TOWN OF CARMEL
PLANNING BOARD

60 McAlpin Avenue
Mahopac, New York 10541
Tel. (845) 628-1500 – Ext.190
www.ci.carmel.ny.us

PLANNING BOARD AGENDA
FEBRUARY 22, 2023– 7:00 P.M.

		TAX MAP #	PUB. HEARING	MAP DATE	COMMENTS
PUBLIC HEARING					
1.	Kiwi Country Day School – 825 Union Valley Rd	77.17-1-31 & 32	2/22/23	1/30/23	Public Hearing & Resolution
2.	Random Ridge Subdivision – Kennicut Hill Road	76.10-1-23	2/22/23		Continuation of Open Public Hearing – Bond Reduction
SITE PLAN					
3.	Willow Wood Country Club, Inc. – 551 Union Valley Road	87.7-1-6, 7 & 11		2/13/22	Amended Site Plan
MISCELLANEOUS					
4.	Yankee Land Development – Bayberry Hill Rd & Owen Drive	76.15-1-12			Extension of Preliminary Subdivision Approval
5.	Joe Zakon d/b/a 14 Nicole Way LLC – 14 Nicole Way	65.6-1-22			Bond Reduction
6.	Pulte Homes of New York, LLC – Lot 4 – Terrace Drive	55.14-1-11.2			Bond Return
7.	Pulte Homes of New York, LLC – Lot 5 – Terrace Drive	55.14-1-11.3			Bond Return

INSITE
ENGINEERING, SURVEYING & LANDSCAPE ARCHITECTURE, P.C.

Feburary 14, 2023

Town of Carmel Planning Board
60 McAlpin Avenue
Mahopac, New York 10541

RE: Willow Wood Country Club, Inc.
Amended Site Plan
Union Valley Road
Tax Map No. 87.7-1-6, 7 & 11

Dear Chairman Paeprer and Members of the Board:

Please find enclosed five (5) copies of the following plans and documents in support of an application for Amended Site Plan Approval for the above referenced project:

- Site Plan Drawings (5 sheets total), last revised February 13, 2023.
- Stormwater Pollution Prevention Plan dated February 13, 2023.
- Draft Notice of Intern (NOI) and MS4 SWPPP Acceptance Form.
- Noise Study Report by Erich Thalheimer dated April 26, 2022.
    - Letter From Erich Thalheimer to George Calcagnini (Response to Epsilon Review of Noise Study) dated October 23, 2022

It is noted that the Town has engaged an acoustical engineer Epsilon Associated, Inc. (Epsilon) to review the Noise Study Report submitted by Mr. Thalheimer. We are in receipt of the February 14th, 2023 review letter by Epsilon which was received concurrently with this submission. Our noise consultant will continue to work with Epsilon to address the few remaining comments.

With respect to the comments offered by the Building Inspector, Consulting Town Planner and Town Engineer, we offer the following:

Memorandum from Michael G. Carnazza, Director of Code Enforcement, dated May 25, 2022:

- Regarding the comment relative to the sound barriers being proposed at stations 4, 12 13 and 14 and the club's compliance with the Town of Carmel Noise Ordinance (paragraph 2 and 3 of the comment letter) we note that a noise report was prepared by Willow Wood's acoustical engineer and reviewed by Epsilon. This report demonstrates Willow Wood will comply with the Town Noise Ordinance by implementing the following measures.
    - Enhance the existing noise barriers at Stations 13 and 14 by adding wing walls to each shooting station, and noise absorptive material to the side of the barrier facing the noise source.
    - Construct a small (12-foot tall) absorptive noise barrier with side panels behind the shooting position at Station 12 to shield noise propagating towards Union Valley Road.
    - Slightly rotate Station 8 in a clockwise direction the downrange direction.
    - Rotate the downrange direction for Station 6 so that it points south.

- Relocate Station 9 between Stations 10 and 11 and rotate the downrange direction for Station 9 so that it points south.
- Relocate Station 4 slightly to the north so that its downrange direction rotates counterclockwise and points west-southwest instead. A noise barrier has also been proposed at Station 4 as an additional mitigation measure.

- The project team looked at the potential addition of a vegetated berm as a noise reducing element. Based on the results of the noise report there were other mitigating measures that were found to be more effective that would result in less loss of trees and creation of ground disturbance which would be necessary to construct the berm.

- It is our understanding the existing sound barriers at the trap field have been reconstructed.

Memorandum from Richard J. Franzetti P.E., Town Engineer dated May 20, 2022:

I. General Comments:

1. Permits

   With respect to the permits cited, we offer the following:

   a. It is acknowledged that coverage under NYSDEC General Permit for Stormwater Discharges from Construction Activities, GP-0-20-001 is required as the project is disturbing more than 5,000 square feet but less than 1 acre. As such, all that is required is an erosion control plan. However, based on Town's policy, a Stormwater Pollution Prevention Plan (SWPPP) has been provided which provides swale sizing calculations as well as the provision of several rain gardens throughout the property.

2. A revised Stormwater Maintenance Agreement has been included as Appendix D in the SWPPP for Town's review and comment. Included in the Maintenance Agreement is the Schedule A which indicates the stormwater maintenance provisions. The table from the Schedule A can also be found on Drawing SP-2 of the Site Plan Set.

3. Prior to the final amended site plan resolution, a quantity takeoff will be provided for the purposes of establishing the required performance bond and inspection fee.

II. Detailed Comments:

1. Comment Noted. Rain Garden calculations have been provided in Appendix B of the project SWPPP enclosed herewith.

2. The NYSDEC Wetland Validation field visit was completed with NYSDEC in May of 2019. A DEC Validation map is in the process of being obtained.

Memorandum from Patrick Cleary, AICP, CEP, PP, LEEP AP, Town Planner dated May 25, 2022:

- General note 5 has been added to the project drawings indicating that any future change, shift or relocation of a station would require an amended site plan approval.
- A picture / graphical detail for the Proposed Sound Barrier can be found on Drawing D-1.
- Since previously before the Board the Town has retained Epsilon to review the study prepared by Mr. Erich Thalheimer. It is our understanding the comments raised by the Town's noise consultant have been mostly addressed. While finalizing this submission an updated letter from Epsilon was received. Our noise consultant will work with Epsilon to address the few remaining items.
- Relative to the comments offered on the noise report, prior to the last Planning Board meeting, resulted in the Board retaining an independent consultant to review the Noise Study. It is our understanding the comments raised by the Town's noise consultant have been mostly addressed.

While finalizing this submission an updated letter from Epsilon was received. Our noise consultant will work with Epsilon to address the few remaining items.

- A separate letter and supporting documents have been submitted by George Calcagnini under a separate cover addressing the issues that have been raised by the neighbor.

We trust you will find the enclosed information in order and respectfully request this item be placed on your February 22, 2023 Planning Board agenda.

Should you have any questions or comments regarding this information, please feel free to contact our office.

Very truly yours,

INSITE ENGINEERING, SURVEYING & LANDSCAPE ARCHITECTURE, P.C.

By: 
Richard D. Williams, Jr. P.E.
Principal Engineer

RDW/jwm/amk

Enclosure(s)

cc: George J. Calcagnini

Insite File No. 18173.100

INSITE
ENGINEERING, SURVEYING &
LANDSCAPE ARCHITECTURE, P.C.

STORMWATER POLLUTION PREVENTION PLAN

Prepared For

Willow Wood Country Club, Inc.

Union Valley Road
Mahopac, NY 10541
February 13, 2023

Owner Information:

Willow Wood Country Club, Inc
Union Valley Road
Mahopac, New York 10541

Contractor Information:

To Be Determined

NOTE: This report in conjunction with the project plans make up the complete Stormwater Management Report.

Prepared by:
Insite Engineering, Surveying & Landscape Architecture, P.C.
3 Garrett Place
Carmel, New York 10512

CONTENTS

1.0 INTRODUCTION

1.1 Project Description

The site is located at 551 Union Valley Road in the Town of Carmel. The site is approximately 86.0 acres and is designated as Tax Map 87.7-1-1/6/11. The property currently contains a household membership rifle and pistol club. The proposed development includes the addition of a sporting clay course.

The project site is located in the Muscoot Reservoir Watershed Basin. Since the project is a *land development activity* under Town Code but is disturbing between 5,000 s.f. and one acre this project is subject to *NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activities* General Permit (General Permit), and is required to provide erosion controls only.

Notwithstanding, at the request of the Planning Board and Town Engineer, post-construction stormwater management practices (SMP's) have been provided where possible that will provide Water Quality Volume (WQv) Treatment for the proposed improvements.

1.2 Existing Site Conditions

The existing property is primarily forested and undeveloped. The eastern portion of the site contains a NYSDEC Wetland (CF-8). The western portion of the property contains a high point in the center and slopes downward toward the property lines. The runoff that flows north, south and west from the above-mentioned high point sheet flows off the property. The runoff that flows east from the high point sheet flows towards the wetland. Currently there are swales along the entrance driveway and eastern portion of the trail. Soil types onsite are identified as ChD/ChC Charlton fine sandy loam, CrC/CsD Charlton-Chatfield complex, ChE Charlton Loam, LeB Leicester Loam and HrF Holis Rock Outcrop Complex.

1.3 Proposed Site Conditions

The subject project includes permitting the existing sporting clay course and proposes the stabilization of the existing trail, improvements to the collection and conveyance system and provisions of SMP. Improvements proposed consist of trail stabilization, removal and replacement of trees and installation of permanent stormwater collection, conveyance and treatment systems. This report will provide sizing calculations for post-construction collection and conveyance systems throughout the site including four (4) Rip Rap Swales, three (3) Flow Spreaders and one (1) Rain Garden.

2.0 STORMWATER MANAGEMENT

Since this project is disturbing more than 5,000 s.f. the project is subject to Town of Carmel *Chapter 156 Stormwater Management* and the General Permit. As noted above, this means the project is only required to provide erosion and sediment controls. However, at the request of the Town Engineer stormwater management practices have been provided where possible. Rip Rap Swales, Level Spreaders and a Rain Garden are being provided to collect, convey and treat stormwater runoff from the sporting clay course.

Contained in the Appendices are sizing calculations for the proposed stormwater collection, conveyance and treatment systems. Specifically, Appendix A contains the HydroCAD stormwater modeling for the Rip Rap Swales and Flow Spreaders. Both the Rip Rap Swales and Flow Spreaders have been sized for 25-year storm event. As can be seen in the routings the flow spreaders will be able to release the discharge from the 25-year storm event at a non-erosive velocity.

The Flow Spreaders have been sized to meet the requirements of the *New York State Standards and Specifications for Erosion and Sediment Control* (Blue Book). See Appendix C for the Flow Spreaders Calculations.

The Rain Garden has been sized in accordance with the *New York State Stormwater Management Design Manual* (Design Manual). See Appendix B for the Rain Garden Sizing Calculations.

3.0 EROSION AND SEDIMENT CONTROL

Erosion and sediment control will be accomplished by three basic principles: containment of sediment, treatment of dirty water, and stabilization of disturbed areas. As the area to be redeveloped consists of the creation of trails, minimal erosion and sediment control is required through construction. Erosion and sediment control notes have been provided on the drawings and silt fence will be provided downhill of disturbed areas.

3.1 Temporary Erosion and Sediment Control Facilities

Temporary erosion and sediment control facilities should be installed and maintained as required to reduce the impacts to off-site properties. The owner will be required to provide maintenance for the temporary erosion and sediment control facilities. In general, the following temporary methods and materials should be used to control erosion and sedimentation from the project site:

- Stabilized Construction Entrance
- Dust Control
- Silt Fence Barriers
- Storm Drain Inlet Protection
- Temporary Soil Stabilization
- Flow Spreaders

All temporary erosion control measures shall be maintained as discussed below. Refer to Project Drawings SP-1 and D-1 for the project Erosion and Sediment Control Plan and additional maintenance items for temporary erosion control facilities. In accordance with GP-0-20-001 a NYSDEC trained contractor shall be onsite at all times soil disturbing activities are commencing. In addition, the owner shall retain a Qualified Profession to perform twice weekly inspections of the erosion control facilities.

A stabilized construction entrance should be installed at the entrance to the site as shown on the plan. The design drawings will include details to guide the contractor in the construction of this entrance. The intent of the stabilized construction entrance is to prevent the “tracking” of soil from the site.

Dust control should be accomplished with water sprinkling trucks if required. During dry periods, sprinkler trucks should wet all exposed earth surfaces as required to prevent the transport of air-borne particles to adjoining areas.

Siltation barriers constructed of geosynthetic filter cloth should be installed at the toe of all disturbed slopes. The intent of these barriers is to contain silt and sediment at the source and inhibit its transport by stormwater runoff. The siltation barriers will also help reduce the rate of runoff by creating filters through which the stormwater must pass. During construction the siltation barriers shall be inspected weekly and after a rainfall event and shall be cleaned/replaced when needed.

Storm drain inlet protection in the form of filter fabric inlet protection will be installed around all proposed inlets. The filter fabric inlet protection will serve to filter stormwater runoff before it enters the collection system. Throughout construction the concrete drainage structures, associated piping and inlet protections shall be inspected weekly and after a rainfall event. These items shall be cleaned, repaired and/or replaced when needed.

When land is exposed during development, the exposure shall be kept to the shortest practical period, but in no case more than 7 days. Temporary grass seed and mulch shall be applied to any construction area idle for seven days. The temporary seeding and mulching shall be performed in accordance with the seeding notes illustrated the Project Drawings. Disturbance shall be minimized in the areas required to perform construction. Upon completion of final grading, topsoil, permanent seeding and mulch shall be applied in accordance the Project Drawings.

3.2 Permanent Erosion and Sediment Control Facilities

Permanent erosion and sediment control will be accomplished by diverting stormwater runoff from steep slopes, controlling/reducing stormwater runoff velocities and volumes, and vegetative and structural surface stabilization. All of the permanent facilities are relatively maintenance free and only require periodic inspections. The owner will provide maintenance for all the permanent erosion and sediment control facilities. Refer to Project Drawings SP-1 and D-1 for the project Erosion and Sediment Control Plan and additional maintenance items for permanent erosion control facilities. A Stormwater Maintenance Agreement will be entered into with the Town of Carmel which shall require the maintenance of permeant erosion control facilities which can be found in Appendix D.

Flow spreaders have been provided to re-establishing sheet flow from discharge points. At a minimum the flow spreaders will meet the design requirements of the New York State Standards and Specifications for Erosion and Sediment Control (Blue Book). The flow spreader has been included in the routings contained in Appendix A. As can be seen in the routings the level spreader will be able to release the discharge from the 25-year storm event at a non-erosive velocity. The dimensions of the level spreader have been provided on the project drawings.

Rip rap swales have been provided as part of the project. Any erosion should be repaired immediately. In addition, any accumulated sediment or debris identified during inspections should be cleaned from swales.

4.0 IMPLEMENTATION, MAINTENANCE & GENERAL HOUSEKEEPING

4.1 Construction Phase

Details associated with the implementation and maintenance of the proposed stormwater facilities and erosion control measures during construction are shown on the Project Drawings. Soil disturbance shall not exceed one acre. The erosion control plan will include associated details and notes to aid the contractor in implementing the plan. Construction is anticipated to begin in the spring of 2023 and anticipated to be completed by the fall of 2023.

In addition to the proposed erosion and sediment control facilities, the following good housekeeping best management practices shall be implemented to mitigate potential pollution during the construction phase of the project. The general contractor overseeing the day-to-day site operation shall be responsible for the good housekeeping best management practices included in the following general categories:

- Material Handling and Waste Management
- Establishment of Building Material Staging Areas
- Establishment of Washout Areas
- Proper Equipment Fueling and Maintenance Practices
- Spill Prevention and Control Plan

All construction waste materials shall be collected and removed from the site regularly by the general contractor. The general contractor shall supply waste barrels for proper disposal of waste materials. All personnel working on the site shall be instructed of the proper procedures for construction waste disposal.

Although it is not anticipated any hazardous waste materials will be utilized during construction, any hazardous waste materials shall be disposed of in accordance with federal, state, and local regulations. No hazardous waste shall be disposed of on-site. Hazardous waste materials shall be stored in appropriate and clearly marked containers and segregated from the other non-waste materials. All hazardous waste shall be stored in a structurally sound and sealed shipping containers located in the staging areas. Material safety data sheets, material inventory, and emergency contact numbers will be maintained in the office trailer. All personnel working on the site shall be instructed of the proper procedures for hazardous waste disposal.

Temporary sanitary facilities (portable toilets) shall be provided on site during the entire length of construction. The sanitary facilities shall be located in the staging areas, or in an alternate area away from

the construction activities on the site. The portable toilets shall be inspected weekly for evidence of leaking holding tanks.

All recyclables, including wood pallets, cardboard boxes, and all other recyclable construction scraps shall be disposed of in a designated recycling barrel provided by the contractor and removed from the site regularly. All personnel working on the site shall be instructed of the proper procedures for construction waste recycling.

All construction equipment and maintenance materials shall be stored in a designated staging area. Silt fence shall be installed down gradient of the construction staging area. Shipping containers shall be utilized to store hand tools, small parts, and other construction materials, not taken off site daily. Construction waste barrels, recycling barrels and if necessary hazardous waste containers shall be located within the limits of the construction staging area.

Throughout the construction of the project several types of vehicles and equipment will be used on-site. Fueling of the equipment shall occur within the limits of the construction staging area. Fuel will be delivered to the site as needed, by the general contractor, or a party chosen by the general contractor. Only minor vehicle equipment maintenance shall occur on-site, all major maintenance shall be performed off-site. All equipment fluids generated from minor maintenance activities shall be disposed of into designated drums and stored in accordance with the hazardous waste storage as previously discussed.

Vehicles and equipment shall be inspected on each day of use. Any leak discovered shall be repaired immediately. All leaking equipment unable to be repaired shall be removed from the site. Ample supplies of absorbent, spill-cleanup materials, and spill kits shall be located in the construction staging area. All spills shall be cleaned up immediately upon discovery. Spent absorbent materials and rags shall be hauled off-site immediately after the spill is cleaned for disposal at a local landfill. All personnel working on the site shall be instructed of the proper procedures for spill prevention and control. Any spill large enough to discharge to surface water will be immediately reported to the local fire / police departments, NYCDEP, and the National Response Center 1-800-424-8802.

It is expected that not all of the species will survive within each basin due to variations within each basin such as water, nutrients, and light. During the initial year of planting, the plants may require watering to germinate and establish. Note that several seedings may be required during the first year to completely establish vegetation within the basin. After the initial year of establishment, the basin does not need to be fertilized or watered. A natural selection process will occur over the first few years, such that the species within the seed mixture most suitable to the conditions will survive.

4.2 Long Term Maintenance

This section discusses the maintenance requirements to insure long term performance of the stormwater facilities. The owner will be responsible for the maintenance of all the stormwater facilities.

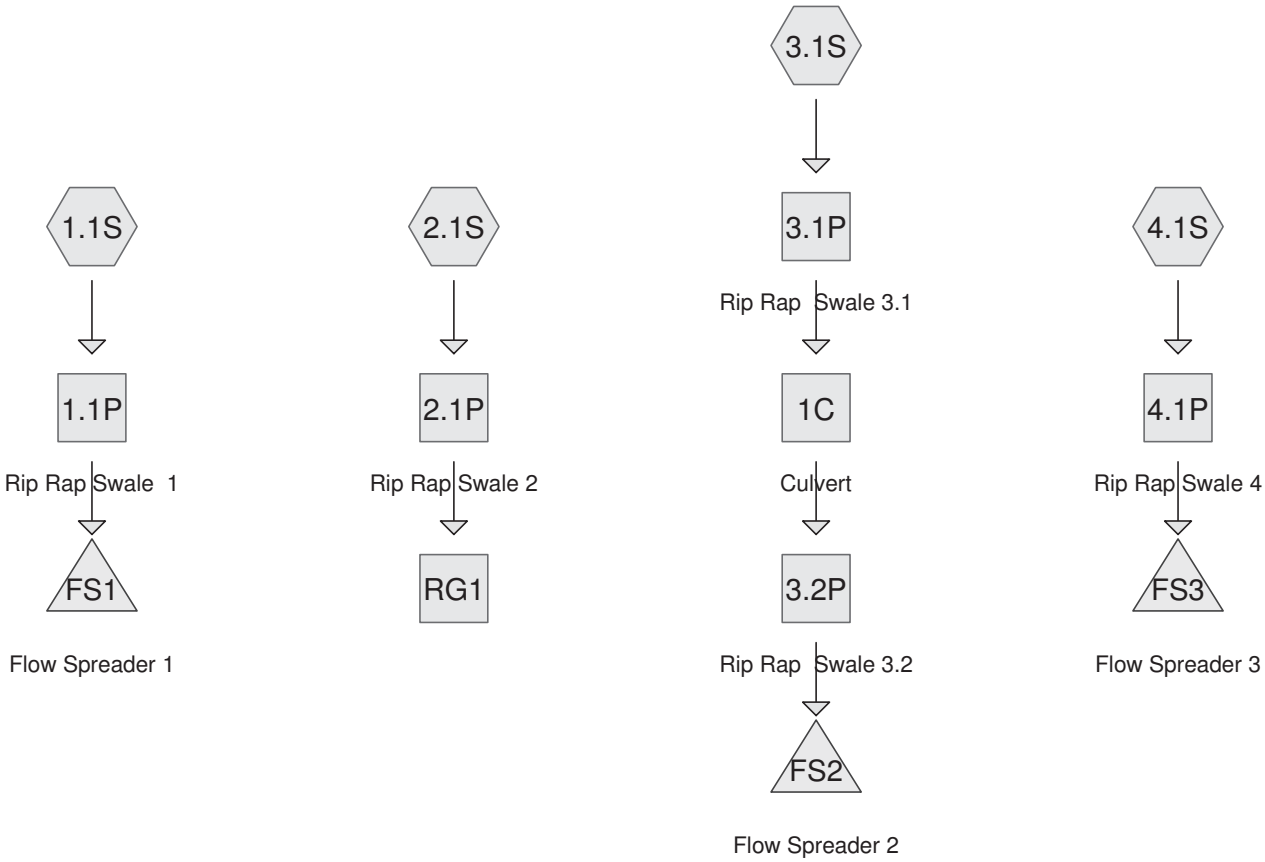
The rip rap swales, flow spreads and rain gardens should be inspected after major storm events and semi-annually. During the inspections, the following should be checked:

- Evidence of clogging of inlet and outlet pipes
- Draindown or rain garden after storm events is occurring
- Accumulation of sediment around the outlet pipes
- Dislodged stones in flow spreader or swale

In addition to guidelines discussed above all maintenance requirements outlined in the Design Manual shall be followed.

APPENDIX A

Post-Development Computer Data / Swale Sizing Calculations



Subcat Reach Pond Link

Routing Diagram for Willow Wood Improvements

Prepared by {enter your company name here}, Printed 3/27/2019

Summary for Subcatchment 1.1S:

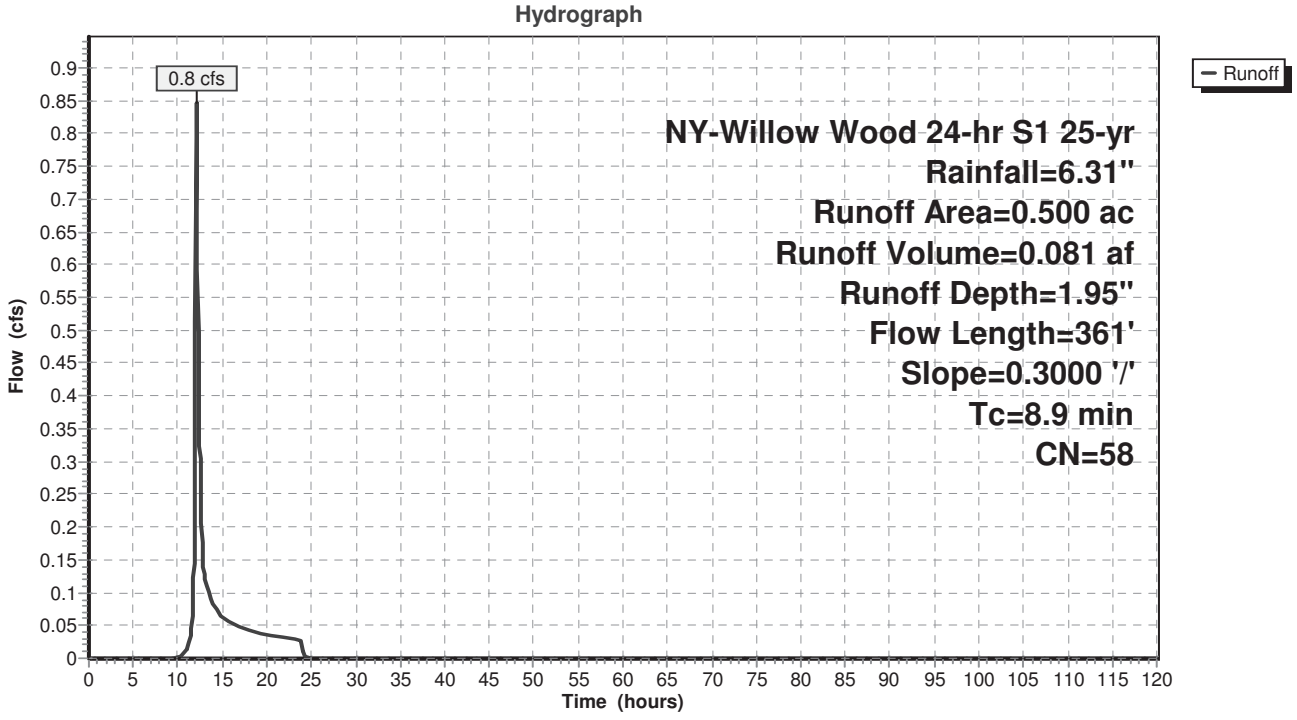
Runoff = 0.8 cfs @ 12.09 hrs, Volume= 0.081 af, Depth= 1.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
NY-Willow Wood 24-hr S1 25-yr Rainfall=6.31"

Area (ac)	CN	Description
0.400	55	Woods, Good, HSG B
0.100	70	Woods, Good, HSG C
0.500	58	Weighted Average
0.500		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	100	0.3000	0.20		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.42"
0.5	261	0.3000	8.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
8.9	361	Total			

Subcatchment 1.1S:



Summary for Subcatchment 2.1S:

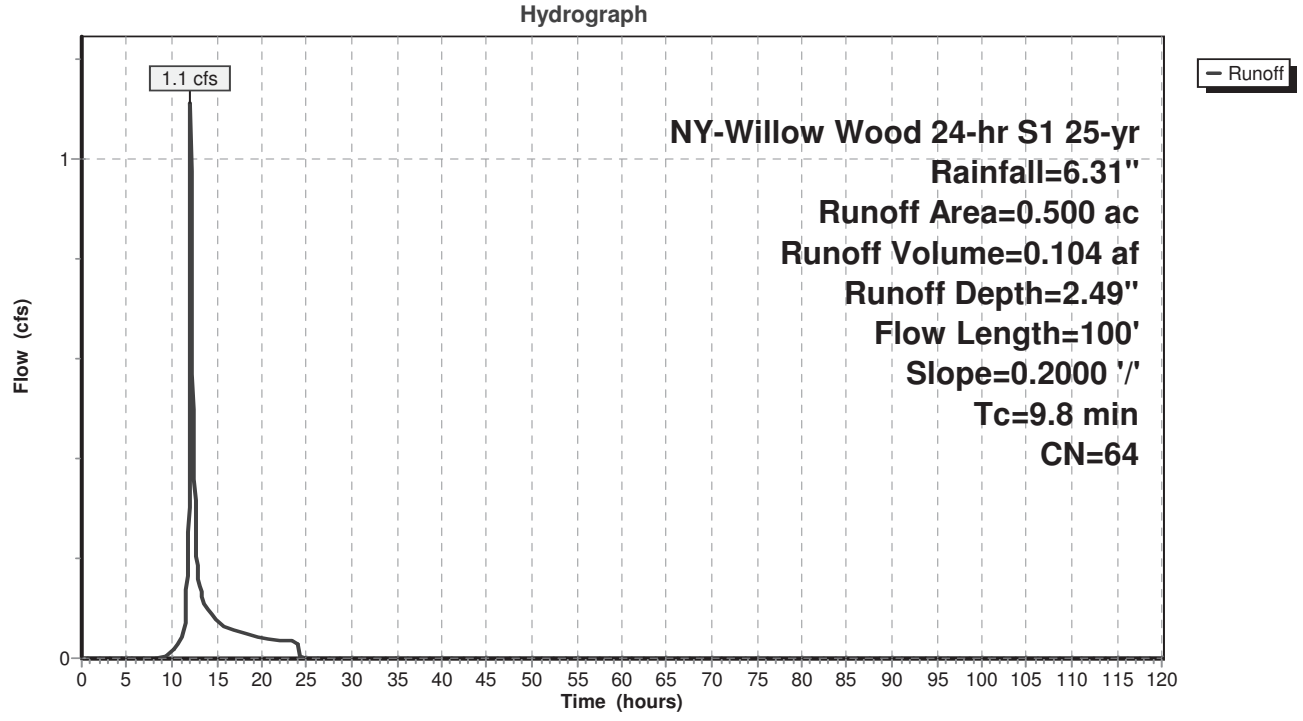
Runoff = 1.1 cfs @ 12.10 hrs, Volume= 0.104 af, Depth= 2.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
NY-Willow Wood 24-hr S1 25-yr Rainfall=6.31"

