STORM WATER POLLUTION PREVENTION PLAN

Monkey Run Townhouse Project
Tax Map No. 53.-1-3.4
5 Freese Road
Town of Dryden
Tompkins County, New York

March 2011

Prepared for:

Nickolas Bellisario and Otis Phillips
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Ithaca, NY 14850

Prepared by:

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TABLE of CONTENTS

PURPOSE

The proposed construction-related activities, further described herein, involve the residential development of a 2-acre lot located at 5 Freese Road in the Town of Dryden, Tompkins County, New York as well as the partial filling of the property with clean fill material. It is planned that up to 20 townhouse units will be constructed on the property over time. Occurring concurrently will be the filling of portions of the site to accommodate full residential development of the property. The construction and filling activities may result in the discharge of storm water from the subject property into waters of the United States.

The purpose of this document is to comply with federal regulation 40 CFR Part 122 which prohibits point source discharges of storm water to waters of the United States without a permit issued under the National Pollutant Discharge Elimination System (NPDES) program. The New York State Department of Environmental Conservation (NYSDEC) is delegated by the US Environmental Protection Agency to administer this program through its State Pollutant Discharge Elimination System (SPDES) program which includes General Permit GP-0-10-001 for Storm Water Discharges from Construction Activities. The Town of Dryden is authorized by the NYSDEC to provide oversight and administration of these regulations on a local level. Construction activities in the Town of Dryden must also comply with Local Law No. 4 (Town of Dryden Stormwater Management and Erosion and Sediment Control Law).

This Storm Water Pollution Prevention Plan has been prepared as part of filing for a Notice of Intent (NOI) to obtain coverage under the NYSDEC SPDES General Permit for the proposed activities. A copy of a completed NOI has been included in an appendix.

PROPERTY INFORMATION

The subject property is located in the Town of Dryden, Tompkins County, New York, in the northwest quadrant of the intersection of Freese Road and Dryden Road (NYS Route 366). The property, which is approximately 2 acres in size, is currently vacant and undeveloped land; however, a majority of the site has been filled either recently or in the past. The land is predominantly covered with fill material although some portions contain vegetation where the property has been graded and temporarily seeded. There are no permanent structures on the property. There are no major drainageways across the property. There is a small drainageway that traverses the northern property boundary. Also, the property receives storm water runoff from properties east of Dryden Road that is conveyed across portions of the site via underground pipe and a drainage ditch. All site runoff eventually flows to Fall Creek which is located approximately 400 LF west of the subject property.

A synopsis of the subject property has been included below:

Location: 5 Freese Road, Town of Dryden, Tompkins County, New York

Owners: Mr. Nickolas Bellisario and Mr. Otis Phillips
41 Oak Brook Drive
Ithaca, NY 14850
Telephone: 607-327-2798 and 607-227-2213

Size: Approximately 2 acres (according to Tompkins County Tax Map)

Tax Map No.: 53.-1-3.4

Current Use: Vacant and undeveloped land undergoing filling activities

Utilities: None currently serve the site; electricity, natural gas, and municipal water and wastewater available.

Adjoining Properties:
East: Dryden Road; commercial across (automotive repair and Laundromat)
North: Agricultural land
West: Residence (unoccupied)
South: Freese Road with residential properties and one private retail commercial building across

PROJECT DESCRIPTION

The following provides a brief description of the project:

Activities

The project proposes a multi-phase residential development of the site including the construction of up to 20 townhouse units along with clean filling of the subject property. It is planned that the site would be filled to at or slightly below the grade of Dryden Road (NYS Route 366). To date, approximately 2/3 of the site has been filled and graded with up to 15 feet of clean fill. Additional portions of the site will be filled and stabilized along the property's north and west sides. Because the portion of the site where an initial construction of five (5) townhouse units is proposed consists of stabilized fill, residential construction will begin immediately, while filling activities in other portions of the site will be ongoing. Subsequent phases of residential construction will be dependent upon the success of the first phase; however, a maximum of 20 units is planned for and that assumption has been included in this SWPPP.

Road Construction

A property entrance is currently available off of Dryden Road where trucks containing fill have accessed the site for several years. Due to the planned location of the residential structures, a new entrance to the property will be constructed as the long-term access to the property. The new entrance will require a review and highway work permit from the New York State Department of Transportation. Although no road construction per se will occur, the new entrance will be constructed to DOT standards and resident parking lot access will be constructed beyond the entrance.

Utility Construction

Water – There is municipal water (Bolton Point Municipal Water System) available at the project site along Dryden Road; therefore, the proposed project will be provided with potable water.

Sewer – Municipal sewer is available to the subject property along Freese Road. A connection to the municipal sewer is planned for this project.

Electricity/Natural Gas – Natural gas and electricity are available to the site from New York State Electric & Gas (NYSEG) along Dryden Road. It is planned that underground electric and natural gas lines will be extended into the site to serve the townhomes.

Miscellaneous – Underground telephone and cable television services are planned to be extended into the property and would be available to each residential unit.

Drainage

Drainage across the site currently flows to the northwest corner of the property and eventually reaches nearby Fall Creek. Fall Creek is located approximately 400 LF west of the subject property. Standard methods will be employed to provide erosion and sediment control and various green infrastructure methods, such as disconnected rooftop runoff, porous sidewalk pavement, and vegetated swales, will be employed to provide water quality treatment for runoff.

A storm water retention pond is proposed to capture and treat storm water runoff from the project site. All areas disturbed by the construction activities will be routed through the retention pond. The retention pond will provide storage for residual water quality volume, channel protection volume, and the 10-year and 100-year design storms.

STORM WATER MANAGEMENT OBJECTIVES

In order to comply with the NYSDEC SPDES Storm Water Permit for construction activities and the Town of Dryden Local Law No. 4, a brief list of the objectives of this SWPPP are described as follows:

- Minimize soil erosion from the subject site during and after construction;
- Reduce or eliminate sediment loading to drainage channels leading to Fall Creek;
- Control the impact of increased storm water quantity across the site, and downstream, utilizing a storm water retention pond;
- Utilize "Better Site Design" practices in the planning and construction of this project to reduce storm water runoff effects on the associated watershed by reducing impervious cover and better integrating storm water treatment;
- Control the impact of storm water runoff on the water quality of receiving waters utilizing "green infrastructure" and a storm water retention pond;
- Control the impact of storm water runoff on receiving channels;
- Prepare maintenance and inspection procedures for storm water controls during and after construction.

CURRENT CONDITIONS

The following provides a description of current site and drainage conditions at the property:

Drainage Areas/Points

Although the property receives controlled runoff via storm water drainage pipe east of Dryden Road, the subject site itself drains to the northwest corner of the property. All runoff from the site, and that which it receives from off-site sources, eventually drains to Fall Creek which is located approximately 400 LF west of the subject property.

Water Bodies/Wetlands; Existing Storm Water Structures

Based on a review of information available from the Tompkins County Planning Department, there are no permanent water bodies, streams, or mapped state or federal wetlands on the property. There is a small drainage swale along the northern property boundary that flows through the northwest corner of the subject site.

Also, concentrated storm water runoff flows into a catch basin east of Dryden Road, is conveyed under Dryden Road by a 24" pipe, and flows into a catch basin located in the southwest corner of the subject property. At the catch basin, the storm water pipe size in increased to 36" and exits the north side of the catch basin. There is approximately 40 LF of 36" diameter plastic pipe that eventually daylights north of the catch basin near the west property line. A drainage channel continues along the remainder of the west property boundary to the northwest corner of the site. The drainage channel and the small drainageway along the north property boundary intersect near the northwest corner of the property. Storm water flows through three corrugated metal pipes located under a tractor path located just west of the northwest property corner on adjoining lands and then continues on to nearby Fall Creek.

It should be noted that as a result of recent filling activities at the site, surface access to the two catch basins on the property has been cutoff; consequently, surface runoff cannot enter either of these basins from above.

Critical/Sensitive Areas

There are no critical or sensitive areas on the property. The subject property does not have highly erosion-prone areas or soils, natural resource conservation areas, wildlife habitats, or significantly sloping areas other than those associated with the stabilized filled portions of the site.

Utilities, Easements, etc.

There are no utilities on or under the subject property; however, municipal water and wastewater, and NYSEG electricity and natural gas are available to the site. There are no known easements that affect the property.

Soil Types

According to the attached Soil Survey Map, there are four soil types mapped that predominantly cover the subject property and include the following:

Current Conditions (Con't)

HsB – Hudson silty clay loam, 2 to 6% slopes; Hydrologic Soil Group "C"

Mm – Madalin mucky silty clay loam; Hydrologic Soil Group "D"

CdC – Chenango gravelly loam; 5-15% slopes; Hydrologic Soil Group "A"

HdA – Howard gravelly loam, 0-5% slopes, Hydrologic Soil Group "A"

It should be noted that although these soils may be present beneath the property, they are currently covered with anywhere from 5 to 15 feet of clean fill material.

A copy of the formal Natural Resources Conservation Service description of each soil type has been included with this report.

POST-DEVELOPMENT CONDITIONS

The following provides a brief description of the planned post-development conditions at the subject site:

Proposed Development/SWPPP Scope

The project proposes the eventual construction of up to 20 townhouses on-site along with the filling and grading of portions of the property to road level across the northern portion of the site.

The Storm Water Pollution Prevention Plan (SWPPP) will primarily consist of controlling storm water runoff from the affected areas and utilizing various storm water control measures to safely convey runoff to a proposed stormwater retention pond that will limit the off-site discharge of stormwater to a maximum of pre-development levels.

Due to the size and scope of the proposed development, the SWPPP will consist of an Erosion and Sediment Control Plan as well as a Water Quality and Quantity Control Plan.

Better Site Design/Green Infrastructure

Better Site Design and green infrastructure practices to be implemented as part of this project include the following:

- Porous sidewalks will be constructed on the property;
- Vegetated swales will be constructed to provide some infiltration and to lengthen the time of concentration of storm water runoff at the storm water retention pond;
- Disconnection of Rooftop Runoff – At each townhouse, roof runoff will be collected by downspouts and sent to a vegetated area to be infiltrated. This will improve water quality treatment as well as reduce the amount of impervious surface that needs to be considered in the design of the storm water retention pond.

Disturbed Area

The site is approximately 2 acres in size and as a result of the proposed residential construction, site filling, and re-grading activities, nearly all of the property will be disturbed. A copy of a completed Town of Dryden Notice of Ground Disturbance/Area Tally Form has been included in an appendix. In reference to the Area Tally Form (Item No. 10), it should be noted that there are three soil types present on-site which are listed as Hydrologic Soil Group "A" and "C" (i.e., Hudson silty clay loam); however, each soil type is located below several feet of fill material and may not be readily identifiable in the field.

Duration of Construction Activity

The first phase of residential construction and filling activities will take place over the course of approximately one year. Subsequent residential construction and filling activities could take place over the course of several years until the site is in its final development condition.

Post-Development Conditions (Con't)

Impervious Area

Upon completion of construction and filling activities, there will be up to 20 townhouse units along with associated sidewalks and parking area that will represent impervious surfaces. Approximately 30,000 SF of the site will be nominally impervious; however, various methods will be employed to mitigate the impervious surfaces associated with the structures (i.e., porous pavement and disconnected roof runoff).

Environmentally Sensitive Areas

As previously indicated, there are no environmentally sensitive areas on the property.

Drainage Areas

At the conclusion of the residential construction, property filling, and grading activities there will be one substantive drainage area associated with the site. All storm water generated from disturbed areas of the site will flow to the northwest corner of the property where it will run through a storm water retention pond and be released to a nearby drainageway and conveyed off-site. Appendix B contains a drainage plan which depicts the proposed erosion and sediment control measures planned for the property.

Pollution Prevention Measures

To the extent possible, construction activities will not occur during foul weather in which accidental release of litter, chemicals, petroleum products, etc. to the storm water conveyance system would be likely. Litter (i.e., construction material packaging, food wrappers, leftover construction product, etc.) will be picked up daily and placed in containerized trash units. Petroleum products, lubricants, cleaning chemicals, etc., if present, would be kept in containers provided with secondary spill containment measures and protected from precipitation to prevent leaching or accidental release to the environment or storm water conveyance system. Minor spill control measures, such as absorbent rags, will be present on site during filling and grading activities in the event of a petroleum or chemical release.

Additionally, storm water control structures constructed as part of this development will be protected from a petroleum or chemical release either by the placement of a physical cover over the inlet during filling and grading activities or by the implementation of the other pollution prevention measures described above.

TMDL/303d Segment

The subject property does not drain directly to a 303d segment stream and the project is not located in a TMDL area.

SWPPP Implementation Responsibility

The responsibility for the implementation of this SWPPP plan lies with Mr. Nickolas Bellisario, Mr. Otis Phillips, or their assigns. A signed contractor certification statement is located in an appendix.

Updated Plans

This SWPPP does not represent an updated plan; however, updated plans would contain a compliance status and the necessary signatures.

MAPS, FIGURES, AND PHOTOGRAPHS

The following maps, figures, and photographs are included in various appendices at the end of this Plan.

- Location Map
- Tax Map
- Soil Survey Map
- Aerial Photograph
- Site Plan
- Site Drainage Plan

EROSION AND SEDIMENT CONTROL

The following constitutes the erosion and sediment control portion of this SWPPP:

Sequence of Construction

In order to limit the potential for erosion and off-site sediment deposition, the following provides a general sequence of construction for the project:

1. Construct stabilized construction entrance and driveway culvert into property;
2. Construct provisions for utility extension along Dryden Road;
3. Conduct site grading and filling activities to accommodate initial residential unit construction;
4. Install perimeter silt fencing in accordance with plan depictions;
5. Stabilize steep slopes created from filling activities with erosion control mats and/or seeding and mulching;
6. Construct storm water retention pond;
7. Construct vegetated waterway and install check dam(s)
8. Upon completion of home construction, install downspouts and roof runoff conveyance to pervious lawn areas of the site;
9. Topsoil, seed, mulch, and landscape lot;
10. Remove silt fence on lot once ground vegetation is established;

Deviations from this proposed sequence are likely due to the size of the project; however, no off-site fill or excavation activities are planned as part of the construction.

Pre-Construction Actions

All proposed erosion and sediment control measures will be constructed in accordance with the standards and specifications provided in Appendix D of this report.

- Resource and Surface Water Protection

  An existing 36" plastic drainage pipe originating at a catch basin in the southwest corner of the property, along with the associated drainage channel, shall be cleared of vegetation and debris from the pipe outlet. The pipe will eventually be extended down the channel to the northwest corner of the site. The pipe will be covered and stone pipe outlet protection will be provided.

  An existing sediment trap shall be used as temporary stormwater treatment and retention prior to discharge to the northwest corner of the site. Based on topographic information, the trap is approximately 4500 cubic feet in size.

- Stabilized Construction Entrance

  At present there is an entrance to the property from Dryden Road. The main property entrance will be relocated to the north and be placed where the new driveway to the townhouses will be constructed. The new entrance, which shall be constructed in accordance with NYS Department of Transportation standards, will represent the stabilized construction entrance to the property. Sediments tracked onto public highways shall be removed on a daily basis and the public highway cleaned as appropriate.

Erosion and Sediment Control (Con't)

Bare areas on-site shall be rough graded and stabilized prior to site construction activities.

- Perimeter Sediment Controls

Due to the nature of the filling and grading activities planned for the site, perimeter sediment controls, such as silt fencing, will not be placed as part of this SWPPP until final grades are reached. At that time silt fence will be placed as appropriate at the top and bottom of slope in order to prevent disturbed materials, sediments, or storm water runoff from leaving the site unchecked. As an interim step toward preventing sediments from leaving the project location, the site will be graded so that all runoff will flow to the north toward the existing swale and sediment trap. An earthen dike, currently in place to prevent site runoff from entering Dryden Road, will remain in place during construction activities and will not be removed until necessitated by final site grading.

Runoff and Drainage Control

- Runoff Control and Conveyance System

The project will endeavor to control storm water runoff from off-site and on-site sources. In general, runoff from off-site sources will be handled separately from on-site sources.

Presently, an underground piping system conveys storm water from east of Dryden Road to the subject property. Storm water conveyed through this system daylights from a 36" diam. plastic pipe along the west property boundary into an existing drainage channel. The drainage pipe outlet is filled with debris that reduces its ability to convey storm water safely through the subject property. No effort will be made to minimize the amount of water that comes onto the site from this system; however, it is planned that the 36" pipe will eventually be extended down the drainage channel to the northwest corner of the site. The pipe and drainage channel will eventually be buried by site filling activities.

Associated swale, culvert, or pipe outlets will be adequately stabilized to minimize erosion potential and check dams will be constructed as required in the grassed waterway and channels to clean runoff and reduce storm water runoff velocities.

- Groundwater Recharge

Converting bare, or sparsely vegetated, fill areas to grassed lawn, and utilizing vegetated swales and channels to control and convey runoff will promote groundwater recharge at the site.

- Outlet Stabilization

Swale, culvert, and pipe outlets will be adequately stabilized through compaction and stone placement to minimize erosion and downstream sediment deposition.

Erosion and Sediment Control (Con't)

Grading

Initial grading and excavation activities will be associated with the installation of a new stabilized construction entrance, a new vegetated swale, and other sediment control measures. Silt fence will be placed around stockpiles of topsoil or other fine fill material that remain undisturbed for more than 14 days. Ongoing grading activities will be conducted regularly as fill material is brought to the site and deposited.

Erosion Control

Erosion control practices to keep soil in place will be implemented as soon as practicable.

Perimeter erosion controls will be stabilized immediately. Soil stockpiles, steep hillsides, and exposed soil should be stabilized by seeding and/or mulching as soon as possible, but in no case more than 14 days after construction activity has ceased. Both seeding and mulching shall be used to treat stockpiles or exposed soils during the growing season, otherwise only mulch shall be used.

Apply temporary or permanent soil stabilization measures immediately on all disturbed areas where work is delayed indefinitely or has been completed.

Local Soil and Water Conservation District personnel or a professional landscaping firm will be contacted for proper timing and application rate of seed, fertilizer, and mulch after filling and grading activities are complete.

Sediment Control

Following the initial grading activities, no grading, filling, or other disturbance will be permitted within existing drainage swales or channels. Sediment control measures (i.e., silt fencing) will be installed downgradient of graded or disturbed construction areas to prevent sediment from being transported off-site.

Vegetated swales will be constructed in a stabilized manner to prevent erosion and sediment transport.

Maintenance and Inspection

The following is a list of erosion and sediment control practices that will require maintenance and inspection:

- Silt fencing
- Check dams
- Vegetated swales and channels
- Stabilized construction entrance
- Erosion control mats/seeding & mulching on hillsides
- Sediment trap
- Pipe/culvert inlets and outlets
- Earth Dike
- Forebay
- Storm water retention pond
- Pond outlet control structure

Erosion and Sediment Control (Con't)

All erosion and sediment control practices will be checked for stability and operation following every runoff-producing rainfall event but in no case less than once every seven calendar days. Any needed repairs will be made immediately by the owner to maintain all practices as designed and installed.

Inspections will verify that all practices are operational and maintained properly and that sediment is removed from all control and conveyance structures. Inspections will look for evidence of soil erosion, potential pollutants entering the drainage systems, problems at discharge points, and signs of sediment transportation off-site.

In accordance with the NYSDEC SPDES General Permit requirements, inspections shall be conducted by a "Qualified Professional" on a weekly basis. The inspections will verify that all practices are operational and maintained properly and that sediments are removed from all control and conveyance structures as required. Inspections will look for evidence of soil erosion, potential pollutants entering the drainage systems, problems at discharge points, and signs of sediment transportation off-site. A copy of a typical storm water inspection form has been included in Appendix A.

The owner will be responsible for identifying the persons or entities that will conduct inspections and implement maintenance actions. Copies of the inspection reports shall be sent to the proper Town officials within 48 hours of conducting the inspection. During construction activities, a ledger of inspection activities, including a copy of this SWPPP, shall be kept on-site at all times and made accessible to the appropriate regulatory authorities.

Maintenance Schedule

The following are the inspection and maintenance practices that will be used to ensure continuous and effective operation of the recommended stormwater control practices.

Sediment and silt will be removed from behind the silt fences when it becomes more than 6 inches deep at the fence. The fences will be repaired as necessary to maintain integrity.

Sediment will be removed from the storm water retention pond and forebay when they become more than 20% full.

Blocked or partially blocked storm water conveyance pipes, channels, or waterways will be cleaned immediately.

Eroded areas will be repaired immediately by re-grading as necessary.

Check dams shall be repaired immediately if damage is observed.

Note: Any long-term maintenance agreement between the Town of Dryden and the owner(s) would be drafted separately from this document.

Erosion and Sediment Control (Con't)

Stormwater Retention Pond

Monthly – Cleanout debris on the pond and forebay surfaces. Clear out inflow and outflow pipes of debris. Review the riser pipe to make sure that it is free of blockages.

Annually – Remove sediment from forebay and pond if required. Make repairs to forebay and pond as needed.

Finalize Grading & Landscaping

Upon completion of residence and utility construction activities, final grading and landscaping will be conducted. Lawn areas will be graded, topsoiled, seeded, mulched and watered to promote rapid growth. Foundation landscaping will be completed simultaneously with lawn development.

Site stabilization will be undertaken within 14 days after construction activity has ceased or as soon as site conditions warrant.

Post-Construction Controls

The permanent structural and non-structural practices that will remain on site include vegetative swales with discharges to the driveway culvert and the retention pond, downspouts to splash blocks that discharge to pervious areas adjacent to the townhouse structures, driveway culverts, check dams in the vegetated swales, foundation landscaping, and the forebay/storm water retention pond system and associated structures.

Additionally, storm water runoff from the site will be conveyed to the retention pond that will provide channel protection and water quality treatment as well as water quantity control for the 1 yr, 10-yr and 100-yr design storms. The storm water retention pond is discussed further in the following section (i.e., Water Quantity and Water Quality Control Plan).

WATER QUANTITY AND WATER QUALITY CONTROL PLAN

Because the area disturbed by the proposed construction activities will exceed 1 acre, a water quantity and quality control plan is required. Meeting water quantity and quality standards for this project will involve providing water quality volume treatment, channel protection volume detention, overbank flood (10-year design storm), and extreme flood (100-year design storm) volume detention. Runoff generated from this project would be controlled and released onto adjoining property below the area proposed for the storm water retention basin at a rate below current runoff rates.

The primary mechanism for meeting water quantity and quality standards for this project is a storm water treatment and retention structure planned for construction in the northwest corner of the property. The location of the proposed retention structure and design has been depicted on the attached project plans.

Hydrologic Considerations

Based on site topography indicated on the survey map, there is one drainage area associated with the portion of the property proposed for development. Generally, the drainage area (and property) is bounded on the east by Dryden Road, on the north and west by adjoining properties, and the south by Freese Road.

In reviewing the drainage area, it was observed that current storm water runoff discharges into a drainageway in the northwest corner of the property that flows to nearby Fall Creek. Fall Creek ultimately discharges into Cayuga Lake. As indicated, runoff from this project will require storm water control measures that treat the quantity and quality of storm water generated as a result of the construction activities.

It is planned that water quality and channel protection volumes will be provided for by the storm water control measure(s) selected for this project. Water quality volumes are generally related to the overall impervious area of the development while channel protection volume storage is associated with the detention of the 1-year, 24-hour design storm. Overall average impervious area of the developed site is anticipated to be approximately 35%. However, utilizing green infrastructure methods, the effective impervious area would be reduced to 18% of the site area.

Technical Release No. 55 (TR-55) was used to determine pre- and post-development runoff rates and volumes from the site for the 1-yr, 10-yr, and 100-yr design storms. The drainage maps and hydrologic calculation worksheets have been included in an appendix.

Water quality volume was calculated using the standard equation presented in the New York State Stormwater Management Design Manual. Associated calculations for the water quality volume have been included in Appendix B.

Findings

The pond size and riser pipe data, along with the data generated from the TR-55 calculations, were plugged into a HydroCAD program to determine pre- and post-development flowrates and determine whether or not the retention pond would provide adequate water quality and channel protection volumes, as well as safely pass the overbank and extreme floods.

Water Quantity and Quality Control Plan (Con't)

A summary of flowrate data generated by HydroCAD follows:

Design Storm	Pre-Development Flowrate (cfs)	Post-Development Flowrate (cfs)
1-year	1.62	0.3
10-year	3.44	2.12
100-year	5.17	4.09

A summary of the water quality and quantity volumes provided by the retention pond are as follows:

NYSDEC Standard	Required Volume	Volume Provided
Water Quality	0.032 ac-ft	0.05 ac-ft
Forebay	0.0032 ac-ft	0.011 ac-ft
Channel Protection	0.03 ac-ft	0.09 ac-ft
Overbank Flood Control	0.05 ac-ft	0.16 ac-ft
Extreme Flood Control	0.16 ac-ft	0.20 ac-ft

Based on the information provided, the proposed storm water retention pond will be more than adequate in providing adequate storage volume for water quality treatment, channel protection, overbank, and extreme flood conditions.

Additional Water Quantity and Quality Control Measures

Although the proposed vegetated swale slope would be gentle across the property (approximately 3% or less), check dams would be placed as appropriate to both provide an added measure of filtration and to slow down runoff velocities in the swale as it discharges into the storm water treatment and detention structure.

Other planned site controls to maintain storm water quality include the sloping of the developed portions of the site toward the vegetated swale; collecting roof runoff via gutters, downspouts, and splash blocks, and discharging roof runoff to lawn areas; and constructing porous sidewalks, would treat and dissipate frequent storm event (i.e, 1- or 2-yr storms) runoff through infiltration into the ground.

Conclusion

Based on the findings of the hydrologic study, which generally indicates relatively low runoff rates and treatment volumes, and the planned use of green infrastructure measures (i.e., vegetated swale w/check dam(s) and disconnecting roof runoff from impervious surfaces), it is believed that the proposed measures to meet water quality and quantity control objectives will be adequate.

CERTIFICATION

The information presented in this Storm Water Pollution Prevention Plan is truthfully presented to the best of my knowledge and belief and has been prepared in accordance with the current version of the "New York State Standards and Specifications for Erosion and Sediment Control" and the Town of Dryden Local Law No. 4 (i.e., Town of Dryden Stormwater Management, Erosion and Sediment Control Law).

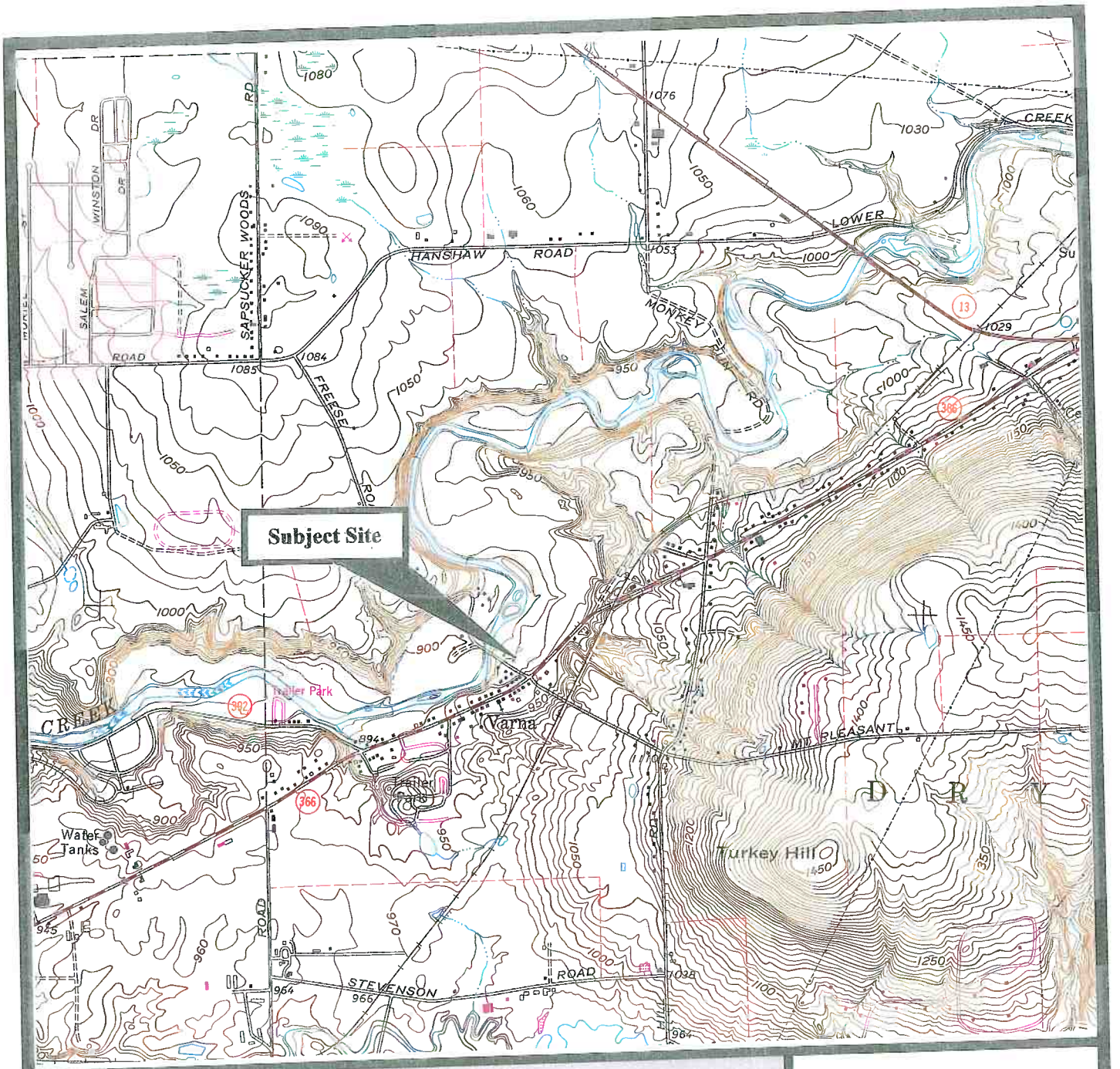
Wayne C. Matteson, Jr., P.E.
NYS LN 68896

3/21/11
Date

APPENDIX A

MAPS AND FORMS

1. Location Map.
2. Tax Map.
3. Soil Survey Map.
4. Aerial Photograph.
5. Town of Dryden Notice of Ground Disturbance/Area Tally Form.
6. Completed Notice of Intent (NOI) Form.
7. Completed MS4 Form.
8. Typical Inspection Form.



