AGENDA PACKET

Part 2 of 3

JANUARY 19, 2021 MEETING

TOWN OF LEWISBORO
Westchester County, New York

Planning Board
79 Bouton Road
South Salem, New York 10590

Tel: (914) 763-5592
Fax: (914) 875-9148
Email: planning@lewisborogov.com

AGENDA

Tuesday, January 19, 2021 Meeting will start at 7:30 p.m. and end at or before 11:00 p.m.

Via Zoom videoconferencing and live streaming to Lewisboro TV YouTube channel

Join Zoom Meeting at https://zoom.us/j/93055289269?pwd=eDBTdkhtcEhsRXozRnJUd2JwazFRQT09
Meeting ID: 930 5528 9269 Passcode 529058
You may call in to the Zoom meeting at 1-929-205-6099 when prompted, enter 930 5528 9269

https://www.youtube.com/channel/UCNUNE5gXs5rnHcyR4l6dikA

I. EXTENSION OF TIME

Cal# 8-14PB, Cal# 95-14WP, Cal# 20-14SW
Goldens Bridge Village Center, NYS Route 22, Goldens Bridge, NY 10526, Sheet 4, Block 11126, Lot 07 (Stephen Cipes, owner of record) - Request for Extension of Site Development Plan, Wetland and Stormwater Permit Approvals.

II. PUBLIC HEARING, CONTINUATION

Cal #03-20PB, Cal #37-20WP
Gossett Brothers Nursery, 1202 Route 35, South Salem, NY 10590, Sheet 31 Block 10805 Lot 46 (Thomas Gossett for T. Gossett Revocable Trust – owner of record) - Application for Site Development Plan Approval and Wetland Activity Permit Approval for an existing nursery.

III. SKETCH PLAN REVIEWS

Cal #01-18PB
Apex Personal Training, 20 North Salem Road, Cross River NY 10518, Sheet 17, Block 10533, Lot 89 (EK Cross River, owner of record) - Application for Change of Use/Waiver of Site Development Plan Procedures.

Cal #06-17PB
Wolf Conservation Center, Buck Run, South Salem, NY 10590, Sheet 21, Block 10803, Lots 3, 65, 67, 81, 82, 83, 86 & 88 (Wolf Conservation Center, owner of record) - Application for a Subdivision and Special Use Permit associated with a private nature preserve.

IV. WETLAND PERMIT REVIEW

Cal #57-20WP, Cal #09-20SW
Schwartz Residence, 0 Twin Lakes Road, South Salem, NY 10590, Sheet 34B, Block 11831 Lot 35 (Michael Schwartz, owner of record) - Application for the construction of a one-bedroom house/studio.

Cal#60-20WP
McGuinness Residence, 17 Schoolhouse Road, Waccabuc, NY 10597, Sheet 22, Block 10802, Lot 35 (Annette and Peter McGuinness, owners of record) - Application for the construction of a greenhouse, covered dining area, spa and extension of an existing patio.

V. WETLAND VIOLATIONS

Cal #02-19WV, Cal #60-19WP, Cal #14-19SW
Kullman Residence, 12 Red Coat Lane, Waccabuc, NY 10597, Sheet 26, Block 11155, Lot 92 (Michael and Susan Kullman, owners of record)

Cal #04-20WV

VI. DISCUSSION

Comprehensive Plan

VII. MINUTES OF December 15, 2020

VIII. NEXT MEETING DATE: February 23, 2021.

DELBELLO DONNELLAN WEINGARTEN WISE & WIEDERKEHR, LLP

Janet J. Giris
Partner
jjg@ddw-law.com

COUNSELLORS AT LAW

THE GATEWAY BUILDING
ONE NORTH LEXINGTON AVENUE
WHITE PLAINS, NEW YORK 10601

(914) 681-0200
FACSIMILE (914) 684-0288

Connecticut Office
1111 SUMMER STREET
STAMFORD, CT 06905
(203) 298-0000

December 28, 2020

By Hand Delivery

Honorable Janet Andersen, Chair
and Members of the Planning Board
Town of Lewisboro
79 Bouton Road
South Salem, New York 10590

Re: Application of The Wolf Conservation Center, Inc., Site Plan and Special Permit Approval to Allow a Private Nature Preserve on Property Located on Buck Run, South Salem.

Dear Chairwoman Andersen and Members of the Board:

As you know, this firm represents the Wolf Conservation Center (the "Applicant" or the "Wolf Center") in connection with the above-referenced application. On behalf of the Applicant and in support of our application, we respectfully submit the enclosed revised materials for the Board's review and consideration.

As you may remember, when we last appeared before the Board in October, 2018, we advised the Board that the Applicant had negotiated the purchase of property at 1 Buck Run (which is the property located at the northeast corner of the intersection of Buck Run and Route 35). We are pleased to advise that the Applicant has now acquired 1 Buck Run, and with that acquisition, is the owner of all of the property along Buck Run with the exception of a single lot located on the northwest corner of the intersection of Buck Run and Route 35.

In addition, since we last met with the Board, the Applicant has engaged a new architect, KG+D Architects, to completely redesign the new Educational Pavilion proposed to be constructed on that portion of property currently known as 3 Buck Run[1]. Accordingly, we respectfully submit four (4) sets of site plan drawings which have been revised to formally

[1] The design previously shared with the Board in October, 2018 ultimately proved to be too costly to be constructed by the Applicant.

incorporate 1 Buck Run as part of the private nature preserve[2], and to reflect the redesigned Educational Pavilion. Each set of drawings consists of the following sheets:

Civil Engineering Plans:

Drawing No.	Title	Prepared By	Dated or Last Revised
PP-1	Preliminary Plot Plan	Bibbo Associates, LLP ("Bibbo")	12-29-20
EX-1	Existing Conditions & Removals Plan	Bibbo	12-29-20
LP-1	Layout Plan - South	Bibbo	12-29-20
LP-1	Layout Plan – North	Bibbo	12-29-20
CP-1	Construction Plan - South	Bibbo	12-29-20
CP-2	Construction Plan – North	Bibbo	12-29-20
EC-1	Erosion Control Plan	Bibbo	12-29-20
P-1	Road Profiles	Bibbo	12-29-20
T-1	Turning Maneuvers	Bibbo	12-29-20
EC-2	Erosion Control Notes & Details	Bibbo	12-29-20
D-1	Details	Bibbo	12-29-20
D-2	Details	Bibbo	12-29-20

Architectural Plans:

Drawing No.	Title	Prepared By	Dated or Last Revised
---	(Cover Sheet) Educational Pavilion - Wolf Conservation Center	KG+D Architects ("KG+D")	12-29-20
CC-1	Code Compliance Information	KG+D	12-29-20
L-100	Landscape Plan	KG+D	12-29-20
A201	Main Floor & Basement Plan	KG+D	12-29-20
A202	Roof Plan & Details	KG+D	12-29-20
A301	Exterior Elevations	KG+D	12-29-20
A302	Exterior Elevations	KG+D	12-29-20
A303	Renderings	KG+D	12-29-20
A801	Wall Sections	KG+D	12-29-20

[2]In addition, the corresponding subdivision application will be amended to merge the properties located at 3 Buck Run (Section 21, Block 10801, Lot 81) and 1 Buck Run (Section 21, Block 10802, Lot 67) with Lots 82, 83, 88 and the 11-acre portion of Lot 3. The amended subdivision plat will be filed under separate cover upon completion; additional field work is currently being conducted and a topographic survey is being prepared. Upon completion of that work, the subdivision plat and corresponding application materials will be resubmitted.

In addition to the above-referenced plans, we have also included for the Board's consideration four (4) copies of a "Preliminary Stormwater Pollution Prevention Plan" prepared by Bibbo Associates, LLP, and dated December 29, 2020.

Since we last met with the Board, the above-referenced civil engineering drawings have been revised to include details of all of the proposed removals, site grading, erosion controls and all relevant construction details, including those of the new Educational Pavilion, as well as the offsite wetlands located on the property at the northwest corner of Buck Run and Route 35. As shown on the enclosed plans, the addition of 1 Buck Run to the private nature preserve allows for the creation of a more traditional on-site parking area than previously proposed; the plan set has been updated to include Drawing No. T-1 entitled, "Turning Maneuvers" which demonstrates the ability of fire trucks and school buses to safely maneuver around the parking area.

Renderings of the newly redesigned Educational Pavilion are included in the enclosed architectural plans. As depicted in the enclosed drawings, the proposed building has been completely reconfigured and has been attractively redesigned to fit better within the existing landscape. This new design which incorporates a number of green features, including photovoltaic panels on the roof, will result in significantly less site disturbance that the previously proposed building the Applicant presented to the Board in the fall of 2018.

The Applicant and its consultants are excited to share the revised plans with the Board in greater detail. Accordingly, we respectfully request that this matter be placed on the Planning Board's January 19, 2021 agenda for continued review.

Thank you for your consideration and Happy New Year. We look forward to meeting with the Board on January 19. In the interim, please feel free to contact me if you have any questions or if you would like any additional information.

Very truly yours,

JANET J. GIRIS

Enclosures

cc: Judson Siebert, Esq.
Jan Johannessen, AICP, Kellard Sessions
Spencer Wilhelm, The Wolf Conservation Center
Matthew Gironda, P.E. Bibbo Associates
Erik Kaeyer, AIA, KD+G Architects

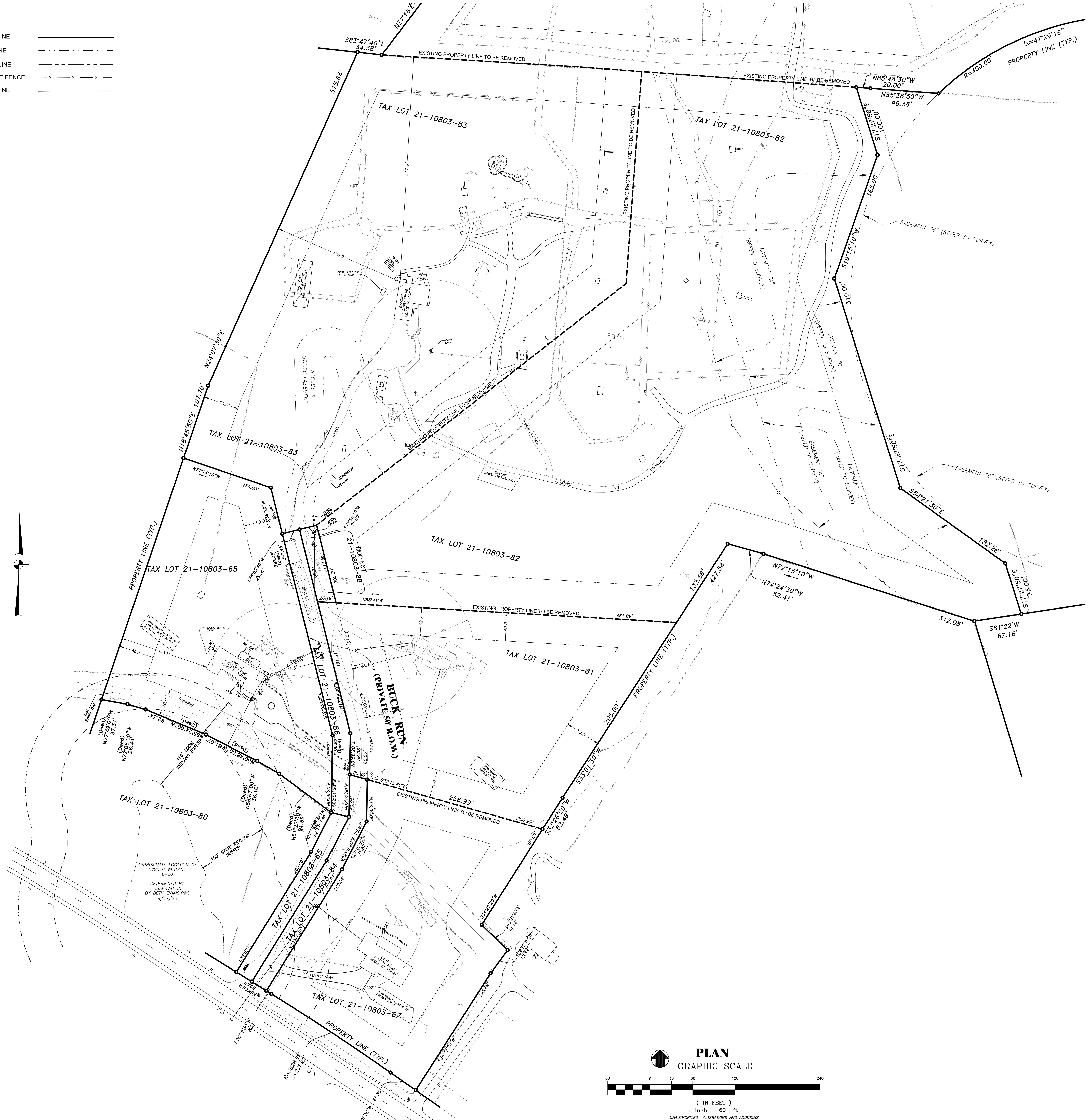
AGENDA PACKET

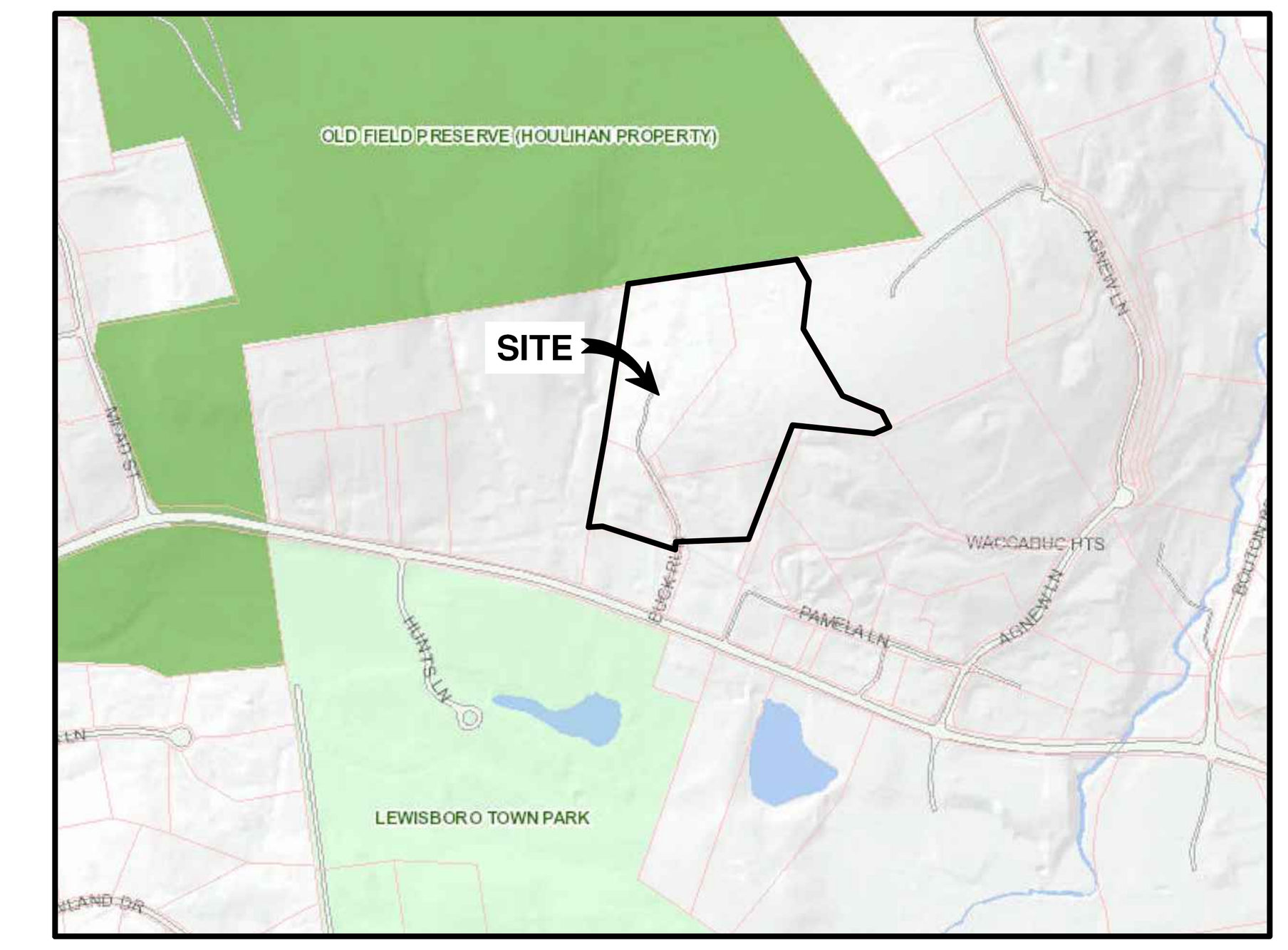
Part 2 of 3

JANUARY 19, 2021 MEETING

LEGEND

- EXISTING PROPERTY LINE
- WETLAND BUFFER LINE
- WETLAND BOUNDARY LINE
- EXISTING WOLF ENCLOSURE FENCE
- EXISTING EASEMENT LINE





LOCATION MAP
1" = 2000'

GENERAL NOTES:

1. EXISTING PROPERTY BOUNDARIES AND SITE FEATURES SHOWN HEREON FOR ARE BASED ON THE FOLLOWING:

   "SURVEY OF PROPERTY", DATED JUNE 12, 2017, PREPARED BY INSITE ENGINEERING, SURVEYING & LANDSCAPE ARCHITECTURE, P.C.

   "SUBDIVISION MAP", DATED JULY 21, 2015, PREPARED BY INSITE ENGINEERING, SURVEYING & LANDSCAPE ARCHITECTURE, P.C.

   "SURVEY OF PROPERTY" PREPARED FOR 1 BUCK RUN, DATED SEPTEMBER 25, 2018, PREPARED BY INSITE ENGINEERING, SURVEYING & LANDSCAPE ARCHITECTURE, P.C.

2. EXISTING SUBSURFACE SEWAGE TREATMENT SYSTEM LOCATIONS SHOWN HEREON OBTAINED FROM SSTS AS-BUILT PLANS ON FILE WITH THE WESTCHESTER COUNTY HEALTH DEPARTMENT.

3. EXISTING TOPOGRAPHY SHOWN HEREON IS BASED ON TOPOGRAPHIC MAP PREPARED BY INSITE ENGINEERING, SURVEYING & LANDSCAPE ARCHITECTURE, P.C., DATED NOVEMBER 21, 2018. ELEVATIONS CONFORM TO NORTH AMERICAN VERTICAL DATUM 1929 (N.A.V.D. 29).

4. PRIOR TO EXCAVATION THE CONTRACTOR SHALL BE RESPONSIBLE TO TO OBTAIN A MARKOUT OF ALL SUBSURFACE UTILITIES WITHIN THE WORK ZONE. THE CONTRACTOR SHALL CONTACT THE DESIGN ENGINEER UPON VERIFICATION OF EXISTING UTILITY LOCATIONS TO DETERMINE IF FIELD CHANGES ARE REQUIRED.

DRAWING INDEX:

SITE DATA

1. TOTAL AREA OF PARCELS: 30.512 AC±
2. OWNER AND APPLICANT:
   WOLF CONSERVATION CENTER
   7 BUCK RUN
   SOUTH SALEM, NY 10590
3. ZONING DISTRICT(S): R-4A and R-2A
4. SURVEY BY:
   INSITE SURVEYING
   3 GARRETT PLACE
   CARMEL, NY 10512
5. TAX ID #: SHEET 21
   BLOCK 10803
   LOT 3, 65, 81, 82, 83 & 88

CALL BEFORE YOU DIG 1-800-962-7962

UNDER THE NY STATE LAW PROTECTING UNDERGROUND FACILITIES, THE FOLLOWING RULES AND REGULATIONS ARE IN EFFECT FOR ALL EXCAVATORS:

* THEY MUST CALL FOR A UTILITY STAKE-OUT (2) TWO FULL WORKING DAYS PRIOR TO AN EXCAVATION.
* THEY MUST CONFIRM PRECISE LOCATIONS OF UNDERGROUND FACILITIES.
* THEY MUST PRESERVE STAKES AND MARKINGS UNTIL NO LONGER NEEDED AT SITE.
* THEY MUST CONTACT NON-UFPO MEMBER UTILITY OWNERS FOR STAKE-OUTS.

SHEET: 21 **BLOCK: 10803** **LOTS: 3, 65, 81, 82, 83, & 88**

REVISIONS: DATE:	DESCRIPTION	BY/CK	DATE:	DESCRIPTION	BY/CK

STATE OF NEW YORK · MATTHEW J. GIRONDA · No. 096030 · LICENSED PROFESSIONAL ENGINEER

MATTHEW J. GIRONDA P.E.

PRELIMINARY PLOT PLAN

WOLF CONSERVATION CENTER

7 BUCK RUN, SOUTH SALEM, NY 10590
TOWN OF LEWISBORO, WESTCHESTER COUNTY, NY

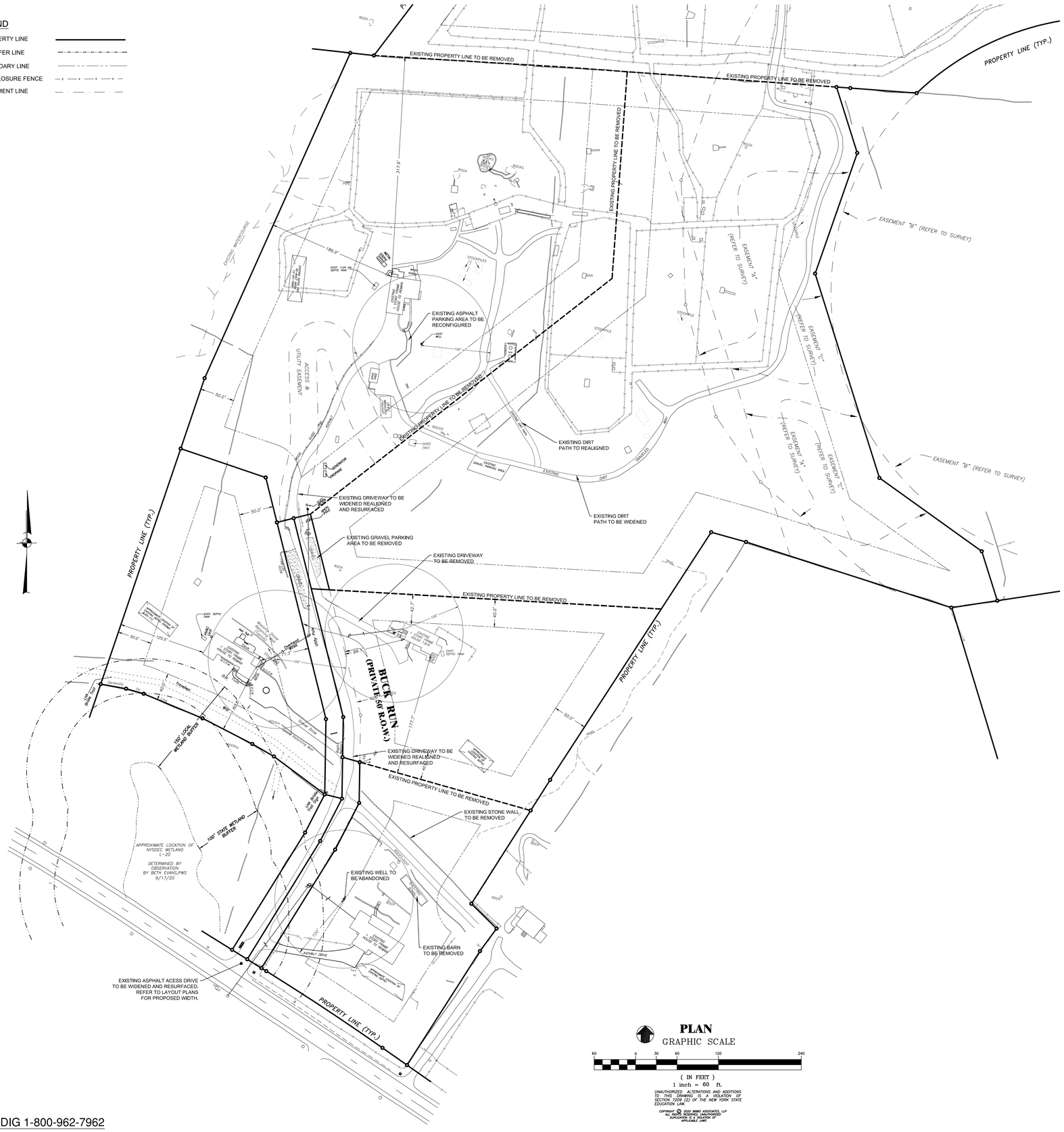
BIBBO ASSOCIATES, LLP
293 ROUTE 100 SUITE 203
SOMERS, NEW YORK 10589
TEL. 914 277 5805

DATE:	12-29-2020
SCALE:	1" = 60'
FILE:	L5
DSGN / CHK:	MG/RH
DRN. BY:	RH
SHT NO.	1 OF 12
DWG NO.	PP-1

P:\Projects\WOLF CONSERV. CENTER\dwg\Wolf Center Site Plan 12-29-20-PB.dwg, 12/28/2020 4:24:07 PM

LEGEND

- EXISTING PROPERTY LINE
- WETLAND BUFFER LINE
- WETLAND BOUNDARY LINE
- EXISTING WOLF ENCLOSURE FENCE
- EXISTING EASEMENT LINE



PLAN

GRAPHIC SCALE

60 0 30 60 120 240

(IN FEET)

1 inch = 60 ft.