Area (ac)	CN	Description
0.100	98	Paved parking, HSG B
0.400	55	Woods, Good, HSG B
0.500	64	Weighted Average
0.400		80.00% Pervious Area
0.100		20.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	100	0.2000	0.17		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.42"

Subcatchment 2.1S:



Summary for Subcatchment 3.1S:

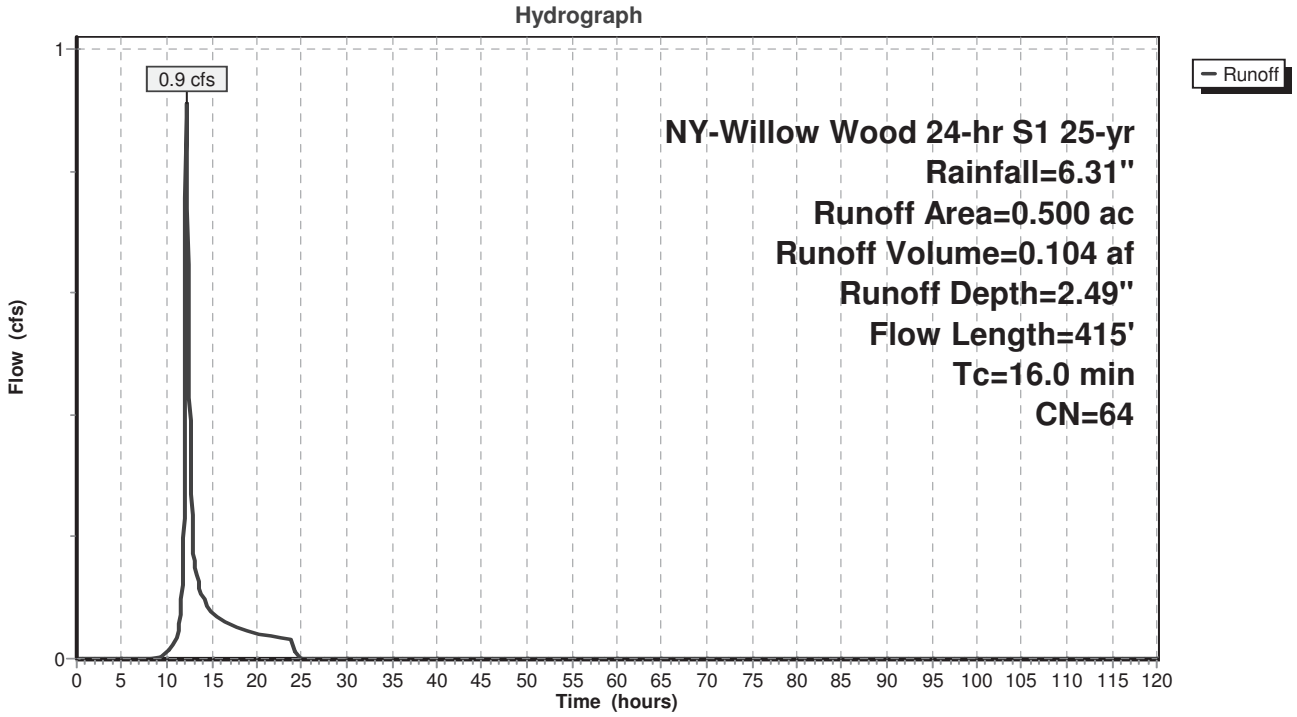
Runoff = 0.9 cfs @ 12.19 hrs, Volume= 0.104 af, Depth= 2.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
NY-Willow Wood 24-hr S1 25-yr Rainfall=6.31"

Area (ac)	CN	Description
0.400	55	Woods, Good, HSG B
0.100	98	Paved parking, HSG B
0.500	64	Weighted Average
0.400		80.00% Pervious Area
0.100		20.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.5	100	0.0900	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.42"
2.5	315	0.1800	2.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
16.0	415	Total			

Subcatchment 3.1S:



Summary for Subcatchment 4.1S:

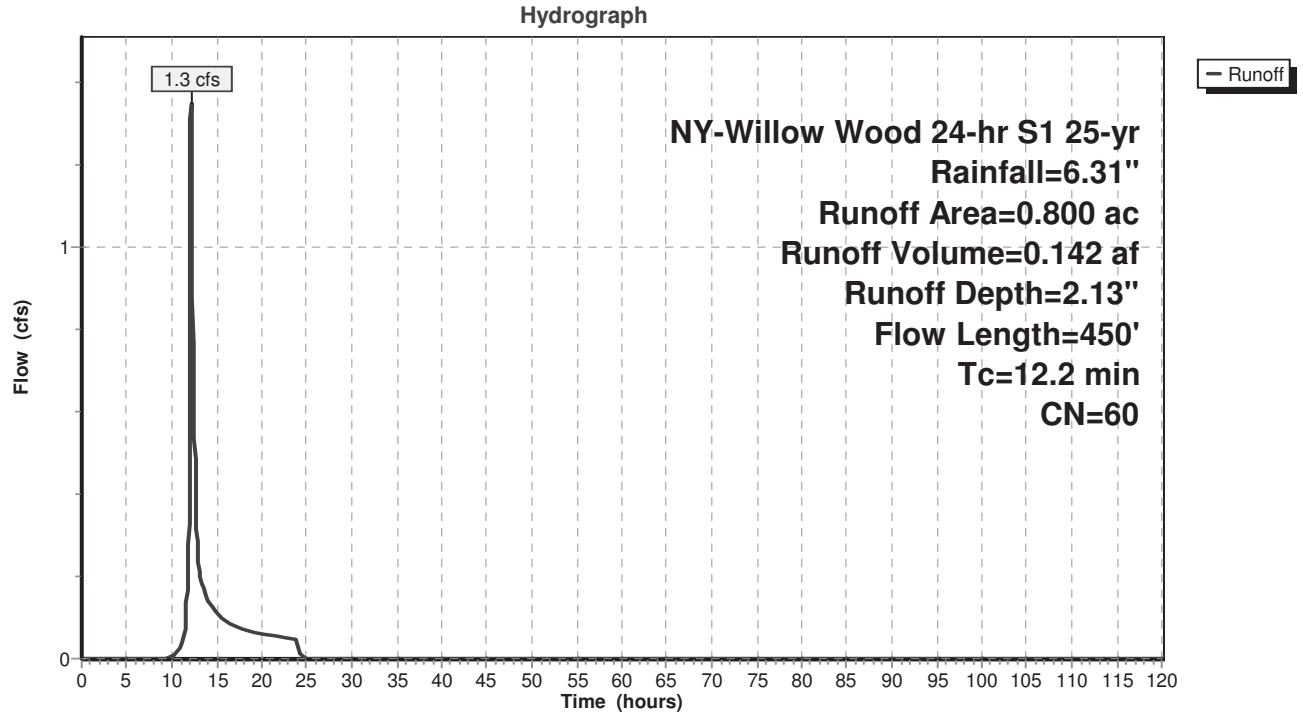
Runoff = 1.3 cfs @ 12.13 hrs, Volume= 0.142 af, Depth= 2.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
NY-Willow Wood 24-hr S1 25-yr Rainfall=6.31"

Area (ac)	CN	Description
0.700	55	Woods, Good, HSG B
0.100	98	Paved parking, HSG B
0.800	60	Weighted Average
0.700		87.50% Pervious Area
0.100		12.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	100	0.2000	0.17		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.42"
2.4	350	0.2400	2.45		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.2	450	Total			

Subcatchment 4.1S:



Summary for Reach 1.1P: Rip Rap Swale 1

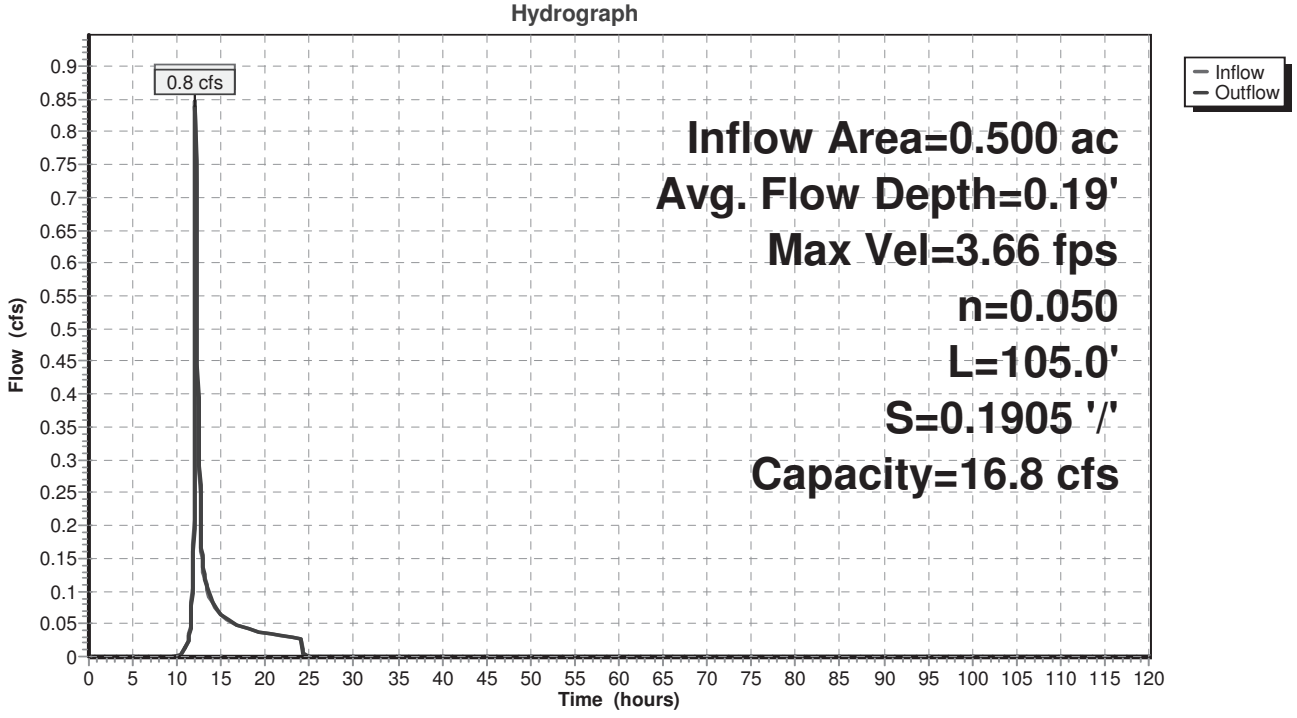
Inflow Area = 0.500 ac, 0.00% Impervious, Inflow Depth = 1.95" for 25-yr event
Inflow = 0.8 cfs @ 12.09 hrs, Volume= 0.081 af
Outflow = 0.8 cfs @ 12.10 hrs, Volume= 0.081 af, Atten= 1%, Lag= 0.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.66 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.36 fps, Avg. Travel Time= 1.3 min

Peak Storage= 24 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.19'
Bank-Full Depth= 1.00' Flow Area= 2.0 sf, Capacity= 16.8 cfs

1.00' x 1.00' deep channel, n= 0.050
Side Slope Z-value= 1.0 '/' Top Width= 3.00'
Length= 105.0' Slope= 0.1905 '/'
Inlet Invert= 519.00', Outlet Invert= 499.00'

Reach 1.1P: Rip Rap Swale 1



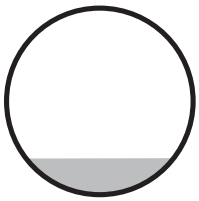
Summary for Reach 1C: Culvert

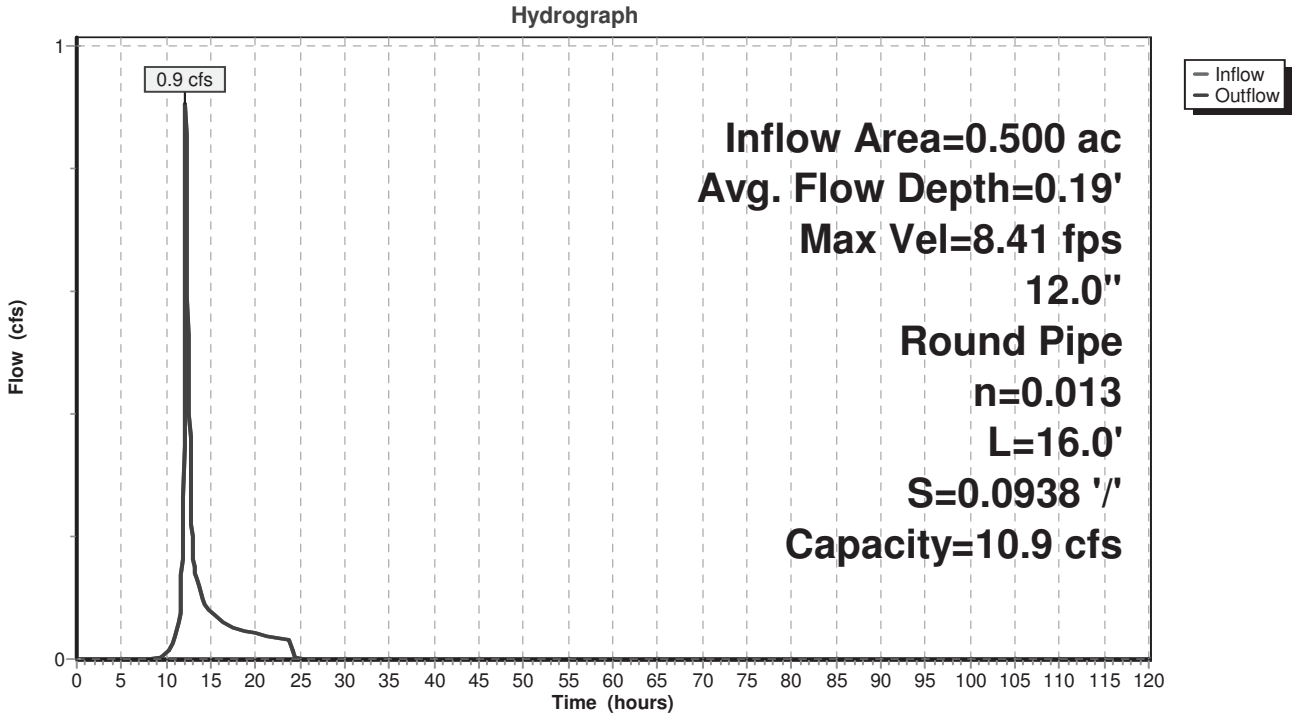
Inflow Area = 0.500 ac, 20.00% Impervious, Inflow Depth = 2.49" for 25-yr event
Inflow = 0.9 cfs @ 12.20 hrs, Volume= 0.104 af
Outflow = 0.9 cfs @ 12.20 hrs, Volume= 0.104 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.41 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.58 fps, Avg. Travel Time= 0.1 min

Peak Storage= 2 cf @ 12.20 hrs
Average Depth at Peak Storage= 0.19'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 10.9 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 16.0' Slope= 0.0938 '/'
Inlet Invert= 612.50', Outlet Invert= 611.00'





Summary for Reach 2.1P: Rip Rap Swale 2

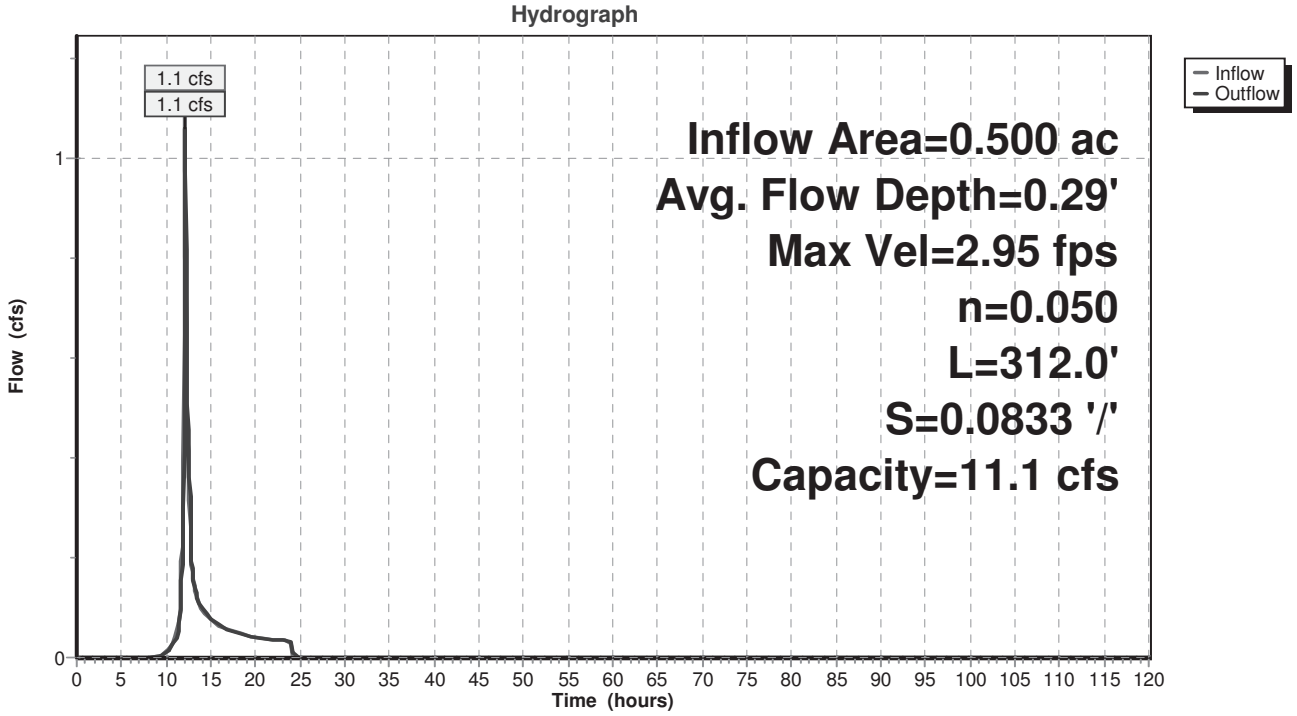
Inflow Area = 0.500 ac, 20.00% Impervious, Inflow Depth = 2.49" for 25-yr event
Inflow = 1.1 cfs @ 12.10 hrs, Volume= 0.104 af
Outflow = 1.1 cfs @ 12.15 hrs, Volume= 0.104 af, Atten= 5%, Lag= 3.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.95 fps, Min. Travel Time= 1.8 min
Avg. Velocity = 1.05 fps, Avg. Travel Time= 5.0 min

Peak Storage= 115 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.29'
Bank-Full Depth= 1.00' Flow Area= 2.0 sf, Capacity= 11.1 cfs

1.00' x 1.00' deep channel, n= 0.050
Side Slope Z-value= 1.0 '/' Top Width= 3.00'
Length= 312.0' Slope= 0.0833 '/'
Inlet Invert= 640.00', Outlet Invert= 614.00'

Reach 2.1P: Rip Rap Swale 2



Summary for Reach 3.1P: Rip Rap Swale 3.1

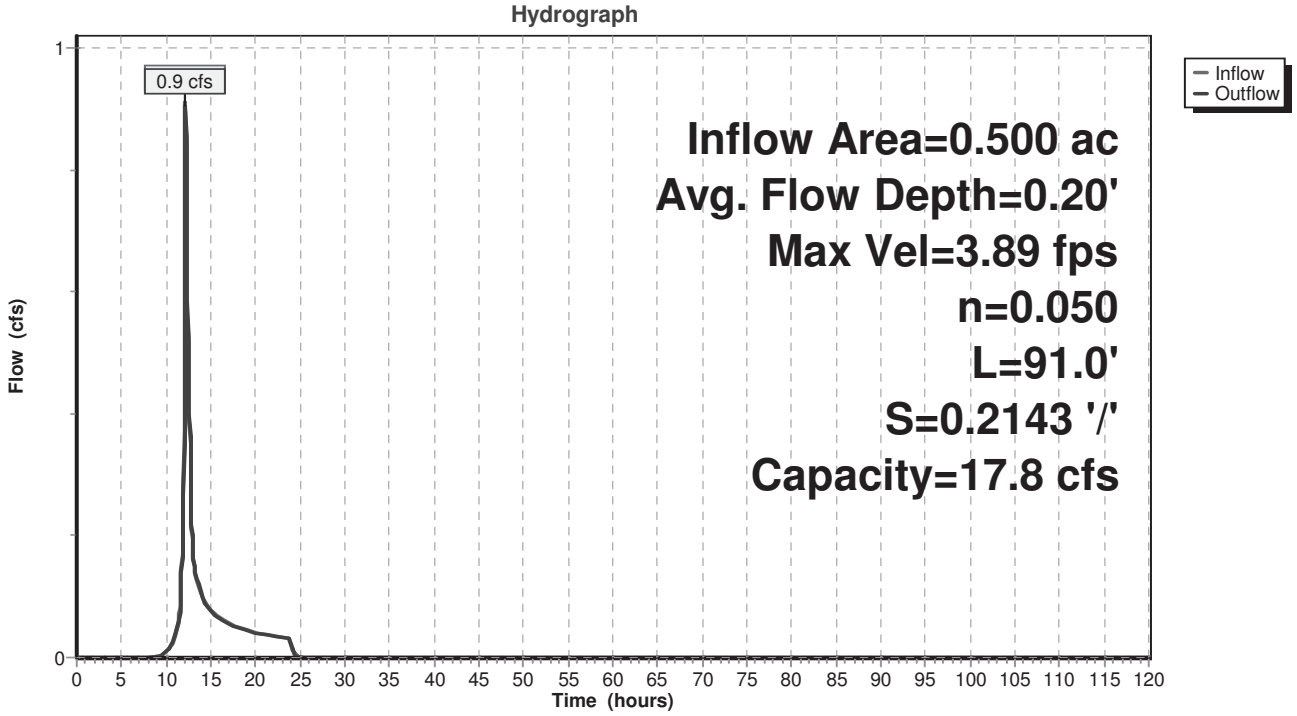
Inflow Area = 0.500 ac, 20.00% Impervious, Inflow Depth = 2.49" for 25-yr event
Inflow = 0.9 cfs @ 12.19 hrs, Volume= 0.104 af
Outflow = 0.9 cfs @ 12.20 hrs, Volume= 0.104 af, Atten= 1%, Lag= 0.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.89 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.46 fps, Avg. Travel Time= 1.0 min

Peak Storage= 21 cf @ 12.19 hrs
Average Depth at Peak Storage= 0.20'
Bank-Full Depth= 1.00' Flow Area= 2.0 sf, Capacity= 17.8 cfs

1.00' x 1.00' deep channel, n= 0.050
Side Slope Z-value= 1.0 '/' Top Width= 3.00'
Length= 91.0' Slope= 0.2143 '/'
Inlet Invert= 632.00', Outlet Invert= 612.50'

Reach 3.1P: Rip Rap Swale 3.1



Summary for Reach 3.2P: Rip Rap Swale 3.2

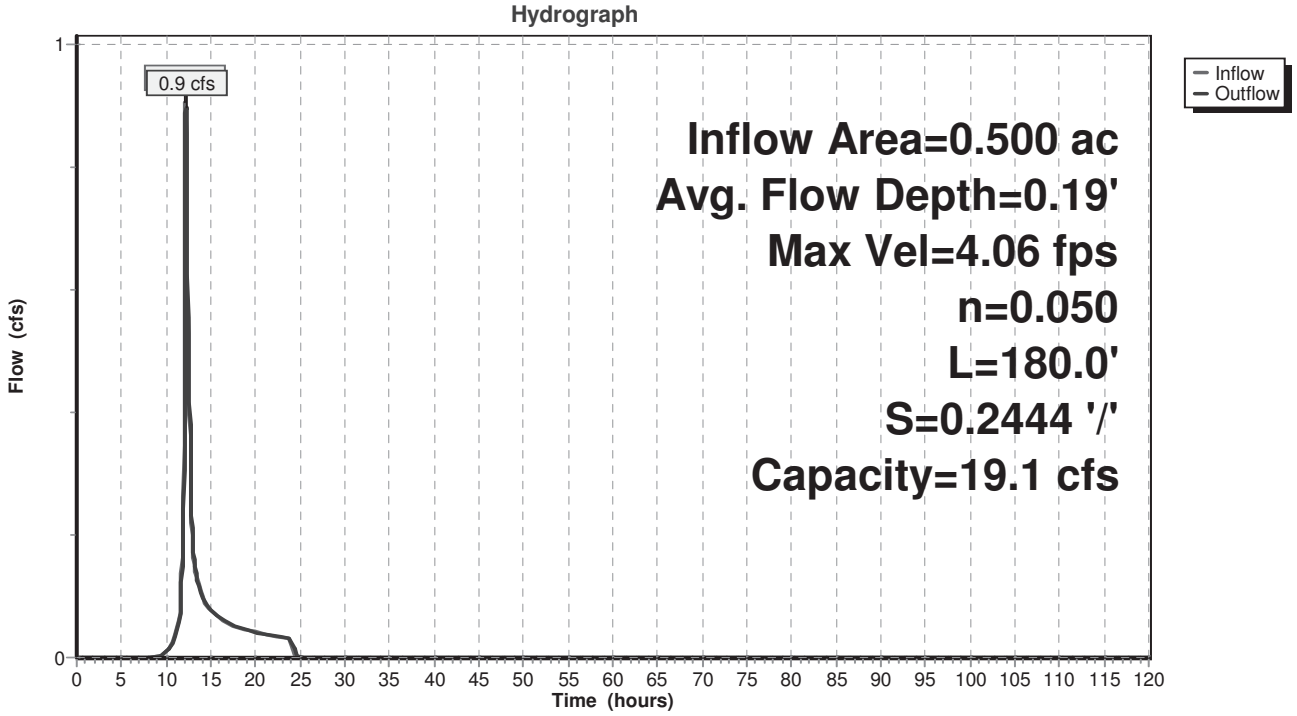
Inflow Area = 0.500 ac, 20.00% Impervious, Inflow Depth = 2.49" for 25-yr event
Inflow = 0.9 cfs @ 12.20 hrs, Volume= 0.104 af
Outflow = 0.9 cfs @ 12.22 hrs, Volume= 0.104 af, Atten= 1%, Lag= 1.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.06 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 1.52 fps, Avg. Travel Time= 2.0 min

Peak Storage= 40 cf @ 12.21 hrs
Average Depth at Peak Storage= 0.19'
Bank-Full Depth= 1.00' Flow Area= 2.0 sf, Capacity= 19.1 cfs

1.00' x 1.00' deep channel, n= 0.050
Side Slope Z-value= 1.0 '/' Top Width= 3.00'
Length= 180.0' Slope= 0.2444 '/'
Inlet Invert= 610.00', Outlet Invert= 566.00'

