site and available for use of contractors & sub-contractors. Certifications by Applicant/Developer and by the Contractors/Subcontractors are included. Sample Inspection Forms are included. SWPPP Inspections must be performed by a qualified professional and submitted to the Stormwater Program Manager at the Department of Water & Water Supply within 24 hours after inspection is completed. A pre-construction meeting is required to be held with a representative with the City of Albany Department of Water prior to the start of construction. Maintenance Plan is attached and includes both temporary and permanent facilities maintenance. This SWPPP, together with all required plans, completed inspection forms and a log of activities including any mitigation of items noted on inspection forms must be kept on the job site and available for inspection by regulatory authorities. An electronic copy of the SWPPP Inspection must be submitted to the Stormwater Management Coordinator.

STORM WATER POLLUTION PREVENTION PLAN (SWPPP)
& STORM WATER MANAGEMENT REPORT (SWMR)

Proposed Gymnasium
135 Academy Road
CITY OF ALBANY
COUNTY OF ALBANY
STATE OF NEW YORK

Applicant: Albany Academy
PREPARED BY:
HERSHBERG & HERSHBERG

CONSULTING ENGINEERS
18 Locust Street
Albany, NY 12203-2908
Phone 518-459-3096
Fax 518-459-5683
Email hhershberg@aol.com

September 18, 2018
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INTRODUCTION

Hershberg & Hershberg, Consulting Engineers and Land Surveyors, were retained by Albany Academy (hereinafter the “Applicant”) as site engineer for the construction of a new gymnasium at 135 Academy Road.

DESCRIPTION OF EXISTING SITE:

PARCEL AREA

The existing parcel is known as Tax Map Parcel #75.12-1-1.1 listed as No. 135 Academy Road. The existing parcel contains 1,227,085 SF ± (28.17 acres) of land. The project area for the site contains approximately 1.75 acres.

The following are the site statistics for the project area prior to redevelopment

<table>
<thead>
<tr>
<th>Description</th>
<th>Area (SF)</th>
<th>Area (acres)</th>
<th>% of Project Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building Area</td>
<td>0.00</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Paved area</td>
<td>16,809</td>
<td>0.38</td>
<td>21.71%</td>
</tr>
<tr>
<td>Green Area</td>
<td>59,651</td>
<td>1.37</td>
<td>78.29%</td>
</tr>
<tr>
<td>Total Area</td>
<td>76,460</td>
<td>1.75</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Fig. No. 1 – Existing Site Coverage Statistics based on project limits
An aerial photo of the site area is shown below.

**Fig. No. 2 - Aerial Photo of Existing Site**

**PARCEL ZONING**

The site lies entirely within the MU-CI: Mixed-Use, Campus/Institutional zoning district.

**WATERCOURSES**

There is a riverine drainage course within the project area, located adjoining the pavement along Hackett Boulevard.

**EXISTING WETLANDS**

This drainage ditch only contains flowing water only during heavy rain events and is identified as a riverine course. A copy of the National Wetland Inventory site data is reproduced below.
Fig. No. 3 - From National Wetland Inventory

FLOOD PLAIN

The site to be developed lies entirely within Zone X (Area of Minimal Flooding) as shown on Flood Insurance Rate Maps reproduced below:
HISTORIC OR ARCHEOLOGICAL RESOURCES

The entire site has been previously graded, developed and disturbed. There are no buildings on the site which are listed on the State or Federal register of historic places.

LISTED, ENDANGERED OR THREATENED SPECIES

NYSDEC Environmental Resource Mapper shows no rare plants or animals or any significant natural community in the area of the project.
EXISTING USAGE

The site is currently occupied by buildings and athletic fields owned by Albany Academy.

EXISTING SOILS

The project area is located in an area of Udorthents Clayey- Urban Land Complex. The site-specific geotechnical evaluation was accomplished by Dente Engineering in May, 2018 and is included as Appendix 3.

Fig. No. 5 – Soils Map
A Geotechnical Evaluation was conducted by Dene Engineering a division of Terracon and is included in Appendix #3.

WATERSHED DESCRIPTION

The entire project area drains to the south by sheet flow toward a catch basin at the northwestern corner of the Field House. This catch basin is
tributary to a 7’ monolithic concrete combined sewer on Hackett Boulevard by a 12” HDPE pipe. This combined sewer is within the Beaver Creek Sewer District.

**SITE TOPOGRAPHY**

The project area slopes from the north at an elevation of 225.5 +/- to the southwestern boundary of the project area at an elevation of 218.0 +/-.

**DESCRIPTION OF INTENDED SITE DEVELOPMENT AND USE**

The applicant proposes to construct a 31,500 SF one-story gymnasium addition. Water and sewer will be provided via connection to the existing building on site. New catch basins will be installed to direct water to an infiltration basin adjacent to the building.

**PROPOSED SITE COVERAGE STATISTICS**

The proposed site coverage statistics for the project area are as shown below.

<table>
<thead>
<tr>
<th>Description</th>
<th>Area (SF)</th>
<th>Area (Acres)</th>
<th>% of site</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building</td>
<td>31,500</td>
<td>0.72</td>
<td>42.85</td>
</tr>
<tr>
<td>Pavement/Sidewalk</td>
<td>5,520</td>
<td>0.13</td>
<td>0.07</td>
</tr>
<tr>
<td>Total Impervious</td>
<td>37,020</td>
<td>0.85</td>
<td>42.92</td>
</tr>
<tr>
<td>Pervious</td>
<td>39,440</td>
<td>0.90</td>
<td>57.08</td>
</tr>
<tr>
<td>Total Site</td>
<td>76,460</td>
<td>1.75</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Fig. No. 8 - Proposed Site Coverage Statistics based on project limits

The site qualifies as a redevelopment site with an increase in Impervious Cover (IC) as described in Chapter 9 of the New York State Stormwater Management Design Manual.
SELECTED METHOD OF TREATMENT AND STORAGE:

The design of the SWMR includes the following elements of treatment and storage:

New catch basins will direct stormwater to a sediment basin at the western side of the proposed gymnasium. At the northern side of the proposed gymnasium, a dry swale with an underdrain will collect stormwater and direct it to the pre-treatment basin. The outfall of the pre-treatment basin is a rip-rap channel which flows into an infiltration basin. The infiltration rate used is 1 inch per hour. The infiltration basin will have enough storage capacity to contain all storms up to the 100-year storm. Any overflow from the basin is directed to an existing catch basin via a 12” HDPE.
DESIGN CONSIDERATIONS:

The design of the SWPPP for the subject site considered the following critical factors:

1. Compliance with Section 375-4(G)(11) of the Unified Sustainable Development Ordinance entitled STORMWATER MANAGEMENT
   (a) All development and redevelopment in the City shall comply with the requirements of Article 14 of Chapter 133 (Stormwater Management and Erosion Control) of the City Code, and with Chapter 299 (Sewers) of the City Code.
   (b) Each application for development or redevelopment shall be referred to the Department of Water and Water Supply for a determination of whether the existing sanitary and storm sewer infrastructure is adequate in size, location, connectivity, and construction quality to accommodate expected flows of both sanitary sewer and stormwater from the proposed facility. If the Albany Department of Water and Water Supply determines that the existing sanitary and/or storm sewer infrastructure is not adequate to accommodate expected sanitary and stormwater flows from the proposed development, the City may require that the applicant modify the proposed development and/or install or contribute a proportional share of the overall cost to the installation of required storm and sanitary sewer infrastructure before the proposed development is approved, and the applicant may be required to pay its proportionate share of those costs.
   (c) All development and redevelopment within the City with a proposed area of disturbance greater than or equal to one-quarter (1/4) of an acre in size shall comply with the latest version of the New York State Department of Environmental Conservation
Stormwater Management Design Manual that are written as applicable to properties with areas of disturbance of one (1) acre in size or larger.

(d) The maximum allowable design peak-flow stormwater discharge into the combined sewer system shall be limited to the calculated peak-flow discharge of the **10-year storm for un-development site conditions**, as determined by a Professional Engineer, and to be reviewed and accepted by the Department of Water and Water Supply. (emphasis added)

2. During construction comply with the *New York State Standards and Specifications for Erosion and Sediment Control* dated July, 2016.

3. The permanent system complies with the New York State Stormwater Management Design Manual (hereinafter NYSSWDM), last revised January, 2015 with the exception of the consideration of the 10 year undeveloped site as opposed to the redevelopment standard.

**CALCULATED FLOWS FROM THE SITE**

The following table is prepared from the comparisons between the Un-developed and the proposed conditions as detailed on the HydroCAD®10.00 contained in Appendix 6.

<table>
<thead>
<tr>
<th></th>
<th>10 YEAR STORM</th>
<th>100 YEAR STORM</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>UNDEVELOPED</strong></td>
<td><strong>POST</strong></td>
<td><strong>UNDEVELOPED</strong></td>
</tr>
<tr>
<td>4.02</td>
<td>2.73</td>
<td>8.15</td>
</tr>
</tbody>
</table>

Fig. No. 9 – Calculated Flows from the site
With the entire site considered as undeveloped for the existing computation, the peak-flow discharge of the post development site is reduced to less than the 10 year storm.

**WATER QUALITY VOLUME**

Water Quality Volume (WQₐ) is computed based upon the following formula:

\[
WQ_v = \frac{(P)(R_v)(A)}{12}
\]

Where

- \( WQ_v \) = water quality volume (acre-feet)
- \( P \) = 90% rainfall event\(^2\) (1.20 inches)
- \( R_v \) = 0.05 + 0.009 I, where I is percent impervious cover
- \( A \) = site area in acres

---

1. Ibid. Table 4-1, Page 4-3
2. Ibid., Page 4-2, Figure 4.1
Fig. No. 10 – NYSDEC 90th Percentile Contour

The Water Quality Volume (WQv) is computed in Appendix #7. The total WQv for the project area is 0.088 acre-feet (3,844 cubic feet).

CONSTRUCTION SEQUENCING & SEDIMENTATION AND EROSION CONTROL DURING CONSTRUCTION

The construction sequence for this project will be governed by the erosion and sediment control plan. Approximate timing is indicated where applicable in red following steps.

Prior to commencement of any work this SWPPP

✓ Assure that copy of SWMR & SWPPP is on the site. ON COMMENCEMENT

✓ Establish Qualified Individual who will be performing site inspection. ON COMMENCEMENT

✓ SWPPP Inspections must be performed by the qualified professional must be submitted to the MS4 Coordinator. FROM COMMENCEMENT UNTIL FILING THE NOTICE OF TERMINATION.

✓ Establish Trained Contractor who will be on site. At least one Trained Contractor must be on site whenever ground disturbing activities are being undertaken. ON COMMENCEMENT

✓ Establish contact person for Contractor/Subcontractor. ON COMMENCEMENT

✓ IN CASE OF ANY SPILLS OF MATERIALS ON SITE, EXECUTE SPILL RESPONSE PLAN CONTAINED IN APPENDIX #9
Construction Sequence

✓ Commence work on site.  **WITHIN 10 DAYS OF PRE-CONSTRUCTION MEETING**

✓ Install silt fence or other controls as indicated on the plan.  **PRIOR TO COMMENCEMENT OF ANY GRADING – FENCE TO REMAIN IN PLACE UNTIL ALL AREAS ARE STABILIZED.**

✓ Grade and prepare construction access.  **PRIOR TO COMMENCEMENT OF ANY GRADING – CONSTRUCTION ACCESS TO REMAIN IN PLACE UNTIL ALL AREAS ARE STABILIZED.**

✓ Commence installation of the temporary sediment trap, interception swale, drop inlet protection, and portion of storm sewer.  **PRIOR TO BUILDING EXCAVATION.**

✓ The existing pavement must be kept swept clean to avoid tracking materials onto any streets.  **CONTINUOUSLY FROM INCEPTION TO COMPLETION OF STABILIZATION OR FILING OF NOTICE OF TERMINATION.**

✓ Maintain this area clean of debris and verify condition and safety of storage of materials listed below.  Requires daily inspection.  **CONTINUOUSLY FROM INCEPTION TO FILING OF NOTICE OF TERMINATION.**

✓ Any construction materials, chemicals or construction debris must be stored in sealed receptacles, trailers or buildings.  Any storage piles of materials meant for installation (i.e., sand, etc.) must be surrounded by sedimentation fence.  The list of anticipated materials stored on site during construction is provided below and must be updated if any additional materials are utilized:  **CONTINUOUSLY FROM INCEPTION TO FILING OF NOTICE OF TERMINATION.**

   - Select Fill
   - Rip-rap
   - Fencing Materials
Concrete Structures
Pipes
Pipe Solvents
Concrete for building
Roofing Materials for Building
Metal Materials for Building
Building Materials for Building

✔ MSDS sheets must be available on site for all materials used or imported to the site. CONTINUOUSLY FROM INCEPTION TO FILING OF NOTICE OF TERMINATION.

✔ Any chemical spills must be contained immediately on site and reported to NYSDEC. CONTINUOUSLY FROM INCEPTION TO FILING OF NOTICE OF TERMINATION.

✔ Oil and grease spills from equipment shall be treated immediately. CONTINUOUSLY FROM INCEPTION TO FILING OF NOTICE OF TERMINATION.

✔ Commence installation of the temporary sediment trap and interception swale. PRIOR TO GRADING.

✔ Clean interception swale and sediment trap as required. CONTINUOUSLY FROM INSTALLATION UNTIL FILING OF NOTICE OF TERMINATION.

✔ Install building, place pavement and prepare lawns and planters. PRIOR TO FILING OF NOTICE OF TERMINATION.

✔ Clean any downstream structures of any accumulated silt. PRIOR TO FILING OF NOTICE OF TERMINATION.

✔ Seed and mulch. PRIOR TO FILING OF NOTICE OF TERMINATION.

