Appendix 4

STORMWATER MANAGEMENT REPORT

(See attached CD for complete Appendix)

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Engineer's Report - Stormwater Pollution Prevention Plan (SWPPP)

for the proposed Subdivision to be known as

Hilltop Manor Subdivision

Creek Bend Road
Town of East Fishkill
Dutchess County, New York

Prepared For:
EFCM, Inc.
10 Carpenter Road,
Hopewell Jct. New York 12533

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I. Introduction

Project Site Description

The Hilltop Manor Subdivision Proposal involves the development of a ±40.9-acre parcel into twenty one (21) individual residential building lots. The parcel is located along Creek Bend Road, in the Town of East Fishkill, Dutchess County, New York. The parcel is identified as tax parcel 132800-6457-02-885725 on the Town of East Fishkill Tax Map. The disturbance area related to the Hilltop Manor subdivision planned construction exceeds the threshold defined by New York State Department of Environmental Conservation's State Pollutant Discharge Elimination System (NYSDEC SPDES) General Permit for construction related activities, as the disturbance is greater than one (1) acre. The total anticipated disturbance has been estimated to be 28.75 acres. The construction of the proposed roadway, houses and associated driveways will add impervious surfaces that contribute to the increase in surface water runoff due to the site development. These additional impervious surfaces, along with other modifications to ground cover (eg. wooded to open space) will increase the quantity of runoff produced at the site as well as inhibit the quality when compared to the runoff which exists today. This is classified as a class C condition where disturbance has been limited to 5 ac. or less during an identified construction phase. Adequate and proper stormwater management is important within the scope of the project. This report is prepared to meet the requirements to obtain the SPDES permit, which includes remediative measures (quality, quantity, and erosion & sediment control) in accordance with standard engineering practice, the New York State Stormwater Management Design Manual and the New York Guidelines for Urban Erosion and Sediment Control.

Method of Analysis

This office implemented TR-55 methodology to determine peak flow (Q) values to the proposed design point locations. Weighted runoff curve numbers (CN's) and Times of Concentration (Tc's) were determined for each subject drainage area. Hydrographs were generated for each specific design storm and values compared in the pre and post development cases. Design of stormwater management facilities follows which shall handle both the quantitative and qualitative impacts.

- United States Geological Survey mapping in conjunction with offsite survey data was used to delineate the overall contributing drainage areas and to select project design points.
- Dutchess County Soil Survey mapping was to identify soils conditions for all contributing drainage areas, dated September 1991.

- The New York State Stormwater Management Design Manual was used to determine unified Stormwater sizing criteria and performance criteria in the selection of stormwater management practices, last revised April 2008.

- Sediment and Erosion Control practices have been selected using the New York State Guidelines for Urban Erosion and Sediment Control, last revised August 2005.

- Dutchess County requires a type III rainfall distribution generate tabular hydrographs for all design storms.

- This office calculated the 1, 2, 10, 25 and 100-year design storm events. 24 hour rainfall depths of 2.8, 3.5, 5.0, 6.0, and 8.0 inches respectfully as per NYSDEC Stormwater Management Design Manual.

Tabular hydrographs were routed using HydroCad 9.1 to model all site drainage characteristics and proposed stormwater management practices. Hydraulic capacity of storm sewers and pond attenuation was determined using Hydrocad 9.10 dynamic storage indication method to determine effective hydraulic grades with consideration for tailwater influences

SWPPP Component Overview

The 1972 amendments to the Federal Water Pollution Control Act, referred to as the Clean Water Act (CWA), prohibit the discharge of any pollutant to navigable waters from a point source unless the discharge is authorized by a National Pollutant Discharge Elimination System (NPDES) permit. Efforts to improve water quality under the NPDES program have traditionally focused on reducing pollutants in discharges of industrial process wastewater and municipal sewage.

In 1987, amendments to the CWA, specifically identified the types of stormwater discharges which required permit authorization and established guidelines for their achievement. In 1990, the United States Environmental Protection Agency (EPA) established Phase I of the NPDES stormwater program, which established stormwater permit application process requirements. New York State administers its SPDES program (through the NYS Department of Environmental Conservation), which serves as the authorizing mechanism for activities in New York State in accordance with the NPDES program. In December 1999, Phase II of the EPA's stormwater control program was put into place. Phase II expanded the scope of regulated activities and increased the number of permits required by municipalities and businesses. All projects falling under the requirements of the Phase II regulations that commence construction after March 10, 2003 are required to obtain general SPDES permit #GP-02-01 coverage by creating a stormwater pollution prevention plan (SWPPP), which includes an erosion and sediment control plan and may include a water quality and quantity control plan. SWPPP required components are determined by completing the SWPPP flow chart. The applicant shall file a Notice of Intent (NOI) with the NYSDEC to obtain the permit. A copy of the flow chart and of the NOI can be found in the rear of this report.

Based on the SWPPP flow chart, the discharge associated with this project (class of activity) falls under the General SPDES Permit #GP-0-10-001. This class of activity is defined as a site greater than 5 acres. Being defined as such, the following minimal SWPPP requirements are to be provided:

Water Quality and Water Quantity Control Plan:
The plan shall include a hydrologic and hydraulic analysis for all structural components of the stormwater system (storm drains, management practices, etc) for applicable design storms. The analysis should include hydrologic calculations for pre-development conditions and for post-development conditions. The hydrologic calculations include time of concentrations, runoff rates, volumes, velocities, water surface elevations and pond routing.
The plan shall include hydraulic calculations used for final sizing of structural stormwater management practices including contributing drainage area, storage, and outlet configuration. Stormwater management practices shall be sized for water quality and water quantity. The selected practice for water quality control (WQ_V) shall be based on "90% rule" methodology as defined in the New York State Stormwater Management Design Manual. WQ_V requirements are designed to treat stormwater

run-off by providing 24-hour extended detention of the 90% storm event (12-hour detention if discharging to a trout stream). The selected practice for water quantity shall be designed based on channel protection volume (Cp_V), overbank flood control (Q_p) and extreme flood control (Q_f). Q_p requires storage to attenuate the post-development 10-year storm event to pre-development rates. Q_f requires storage to attenuate the post-development 100-year storm event to pre-development rates and to safely pass the discharge.
The plan shall include stage-discharge or outlet rating curves and inflow/outflow hydrographs for storage facilities.
Where necessary, the plan shall include potential downstream impacts/effects of the project.
Where necessary, the plan shall include a dam breach analysis.

Erosion and Sediment Control Plan: An integrated erosion and sediment control plan which details temporary and permanent erosion and sediment control measures before, during and after the course of construction shall be created. A maintenance schedule with attributable responsibilities is to be provided for all phases of construction (road and individual lot) for the selected measures. The management practices used in each phase of the plan are identified in the construction sequence schedule, which can be found in the rear of this report.

Waiver of Quality Control Components

Certain components of the water quantity control plan can be waived if any of the conditions as listed in the NYS Stormwater Design Manual are applicable. The conditions are as follows:

For Cp_V:
-Recharge of the entire Cp_V is achieved at the site
-The site discharges directly to a fourth order or larger stream
-A downstream analysis reveals that channel protection is not required

For Q_p:
-The site discharges directly to a fourth order or larger stream
-A downstream analysis reveals that overbank flood control is not required

For Q_f:
-The site discharges directly to a fourth order or larger stream
-Development is prohibited within the ultimate 100-year floodplain
-A downstream analysis reveals that extreme flood control is not required

This office has provided attenuation for Wqv, Cpv, Qp and Qf. Refer to the appendix for supporting calculations.

II. Existing Conditions

General Site Characteristics

As per USGS mapping and project overlay, the site is within the Fishkill Creek watershed. The proposed routing of stormwater generated from site development will discharge into the existing Fishkill Creek via existing Town of East Fishkill drainage system components, ultimately to the receiving waters of the Hudson River.

Contributing Drainage Area Soils

In a review of the Dutchess County Soils Maps, the following underlying soil types reside on the subject site (and its off-site contributing area):

Soil Type	Hydrologic Soil Group (HSG)
FcB – Farmington-Galway Complex	C
FcC - Farmington-Galway Complex	C
FcD – Farmington-Galway Complex	C
FeE - Farmington Rock Outcrop	C

A review of the map detailing the specific locations of the soil types along with soil definitions and classification of the hydrologic soil group can be found in Appendix A of this report.

The parcel and associated drainage boundary curre ntly has wooded, gr assed, and brush ground cover conditions.

Pre-Development Analysis

CN – Weighted Runoff Curve Number

A summary of underlying soils found on site can be found in the rear of this report.

Drainage area #1 design point assumes the runoff from the north westerly section of the parcel drains toward the Fishkill Creek (H-95 Class B(t)) directly adjacent to the parcel. At the request of the town engineer design point #1 has been broken down into four subareas identified as #1a though #1d. The design point assumed a discharge convergence point as shown on the pre development plan based on a field visit by this office.

Drainage area #2 design point is located on the easterly side of the project site. Three subareas #2a and #2b, 2c drain each drain into an existing low points, fill, then over top into each other, and then empty to design point #2. As requested by the town engineer, two additional sub areas were added to drainage area #2 identified as area #2d and #2c. The low points have been modeled as ponds with no infiltration assumed for conservative measures, ultimately discharging into the Fishkill Creek (H-95 Class B(t)). Refer to the predevelopment drainage analysis for a graphical representation.

A review of the map detailing the specific locations of the soil types along with soil definitions and interpretation records (detailing the hydrologic soil group) can be found in the rear of this report.

The subject parcel is currently wooded. Adjacent properties within the contributory drainage area are mostly wooded with brush, impervious, and grassed areas (per USGS map and based on site visit). Corresponding area calculations of each land use along with a summary of CN has been provided in the rear of this report.

A review of the map detailing the specific locations of the soil types along with soil definitions and classification of the hydrologic soil group can be found in (Appendix A).

Tc – Times of Concentration

The flow path associated with each drainage area has been detailed on the aforementioned map as well as a summary provided in the rear of this report. Refer to the pre-development HydroCad calculations for individual time of concentration calculations.

Q - Peak Flow Values

Based upon the above, peak flow values were determined for the 1, 2, 10 (Q_p), 25, & 100 (Q_f) year design storms. The corresponding 24-hour rainfall values for each of the design storms are 2.5 3.5, 5.0, 6.0 & 8.0 inches accordingly. Peak values are provided as follows (note all peak values are expressed in cfs (cubic feet per second):

	Design Storm				
Design Point	**1yr**	**2 yr**	**10 yr**	**25 yr**	**100 yr**
DP 1	10.55	23.66	46.76	63.36	97.90
DP 2	4.17	9.88	20.11	27.53	43.07

II. Proposed Conditions

Post-Development Analysis

CN – Weighted Runoff Curve Number

A summary of underlying soils found on site can be found in the rear of this report.

Drainage area #1 design point assumes the runoff from the north westerly section of the parcel drains toward the Fishkill Creek H-95 Class B(t)). directly adjacent to the parcel. The design point assumed a discharge convergence point as shown on the post development plan based on a field visit by this office.

Drainage area #2 design point is located on the easterly side of the project site. The low points modeled in the predevelopment condition have been filled in the post development condition. Design point #2 has a decrease in total drainage area as a result of proposed development. The area ultimately discharging into the Fishkill Creek (H-95 Class B(t)).

A review of the map detailing the specific locations of the soil types along with soil definitions and classification of the hydrologic soil group can be found in (Appendix A).

Tc – Times of Concentration

The flow path associated with each drainage area has been detailed on the aforementioned map as well as a summary provided in the rear of this report. Refer to the pre-development HydroCad calculations for individual time of concentration calculations.

Q - Peak Flow Values (with pond routing)

Based upon the above, peak flow values were determined for the 2, 10 (Q_p), 25, & 100 (Q_f) year design storms. The corresponding 24-hour rainfall values for each of the design storms are 3.5, 5.0, 6.0 & 8.0 inches accordingly. Peak values (without the benefit of pond routing) are provided as follows (note all peak values are expressed in cfs):

	Design Storm				
Design Point	**1yr**	**2 yr**	**10 yr**	**25 yr**	**100 yr**
DP 1	5.83	13.17	29.10	49.49	90.60
DP 2	3.33	7.87	16.01	21.91	34.27

Proposed conditions hydrographs can be found in Appendix B of this report.