WAYNE C. MATTESON, JR., P.E.
3893 Eatonbrook Road
Erieville, NY 13061

Scale: 1" = 2000'

Figure No.: 1

Map Source:
Ithaca East USGS

Project: Monkey Run Townhouses SWPPP
5 Freese Road
Ithaca, NY

Prepared By:
WCM

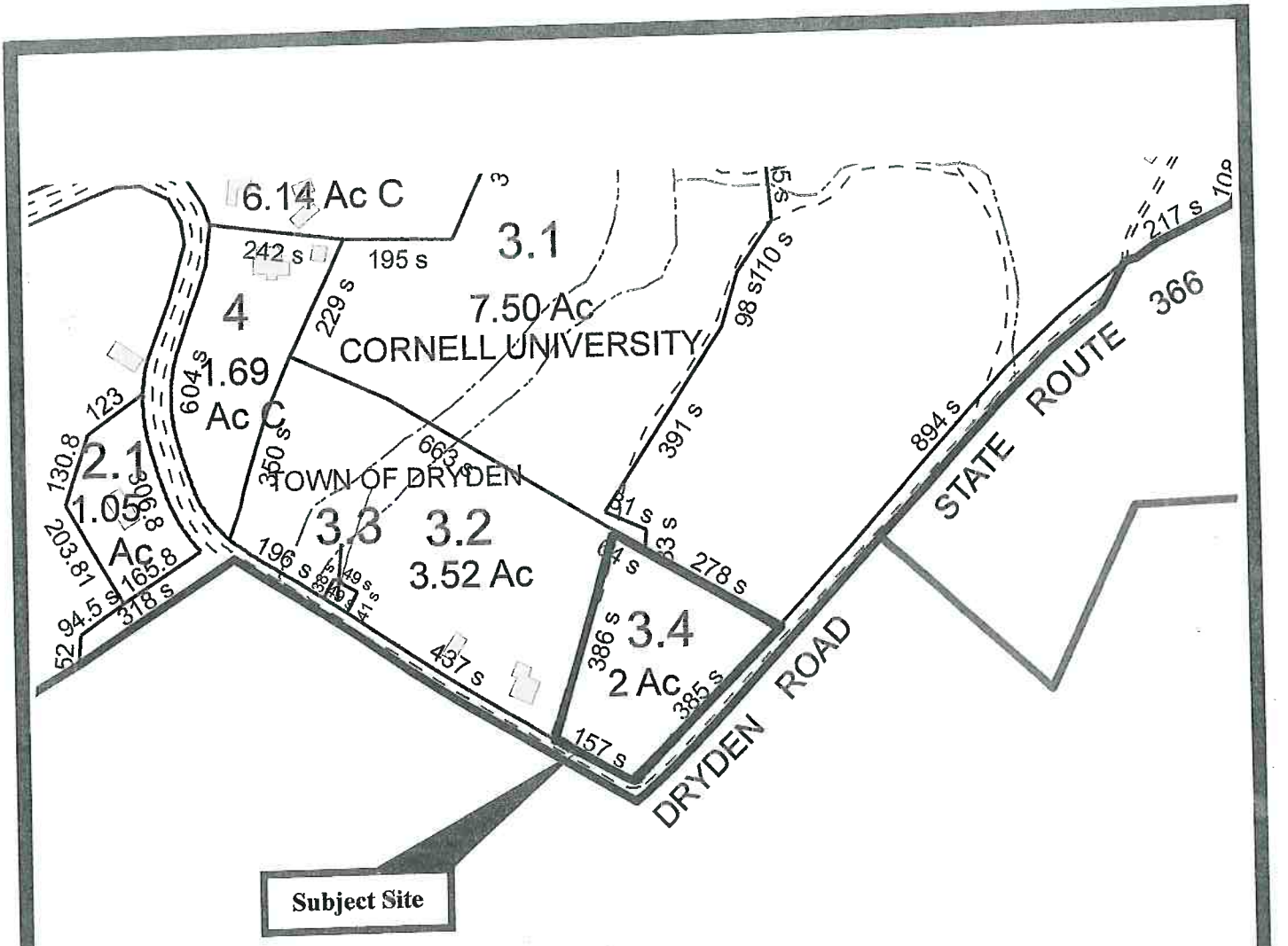
Client: Bellisario/Phillips
41 Oak Brook Drive
Ithaca, NY

Project Location:
5 Freese Rd.,
Town of Dryden, NY

Site Location Map

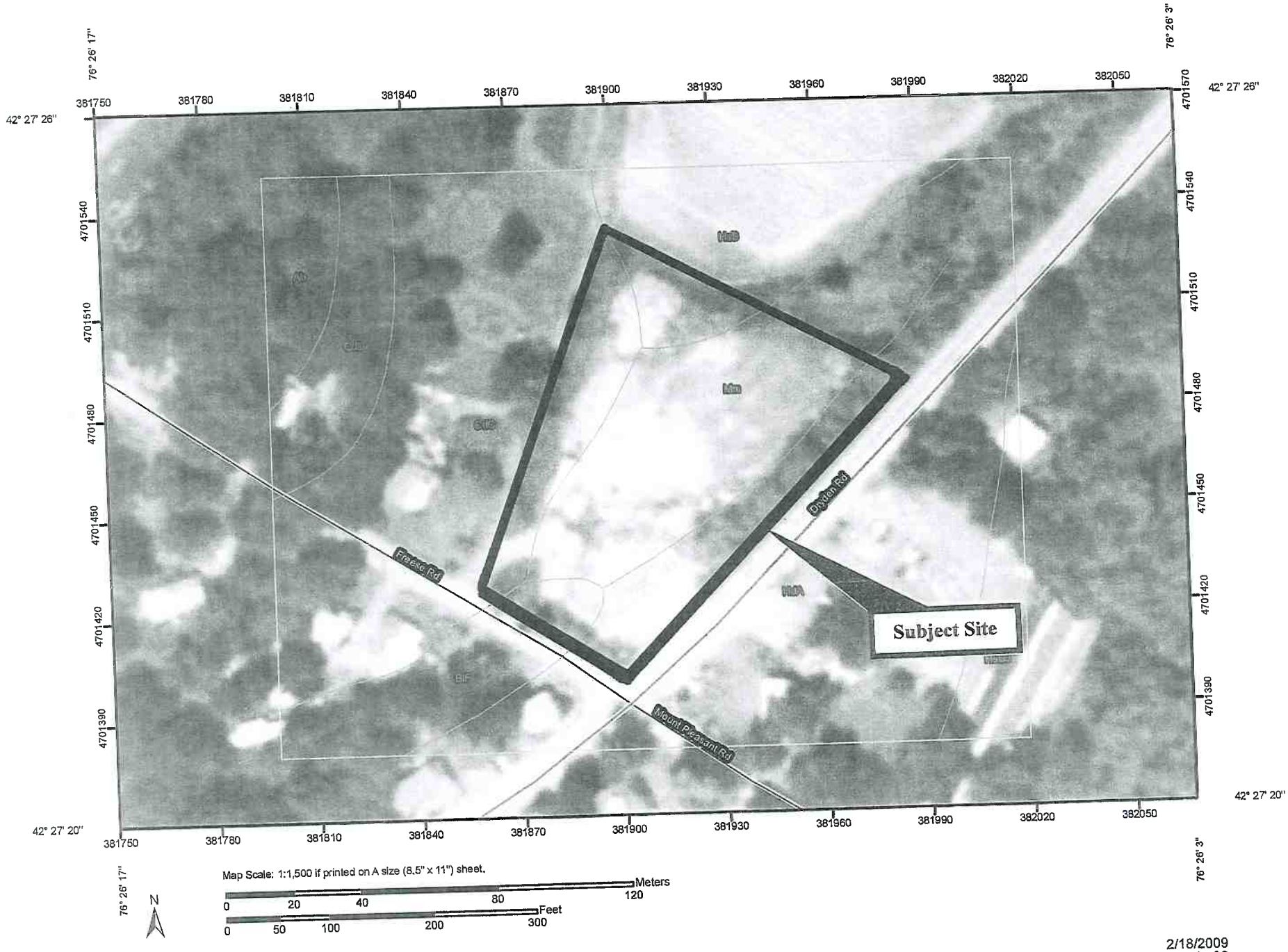
Storm Water Pollution Prevention Plan

Monkey Run Townhouses
5 Freese Road
Ithaca, NY



Wayne C. Matteson, Jr., P.E. 3893 Eatonbrook Road Erieville, NY 13061		**Scale: 1" = 300'**
Figure No: 2	**Tax Map No.:** 53.-1-3.4	**TAX MAP** **Storm Water Pollution Prevention Plan**
Project: Monkey Run Townhouses SWPPP 5 Freese Road Ithaca, New York	**Prepared By:** WCM	
Client: Bellisario/Phillips 41 Oak Brook Drive Ithaca, NY	**Project Location:** 5 Freese Road, Town of Dryden, NY	**Monkey Run Townhouses** 5 Freese Road Ithaca, NY

Soil Map—Tompkins County, New York



Aerial Photograph

Monkey Run Townhouse Project
5 Freese Road
Town of Dryden
Tompkins County, New York

Source: NYSGIS
2007 Aerial Photography

Notice of Ground Disturbance / Area Tally Form

Please complete this form and submit to the Town of Dryden Stormwater Management Officer. "**Land Development Activity**" resulting in Ground Disturbance is defined as all areas where soil will be disturbed as a result of clearing, grubbing, grading, excavating, stockpiling, placement of fill, paving, installation of utilities, and construction of buildings or structures. This form will enable Town of Dryden staff to assist applicants in meeting local stormwater standards, and it is helpful to submit this form prior to finalizing your SWPPP.

Owner's Name: Nickolas Belhsario / Otis Phillips Date: 3/15/11

Phone #607-327-2798 Mailing Address: 41 Oak Brook Drive, Ithaca, NY 14850

Project Site Address: 5 Freese Rd Tax Parcel # 53.-1-3.4

Project Sponsor Name (If Different than Owner): _____ Phone: _____

Address: _____

Brief Description of the Project: Project proposes the phased construction of up to 30 townhouse units along with the clean filling of a portion of the subject property.

(Attach additional sheets of paper as necessary and include a project sketch)

Project and Site Characteristics (Check yes or no as appropriate)

1. Will the project involve multiple phases? ☒ YES ☐ NO If YES, how many phases? 4
2. What is the shortest distance from the project area of disturbance to the edge of any stream, pond, lake, or wetland in the vicinity of the project? 400 feet.
3. Does the site show any field or map indicators of potential wetland presence? ☐ YES ☒ NO
   Check all that are applicable:

   ☐ Mapped NWI Wetlands ☐ Mapped DEC Wetlands ☐ Mapped Hydric Soils

   ☐ Field indicators of Hydric Soils ☐ Vegetation indicative of wetlands ☐ Wetland Delineation
4. Please describe the slope on site (e.g. steep or flat areas, streambanks, gullies, bluffs etc.).
   A majority of the site is flat; however, at the edge of the fill material the slopes are steep.
5. Will the project include a linear excavation that is more than 500 feet long and 3 feet wide? ☐ YES ☒ NO
6. Will the project involve excavation or fill resulting in the movement of more than 250 cubic yards of soil, sand, or similar material? ☒ YES ☐ NO
7. Does the project require any state or federal environmental permits? ☒ YES ☐ NO
   Permit(s): NYSDOT Highway Work Permit
8. Do connected Impervious Areas exceed ½ acre. ☐ YES ☒ NO
   (If YES a Full SWPPP is required)

---

9. Area Tally

9A) Fill in the approximate area to be disturbed by the following, in square feet, as applicable. If it has been determined that a Full SWPPP is necessary from the Notice of Ground Disturbance, then please present this information when the final draft is complete.

Driveway 2500 SF
Parking Area 10,500 SF
House / Main Building –
Other Buildings 13,200 SF
Septic System –
Other Grading / Clearing / Lawn 32,700 SF
Wells and Ditches –
Drainage Structures 10,000 SF
Utility Laying 1,000 SF
Additional Area – (for construction access, stockpiling, etc.)

Total (do not total overlapping areas): 71,900 SF

9B) For subdivisions only:
Total from Above: _____ x _____ (# of lots) + _____ (road area) = _____

9C) As estimated above, the total Area of Disturbance is: 1.65 Acres

10. Is more than half of the project site area over soils in Hydrologic Soil Group A, B, or C according to the Tompkins County Soil Survey? ☒ YES ☐ NO

11. Is the project redevelopment, as defined by Chapter 9 of the DEC's design manual? ☐ YES ☒ NO

12. Total Parcel Acreage: 2 acres

13. Area of existing impervious surface prior to development: 0

14. Total Impervious Area expected after project completion: 1 acre

Signature: _____ **Date:** _____

0669273036

NOTICE OF INTENT

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

NYR _____ (for DEC use only)

Stormwater Discharges Associated with Construction Activity Under State Pollutant Discharge Elimination System (SPDES) General Permit # GP-0-10-001

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

-IMPORTANT-

RETURN THIS FORM TO THE ADDRESS ABOVE

OWNER/OPERATOR MUST SIGN FORM

Owner/Operator Information

Owner/Operator (Company Name/Private Owner Name/Municipality Name)
Nickolas Bellisario, Otis Phillips

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

Owner/Operator Contact Person First Name
Nickolas

Owner/Operator Mailing Address
41 Oak Brook Drive

City
Ithaca

State
NY

Zip
14850 -

Phone (Owner/Operator)
607 - 327 - 2798

Fax (Owner/Operator)
607 - 697 - 0128

Email (Owner/Operator)
thebestbushwacker@yahoo.com

FED TAX ID
__ - _____ (not required for individuals)

0457273031

Project Site Information

Project/Site Name
Monkey Run Townhouses

Street Address (NOT P.O. BOX)
5 Freese Road, Ithaca, NY

Side of Street
● North ○ South ○ East ○ West

City/Town/Village (THAT ISSUES BUILDING PERMIT)
Town of Dryden

State: NY
Zip: 14850-
County: Tompkins
DEC Region: 7

Name of Nearest Cross Street
Freese Road and Dryden Road

Distance to Nearest Cross Street (Feet)
0

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

Tax Map Numbers
Section-Block-Parcel
53.-1-3.4

Tax Map Numbers

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

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

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

X Coordinates (Easting): 381884

Y Coordinates (Northing): 4701451

2. What is the nature of this construction project?

● New Construction

○ Redevelopment with increase in imperviousness

○ Redevelopment with no increase in imperviousness

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

Pre-Development Existing Land Use	Post-Development Future Land Use
○ FOREST	○ SINGLE FAMILY HOME Number of Lots
○ PASTURE/OPEN LAND	○ SINGLE FAMILY SUBDIVISION [ ]
○ CULTIVATED LAND	● TOWN HOME RESIDENTIAL
○ SINGLE FAMILY HOME	○ MULTIFAMILY RESIDENTIAL
○ SINGLE FAMILY SUBDIVISION	○ INSTITUTIONAL/SCHOOL
○ TOWN HOME RESIDENTIAL	○ INDUSTRIAL
○ MULTIFAMILY RESIDENTIAL	○ COMMERCIAL
○ INSTITUTIONAL/SCHOOL	○ MUNICIPAL
○ INDUSTRIAL	○ ROAD/HIGHWAY
○ COMMERCIAL	○ RECREATIONAL/SPORTS FIELD
○ ROAD/HIGHWAY	○ BIKE PATH/TRAIL
○ RECREATIONAL/SPORTS FIELD	○ LINEAR UTILITY (water, sewer, gas, etc.)
○ BIKE PATH/TRAIL	○ PARKING LOT
○ LINEAR UTILITY	○ CLEARING/GRADING ONLY
○ PARKING LOT	○ DEMOLITION, NO REDEVELOPMENT
● OTHER	○ OTHER
Filled Land	[ ]

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

5. Is this a project which does not require coverage under the General Permit (e.g. Project done under an Individual SPDES Permit, or department approved remediation)? ○ Yes ● No

6. Is this property owned by a state authority, state agency or local government? ○ Yes ● No

7. In accordance with the larger common plan of development or sale, enter the total project site acreage, the acreage to be disturbed and the future impervious area (acreage)within the disturbed area. Round to the nearest tenth of an acre.

Total Site Acreage	Acreage To Be Disturbed	Existing Impervious Area Within Disturbed	Future Impervious Area Within Disturbed
2.0	1.7	.	0.8

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

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

A	B	C	D
40 %	0 %	10 %	50 %

10. Is this a phased project? ● Yes ○ No

11. Enter the planned start and end dates of the disturbance activities. Start Date 04/30/2011 – End Date 12/31/2014

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

Name: Fall Creek

12a. Type of waterbody identified in Question 12?

- ○ Wetland / State Jurisdiction On Site (Answer 12b)
- ○ Wetland / State Jurisdiction Off Site
- ○ Wetland / Federal Jurisdiction On Site (Answer 12b)
- ○ 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

12b. How was the wetland identified?

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

13. Has the surface waterbody(ies) in question 12 been identified as a 303(d) segment in Appendix E of GP-0-10-001? ○ Yes ● No

14. Is this project located in one of the Watersheds identified in Appendix C of GP-0-10-001? ○ Yes ● No

15. Is the project located in one of the watershed areas associated with AA and AA-S classified waters? **If no, skip question 16.** ○ Yes ● No

16. 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?
[ ][ ][ ][ ].[ ]

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

18. Does the site runoff enter a separate storm sewer system (including roadside drains, swales, ditches, culverts, etc)? ○ Yes ○ No ● Unknown
(If No, skip question 19)

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

20. Does any runoff from the site enter a sewer classified as a Combined Sewer? ○ Yes ● No ○ Unknown

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

22. Does this construction activity require the development of a SWPPP that includes Water Quality and Quantity Control components (Post-Construction Stormwater Management Practices) ● Yes ○ No
(If No, skip questions 23 and 27-35)

23. Have the Water Quality and Quantity Control components of the SWPPP been developed in comformance with the current NYS Stormwater Management Design Manual ? ● Yes ○ No

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

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

SWPPP Preparer
Wayne C. Matteson, Jr., P.E.

Contact Name (Last, Space, First)
Matteson Wayne

Mailing Address
3893 Eatonbrook Road

City
Erieville

State NY

Zip 13061-

Phone 315-662-7146

Fax

Email
wmatteson@frontiernet.net

SWPPP Preparer Certification

I hereby certify that the Stormwater Pollution Prevention Plan (SWPPP) for this project has been prepared in accordance with the terms and conditions of the GP-0-10-001. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of this permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

First Name
Wayne

MI
C

Last Name
Matteson, Jr.

Signature
Wayne C. Matteson Jr. PE

Date
03/18/2011

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

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

Temporary Structural

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

Biotechnical

- ○ Brush Matting
- ○ Wattling

Vegetative Measures

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

Permanent Structural

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

Other

Water Quality and Quantity Control

Important: Completion of Questions 27-35 is not required if response to Question 22 is No.

Post-Construction Stormwater Management Practices

27. Indicate **all** Stormwater Management Practice(s) that will be installed/constructed on this site:

Ponds
- ○ Micropool Extended Detention (P-1)
- ○ Wet Pond (P-2)
- ◉ Wet Extended Detention (P-3)
- ○ Multiple Pond System (P-4)
- ○ Pocket Pond (P-5)

Filtering
- ○ Surface Sand Filter (F-1)
- ○ Underground Sand Filter (F-2)
- ○ Perimeter Sand Filter (F-3)
- ○ Organic Filter (F-4)
- ○ Bioretention (F-5)
- ○ Other

Alternative Practice
- ○ Rain Garden
- ○ Cistern
- ○ Green Roof
- ○ Stormwater Planters
- ◉ Permeable Paving (Modular Block)

Wetlands
- ○ Shallow Wetland (W-1)
- ○ Extended Detention Wetland (W-2)
- ○ Pond/Wetland System (W-3)
- ○ Pocket Wetland (W-4)

Infiltration
- ○ Infiltration Trench (I-1)
- ○ Infiltration Basin (I-2)
- ○ Dry Well (I-3)
- ○ Underground Infiltration System

Open Channels
- ○ Dry Swale (O-1)
- ○ Wet Swale (O-2)

Verified Proprietary Practice
- ○ Hydrodynamic
- ○ Wet Vault
- ○ Media Filter

28. Describe other stormwater management practices not listed above or explain any deviations from the technical standards.

The project will include the disconnection of roof top runoff from impervious surfaces and also a vegetated swale to convey runoff to a storm water retention pond.

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

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

Owner

30. Provide the total water quality volume required and the total provided for the site.

WQv Required 0.032 acre-feet

WQv Provided 0.05 acre-feet

31. Provide the following Unified Stormwater Sizing Criteria for the site.

Total Channel Protection Storage Volume (CPv) - Extended detention of post-developed 1 year, 24 hour storm event

CPv Required 0.03 acre-feet

CPv Provided 0.09 acre-feet

31a. The need to provide for channel protection has been waived because:

○ **Site discharges directly to fourth order stream or larger**

Total Overbank Flood Control Criteria (Qp) - Peak discharge rate for the 10 year storm

Pre-Development 3.44 CFS

Post-development 2.12 CFS

Total Extreme Flood Control Criteria (Qf) - Peak discharge rate for the 100 year storm

Pre-Development 5.17 CFS

Post-development 4.09 CFS

31b. The need to provide for flood control has been waived because:

○ **Site discharges directly to fourth order stream or larger**

○ **Downstream analysis reveals that flood control is not required**

IMPORTANT: For questions 31 and 32, impervious area should be calculated considering the project site and all offsite areas that drain to the post-construction stormwater management practice(s). (Total Drainage Area = Project Site + Offsite areas)

32. Pre-Construction Impervious Area - As a percent of the Total Drainage Area enter the percentage of the existing impervious areas before construction begins. 85 %

33. Post-Construction Impervious Area - As a percent of the Total Drainage Area, enter the percentage of the future impervious areas that will be created/remain on the site after completion of construction. 40 %

34. Indicate the total number of post-construction stormwater management practices to be installed/constructed. 3

35. Provide the total number of stormwater discharge points from the site. (include discharges to either surface waters or to separate storm sewer systems) 1

36. Identify other DEC permits that are required for this project.

DEC Permits

○ Air Pollution Control	○ Navigable Waters Protection / Article 15
○ Coastal Erosion	○ Water Quality Certificate
○ Hazardous Waste	○ Dam Safety
○ Long Island Wells	○ Water Supply
○ Mined Land Reclamation	○ Freshwater Wetlands/Article 24
○ Other SPDES	○ Tidal Wetlands
○ Solid Waste	○ Wild, Scenic and Recreational Rivers
● None	○ Stream Bed or Bank Protection / Article 15

○ Other

37. Does this project require a US Army Corps of Engineers Wetland Permit? ○ Yes ● No
If Yes, Indicate Size of Impact. [ ].[ ]

38. Is this project subject to the requirements of a regulated, traditional land use control MS4? ● Yes ○ No
(If No, skip question 39)

39. 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

40. If this NOI is being submitted for the purpose of continuing coverage under a general permit for stormwater runoff from construction activities, please indicate the former SPDES number assigned. NYR[ ][ ][ ][ ][ ]

Owner/Operator Certification

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

Print First Name Nicholas **MI**

Print Last Name Bellisario

Owner/Operator Signature

Date [ ][ ] / [ ][ ] / [ ][ ][ ][ ]

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

MS4 Stormwater Pollution Prevention Plan (SWPPP) Acceptance Form

for

Construction Activities Seeking Authorization Under SPDES General Permit

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

I. Project Owner/Operator Information
1. Owner/Operator Name: Nickolas Bellisario / Otis Phillips
2. Contact Person: Nick Bellisario
3. Street Address: 41 Oak Brook Drive
4. City/State/Zip: Ithaca, NY 14850
II. Project Site Information
5. Project/Site Name: Monkey Run Townhouse Project
6. Street Address: 5 Freese Rd (Town of Dryden)
7. City/State/Zip: Ithaca, NY 14850
III. Stormwater Pollution Prevention Plan (SWPPP) Review and Acceptance Information
8. SWPPP Reviewed by:
9. Title/Position:
10. Date Final SWPPP Reviewed and Accepted:
IV. Regulated MS4 Information
11. Name of MS4:
12. MS4 SPDES Permit Identification Number: NYR20A _____
13. Contact Person:
14. Street Address:
15. City/State/Zip:
16. Telephone Number:

(NYS DEC - MS4 SWPPP Acceptance Form - January 2010)

MS4 SWPPP Acceptance Form - continued

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

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

Printed Name:

Title/Position:

Signature:

Date:

VI. Additional Information

CONSTRUCTION DURATION INSPECTIONS **Page 1 of _____**

SITE PLAN/SKETCH

_____ _____

Inspector (print name) **Date of Inspection**

_____ _____

Qualified Professional (print name) **Qualified Professional Signature**

The above signed acknowledges that, to the best of his/her knowledge, all information provided on the forms is accurate and complete.

Maintaining Water Quality

Yes No NA
[ ] [ ] [ ] Is there an increase in turbidity causing a substantial visible contrast to natural conditions?
[ ] [ ] [ ] Is there residue from oil and floating substances, visible oil film, or globules or grease?
[ ] [ ] [ ] All disturbance is within the limits of the approved plans.
[ ] [ ] [ ] Have receiving lake/bay, stream, and/or wetland been impacted by silt from project?

Housekeeping

1. General Site Conditions
Yes No NA
[ ] [ ] [ ] Is construction site litter and debris appropriately managed?
[ ] [ ] [ ] Are facilities and equipment necessary for implementation of erosion and sediment control in working order and/or properly maintained?
[ ] [ ] [ ] Is construction impacting the adjacent property?
[ ] [ ] [ ] Is dust adequately controlled?

2. Temporary Stream Crossing
Yes No NA
[ ] [ ] [ ] Maximum diameter pipes necessary to span creek without dredging are installed.
[ ] [ ] [ ] Installed non-woven geotextile fabric beneath approaches.
[ ] [ ] [ ] Is fill composed of aggregate (no earth or soil)?
[ ] [ ] [ ] Rock on approaches is clean enough to remove mud from vehicles & prevent sediment from entering stream during high flow.

Runoff Control Practices

1. Excavation Dewatering
Yes No NA
[ ] [ ] [ ] Upstream and downstream berms (sandbags, inflatable dams, etc.) are installed per plan.
[ ] [ ] [ ] Clean water from upstream pool is being pumped to the downstream pool.
[ ] [ ] [ ] Sediment laden water from work area is being discharged to a silt-trapping device.
[ ] [ ] [ ] Constructed upstream berm with one-foot minimum freeboard.

2. Level Spreader
Yes No NA
[ ] [ ] [ ] Installed per plan.
[ ] [ ] [ ] Constructed on undisturbed soil, not on fill, receiving only clear, non-sediment laden flow.
[ ] [ ] [ ] Flow sheets out of level spreader without erosion on downstream edge.

3. Interceptor Dikes and Swales
Yes No NA
[ ] [ ] [ ] Installed per plan with minimum side slopes 2H:1V or flatter.
[ ] [ ] [ ] Stabilized by geotextile fabric, seed, or mulch with no erosion occurring.
[ ] [ ] [ ] Sediment-laden runoff directed to sediment trapping structure

Runoff Control Practices (continued)

4. Stone Check Dam

Yes No NA

[ ] [ ] [ ] Is channel stable? (flow is not eroding soil underneath or around the structure).
[ ] [ ] [ ] Check is in good condition (rocks in place and no permanent pools behind the structure).
[ ] [ ] [ ] Has accumulated sediment been removed?.

5. Rock Outlet Protection

Yes No NA

[ ] [ ] [ ] Installed per plan.
[ ] [ ] [ ] Installed concurrently with pipe installation.

Soil Stabilization

1. Topsoil and Spoil Stockpiles

Yes No NA

[ ] [ ] [ ] Stockpiles are stabilized with vegetation and/or mulch.
[ ] [ ] [ ] Sediment control is installed at the toe of the slope.

2. Revegetation

Yes No NA

[ ] [ ] [ ] Temporary seedings and mulch have been applied to idle areas.
[ ] [ ] [ ] 4 inches minimum of topsoil has been applied under permanent seedings

Sediment Control Practices

1. Stabilized Construction Entrance

Yes No NA

[ ] [ ] [ ] Stone is clean enough to effectively remove mud from vehicles.
[ ] [ ] [ ] Installed per standards and specifications?
[ ] [ ] [ ] Does all traffic use the stabilized entrance to enter and leave site?
[ ] [ ] [ ] Is adequate drainage provided to prevent ponding at entrance?

2. Silt Fence

Yes No NA

[ ] [ ] [ ] Installed on Contour, 10 feet from toe of slope (not across conveyance channels).
[ ] [ ] [ ] Joints constructed by wrapping the two ends together for continuous support.
[ ] [ ] [ ] Fabric buried 6 inches minimum.
[ ] [ ] [ ] Posts are stable, fabric is tight and without rips or frayed areas.

Sediment accumulation is ___% of design capacity.

Sediment Control Practices (continued)

3. Storm Drain Inlet Protection (Use for Stone & Block; Filter Fabric; Curb; or, Excavated practices)

Yes No NA

[ ] [ ] [ ] Installed concrete blocks lengthwise so open ends face outward, not upward.
[ ] [ ] [ ] Placed wire screen between No. 3 crushed stone and concrete blocks.
[ ] [ ] [ ] Drainage area is 1acre or less.
[ ] [ ] [ ] Excavated area is 900 cubic feet.
[ ] [ ] [ ] Excavated side slopes should be 2:1.
[ ] [ ] [ ] 2" x 4" frame is constructed and structurally sound.
[ ] [ ] [ ] Posts 3-foot maximum spacing between posts.
[ ] [ ] [ ] Fabric is embedded 1 to 1.5 feet below ground and secured to frame/posts with staples at max 8-inch spacing.
[ ] [ ] [ ] Posts are stable, fabric is tight and without rips or frayed areas.

Sediment accumulation ___% of design capacity.

4. Temporary Sediment Trap

Yes No NA

[ ] [ ] [ ] Outlet structure is constructed per the approved plan or drawing.
[ ] [ ] [ ] Geotextile fabric has been placed beneath rock fill.

Sediment accumulation is ___% of design capacity.

5. Temporary Sediment Basin

Yes No NA

[ ] [ ] [ ] Basin and outlet structure constructed per the approved plan.
[ ] [ ] [ ] Basin side slopes are stabilized with seed/mulch.
[ ] [ ] [ ] Drainage structure flushed and basin surface restored upon removal of sediment basin facility.

Sediment accumulation is ___% of design capacity.

Note: Not all erosion and sediment control practices are included in this listing. Add additional pages to this list as required by site specific design.
Construction inspection checklists for post-development stormwater management practices can be found in Appendix F of the New York Stormwater Management Design Manual.

CONSTRUCTION DURATION INSPECTIONS

b. Modifications to the SWPPP (To be completed as described below)

The Operator shall amend the SWPPP whenever:
1. There is a significant change in design, construction, operation, or maintenance which may have a significant effect on the potential for the discharge of pollutants to the waters of the United States and which has not otherwise been addressed in the SWPPP; or
2. The SWPPP proves to be ineffective in:
   a. Eliminating or significantly minimizing pollutants from sources identified in the SWPPP and as required by this permit; or
   b. Achieving the general objectives of controlling pollutants in stormwater discharges from permitted construction activity; and
3. Additionally, the SWPPP shall be amended to identify any new contractor or subcontractor that will implement any measure of the SWPPP.

Modification & Reason:

III. Monthly Summary of Site Inspection Activities

Name of Permitted Facility:	Today's Date:	Reporting Month:
Location:	Permit Identification #:	
Name and Telephone Number of Site Inspector:		

Date of Inspection	Regular / Rainfall based Inspection	Name of Inspector	Items of Concern

Owner/Operator Certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that false statements made herein are punishable as a class A misdemeanor pursuant to Section 210.45 of the Penal Law."

Signature of Permittee or Duly Authorized Representative

Name of Permittee or Duly Authorized Representative Date

Duly authorized representatives must have written authorization, submitted to DEC, to sign any permit documents.

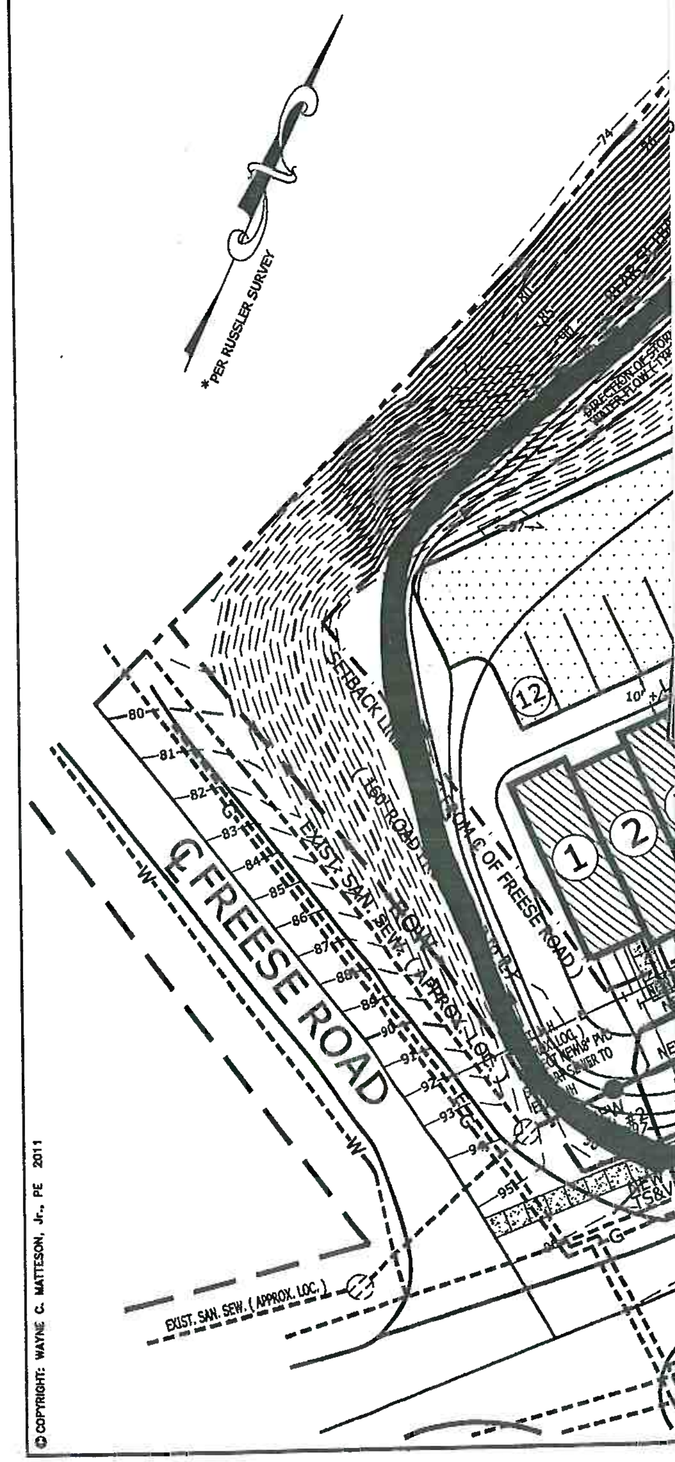
APPENDIX B

HYDROLOGIC CALCULATIONS

1. Drainage Area Map.
2. Water Quality Volume Calculations.
3. TR-55 Runoff Worksheets.
4. HydroCAD Flood Routing Data for Pre- and Post-development conditions.