✔ Obtain approval on Notice of Termination from MS4 coordinator after site has achieved >80% grass cover. PRIOR TO FILING OF NOTICE OF TERMINATION.

✔ File NOTICE OF TERMINATION.
**HOUSEKEEPING SECTION**

During construction any construction materials, chemicals or construction debris must be stored in sealed receptacles, trailers or buildings. Any storage piles of materials meant for installation (i.e., sand, etc.) must be surrounded by sedimentation fence. The list of anticipated materials stored on site during construction is provided below and must be updated if any additional materials are utilized:

- Select Fill
- Rip-rap
- Fencing Materials
- Concrete Structures
- Pipes
- Pipe Solvents
- Concrete for building
- Roofing Materials for Building
- Building Materials for Building

MSDS sheets must be available on site for all materials used or imported to the site.

Any chemical spills must be contained immediately on site and reported to NYSDEC.

**IN CASE OF ANY SPILLS OF MATERIALS ON SITE, EXECUTE SPILL RESPONSE PLAN CONTAINED IN APPENDIX #8**

Oil and grease spills from equipment shall be treated immediately. Vehicle fueling must take place in designated area. Relocate designated fueling area when required. A concrete truck washout must be provided
and used by all trucks washing out concrete. Pit must be maintained and pumped out regularly.

After construction, materials and chemicals must be stored in sealed receptacles or in buildings. Daily inspection by trained individual shall be made by staff to ensure that materials listed below are properly stored. The list of anticipated materials stored on site after occupancy of the building and solar farm is provided below and must be updated if any additional materials are utilized:

- Cleaning Materials for Building

MSDS sheets must be available on site for all materials utilized for used or imported to the site. Any chemical spills must be contained immediately on site and reported to NYSDEC. Oil and grease spills from equipment shall be treated immediately.

**DESCRIPTION OF NEED FOR WINTER CONDITION**

The construction sequence for this project may require work between November 15th and April 1st of any year when construction is ongoing. Some unstabilized soil areas may exist on November 15th. This Section is issued for use in the event that such conditions exist. The **STANDARD AND SPECIFICATIONS FOR WINTER STABILIZATION** (reproduced below) will apply to this project area. Accommodations for wintertime conditions are addressed below.
STANDARD AND SPECIFICATIONS FOR WINTER STABILIZATION

Definition & Scope

A temporary site specific, enhanced erosion and sediment control plan to manage runoff and sediment at the site during construction activities in the winter months to protect off-site water resources.

Conditions Where Practice Applies

This standard applies to all construction activities involved with ongoing land disturbance and exposure between November 15th to the following April 1st.

Design Criteria

1. Prepare a snow management plan with adequate storage for snow and control of melt water, requiring cleared snow to be stored in a manner not affecting ongoing construction activities.

2. Enlarge and stabilize access points to provide for snow management and stockpiling. Snow management activities must not destroy or degrade installed erosion and sediment control practices.

3. A minimum 25 foot buffer shall be maintained from all perimeter controls such as silt fence. Mark silt fence with tall stakes that are visible above the snow pack.

4. Edges of disturbed areas that drain to a waterbody within 100 feet will have 2 rows of silt fence, 5 feet apart, installed on the contour.

5. Drainage structures must be kept open and free of snow and ice dams. All debris, ice dams, or debris from plowing operations, that restrict the flow of runoff and meltwater, shall be removed.

6. Sediment barriers must be installed at all appropriate perimeter and sensitive locations. Silt fence and other practices requiring earth disturbance must be installed before the ground freezes.

7. Soil stockpiles must be protected by the use of established vegetation, anchored straw mulch, rolled stabilization matting, or other durable covering. A barrier must be installed at least 15 feet from the toe of the stockpile to prevent soil migration and to capture loose soil.

8. In areas where soil disturbance activity has temporarily or permanently ceased, the application of soil stabilization measures should be initiated by the end of the next business day and completed within three (3) days. Rolled erosion control blankets must be used on all slopes 3 horizontal to 1 vertical or steeper.

9. If straw mulch alone is used for temporary stabilization, it shall be applied at double the standard rate of 2 tons per acre, making the application rate 4 tons per acre. Other manufactured mulches should be applied at double the manufacturer’s recommended rate.

10. To ensure adequate stabilization of disturbed soil in advance of a melt event, areas of disturbed soil should be stabilized at the end of each work day unless:

   a. work will resume within 24 hours in the same area and no precipitation is forecast;
   b. the work is in disturbed areas that collect and retain runoff, such as open utility trenches, foundation excavations, or water management areas.

11. Use stone paths to stabilize access perimeters of buildings under construction and areas where construction vehicle traffic is anticipated. Stone paths should be a minimum 10 feet in width but wider as necessary to accommodate equipment.

Maintenance

The site shall be inspected frequently to ensure that the erosion and sediment control plan is performing its winter stabilization function. If the site will not have earth disturbing activities ongoing during the “winter season”, all bare exposed soil must be stabilized by established vegetation, straw or other acceptable mulch, matting, rock, or other approved material such as rolled erosion control products. Seeding of areas with mulch cover is preferred but seeding alone is not acceptable for proper stabilization.

Compliance inspections must be performed and reports filed properly in accordance with the SWPPP for all sites under a winter shutdown.
WINTER CONDITIONS ITEMS TO BE ADDRESSED

1. Identify areas within the site to store snow which is tributary to the temporary sediment control trap. As work progresses this area may move but positive drainage tributary to the temporary sediment control trap must be maintained.

2. Widen stabilized construction access points to a minimum of 15 feet. Where pavement forms a portion of that route, maintain 50 feet of stone pavement meeting the detail as shown on the SWPPP plan. Stockpile a minimum of 25 cubic yard of stone for the purposes of establishing stone access point after snow storms.

3. Where any areas at the street grade or within two feet of the street grade remain disturbed overnight, stabilize those areas using 6” of broken stone.

4. Where equipment or vehicles are traversing the bottom of the excavation, establish paths using 6” of broken stone.

5. At any point on the perimeter where drainage from accumulated snow or ice will drain away from the site protect these areas coir logs or polyethelene coated check dam materials (Filtrexx, Erosion eel or equal).

6. If work is to cease for more than 3 days, stabilize all disturbed soils.
**WINTER CONDITIONS SUMMARY:**

The following is a summary of the required work if wintertime as presented by the preparer of this report:

1. The temporary system and control measures proposed herein and on the plans comply with the *New York State Standards and Specifications for Erosion and Sediment Control* dated July, 2016.

2. The winter stabilization complies with Standard and Specifications for Winter Stabilization as described *New York State Standards and Specifications for Erosion and Sediment Control* dated July, 2016.

**MAINTENANCE PLAN**

The maintenance of the infiltration basin will be the responsibility of the applicant. Maintenance plans have been developed and are contained in Appendix #4.

**SUMMARY:**

The following is a summary of the findings of this study as presented by the preparer of this report:

1. The temporary system and control measures proposed herein and on the plans comply with the *New York State Standards and Specifications for Erosion and Sediment Control* dated July, 2016.

2. The permanent system complies with Section 375-4(G)(11) of the Unified Sustainable Development Ordinance entitled STORMWATER MANAGEMENT.
CONCLUSION:

It is the conclusion of the Engineer that the drainage system, as designed, will function adequately and will not adversely affect adjacent or downstream properties.

Prepared by: Daniel R. Hershberg, P.E. & L.S.
Lic. No. 044226

File:DRH/SWPPP/SWPSSWMR20180034.DOC
APPENDIX #2

TRIBUTARY AREA MAPS
POST DEVELOPMENT TRIBUTARY AREA  MAP 1"=60'
Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a civil engineer may not fulfill the needs of a constructor — a construction contractor — or even another civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared solely for the client. No one except you should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. And no one — not even you — should apply this report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical-engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

Geotechnical Engineers Base Each Report on a Unique Set of Project-Specific Factors

Geotechnical engineers consider many unique, project-specific factors when establishing the scope of a study. Typical factors include: the client’s goals, objectives, and risk-management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical-engineering report that was:

- not prepared for you;
- not prepared for your project;
- not prepared for the specific site explored; or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical-engineering report include those that affect:

- the function of the proposed structure, as when it’s changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the composition of the design team; or
- project ownership.

As a general rule, always inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.

Subsurface Conditions Can Change

A geotechnical-engineering report is based on conditions that existed at the time the geotechnical engineer performed the study. Do not rely on a geotechnical-engineering report whose adequacy may have been affected by: the passage of time; man-made events, such as construction on or adjacent to the site; or natural events, such as floods, droughts, earthquakes, or groundwater fluctuations. Contact the geotechnical engineer before applying this report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ — sometimes significantly — from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide geotechnical-construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report’s Recommendations Are Not Final

Do not overrely on the confirmation-dependent recommendations included in your report. Confirmation-dependent recommendations are not final, because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual subsurface conditions revealed during construction. The geotechnical engineer who developed your report cannot assume responsibility or liability for the report’s confirmation-dependent recommendations if that engineer does not perform the geotechnical-construction observation required to confirm the recommendations’ applicability.

A Geotechnical-Engineering Report Is Subject to Misinterpretation

Other design-team members’ misinterpretation of geotechnical-engineering reports has resulted in costly
problems. Confront that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team’s plans and specifications. Constructors can also misinterpret a geotechnical-engineering report. Confront that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing geotechnical construction observation.

**Do Not Redraw the Engineer’s Logs**

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical-engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, but recognize that separating logs from the report can elevate risk.

**Give Constructors a Complete Report and Guidance**

Some owners and design professionals mistakenly believe they can make constructors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give constructors the complete geotechnical-engineering report, but preface it with a clearly written letter of transmittal. In that letter, advise constructors that the report was not prepared for purposes of bid development and that the report’s accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure constructors have sufficient time* to perform additional study. Only then might you be in a position to give constructors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

**Read Responsibility Provisions Closely**

Some clients, design professionals, and constructors fail to recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to discrepancies, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled “limitations,” many of these provisions indicate where geotechnical engineers’ responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

**Environmental Concerns Are Not Covered**

The equipment, techniques, and personnel used to perform an *environmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. *Do not rely on an environmental report prepared for someone else.*

**Obtain Professional Assistance To Deal with Mold**

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold-prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, many mold-prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical-engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; *none of the services performed in connection with the geotechnical engineer’s study were designed or conducted for the purpose of mold prevention.* Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.

**Rely, on Your GBC-Member Geotechnical Engineer for Additional Assistance**

Membership in the Geotechnical Business Council of the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project. Confer with you GBC-Member geotechnical engineer for more information.
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APPENDICES

APPENDIX A Current & Historic Topographic Maps and Subsurface Investigation Plan

APPENDIX B Subsurface Logs with Key

APPENDIX C Infiltration Test Results

APPENDIX F Laboratory Test Results
I. INTRODUCTION

This report presents the results of a geotechnical evaluation completed by the Dente Group for the Athletic Facility Addition planned at The Albany Academies in Albany, New York. The evaluation was completed in general accord with Dente proposal number FDE-18-38, which was accepted by the Albany Academies on April 1, 2018.

In general, our scope of services for this project consisted of the following:

- Review of Geotechnical studies completed by this office at nearby sites,
- Layout and completion of 5 test borings and 1 infiltration test,
- Completion of laboratory index testing upon selected samples collected through the investigation,
- Preparation of this report, which summarizes the results of our explorations and presents recommendations to assist in planning for the geotechnical related aspects of the project.

This report and the recommendations contained within it were developed for specific application to the site and construction planned, as we currently understand it. Corrections in our understanding, changes in the structure locations, their grades, loads, etc. should be brought to our attention so that we may evaluate their effect upon the recommendations offered in this report.

It should be understood that this report was prepared, in part, on the basis of a limited field exploration. The borings were advanced at discrete locations and the overburden...
sampled at specific intervals. It should be understood that conditions are only known at the locations and through the specific depths sampled. Conditions at other locations and depths may be different, and these differences may impact upon the conclusions reached and the recommendations offered. For this reason, we strongly recommend that we be retained to provide site observation services during construction.

This report was prepared for informational purposes only and should not be considered part of the contract documents. It should be made available to interested parties in its entirety only. Should the data contained in this report not be adequate for the contractors’ bidding purposes, the contractors may make their own investigations, tests, and analyses for use in bid preparation.

The recommendations offered in this report concerning the control of surface and subsurface waters, moisture, or vapor membranes address conventional Geotechnical Engineering aspects only and are not to be construed as recommendations for controlling or providing an environment that would prohibit or control infestations of the structure or its surroundings with mold or other biological agents.

A sheet entitled "Important Information about this Geotechnical Engineering Report" prepared by the Geotechnical Business Council is presented following the title page of this report. This sheet should never be separated from this report and be carefully reviewed as it sets the only context within which this report should be used.

II. SITE AND PROJECT DESCRIPTION

The site is located north of the existing Field House in a near level asphalt surfaced drive, parking area and turf field as depicted on the USGS Maps and Site Plan presented in Appendix A. The proposed building area grades have yet to be set but we expect between one and three feet of filling will be required to establish subgrades.

The new building is planned to be a high single story, slab on grade structure with a plan area of roughly 31,500sf. We have assumed wall and column loads will be less than 200 kips and 5 kips per lineal foot with floor loads less than 200psf to facilitate our analysis.

III. SUBSURFACE CONDITIONS

The subsurface conditions at the site were investigated through the completion of test borings made at the approximate locations shown on the plan in Appendix A. The test
borings were completed using a standard rotary drill rig equipped with hollow stem augers. As the augers were advanced, the overburden soils were sampled and their relative density determined using split-spoon sampling techniques in general accord with ASTM D1586 procedures. Representative portions of the recovered soil samples were transported to our office for visual classification by a Geotechnical Engineer. Individual subsurface logs were prepared for the borings on this basis and are presented in Appendix B.