Pre-Post Development Peak Flow Comparison

	Design Storm (CFS)				
Design Point	**1yr**	**2 yr**	**10 yr**	**25 yr**	**100 yr**
DP1	-4.72	-10.49	-17.66	-13.87	-7.30
DP2	-0.84	-2.01	-4.10	-5.62	-8.80

As a result of the stormwater management facilities proposed for the project site, a decrease in post development discharge is proposed at the identified design points. The stromwater practices implemented for the project site significantly reduce the post development discharge at the design point.

IV. Water Quality Conditions

Water Quality Volume - Wqv

As a direct result of new development, there is an increase in impervious area. These impervious surfaces accumulate depositions of pollutants. These pollutants include sediment (suspended solids), nutrients (nitrogen and phosphorous), organic carbon, bacteria, hydrocarbons, trace metals, pesticides, chlorides, and trash/debris. All of these pollutants can adversely affect the entire ecology of streams, lake and estuaries.

It is proposed to install three (3) NYSDEC stormwater treatment facilities on the site that will capture the post development flow discharging from the developed area. This office is proposing that three storm water ponds be built to attenuate and treat the stormwater run off associated with the development. The subdivision entrance impervious surface from station 0+00 to 2+50 will be treated via a water quality basin prior to discharging to the Fishkill Creek.

All water quality structures are designed to capture and treat the water quality volume and are designed in accordance with the Design Manual. All water quality volume calculations can be found in Appendix C.

Stormwater Sizing Criteria as per NYSDEC Stormwater Management Design Manuel

Water quality volume requirements (90% rule)

Wqv = [(P)(Rv)(A)]/12 – Ac.- Ft.
Rv = 0.05+0.09(I)
I = Impervious Cover (%)
Minimum Rv = 0.2
P = 90% Rainfall Event Number (1.1'')
A = Site Area in Acre

Pond Area	**Drainage Area**	**Imp. Area**	**Wqv Req. Ac –Ft.**	**Wqv Prov. C –Ft.**
P-1	5.78 ac.	0.50 ac.	0.10	0.18
P-2	20.98 ac.	3.38 ac.	0.38	0.57
P-3	3.47 ac.	0.42 ac.	0.06	0.085
WQV-P	0.69 ac.	0.14 ac.	0.01	0.04
Wqv Total Site		***Required -***	***0.55 cfs***	***Provided – 0..875 cfs***

Stream Channel Protection - Cpv

As per NYSDEC Stormwater Management Design Manual, stream channel protection volume requirements (Cpv) are designed to protect stream channels from erosion as a results of developed areas. The 24-hour extended detention of the one-year, 24-hour storm event is required.

Basis for Determining Channel Protection Storage Volume as per NYSDEC Design Manual

The following represent the minimum basis for design:

- HydroCad 9.1 used to determine peak discharge rate for each stormwater management facility based upon the default criteria listed on table 4.1, of the NYSDEC Design Manual.
- Rainfall depths for the one-year, 24 hour storm event used = 2.8'' as per NYSDEC Figure 4.4.
- Off-site areas modeled as "present condition" for the one-year, 24 hour storm event.
- The length of overland flow used in time of concentration (tc) calculations is limited to no more than 100 feet for post development conditions.
- A trash rack has been provided to protect Cpv orifice as per NYSDEC Manual Appendix K
- Cpv protection has been provided above the extended detention volume within the SMP.

Pond Area		**Cpv Req. Ac –Ft.**	**Cpv Prov. Ac –Ft.**
P-1	0.19	0.19	
P-2	0.79	0.94	
P-3	0.13	0.16	
Wqv-P		- Serves as a water quality facility only.	
Cpv Total Site		***1.11 Ac.-Ft.***	***1.29 Ac.-Ft.***

Overbank Flood Protection - Qp

As per the NYSDEC Stormwater Management Design Manual, the primary purpose of the overbank flood control sizing criterion is to prevent an increase in the frequency and magnitude of out-of-bank flooding generated by urban development (i.e., flow events that exceed the bankfull capacity of the channel, and therefore must spill over into the floodplain). Overbank control requires storage to attenuate the post development 10-year, 24-hour peak discharge rate (Qp) to predevelopment rates.

Basis for Design of Overbank Flood protection as per NYSDEC Design Manual

The following represent the minimum basis for design:

- HydroCad 9.1 used to determine peak discharge rate for each stormwater management facility based upon the default listed on table 4.1, of the NYSDEC Design Manual.
- Predevelopment land use is not considered agriculture, observed ground cover modeled.
- Off-site areas modeled as "present condition" for the 10-year, 24 hour storm event.
- Rainfall depths for the 10-year, 24 hour storm event used = 5.0'' as per NYSDEC Figure 4.5.
- The length of overland flow used in time of concentration (tc) calculations is limited to no more than 100 feet for post development conditions.

Design Point		Existing Overbank Peak Flow		Provided Overbank Peak Flow
DP 1	46.76	cfs	29.10	cfs
DP 2	20.11	cfs	16.01	cfs

Extreme Flood Protection - Qf

As per the NYSDEC Stormwater Management Design Manual, the intent of the extreme flood criteria is to (a) prevent the increased risk of flood damage from large storm events, (b) maintain the boundaries of the predevelopment 100-year floodplain, and (c) protect the physical integrity of stormwater management practices. Extreme flood protection requires storage to attenuate the post development 100-year, 24-hour peak discharge rate (Qf) to predevelopment rates.

Basis for Design of Extreme Flood protection as per NYSDEC Design Manual

The following represent the minimum basis for design:

- HydroCad 9.1 used to determine peak discharge rate for each stormwater management facility based upon the criteria listed on table 4.1, of the NYSDEC Design Manual.
- Predevelopment land use is not considered agriculture, observed ground cover modeled.
- Off-site areas modeled as "present condition" for the 100-year, 24 hour storm event.
- Rainfall depths for the 100-year, 24 hour storm event used = 8.0'' as per NYSDEC Figure 4.6.

The length of overland flow used i n tim e of concentra tion (tc) c alculations is lim ited to no m ore than 100 feet for post development conditions

Design Point		Existing Extreme Flood Peak Flow		Provided Extreme Flood Peak Flow
DP 1	97.90	cfs	90.60	cfs
DP 2	43.07	cfs	34.27	cfs

The site is located directly adjacent to the Fishkill Creek. FEMA mapping indicates the 100 yr flood elevation at 252.5. The proposed entrance to the subdivision is located at elevation 258.58 or 6.08' higher in elevation. The post development drainage analysis has sized all proposed culverts to safely convey the 100yr design storm. The flood elevation of 252.5 was assumed for computation of the 100yr post development drainage analysis.

Stormwater Management Practices

Pond P-1 – Micro Pool Ext. Det. ~ P-1 NYSDEC Stormwater Manual Design

This office proposes a Micro Pool Extended Detention Pond located near the subdivision entrance of the project site. The functional intent of the pond is to treat the quality of the stormwater run-off and to provide quantitative attenuation.

As per the NYSDEC Stormwater Management Design Manual Chapter 6

Feasibility & Design Guidance

- Stormwater pond is not located within jurisdictional waters, including wetlands.
- The stormwater pond does not require a dam permit.
- A 2' minimum separation between the pond bottom and groundwater.
- The pond is not located within a sole source aquifer recharge area.
- P-1 pond design has a minimum contributing drainage area of 5.78 acres
- The site does not discharge to a trout stream.
- The pond is not located within the stream channel.

Conveyance - Inlet Protection & Design Guidance,

- The forebay has been provided at each pond inflow point.
- Inlet areas have been stabilized to ensure that non-erosive conditions exist for at least the 2-year frequency storm event.
- Outlet protection has been shown to reduce flow velocities the non-erosive velocities.
- Outfalls have been constructed such that they do not increase erosion or have undue influence on the downstream geomorphology of the stream.
- Flared pipe sections that discharge at or near the stream invert or into a step-pool arrangement have been used at the spillway outlet.

Adequate Outfall Protection

Pond Liner & Pretreatment

- Wqv total = 4,616 cubic feet.
- The forebay has been sized to contain a minimum 10% of the water quality volume (WQv) and designed with a four depth.
    - Forebay – Wqv Req. – 461 cubic feet, Wqv provided – 1,206 cubic feet
- The forebay have been designed with non-erosive outlet exit velocities.
- Access for appropriate maintenance equipment have been provided to the forebay.
- A fixed vertical sediment depth marker has been shown in the forebay to measure sediment deposition over time.

Treatment – Wqv, Pond Geometetry, Pond Benches

- 20% of the water quality volume has been contained within the permanent pool as required.
    - Permanent pool – Req.-923 cubic feet, Provided – 3,374 cubic feet
- 80% of the water quality volume has been contained within the extended detention and stream channel protection area as allowed by the NYSDEC.
    - Wqv-Ext. + Cpv Req. – 11,969 cubic feet, Provided – 13,238 cubic feet
- The length to width ratio of the permanent pool is 2.8:1, a minimum of 1.5:1 is required\The ratio of the surface area of the permanent pool to the contributing drainage area is 1:75 where a minimum of 1:100 is required
- The permanent pool has been shown with a jagged shape with a long winding flow path to aid in water quality treatment.
- A safety bench has not been provided due to due pond side slopes shown at 1:4 for a majority of the ponds perimeter, except in the forebay areas.
- An aquatic bench has been provided that extends 8' inward from the permanent pool edge

Landscaping Plan

- A landscaping plan for the stormwater pond have been prepared to indicate how aquatic and
- terrestrial areas will be vegetatively stabilized and established.
- Wetland plants are required in the pond design, and along the aquatic bench, side slopes, and within shallow areas of the pool itself.
- The best elevations for establishing wetland plants, either through transplantation or volunteer colonization, are within six inches (plus or minus) of the normal pool.
- Excavate large and deep holes around the proposed planting sites, and backfill these with uncompacted topsoil.
- Planting holes should be three times deeper and wider than the diameter of the rootball (of balled and burlap stock), and five times deeper and wider for container grown stock.
- Extra mulching around the base of the tree or shrub is strongly recommended as a means of conserving moisture and suppressing weeds.

Maintenance – Required Elements, Design Guidance

- Maintenance responsibility for a pond and its buffer shall be vested with the Town of East Fishkill Highway Department and or other responsible authority by means of a legally binding and enforceable maintenance agreement that is executed as a condition of plan approval.
- The principal spillway is equipped with a removable trash rack, and is accessible from dry land.
- Sediment removal in the forebay shall occur every five to six years or after 50% of total forebay capacity has been lost.
- Sediment removed from stormwater ponds should be disposed of according to an approved comprehensive operation and maintenance plan.

Pond Drain

- The pond has been equipped with a pond drain. A gate valve has been placed within the pond outlet structure. Refer to profile on plan sheet.

Safety Features – Required Elements, Design Guidance

- Side slopes to the pond are 4:1 (h:v) except for the forebay and perm. pool area, and shall terminate at a safety bench.
- Both the safety bench and the aquatic bench have been shown to be landscaped to prevent access to the pool.

Pond P-2 – Micro Pool Ext. Det. ~ P-1 NYSDEC Stormwater Manual Design

This office proposes a Micro Pool Extended Detention Pond located near the subdivision entrance of the project site. The functional intent of the pond is to treat the quality of the stormwater run-off and to provide quantitative attenuation.

As per the NYSDEC Stormwater Management Design Manual Chapter 6

Feasibility & Design Guidance

- Stormwater pond is not located within jurisdictional waters, including wetlands.
- The stormwater pond does not require a dam permit.
- A 2' minimum separation between the pond bottom and groundwater.
- The pond is not located within a sole source aquifer recharge area.
- P-1 pond design has a minimum contributing drainage area of 20.98 acres
- The site does not discharge to a trout stream.
- The pond is not located within the stream channel.

Conveyance - Inlet Protection & Design Guidance,

- The forebay has been provided at each pond inflow point.
- Inlet areas have been stabilized to ensure that non-erosive conditions exist for at least the 2-year frequency storm event.
- Outlet protection has been shown to reduce flow velocities the non-erosive velocities.
- Outfalls have been constructed such that they do not increase erosion or have undue influence on the downstream geomorphology of the stream.
- Flared pipe sections that discharge at or near the stream invert or into a step-pool arrangement have been used at the spillway outlet.