DRAINAGE AREA MAP

Monkey Run Townhouse Project
5 Freese Road
Town of Dryden, Tompkins Co., NY



NOTES:

1. DATUM: ASSUMED.
2. THIS SURVEY WAS PERFORMED WITH APPROXIMATELY 12" OF SNOW COVER. NOT ALL SL VARIATIONS AND SURFACE IMPROVEMENTS WERE VISIBLE AT THE TIME OF THE SURVEY.
3. NO TITLE RESEARCH WAS PERFORMED FOR THIS SURVEY. THE BOUNDARY LINE SHOWN APPROXIMATE AND WAS BASED UPON THE REFERENCE SURVEY PROVIDED BY THE OWNER THE PARCEL.
4. UNDERGROUND UTILITIES WERE NOT LOCATED BY THIS SURVEY.
5. BOUNDARY & TOPO TAKEN FROM A MAP PREPARED BY KLUMPP L.S. DATED MAR.10,2011 TITLED TOPOGRAPHIC SURVEY.

LEGEND:

- ● EXISTING MONUMENT AS SHOWN
- ø UTILITY POLE
- APPROXIMATE PROPERTY LINE
- —84— EXISTING CONTOUR
- × 79.8 SPOT ELEVATION
- DRAINAGE DITCH

ADJOINING PROPERTY OWNERS	
TAX PARCEL NO.	OWNER
53. - 1- 3.2	THOMAS BOSSACK
53. - 1- 9.2	CORNELL UNIVERSITY
53. - 1- 3.1	CORNELL UNIVERSITY
53. - 1- 3.4	NICKOLAS BELLISARIO OTIS PHILLIPS
53. - 3- 5	PENALTY BOX SPORTS
53. - 3- 4	KATHLEEN SCHLATHER
53. - 4- 1	PETER SARKUS J. MICHAEL KIMBALL LARS KELLSTROM
53. - 4- 2	J. MICHAEL KIMBALL

...CATIONS ...INED ...R.

Jr., PE
Engineer

...EDUCATION LAW) ...ION OF THIS ...LICENSED ...SPECIFICALLY ...AND SIGNATURE

STAMP: LICENSED PROFESSIONAL ENGINEER — WAYNE C. MATTESON, JR. — STATE OF NEW YORK — No. 68895

SCALE:	1" = 20'
DATE:	Mar. 19, 2011
PREPARED BY:	MB
CHECKED BY:	WM
STATUS:	
CLIENT:	Nick Bellisario and Otis Phillips 41 Oak Brook Drive Ithaca , N.Y.
PROJECT:	Monkey Run Townhouse Project Dryden Road - NYS Rte. 366 Town of Dryden
TITLE:	Site Plan
SHEET:	S-1
PROJECT NO.:	1100

Water Quality Volume Calculation

Base Data

Site Data: 20 Townhomes
90 % Rainfall = 0.9 inches
Site Area = 2 acres
Original Impervious Area:

12,320 SF	(homes)
2,600 SF	(driveway)
6,200 SF	(Parking Spaces)
7,200 SF	(Additional Parking)
2,100 SF	(Sidewalks)
30,420 SF	= 0.698 Ac.

$$I = \frac{30,420\ SF}{2\ ac\ (43560\ SF/Ac)} = 35\%$$

Original $R_v = 0.05 + .009\,I$

$= 0.05 + .009(35) = 0.365$

Original $WQ_v = \frac{P(A)R_v}{12} = \frac{0.9\,(2)\,0.365}{12}$

Original $WQ_v = 0.055$ Ac-ft

Water Quality Volume % Reduction Using Disconnection of Rooftop Runoff and Porous Sidewalks

20 Townhouses Disconnected to lawn area

Average House Area = 616 ft^2

Net impervious reduction = $20 (616\ ft^2) / 43560\ ft^2/ac$

= 0.28 Ac.

New impervious area = 0.698 ac − 0.28 ac

= 0.418 Ac

$$I = \frac{0.418}{2} = 0.21 = 21\%$$

New $R_v = 0.05 + .009(21) = 0.24$

New $WQ_v = \frac{P(R_v)A}{12} = \frac{0.9(.24)2}{12} = 0.036$ Ac-ft*

* After bldg area reduction

Porous Sidewalk Area = 2100 SF = 0.048 ac.

Final Impervious Area = 0.418 − .048

= 0.37 Ac.

Final $I = \frac{.37}{2} = 0.18$ or 18%

Final $R_v = 0.05 + 0.009(18) = 0.212$

Final $WQ_v = \frac{P(R_v)A}{12} = \frac{0.9(.212)2}{12}$

Final $WQ_v = 0.032$ Ac-ft

Worksheet 2: Runoff curve number and runoff

Project	By	Date
Monkey Run Townhouses	Wayne Matteson	3/11
Location	**Checked**	**Date**
Freese Rd., Town of Dryden		

Check one: ☒ Present ☐ Developed

1. Runoff curve number

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN 1/ Table 2-2	CN 1/ Figure 2-3	CN 1/ Figure 2-4	Area ☒ acres ☐ mi² ☐ %	Product of CN x area
Fill Material	Newly graded w/ no vegetation	91			0.3	27.3
Fill Material	Vegetated Fill Material	87			0.55	47.9
1/ Use only one CN source per line				Totals ➡	0.85	75.2

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{75.2}{0.85} = 88$; Use CN ➡ 88

2. Runoff

		Storm #1	Storm #2	Storm #3
Frequency	yr	1	10	100
Rainfall, P (24-hour)	in	2.3	3.9	5.4
Runoff, Q	in	1.22	2.65	4.06

(Use P and CN with table 2-1, figure 2-1, or equations 2-3 and 2-4)

Worksheet 3: Time of Concentration (T_c) or travel time (T_t)

Project	By	Date
Monkey Run Townhouses	Wayne Matterson	3/11
Location	**Checked**	**Date**
Reese Rd., Town of Dryden		

Check one: ☒ Present ☐ Developed

Check one: ☒ T_c ☐ T_t through subarea

Notes: Space for as many as two segments per flow type can be used for each worksheet.
Include a map, schematic, or description of flow segments.

Sheet flow (Applicable to Tc only)

	Segment ID		
1. Surface description (table 3-1)	Short grass		
2. Manning's roughness coefficient, n (table 3-1)	0.15		
3. Flow length, L (total L † 300 ft) ft	60		
4. Two-year 24-hour rainfall, P_2 in	2.7		
5. Land slope, s ft/ft	0.017		
6. $T_t = \frac{0.007\ (nL)^{0.8}}{P_2^{0.5}\ s^{0.4}}$ Compute T_t hr	0.13	+	= 0.13

Shallow concentrated flow

	Segment ID		
7. Surface description (paved or unpaved)	Unpaved	Unpaved	
8. Flow length, L ft	25	205	
9. Watercourse slope, s ft/ft	0.4	0.039	
10. Average velocity, V (figure 3-1) ft/s	10	3.1	
11. $T_t = \frac{L}{3600\ V}$ Compute T_t hr	0.001	+ 0.018	= 0.019

Channel flow

	Segment ID		
12. Cross sectional flow area, a ft^2			
13. Wetted perimeter, p_w ft			
14. Hydraulic radius, $r = \frac{a}{p_w}$ Compute r ft			
15 Channel slope, s ft/ft			
16. Manning's roughness coefficient, n			
17. $V = \frac{1.49\ r^{2/3}\ s^{1/2}}{n}$ Compute V ft/s			
18. Flow length, L ft			
19. $T_t = \frac{L}{3600\ V}$ Compute T_t hr		+	=
20. Watershed or subarea T_c or T_t (add T_t in steps 6, 11, and 19) Hr			0.15

Worksheet 4: Graphical Peak Discharge method

Project	By	Date
Monkey Run Townhouses	Wayne Patterson	3/11
Location	**Checked**	**Date**
Freese Rd, Town of Dryden		

Check one: ☒ Present ☐ Developed

1. Data

Drainage area ..... A_m = 0.0013 mi^2 (acres/640)

Runoff curve number ..... CN = 88 (From worksheet 2)

Time of concentration ..... T_c = 0.15 hr (From worksheet 3)

Rainfall distribution ..... = II (I, IA, II III)

Pond and swamp areas sprea throughout watershed ..... = 5 percent of A_m (_____ acres or mi^2 covered)

	Storm #1	Storm #2	Storm #3
2. Frequency ..... yr	1	10	100
3. Rainfall, P (24-hour) ..... in	1.22	2.65	4.06
4. Initial abstraction, I_a ..... in (Use CN with table 4-1)	0.273	0.273	0.273
5. Compute I_a/P	0.22	0.10	0.07
6. Unit peak discharge, q_u ..... csm/in (Use T_c and I_a/P with exhibit 4– _____)	850	900	950
7. Runoff, Q ..... in (From worksheet 2) Figure 2-6	1.22	2.65	4.06
8. Pond and swamp adjustment factor, F_p ..... (Use percent pond and swamp area with table 4-2. Factor is 1.0 for zero percent pond ans swamp area.)	0.72	0.72	0.72
9. Peak discharge, q_p ..... ft^3/s	0.97	2.23	3.61

(Where $q_p = q_u A_m Q F_p$)

Worksheet 2: Runoff curve number and runoff

Project	By	Date
Monkey Run Townhouses	Wayne Patterson	3/14
Location	**Checked**	**Date**
Freese Rd., Town of Dryden		

Check one: ☐ Present ☒ Developed

1. Runoff curve number

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN [1] Table 2-2	CN [1] Figure 2-3	CN [1] Figure 2-4	Area ☒ acres ☐ mi² ☐ %	Product of CN x area
Fill Material	Townhouse Development	92			1.40	128.8

[1] Use only one CN source per line

Totals ➡ 1.40 | 128.8

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{128.8}{1.40} = 92$; **Use CN** ➡ 92

2. Runoff

		Storm #1	Storm #2	Storm #3
Frequency	yr	1	10	100
Rainfall, P (24-hour)	in	2.3	3.9	5.4
Runoff, Q	in	1.52	3.03	4.88

(Use P and CN with table 2-1, figure 2-1, or equations 2-3 and 2-4)

Worksheet 3: Time of Concentration (T_c) or travel time (T_t)

Project	By	Date
Monkey Run Townhouses	Wayne Matteson	3/11
Location	**Checked**	**Date**
Freese Rd., Town of Dryden		

Check one: ☐ Present ☒ Developed

Check one: ☒ T_c ☐ T_t through subarea

Notes: Space for as many as two segments per flow type can be used for each worksheet.
Include a map, schematic, or description of flow segments.

Sheet flow (Applicable to T_c only)

	Segment ID		
1. Surface description (table 3-1)	Dense Grasses		
2. Manning's roughness coefficient, n (table 3-1)	0.24		
3. Flow length, L (total L † 300 ft) ft	70		
4. Two-year 24-hour rainfall, P_2 in	2.7		
5. Land slope, s ft/ft	0.004		
6. $T_t = \frac{0.007\ (nL)^{0.8}}{P_2^{0.5}\ s^{0.4}}$ Compute T_t hr	0.37	+	= 0.37

Shallow concentrated flow

	Segment ID		
7. Surface description (paved or unpaved)	Unpaved		
8. Flow length, L ft	130		
9. Watercourse slope, s ft/ft	0.006		
10. Average velocity, V (figure 3-1) ft/s	1.2		
11. $T_t = \frac{L}{3600\ V}$ Compute T_t hr	0.03	+	= 0.03

Channel flow

	Segment ID		
12. Cross sectional flow area, a ft^2	6.5		
13. Wetted perimeter, p_w ft	8.6		
14. Hydraulic radius, $r = \frac{a}{p_w}$ Compute r ft	0.76		
15 Channel slope, s ft/ft	0.016		
16. Manning's roughness coefficient, n	0.029		
17. $V = \frac{1.49\ r^{2/3}\ s^{1/2}}{n}$ Compute V ft/s	5.41		
18. Flow length, L ft	250		
19. $T_t = \frac{L}{3600\ V}$ Compute T_t hr	0.01	+	= 0.01
20. Watershed or subarea T_c or T_t (add T_t in steps 6, 11, and 19) Hr			0.41

Worksheet 4: Graphical Peak Discharge method

Project	By	Date
Monkey Run Townhouses	Wayne Matteson	3/11
Location	**Checked**	**Date**
Freeve Rd., Town of Dryden		

Check one: ☐ Present ☒ Developed

1. Data

Drainage area ..... A_m = 0.0022 mi² (acres/640)

Runoff curve number ..... CN = 92 (From worksheet 2)

Time of concentration ..... T_c = 0.41 hr (From worksheet 3)

Rainfall distribution ..... = II (I, IA, II III)

Pond and swamp areas sprea throughout watershed ..... = 0 percent of A_m (0 acres or mi² covered)

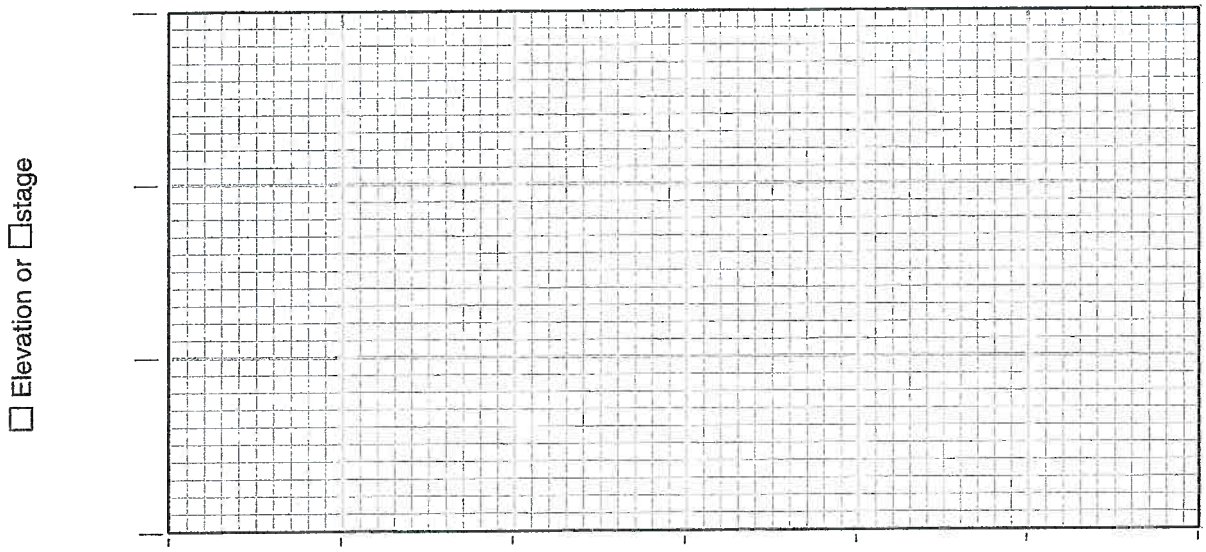
	Storm #1	Storm #2	Storm #3
2. Frequency ..... yr	1	10	100
3. Rainfall, P (24-hour) ..... in	2.3	3.9	5.4
4. Initial abstraction, I_a ..... in (Use CN with table 4-1)	0.174	0.174	0.174
5. Compute I_a/P	0.076	0.045	0.032
6. Unit peak discharge, q_u ..... csm/in (Use T_c and I_a/P with exhibit 4– ____)	650	700	750
7. Runoff, Q ..... in (From worksheet 2) Figure 2-6	1.52	3.03	4.88
8. Pond and swamp adjustment factor, F_p ..... (Use percent pond and swamp area with table 4-2. Factor is 1.0 for zero percent pond ans swamp area.)	1.0	1.0	1.0
9. Peak discharge, q_p ..... ft^3/s	2.17	4.67	8.05

(Where $q_p = q_u A_m Q F_p$)

Worksheet 6a: Detention basin storage, peak outflow discharge (q_o) known

Project	By	Date
Monkey Run Townhouses	Wayne Matteson	3/11
Location	**Checked**	**Date**
Freese Rd., Town of Dryden		

Check one: ☐ Present ☒ Developed



1. Data:
   Drainage area ..... A_m = 0.0022 mi²
   Rainfall distribution type (I, IA, II, III) = II

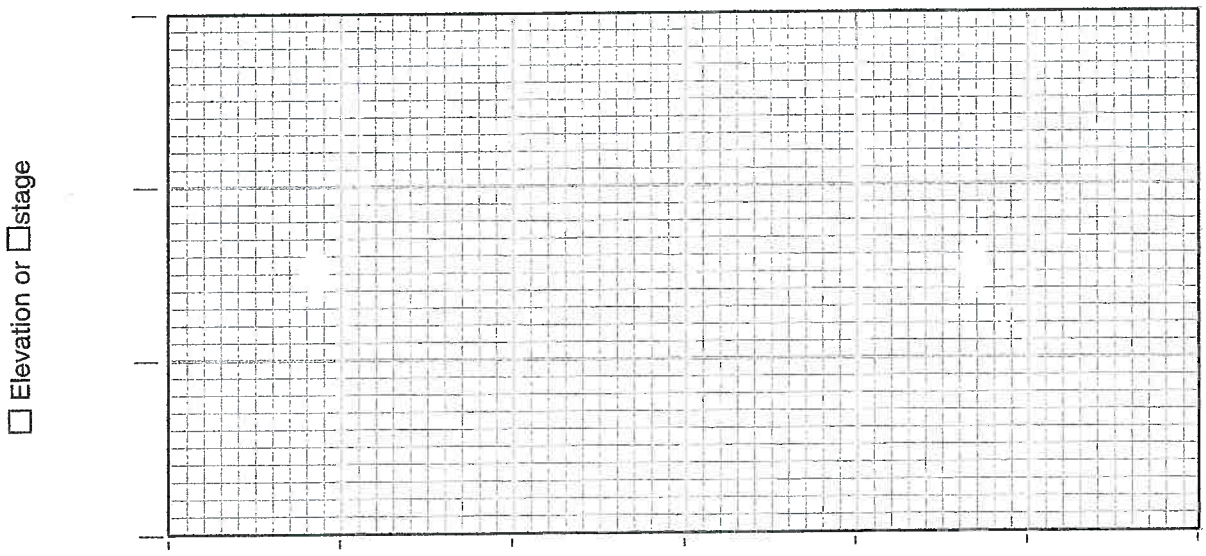
	1st Stage	2nd Stage
2. Frequency ..... yr	1	10
3. Peak inflow discharge q_i ..... ft³/s (from worksheet 4 or 5b)	1.52	3.03
4. Peak outflow discharge q_o ..... ft³/s [1/]	1.22	2.65
5. Compute $\frac{q_o}{q_i}$	0.80	0.87
6. $\frac{V_s}{V_r}$ ..... (Use $\frac{q_o}{q_i}$ with figure 6-1)	0.18	0.14
7. Runoff, Q ..... in (From worksheet 2)	1.52	3.03
8. Runoff volume V_r ..... ac ft ($V_r = QA_m$ 53.33)	0.18	0.36
9. Storage volume, V_s ..... ac-ft ($V_s = V_r (\frac{V_s}{V_r})$)	0.03	0.05
10. Maximum storage E_{max} (from plot)		

[1/] 2nd stage q_o includes 1st stage q_o.

Worksheet 6a: Detention basin storage, peak outflow discharge (q_o) known

Project	By	Date
Monkey Run Townhouses	Wayne Patterson	3/11
Location	**Checked**	**Date**
Freese Rd., Town of Dryden		

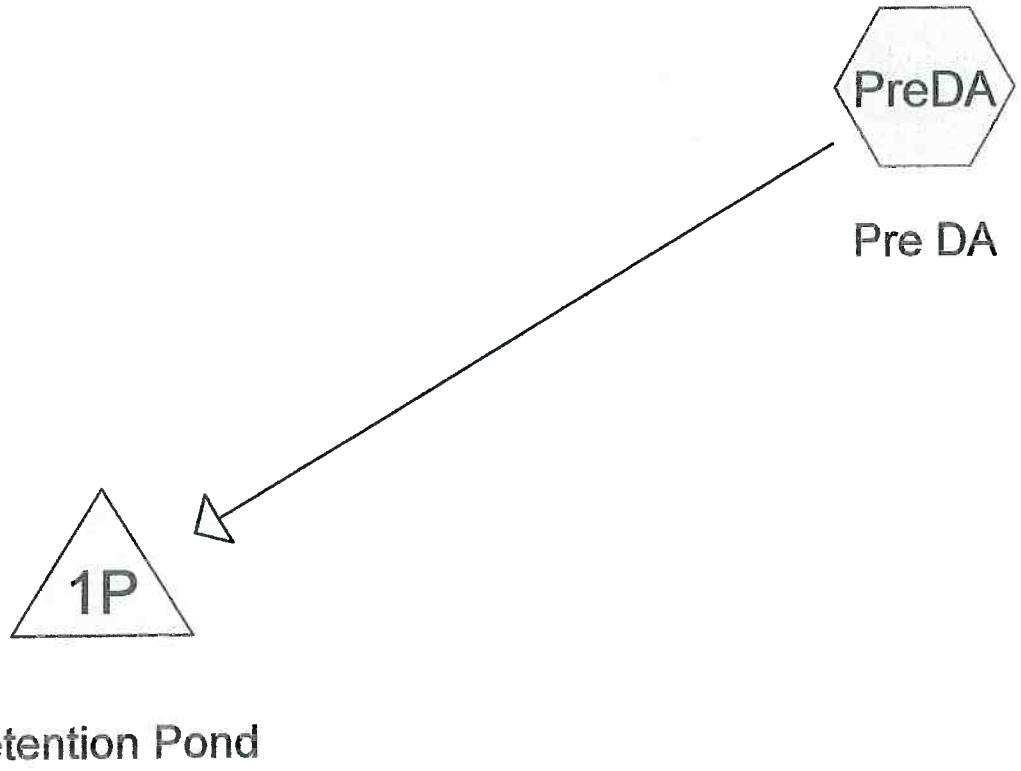
Check one: ☐ Present ☒ Developed



1. Data:
   Drainage area ..... A_m = 0.0022 mi²
   Rainfall distribution type (I, IA, II, III) = II

	1st Stage	2nd Stage
2. Frequency ..... yr	100	
3. Peak inflow discharge q_i ..... ft³/s (from worksheet 4 or 5b)	8.05	
4. Peak outflow discharge q_u ..... ft³/s 1/	4.06	
5. Compute $\frac{q_o}{q_i}$	0.5	
6. $\frac{V_s}{V_r}$ ..... (Use $\frac{q_o}{q_i}$ with figure 6-1)	0.28	
7. Runoff, Q ..... in (From worksheet 2)	4.88	
8. Runoff volume V_r ..... ac ft ($V_r = QA_m$ 53.33)	0.57	
9. Storage volume, V_s ..... ac-ft ($V_s = V_r (\frac{V_s}{V_r})$)	0.16	
10. Maximum storage E_{max} (from plot)		

1/ 2nd stage q_o includes 1st stage q_o.



Subcat Reach Pond Link

Drainage Diagram for Monkey Run Pre

Prepared by HydroCAD SAMPLER 1-800-927-7246 www.hydrocad.net, Printed 3/20/2011

HydroCAD® 9.10 Sampler s/n S31982 © 2010 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.850	88	Predevelopment Drainage Area (PreDA)
0.850	88	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.850	Other	PreDA
0.850		**TOTAL AREA**

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PreDA: Pre DA Runoff Area=0.850 ac 0.00% Impervious Runoff Depth>1.12"
Tc=9.0 min CN=88 Runoff=1.62 cfs 0.079 af

Pond 1P: Detention Pond Inflow=1.62 cfs 0.079 af
Primary=1.62 cfs 0.079 af

Total Runoff Area = 0.850 ac Runoff Volume = 0.079 af Average Runoff Depth = 1.12"
100.00% Pervious = 0.850 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment PreDA: Pre DA

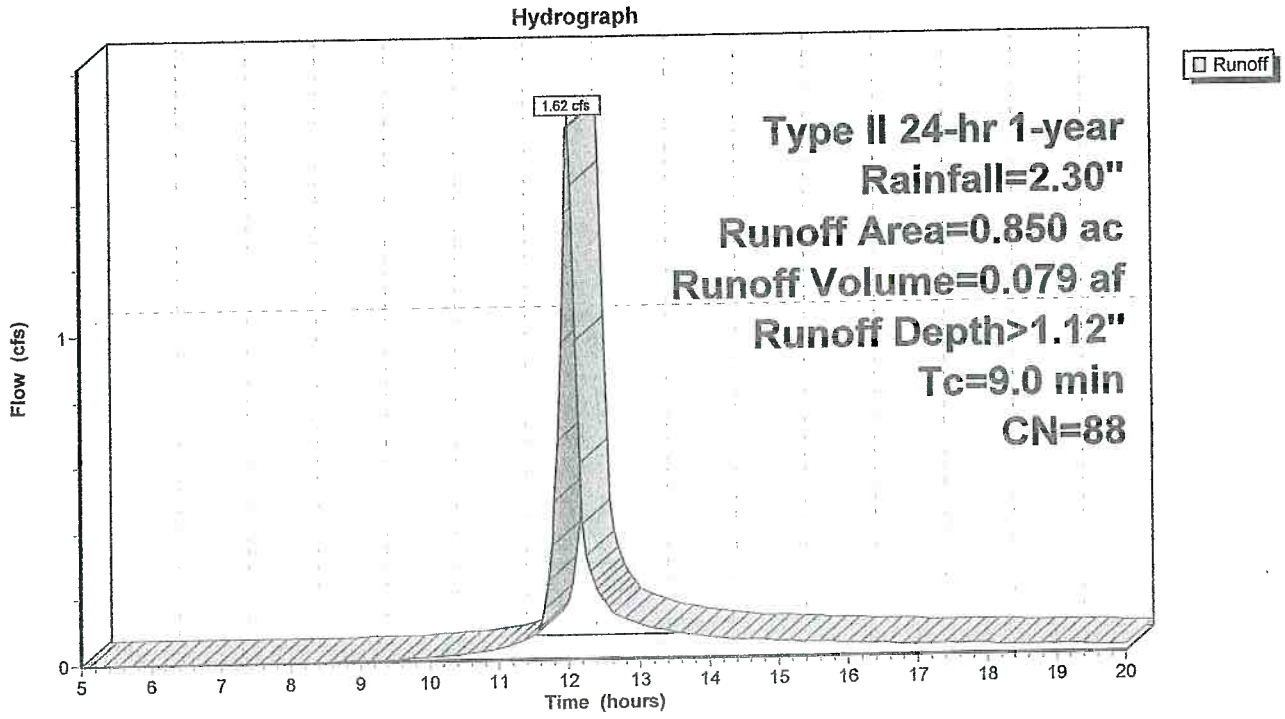
Runoff = 1.62 cfs @ 12.00 hrs, Volume= 0.079 af, Depth> 1.12"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-year Rainfall=2.30"

	Area (ac)	CN	Description
*	0.850	88	Predevelopment Drainage Area
	0.850		100.00% Pervious Area

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

Subcatchment PreDA: Pre DA



Hydrograph for Subcatchment PreDA: Pre DA

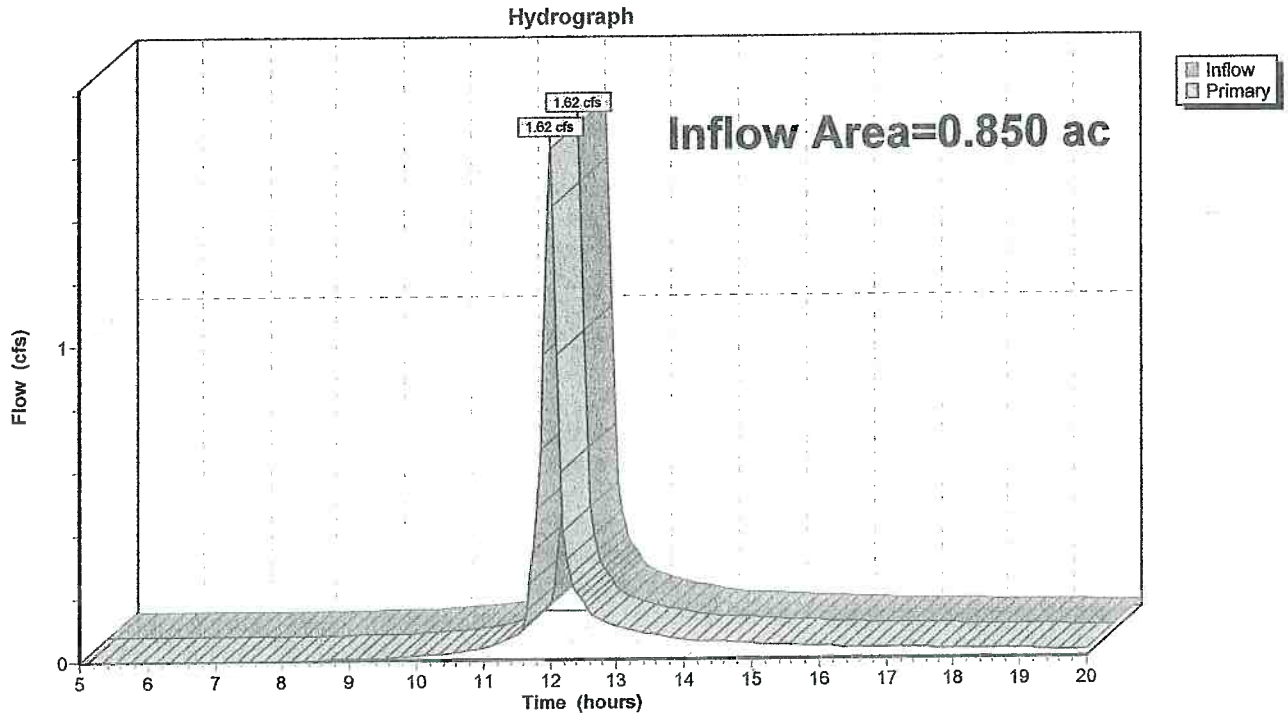
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.14	0.00	0.00
5.25	0.15	0.00	0.00
5.50	0.16	0.00	0.00
5.75	0.17	0.00	0.00
6.00	0.18	0.00	0.00
6.25	0.19	0.00	0.00
6.50	0.21	0.00	0.00
6.75	0.22	0.00	0.00
7.00	0.23	0.00	0.00
7.25	0.24	0.00	0.00
7.50	0.25	0.00	0.00
7.75	0.26	0.00	0.00
8.00	0.28	0.00	0.00
8.25	0.29	0.00	0.00
8.50	0.30	0.00	0.00
8.75	0.32	0.00	0.00
9.00	0.34	0.00	0.00
9.25	0.36	0.00	0.01
9.50	0.37	0.01	0.01
9.75	0.39	0.01	0.01
10.00	0.42	0.01	0.01
10.25	0.44	0.02	0.02
10.50	0.47	0.02	0.02
10.75	0.50	0.03	0.03
11.00	0.54	0.04	0.04
11.25	0.59	0.06	0.05
11.50	0.65	0.08	0.08
11.75	0.89	0.19	0.34
12.00	1.52	0.60	**1.62**
12.25	1.62	0.67	0.32
12.50	1.69	0.72	0.18
12.75	1.74	0.76	0.12
13.00	1.78	0.79	0.10
13.25	1.81	0.81	0.09
13.50	1.84	0.84	0.08
13.75	1.86	0.86	0.07
14.00	1.89	0.87	0.06
14.25	1.91	0.89	0.06
14.50	1.93	0.91	0.05
14.75	1.95	0.92	0.05
15.00	1.96	0.94	0.05
15.25	1.98	0.95	0.05
15.50	2.00	0.96	0.04
15.75	2.01	0.97	0.04
16.00	2.02	0.98	0.04
16.25	2.04	1.00	0.04
16.50	2.05	1.01	0.04
16.75	2.06	1.02	0.03
17.00	2.07	1.03	0.03
17.25	2.09	1.03	0.03
17.50	2.10	1.04	0.03
17.75	2.11	1.05	0.03
18.00	2.12	1.06	0.03
18.25	2.13	1.07	0.03
18.50	2.14	1.08	0.03
18.75	2.15	1.09	0.03
19.00	2.16	1.09	0.03
19.25	2.17	1.10	0.02
19.50	2.17	1.11	0.02
19.75	2.18	1.11	0.02
20.00	**2.19**	**1.12**	0.02