An infiltration test was performed at the approximate location and depth requested in general accord with NYSDEC procedures. The test results are presented in Appendix C.

The subsurface logs should be reviewed for a description of the conditions encountered at the specific test locations. It should be understood that conditions are only known at the depths and locations sampled. Conditions at other depths and locations may be different.

**Subsurface Profile**
In general, beneath the surficial topsoil and pavement structure are fill soils and reworked site soils placed as fill to create the existing site grades. The fills are composed of brownish silt and clay with lesser amounts of sand, gravel and building rubble in some areas. The fills are moist and soft to medium in consistency where cohesive and loose where granular. The fills and disturbed soils ranged in depth between nil and about 4 feet where they grade into undisturbed native soils.

The native overburden is composed of brown grading to gray glacio lacustrine silt and clay soils. These surficial soils are of a medium grading to soft consistency and extended through the depths explored, about 50 feet. Available information suggests this deposit extends to depths of about 120 feet in this area.

Our experience and the laboratory testing of collected samples indicates the cohesive soils are modestly preconsolidated. The preconsolidation pressures are the result of desiccation and overburden loadings which have since been eroded. The preconsolidation effects upon the deposit are as great as 4 tons surficially decreasing to nominal values at depths of about 50 or so feet in the area.

**Groundwater Conditions**
Groundwater measurements were attempted at completion of drilling and sampling and the results are noted on the individual subsurface logs. It appears that
groundwater may exist seasonally as a perched saturated zone near the ground surface and at the fill soil interface depths. The true groundwater level is judged to exist at depths of about 15 or so feet at the site.

IV. GEOTECHNICAL RECOMMENDATIONS

A. General Site Evaluation

Based upon our evaluation of the subsurface conditions disclosed through our investigation, we have developed the following general conclusions and recommendations to assist in planning for design and construction.

1. Any existing fills should be removed from beneath the new building areas.

2. Site soils are not well suited for reuse as structural fill material in building and pavement areas.

3. The new building may be supported using ordinary spread foundations bearing upon the undisturbed native soils or upon structural fill placed for the new building areas.

4. Foundation level drains are recommended.

The following report sections provide detailed recommendations to assist in planning for design and construction. We should review plans and specifications prior to their release for bidding to allow us to refine our recommendations, if required, and confirm that our recommendations were properly interpreted and applied.

B. Seismic Design Considerations

For seismic design purposes, we evaluated the site conditions in accord with Section 1613 of the International Building Code (2015) adopted by New York State. On this basis, it was determined that Seismic Site Class “D - Stiff Profile” is applicable to this project. Based upon the composition of the site soils, liquefaction should not occur in response to earthquake motions.

C. Site Preparation and Earthwork

All vegetation, topsoil, pavements and any fills should be removed from the proposed building and pavement areas of the site.

Prior to placing any required structural fill, the building and pavement subgrades should be proof-rolled by completing at least three (3) passes using a steel drum roller with a static weight of at least ten (10) tons. The roller should operate in the vibratory
mode unless directed otherwise by a Geotechnical Engineer observing the work. Any subgrade soils that are or become unstable or wet should be undercut and stabilized accordingly.

Imported Structural Fill should be used as fill and backfill in new building and pavement areas. These materials should consist of well graded sand and gravel with no particles larger than three (3) inches, between 30 and 70 percent passing the No. 4 sieve, and less than 15 percent, by weight, of material finer than a No. 200 mesh sieve. The fill should not contain recycled asphalt, bricks, glass, pyritic shale, or recycled concrete and building materials.

The Structural Fill should be placed in uniform loose layers no more than about one (1) foot in thickness where heavy vibratory compaction equipment is used. Smaller lifts should be used where hand operated equipment is required for compaction. Each lift should be compacted to no less than 95 percent of the maximum dry density for the soil which is established by the Modified Proctor Compaction Test, ASTM D1557. In landscape areas, the compaction may be reduced to 90 percent.

D. Foundations and Retaining Walls

New building foundations may be seated on the undisturbed native soils or upon the imported Structural Fill placed to increase site grades.

The foundations may be proportioned for a maximum net allowable bearing pressure equal to 3,500 psf. Continuous wall and isolated column foundations should have minimum widths of 18 and 30 inches, respectively, even if this results in a bearing pressure which is less than the maximum allowable. Exterior foundations should bear at least four (4) feet beneath final adjacent exterior grades to afford frost penetration protection. Interior foundations may be seated at a nominal two (2) foot depth below the interior floor slabs if allowed by local codes.

The subgrade soils will be sensitive to disturbance if allowed to collect precipitation and/or runoff. If inclement weather is anticipated during foundation construction, the grades should be covered with four inches of ASTM C33 Blend 57 Aggregate to facilitate dewatering and minimize disturbance from foot traffic.

Assuming standard care is used in preparing the bearing grades, we estimate that total foundation settlement should be less than one (1) inch. The settlements should occur within a few days after construction is completed and each load increment is applied.
The building should be encircled with a foundation level drain. A foundation level drain should also be planned within the foundation in areas to facilitate drainage of the subfloor fills during the construction period.

The foundation and any site retaining walls should be designed to support lateral earth pressures together with all applicable temporary and permanent surcharge loads. Structural fill materials should be used as the retaining and foundation wall’s backfill.

If the walls are free to deflect as the backfill is placed or surcharge loads applied, “Active” earth pressures may be assumed. If the walls are braced prior to backfilling or applying surcharge loads, “At-Rest” conditions should be assumed. The following design parameters are provided to assist in determining the lateral wall loads for level soil surfaces above and below the wall, whichever apply:

- Coefficient of “At-Rest” Lateral Earth Pressure \( K_o = 0.50 \)
- Coefficient of “Active” Lateral Earth Pressure \( K_a = 0.33 \)
- Coefficient of “Passive” Earth Pressure \( K_P = 2.0 \)
- Total Unit Weight of Soil and Compacted Backfill \( \gamma_T = 120 \text{ pcf} \)
- Coefficient of Sliding Friction (Native or Fill Soil) \( \delta_f = 0.30 \)

E. Floor Slabs

At grade floor slabs should be constructed upon a minimum eight (8) inch thick subbase of Structural Fill, and where floor coverings or moisture sensitive coatings are to be placed upon the slabs, an additional four (4) inch thick base of crushed stone (ASTM Blend 57 material).

In addition, a vapor retarder (Stego Wrap 15 mil Class A or equivalent) should be installed if any floor coverings or moisture sensitive coatings are to be placed upon the slabs. The vapor retarder should be positioned above or below the stone base in accord with the American Concrete Institute Manual of Concrete Practice Manual Section 302.1R. A modulus of subgrade reaction equal to 150 pounds per cubic inch (pci) at the top of the stone base layer may be assumed for the slab design purposes.

F. Pavements

Two flexible pavement sections are provided for consideration at the site dependent upon anticipated traffic types. A Heavy Section should be used for entrance drives and areas subject to repeated truck traffic, and a Light Section employed for areas subject to automobile parking and occasional delivery and/or service trucks. We should review final grading plans to determine if modifications to the pavement design are needed.
All base course layers and their subgrades should be drained through sloping and crowning of subgrades to the peripheral swales and/or french drains, or to underdrains where appropriate to the final grading plan to assure satisfactory performance. Peripheral and intermediate under drains should also be incorporated, as well as gravel backfilled utilities with sloped subgrades, to assure that drained base courses are provided. All base course materials should be compacted to 95 percent of the material’s maximum dry density as established through the Modified Proctor Test, ASTM D-1557.

<table>
<thead>
<tr>
<th>MATERIAL SECTION</th>
<th>THICKNESS (inches)</th>
<th>NYSDOT SPECIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Light Section</td>
<td>Heavy Section</td>
</tr>
<tr>
<td>Wearing Course</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Binder Course</td>
<td>2 3</td>
<td>403 Type 3</td>
</tr>
<tr>
<td>Base Course</td>
<td>8 12</td>
<td>304 Type 2</td>
</tr>
<tr>
<td>Fabric – Mirafi 500X</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Rigid Portland concrete pavement may be designed to bear upon twelve (12) inches of NYSDOT Type 2 material and the synthetic fabric recommended above, and designed in accord with the recommended procedures of the American Concrete Institute or Portland Cement Association using a composite modulus of subgrade reaction equal to 150 pounds per cubic inch when constructed upon the subgrades prepared as recommended previously.

It should be understood that sidewalks and pavements constructed upon the site’s soils will heave as frost seasonally penetrates the subgrades. The magnitude of the seasonal heave will vary with many factors, and result in differential movements. As the frost leaves the ground, the sidewalks and pavements will settle back, but not entirely in all areas, and this may accentuate the differential movements across the pavement areas. Where curbs, walks, and storm drains meet these pavements, these differential heave and settlements may result in undesirable movements, and create trip hazards. To limit the magnitude of heave and the creation of these uneven joints to generally tolerable magnitudes for most winters, a sixteen (16) inch thick crushed stone base course, composed of Blend 57 aggregate, may be placed beneath the sensitive sidewalk, drive, etc. areas. The stone layer must have an underdrain placed within it.
It should also be understood that the recommended pavement sections were not
designed to support heavy construction equipment loads which would require an
augmented section. The contractor should construct temporary haul and construction
roadways and routes about the site as appropriate for the specific weather conditions
and construction equipment he intends to employ, and the overburden soil conditions
encountered in the specific areas. Construction period traffic should not be routed
across the recommended pavement sections unless augmented.

Finally, all pavements require routine maintenance and occasional repairs. Failure to
provide maintenance and complete the required repairs in a timely manner will result
in a shortened pavement service life.

G. Plan Review and Construction Monitoring
The Dente Group should be retained to review plans and specifications related to site
grading, foundations, and earthwork prior to their release for bidding to confirm that
the recommendations contained herein were properly interpreted and applied.

It should be understood that the actual subsurface conditions that exist across this site
will only be known when the site is excavated. For this reason, we should be retained
to monitor earthwork and bearing grade preparations for foundations, floor slabs, and
pavements. The presence of the Geotechnical Engineer during the earthwork and
foundation construction phases will allow validation of the subsurface conditions
assumed to exist for this study and the design recommended in this report.

V. CLOSURE
This report was prepared for specific application to the project site and the
construction planned using methods and practices common to Geotechnical
Engineering in the area and at the time of its preparation. No other warranty, either
expressed or implied, is made. Should questions arise or if we may be of any other
service, please contact us at your convenience.

Prepared by,
Dente Group

Fred A. Dente, P.E. Edward Gravelle, P.E.
Principal Senior Engineer
APPENDIX A
The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: [Web Soil Survey](https://websoilsurvey.sc.egov.usda.gov/)
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Albany County, New York
Survey Area Data: Version 15, Oct 8, 2017

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 10, 2015—Mar 29, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.
### Map Unit Legend

<table>
<thead>
<tr>
<th>Map Unit Symbol</th>
<th>Map Unit Name</th>
<th>Acres in AOI</th>
<th>Percent of AOI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uh</td>
<td>Udorthents, clayey-Urban land</td>
<td>2.5</td>
<td>100.0%</td>
</tr>
<tr>
<td></td>
<td>complex</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Totals for Area of Interest</strong></td>
<td></td>
<td>2.5</td>
<td>100.0%</td>
</tr>
</tbody>
</table>
Albany County, New York

Ud—Udorthents, clayey-Urban land complex

Map Unit Setting
- National map unit symbol: 9pj2
- Mean annual precipitation: 36 to 41 inches
- Mean annual air temperature: 45 to 48 degrees F
- Frost-free period: 100 to 170 days
- Farmland classification: Not prime farmland

Map Unit Composition
- Udorthents, clayey, and similar soils: 40 percent
- Urban land: 30 percent
- Minor components: 30 percent
- Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents, Clayey

Typical profile
- H1 - 0 to 18 inches: silty clay
- H2 - 18 to 72 inches: stratified silt loam to clay

Properties and qualities
- Slope: 0 to 8 percent
- Depth to restrictive feature: More than 80 inches
- Natural drainage class: Moderately well drained
- Capacity of the most limiting layer to transmit water (Ksat):
  - Moderately low to moderately high (0.06 to 0.20 in/hr)
- Depth to water table: About 6 to 18 inches
- Frequency of flooding: None
- Frequency of ponding: None
- Available water storage in profile: Moderate (about 8.2 inches)

Description of Urban Land

Typical profile
- H1 - 0 to 6 inches: variable

Minor Components

Scio
- Percent of map unit: 10 percent
- Hydric soil rating: No

Hudson
- Percent of map unit: 10 percent
- Hydric soil rating: No

Rhinebeck
- Percent of map unit: 7 percent
- Hydric soil rating: No
Madalin

Percent of map unit: 3 percent
Landform: Depressions
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Albany County, New York
Survey Area Data: Version 15, Oct 8, 2017
APPENDIX B
**INTERPRETATION OF SUBSURFACE LOGS**

The Subsurface Logs present observations and the results of tests performed in the field by the Driller, Technicians, Geologists and Geotechnical Engineers as noted. Soil/Rock Classifications are made visually, unless otherwise noted, on a portion of the materials recovered through the sampling process and may not necessarily be representative of the materials between sampling intervals or locations.

The following defines some of the terms utilized in the preparation of the Subsurface Logs.

### SOIL CLASSIFICATIONS

Soil Classifications are visual descriptions on the basis of the Unified Soil Classification ASTM D-2487 and USBR, 1973 with additional comments by weight of constituents by BUHRMASTER. The soil density or consistency is based on the penetration resistance determined by ASTM METHOD D1586. Soil Moisture of the recovered materials is described as DRY, MOIST, WET or SATURATED.