Adequate Outfall Protection

Pond Liner & Pretreatment

- Wqv total = 16,755 cubic feet.
- The forebay has been sized to contain a minimum 10% of the water quality volume (WQv) and designed with a four depth.
    - Forebay – Wqv Req. – 1,675 cubic feet, Wqv provided – 5,586 cubic feet
- The forebay have been designed with non-erosive outlet exit velocities.
- Access for appropriate maintenance equipment have been provided to the forebay.
- A fixed vertical sediment depth marker has been shown in the forebay to measure sediment deposition over time.

Treatment – Wqv, Pond Geometetry, Pond Benches

- 20% of the water quality volume has been contained within the permanent pool as required.
    - Permanent pool – Req.-923 cubic feet, Provided – 3,374 cubic feet
- 80% of the water quality volume has been contained within the extended detention and stream channel protection area as allowed by the NYSDEC.
    - Wqv-Ext. + Cpv Req. – 47,816 cubic feet, Provided – 54,431 cubic feet
- The length to width ratio of the permanent pool is 2.1:1, a minimum of 1.5:1 is required.
- The ratio of the surface area of the permanent pool to the contributing drainage area is 1:55 where a minimum of 1:100 is required
- The permanent pool has been shown with a jagged shape with a long winding flow path to aid in water quality treatment.
- A safety bench has not been provided due to due pond side slopes shown at 1:4 for a majority of the ponds perimeter, except in the forebay areas.

- An aquatic bench has been provided that extends 10' inward from the permanent pool edge.

Landscaping Plan

- A landscaping plan for the stormwater pond have been prepared to indicate how aquatic and
- terrestrial areas will be vegetatively stabilized and established.
- Wetland plants are required in the pond design, and along the aquatic bench, side slopes, and within shallow areas of the pool itself.
- The best elevations for establishing wetland plants, either through transplantation or volunteer colonization, are within six inches (plus or minus) of the normal pool.
- Excavate large and deep holes around the proposed planting sites, and backfill these with uncompacted topsoil.
- Planting holes should be three times deeper and wider than the diameter of the rootball (of balled and burlap stock), and five times deeper and wider for container grown stock.
- Extra mulching around the base of the tree or shrub is strongly recommended as a means of conserving moisture and suppressing weeds.

Maintenance – Required Elements, Design Guidance

- Maintenance responsibility for a pond and its buffer shall be vested with the Town of East Fishkill Highway Department and or other responsible authority by means of a legally binding and enforceable maintenance agreement that is executed as a condition of plan approval.
- The principal spillway is equipped with a removable trash rack, and is accessible from dry land.
- Sediment removal in the forebay shall occur every five to six years or after 50% of total forebay capacity has been lost.
- Sediment removed from stormwater ponds should be disposed of according to an approved comprehensive operation and maintenance plan.

Pond Drain

- The stormwater facility shall be drained via portable trash pump as required.

Safety Features – Required Elements, Design Guidance

- Side slopes to the pond are 4:1 (h:v) except for the forebay and perm. pool area, and shall terminate at a safety bench.
- Both the safety bench and the aquatic bench have been shown to be landscaped to prevent access to the pool.

Pond P-3 – Pocket Pond Design ~ P-5 Design

This office proposes a Pocket Pond located in the along the eastern portion of the project site. The functional intent of the pond is to treat the quality of the stormwater run-off and to provide quantitative attenuation. Deep test pits have been indicated on the plan set in the areas of the stormwater management facilities.

As per the NYSDEC Stormwater Management Design Manual Chapter 6

Feasibility & Design Guidance

- Stormwater pond is not located within jurisdictional waters, including wetlands.
- The stormwater pond does not require a dam permit.
- A 2' minimum separation between the pond bottom and groundwater.
- The pond is not located within a sole source aquifer recharge area.
- P-5 pond design has a minimum contributing drainage area of 3.47 acres
- The site does not discharge to a trout stream.
- The pond is not located within the stream channel

Conveyance - Inlet Protection & Design Guidance,

- A forebay has been provided at each pond inflow point.
- Inlet areas have been stabilized to ensure that non-erosive conditions exist for at least the 2-year frequency storm event.
- Outlet protection has been shown to reduce flow velocities the non-erosive velocities.
- Outfalls have been constructed such that they do not increase erosion or have undue influence on the downstream geomorphology of the stream.
- Flared pipe sections that discharge at or near the stream invert or into a step-pool arrangement have been used at the spillway outlet.

Adequate Outfall Protection

Pond Liner & Pretreatment

- Wqv total = 2,771 cubic feet.
- The forebay has been sized to contain a minimum 10% of the water quality volume (WQv) and is four feet in depth.
    - Forebay – Wqv Req. – 271 cubic feet, Wqv provided – 930 cubic feet
- The forebay have been designed with non-erosive outlet exit velocities.
- Access for appropriate maintenance equipment have been provided to the forebay.
- A fixed vertical sediment depth marker has been shown in the forebay to measure sediment deposition over time.

Treatment – Wqv, Pond Geometetry, Pond Benches

- 50% of the water quality volume has been contained within the permanent pool as required.
    - Permanent pool – Req.-1,385.5 cubic feet, Provided – 1,395 cubic feet
- 50% of the water quality volume has been contained within the extended detention and stream channel protection area as allowed by the NYSDEC.
- Wqv-Ext. + Cpv Req. – 7,047 cubic feet, Provided – 8,458 cubic feet
- The length to width ratio of the permanent pool is 2.0:1, a minimum of 1.5:1 is required. The ratio of the surface area of the permanent pool to the contributing drainage area is 1:80 where a minimum of 1:100 is required
- The permanent pool has been shown with a jagged shape with a long winding flow path to aid in water quality treatment.

- A safety bench has not been provided due to due pond side slopes shown at 1:4 for a majority of the ponds perimeter, except in the forebay areas.
- An aquatic bench has been provided that extends 6' inward from the permanent pool edge

Landscaping Plan

- Each pond has been provided landscaping plan for the stormwater management areas to indicate how aquatic and terrestrial areas will be vegetatively stabilized and established.
- Wetland plants are required in the pond design, and along the aquatic bench, side slopes, and within shallow areas of the pool itself.
- The best elevations for establishing wetland plants, either through transplantation or volunteer colonization, are within six inches (plus or minus) of the normal pool.
- Excavate large and deep holes around the proposed planting sites, and backfill these with uncompacted topsoil.
- Planting holes should be three times deeper and wider than the diameter of the rootball (of balled and burlap stock), and five times deeper and wider for container grown stock.
- Extra mulching around the base of the tree or shrub is strongly recommended as a means of conserving moisture and suppressing weeds.

Maintenance – Required Elements, Design Guidance

- Maintenance responsibility for a pond and its buffer shall be vested with the Town of East Fishkill Highway Department and or other responsible authority by means of a legally binding and enforceable maintenance agreement that is executed as a condition of plan approval.
- The principal spillway is equipped with a removable trash rack, and is accessible from dry land.
- Sediment removal in the forebay shall occur every five to six years or after 50% of total forebay capacity has been lost.
- Sediment removed from stormwater ponds should be disposed of according to an approved comprehensive operation and maintenance plan.

Pond Drain

- The pond has been equipped with a pond drain. A gate valve has been placed within the pond outlet structures. Refer to profile on plan sheet.

Safety Features – Required Elements, Design Guidance

- Side slopes to the pond are 4:1 (h:v) except for the forebay and perm. pool area, and shall terminate at a safety bench.
- Both the safety bench and the aquatic bench have been shown to be landscaped to prevent access to the pool.

Pond Wqv-P – Water Quality Pond

This office proposes a Water Quality Pond located at the subdivision entrance to treat the impervious surfaces associated with the fist 250 lineal feet of proposed subdivision road. The water quality volume

associated with the contributing drainage area is 641 cubic feet, the pond has the treatment potential of 2,004 cubic feet.

Feasibility & Design Guidance

- Stormwater pond is not located within jurisdictional waters, including wetlands.
- The stormwater pond does not require a dam permit.
- A 2' minimum separation between the pond bottom and groundwater.
- The pond is not located within a sole source aquifer recharge area.
- The pond design has a minimum contributing drainage area of 0.69 acres
- The site does not discharge to a trout stream.
- The pond is not located within the stream channel

Conveyance - Inlet Protection & Design Guidance,

- Inlet areas have been stabilized to ensure that non-erosive conditions exist for at least the 2-year frequency storm event.
- Outlet protection has been shown to reduce flow velocities the non-erosive velocities.
- Outfalls have been constructed such that they do not increase erosion or have undue influence on the downstream geomorphology of the stream.

Treatment – Wqv, Pond Geometetry, Pond Benches

- Wqv total = 641 cubic feet.
- Wqv treatment provided = 2,001 cubic feet.
- Access for appropriate maintenance equipment have been provided to the facility.

Maintenance – Required Elements, Design Guidance

- Maintenance responsibility for a pond and its buffer shall be vested with the Town of East Fishkill Highway Department and or other responsible authority by means of a legally binding and enforceable maintenance agreement that is executed as a condition of plan approval.

Pond Drain

- The stormwater facility shall be drained via portable trash pump as required.

Stormwater Management Practice Maintenance

- Short Term – (during construction, until the road is dedicated to the Town of East Fishkill)

  Maintenance responsibility for all stormwater management components, structures, pipe, ponds, swales, outlet structures, and buffers shall be vested with the subdivision owner and general contractor chosen by the parcel owner. All components have been contained within drainage and maintenance easements throughout the subdivision with access via subdivision road and pond access paths.

  Site inspection of Sediment and Erosion Controls during Construction

Daily – The site construction entrance, any litter/debris, and dust shall be checked and/or inspected on a daily basis until the road is dedicated to the Town of East Fishkill.

Weekly - The project site shall be inspected by a qualified individual once every week. Site inspections are subject to any modifications required by the Town Engineer, Town Inspector or changes to the NOI as per NYSDEC recommendations. Site inspection sheet can be found in Appendix G of this report.

- Long Term – (Road is dedicated to the Town of East Fishkill)

  Maintenance responsibility for all stormwater management components, structures, pipe, ponds, swales, outlet structures, and buffers shall be vested with the Town of East Fishkill Highway Department and or other responsible authority by means of a legally binding and enforceable maintenance agreement that is executed as a condition of plan approval. All components have been contained within drainage and maintenance easements throughout the subdivision with access via town subdivision road and pond access paths.

Maintenance of the various components of the system is described

In order for any plan to operate as it was originally intended, it must be maintained properly. The following additional measures have been implemented in the overall design of the subdivision.

- The Hilltop Manor Subdivision contains a total of thirty-eight (38) catch basins, eleven (11) manholes, HDPE culverts, RCP elliptical culverts, and four (4) outlet control structure to be maintained as described below.
- The proposed stormwater management practices on site will be inspected on a monthly basis and after all major storm events (e.g., after each event where 3 inches of rainfall is exceeded in a 24 hour period).
- During the inspection, the New York State DEC Maintenance Inspection checklist should be utilized to properly maintain the practices.

In addition, the following items should be checked and repaired as needed:

- The area between the normal water surface and upland discharge points should be checked for erosion, and all eroded areas should be stabilized with topsoil, seed and mulch immediately.
- If a minimum coverage of 50% is not achieved in the planted aquatic bench after the second growing season, reinforcement plantings shall be required.
- All culvert outlets and inlets directing stormwater either into or out of the practices, should be checked for clogging and accumulation of sediment and cleaned as needed.
- The areas immediately surrounding the culvert outlets and inlets should be mowed monthly during the growing season to prevent the growth of trees and shrubs. Also, the accumulation of sediment within the practices should be monitored and when sediment accumulation within a practice has visibly exceeded the capacity, it should be removed as described above. It is expected that sediment will have to be removed from this area every 3 – 5 years.

Catch Basins

- All catch basins are required to have a 12" sump in order to accumulate sediment and silt prior to stormwater entering into the network of pipes. The sump serves as a supplemental practice suitable for pretreatment. Catch basins should be kept free of any accumulation of silts and sedimentation both during and after construction.
- Once construction is complete, the basins should be inspected on a yearly basis as a minimum. The sumps should be kept free of any siltation and organic debris that may impede stormwater flow and/or be washed out in the storm.