Summary for Pond 1P: Detention Pond

Inflow Area = 0.850 ac, 0.00% Impervious, Inflow Depth > 1.12" for 1-year event
Inflow = 1.62 cfs @ 12.00 hrs, Volume= 0.079 af
Primary = 1.62 cfs @ 12.00 hrs, Volume= 0.079 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond 1P: Detention Pond



Hydrograph for Pond 1P: Detention Pond

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
5.00	0.00		0.00
5.25	0.00		0.00
5.50	0.00		0.00
5.75	0.00		0.00
6.00	0.00		0.00
6.25	0.00		0.00
6.50	0.00		0.00
6.75	0.00		0.00
7.00	0.00		0.00
7.25	0.00		0.00
7.50	0.00		0.00
7.75	0.00		0.00
8.00	0.00		0.00
8.25	0.00		0.00
8.50	0.00		0.00
8.75	0.00		0.00
9.00	0.00		0.00
9.25	0.01		0.01
9.50	0.01		0.01
9.75	0.01		0.01
10.00	0.01		0.01
10.25	0.02		0.02
10.50	0.02		0.02
10.75	0.03		0.03
11.00	0.04		0.04
11.25	0.05		0.05
11.50	0.08		0.08
11.75	0.34		0.34
12.00	**1.62**		**1.62**
12.25	0.32		0.32
12.50	0.18		0.18
12.75	0.12		0.12
13.00	0.10		0.10
13.25	0.09		0.09
13.50	0.08		0.08
13.75	0.07		0.07
14.00	0.06		0.06
14.25	0.06		0.06
14.50	0.05		0.05
14.75	0.05		0.05
15.00	0.05		0.05
15.25	0.05		0.05
15.50	0.04		0.04
15.75	0.04		0.04
16.00	0.04		0.04
16.25	0.04		0.04
16.50	0.04		0.04
16.75	0.03		0.03
17.00	0.03		0.03
17.25	0.03		0.03
17.50	0.03		0.03
17.75	0.03		0.03
18.00	0.03		0.03
18.25	0.03		0.03
18.50	0.03		0.03
18.75	0.03		0.03
19.00	0.03		0.03
19.25	0.02		0.02
19.50	0.02		0.02
19.75	0.02		0.02
20.00	0.02		0.02

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PreDA: Pre DA Runoff Area=0.850 ac 0.00% Impervious Runoff Depth>2.46"
Tc=9.0 min CN=88 Runoff=3.44 cfs 0.174 af

Pond 1P: Detention Pond Inflow=3.44 cfs 0.174 af
Primary=3.44 cfs 0.174 af

Total Runoff Area = 0.850 ac Runoff Volume = 0.174 af Average Runoff Depth = 2.46"
100.00% Pervious = 0.850 ac 0.00% Impervious = 0.000 ac

Monkey Run Pre
Prepared by HydroCAD SAMPLER 1-800-927-7246 www.hydrocad.net

Summary for Subcatchment PreDA: Pre DA

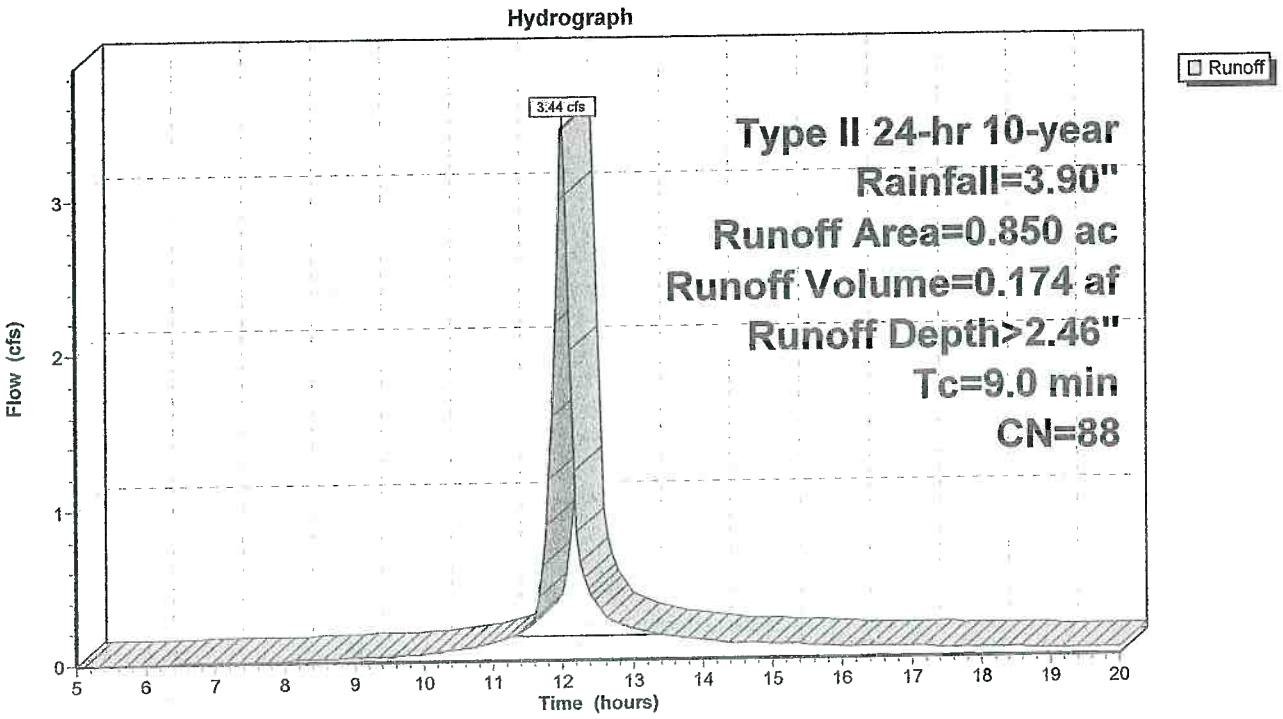
Runoff = 3.44 cfs @ 12.00 hrs, Volume= 0.174 af, Depth> 2.46"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-year Rainfall=3.90"

	Area (ac)	CN	Description
*	0.850	88	Predevelopment Drainage Area
	0.850		100.00% Pervious Area

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

Subcatchment PreDA: Pre DA



Hydrograph for Subcatchment PreDA: Pre DA

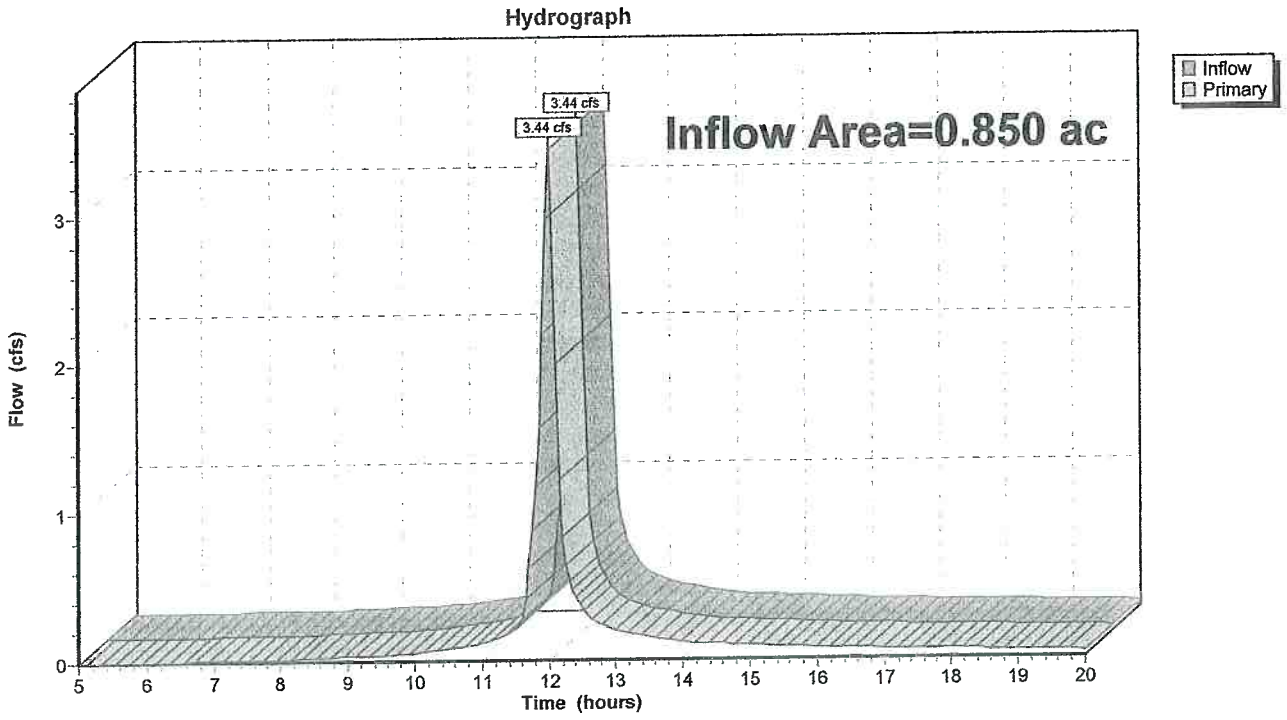
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.25	0.00	0.00
5.25	0.26	0.00	0.00
5.50	0.28	0.00	0.00
5.75	0.29	0.00	0.00
6.00	0.31	0.00	0.00
6.25	0.33	0.00	0.00
6.50	0.35	0.00	0.01
6.75	0.37	0.01	0.01
7.00	0.39	0.01	0.01
7.25	0.41	0.01	0.01
7.50	0.43	0.02	0.01
7.75	0.45	0.02	0.01
8.00	0.47	0.02	0.02
8.25	0.49	0.03	0.02
8.50	0.52	0.04	0.02
8.75	0.54	0.04	0.03
9.00	0.57	0.05	0.03
9.25	0.60	0.06	0.04
9.50	0.64	0.08	0.04
9.75	0.67	0.09	0.04
10.00	0.71	0.10	0.05
10.25	0.75	0.12	0.06
10.50	0.80	0.14	0.08
10.75	0.85	0.17	0.09
11.00	0.92	0.21	0.12
11.25	1.00	0.25	0.15
11.50	1.10	0.31	0.21
11.75	1.51	0.59	0.87
12.00	2.59	1.46	**3.44**
12.25	2.75	1.60	0.64
12.50	2.87	1.70	0.35
12.75	2.94	1.77	0.24
13.00	3.01	1.83	0.20
13.25	3.07	1.88	0.17
13.50	3.12	1.92	0.15
13.75	3.16	1.96	0.13
14.00	3.20	2.00	0.12
14.25	3.23	2.03	0.11
14.50	3.27	2.06	0.10
14.75	3.30	2.09	0.10
15.00	3.33	2.11	0.09
15.25	3.36	2.14	0.09
15.50	3.38	2.16	0.08
15.75	3.41	2.19	0.08
16.00	3.43	2.21	0.07
16.25	3.45	2.23	0.07
16.50	3.48	2.25	0.07
16.75	3.50	2.27	0.07
17.00	3.52	2.28	0.06
17.25	3.54	2.30	0.06
17.50	3.56	2.32	0.06
17.75	3.57	2.34	0.06
18.00	3.59	2.35	0.06
18.25	3.61	2.37	0.05
18.50	3.63	2.38	0.05
18.75	3.64	2.40	0.05
19.00	3.66	2.41	0.05
19.25	3.67	2.43	0.05
19.50	3.69	2.44	0.04
19.75	3.70	2.45	0.04
20.00	**3.71**	**2.46**	0.04

Summary for Pond 1P: Detention Pond

Inflow Area = 0.850 ac, 0.00% Impervious, Inflow Depth > 2.46" for 10-year event
Inflow = 3.44 cfs @ 12.00 hrs, Volume= 0.174 af
Primary = 3.44 cfs @ 12.00 hrs, Volume= 0.174 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond 1P: Detention Pond



Hydrograph for Pond 1P: Detention Pond

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
5.00	0.00		0.00
5.25	0.00		0.00
5.50	0.00		0.00
5.75	0.00		0.00
6.00	0.00		0.00
6.25	0.00		0.00
6.50	0.01		0.01
6.75	0.01		0.01
7.00	0.01		0.01
7.25	0.01		0.01
7.50	0.01		0.01
7.75	0.01		0.01
8.00	0.02		0.02
8.25	0.02		0.02
8.50	0.02		0.02
8.75	0.03		0.03
9.00	0.03		0.03
9.25	0.04		0.04
9.50	0.04		0.04
9.75	0.04		0.04
10.00	0.05		0.05
10.25	0.06		0.06
10.50	0.08		0.08
10.75	0.09		0.09
11.00	0.12		0.12
11.25	0.15		0.15
11.50	0.21		0.21
11.75	0.87		0.87
12.00	**3.44**		**3.44**
12.25	0.64		0.64
12.50	0.35		0.35
12.75	0.24		0.24
13.00	0.20		0.20
13.25	0.17		0.17
13.50	0.15		0.15
13.75	0.13		0.13
14.00	0.12		0.12
14.25	0.11		0.11
14.50	0.10		0.10
14.75	0.10		0.10
15.00	0.09		0.09
15.25	0.09		0.09
15.50	0.08		0.08
15.75	0.08		0.08
16.00	0.07		0.07
16.25	0.07		0.07
16.50	0.07		0.07
16.75	0.07		0.07
17.00	0.06		0.06
17.25	0.06		0.06
17.50	0.06		0.06
17.75	0.06		0.06
18.00	0.06		0.06
18.25	0.05		0.05
18.50	0.05		0.05
18.75	0.05		0.05
19.00	0.05		0.05
19.25	0.05		0.05
19.50	0.04		0.04
19.75	0.04		0.04
20.00	0.04		0.04

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PreDA: Pre DA Runoff Area=0.850 ac 0.00% Impervious Runoff Depth>3.79"
Tc=9.0 min CN=88 Runoff=5.17 cfs 0.269 af

Pond 1P: Detention Pond Inflow=5.17 cfs 0.269 af
Primary=5.17 cfs 0.269 af

Total Runoff Area = 0.850 ac Runoff Volume = 0.269 af Average Runoff Depth = 3.79"
100.00% Pervious = 0.850 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment PreDA: Pre DA

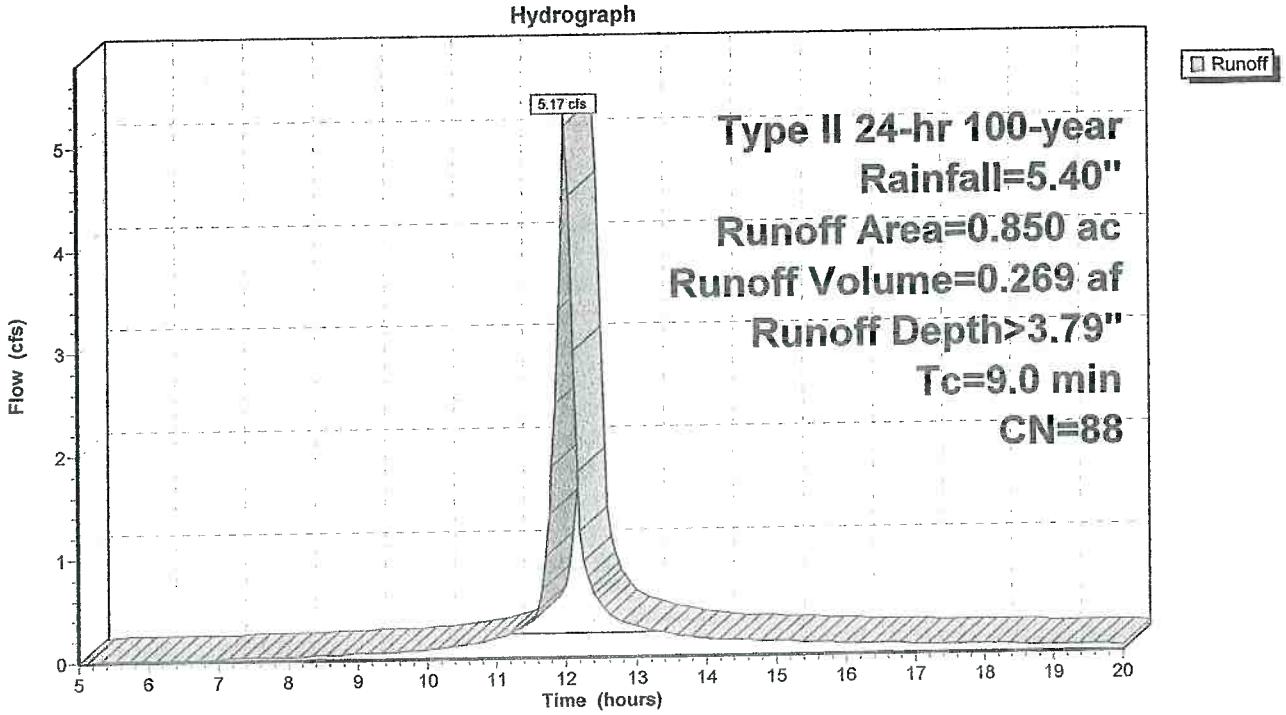
Runoff = 5.17 cfs @ 12.00 hrs, Volume= 0.269 af, Depth> 3.79"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year Rainfall=5.40"

	Area (ac)	CN	Description
*	0.850	88	Predevelopment Drainage Area
	0.850		100.00% Pervious Area

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

Subcatchment PreDA: Pre DA



Hydrograph for Subcatchment PreDA: Pre DA

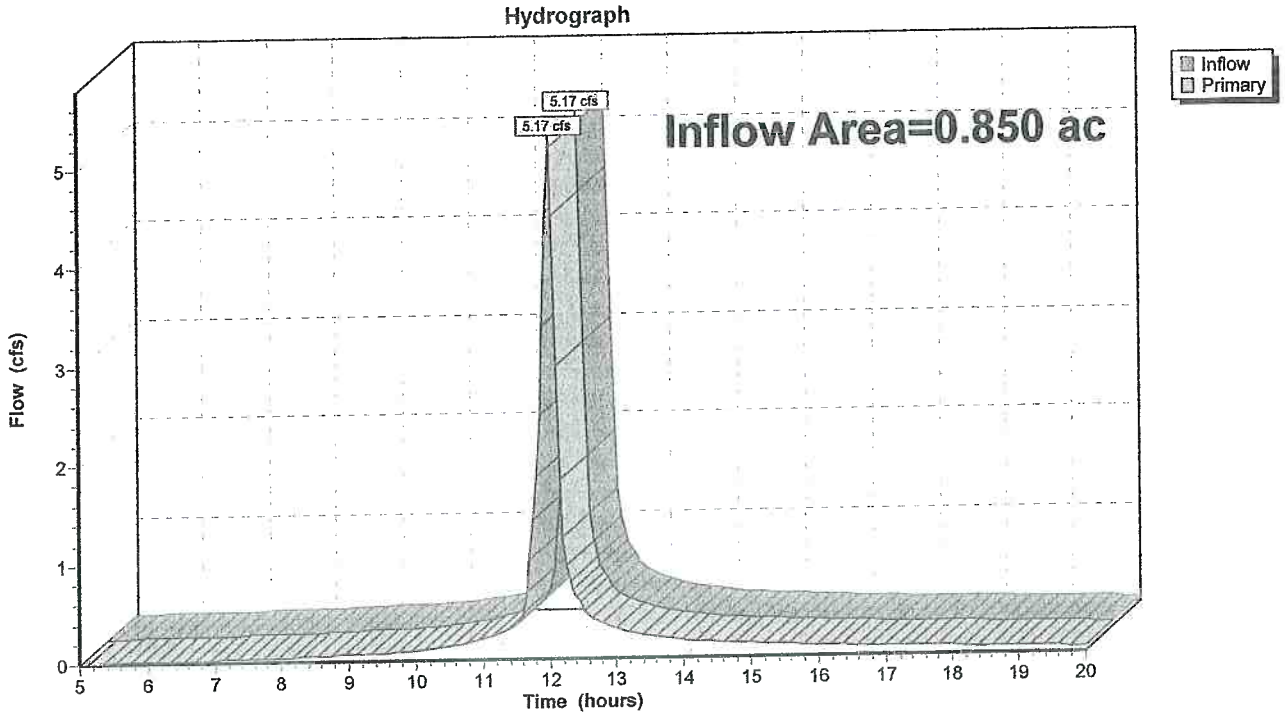
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.34	0.00	0.01
5.25	0.36	0.01	0.01
5.50	0.38	0.01	0.01
5.75	0.41	0.01	0.01
6.00	0.43	0.02	0.02
6.25	0.46	0.02	0.02
6.50	0.48	0.03	0.02
6.75	0.51	0.03	0.02
7.00	0.53	0.04	0.03
7.25	0.56	0.05	0.03
7.50	0.59	0.06	0.03
7.75	0.62	0.07	0.03
8.00	0.65	0.08	0.04
8.25	0.68	0.09	0.04
8.50	0.71	0.11	0.05
8.75	0.75	0.12	0.06
9.00	0.79	0.14	0.07
9.25	0.84	0.17	0.07
9.50	0.88	0.19	0.08
9.75	0.93	0.21	0.08
10.00	0.98	0.24	0.10
10.25	1.04	0.27	0.11
10.50	1.10	0.31	0.14
10.75	1.18	0.36	0.16
11.00	1.27	0.42	0.20
11.25	1.38	0.50	0.26
11.50	1.53	0.60	0.35
11.75	2.09	1.04	1.39
12.00	3.58	2.34	**5.17**
12.25	3.81	2.56	0.93
12.50	3.97	2.70	0.51
12.75	4.08	2.80	0.35
13.00	4.17	2.89	0.29
13.25	4.25	2.96	0.25
13.50	4.31	3.02	0.22
13.75	4.37	3.08	0.19
14.00	4.43	3.13	0.17
14.25	4.48	3.17	0.16
14.50	4.52	3.22	0.15
14.75	4.57	3.26	0.14
15.00	4.61	3.30	0.14
15.25	4.65	3.34	0.13
15.50	4.69	3.37	0.12
15.75	4.72	3.40	0.11
16.00	4.75	3.43	0.10
16.25	4.78	3.46	0.10
16.50	4.81	3.49	0.10
16.75	4.84	3.52	0.09
17.00	4.87	3.55	0.09
17.25	4.90	3.57	0.09
17.50	4.92	3.60	0.09
17.75	4.95	3.62	0.08
18.00	4.97	3.64	0.08
18.25	5.00	3.67	0.08
18.50	5.02	3.69	0.08
18.75	5.04	3.71	0.07
19.00	5.06	3.73	0.07
19.25	5.08	3.75	0.07
19.50	5.10	3.77	0.06
19.75	5.12	3.79	0.06
20.00	**5.14**	**3.80**	0.06

Summary for Pond 1P: Detention Pond

Inflow Area = 0.850 ac, 0.00% Impervious, Inflow Depth > 3.79" for 100-year event
Inflow = 5.17 cfs @ 12.00 hrs, Volume= 0.269 af
Primary = 5.17 cfs @ 12.00 hrs, Volume= 0.269 af, Atten= 0%, Lag= 0.0 min

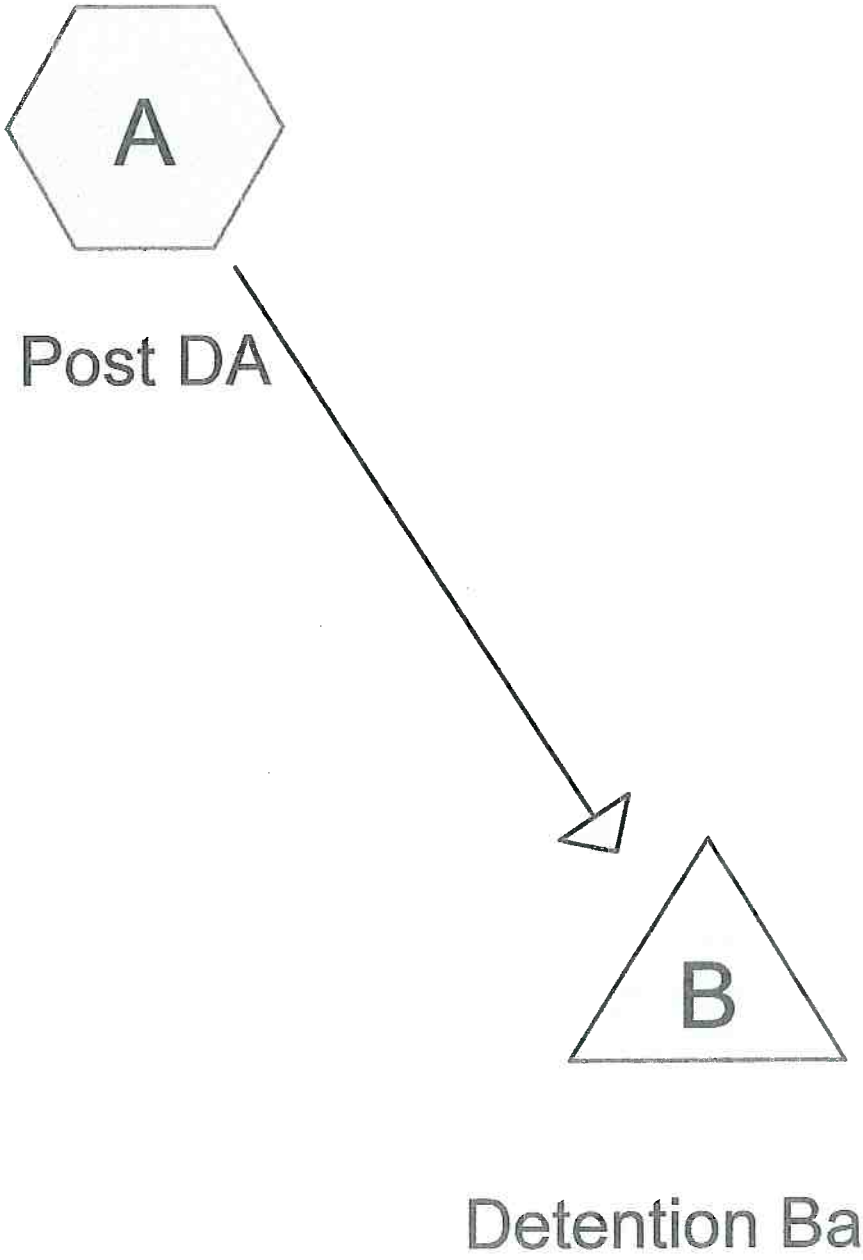
Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond 1P: Detention Pond



Hydrograph for Pond 1P: Detention Pond

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
5.00	0.01		0.01
5.25	0.01		0.01
5.50	0.01		0.01
5.75	0.01		0.01
6.00	0.02		0.02
6.25	0.02		0.02
6.50	0.02		0.02
6.75	0.02		0.02
7.00	0.03		0.03
7.25	0.03		0.03
7.50	0.03		0.03
7.75	0.03		0.03
8.00	0.04		0.04
8.25	0.04		0.04
8.50	0.05		0.05
8.75	0.06		0.06
9.00	0.07		0.07
9.25	0.07		0.07
9.50	0.08		0.08
9.75	0.08		0.08
10.00	0.10		0.10
10.25	0.11		0.11
10.50	0.14		0.14
10.75	0.16		0.16
11.00	0.20		0.20
11.25	0.26		0.26
11.50	0.35		0.35
11.75	1.39		1.39
12.00	**5.17**		**5.17**
12.25	0.93		0.93
12.50	0.51		0.51
12.75	0.35		0.35
13.00	0.29		0.29
13.25	0.25		0.25
13.50	0.22		0.22
13.75	0.19		0.19
14.00	0.17		0.17
14.25	0.16		0.16
14.50	0.15		0.15
14.75	0.14		0.14
15.00	0.14		0.14
15.25	0.13		0.13
15.50	0.12		0.12
15.75	0.11		0.11
16.00	0.10		0.10
16.25	0.10		0.10
16.50	0.10		0.10
16.75	0.09		0.09
17.00	0.09		0.09
17.25	0.09		0.09
17.50	0.09		0.09
17.75	0.08		0.08
18.00	0.08		0.08
18.25	0.08		0.08
18.50	0.08		0.08
18.75	0.07		0.07
19.00	0.07		0.07
19.25	0.07		0.07
19.50	0.06		0.06
19.75	0.06		0.06
20.00	0.06		0.06



Subcat Reach Pond Link

Drainage Diagram for Monkey Run Post

Prepared by HydroCAD SAMPLER 1-800-927-7246 www.hydrocad.net, Printed 3/20/2011

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.400	92	(A)
1.400	92	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
1.400	Other	A
1.400		**TOTAL AREA**

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Fill (inches)
1	B	91.00	73.00	60.0	0.3000	0.015	24.0	0.0	0.0

Time span=2.00-23.00 hrs, dt=0.05 hrs, 421 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment A: Post DA Runoff Area=1.400 ac 0.00% Impervious Runoff Depth>1.43"
Tc=24.6 min CN=92 Runoff=2.00 cfs 0.167 af

Pond B: Detention Basin Peak Elev=92.78' Storage=0.080 af Inflow=2.00 cfs 0.167 af
Outflow=0.30 cfs 0.160 af

Total Runoff Area = 1.400 ac Runoff Volume = 0.167 af Average Runoff Depth = 1.43"
100.00% Pervious = 1.400 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment A: Post DA

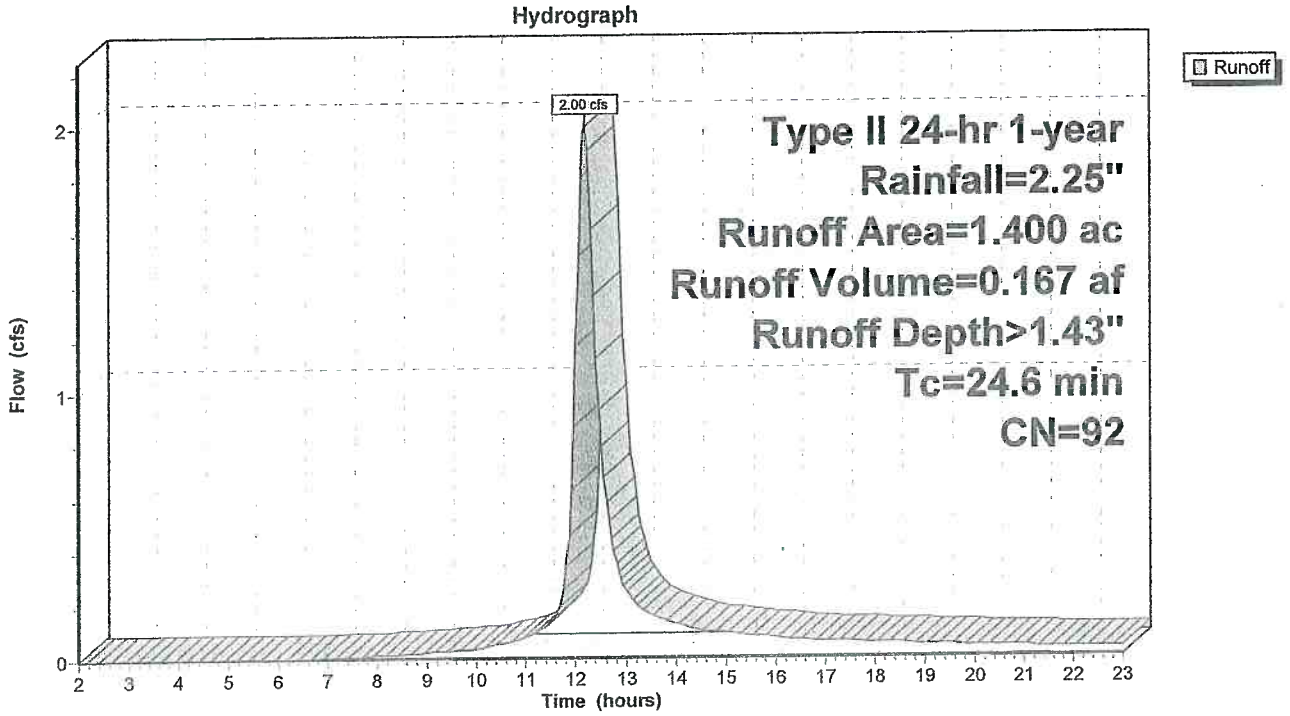
Runoff = 2.00 cfs @ 12.17 hrs, Volume= 0.167 af, Depth> 1.43"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 2.00-23.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-year Rainfall=2.25"