<table>
<thead>
<tr>
<th>SIZE DESCRIPTION</th>
<th>RELATIVE DENSITY/CONSISTENCY (basis ASTM D1586)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>GRANULAR SOIL</td>
</tr>
<tr>
<td></td>
<td>DENSITY</td>
</tr>
<tr>
<td>BOULDER &gt; 12</td>
<td>LOOSE</td>
</tr>
<tr>
<td>COBBLE 3&quot; - 12&quot;</td>
<td>FIRM</td>
</tr>
<tr>
<td>GRAVEL-COARSE 3&quot; - 3/4&quot;</td>
<td>COMPACT</td>
</tr>
<tr>
<td>GRAVEL - FINE 3/4&quot; - #4</td>
<td>VERY COMPACT</td>
</tr>
<tr>
<td>SAND - COARSE #4 - #10</td>
<td>HARD</td>
</tr>
<tr>
<td>SAND - MEDIUM #10 - #40</td>
<td></td>
</tr>
<tr>
<td>SAND - FINE #40 - #200</td>
<td></td>
</tr>
<tr>
<td>SILT/NONPLASTIC &lt; #200</td>
<td></td>
</tr>
<tr>
<td>CLAY/PLASTIC &lt; #200</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SOIL STRUCTURE</th>
<th>DESCRIPTION</th>
<th>RELATIVE PROPORTION OF SOIL TYPES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DESCRIPTION</td>
<td>% OF SAMPLE BY WEIGHT</td>
</tr>
<tr>
<td>LAYER 6&quot; THICK OR GREATER</td>
<td>AND</td>
<td>35 - 50</td>
</tr>
<tr>
<td>SEAM 6&quot; THICK OR LESS</td>
<td>SOME</td>
<td>20 - 35</td>
</tr>
<tr>
<td>PARTING LESS THAN 1 1/4&quot; THICK</td>
<td>LITTLE</td>
<td>10 - 20</td>
</tr>
<tr>
<td>VARVED UNIFORM HORIZONTAL PARTINGS OR SEAMS</td>
<td>TRACE</td>
<td>LESS THAN 10</td>
</tr>
</tbody>
</table>

Note that the classification of soils or soil like materials is subject to the limitations imposed by the size of the sampler, the size of the sample and its degree of disturbance and moisture.
ROCK CLASSIFICATIONS

Rock Classifications are visual descriptions on the basis of the Driller's, Technician's, Geologist's or Geotechnical Engineer's observations of the coring activity and the recovered samples applying the following classifications.

<table>
<thead>
<tr>
<th>CLASSIFICATION TERM</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>VERY HARD</td>
<td>NOT SCRATCHED BY KNIFE</td>
</tr>
<tr>
<td>HARD</td>
<td>SCRATCHED WITH DIFFICULTY</td>
</tr>
<tr>
<td>MEDIUM HARD</td>
<td>SCRATCHED EASILY</td>
</tr>
<tr>
<td>SOFT</td>
<td>SCRATCHED WITH FINGERNAIL</td>
</tr>
<tr>
<td>VERY WEATHERED</td>
<td>DISINTEGRATED WITH NUMEROUS SOIL SEAM</td>
</tr>
<tr>
<td>WEATHERED</td>
<td>SLIGHT DISINTEGRATION, STAINING, NO SEAMS</td>
</tr>
<tr>
<td>SOUND</td>
<td>NO EVIDENCE OF ABOVE</td>
</tr>
<tr>
<td>MASSIVE</td>
<td>ROCK LAYER GREATER THAN 36&quot; THICK</td>
</tr>
<tr>
<td>THICK BEDDED</td>
<td>ROCK LAYER 12&quot; - 36&quot;</td>
</tr>
<tr>
<td>BEDDED</td>
<td>ROCK LAYER 4&quot; - 12&quot;</td>
</tr>
<tr>
<td>THIN BEDDED</td>
<td>ROCK LAYER 1&quot; - 4&quot;</td>
</tr>
<tr>
<td>LAMINATED</td>
<td>ROCK LAYER LESS THAN 1&quot;</td>
</tr>
<tr>
<td>FRACTURES</td>
<td>NATURAL BREAKS AT SOME ANGLE TO BEDS</td>
</tr>
</tbody>
</table>

Core sample recovery is expressed as percent recovered of total sampled. The ROCK QUALITY DESIGNATION (RQD) is the total length of core sample pieces exceeding 4" length divided by the total core sample length for N size cored.

GENERAL

- Soil and Rock classifications are made visually on samples recovered. The presence of Gravel, Cobbles and Boulders will influence sample recovery classification density/consistency determination.
- Groundwater, if encountered, was measured and its depth recorded at the time and under the conditions as noted.
- Topsoil or pavements, if present, were measured and recorded at the time and under the conditions as noted.
- Stratification Lines are approximate boundaries between soil types. These transitions may be gradual or distinct and are approximated.
**PROJECT:** Addition to Albany Academy  
**DATE:** START: 4/11/18  
**FINISH:** 4/11/18  

**LOCATION:** Albany, New York  
**METHODS:** 3 1/4" Hollow Stem Augers, ASTM D1586 Drilling Methods with Auto Hammer  

**CLIENT:** The Albany Academies  
**SURFACE ELEVATION:** +/- 220.0'  

**JOB NUMBER:** JB185044  
**CLASSIFICATION:** O.Burns  

<table>
<thead>
<tr>
<th>DEPTH</th>
<th>SAMPLE</th>
<th>BLOWS ON SAMPLER</th>
<th>CLASSIFICATION / OBSERVATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>6&quot;</td>
<td>1</td>
<td>1 2 3 4 5 8 8 16</td>
<td>+/- 6&quot; Topsoil (FILL: Brown Mottled SILT and CLAY, trace fine to medium sand (MOIST, SOFT))</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td></td>
<td>Brown Mottled SILT and CLAY</td>
</tr>
<tr>
<td>5'</td>
<td>3</td>
<td>2 3 4 4 3 4 3 7</td>
<td>Grades Little Gray Mottling</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td></td>
<td>Grades Gray Varved</td>
</tr>
<tr>
<td>10'</td>
<td>5</td>
<td>1 2 1 1 3</td>
<td>(MOIST, MEDIUM TO VERY SOFT)</td>
</tr>
<tr>
<td>15'</td>
<td>6</td>
<td>WH WH</td>
<td>End of boring 17.0' depth.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Groundwater was not present within auger casings upon completion of borehole.</td>
</tr>
<tr>
<td>20'</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25'</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DEPTH</td>
<td>SAMPLE</td>
<td>BLOWS ON SAMPLER</td>
<td>CLASSIFICATION / OBSERVATIONS</td>
</tr>
<tr>
<td>-------</td>
<td>--------</td>
<td>------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>6&quot;   4 4 5 9</td>
<td>FILL: Brown F-C SAND, SILT, and CLAY, Some Gravel (MOIST), Grades Brown Mottled</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>3 2 2</td>
<td>Fine SAND and SILT, Grades Some Gravel</td>
</tr>
<tr>
<td>5'</td>
<td>3</td>
<td>2 2 6</td>
<td>Grades to Gray GRAVEL, Little Silt and Clay (MOIST, LOOSE)</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>3 5 10 12 15</td>
<td>Brown SILT and CLAY</td>
</tr>
<tr>
<td>10'</td>
<td>5</td>
<td>2 3 3</td>
<td>Similar with Silt Bands</td>
</tr>
<tr>
<td></td>
<td>10'</td>
<td></td>
<td>Grades Gray, Varved with Occasional F-M Sand Partings (MOIST, MEDIM TO V. SOFT)</td>
</tr>
<tr>
<td>15'</td>
<td>6</td>
<td>WH 1 1 1 2</td>
<td>End of boring 17.0’ depth.</td>
</tr>
<tr>
<td></td>
<td>20'</td>
<td></td>
<td>Groundwater was not present within auger casings upon completion of borehole.</td>
</tr>
<tr>
<td>25'</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**PROJECT:** Addition to Albany Academy  
**DATE:** START: 4/12/18  
**LOCATION:** Albany, New York  
**METHODS:** 3 1/4" Hollow Stem Augers, ASTM D1586 Drilling Methods with Auto Hammer  
**CLIENT:** The Albany Academies  
**JOB NUMBER:** JB185044  
**SURFACE ELEVATION:** +/- 219.0’  
**DRILL TYPE:** CME 45C  
**CLASSIFICATION:** O.Burns

<table>
<thead>
<tr>
<th>SAMPLE</th>
<th>BLOWS ON SAMPLER</th>
<th>CLASSIFICATION / OBSERVATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEPTH</td>
<td># 6” 12” 18” 24” N</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>2 3</td>
<td>+/− 2” Topsoil</td>
</tr>
<tr>
<td>2</td>
<td>6 10</td>
<td>FILL: Brown SILT and CLAY, Little F-M Sand (MOIST, MEDIUM) Brown SILT and CLAY</td>
</tr>
<tr>
<td>3</td>
<td>4 5</td>
<td>Grades Varved</td>
</tr>
<tr>
<td>4</td>
<td>8 8</td>
<td></td>
</tr>
<tr>
<td>5’</td>
<td>3 4 5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5 7 10</td>
<td>Grades Brown/Gray Banded, Occasional Seams of Fine Sand and Silt</td>
</tr>
<tr>
<td>10’</td>
<td>5 2 2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 3 4</td>
<td></td>
</tr>
<tr>
<td>15’</td>
<td>6 WH WH</td>
<td>Grades Gray (MOIST, MEDIUM TO VERY SOFT)</td>
</tr>
<tr>
<td></td>
<td>1 1 1</td>
<td>End of boring 17.0’ depth. Groundwater was not present within auger casings upon completion of borehole.</td>
</tr>
<tr>
<td>20’</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25’</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depth</td>
<td>Sample</td>
<td>Blows on Sampler</td>
</tr>
<tr>
<td>-------</td>
<td>--------</td>
<td>------------------</td>
</tr>
<tr>
<td>6'</td>
<td>1</td>
<td>1 1 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5'</td>
<td>2</td>
<td>5 6</td>
</tr>
<tr>
<td>10'</td>
<td>3</td>
<td>1 2</td>
</tr>
<tr>
<td>15'</td>
<td>4</td>
<td>1 1</td>
</tr>
<tr>
<td>20'</td>
<td>5</td>
<td>WH WH</td>
</tr>
<tr>
<td>25'</td>
<td>6</td>
<td>WH 1</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>WR WH</td>
</tr>
</tbody>
</table>
### SUBSURFACE LOG

- **PROJECT**: Addition to Albany Academy
- **DATE**: START: 4/11/18, FINISH: 4/12/18
- **LOCATION**: Albany, New York
- **METHODS**: 3 1/4" Hollow Stem Augers, ASTM D1586 Drilling Methods with Auto Hammer
- **CLIENT**: The Albany Academies
- **JOB NUMBER**: JB185044
- **SURFACE ELEVATION**: +/- 219.0’
- **DRILL TYPE**: CME 45C
- **CLASSIFICATION**: O.Burns

<table>
<thead>
<tr>
<th>DEPTH</th>
<th>SAMPLE</th>
<th>BLOWS ON SAMPLER</th>
<th>CLASSIFICATION / OBSERVATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>30’</td>
<td>8</td>
<td>WH WH</td>
<td>Gray SILT and CLAY</td>
</tr>
<tr>
<td></td>
<td></td>
<td>WH WH</td>
<td></td>
</tr>
<tr>
<td>35’</td>
<td>9</td>
<td>WR WH</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>WH WH WH</td>
<td></td>
</tr>
<tr>
<td>40’</td>
<td>10</td>
<td>WH WH</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>WH WH WH</td>
<td></td>
</tr>
<tr>
<td>45’</td>
<td>11</td>
<td>WH WH</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>WH WH WH</td>
<td></td>
</tr>
<tr>
<td>50’</td>
<td>12</td>
<td>WH WH</td>
<td>Grades trace fine sand and fine gravel (MOIST, SOFT &amp; MEDIUM TO V. SOFT)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>WH WH WH</td>
<td>End of boring 52.0’ depth.</td>
</tr>
<tr>
<td>55’</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**PROJECT:** Addition to Albany Academy  
**DATE**  
**LOCATION:** Albany, New York  
**METHODS:** 3 1/4" Hollow Stem Augers, ASTM D1586 Drilling Methods with Auto Hammer  
**CLIENT:** The Albany Academies  
**JOB NUMBER:** JB185044  
**SURFACE ELEVATION:** +/- 218.5’  
**DRILL TYPE:** CME 45C  
**CLASSIFICATION:** O.Burns

<table>
<thead>
<tr>
<th>SAMPLE DEPTH</th>
<th>#</th>
<th>6&quot;</th>
<th>12&quot;</th>
<th>18&quot;</th>
<th>24&quot;</th>
<th>N</th>
<th>CLASSIFICATION / OBSERVATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>0’</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+/- 6&quot; Topsoil</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>1</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td>Brown SILT and CLAY (MOIST)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5</td>
<td>5</td>
<td>8</td>
<td></td>
<td></td>
<td>(MOIST, MEDIUM)</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>6</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td>Brown SILT, Little Clay</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>5</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td>Similar with Clay Partings</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10</td>
<td>12</td>
<td>19</td>
<td></td>
<td></td>
<td>(MOIST, FIRM)</td>
</tr>
<tr>
<td>5’</td>
<td>4</td>
<td>10</td>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td>End of boring 8.0’ depth.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12</td>
<td>11</td>
<td>24</td>
<td></td>
<td></td>
<td>Groundwater was not present within auger casings upon completion of borehole.</td>
</tr>
<tr>
<td>10’</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15’</td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<td>20’</td>
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<tr>
<td>25’</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
# INFRINGEMENT TEST RESULTS

**PROJECT:** Addition to Albany Academies  
**PROJECT NO.:** JB18044

**PROJECT LOCATION:** Albany, New York  
**TEST DATE:** 4/12/18

**WEATHER:**  
**TESTER:** S. Loiselle

<table>
<thead>
<tr>
<th>Test Location</th>
<th>Test Depth (feet)</th>
<th>Trial No.</th>
<th>Water Drop (inches)</th>
<th>Elapsed Time (hours)</th>
<th>Infiltration Rate (inches/hour)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I-1</td>
<td>4.0</td>
<td>1</td>
<td>6.0</td>
<td>1.00</td>
<td>6.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>4.0</td>
<td>1.00</td>
<td>4.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>2.0</td>
<td>1.00</td>
<td>2.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>2.0</td>
<td>1.00</td>
<td>2.0</td>
</tr>
</tbody>
</table>

Average infiltration rate for four trials was 3.5 inches per hour. Infiltration rate of final trial was 2.0 inches per hour.