Reach 3.2P: Rip Rap Swale 3.2



Summary for Reach 4.1P: Rip Rap Swale 4

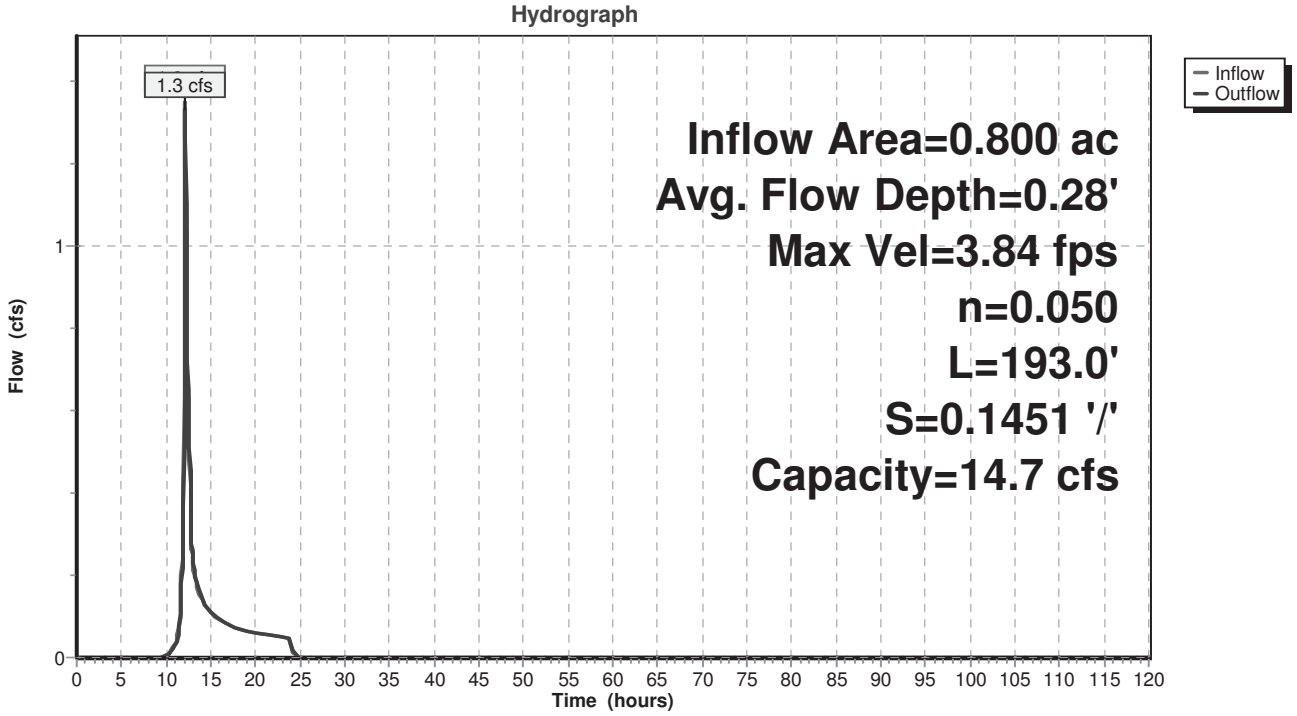
Inflow Area = 0.800 ac, 12.50% Impervious, Inflow Depth = 2.13" for 25-yr event
Inflow = 1.3 cfs @ 12.13 hrs, Volume= 0.142 af
Outflow = 1.3 cfs @ 12.16 hrs, Volume= 0.142 af, Atten= 1%, Lag= 1.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.84 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 1.47 fps, Avg. Travel Time= 2.2 min

Peak Storage= 68 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.28'
Bank-Full Depth= 1.00' Flow Area= 2.0 sf, Capacity= 14.7 cfs

1.00' x 1.00' deep channel, n= 0.050
Side Slope Z-value= 1.0 '/' Top Width= 3.00'
Length= 193.0' Slope= 0.1451 '/'
Inlet Invert= 530.00', Outlet Invert= 502.00'

Reach 4.1P: Rip Rap Swale 4

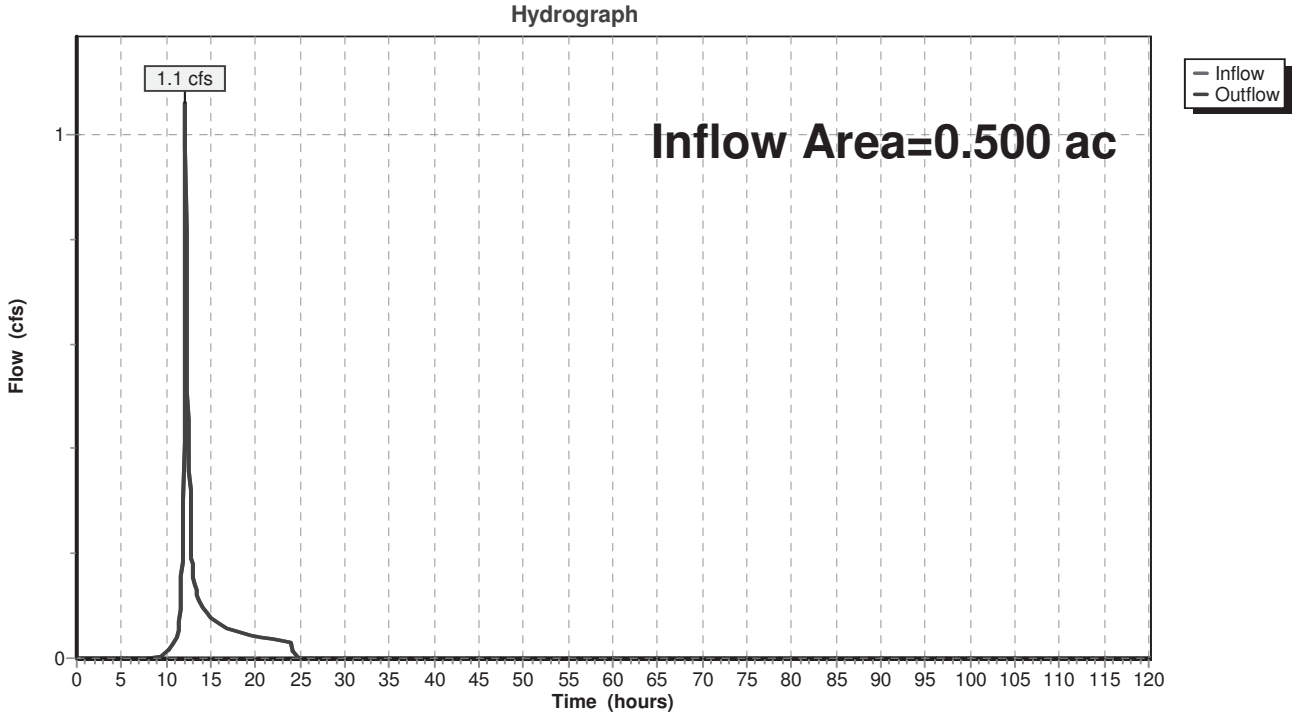


Summary for Reach RG1:

Inflow Area = 0.500 ac, 20.00% Impervious, Inflow Depth = 2.49" for 25-yr event
Inflow = 1.1 cfs @ 12.15 hrs, Volume= 0.104 af
Outflow = 1.1 cfs @ 12.15 hrs, Volume= 0.104 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs

Reach RG1:



Summary for Pond FS1: Flow Spreader 1

Inflow Area = 0.500 ac, 0.00% Impervious, Inflow Depth = 1.95" for 25-yr event
Inflow = 0.8 cfs @ 12.10 hrs, Volume= 0.081 af
Outflow = 0.8 cfs @ 12.10 hrs, Volume= 0.081 af, Atten= 0%, Lag= 0.0 min
Primary = 0.8 cfs @ 12.10 hrs, Volume= 0.081 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 489.60' @ 12.11 hrs Surf.Area= 12 sf Storage= 4 cf

Plug-Flow detention time= 0.6 min calculated for 0.081 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (900.3 - 900.0)

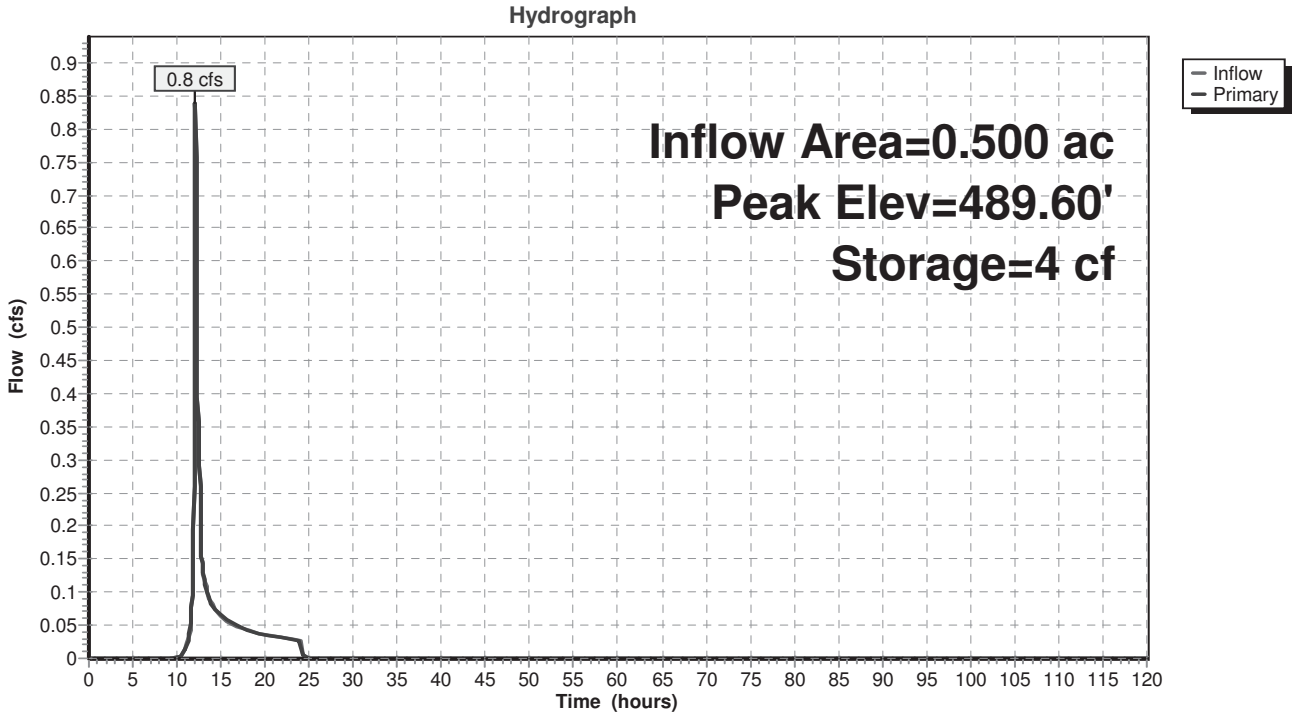
Volume	Invert	Avail.Storage	Storage Description
#1	489.00'	125 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
489.00	0	0	0
490.00	20	10	10
490.50	35	14	24
492.00	100	101	125

Device	Routing	Invert	Outlet Devices
#1	Primary	489.50'	**10.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.8 cfs @ 12.10 hrs HW=489.60' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 0.8 cfs @ 0.81 fps)

Pond FS1: Flow Spreader 1



Summary for Pond FS2: Flow Spreader 2

Inflow Area = 0.500 ac, 20.00% Impervious, Inflow Depth = 2.49" for 25-yr event
Inflow = 0.9 cfs @ 12.22 hrs, Volume= 0.104 af
Outflow = 0.9 cfs @ 12.22 hrs, Volume= 0.101 af, Atten= 0%, Lag= 0.2 min
Primary = 0.9 cfs @ 12.22 hrs, Volume= 0.101 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 559.61' @ 12.22 hrs Surf.Area= 183 sf Storage= 146 cf

Plug-Flow detention time= 23.3 min calculated for 0.101 af (97% of inflow)
Center-of-Mass det. time= 7.7 min (897.6 - 889.8)

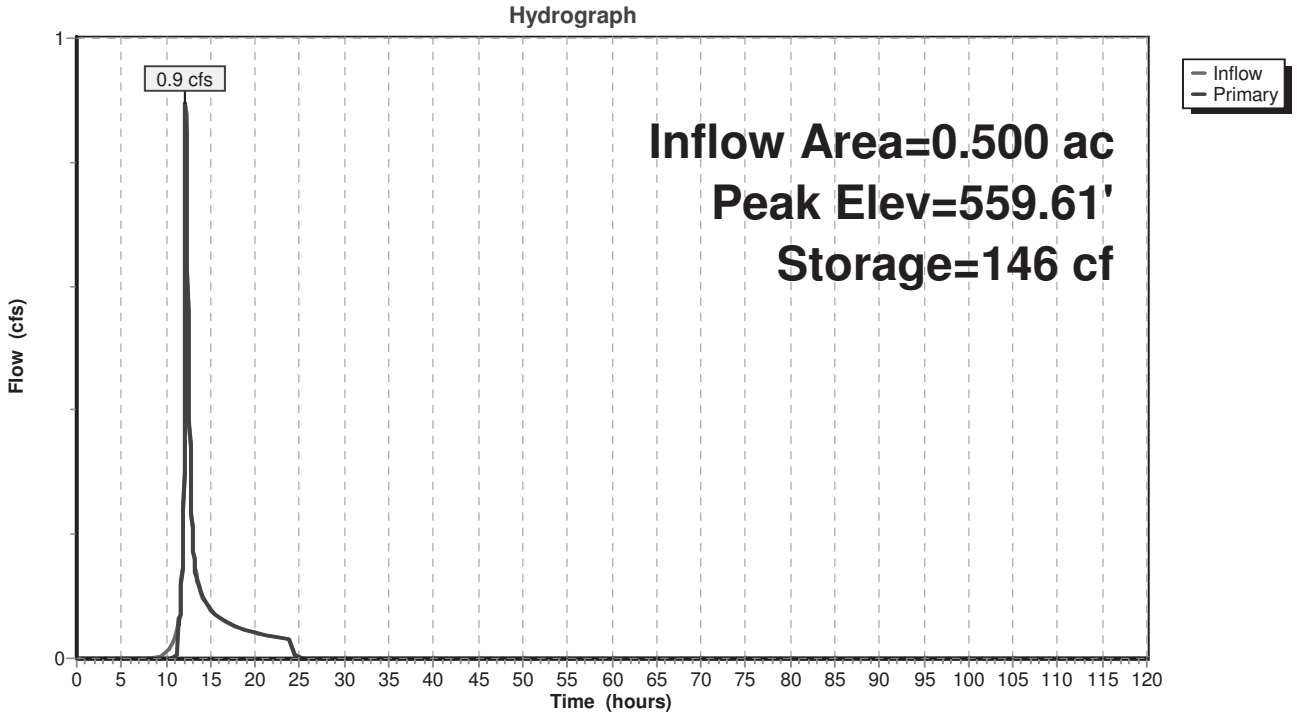
Volume	Invert	Avail.Storage	Storage Description
#1	558.00'	228 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
558.00	0	0	0
559.50	170	128	128
560.00	230	100	228

Device	Routing	Invert	Outlet Devices
#1	Primary	559.50'	**10.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.9 cfs @ 12.22 hrs HW=559.61' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 0.9 cfs @ 0.83 fps)

Pond FS2: Flow Spreader 2



Summary for Pond FS3: Flow Spreader 3

Inflow Area = 0.800 ac, 12.50% Impervious, Inflow Depth = 2.13" for 25-yr event
Inflow = 1.3 cfs @ 12.16 hrs, Volume= 0.142 af
Outflow = 1.3 cfs @ 12.16 hrs, Volume= 0.141 af, Atten= 0%, Lag= 0.1 min
Primary = 1.3 cfs @ 12.16 hrs, Volume= 0.141 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 496.64' @ 12.16 hrs Surf.Area= 58 sf Storage= 43 cf

Plug-Flow detention time= 4.8 min calculated for 0.141 af (99% of inflow)
Center-of-Mass det. time= 1.6 min (899.3 - 897.6)

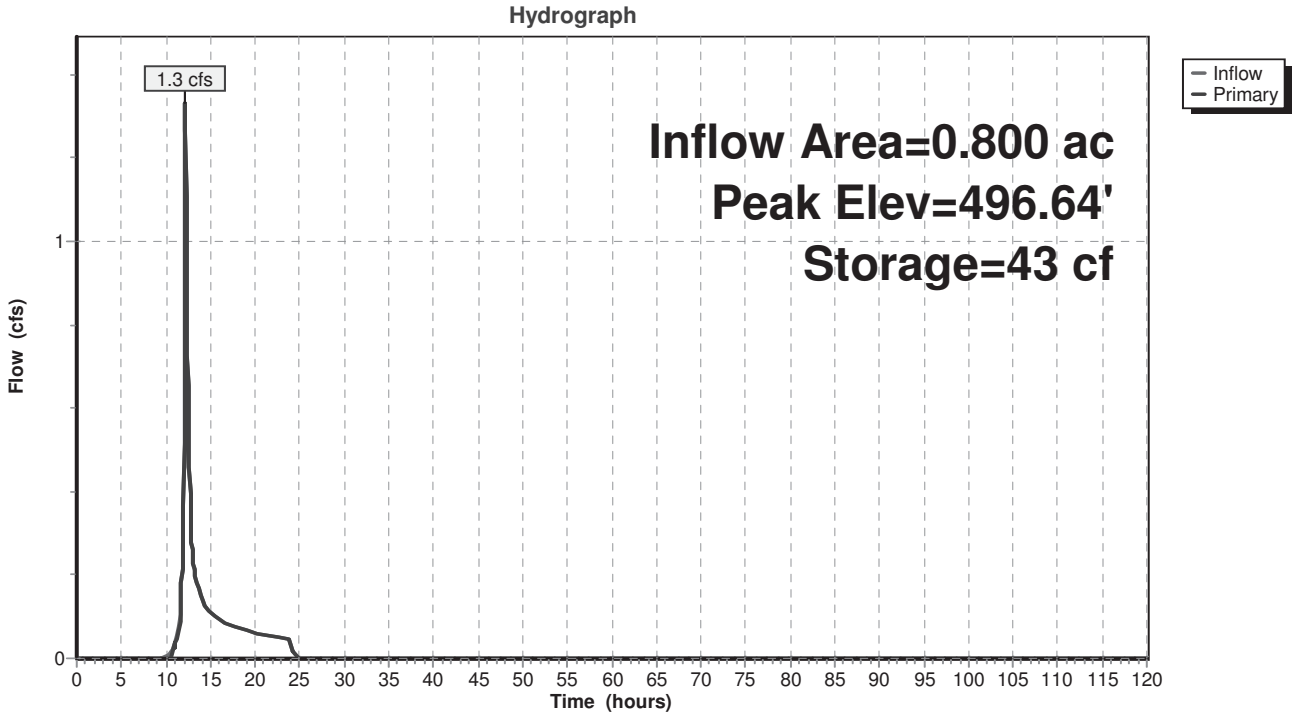
Volume	Invert	Avail.Storage	Storage Description
#1	495.00'	178 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
495.00	0	0	0
496.00	30	15	15
496.50	50	20	35
498.00	140	143	178

Device	Routing	Invert	Outlet Devices
#1	Primary	496.50'	**10.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=1.3 cfs @ 12.16 hrs HW=496.64' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 1.3 cfs @ 0.94 fps)

Pond FS3: Flow Spreader 3



APPENDIX B
Rain Garden Sizing Calculations

(See HydroCAD output below for the WQv used in the below equation)

Rain Garden Volume Provided (Section 5.3.7 of NYSSWDM)

WQ_v required $\leq V_{SM} + V_{DL} + (D_P \times A_{RG})$

V_{SM} = $A_{RG} * D_{SM} * n_{SM}$ = 700*1.5*0.2 = 210 FT^3

V_{DL} = $A_{RG} * D_{DL} * n_{DL}$ = 700*0.5*0.4 = 140 FT^3

V_{SM} = volume of the soil media (in cubic feet)

V_{DL} = volume of the gravel drainage layer (in cubic feet)

A_{RG} = rain garden surface area (in square feet)

D_{SM} = depth of the soil media (1.5 foot)

D_{DL} = depth of the drainage layer (0.5 feet)

D_P = depth of ponding above surface (0.5 feet)

n_{SM} = porosity of the soil media (0.2)

n_{DL} = porosity of the drainage layer (0.4)

Therefore, 697 $\leq$ 210 + 140 + (0.5 x 700) = 700 FT^3

The required WQ_v of 697 FT^3 $\leq$ rain garden volume provided of 700 FT^3

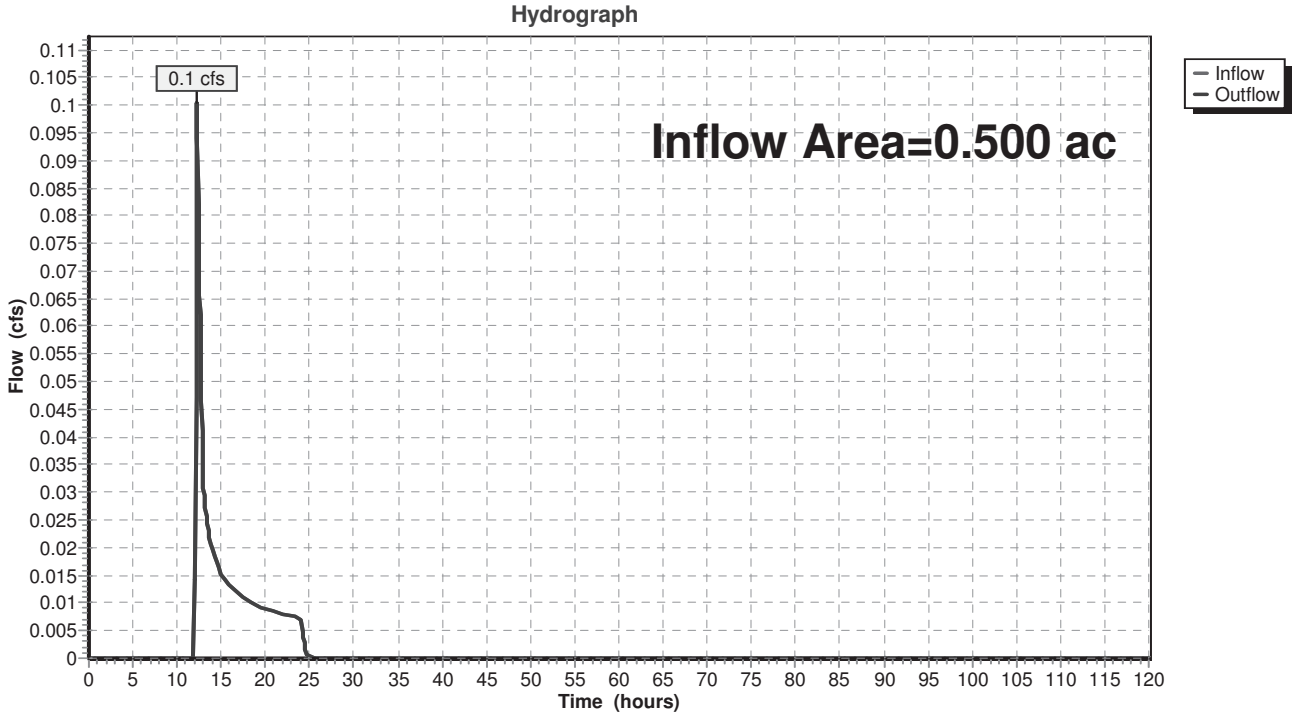
Therefore, the proposed rain garden design for treating a contributing area of 23,372 square feet exceeds the NYSDEC WQ_v requirements.

Summary for Reach RG1:

Inflow Area = 0.500 ac, 20.00% Impervious, Inflow Depth = 0.37" for 1-yr event
Inflow = 0.1 cfs @ 12.27 hrs, Volume= 0.016 af
Outflow = 0.1 cfs @ 12.27 hrs, Volume= 0.016 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs

Reach RG1:



APPENDIX C
Flow Spreader Sizing Calculations

The proposed Flow Spreader for the Willow Wood Country Club project is sized to disperse flow uniformly from the 25-year design storm event and is sized in accordance with the *New York State Standards and Specifications for Erosion and Sediment Control* (Blue Book).

Utilizing the calculated flows from Appendix C and the design criteria stated on Figure 3.7 – *Flow Spreader Detail* of the Blue Book, the size of the Flow Spreader was calculated as follows:

Flow Spreader ID	25-Year Peak Flow (cfs)	Minimum Entrance Width (ft.)	Depth (ft.)	End Width (ft.)	Length (ft.)
FS1	0.8 (1)	10	0.10	10	10
FS2	0.9 (1)	10	0.11	10	10
FS3	1.3 (1)	10	0.14	10	10

[1] 25-year peak flow provided in Appendix A.

APPENDIX D
DRAFT Town of Carmel Stormwater Maintenance Agreement

Town of Carmel
Stormwater Facility Maintenance Agreement

Whereas, the Town of Carmel, County of Putnam, State of New York and Willow Wood Country Club, Inc. want to enter into an agreement to provide for the long-term maintenance and continuation of stormwater control measures approved by the Municipality for the below named project, and

Whereas, the Municipality and the facility owner desire that the stormwater control measures be built in accordance with the approved project plans and thereafter be maintained, cleaned, repaired, replaced and continued in perpetuity in order to ensure optimum performance of the components.

Therefore, the Municipality and the facility owner agree as follows:

1. This agreement inures to the benefit of the Municipality and binds the facility owner, its successors and assigns, to the maintenance provisions depicted in the approved project plans which are attached as Schedule A of this agreement.
2. The facility owner shall maintain, clean, repair, replace and continue the stormwater control measures depicted in Schedule A as necessary to ensure optimum performance of the measures to design specifications. The stormwater control measures shall include, but shall not be limited to, the following: drainage ditches, swales, dry wells, infiltrators, drop inlets, pipes, culverts, soil absorption devices and retention ponds.
3. The facility owner shall be responsible for all expenses related to the maintenance of the stormwater control measures and shall establish a means for the collection and distribution of expenses among parties for any commonly owned facilities.
4. The facility owner shall provide for the periodic inspection of the stormwater control measures, not less than once in every five-year period, to determine the condition and integrity of the measures. Such inspection shall be performed by a professional engineer licensed by the State of New York. The inspecting engineer shall prepare and submit to the Municipality, within 30 days of the inspection, a written report of the findings, including recommendations for those actions necessary for the continuation of the stormwater control measures.
5. The facility owner shall not authorize, undertake or permit alteration, abandonment, modification or discontinuation of the stormwater control measures except in accordance with written approval of the Municipality.
6. The facility owner shall undertake necessary repairs and replacement of the stormwater control measures at the direction of the Municipality or in accordance with the recommendations of the inspecting engineer.

7. The facility owner shall provide to the Municipality, within 30 days of the date of this agreement, a security for the maintenance and continuation of the stormwater control measures in the form of a bond, letter of credit or escrow account in the amount not to exceed $_____ (***if applicable***).
8. This agreement shall be recorded in the Office of the County Clerk, County of Putnam together with the deed for the subject premises.
9. In the event that the Municipality determines that the facility owner has failed to construct or maintain the stormwater control measures in accordance with the project plan or has failed to undertake corrective action specified by the Municipality or by the inspecting engineer, the Municipality is authorized to undertake such steps as reasonably necessary for the preservation, continuation or maintenance of the stormwater control measures and to affix the expenses thereof as a lien against the property.
10. Nothing within this agreement shall be construed to impose any affirmative obligation or covenant of performance on the Municipality.
11. This agreement is effective _____.

Facility Owner: _____.

Owner's Representative: _____.

Representative Signature: _____.

ACKNOWLEDGEMENTS

STATE OF NEW YORK)
) ss.:
TOWN OF _____)

On this ____ day of _____, 20___, before me personally came _____ to me known and known to me to be the person described in and who executed the foregoing instrument and he acknowledged to me that he executed the same.

_____
Notary Public

Town of Carmel: _____.

Representative Signature: _____.

ACKNOWLEDGEMENTS

STATE OF NEW YORK)
) ss.:
TOWN OF _____)

On this ____ day of _____, 20___, before me personally came _____ to me known and known to me to be the person described in and who executed the foregoing instrument and he acknowledged to me that he executed the same.