CALL BEFORE YOU DIG 1-800-962-7962

UNDER THE NY STATE LAW PROTECTING UNDERGROUND FACILITIES, THE FOLLOWING RULES AND REGULATIONS ARE IN EFFECT FOR ALL EXCAVATORS:

- THEY MUST CALL FOR A UTILITY STAKE-OUT (2) TWO FULL WORKING DAYS PRIOR TO AN EXCAVATION.
- THEY MUST CONFIRM PRECISE LOCATIONS OF UNDERGROUND FACILITIES.
- THEY MUST PRESERVE STAKES AND MARKINGS UNTIL NO LONGER NEEDED AT SITE.
- THEY MUST CONTACT NON-UFPO MEMBER UTILITY OWNERS FOR STAKE-OUTS.

REVISIONS					
DATE:	DESCRIPTION	BY/CK	DATE:	DESCRIPTION	BY/CK

MATTHEW J. GIRONDA P.E.

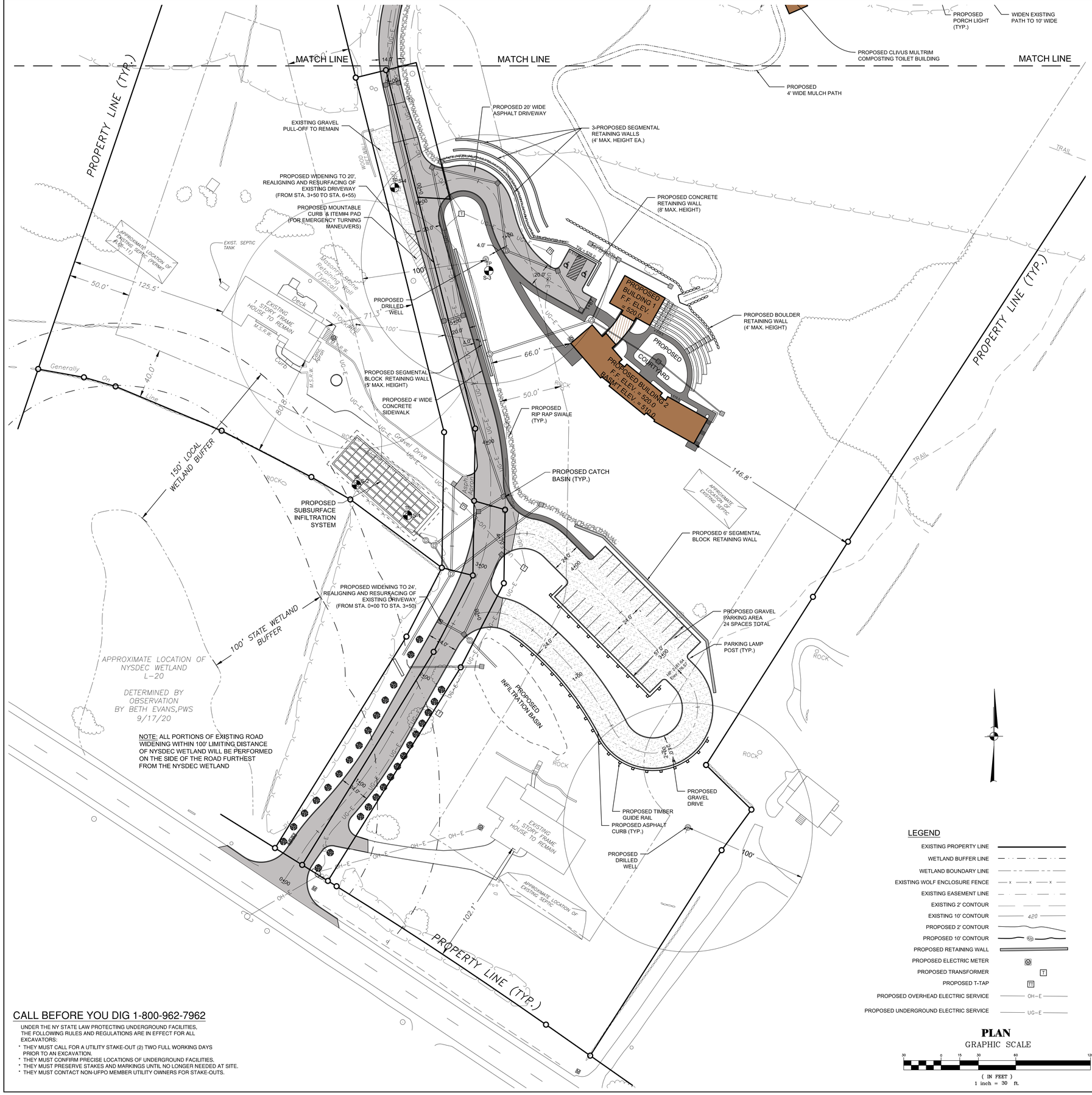
EXISTING CONDITIONS & REMOVALS PLAN

WOLF CONSERVATION CENTER
7 BUCK RUN, SOUTH SALEM, NY 10590
TOWN OF LEWISBORO, WESTCHESTER COUNTY, NY

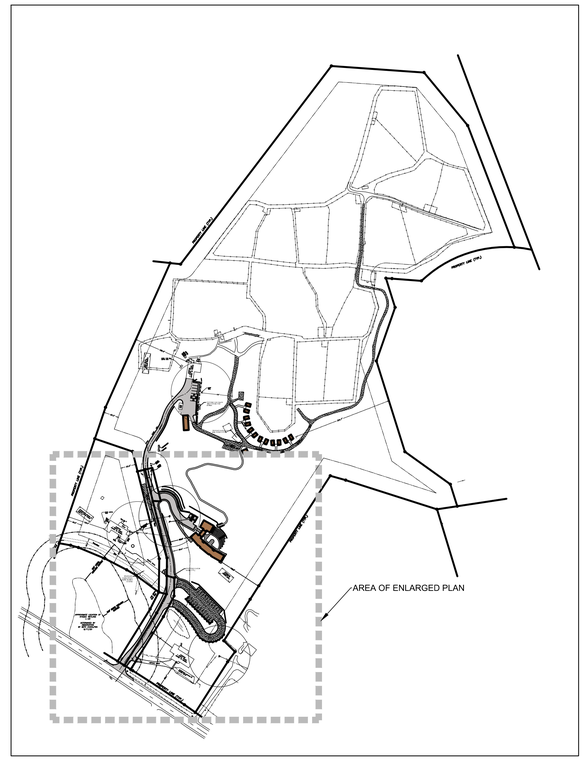
BIBBO ASSOCIATES, LLP
293 ROUTE 100 SUITE 203
SOMERS, NEW YORK 10589
TEL. 914 277 5805

DATE:	12-29-2020
SCALE:	1" = 60'
FILE:	L5
DSGN / CHK:	MG/RH
DRN. BY:	RH
SHT NO.	2 OF 12
DWG NO.	**EX-1**

P:\Projects\WOLF CONSERV. CENTER\dwg\Wolf Center Site Plan 12-29-20 PB.dwg 12/28/2020 4:04:15 PM



NOTE: ALL PORTIONS OF EXISTING ROAD WIDENING WITHIN 100' LIMITING DISTANCE OF NYSDEC WETLAND WILL BE PERFORMED ON THE SIDE OF THE ROAD FURTHEST FROM THE NYSDEC WETLAND



OVERALL PLAN
GRAPHIC SCALE
200 0 100 200 400 800
(IN FEET)
1 inch = 200 ft.

ZONING CONFORMANCE CHART R-2A DISTRICT

	REQUIRED	PROVIDED LOT 65
MIN. LOT SIZE	2.0 AC.	2.085 AC
DIAM. / CIRCLE	200'	200'
MIN. YARD FRONT	75'	103.1'
MIN. YARD SIDE	40'	80.8'
MIN. YARD REAR	50'	125.5'
MAX. BUILDING HEIGHT, STORIES / FEET	35' / 2 ½	<35' / 2 ½
BUILDING COVERAGE	9%	2.4%

ZONING CONFORMANCE CHART AS PER TOWN OF LEWISBORO R-4A

	REQUIRED	PROPOSED COMBINED LOTS 67,81,82,88, 83 & P/O 3
MIN. LOT SIZE	9.0 AC. (10 AC.*)	30.496 AC
DIAM. / CIRCLE	250'	250'
MIN. YARD FRONT	75'	102.1'
MIN. YARD SIDE	50'	66'
MIN. YARD REAR	50'	1338'
MAX. BUILDING HEIGHT, STORIES / FEET	35' / 2 ½	<35' / 2 ½
BUILDING COVERAGE	6%	0.82%
BASE LOT DEPTH	700'	2137'

LEGEND

- EXISTING PROPERTY LINE
- WETLAND BUFFER LINE
- WETLAND BOUNDARY LINE
- EXISTING WOLF ENCLOSURE FENCE
- EXISTING EASEMENT LINE
- EXISTING 2' CONTOUR
- EXISTING 10' CONTOUR (420)
- PROPOSED 2' CONTOUR
- PROPOSED 10' CONTOUR (60)
- PROPOSED RETAINING WALL
- PROPOSED ELECTRIC METER (M)
- PROPOSED TRANSFORMER (T)
- PROPOSED T-TAP (TT)
- PROPOSED OVERHEAD ELECTRIC SERVICE (OH-E)
- PROPOSED UNDERGROUND ELECTRIC SERVICE (UG-E)

PLAN
GRAPHIC SCALE
30 0 15 30 60 120
(IN FEET)
1 inch = 30 ft.

CALL BEFORE YOU DIG 1-800-962-7962

UNDER THE NY STATE LAW PROTECTING UNDERGROUND FACILITIES, THE FOLLOWING RULES AND REGULATIONS ARE IN EFFECT FOR ALL EXCAVATORS:
- THEY MUST CALL FOR A UTILITY STAKE-OUT (2) TWO FULL WORKING DAYS PRIOR TO AN EXCAVATION.
- THEY MUST CONFIRM PRECISE LOCATIONS OF UNDERGROUND FACILITIES.
- THEY MUST PRESERVE STAKES AND MARKINGS UNTIL NO LONGER NEEDED AT SITE.
- THEY MUST CONTACT NON-UFPO MEMBER UTILITY OWNERS FOR STAKE-OUTS.

REVISIONS					
DATE:	DESCRIPTION	BY/CK	DATE:	DESCRIPTION	BY/CK

STATE OF NEW YORK · MATTHEW J. GIRONDA · LICENSED PROFESSIONAL ENGINEER · 096000

MATTHEW J. GIRONDA P.E.

LAYOUT PLAN - SOUTH

WOLF CONSERVATION CENTER
7 BUCK RUN, SOUTH SALEM, NY 10590
TOWN OF LEWISBORO , WESTCHESTER COUNTY, NY

BIBBO ASSOCIATES, LLP
293 ROUTE 100 SUITE 203
SOMERS, NEW YORK 10589
TEL. 914 277 5805

DATE:	12-29-2020
SCALE:	1" = 30'
FILE:	L5
DSGN / CHK:	MG/RH
DRN. BY:	RH
SHT NO.	3 OF 12
DWG NO.	**LP-1**

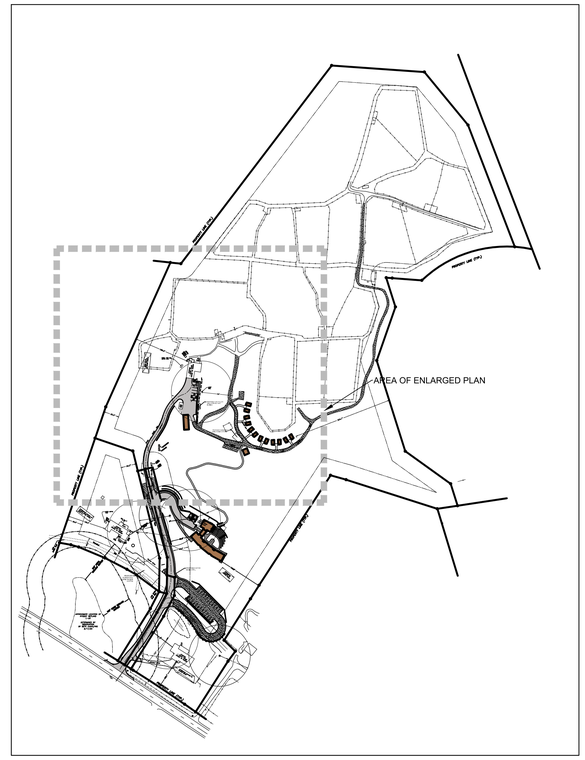
LEGEND

- EXISTING PROPERTY LINE
- WETLAND BUFFER LINE
- WETLAND BOUNDARY LINE
- EXISTING WOLF ENCLOSURE FENCE
- EXISTING EASEMENT LINE
- EXISTING 2' CONTOUR
- EXISTING 10' CONTOUR — 420
- PROPOSED 2' CONTOUR
- PROPOSED 10' CONTOUR
- PROPOSED RETAINING WALL
- PROPOSED ELECTRIC METER
- PROPOSED TRANSFORMER — T
- PROPOSED T-TAP — TT
- PROPOSED OVERHEAD ELECTRIC SERVICE — OH-E
- PROPOSED UNDERGROUND ELECTRIC SERVICE — UG-E

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.



OVERALL PLAN

GRAPHIC SCALE

200 0 100 200 400 800

(IN FEET)
1 inch = 200 ft.

CALL BEFORE YOU DIG 1-800-962-7962

UNDER THE NY STATE LAW PROTECTING UNDERGROUND FACILITIES, THE FOLLOWING RULES AND REGULATIONS ARE IN EFFECT FOR ALL EXCAVATORS:

* THEY MUST CALL FOR A UTILITY STAKE-OUT (2) TWO FULL WORKING DAYS PRIOR TO AN EXCAVATION.
* THEY MUST CONFIRM PRECISE LOCATIONS OF UNDERGROUND FACILITIES.
* THEY MUST PRESERVE STAKES AND MARKINGS UNTIL NO LONGER NEEDED AT SITE.
* THEY MUST CONTACT NON-UFPO MEMBER UTILITY OWNERS FOR STAKE-OUTS.

REVISIONS					
DATE:	DESCRIPTION	BY/CK	DATE:	DESCRIPTION	BY/CK

STATE OF NEW YORK · MATTHEW J. GIRONDA · LICENSED PROFESSIONAL ENGINEER · No. 096005

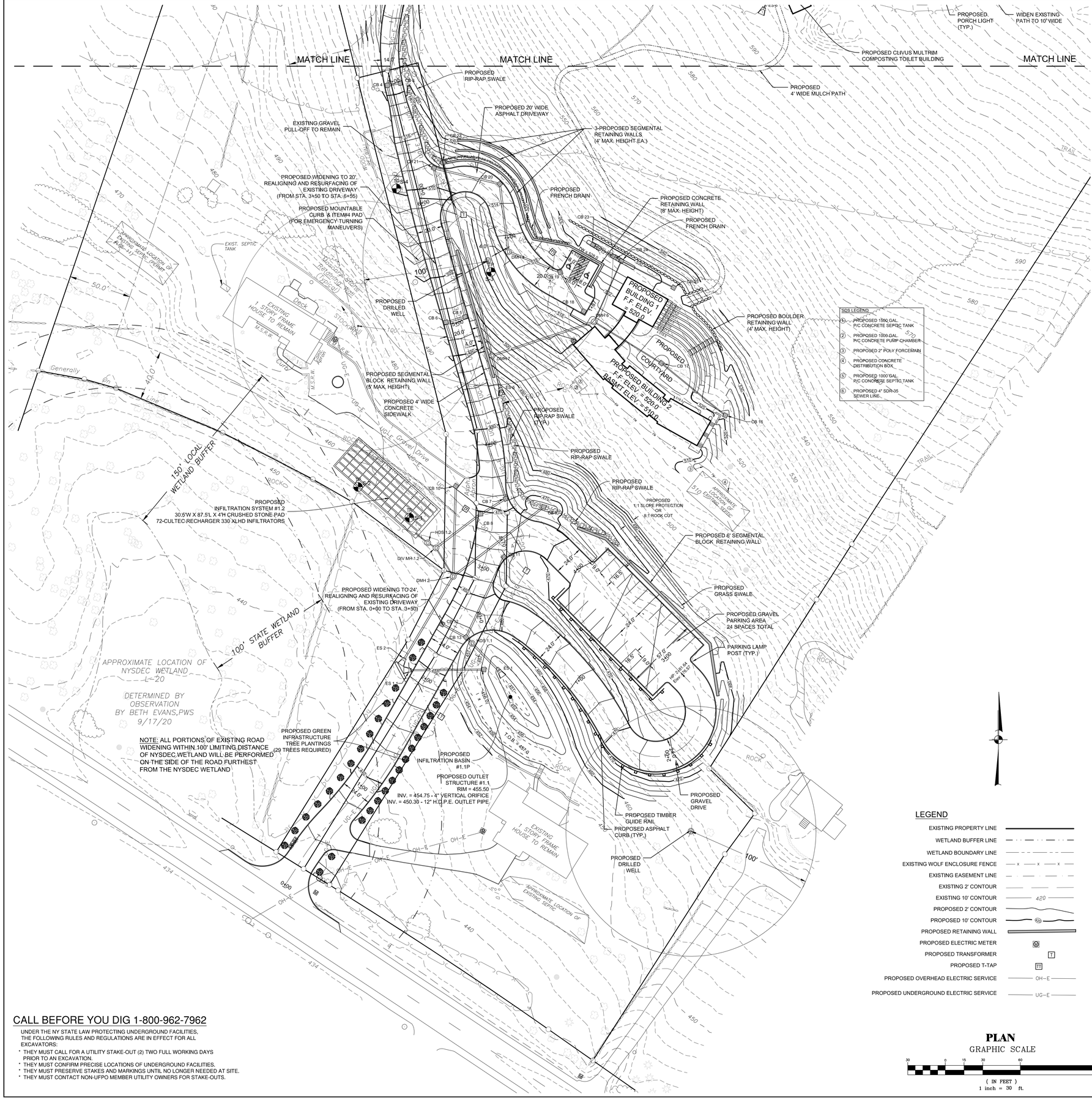
MATTHEW J. GIRONDA P.E.