Storm Sewer Pipe

- The storm sewer culvert pipes should be inspected on a bi-annular basis. If the catch basins and outlet structures are properly maintained, obstruction in the storm sewer piping should be kept to a minimum. The piping should be kept free of siltation and build-up of either inorganic or organic loading.

Stormwater Pollution Prevention Measures

- Portable toilets shall be provided in a location convenient to site workers and shall be maintained on a as needed basis.
- This site project site shall be checked for litter and construction debris at the conclusion of each construction day. Wastes shall be disposed of properly to prevent debris from entering into stormwater management areas. The general contractor shall empty disposal containers on an as needed basis.
- Hazardous materials such as paint, fuel, and fertilizers are not anticipated to be stored onsite. If the storage of such materials is required, all EPA, NYSDEC, local, state, and manufacture guidelines shall be followed.
- The site shall be provided a truck wash area for all vehicles leaving the site to protect adjoining roads and the downstream creek form sediment contamination.
- Spill Response Emergency Phone Number(s):
    - NYS Spill Hotline: 1-800-457-7362
    - National Response Center: 1-800-424-8802

V. Erosion and Sediment Control

Temporary Erosion and Sediment Control Measures:

To reduce the amount of sediment runoff from the project site the following structural and vegetative measures have been identified.

Temporary Swale – A temporary excavated drainage way. The purpose of a temporary swale is to prevent runoff from entered disturbance areas by intercepting and diverting it to a stabilized outlet or to intercept sediment laden water and divert it to a sediment trapping device.

Silt Fence – A temporary barrier of geotextile fabric (filter cloth) used to intercept sediment laden runoff from small drainage areas of disturbed soil. 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.

Sediment Trap – A temporary sediment control device formed by excavation and/or embankment to intercept sediment laden runoff and to retain the sediment. The purpose of the structure is to intercept sediment laden runoff and trap the sediment in order to protect drainage ways, properties, and right-of-way below the sediment trap from sedimentation.

Stabilized Construction Entrance – A stabilized pad of aggregate underlain with filter cloth 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. The purpose of a stabilized construction entrance is to reduce or eliminate the tracking of sediment onto public rights-of-way or streets.

Dust Control – The control of dust resulting from land-disturbing activities. The purpose is to prevent surface and air movement of dust from disturbed soil surfaces that may cause off-site damage, health hazards, and traffic safety problems.

Vegetative Measures

Seeding Notes:

1. Exposed slopes and all graded areas shall be seeded with the following grass seed mix as required:

   Steep slopes (3:1)
   Temporary seeding -
   Summer season - german millet @ 40 lbs per acre
   Winter season - rye grain @ 120 lbs per acre

   Permanent seeding - spring/fall
   Tall fescue @ 100 lbs per acre
   Kobe lespedeza @ 10 lbs per acre
   Bahiagrass @ 25 lbs per acre
   Rye grain @ 40 lbs per acre

2. Grass seed mix may be applied by either mechanical or hydroseeding methods. Hydroseeding shall be performed in accordance with the current edition of n.y. standards and specifications for erosion and sediment control.
3. Seeded areas shall be mulched as required:
   Mid-summer, late fall or winter
   Apply at a rate of 100 lbs/1,000 sq.ft. Grain straw, cover with netting and staple to the slope.

   Spring or early fall
   Apply at a rate of 45 lbs/1,000 sq.ft. Wood fiber in a hydro seeder slurry.

Permanent Structural Measures:

Rock Outlet Protection – A section of rock protection placed at the outlet and of the culverts, conduits, or channels. The purpose of the rock outlet protection is to reduce the depth, velocity, and energy of the water, such that the flow will not erode the receiving downstream reach. See erosion control plan for further detail.

Site inspection of Sediment and Erosion Controls

The project site shall be inspected by a qualified individual once every week. Site inspections are subject to any modifications required by the Town Engineer, Town Inspector or changes to the NOI as per NYSDEC recommendations. Site inspection sheet can be found in Appendix G of this report.

VI. Construction Schedule

PHASE I (APPROXIMATE AREA OF DISTURBANCE 4.90 ACRES) -

1. FILE NOI WITH THE N.Y.S.D.E.C.

2. THE GENERAL CONTRACTOR IS RESPONS IBLE FOR INSTALLING, MAINTAINING, AND REMOVING ALL SITE EROSION AND SEDI MENT CONTROLS UNTIL THE ROAD I S DEDICATED TO THE TOWN OF EAST FISHKILL. THE LI ST OF COMPLIANCE INSPECTION MILESTONES HAVE BEEN PROVIDED ON THIS PLAN SET LISTED BELOW.

3. THE P ARCEL OWNER IS RE SPONSIBLE FOR RETAINING A QUALIFIE D INDIVIDUAL T O PERFORM ONSITE INSPECTS AS REQUIRED BY THE GP 0-08-001 PERMIT.

4. PRE-CONSTRUCTI ON MEETI NG IS REQUIRE D PRIOR TO CONSTRUCTION W ITH THE TOWN ENGINEER, CONTRACTOR, OWNER, AND SWPPP INSPECTOR FOR THE OWNER.

5. A NYSLS SHALL FILED IDENTIFY THE PROP OSED LIMIT OF DISTUR BANCE, SEDIMENT TRAPS, AND PARCEL ACCESS POINTS AS IDENTIFIED ON THE PLAN SET.

6 SEDIMENT TRAP AND SUBDIVISION ENTRANCE(S) FROM CREEK BEND ROAD -
: CLEAR AND ROUGH GRADE AS REQUIRED.
: STABILIZE SUB DIVISION R OAD/POND ENT RANCE T O S ITE BY INSTALLING GRAVEL PER CONSTRUCTION ACCESS DETAIL. ST ABILIZE ADJACENT BARE AREAS W ITH VEGETATION.

7. INSTALL SEDIMENT TRAPS FOR CONSTRUCTION OF SUBDIVISION ROAD -
: A NYSL S SHALL STAKE OUT THE LIMIT OF DISTURBANCE IN THE AREA OF THE SEDIMENT TRAP.
: ORANGE CONSTRUCTION FENCING SHALL LINE THE SEDIMENT TRAP AREA.
: INSTALL SILT FENCE ALONG THE LOWER SIDE OF THE PROPOSED SEDIMENT TRAPS.
: EXCAVATE AR EA FOR S EDIMENT TR AP. PO ND VEGET ATION AND F INAL GRADING T O BE PERFORMED SUBSEQUENT TO FINAL ASPHALT COURSE.
: INSTAL L TEMP. DRAINAGE S WALE A-4, PR OPER ER OSION C ONTROLS AR OUND SWALES AND DISTURBED AREA AS REQUIRED.
: INSTALL DE WATERING DEVICE. DE WATERING DEVICE T O OUTLET TO A T EMPORARY CATCH BASIN W ITHTHE SPECIFIED HDPE OU TLET PIPE RI M AND INVERT ELE VATIONS

TO MAT CH THE OUTLET CONTROL STRUCT URES. INST ALL CB1 A,1B,1C, AND ALL ASSOCIAED PIPING AND IPRAP OUTLET S REQUIRED TO DRAIN SEDI MENT TRAP A AND B.
: TEMPORARY STABILIZATION OF THE SEDI MENT TRAPS AND ADJ ACENT DIVERSIONS SHALL BE PREFORMED.

8. REMOVE TREES FROM ROW, INSTA LL W ATER BARS, TEMPORARY DIVE RSION SWALES A-4, ROUGH GRADE SUBDIVISION HAUL ROAD TO STABLE ROCK GRADE.
: PLACE E XCAVED ROC K MATERIAL IN DESI GNATED FILL AREAS AS INDICAT ED ON THE PLAN SET. FILL TO BE INSTALLED AND COMPACTED IN 6" LIFT TO 95% STANDAR D PROCTOR TEST.
:LOT #4 SDS ARE A TO BE LOCATE D BY A NYSLS, LINED W IH ORANGE CONST RUCITON FENCING. MATERIAL TO B E PLACED INSIDE ORANGE CONSTRIUCTION FENCING TO BE APPROVED SAND AND GRAVEL.

9. TEMPORARY STABILIZE THE HAUL ROAD SHOULDERS WHILE EXCAVATION OF ROAD CONTINUES VIA SILT FENCING, WATER BARS, SEEDING AND MULCHING.

10. CONSTRUCTION SEQUENCES MAY BE CONDUCTED IN A ROLLING PATTERN AS LONG AS THE TOTAL DISTURBANCE AT ANY ONE TIME IS ALWAYS LESS THAN 5 ACRES.

14. REFER TO § 157-10 CONSTRUCTION INSPECTION MILESTONES FOR INSPECTION REQUIREMENTS.

: VEGETATE DISTURBED AR EAS NOT TO BE SUBJECT TO CONS TRUCTION W ITHIN 1 4 DAYS.
: UPON INSTALL ATION OF RO AD-SUBBASE AND S TABILIZATION OF ALL DIST URBED AREAS, SILT FENCING, TEMP ORARY S WALES, CHECK DAMS, AND I NLET P ROTECTION ASSOCIATED W ITH THIS PHASE MAY BE REMOVED UNLES S OTHE R W ISE NOT ED B Y FIELD INSPECTIONS BY THE TOWN ENGINEER AND PROJECT ENGINEER.

REFER TO EROSION CONTROL MAINTENANCE SCHEDULE FOR FURTHER INFORMATION EROSION AND SEDI MENT C ONTROL PL AN S UBJECT TO ANY IN FIEL D MODIFI CATIONS REQUIRED BY THE TOWN OF EAST FIS HKILL INSPECT ORS, NYSDEC, AND P ROJECT ENGINEER.

PHASE II (APPROXIMATE AREA OF DISTURBANCE 4.28 ACRES) -

1. CONTINUE TO RE MOVE TREES AND MA TERIAL ALONG HAUL RO AD AS RE QUIRED TO MEET LIMITS OF GRADING AS SHOWN ON PHASE II. REPOSI TION WATER BARS, TEMPORARY DIVER SION S WALES A-4, AS RO UGH GRADE S UBDIVISION HAUL ROAD IS SHAPED INTO THE TOWN ROAD.
: PLACE EXCAVATED ROCK MATERIAL I N DE SIGNATED FILL AREAS AS INDICAT ED ON THE PLAN SET. FILL TO BE INSTALLED AND COMPACTED IN 6" LIFT TO 95% STANDAR D PROCTOR TEST.

:LOT #4 SDS AREA TO BE LOCATED BY A NYSLS, LINED WITH ORANGE CONSTRUCTION FENCING. MATERIAL TO B E PLACED INSIDE ORANGE CONSTRUCTION FENCING TO BE APPROVED SAND AND GRAVEL.

2. TEMPORARY STABILIZE THE HAUL ROAD SHOULDERS WHILE EXCAVATION OF ROAD CONTINUES VIA SILT FENCING, WATER BARS, SEEDING AND MULCHING.

3. INSTALL DRAINAGE INFRASTRUCTURE AS REQUIRED AS EXCAVATION CONTINUES.

4. CONSTRUCTION SEQUENCES MAY BE CO NDUCTED IN A ROLLING PATTERN AS LONG AS THE TOTAL DISTURBANCE AT ANY ONE TIME IS ALWAYS LESS THAN 5 ACRES.

5. CONTINUE TO CHECK ALL S EDIMENT AND EROSION CONTROLS INSTALLED AS PART OF PHASE I.

5. REFER TO § 157- 10 CONS TRUCTION INSPECTI ON MI LESTONES FOR INSPECTION REQUIREMENTS.

: VEGETATE DISTURBED AR EAS NOT TO BE SUBJECT TO CONS TRUCTION W ITHIN 1 4 DAYS.
: UPON INSTALL ATION OF RO AD-SUBBASE AND S TABILIZATION OF ALL DIST URBED AREAS, SILT FENCING, TEMP ORARY S WALES, CHECK DAMS, AND I NLET P ROTECTION ASSOCIATED W ITH THIS PHASE MAY BE REMOVED UNLES S OTHE R W ISE NOT ED B Y FIELD INSPECTIONS BY THE TOWN ENGINEER AND PROJECT ENGINEER.