_____
Notary Public

SCHEDULE A
Maintenance Provisions

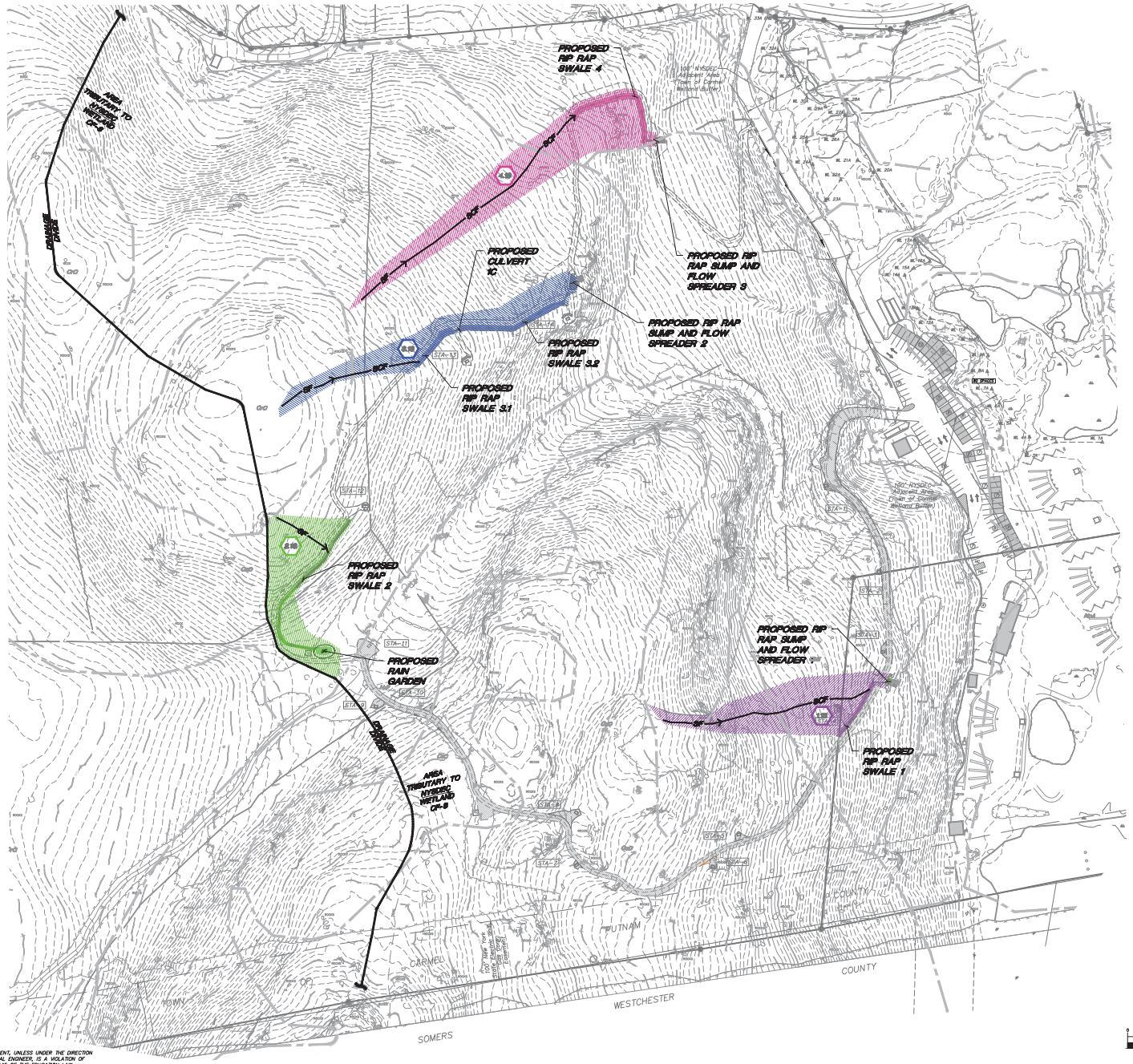
PERMANENT STORMWATER FACILITIES MAINTENANCE SCHEDULE

PRACTICE/FACILITY	MONTHLY	AFTER MAJOR STORM EVENTS	BI-ANNUALLY	YEARLY	EVERY 5 to 10 YEARS
GRASS & RIP RAP SWALES	Ensure contributing areas clean of debris, no evidence of erosion, & mowing performed.	Inspect for erosion, soil permeability & evidence of flow going around structures.	–	Inspect & clean accumulated sediment.	–
RAIN GARDENS	Inspect vegetation & mulch layer.	Ensure rain garden dewaters between storms.	–	–	–
SUBSURFACE STORMWATER COLLECTION SYSTEMS	–	–	Inspect & clean	Inspect, clean, repair and/or replace structures. Remove debris.	–

Note: The party responsible for implementation of the maintenance schedule during and after construction is:

Willow Wood Country Club Inc.
Union Valley Road
Mahopac, NY 10541

FIGURES



LEGEND

2.15	SUBCATCHMENT
SF →	TIME OF CONCENTRATION SHEET FLOW
SCF →	TIME OF CONCENTRATION SHALLOW CONCENTRATED FLOW
PF →	TIME OF CONCENTRATION PIPE FLOW
CF →	TIME OF CONCENTRATION CHANNEL FLOW

SOILS LEGEND

SOILS	DESCRIPTION	HYDROLOGICAL GROUP
ChD	Charlton fine sandy loam, 8% to 15% slopes	B
ChC	Charlton fine sandy loam, 15% to 20% slopes	B
CrC	Charlton–Chatfield complex, 0 to 15 percent slopes, very rocky	B
CeD	Charlton–Chatfield complex, 0 to 15 percent slopes, very rocky	B
ChE	Charlton loam, 25% to 35% slopes	B
LeB	Leicester loam, 2% to 8% slopes, very stony	C
HrF	Hollis–Rock outcrop complex, very steep	C/D

GRAPHIC SCALE

0 40 80 160

(IN FEET)

1 inch = 80 ft.

NO.	DATE	REVISION	BY
1	5/12/22	REVISED FOR UPDATED SITE PLAN	JWM

INSITE
ENGINEERING, SURVEYING & LANDSCAPE ARCHITECTURE, P.C.
3 Garrett Place
Carmel, NY 10512
(845) 225-9690
(845) 225-9717 fax
www.insite-eng.com

PROJECT:
WILLOW WOOD COUNTRY CLUB, INC.
UNION VALLEY ROAD, TOWN OF CARMEL, PUTNAM VALLEY, NY

DRAWING:
POST-DEVELOPMENT DRAINAGE MAP

PROJECT NUMBER	18173.100	PROJECT MANAGER	R.J.W.
DATE	3-27-19	DRAWN BY	J.W.M.
SCALE	1" = 80'	CHECKED BY	

DRAWING NO. FIG-1 SHEET 1 / 1

0644089821

NOTICE OF INTENT

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

NYR _____ (for DEC use only)

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

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

-IMPORTANT-
RETURN THIS FORM TO THE ADDRESS ABOVE

OWNER/OPERATOR MUST SIGN FORM

Owner/Operator Information

Owner/Operator (Company Name/Private Owner Name/Municipality Name)
Willow Wood Country Club Inc.

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

Owner/Operator Contact Person First Name
George

Owner/Operator Mailing Address
551 Union Valley Road

City
Mahopac

State
NY

Zip
10541-____

Phone (Owner/Operator)
845-621-0200

Fax (Owner/Operator)
___-___-____

Email (Owner/Operator)
gcalcagnin@aol.com

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

Project Site Information

Project/Site Name
Willow Wood Country Club, Inc.

Street Address (NOT P.O. BOX)
551 Union Valley Road, Mahopac, NY

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

City/Town/Village (THAT ISSUES BUILDING PERMIT)
Carmel

State
NY

Zip
10541 -

County
Putnam

DEC Region
3

Name of Nearest Cross Street
Englewood Terrace

Distance to Nearest Cross Street (Feet)
370

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

Tax Map Numbers
Section-Block-Parcel
87.-1-7

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)
413515

Y Coordinates (Northing)
7370373

2. What is the nature of this construction project?

○ **New Construction**

☑ **Redevelopment with increase in impervious area**

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

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

Pre-Development Existing Land Use

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

Post-Development Future Land Use

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

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

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

Total Site Area	Total Area To Be Disturbed	Existing Impervious Area To Be Disturbed	Future Impervious Area Within Disturbed Area
86.	0.9	0.3	0.7

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

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

A	B	C	D
0 %	96 %	4 %	0 %

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

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

Start Date	End Date
07/01/2023	10/01/2023

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

Name

NYSDEC Wetland CF-8

9a. Type of waterbody identified in Question 9?

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

9b. How was the wetland identified?

- [ ] Regulatory Map
- [x] Delineated by Consultant
- [ ] Delineated by Army Corps of Engineers
- [ ] Other (identify)

10. Has the surface waterbody(ies) in question 9 been identified as a 303(d) segment in Appendix E of GP-0-20-001? ○ **Yes** ● **No**

11. Is this project located in one of the Watersheds identified in Appendix C of GP-0-20-001? ☑ **Yes** ○ **No**

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

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

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

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

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

Town of Carmel

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

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

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

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

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

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

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

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

- [x] **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: Insite Engineering

Contact Name (Last, Space, First): Williams, Richard D. Jr., P.E.

Mailing Address: 3 Garrett Place

City: Carmel

State: NY Zip: 10512 -

Phone: 845 - 225 - 9690 Fax: 845 - 225 - 9717

Email: rwilliams@insite-eng.com

SWPPP Preparer Certification

I hereby certify that the Stormwater Pollution Prevention Plan (SWPPP) for this project has been prepared in accordance with the terms and conditions of the GP-0-20-001. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of this permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

First Name Richard **MI** D

Last Name Williams, Jr., P.E.

Signature

Date / /

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

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

Temporary Structural

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

Biotechnical

- Brush Matting
- Wattling

Vegetative Measures

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

Permanent Structural

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

Other

Post-construction Stormwater Management Practice (SMP) Requirements

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

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

- ☐ **Preservation of Undisturbed Areas**
- ☐ **Preservation of Buffers**
- ☐ **Reduction of Clearing and Grading**
- ☐ **Locating Development in Less Sensitive Areas**
- ☐ **Roadway Reduction**
- ☐ **Sidewalk Reduction**
- ☐ **Driveway Reduction**
- ☐ **Cul-de-sac Reduction**
- ☐ **Building Footprint Reduction**
- ☐ **Parking Reduction**

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

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

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

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

Total WQv Required

☐☐☐.☐☐☐ **acre-feet**

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

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

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

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

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

Table 2 - Alternative SMPs (DO NOT INCLUDE PRACTICES BEING USED FOR PRETREATMENT ONLY)

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

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

Name

Manufacturer

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

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

Total RRv provided

. **acre-feet**

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

○ **Yes** ○ **No**

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

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

Minimum RRv Required

. **acre-feet**

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

○ **Yes** ○ **No**

If Yes, go to question 33.
Note: Use the space provided in question #39 to summarize the specific site limitations and justification for not reducing 100% of WQv required (#28). A detailed evaluation of the specific site limitations and justification for not reducing 100% of the WQv required (#28) must also be included in the SWPPP.
If No, sizing criteria has not been met, so NOI can not be processed. SWPPP preparer must modify design to meet sizing criteria.

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

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

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

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

WQv Provided

			.			
			.			**acre-feet**

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

34. Provide the sum of the Total RRv provided (#30) and the WQv provided (#33a).

			.			
			.			

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

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

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

CPv Required

			.			
			.			**acre-feet**

CPv Provided

			.			
			.			**acre-feet**

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

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

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

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

Total Overbank Flood Control Criteria (Qp)

Pre-Development

			.			
			.			**CFS**

Post-development

			.			
			.			**CFS**

Total Extreme Flood Control Criteria (Qf)

Pre-Development

			.			
			.			**CFS**

Post-development

			.			
			.			**CFS**

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

- ○ Site discharges directly to tidal waters or a fifth order or larger stream.
- ○ Downstream analysis reveals that the Qp and Qf controls are not required

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

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

Property Owner

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

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

Air Pollution Control

Coastal Erosion

Hazardous Waste

Long Island Wells

Mined Land Reclamation

Solid Waste

Navigable Waters Protection / Article 15

Water Quality Certificate

Dam Safety

Water Supply

Freshwater Wetlands/Article 24

Tidal Wetlands

Wild, Scenic and Recreational Rivers

Stream Bed or Bank Protection / Article 15

Endangered or Threatened Species(Incidental Take Permit)

Individual SPDES

SPDES Multi-Sector GP [N][Y][R][ ][ ][ ][ ][ ][ ]

Other [ ]

✔ None

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

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

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

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

Owner/Operator Certification

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

Print First Name: George

MI:

Print Last Name: Calcagnini

Owner/Operator Signature:

Date: / /

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

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

MS4 Stormwater Pollution Prevention Plan (SWPPP) Acceptance Form

for

Construction Activities Seeking Authorization Under SPDES General Permit

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

I. Project Owner/Operator Information	
1. Owner/Operator Name:	Willow Wood Country Club Inc.
2. Contact Person:	George Calcagnini
3. Street Address:	551 Union Valley Road
4. City/State/Zip:	Mahopac, NY 10541
II. Project Site Information	
5. Project/Site Name:	Willow Wood Country Club
6. Street Address:	551 Union Valley Road
7. City/State/Zip:	Mahopac, NY 10541
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:	Town of Carmel
12. MS4 SPDES Permit Identification Number: NYR20A	
13. Contact Person:	
14. Street Address:	
15. City/State/Zip:	
16. Telephone Number:	

MS4 SWPPP Acceptance Form - continued

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

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

Printed Name:

Title/Position:

Signature:

Date:

VI. Additional Information

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

ERICH THALHEIMER

INCE BOARD CERTIFIED ACOUSTICAL ENGINEER
27 PETERSON ROAD, NATICK, MA 01760
PHONE: (508) 651-9772, FAX: (508) 315-3510
E-MAIL: THALHEIMER@RCN.COM
WEBSITE: WWW.ERICHTHALHEIMER.COM

George J. Calcagnini
Attorney at Law
376 Route 202
Somers, NY 10589

23 October 2022

RE: Willow Wood Shotgun Club - Responses to Epsilon Review of Noise Study

Dear Mr. Calcagnini,

I have reviewed the comments and questions developed by Epsilon Associates in their letter dated 10/18/22 in which they perform a peer review of our noise study. Epsilon performed this review on behalf of the Town of Carmel, NY.

Epsilon's review letter was thorough, professionally done, and more importantly, generally positive and complimentary. And while several questions were raised for clarification, none of them would be considered a serious concern from a technical accuracy perspective. Epsilon's questions were due to my not having included such specific details in the report. Thus, further revisions of our noise study are not necessary.

The following responses are offered to answer Epsilon's questions:

1.) *Can additional support for using the 'slow' time response be provided by way of technical explanation or professional experience?*

   a. Sound levels, even impulsive sounds like gunshots, can be measured or modeled using any time response defined in ANSI Standard S1.4 (i.e. RMS slow, RMS fast, RMS impulse, and Peak), so long as the time response is disclosed. The key to selecting the right time response to use is to match it to the one intended in the noise criteria limits for the given project. In this manner, results can be concluded based on a "apples-to-apples" comparison.

   b. In this case, the Carmel Noise Ordinance did not specify which time response was required. However, my professional judgement and past experience using and writing noise regulations led me to conclude that the noise limits contained in the ordinance (i.e. 60 dBA Lmax) were best expressed as RMS slow. Had the ordinance selected noise limits using fast, impulse or peak, then the numerical limits would have been proportionally higher.

   c. Some example noise regulations that address impulsive type noises that indeed do specify using the RMS slow time response would include (1) the Construction Noise Specification 721-560 used for the Big Dig Project in Boston, (2) the default criteria promulgated by the Federal Highway Administration (FHWA) for the Roadway Construction Noise Model (RCNM), and (3) Construction Noise Regulation 24-219, Title 15, Chapter 28 currently in effect in New York City – all of which I wrote.

2.) *Approximate height of the microphones used to measure ambient?*

   a. The Larson Davis Model 720 long-term noise monitors were hung on tree branches at a height of approximately 5 to 10 feet above the ground.

3.) *Figures 3 through 7 show a 24-hour period from 0:00 through 24:00, but the titles indicate 6/28-6/29/2020. Please confirm whether this is a continuous period of time and to which date they pertain.*

   a. The long-term ambient noise measurements were performed continuously from 6/28/20 through 6/29/20. Data was stored for each separate hour. The figures show the <u>average</u> results for a given hour of the day or night starting at 00:00 through 23:00.

4.) *The date during which the controlled gunfire measurements were conducted is noted inconsistently in the report (see page 3 and page 11). Please clarify which date the controlled gunfire measurements were performed and that they were not conducted during the period of ambient measurement.*

   a. The controlled gunfire sound tests were performed on 6/29/20. Ambient noise data collected during the live fire tests were excluded from the long-term ambient noise results.

5.) *Identify source of the meteorological data used to derive the statement regarding the conditions during the ambient measurements.*

   a. Weather conditions were noted firsthand by myself on both days 6/28/20 and 6/29/20. Air temperature was measured, sky conditions were observed, and wind conditions were estimated based on experience.

6.) *Clarification whether the gunshot tests were performed at all 5 locations simultaneously, i.e., with 5 separate sound level meters and recorders.*

   a. The controlled gunshot sound tests were performed at one receptor at a time using one ANSI Type 1 sound level meter and recorder. Gunshots were performed by club members using the same 12 gauge shot shells from all shooting positions for each receptor location test.

7.) *Clarification whether these tests were attended by personnel.*

   a. Yes, confirmed. I performed the live fire gunshot sound tests myself.

8.) *What was the ground attenuation, G value, used in the model to represent "absorptive grass and dirt"?*

   a. A ground absorption factor of G = 1.0, corresponding to ground covered with grass and woodlands, was used as the default value in the Cadna-A noise model for this project.

9.) *Table 3 indicates that the "loudest single shot" from the measurement tests was used in the model calibration. Does this mean that a single gunshot resulted in an Lmax 'slow' sound level of 61 dBA at LT-1, 64 dBA at LT-2, 54 dBA at LT-3, and so on, simultaneously? If so, these sound levels correlated with a gunshot fired at a specific location at the site and fired in a specific direction. Was the same specific gunshot location and direction used in the model calibration? If not, please provide some details of how the model was calibrated, e.g., gunshot locations and modeling parameter adjustments.*

a. Yes, the loudest single shot results were derived from the loudest measured and/or modeled gunshot sound levels regardless of where the gun source might be located. In total, six shots were fired from each of the seven shooting positions during the measurements, and repeated for each of the five receptor locations. Reporting of the loudest single shot was done to be conservative in the public's favor and to try to compare "apples-to-apples" results between measured and modeled sound levels.

10.) *It is anticipated that multiple patrons of the WWGC may be onsite at a given time with the greenlight to shoot "at will", perhaps within close proximity to each other or at distant shooting stations onsite. While it may be unlikely that two or more guns fire at the exact same time, where multiple simultaneous gunshots considered for the study?*

a. Multiple simultaneous gunshots were considered and intentionally discarded. The way a digital sound level meter works is to sample the incoming sound level thousands of times in a second, and then reports the loudest (Lmax) single instant using the selected time response (e.g. RMS slow). Thus, the chances of two Lmax signals occurring at the exact same fraction of a second are insignificant. If two gunshots were to occur together very close in time, the sound meter would only report the single loudest Lmax, even if the two shots sounded simultaneous to a human listener.

11.) *Table 4 appears to show the loudest gunshot from a specific proposed location during winter conditions at each of the 11 modeled locations, but it is unclear how the "existing worst-case wintertime gunshot noise impact zone" shown in Figure 11 was calculated. Please clarify.*

a. The noise impact zone shown in Figure 11 was computed using the Cadna-A noise model with 60 dBA being the only isopleth contour selected for display, i.e. the community noise limit in the Carmel Noise Ordinance. All the proposed shooting positions were <u>active</u> in the model because gunshots from different shooting positions project their noise more significantly (i.e. louder) in different directions. Thus, the figure illustrates the worst-case potential noise impact zone in all directions surrounding the club, regardless of which specific shooting position is actually being used.

12.) *Were any modeling corrections considered and/or applied to the results at locations LT-3 and LT-5 which were underpredicted in the calibrated model? We would not anticipate corrections to be applied to any of the other nine (9) modeled locations due to the calibrated agreement at locations LT-1, LT-2, and LT-4 and the proximity of the other modeled-only locations to LT-1.*

a. No modeling corrections or adjustments were included in the Cadna-A noise model due to the excellent model calibration results at the other receptors. Receptors LT-3 and LT-5 were exposed to the lowest gunshot sound levels largely due to their being located on the <u>far side</u> of a significant hill.

Yours Truly,

Erich Thalheimer

Erich Thalheimer
INCE Board Certified No. 20104

ERICH THALHEIMER

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George J. Calcagnini
Attorney at Law
376 Route 202
Somers, NY 10589

26 April 2022

RE: Willow Wood Gun Club Community Noise Study

Dear Mr. Calcagnini,

We have completed our community noise assessment involving the Willow Wood Gun Club in Mahopac, New York, to evaluate the existing and proposed noise levels (with the 14 position sporting clays circuit) at the club as they relate to Chapter 104 of the Town of Carmel Town Code. The club's intent is to expand to include a 14 position sporting clays circuit in addition to their current four trap fields and one 5-stand field. The study's goals were to (1) quantify the existing shooting noise levels propagating from the club to the surrounding community, (2) use the existing noise level results to determine compliance with applicable noise codes, and (3) to describe reasonable and feasible mitigation options that could be implemented to mitigate noise from shooting activities, if needed, particularly with respect to the neighbors to the north of the club.

As the attorney for the Willow Wood Club, you have advised us that the applicable regulations governing this application are set forth in New York State General Business Law Section 150 (GBL §150) which specifically exempts existing gun ranges, such as the Willow Wood Club, from local noise control ordinances. The standard set by GBL §150 is that the A-weighted sound level of small arms fire at the shooting range shall not exceed 90 dBA for one hour out of a day or 85 dBA for eight hours out of a day, as measured at, or adjusted to, a distance of 100 feet outside the real property boundary of the shooting range – *to which the club will easily comply*. You have further advised that even though the state statute has preempted regulation by the Town of Carmel Noise Ordinance, you would like us to test for compliance with that noise ordinance and, if feasible, implement mitigation measures to comply with it to the extent reasonably feasible. As applied to the Willow Wood Club, the Carmel Noise Ordinance would limit noise to 60 dBA at community receptor locations; which is certainly more restrictive than GBL §150's noise limits.

The noise study involved our (1) reviewing the case history and previous acoustical studies performed for the club, (2) performing ambient noise measurements for several days in the surrounding community, (3) performing a series of controlled noise measurement tests involving the shooting of shotguns at seven test firing positions, (4) reducing the noise measurement data to identify trends and to calibrate our noise prediction model, (5) developing a computer model using Cadna-A to simulate shooting noise levels emanating from the club during various times of year, (6) evaluating the results against the club's voluntary noise limits taking into account the Carmel Noise Ordinance, and (7) describing options that could be considered to reduce the shooting noise levels in the community.

In brief summary, we found that shooting noise from the proposed sporting clays positions fully complies with the governing state statute GBL §150, but could exceed the Carmel Noise Ordinance limits at two nearby residential properties. Consequently, noise mitigation measures were developed in this report for your consideration for implementation. Noise mitigation measures include building or enhancing small noise barriers behind two clays stations, relocating two clays stations, and rotating four clays stations to direct their noise in a less offensive direction. With the noise mitigation measures in place, full compliance with your self-imposed community noise limit, and Chapter 104 of the Town of Carmel Town Code can be demonstrated at all receiving properties.

A complete description of our study's technical approach, noise measurement data, noise model simulation, findings and recommendations is attached. Feel free to contact me with any questions.

Professional Certification:

I hereby certify that this plan, specification, or report was prepared or reviewed by me and that I am a duly certified acoustical professional as recognized by the Institute for Noise Control Engineering (INCE).

Erich Thalheimer
INCE Board Certified No. 20104

Project Overview

The Willow Wood Club, located in Mahopac, New York, is a private shooting club that has been in existence since 1955. The club, as shown in **Photos 1 and 2**, is currently comprised of four trap fields and one 5-stand field, however the intent is to expand the club to include a 14-station sporting clays circuit. Shotguns are the only firearms currently used at the club, with the majority being 12 gauge in caliber. Hours of year-round operation are currently Thursday, Friday, Saturday and Sunday, 10 AM – 5 PM (6 PM during DST). The club is currently closed on Mondays, Tuesdays and Wednesdays. Those days of operation have been in effect for many years.

Photo 1. Trap Fields

Photo 2. 5-Stand Field

The downrange direction for the trap fields is oriented towards the east-northeast, and the 5-stand field is generally pointed towards the east-southeast. The topography in this area of New York is quite hilly, with the club's existing facilities situated in a valley between two hills. The relative elevation of the hilltops are about 250 to 300 feet above grade of the shooting fields. There is a clubhouse and a couple small garage structures on the property.

Figure 1 shows an aerial view of the area around the club. The surrounding area is developed as lightly suburban to rural in population density. There are no major or arterial highways within miles of the club, and the undeveloped areas are wooded with primarily deciduous trees.

Also as shown in **Figure 1**, and summarized in **Table 1**, five long-term (LT) noise receptor locations were selected to measure ambient noise levels in the community surrounding the club. The receptors were selected to represent potential worst-case noise levels propagating from the range in various directions and to represent similarly affected properties in the respective neighborhoods. Existing ambient noise levels were measured at the five long-term receptors (LT-1 thru LT-5) over the two day period of 6/28/20 to 6/29/20. The long-term receptors were also used to measure gunfire noise during a series of controlled live fire tests performed on 6/28/20.

In addition, five more discrete receptors were selected to evaluate the propagation of gunfire noise throughout the community, primarily at locations of previously known complainants. Noise levels at these five receptors (R-6 thru R-10) were predicted using the Cadna-A noise model, described below. Receptor LT-1A was also added into the noise model to more accurately evaluate shooting noise affecting the nearest residence at 553 Union Valley Road.

Figure 1. Willow Wood Club Surrounding Area

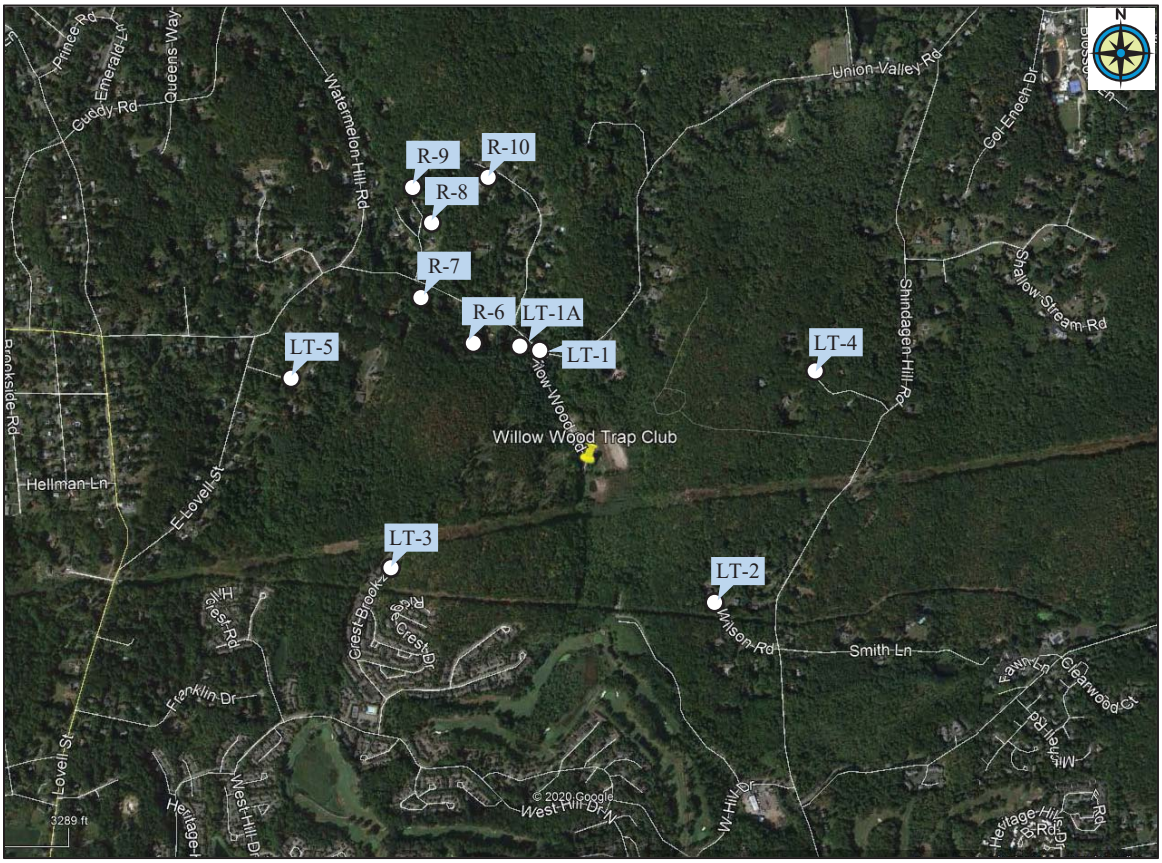


Table 1. Summary of Noise Receptor Locations

Receptor No.	Street Address	Land-Use	Direction From Club	Est. Distance From Club
LT-1	551 Union Valley Road	Gun Club	North-Northwest	1,190 feet
LT-1A	553 Union Valley Road	Residential	North-Northwest	1,190 feet
LT-2	8 Wilson Road	Residential	Southwest	1,760 feet
LT-3	870 Crest Brook Drive	Residential	West-Southwest	1,980 feet
LT-4	39 Wilderness Trail	Residential	East-Northeast	2,320 feet
LT-5	7 Margaret Road	Residential	West-Northwest	3,300 feet
R-6	507 Union Valley Road	Residential	Northwest	1,760 feet
R-7	491 Union Valley Road	Residential	Northwest	2,190 feet
R-8	18 Fox Hill Road	Residential	North-Northwest	2,760 feet
R-9	20 Fox Hill Road	Residential	North-Northwest	2,950 feet
R-10	75 Englewood Terrace	Residential	North-Northwest	3,040 feet

Acoustical Terminology

As with any field of science, it is critical to understand and make proper use of technical terms and definitions that are used in the acoustical industry. Noise can be quantified in many different manners depending on its temporal/time, tonal/frequency, or magnitude/loudness properties.