LAYOUT PLAN - NORTH

WOLF CONSERVATION CENTER
7 BUCK RUN, SOUTH SALEM, NY 10590
TOWN OF LEWISBORO , WESTCHESTER COUNTY, NY

BIBBO ASSOCIATES, LLP
293 ROUTE 100 SUITE 203
SOMERS, NEW YORK 10589
TEL. 914 277 5805

DATE:	12-31-2020
SCALE:	1" = 30'
FILE:	L5
DSGN / CHK:	MG/RH
DRN. BY:	RH
SHT NO.	4 OF 12
DWG NO.	**LP-2**



DRAINAGE SCHEDULE			
NAME	RIM:	PIPES IN:	PIPES OUT:
CB 1	551.89	15" HDPE INV. IN =548.24 (FROM CB 2) L =7.5', S = 1.72%	
CB 2	551.97		15" HDPE INV, OUT =548.36 (TO CB 1) L = 7.5', S = 1.72% 15" HDPE INV, OUT =548.24 (TO DMH 1) L = 95.1', S = 22.17%
CB 3	521.39		15" HDPE INV, OUT =516.46 (TO CB 4) L = 7.6', S = 1.20%
CB 4	521.02	15" HDPE INV. IN =516.46 (FROM DMH 1) L =99.3', S = 16.26% 15" HDPE INV, IN =516.34 (FROM CB 3) L =7.6', S = 1.20%	15" HDPE INV, OUT =516.34 (TO CB 6) L = 194.4', S = 14.09%
CB 5	494.25	15" CORRUGATED HDPE PIPE INV. IN =490.50 (FROM CB 21) L =119.5', S = 13.90%	15" HDPE INV, OUT =490.50 (TO CB 6) L = 13.1', S = 10.22%
CB 6	494.25	15" HDPE INV. IN =489.05 (FROM CB 5) L =13.1', S = 10.22% 15" HDPE INV, IN =489.05 (FROM CB 4) L =194.4', S = 14.09%	15" HDPE INV, OUT =489.05 (TO CB 7) L = 147.8', S = 15.03%
CB 7	471.82	15" HDPE INV, IN =467.00 (FROM CB 6) L =147.8', S = 15.03%	15" HDPE INV, OUT =465.00 (TO CB 8) L = 20.4', S = 1.15%
CB 8	469.78	15" HDPE INV. IN =464.76 (FROM CB 7) L =20.4', S = 1.15%	15" HDPE INV. OUT =464.76 (TO DIV MH 1.2) L = 41.4', S = 11.02%
CB 9	467.00		15" HDPE INV. OUT =463.50 (TO DMH 2) L = 88.0', S = 10.37%
CB 10	471.80		15" HDPE INV. OUT =463.00 (TO DMH 2) L = 69.2', S = 12.43%
CB 11	465.99		15" HDPE INV. OUT =461.68 (TO CB 13) L = 68.4', S = 13.09%
CB 12	455.51		15" CORRUGATED HDPE PIPE INV. OUT =452.65 (TO CB 13) L = 18.8', S = 1.14%
CB 13	455.26	15" HDPE INV. IN =452.40 (FROM CB 11) L =68.4', S = 13.09% 15" CORRUGATED HDPE PIPE INV. IN =452.40 (FROM CB 12) L =18.8', S = 1.14%	15" CORRUGATED HDPE PIPE INV. OUT =452.40 (TO HDS 1.1) L = 3.3', S = 1.06%
CB 14	583.00		15" CORRUGATED HDPE PIPE INV. OUT =575.68 (TO CB 15) L = 11.1', S = 22.71%
CB 15	581.71	15" CORRUGATED HDPE PIPE INV. IN =572.50 (FROM CB 14) L =11.1', S = 22.71%	15" HDPE INV, OUT =570.80 (TO ES 4) L = 113.1', S = 8.58%
CB 16	531.97		8" INV. OUT =525.81 (TO CB 17) L = 62.9', S = 0.35%
CB 17	531.80	8" INV. IN =525.57 (FROM CB 16) L =62.9', S = 0.35%	8" CORRUGATED HDPE PIPE INV. OUT =524.99 (TO DMH 5) L = 60.1', S = 11.30%
CB 18	517.02		15" CORRUGATED HDPE PIPE INV. OUT =512.69 (TO CB 19) L = 33.1', S = 1.47%
CB 19	516,13	15" CORRUGATED HDPE PIPE INV. IN =512.16 (FROM CB 18) L =33.1', S = 1.47%	15" CORRUGATED HDPE PIPE INV. OUT =512.16 (TO DMH 4) L = 40.7', S = 5.59%
CB 20	511.80	15" CORRUGATED HDPE PIPE INV. IN =508.65 (FROM DMH 4) L =50.7', S = 1.24% 15" CORRUGATED HDPE PIPE INV. IN =507.72 (FROM CB 21) L =50.8', S = -1.00%	
CB 21	511.80		15" CORRUGATED HDPE PIPE INV. OUT =507.18 (TO CB 5) L = 119.5', S = 13.90% 15" CORRUGATED HDPE PIPE INV. OUT =507.18 (TO CB 20) L = 50.8', S = -1.00%
CB 22	511.50		15" CORRUGATED HDPE PIPE INV. OUT =505.75 (TO DMH 7) L = 155.8', S = 1.83%
CB 23	0.00		8" PVC INV. OUT =-2.54 (TO CB 24) L = 23.2', S = 1.00%
CB 24	0.00	8" PVC INV. IN =-2.80 (FROM CB 23) L =23.2', S = 1.00% 6" INV. IN =-3.01 (FROM CB 25) L =43.9', S = 1.00%	6" INV. OUT =-2.90 (TO DMH 5) L = 51.9', S = 1.73%
CB 25	0.00		6" INV. OUT =-2.54 (TO CB 24) L = 43.9', S = 1.00%
DIV MH 1.2	464.02	15" HDPE INV. IN =459.82 (FROM CB 8) L =41.4', S = 11.02%	8" CORRUGATED HDPE PIPE INV. OUT =452.00 (TO HDS 1.2) L = 5.7', S = 0.00% 8" CORRUGATED HDPE PIPE INV. OUT =455.20 (TO DMH 2) L = 22.7', S = 2.25%
DMH 1	532.88	15" HDPE INV. IN =526.94 (FROM CB 2) L =95.1', S = 22.17%	15" HDPE INV, OUT =526.94 (TO CB 4) L = 99.3', S = 10.25%
DMH 2	461,36	15" HDPE INV. IN =454.02 (FROM CB 9) L =88.0', S = 10.37% 8" CORRUGATED HDPE PIPE INV. IN =454.60 (FROM DIV MH 1.2) L =22.7', S = 2.25% 15" HDPE INV. IN =454.02 (FROM CB 10) L =69.2', S = 12.43%	15" CORRUGATED HDPE PIPE INV. OUT =454.02 (TO ES 2) L = 74.7', S = 5.90%
DMH 4	514,76	15" CORRUGATED HDPE PIPE INV. IN =509.66 (FROM CB 19) L =40.7', S = 5.59%	15" CORRUGATED HDPE PIPE INV. OUT =509.33 (TO CB 20) L = 50.7', S = 1.24%
DMH 5	520.74	8" CORRUGATED HDPE PIPE INV. IN =517.86 (FROM CB 17) L =60.1', S = 11.30% 6" INV. IN =3.82 (FROM CB 24) L =51.9', S = 1.73%	15" CORRUGATED HDPE PIPE INV. OUT =507.98 (TO DMH 7) L = 82.9', S = 5.28%
DMH 7	505,03	15" CORRUGATED HDPE PIPE INV. IN =502.84 (FROM CB 22) L =155.8', S = 1.83% 15" CORRUGATED HDPE PIPE INV. IN =503.44 (FROM DMH 5) L =82.9', S = 5.28%	15" CORRUGATED HDPE PIPE INV. OUT =502.84 (TO ES 5) L = 32.6', S = 69.95%
ES 1		15" CORRUGATED HDPE PIPE INV. IN =452.00 (FROM HDS 1.1) L =29.2', S = 1.06%	
ES 1.1		12" CORRUGATED HDPE PIPE INV. IN =449.50 (FROM O.C.S. 1) L =57.2', S = 1.37%	
ES 2		15" CORRUGATED HDPE PIPE INV. IN =449.50 (FROM DMH 2) L =74.7', S = 5.90%	
ES 4		15" HDPE INV. IN =561.00 (FROM CB 15) L =113.1', S = 8.58%	
ES 5		15" CORRUGATED HDPE PIPE INV. IN =484.06 (FROM DMH 7) L =32.6', S = 69.95%	
HDS 1.1	456.52	15" CORRUGATED HDPE PIPE INV. IN =452.33 (FROM CB 13) L =3.3', S = 1.06%	15" CORRUGATED HDPE PIPE INV. OUT =452.33 (TO ES 1) L = 29.2', S = 1.06%
HDS 1.2	461.37	8" CORRUGATED HDPE PIPE INV. IN =452.00 (FROM DIV MH 1.2) L =5.7', S = 0.00%	8" CORRUGATED HDPE PIPE INV. OUT =452.00 (TO INF 1.2) L = 12.1', S = 0.00%
INF 1.2		8" CORRUGATED HDPE PIPE INV. IN =452.00 (FROM HDS 1.2) L =12.1', S = 0.00%	
O.C.S. 1	455.50		12" CORRUGATED HDPE PIPE INV. OUT =450.30 (TO ES 1.1) L = 57.2', S = 1.37%

DRAINAGE SCHEDULE			
NAME	RIM:	PIPES IN:	PIPES OUT:
DIV MH 1.3	600,87	6" PVC INV. IN =598.00 (FROM ROOF DRAINS) L =28.9', S = 1.10% 6" PVC INV. IN =598.00 (FROM ROOF DRAIN) L =16.9', S = 1.04%	6" PVC INV. OUT =598.42 (TO HDS 1.3) L = 3.1', S = 15.51% 6" PVC INV. OUT =598.67 (TO ES 6) L = 44.1', S = 31.15%
ES 6		6" PVC INV. IN =585.08 (FROM DIV MH 1.3) L =44.1', S = 31.15%	
HDS 1.3	600.00	6" PVC INV. IN =597.34 (FROM DIV MH 1.3) L =3.1', S = 15.51%	6" PVC INV. OUT =597.34 (TO INF 1.3) L = 3.3', S = 45.78%
INF 1.3		6" PVC INV. IN =595.26 (FROM HDS 1.3) L =3.3', S = 45.78%	
ROOF DRAIN			6" PVC INV. OUT =598.25 (TO DIV MH 1.3) L = 16.9', S = 1.04%
ROOF DRAINS		6" PVC INV. IN =598.40 (FROM) L =28.9', S = 1.09%	6" PVC INV. OUT =598.40 (TO DIV MH 1.3) L = 28.9', S = 1.10%

LEGEND

- EXISTING PROPERTY LINE
- WETLAND BUFFER LINE
- WETLAND BOUNDARY LINE
- EXISTING WOLF ENCLOSURE FENCE
- EXISTING EASEMENT LINE
- EXISTING 2' CONTOUR
- EXISTING 10' CONTOUR
- PROPOSED 2' CONTOUR
- PROPOSED 10' CONTOUR
- PROPOSED RETAINING WALL
- PROPOSED ELECTRIC METER
- PROPOSED TRANSFORMER
- PROPOSED T-TAP
- PROPOSED OVERHEAD ELECTRIC SERVICE
- PROPOSED UNDERGROUND ELECTRIC SERVICE

PLAN

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

CALL BEFORE YOU DIG 1-800-962-7962

UNDER THE NY STATE LAW PROTECTING UNDERGROUND FACILITIES, THE FOLLOWING RULES AND REGULATIONS ARE IN EFFECT FOR ALL EXCAVATORS:

- THEY MUST CALL FOR A UTILITY STAKE-OUT (2) TWO FULL WORKING DAYS PRIOR TO AN EXCAVATION.
- THEY MUST CONFIRM PRECISE LOCATIONS OF UNDERGROUND FACILITIES.
- THEY MUST PRESERVE STAKES AND MARKINGS UNTIL NO LONGER NEEDED AT SITE.
- THEY MUST CONTACT NON-UFPO MEMBER UTILITY OWNERS FOR STAKE-OUTS.

REVISIONS					
DATE:	DESCRIPTION	BY/CK	DATE:	DESCRIPTION	BY/CK

STATE OF NEW YORK · MATTHEW J. GIRONDA · LICENSED PROFESSIONAL ENGINEER · No. 096000

MATTHEW J. GIRONDA P.E.

CONSTRUCTION PLAN - SOUTH

WOLF CONSERVATION CENTER

7 BUCK RUN, SOUTH SALEM, NY 10590
TOWN OF LEWISBORO , WESTCHESTER COUNTY, NY

BIBBO ASSOCIATES, LLP
293 ROUTE 100 SUITE 203
SOMERS, NEW YORK 10589
TEL. 914 277 5805

DATE:	12-29-2020
SCALE:	1" = 30'
FILE:	L5
DSGN / CHK:	MG/RH
DRN. BY:	RH
SHT NO.	5 OF 12
DWG NO.	CP-1

LEGEND

- EXISTING PROPERTY LINE
- WETLAND BUFFER LINE
- WETLAND BOUNDARY LINE
- EXISTING WOLF ENCLOSURE FENCE
- EXISTING EASEMENT LINE
- EXISTING 2' CONTOUR
- EXISTING 10' CONTOUR — 420
- PROPOSED 2' CONTOUR
- PROPOSED 10' CONTOUR — 420
- PROPOSED RETAINING WALL
- PROPOSED ELECTRIC METER — M
- PROPOSED TRANSFORMER — T
- PROPOSED T-TAP — TT
- PROPOSED OVERHEAD ELECTRIC SERVICE — OH–E
- PROPOSED UNDERGROUND ELECTRIC SERVICE — UG–E

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

DRAINAGE SCHEDULE

NAME	RIM:	PIPES IN:	PIPES OUT:
CB 1	551.89	15" HDPE INV. IN =548.24 (FROM CB 2) L =7.5', S = 1.72%	
CB 2	551.97		15" HDPE INV. OUT =548.36 (TO CB 1) L = 7.5', S = 1.72% 15" HDPE INV. OUT =548.24 (TO DMH 1) L = 95.1', S = 22.17%
CB 3	521.39		15" HDPE INV. OUT =516.46 (TO CB 4) L = 7.6', S = 1.20%
CB 4	521.02	15" HDPE INV. IN =516.46 (FROM DMH 1) L =99.2', S = 10.25% 15" HDPE INV. IN =516.34 (FROM CB 3) L =7.6', S = 1.20%	15" HDPE INV. OUT =516.34 (TO CB 6) L = 194.4', S = 14.09%
CB 5	494.25	15" CORRUGATED HDPE PIPE INV. IN =490.50 (FROM CB 21) L =119.0', S = 13.90%	15" HDPE INV. OUT =490.50 (TO CB 6) L = 13.1', S = 10.22%
CB 6	494.25	15" HDPE INV. IN =489.05 (FROM CB 5) L =13.1', S = 10.22% 15" HDPE INV. IN =489.05 (FROM CB 4) L =194.4', S = 14.09%	15" HDPE INV. OUT =489.05 (TO CB 7) L = 147.8', S = 15.03%
CB 7	471.82	15" HDPE INV. IN =467.00 (FROM CB 6) L =147.8', S = 15.03%	15" HDPE INV. OUT =465.00 (TO CB 8) L = 20.4', S = 1.15%
CB 8	469.78	15" HDPE INV. IN =464.76 (FROM CB 7) L =20.4', S = 1.15%	15" HDPE INV. OUT =464.76 (TO DIV MH 1.2) L = 41.4', S = 11.02%
CB 9	467.00		15" HDPE INV. OUT =463.50 (TO DMH 2) L = 88.0', S = 10.37%
CB 10	471.80		15" HDPE INV. OUT =463.00 (TO DMH 2) L = 69.2', S = 12.43%
CB 11	465.99		15" HDPE INV. OUT =461.68 (TO CB 13) L = 68.4', S = 13.09%
CB 12	455.51		15" CORRUGATED HDPE PIPE INV. OUT =452.65 (TO CB 13) L = 18.8', S = 1.14%
CB 13	455.26	15" HDPE INV. IN =452.40 (FROM CB 11) L =68.4', S = 13.09% 15" CORRUGATED HDPE PIPE INV. IN =452.40 (FROM CB 12) L =18.8', S = 1.14%	15" CORRUGATED HDPE PIPE INV. OUT =452.40 (TO HDS 1.1) L = 3.3', S = 1.06%
CB 14	583.00		15" CORRUGATED HDPE PIPE INV. OUT =575.68 (TO CB 15) L = 11.1', S = 22.71%
CB 15	581.71	15" CORRUGATED HDPE PIPE INV. IN =572.50 (FROM CB 14) L =11.1', S = 22.71%	15" HDPE INV. OUT =570.80 (TO ES 4) L = 113.1', S = 8.58%
CB 16	531.97		8" INV. OUT =525.81 (TO CB 17) L = 62.9', S = 0.35%
CB 17	531.80	8" INV. IN =525.57 (FROM CB 16) L =62.9', S = 0.35%	8" CORRUGATED HDPE PIPE INV. OUT =524.99 (TO DMH 5) L = 60.1', S = 11.30%
CB 18	517.02		15" CORRUGATED HDPE PIPE INV. OUT =512.69 (TO CB 19) L = 33.1', S = 1.47%
CB 19	516.13	15" CORRUGATED HDPE PIPE INV. IN =512.16 (FROM CB 18) L =33.1', S = 1.47%	15" CORRUGATED HDPE PIPE INV. OUT =512.16 (TO DMH 4) L = 40.7', S = 5.59%
CB 20	511.80	15" CORRUGATED HDPE PIPE INV. IN =508.65 (FROM DMH 4) L =50.7', S = 1.24% 15" CORRUGATED HDPE PIPE INV. IN =507.72 (FROM CB 21) L =50.8', S = -1.00%	
CB 21	511.80		15" CORRUGATED HDPE PIPE INV. OUT =507.18 (TO CB 5) L = 119.5', S = 13.90% 15" CORRUGATED HDPE PIPE INV. OUT =507.18 (TO CB 20) L = 50.8', S = -1.00%
CB 22	511.50		15" CORRUGATED HDPE PIPE INV. OUT =505.75 (TO DMH 7) L = 155.8', S = 1.83%
CB 23	0.00		8" PVC INV. OUT =-2.54 (TO CB 24) L = 23.2', S = 1.00%
CB 24	0.00	8" PVC INV. IN =-2.80 (FROM CB 23) L =23.2', S = 1.00% 6" INV. IN =-3.01 (FROM CB 25) L =43.9', S = 1.00%	6" INV. OUT =-2.90 (TO DMH 5) L = 51.9', S = 1.73%
CB 25	0.00		6" INV. OUT =-2.54 (TO CB 24) L = 43.9', S = 1.00%
DIV MH 1,2	464.02	15" HDPE INV. IN =459.82 (FROM CB 8) L =41.4', S = 11.02%	8" CORRUGATED HDPE PIPE INV. OUT =452.00 (TO HDS 1.2) L = 5.7', S = 0.00% 8" CORRUGATED HDPE PIPE INV. OUT =455.20 (TO DMH 2) L = 22.7', S = 2.25%
DMH 1	532.88	15" HDPE INV. IN =526.94 (FROM CB 2) L =95.1', S = 22.17%	15" HDPE INV. OUT =526.94 (TO CB 4) L = 99.3', S = 10.25%
DMH 2	461.36	15" HDPE INV. IN =454.02 (FROM CB 9) L =88.0', S = 10.37% 8" CORRUGATED HDPE PIPE INV. IN =454.60 (FROM DIV MH 1,2) L =22.7', S = 2.25% 15" HDPE INV. IN =454.02 (FROM CB 10) L =69.2', S = 12.43%	15" CORRUGATED HDPE PIPE INV. OUT =454.02 (TO ES 2) L = 74.7', S = 5.90%
DMH 4	514.76	15" CORRUGATED HDPE PIPE INV. IN =509.66 (FROM CB 19) L =40.7', S = 5.59%	15" CORRUGATED HDPE PIPE INV. OUT =509.33 (TO CB 20) L = 50.7', S = 1.24%
DMH 5	520.74	8" CORRUGATED HDPE PIPE INV. IN =517.86 (FROM CB 17) L =60.1', S = 11.30% 6" INV. IN =-3.82 (FROM CB 24) L =51.9', S = 1.73%	15" CORRUGATED HDPE PIPE INV. OUT =507.98 (TO DMH 7) L = 82.9', S = 5.28% 15" CORRUGATED HDPE PIPE INV. OUT =507.98 (TO DMH 7) L = 82.9', S = 5.28%
DMH 7	505.03	15" CORRUGATED HDPE PIPE INV. IN =502.84 (FROM CB 22) L =155.8', S = 1.83% 15" CORRUGATED HDPE PIPE INV. IN =503.44 (FROM DMH 5) L =82.9', S = 5.28%	15" CORRUGATED HDPE PIPE INV. OUT =502.84 (TO ES 5) L = 32.6', S = 69.95%
ES 1		15" CORRUGATED HDPE PIPE INV. IN =452.00 (FROM HDS 1.1) L =29.2', S = 1.06%	
ES 1.1		12" CORRUGATED HDPE PIPE INV. IN =449.50 (FROM O.C.S. 1) L =57.2', S = 1.37%	
ES 2		15" CORRUGATED HDPE PIPE INV. IN =449.50 (FROM DMH 2) L =74.7', S = 5.90%	
ES 4		15" HDPE INV. IN =561.00 (FROM CB 15) L =113.1', S = 8.58%	
ES 5		15" CORRUGATED HDPE PIPE INV. IN =484.06 (FROM DMH 7) L =32.6', S = 69.95%	
HDS 1.1	456.52	15" CORRUGATED HDPE PIPE INV. IN =452.33 (FROM CB 13) L =3.3', S = 1.06%	15" CORRUGATED HDPE PIPE INV. OUT =452.33 (TO ES 1) L = 29.2', S = 1.06%
HDS 1.2	461.37	8" CORRUGATED HDPE PIPE INV. IN =452.00 (FROM DIV MH 1,2) L =5.7', S = 0.00%	8" CORRUGATED HDPE PIPE INV. OUT =452.00 (TO INF 1.2) L = 12.1', S = 0.00%
INF 1.2		8" CORRUGATED HDPE PIPE INV. IN =452.00 (FROM HDS 1.2) L =12.1', S = 0.00%	
O.C.S. 1	455.50		12" CORRUGATED HDPE PIPE INV. OUT =450.30 (TO ES 1.1) L = 57.2', S = 1.37%

DRAINAGE SCHEDULE

NAME	RIM:	PIPES IN:	PIPES OUT:
DIV MH 1,3	600.87	6" PVC INV. IN =598.00 (FROM ROOF DRAINS) L =28.9', S = 1.10% 6" PVC INV. IN =598.00 (FROM ROOF DRAIN) L =16.9', S = 1.04%	6" PVC INV. OUT =598.42 (TO HDS 1.3) L = 3.1', S = 15.51% 6" PVC INV. OUT =598.67 (TO ES 6) L = 44.1', S = 31.15%
ES 6		6" PVC INV. IN =585.08 (FROM DIV MH 1.3) L =44.1', S = 31.15%	
HDS 1.3	600.00	6" PVC INV. IN =597.34 (FROM DIV MH 1.3) L =3.1', S = 15.51%	6" PVC INV. OUT =597.34 (TO INF 1.3) L = 3.3', S = 45.78%
INF 1.3		6" PVC INV. IN =595.26 (FROM HDS 1.3) L =3.3', S = 45.78%	
ROOF DRAIN			6" PVC INV. OUT =598.25 (TO DIV MH 1.3) L = 16.9', S = 1.04%
ROOF DRAINS		6" PVC INV. IN =598.40 (FROM) L =28.9', S = 1.09%	6" PVC INV. OUT =598.40 (TO DIV MH 1.3) L = 28.9', S = 1.10%

CALL BEFORE YOU DIG 1-800-962-7962

UNDER THE NY STATE LAW PROTECTING UNDERGROUND FACILITIES, THE FOLLOWING RULES AND REGULATIONS ARE IN EFFECT FOR ALL EXCAVATORS:

* THEY MUST CALL FOR A UTILITY STAKE-OUT (2) TWO FULL WORKING DAYS PRIOR TO AN EXCAVATION.
* THEY MUST CONFIRM PRECISE LOCATIONS OF UNDERGROUND FACILITIES.
* THEY MUST PRESERVE STAKES AND MARKINGS UNTIL NO LONGER NEEDED AT SITE.
* THEY MUST CONTACT NON-UFPO MEMBER UTILITY OWNERS FOR STAKE-OUTS.

REVISIONS

DATE:	DESCRIPTION	BY/CK	DATE:	DESCRIPTION	BY/CK

STATE OF NEW YORK · MATTHEW J. GIRONDA · LICENSED PROFESSIONAL ENGINEER · No. 096036

MATTHEW J. GIRONDA P.E.