REFER TO EROSION CONTROL MAINTENANCE SCHEDULE FOR FURTHER INFORMATION EROSION AND SEDI MENT C ONTROL PL AN S UBJECT TO ANY IN FIEL D MODIFI CATIONS REQUIRED BY THE TOWN OF EAST FIS HKILL INSPECT ORS, NYSDEC, AND P ROJECT ENGINEER.

PHASE III (APPROXIMATE AREA OF DISTURBANCE 4.95 ACRES) -

1. CONTINUE TO RE MOVE TREES AND MA TERIAL ALONG HAUL RO AD AS RE QUIRED TO MEET LIMITS OF GRADING AS SHOWN ON PHASE III. REPO SITION WATER BARS, TEMPORARY DIVE RSION S WALES, AS R OUGH GR ADE SUB DIVISION HAUL ROAD IS SHAPED INTO THE TOWN ROAD.
: PLACE EXCAVATED ROCK MATERIAL I N DESIGNATED FILL AREAS AS INDICAT ED ON THE PLAN SET. FILL TO BE INSTALLED AND COMPACTED IN 6" LIFT TO 95% STANDAR D PROCTOR TEST.
:LOT #4 SDS AREA TO BE LOCATED BY A NYSLS, LINED WITH ORANGE CONSTRUCTION FENCING. MATERIAL TO B E PLACED INSIDE ORANGE CONSTRUCTION FENCING TO BE APPROVED SAND AND GRAVEL.

2. TEMPORARY STABILIZE THE HAUL ROAD SHOULDERS WHILE EXCAVATION OF ROAD CONTINUES VIA SILT FENCING, WATER BARS, SEEDING AND MULCHING.

3. INSTALL DRAINAGE INFRASTRUCTURE AS REQUIRED AS EXCAVATION CONTINUES.

4. CONSTRUCTION SEQUENCES MAY BE CO NDUCTED IN A ROLLING PATTERN AS LONG AS THE TOTAL DISTURBANCE AT ANY ONE TIME IS ALWAYS LESS THAN 5 ACRES.

5. CONTINUE TO CHECK ALL S EDIMENT AND EROSION CONTROLS INSTALLED AS PART OF PHASE I & II.

5. REFER TO § 157- 10 CONS TRUCTION INSPECTI ON MILES TONES FOR INSPECTION REQUIREMENTS.

: VEGETATE DISTURBED AR EAS NOT TO BE SUBJECT TO CONS TRUCTION W ITHIN 1 4 DAYS.
: UPON INSTALL ATION OF RO AD-SUBBASE AND S TABILIZATION OF ALL DIST URBED AREAS, SILT FENCING, TEMP ORARY S WALES, CHECK DAMS, AND I NLET P ROTECTION ASSOCIATED W ITH THIS PHASE MAY BE REMOVED UNLES S OTHE R W ISE NOT ED B Y FIELD INSPECTIONS BY THE TOWN ENGINEER AND PROJECT ENGINEER.

REFER TO EROSION CONTROL MAINTENANCE SCHEDULE FOR FURTHER INFORMATION EROSION AND SEDI MENT C ONTROL PL AN S UBJECT TO ANY IN FIEL D MODIFI CATIONS REQUIRED BY THE TOWN OF EAST FIS HKILL INSPECT ORS, NYSDEC, AND P ROJECT ENGINEER.

PHASE IV APPROXIMATE AREA OF DISTURBANCE 4.5 ACRES) -
DISTURBANCE AREA - STATION 16+50 THROUGH 22+50

1. CONTINUE TO RE MOVE TREES AND MA TERIAL ALONG HAUL RO AD AS RE QUIRED TO MEET LIMITS OF GRADING AS SHOWN ON PHASE IV. REPOSITI ON WATER BARS, TEMPORARY DIVE RSION S WALES, AS R OUGH GR ADE SUB DIVISION HAUL ROAD IS SHAPED INTO THE TOWN ROAD.
: PLACE EXCAVATED ROCK MATERIAL I N DE SIGNATED FILL AREAS AS INDICAT ED ON THE PLAN SET. FILL TO BE INS TALLED AND COMP ACTED IN 6" LIFT TO 95% STANDAR D PROCTOR TEST.
:LOT #3 & #4 SDS AREA T O BE LOCATE D B Y A NYS LS, LINE D W ITH ORANGE CONSTRUCTION FE NCING. MATERIAL TO BE PL ACED INSIDE ORANGE CONST RUCTION FENCING TO BE APPROVED SAND AND GRAVEL.

2. TEMPORARY STABILIZE THE HAUL ROAD SHOULDERS WHILE EXCAVATION OF ROAD CONTINUES VIA SILT FENCING, WATER BARS, SEEDING AND MULCHING.

3. INSTALL DRAINAGE INFRASTRUCTURE AS REQUIRED AS EXCAVATION CONTINUES.

4. CONSTRUCTION SEQUENCES MAY BE CO NDUCTED IN A ROLLING PATTERN AS LONG AS THE TOTAL DISTURBANCE AT ANY ONE TIME IS ALWAYS LESS THAN 5 ACRES.

5. CONTINUE TO CHECK ALL S EDIMENT AND EROSION CONTROLS INSTALLED AS PART OF PHASE I, II & III.

6. REFER TO § 157- 10 CONS TRUCTION INSPECTI ON MI LESTONES FOR INSPECTION REQUIREMENTS.

: VEGETATE DISTURBED AR EAS NOT TO BE SUBJECT TO CONS TRUCTION W ITHIN 1 4 DAYS.
: UPON INSTALL ATION OF RO AD-SUBBASE AND S TABILIZATION OF ALL DIST URBED AREAS, SILT FENCING, TEMP ORARY S WALES, CHECK DAMS, AND I NLET P ROTECTION ASSOCIATED W ITH THIS PHASE MAY BE REMOVED UNLES S OTHE R W ISE NOT ED B Y FIELD INSPECTIONS BY THE TOWN ENGINEER AND PROJECT ENGINEER.

REFER TO EROSION CONTROL MAINTENANCE SCHEDULE FOR FURTHER INFORMATION EROSION AND SEDI MENT C ONTROL PL AN S UBJECT TO ANY IN FIEL D MODIFI CATIONS REQUIRED BY THE TOWN OF EAST FIS HKILL INSPECT ORS, NYSDEC, AND P ROJECT ENGINEER.

PHASE IVA APPROXIMATE AREA OF DISTURBANCE 0.75 ACRES) -
DISTURBANCE AREA - STATION 22+50 THROUGH 29+25

1. CONTI NUE T O REMOVE TREES AND MA TERIAL AL ONG SUBDI VISION R OAD AS REQUIRED TO MEET LIMITS O F GRADING AS SHOWN IVA. PLACE SILT FENCING AND CHECK DAMS AS R EQUIRED AND SHOWN. PLACE EX CAVATED RO CK MA TERIAL IN DESIGNATED FILL AREAS AS INDICATED ON THE PLAN SET. FILL TO BE INSTALLED AND COMPACTED IN 6" LIFT TO 95% STANDARD PROCTOR TEST.

2. TEMPORARY STABILIZE THE HAUL ROAD SH OULDERS WHILE EXCAVATION OF ROAD CONTINUES VIA SILT FENCING, WATER BARS, SEEDING AND MULCHING.

3. INSTALL DRAINAGE INFRASTRUCTURE AS REQUIRED AS EXCAVATION CONTINUES.

4. CONSTRUCTION SEQUENCES MAY BE CO NDUCTED IN A ROLLING PATTERN AS LONG AS THE TOTAL DISTURBANCE AT ANY ONE TIME IS ALWAYS LESS THAN 5 ACRES.

5. CONTINUE TO CHECK ALL S EDIMENT AND EROSION CONTROLS INST ALLED AS PART OF PHASE I, II & III.

6. REFER TO § 157- 10 CONS TRUCTION INSPECTI ON MILES TONES FOR INSPECTION REQUIREMENTS.

: VEGETATE DISTURBED AR EAS NOT TO BE SUBJECT TO CONS TRUCTION W ITHIN 1 4 DAYS.
: UPON INSTALL ATION OF RO AD-SUBBASE AND S TABILIZATION OF ALL DIST URBED AREAS, SILT FENCING, TEMP ORARY S WALES, CHECK DAMS, AND I NLET P ROTECTION ASSOCIATED W ITH THIS PHASE MAY BE REMOVED UNLES S OTHE R W ISE NOT ED B Y FIELD INSPECTIONS BY THE TOWN ENGINEER AND PROJECT ENGINEER.

REFER TO EROSION CONTROL MAINTENANCE SCHEDULE FOR FURTHER INFORMATION

EROSION AND SEDI MENT C ONTROL PL AN S UBJECT TO ANY IN FIEL D MODIFI CATIONS REQUIRED BY THE TOWN OF EAST FIS HKILL INSPECT ORS, NYSDEC, AND P ROJECT ENGINEER.

PHASE V APPROXIMATE AREA OF DISTURBANCE 1.80 ACRES) -

1. REGRADE UP PER HOL DING POND TO CO NFORM TO SHAPE AND DEPTH OF NYDS EC STORMWATER POND P-2.

2. TEMPORARY STABILIZE THE DISTURBED AREA VIA SILT FENCING, WAT ER BARS , SEEDING AND MULCHING.

3. INSTALL DRAINAGE INFRASTRUCTURE AS REQUIRED AS EXCAVATION CONTINUES.

4. CONSTRUCTION SEQUENCES MAY BE CO NDUCTED IN A ROLLING PATTERN AS LONG AS THE TOTAL DISTURBANCE AT ANY ONE TIME IS ALWAYS LESS THAN 5 ACRES.

5. CONTINUE TO CHECK ALL S EDIMENT AND EROSION CONTROLS INST ALLED AS PART OF PHASE I, II III, & IV.

6. REFER TO § 157- 10 CONS TRUCTION INSPECTI ON MILES TONES FOR INSPECTION REQUIREMENTS.

: VEGETATE DISTURBED AR EAS NOT TO BE SUBJECT TO CONS TRUCTION W ITHIN 1 4 DAYS.
: UPON INSTALL ATION OF RO AD-SUBBASE AND S TABILIZATION OF ALL DIST URBED AREAS, SILT FENCING, TEMP ORARY S WALES, CHECK DAMS, AND I NLET P ROTECTION ASSOCIATED W ITH THIS PHASE MAY BE REMOVED UNLES S OTHE R W ISE NOT ED B Y FIELD INSPECTIONS BY THE TOWN ENGINEER AND PROJECT ENGINEER.

REFER TO EROSION CONTROL MAINTENANCE SCHEDULE FOR FURTHER INFORMATION
EROSION AND SEDI MENT C ONTROL PL AN S UBJECT TO ANY IN FIEL D MODIFI CATIONS REQUIRED BY THE TOWN OF EAST FIS HKILL INSPECT ORS, NYSDEC, AND P ROJECT ENGINEER.

PHASE VI APPROXIMATE AREA OF DISTURBANCE 2.50 ACRES) -

1. TEMPORARY STABILIZE THE HAUL ROAD SHOULDERS W HILE UTILITY INSTALLATION (EL ECTRIC AND FIB ER) IS BEING PRE FORMED VIA SILT F ENCING, WATER BARS, SEEDING AND MULCHING.

1. INSTALL BINDER COURSE FOR TOWN ROAD W HILE MEETING THE INSPECTION REQUIREMENTS LISTED ON 2HIS PLAN SET. TOPSOIL SHOULDERS, MULCH AND SEED AS REQUIRED.

3. TEMPORARY STABILIZE THE DISTURBED AREA VIA SILT FENCING, WAT ER BARS , SEEDING AND MULCHING.

4. CONSTRUCTION SEQUENCES MAY BE CO NDUCTED IN A ROLLING PATTERN AS LONG AS THE TOTAL DISTURBANCE AT ANY ONE TIME IS ALWAYS LESS THAN 5 ACRES.

5. CONTINUE TO CHECK ALL S EDIMENT AND EROSION CONTROLS INSTALLED AS PART OF PHASE I, II III, & IV.

6. REMOVE TEMPOR ARY DIVERSION SWALES AND W ATER BARS UPON SHOULDER AND SIDE SLOPE STABLIZATION.

7. REFER TO § 157- 10 CONS TRUCTION INSPECTI ON MILES TONES FOR INSPECTION REQUIREMENTS.

: VEGETATE DISTURBED AR EAS NOT TO BE SUBJECT TO CONS TRUCTION W ITHIN 1 4 DAYS.
: UPON INSTALL ATION OF RO AD-SUBBASE AND S TABILIZATION OF ALL DIST URBED AREAS, SILT FENCING, TEMP ORARY S WALES, CHECK DAMS, AND I NLET P ROTECTION ASSOCIATED W ITH THIS PHASE MAY BE REMOVED UNLES S OTHE R W ISE NOT ED B Y FIELD INSPECTIONS BY THE TOWN ENGINEER AND PROJECT ENGINEER.