**Notes:**

1. Testing was conducted in general accord with the “Infiltration Testing Requirements” contained in Appendix D of the New York State Storm Water Management Design Manual.

2. Test pipe was installed in a borehole made adjacent to test borings I-1.

**SOIL CLASSIFICATION AT TEST DEPTH**

Test Location I-1: Brown SILT, Little Clay
APPENDIX #4

MAINTENANCE PLAN
Facility Owner (Responsible Party):
Albany Academy
135 Academy Road
Albany, NY 12208

The facility owner will be responsible to provide capital funding for this facility. The source will be from infrastructure funds set aside for construction. On an annual basis the responsible party will budget funds to fund the annual operating and maintenance costs. The facility owner must maintain all drainage facilities, stormwater quantity control facilities and all stormwater quality control facilities in accordance with approved plans and with this maintenance manual. Complete inspection form and retain with SWPPP. Inspection may be performed by a Qualified Inspector or a Qualified Professional. The Qualified Inspector is defined in GP #0-15-002 as follows:

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, 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.

The Qualified Professional is defined in GP #0-15-002 as follows:

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 in order to prepare a SWPPP that conforms to the Department’s technical standard. 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.

The elements of this SWPPP which require inspection include:

**Overall Function of Collection System**
This inspection includes pipe from catch basins to the sedimentation basin which is connected to the infiltration basin. Also examine the quality of vegetation cover within both basin. If vegetation is not in healthy condition report to owner and schedule another site visit after vegetation is restored to required levels. If objectionable odors exist determine source and report to the owner for correction. Determine schedule for repair and perform an inspection upon repair.

**Vegetation cover within the tributary area.** The inspection shall verify that for lawns or other seeded areas that vegetation covers a minimum of 90% of the exposed ground. Other areas such as mulch beds or landscaped areas shall be inspected to verify that proper mulching is in place.

**Rip-Rap or broken stone in in overflow and check dams.** Inspection shall verify that these areas are to proper grade and that no material has been moved by erosive impact of water.

**Concrete structures.** Inspection shall verify that structures and their metal frames & grates or metal covers are in good condition. Structures shall be opened to verify that structures are clean.

**Housekeeping Section** – This section describes items requiring regular checking and should be conducted on a daily basis.

**Daily inspection.**

Debris cleanup – Remove and dispose of all debris encountered on roadway, near outfalls or in area adjacent to public right-of-way.

Materials storage – Verify that all materials identified in the Housekeeping Section have been properly stored.

Oil & Grease – Any visible oil and grease shall be treated with proper materials to capture residue. Remove any materials from the site. If possible, determine cause of accumulation of oil & grease and address these.
**Monthly** inspection or inspection after every significant rainfall (0.5 inches in 24 hours) shall determine whether the following benchmarks are reached in which case appropriate action shall be taken.

Condition of vegetation – Vegetation within the sediment basin and in the infiltration basin should be examined to determine the condition. Other areas with seeded lawns should be maintained in accordance with good cultural practices. Mow and remove clippings if required. Dead or diseased plant material shall be replaced.

**Annual** inspection shall determine whether the following benchmarks are reached in which case appropriate action shall be taken:

Condition of vegetation – Vegetation within the sediment basin and in the infiltration basin should be examined to determine the condition. Other areas with seeded lawns should be maintained in accordance with good cultural practices. Mow and remove clippings if required. Dead or diseased plant material shall be replaced.

Structures and pipes – Inspect condition of all concrete structures for spalling or cracking. Repair or replace as required. Examine metal grates and repair or replaces as required.
Infiltration Basin
Operation, Maintenance
and Management Inspection Checklist (Complete in 3 Pages)

Project: Proposed Gymnasium
Location: 135 Academy Road
          City of Albany, Albany County, NY
Site Status: ______________________________________
Date:  _______________________________________
Time:  _____________
Inspector: _______________________________________

<table>
<thead>
<tr>
<th>MAINTENANCE ITEM</th>
<th>SATISFACTORY(S)/</th>
<th>UNSATISFACTORY(U)</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Cleanout (Monthly or after any significant storm event)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contributing areas clean of debris</td>
<td>☐ (S) ☐ (U)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Oil and Grease (Monthly)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inspect water for evidence of oil &amp; grease</td>
<td>☐ (S) ☐ (U)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Activities in drainage area minimize oil</td>
<td>☐ (S) ☐ (U)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>and grease entry</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Vegetation Control (Monthly)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contributing drainage area stabilized</td>
<td>☐ (S) ☐ (U)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No evidence of erosion</td>
<td>☐ (S) ☐ (U)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Area mowed and clipping removed</td>
<td>☐ (S) ☐ (U)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Date of Inspection  _____________  Sheet 1 of 3
<table>
<thead>
<tr>
<th>Maintenance Item</th>
<th>Satisfactory(S)/Unsatisfactory(U)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>4. Structural Components (Annual)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No evidence of structural deterioration</td>
<td>☐ (S) ☐ (U)</td>
<td></td>
</tr>
<tr>
<td>All grates are in good condition</td>
<td>☐ (S) ☐ (U)</td>
<td></td>
</tr>
<tr>
<td>No evidence of spalling or cracking of structural parts</td>
<td>☐ (S) ☐ (U)</td>
<td></td>
</tr>
<tr>
<td>No evidence of damage to practice signs</td>
<td>☐ (S) ☐ (U)</td>
<td></td>
</tr>
<tr>
<td><strong>5. Overall Function of Facility (Annual)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No replacement of pipes or catch basins required</td>
<td>☐ (S) ☐ (U)</td>
<td></td>
</tr>
<tr>
<td>Evidence of flow bypassing facility</td>
<td>☐ (S) ☐ (U)</td>
<td></td>
</tr>
<tr>
<td>No noticeable odors outside of facility</td>
<td>☐ (S) ☐ (U)</td>
<td></td>
</tr>
<tr>
<td>Check vegetation Condition</td>
<td>☐ (S) ☐ (U)</td>
<td></td>
</tr>
<tr>
<td><strong>6. Winter Conditions and Transition Periods (Daily)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Follow winter conditions for construction between November 15th and April 1st</td>
<td>☐ (S) ☐ (U)</td>
<td></td>
</tr>
<tr>
<td>After April 1st during spring thaw, if ground remains unstabilized</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extend winter conditions</td>
<td>☐ (S) ☐ (U)</td>
<td></td>
</tr>
<tr>
<td>Prior to November 15th, if freezing occurs and ground remains unstabilized</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extend winter conditions</td>
<td>☐ (S) ☐ (U)</td>
<td></td>
</tr>
</tbody>
</table>

Date of Inspection: _______________ Sheet 2 of 3
APPENDIX #5

STORMWATER MANAGEMENT SYSTEM
MAINTENANCE AGREEMENT
STORMWATER MANAGEMENT SYSTEM MAINTENANCE AGREEMENT
Albany Academy

THIS AGREEMENT ("Agreement") is made and entered into on the ___ day of ___, 2018, by and between Albany Academy, with an address at 135 Academy Road, Albany, NY 12208 (hereinafter referred to as the "Facility Owner"), and

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

WITNESSETH:

WHEREAS, the Facility Owner is the owner of the subject parcel of land in the City of Albany, County of Albany and State of New York as more particularly located at 135 Academy Road, Albany New York.

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

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

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

a. Plan set submitted to the City representing a stormwater management system including stormwater collection, conveyance and storage using structures designed and specified by Hershberg & Hershberg, Consulting Engineers, sealed by Daniel R. Hershberg, P.E., as the Engineer of Record. The plan sheets showing features associated with the stormwater management system are listed below.
<table>
<thead>
<tr>
<th>Sheet#</th>
<th>Date</th>
<th>Drawing Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>C-1</td>
<td>Existing Conditions Plan</td>
<td>6/14/18, Last Revised 9/26/18</td>
</tr>
<tr>
<td>C-2</td>
<td>Demolition Plan</td>
<td>6/14/18, Last Revised 9/26/18</td>
</tr>
<tr>
<td>C-3</td>
<td>Site Plan</td>
<td>6/14/18, Last Revised 9/26/18</td>
</tr>
<tr>
<td>C-4</td>
<td>Utility Plan</td>
<td>6/14/18, Last Revised 9/26/18</td>
</tr>
<tr>
<td>C-5</td>
<td>Erosion and Sediment Control Plan</td>
<td>6/14/18, Last Revised 9/26/18</td>
</tr>
<tr>
<td>C-6</td>
<td>Details</td>
<td>6/14/18, Last Revised 9/26/18</td>
</tr>
<tr>
<td>C-7</td>
<td>Details</td>
<td>6/14/18, Last Revised 9/26/18</td>
</tr>
<tr>
<td>C-8</td>
<td>Utility Profiles</td>
<td>6/14/18, Last Revised 9/26/18</td>
</tr>
</tbody>
</table>
IN CONSIDERATION THEREOF, the parties agree as follow:

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

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

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

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

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

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

7. Facility Owner agrees to defend, indemnify, and save harmless the CITY and its officers, employees and agents, from and against all claims, actions, causes of action, injuries, damages, losses, liabilities, and expenses (including, without limitation, reasonable attorney’s fees and court costs) arising out of, or in consequence of, any negligent or intentional act or omission of Facility Owner to the extent of its or their responsibility for such claims, actions, causes of action, injuries, damages, losses, liabilities, and expenses. The provisions of this Article shall survive any termination or expiration of this Agreement.
IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be signed by their duly authorized officers as of the day and year first above written.

CITY OF ALBANY, NEW YORK

BY: ________________________
KATHY M. SHEEHAN
MAYOR, CITY OF ALBANY

ALBANY ACADEMY

BY: ________________________
PAMELA MACAFFER
ALBANY ACADEMY

STATE OF NEW YORK
) ss.: COUNTY OF ALBANY

On the _ day of ____________, 20__, before me the undersigned, a Notary Public in and for said State, personally appeared ____________________, personally known to me or proved to me on the basis of satisfactory evidence to be the individual whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his capacity, and that by his signature on the instrument, the individual, or person upon behalf of which the individual acted, executed the instrument.

________________________________________
Notary Public

STATE OF NEW YORK
) ss.: COUNTY OF ALBANY

On the _ day of ____________, 20__, before me the undersigned, a Notary Public in and for said State, personally appeared ____________________, personally known to me or proved to me on the basis of satisfactory evidence to be the individual whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his capacity, and that by his signature on the instrument, the individual, or person upon behalf of which the individual acted, executed the instrument.

________________________________________
Notary Public
APPENDIX #6

HydroCAD 10.0 CALCULATIONS
Trib A

Reach 1

A

R1
## Area Listing (all nodes)

<table>
<thead>
<tr>
<th>Area (acres)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.520</td>
<td>74</td>
<td>&gt;75% Grass cover, Good, HSG C (A)</td>
</tr>
<tr>
<td><strong>1.520</strong></td>
<td><strong>74</strong></td>
<td><strong>TOTAL AREA</strong></td>
</tr>
</tbody>
</table>
### Soil Listing (all nodes)

<table>
<thead>
<tr>
<th>Area (acres)</th>
<th>Soil Group</th>
<th>Subcatchment Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.000</td>
<td>HSG A</td>
<td></td>
</tr>
<tr>
<td>0.000</td>
<td>HSG B</td>
<td></td>
</tr>
<tr>
<td>1.520</td>
<td>HSG C</td>
<td>A</td>
</tr>
<tr>
<td>0.000</td>
<td>HSG D</td>
<td></td>
</tr>
<tr>
<td>0.000</td>
<td>Other</td>
<td></td>
</tr>
<tr>
<td><strong>1.520</strong></td>
<td><strong>TOTAL AREA</strong></td>
<td></td>
</tr>
</tbody>
</table>
## Ground Covers (all nodes)

<table>
<thead>
<tr>
<th>HSG-A (acres)</th>
<th>HSG-B (acres)</th>
<th>HSG-C (acres)</th>
<th>HSG-D (acres)</th>
<th>Other (acres)</th>
<th>Total (acres)</th>
<th>Ground Cover</th>
<th>Subcatchment Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.000</td>
<td>0.000</td>
<td>1.520</td>
<td>0.000</td>
<td>0.000</td>
<td>1.520</td>
<td>&gt;75% Grass cover, Good</td>
<td>A</td>
</tr>
<tr>
<td>0.000</td>
<td>0.000</td>
<td>1.520</td>
<td>0.000</td>
<td>0.000</td>
<td>1.520</td>
<td>TOTAL AREA</td>
<td></td>
</tr>
</tbody>
</table>
Type II 24-hr 10 Year Rainfall = 4.50”

Time span = 0.00-30.00 hrs, dt = 0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH = SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment A: Trib A
Runoff Area = 66,211 sf  0.00% Impervious  Runoff Depth = 1.97”
Flow Length = 335’  Tc = 13.6 min  CN = 74  Runoff = 4.02 cfs  0.250 af