Noise magnitude is expressed in units of ***decibels*** *(dB)* which is a logarithmic quantity comparing fluctuating air pressure to that of a standardized reference static air pressure of 20 micro-pascals (i.e. dB re: 20 µPa). For this reason the noise levels that humans hear are called *sound pressure levels*. Noise is expressed as a logarithmic quantity because humans are sensitive to relative changes in noise levels. To illustrate, humans can barely perceive a change in noise level of +/- 1 decibel, can likely perceive a change of +/- 3 decibels, can easily perceive a change of +/- 5 decibels, and will generally describe a change of +/- 10 decibels as a doubling or halving in level.

With respect to tonal qualities (frequency), a frequency weighting adjustment has been standardized to account for the human auditory response over the audible frequency range of approximately 20 Hz to 20,000 Hz. Humans are less capable of hearing low frequency sounds, exhibit a maximum sensitivity to tones in mid-frequency ranges, and are slightly less sensitive to high frequency sound as well. This frequency weighted adjustment is referred to as "A-weighting", with results expressed as ***A-weighted decibels****, or dBA.* Examples of A-weighted decibel levels for common outdoor and indoor noise sources are provided in **Figure 2**.

Another common practice is to separate a sample of noise into its spectral components by using frequency filters of known shape and bandwidth. This approach provides insights into the source and transmission characteristics of the noise and allows for identification of frequency ranges that contain the most acoustical energy. ***Octave band and third-octave band*** filters are typically used for this purpose because their bandwidths are a constant percentage of their center frequencies, and are better for mimicking how humans perceive discrete frequencies by providing finer resolution at lower frequencies.

Numerous metrics and indices have been developed to quantify the temporal characteristics (changes over time) of community noise include the following:

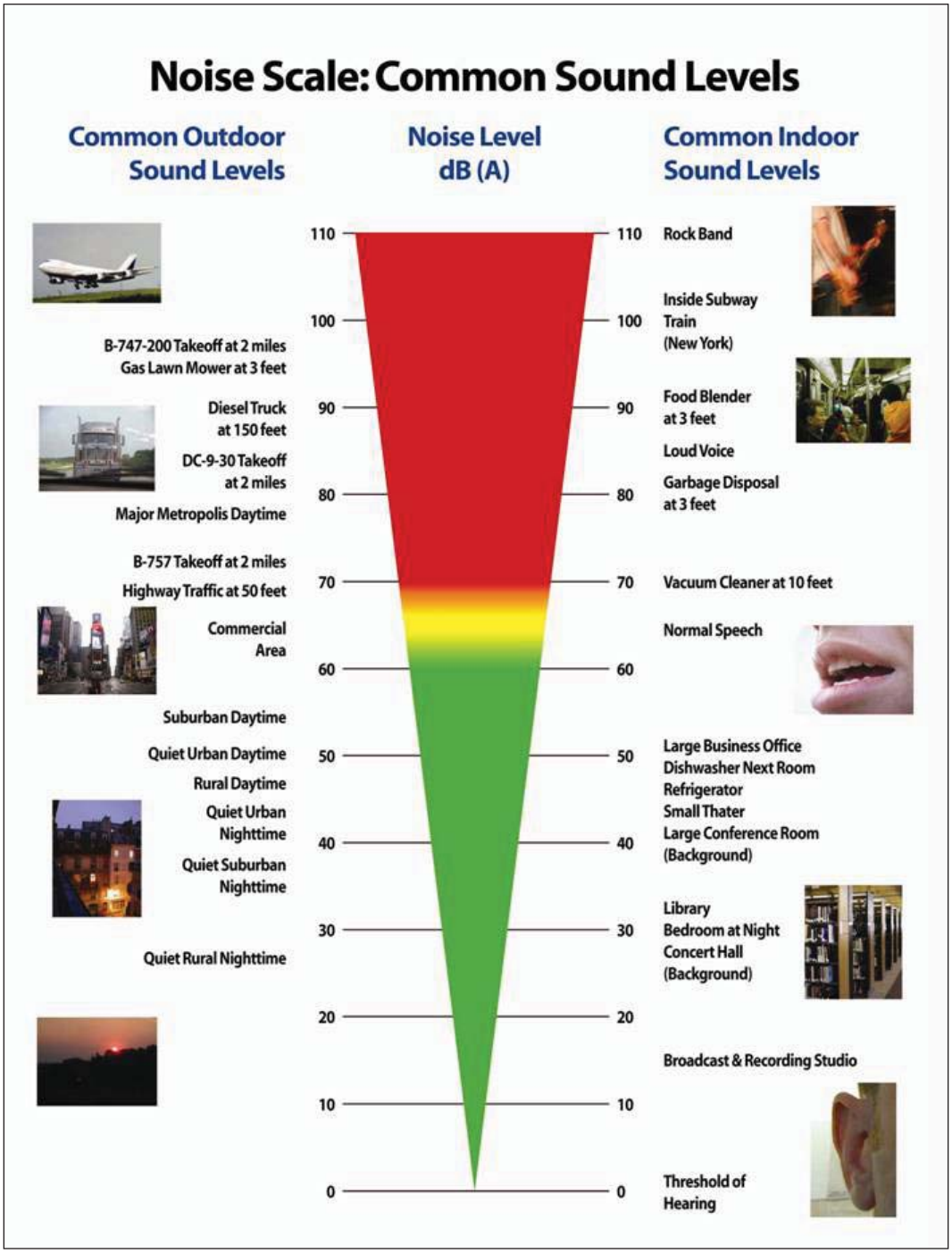
The ***Equivalent Sound Level****, or Leq*, is the energy-averaged single noise level that represents the same acoustic energy that was contained in the fluctuating noise level over a defined period of time. The Leq is useful for describing the "average" sound level over a defined period of time, and is expressed in dBA.

The ***Maximum and Minimum Sound Levels****, or Lmax and Lmin*, are the loudest and quietest instant sound levels occurring during a period of time. The Lmax is particularly useful for evaluating loud, impulsive noise events. Lmax and Lmin levels are expressed in dBA, however the root-mean-square (RMS) time constant of the sound level meter's detector has a significant effect on the measured levels. By International agreement, a sound level meter with an RMS response set to 'slow' (Lmaxs) has a rise time constant of 1 second, where a setting of 'fast' (Lmaxf) is about 8x faster with a rise time constant of only 0.125 seconds.

The ***Day Night Sound Level****, or Ldn*, is a 24-hour community noise metric in which a 10 decibel adjustment has been added to the measured hourly Leq levels from 10 PM to 7 AM to account for people's greater sensitivity to noise intrusion at night. The Ldn metric is used in many federal noise guidelines to assess the long-term effects of transportation sources.

The ***Sound Percentile Level****, or Ln*, expressed in dBA is a statistical representation of changing noise levels indicating that the fluctuating noise level was equal to, or greater than, the stated level for "n" percent of the time. For example, the L1, L10, L50, and L90 represent the noise levels exceeded 1%, 10%, 50%, and 90% of the time. The L10 is often used to identify impacts of transportation or construction noise sources, while the L90 is considered to represent steady background noise.

Figure 2. Common A-Weighted Decibel (dBA) Sound Levels



The ***Sound <u>Power</u> Level*** *(PWL)* of a noise source is the strength or intensity of noise that the source produces/emits regardless of the environment in which it is placed. Sound power is a property of the source, and therefore is independent of distance. The radiating sound power then produces a ***Sound <u>Pressure</u> Level*** *(SPL)* at any given point of interest which human beings perceive as audible sound. The sound pressure level is dependent on its environment (absorption, reflections, etc.) and its distance from the noise source. And even though both sound power and sound pressure are expressed in decibels (dB), they are not the same thing and should not be confused. Decibel levels of sound power are referenced to a power level of 1 pW, while decibel levels of sound pressure have a pressure reference level of 20 µPa.

Noise Regulatory Setting

There are no federal community noise regulations that would apply in this case. The noise regulations governing the shooting range at the Willow Wood Club are set forth in New York State General Business Law Section 150 (GBL §150) which specifically exempts existing gun ranges, such as the Willow Wood Club, from local noise control ordinances. The standard set by GBL §150 is that the A-weighted sound level of small arms fire at the shooting range shall not exceed 90 dBA for one hour out of a day or 85 dBA for eight hours out of a day, as measured at, or adjusted to, a distance of 100 feet outside the real property boundary of the shooting range. These noise limits are primarily intended to protect the public from hearing damage but not from potential perceived annoyance.

The Carmel NY Noise Ordinance, Article II, Chapter 104, which is preempted by State statute GBL §150, contains noise limits at residential receptor property lines expressed as maximum A-weighted decibels (dBA Lmax). The daytime (8 AM to 6 PM) receptor noise limit is normally 65 dBA Lmax, however there is a 5-decibel penalty for impulsive noise sources such as gunfire. Thus, the daytime residential receptor noise limit would be 60 dBA Lmax in this case at community receptor locations.

However, GBL §150 specifically <u>exempts</u> gun ranges from local noise control ordinances if the gun range predates the local ordinance. In this case, the local Carmel Noise Ordinance was originally adapted in 1972. However, the Willow Wood Club has been in continuous operation as a gun range since 1955, and therefore predates the local noise control ordinance. Thus, under General Business Law §150(1), "*…… the applicable noise control laws or ordinances have no legal force and effect against such owner or user.*"

Also noteworthy is the fact that the Carmel Noise Ordinance does not specify the electronic time response of a sound level meter when trying to measure for compliance with the ordinance's limits. Thus, consistent with most other community noise studies performed in the United States, a sound meter response time of RMS 'slow' was selected for all noise measurements and modeling results in this case.

The Willow Wood Club is therefore exempt from any neighborhood noise annoyance regulations or restrictions. However, in an attempt to promote good neighbor relations, the club is willing to <u>voluntarily</u> adopt receptor noise limits consistent with the Carmel Noise Ordinance (i.e. 60 dBA Lmax 'slow') *to the extent reasonably feasible*.

Ambient Noise Measurements

Long-term ambient noise measurements were performed at five community receptor locations (LT-1 thru LT-5) from 6/28/20 thru 6/29/20. The purpose of the long-term measurements was to document existing noise conditions affecting the various representative receptors as caused by non-shooting-related noise sources such as traffic, HVAC equipment, aircraft, human activity, birds and wind, etc. Meteorological conditions were acceptable throughout the noise monitor period with temperatures ranging from 60 to 90 deg. F, calm to mild winds, and no precipitation.

The ambient noise measurements were performed using Larson Davis Model 720 (LD 720) noise monitors in self-contained cases. The LD 720 noise monitors were programmed to measure and digitally store sound level data in hourly intervals including the Leq, L1, L10, L50, L90, Lmax and Lmin levels in A-weighted decibels (dBA) using a 'slow' time response. The monitors were calibrated beforehand using a Bruel & Kjaer Model 4231 acoustical calibrators, deployed out-of-reach on tree branches, and the microphones were covered with windscreens. The entire ambient noise monitoring system complied with ANSI Standard S1.4 for Type 2 accuracy.

The results of the ambient noise monitoring exercise can be seen in **Table 2** and **Figures 3 thru 7**. Daytime was defined as 7 AM to 10 PM, and nighttime was defined as 10 PM to 7 AM, consistent with standard acoustical practices. Being a rural/light suburban area, there was relatively little fluctuation in ambient noise levels of only a couple decibels between daytime and nighttime periods, as illustrated by the steady background L90 sound levels. Typical noise "events" are indicated in the L1 results, which in this case are about 15 to 25 decibels louder than the steady L90 background levels. The evening "rush hour" appears to occur around 6 PM as illustrated in the figures.

Table 2. Community Ambient Noise Monitoring Results

Receptor No.	Street Address	Average Ambient Sound Level Results, dBA 'slow'				
		Ldn	Leq Day / Night	L1 Day / Night	L10 Day / Night	L90 Day / Night
LT-1	551 Union Valley Road	58	57 / 49	66 / 59	61 / 50	44 / 43
LT-2	8 Wilson Road	57	58 / 44	66 / 51	61 / 47	40 / 40
LT-3	870 Crest Brook Drive	53	54 / 42	65 / 52	58 / 43	40 / 37
LT-4	39 Wilderness Trail	59	60 / 48	65 / 58	61 / 52	42 / 41
LT-5	7 Margaret Road	55	56 / 45	67 / 58	59 / 45	41 / 36

It is interesting to note that louder moments of ambient noise experienced in the neighboring properties during the daytime are actually louder than the gunshots from the Willow Wood Club.

Figure 3. Ambient Noise Monitoring Summary for Site LT-1

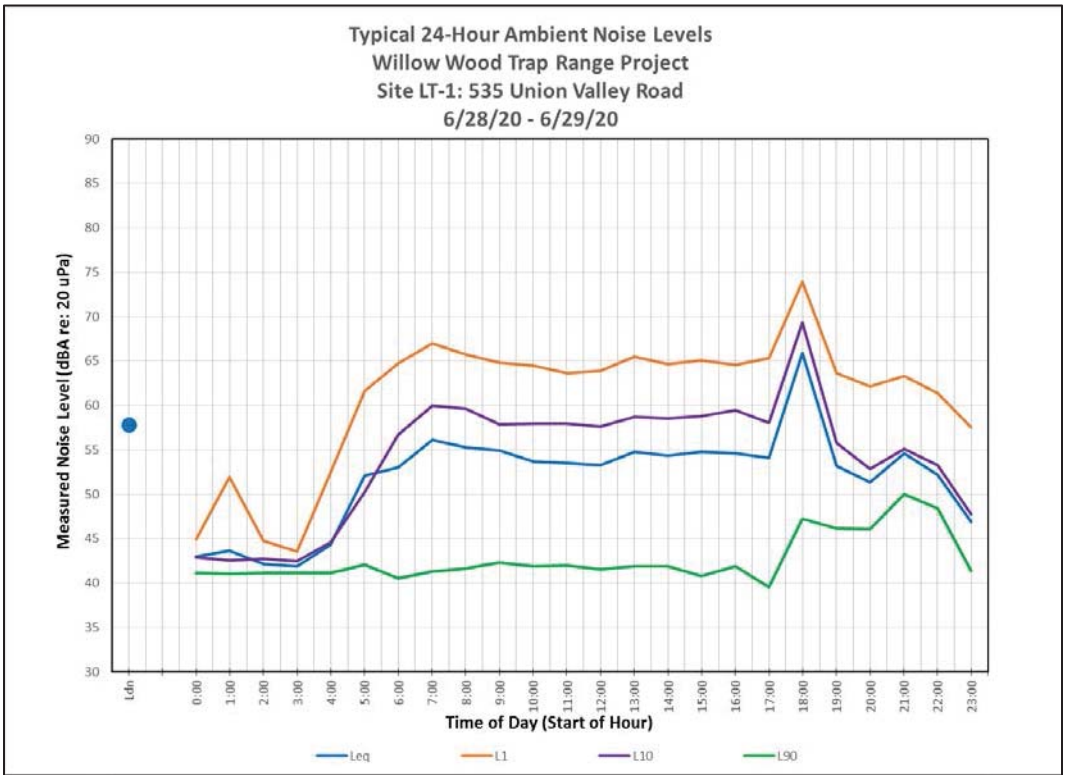


Figure 4. Ambient Noise Monitoring Summary for Site LT-2

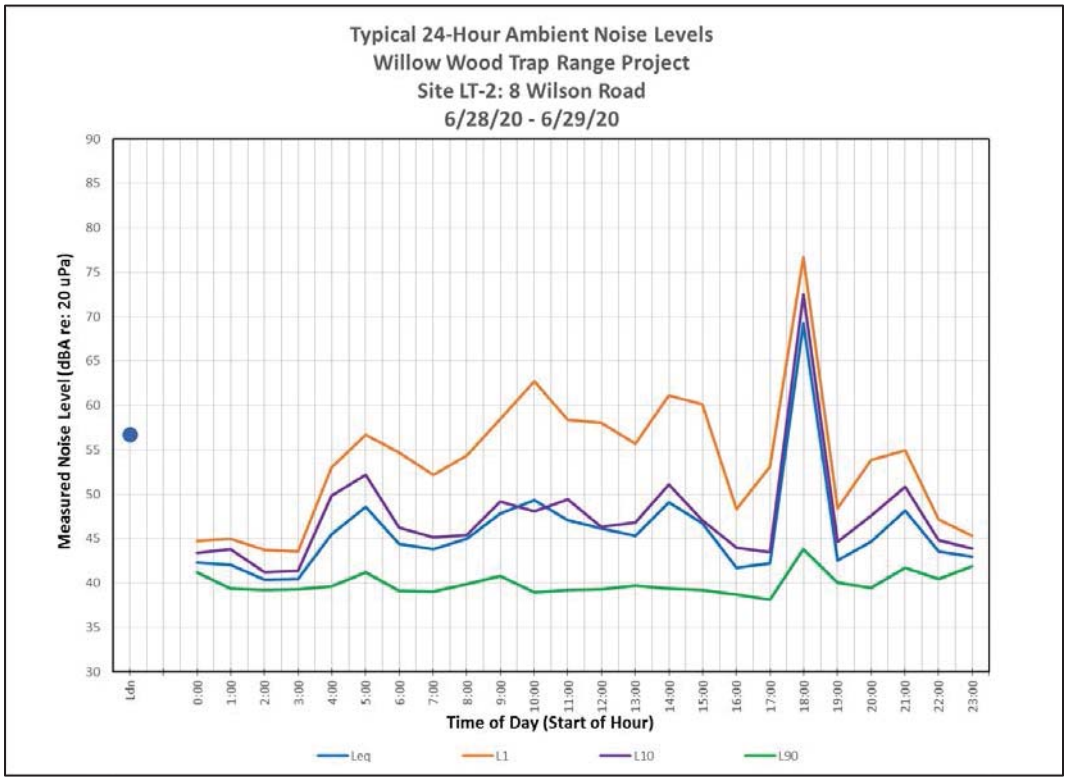


Figure 5. Ambient Noise Monitoring Summary for Site LT-3

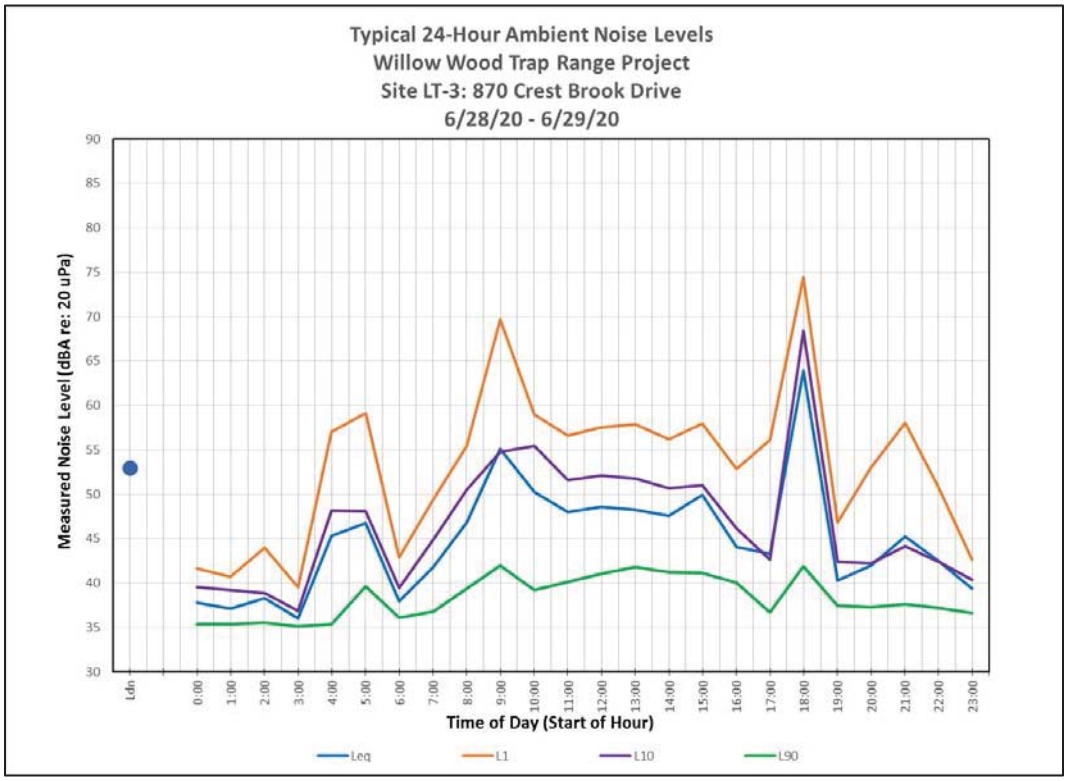


Figure 6. Ambient Noise Monitoring Summary for Site LT-4

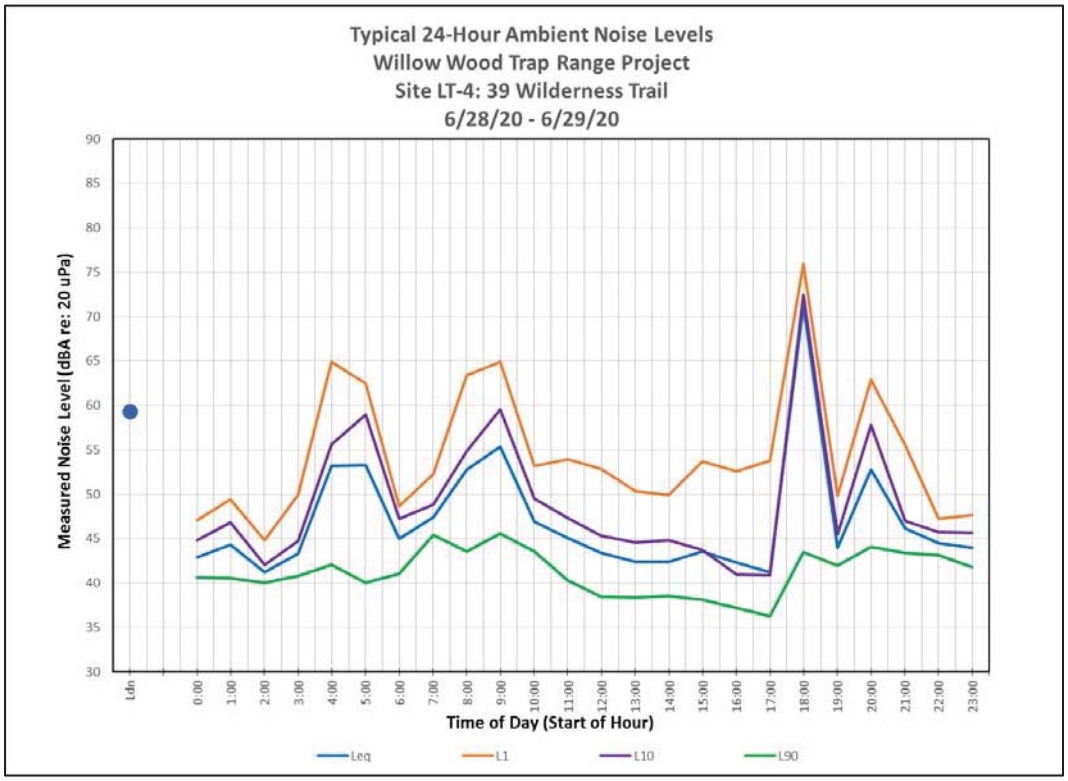
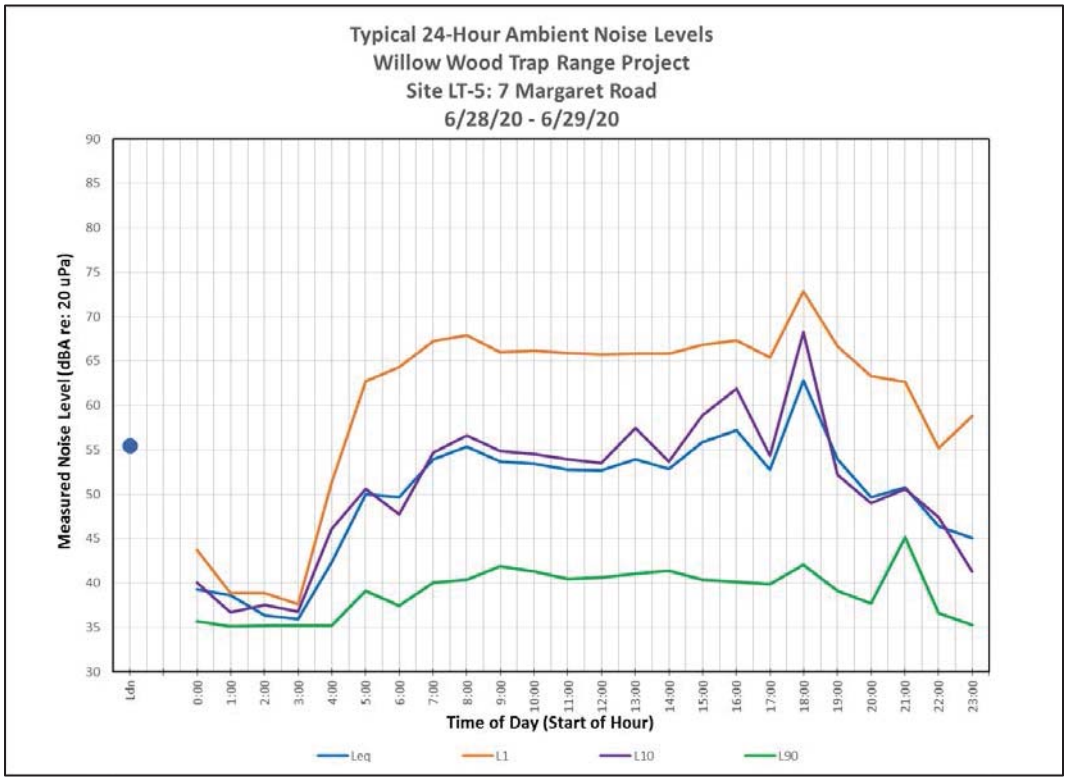


Figure 7. Ambient Noise Monitoring Summary for Site LT-5



Controlled Gunshot Noise Tests

A series of carefully controlled gunshot noise measurement tests were performed on 9/29/20 at the five long-term receptor locations (LT-1 thru LT-5) surrounding the club, as shown in **Figure 1**. The purpose of these tests was to quantitatively measure the loudness of representative shotguns that are typically used at the Willow Wood Club, and in doing so, create comparison levels against which the subsequently developed computer noise model could be calibrated.

The gunshot noise measurement equipment used in this study is shown in **Photo 3**. The sound instrumentation complied with ANSI Standard S1.4 for Type 1 (Engineering-Grade) requirements for accuracy and precision and consisted of a CEL Instruments Model 593 Acoustical Analyzer equipped with a Bruel & Kjaer Model 4189 Microphone. A three-inch foam windscreen was used to minimize errant wind noise from affecting the microphone. The acoustical signal was passed through the analyzer and recorded in the field with a Marantz Model PMD 670 Audio Wavefile Data Recorder. The CEL 593 Analyzer was configured to measure broadband (Linear and A-weighted) and third-octave band noise data using an RMS 'slow' time response. The entire measurement system was calibrated with a Bruel & Kjaer Model 4231 Acoustical Calibrator.

Six individual gunshots were fired from each of seven positions at the club, namely from the trap fields, the 5-stand field, and from proposed clays stations 2, 6, 8, 11 and 13. These stations provided good circular coverage of the proposed shooting circuit, with fields of fire pointed in all directions. Over-under 12 gauge shotguns were used for all test shots using the same ammunition consisting of Rio Target Loads, 2.75 inch, 1.125 ounce, No. 7½ lead shot size traveling at 1,250 feet/second. The gunshots were then measured and recorded at each of the five long-term receptors. Some of the gunshots were easily noticeable, some were barely audible, and a few were completely inaudible relative to the background sound level at the time.