REFER TO EROSION CONTROL MAINTENANCE SCHEDULE FOR FURTHER INFORMATION EROSION AND SEDI MENT C ONTROL PL AN S UBJECT TO ANY IN FIEL D MODIFI CATIONS REQUIRED BY THE TOWN OF EAST FIS HKILL INSPECT ORS, NYSDEC, AND P ROJECT ENGINEER.

PHASE VII-X APPROXIMATE AREA OF DISTURBANCE 4.95 ACRES) -

1. CONSR UCT INDIVIDUAL DRIVE WAY(S) AND HOUSE SITE(S), A MAXIMUM OF 6 BUILDING LOTS AT ONE TI ME AND/OR LESS THAN 5.0 A CRES OF DISTURBANCE TOTAL ACROSS ALL BUILDING LOTS. REFER TO PHASING LISTED ON THIS SHEET.
: INSTALL SILT FENCING ON DOWN HILL PORTION OF GRADING.
: CLEAR AND ROUGH GRADE FOR DRIVEWAY AND HOUSE AS REQUIRED.
: CHECK STABILIZED ENTRANCE TO INSURE PROPER FUNCTION.
: STABILIZE ADJACENT BARE AREAS WITH VEGETATION.

2. INSTALL DRIANAGE STRUCTURES AS REQUIRED.
: INSTALL DRIVEWAY FOUNDATION AND ASPHALT COURSE.

3: FOLLOW INDIVIDUAL LOT CONSTRUCTION GENERAL NOTE.

4. CONSTRUCT HOME AS PER BUILDING PLOT PLAN.

5. VEGETATE ALL DI STURBED AREAS NOT TO BE SUBJECT TO CONSTRUCTION WITHIN 14 DAYS.

6. REMOVE SILT FENCING EROSION CONTRO L FOR THE INDIVIDUAL LOT ONCE THE AREA HAS BEEN STABILIZED AS REQUIRED.

7. CONSTRUCTION SEQUENCES MAY BE CO NDUCTED IN A ROLLING PATTERN AS LONG AS THE TOTAL DISTURBANCE AT ANY ONE TIME IS ALWAYS LESS THAN 5 ACRES.

8. REFER TO § 157-10 CONSTRUCTI ON IN SPECTION MI LESTONE FOR INSPECTION REQUIREMENTS.

REFER TO EROSION CONTROL MAINTENANCE SCHEDULE FOR FURTHER INFORMATION EROSION AND SEDI MENT C ONTROL PL AN S UBJECT TO ANY IN FIEL D MODIFI CATIONS REQUIRED BY THE TOWN OF EAST FIS HKILL INSPECT ORS, NYSDEC, AND P ROJECT ENGINEER.

: VEGETATE DISTURBED AR EAS NOT TO BE SUBJECT TO CONS TRUCTION W ITHIN 1 4 DAYS.
: UPON INSTALL ATION OF RO AD-SUBBASE AND S TABILIZATION OF ALL DIST URBED AREAS, SILT FENCING, TEMP ORARY S WALES, CHECK DAMS, AND I NLET P ROTECTION ASSOCIATED W ITH THIS PHASE MAY BE REMOVED UNLES S OTHE R W ISE NOT ED B Y FIELD INSPECTIONS BY THE TOWN ENGINEER AND PROJECT ENGINEER.

PHASE XII (APPROXIMATE AREA OF RE-DISTURBANCE 4.75 ACRES) -

1. CONVERT TEM PORARY SEDIMENT P ONDS TO FUNCTIONAL STORM WATER MANAGEMENT PONDS.

2. BEGIN RESHAPING OF POND INTERIOR ONL Y IF THE SEDIMENT TRAP IS FR EE OF STANDING WATER TO AVOID A RELEASE OF SEDIMENT INTO RECEIVEING SWALE.

3. INSTALL OUTLET CONT ROL STRUCTURE AND 18 " HDPE FROM PERIMETER S WALE TO DMH AS PER PLAN. REMOVE ANY TEMPORARY SWALES.

4. INSTALL POND PLANTINGS AS REQUI RED FOL LOWING ALL PLANTIN G RECOMMENDATIONS FOUND WITHIN THE PLAN SET.

5. FINAL ASPHALT COURSE, ADJUST CATCH BASIN GRATES AS REQUIRED.

6. SEED AND MULCH, INSTALL STREET TREES, SIGNS, AND MONUMENTS AS REQUIRED.

7. VEGETATE ALL DI STURBED AREAS NOT TO BE SUBJECT TO CONSTRUCTION WITHIN 14 DAYS.
REMOVE ALL SILT FENCING AND STABILIZATION MEASURES AS REQUIRED.

8. REMOVE SILT FENCING WHEN PHASE HAS BEEN STABLIZED AS REQUIRED.

9. REFER TO § 157- 10 CONS TRUCTION INSPECTI ON MILES TONES FOR INSPECTION REQUIREMENTS.

REFER TO EROSION CONTROL MAINTENANCE SCHEDULE FOR FURTHER INFORMATION

EROSION AND SEDI MENT C ONTROL PL AN S UBJECT TO ANY IN FIEL D MODIFI CATIONS REQUIRED BY THE TOWN OF EAST FIS HKILL INSPECT ORS, NYSDEC, AND P ROJECT ENGINEER.

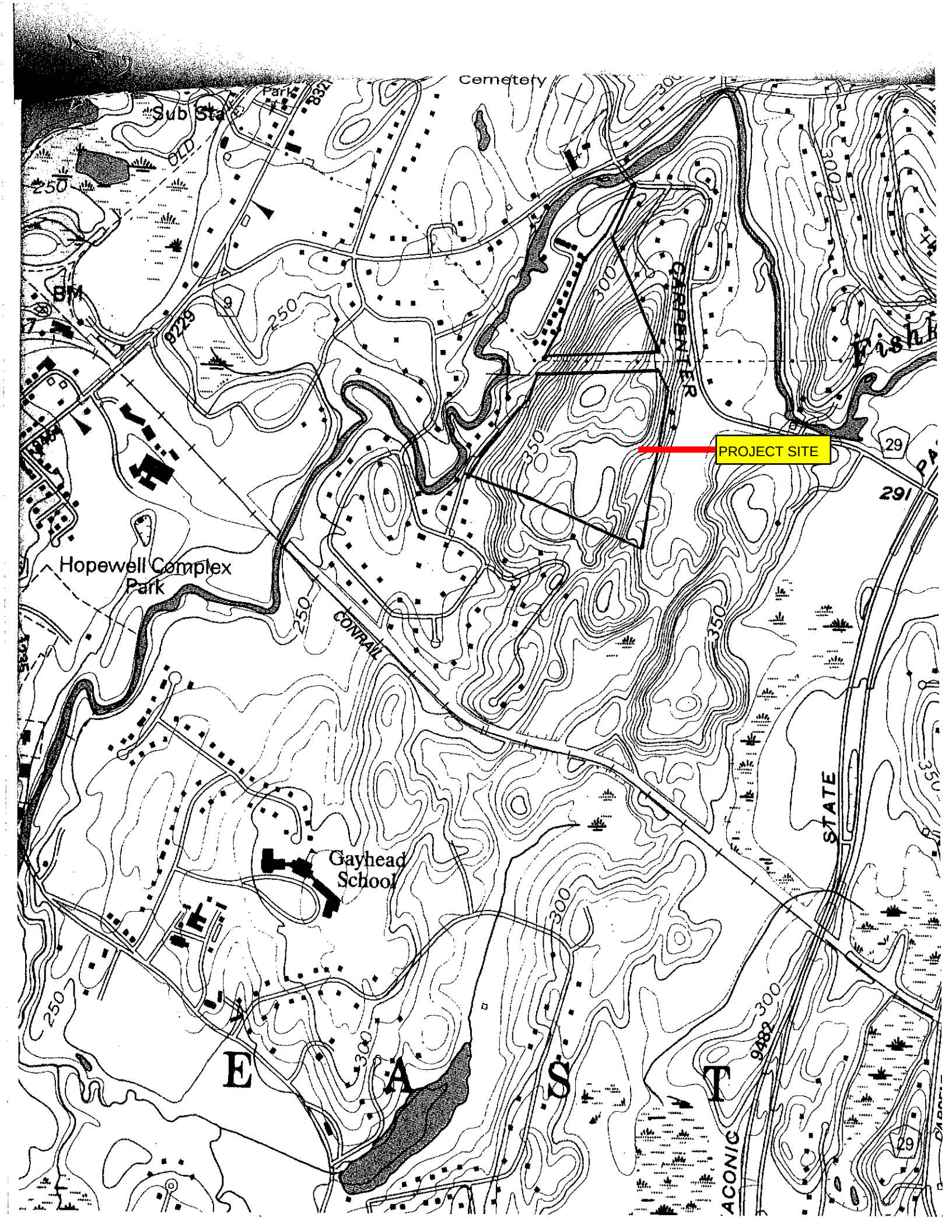
: VEGETATE DISTURBED AR EAS NOT TO BE SUBJECT TO CONS TRUCTION W ITHIN 1 4 DAYS.
: UPON INSTALL ATION OF RO AD-SUBBASE AND S TABILIZATION OF ALL DIST URBED AREAS, SILT FENCING, TEMP ORARY S WALES, CHECK DAMS, AND I NLET P ROTECTION ASSOCIATED W ITH THIS PHASE MAY BE REMOVED UNLES S OTHE R W ISE NOT ED B Y FIELD INSPECTIONS BY THE TOWN ENGINEER AND PROJECT ENGINEER.

VII. Conclusion

As a result of the stormwater management practices proposed within the SWPPP prepared for this project, a reduction in erosion, sediment, and post development flows have been reduced as per the requirements of the NYSDEC GP0-10-001 Permit.

Appendix A

USGS Mappings
Dutchess County Soils Mapping
Dutchess County Soils Description
SWPPP Component Flow Chart
Existing Drainage Analysis Hydrocad Calculations

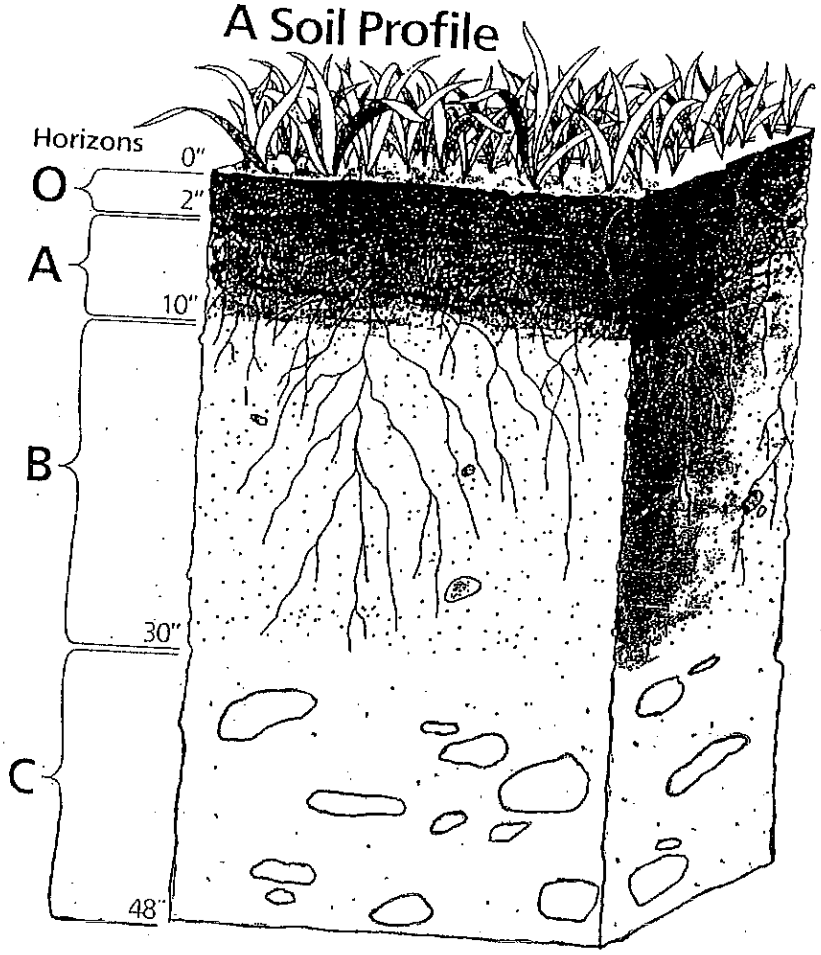

Cemetery
Sub Sta
Park
832
OLD
250
BM
9229
250
300
CARPENTER
Fish
PROJECT SITE
29
291
350
Hopewell Complex
Park
250
CONRAIL
350
STATE
Gayhead
School
300
250
300
E
A
S
T
9482
300
ACONIC
29

UNDERLYING SOILS INFORMATION

R. OSWALD

DUTCHESS COUNTY SOIL SURVEY

USERS GUIDE



Dutchess County, New York

Dutchess County Soil and Water Conservation District

Cardigan soils - Moderately deep (20 to 40 inches), well drained loamy soils formed in till underlain by folded shale bedrock. Permeability is moderate.