Reach R1: Reach 1
Inflow = 4.02 cfs  0.250 af
Outflow = 4.02 cfs  0.250 af

Total Runoff Area = 1.520 ac  Runoff Volume = 0.250 af  Average Runoff Depth = 1.97”
100.00% Pervious = 1.520 ac  0.00% Impervious = 0.000 ac
Summary for Subcatchment A: Trib A

Runoff = 4.02 cfs @ 12.06 hrs, Volume= 0.250 af, Depth= 1.97"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 Year Rainfall=4.50"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>66,211</td>
<td>74</td>
<td>&gt;75% Grass cover, Good, HSG C</td>
</tr>
<tr>
<td>66,211</td>
<td>100.00% Pervious Area</td>
<td></td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.9</td>
<td>100</td>
<td>0.0200</td>
<td>0.15</td>
<td></td>
<td>Sheet Flow, Grass</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Grass: Short n= 0.150 P2= 2.60&quot;</td>
</tr>
<tr>
<td>2.7</td>
<td>235</td>
<td>0.0080</td>
<td>1.44</td>
<td></td>
<td>Shallow Concentrated Flow, Grass</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Unpaved Kv= 16.1 fps</td>
</tr>
<tr>
<td>13.6</td>
<td>335</td>
<td></td>
<td></td>
<td></td>
<td>Total</td>
</tr>
</tbody>
</table>

Subcatchment A: Trib A

Type II 24-hr 10 Year Rainfall=4.50"
Runoff Area=66,211 sf
Runoff Volume=0.250 af
Runoff Depth=1.97"
Flow Length=335'
Tc=13.6 min
CN=74
Summary for Reach R1: Reach 1

Inflow Area = 1.520 ac, 0.00% Impervious, Inflow Depth = 1.97" for 10 Year event
Inflow = 4.02 cfs @ 12.06 hrs, Volume= 0.250 af
Outflow = 4.02 cfs @ 12.06 hrs, Volume= 0.250 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment A: Trib A
Runoff Area=66,211 sf  0.00% Impervious  Runoff Depth=4.04"
Flow Length=335’  Tc=13.6 min  CN=74  Runoff=8.25 cfs  0.512 af

Reach R1: Reach 1
Inflow=8.25 cfs  0.512 af
Outflow=8.25 cfs  0.512 af

Total Runoff Area = 1.520 ac  Runoff Volume = 0.512 af  Average Runoff Depth = 4.04"
100.00% Pervious = 1.520 ac  0.00% Impervious = 0.000 ac
Summary for Subcatchment A: Trib A

Runoff = 8.25 cfs @ 12.05 hrs, Volume= 0.512 af, Depth= 4.04"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

| Type II 24-hr 100 Year Rainfall=7.00" |

Area (sf)  | CN  | Description                        |
------------|-----|------------------------------------|
66,211      | 74  | >75% Grass cover, Good, HSG C      |
66,211      | 100 | 100.00% Pervious Area              |

<table>
<thead>
<tr>
<th>Tc</th>
<th>Length</th>
<th>Slope</th>
<th>Velocity</th>
<th>Capacity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.9</td>
<td>100</td>
<td>0.0200</td>
<td>0.15</td>
<td></td>
<td>Sheet Flow, Grass</td>
</tr>
<tr>
<td>2.7</td>
<td>235</td>
<td>0.0080</td>
<td>1.44</td>
<td></td>
<td>Shallow Concentrated Flow, Grass</td>
</tr>
</tbody>
</table>

Subcatchment A: Trib A

Hydrograph

Type II 24-hr
100 Year Rainfall=7.00"
Runoff Area=66,211 sf
Runoff Volume=0.512 af
Runoff Depth=4.04"
Flow Length=335'
Tc=13.6 min
CN=74
Summary for Reach R1: Reach 1

Inflow Area = 1.520 ac, 0.00% Impervious, Inflow Depth = 4.04" for 100 Year event

Inflow = 8.25 cfs @ 12.05 hrs, Volume= 0.512 af
Outflow = 8.25 cfs @ 12.05 hrs, Volume= 0.512 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach R1: Reach 1

Hydrograph

Inflow Area=1.520 ac
Routing Diagram for 180034-Post
Prepared by Hershberg & Hershberg, Printed 9/26/2018
HydroCAD® 10.00 s/n 03289 © 2012 HydroCAD Software Solutions LLC
<table>
<thead>
<tr>
<th>Area (acres)</th>
<th>CN</th>
<th>Description</th>
<th>(subcatchment-numbers)</th>
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</thead>
<tbody>
<tr>
<td>0.620</td>
<td>74</td>
<td>&gt;75% Grass cover, Good, HSG C</td>
<td>(1)</td>
</tr>
<tr>
<td>0.900</td>
<td>98</td>
<td>Paved parking, HSG C</td>
<td>(1)</td>
</tr>
<tr>
<td><strong>1.520</strong></td>
<td>88</td>
<td><strong>TOTAL AREA</strong></td>
<td></td>
</tr>
</tbody>
</table>
## Soil Listing (all nodes)

<table>
<thead>
<tr>
<th>Area (acres)</th>
<th>Soil Group</th>
<th>Subcatchment Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.000</td>
<td>HSG A</td>
<td></td>
</tr>
<tr>
<td>0.000</td>
<td>HSG B</td>
<td></td>
</tr>
<tr>
<td>1.520</td>
<td>HSG C</td>
<td>1</td>
</tr>
<tr>
<td>0.000</td>
<td>HSG D</td>
<td></td>
</tr>
<tr>
<td>0.000</td>
<td>Other</td>
<td></td>
</tr>
<tr>
<td><strong>1.520</strong></td>
<td><strong>TOTAL AREA</strong></td>
<td></td>
</tr>
<tr>
<td>HSG-A (acres)</td>
<td>HSG-B (acres)</td>
<td>HSG-C (acres)</td>
</tr>
<tr>
<td>--------------</td>
<td>--------------</td>
<td>--------------</td>
</tr>
<tr>
<td>0.000</td>
<td>0.000</td>
<td>0.620</td>
</tr>
<tr>
<td>0.000</td>
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<td>0.900</td>
</tr>
<tr>
<td><strong>0.000</strong></td>
<td><strong>0.000</strong></td>
<td><strong>1.520</strong></td>
</tr>
<tr>
<td>Line#</td>
<td>Node Number</td>
<td>In-Invert (feet)</td>
</tr>
<tr>
<td>-------</td>
<td>-------------</td>
<td>------------------</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>0.00</td>
</tr>
</tbody>
</table>
Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points  
Runoff by SCS TR-20 method, UH=SCS  
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

<table>
<thead>
<tr>
<th>Subcatchment 1: Trib 1</th>
<th>Runoff Area=66,211 sf  59.21% Impervious Runoff Depth=3.20&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Flow Length=507’ Tc=8.1 min CN=88 Runoff=7.62 cfs 0.405 af</td>
</tr>
</tbody>
</table>

| Reach R1: Reach 1     | Inflow=2.73 cfs 0.356 af                                    |
|                       | Outflow=2.73 cfs 0.356 af                                   |

| Pond IB: Infiltration Basin | Peak Elev=216.47’ Storage=4,505 cf Inflow=7.57 cfs 0.383 af |
|                            | Discarded=0.05 cfs 0.027 af Primary=2.73 cfs 0.356 af Outflow=2.78 cfs 0.383 af |

| Pond SB: Sediment Basin   | Peak Elev=217.44’ Storage=1,258 cf Inflow=7.62 cfs 0.405 af |
|                           | Outflow=7.57 cfs 0.383 af                                   |

Total Runoff Area = 1.520 ac Runoff Volume = 0.405 af Average Runoff Depth = 3.20"  
40.79% Pervious = 0.620 ac 59.21% Impervious = 0.900 ac
Summary for Subcatchment 1: Trib 1

Runoff = 7.62 cfs @ 11.99 hrs, Volume = 0.405 af, Depth = 3.20"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 Year Rainfall=4.50"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>39,204</td>
<td>98</td>
<td>Paved parking, HSG C</td>
</tr>
<tr>
<td>27,007</td>
<td>74</td>
<td>&gt;75% Grass cover, Good, HSG C</td>
</tr>
<tr>
<td>66,211</td>
<td>88</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>27,007</td>
<td></td>
<td>40.79% Pervious Area</td>
</tr>
<tr>
<td>39,204</td>
<td></td>
<td>59.21% Impervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
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<tbody>
<tr>
<td>6.5</td>
<td>75</td>
<td>0.0400</td>
<td>0.19</td>
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<td><strong>Sheet Flow, Grass</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Grass: Short n= 0.150 P2= 2.60&quot;</td>
</tr>
<tr>
<td>1.6</td>
<td>432</td>
<td>0.0060</td>
<td>4.57</td>
<td>3.59</td>
<td><strong>Pipe Channel, Pipe</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>12.0&quot; Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.010 PVC, smooth interior</td>
</tr>
</tbody>
</table>

8.1 507 Total

Subcatchment 1: Trib 1

Hydrograph

Type II 24-hr
10 Year Rainfall=4.50"
Runoff Area=66,211 sf
Runoff Volume=0.405 af
Runoff Depth=3.20"
Flow Length=507'
Tc=8.1 min
CN=88
Summary for Reach R1: Reach 1

Inflow Area = 1.520 ac, 59.21% Impervious, Inflow Depth = 2.81" for 10 Year event

Inflow = 2.73 cfs @ 12.15 hrs, Volume = 0.356 af
Outflow = 2.73 cfs @ 12.15 hrs, Volume = 0.356 af, Atten = 0%, Lag = 0.0 min

Routing by Stor-Ind+Trans method, Time Span = 0.00-30.00 hrs, dt = 0.05 hrs

Reach R1: Reach 1

Hydrograph

Inflow Area = 1.520 ac
Summary for Pond IB: Infiltration Basin

Inflow Area = 1.520 ac, 59.21% Impervious, Inflow Depth = 3.03" for 10 Year event
Inflow = 7.57 cfs @ 12.00 hrs, Volume= 0.383 af
Outflow = 2.78 cfs @ 12.15 hrs, Volume= 0.383 af, Attenuation= 63%, Lag= 8.9 min
Discarded = 0.05 cfs @ 12.15 hrs, Volume= 0.027 af
Primary = 2.73 cfs @ 12.15 hrs, Volume= 0.356 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 216.47' @ 12.15 hrs  Surf.Area= 2,248 sf  Storage= 4,505 cf

Plug-Flow detention time= 19.0 min calculated for 0.383 af (100% of inflow)
Center-of-Mass det. time= 18.8 min (836.1 - 817.3)

Volume, Invert, Avail.Storage, Storage Description

<table>
<thead>
<tr>
<th>#1</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>213.50'</td>
<td>10,805 cf</td>
<td>Custom Stage Data (Prismatic)</td>
<td>Listed below (Recalc)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>213.50</td>
<td>820</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>214.50</td>
<td>1,234</td>
<td>1,027</td>
<td>1,027</td>
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<tr>
<td>215.50</td>
<td>1,793</td>
<td>1,514</td>
<td>2,541</td>
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<tr>
<td>216.50</td>
<td>2,261</td>
<td>2,027</td>
<td>4,568</td>
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<tr>
<td>217.50</td>
<td>3,210</td>
<td>2,736</td>
<td>7,303</td>
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<tr>
<td>218.50</td>
<td>3,794</td>
<td>3,502</td>
<td>10,805</td>
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</tbody>
</table>

Device Routing Invert Outlet Devices

<table>
<thead>
<tr>
<th>#1</th>
<th>Routing</th>
<th>Invert</th>
<th>Outlet Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary</td>
<td>213.50'</td>
<td>8.0&quot; Vert. Orifice/Grate</td>
<td>C= 0.600</td>
</tr>
<tr>
<td>#2</td>
<td>Discarded</td>
<td>213.50'</td>
<td>1.000 in/hr Exfiltration over Surface area</td>
</tr>
</tbody>
</table>

**Discarded OutFlow** Max=0.05 cfs @ 12.15 hrs  HW=216.47'  (Free Discharge)
**Primary OutFlow** Max=2.73 cfs @ 12.15 hrs  HW=216.47'  (Free Discharge)
Pond IB: Infiltration Basin

Inflow Area=1.520 ac
Peak Elev=216.47'
Storage=4,505 cf
Summary for Pond SB: Sediment Basin

Inflow Area = 1.520 ac, 59.21% Impervious, Inflow Depth = 3.20" for 10 Year event
Inflow = 7.62 cfs @ 11.99 hrs, Volume= 0.405 af
Outflow = 7.57 cfs @ 12.00 hrs, Volume= 0.383 af, Atten= 1%, Lag= 0.5 min
Primary = 7.57 cfs @ 12.00 hrs, Volume= 0.383 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 217.44' @ 12.00 hrs Surf.Area= 801 sf Storage= 1,258 cf

Plug-Flow detention time= 46.7 min calculated for 0.383 af (95% of inflow)
Center-of-Mass det. time= 16.7 min (817.3 - 800.6)

Volume Invert Avail.Storage Storage Description
#1 213.75' 2,285 cf Custom Stage Data (Prismatic) Listed below (Recalc)

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<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
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<td>50</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>214.50</td>
<td>120</td>
<td>64</td>
<td>64</td>
</tr>
<tr>
<td>215.50</td>
<td>266</td>
<td>193</td>
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<tr>
<td>216.50</td>
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</tr>
<tr>
<td>217.50</td>
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</tr>
<tr>
<td>218.50</td>
<td>1,137</td>
<td>979</td>
<td>2,285</td>
</tr>
</tbody>
</table>

Device Routing Invert Outlet Devices
#1 Primary 217.00' 10.0' long x 10.0' breadth Broad-Crested Rectangular Weir
Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=7.54 cfs @ 12.00 hrs HW=217.44’ (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 7.54 cfs @ 1.72 fps)
Pond SB: Sediment Basin