CONSTRUCTION PLAN - NORTH

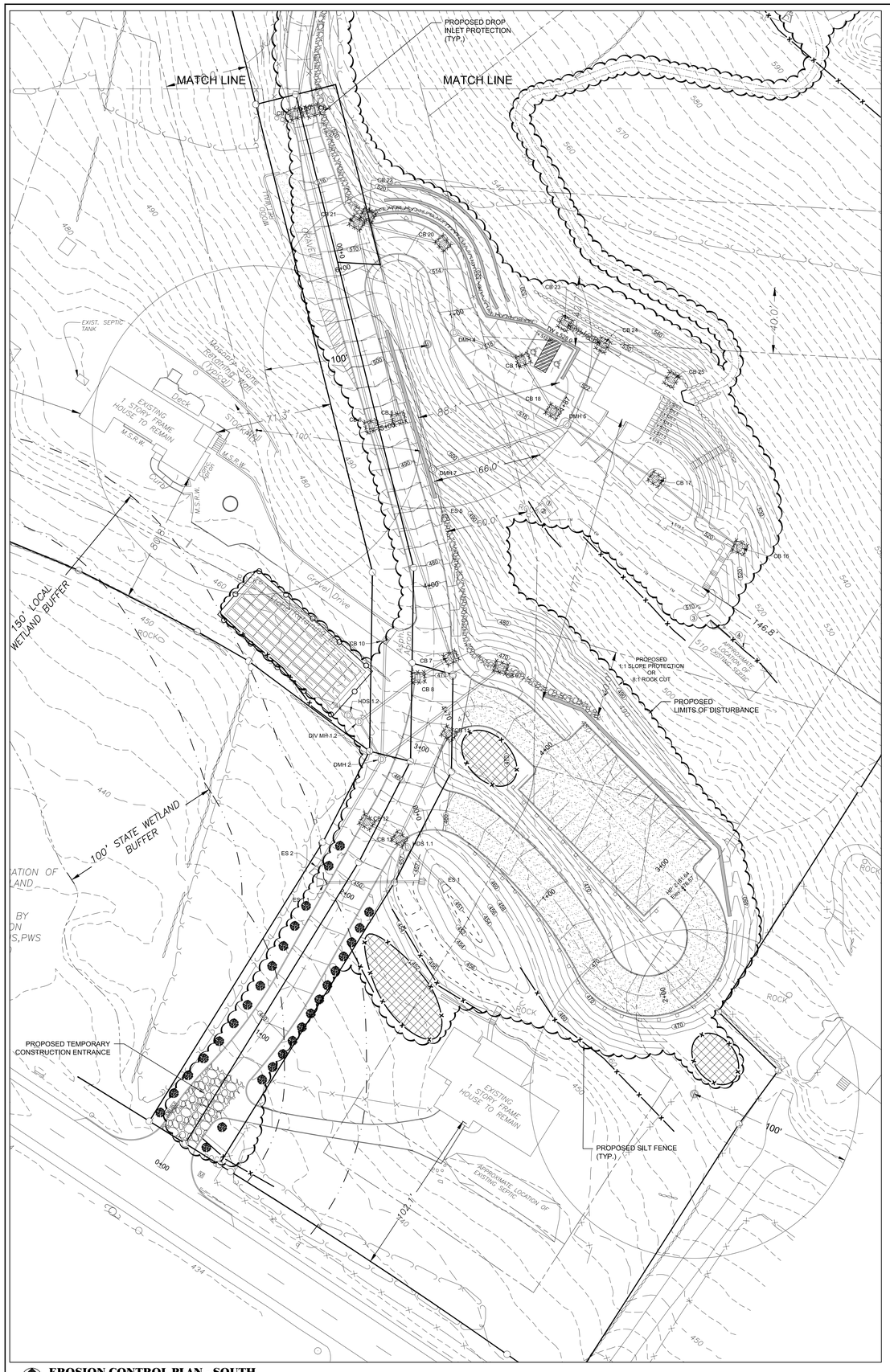
WOLF CONSERVATION CENTER

7 BUCK RUN, SOUTH SALEM, NY 10590
TOWN OF LEWISBORO , WESTCHESTER COUNTY, NY

BIBBO ASSOCIATES, LLP
253 ROUTE 100 SUITE 203
SOMERS, NEW YORK 10589
TEL. 914 277 5805

DATE:	12-29-2020
SCALE:	1" = 30'
FILE:	L5
DSGN / CHK:	MG/RH
DRN. BY	RH
SHT NO.	6 OF 12
DWG NO.	CP-2

P:\Projects\WOLF CONSERV. CENTER\dwg\Wolf Center Site Plan 12-29-20 PB.dwg, 12/29/2020 4:23:17 PM



EROSION CONTROL PLAN - SOUTH

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

EROSION CONTROL PLAN - NORTH

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

LEGEND

- EXISTING PROPERTY LINE
- WETLAND BUFFER LINE
- WETLAND BOUNDARY LINE
- EXISTING WOLF ENCLOSURE FENCE
- EXISTING EASEMENT LINE
- EXISTING 2' CONTOUR
- EXISTING 10' CONTOUR — 420
- PROPOSED 2' CONTOUR
- PROPOSED 10' CONTOUR — 420
- PROPOSED RETAINING WALL
- PROPOSED ELECTRIC METER — M
- PROPOSED TRANSFORMER — T
- PROPOSED T-TAP — TT
- PROPOSED OVERHEAD ELECTRIC SERVICE — OH-E
- PROPOSED UNDERGROUND ELECTRIC SERVICE — UG-E

EROSION CONTROL LEGEND:

- DRAIN INLET PROTECTION (TYP.) * TO BE INSTALLED ON ALL CATCH BASINS
- CONSTRUCTION ENTRANCE
- PROPOSED SILT FENCE
- TEMPORARY STOCKPILE AREA
- PROPOSED TEMPORARY CONSTRUCTION FENCING (ORANGE FENCING)
- LIMIT OF DISTURBANCE (9.5 ACRES)

CALL BEFORE YOU DIG 1-800-962-7962

UNDER THE NY STATE LAW PROTECTING UNDERGROUND FACILITIES, THE FOLLOWING RULES AND REGULATIONS ARE IN EFFECT FOR ALL EXCAVATORS:

* THEY MUST CALL FOR A UTILITY STAKE-OUT (2) TWO FULL WORKING DAYS PRIOR TO AN EXCAVATION.
* THEY MUST CONFIRM PRECISE LOCATIONS OF UNDERGROUND FACILITIES.
* THEY MUST PRESERVE STAKES AND MARKINGS UNTIL NO LONGER NEEDED AT SITE.
* THEY MUST CONTACT NON-UFPO MEMBER UTILITY OWNERS FOR STAKE-OUTS.

REVISIONS					
DATE:	DESCRIPTION	BY/CK	DATE:	DESCRIPTION	BY/CK

STATE OF NEW YORK — MATTHEW J. GIRONDA — LICENSED PROFESSIONAL ENGINEER — No. 096030

MATTHEW J. GIRONDA P.E.

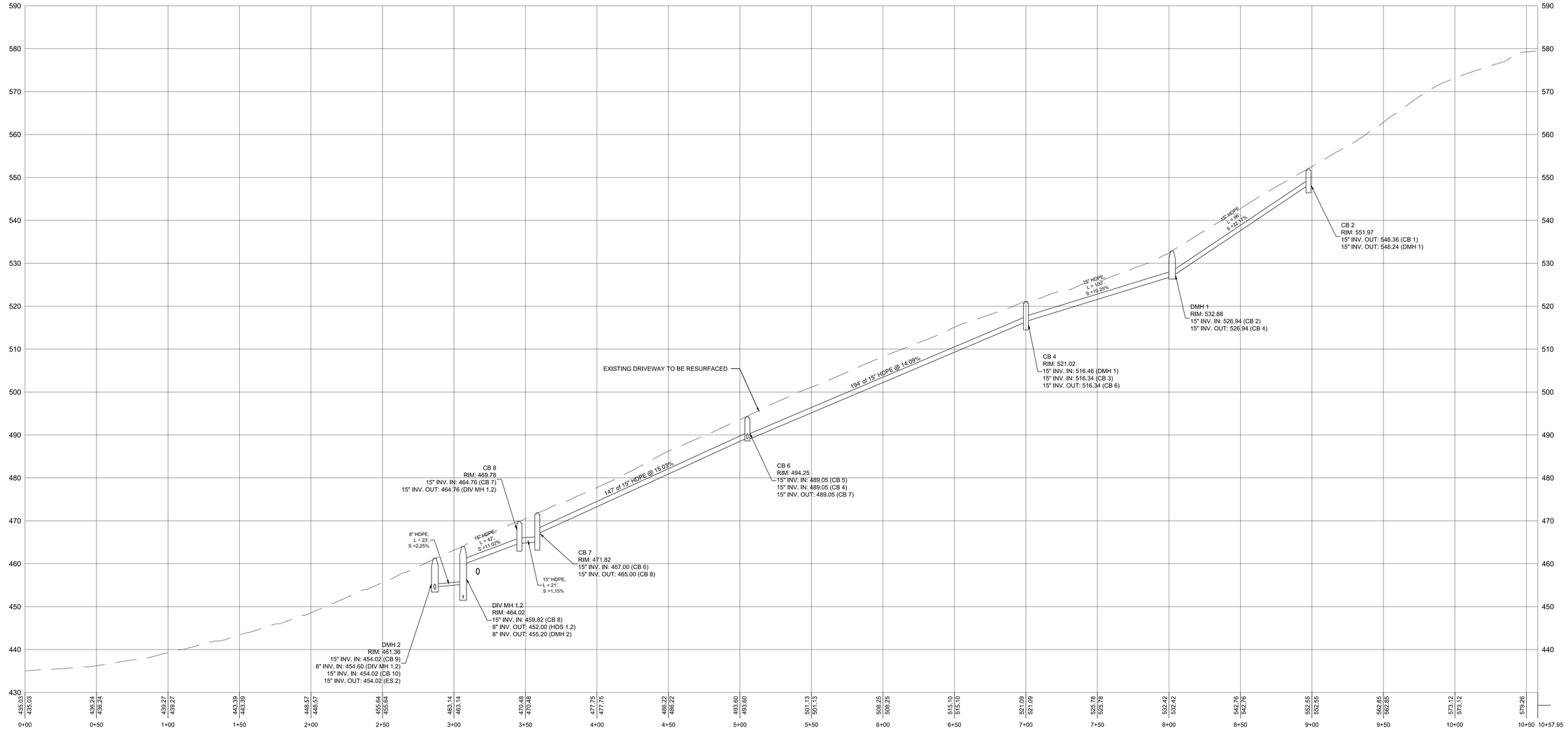
EROSION CONTROL PLAN

WOLF CONSERVATION CENTER

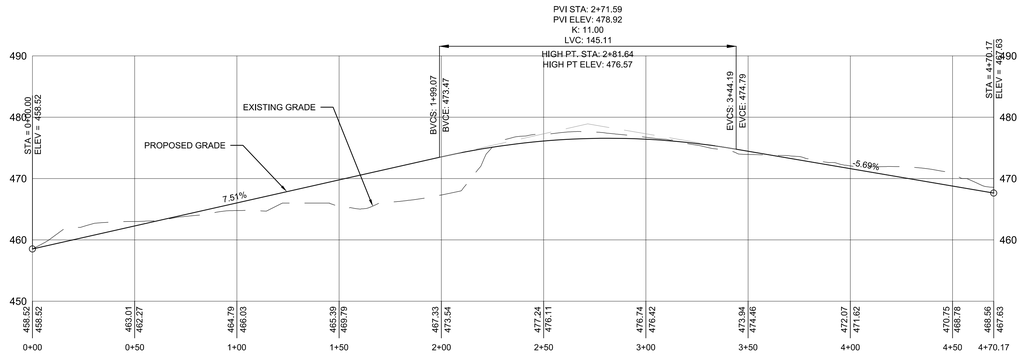
7 BUCK RUN, SOUTH SALEM, NY 10590
TOWN OF LEWISBORO , WESTCHESTER COUNTY, NY

BIBBO ASSOCIATES, LLP
293 ROUTE 100 SUITE 203
SOMERS, NEW YORK 10589
TEL. 914 277 5805

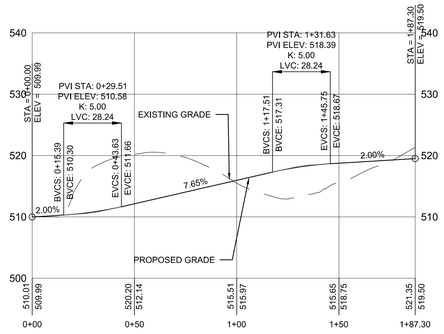
DATE:	12-29-2020
SCALE:	1" = 30'
FILE:	L5
DSGN / CHK:	MG/RH
DRN. BY:	RH
SHT NO.	7 OF 12
DWG NO.	EC-1



MAIN DRIVEWAY PROFILE
SCALE: 1" = 30' (H)
1" = 10' (V)



BUS ROUTE PROFILE
SCALE: 1" = 30' (H)
1" = 10' (V)



EDUCATION PAVILION PROFILE
SCALE: 1" = 30' (H)
1" = 10' (V)

CALL BEFORE YOU DIG 1-800-962-7962

UNDER THE NY STATE LAW PROTECTING UNDERGROUND FACILITIES, THE FOLLOWING RULES AND REGULATIONS ARE IN EFFECT FOR ALL EXCAVATORS:

* THEY MUST CALL FOR A UTILITY STAKE-OUT (2) TWO FULL WORKING DAYS PRIOR TO AN EXCAVATION.
* THEY MUST CONFIRM PRECISE LOCATIONS OF UNDERGROUND FACILITIES.
* THEY MUST PRESERVE STAKES AND MARKINGS UNTIL NO LONGER NEEDED AT SITE.
* THEY MUST CONTACT NON-UFPO MEMBER UTILITY OWNERS FOR STAKE-OUTS.

REVISIONS					
DATE:	DESCRIPTION	BY/CK	DATE:	DESCRIPTION	BY/CK

STATE OF NEW YORK · MATTHEW J. GIRONDA · LICENSED PROFESSIONAL ENGINEER · 096059

MATTHEW J. GIRONDA P.E.

ROAD PROFILES

WOLF CONSERVATION CENTER
7 BUCK RUN, SOUTH SALEM, NY. 10590
TOWN OF LEWISBORO , WESTCHESTER COUNTY, NY

BIBBO ASSOCIATES, LLP
293 ROUTE 100 SUITE 203
SOMERS, NEW YORK 10589
TEL. 914 277 5805

DATE:	12-29-2020
SCALE:	1" = 30'
FILE:	L5
DSGN / CHK:	MG/RH
DRN. BY:	RH
SHT NO.	8 OF 12
DWG NO.	**P-1**

NOTE: ALL PORTIONS OF EXISTING ROAD WIDENING WITHIN 100' LIMITING DISTANCE OF NYSDEC WETLAND WILL BE PERFORMED ON THE SIDE OF THE ROAD FURTHEST FROM THE NYSDEC WETLAND

OLD POST ROAD (RT # 35)

24.0'

434

ORTIONS OF EXISTING ROAD
ITHIN 100' LIMITING DISTANCE
WETLAND WILL BE PERFORMED
OF THE ROAD FURTHEST
YSDEC WETLAND

OLD POST ROAD (RT # 35)

EXISTING GRAVEL PULL-OFF TO REMAIN

PROPOSED 20' WIDE ASPHALT DRIVEWAY

3-PROPOSED SEGMENTAL RETAINING WALLS (4' MAX. HEIGHT EA.)

PROPOSED WIDENING TO 20', REALIGNING AND RESURFACING OF EXISTING DRIVEWAY (FROM STA. 3+50 TO STA. 6+55)

PROPOSED MOUNTABLE CURB & ITEM#4 PAD (FOR EMERGENCY TURNING MANEUVERS)

Masonry Stone Retaining Wall (typical)

EXISTING STORY FRAME SE TO REMAIN

Deck

STOCKPILE

PROPOSED DRILLED WELL

PROPOSED BUILDING 1 F.F. ELEV. = 520.0

PROPOSED SEGMENTAL BLOCK RETAINING WALL (5' MAX. HEIGHT)

PROPOSED 4' WIDE CONCRETE

PROPOSED BUILDING F.F. ELEV. = 520.0 BASMT ELEV. = 5

COURTYAR

TW = 528.0

4.0'

8.0'

20.0'

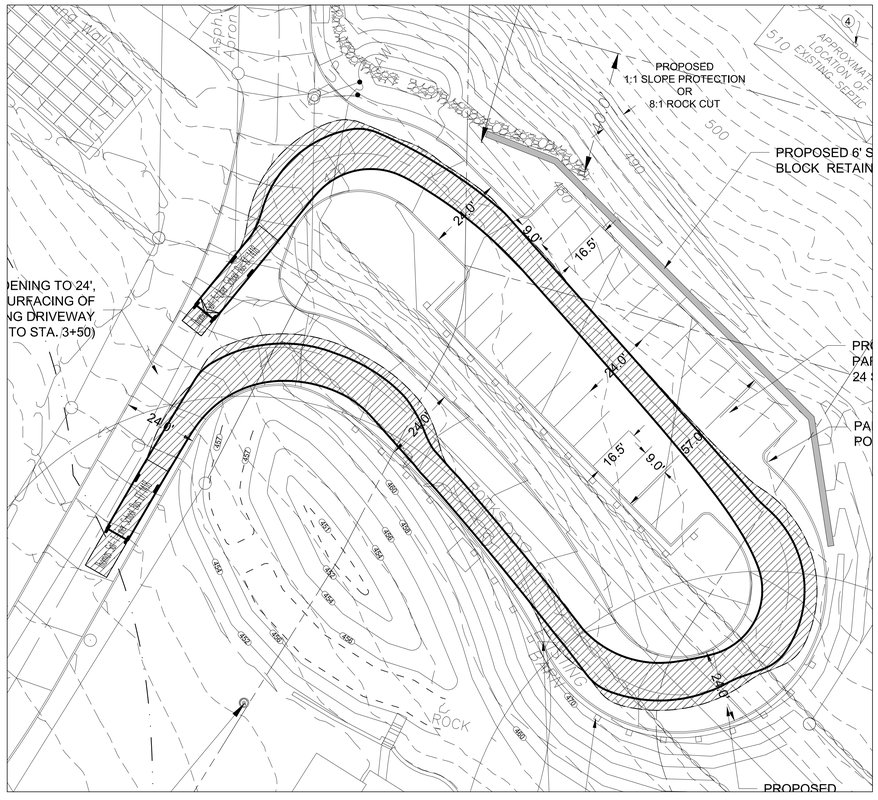
100'

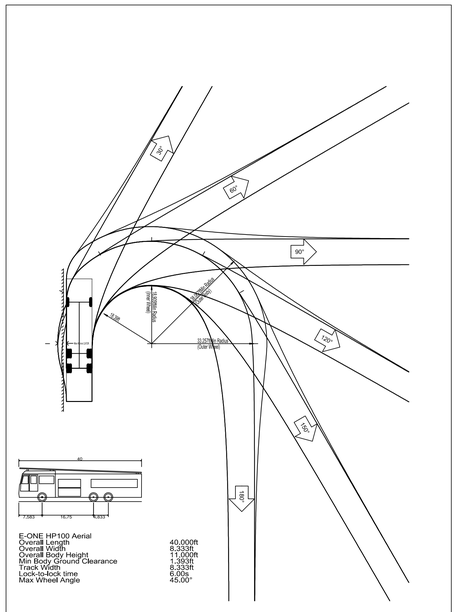
66.0'

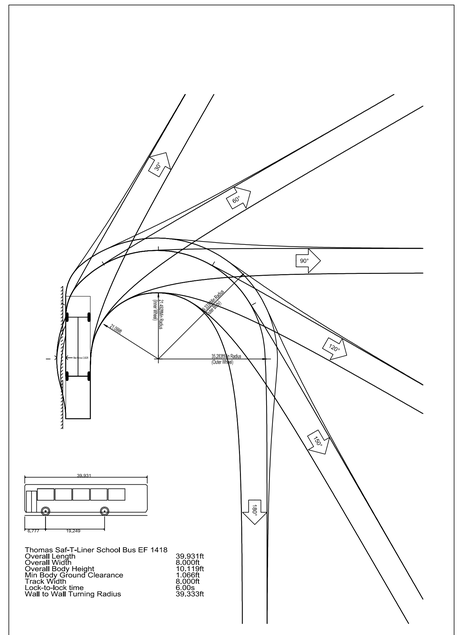
50.0'

86.1'

71.3'







LEGEND:

- DESIGN VEHICLE OUTLINE & DIRECTION OF TRAVEL
- DESIGN VEHICLE OUTLINE & DIRECTION OF TRAVEL
- FORWARD MOVEMENT WHEEL PATH
- REVERSE MOVEMENT WHEEL PATH
- VEHICLE BODY ENVELOPE

REVISIONS

DATE:	DESCRIPTION	BY/CK	DATE:	DESCRIPTION	BY/CK

STATE OF NEW YORK · MATTHEW J. GIRONDA · LICENSED PROFESSIONAL ENGINEER · No. 095008

MATTHEW J. GIRONDA P.E.

TURNING MANEUVERS

WOLF CONSERVATION CENTER

7 BUCK RUN, SOUTH SALEM, NY 10590
TOWN OF LEWISBORO , WESTCHESTER COUNTY, NY

BIBBO ASSOCIATES, LLP
293 ROUTE 100 SUITE 203
SOMERS, NEW YORK 10589
TEL: 914 277 5805

DATE:	12-29-2020
SCALE:	1" = 30'
FILE:	L5
DSGN / CHK:	MG/RH
DRN. BY:	RH
SHT NO.	9 OF 12
DWG NO.	T-1

MAINTENANCE AND INSPECTION REQUIREMENTS

A. Construction Phase

Throughout project construction, the responsibility for installation, maintenance and repair of erosion controls and SMP's will rest with the site contractor as the owner's representative. Oversight of the preparedness of erosion controls and SMP's will be conducted by the owner's qualified professional through regular inspections in accordance with NYSDEC SPDES GP-0-15-002 General Permit requirements. On a daily basis, the project superintendent shall check for damaged silt fence, the need to clean mud tracked onto Route 35. Street sweeping should be conducted as required. Monitor catch basin sumps for sediment accumulation and clean out when one half full.

Construction debris, such as sheet metal and wood scrap, paper and insulation products, styrofoam cups and paper wrappers can become windblown litter over and off the site if neglected. Such litter is easily controlled and prevented when the project superintendent sets the tone for vigilant litter control at the outset of the project. Suitable and ample refuse containers will be provided on the site and emptied when full. Any scattered debris will be picked up and placed in containers on a daily basis. Heavy equipment will be refueled by daily deliveries to the site. Gasoline and oil for small engine equipment will be stored in construction equipment storage sheds. Refueling will take place at least 100 feet from the drainage swales to preclude any possible escape of spilled fuel to stormwater. In the event of any major spill, its capture and the removal of contaminated soil will be conducted under NYSDEC regulations for spill remediation.

As work progresses, the superintendent must ensure that the new work area is first protected with perimeter erosion controls. As important as the need to identify areas requiring protection, is the need to determine disturbed areas that can be stabilized with temporary vegetation. Site management responsibilities will include identification of sections in a work phase where active site work will not occur over the next 7 days. If disturbed earth is present, the superintendent will direct the spreading of rye grass seed and mulch for a temporary protective cover.

B. Post Construction

Following completion of construction, stabilization of the site and establishment of turf material, responsibility and maintenance will remain with the Owner. These items will require the following maintenance tasks:

Inspection - Following construction, each Infiltration System, detention system, CDS's outlet and diversion MH's will require regular inspections on at least a semi-annual basis and following major storm events to check for:

A. Evidence of clogging of detention system outlet structure
B. Accumulation of sediment at the inlet and around detention system outlet control structure
C. Sediment accumulation at the Infiltration Systems
D. Accumulation of debris and sediment in the diversion manholes, detention system inlet and equalization piping and catch basins
E. Swale erosion

Debris and Litter Control - Removal of debris and litter should be undertaken during the mowing operation.

Erosion Control - Eroding soil on slopes, contributory areas noted during inspections and in diversion swales should be stabilized immediately with topsoil replacement, seeding and mulching. Any riprap dislodged at pipe outlets and in swales should be repositioned.

Sediment Removal - Sediment deposition in the detention and Infiltration Systems, CDS pretreatments and diversion Manholes will need to be removed in order to maintain capacity for stormwater treatment and prevent clogging of the outlet structure. The need for sediment removal should be determined during routine inspections and the appropriate equipment and manpower scheduled for the task.

Catch Basin Cleanout - Catch basins are provided with sumps 18 inches below the pipe inverts for sediment trapping purposes. Catch basin sumps should be cleaned annually using a vacuum cleaning service.

SOIL RESTORATION

SOIL RESTORATION IS A REQUIRED PRACTICE APPLIED ACROSS AREAS OF A DEVELOPMENT SITE WHERE SOILS HAVE BEEN DISTURBED AND WILL BE VEGETATED IN ORDER TO RECOVER THE ORIGINAL PROPERTIES AND POROSITY OF THE SOIL.

SOIL RESTORATION IS APPLIED IN THE CLEANUP, RESTORATION, AND LANDSCAPING PHASE OF CONSTRUCTION FOLLOWED BY THE PERMANENT ESTABLISHMENT OF AN APPROPRIATE, DEEP-ROOTED GROUNDCOVER TO HELP MAINTAIN THE RESTORED SOIL STRUCTURE. SOIL RESTORATION INCLUDES MECHANICAL DECOMPACTION, COMPOST AMENDMENT, OR BOTH.