DxB Dutchess-Cardigan-Urban land complex, undulating, rocky (1 to 6 percent slopes) - This complex is about 25 percent Dutchess soils, 25 percent Cardigan soils, 25 percent Urban land, and 25 percent other soils and rock outcrop. Folded shale rock outcrop covers 0.1 to 2 percent of the surface.

Dutchess soils - Very deep, well drained loamy soils formed in till. Permeability is moderate.

Cardigan soils - Moderately deep (20 to 40 inches), well drained loamy soils formed in till underlain by folded shale bedrock. Permeability is moderate.

Urban land - Areas covered by buildings, streets, parking lots, and other impervious surfaces which obscure soil identification.

DxC Dutchess-Cardigan-Urban land complex, rolling, rocky (5 to 16 percent slopes) - This complex is about 25 percent Dutchess soils, 25 percent Cardigan soils, 25 percent Urban land, and 25 percent other soils and rock outcrop. Folded shale rock outcrop covers 0.1 to 2 percent of the surface.

Dutchess soils - Very deep, well drained loamy soils formed in till. Permeability is moderate.

Cardigan soils - Moderately deep (20 to 40 inches), well drained loamy soils formed in till underlain by folded shale bedrock. Permeability is moderate.

Urban land - Areas covered by buildings, streets, parking lots, and other impervious surfaces which obscure soil identification.

FcB Farmington-Galway complex, undulating, very rocky (1 to 6 percent slopes) - This complex is about 40 percent Farmington soils, 30 percent Galway soils, and 30 percent other soils and rock outcrop. Folded limestone bedrock covers 2 to 10 percent of the surface.

Farmington soils - Shallow (10 to 20 inches), well drained and somewhat excessively drained loamy soils formed in till underlain by folded limestone bedrock. Permeability is moderate.

Galway soils - Moderately deep (20 to 40 inches), well drained and moderately well drained loamy soils formed in till underlain by folded limestone bedrock. Permeability is moderate. Seasonal high water table at 1.5 to 3.0 feet from March to April.

FcC Farmington-Galway complex, rolling, very rocky (5 to 16 percent slopes) - This complex is about 40 percent Farmington soils, 30 percent Galway soils, and 30 percent other soils and rock outcrop. Folded limestone bedrock covers 2 to 10 percent of the surface.

Farmington soils - Shallow (10 to 20 inches), well drained and somewhat excessively drained loamy soils formed in till underlain by folded limestone bedrock. Permeability is moderate.

Galway soils - Moderately deep (20 to 40 inches), well drained and moderately well drained loamy soils formed in till underlain by folded limestone bedrock. Permeability is moderate. Seasonal high water table at 1.5 to 3.0 feet from March to April.

FcD Farmington-Galway complex, hilly, very rocky (15 to 30 percent slopes) - This complex is about 40 percent Farmington soils, 30 percent Galway soils, and 30 percent other soils and rock outcrop. Folded limestone bedrock covers 2 to 10 percent of the surface.

Farmington soils - Shallow (10 to 20 inches), well drained and somewhat excessively drained loamy soils formed in till underlain by folded limestone bedrock. Permeability is moderate.

Galway soils - Moderately deep (20 to 40 inches), well drained and moderately well drained loamy soils formed in till underlain by folded limestone bedrock. Permeability is moderate. Seasonal high water table at 1.5 to 3.0 feet from March to April.

FeE Farmington-Rock Outcrop complex, steep (25 to 45 percent slopes) - This complex is about 60 percent Farmington soils, 20 percent folded limestone rock outcrop, and 20 percent other soils.

Farmington soils - Shallow (10 to 20 inches), well drained and somewhat excessively drained, loamy soils formed in till underlain by folded limestone bedrock. Permeability is moderate.

Rock outcrop - Common exposures of folded and tilted limestone bedrock or soils too thin to support plant

MLRA(S): 101, 140, 142, 144A, 144B, 143
REV. JDV,WEH, 3-90
LITHIC EUTROCHREPTS, LOAMY, MIXED, MESIC

THE FARMINGTON SERIES CONSIS OF SHALLOW, WELL DRAINED AND SOMEWHAT EXCESSIVELY DRAINED SOILS ON GLACIALTED UPLANDS. THEY FORMED IN GLACIAL TILL OR IN WIND AND WATER DEPOSITS MIXED WITH TILL. TYPICALLY, THESE SOILS HAVE A DARK GRAYISH BROWN SILT LOAM SURFACE LAYER, 8 INCHES THICK. THE SUBSOIL, FROM 8 TP 14 INCHES, IS YELLOWISH BROWN SILT LOAM AND, FROM 14 TO 18 INCHES, IS BROWN LOAM. HARD BEDROCK IS AT 18 INCHES. SLOPES RANGE FROM 0 TO 70 PERCENT.

LANDSCAPE AND CLIMATE PROPERTIES

ANNUAL AIR TEMPERATURE	FROST FREE DAYS	ANNUAL PRECIPITATION	ELEVATION (FT)	DRAINAGE CLASS	SLOPE (PCT)
45-50	120-190	28-45	100-800	W, SE	0-70

ESTIMATED SOIL PROPERTIES (A)

DEPTH (IN.)	USDA TEXTURE	UNIFIED	AASHTO	FRACT. >10 IN (PCT)	FRACT. 3-10IN (PCT)	PERCENT OF MATERIAL LESS THAN 3" PASSING SIEVE NO. 4	10	40	200	CLAY (PCT)
0-8	SIL, L, FSL	ML, CL, SM, SC	A-2, A-4, A-6	0	0-5	80-95	75-80	50-85	30-80	10-27
0-8	GR-SIL, GR-L, GR-FSL	ML, CL, GM, GC	A-2, A-4, A-6, A-1	0	0-5	55-80	50-75	35-70	20-65	10-27
0-8	CN-SIL, CN-L, CN-FSL	ML, CL, GM, GC	A-2, A-4, A-6, A-1	0	0-5	55-80	50-75	35-70	20-65	10-27
8-18	SIL, L, GR-FSL	ML, CL, GM, GC	A-2, A-4, A-6, A-1	0	0-5	60-95	55-90	35-85	20-80	10-27
18	UWB									

DEPTH (IN.)	LIQUID LIMIT	PLASTICITY INDEX	MOIST BULK DENSITY (G/CM3)	PERMEABILITY (IN/HR)	AVAILABLE WATER CAPACITY (IN/IN)	SOIL REACTION (PH)	SALINITY (MMHOS/CM)	SAR	CEC (ME/100G)	CACO3 (PCT)	GYPSUM (PCT)
0-8	20-35	3-15	1.10-1.40	0.6-2.0	0.11-0.19	5.1-7.3	-	-	10-35	0-2	0
0-8	20-35	3-15	1.10-1.40	0.6-2.0	0.08-0.15	5.1-7.3	-	-	10-35	0-2	0
0-8	20-35	3-15	1.10-1.40	0.6-2.0	0.08-0.15	5.1-7.3	-	-	10-35	0-2	0
8-18	20-35	3-15	1.20-1.50	0.6-2.0	0.07-0.18	5.6-7.8	-	-	5-20	0-5	0
18											

DEPTH (IN.)	ORGANIC MATTER (PCT)	SHRINK-SWELL POTENTIAL	EROSION FACTORS K	EROSION FACTORS T	WIND EROD. GROUP	WIND EROD. INDEX	CORROSIVITY STEEL	CORROSIVITY CONCRETE
0-8	2-8	LOW	.32	2	-	-	LOW	MODERATE
0-8	2-5	LOW	.24	2	-	-		
0-8	2-6	LOW	.24	2	-	-		
8-18		LOW	.32					
18								

FLOODING FREQUENCY	FLOODING DURATION	FLOODING MONTHS	HIGH WATER TABLE DEPTH (FT)	HIGH WATER TABLE KIND	HIGH WATER TABLE MONTHS	CEMENTED PAN DEPTH (IN)	CEMENTED PAN HARDNESS	BEDROCK DEPTH (IN)	BEDROCK HARDNESS	SUBSIDENCE INIT. (IN)	SUBSIDENCE TOTAL (IN)	HYD GRP	POTENT'L FROST ACTION
NONE			>6.0			-		10-20	HARD	-		C	MODERATE

SANITARY FACILITIES (B)

SEPTIC TANK ABSORPTION FIELDS	0-15%:SEVERE-DEPTH TO ROCK 15+%:SEVERE-DEPTH TO ROCK,SLOPE
SEWAGE LAGOON AREAS	0-7%:SEVERE-DEPTH TO ROCK 7+%:SEVERE-DEPTH TO ROCK,SLOPE
SANITARY LANDFILL (TRENCH)	0-15%:SEVERE-DEPTH TO ROCK 15+%:SEVERE-DEPTH TO ROCK,SLOPE
SANITARY LANDFILL (AREA)	0-15%:SEVERE-DEPTH TO ROCK 15+%:SEVERE-DEPTH TO ROCK,SLOPE
DAILY COVER FOR LANDFILL	0-15%:POOR-AREA RECLAIM 15+%:POOR-AREA RECLAIM,SLOPE

CONSTRUCTION MATERIAL (B)