Inflow Area=1.520 ac
Peak Elev=217.44'
Storage=1,258 cf
Subcatchment 1: Trib 1
- Runoff Area: 66,211 sf
- Impervious: 59.21%
- Runoff Depth: 5.59"
- Flow Length: 507'
- Tc: 8.1 min
- CN: 88
- Runoff: 12.90 cfs
- 0.709 af

Reach R1: Reach 1
- Inflow: 3.43 cfs
- 0.652 af

Pond IB: Infiltration Basin
- Peak Elev: 218.01'
- Storage: 9,005 cf
- Inflow: 12.82 cfs
- 0.687 af
- Discarded: 0.08 cfs
- 0.035 af
- Primary: 3.43 cfs
- 0.652 af
- Outflow: 3.51 cfs
- 0.687 af

Pond SB: Sediment Basin
- Peak Elev: 217.61'
- Storage: 1,398 cf
- Inflow: 12.90 cfs
- 0.709 af

Total Runoff Area = 1.520 ac
- Runoff Volume = 0.709 af
- Average Runoff Depth = 5.59"
- 40.79% Pervious = 0.620 ac
- 59.21% Impervious = 0.900 ac
Summary for Subcatchment 1: Trib 1

Runoff = 12.90 cfs @ 11.99 hrs, Volume= 0.709 af, Depth= 5.59"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 Year Rainfall=7.00"

<table>
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<tr>
<th>Area (sf)</th>
<th>CN</th>
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<tbody>
<tr>
<td>39,204</td>
<td>98</td>
<td>Paved parking, HSG C</td>
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<tr>
<td>27,007</td>
<td>74</td>
<td>&gt;75% Grass cover, Good, HSG C</td>
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<tr>
<td>66,211</td>
<td>88</td>
<td>Weighted Average</td>
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<td>27,007</td>
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<td>40.79% Pervious Area</td>
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<tr>
<td>39,204</td>
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<td>59.21% Impervious Area</td>
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<table>
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<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
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<tr>
<td>6.5</td>
<td>75</td>
<td>0.0400</td>
<td>0.19</td>
<td></td>
<td><strong>Sheet Flow, Grass</strong></td>
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</table>
|          |               |              |                   |                | Grass: Short n= 0.150 P2= 2.60"
| 1.6      | 432           | 0.0060       | 4.57              | 3.59           | **Pipe Channel, Pipe**       |
|          |               |              |                   |                | 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.010 PVC, smooth interior |

8.1 507 Total

Subcatchment 1: Trib 1

Type II 24-hr
100 Year Rainfall=7.00"
Runoff Area=66,211 sf
Runoff Volume=0.709 af
Runoff Depth=5.59"
Flow Length=507'
Tc=8.1 min
CN=88
Summary for Reach R1: Reach 1

Inflow Area = 1.520 ac, 59.21% Impervious, Inflow Depth = 5.15" for 100 Year event

Inflow = 3.43 cfs @ 12.17 hrs, Volume= 0.652 af
Outflow = 3.43 cfs @ 12.17 hrs, Volume= 0.652 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach R1: Reach 1

Inflow Area=1.520 ac
Summary for Pond IB: Infiltration Basin

Inflow Area = 1.520 ac, 59.21% Impervious, Inflow Depth = 5.42” for 100 Year event
Inflow = 12.82 cfs @ 12.00 hrs, Volume= 0.687 af
Outflow = 3.51 cfs @ 12.17 hrs, Volume= 0.687 af, Atten= 73%, Lag= 10.6 min
Discarded = 0.08 cfs @ 12.17 hrs, Volume= 0.035 af
Primary = 3.43 cfs @ 12.17 hrs, Volume= 0.652 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 218.01’ @ 12.17 hrs  Surf.Area= 3,506 sf  Storage= 9,005 cf

Plug-Flow detention time= 23.7 min calculated for 0.687 af (100% of inflow)
Center-of-Mass det. time= 23.5 min (821.9 - 798.4)

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<th>Storage Description</th>
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<td>218.50</td>
<td>3,794</td>
<td>3,502</td>
<td>10,805</td>
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<th>Device</th>
<th>Routing</th>
<th>Invert</th>
<th>Outlet Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>Primary</td>
<td>213.50’</td>
<td>8.0” Vert. Orifice/Grate C= 0.600</td>
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<tr>
<td>#2</td>
<td>Discarded</td>
<td>213.50’</td>
<td>1.000 in/hr Exfiltration over Surface area</td>
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Discarded OutFlow Max=0.08 cfs @ 12.17 hrs  HW=217.99’ (Free Discharge)

Primary OutFlow Max=3.43 cfs @ 12.17 hrs  HW=217.99’ (Free Discharge)
Pond IB: Infiltration Basin

Inflow Area = 1.520 ac
Peak Elev = 218.01'
Storage = 9,005 cf

Hydrograph

Inflow = 12.82 cfs
Discarded = 3.51 cfs
Primary = 3.43 cfs
Summary for Pond SB: Sediment Basin

Inflow Area = 1.520 ac, 59.21% Impervious, Inflow Depth = 5.59" for 100 Year event
Inflow = 12.90 cfs @ 11.99 hrs, Volume= 0.709 af
Outflow = 12.82 cfs @ 12.00 hrs, Volume= 0.687 af, Atten= 1%, Lag= 0.4 min
Primary = 12.82 cfs @ 12.00 hrs, Volume= 0.687 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 217.61' @ 12.00 hrs   Surf.Area= 854 sf   Storage= 1,398 cf

Plug-Flow detention time= 31.9 min calculated for 0.687 af (97% of inflow)
Center-of-Mass det. time= 13.4 min (798.4 - 785.0 )

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<td>217.50</td>
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<td>664</td>
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<td>218.50</td>
<td>1,137</td>
<td>979</td>
<td>2,285</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Device</th>
<th>Routing</th>
<th>Invert</th>
<th>Outlet Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>Primary</td>
<td>217.00'</td>
<td>10.0' long x 10.0' breadth Broad-Crested Rectangular Weir</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64</td>
</tr>
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</table>

Primary OutFlow Max=12.71 cfs @ 12.00 hrs HW=217.61' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 12.71 cfs @ 2.10 fps)
Pond SB: Sediment Basin

Inflow Area=1.520 ac
Peak Elev=217.61'
Storage=1,398 cf
APPENDIX #7

WQV CALCULATION
COMPUTATION OF WATER QUALITY VOLUME (WQv)

Paved Area (Acres) 0.90
I (Impervious Cover) 51.4%
Rv = 0.05+0.009I 0.51
A (site area in acres) 1.75
WQv = [(P)(Rv)(A)]/12 (in acre-feet) 0.088
WQv (in cubic-feet) 3,844
APPENDIX #8

SPILL RESPONSE PLAN
In addition to the good housekeeping and material management practices discussed in relevant sections of this plan, the following practices will be implemented for spill prevention and cleanup:

Manufacturer's recommended methods for spill cleanup will be clearly posted and site personnel will be made aware of the procedures and the location of the information and cleanup supplies. Any spill in excess or suspected to be in excess of two gallons will be reported to the NYSDEC Spill Response Unit. Notification to NYSDEC (1-800-457-7362) must be completed within two hours of the discovery of the spill.

Materials and equipment necessary for spill cleanup will be kept in the material storage area onsite. Equipment and materials will include but not be limited to: absorbent pads, brooms, dust pans, mops, rags, gloves, goggles, kitty litter, sand, sawdust, and plastic and metal trash containers specifically for this purpose.

All spills will be cleaned up immediately after discovery.

The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contact with spilled substance.

Spills of toxic or hazardous material will be reported to the appropriate State or local government agency, regardless of the size.

The spill prevention plan will be adjusted to include measures to prevent this type of spill from reoccurring, and how to clean up the spill if there is another one. A description of the spill, what caused it, and the cleanup measures will also be included.

The contractor/trained individual will be the spill prevention and cleanup coordinator. He will designate at least three other site personnel who will receive spill prevention and cleanup training. These individuals will each become responsible for a particular phase of prevention and cleanup. The names of responsible spill personnel will be posted in the material storage area on the onsite construction office or trailer.
A Spill Response Report notification are provided below.

**SPILL RESPONSE REPORT**

**ALBANY ACADEMY PROPOSED GYMNASIUM**

**Within 1 hour of a spill discovery less than 2 gallons in volume the following must be notified:**

Albany Academy, 518-429-2439  
City of Albany, Randy Milano, P.E., City Engineer, 518-427-7481  
City of Albany, Neil O’Connor, P.E., 518-434-5300

**Within 1 hour of a spill discovery greater than 2 gallons in volume the following must be notified:**

NYSDEC Spill Response Hotline 800-457-7362  
Albany Academy, 518-429-2439  
City of Albany, Randy Milano, P.E., City Engineer, 518-427-7481  
City of Albany, Neil O’Connor, P.E., 518-434-5300  
Spill Response Contractor, *To Be Designated*
ATTACHMENT NO. 1

DEEP RIPPING & DECOMPACTION (APRIL 2008)
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)
Alternative Stormwater Management
Deep-Ripping and Decompaction

Description

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

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

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

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

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

The objective of Deep Ripping and Decompaction is to effectively fracture (vertically and laterally) 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 Decomposition 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.](image)
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 Decompostion 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 Decompostion 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 Decompostion 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 decompostion (subsoiling); and other measures may be more practical.

**Slope**

The two-phase application of 1) deep ripping and 2) decompostion (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 decomposed. For limited instances of moderate steepness on other projects, however, the post-construction land use and the relative alignment of the potential ripping and decompostion 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 decompostion (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 decompaaction (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 decompaaction. 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 decompaaction.

**Design Guidance**

Beyond the above-noted site factors, a vital requirement for the effective Deep Ripping and Decompaaction (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) Decompaaction (deep subsoil), simultaneously through the restored topsoil layer and the upper half of the affected subsoil (Figure 13). The second phase, “decompaaction,” mitigates the partial recompaaction which occurs during the heavy process of topsoil spreading/grading. Prior to deep ripping and decompaacting 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.](image)

![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.](image)

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.

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 Decompaclation (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 Decompaclation (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 Decompaclation 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 Decompaclation (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 Decompaction 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.](image)

![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.](image)
The Deep Ripping and Decompauction 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) Decompauction 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.


• Magdoff, F., and H. van Es. 2000. *Building Soils for Better Crops.* 2nd ed. Sustainable Agricultural Networks


• 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:


• 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.*  
ATTACHMENT NO. 2

COMPLETED NOTICE OF INTENT
NOTICE OF INTENT

Stormwater Discharges Associated With Construction Activities Under Rezone Albany

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 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

<table>
<thead>
<tr>
<th>Owner/Operator Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Owner/Operator (Company Name/Private Owner Name/Municipality Name)</td>
</tr>
<tr>
<td>Owner/Operator Contact Person Last Name (NOT CONSULTANT)</td>
</tr>
<tr>
<td>Owner/Operator Contact Person First Name</td>
</tr>
<tr>
<td>Owner/Operator Mailing Address</td>
</tr>
<tr>
<td>City</td>
</tr>
<tr>
<td>State</td>
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<td>Fax (Owner/Operator)</td>
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<tr>
<td>Email (Owner/Operator)</td>
</tr>
<tr>
<td>FED TAX ID</td>
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</table>
**Project Site Information**

<table>
<thead>
<tr>
<th>Project/Site Name</th>
<th>Proposed Gymnasium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Street Address (NOT P.O. BOX)</td>
<td>135 Academy Road</td>
</tr>
<tr>
<td>Side of Street</td>
<td>○ North  ○ South ○ East  ● West</td>
</tr>
<tr>
<td>City/Town/Village (THAT ISSUES BUILDING PERMIT)</td>
<td>Albany</td>
</tr>
<tr>
<td>State □ Zip □ County □</td>
<td>NY □ - □ Albany</td>
</tr>
<tr>
<td>Name of Nearest Cross Street</td>
<td>Hackett Boulevard</td>
</tr>
<tr>
<td>Project In Relation to Cross Street</td>
<td>● North ○ South ○ East ○ West</td>
</tr>
<tr>
<td>Distance to Nearest Cross Street (Feet)</td>
<td>330</td>
</tr>
<tr>
<td>Tax Map Numbers Section-Block-Parcel</td>
<td>75·12-1·1·1</td>
</tr>
<tr>
<td>Tax Map Numbers</td>
<td></td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>X Coordinates (Easting)</th>
<th>Y Coordinates (Northing)</th>
</tr>
</thead>
<tbody>
<tr>
<td>42·646816</td>
<td>-73·788714</td>
</tr>
</tbody>
</table>

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

**Post-Development**  
Future Land Use  
- ø SINGLE FAMILY HOME  
- ø SINGLE FAMILY SUBDIVISION  
- ø TOWN HOME RESIDENTIAL  
- ø MULTIFAMILY RESIDENTIAL  
- ☐ INSTITUTIONAL/SCHOOL  
- ø INDUSTRIAL  
- ø COMMERCIAL  
- ø MUNICIPAL  
- ø ROAD/HIGHWAY  
- ø RECREATIONAL/SPORTS FIELD  
- ø BIKE PATH/TRAIL  
- ø LINEAR UTILITY (water, sewer, gas, etc.)  
- ø PARKING LOT  
- ø CLEARING/GRADING ONLY  
- ø DEMOLITION, NO REDEVELOPMENT  
- ø WELL DRILLING ACTIVITY *(Oil, Gas, etc.)  
- ø 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 existing impervious area to be disturbed (for redevelopment disturbed area). (Round to the nearest tenth of an acre).