DURING PERIODS OF RELATIVELY LOW TO MODERATE SUBSOIL MOISTURE, THE DISTURBED SUBSOILS ARE RETURNED TO ROUGH GRADE AND THE FOLLOWING SOIL RESTORATION STEPS APPLIED:

1) APPLY 3 INCHES OF COMPOST¡ OVER SUBSOIL

2) TILL COMPOST INTO SUBSOIL TO A DEPTH OF AT LEAST 12" (INCHES) USING A CAT-MOUNTED RIPPER, TRACTOR-MOUNTED DISC, OR TILLER, MIXING, AND CIRCULATING AIR AND COMPOST INTO SUBSOILS.

3) ROCK-PICK UNTIL UPLIFTED STONE/ROCK MATERIALS OF FOUR INCHES AND LARGER SIZE ARE CLEANED OFF THE SITE.

4) APPLY TOPSOIL TO A DEPTH OF 6" (INCHES).

5) VEGETATE AS REQUIRED BY APPROVED PLAN.

COMPOST SHALL BE AGED, FROM PLANT DERIVED MATERIALS, FREE OF VIABLE WEED SEEDS, HAVE NO VISIBLE FREE WATER OR DUST PRODUCED WHEN HANDLING, PASS THROUGH A HALF INCH SCREEN AND HAVE A PH SUITABLE TO GROW DESIRED PLANTS.

CRITICAL AREA SEEDING SPECIFICATION

This practice applies to all disturbed areas void of vegetation except where specific seeding/planting recommendations exist in other standards and specifications for specific uses such as recreation.

SEEDING
Site preparation-scarify soil surface for: seedbed preparation if compacted.
Remove debris and obstacles such as rocks and stumps.

Soil Amendments
1. Lime to PH 6.0
2. Fertilize with 600lbs. of 5-10-10 or equivalent per acre (14lbs./ 1000 sq.ft.).

Seed Mixtures
1. Temporary Seeding's
   a. Ryegrass (annual or perennial) @ 30lbs. per acre(0.7 lbs/ 100sq.ft.).
   b. Certified "aroostook" winter rye (ceral rye) @ 100 lbs. per acre(2.5lbs./1000 sq.ft.).

   Use winter rye if seeding in October/November.

2) Permanent Seeding's
   a. Rough or occasionally mowed areas:

	lbs. / acre	lbs. / 1000sq. ft.
Empire birdsfoot trefoil(1)	8	0.20
OR		
Common white clover(1)	8	0.20
PLUS		
Tall fescue	20	0.45
PLUS		
Redtop	2	.05
OR		
Ryegrass	5	0.10 (perennial)

(1) add innoculant immediately prior to seeding.

Time of seeding

The optimum time for permanent seeding's with legumes (birdsfoot trefoil or clover) is early spring.

Permanent seeding's may be any time of the year if properly mulched and adequate moisture is provided. Mid summer is not a good time to seed, but these seeding's if construction is complete, will facilitate covering the land. Portions may fail and may need reseeding the following year.

Temporary seeding's should be made within 24 hours of construction or disturbance. If not, the soil must be scarified prior to seeding.

Method of seeding

Broadcasting. drilling with cultipack type seeder or hydroseeding are acceptable. Good soil to seed contact is the key to successful seeding's.

Mulching and Mulch Anchoring

See specifications below.

Irrigation

Watering may be essential to establish a new seeding. Weather conditions and the intended use of the area will dictate when to water. Irrigation is specialized practice and care needs to be taken not to exceed the application rate/infiltration rate of a given soil.

Each application must be uniformly applied and 1 to 2 inches of water should be applied per application set up.

Mulching

The mulching specifications provided hereon apply to any disturbed areas or exposed slopes 20' vertical or greater that are exposed outside of the spring and fall grass growing season.

Mulch Material: Air-dried hay or straw: free of undesirable seeds and coarse materials.

Application Rate: 90-100 lbs per 1000 s.f. or 2 tons per acre.

Recommended Surface Coverage: Approximately 90%

Mulch Anchoring Material: Biodegradable Mulch netting: light-weight paper, jute wood fiber, or plastic netting

Method of Anchoring Application: Staple mulch netting to soil surface in accordance with netting manufacturers recommendations.

SEDIMENTATION & EROSION CONTROL NOTES

A. General Notes

1. Prior to commencement of any clearing, grading, or excavation in connection with any proposed construction activity, the Owner of Record shall file a notice of Intent (NOI) with the New York State Department of Environmental Conservation (NYSDEC) and the Town of Lewisboro. When all construction has been completed and the site has reached final stabilization, the Owner shall submit a Notice of Termination NOT) to the NYSDEC and the Town of Lewisboro.

2. A copy of all Notice of Intents and all Contractor's Certifications, required pursuant to the NYS DEC's "SPDES General Permit for Stormwater Discharges from Construction Activity" (Permit No. GP-02-01) for all land disturbances, development or redevelopment located within the Town of Lewisboro, shall also be filed with the Lewisboro Planning Department.

3. All construction activities involving the removal or deposition of soil are to be provided with appropriate protective measures to minimize erosion and contain sediment deposition within the site. Minimum soil erosion and sediment control measures shall be implemented as shown on the plans approved by the Town of Lewisboro. All erosion and sediment control measures employed during construction shall comply with the NYS DEC's "New York Standards and Specifications for Erosion and Sediment Control," latest edition.

4. The Owner's Field Representative (O.F.R.) will be responsible for the implementation and maintenance of sediment and erosion control measures on the site prior to and during construction. All erosion control measures are to be maintained in proper functioning order and are to be repaired or replaced as necessary, or as required by the Town Planner, Building Inspector, Town ECI, or Town Engineer.

5. Sedimentation and erosion control measures shall be inspected and maintained on a daily basis by the O.F.R. to ensure 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 sediment and erosion control measures shall be immediately repaired by the Contractor and inspected for approval by the O.F.R. and/or Site Engineer.

6. The O.F.R. shall inspect downstream conditions for evidence of sedimentation on a weekly basis and after rainstorms of 0.5 inches or greater.

7. All erosion control measures are to be inspected and maintained on a regular basis throughout the construction period and until all disturbed land has been stabilized by vegetation or paving. Responsibility for the erosion and sediment control plan rests with the landowner of record. This responsibility includes installation and maintenance of all control measures, informing all parties involved in site construction of the plan's objectives and requirements, notifying the Town of Lewisboro of any transfer of its responsibility and transferring a copy of the certified erosion and sediment control plan should the title of all or part of the land be transferred.

8. Site inspections shall be conducted by a qualified soil erosion control professional (retained by the Owner) at least twice every seven (7) calendar days and within 24 hours of the end of a storm event of 0.5 inches or greater.

9. Wherever feasible, natural vegetation should be retained and protected. Only the smallest practical area of land should be exposed at any one time during development, and the exposure shall be kept to the shortest practical period of time. Disturbance shall be limited to the areas required to perform construction.

10 Stabilized construction entrances, silt fences and other erosion and sediment controls shall be installed as shown on plans approved by the Town of Lewisboro prior to beginning any clearing and grubbing or earthwork.

11 The exposure of an area by site preparation shall be kept to the shortest practical period of time. Erosion and sediment control requirements shall include surface stabilization measures applied as soon as practical in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than seven (7) days after the construction activity in that portion of the site has temporarily or permanently ceased. From November 1 through March 31 any disturbed area must be stabilized using a heavy mulch layer, a rolled erosion control product or another method that does not require seed germination to control erosion. Any graded areas not subject to further disturbance or construction traffic shall be immediately brought to final grade and receive permanent vegetation cover in combination with a suitable mulch.

12 The permanent final vegetation and structures shall be installed as soon as practical and as may be directed by the Town Planner, Town ECI, or Town Engineer.

13. All topsoil to be stripped from the area being developed shall be stockpiled not less than two hundred (200) feet from any body of surface water and shall be immediately seeded with a rye grass mixture having a quick germination time.

14. Grass seed mix may be applied by either mechanical or hydroseeding methods. All seeding and turf establishment shall be performed in accordance with the current edition of the NYS DOT's "Standard Specifications- Construction and Materials," Section 610-3.02, Method No. 1. If seeding is performed between May 15th and August 15th irrigation may be required to ensure proper lawn establishment, and shall be performed if so directed by the project engineer or the Town's representatives.

15. All cut slopes and embankment fills are to be immediately laid back and stabilized using appropriate techniques which meet the design standards found in the "New York Standards and Specifications for Erosion and Sediment Control," latest edition. At a minimum, slopes and embankments shall be stabilized as follows:
   a. Grade to finished slopes.
   b. Scarified.
   c. Topsoiled with not less than four (4) inches of suitable topsoil material.
   d. Seeded with perennial rye grass. Seed shall be applied at the rate of not less than five (5) pounds per one thousand (1,000) square feet.
   e. Mulched with not less than one (1) inch and not more than three (3) inches of straw (two tons per acre) and anchored in a suitable manner.
   f. All graded slopes greater than a 2h:1v shall use a rolled erosion control product or other means necessary to provide permanent stabilization, and shall be approved by the Town of Lewisboro prior to installation.

16. On all embankment fill slopes, topsoil shall be stripped at least five (5) feet wider than required for the embankment toe of slope. A protective berm of topsoil shall be left in this area, running parallel to the contours for the purpose of restricting drainage runoff. The topsoil berm shall be seeded as required for stockpiles.

17. Paved roadways shall be kept clean at all times.

18. The site shall at all times be graded and maintained such that all stormwater runoff is diverted to soil erosion and sediment control facilities.

19. All storm drainage outlets shall be stabilized, as required, before the discharge points become operational.

20. Stormwater from disturbed areas must be passed through sediment control devices before discharge beyond disturbed areas or discharged into other drainage systems.

21. Dust shall be controlled by sprinkling or other approved methods as necessary, or as directed by the O.F.R.

22. Cut and fills shall not endanger adjoining property, nor divert water onto the property of others.

23. All fills shall be compacted to provide stability of material and to prevent settlement.

24. Erosion control measures shall remain in place until all soil disturbing activities have been completed and all disturbed areas are suitably stabilized. A disturbed area shall be deemed to be "suitably stabilized" upon establishment of a uniform perennial vegetative cover (having a density of at least 80%) on all unpaved areas or areas not covered by permanent structures. Areas which are paved or covered by a permanent structures shall also be considered to be "suitably stabilized."

25. Construction equipment shall not unnecessarily cross live streams except by means of bridges and culverts or other approved methods.

26. Temporary on-site sedimentation basins for the immediate control of erosion and sediment transport are to be provided when and where required or ordered. The length, width and depth of such basins are to be determined in the field in accordance with the "New York Standards and Specifications for Erosion and Sediment Control," latest edition.

27. As warranted by field conditions, special additional sedimentation and erosion control measures, as specified by the site Engineer, the Building Inspector, the Town Planner the Town ECI and/or the Town Engineer shall be installed by the Contractor at no cost to the Town.

B. Streams

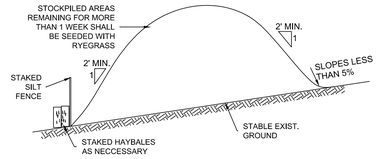
1. All construction activities in or around streams are to be provided with temporary erosion control structures, dewatering devices, or temporary stream diversions as approved by the Town of Lewisboro. These structures shall be in place as shown on the approved plans prior to the start of any construction activity.

2. Construction of temporary erosion control measures shall begin with the installation of devices/measures located farthest downstream, and thence proceed upstream until all required erosion control measures are in place.

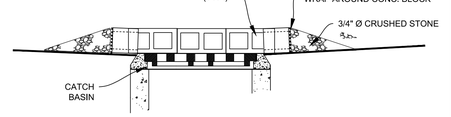
3. After construction, the temporary erosion control measures are to be removed in reverse order, with the erosion control measures located farthest upstream removed first, and thence proceeding downstream.

4. Construction activities are to begin with the farthest downstream work and proceed to activities farthest upstream. Prior to commencement of upstream activities, all downstream construction must be completed and permanently stabilized.

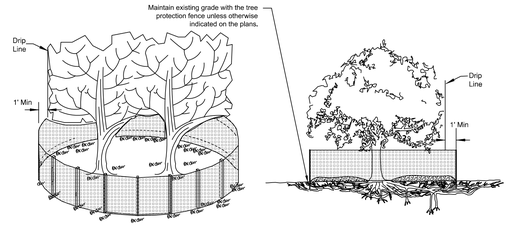
5. All temporary erosion control measures are to be left in place, maintained and replaced as needed or as directed, until all work upstream therefrom has been completed and all related temporary erosion control measures have been removed.



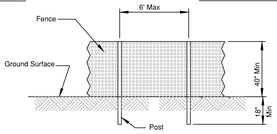
TYPICAL SOIL STOCKPILE DETAIL
N.T.S.



STONE & CONCRETE BLOCK INLET PROTECTION AT CATCH BASIN
N.T.S.
(TO BE INSTALLED ON DRIVEWAY AFTER INSTALLATION OF ITEM #4)



TREE GROUP INDIVIDUAL TREE

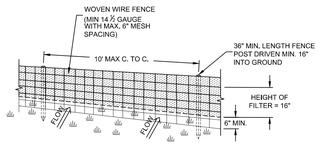


POST AND FENCE DETAIL

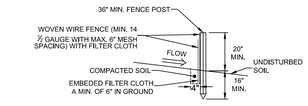
EXISTING TREE PROTECTION
N.T.S.

TREE PROTECTION SHALL BE INSTALLED PRIOR TO ANY CONSTRUCTION ACTIVITY.

NOTES:
1. THE FENCE SHALL BE LOCATED A MINIMUM OF 1 FOOT OUTSIDE THE DRIP LINE OF THE TREE TO BE SAVED AND IN NO CASE CLOSER THAN 5 FEET TO THE TRUNK OF ANY TREE.
2. FENCE POSTS SHALL BE EITHER STANDARD STEEL OR 2" X 6" WOOD POSTS OR APPROVED EQUAL.
3. THE FENCE MAY BE EITHER 40" HIGH SNOW FENCE, 40" PLASTIC WEB FENCING OR APPROVED EQUAL.
4. NO PRUNING SHALL BE PERFORMED EXCEPT BY APPROVED ARBORIST.
5. NO EQUIPMENT SHALL OPERATE INSIDE THE PROTECTIVE FENCING INCLUDING DURING FENCE INSTALLATION AND REMOVAL.



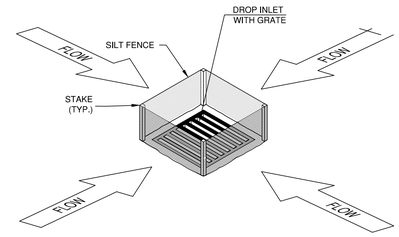
PERSPECTIVE VIEW



SECTION VIEW

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

SILT FENCE DETAIL
N.T.S.



CONSTRUCTION SPECIFICATIONS

1. FILTER FABRIC SHALL HAVE AN EOS OF 40-85. BURLAP MAY BE USED FOR SHORT TERM APPLICATIONS.
2. CUT FABRIC FROM A CONTINUOUS ROLL TO ELIMINATE JOINTS. IF JOINTS ARE NEEDED THEY WILL BE OVERLAPPED TO THE NEXT STAKE.
3. STAKE MATERIALS WILL BE STANDARD 2" x 4" WOOD OR EQUIVALENT, METAL WITH A MINIMUM LENGTH OF 3 FEET.
4. SPACE STAKES EVENLY AROUND INLET 3 FEET APART AND DRIVE A MINIMUM 18 INCHES DEEP, SPANS GREATER THAN 3 FEET MAY BE BRIDGED WITH THE USE OF WIRE MESH BEHIND THE FILTER FABRIC FOR SUPPORT.
5. FABRIC SHALL BE EMBEDDED 1 FOOT MINIMUM BELOW GROUND AND BACKFILLED. IT SHALL BE SECURELY FASTENED TO THE STAKES AND FRAME.

DROP INLET PROTECTION AT CATCH BASIN
N.T.S.

CONSTRUCTION SPECIFICATION

1 STONE SIZE- USE 2" STONE, OR RECYCLED CONCRETE EQUIVALENT.

2 LENGTH-NOT LESS THAN 50' (EXCEPT ON A SINGLE RESIDENCE LOT WHERE A 30 FOOT MINIMUM LENGHT WOULD APPLY.)

3 THICKNESS- NOT LESS THAN SIX (6) INCHES.

4 WIDTH- TWELVE (12) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS. TWENTY-FOUR (24) FOOT IF SINGLE ENTRANCE TO SITE.

5 FILTER CLOTH- WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.

6 SURFACE WATER- ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRACES SHALL BE PIPED ACROSS THE ENTRANCE, IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.

7 MAINTENANCE- THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACTED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.

8 WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE & 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.

TREE GROUP INDIVIDUAL TREE

POST AND FENCE DETAIL

EXISTING TREE PROTECTION
N.T.S.

TREE PROTECTION SHALL BE INSTALLED PRIOR TO ANY CONSTRUCTION ACTIVITY.

NOTES:
1. THE FENCE SHALL BE LOCATED A MINIMUM OF 1 FOOT OUTSIDE THE DRIP LINE OF THE TREE TO BE SAVED AND IN NO CASE CLOSER THAN 5 FEET TO THE TRUNK OF ANY TREE.
2. FENCE POSTS SHALL BE EITHER STANDARD STEEL OR 2" X 6" WOOD POSTS OR APPROVED EQUAL.
3. THE FENCE MAY BE EITHER 40" HIGH SNOW FENCE, 40" PLASTIC WEB FENCING OR APPROVED EQUAL.
4. NO PRUNING SHALL BE PERFORMED EXCEPT BY APPROVED ARBORIST.
5. NO EQUIPMENT SHALL OPERATE INSIDE THE PROTECTIVE FENCING INCLUDING DURING FENCE INSTALLATION AND REMOVAL.

PERSPECTIVE VIEW

SECTION VIEW

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

SILT FENCE DETAIL
N.T.S.

CONSTRUCTION SPECIFICATIONS

1. FILTER FABRIC SHALL HAVE AN EOS OF 40-85. BURLAP MAY BE USED FOR SHORT TERM APPLICATIONS.
2. CUT FABRIC FROM A CONTINUOUS ROLL TO ELIMINATE JOINTS. IF JOINTS ARE NEEDED THEY WILL BE OVERLAPPED TO THE NEXT STAKE.
3. STAKE MATERIALS WILL BE STANDARD 2" x 4" WOOD OR EQUIVALENT, METAL WITH A MINIMUM LENGTH OF 3 FEET.
4. SPACE STAKES EVENLY AROUND INLET 3 FEET APART AND DRIVE A MINIMUM 18 INCHES DEEP, SPANS GREATER THAN 3 FEET MAY BE BRIDGED WITH THE USE OF WIRE MESH BEHIND THE FILTER FABRIC FOR SUPPORT.
5. FABRIC SHALL BE EMBEDDED 1 FOOT MINIMUM BELOW GROUND AND BACKFILLED. IT SHALL BE SECURELY FASTENED TO THE STAKES AND FRAME.

DROP INLET PROTECTION AT CATCH BASIN
N.T.S.

CALL BEFORE YOU DIG 1-800-962-7962

UNDER THE NY STATE LAW PROTECTING UNDERGROUND FACILITIES, THE FOLLOWING RULES AND REGULATIONS ARE IN EFFECT FOR ALL EXCAVATORS:

* THEY MUST CALL FOR A UTILITY STAKE-OUT (2) TWO FULL WORKING DAYS PRIOR TO AN EXCAVATION.
* THEY MUST CONFIRM PRECISE LOCATIONS OF UNDERGROUND FACILITIES.
* THEY MUST PRESERVE STAKES AND MARKINGS UNTIL NO LONGER NEEDED AT SITE.
* THEY MUST CONTACT NON-UFPO MEMBER UTILITY OWNERS FOR STAKE-OUTS.

REVISIONS:

DATE:	DESCRIPTION	BY/CK	DATE:	DESCRIPTION	BY/CK

STATE OF NEW YORK · MATTHEW J. GIRONDA · LICENSED PROFESSIONAL ENGINEER · No. 095400

MATTHEW J. GIRONDA P.E.

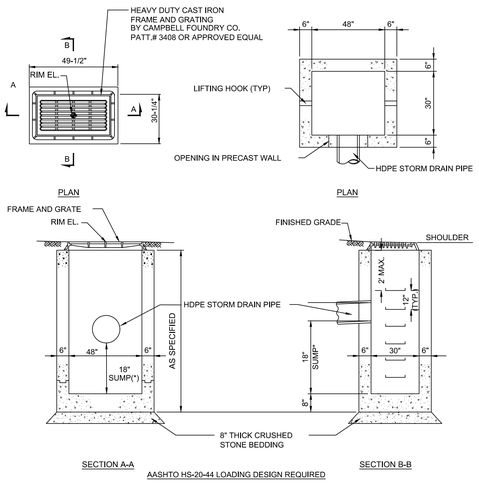
EROSION CONTROL NOTES & DETAILS

WOLF CONSERVATION CENTER
7 BUCK RUN, SOUTH SALEM, NY 10590
TOWN OF LEWISBORO , WESTCHESTER COUNTY, NY

BIBBO ASSOCIATES, LLP
293 ROUTE 100 SUITE 203
SOMERS, NEW YORK 10589
TEL. 914 277 5805

DATE:	12-29-2020
SCALE:	1" = 60'
FILE:	L5
DSGN / CHK:	MG/RH
DRN. BY:	RH
SHT NO.	10 OF 12
DWG NO.	EC-2

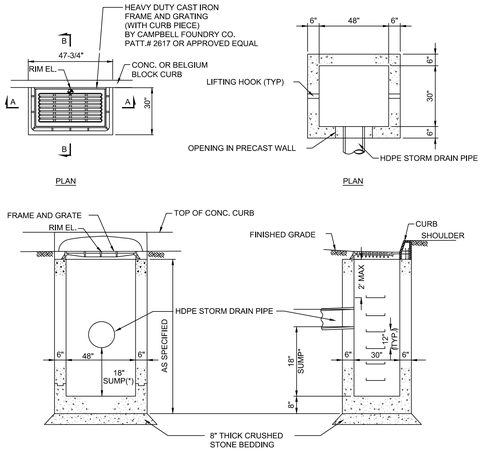
P:\Projects\WOLF CONSERV. CENTER\dwg\Wolf Center Site Plan 12-29-20 PB.dwg, 12/28/2020 4:24:25 PM



AASHTO HS-20-44 LOADING DESIGN REQUIRED

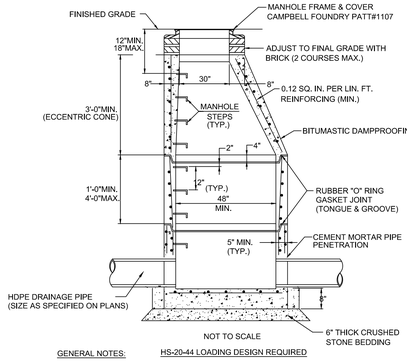
1. BASE & RISE SECTIONS SHALL BE PRECAST & MONOLITHICALLY POURED.
2. CONCRETE SHALL BE 4,000 PSI AT TIME OF DELIVERY.
3. ALL BASINS SHALL HAVE 18" MINIMUM SUMPS.
4. PROVIDE PROPER LIP AND / OR ANCHORING IN CASES OF HIGH GROUND WATER TO PREVENT FLOATATION.
5. LADDER RUNGS CONFORMING TO N.Y.S.D.O.T. SPEC. NO.725-02.01
6. ALL PIPES SHALL BE LAID OR CUT FLUSH WITH THE INSIDE OF THE BASIN WALL & SHALL BE FIRMLY PARGED IN PLACE, BOTH INSIDE AND OUTSIDE.
7. BRICK FRAME & GRATE TO GRADE TO MATCH BOTH CROWN OF ROAD & SLOPE OF ROAD, A MAX. OF TWO (2) CONCRETE BRICKS OR ONE (1) 6" SOLID BLOCK WILL BE PERMITTED, PARGED INSIDE & OUTSIDE.