	Area (ac)	CN	Description
*	1.400	92	
	1.400		100.00% Pervious Area

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

Subcatchment A: Post DA



Hydrograph for Subcatchment A: Post DA

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
2.00	0.05	0.00	0.00	13.00	1.74	1.00	0.25
2.25	0.06	0.00	0.00	13.25	1.77	1.03	0.19
2.50	0.06	0.00	0.00	13.50	1.80	1.06	0.16
2.75	0.07	0.00	0.00	13.75	1.82	1.08	0.14
3.00	0.08	0.00	0.00	14.00	1.84	1.10	0.13
3.25	0.09	0.00	0.00	14.25	1.87	1.12	0.11
3.50	0.09	0.00	0.00	14.50	1.88	1.13	0.10
3.75	0.10	0.00	0.00	14.75	1.90	1.15	0.10
4.00	0.11	0.00	0.00	15.00	1.92	1.17	0.09
4.25	0.12	0.00	0.00	15.25	1.94	1.18	0.09
4.50	0.12	0.00	0.00	15.50	1.95	1.19	0.08
4.75	0.13	0.00	0.00	15.75	1.97	1.21	0.08
5.00	0.14	0.00	0.00	16.00	1.98	1.22	0.07
5.25	0.15	0.00	0.00	16.25	1.99	1.23	0.07
5.50	0.16	0.00	0.00	16.50	2.01	1.24	0.06
5.75	0.17	0.00	0.00	16.75	2.02	1.25	0.06
6.00	0.18	0.00	0.00	17.00	2.03	1.26	0.06
6.25	0.19	0.00	0.00	17.25	2.04	1.27	0.06
6.50	0.20	0.00	0.00	17.50	2.05	1.28	0.06
6.75	0.21	0.00	0.00	17.75	2.06	1.29	0.06
7.00	0.22	0.00	0.00	18.00	2.07	1.30	0.05
7.25	0.23	0.00	0.01	18.25	2.08	1.31	0.05
7.50	0.25	0.01	0.01	18.50	2.09	1.32	0.05
7.75	0.26	0.01	0.01	18.75	2.10	1.33	0.05
8.00	0.27	0.01	0.01	19.00	2.11	1.34	0.05
8.25	0.28	0.01	0.01	19.25	2.12	1.34	0.05
8.50	0.30	0.02	0.01	19.50	2.13	1.35	0.04
8.75	0.31	0.02	0.02	19.75	2.13	1.36	0.04
9.00	0.33	0.02	0.02	20.00	2.14	1.36	0.04
9.25	0.35	0.03	0.03	20.25	2.15	1.37	0.04
9.50	0.37	0.04	0.03	20.50	2.16	1.38	0.04
9.75	0.39	0.04	0.03	20.75	2.16	1.38	0.04
10.00	0.41	0.05	0.04	21.00	2.17	1.39	0.04
10.25	0.43	0.06	0.04	21.25	2.18	1.40	0.04
10.50	0.46	0.07	0.05	21.50	2.18	1.40	0.04
10.75	0.49	0.08	0.07	21.75	2.19	1.41	0.04
11.00	0.53	0.10	0.08	22.00	2.20	1.42	0.04
11.25	0.58	0.13	0.10	22.25	2.20	1.42	0.03
11.50	0.64	0.16	0.14	22.50	2.21	1.43	0.03
11.75	0.87	0.31	0.26	22.75	2.22	1.43	0.03
12.00	1.49	0.79	1.17	23.00	2.22	1.44	0.03
12.25	1.59	0.88	1.84				
12.50	1.65	0.93	0.79				
12.75	1.70	0.97	0.40				

Summary for Pond B: Detention Basin

Inflow Area = 1.400 ac, 0.00% Impervious, Inflow Depth > 1.43" for 1-year event
Inflow = 2.00 cfs @ 12.17 hrs, Volume= 0.167 af
Outflow = 0.30 cfs @ 12.88 hrs, Volume= 0.160 af, Atten= 85%, Lag= 42.6 min
Primary = 0.30 cfs @ 12.88 hrs, Volume= 0.160 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-23.00 hrs, dt= 0.05 hrs
Peak Elev= 92.78' @ 12.88 hrs Surf.Area= 0.000 ac Storage= 0.080 af

Plug-Flow detention time= 146.1 min calculated for 0.160 af (96% of inflow)
Center-of-Mass det. time= 125.5 min (937.6 - 812.1)

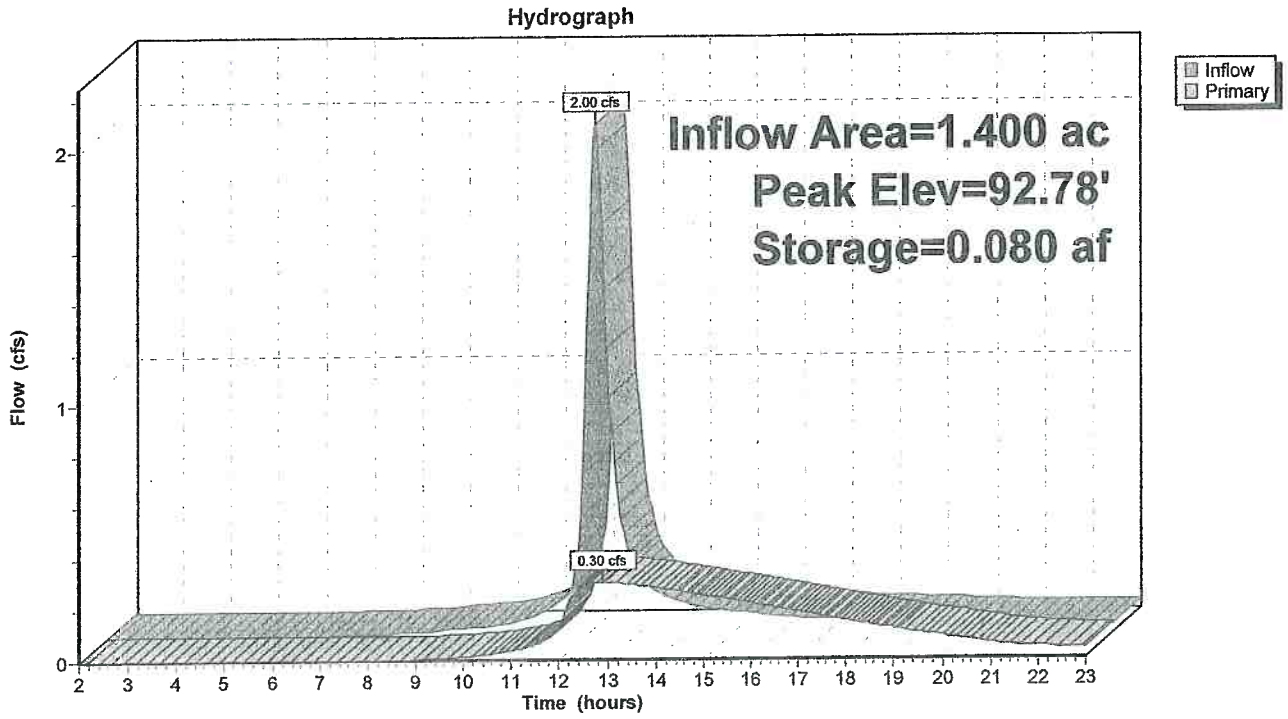
Volume	Invert	Avail.Storage	Storage Description
#1	91.00'	0.200 af	**Custom Stage Data** Listed below

Elevation (feet)	Cum.Store (acre-feet)
91.00	0.000
93.00	0.090
94.50	0.160
95.50	0.200

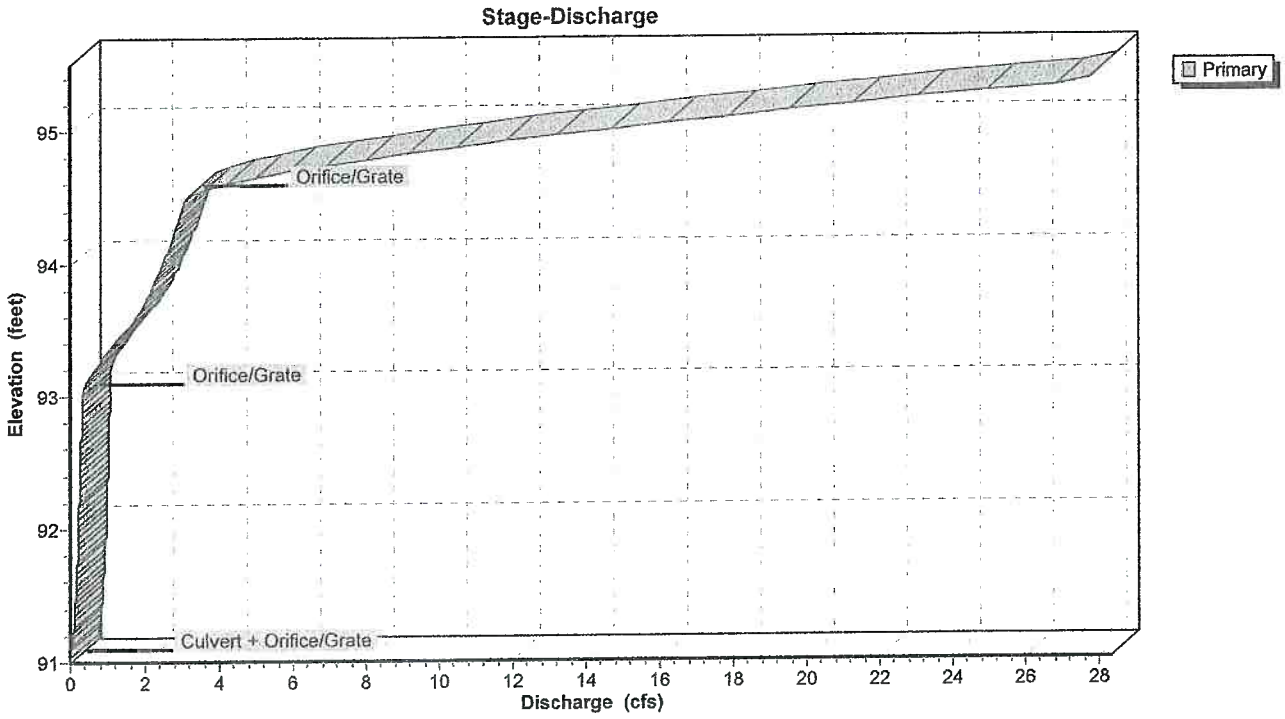
Device	Routing	Invert	Outlet Devices
#1	Primary	91.00'	**24.0" Round Culvert** L= 60.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 91.00' / 73.00' S= 0.3000 '/' Cc= 0.900 n= 0.015
#2	Device 1	91.00'	**3.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	93.00'	**12.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	94.50'	**36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.30 cfs @ 12.88 hrs HW=92.78' (Free Discharge)
└─**1=Culvert** (Passes 0.30 cfs of 13.45 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.30 cfs @ 6.20 fps)
  ├─**3=Orifice/Grate** (Controls 0.00 cfs)
  └─**4=Orifice/Grate** (Controls 0.00 cfs)

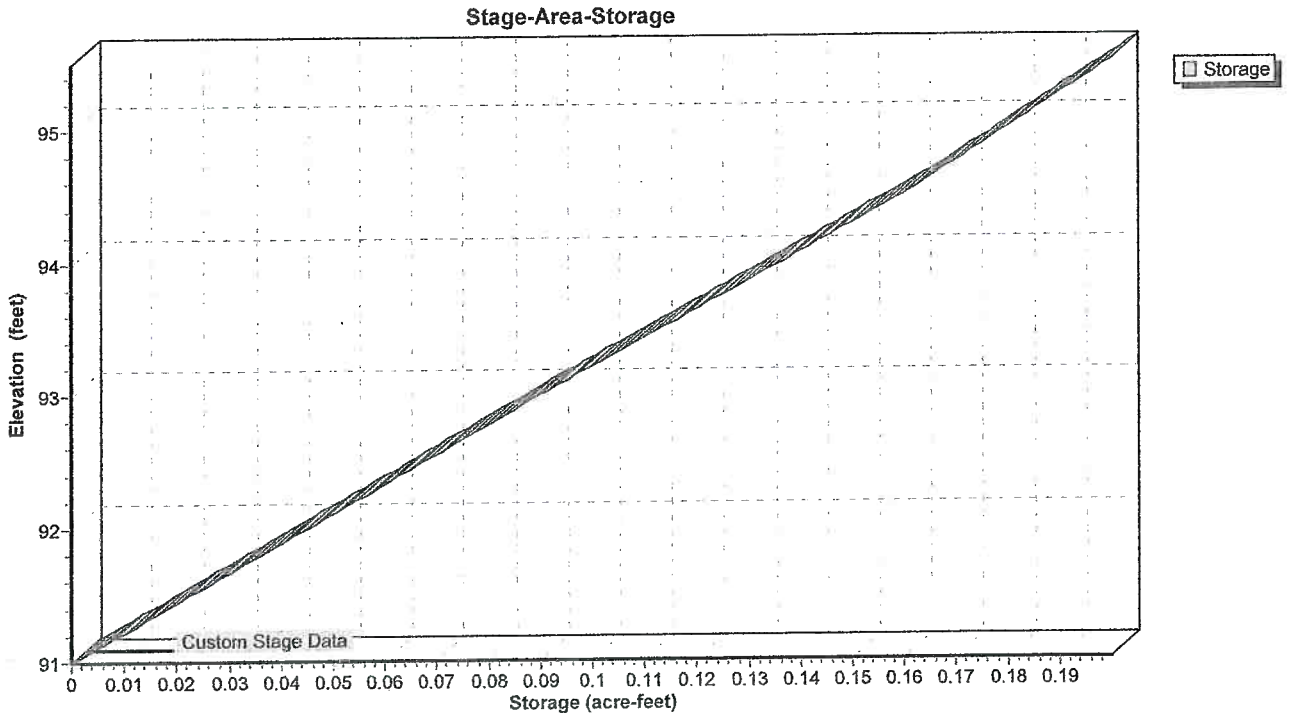
Pond B: Detention Basin



Pond B: Detention Basin



Pond B: Detention Basin



Hydrograph for Pond B: Detention Basin

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
2.00	0.00	0.000	91.00	0.00
2.50	0.00	0.000	91.00	0.00
3.00	0.00	0.000	91.00	0.00
3.50	0.00	0.000	91.00	0.00
4.00	0.00	0.000	91.00	0.00
4.50	0.00	0.000	91.00	0.00
5.00	0.00	0.000	91.00	0.00
5.50	0.00	0.000	91.00	0.00
6.00	0.00	0.000	91.00	0.00
6.50	0.00	0.000	91.00	0.00
7.00	0.00	0.000	91.00	0.00
7.50	0.01	0.000	91.01	0.00
8.00	0.01	0.001	91.02	0.00
8.50	0.01	0.001	91.03	0.00
9.00	0.02	0.002	91.04	0.00
9.50	0.03	0.003	91.06	0.01
10.00	0.04	0.004	91.08	0.01
10.50	0.05	0.005	91.11	0.02
11.00	0.08	0.006	91.14	0.04
11.50	0.14	0.009	91.19	0.06
12.00	**1.17**	0.021	91.47	0.14
12.50	**0.79**	**0.074**	**92.65**	**0.29**
13.00	0.25	**0.080**	**92.78**	**0.30**
13.50	0.16	0.076	92.69	0.30
14.00	0.13	0.070	92.55	0.28
14.50	0.10	0.063	92.40	0.27
15.00	0.09	0.056	92.25	0.25
15.50	0.08	0.050	92.11	0.23
16.00	0.07	0.044	91.97	0.22
16.50	0.06	0.038	91.84	0.20
17.00	0.06	0.033	91.73	0.18
17.50	0.06	0.028	91.62	0.17
18.00	0.05	0.024	91.53	0.15
18.50	0.05	0.020	91.44	0.13
19.00	0.05	0.017	91.37	0.12
19.50	0.04	0.014	91.31	0.10
20.00	0.04	0.012	91.27	0.09
20.50	0.04	0.010	91.23	0.08
21.00	0.04	0.009	91.20	0.06
21.50	0.04	0.008	91.18	0.05
22.00	0.04	0.007	91.16	0.05
22.50	0.03	0.007	91.15	0.04
23.00	0.03	0.007	91.15	0.04

Stage-Discharge for Pond B: Detention Basin

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
91.00	0.00	93.20	0.63	95.40	27.89
91.05	0.01	93.25	0.75	95.45	28.10
91.10	0.02	93.30	0.88	95.50	**28.30**
91.15	0.04	93.35	1.02		
91.20	0.06	93.40	1.17		
91.25	0.08	93.45	1.33		
91.30	0.10	93.50	1.50		
91.35	0.11	93.55	1.64		
91.40	0.12	93.60	1.76		
91.45	0.13	93.65	1.87		
91.50	0.14	93.70	1.97		
91.55	0.15	93.75	2.07		
91.60	0.16	93.80	2.16		
91.65	0.17	93.85	2.24		
91.70	0.18	93.90	2.32		
91.75	0.19	93.95	2.40		
91.80	0.19	94.00	2.48		
91.85	0.20	94.05	2.55		
91.90	0.21	94.10	2.62		
91.95	0.21	94.15	2.69		
92.00	0.22	94.20	2.75		
92.05	0.23	94.25	2.82		
92.10	0.23	94.30	2.88		
92.15	0.24	94.35	2.94		
92.20	0.25	94.40	3.00		
92.25	0.25	94.45	3.06		
92.30	0.26	94.50	3.12		
92.35	0.26	94.55	3.52		
92.40	0.27	94.60	4.21		
92.45	0.27	94.65	5.08		
92.50	0.28	94.70	6.10		
92.55	0.28	94.75	7.25		
92.60	0.29	94.80	8.51		
92.65	0.29	94.85	9.88		
92.70	0.30	94.90	11.35		
92.75	0.30	94.95	12.90		
92.80	0.31	95.00	14.54		
92.85	0.31	95.05	16.27		
92.90	0.31	95.10	18.07		
92.95	0.32	95.15	19.94		
93.00	0.32	95.20	21.89		
93.05	0.36	95.25	23.90		
93.10	0.43	95.30	25.98		
93.15	0.52	95.35	27.69		

Stage-Area-Storage for Pond B: Detention Basin

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
91.00	0.000	93.20	0.099	95.40	0.196
91.05	0.002	93.25	0.102	95.45	0.198
91.10	0.004	93.30	0.104	95.50	**0.200**
91.15	0.007	93.35	0.106		
91.20	0.009	93.40	0.109		
91.25	0.011	93.45	0.111		
91.30	0.013	93.50	0.113		
91.35	0.016	93.55	0.116		
91.40	0.018	93.60	0.118		
91.45	0.020	93.65	0.120		
91.50	0.022	93.70	0.123		
91.55	0.025	93.75	0.125		
91.60	0.027	93.80	0.127		
91.65	0.029	93.85	0.130		
91.70	0.032	93.90	0.132		
91.75	0.034	93.95	0.134		
91.80	0.036	94.00	0.137		
91.85	0.038	94.05	0.139		
91.90	0.041	94.10	0.141		
91.95	0.043	94.15	0.144		
92.00	0.045	94.20	0.146		
92.05	0.047	94.25	0.148		
92.10	0.049	94.30	0.151		
92.15	0.052	94.35	0.153		
92.20	0.054	94.40	0.155		
92.25	0.056	94.45	0.158		
92.30	0.058	94.50	0.160		
92.35	0.061	94.55	0.162		
92.40	0.063	94.60	0.164		
92.45	0.065	94.65	0.166		
92.50	0.068	94.70	0.168		
92.55	0.070	94.75	0.170		
92.60	0.072	94.80	0.172		
92.65	0.074	94.85	0.174		
92.70	0.077	94.90	0.176		
92.75	0.079	94.95	0.178		
92.80	0.081	95.00	0.180		
92.85	0.083	95.05	0.182		
92.90	0.086	95.10	0.184		
92.95	0.088	95.15	0.186		
93.00	0.090	95.20	0.188		
93.05	0.092	95.25	0.190		
93.10	0.095	95.30	0.192		
93.15	0.097	95.35	0.194		

Time span=2.00-23.00 hrs, dt=0.05 hrs, 421 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment A: Post DA Runoff Area=1.400 ac 0.00% Impervious Runoff Depth>2.96"
Tc=24.6 min CN=92 Runoff=4.04 cfs 0.346 af

Pond B: Detention Basin Peak Elev=93.78' Storage=0.126 af Inflow=4.04 cfs 0.346 af
Outflow=2.12 cfs 0.333 af

Total Runoff Area = 1.400 ac Runoff Volume = 0.346 af Average Runoff Depth = 2.96"
100.00% Pervious = 1.400 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment A: Post DA

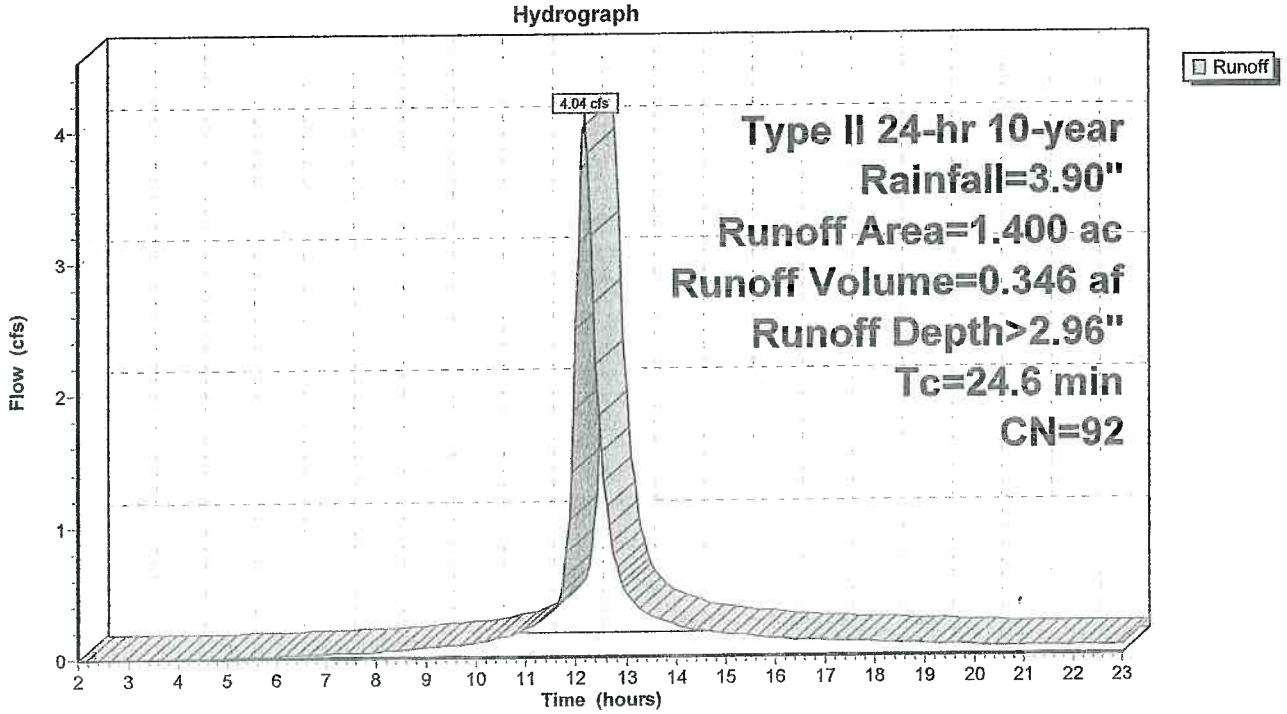
Runoff = 4.04 cfs @ 12.17 hrs, Volume= 0.346 af, Depth> 2.96"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 2.00-23.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-year Rainfall=3.90"

	Area (ac)	CN	Description
*	1.400	92	
	1.400		100.00% Pervious Area

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

Subcatchment A: Post DA



Hydrograph for Subcatchment A: Post DA

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
2.00	0.09	0.00	0.00	13.00	3.01	2.17	0.48
2.25	0.10	0.00	0.00	13.25	3.07	2.22	0.36
2.50	0.11	0.00	0.00	13.50	3.12	2.27	0.31
2.75	0.12	0.00	0.00	13.75	3.16	2.31	0.27
3.00	0.13	0.00	0.00	14.00	3.20	2.35	0.23
3.25	0.15	0.00	0.00	14.25	3.23	2.38	0.21
3.50	0.16	0.00	0.00	14.50	3.27	2.41	0.19
3.75	0.17	0.00	0.00	14.75	3.30	2.44	0.18
4.00	0.19	0.00	0.00	15.00	3.33	2.47	0.17
4.25	0.20	0.00	0.00	15.25	3.36	2.50	0.16
4.50	0.22	0.00	0.00	15.50	3.38	2.53	0.15
4.75	0.23	0.00	0.01	15.75	3.41	2.55	0.14
5.00	0.25	0.01	0.01	16.00	3.43	2.57	0.13
5.25	0.26	0.01	0.01	16.25	3.45	2.59	0.13
5.50	0.28	0.01	0.01	16.50	3.48	2.61	0.12
5.75	0.29	0.01	0.02	16.75	3.50	2.63	0.12
6.00	0.31	0.02	0.02	17.00	3.52	2.65	0.11
6.25	0.33	0.02	0.02	17.25	3.54	2.67	0.11
6.50	0.35	0.03	0.03	17.50	3.56	2.69	0.11
6.75	0.37	0.04	0.03	17.75	3.57	2.71	0.10
7.00	0.39	0.04	0.03	18.00	3.59	2.72	0.10
7.25	0.41	0.05	0.04	18.25	3.61	2.74	0.10
7.50	0.43	0.06	0.04	18.50	3.63	2.76	0.09
7.75	0.45	0.07	0.04	18.75	3.64	2.77	0.09
8.00	0.47	0.07	0.05	19.00	3.66	2.79	0.09
8.25	0.49	0.08	0.05	19.25	3.67	2.80	0.08
8.50	0.52	0.10	0.06	19.50	3.69	2.82	0.08
8.75	0.54	0.11	0.07	19.75	3.70	2.83	0.08
9.00	0.57	0.13	0.08	20.00	3.71	2.84	0.07
9.25	0.60	0.14	0.09	20.25	3.73	2.85	0.07
9.50	0.64	0.16	0.09	20.50	3.74	2.86	0.07
9.75	0.67	0.18	0.10	20.75	3.75	2.88	0.07
10.00	0.71	0.20	0.11	21.00	3.76	2.89	0.07
10.25	0.75	0.23	0.13	21.25	3.77	2.90	0.07
10.50	0.80	0.26	0.15	21.50	3.79	2.91	0.07
10.75	0.85	0.30	0.18	21.75	3.80	2.92	0.07
11.00	0.92	0.34	0.21	22.00	3.81	2.93	0.06
11.25	1.00	0.40	0.26	22.25	3.82	2.95	0.06
11.50	1.10	0.48	0.34	22.50	3.83	2.96	0.06
11.75	1.51	0.81	0.60	22.75	3.84	2.97	0.06
12.00	2.59	1.77	**2.48**	23.00	**3.86**	**2.98**	0.06
12.25	2.75	1.93	**3.67**				
12.50	2.87	2.04	1.55				
12.75	2.94	2.11	0.77				

Summary for Pond B: Detention Basin

Inflow Area = 1.400 ac, 0.00% Impervious, Inflow Depth > 2.96" for 10-year event
Inflow = 4.04 cfs @ 12.17 hrs, Volume= 0.346 af
Outflow = 2.12 cfs @ 12.42 hrs, Volume= 0.333 af, Atten= 47%, Lag= 14.7 min
Primary = 2.12 cfs @ 12.42 hrs, Volume= 0.333 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-23.00 hrs, dt= 0.05 hrs
Peak Elev= 93.78' @ 12.42 hrs Surf.Area= 0.000 ac Storage= 0.126 af

Plug-Flow detention time= 117.1 min calculated for 0.332 af (96% of inflow)
Center-of-Mass det. time= 97.5 min (890.3 - 792.8)

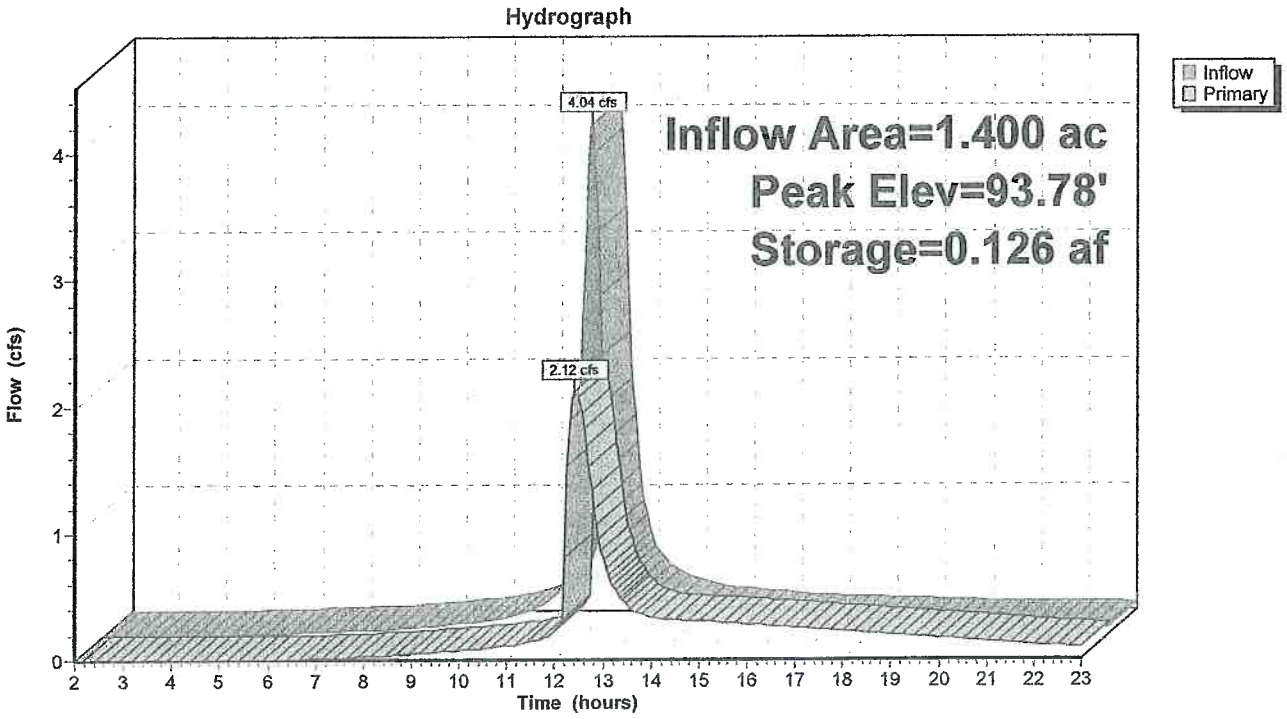
Volume	Invert	Avail.Storage	Storage Description
#1	91.00'	0.200 af	**Custom Stage Data** Listed below

Elevation (feet)	Cum.Store (acre-feet)
91.00	0.000
93.00	0.090
94.50	0.160
95.50	0.200