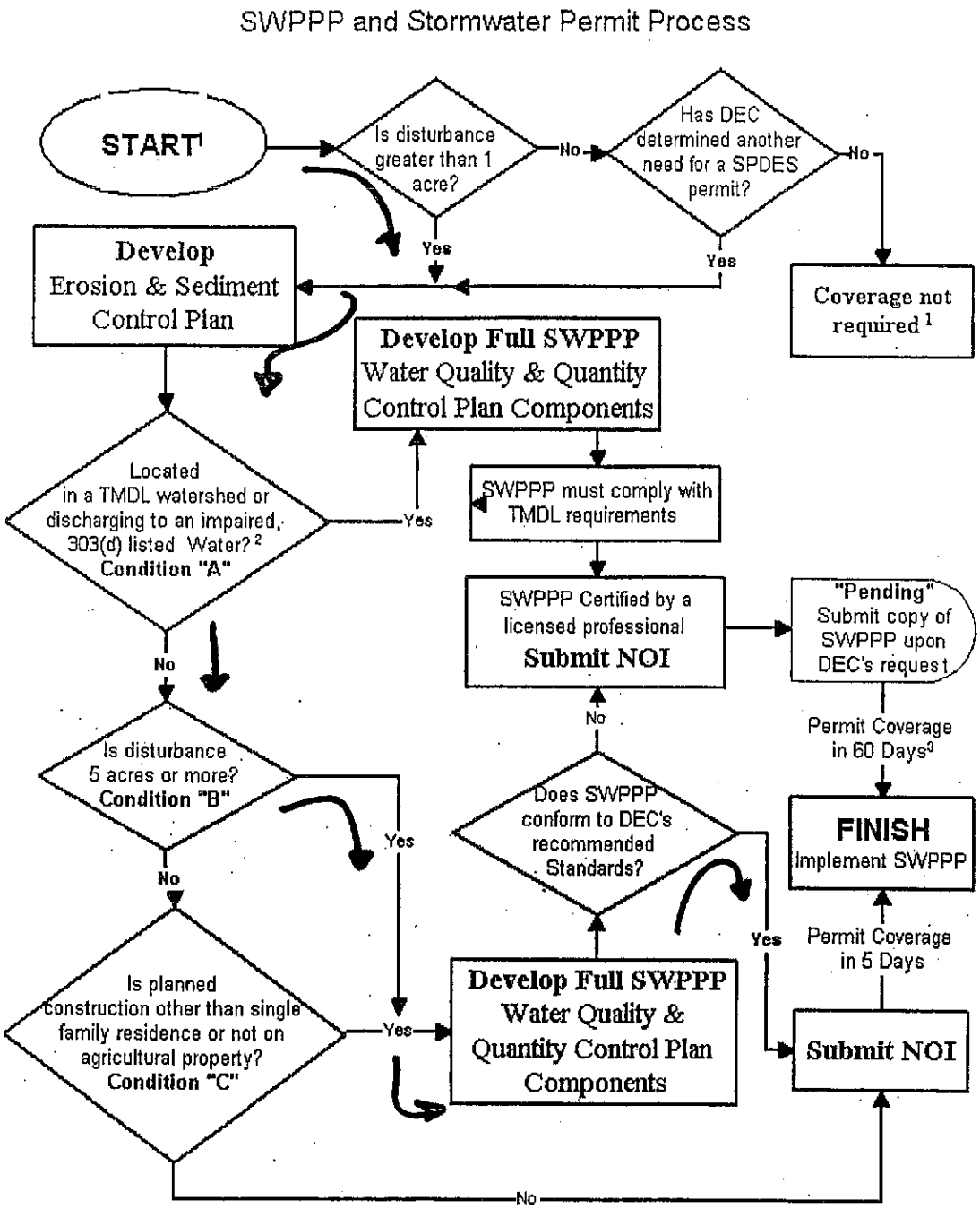
ROADFILL	0-25%:POOR-AREA RECLAIM 25+%:POOR-AREA RECLAIM,SLOPE
SAND	IMPROBABLE-EXCESS FINES
GRAVEL	IMPROBABLE-EXCESS FINES
TOPSOIL	0-15%:POOR-AREA RECLAIM,SMALL STONES 15+%:POOR-AREA RECLAIM,SMALL STONES,SLOPE

BUILDING SITE DEVELOPMENT (B)

SHALLOW EXCAVATIONS	0-15%:SEVERE-DEPTH TO ROCK 15+%:SEVERE-DEPTH TO ROCK,SLOPE
DWELLINGS WITHOUT BASEMENTS	0-15%:SEVERE-DEPTH TO ROCK 15+%:SEVERE-SLOPE,DEPTH TO ROCK
DWELLINGS WITH BASEMENTS	0-15%:SEVERE-DEPTH TO ROCK 15+%:SEVERE-DEPTH TO ROCK,SLOPE
SMALL COMMERCIAL BUILDINGS	0-8%:SEVERE-DEPTH TO ROCK 8+%:SEVERE-SLOPE,DEPTH TO ROCK
LOCAL ROADS AND STREETS	0-15%:SEVERE-DEPTH TO ROCK 15+%:SEVERE-DEPTH TO ROCK,SLOPE
LAWNS, LANDSCAPING AND GOLF FAIRWAYS	0-15%:SEVERE-THIN LAYER 15+%:SEVERE-SLOPE,THIN LAYER

WATER MANAGEMENT (B)

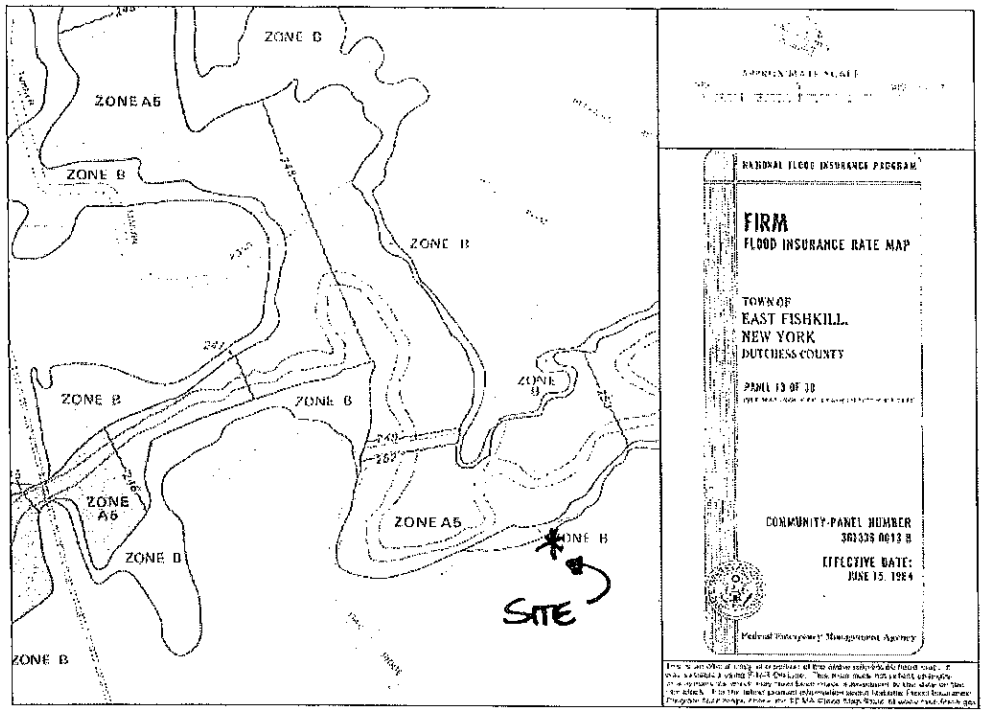
POND RESERVOIR AREA	0-8%:SEVERE-DEPTH TO ROCK 8+%:SEVERE-DEPTH TO ROCK,SLOPE
EMBANKMENTS DIKES AND LEVEES	SEVERE-PIPING
EXCAVATED PONDS AQUIFER FED	SEVERE-NO WATER
DRAINAGE	DEEP TO WATER
IRRIGATION	0-3%:DROUGHTY,DEPTH TO ROCK 3+%:DROUGHTY,DEPTH TO ROCK,SLOPE
TERRACES AND DIVERSIONS	0-8%:DEPTH TO ROCK 8+%:SLOPE,DEPTH TO ROCK
GRASSED WATERWAYS	0-8%:DROUGHTY,DEPTH TO ROCK 8+%:SLOPE,DROUGHTY,DEPTH TO ROCK



NOTES:

1. Under any of the above conditions other environmental permits may be required. DEC may require permit for construction disturbance <.1 acre on a case by case basis.
2. and the following exists: construction and/or stormwater discharges from the construction or post-construction site contain the pollutant of concern identified in the TMDL or 303(d) listing.
3. After receipt by DEC of completed application.

Figure 1- Stormwater Pollution Prevention Plan Component Flow Chart


ZONE B
ZONE A5
ZONE B
ZONE B
ZONE B
ZONE B
ZONE B
ZONE A5
ZONE A5
ZONE B
ZONE B
ZONE B
SITE
NATIONAL FLOOD INSURANCE PROGRAM
FIRM
FLOOD INSURANCE RATE MAP
TOWN OF
EAST FISHKILL,
NEW YORK
DUTCHESS COUNTY
PANEL 13 OF 30
COMMUNITY-PANEL NUMBER
360338 0013 B
EFFECTIVE DATE:
JUNE 15, 1984
Federal Emergency Management Agency

Definitions of FEMA Flood Zone Designations

Flood zones are geographic areas that the FEMA has defined according to varying levels of flood risk. These zones are depicted on a community's Flood Insurance Rate Map (FIRM) or Flood Hazard Boundary Map. Each zone reflects the severity or type of flooding in the area.

Moderate to Low Risk Areas

In communities that participate in the NFIP, flood insurance is available to all property owners and renters in these zones:

ZONE	DESCRIPTION
B, C, and X	Areas outside the 1-percent annual chance floodplain, areas of 1% annual chance sheet flow flooding where average depths are less than 1 foot, areas of 1% annual chance stream flooding where the contributing drainage area is less than 1 square mile, or areas protected from the 1% annual chance flood by levees. No Base Flood Elevations or depths are shown within this zone. Insurance purchase is not required in these zones.

High Risk Areas

In communities that participate in the NFIP, mandatory flood insurance purchase requirements apply to all of these zones:

ZONE	DESCRIPTION
A	Areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. Because detailed analyses are not performed for such areas; no depths or base flood elevations are shown within these zones.
AE, A1-A30	Areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. In most instances, base flood elevations derived from detailed analyses are shown at selected intervals within these zones.
AH	Areas with a 1% annual chance of shallow flooding, usually in the form of a pond, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Base flood elevations derived from detailed analyses are shown at selected intervals within these zones.
AO	River or stream flood hazard areas, and areas with a 1% or greater chance of shallow flooding each year, usually in the form of sheet flow, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Average flood depths derived from detailed analyses are shown within these zones.
AR	Areas with a temporarily increased flood risk due to the building or restoration of a flood control system (such as a levee or a dam). Mandatory flood insurance purchase requirements will apply, but rates will not exceed the rates for unnumbered A zones if the structure is built or restored in compliance with Zone AR floodplain management regulations.
A99	Areas with a 1% annual chance of flooding that will be protected by a Federal flood control system where construction has reached specified legal requirements. No depths or base flood elevations are shown within these zones.

High Risk - Coastal Areas

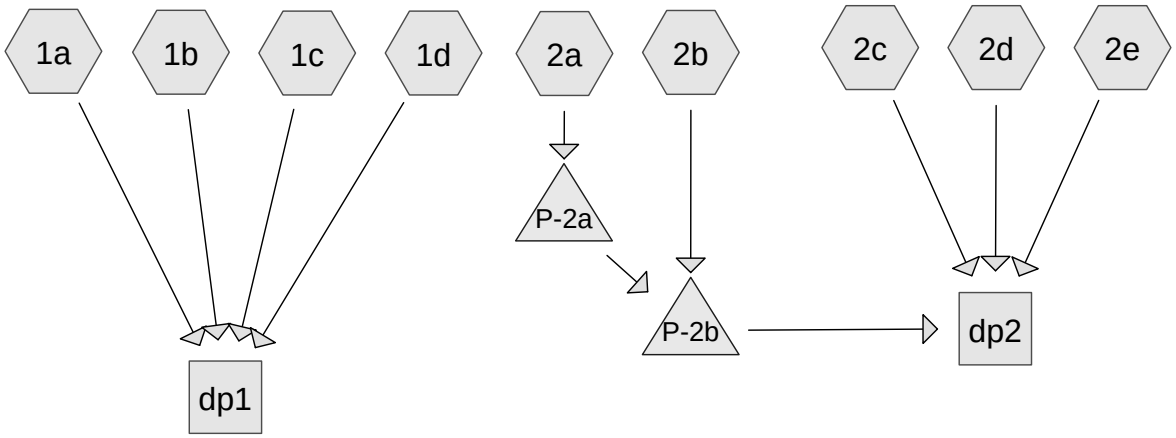
In communities that participate in the NFIP, mandatory flood insurance purchase requirements apply to all of these zones:

ZONE	DESCRIPTION
V	Coastal areas with a 1% or greater chance of flooding and an additional hazard associated with storm waves. These areas have a 26% chance of flooding over the life of a 30-year mortgage. No base flood elevations are

	shown within these zones.
VE, V1 - 30	Coastal areas with a 1% or greater chance of flooding and an additional hazard associated with storm waves. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Base flood elevations derived from detailed analyses are shown at selected intervals within these zones.

Undetermined Risk Areas

ZONE	DESCRIPTION
D	Areas with possible but undetermined flood hazards. No flood hazard analysis has been conducted. Flood insurance rates are commensurate with the uncertainty of the flood risk.



DESIGN STORMS 1YR , 2YR, 10YR, AND 25YR - NO FLOODPLAIN

Subcat Reach Pond Link

Drainage Diagram for HILLTOP PRE

Prepared by M. GILLESPIE & ASSOC., Printed 2/16/2010