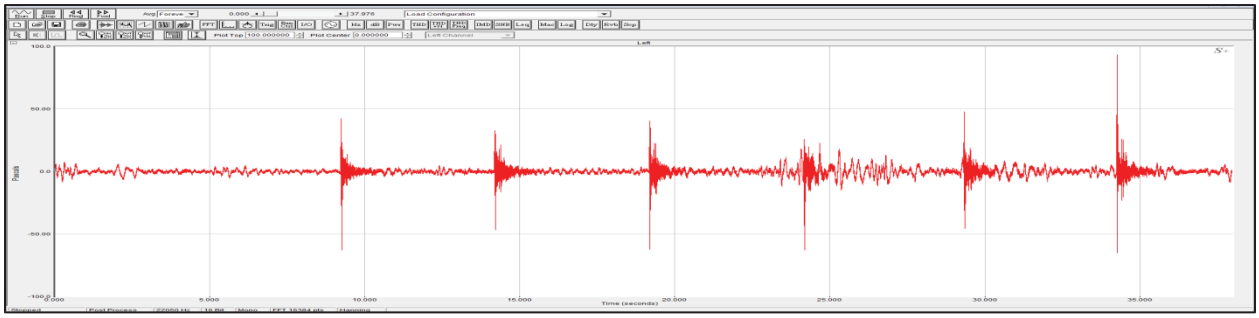
Upon return to the office, the recorded gunfire sound level signals were downloaded from the Marantz PMD 670 and transferred to a computer in the form of an uncompressed digital audio wave file (.wav). The wavefiles were then post-processed using SpectraPLUS sound analysis software which performs a Fast Fourier Transform (FFT) on the acoustical signal in order to determine its magnitude and frequency composition.

Photo 3. Sound Meter and Data Recorder

SpectraPLUS was configured to measure and hold the loudest noise level in each third-octave band over a time window interval of 1.0 seconds (i.e. RMS 'slow') for each gunshot. Thus, SpectraPLUS was able to zoom in and isolate *just the gunfire noise* from the background noise, yielding a conservative (i.e. worst-case) composite third-octave band spectrum. The third-octave band levels were then adjusted to apply each band's A-weighting factor and then logarithmically summed to yield the broadband A-weighted noise level (dBA).

Each gunshot in the recordings was visually and audible located in SpectraPLUS's time history module, as shown in **Figure 8**, and the signal from 0.3 seconds prior to and 0.7 seconds following the loudest moment of the gunshot was measured. This time window ensured that the rise in air pressure as the shot arrived and the drop in air pressure immediately following the shot were all included in the analyzed data sample. Also, by using a time interval of 1.0 seconds, SpectraPLUS was able to measure the maximum noise levels (Lmax) for each gunshot consistent with the results produced by a sound level meter configured with a response time of RMS 'slow', and the results were thus directly comparable to the voluntary noise limits adopted by the Willow Wood Club.

Figure 8. SpectraPLUS Time History Plot Showing Gunshot Events



In this example time history plot, taken from receptor LT-2 while shooting at the 5-stand field, the six gunshot noise events can be seen at approximately 9.24 seconds, 14.14 seconds, 19.18 seconds, 24.17 seconds, 29.34 seconds and 34.25 seconds.

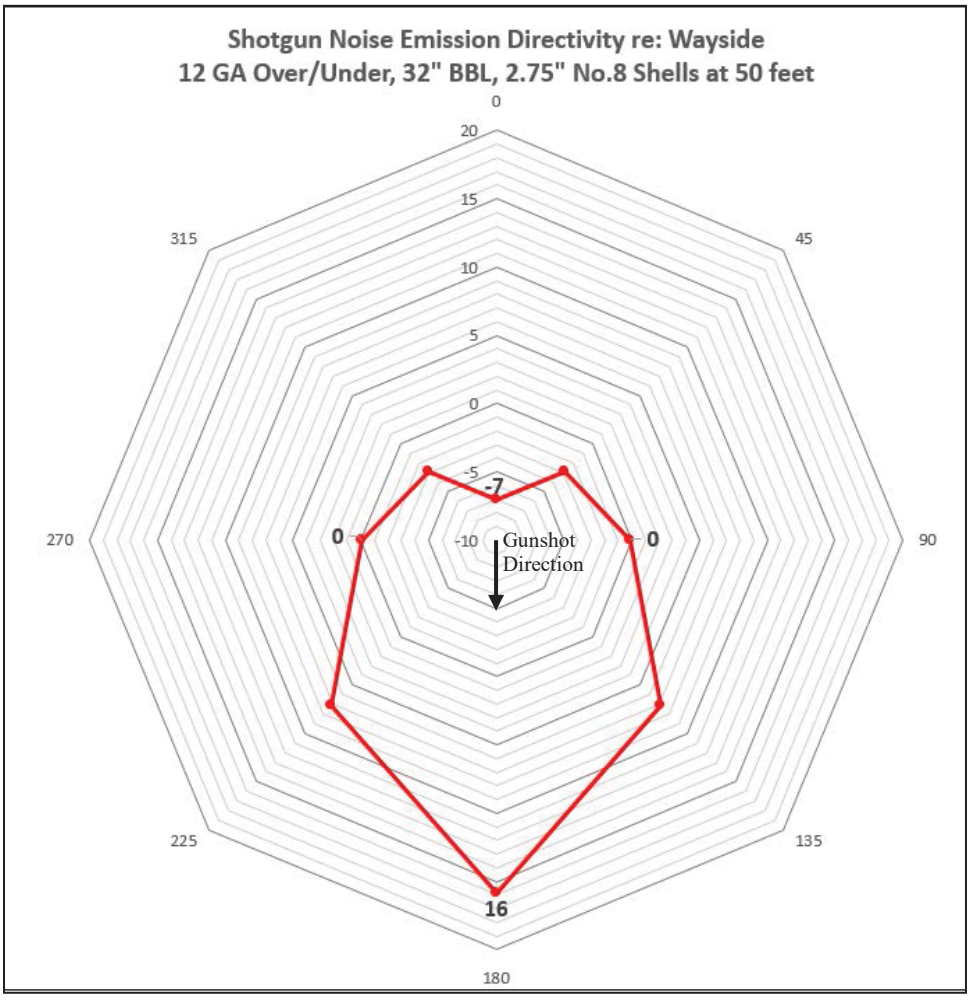
Gunshot Noise Directivity

A very important concept that factors into this case has to do with the acoustical directivity pattern of gunshot noise. Contrary to uninformed intuition, gunshot noise does not act as a perfect acoustical point source radiating sound equally in all directions. Rather, gunfire noise is loudest in a downrange direction in-line with the muzzle, and then radiates as a classic cardioid shape towards the sides and rear of the shooter.

This effect is illustrated in **Figure 9** which shows the directivity pattern of a 12 gauge shotgun which was measured under controlled conditions during a previous gun noise study. As can be seen, gunshots are approximately 16 decibels louder straight downrange (180^{o}) than they are at wayside positions (90^{o} and 270^{o}). Moreover, gunshot noise is actually quieter by approximately 7 decibels in a direction behind the shooter (0^{o}) relative to the wayside noise levels. Thus, shotgun noise levels are a total of 23 decibels quieter towards the rear of the shooter than they are downrange in front of the shooter.

This acoustical directivity pattern was included in the Cadna-A noise model for this project for all gunshot sound sources and adjusted to account for the direction of fire for each shooting position.

Figure 9. Acoustical Directivity Pattern of a Shotgun



Noise Model Development

A predictive simulation model of shooting noise emissions from the Willow Wood Club and related noise levels in the surrounding community was developed using the sophisticated Cadna-A® noise model. The noise model allows for assessment of individual shooting positions, the specific types of firearms and ammunition used in this case, and benefits of potential noise mitigation measures to reduce shooting noise levels in the community. While the model specifically assesses noise levels at the ten representative receptor locations (LT-1A thru R-10), it can also be used to evaluate noise levels at any other location of interest as well.

Cadna-A is a powerful, three-dimensional, ray-tracing acoustical model that implements ISO Standard 9613 for the prediction and propagation of outdoor sound levels. Cadna-A and ISO 9613 are used and accepted by the acoustics industry on a worldwide basis. Noise sources are entered into the Cadna-A model in the form of point, line and/or area components, each emitting sound power levels (PWL) in octave bands or broadband A-weighted format. Distance attenuation, elevation differences, ground absorption, wind effects, foliage, building shielding, and attenuation from barrier/berm effects are computed in the Cadna-A model. The resulting sound pressure levels (SPL) are predicted at any receptor location of interest.

As shown in **Figure 10**, the Cadna-A model for this project was configured by first importing a GoogleEarth® base map of the area. Then a scale drawing of the club was overlaid in the correct location. In this manner, the positions of the existing range, structures, streets, foliage areas, receptor locations and distances could be modeled to a high degree of accuracy. Terrain elevation data taken from ESRI/USGS topographical maps were then brought into the Cadna-A model. This was a critical step because there are noteworthy hills in the area that can play a role in how sound propagates from the club.

The ground surface was modeled as being acoustically absorptive grass and dirt except where there were bodies of water which were modeled as being acoustically reflective. Deciduous foliage (trees that drop their leaves) were added to the model to simulate noise propagation conditions in the summertime, and no foliage attenuation was assumed in the model to account for wintertime conditions.

The model was then populated with sound power noise emission spectra data for 12 gauge over/under shotguns (obtained on a previous project) shooting in the direction of each particular shooting position. The acoustical directivity pattern shown in **Figure 9** was assigned to each firearm such that the downrange direction was pointed in the correct direction. The trap fields are generally pointing towards the east-northeast and the 5-stand field is oriented towards the east-southeast, however the proposed sporting clays stations shoot in a round circuit so their downrange directions vary considerably.

Once the Cadna-A model had been configured, it was tested for its prediction accuracy by comparing its results to those of actual shooting noise levels measured during the controlled tests. **Table 3** summarizes the results of this model calibration exercise which indicate an acceptable agreement between the measured and modeled gunshot sound levels. The close agreement meant the Cadna-A model was considered to be configured properly and reliable for predicting future noise levels as well.

Figure 10. Cadna-A Noise Model Configuration
(Looking Northeast Towards Club)

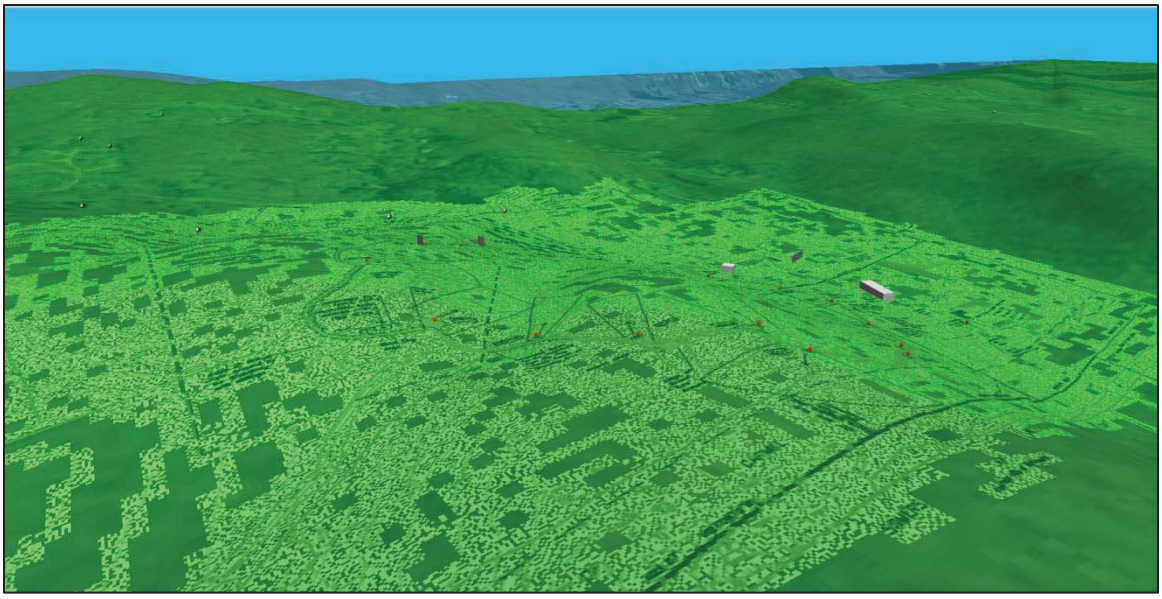


Table 3. Cadna-A Model Calibration Results

Receptor No.	Street Address	Loudest Single Shot, dBA Lmax 'slow'		
		Measured 6/29/20	Modeled Summertime	Difference (Measure – Model)
LT-1	551 Union Valley Road	61	60	1
LT-2	8 Wilson Road	64	64	0
LT-3	870 Crest Brook Drive	54	48	6
LT-4	39 Wilderness Trail	49	50	-1
LT-5	7 Margaret Road	48	45	3

Noise Model Results

The calibrated Cadna-A model was first used to answer the fundamental question – *How loud is the existing shooting noise in the community?* As described above, sixteen different shooting positions were included in the model and their resulting noise levels were computed at ten representative community receptor locations. Both summertime and wintertime noise levels were modeled, with the latter being the louder condition due to deciduous trees losing their leaves. In general, the wintertime noise levels were louder than the summertime noise levels by 1 to 12 decibels depending on the distance and amount of foliage between the club and given receptor. Consequently, the *louder wintertime noise results predicted using the Cadna-A model* are presented in this report for the existing condition.

Table 4 summarizes the noise model results for the club in its existing condition and the corresponding voluntary noise limits in the community. Neighbors who have raised noise concerns in the past include the receptors located at LT-2 and R-6 to R-10. The predicted loudest (i.e. wintertime) gunshots from a 12 gauge over/under shotgun are included in the table for each receptor location. The relatively steady daytime background noise level (L90) at each receptor is provided as well for comparative reference.

As can be seen, two of the receptors (LT-1A and LT-2) are expected to be exposed to gunshot noise levels potentially exceeding the club's voluntary noise limit goal. The single loudest shooting positions in these two cases are sporting clays stations 9 and 6, respectively. Other shooting positions, particularly for receptor LT-1A, could also exceed the club's noise limit, although to a lesser degree. Consequently, noise mitigation measures to noticeably reduce the shooting noise levels and to ensure compliance with the club's self-imposed noise limit goal have been developed for consideration in the next section.

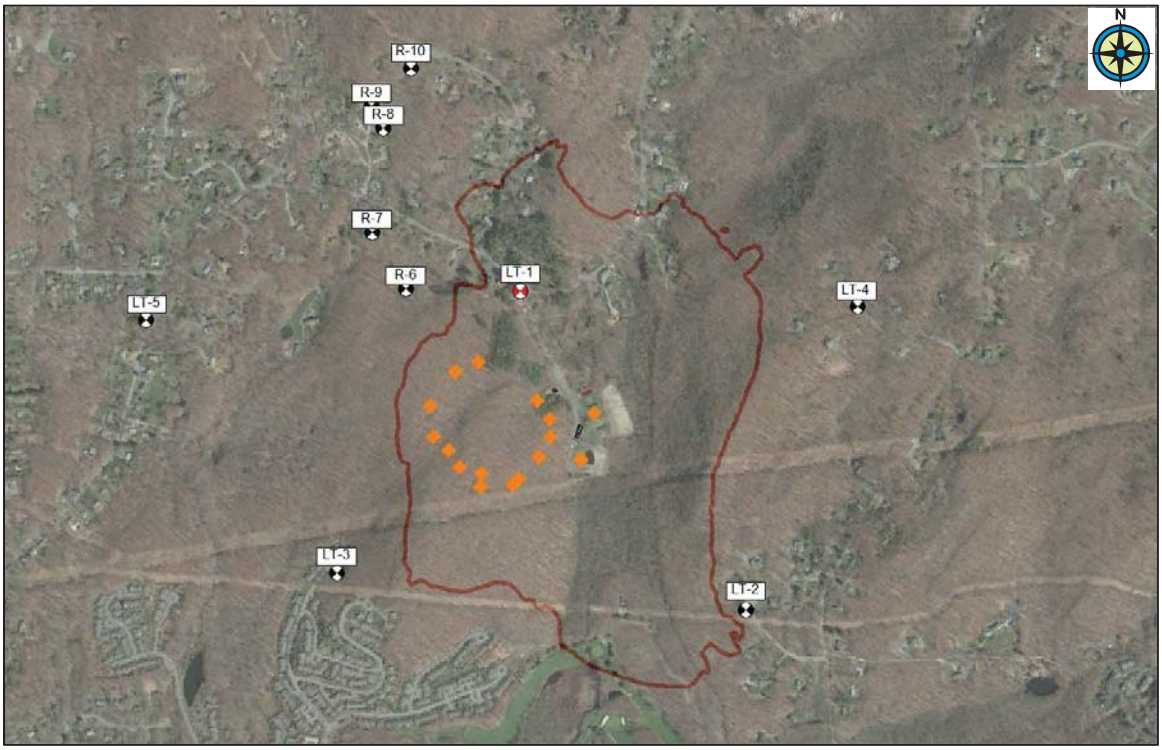
Table 4. Shooting Club Community Noise Results

Receptor No.	Street Address	Daytime Background dBA L90 'slow'	Carmel Daytime Noise Limit dBA Lmax 'slow'(1)	Loudest Gunshot Noise Level dBA Lmax 'slow'		
				Winter Condition	Shooting Positon	Complies or Exceeds
LT-1A	553 Union Valley Road	44	60	67	Clays 9	Exceeds by 7 dBA
LT-2	8 Wilson Road	40	60(2)	65	Clays 6	Exceeds by 5 dBA
LT-3	870 Crest Brook Drive	40	60	51	Clays 12	Complies
LT-4	39 Wilderness Trail	42	60	56	Clays 12	Complies
LT-5	7 Margaret Road	41	60	46	Clays 9	Complies
R-6	507 Union Valley Road	Approx. 40	60	50	Clays 1	Complies
R-7	491 Union Valley Road	Approx. 40	60	54	Clays 2	Complies
R-8	18 Fox Hill Road	Approx. 40	60	58	Clays 9	Complies
R-9	20 Fox Hill Road	Approx. 40	60	58	Clays 5	Complies
R-10	75 Englewood Terrace	Approx. 40	60	57	Clays 4	Complies

Notes: (1) The actual noise limit is 90 dBA Leq(h) set forth in GBL §150. The Carmel Noise Ordinance regulations are referenced here for informational purposes only.
(2) LT-2 receives 64 dBA from the existing 5-stand, which predated the Carmel Noise Ordinance.

As mentioned above, the ten receptors (LT-1A thru R-10) discussed in this study represent similarly affected receptors in the community, but they are only discrete locations. More generalized results for the community-at-large can be seen in **Figure 11** which shows the existing worst-case wintertime gunshot ***noise impact zone*** for the Carmel Noise Ordinance noise limit of 60 dBA Lmax 'slow'. Any receptor located within the impact zone could be (but is not guaranteed to be) exposed to shooting noise levels that could exceed the noise limit goal.

Figure 11. 60 dBA Lmax Slow Noise Impact Zone
(Existing Worst-Case Winter Condition)



Noise Mitigation Options

Whereas two of the community noise receptors in this study (LT-1A and LT-2) are expected to be exposed to gunshot noise levels in excess of the Willow Wood Club's voluntary noise limit goal, feasible and reasonable noise control options have been developed here for consideration. Within this context, the word "feasible" refers to the engineering and noise reduction performance aspects of the mitigation, while the word "reasonable" addresses the issue of cost-justification.

In general, noise levels can be reduced by applying sound abatement (mitigation) measures to the noise source itself, along the propagation pathway, or by directly affecting the receiver; the former of which typically being the most effective. In this case, there are possible mitigation options for consideration for the noise sources and along the pathways to the receptors.

The following noise control measures were developed in an exhaustive iterative process involving the Willow Wood Club's attorney, civil engineer and acoustical engineer. These measures were developed by balancing the environmental constraints, minimization of site disturbance, and maximizing noise mitigation to ensure the club voluntary mitigates the noise levels beyond GBL §150's noise standards to those of the Carmel Noise Ordinance.

The loudest gunshot noise level affecting receptor LT-1A at 553 Union Valley Road is anticipated to be as loud as 67 dBA Lmax 'slow' during the wintertime, thus exceeding the club's voluntary noise limit goal of 60 dBA Lmax 'slow' by 7 decibels. The loudest shooting position affecting receptor LT-1A is expected to come from the existing clays Station 9, however shooting from ten other clays stations could also exceed the noise limit.

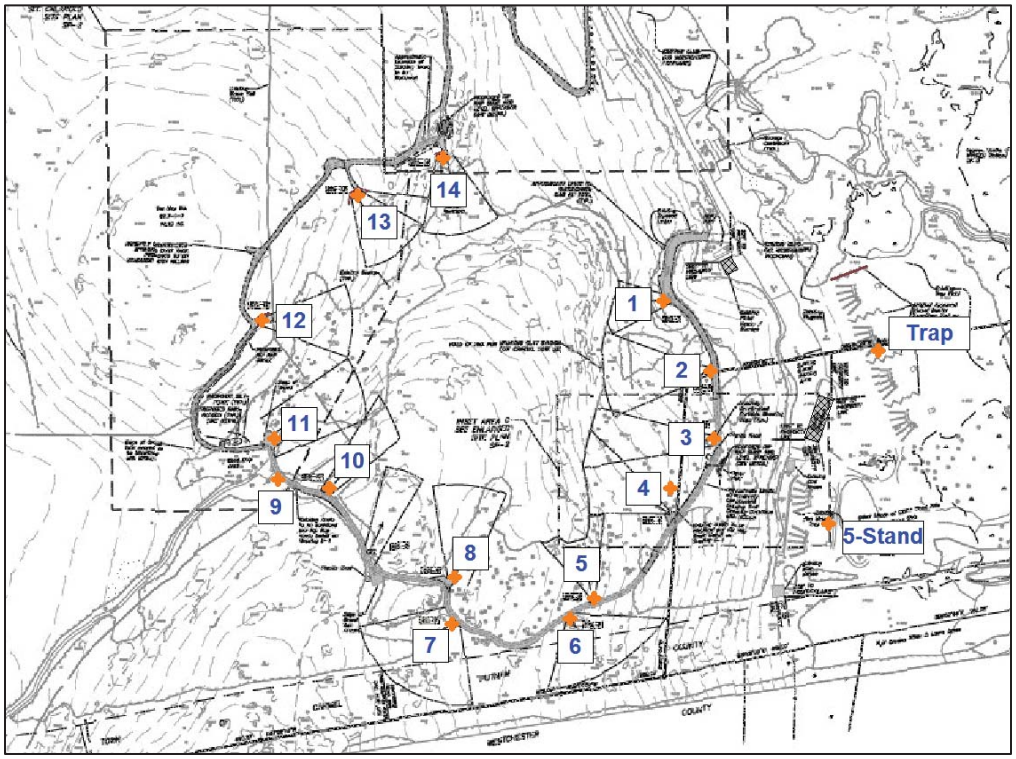
The loudest gunshot noise level affecting receptor LT-2 at 8 Wilson Road is anticipated to be as loud as 65 dBA Lmax 'slow' during the wintertime, thus exceeding the club's voluntary noise limit goal of 60 dBA Lmax 'slow' by 5 decibels. The loudest shooting position affecting receptor LT-2 is expected to come from clays Station 6.

Thus, the following noise mitigation measures are recommended to reduce gunshot noise levels affecting receptors LT-1A and LT-2 (as discussed via conference call on 4/1/22):

1. Enhance the existing noise barriers at Stations 13 and 14 by adding wings to each shooting station, and add noise absorptive material to the side of the barrier facing the noise source.
2. Construct a small (12-foot tall) absorptive noise barrier with side panels behind the shooting position at Station 12 to shield noise propagating towards Union Valley Road.
3. Slightly rotate in a clockwise direction the downrange direction for Station 8.
4. Rotate the downrange direction for Station 6 so that it points south.
5. Relocate Station 9 to between Stations 10 and 11, and rotate the downrange direction for Station 9 so that it points south.
6. Relocate Station 4 slightly to the north so that its downrange direction rotates counter-clockwise and points west-southwest instead.

The locations for all the clays stations after mitigation is applied can be seen in **Figure 12**.

Figure 12. Locations of Clays Stations After Mitigation



If the mitigation options described above are implemented, it can then be demonstrated in the Cadna-A noise model that full compliance with the Willow Woods Club's self-imposed community noise limit goal of 60 dBA Lmax 'slow' can be achieved at each of the receptor locations evaluated in this study. **Table 5** summarizes the noise model results if the additional forms of mitigation are included.

Table 5. Predicted Gunshot Noise Levels With Mitigation Measures

Receptor No.	Street Address	Noise Limit, dBA Lmax 'slow'	Predicted Loudest Shot, dBA Lmax 'slow'			With Mitigation, dBA Lmax 'slow'		
			Modeled Winter Condition	Loudest Station	Exceeds or Complies	Modeled With Mitigation	Loudest Station	Exceeds or Complies
LT-1A	553 Union Valley Road	60	67	Clays 9	7	59	Clays 5	Complies
LT-2	8 Wilson Road	60	65	Clays 6	5	59	Clays 13*	Complies
LT-3	870 Crest Brook Drive	60	51	Clays 12	Complies	55	Clays 9*	Complies
LT-4	39 Wilderness Trail	60	56	Clays 12	Complies	56	Clays 12*	Complies
LT-5	7 Margaret Road	60	46	Clays 9	Complies	46	Clays 7	Complies
R-6	507 Union Valley Road	60	50	Clays 1	Complies	50	Clays 1	Complies
R-7	491 Union Valley Road	60	54	Clays 2	Complies	54	Clays 2	Complies
R-8	18 Fox Hill Road	60	58	Clays 9	Complies	58	Clays 5	Complies
R-9	20 Fox Hill Road	60	58	Clays 5	Complies	58	Clays 5	Complies
R-10	75 Englewood Terrace	60	57	Clays 4	Complies	57	Clays 9*	Complies

Note: (*) Indicates that the loudest shot comes from the station after it has been mitigated for other receptors.

Conclusions

A comprehensive shooting noise assessment was performed for the community surrounding the Willow Wood Gun Club in Mahopac, New York. The acoustical study took into account the types of firearms used at the club, the existing orientation of the shooting positions, topographical, terrain and foliage conditions, time of year, the locations and background noise levels of noise-sensitive receptors, the relevant noise criteria limits in this case, and the Planning Board's concerns regarding the neighbors to the north of the club. The initial conclusion was that shooting noise levels could exceed the club's self-imposed noise limits goal at two community receptors. Consequently, noise mitigation measures were developed for the club to consider which would noticeably reduce the anticipated shooting noise levels at the affected neighbors' homes and bring the gunshot noise levels within compliance with the club's voluntary noise limits.

Noise mitigation measures included building or enhancing small noise barriers behind two clays stations, relocating two clays stations, and rotating four clays stations to direct their noise in a less offensive direction. With these noise mitigation measures in place, full compliance with the club's voluntary community noise limit of 60 dBA Lmax 'slow' can be demonstrated at all receptor locations.

Disclaimer – The noise mitigation measures presented in this report are for conceptual and feasibility consideration purposes only. Any noise mitigation options selected by the Willow Wood Club for implementation would need to be further analyzed from a constructability, cost and safety perspective.