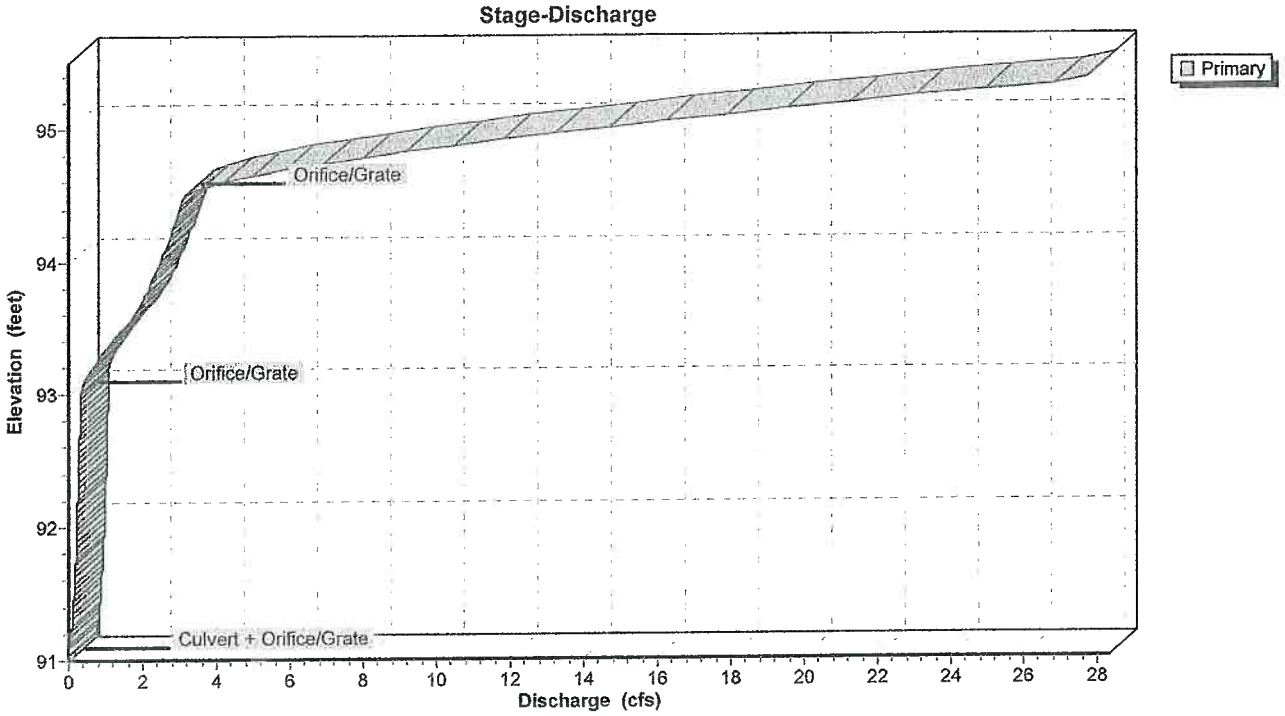
Device	Routing	Invert	Outlet Devices
#1	Primary	91.00'	**24.0" Round Culvert** L= 60.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 91.00' / 73.00' S= 0.3000 '/' Cc= 0.900 n= 0.015
#2	Device 1	91.00'	**3.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	93.00'	**12.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	94.50'	**36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.12 cfs @ 12.42 hrs HW=93.78' (Free Discharge)
└─**1=Culvert** (Passes 2.12 cfs of 20.17 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.38 cfs @ 7.84 fps)
  ├─**3=Orifice/Grate** (Orifice Controls 1.73 cfs @ 3.46 fps)
  └─**4=Orifice/Grate** (Controls 0.00 cfs)

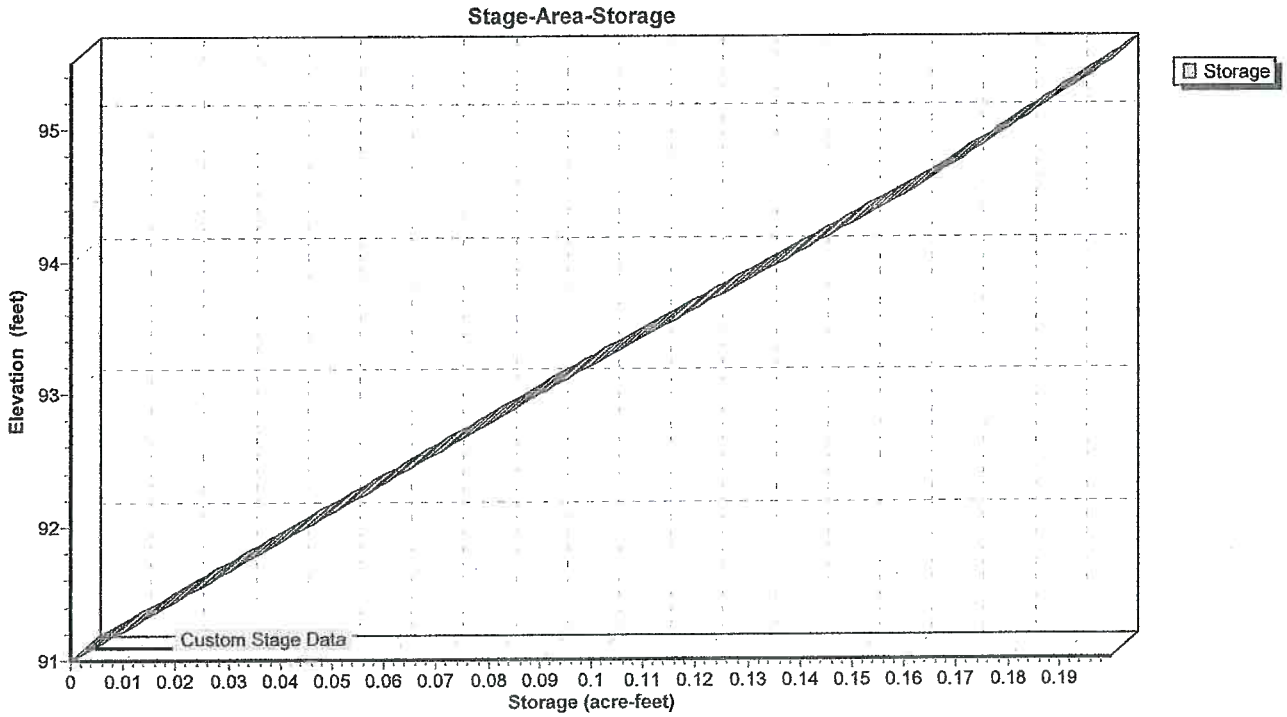
Pond B: Detention Basin



Pond B: Detention Basin



Pond B: Detention Basin



Hydrograph for Pond B: Detention Basin

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
2.00	0.00	0.000	91.00	0.00
2.50	0.00	0.000	91.00	0.00
3.00	0.00	0.000	91.00	0.00
3.50	0.00	0.000	91.00	0.00
4.00	0.00	0.000	91.00	0.00
4.50	0.00	0.000	91.00	0.00
5.00	0.01	0.000	91.01	0.00
5.50	0.01	0.001	91.02	0.00
6.00	0.02	0.001	91.03	0.00
6.50	0.03	0.002	91.05	0.01
7.00	0.03	0.003	91.07	0.01
7.50	0.04	0.004	91.09	0.02
8.00	0.05	0.005	91.11	0.03
8.50	0.06	0.006	91.14	0.03
9.00	0.08	0.007	91.16	0.05
9.50	0.09	0.009	91.19	0.06
10.00	0.11	0.010	91.22	0.07
10.50	0.15	0.012	91.27	0.09
11.00	0.21	0.015	91.34	0.11
11.50	0.34	0.021	91.47	0.14
12.00	**2.48**	**0.050**	**92.12**	**0.24**
12.50	**1.55**	**0.124**	**93.74**	**2.04**
13.00	0.48	0.102	93.27	0.79
13.50	0.31	0.094	93.10	0.43
14.00	0.23	0.090	93.01	0.33
14.50	0.19	0.086	92.91	0.32
15.00	0.17	0.080	92.79	0.30
15.50	0.15	0.075	92.66	0.29
16.00	0.13	0.069	92.53	0.28
16.50	0.12	0.063	92.40	0.27
17.00	0.11	0.057	92.27	0.25
17.50	0.11	0.051	92.14	0.24
18.00	0.10	0.046	92.02	0.22
18.50	0.09	0.041	91.91	0.21
19.00	0.09	0.036	91.81	0.20
19.50	0.08	0.032	91.71	0.18
20.00	0.07	0.028	91.62	0.17
20.50	0.07	0.024	91.54	0.15
21.00	0.07	0.021	91.47	0.14
21.50	0.07	0.018	91.41	0.13
22.00	0.06	0.016	91.36	0.11
22.50	0.06	0.014	91.32	0.10
23.00	0.06	0.013	91.28	0.09

Stage-Discharge for Pond B: Detention Basin

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
91.00	0.00	93.20	0.63	95.40	27.89
91.05	0.01	93.25	0.75	95.45	28.10
91.10	0.02	93.30	0.88	95.50	**28.30**
91.15	0.04	93.35	1.02		
91.20	0.06	93.40	1.17		
91.25	0.08	93.45	1.33		
91.30	0.10	93.50	1.50		
91.35	0.11	93.55	1.64		
91.40	0.12	93.60	1.76		
91.45	0.13	93.65	1.87		
91.50	0.14	93.70	1.97		
91.55	0.15	93.75	2.07		
91.60	0.16	93.80	2.16		
91.65	0.17	93.85	2.24		
91.70	0.18	93.90	2.32		
91.75	0.19	93.95	2.40		
91.80	0.19	94.00	2.48		
91.85	0.20	94.05	2.55		
91.90	0.21	94.10	2.62		
91.95	0.21	94.15	2.69		
92.00	0.22	94.20	2.75		
92.05	0.23	94.25	2.82		
92.10	0.23	94.30	2.88		
92.15	0.24	94.35	2.94		
92.20	0.25	94.40	3.00		
92.25	0.25	94.45	3.06		
92.30	0.26	94.50	3.12		
92.35	0.26	94.55	3.52		
92.40	0.27	94.60	4.21		
92.45	0.27	94.65	5.08		
92.50	0.28	94.70	6.10		
92.55	0.28	94.75	7.25		
92.60	0.29	94.80	8.51		
92.65	0.29	94.85	9.88		
92.70	0.30	94.90	11.35		
92.75	0.30	94.95	12.90		
92.80	0.31	95.00	14.54		
92.85	0.31	95.05	16.27		
92.90	0.31	95.10	18.07		
92.95	0.32	95.15	19.94		
93.00	0.32	95.20	21.89		
93.05	0.36	95.25	23.90		
93.10	0.43	95.30	25.98		
93.15	0.52	95.35	27.69		

Stage-Area-Storage for Pond B: Detention Basin

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
91.00	0.000	93.20	0.099	95.40	0.196
91.05	0.002	93.25	0.102	95.45	0.198
91.10	0.004	93.30	0.104	95.50	**0.200**
91.15	0.007	93.35	0.106		
91.20	0.009	93.40	0.109		
91.25	0.011	93.45	0.111		
91.30	0.013	93.50	0.113		
91.35	0.016	93.55	0.116		
91.40	0.018	93.60	0.118		
91.45	0.020	93.65	0.120		
91.50	0.022	93.70	0.123		
91.55	0.025	93.75	0.125		
91.60	0.027	93.80	0.127		
91.65	0.029	93.85	0.130		
91.70	0.032	93.90	0.132		
91.75	0.034	93.95	0.134		
91.80	0.036	94.00	0.137		
91.85	0.038	94.05	0.139		
91.90	0.041	94.10	0.141		
91.95	0.043	94.15	0.144		
92.00	0.045	94.20	0.146		
92.05	0.047	94.25	0.148		
92.10	0.049	94.30	0.151		
92.15	0.052	94.35	0.153		
92.20	0.054	94.40	0.155		
92.25	0.056	94.45	0.158		
92.30	0.058	94.50	0.160		
92.35	0.061	94.55	0.162		
92.40	0.063	94.60	0.164		
92.45	0.065	94.65	0.166		
92.50	0.068	94.70	0.168		
92.55	0.070	94.75	0.170		
92.60	0.072	94.80	0.172		
92.65	0.074	94.85	0.174		
92.70	0.077	94.90	0.176		
92.75	0.079	94.95	0.178		
92.80	0.081	95.00	0.180		
92.85	0.083	95.05	0.182		
92.90	0.086	95.10	0.184		
92.95	0.088	95.15	0.186		
93.00	0.090	95.20	0.188		
93.05	0.092	95.25	0.190		
93.10	0.095	95.30	0.192		
93.15	0.097	95.35	0.194		

Time span=2.00-23.00 hrs, dt=0.05 hrs, 421 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment A: Post DA Runoff Area=1.400 ac 0.00% Impervious Runoff Depth>4.40"
Tc=24.6 min CN=92 Runoff=5.88 cfs 0.513 af

Pond B: Detention Basin Peak Elev=94.59' Storage=0.164 af Inflow=5.88 cfs 0.513 af
Outflow=4.09 cfs 0.492 af

Total Runoff Area = 1.400 ac Runoff Volume = 0.513 af Average Runoff Depth = 4.40"
100.00% Pervious = 1.400 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment A: Post DA

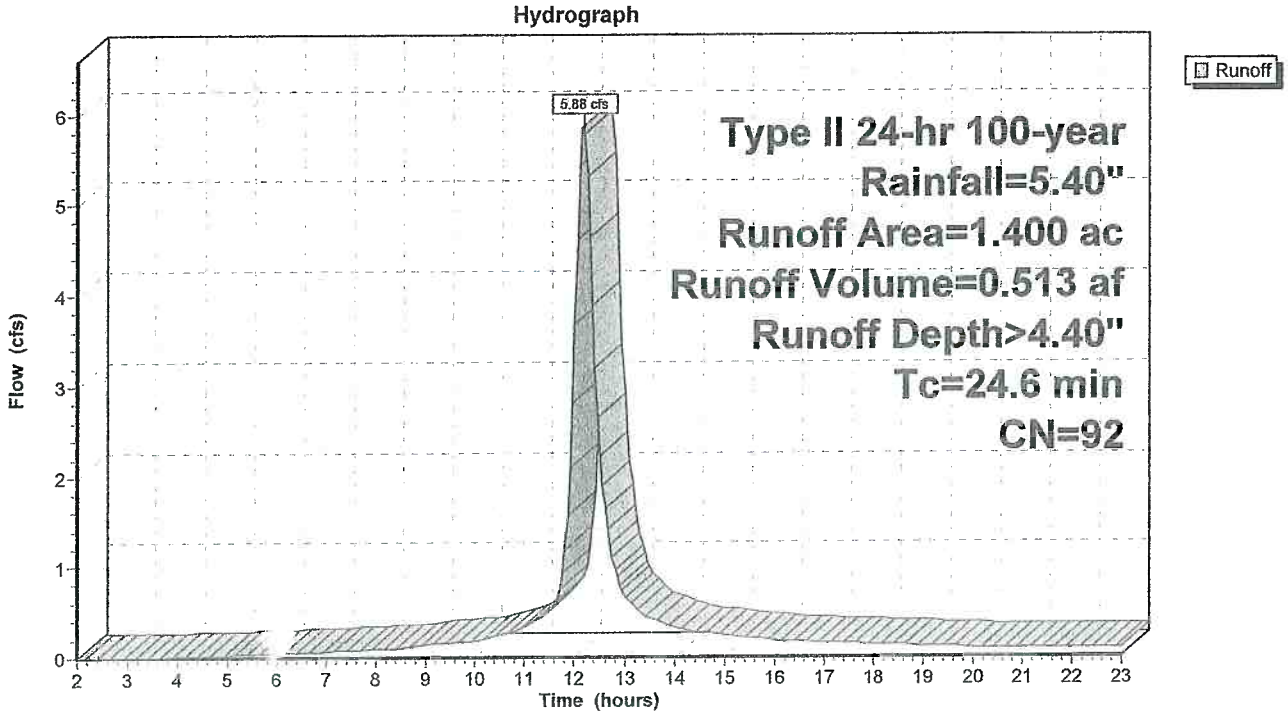
Runoff = 5.88 cfs @ 12.17 hrs, Volume= 0.513 af, Depth> 4.40"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 2.00-23.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year Rainfall=5.40"

	Area (ac)	CN	Description
*	1.400	92	
	1.400		100.00% Pervious Area

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

Subcatchment A: Post DA



Hydrograph for Subcatchment A: Post DA

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
2.00	0.12	0.00	0.00	13.00	4.17	3.28	0.69
2.25	0.14	0.00	0.00	13.25	4.25	3.36	0.52
2.50	0.15	0.00	0.00	13.50	4.31	3.42	0.43
2.75	0.17	0.00	0.00	13.75	4.37	3.48	0.38
3.00	0.19	0.00	0.00	14.00	4.43	3.53	0.33
3.25	0.20	0.00	0.00	14.25	4.48	3.58	0.29
3.50	0.22	0.00	0.00	14.50	4.52	3.62	0.27
3.75	0.24	0.00	0.01	14.75	4.57	3.67	0.26
4.00	0.26	0.01	0.01	15.00	4.61	3.71	0.24
4.25	0.28	0.01	0.02	15.25	4.65	3.75	0.23
4.50	0.30	0.02	0.02	15.50	4.69	3.78	0.22
4.75	0.32	0.02	0.02	15.75	4.72	3.82	0.20
5.00	0.34	0.03	0.03	16.00	4.75	3.85	0.19
5.25	0.36	0.03	0.03	16.25	4.78	3.88	0.18
5.50	0.38	0.04	0.04	16.50	4.81	3.91	0.17
5.75	0.41	0.05	0.04	16.75	4.84	3.93	0.16
6.00	0.43	0.06	0.05	17.00	4.87	3.96	0.16
6.25	0.46	0.07	0.05	17.25	4.90	3.99	0.15
6.50	0.48	0.08	0.06	17.50	4.92	4.01	0.15
6.75	0.51	0.09	0.06	17.75	4.95	4.04	0.15
7.00	0.53	0.11	0.07	18.00	4.97	4.06	0.14
7.25	0.56	0.12	0.07	18.25	5.00	4.09	0.14
7.50	0.59	0.13	0.08	18.50	5.02	4.11	0.13
7.75	0.62	0.15	0.08	18.75	5.04	4.13	0.13
8.00	0.65	0.17	0.09	19.00	5.06	4.15	0.12
8.25	0.68	0.19	0.10	19.25	5.08	4.17	0.12
8.50	0.71	0.21	0.11	19.50	5.10	4.19	0.11
8.75	0.75	0.23	0.12	19.75	5.12	4.21	0.11
9.00	0.79	0.26	0.14	20.00	5.14	4.23	0.10
9.25	0.84	0.29	0.15	20.25	5.16	4.24	0.10
9.50	0.88	0.32	0.16	20.50	5.18	4.26	0.10
9.75	0.93	0.35	0.17	20.75	5.19	4.28	0.10
10.00	0.98	0.39	0.18	21.00	5.21	4.29	0.09
10.25	1.04	0.43	0.21	21.25	5.23	4.31	0.09
10.50	1.10	0.48	0.24	21.50	5.24	4.33	0.09
10.75	1.18	0.54	0.28	21.75	5.26	4.34	0.09
11.00	1.27	0.61	0.34	22.00	5.28	4.36	0.09
11.25	1.38	0.70	0.41	22.25	5.29	4.37	0.09
11.50	1.53	0.82	0.53	22.50	5.31	4.39	0.09
11.75	2.09	1.32	0.92	22.75	5.32	4.41	0.09
12.00	3.58	2.71	3.67	23.00	5.34	4.42	0.09
12.25	3.81	2.94	5.32				
12.50	3.97	3.09	2.23				
12.75	4.08	3.19	1.09				

Summary for Pond B: Detention Basin

Inflow Area = 1.400 ac, 0.00% Impervious, Inflow Depth > 4.40" for 100-year event
Inflow = 5.88 cfs @ 12.17 hrs, Volume= 0.513 af
Outflow = 4.09 cfs @ 12.35 hrs, Volume= 0.492 af, Atten= 30%, Lag= 11.2 min
Primary = 4.09 cfs @ 12.35 hrs, Volume= 0.492 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-23.00 hrs, dt= 0.05 hrs
Peak Elev= 94.59' @ 12.36 hrs Surf.Area= 0.000 ac Storage= 0.164 af

Plug-Flow detention time= 99.4 min calculated for 0.491 af (96% of inflow)
Center-of-Mass det. time= 77.4 min (859.9 - 782.6)

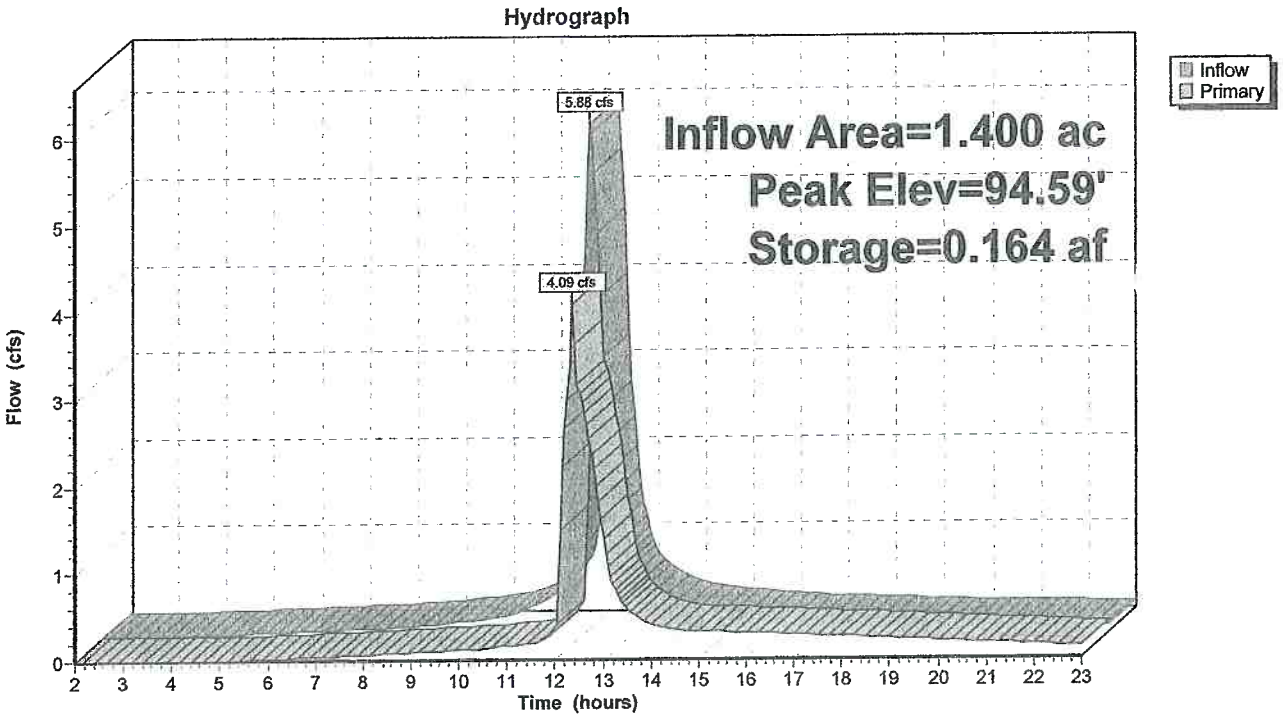
Volume	Invert	Avail.Storage	Storage Description
#1	91.00'	0.200 af	**Custom Stage Data** Listed below

Elevation (feet)	Cum.Store (acre-feet)
91.00	0.000
93.00	0.090
94.50	0.160
95.50	0.200

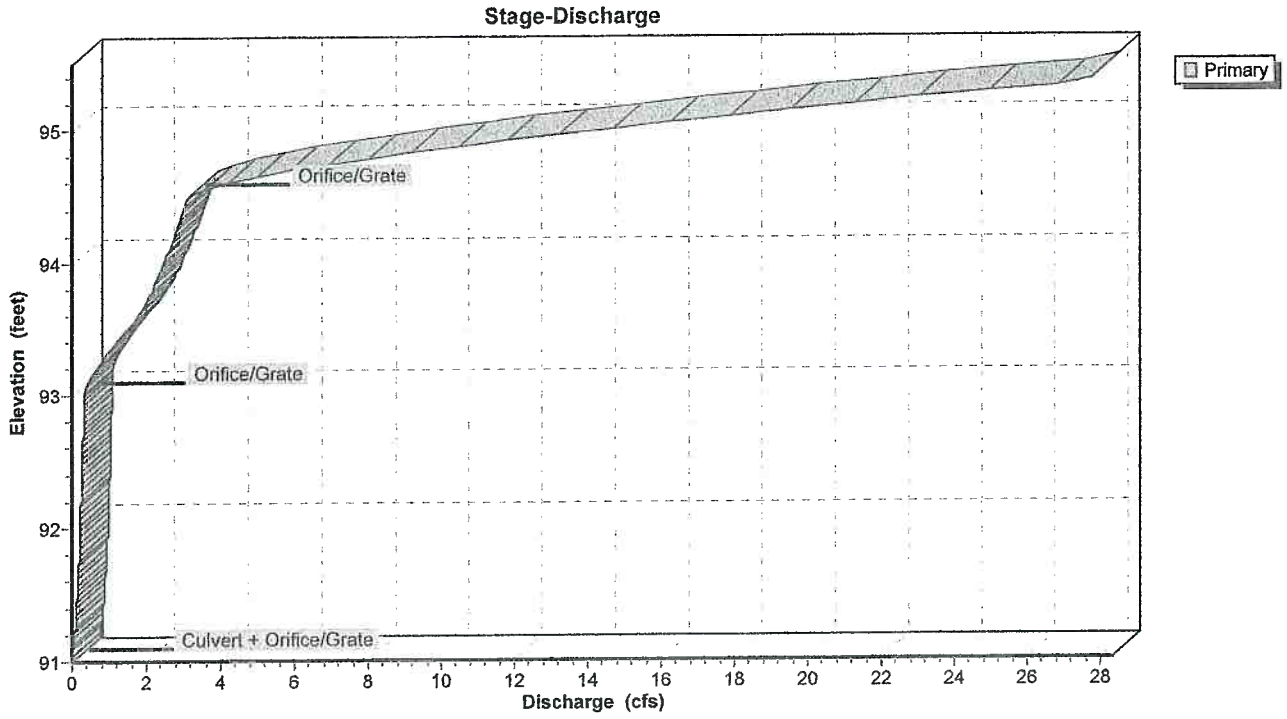
Device	Routing	Invert	Outlet Devices
#1	Primary	91.00'	**24.0" Round Culvert** L= 60.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 91.00' / 73.00' S= 0.3000 '/' Cc= 0.900 n= 0.015
#2	Device 1	91.00'	**3.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	93.00'	**12.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	94.50'	**36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=4.04 cfs @ 12.35 hrs HW=94.59' (Free Discharge)
└**1=Culvert** (Passes 4.04 cfs of 24.34 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.44 cfs @ 8.96 fps)
  ├**3=Orifice/Grate** (Orifice Controls 2.78 cfs @ 5.56 fps)
  └**4=Orifice/Grate** (Weir Controls 0.82 cfs @ 0.98 fps)

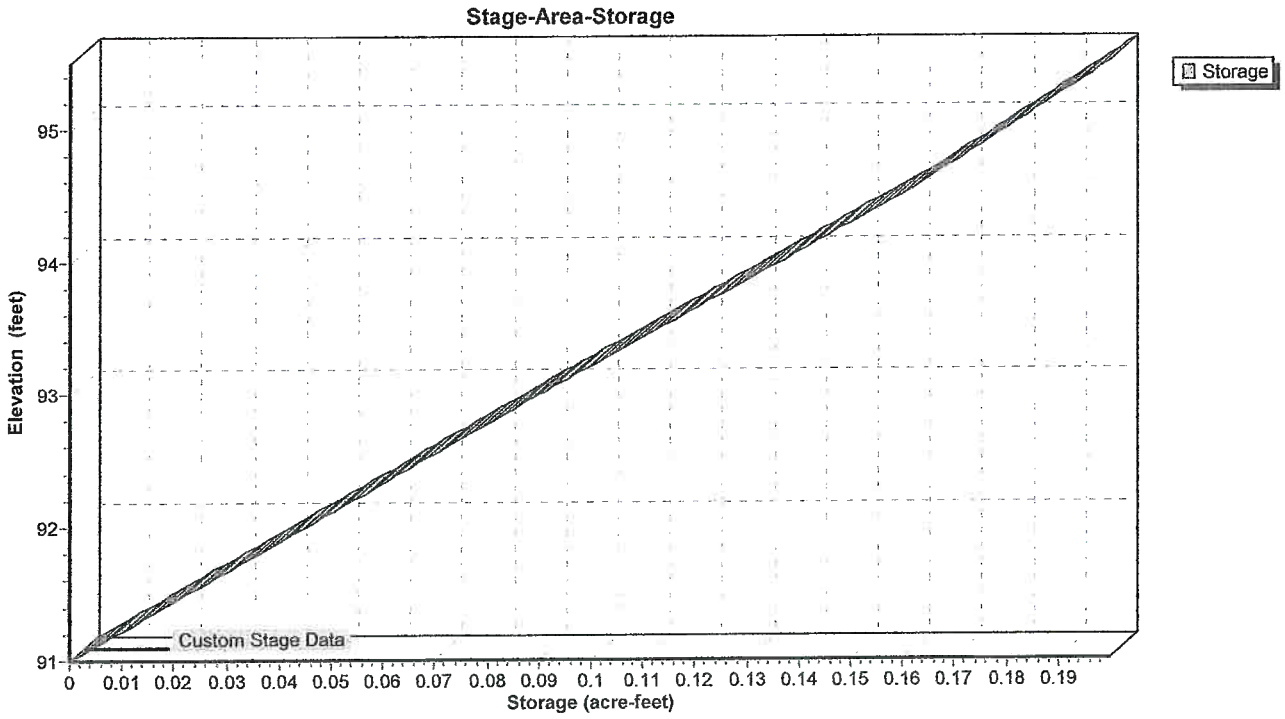
Pond B: Detention Basin



Pond B: Detention Basin



Pond B: Detention Basin



Hydrograph for Pond B: Detention Basin

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
2.00	0.00	0.000	91.00	0.00
2.50	0.00	0.000	91.00	0.00
3.00	0.00	0.000	91.00	0.00
3.50	0.00	0.000	91.00	0.00
4.00	0.01	0.000	91.01	0.00
4.50	0.02	0.001	91.02	0.00
5.00	0.03	0.002	91.04	0.00
5.50	0.04	0.003	91.07	0.01
6.00	0.05	0.004	91.10	0.02
6.50	0.06	0.006	91.12	0.03
7.00	0.07	0.007	91.15	0.04
7.50	0.08	0.008	91.17	0.05
8.00	0.09	0.009	91.20	0.06
8.50	0.11	0.010	91.22	0.07
9.00	0.14	0.012	91.26	0.09
9.50	0.16	0.014	91.31	0.10
10.00	0.18	0.017	91.37	0.12
10.50	0.24	0.020	91.45	0.13
11.00	0.34	0.026	91.58	0.16
11.50	0.53	0.036	91.80	0.19
12.00	**3.67**	**0.081**	**92.80**	**0.31**
12.50	**2.23**	**0.158**	**94.45**	**3.06**
13.00	0.69	0.112	93.47	1.39
13.50	0.43	0.098	93.18	0.58
14.00	0.33	0.094	93.09	0.41
14.50	0.27	0.091	93.02	0.34
15.00	0.24	0.088	92.96	0.32
15.50	0.22	0.085	92.88	0.31
16.00	0.19	0.080	92.78	0.30
16.50	0.17	0.075	92.67	0.29
17.00	0.16	0.070	92.56	0.28
17.50	0.15	0.065	92.45	0.27
18.00	0.14	0.060	92.34	0.26
18.50	0.13	0.055	92.23	0.25
19.00	0.12	0.050	92.12	0.24
19.50	0.11	0.046	92.02	0.22
20.00	0.10	0.041	91.92	0.21
20.50	0.10	0.037	91.82	0.20
21.00	0.09	0.033	91.74	0.18
21.50	0.09	0.030	91.66	0.17
22.00	0.09	0.027	91.59	0.16
22.50	0.09	0.024	91.53	0.15
23.00	0.09	0.021	91.48	0.14

Stage-Discharge for Pond B: Detention Basin

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
91.00	0.00	93.20	0.63	95.40	27.89
91.05	0.01	93.25	0.75	95.45	28.10
91.10	0.02	93.30	0.88	95.50	**28.30**
91.15	0.04	93.35	1.02		
91.20	0.06	93.40	1.17		
91.25	0.08	93.45	1.33		
91.30	0.10	93.50	1.50		
91.35	0.11	93.55	1.64		
91.40	0.12	93.60	1.76		
91.45	0.13	93.65	1.87		
91.50	0.14	93.70	1.97		
91.55	0.15	93.75	2.07		
91.60	0.16	93.80	2.16		
91.65	0.17	93.85	2.24		
91.70	0.18	93.90	2.32		
91.75	0.19	93.95	2.40		
91.80	0.19	94.00	2.48		
91.85	0.20	94.05	2.55		
91.90	0.21	94.10	2.62		
91.95	0.21	94.15	2.69		
92.00	0.22	94.20	2.75		
92.05	0.23	94.25	2.82		
92.10	0.23	94.30	2.88		
92.15	0.24	94.35	2.94		
92.20	0.25	94.40	3.00		
92.25	0.25	94.45	3.06		
92.30	0.26	94.50	3.12		
92.35	0.26	94.55	3.52		
92.40	0.27	94.60	4.21		
92.45	0.27	94.65	5.08		
92.50	0.28	94.70	6.10		
92.55	0.28	94.75	7.25		
92.60	0.29	94.80	8.51		
92.65	0.29	94.85	9.88		
92.70	0.30	94.90	11.35		
92.75	0.30	94.95	12.90		
92.80	0.31	95.00	14.54		
92.85	0.31	95.05	16.27		
92.90	0.31	95.10	18.07		
92.95	0.32	95.15	19.94		
93.00	0.32	95.20	21.89		
93.05	0.36	95.25	23.90		
93.10	0.43	95.30	25.98		
93.15	0.52	95.35	27.69		

Stage-Area-Storage for Pond B: Detention Basin

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
91.00	0.000	93.20	0.099	95.40	0.196
91.05	0.002	93.25	0.102	95.45	0.198
91.10	0.004	93.30	0.104	95.50	**0.200**
91.15	0.007	93.35	0.106		
91.20	0.009	93.40	0.109		
91.25	0.011	93.45	0.111		
91.30	0.013	93.50	0.113		
91.35	0.016	93.55	0.116		
91.40	0.018	93.60	0.118		
91.45	0.020	93.65	0.120		
91.50	0.022	93.70	0.123		
91.55	0.025	93.75	0.125		
91.60	0.027	93.80	0.127		
91.65	0.029	93.85	0.130		
91.70	0.032	93.90	0.132		
91.75	0.034	93.95	0.134		
91.80	0.036	94.00	0.137		
91.85	0.038	94.05	0.139		
91.90	0.041	94.10	0.141		
91.95	0.043	94.15	0.144		
92.00	0.045	94.20	0.146		
92.05	0.047	94.25	0.148		
92.10	0.049	94.30	0.151		
92.15	0.052	94.35	0.153		
92.20	0.054	94.40	0.155		
92.25	0.056	94.45	0.158		
92.30	0.058	94.50	0.160		
92.35	0.061	94.55	0.162		
92.40	0.063	94.60	0.164		
92.45	0.065	94.65	0.166		
92.50	0.068	94.70	0.168		
92.55	0.070	94.75	0.170		
92.60	0.072	94.80	0.172		
92.65	0.074	94.85	0.174		
92.70	0.077	94.90	0.176		
92.75	0.079	94.95	0.178		
92.80	0.081	95.00	0.180		
92.85	0.083	95.05	0.182		
92.90	0.086	95.10	0.184		
92.95	0.088	95.15	0.186		
93.00	0.090	95.20	0.188		
93.05	0.092	95.25	0.190		
93.10	0.095	95.30	0.192		
93.15	0.097	95.35	0.194		

APPENDIX C

DRAINAGE PLAN

Site Drainage Plans (See attached project plans).