TYPICAL CATCH BASIN (FT TYPE)
N.T.S.



AASHTO HS-20-44 LOADING DESIGN REQUIRED

TYPICAL CATCH BASIN (CI TYPE)
N.T.S.



GENERAL NOTES: HS-20-44 LOADING DESIGN REQUIRED

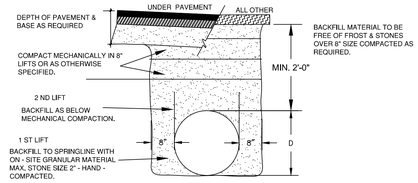
1. DRAINAGE PIPES MARKED WITH "HDPE" SHALL BE HIGH DENSITY POLYETHYLENE SMOOTH BORE AS MANUFACTURED BY ADS N-12 OR APPROVED EQUAL
2. CATCH BASINS, MANHOLES AND ALL CASTINGS SHALL BE IN ACCORDANCE WITH TOWN OF SOMERS REQUIREMENTS, STANDARDS AND SPECIFICATIONS AND AS SHOWN ON PLANS.
3. UNDERDRAINS SHALL BE 6" DIA. PERFORATED CORRUGATED STEEL PIPE OR EQUAL.
4. CATCH BASIN OR DRAIN MANHOLE WITH 3 OR MORE PIPE CONNECTIONS SHALL BE OVERSIZED DIMENSIONS.

NOTES:

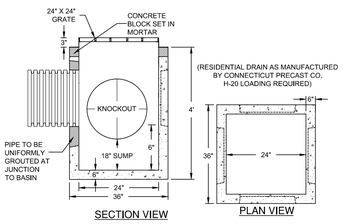
1. 5' OR 6' DIA. PRECAST BASES MAY BE USED WHEN REQUIRED DUE TO SIZE OR NUMBER OF PIPES AT THE MANHOLE. ECCENTRIC PRECAST REDUCERS SHALL BE PLACED ABOVE THE 5' OR 6' BASE AND THE WALL THICKNESS INCREASED 1" FOR EACH 1' OF INSIDE DIAMETER INCREASE.
2. NON-SHRINK GROUT MAY BE UTILIZED IN LIEU OF FLEXIBLE SLEEVES FOR STORM DRAINAGE MANHOLES.
3. LIFTING HOLES IN PRECAST SECTIONS TO BE FILLED WITH MORTAR.
4. FOR SHALLOW MANHOLES, SUBSTITUTE PRECAST SLAB TOP FOR ECCENTRIC CONE. SLAB SHALL BE CAPABLE OF SUPPORTING AN HS-20-44 LOAD.

EXCEPTION: DMH #4 WILL HAVE 2' SUMP AT THE END OF THE BYPASS LINE TO TREAT OFFSITE AREAS

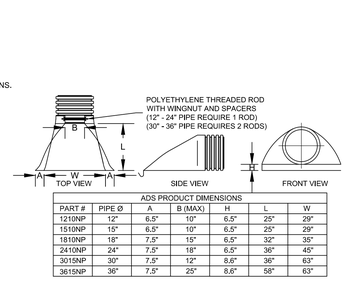
PRECAST CONCRETE DRAINAGE MANHOLE
N.T.S.



DRAINAGE PIPE INSTALLATION
N.T.S.

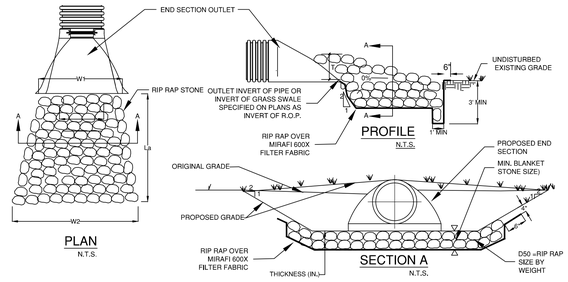


YARD DRAIN DETAIL
N.T.S.

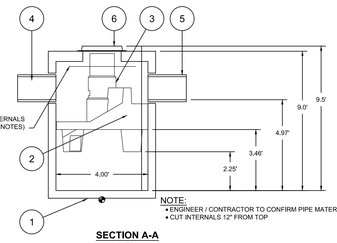


ADS PRODUCT DIMENSIONS						
PART #	PIPE Ø	A	B (MAX)	H	L	W
1210NP	12"	6.5"	10"	6.5"	25"	29"
1510NP	15"	6.5"	10"	6.5"	25"	29"
1810NP	18"	7.5"	15"	6.5"	32"	35"
2410NP	24"	7.5"	18"	6.5"	36"	45"
3015NP	30"	7.5"	12"	8.6"	36"	63"
3615NP	36"	7.5"	25"	8.6"	58"	63"

ADS - FLARED END SECTION
N.T.S.
(OR APPROVED EQUAL)



ROCK OUTLET PROTECTION (R.O.P.)
N.T.S



PARTS LIST : 4' FIRST DEFENSE HC			
ITEM	SIZE (IN)	MATERIAL	DESCRIPTION
1	48	-	I.D. PRECAST MANHOLE
2	-	-	LEDGER SUPPORT
3	-	-	SEPARATION MODULE
4	8	-	INLET PIPE (BY OTHERS)
5	8	-	OUTLET PIPE (BY OTHERS)
6	30	-	FRAME & COVER

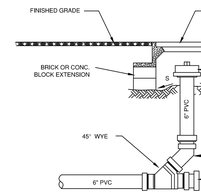
CAPACITIES:

1. PEAK HYDRAULIC FLOW: 18.0 cfs (510 l/s)
2. TYPICAL TREATMENT FLOW: 1.50 cfs (42.40 l/s)
3. SEDIMENT STORAGE CAPACITY: 0.7 cu. yd. (0.5 cu. m.)
4. OIL STORAGE CAPACITY: 191 gal. (723 liters)
5. MAXIMUM INLET/OUTLET PIPE DIAMETERS: 24 in. (600 mm)

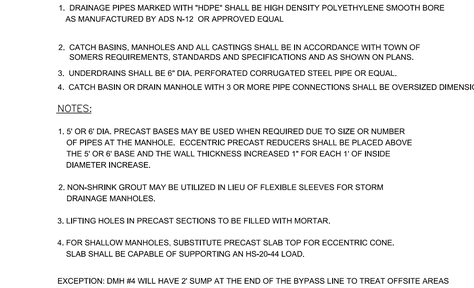
PRODUCT SPECIFICATIONS:

A. The treatment system shall use an induced vortex to separate pollutants from stormwater runoff.
B. The treatment system shall fit within the limits of excavation (area and depth) as shown in the project plans and will not exceed the dimensions for the design flow rates specified herein.
C. The treatment system shall remove greater than or equal to 90% of TSS based on the Target Particle Size (TPS) of 106 microns and/or 80% of TSS based on the TPS of 230 microns at 2.2 cfs and 3.8 cfs, respectively.
D. The treatment system shall convey the Peak On-line Flow Rates of up to 32 cfs without causing upstream surcharge conditions. Full-scale independent laboratory scour testing shall demonstrate effluent control of less than or equal to 5 mg/L for all flows up to 200% of MTFR-106.
E. The treatment system shall be capable of capturing and retaining fine silt and sand size particles. Analysis of captured sediment from full-scale field installations shall demonstrate particle sizes predominately in the 20-micron range

4' FIRST DEFENSE HC DETAIL
N.T.S.
(DESIGNED, MANUFACTURED, AND SUPPLIED BY HYDRO INTERNATIONAL PLC.)



TYPICAL CLEANOUT DETAIL
N.T.S.



ROOF LEADER CONNECTION DETAIL
N.T.S.

SWALE DIMENSIONS				
SWALE I.D.	Z	B	Y	SLOPE
RIP-RAP	2	2'	1'	VARIES

TO BE USED WHERE FLOWS EXCEED 2 F.P.S. OR GRADES EXCEEDING 15 %

RIP-RAP SWALE DETAIL
N.T.S.

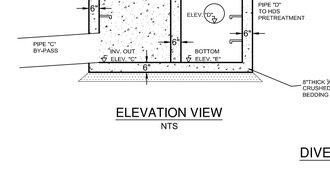
SEED MIXTURE	RATE / 1000 SF
BIRDSFOOT TREFOIL	.2lb
TALL FESCUE	.45 lb
PERRENNIAL RYEGRASS	.1 lb
MULCH: HAY OR STRAW	2 BALES

GRASS LINED SWALE DETAIL
N.T.S.

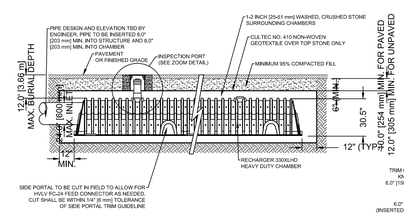
INSTALLATION NOTE:
TO INSURE TANK STABILITY, PROVIDE FOR SUBSURFACE DRAINAGE OF BEDDING AND BACKFILL AREA AS EXISTING CONDITIONS WARRANT. THE USE OF ANCHORING "DEADMEN" WITH STRAPS SHALL ALSO BE USED, IF REQUIRED BY THE PROJECT ENGINEER AFTER INSPECTION OF SITE CONDITIONS PRIOR TO TANK PLACEMENT.

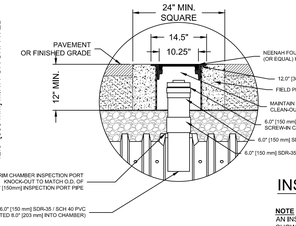
NOTE:
FINAL TANK LOCATION AND CONNECTION DETAILS TO BE COORDINATED WITH THE LOCAL FIRE DEPARTMENT PRIOR TO PURCHASE AND INSTALLATION.

5,025 GAL. FIRE SUPPRESSION WATER STORAGE TANK
N.T.S.



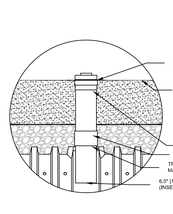
DIVERSION MANHOLE DETAIL
N.T.S.

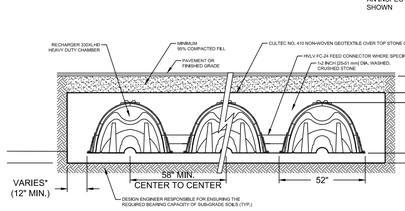




INSPECTION PORT
N.T.S.

NOTE
AN INSPECTION PORT SHALL BE INSTALLED AS SHOWN





CULTEC RECHARGER 330 XLHD
N.T.S.
(OR APPROVED EQUAL)

GENERAL NOTES
RECHARGER 330XL HD BY CULTEC, INC. OF BROOKFIELD, CT. REFER TO CULTEC, INC.'S CURRENT RECOMMENDED INSTALLATION GUIDELINES.
THE CHAMBER WILL BE DESIGNED TO WITHSTAND TRAFFIC LOADS WHEN INSTALLED ACCORDING TO CULTEC'S RECOMMENDED INSTALLATION INSTRUCTIONS

ALL RECHARGER 330XL HD HEAVY DUTY UNITS ARE MARKED WITH A COLOR STRIPE FORMED INTO THE PART ALONG THE LENGTH OF THE CHAMBER.
ALL RECHARGER 330XL HD CHAMBERS MUST BE INSTALLED IN ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE AND FEDERAL REGULATIONS

NOTE:
SHOP DRAWINGS OF ALL CIVIL COMPONENTS SHOULD BE PROVIDED TO OUR OFFICE FOR THEIR REVIEW AND APPROVAL PRIOR TO PRODUCTION / PURCHASING

REVISIONS					
DATE:	DESCRIPTION	BY/CK	DATE:	DESCRIPTION	BY/CK

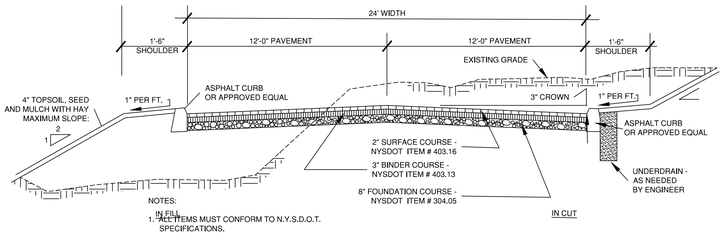
STATE OF NEW YORK
MATTHEW J. GIRONDA
LICENSED PROFESSIONAL ENGINEER
No. 096026
MATTHEW J. GIRONDA P.E.

DETAILS

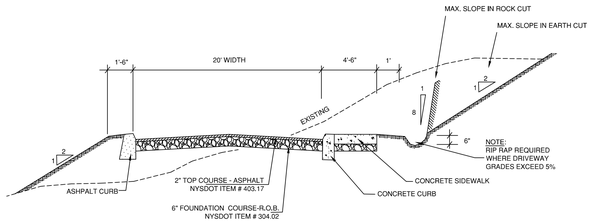
WOLF CONSERVATION CENTER
7 BUCK RUN, SOUTH SALEM, NY 10590
TOWN OF LEWISBORO , WESTCHESTER COUNTY, NY

BIBBO ASSOCIATES, LLP
253 ROUTE 100 SUITE 203
SOMERS, NEW YORK 10589
TEL. 914 277 5805

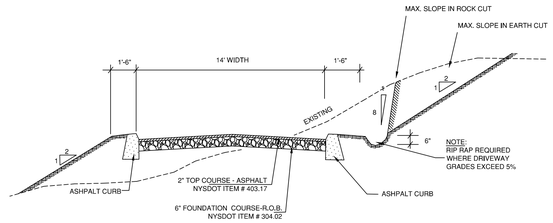
DATE:	12-29-2020
SCALE:	1" = 30'
FILE:	L5
DSGN / CHK:	MG/RH
DRN. BY:	RH
SHT NO.	11 OF 12
DWG NO.	D-1



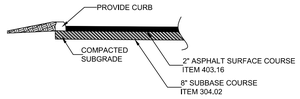
24' WIDE PRIVATE ROAD PAVEMENT SECTION
(STATION 0+00 - 3+50)
N.T.S.



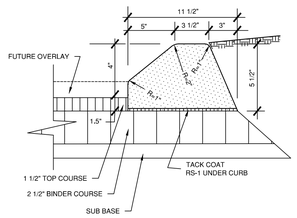
20' WIDE DRIVEWAY PAVEMENT SECTION
(STATION 3+50 - 6+60)
N.T.S.



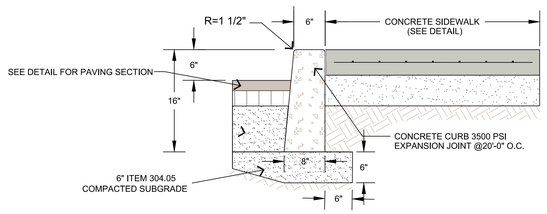
14' WIDE DRIVEWAY PAVEMENT SECTION
(STATION 6+60 - PARKING AREA)
N.T.S.



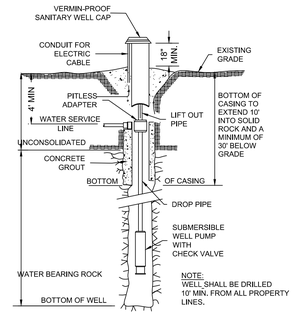
PROPOSED PARKING AREA PAVEMENT SECTION
N.T.S.



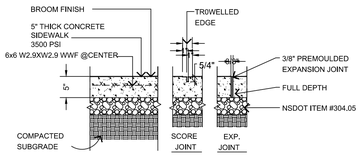
ASPHALT CURB DETAIL
N.T.S.



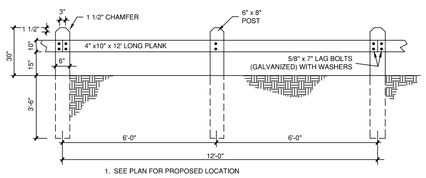
CONCRETE CURB DETAIL
N.T.S.



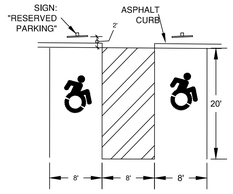
WELL DETAIL
N.T.S.



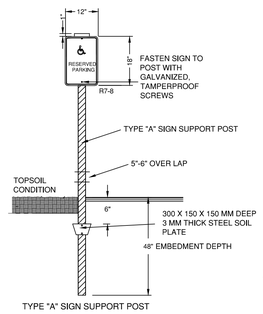
CONCRETE SIDEWALK DETAIL
N.T.S.



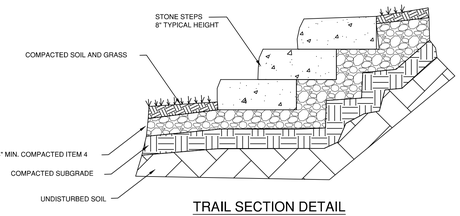
TIMBER GUIDE RAIL DETAIL
N.T.S.



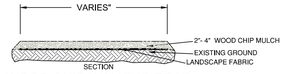
ACCESSIBLE PARKING DIMENSIONS & SIGN PLACEMENT
N.T.S.



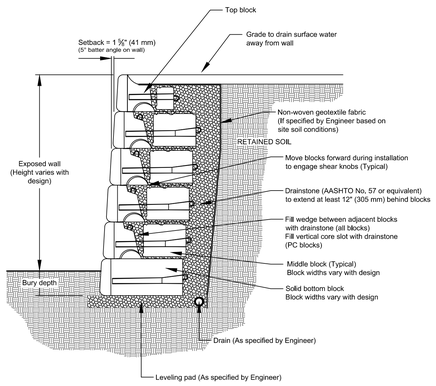
ACCESSIBLE PARKING SIGNAGE &
N.T.S.



TRAIL SECTION DETAIL
N.T.S.



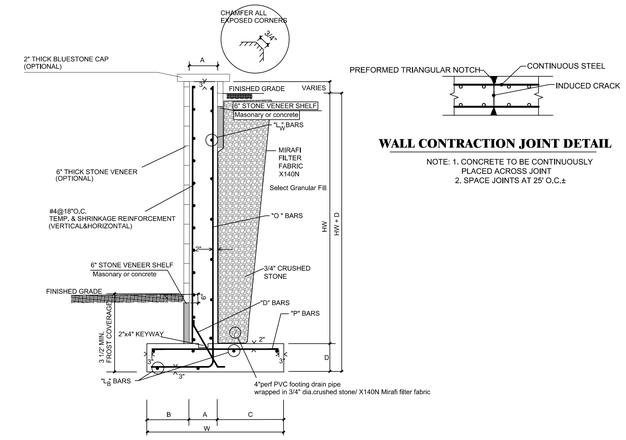
WOOD CHIP WALKING TRAIL
N.T.S.



TYPICAL SEGMENTAL BLOCK RETAINING WALL DETAIL
N.T.S.

NOTES:

1. TYPICAL WALL DETAIL IS PROVIDED FOR REFERENCE ONLY. WALL DESIGN DRAWINGS PREPARED BY A NYS LICENSED ENGINEER SHALL BE PROVIDED TO THE PROJECT ENGINEER FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
2. ACTUAL WALL DESIGN DRAWINGS AND CALCULATIONS SHALL BE BASED ON SITE CONDITIONS.
3. TYPICAL WALL DETAIL PROVIDED ABOVE BASED ON "TYPICAL GRAVITY WALL SECTION" AS MANUFACTURED BY REDI ROCK.



REINFORCED CONCRETE RETAINING WALL DETAIL- SECTION
NTS

RETAINING WALL SCHEDULE										
HW	A	B	C	W	"O" BARS	"D" BARS	"L" BARS	"L" BARS	"P" BARS	"D" BASE DEPTH	DESCRIPTIONS
0' to 10'	12"	15"	3'-5"	5'-8"	#5@12"o.c.	#4@12"	6-#5	#5@12"o.c.	#5@12"o.c.	12"	

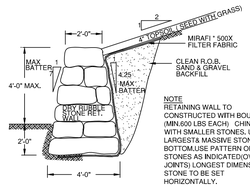
WALL CONTRACTION JOINT DETAIL
NOTE: 1. CONCRETE TO BE CONTINUOUSLY PLACED ACROSS JOINT
2. SPACE JOINTS AT 25' O.C.±

NOTES:

1. THE CONTRACTOR SHALL VERIFY THE EXISTING SOIL, TOPOGRAPHIC CONDITIONS, SUBSEQUENT RETAINING WALL HEIGHTS AND SOIL CONDITIONS PRIOR TO STARTING THE WORK. ANY INCONSISTENCIES SHALL BE REPORTED TO THE DESIGN ENGINEER TO DETERMINE IF FIELD CHANGES ARE REQUIRED.
2. REINFORCEMENT SHALL BE ASTM GRADE 60, DEFORMED BILLET-STEEL REBAR FOR CONCRETE REINFORCEMENT COMPLIANCE WITH ASTM A615.
3. ALL POURED IN PLACE CONCRETE SHALL HAVE A 3000 PSI COMPRESSIVE STRENGTH AT 28 DAYS.
4. WHERE THE RETAINING WALL SHALL BE CONSTRUCTED ON A SLOPE, SUFFICIENT LEVEL SHELVING SHALL BE PROVIDED FOR FOOTING CONSTRUCTION. BOTTOM OF FOOTING SHALL BE CONSTRUCTED AS SHOWN ON THE RETAINING WALL CROSS SECTION.
5. BACKFILL MATERIAL OF THE RETAINING WALL SHALL BE SELECT GRANULAR FILL CONFORMING TO THE GRADATION REQUIREMENTS SPECIFIED IN TABLE 7-7 OF THE NYSDOT STANDARD SPECIFICATIONS AND AS DESCRIBED BELOW:

SIEVE SIZE	PERCENT PASSING
4"	100%
No. 40	0-70%
No. 200	0-15%

6. SELECT GRANULAR FILL SHALL BE FREE OF LARGE STONES, ORGANIC MATTER, SOILS CONTAINING LARGE PERCENTAGES OF SILT / CLAY AND FROZEN MATERIALS. BACKFILL SHALL PROVIDE ADEQUATE DRAINAGE BEHIND THE WALL.
7. RETAINING WALL DESIGN IS BASED ON A 2,0 TON/SF SOIL BEARING CAPACITY. THE CONTRACTOR SHALL FIELD VERIFY SOIL CONDITIONS AND BEARING CAPACITIES OF IN-SITU SOIL. IF SOIL TESTING REVEALS INADEQUATE SOIL BEARING CAPACITIES, THE DESIGN ENGINEER SHALL BE NOTIFIED TO CONFIRM WALL DESIGN PARAMETERS PRIOR TO CONSTRUCTION.
8. THE RETAINING WALL DESIGN IS BASED ON A "B" CLASS "GRANULAR SOILS, MIX GRAIN SIZES" BACKFILL SOIL CONDITION. ANY ALTERATION FROM THESE SOILS, SUCH AS HIGH GROUNDWATER, HIGH PERCENTAGES OF FINES, SILTS AND CLAYS WILL CONSTITUTE DESIGN CHANGES.
9. CONTRACTOR SHALL TAKE CONCRETE CORE SAMPLES FROM FOOTING AND STEM POURS SEPARATELY AND HAVE THEM LABORATORY TESTED FOR COMPRESSIVE STRENGTH FOR 7 AND 28 DAYS.
10. ALL REBAR LAP SPLICES SHALL BE A MINIMUM OF 32" IN LENGTH.
11. WALL CONTRACTION JOINTS WILL BE PROVIDED AT EVERY 25" O.C. AS INDICATED ON THE PLANS
12. CHAMFER ALL EXPOSED CORNERS ¾"
13. NO WALL DRAINAGE SHALL DISCHARGE DIRECTLY TO ADJOINING PROPERTIES.
14. THE COMPLETED RETAINING WALL CONSTRUCTION SHALL BE CERTIFIED BY A LICENSED NEW YORK STATE PROFESSIONAL ENGINEER TO BE IN CONFORMANCE WITH THE APPROVED PLANS AND MUST INCLUDE LABORATORY TESTING RESULTS FOR SUB GRADE BEARING CAPACITY, BACKFILL GRADATION, COMPACTION, CONCRETE STRENGTH AND REBAR PLACEMENT.
14. RETAINING WALL FOOTING BOTTOM WILL BE ON THE EXISTING GRADE. ALL CONCRETE POURS SHALL BE MONOLITHIC AND NO HORIZONTAL COLD JOINTS WILL BE ALLOWED.
15. CONTRACTOR TO ENSURE PROPER SHORING AND/PR BRACING TO STABILIZE OR PREVENT CAVE-INS OF LOOSE SOIL AT THE EXCAVATION SITE.
16. WHEN BACKFILLING AGAINST THE WALLS, HEAVY COMPACTION EQUIPMENT SHALL BE KEPT AT LEAST 5 FEET AWAY FROM THE WALL. ONLY THE LIGHTWEIGHT COMPACTION EQUIPMENT SHALL BE USED NEAR THE WALL.
17. TOP OF WALL ELEVATIONS SHOWN ON THE PLANS INCLUDE 2" THICK CAP STONE, FOR NET CONCRETE ELEVATION SUBTRACT 2" FROM TOP ELEVATIONS.