Appendix A

Professional Qualifications

INCE

The Institute of Noise Control Engineering
of the United States of America, Inc.

in recognition of
professional standing and contributions
attests that

ERICH THALHEIMER

a Member of the Institute
is
Board Certified
in Noise Control Engineering

For the Board of Directors

Paul R. Donavan
President

David J Kato
Secretary

2001 June

20104

500' ADJOINERS:

1. N/F NYS ELEC. & GAS CORP.
2. N/F KESUL CORP. / SULLIVAN
3. N/F FANTE
4. N/F OCEAN II, LLC
5. N/F EGAN
6. N/F HILBRICH
7. N/F WEAVER
8. N/F BARRY
9. N/F WILLIAMS
10. N/F ZAMBARDINO / FRIEL
11. N/F MARTINELLI
12. N/F RUFFIN
13. N/F MUNCH
14. N/F DIPELESI
15. N/F DIPELESI
16. N/F RICCI REVOCABLE LIVING TRUST
17. N/F ROSS
18. N/F WELLS FARGO BANK/VUKAJ/SNIFFEN
19. N/F FERGUSON
20. N/F SPARDO, JR.
21. N/F LINDENBERG
22. N/F LORUSSO
23. N/F PALUMBO
24. N/F POLJAK
25. N/F CATTI
26. N/F EISENBERG
27. N/F JUSINO / COBELLI
28. N/F DEYO
29. N/F DOYLE
30. N/F CHIN
31. N/F ROSAMILIA
32. N/F ROSAMILIA
33. N/F FROHM
34. N/F KILIAN / CANDEE / JONES
35. N/F HERITAGE HILLS OF WESTCHESTER

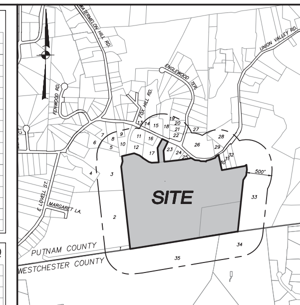
R-ZONING COMPLIANCE INFORMATION (SEE GENERAL NOTE 4 FOR VARIANCES GRANTED)

	Required/Permitted:	Existing:	Proposed:
Min. Lot Size:	See Below	See Below	See Below
Lot Coverage	15%	<1%	<1%
Lot Width:	200'	2380' ±	2380' ±
Lot Depth:	200'	1610' ±	1610' ±
Min. Yard Setbacks (Primary):			
Front:	100'	1030' ±	1030' ±
Side:	50'	483' ±, 1767' ±	483' ±, 1767' ±
Rear:	50'	394' ±	394' ±
Min. Yard Setback (Accessory):			
Front:	50'	690' ±	690' ±
Side:	25'	548' ±, 1607' ±	548' ±, 1607' ±
Rear:	25'	110' ±	110' ±
Min. Required Floor Area	N/A	N/A	N/A
Floor Area Ratio	N/A	N/A	N/A
Height	35'	<35'	<35'
Off-Street Parking	See Below	See Below	See Below
Off-Street Loading	1	1	1

MEMBERSHIP CLUB ZONING COMPLIANCE (SEE GENERAL NOTE 4 FOR VARIANCES GRANTED)

	Required/Permitted:	Existing:	Proposed:
A) Min. Lot Size:	5 Acres	86 Acres ±	86 Acres ±
C) Landscape Buffer			
Height	4'	4'*	4'*
Depth	10'	102'*	102'*
D) Parking Space	2 per Member Household plus 1 per Employee (502 spaces)**	80 spaces***	80 standard spaces / 47 additional special event spaces***

* See Landscape Plan for natural vegetated buffer to remain.
** The Club anticipates a maximum of 250 member households and has 2 employees. This results in 502 spaces being required. A variance will be required.
*** See Drawing D-2 for Parking Plan for special events.



LOCATION MAP SCALE: 1" = 1000'±

OWNER/APPLICANT:

Willow Country Club Inc., formerly known as
Willow Wood Rifle & Pistol Club Inc.,
d/b/a Willow Wood Gun Club
Union Valley Road
Mahopac, NY 10541

SITE DATA:

Zone: R (Residential)
Total Acreage 86.0 AC
Tax Map No.: 87.7-1-7
87.7-1-6
87.7-1-11

GENERAL NOTES:

1. The following zoning variances/determinations have been granted for the subject property:
   1.1. December 1985 – Carmel Zoning Board of Appeals determined that the club is a permitted use under the applicable zoning ordinance provision.
   1.2. June 1987 – Carmel Zoning Board of Appeals granted Variance for 55 parking spaces.
   1.3. July 2019 – Carmel Zoning Board of Appeals granted variances for parking space width (9 feet) and length (18 feet), gravel parking area surface, and reduced driveway width (20 feet).
   1.4. October 2021 – Carmel Zoning Board of Appeals granted a variance for the number of parking spaces to permit 80 standard spaces plus 47 special event spaces for a total of 127 special event spaces.
2. Property Boundary, Existing Conditions and New York State Electric & Gas Corporation Easement shown hereon is taken from survey prepared by Badey & Watson dated July 8, 1988.
3. Topographic contours and additional information shown hereon is derived from aerial photogrammetry provided by Geomaps International.
4. The approximate location of each station (14 total) with the approximate field and direction of fire have been shown for informational purposes. Each station consists of multiple mobile trap machines and a moveable wooden cage from which the shooter stands to limit the field of fire. Clay targets are thrown from the trap machines. The target can be thrown at almost any angle or trajectory, including rolling on the ground, at a variety of different speeds. The targets themselves come in a variety of sizes and configurations for different performance characteristics. Targets are released by digital radio signal from the cages and may be released sequentially or simultaneously.
   4.1. The Club's Sporting Clays Chairman, a certified range safety officer, is responsible for supervising the arrangement of target presentations to operate within safe limits at each station. Members of the Sporting Clays Committee and other Range Safety Officers monitor compliance with safety protocols.
   4.2. The approximate limits of each station shown herein are based upon topography, existing tree cover and the areas within where the clay targets are shot.
5. Any future change, shift or relocation of the stations shown would require an amended site plan approval.

PLANTING NOTES:

1. All plantings shall be verified by the Town of Carmel Wetlands Inspector.
2. All plantings shall be installed in accordance with Chapter 142 of the Town of Carmel Town Code.

LEGEND

- EXISTING PROPERTY LINE
- EXISTING BUILDING
- EXISTING CHAIN LINK FENCE
- EXISTING STONEWALL
- EXISTING DRAINAGE PIPE
- EXISTING TREELINE
- EXISTING 10' CONTOUR
- EXISTING SWALE
- EXISTING SPOT GRADE
- STA-3 SPORTING CLAY STATION LABEL (SEE GENERAL NOTE)
- EXISTING TREE
- EXISTING STUMP
- PROPOSED 2' CONTOUR
- PROPOSED 10' CONTOUR
- SF PROPOSED SILT FENCE
- LIMITS OF DISTURBANCE ASSOCIATED WITH RECENTLY CONSTRUCTED AND PROPOSED IMPROVEMENTS
- RG PROPOSED RAIN GARDEN
- PROPOSED SWALE
- APPROXIMATE LIMITS OF EXISTING LOGGING TRAIL STABILIZED WITH MILLINGS
- APPROXIMATE LIMITS OF RECENTLY CONSTRUCTED TRAIL TO BE STABILIZED WITH MILLINGS
- APPROXIMATE LOCATION OF SHOOTING STATION WITH DIRECTION AND FIELD OF FIRE (SEE GENERAL NOTE 3)

SIGHT DISTANCE TABLE – DRIVEWAY

	Required[1]	Provided
Left Turn from Driveway (Refer to Exhibits 9-53 & 9-55)[2]	Looking Right = 335'	280'
	Looking Left = 335'	178'
Right Turn from Driveway (Refer to Exhibits 9-53 & 9-58)[2]	Looking Left = 290'	178'
Left Turn from Union Valley Road Into Driveway	245'	286'
Stopping Sight Distance on Union Valley Road for car turning left into site	200'	238'

1 Required sight distances based on 30 mph roadway speed limit.
2 All exhibits from AASHTO Geometric Design of Highways and Streets 2004.
3. All measurements taken 14.5' from the edge of Union Valley Road traveled way. Assuming a drivers eye height of 3.5' above the roadway surface and an object height of 3.5' above the roadway surface.

GRAPHIC SCALE
0 40 80 160
(IN FEET)
1 inch = 80 ft.

NO.	DATE	REVISION	BY
7	2-13-23	REVISED PER TOWN COMMENTS	JWM
6	5-12-22	REVISED PER TOWN COMMENTS	JWM
5	3-10-22	PLANNING BOARD SUBMISSION	PJM
4	9-11-19	ZBA SUBMISSION	JWM
3	5-9-19	REVISED PER TOWN COMMENTS	JWM
2	3-25-19	REVISED PER TOWN COMMENTS	JWM
1	1-2-19	REVISED PER TOWN COMMENTS	JWM

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3 Garrett Place
Carmel, NY 10512
(845) 225-9690
(845) 225-9717 fax
www.insite-eng.com

PROJECT:
WILLOW WOOD COUNTRY CLUB, INC.
UNION VALLEY ROAD, TOWN OF CARMEL, PUTNAM COUNTY, NY

DRAWING:
OVERALL/CURRENT CONDITIONS SITE PLAN

PROJECT NUMBER	18173.100	PROJECT MANAGER	R.D.W
DATE	12-26-18	DRAWN BY	J.W.M.
SCALE	1" = 80'	CHECKED BY	

DRAWING NO. SP-1
SHEET 1 / 5

PERMANENT STORMWATER FACILITIES MAINTENANCE SCHEDULE

PRACTICE/FACILITY	MONTHLY	AFTER MAJOR STORM EVENTS	BI-ANNUALLY	YEARLY	EVERY 5 to 10 YEARS
GRASS & RIP RAP SWALES	Ensure contributing areas clean of debris, no evidence of erosion, & mowing performed.	Inspect for erosion, soil permeability & evidence of flow going around structures.	–	Inspect & clean accumulated sediment.	–
RAIN GARDENS	Inspect vegetation & mulch layer.	Ensure rain garden dewaters between storms.	–	–	–
SUBSURFACE STORMWATER COLLECTION SYSTEMS	–	–	Inspect & clean	Inspect, clean, repair and/or replace structures. Remove debris.	–

Note: The party responsible for implementation of the maintenance schedule during and after construction is:

Willow Wood Country Club Inc.
Union Valley Road
Mahopac, NY 10541

PLANT LIST

QTY	SYMBOL	BOTANICAL/COMMON NAME	SIZE	ROOT
WEST				
		EVERGREEN TREES		
9	VR	Viburnum rhytidophyllum / Leather Leaf Viburnum	5' – 6' HT.	B & B

LEGEND

- EXISTING PROPERTY LINE
- EXISTING BUILDING
- EXISTING CHAIN LINK FENCE
- EXISTING STONEWALL
- EXISTING DRAINAGE PIPE
- EXISTING TREELINE
- EXISTING 10' CONTOUR
- EXISTING SPOT GRADE
- STA-3 SPORTING CLAY STATION LABEL (SEE GENERAL NOTE)
- EXISTING TREE
- EXISTING STUMP
- SF PROPOSED SILT FENCE
- LIMITS OF DISTURBANCE ASSOCIATED WITH RECENTLY CONSTRUCTED AND PROPOSED IMPROVEMENTS
- APPROXIMATE LIMITS OF NATURAL WOODED & LANDSCAPED AREA
- EXISTING TREE REMOVAL
- PROPOSED EVERGREEN TREE

EROSION AND SEDIMENT CONTROL MAINTENANCE SCHEDULE

	MONITORING REQUIREMENTS			MAINTENANCE REQUIREMENTS	
PRACTICE	DAILY	WEEKLY	AFTER RAINFALL	DURING CONSTRUCTION	AFTER CONSTRUCTION
SILT FENCE BARRIER	–	Inspect	Inspect	Clean/Replace	Remove
STABILIZED CONSTRUCTION ENTRANCE	Inspect	–	Inspect	Clean/Replace Stone and Fabric	Remove
DUST CONTROL	Inspect	–	Inspect	Mulching/ Spraying Water	N/A
*VEGETATIVE ESTABLISHMENT	–	Inspect	Inspect	Water/Reseed/ Remulch	Reseed to 80% Coverage
INLET PROTECTION	–	Inspect	Inspect	Clean/Repair/ Replace	Remove
SOIL STOCKPILES	–	Inspect	Inspect	Mulching/ Silt Fence Repair	Remove
SWALES	–	Inspect	Inspect	Clean/Mulch/ Repair	Mow Permanent Grass/Replace/ Repair Rip Rap
CHECK DAMS	–	Inspect	Inspect	Clean/Replace Stones/Repair	Clean/Replace Stones/Repair
CONCRETE DRAINAGE STRUCTURES	–	Inspect	Inspect	Clean Sumps/ Remove Debris/ Repair/Replace	Clean Sumps/ Remove Debris/ Repair/Replace
DRAINAGE PIPES	–	Inspect	Inspect	Clean/Repair	Clean/Repair
ROAD & PAVEMENT	–	Inspect	Inspect	Clean	Clean
*STORMWATER TRAP/BASIN	–	Inspect	Inspect	Clean/Mulch/ Repair/Reseed	See Permanent Stormwater Facilities Maintenance Schedule on Drawing

* Permanent vegetation is considered stabilized when 80% of the plant density is established. Erosion control measures shall remain in place until all disturbed areas are permanently stabilized.

Note: The party responsible for implementation of the maintenance schedule during and after construction is:

Willow Wood Country Club Inc.
Union Valley Road
Mahopac, NY 10541

and/or the current owner(s) of the subject property.

GRAPHIC SCALE

80 0 40 80 160 320

(IN FEET)
1 inch = 80 ft.

NO.	DATE	REVISION	BY
5	2-13-23	REVISED PER TOWN COMMENTS	JMM
4	5-12-22	REVISED PER TOWN COMMENTS	JMM
3	3-10-22	PLANNING BOARD SUBMISSION	PJM
2	9-11-19	ZBA SUBMISSION	JMM
1	5-9-19	REVISED PER TOWN COMMENTS	JMM

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Carmel, NY 10512
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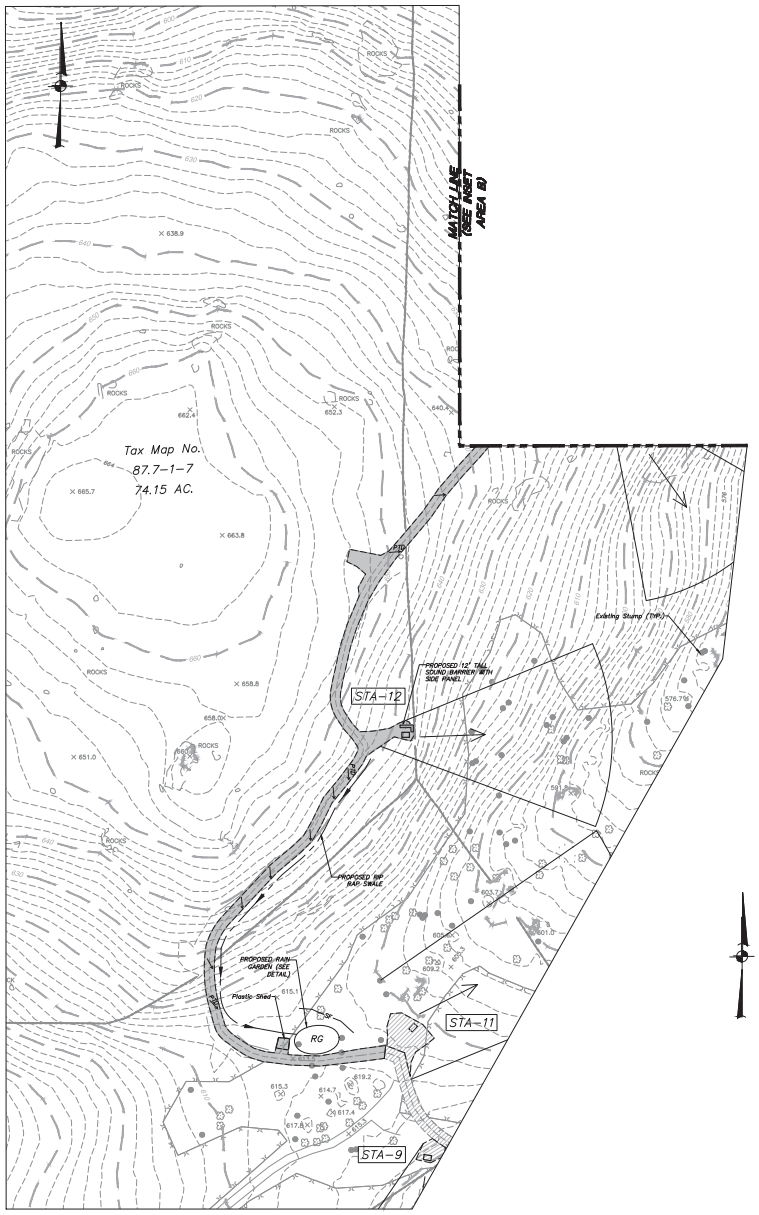
(845) 225-9717 fax
www.insite-eng.com

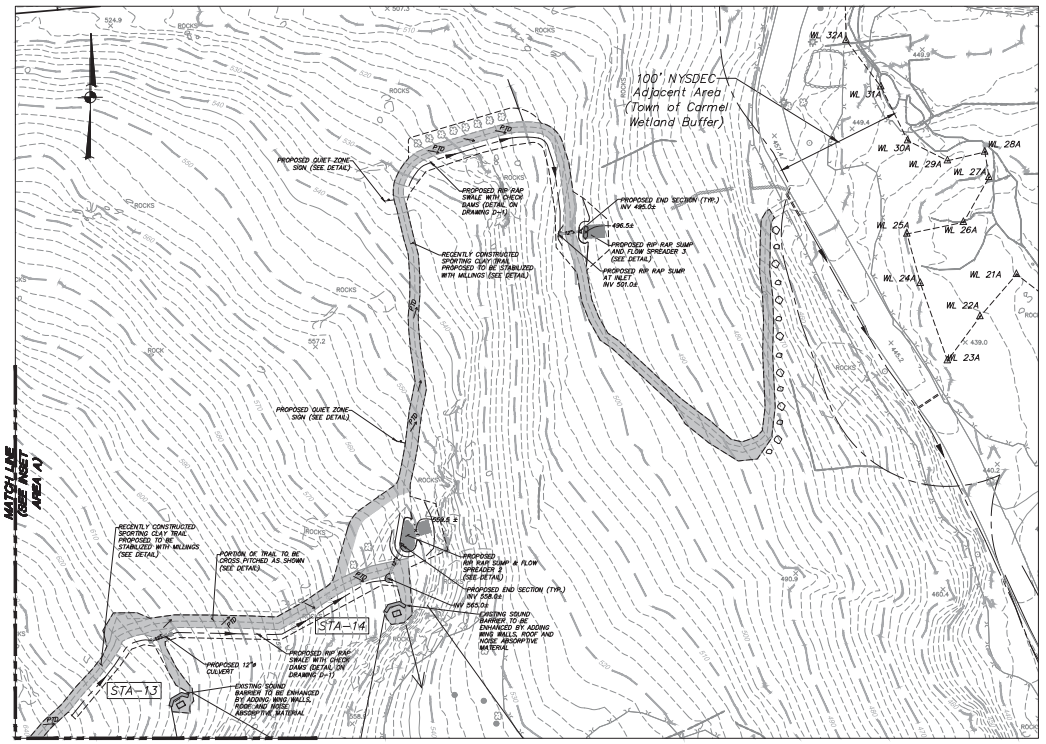
PROJECT:
WILLOW WOOD COUNTRY CLUB, INC.
UNION VALLEY ROAD, TOWN OF CARMEL, PUTNAM COUNTY, NY

DRAWING:
LANDSCAPE & LIMITS OF DISTURBANCE PLAN

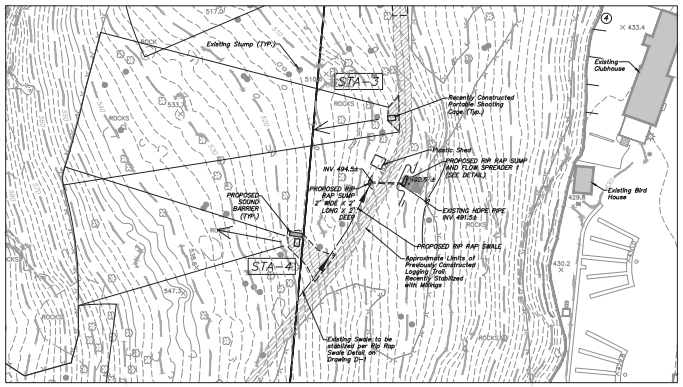
PROJECT NUMBER	18173.100	PROJECT MANAGER	R.D.W	DRAWING NO.	SHEET
DATE	3-27-19	DRAWN BY	J.W.M.	SP-2	2 / 5
SCALE	AS SHOWN	CHECKED BY			



ENLARGED SITE PLAN
INSET AREA A
SCALE: 1" = 40'



ENLARGED SITE PLAN
INSET AREA B
SCALE: 1" = 40'



ENLARGED SITE PLAN
INSET AREA C
SCALE: 1" = 40'

NO.	DATE	REVISION	BY
6	2-13-23	REVISED PER TOWN COMMENTS	JMM
5	5-12-22	REVISED PER TOWN COMMENTS	JMM
4	3-10-22	PLANNING BOARD SUBMISSION	PJM
3	9-11-19	ZBA SUBMISSION	JMM
2	5-9-19	REVISED PER TOWN COMMENTS	JMM
1	3-27-19	REVISED PER TOWN COMMENTS	JMM

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PROJECT:
WILLOW WOOD COUNTRY CLUB, INC.
UNION VALLEY ROAD, TOWN OF CARMEL, PUTNAM COUNTY, NY

DRAWING:
ENLARGED SITE PLANS

PROJECT NUMBER	18173.100	PROJECT MANAGER	R.D.W
DATE	12-26-18	DRAWN BY	J.W.M.
SCALE	AS SHOWN	CHECKED BY	

DRAWING NO. SP-3 SHEET 3/5

EROSION & SEDIMENTATION CONTROL NOTES:

1. The owner's field representative (O.F.R.) will be responsible for the implementation and maintenance of erosion and sediment control measures on this site prior to and during construction.
2. All construction activities involving the removal or disposition of soil are to be provided with appropriate protective measures to minimize erosion and contain sediment disposition within. Minimum soil erosion and sediment control measures shall be implemented as shown on the plans and shall be installed in accordance with "New York Standards and Specifications For Erosion and Sediment Control," latest edition.
3. Wherever feasible, natural vegetation should be retained and protected. Disturbance shall be minimized in the areas required to perform construction. No more than 5 acres of unprotected soil shall be exposed at any one time.
4. When land is exposed during development, the exposure shall be kept to the shortest practical period of time, but in no case more than 7 days after the construction activity in that portion of the site has ceased. Disturbance shall be minimized in the areas required to perform construction.
5. All construction vehicles shall be kept clear of the watercourses and wetland control areas outside the areas of proposed development. SIH fence and orange construction fence shall be installed in the areas where the grading is in close proximity of the watercourses or wetland control areas.
6. The stabilized construction entrances, silt fence, and orange construction fence shall be installed as shown on the plans prior to beginning any clearing, grubbing or earthwork.
7. All topsoil to be stripped from the area being developed shall be stockpiled and immediately seeded with Lolium perenne aristatum or Lolium perenne multiflorum for temporary stabilization. Lolium perenne aristatum shall be used for winter seeding and Lolium perenne multiflorum shall be used for spring and summer seeding.
8. Any graded areas not subject to further disturbance or construction traffic shall, within 7 days of final grading, receive permanent vegetation cover in combination with a suitable mulch. All seeded areas to receive a minimum 4" topsoil (from stockpile area) and be seeded and mulched as follows:
   - Seed mixture to be planted between March 21 and May 20, or between August 15 and October 15 or as directed by project representative at a rate of 100 pounds per acre in the following proportions:
     Kentucky Bluegrass 20%
     Creeping Red Fescue 40%
     Perennial Ryegrass 20%
     Annual Ryegrass 20%
   - Mulch: Salt hay or small grain straw applied at a rate of 90 lbs./1000 S.F. or 2 tons/acre, to be applied and anchored according to "New York Standards and Specification For Erosion and Sediment Control," latest edition.
9. Grass seed mix may be applied by either mechanical or hydroseeding methods. Hydroseeding shall be performed in accordance with the current edition of the "NYSDOT Standard Specification, Construction and Materials, Section 610-3.02, Method No. 1".
10. Cut or fill slopes steeper than 3:1 shall be stabilized immediately after grading with Curlex I Single Net Erosion Control Blanket, or approved equal.
11. Paved roadways shall be kept clean at all times.
12. The site shall at all times be graded and maintained such that all stormwater runoff is diverted to self erosion and sediment control facilities.
13. All storm drainage outlets shall be stabilized, as required, before the discharge points become operational.
14. Stormwater from disturbed areas must be passed through erosion control barriers before discharge beyond disturbed areas or discharged into other drainage systems.
15. Erosion and sediment control measures shall be inspected and maintained on a daily basis by the O.F.R. to insure that channels, temporary and permanent ditches and pipes are clear of debris, that embankments and berms have not been breached and that all straw bales and silt fences are intact. Any failure of erosion and sediment control measures shall be immediately repaired by the contractor and inspected for approval by the O.F.R. and/or site engineer.
16. Dust shall be controlled by sprinkling or other approved methods as necessary, or as directed by the O.F.R.
17. Cut and fills shall not endanger adjoining property, nor divert water onto the property of others.
18. All fills shall be placed and compacted in 6" lifts to provide stability of material and to prevent settlement.
19. The O.F.R. shall inspect downstream conditions for evidence of sedimentation on a weekly basis and after rainstorms.
20. As warranted by field conditions, special additional erosion and sediment control measures, as specified by the site engineer, the Wetlands Inspector, the Town Engineer and/or NYCDEP shall be installed by the contractor.
21. Erosion and sediment control measures shall remain in place until all disturbed areas are suitably stabilized.

REQUIRED EROSION CONTROL SWPPP CONTENTS:

Pursuant to the NYSDEC "SPDES General Permit for Stormwater Discharges from Construction Activity" (GP-0-20-001), all Stormwater Pollution Prevention Plan's (SWPPP) shall include erosion and sediment control practices designed in conformance with the most current version of the technical standard, "New York Standards and Specifications for Erosion and Sediment Control." Where erosion and sediment control practices are not designed in conformance with this technical standard, the owner or operator must demonstrate equivalence to the technical standard. The following list of required SWPPP components is provided in accordance with Part III.B.1a–l of General Permit GP-0-20-001:

a. Background information: The project consists of permitting an existing sporting clay course and stabilizing an existing trail.

b. Site map / construction drawing: These plans serve to satisfy this SWPPP requirement.

c. Description of the soils present at the site: Onsite soils located within the proposed limits of disturbance consist of Charlton fine sandy loam (ChD and ChD), Chatfield-Charlton Complex (CrC and CaD), Charlton loam (ChE), Leicester loam (LaE), and Hollis Rock Outcrop (HrF) as identified on the Soil Conservation Service Web Soil Survey. These soil types belong to the Hydrologic Soil Group "B", "C" and "D."

d. Construction phasing plan / sequence of operations: The Construction Sequence and phasing found on these plans provide the required phasing. A Construction Sequence and Erosion and Sediment Control Maintenance Schedule has been provided. The Erosion and Sediment Control Notes contained hereon outline a general sequence of operations for the proposed project. In general all erosion and sediment control facilities shall be installed prior to commencement with land disturbing activities, and areas of disturbance shall be limited to the shortest period of time as practicable.

e. Description of erosion and sediment control practices: This plan, and details / notes shown hereon serve to satisfy this SWPPP requirement.

f. Temporary and permanent soil stabilization plan: The Sedimentation and Erosion Control Notes and Details provided heron identify temporary and permanent stabilization measures to be employed with respect to specific elements of the project, and at the various stages of development.

g. Site map / construction drawing: This plan serves to satisfy this SWPPP requirement.

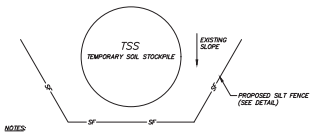
h. The dimensions, material specifications, installation details, and operation and maintenance requirements for all erosion and sediment control practices: The details, Erosion and Sediment Control Notes, and Erosion and Sediment Control Maintenance Schedule serve to satisfy this SWPPP requirement.

i. An inspection schedule: Inspections are to be performed twice weekly and by a qualified professional as required by the General Permit GP-0-20-001. In addition the NYSDEC Trained Contractor shall perform additional inspections as cited in the Sedimentation and Erosion Control Notes.

j. A description of pollution prevention measures that will be used to control litter, construction chemicals and construction debris: In general, all construction litter / debris shall be collected and removed from the site. The general contractor shall supply either waste barrels or dumpster for proper waste disposal. Any construction chemicals utilized during construction shall either be removed from site daily by the contractor or stored in a structurally sound and weatherproof building. No hazardous waste shall be disposed of onsite, and shall ultimately be disposed of in accordance with all federal, state and local regulations. Material Safety Data Sheets (MSDS), material inventory, and emergency contact numbers shall be maintained by the general contractor for all construction chemicals utilized onsite. Finally, temporary sanitary facilities (portable toilets) shall be provided onsite during the entire length of construction, and inspected weekly for evidence of leaking holding tanks.

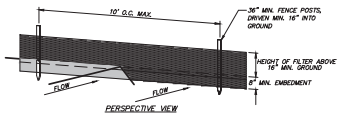
k. A description and location of any stormwater discharges associated with industrial activity other than construction at the site: There are no known industrial stormwater discharges present or proposed at the site.

l. Identification of any elements of the design that are not in conformance with the technical standard, "New York Standards and Specifications for Erosion and Sediment Control." All proposed elements of this SWPPP have been designed in accordance with the "New York Standards and Specifications for Erosion and Sediment Control."