APPENDIX D

MISCELLANEOUS DOCUMENTS

1. NYS Parks, Recreation and Historic Preservation Correspondence.
2. NRCS Soils Descriptions (Hudson, Madalin, Chenango and Howard Series).
3. Contractor Certification.

March 21, 2011

New York State Historic Preservation Office
Peebles Island Resource Center
PO Box 189
Waterford, NY 12188-0189

Re: Project Review – Tompkins County
Monkey Run Townhouse Project
5 Freese Road, Town of Dryden, NY

To whom it may concern:

Enclosed herein please find the following items to be included as part of a review of the subject project for items of historic significance:

- USGS location map;
- Tax map;
- NYSDEC Archeological Site map; and,
- Short Environmental Assessment Form (EAF).

As indicated in the Short EAF, the project consists of the eventual construction of up to 20 townhouses on a filled lot. The lot is currently vacant and undeveloped with between 5 and 20 feet of fill placed across the two-acre property. To my knowledge, the property has never contained a structure. It should also be noted that residential and commercial buildings on adjoining properties are generally 50-75 years old and are not believed to be of historic significance.

Please let me know if further information is required to complete your review of this project. Please don't hesitate to call if you have questions regarding the items submitted or this correspondence.

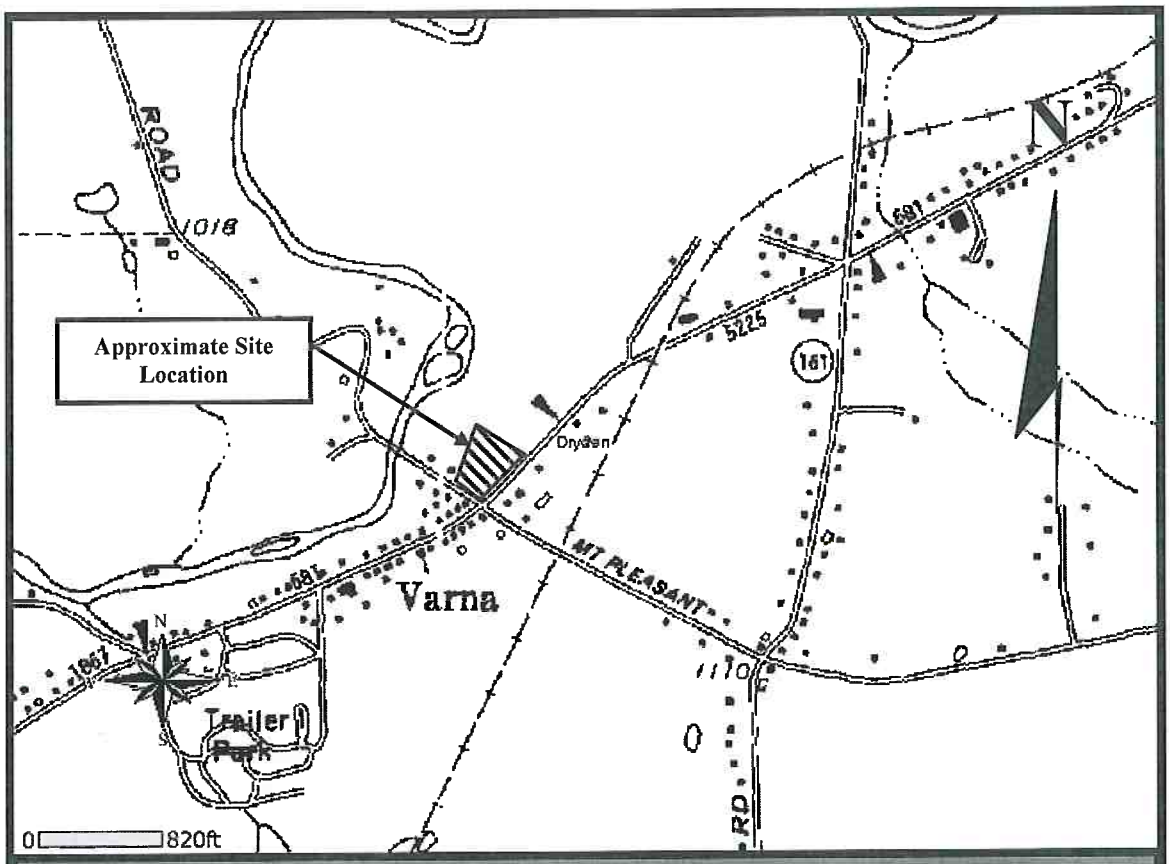
Sincerely,

Wayne C. Matteson, Jr., P.E.
Environmental Professional

attachments

cc: Mr. Nickolas Bellisario
Mr. Otis Phillips

Wayne C. Matteson, Jr., P.E., 3893 Eatonbrook Road, Erieville, NY 13061
315-662-7146 (telephone) 607-423-4321 (cell)



NYS Office of Parks Recreation and Historic Preservation Map

Monkey Run Townhouse Project Property
5 Freese Road
Town of Dryden
Tompkins County, New York

Source: NYSOPRHP

Tompkins County, New York

HsB—Hudson silty clay loam, 2 to 6 percent slopes

Map Unit Setting

Elevation: 300 to 1,800 feet
Mean annual precipitation: 32 to 42 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days

Map Unit Composition

Hudson and similar soils: 80 percent

Description of Hudson

Setting

Landform: Lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Clayey and silty glaciolacustrine deposits

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
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 18 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Available water capacity: High (about 9.4 inches)

Interpretive groups

Land capability (nonirrigated): 2e

Typical profile

0 to 12 inches: Silty clay loam
12 to 36 inches: Silty clay loam
36 to 60 inches: Silt loam

Data Source Information

Soil Survey Area: Tompkins County, New York
Survey Area Data: Version 5, Dec 11, 2006

Tompkins County, New York

Mm—Madalin mucky silty clay loam

Map Unit Setting

Mean annual precipitation: 32 to 42 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days

Map Unit Composition

Madalin and similar soils: 75 percent

Description of Madalin

Setting

Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Clayey and silty glaciolacustrine deposits

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly 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 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 10 percent
Available water capacity: Moderate (about 8.4 inches)

Interpretive groups

Land capability (nonirrigated): 5w

Typical profile

0 to 8 inches: Mucky silty clay loam
8 to 26 inches: Silty clay
26 to 60 inches: Clay

Data Source Information

Soil Survey Area: Tompkins County, New York
Survey Area Data: Version 5, Dec 11, 2006

Tompkins County, New York

CdC—Chenango gravelly loam, 5 to 15 percent slopes

Map Unit Setting

Elevation: 600 to 1,800 feet
Mean annual precipitation: 32 to 42 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days

Map Unit Composition

Chenango and similar soils: 80 percent

Description of Chenango

Setting

Landform: Valley trains, terraces
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits, derived mainly from sandstone, shale, and siltstone

Properties and qualities

Slope: 5 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 4.0 inches)

Interpretive groups

Land capability (nonirrigated): 3e

Typical profile

0 to 8 inches: Gravelly loam
8 to 26 inches: Gravelly silt loam
26 to 60 inches: Very gravelly loamy coarse sand

Data Source Information

Soil Survey Area: Tompkins County, New York
Survey Area Data: Version 5, Dec 11, 2006

Tompkins County, New York

HdA—Howard gravelly loam, 0 to 5 percent slopes

Map Unit Setting

Mean annual precipitation: 32 to 42 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days

Map Unit Composition

Howard and similar soils: 75 percent

Description of Howard

Setting

Landform: Valley trains, terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits, containing significant amounts of limestone

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Available water capacity: Low (about 4.8 inches)

Interpretive groups

Land capability (nonirrigated): 2s

Typical profile

0 to 9 inches: Gravelly loam
9 to 25 inches: Loam
25 to 47 inches: Gravelly silt loam
47 to 60 inches: Error

Data Source Information

Soil Survey Area: Tompkins County, New York
Survey Area Data: Version 5, Dec 11, 2006

CONTRACTOR CERTIFICATION

MONKEY RUN TOWNHOUSE PROJECT

Town of Dryden, Tompkins County, NY

In accordance with the requirements of the SPDES General Permit for Storm Water Discharges from Construction Activity (GP-0-10-001) each contractor and subcontractor involved in soil disturbance shall sign this certification acknowledging that they have read and understand the SWPPP. The certification shall be signed by a principal or president of the firm.

> "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 most current version of the New York State Pollutant Discharge Elimination System (SPDES) General Permit for storm water discharges from construction activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards established by the State of New York, the County of Tompkins, and/or the Town of Dryden. 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."

SIGNED: _____ **DATE:** _____

PRINTED NAME AND TITLE: _____

TRAINED CONTRACTOR NAME AND TITLE: _____

COMPANY: _____

ADDRESS: _____

_____

_____

TELEPHONE: _____

CONTRACTOR RESPONSIBILITIES: _____

APPENDIX D

EROSION CONTROL MEASURES STANDARD AND SPECFICATIONS

- Stabilized Construction Entrance
- Dust Control
- Silt Fence
- Check Dam
- Grassed Waterway
- Sediment Trap
- Earth Dike
- Forebay/Storm Water Retention Pond (See Plans)

STANDARD AND SPECIFICATIONS FOR STABILIZED CONSTRUCTION ENTRANCE

Definition

A stabilized pad of aggregate underlain with geotextile located at any point where traffic will be entering or leaving a construction site to or from a public right-of-way, street, alley, sidewalk, or parking area.

Purpose

The purpose of stabilized construction entrance is to reduce or eliminate the tracking of sediment onto public rights-of-way or streets.

Conditions Where Practice Applies

A stabilized construction entrance shall be used at all points of construction ingress and egress.

Design Criteria

See Figure 5A.35 on page 5A.76 for details.

Aggregate Size: Use a matrix of 1-4 inch stone, or reclaimed or recycled concrete equivalent.

Thickness: Not less than six (6) inches.

Width: 12-foot minimum but not less than the full width of points where ingress or egress occurs. 24-foot minimum if there is only one access to the site.

Length: As required, but not less than 50 feet (except on a single residence lot where a 30 foot minimum would apply).

Geotextile: To be placed over the entire area to be covered with aggregate. Filter cloth will not be required on a single-family residence lot. Piping of surface water under entrance shall be provided as required. If piping is impossible, a mountable berm with 5:1 slopes will be permitted.

Criteria for Geotextile

The geotextile shall be woven or nonwoven fabric consisting only of continuous chain polymeric filaments or yarns of polyester. The fabric shall be inert to commonly encountered chemicals, hydro-carbons, mildew, rot resistant, and conform to the fabric properties as shown:

Fabric Properties[3]	Light Duty[1] Roads Grade Subgrade	Heavy Duty[2] Haul Roads Rough Graded	Test Method
Grab Tensile Strength (lbs)	200	220	ASTM D1682
Elongation at Failure (%)	50	60	ASTM D1682
Mullen Brust Strength (lbs)	190	430	ASTM D3786
Puncture Strength (lbs)	40	125	ASTM D751 modified
Equivalent Opening Size	40-80	40-80	US Std Sieve CW-02215
Aggregate Depth	6	10	--

[1]Light Duty Road: Area sites that have been graded to subgrade and where most travel would be single axle vehicles and an occasional multi-axle truck. Acceptable materials are Trevira Spunbond 1115, Mirafi 100X, Typar 3401, or equivalent.

[2]Heavy Duty Road: Area sites with only rough grading, and where most travel would be multi-axle vehicles. Acceptable materials are Trevira Spunbond 1135, Mirafi 600X, or equivalent.

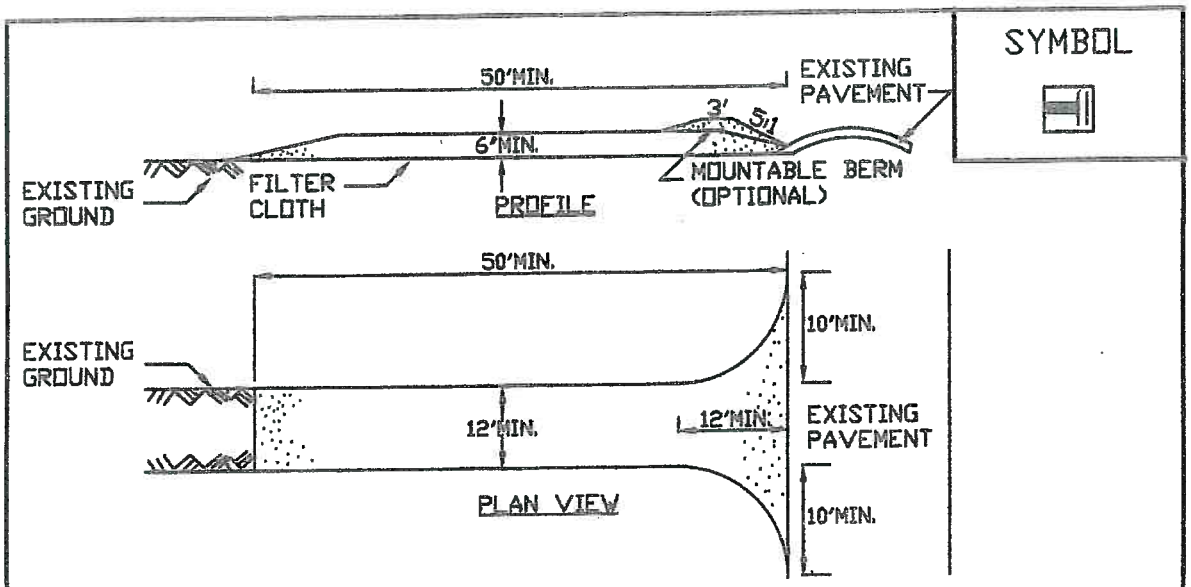
[3]Fabrics not meeting these specifications may be used only when design procedure and supporting documentation are supplied to determine aggregate depth and fabric strength.

Maintenance

The entrance shall be maintained in a condition which will prevent tracking of sediment onto public rights-of-way or streets. This may require periodic top dressing with additional aggregate. All sediment spilled, dropped, or washed onto public rights-of-way must be removed immediately.

When necessary, wheels must be cleaned to remove sediment prior to entrance onto public rights-of-way. When washing is required, it shall be done on an area stabilized with aggregate, which drains into an approved sediment-trapping device. All sediment shall be prevented from entering storm drains, ditches, or watercourses.

Figure 5A.35
Stabilized Construction Entrance



CONSTRUCTION SPECIFICATIONS

1. STONE SIZE - USE 1-4 INCH STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH - NOT LESS THAN 50 FEET (EXCEPT ON A SINGLE RESIDENCE LOT WHERE A 30 FOOT MINIMUM LENGTH WOULD APPLY).
3. THICKNESS - NOT LESS THAN SIX (6) INCHES.
4. WIDTH - TWELVE (12) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS. TWENTY-FOUR (24) FOOT IF SINGLE ENTRANCE TO SITE.
5. GEOTEXTILE - WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
6. SURFACE WATER - ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
7. MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY, ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACTED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
8. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON A AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.

ADAPTED FROM DETAILS PROVIDED BY: USDA - NRCS, NEW YORK STATE DEPARTMENT OF TRANSPORTATION, NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION, NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE

STABILIZED CONSTRUCTION ENTRANCE

STANDARD AND SPECIFICATIONS FOR DUST CONTROL

Definition

The control of dust resulting from land-disturbing activities.

Purpose

To prevent surface and air movement of dust from disturbed soil surfaces that may cause off-site damage, health hazards, and traffic safety problems.

Conditions Where Practice Applies

On construction roads, access points, and other disturbed areas subject to surface dust movement and dust blowing where off-site damage may occur if dust is not controlled.

Design Criteria

Construction operations should be scheduled to minimize the amount of area disturbed at one time. Buffer areas of vegetation should be left where practical. Temporary or permanent stabilization measures shall be installed. No specific design criteria is given; see construction specifications below for common methods of dust control.

Water quality must be considered when materials are selected for dust control. Where there is a potential for the material to wash off to a stream, ingredient information must be provided to the local permitting authority.

Construction Specifications

A. **Non-driving Areas** – These areas use products and materials applied or placed on soil surfaces to prevent airborne migration of soil particles.

Vegetative Cover – For disturbed areas not subject to traffic, vegetation provides the most practical method of dust control (see Section 3).

Mulch (including gravel mulch) – Mulch offers a fast effective means of controlling dust. This can also include rolled erosion control blankets.

Spray adhesives – These are products generally composed of polymers in a liquid or solid form that are mixed with water to form an emulsion that is sprayed on the soil surface with typical hydroseeding equipment. The mixing ratios and application rates will be in accordance with the manufacturer's recommendations for the specific soils on the site. In no case should the application of these adhesives be made on wet soils or if there is a probability of precipitation within 48 hours of its proposed use. Material Safety Data Sheets will be provided to all applicators and others working with the material.

B. **Driving Areas** – These areas utilize water, polymer emulsions, and barriers to prevent dust movement from the traffic surface into the air.

Sprinkling – The site may be sprayed with water until the surface is wet. This is especially effective on haul roads and access routes.

Polymer Additives – These polymers are mixed with water and applied to the driving surface by a water truck with a gravity feed drip bar, spray bar or automated distributor truck. The mixing ratios and application rates will be in accordance with the manufacturer's recommendations. Incorporation of the emulsion into the soil will be done to the appropriate depth based on expected traffic. Compaction after incorporation will be by vibratory roller to a minimum of 95%. The prepared surface shall be moist and no application of the polymer will be made if there is a probability of precipitation within 48 hours of its proposed use. Material Safety Data Sheets will be provided to all applicators working with the material.

Barriers – Woven geotextiles can be placed on the driving surface to effectively reduce dust throw and particle migration on haul roads. Stone can also be used for construction roads for effective dust control.

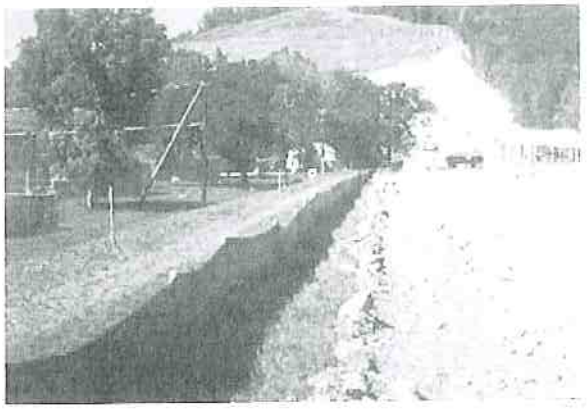
Windbreak – A silt fence or similar barrier can control air currents at int als equal to ten times the barrier height. Preserve existing wind barrier vegetation as much as practical.

All Stormwater Pollution Prevention Plans must contain the NYS DEC issued "Conditions for Use" and "Application Instructions" for any polymers used on the site. This information can be obtained from the NYS DEC website.

Maintenance

Maintain dust control measures through dry weather periods until all disturbed areas are stabilized.

STANDARD AND SPECIFICATIONS FOR SILT FENCE



Definition

A temporary barrier of geotextile fabric installed on the contours across a slope used to intercept sediment laden runoff from small drainage areas of disturbed soil.

Purpose

The purpose of a silt fence is to reduce runoff velocity and effect deposition of transported sediment load. Limits imposed by ultraviolet stability of the fabric will dictate the maximum period the silt fence may be used (approximately one year).

Conditions Where Practice Applies

A silt fence may be used subject to the following conditions:

1. Maximum allowable slope lengths contributing runoff to a silt fence placed on a slope are:

Slope Steepness	Maximum Length (ft.)
2:1	25
3:1	50
4:1	75
5:1 or flatter	100

2. Maximum drainage area for overland flow to a silt fence shall not exceed ¼ acre per 100 feet of fence, with maximum ponding depth of 1.5 feet behind the fence; and

3. Erosion would occur in the form of sheet erosion; and

4. There is no concentration of water flowing to the barrier.

Design Criteria

Design computations are not required for installations of 1 month or less. Longer installation periods should be designed for expected runoff. All silt fences shall be placed as close to the areas as possible, but at least 10 feet from the toe of a slope to allow for maintenance and roll down. The area beyond the fence must be undisturbed or stabilized.

Sensitive areas to be protected by silt fence may need to be reinforced by using heavy wire fencing for added support to prevent collapse.

Where ends of filter cloth come together, they shall be overlapped, folded and stapled to prevent sediment bypass. A detail of the silt fence shall be shown on the plan. See Figure 5A.8 on page 5A.21 for details.

Criteria for Silt Fence Materials

1. Silt Fence Fabric: The fabric shall meet the following specifications unless otherwise approved by the appropriate erosion and sediment control plan approval authority. Such approval shall not constitute statewide acceptance.

Fabric Properties	Minimum Acceptable Value	Test Method
Grab Tensile Strength (lbs)	90	ASTM D1682
Elongation at Failure (%)	50	ASTM D1682

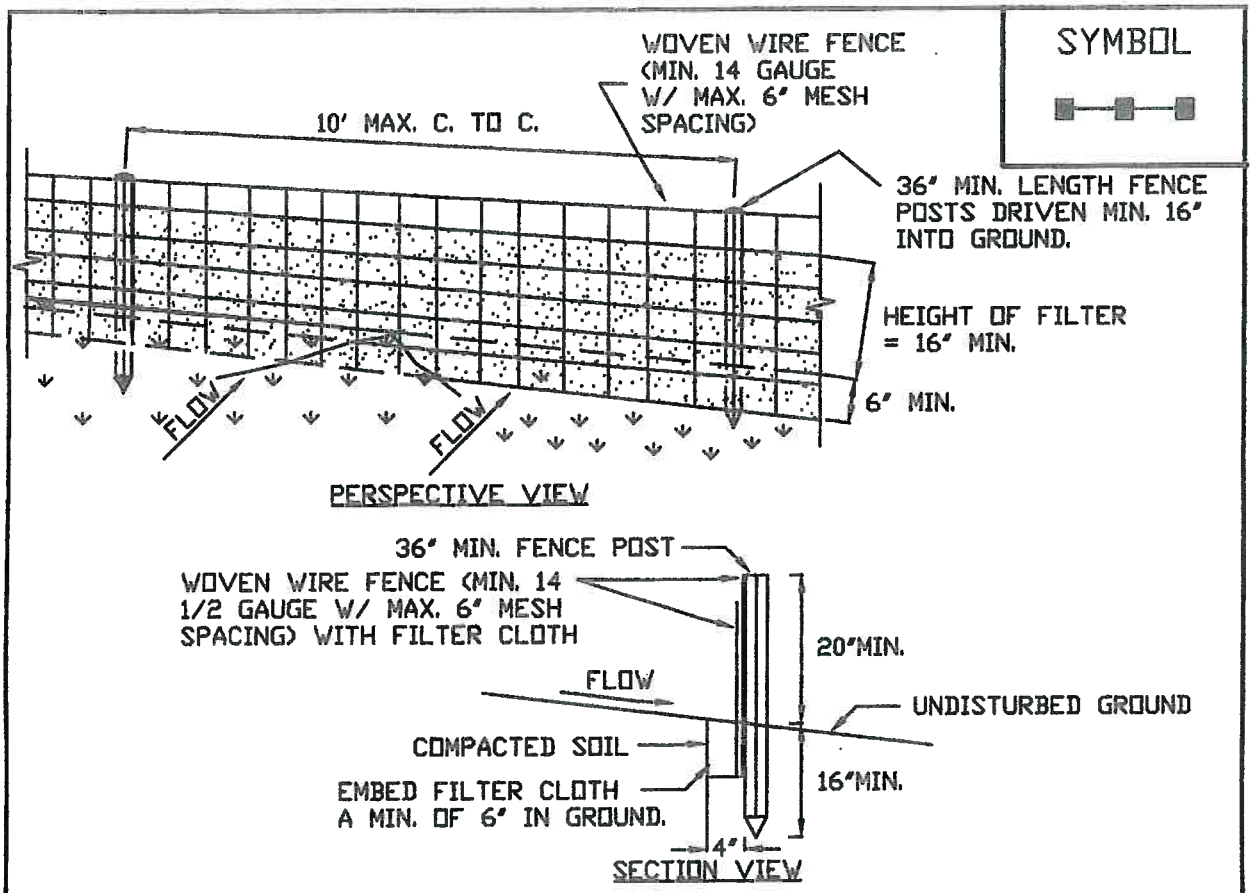
Mullen Burst Strength (PSI)	190	ASTM D3786
Puncture Strength (lbs)	40	ASTM D751 (modified)
Slurry Flow Rate (gal/min/sf)	0.3	
Equivalent Opening Size	40-80	US Std Sieve CW-02215
Ultraviolet Radiation Stability (%)	90	ASTM G-26

2. Fence Posts (for fabricated units): The length shall be a minimum of 36 inches long. Wood posts will be of sound quality hardwood with a minimum cross sectional area of 3.0 square inches. Steel posts will be standard T and U section weighing not less than 1.00 pound per linear foot.

3. Wire Fence (for fabricated units): Wire fencing shall be a minimum 14 gage with a maximum 6 in. mesh opening, or as approved.

4. Prefabricated Units: Envirofence, Geofab, or approved equal, may be used in lieu of the above method providing the unit is installed per details shown in Figure 5A.8.

Figure 5A.8
Silt Fence



CONSTRUCTION SPECIFICATIONS

1. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES. POSTS SHALL BE STEEL EITHER "T" OR "U" TYPE OR HARDWOOD.
2. FILTER CLOTH TO BE TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION. FENCE SHALL BE WOVEN WIRE, 6" MAXIMUM MESH OPENING.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVER-LAPPED BY SIX INCHES AND FOLDED. FILTER CLOTH SHALL BE EITHER FILTER X, MIRAFI 100X, STABILINKA T140N, OR APPROVED EQUIVALENT.
4. PREFABRICATED UNITS SHALL BE GEOFAB, ENVIROFENCE, OR APPROVED EQUIVALENT.
5. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.

ADAPTED FROM DETAILS PROVIDED BY: USDA - NRCS, NEW YORK STATE DEPARTMENT OF TRANSPORTATION, NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION, NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE	SILT FENCE

STANDARD AND SPECIFICATIONS FOR CHECK DAM

Definition

Small barriers or dams constructed of stone, bagged sand or gravel, or other durable material across a drainage way.

Purpose

To reduce erosion in a drainage channel by restricting the velocity of flow in the channel.

Condition Where Practice Applies

This practice is used as a temporary or emergency measure to limit erosion by reducing velocities in small open channels that are degrading or subject to erosion and where permanent stabilization is impractical due to short period of usefulness and time constraints of construction.

Design Criteria

Drainage Area: Maximum drainage area above the check dam shall not exceed two (2) acres.

Height: Not greater than 2 feet. Center shall be maintained 9 inches lower than abutments at natural ground elevation.

Side Slopes: Shall be 2:1 or flatter.

Spacing: The check dams shall be spaced as necessary in the channel so that the crest of the downstream dam is at the elevation of the toe of the upstream dam. This spacing is equal to the height of the check dam divided by the channel slope.

Therefore:

$S = h/s$

Where:

S = spacing interval (ft.)
h = height of check dam (ft.)
s = channel slope (ft./ft.)

Example:

For a channel with a 4% slope and 2 ft. high stone check dams, they are spaced as follows:

$$S = \frac{2 \text{ ft.}}{.04 \text{ ft/ft.}} = 50 \text{ ft.}$$

Stone size: Use a well graded stone matrix 2 to 9 inches in size (NYS – DOT Light Stone Fill meets these requirements).

The overflow of the check dams will be stabilized to resist erosion that might be caused by the check dam. See Figure 5A.9 on page 5A.24 for details.

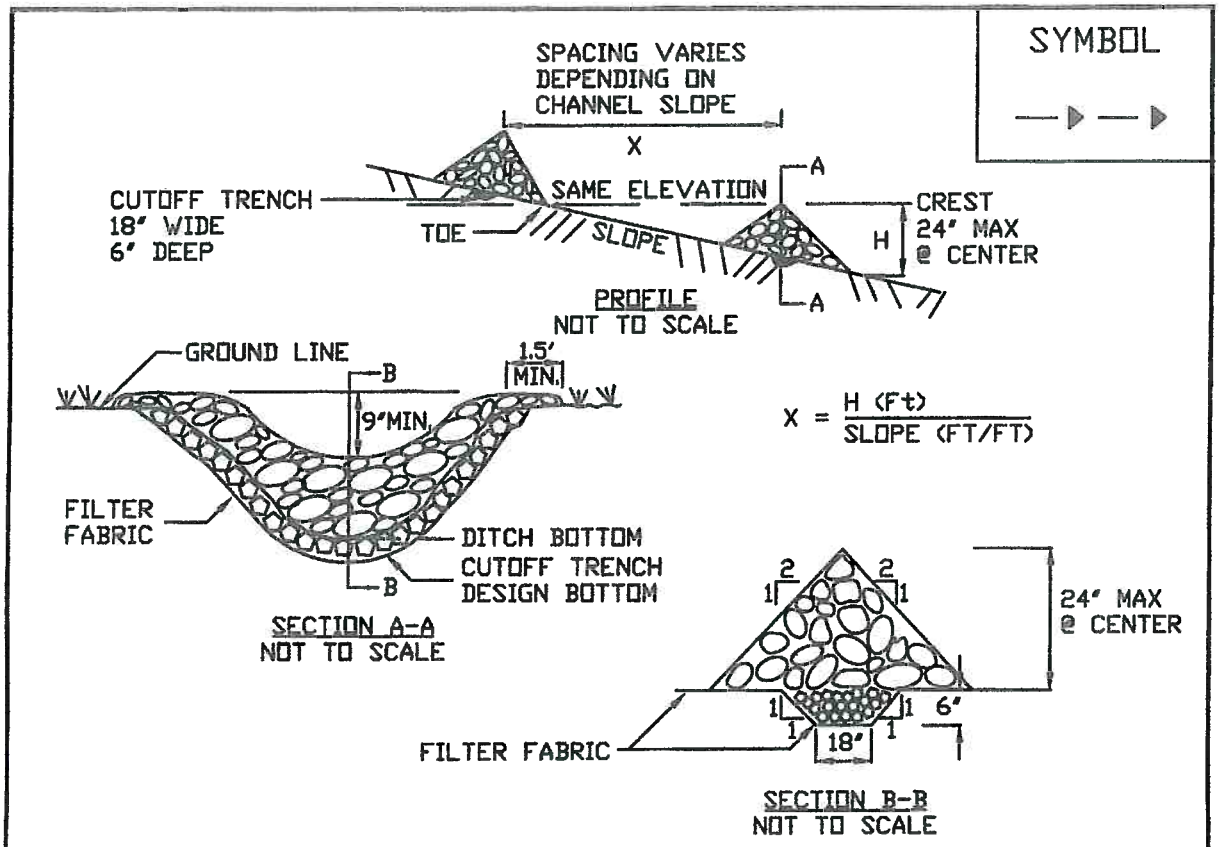
Check dams should be anchored in the channel by a cutoff trench 1.5 ft. wide and 0.5 ft. deep and lined with filter fabric to prevent soil migration.