BOULDER RETAINING WALL DETAIL
N.T.S.

NOTE:
SHOP DRAWINGS OF ALL CIVIL COMPONENTS SHOULD BE PROVIDED TO OUR OFFICE FOR THEIR REVIEW AND APPROVAL PRIOR TO PRODUCTION / PURCHASING

REVISIONS					
12-29-20					
DATE:	DESCRIPTION	BY/CK	DATE:	DESCRIPTION	BY/CK

STATE OF NEW YORK — MATTHEW J. GIRONDA — LICENSED PROFESSIONAL ENGINEER — 095090

MATTHEW J. GIRONDA P.E.

DETAILS

WOLF CONSERVATION CENTER
7 BUCK RUN, SOUTH SALEM, NY 10590
TOWN OF LEWISBORO , WESTCHESTER COUNTY, NY

BIBBO ASSOCIATES, LLP
293 ROUTE 100 SUITE 203
SOMERS, NEW YORK 10589
TEL. 914 277 5805

DATE:	12-29-2020
SCALE:	1" = 30'
FILE:	L5
DSGN / CHK:	SB
DRN. BY	NH
SHT NO.	12 OF 12
DWG NO.	D-2

Preliminary
Stormwater Pollution Prevention Plan

for

Wolf Conservation Center

1,3,4 & 7 Buck Run
Town of Lewisboro,
New York

Date: December 29, 2020

Prepared by:

Bibbo Associates, LLP
Mill Pond Offices
293 Route 100- Suite 203
Somers, New York 10589
(914) 277-5805

Matthew J. Gironda, P.E.
NYS License No. 096030

CONTACT INFORMATION AND CERTIFICATION

Applicant:

Wolf Conservation Center
7 Buck Run
South Salem, NY 10590

Project Engineer & Qualified Inspector:

Bibbo Associates, LLP
293 Route 100, Suite 203
Somers, NY 10589
Attn: Matthew J. Gironda, P.E., NY License 096030
mgironda@bibboassociates.com
(914) 277-5805 ext. 314

Contractor's Certification:

"I hereby certify that I understand and agree to comply with the terms and conditions of the SWPPP and agree to implement any corrective actions identified by the qualified inspector during a site inspection. I also understand that the *owner or operator* must comply with the terms and conditions of the New York State Pollutant Discharge Elimination System ("SPDES") General Permit for Stormwater Discharges from Construction Activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings."

Name & Title: _____

Signature: _____

Company Name: _____

Company Address _____

Phone: _____

Date: _____

Trained Contractor: _____
(On-site, Daily)

Table of Contents:

Appendices:

Figures:

1.0 Introduction

1.1 Project Description

The Wolf Conservation Center is proposing to construct a new educational pavilion and related site improvements to support their existing operations on the subject parcel. The project site is located on Buck Run in the Town of Lewisboro and consists of multiple tax parcels which were previously developed for single family residential use. The Wolf Center currently utilizes the existing dwellings and large wooded areas for their daily operations. In order to better facilitate the current use The Wolf Center is seeking to implement the following site improvements:

- Widening of the existing private road (Buck Run) which provides access to the project site from NYS Route 35.
- Demolition of the existing single-family residence located at 4 Buck Run.
- Construction of a new educational pavilion and supporting water supply and wastewater treatment components.
- Construction of new site wide Stormwater Management system.
- Construction of new and expanded parking areas as well as pedestrian access ways to support the new educational pavilion.
- Construction of new freezer building.
- Construction of 12 camping pods / Yurts.

The total land disturbance resulting from the proposed development including all individual lot construction is approximately 3.8 ac.±. As the total land disturbance exceeds 1-acre and the project is located within the NYC East of Hudson Watershed, coverage under the SPDES General Permit for Temporary Stormwater Discharges from Construction Activity (GP-0-20-001) is required and all proposed SMP's must be designed in accordance with the Enhanced Phosphorous Removal standards specified in Chapter 10 of the Design Manual. In addition, the project will also require a SWPPP approval from the NYCDEP per section 18-39 of their Rules and Regulations. For further discussion regarding NYCDEP requirements, refer to section 2.6 of this report.

Assuming a timely permitting process construction is anticipated to begin in the Fall of 2021.

The following permits are required for the subject project:

Wolf Conservation Center – Required Approvals

Agency and Approval Required:	Status:
Town of Lewisboro Planning Board:	
Subdivision Approval (Preliminary & Final)	Pending
Site Development Plan Approval	Pending
Wetland Permit	Pending
Stormwater Permit	Pending
Westchester County Health Department	
Realty Subdivision Approval	Pending
Change of Use Approval	Pending
Public Water Supply Approval	Pending
New York City Dept. of Environmental Protection: SWPPP Approval	Pending
New York State Dept. of Environmental Conservation:	
Coverage under SPDES General Permit for Stormwater Discharges from Construction Activity (GP-0-20-001)	Pending
Freshwater Wetland Activity Permit	Pending
New York State Department of Transportation: Highway Work Permit for Commercial Entrance	Pending

1.2 Existing Conditions

The project site is located on the north side of NYS Rte. 35 at the intersection with Buck Run in the Town of Lewisboro. The site consists of six (6) separate tax parcels, four (4) of which contain existing single-family dwellings. The two (2) remaining parcels are largely undeveloped and are utilize for the wolf enclosures located in the north and northeastern portions of the property.

The majority of the site is wooded, with lawn areas in the vicinity of the existing dwellings. Existing onsite impervious surfaces consist of the private road (Buck Run), individual driveways and dwellings. Slopes onsite range from moderate to steep, and site topography generally directs runoff from north to south towards an offsite NYSDEC regulated wetland located southwest of the project site. The wetland flows from north to south under NYS Rte. 35 through a drainage culvert. The entrance of which was utilized as the design point in the enclosed peak flow analysis.

The Natural Resource Conservation Service Soil Survey identifies the onsite soils

as Charlton Loam (ChC), Paxton Fine Sandy Loam (PnC & PnD), Sutton Loam (SuB), and Woodbridge Loam (WdC). The Charlton soils are specified as Hydrologic Soil Group "B", the Paxton soils are identified as Hydrologic soil group "C", and the Sutton Loam as well as Woodbridge Loam are given dual "C/D" hydrologic group classifications.

1.3 Proposed Conditions

As described above the proposed development consists of the following site improvements:

- Widening of the existing private road (Buck Run) which provides access to the project site from NYS Route 35.
- Demolition of the existing single-family residence located at 4 Buck Run.
- Construction of a new educational pavilion and supporting water supply and wastewater treatment components.
- Construction of new site wide Stormwater Management system.
- Construction of new and expanded parking areas as well as pedestrian access ways to support the new educational pavilion.
- Construction of new freezer building.
- Construction of 12 camping pods / Yurts.

Stormwater runoff generated by the proposed impervious surfaces will be captured and treated in two (2) subsurface infiltration systems and one (1) Infiltration Basin sized to provide storage volume for 100% of the contributing WQv to each practice in accordance with the NYSDEC WQV and RRv requirements. In addition to the proposed infiltration practices additional Green Infrastructure will be provided for impervious area reduction purposes in the form of tree planting along the site entrance.

Stormwater peak runoff rates following development will not exceed those in the existing condition. As proposed, stormwater runoff rates following development would have no adverse impacts on downstream properties or stormwater conveying systems. Similarly, considering the nature of the existing site conditions and the level of stormwater treatment proposed in the post-development condition, it is predicted that this development will not result in any adverse impacts to downstream reservoirs, streams, wetlands or watercourses.

2.0 Stormwater Management

2.1 Methodology

Stormwater management computations provided in this report are based upon the Soil Conservation Service (SCS) a.k.a. Natural Resource Conservation Service (NRCS), TR-20 methodologies and recommendations included in the NYSDEC Design Manual and GP-0-20-001 requirements. Pre-and post-development rates for stormwater runoff have been computed for comparison of the 1, 10, and 100-year

storm events using the precip.net, Northeast Regional Climate Center (NRCC) precipitation data website for New York and New England. Extreme precipitation tables for the specific site location for various storms have been provided in appendix I of this report.

The computer software entitled "HydroCAD Version 10.00-21" by Applied Microcomputer Systems has been utilized to determine runoff volumes, peak runoff rates, and high-water elevations in the stormwater treatment facilities. The precipitation values obtained for the above-mentioned storm events are summarized in the Table provided below:

TABLE 1
Precipitation Values based on 24-hours
Accumulation Period and Recurrence Interval

Storm Frequency	Precipitation (inches) – 24 hour
1-year	2.83
10-year	4.03
100-year	9.04
90% Rainfall	1.50

2.2 NYSDEC Requirements

The subject project lies within The New York City East of Hudson watershed as identified in Appendix C of GP-0-20-001, and proposes to disturb in excess of 1 acre of land. Therefore, a SWPPP with post construction stormwater management practices must be provided, and all proposed stormwater management practices must conform to the Enhanced Phosphorous Removal Standards specified in Chapter 10 of the NYSDEC Design Manual.

2.3 Water Quality Volume (WQv) / Runoff Reduction Volume (RRv)

The stormwater management practices employed have been sized to satisfy the Water Quality Volume (RRv) and Runoff Reduction Volume (RRv) requirements specified in the Design Manual. In accordance with chapter 10, the minimum WQv/RRv for the subject project was determined based on the volume of runoff generated by the 1 year 24-hour storm event. For the portions of the subject project which consist of redevelopment activities, Water Quality Volume (WQv) sizing criteria was applied based on the Redevelopment rules specified in chapter 9 of the design manual. Figure 3 included at the end of this report has been prepared to illustrate the areas of new development as well as the areas where redevelopment sizing can be applied.

The WQv requirements set forth in the Design Manual specify that the goal for each site is to reduce the entire WQv through the use of green infrastructure practices (GIP's) and standard stormwater management practices (SMP's) with runoff reduction capacity. The proposed stormwater management practices (SMP's) to be utilized for WQv/RRv treatment are two (2) subsurface infiltration systems and one infiltration basin. Each infiltration practice is designated as a standard SMP with RRv capacity.

Calculations for the required WQv can be found in appendix "E" of this report and are summarized in the table provided below. It should be noted that WQv/RRv treatment is proposed for runoff generated by all proposed impervious surfaces as well as areas of existing impervious located within the project disturbance limits.

Calculations for the required water quality volume at design point 1 can be found in Appendix "A" of this report and are summarized in the table provided below. Please note the Impervious areas treated through the application of green infrastructure area reduction practices have been excluded.

TABLE 2
Water Quality Volume Summary

SMP ID #	Watershed Area (Ac.)*	WQv Required (AF)**	RRv Minimum (AF)***	RRv Provided (AF)****
1.1 P	0.722	0.075	0.022	0.075
INF 1.2	0.813	0.142	0.043	0.142
INF 1.3	0.046	0.01	0.003	0.01

(*) Watershed area identified above is based on contributing drainage area to the proposed infiltration practices. All sub catchments which do not contain proposed impervious surfaces or provide RRv treatment through the use of Green Infrastructure Area Reduction Practices have been excluded from the WQv calculations summarized above.
(**) Refer to HydroCAD output provided in Appendix C for 1-year storm runoff Volumes.
(***) Refer to Minimum RRv calculations provided in Appendix A.
(****) Refer to stage storage tables in HydroCAD routing contained in Appendix C. 100% RRv has been provided through the use of subsurface infiltration systems and infiltration basins.

As indicated in the above table, the project SWPPP provides treatment for 100% of the contributing WQv to the proposed infiltration practices which are designated as standard SMP's with runoff reduction capacity. Storage for 100% of the WQv is provided within each infiltration practice based on the volume of runoff generated by its contributing area. It should be noted that for the purposes of calculating the above summarized required WQv, the proposed gravel parking lot was considered impervious.

The HydroCAD routings contained in Appendix C account for an exfiltration rate utilized for modeling purposes to minimize oscillations within the infiltration system outflow hydrographs. The exfiltration rate utilized has been confirmed based on

preliminary soil testing results. The results of which are provided in Appendix L. The test results indicate suitable soils exist for infiltration as well as adequate separation to groundwater or ledge rock. Witnessed deep test descriptions and infiltration testing results will be provided in the final project SWPPP.

The subsurface infiltration systems have been designed offline. Diversion structures have been provided to divert inflow from storms larger than the 1 year to the downstream infiltration basins. In accordance with chapter 3 of the Design Manual extended detention storage has been provided in the infiltration basins and the outlet control structures have been designed peak flow attenuation requirements. Pretreatment for the infiltration practices will consist of hydrodynamic separator pretreatment units.

Stormwater runoff from proposed impervious surfaces will be directed via a piping network to the stormwater treatment facilities. Pipe sizing calculations for the proposed stormwater conveyance system will be included in the final project SWPPP.

2.4 NYSDEC Redevelopment Requirements

As noted in previous sections of this report, the subject property contains existing impervious surfaces associated with the onsite dwellings, access road and driveways. Portions of these areas will be reconstructed as impervious and as such can be considered "Redevelopment Areas" per NYSDEC requirements.

There are several options listed on chapter 9 of the design manual which can be used to satisfy the redevelopment sizing criteria. This S.W.P.P.P. was prepared based on option II. Which specifies that a minimum of 25% of the WQv generated by the disturbed impervious area is captured and treated by the implementation of a standard SMP or reduced by application of green infrastructure techniques. As the subject project includes both areas of New Development as well as redevelopment activities, treatment is required for a minimum of 25% of the existing disturbed impervious area.

In order to demonstrate that runoff from a minimum of 25% of the existing impervious areas to be disturbed will be captured and treated, a Redevelopment Figure is included at the end of this report (Figure 3). The attached figure clearly illustrates that the project will provide WQv/RRv treatment through the use of standard SMP's with RRv capacity as well as Green Infrastructure area reduction practices for 100% of all new impervious as well as more than 25% of existing disturbed impervious areas, thus satisfying the requirements of chapter 9.

2.5 Stream Channel Protection Volume (CPv)

Stream Channel Protection is intended to protect stream channels from erosion and the requirements are met by providing 24-hr extended detention of the 1-yr 24-hr rainfall event. However, this requirement may be waived if the entire Stream Channel Protection Volume (CP_v) is reduced through the use of green infrastructure practices and or infiltration. Or if the site discharges directly to tidal waters or fifth

order or larger streams as determined by the Strahler-Horton methodology (Section 4.3 of the Design Manual).

As a result of the chapter 10 design specifications, this project satisfies the CPv requirement as infiltration has been provided for 100% of the required WQv which is equivalent to the 1-year storm runoff volume.

2.6 Overbank and Extreme Flood Control

Overbank Flood Control is intended to prevent an increase in the frequency and magnitude of out-of–bank flooding resulting from proposed development. To achieve Overbank Flood Control at a site the post-development peak rate of runoff generated by the 10-yr design storm must be attenuated to pre-development levels. The exception to this is for sites that discharge to fifth order streams or larger.

Extreme Flood Control is intended to prevent the risk of flood damage from large storms, maintain the pre-development 100-yr floodplain boundary, and protect the integrity of stormwater management practices. The requirement for Extreme Flood Control is met by attenuating the post-development peak flow rates generated by the 100-yr storm event to pre-development levels, unless the site discharges to a fifth order or larger stream.

As shown in the HydroCAD routings contained in Appendix C, peak flows from the 10- and 100-year storm events have been reduced to predevelopment levels with modification of summary of the pre development vs post development peak flows is provided below:

TABLE 3
Peak Runoff Discharges to Design Point 1

Design Storm (yr)	Pre-Development Peak Runoff (cfs)	Post-Development Peak Runoff (cfs)
1	4.90	4.68
10	21.22	20.25
100	54.52	53.05

2.7 NYCDEP Requirements

The subject project is located within the NYC East of Hudson Watershed and a NYCDEP SWPPP approval is required as it meets or exceeds the following thresholds listed in the Rules and Regulations described below:

§18-39(b)(3)(iv): A land clearing or land grading project, involving two (2) or more acres, located at least in part within the limiting distance of 100 feet of a watercourse or wetland, or within the limiting distance of 300 feet of a reservoir, reservoir stem or controlled lake or on a slope exceeding 15 percent;

The proposed site improvements will result in land disturbance in excess of 2 acres, a portion of which will take on slopes exceeding 15% thus exceeding the threshold specified in §18-39(b)(3)(iv) of the Rules and Regulations.

The NYCDEP Rules and Regulations generally match the requirements of the NYSDEC and Town of Lewisboro with several exceptions. There are two (2) exceptions of note discussed below.

The first exception of note being that two (2) different standard SMP's are required in series when the contributing drainage area to that SMP is greater than 20% impervious or an infiltration practice is not provided. As noted previously infiltration practices will provide treatment of stormwater runoff from all proposed impervious surfaces, therefore two (2) SMP's in series are not required.

The second exception is the NYCDEP requires that the minimum required stormwater treatment volume used shall be the greater of the 1-year 24 hour storm event or the volume generated by the 90% storm.

In accordance with chapter 4 of the Design Manual the following equation was used to determine the water quality volume generated by the 90% rainfall event:

$$WQv = \frac{(P)(Rv)(A)}{12}$$

Where,

WQv = Runoff Volume (acre-feet)
P = 90% Rainfall Value (inches) – (Use 1. 5")
Rv = 0.05 + 0.009(I), where I is percent Impervious Cover (use 0.2 min)
A = Contributing Drainage Area in acres

A comparison of the Runoff volumes for each infiltration system's respective contributing area are summarized in the table below:

Water Quality Volume Comparison Summary (90% Storm Runoff Volume vs 1-Year Storm Runoff Volume)

Sub Area	P (in.) Rainfall Value	Rv	Area (Ac.)	WQv (af) (90% Storm)	WQv (af) (1-Yr Storm)
1.1S	1.5	0.43	0.722	0.039	0.075
1.2S	1.5	0.45	0.813	0.046	0.142
1.3S	1.5	0.95	0.046	0.005	0.010

As discussed in previous sections of this report all proposed SMP's have been sized based on their contributing runoff volume generated by the 1-year 24-hour storm event, which as summarized above provides the larger runoff volume.

3.0 Erosion and Sediment Control

The plans provide for specific erosion and sediment controls to be employed during construction. It is the intent to provide effective erosion control by minimizing land disturbance at one given time, containing sediment from disturbed areas, treating runoff where possible, and stabilizing disturbed soils as soon as possible. The directives specified on the plans and in this report serve as a minimum for erosion and sediment control. Further practices and measures may be required pursuant to onsite inspections in conformance with the requirements of the SPDES #GP-0-15-002 permit. As per the SPDES permit onsite, inspections are to be performed at a rate of at least two (2) site inspections every seven (7) calendar days. The two (2) inspections shall be separated by a minimum of two (2) full calendar days. All erosion and sediment control practices specified for this site shall be in conformance with the New York Standards & Specifications for Erosion & Sediment Control.

3.1 Temporary Erosion and Sediment Control Practices

Listed below are the Temporary Erosion and Sediment Control Practices specified for the subject project. All practices shall be installed and maintained in conformance with the New York Standards & Specifications for Erosion & Sediment Control:

- Stabilized Construction Entrance
- Silt Fence
- Drop Inlet Protection
- Soil Stockpiles
- Debris Control

A stabilized construction entrance should be installed at construction vehicle access points. The construction entrance is designed to prevent outgoing trucks from tracking soil onto the public roadways. Construction details specifying installation requirements can be found on the plan.

The silt fence for the site will consist of a geotextile fabric installed at the toe of all disturbed slopes and parallel to the contours. The silt fence is intended to reduce runoff velocity and intercept sediment-laden runoff. Construction details specifying the proposed installation and type of permissible silt fence can be found on the plans.

Drop inlet protection for the site will consist of stone and concrete block wrapped with wire mesh surrounding the catch basins. The purpose of the stone and block inlet protection is to filter stormwater runoff and prevent sediment laden runoff from entering the drainage system through existing or proposed drain inlet structures.

Soil stockpiles are to be stabilized with vegetation and surrounded with silt fencing. This will ensure the topsoil that is stripped from the site during construction will be protected for use during final grading and that no sediment from the stockpiles will be deposited downstream.

Construction debris, such as sheet metal, wood scrap, paper and insulation products, Styrofoam cups and paper wrappers can become windblown litter over and off the site if neglected. Suitable and ample refuse containers shall be provided on the site and emptied when full. Any scattered debris shall be picked up and placed in containers on an as needed basis.

3.2 Permanent Erosion and Sediment Control Practices

The intent of the permanent erosion and sediment control practices is to permanently stabilize the ground surface via vegetative and structural practices, while controlling and reducing runoff velocities. The following permanent erosion & sediment control practices are proposed for the site:

- Land Grading
- Vegetation

Land grading is the reshaping of the existing land surface in accordance with the grading plan. Proper land grading is an essential component of the erosion control plan, as well as the stormwater pollution prevention plan. Proper grading will ensure the intended drainage areas are directed to the stormwater management practices.

Vegetation will be provided on all disturbed soils not covered by the proposed impervious surfaces. Permanent vegetation will reduce runoff velocities, filter stormwater runoff, and minimize soil erosion. Optimum times for planting are the early spring and fall; however, plantings can be started in the summer provided adequate mulch and moisture is supplied.

4.0 Maintenance & Inspection Requirements

4.1 Short Term Maintenance and Inspection Requirements

As per the SPDES permit onsite, inspections are to be performed at a rate of at least two (2) site inspections every seven (7) calendar days. The two (2) inspections shall be separated by a minimum of two (2) full calendar days. All erosion and sediment control practices specified for this site shall be in conformance with the New York Standards & Specifications for Erosion & Sediment Control.

Inspections performed during construction should verify that all practices are functioning properly, correctly maintained, and that accumulated sediment is removed from all control structures. The inspector must also examine the site for any evidence of soil erosion, the potential for pollutants to enter the storm drain system, turbid discharge at all outfalls, and the potential for soil and mud to be transported on the public roadway at the site entrance. In addition to these general guidelines, the project plans will provide more specific erosion control guidelines, as well as a construction sequence to guide the contractor through the construction process. Discussed below are specific maintenance and inspection requirements for the temporary practices to be employed at the site.

During construction, the silt fence should be inspected weekly to ensure correct installation. In addition, any accumulated sediment resulting in "bulges" in the silt fence should be removed and mixed with onsite soil. Any damaged or torn silt fence should be replaced.

The construction entrance should be checked to ensure no sediment is being deposited onto the public roadway. Should sediment be observed, it should be removed from the street, and the stone in the construction entrance replaced.