<table>
<thead>
<tr>
<th>Total Site Area</th>
<th>Total Area To Be Disturbed</th>
<th>Existing Impervious Area To Be Disturbed</th>
<th>Future Impervious Area Within Disturbed Area</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5. Do you plan to disturb more than 5 acres of soil at any one time?  
- ø Yes  
- ☐ No

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

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>100</td>
<td>0</td>
</tr>
</tbody>
</table>

7. Is this a phased project?  
- ø 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
Hudson River

9a. Type of waterbody identified in Question 9?
- □ Wetland / State Jurisdiction On Site (Answer 9b)
- □ Wetland / State Jurisdiction Off Site
- □ Wetland / Federal Jurisdiction On Site (Answer 9b)
- □ Wetland / Federal Jurisdiction Off Site
- □ Stream / Creek On Site
- □ Stream / Creek Off Site
- □ River On Site
- □ River Off Site
- □ Lake On Site
- □ Lake Off Site
- □ Other Type On Site
- □ Other Type Off Site

9b. How was the wetland identified?
- □ Regulatory Map
- □ Delineated by Consultant
- □ Delineated by Army Corps of Engineers
- □ Other (identify)

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

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

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

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

14. Will the project disturb soils within a State regulated wetland or the protected 100 foot adjacent area?  ○ Yes  ● No
<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
<th>Unknown</th>
</tr>
</thead>
<tbody>
<tr>
<td>15. Does the site runoff enter a separate storm sewer system (including roadside drains, swales, ditches, culverts, etc)?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. What is the name of the municipality/entity that owns the separate storm sewer system?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Albany Water Board</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. Does any runoff from the site enter a sewer classified as a Combined Sewer?</td>
<td>Yes</td>
<td>No</td>
<td>Unknown</td>
</tr>
<tr>
<td>18. Will future use of this site be an agricultural property as defined by the NYS Agriculture and Markets Law?</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>19. Is this property owned by a state authority, state agency, federal government or local government?</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>20. Is this a remediation project being done under a Department approved work plan? (i.e. CERCLA, RCRA, Voluntary Cleanup Agreement, etc.)</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>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)?</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>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)?</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td><strong>If No, skip questions 23 and 27-39.</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23. Has the post-construction stormwater management practice component of the SWPPP been developed in conformance with the current NYS Stormwater Management Design Manual?</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>
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

Hershberg & Hershberg

Contact Name (Last, Space, First)

Hershberg Daniel

Mailing Address

18 Locust Street

City

Albany

State

NY

Phone

Fax

Email
dan@hhershberg.com

SWPPP Preparer Certification

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

First Name

Daniel

MI

R

Last Name

Hershberg

Signature

Date

9/28/18
25. Has a construction sequence schedule for the planned management practices been prepared?  
   - Yes  - No

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

<table>
<thead>
<tr>
<th>Temporary Structural</th>
<th>Vegetative Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>○ Check Dams</td>
<td>○ Brush Matting</td>
</tr>
<tr>
<td>○ Construction Road Stabilization</td>
<td>○ Dune Stabilization</td>
</tr>
<tr>
<td>○ Dust Control</td>
<td>○ Grassed Waterway</td>
</tr>
<tr>
<td>○ Earth Dike</td>
<td>○ Mulching</td>
</tr>
<tr>
<td>○ Level Spreader</td>
<td>○ Protecting Vegetation</td>
</tr>
<tr>
<td>○ Perimeter Dike/Swale</td>
<td>○ Recreation Area Improvement</td>
</tr>
<tr>
<td>○ Pipe Slope Drain</td>
<td>○ Seeding</td>
</tr>
<tr>
<td>○ Portable Sediment Tank</td>
<td>○ Sodding</td>
</tr>
<tr>
<td>○ Rock Dam</td>
<td>○ Straw/Hay Bale Dike</td>
</tr>
<tr>
<td>○ Sediment Basin</td>
<td>○ Streambank Protection</td>
</tr>
<tr>
<td>○ Sediment Traps</td>
<td>○ Temporary Swale</td>
</tr>
<tr>
<td>○ Silt Fence</td>
<td>○ Topsoiling</td>
</tr>
<tr>
<td>○ Stabilized Construction Entrance</td>
<td>○ Vegetating Waterways</td>
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<td>○ Storm Drain Inlet Protection</td>
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<tr>
<td>○ Straw/Hay Bale Dike</td>
<td></td>
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<tr>
<td>○ Temporary Access Waterway Crossing</td>
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<td>○ Temporary Stormdrain Diversion</td>
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<tr>
<td>○ Temporary Swale</td>
<td></td>
</tr>
<tr>
<td>○ Turbidity</td>
<td></td>
</tr>
<tr>
<td>○ Curtain</td>
<td></td>
</tr>
<tr>
<td>○ Water Bars</td>
<td></td>
</tr>
</tbody>
</table>

| Biotechnical         | |
| ○ Brush Matting      | |
| ○ Wattling           | |

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

27a. Indicate which of the following soil restoration criteria was used to address the requirements in Section 5.1.6 (“Soil Restoration”) of the Design Manual (2010 version).
   - All disturbed areas will be restored in accordance with the Soil Restoration 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
   
   

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

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

   Note: Redevelopment projects shall use Table 1 and 2 to identify the SMPs used to treat and/or reduce the WQv required. If runoff reduction techniques will not be used to reduce the required WQv, skip to question 33a after identifying the SMPs.
Table 1 - Runoff Reduction (RR) Techniques and Standard Stormwater Management Practices (SMPs)

<table>
<thead>
<tr>
<th>RR Techniques (Area Reduction)</th>
<th>Total Contributing Area (acres)</th>
<th>and/or</th>
<th>Total Contributing Impervious Area (acres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conservation of Natural Areas (RR-1)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Sheetflow to Riparian Buffers/Filters Strips (RR-2)</td>
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</tr>
<tr>
<td>Tree Planting/Tree Pit (RR-3)</td>
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<tr>
<td>Disconnection of Rooftop Runoff (RR-4)</td>
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<tr>
<td>Vegetated Swale (RR-5)</td>
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<tr>
<td>Rain Garden (RR-6)</td>
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<tr>
<td>Stormwater Planter (RR-7)</td>
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<td></td>
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</tr>
<tr>
<td>Rain Barrel/Cistern (RR-8)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Porous Pavement (RR-9)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Green Roof (RR-10)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Standard SMPs with RRv Capacity**

<table>
<thead>
<tr>
<th>Standard SMPs</th>
<th>Total Contributing Area (acres)</th>
<th>and/or</th>
<th>Total Contributing Impervious Area (acres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infiltration Trench (I-1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Infiltration Basin (I-2)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dry Well (I-3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Underground Infiltration System (I-4)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bioretention (F-5)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dry Swale (O-1)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Standard SMPs**

<table>
<thead>
<tr>
<th>Standard SMPs</th>
<th>Total Contributing Area (acres)</th>
<th>and/or</th>
<th>Total Contributing Impervious Area (acres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Micropool Extended Detention (P-1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wet Pond (P-2)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wet Extended Detention (P-3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multiple Pond System (P-4)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pocket Pond (P-5)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surface Sand Filter (F-1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Underground Sand Filter (F-2)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perimeter Sand Filter (F-3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organic Filter (F-4)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Shallow Wetland (W-1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extended Detention Wetland (W-2)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pond/Wetland System (W-3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pocket Wetland (W-4)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wet Swale (O-2)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 2 - Alternative SMPs (Do Not Include Practices Being Used For Pretreatment Only)

<table>
<thead>
<tr>
<th>Alternative SMP</th>
<th>Total Contributing Impervious Area (acres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>○ Hydrodynamic</td>
<td></td>
</tr>
<tr>
<td>○ Wet Vault</td>
<td></td>
</tr>
<tr>
<td>○ Media Filter</td>
<td></td>
</tr>
<tr>
<td>○ Other</td>
<td></td>
</tr>
</tbody>
</table>

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

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

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

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

\[
\text{WQv Provided} \cdot \text{acre-feet}
\]

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). \[
\text{acre-feet}
\]

35. Is the sum of the RRv provided (#30) and the WQv provided (#33a) greater than or equal to the total WQv required (#28)?

\[\begin{array}{ll}
\text{Yes} & \text{No}
\end{array}\]

If Yes, go to question 36.
If No, sizing criteria has not been met, so NOI cannot 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.

\[
\text{CPv Required} \cdot \text{acre-feet} \quad \text{CPv Provided} \cdot \text{acre-feet}
\]

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

\[\begin{array}{ll}
\text{Site discharges directly to tidal waters} & \text{or a fifth order or larger stream.}
\end{array}\]

\[\begin{array}{ll}
\text{Reduction of the total CPv is achieved on site} & \text{through runoff reduction techniques or infiltration systems.}
\end{array}\]

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

\[
\text{Total Overbank Flood Control Criteria (Qp)} \quad \text{Total Extreme Flood Control Criteria (Qf)}
\]

\[\begin{array}{ll}
\text{Pre-Development} & \text{Post-Development}
\end{array}\]

\[
\text{CFS} \quad \text{CFS}
\]

Page 11 of 14
37a. The need to meet the Qp and Qf criteria has been waived because:
   ○ Site discharges directly to tidal waters or a fifth order or larger stream.
   ○ Downstream analysis reveals that the Qp and Qf controls are not required.

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

   If yes, identify the entity responsible for the long term Operation & 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
- Other
- None

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

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

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

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

AWD
Owner/Operator Certification

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

Print First Name
Pamela

Print Last Name
MacAffer

Owner/Operator Signature

Date 9/26/18
ATTACHMENT NO. 3

NOTICE OF TERMINATION
(BLANK FOR FUTURE USE)
Please indicate your permit identification number: AWD

I. Owner or Operator Information:

1. Owner/Operator Name: Albany Academy

2. Street Address: 135 Academy Road

3. City/State/Zip: Albany, NY 12008

4. Contact Person: Pamela MacAffer

5. Telephone: 518-429-2439

6. Contact Person E-Mail: macafferp@albanyacademies.org

II. Project Site Information:

7. Project/Site Name: Proposed Gymnasium

8. Street Address: 135 Academy Road

9. City/Zip: Albany, NY 1228

10. County: Albany

III. Reason for Termination:

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

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

13. Other (Explain on Page 2)

IV. Final Site Information:

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

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

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

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

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

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

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

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

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

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

Printed Name:

Title/Position:

Signature:  Date:
### NOTICE OF TERMINATION

**VII. Qualified Inspector Certification - Final Stabilization:**

I hereby certify that all disturbed areas have achieved final stabilization as defined in the current version of the permit, and that all temporary, structural erosion and sediment control measures have been removed. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

- **Printed Name:**
- **Title/Position:**
- **Signature:**
- **Date:**

**VIII. Qualified Inspector Certification - Post construction Stormwater Management Practice(s):**

I hereby certify that all post-construction stormwater management practices have been constructed in conformance with the SWPPP. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

- **Printed Name:**
- **Title/Position:**
- **Signature:**
- **Date:**

**IX. Owner or Operator Certification:**

I hereby certify that this document was prepared by me or under my direction or supervision. My determination, based upon my inquiry of the person(s) who managed the construction activity, or those persons directly responsible for gathering the information, is that the information provided in this document is true, accurate and complete. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

- **Printed Name:**
- **Title/Position:**
- **Signature:**
- **Date:**

(City of Albany Department of Water & Water Supply Notice of Termination - September 2017)
ATTACHMENT NO. 4

CERTIFICATION OF CONTRACTOR
Contractor/Subcontractor SWPPP Certification

NOTE: This SWPPP identifies for each measure identified in the SWPPP, the contractor(s) and subcontractor(s) that will implement the measure. All contractors and subcontractors identified in the SWPPP must sign a copy of the certification statement. All certifications must be included in the SWPPP. Additionally, new contractors and subcontractors need to similarly certify. All contractors and subcontractors identified in a SWPPP shall sign a copy of this certification statement before undertaking any construction activity at the site identified in the SWPPP:

I hereby certify 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 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 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.

SERVICES PROVIDED BY THIS CONTRACTOR/SUBCONTRACTOR:
(Contractor/Subcontractor must complete)

List all trades covered: ____________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________

______________________________________________________________
Signature

______________________________________________________________
Name & Title (Print or Type)

______________________________________________________________
Name of Entity Constituting Contractor/Subcontractor (Print or Type)

______________________________________________________________
Address of Entity Constituting Contractor/Subcontractor (Print or Type)

______________________________________________________________
Phone Number/Fax Number of Entity Constituting Contractor/Subcontractor (Print or Type)

Signatory Requirements – This SWPPP certification shall be signed as follows:

a. For a corporation: by (1) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person authorized to and who performs similar policy or decision making functions for the corporation; or (2) the manager of one or more manufacturing, production or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding $25,000,000 (in second-quarter 1980 dollars) if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

b. For a partnership or sole proprietorship: by a general partner or the proprietor, respectively.
ATTACHMENT NO. 5

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

Print First Name
Pamela

Print Last Name
MacAffer

Owner/Operator Signature

Date
9/26/18
ATTACHMENT NO. 6
SAMPLE INSPECTION FORM
FOR USE
DURING CONSTRUCTION
UNTIL FILING OF NOTICE OF TERMINATION
(NOT)
UNDER SPDES GENERAL PERMIT
(GP# 0-15-002)
Inspection Form
(Attach additional pages as required)
OTHER FORMATS CONTAINING THIS INFORMATION MAY BE USED

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;

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.
PROPOSED GYMNASIUM
FF=219.50
MAP POCKET #2
MAP #C – 4
UTILITY PLAN
EXISTING BUILDING

PROPOSED GYMNASIUM
FF=219.50

STORMWATER MANAGEMENT PRACTICE -SEDIMENT BASIN
Must Be Maintained In Accordance With O&M Plan
DO NOT REMOVE OR ALTER

STORMWATER MANAGEMENT PRACTICE -INFILTRATION BASIN
Must Be Maintained In Accordance With O&M Plan
DO NOT REMOVE OR ALTER
MAP POCKET #5

MAP #C – 7

DETAILS
MAP POCKET #6
MAP # C-8
UTILITY PROFILES