Maintenance

The check dams should be inspected after each runoff event. Correct all damage immediately. If significant erosion has occurred between structures, a liner of stone or other suitable material should be installed in that portion of the channel.

Remove sediment accumulated behind the dam as needed to allow channel to drain through the stone check dam and prevent large flows from carrying sediment over the dam. Replace stones as needed to maintain the design cross section of the structures.

Figure 5A.9
Check Dam



CONSTRUCTION SPECIFICATIONS

1. STONE WILL BE PLACED ON A FILTER FABRIC FOUNDATION TO THE LINES, GRADES AND LOCATIONS SHOWN IN THE PLAN.
2. SET SPACING OF CHECK DAMS TO ASSUME THAT THE ELEVATIONS OF THE CREST OF THE DOWNSTREAM DAM IS AT THE SAME ELEVATION OF THE TOE OF THE UPSTREAM DAM.
3. EXTEND THE STONE A MINIMUM OF 1.5 FEET BEYOND THE DITCH BANKS TO PREVENT CUTTING AROUND THE DAM.
4. PROTECT THE CHANNEL DOWNSTREAM OF THE LOWEST CHECK DAM FROM SCOUR AND EROSION WITH STONE OR LINER AS APPROPRIATE.
5. ENSURE THAT CHANNEL APPURTENANCES SUCH AS CULVERT ENTRANCES BELOW CHECK DAMS ARE NOT SUBJECT TO DAMAGE OR BLOCKAGE FROM DISPLACED STONE.

MAXIMUM DRAINAGE AREA 2 ACRES.

ADAPTED FROM DETAILS PROVIDED BY: USDA - NRCS, NEW YORK STATE DEPARTMENT OF TRANSPORTATION, NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION, NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE	CHECK DAM

STANDARD AND SPECIFICATIONS FOR GRASSED WATERWAY

Definition

A natural or man-made channel of parabolic or trapezoidal cross-section that is below adjacent ground level and is stabilized by suitable vegetation. The flow channel is normally wide and shallow and conveys the runoff down the slope.

Purpose

The purpose of a grassed waterway is to convey runoff without causing damage by erosion.

Conditions Where Practice Applies

Grass waterways are used where added vegetative protection is needed to control erosion resulting from concentrated runoff.

Design Criteria

Capacity

The minimum capacity shall be that required to confine the peak rate of runoff expected from a 10-year frequency rainfall event or a higher frequency corresponding to the hazard involved. This requirement for confinement may be waived on slopes of less than one (1) percent where out-of-bank flow will not cause erosion or property damage.

Peak rates of runoff values used in determining the capacity requirements shall be computed by TR-55, Urban Hydrology for Small Watersheds, or other appropriate methods.
Where there is base flow, it shall be handled by a stone center, subsurface drain, or other suitable means since sustained wetness usually prevents adequate vegetative cover. The cross-sectional area of the stone center or subsurface drain size to be provided shall be determined by using a flow rate of 0.1 cfs/acre or by actual measurement of the maximum base flow.

Velocity

Please see Table 5B.1, Diversion Maximum Permissible Design Velocities, for seed, soil, and velocity variables.

Cross Section

The design water surface elevation of a grassed waterway receiving water from diversions or other tributary channels shall be equal to or less than the design water surface elevation in the diversion or other tributary channels.

The top width of parabolic waterways shall not exceed 30 feet and the bottom width of trapezoidal waterways shall not exceed 15 feet unless multiple or divided waterways, stone center, or other means are provided to control meandering of low flows.

Structural Measures

In cases where grade or erosion problems exist, special control measures may be needed such as lined waterways (5B.17), or grade stabilization measures (5B.31). Where needed, these measures will be supported by adequate design computations. For typical cross sections of waterways with riprap sections or stone centers, refer to Figure 5B.8 on page 5B.13.

The design procedures for parabolic and trapezoidal channels are available in the NRCS Engineering Field Handbook; Figure 5B.9 on page 5B.14 also provides a design chart for parabolic waterway.

Outlets

Each waterway shall have a stable outlet. The outlet may be another waterway, a stabilized open channel, grade stabilization structure, etc. In all cases, the outlet must discharge in such a manner as not to cause erosion. Outlets shall be constructed and stabilized prior to the operation of the waterway.

Stabilization

Waterways shall be stabilized in accordance with the appropriate vegetative stabilization standard and specifications, and will be dependent on such factors as slope, soil class, etc.

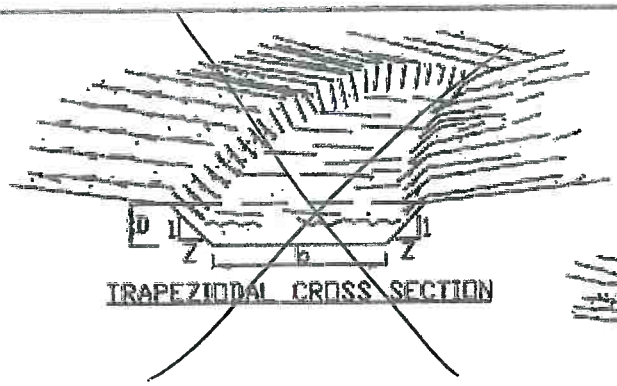
Construction Specifications

See Figure 5B.10 on page 5B.15 for details.

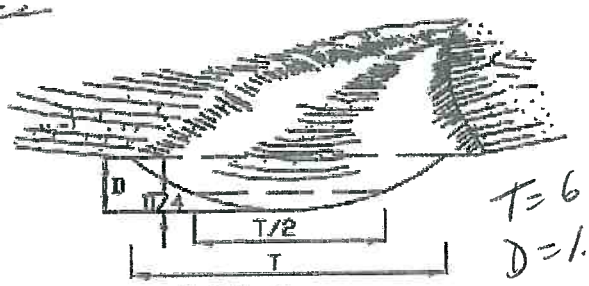
Figure 5B.10
Grassed Waterway

SYMBOL

GL



TRAPEZIODAL CROSS SECTION



T = 6'
D = 1.5'

PARABOLIC CROSS SECTION

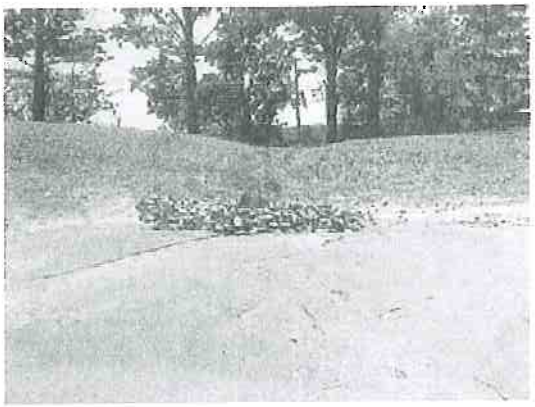
CONSTRUCTION SPECIFICATIONS

1. ALL TREES, BRUSH, STUMPS, OBSTRUCTIONS, AND OTHER OBJECTIONABLE MATERIAL SHALL BE REMOVED AND DISPOSED OF SO AS NOT TO INTERFERE WITH THE PROPER FUNCTIONING OF THE WATERWAY.
2. THE WATERWAY SHALL BE EXCAVATED OR SHAPED TO LINE, GRADE, AND CROSS SECTION AS REQUIRED TO MEET THE CRITERIA SPECIFIED HEREIN, AND BE FREE OF BANK PROJECTIONS OR OTHER IRREGULARITIES WHICH WILL IMPEDE NORMAL FLOW.
3. FILLS SHALL BE COMPACTED AS NEEDED TO PREVENT UNEQUAL SETTLEMENT THAT WOULD CAUSE DAMAGE IN THE COMPLETE WATERWAY.
4. ALL EARTH REMOVED AND NOT NEEDED IN CONSTRUCTION SHALL BE SPREAD OR DISPOSED OF SO THAT IT WILL NOT INTERFERE WITH THE FUNCTIONING OF THE WATERWAY.
5. STABILIZATION SHALL BE DONE ACCORDING TO THE APPROPRIATE STANDARD AND SPECIFICATIONS FOR VEGETATIVE PRACTICES.
   - A. FOR DESIGN VELOCITIES OF LESS THAN 3.5 FT. PER. SEC., SEEDING AND MULCHING MAY BE USED FOR THE ESTABLISHMENT OF THE VEGETATION. IT IS RECOMMENDED THAT, WHEN CONDITIONS PERMIT, TEMPORARY WATERWAYS OR OTHER MEANS SHOULD BE USED TO PREVENT WATER FROM ENTERING THE WATERWAY DURING THE ESTABLISHMENT OF THE VEGETATION.
   - B. FOR DESIGN VELOCITIES OF MORE THAN 3.5 FT. PER. SEC., THE WATERWAY SHALL BE STABILIZED WITH SOD, WITH SEEDING PROTECTED BY JUTE OR EXCELSIOR MATTING OR WITH SEEDING AND MULCHING INCLUDING TEMPORARY DIVERSION OF THE WATER UNTIL THE VEGETATION IS ESTABLISHED.
   - C. STRUCTURAL - VEGETATIVE PROTECTION
     SUBSURFACE DRAIN FOR BASE FLOW SHALL BE CONSTRUCTED AS SHOWN ON THE STANDARD DRAWING AND AS SPECIFIED IN THE STANDARD AND SPECIFICATIONS FOR SUBSURFACE DRAIN.

ADAPTED FROM DETAILS PROVIDED BY: USDA - NRCS,
NEW YORK STATE DEPARTMENT OF TRANSPORTATION,
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION,
NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE

GRASSED WATERWAY

STANDARD AND SPECIFICATIONS FOR SEDIMENT TRAP



Definition

A temporary sediment control device formed by excavation and/or embankment to intercept sediment laden runoff and retain the sediment.

Purpose

The purpose of the structure is to intercept sediment-laden runoff and trap the sediment in order to protect drainage ways, properties, and rights-of-way below the sediment trap from sedimentation.

Conditions Where Practice Applies

A sediment trap is usually installed in a drainage way, at a storm drain inlet, or other points of collection from a disturbed area.

Sediment traps should be used to artificially break up the natural drainage area into smaller sections where a larger device (sediment basin) would be less effective.

Design Criteria

If any of the design criteria presented here cannot be met, see Standard and Specification for Sediment Basin on page 5A.49.

Drainage Area

The drainage area for sediment traps shall be in accordance with the specific type of sediment trap used (Type I through V).

Location

Sediment traps shall be located so that they can be installed prior to grading or filling in the drainage area they are to protect. Traps must not be located any closer than 20 feet from a proposed building foundation if the trap is to function during building construction. Locate traps to obtain maximum storage benefit from the terrain and for ease of cleanout and disposal of the trapped sediment.

Trap Size

The volume of a sediment trap as measured at the elevation of the crest of the outlet shall be at least 3,600 cubic feet per acre of drainage area. The volume of a constructed trap shall be calculated using standard mathematical procedures. The volume of a natural sediment trap may be approximated by the equation: Volume (cu.ft.) = 0.4 x surface area (sq.ft.) x maximum depth (ft.).

Trap Cleanout

Sediment shall be removed and the trap restored to the original dimensions when the sediment has accumulated to ½ of the design depth of the trap. Sediment removed from the trap shall be deposited in a protected area and in such a manner that it will not erode.

Embankment

All embankments for sediment traps shall not exceed five (5) feet in height as measured at the low point of the original ground along the centerline of the embankment. Embankments shall have a minimum four (4) foot wide top and side slopes of 2:1 or flatter. The embankment shall be compacted by traversing with equipment while it is being constructed. The embankment shall be stabilized with seed and mulch as soon as it is completed

The elevation of the top of any dike directing water to any sediment trap will equal or exceed the maximum height of the outlet structure along the entire length of the trap.

Excavation

All excavation operations shall be carried out in such a manner that erosion and water pollution shall be minimal. Excavated portions of sediment traps shall have 1:1 or flatter slopes.

Outlet

The outlet shall be designed, constructed, and maintained in such a manner that sediment does not leave the trap and that erosion at or below the outlet does not occur.

Sediment traps must outlet onto stabilized (preferable undisturbed) ground, into a watercourse, stabilized channel, or into a storm drain system. Distance between inlet and outlet should be maximized to the longest length practicable.

Trap Details Needed on Erosion and Sediment Control Plans

Each trap shall be delineated on the plans in such a manner that it will not be confused with any other features. Each trap on a plan shall indicate all the information necessary to properly construct and maintain the structure. If the drawings are such that this information cannot be delineated on the drawings, then a table shall be developed. If a table is developed, then each trap on a plan shall have a number and the numbers shall be consecutive.

The following information shall be shown for each trap in a summary table format on the plans.

1. Trap number
2. Type of trap
3. Drainage area
4. Storage required
5. Storage provided (if applicable)
6. Outlet length or pipe sizes
7. Storage depth below outlet or cleanout elevation
8. Embankment height and elevation (if applicable)

Type of Sediment Traps

There are five (5) specific types of sediment traps which vary according to their function, location, or drainage area.

I. Pipe Outlet Sediment Trap
II. Grass Outlet Sediment Trap
III. Catch Basin Sediment Trap
IV. Stone Outlet Sediment Trap
V. Riprap Outlet Sediment Trap

I. Pipe Outlet Sediment Trap

A Pipe Outlet Sediment Trap consists of a trap formed by embankment or excavation. The outlet for the trap is through a perforated riser and a pipe through the embankment. The outlet pipe and riser shall be made of steel, corrugated metal or other suitable material. The top of the embankment shall be at least 1 ½ feet above the crest of the riser. The top 2/3 of the riser shall be perforated with one (1) inch nominal diameter holes or slits spaced six (6) inches vertically and horizontally placed in the concave portion of the corrugated pipe.

No holes or slits will be allowed within six (6) inches of the top of the horizontal barrel. All pipe connections shall be watertight. The riser shall be wrapped with ½ to ¼ inch hardware cloth wire then wrapped with filter cloth with a sieve size between #40-80 and secured with strapping or connecting band at the top and bottom of the cloth. The cloth shall cover an area at least six (6) inches above the highest hole and six (6) inches below the lowest hole. The top of the riser pipe shall not be covered with filter cloth. The riser shall have a base with sufficient weight to prevent flotation of the riser. Two approved bases are:

1. A concrete base 12 in. thick with the riser embedded 9 in. into the concrete base, or

2. One quarter inch, minimum, thick steel plate attached to the riser by a continuous weld around the circumference of the riser to form a watertight connection. The plate shall have 2.5 feet of stone, gravel, or earth placed on it to prevent flotation. In either case, each side of the square base measurement shall be the riser diameter plus 24 inches.

Pipe outlet sediment traps shall be limited to a five (5) acre maximum drainage area. Pipe outlet sediment traps may be interchangeable in the field with stone outlet or riprap sediment traps provided that these sediment traps are constructed in accordance with the detail and specifications for that trap.

Select pipe diameter from the following table:

Minimum Sizes

Barrel Diameter[1] (in.)	Riser Diameter[1] (in.)	Maximum Drainage Area (ac.)
12	15	1
15	18	2
18	21	3
21	24	4
21	27	5

[1] Barrel diameter may be same size as riser diameter.

See details for Pipe Outlet Sediment Trap ST-I in Figure 5A.16 (1) and 5A.16 (2) on pages 5A.38 and 5A.39.

II. Grass Outlet Sediment Trap

A Grass Outlet Sediment Trap consists of a trap formed by excavating the earth to create a holding area. The trap has a discharge point over natural existing grass. The outlet crest width (feet) shall be equal to four (4) times the drainage area (acres) with a minimum width of four (4) feet. The outlet shall be free of any restrictions to flow. The outlet lip must remain undisturbed and level. The volume of this trap shall be computed at the elevation of the crest of the outlet. Grass outlet sediment traps shall be limited to a five (5) acre maximum drainage area.

See details for Grass Outlet Sediment Trap ST-II in Figure 5A.17 on page 5A.40.

III. Catch Basin Sediment Trap

A Catch Basin Sediment Trap consists of a basin formed by excavation on natural ground that discharges through an opening in a storm drain inlet structure. This opening can either be the inlet opening or a temporary opening made by omitting bricks or blocks in the inlet.

A yard drain inlet or an inlet in the median strip of a dual highway could use the inlet opening for the type outlet. The trap should be out of the roadway so as not to interfere with future compaction or construction. Placing the trap on the opposite side of the opening and diverting water from the roadway to the trap is one means of doing this. Catch basin sediment traps shall be limited to a three (3) acre maximum drainage area. The volume of this trap is measured at the elevation of the crest of the outlet (invert of the inlet opening).

See details for Catch Basin Sediment Trap ST-III in Figure 5A.18 on page 5A.41.

IV. Stone Outlet Sediment Trap

A Stone Outlet Sediment Trap consists of a trap formed by an embankment or excavation. The outlet of this trap is over a stone section placed on level ground. The minimum length (feet) of the outlet shall be equal to four (4) times the drainage area (acres).

Required storage shall be 3,600 cubic feet per acre of drainage area.

The outlet crest (top of stone in weir section) shall be level, at least one (1) foot below top of embankment and no more than one (1) foot above ground beneath the outlet. Stone used in the outlet shall be small riprap (4 in. x 8 in.). To provide more efficient trapping effect, a layer of filter cloth should be embedded one (1) foot back into the upstream face of the outlet stone or a one (1) foot thick layer of two (2) inch or finer aggregate shall be placed on the upstream face of the outlet.

Stone Outlet Sediment Traps may be interchangeable in the field with pipe or riprap outlet sediment traps provided they are constructed in accordance with the detail and specifications for those traps. Stone outlet sediment traps shall be limited to a five (5) acre maximum drainage area.

See details for Stone Outlet Sediment Trap ST-IV in Figure 5A.19 on page 5A.42.

V. Riprap Outlet Sediment Trap

A Riprap Outlet Sediment Trap consists of a trap formed by an excavation and embankment. The outlet for this trap shall be through a partially excavated channel lined with riprap. This outlet channel shall discharge onto a stabilized area or to a stable watercourse. The riprap outlet sediment trap may be used for drainage areas of up to a maximum of 15 acres.

Design Criteria for Riprap Outlet Sediment Trap

1. The total contributing drainage area (disturbed or undisturbed either on or off the developing property) shall not exceed 15 acres.
2. The storage needs for this trap shall be computed using 3600 cubic feet of required storage for each acre of drainage area. The storage volume provided can be figured by computing the volume of storage area available behind the outlet structure up to an elevation of one (1) foot below the level weir crest.
3. The maximum height of embankment shall not exceed five (5) feet.
4. The elevation of the top of any dike directing water to a riprap outlet sediment trap will equal or exceed the minimum elevation of the embankment along the entire length of this trap.

Riprap Outlet Sediment Trap ST-V
(for Stone Lined Channel)

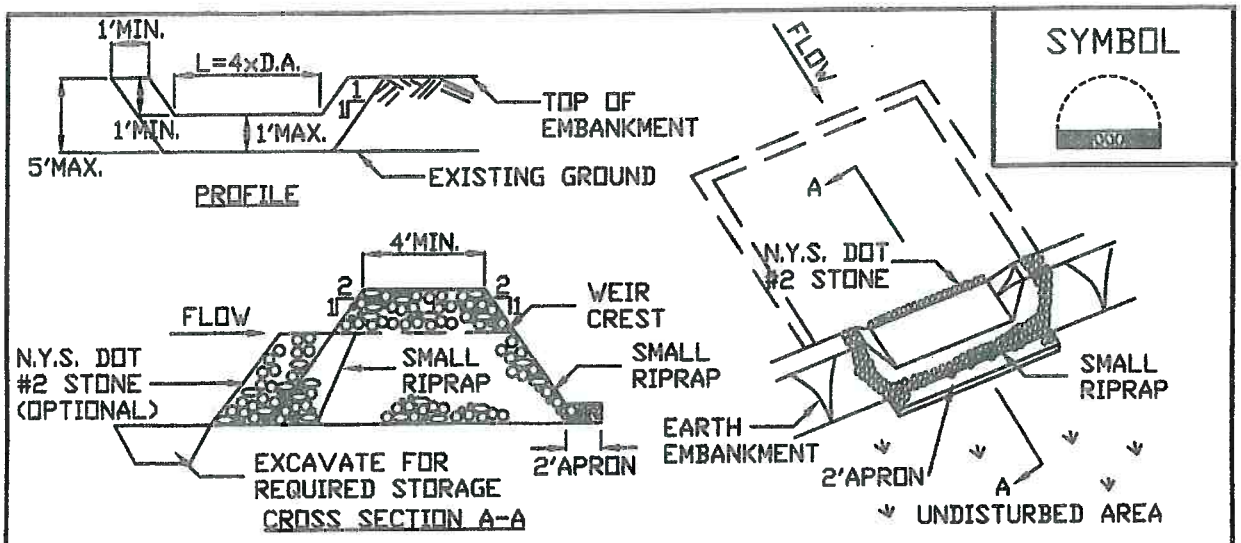
Contributing Drainage Area (ac.)	Depth of Channel (a) (ft.)	Length of Weir (b) (ft.)
1	1.5	4.0
2	1.5	5.0
3	1.5	6.0
4	1.5	10.0
5	1.5	12.0
6	1.5	14.0
7	1.5	16.0
8	2.0	10.0
9	2.0	10.0
10	2.0	12.0
11	2.0	14.0
12	2.0	14.0
13	2.0	16.0
14	2.0	16.0
15	2.0	18.0

See details for Riprap Outlet Sediment Trap ST-V on Figures 5A.20(1) and 5A.20(2) on pages 5A.43 and 5A.44.

Optional Dewatering Methods

Optional dewatering devices may be designed for use with sediment traps. Included are two methods, which may be used. See Figure 5A.21 on page 5A.45 for details.

Figure 5A.19
Stone Outlet Sediment Trap: ST-IV



OPTION: A ONE FOOT LAYER OF N.Y.S. DOT #2 STONE MAY BE PLACED ON THE UPSTREAM SIDE OF THE RIPRAP INPLACE OF THE EMBEDDED FILTER CLOTH.

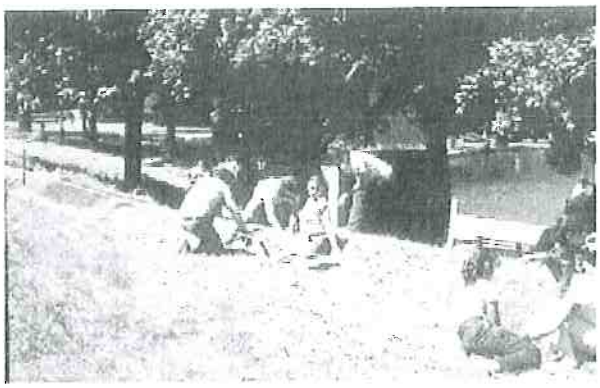
CONSTRUCTION SPECIFICATIONS

1. AREA UNDER EMBANKMENT SHALL BE CLEARED, GRUBBED AND STRIPPED OF ANY VEGETATION AND ROOT MAT. THE POOL AREA SHALL BE CLEARED.
2. THE FILL MATERIAL FOR THE EMBANKMENT SHALL BE FREE OF ROOTS AND OTHER WOODY VEGETATION AS WELL AS OVER-SIZED STONES, ROCKS, ORGANIC MATERIAL OR OTHER OBJECTIONABLE MATERIAL. THE EMBANKMENT SHALL BE COMPACTED BY TRAVERSING WITH EQUIPMENT WHILE IT IS BEING CONSTRUCTED.
3. ALL CUT AND FILL SLOPES SHALL BE 2:1 OR FLATTER.
4. THE STONE USED IN THE OUTLET SHALL BE SMALL RIPRAP 4"-8" ALONG WITH A 1' THICKNESS OF 2" AGGREGATE PLACED ON THE UP-GRADE SIDE ON THE SMALL RIPRAP OR EMBEDDED FILTER CLOTH IN THE RIPRAP.
5. SEDIMENT SHALL BE REMOVED AND TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO 1/2 THE DESIGN DEPTH OF THE TRAP. IT SHALL BE PLACED ON SITE AND STABILIZED.
6. THE STRUCTURE SHALL BE INSPECTED AFTER EACH RAIN AND REPAIRS MADE AS NEEDED.
7. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER THAT EROSION AND SEDIMENT ARE CONTROLLED.
8. THE STRUCTURE SHALL BE REMOVED AND THE AREA STABILIZED WHEN THE DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.

MAXIMUM DRAINAGE AREA 5 ACRES

ADAPTED FROM DETAILS PROVIDED BY: USDA - NRCS, NEW YORK STATE DEPARTMENT OF TRANSPORTATION, NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION, NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE	STONE OUTLET SEDIMENT TRAP ST-IV

STANDARD AND SPECIFICATIONS FOR EARTH DIKE



Definition

A temporary berm or ridge of compacted soil, located in such a manner as to channel water to a desired location.

Purpose

The purpose of an earth dike is to direct runoff to a sediment trapping device, thereby reducing the potential for erosion and off site sedimentation. Earth dikes can also be used for diverting clean water away from disturbed areas.

Conditions Where Practice Applies

Earth dikes are often constructed across disturbed areas and around construction sites such as graded parking lots and subdivisions. The dikes shall remain in place until the disturbed areas are permanently stabilized.

Design Criteria

See Figure 5A.1 on page 5A.2 for details.

General

	Dike A	Dike B
Drainage Area	<5 Ac	5-10 Ac
Dike Height	18 in.	36 in.
Dike Width	24 in.	36 in.
Flow Width	4 ft.	6 ft.
Flow Depth in Channel	8 in.	15 in.
Side Slopes	2:1 or flatter	2:1 or flatter
Grade	0.5% Min. 20% Max.	0.5% Min. 20% Max.

For drainage areas larger than 10 acres, refer to the Standard and Specifications for Diversion on page 5B.1.

Stabilization

Stabilization of the dike shall be completed within 7 days of installation in accordance with the standard and specifications for seed and straw mulch or straw mulch only if not in seeding season and flow channel shall be stabilized as per the following criteria:

Type of Treatment	Channel Grade[1]	Flow Channel A (<5 Ac.)	Flow Channel B (5-10 Ac)
1	0.5-3.0%	Seed & Straw Mulch	Seed & Straw Mulch
2	3.1-5.0%	Seed & Straw Mulch	Seed and cover with RECP, sod, or lined with plastic or 2 in. stone
3	5.1-8.0%	Seed and cover with RECP, Sod, or line with plastic or 2 in. stone	Line with 4-8 in. stone or, Recycled Concrete Equivalent[2] or geotextile
4	8.1-20%	Line with 4-8 in. stone or Recycled Concrete Equivalent[2] or geotextile	Site Specific Engineering Design

[1] In highly erodible soils, as defined by the local approving agency, refer to the next higher slope grade for type of stabilization.
[2] Recycled Concrete Equivalent shall be concrete broken into the required size, and shall contain no steel reinforcement.

Outlet

Earth dikes shall have an outlet that functions with a minimum of erosion.

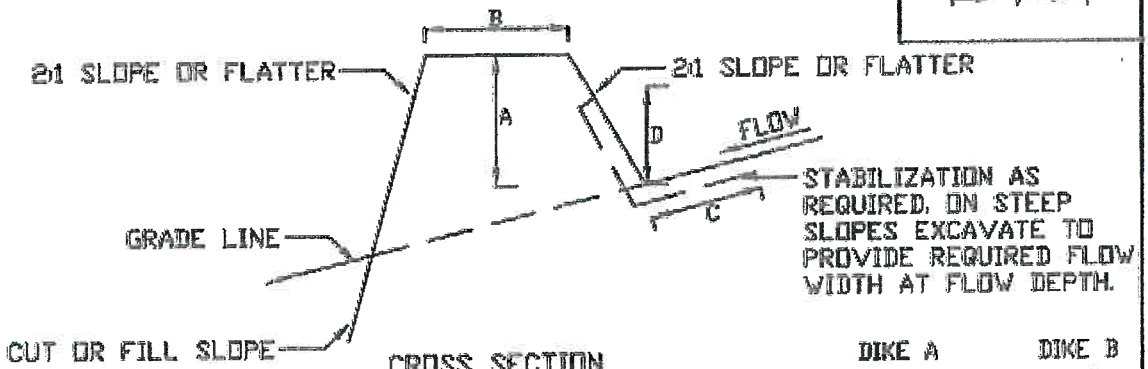
Runoff shall be conveyed to a sediment trapping device until the drainage area above the dike is adequately stabilized.

The on-site loc on may need to be adjusted to meet field conditions in order to utilize the most suitable outlet.

Figure 5A.1
Earth Dike

SYMBOL

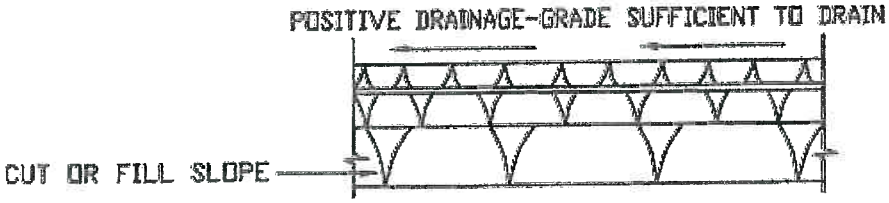
A=2, B=3



CROSS SECTION

NOT TO SCALE

	DIKE A (5 AC. OR LESS)	DIKE B (5-10AC.)
A - DIKE HEIGHT	18"	36"
B - DIKE WIDTH	24"	36"
C - FLOW WIDTH	48"	72"
D - FLOW DEPTH	8"	15"



CONSTRUCTION SPECIFICATIONS

1. ALL DIKES SHALL BE COMPACTED BY EARTH-MOVING EQUIPMENT.
2. ALL DIKES SHALL HAVE POSITIVE DRAINAGE TO AN OUTLET.
3. TOP WIDTH MAY BE WIDER AND SIDE SLOPES BE FLATTER IF DESIRED TO FACILITATE CROSSING BY CONSTRUCTION TRAFFIC.
4. FIELD LOCATION SHOULD BE ADJUSTED AS NEEDED TO UTILIZE A STABILIZED SAFE OUTLET.
5. EARTH DIKES SHALL HAVE AN OUTLET THAT FUNCTIONS WITH A MINIMUM OF EROSION. RUNOFF SHALL BE CONVEYED TO A SEDIMENT TRAPPING DEVICE SUCH AS A SEDIMENT TRAP OR SEDIMENT BASIN WHERE EITHER THE DIKE CHANNEL OR THE DRAINAGE AREA ABOVE THE DIKE ARE NOT ADEQUATELY STABILIZED.
6. STABILIZATION SHALL BE: (A) IN ACCORDANCE WITH STANDARD SPECIFICATIONS FOR SEED AND STRAW MULCH IF NOT IN SEEDING SEASON, (B) FLOW CHANNEL AS PER THE CHART ON THE PREVIOUS PAGE.

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NEW YORK STATE DEPARTMENT OF TRANSPORTATION,
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EARTH DIKE