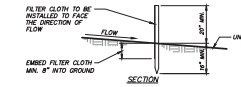


NOTES:
1. AREA CHOSEN FOR STOCKPILE LOCATION SHALL BE DRY AND STABLE.
2. MAXIMUM SLOPE OF STOCKPILE SHALL BE 2:1.
3. UPON COMPLETION OF SOIL STOCKPILING, EACH PILE SHALL BE IMMEDIATELY SEEDED WITH K31 PERENNIAL TALL FESCUE.
4. ALL STOCKPILES SHALL BE PROTECTED WITH SILT FENCING INSTALLED ON THE DOWNGRADIENT SIDE.

TEMPORARY SOIL STOCKPILE DETAIL
(N.T.S.)



PERSPECTIVE VIEW



SECTION

CONSTRUCTION NOTES FOR FABRICATED SILT FENCE

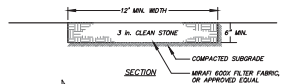
1. FILTER CLOTH TO BE FASTENED SECURELY TO POSTS AT TOP AND MID SECTION.
2. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED BY SIX INCHES AND FOLDED.
3. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.

POSTS: STEEL EITHER T OR U TYPE OR 2" HARDWOOD

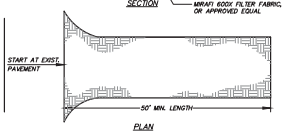
FILTER CLOTH: FILTER X, MIRAFI 100X, STABILINKA T140N, OR APPROVED EQUAL

PREFABRICATED UNIT: GEOFAB, ENVIROFENCE, OR APPROVED EQUAL

SILT FENCE DETAIL
(N.T.S.)



SECTION

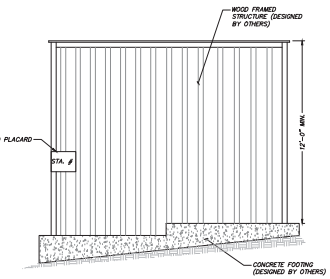


PLAN

INSTALLATION NOTES

1. STONE SIZE – USE 3" STONE
2. LENGTH – AS REQUIRED, BUT 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 – 12 FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCUR.
5. FILTER CLOTH – WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE. FILTER CLOTH WILL NOT BE REQUIRED ON A SINGLE FAMILY RESIDENCE LOT.
6. SURFACE WATER – ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
7. MAINTENANCE – THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT OF WAY (THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHT OF WAY MUST BE REMOVED IMMEDIATELY.
8. WASHING – WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHT OF WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.

STABILIZED CONSTRUCTION ENTRANCE DETAIL
(N.T.S.)

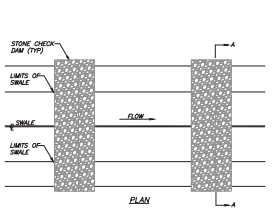


SECTION

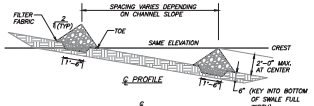
EXAMPLE (PHOTO)

NOTES:
1. THIS DETAIL IS PROVIDED AS A GRAPHICAL REPRESENTATION OF THE PROPOSED SOUND BARRIERS. FINAL DESIGN & ELEVATIONS SHALL BE PROVIDED BY OTHERS.
2. SOUND BARRIER WALLS SHALL HAVE A MINIMUM HEIGHT OF 12 FEET.
3. SOUND PROOFING TO BE INSTALLED INSIDE SOUND BARRIER ENCLOSURE.

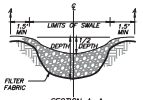
PROPOSED SOUND BARRIER
BY OTHERS
N.T.S.



PLAN



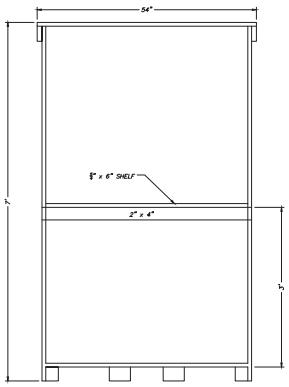
℄ PROFILE

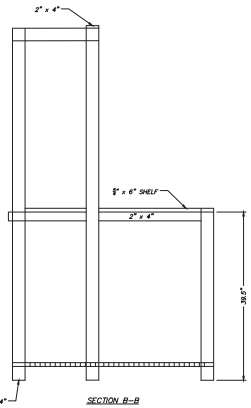


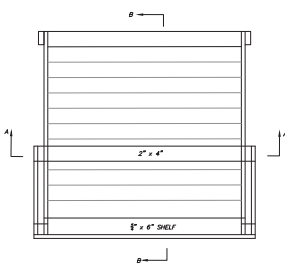
SECTION A–A

NOTES:
1. STONE SHALL BE PLACED ON A FILTER FABRIC FOUNDATION.
2. SET SPACING OF CHECK DAMS SO 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 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.

STONE CHECK DAM DETAIL
(N.T.S.)

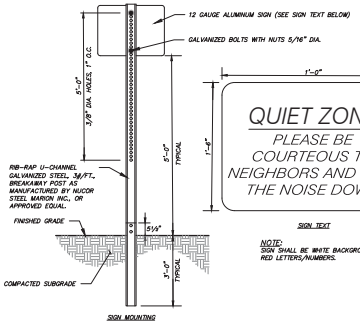






PLAN

EXISTING SPORTING CLAY STAND DETAIL
BY OTHERS
N.T.S.



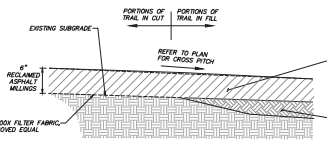
SIGN MOUNTING

QUIET ZONE
PLEASE BE COURTEOUS TO NEIGHBORS AND KEEP THE NOISE DOWN

SIGN TEXT

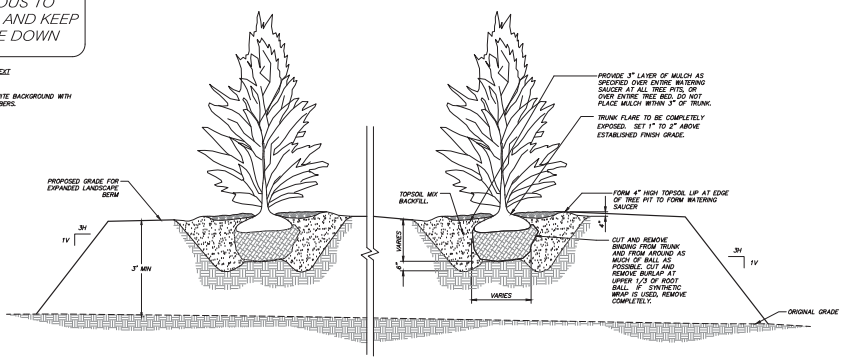
NOTE:
SIGN SHALL BE WHITE BACKGROUND WITH RED LETTERS/NUMBERS.

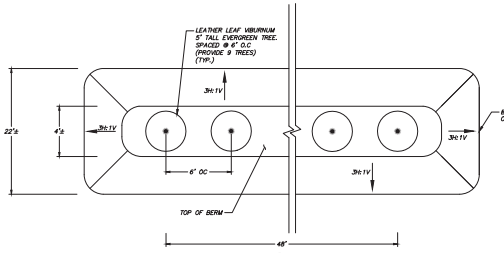
QUIET ZONE SIGN DETAIL
N.T.S.



SPORTING CLAY TRAIL DETAIL
(N.T.S.)

NOTE: THE ABOVE DETAIL APPLIES TO THE PREVIOUSLY CONSTRUCTED TRAIL AND PROPOSED IMPROVEMENTS TO THE TRAIL





PLAN

EVERGREEN TREE REPLACEMENT AND LANDSCAPE BERM DETAIL
(N.T.S.)

NO.	DATE	REVISION	BY
6	2-13-23	REVISED PER TOWN COMMENTS	JMM
5	5-12-22	REVISED PER TOWN COMMENTS	JMM
4	3-10-22	PLANNING BOARD SUBMISSION	PJM
3	9-11-19	ZBA SUBMISSION	JMM
2	5-9-19	REVISED PER TOWN COMMENTS	JMM
1	3-27-19	REVISED PER TOWN COMMENTS	JMM

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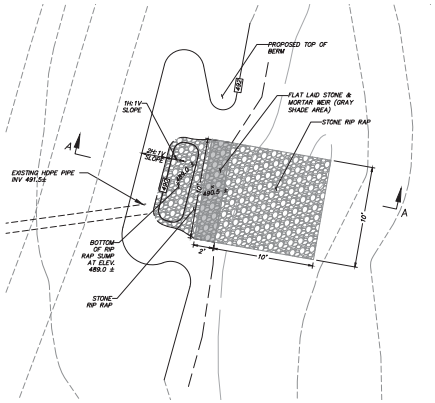
3 Garrett Place
Carmel, NY 10512
(845) 225-9690
(845) 225-9717 fax
www.insite-eng.com

PROJECT:
WILLOW WOOD COUNTRY CLUB, INC.
UNION VALLEY ROAD, TOWN OF CARMEL, PUTNAM COUNTY, NY

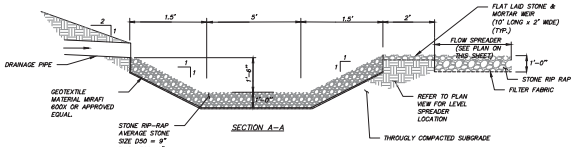
DRAWING:
DETAILS

PROJECT NUMBER	18173.100	PROJECT MANAGER	R.D.W
DATE	12-26-18	DRAWN BY	J.W.M.
SCALE	AS SHOWN	CHECKED BY	

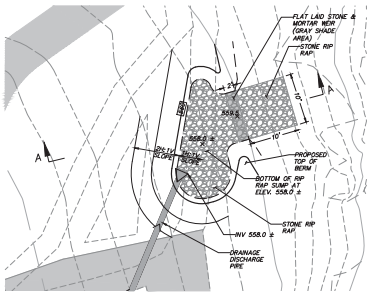
DRAWING NO. D-1
SHEET 4/5



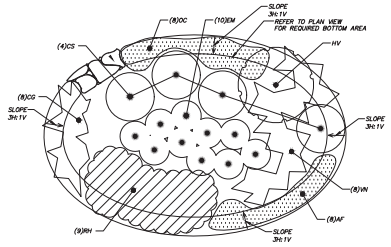
RIP RAP & FLOW SPREADER 1 DETAIL
(N.T.S.)



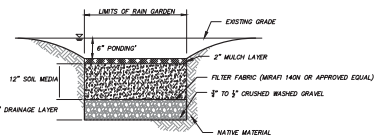
TYPICAL RIP RAP SUMP & FLOW SPREADER DETAIL
(N.T.S.)



RIP RAP & FLOW SPREADER 2 DETAIL
(N.T.S.)

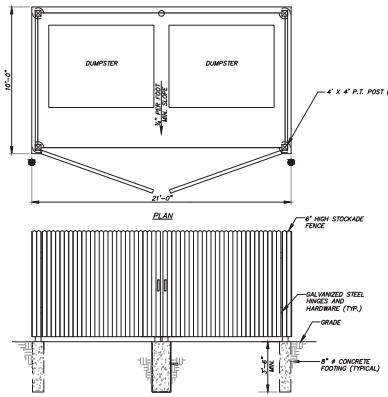


SCHEMATIC RAIN GARDEN LANDSCAPE PLAN
(N.T.S.)



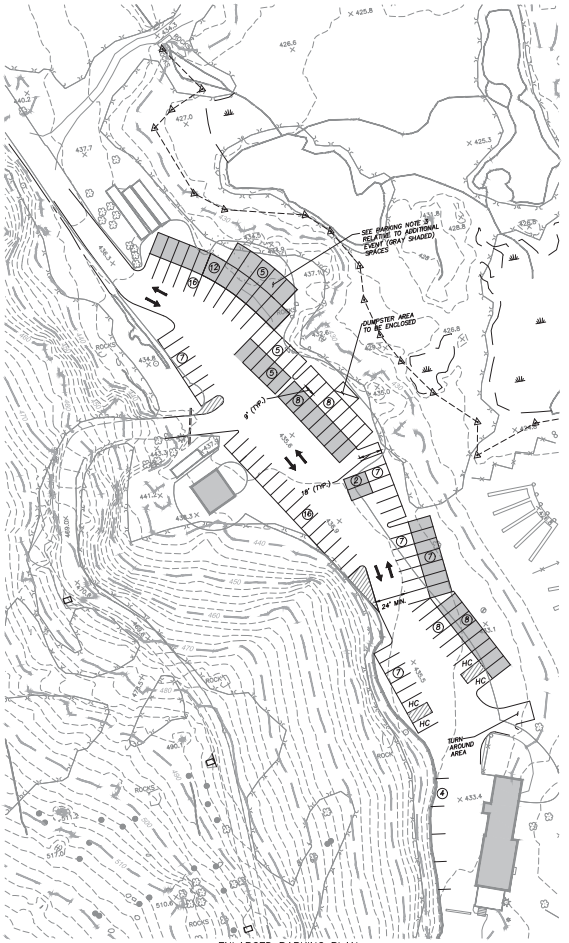
RAIN GARDEN CROSS-SECTION
(N.T.S.)

NOTES:
1. SOIL MEDIA TO CONSIST OF 50% SAND, 20-30% TOPSOIL WITH LESS THAN 5% CLAY CONTENT, AND 20-30% LEAF COMPOST.
2. DRAINAGE LAYER TO CONSIST OF 1.5-2.0" DIA. CLEAN WASHED GRAVEL.



NOTE: CHECK WITH REFUSE HAULER PRIOR TO INSTALLATION OF REFUSE ENCLOSURE FOR DIMENSIONS.

DUMPSTER ENCLOSURE DETAIL
(N.T.S.)



ENLARGED PARKING PLAN
SCALE: 1" = 40'

PARKING SUMMARY

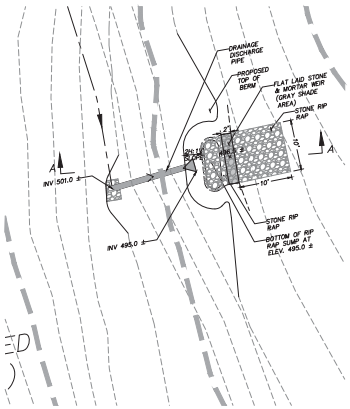
EXISTING CONFORMING SPACES	80 SPACES
ADDITIONAL SPECIAL EVENT PARKING	47 SPACES
TOTAL (INCLUDING EVENT PARKING)	127 SPACES

PARKING NOTES:

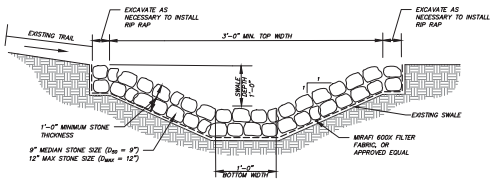
1. SEE GENERAL NOTE 1 ON SP-1 FOR ZONING VARIANCES GRANTED WITH RESPECT TO THE EXISTING CONFORMING SPACES.
2. DURING DAILY OPERATION AND MEMBER ONLY SPECIAL EVENTS, 80 SPACES IS SUFFICIENT TO ACCOMMODATE THE PARKING DEMAND.
3. PERIODICALLY WILLOW WOOD COUNTY CLUB, INC. WILL HOLD SPECIAL EVENTS FOR MEMBERS & NON MEMBERS. BASED ON COURSE CAPACITY ONLY 111 INDIVIDUALS CAN OCCUPY ALL COURSE FACILITIES. DURING THESE EVENTS VALET PARKING CAN BE PROVIDED TO ALLOW THE STACKING OF PARKING SPACES. SHOWN IN GRAY ARE THE ADDITIONAL SPACES CREATED BY STACKING PARKING. A MINIMUM 24 FOOT DRIVE AISLE SHALL BE MAINTAINED AT ALL TIMES AND THE PARKING SPACE LAYOUT SHOWN HEREON PROVIDES THE 24 FOOT REQUIRED ACCESS AISLE.

SCHEMATIC RAINGARDEN PLANT LIST

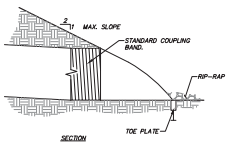
KEY	BOTANICAL/COMMON NAME	SIZE	ROOT/SPACING
CS	Cornus sericea / Red-Osier Dogwood	18-24" Ht.	#2 CONT.
HV	Hamamelis virginiana / Common Witchhazel	2'-3' Ht.	B&B
AF	Athyrium filix-femina / Lady Fern	#1 CONT.	18" ON CENTER
CG	Chelone glabra / White Turtlehead	#1 CONT.	18" ON CENTER
EM	Eupatorium maculatum / Joe-pye Weed	#1 CONT.	AS SHOWN
OC	Camunda cinnamomea / Cinnamon Fern	#1 CONT.	24" ON CENTER
RH	Rudbeckia hirta / Black-Eyed Susan	#1 CONT.	24" ON CENTER
VN	Vernonia noveboracensis / Common Ironweed	#1 CONT.	18" ON CENTER

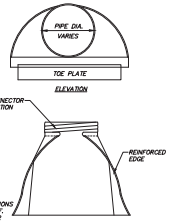


RIP RAP & FLOW SPREADER 3 DETAIL
(N.T.S.)



RIP RAP SWALE DETAIL
(N.T.S.)





NOTE: END SECTION CONNECTIONS TO CONFORM TO MANUF. RECOMMENDATIONS FOR VARIOUS PIPE SIZES

END SECTION DETAIL
(N.T.S.)

NO.	DATE	REVISION	BY
5	2-13-23	REVISED PER TOWN COMMENTS	JMM
4	5-12-22	REVISED PER TOWN COMMENTS	JMM
3	3-10-22	PLANNING BOARD SUBMISSION	PJM
2	9-11-19	ZBA SUBMISSION	JMM
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PROJECT:
WILLOW WOOD COUNTRY CLUB, INC.
UNION VALLEY ROAD, TOWN OF CARMEL, PUTNAM COUNTY, NY

DRAWING:
DETAILS

PROJECT NUMBER	18173.100	PROJECT MANAGER	R.D.W
DATE	3-27-19	DRAWN BY	J.W.M.
SCALE	AS SHOWN	CHECKED BY	

DRAWING NO. D-2
SHEET 5 / 5

BIBBO ASSOCIATES, L.L.P.
Consulting Engineers

Timothy S. Allen, P.E.
Nicholas Gaboury, P.E.
Matthew J. Gironda, P.E.

February 3, 2023

Town of Carmel Planning Board
60 McAlpin Avenue
Mahopac, NY 10541-2340

Attn: Mr. Craig Paeprer, Chairman

Re: Proposed 14-Lot Subdivision
Yankee Land Development Subdivision
Bayberry Hill Road & Owen Drive
TM # 76.15-1-12

Dear Chairman and Members of the Board:

On behalf of the owners of the above captioned property we are hereby requesting an additional 180-day extension of Preliminary Subdivision Approval. This project was granted a 180 day extension until February 15, 2023. Check # 1133 in the amount of $ 2,500 for the renewal fee is enclosed.

We respectfully request to be placed on your earliest available agenda. Should you require any additional information, please feel free to contact me.

Very truly yours,

Timothy S. Allen, P.E.
Senior Partner

TSA/mme
Enclosure
cc: Angelo Luppino
Michael Sirignano
File

ALFRED A. CAPPELLI, JR.
ARCHITECT
23 DIDDELL ROAD
WAPPINGERS FALLS, NY 12590

Telephone: 845-632-6500
Fax: 845-632-6499
Email: acappe2102@aol.com

February 14, 2023

Chairman Paeprer
T/O Carmel Planning Board
60 McAlpin Ave.
Mahopac, NY 10541

Re: Bond Reduction
Joe Zakon, Optimum Oil & Propane
14 Nicole Way Site Plan

Dear Chairman Paeprer,

Attached please find a breakdown of those site elements in place at the above referenced project. Nearing completion and Mr. Zakon is looking to have the Site Performance Bond reduced accordingly.

If you have any questions, please do not hesitate to contact our office.

Very truly yours,

Alfred A. Cappelli, Jr.
Architect

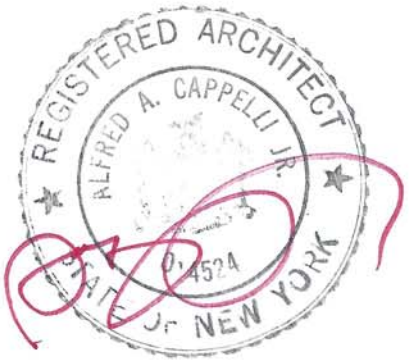
AAC/dc
Encl.

ZAKON, NICOLE WAY
PERFORMANCE BOND REDUCTION AMOUNT

FEBRUARY 10, 2023

ITEM	TOTAL ORIGNAL AMOUNT	PERCENTAGE COMPLETED	VALUE	BALANCE
EROSION CONTROLS				
Silt fence	$ 660.00	100%	$ 660.00	0
Orange const. fence	$ 1,167.00	100%	$ 1,167.00	0
Erosion blankets	$ 7,150.00	0%	0	$ 7,150.00
Soil stockpile stabilization	$ 1,500.00	100%	$ 1,500.00	0
Stabilized const. entrance	$ 1,500.00	100%	$ 1,500.00	0
EARTHWORK				
Clear & grub	$ 4,800.00	100%	$ 4,800.00	0
Retaining walls (exposed face)	$41,250.00	100%	$41,250.00	0
Cut/export	$69,875.00	100%	$68,875.00	0
DRAINAGE				
8" perforated PVC	$ 2,720.00	100%	$ 2,720.00	0
15"HDPE	$ 2,090.00	100%	$ 2,090.00	0
Catch basins	$ 2,500.00	100%	$ 2,500.00	0
CURBING				
Curbing	$ 9,900.00	0%	0	$ 9,900.00
TRAFFIC AREA				
15" item #4 base	$15,155.00	100%	$15,155.00	0
2 ½" asphalt binder course	$16,060.00	0%	0	$16,060.00
2" asphalt top course	$12,430.00	0%	0	$12,430.00
Gravel storage area	$ 2,478.00	50%	$ 1,239.00	$ 1,239.00
Porous pavement gravel base	$ 9,345.00	0%	0	$ 9,345.00
Porous pavement	$ 7,144.00	0%	0	$ 7,144.00
Pole lighting	$12,500.00	0%	0	$12,250.00
PAVEMENT MARKINGS				
4" epoxy striping	$ 1,740.00	0%	0	$ 1,740.00
FENCING				
Privacy fence	$ 2,250.00	0%	0	$ 2,250.00

ITEM	TOTAL ORIGINAL AMOUNT	PERCENTAGE COMPLETED	VALUE	BALANCE
SIGNAGE				
Traffic control signs	$ 225.00	0%	0	$ 225.00
LANDSCAPING				
Trees	$ 2,208.00	0%	0	$ 2,208.00
Shrubs	$ 500.00	0%	0	$ 500.00
Seed & mulch	$ 3,125.00	0%	0	$ 3,125.00
SUB-TOTAL			$144,456.00	$85,566.00
CONTINGENCIES (5%)				$ 4,278.00
TOTAL ESTIMATED CONSTRUCTION COST				$89,844.00



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Michael V. Caruso
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January 13, 2022

Town of Carmel Planning Board
c/o Joseph Charbonneau, Esq.
60 McAlpin Avenue
Carmel, New York 10512

Via email: JCharbEsq@aol.com

Re: Pulte Homes of New York, LLC ("Pulte")
Lot 4 performance bond of $4,196,104.50 ("Lot 4 Bond")
Lot 5 performance bond of $872,660.75 ("Lot 5 Bond")

Dear Joe:

I have reviewed correspondence from Paul M. Lynch, P.E., dated October 28, 2022, copies of which are attached. In it, Paul represents that all bond release conditions have been met. Additionally, I have reviewed correspondence between your office and the Town Engineer that you recently provided to me as a courtesy. Those communications reference Punch List Item Nos. 13-20 having been completed. Further, as I emailed to you earlier today, the Town Engineer's belief that Terrace Drive improvements and conditions for road acceptance are "intertwined" with the release of individual lot performance bonds is unsupported. Town Code § 128-45(B) entitled "Plans and profiles; final acceptance" codifies a mutually exclusive review process for road acceptance by the Town Board, which is independent from review and recommendation as to site plan or subdivision performance bond conditions. This process does not change regardless of whether the improvements and their location(s) have physical commonality.

It is very clear that Pulte has satisfied the conditions for a full release of both the Lot 4 Bond and Lot 5 Bond long ago per their terms and that of the Code. Please calendar and direct the Planning Board Secretary to notice the Lot 4 Bond and Lot 5 Bond for full release at the next available Planning Board meeting. Please do not hesitate to contact me with any questions.

Very truly yours,

Cuddy & Feder LLP

By: /s/ Michael V. Caruso
Michael V. Caruso

cc: Rose Trombetta, Plannng Board Secretary (Rtrombetta@ci.carmel.ny.us)
John Evans, Division President for Pultegroup
James P. Mullen, Esq., Director, Northeast Corridor Division
Joshua J. Grauer, Esq.

PUTNAM ENGINEERING, PLLC.
Engineers and Architects

October 28, 2022

Mr. Craig Paeprer, Chairman
Town of Carmel Planning Board
60 McAlpin Avenue
Mahopac, NY 10541

Re: Pulte Homes
Lot 4
Bond Return

Dear Chairman Paeprer and Members of the Board:

The original bond was set at $4,196,104.50 and was reduced to $840,000.00. We ask that the bond be reduced in full at this time as Pulte House believes all punch list items were addressed.

Sincerely,

PUTNAM ENGINEERING, PLLC

Paul M. Lynch, P.E.
PML/rrm

L2054

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January 13, 2022

Town of Carmel Planning Board
c/o Joseph Charbonneau, Esq.
60 McAlpin Avenue
Carmel, New York 10512

Via email: JCharbEsq@aol.com

Re: Pulte Homes of New York, LLC ("Pulte")
Lot 4 performance bond of $4,196,104.50 ("Lot 4 Bond")
Lot 5 performance bond of $872,660.75 ("Lot 5 Bond")

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Very truly yours,

Cuddy & Feder LLP

By: /s/ Michael V. Caruso
Michael V. Caruso

cc: Rose Trombetta, Plannng Board Secretary (Rtrombetta@ci.carmel.ny.us)
John Evans, Division President for Pultegroup
James P. Mullen, Esq., Director, Northeast Corridor Division
Joshua J. Grauer, Esq.

PUTNAM ENGINEERING, PLLC.
Engineers and Architects

October 28, 2022

Mr. Craig Paeprer, Chairman
Town of Carmel Planning Board
60 McAlpin Avenue
Mahopac, NY 10541

Re: Pulte Homes
Lot 5
Bond Return

Dear Chairman Paeprer and Members of the Board:

The original bond amount for the Lot 5 development was $872,660.75. The site work has been completed and we are unaware of any outstanding punch list items. We therefore ask that the bond be returned in full at this time.

Should there be any outstanding punch list items, then we request that the bond be reduced 80% and a new bond be set at $174,532.15. It is our understanding that the May 28, 2020 memorandum that outlined open punch list items has been completed with the exception of one item that dealt with the walking trail that we do not believe is warranted.

The Town of Carmel Engineering Department decided that the Town (P.B.) approved granular walking trail surface for Lots 3 and 5 should be paved to eliminate maintenance issues. Pulte agreed to do this if it were possible. Changing from a pervious surface to impervious surface required that the Stormwater Pollution Prevention Plan had to be revised and resubmitted to N.Y.C.D.E.P. for their approval.

It should be noted that there is a perennial stream running through Lot 5. The N.Y.C.D.E.P. does not allow for new impervious surfaces to be installed within 100 feet of a watercourse. To do so would require a D.E.P. approved variance and stormwater treatment for the impervious surface would have to occur.

Putnam Engineering was able to revise the S.W.P.P.P. and obtain approval from the N.Y.C.D.E.P. to pave the walking trail on Lot 3 and part of Lot 5. It was an arduous task.

The effort, analysis, study, computations, testing, etc., that would be required to try to justify paving the approximate 400 linear feet of walking trail within 100 feet of the stream is a very expensive proposition for something that may or may not get approved as it requires the D.E.P. variance. The request for a variance would require proving hardship which in our opinion would be very difficult to do. Pulte's approved site plan which they were obligated to construct was completed. That the walking trail would require maintenance was a known fact. As a result, Pulte

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has informed the Engineering Department that they will not pave (and their approval does not require them to do so) that portion of the walking trail but offered instead to install and roll asphalt millings.

The offer to install millings, which are acceptable to D.E.P., as they consider them porous, was turned down.

We do not believe the bond return should be held up for an item of work that Pulte is not obligated to install.

Sincerely,

PUTNAM ENGINEERING, PLLC

Paul M. Lynch, P.E.
PML/rrm

L2051