The drop inlet protection shall be checked for accumulated sediment on a monthly basis and after significant rainfall. Any accumulated sediment shall be removed and the crushed stone shall be replaced as needed.

Once construction is completed and the site has been stabilized, a "Notice of Termination" shall be filed. At this point limited maintenance requirements are anticipated.

4.2 Long Term Maintenance and Inspection Requirements

Once final stabilization is achieved and construction complete, only limited maintenance will be required. A copy of the Maintenance and Inspection Checklists from Appendix "G" of the New York State Stormwater Management Design Manual is included in Appendix "G" of this report to serve as a guide for maintaining and inspecting the stormwater infiltration practices.

Inspections of the following items should be performed at a minimum annually and following significant rainstorms in excess of ½" of rainfall within 24 hours.

Infiltration Systems:
Refer to manufacturer's maintenance schedule in Appendix J for more specific maintenance requirements.

- Inspect the infiltration systems to ensure accumulated water is infiltrating into the soil, and debris has not entered the diversion manholes and pretreatment structures; any debris should be removed. Once debris is removed, if stormwater is still not infiltrating contact a professional engineer licensed in the State of New York to examine the system.
- Inspection of the outlet of the overflow pipe to ensure it is not plugged or clogged.

Infiltration Basin:

- Inspect emergency spillway and rock outlet protection for any dislodged stones or signs of erosion; additional stone / rip-rap shall be added as needed.
- Inspect outlet structure for clogging and debris/sediment accumulation. Any accumulated sediment/debris shall be removed and properly disposed of.
- Basin berm shall be inspected annually and mowed as needed to prevent woody growth.
- Vegetative establishment within the infiltration basin is critical to its function. Any dead, invasive, or diseased species shall be removed immediately and replaced. Additional seed and mulch shall be used as needed to maintain healthy vegetative cover.

Hydrodynamic Separators (CDS) - Pretreatment Units:
Refer to manufacturer's maintenance schedule in Appendix M for more specific maintenance requirements.

- Inspect after heavy rainfall greater than ½" in 24 hours for the first year to determine an appropriate maintenance schedule. Subsequent inspections are reduced to quarterly.
- When the sediment volume reaches within 24"-30" of the water surface, the system should be maintained.
- Maintenance is to be performed using a vacuum truck and removing the accumulated sediment pile and debris.

Catch Basins and Drain Manholes:

- Inspect monthly and after heavy rain storms >½" in 24 hours for sediment accumulation in sumps. Accumulated sediment should be removed immediately.

5.0 Outstanding Violations or Enforcement Actions

There are no known outstanding violations or enforcement actions against this property, the owner or the applicant. There are no stormwater discharges associated with industrial activity from this site.

6.0 Conclusion

The Stormwater Pollution Prevention Plan prepared for the subject project has been prudently designed to manage stormwater runoff from both qualitative and quantitative standpoints. Proper implementation of this plan will ensure meeting water quality and quantity standards as required by the NYSDEC based on current New York State guidelines as well as most recent guidelines set forth by the NYCDEP.

Appendix A:

Water Quality Volume (WQv) / Runoff Reduction Volume (RRv) Calculations

Project **WOLF CENTER**

Water Quality Volume (WQv) Calculation

Basin ID: **Design Point** Dec 15,2020

The required stormwater quality volume will be determined using “New York State Stormwater Management Design Manual – GP 0-20-0001" Unified Stormwater Sizing Criteria. Since the project is located within the NYCDEP Watershed the “Chapter 10- Enhanced Phosphorus Removal Standards” will apply.

Rainfall events for this project have been obtained from "precip.net", Northeast Regional Climate Center - NRCC - Precipitation Data website for New York and New Englans. Extreme Precipitation Tables for the specific site location for various storms have been downloaded to HydroCAD Version 10.00-24 computer model.

Precipitation distribution curves are generated for each grid directly eliminating the need to use a static Type III curve.

Original WQv:	Subcatchment Area (A):	68,885	sq.ft.
	Rainfall (P):	2.83	in.
	Impervious Area	43,300	sq.ft.
	Percent Imperviousness(I):	62.86	%
	WQv from HydroCAD =	9,888	cu.ft.
		or	
		0.2270	ac.ft.
Area Reduced WQv:	Subcatchment Area (A):	68,885	sq.ft.
	Rainfall (P):	2.83	in.
	Impervious Area	43,300	sq.ft.
	Percent Imperviousness(I):	62.86	%
	WQv from HydroCAD =	9,888	cu.ft.
		or	
		0.2270	ac.ft.
Remaining WQv for Standard Treatment:			
	Subcatchment Area (A):	0	sq.ft.
	Rainfall (P):	2.83	in.
	Impervious Area	-2,900	sq.ft.
	Percent Imperviousness(I):	0.00	%
	WQv from HydroCAD =	0	cu.ft.
		or	
		0.0000	ac.ft.

BIBBO ASSOCIATES, LLP
Consulting Engineers - Planners

Project **WOLF CENTER**

Specified Runoff Reduction Volume (S-RRv)

RRv (in acre-feet of storage) = [(P)(Rv)(Ai)] /12

Basin ID: **1.1S** HSG: **B**

P = Rainfall (inches)	2.83	in
Rv = 0.05+0.009(I) where I is 100% impervious	0.95	
Aic = Total area of new impervious cover	2,856	ft²
S = Hydrologic Soil Group (HSG) Specific Reduction Factor (S)	0.40	

HSG A = 0.55 HSG C = 0.30
HSG B = 0.40 HSG D = 0.20

Ai = (S)(Aic) 1,142 ft²

Ai = impervious cover targeted for runoff reduction

therefore:

RRv =	[(P)	(Rv)	(Ai)]	/ 12		
	2.83	0.95	1,142	/ 12	=	**256 cu.ft.**
						0.0059 ac.ft

BIBBO ASSOCIATES, LLP
Consulting Engineers - Planners

Project **WOLF CENTER**

Specified Runoff Reduction Volume (S-RRv)

RRv (in acre-feet of storage) = [(P)(Rv)(Ai)] /12

Basin ID: **1.1S** HSG: **C**

P = Rainfall (inches)	2.83	in
Rv = 0.05+0.009(I) where I is 100% impervious	0.95	
Aic = Total area of new impervious cover	10,354	ft²
S = Hydrologic Soil Group (HSG) Specific Reduction Factor (S)	0.30	

HSG A = 0.55 HSG C = 0.30
HSG B = 0.40 HSG D = 0.20

Ai = (S)(Aic) 3,106 ft²

Ai = impervious cover targeted for runoff reduction

therefore:

RRv =	[(P)	(Rv)	(Ai)]	/ 12		
	2.83	0.95	3,106	/ 12	=	**696 cu.ft.**
						0.0160 ac.ft

BIBBO ASSOCIATES, LLP
Consulting Engineers - Planners

Project **WOLF CENTER**

Specified Runoff Reduction Volume (S-RRv)

RRv (in acre-feet of storage) = [(P)(Rv)(Ai)] /12

Basin ID: **1.2S** HSG: **C**

P = Rainfall (inches)	2.83	in
Rv = 0.05+0.009(I) where I is 100% impervious	0.95	
Aic = Total area of new impervious cover	28,090	ft²
S = Hydrologic Soil Group (HSG) Specific Reduction Factor (S)	0.30	

HSG A = 0.55 HSG C = 0.30
HSG B = 0.40 HSG D = 0.20

Ai = (S)(Aic) 8,427 ft²

Ai = impervious cover targeted for runoff reduction

therefore:

RRv =	[(P)	(Rv)	(Ai)]	/ 12		
	2.83	0.95	8,427	/ 12	=	**1,888 cu.ft.**
						0.0433 ac.ft

Project **WOLF CENTER**

Specified Runoff Reduction Volume (S-RRv)

RRv (in acre-feet of storage) = [(P)(Rv)(Ai)] /12

Basin ID: **1.3S** HSG: **C**

P = Rainfall (inches)	2.83	in
Rv = 0.05+0.009(I) where I is 100% impervious	0.95	
Aic = Total area of new impervious cover	2,000	ft²
S = Hydrologic Soil Group (HSG) Specific Reduction Factor (S)	0.30	

HSG A = 0.55 HSG C = 0.30
HSG B = 0.40 HSG D = 0.20

Ai = (S)(Aic) 600 ft²

Ai = impervious cover targeted for runoff reduction

therefore:

RRv =	[(P)	(Rv)	(Ai)]	/ 12		
	2.83	0.95	600	/ 12	=	**134 cu.ft.**
						0.0031 ac.ft

Project **WOLF CENTER**

Specified Runoff Reduction Volume (S-RRv)

RRv (in acre-feet of storage) = [(P)(Rv)(Ai)] /12

Basin ID: **Total- Design Point** HSG: **C**

P = Rainfall (inches)	2.83	in
Rv = 0.05+0.009(I) where I is 100% impervious	0.95	
Aic = Total area of new impervious cover	41,300	ft²
S = Hydrologic Soil Group (HSG) Specific Reduction Factor (S)	0.30	

HSG A = 0.55 HSG C = 0.30
HSG B = 0.40 HSG D = 0.20

Ai = (S)(Aic) 12,390 ft²

Ai = impervious cover targeted for runoff reduction

therefore:

		RRv =	[(P)	(Rv)	(Ai)]	/ 12		
1.1S		RRv =	2.83	0.95	1,142	/ 12	=	256 cu.ft. 0.0059 ac.ft
1.1S		RRv =	2.83	0.95	3,106	/ 12	=	696 cu.ft. 0.0160 ac.ft
1.2S		RRv =	2.83	0.95	8,427	/ 12	=	1,888 cu.ft. 0.0433 ac.ft
1.3S		RRv =	2.83	0.95	600	/ 12	=	134 cu.ft. 0.0031 ac.ft
	Total	**RRv =**	**2.83**	**0.95**	**12,390**	**/ 12**	**=**	**2,776 cu.ft.** **0.0637 ac.ft**

Project **WOLF CENTER**

Area Reduction Practices

Basin ID: **Design Point**

		Total Area			Area of Impervious (AI)	
Original Drainage Area (DA):		68,885	sq.ft.		43,300	sq.ft.
Conservation of Natural Areas:	-	0	sq.ft.	-	0	sq.ft.
Riparian Buffers / Filter Strips:	-	0	sq.ft.	-	0	sq.ft.
Tree Planting / Tree Preservation:	-	0	sq.ft.	-	0	sq.ft.
Total Area Reduction:	=	0	sq.ft.			
Total AI Reduction:	=				0	sq.ft.
Remaining DA:		**68,885**	**sq.ft.**		-	
Remaining AI:		-			**43,300**	**sq.ft.**
	or	**1.5814**	**ac.ft.**		**0.9940**	**ac.ft.**

Project **WOLF CENTER**

Source Control Practices

Basin ID: **1.1S** HSG: B & C

Practice Type: I = Infiltration

(I)=Infiltration, (B)=Bioretention, (D)=Dry Swale, (V)=Vegetated Swale, (G)=Green Roof, (R)=Rain Garden, (S)=Stormwater Planters, (C)=Cisterns/Rain Barrels, (P)=Porous Pavement

	Total Area:
DA Tributary to Practice(s):	31,450 sq.ft.
AI to Practice(s):	13,210 sq.ft.

Subcatchment Area (A):	31,450	sq.ft.
Rainfall (P):	2.83	in.
Impervious Area	13,210	sq.ft.
Percent Imperviousness(I):	42.00	%

WQv from HydroCAD = **3,267 cu.ft.**
or
0.0750 ac.ft.

Allowable Runoff Reduction Volume (RRv)

Practice Type: I = Infiltration **HSG:** B & C

Allowable runoff reduction volume for Infiltration is 100%

3,267 x 1.00 = **3,267 cu.ft.**
or
0.0750 ac.ft.

Project **WOLF CENTER**

Source Control Practices

Basin ID: **1.2S** HSG: C

Practice Type: I = Infiltration

(I)=Infiltration, (B)=Bioretention, (D)=Dry Swale, (V)=Vegetated Swale, (G)=Green Roof, (R)=Rain Garden, (S)=Stormwater Planters, (C)=Cisterns/Rain Barrels, (P)=Porous Pavement

	Total Area:
DA Tributary to Practice(s):	35,435 sq.ft.
AI to Practice(s):	28,090 sq.ft.

Subcatchment Area (A):	35,435	sq.ft.
Rainfall (P):	2.83	in.
Impervious Area	28,090	sq.ft.
Percent Imperviousness(I):	79.27	%

WQv from HydroCAD = **6,186 cu.ft.**
or
0.1420 ac.ft.

Allowable Runoff Reduction Volume (RRv)

Practice Type: I = Infiltration **HSG:** C

Allowable runoff reduction volume for Infiltration in C soil = 100% of WQv

6,186 x 1.00 = **6,186 cu.ft.**
or
0.1420 ac.ft.

Project **WOLF CENTER**

Source Control Practices

Basin ID: **1.3S** HSG: C

Practice Type: I = Infiltration

(I)=Infiltration, (B)=Bioretention, (D)=Dry Swale, (V)=Vegetated Swale, (G)=Green Roof, (R)=Rain Garden, (S)=Stormwater Planters, (C)=Cisterns/Rain Barrels, (P)=Porous Pavement

	Total Area:
DA Tributary to Practice(s):	2,000 sq.ft.
AI to Practice(s):	2,000 sq.ft.

Subcatchment Area (A):	2,000	sq.ft.
Rainfall (P):	2.83	in.
Impervious Area	2,000	sq.ft.
Percent Imperviousness(I):	100.00	%

WQv from HydroCAD = **436 cu.ft.**
or
0.0100 ac.ft.

Allowable Runoff Reduction Volume (RRv)

Practice Type: I = Infiltration **HSG:** C

Allowable runoff reduction volume for Infiltration in C soil = 100% of WQv

436 x 1.00 = **436 cu.ft.**
or
0.0100 ac.ft.

Project WOLF CENTER

Total Runoff Reduction Volume

Basin ID: **Design Point**

Total RRv provided:

				RRv	
Original WQv - Area Reduced WQv:	9,888	-	9,888	=	0 cu.ft.
Source Control WQv Treatment Practices:					
Basin:					
1.1S				=	3,267 cu.ft.
1.2S				=	6,186 cu.ft.
1.3S				=	436 cu.ft.

Total RRv provided: **9,888 cu.ft.**
or
0.227 ac.ft.

Is RRv provided	**9,888 cu.ft.**	≥ Original WQv	**9,888 cu.ft.**	
	0.227 ac.ft		0.227 ac.ft	
			Yes	
Is RRv provided	**9,888 cu.ft.**	≥ S-RRv (min. RRv)	**2,776 cu.ft.**	
	0.227 ac.ft		0.064 ac.ft	
			Yes	

Total drainage area treated with runoff reduction / source control practices:

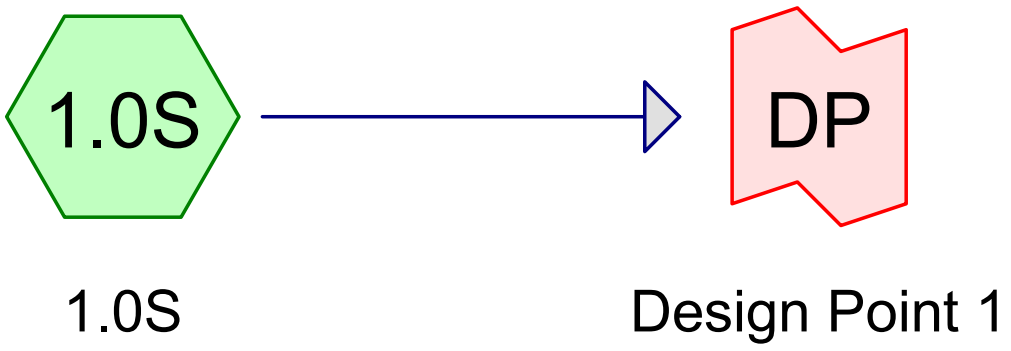
Area Reduction Practices:	0 sq.ft.	or	**0.000 Acres**
Source Control Practices:	68,885 sq.ft.	or	**1.581 Acres**
		Total:	**1.581 Acres**

Total impervious area treated with runoff reduction / source control practices:

Area Reduction Practices:	2,900 sq.ft.	or	**0.067 Acres**
Source Control Practices:	43,300 sq.ft.	or	**0.994 Acres**
		Total:	**1.061 Acres**

Appendix B:

Pre Development Peak Flow Analysis -
(HydroCAD Output for 1, 10 & 100-year Storm Events)



1.0S

Design Point 1

Subcat Reach Pond Link

Routing Diagram for Wolf Center - Pre- 4-21-2020
Prepared by Bibbo Associates, LLP, Printed 12/28/2020

Summary for Subcatchment 1.0S: 1.0S

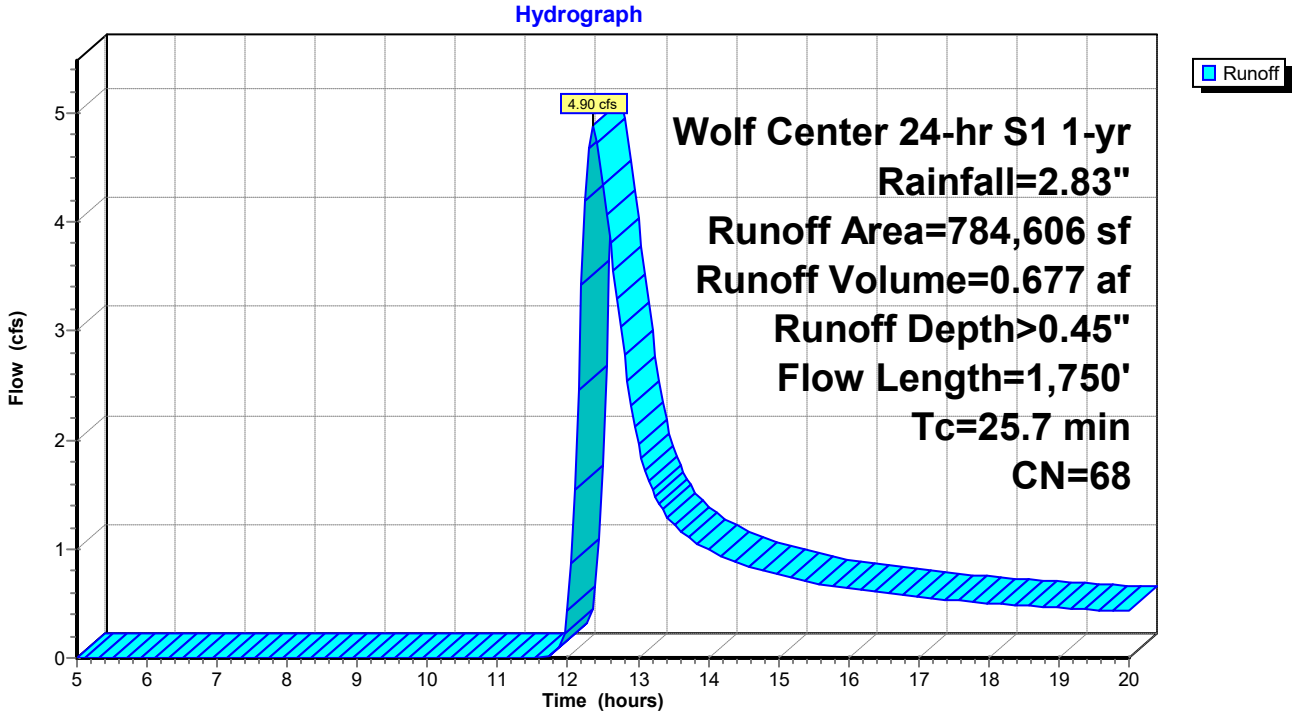
Runoff = 4.90 cfs @ 12.37 hrs, Volume= 0.677 af, Depth> 0.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Wolf Center 24-hr S1 1-yr Rainfall=2.83"

	Area (sf)	CN	Description
*	36,175	98	Existing Pavement
*	8,130	98	Existing Buildings
	18,678	61	>75% Grass cover, Good, HSG B
	13,090	74	>75% Grass cover, Good, HSG C
	1,182	89	Gravel roads, HSG C
	8,804	87	Dirt roads, HSG C
	191,290	55	Woods, Good, HSG B
	507,257	70	Woods, Good, HSG C
	784,606	68	Weighted Average
	740,301		94.35% Pervious Area
	44,305		5.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.0900	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.40"
6.8	860	0.1800	2.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.1	20	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
7.4	770	0.1200	1.73		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
25.7	1,750	Total			

Subcatchment 1.0S: 1.0S

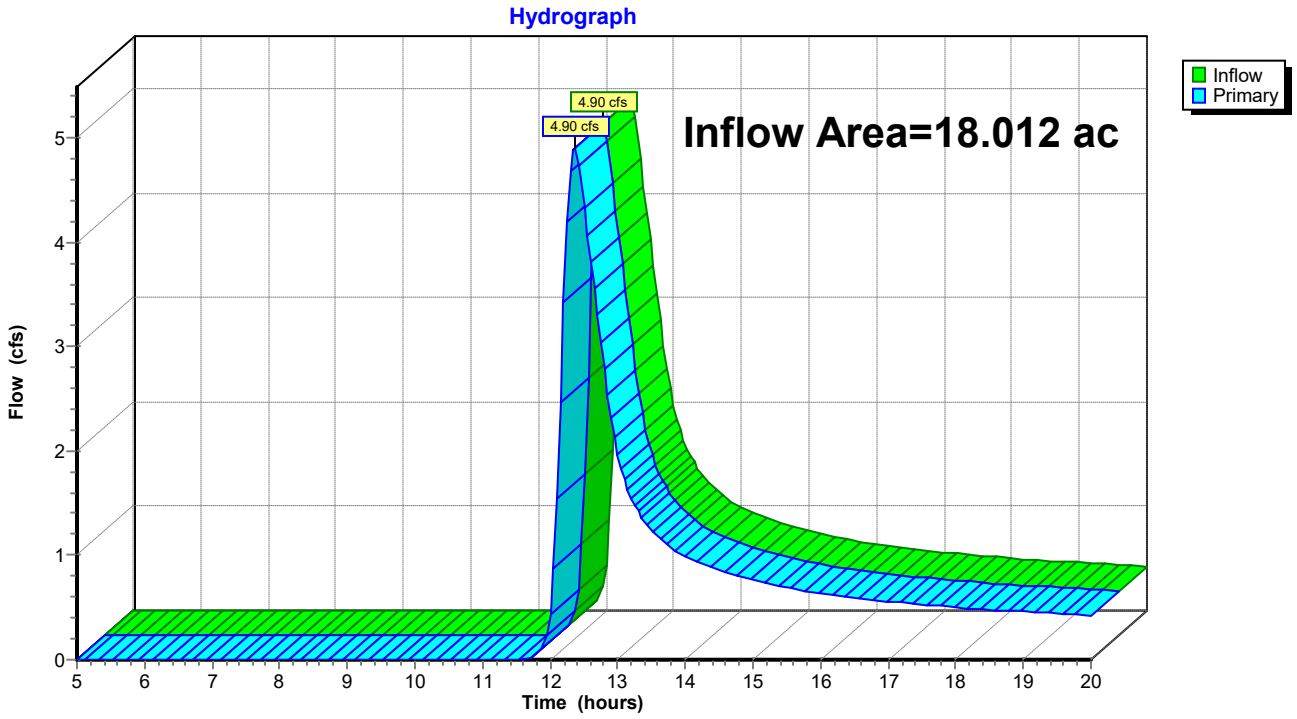


Summary for Link DP: Design Point 1

Inflow Area = 18.012 ac, 5.65% Impervious, Inflow Depth > 0.45" for 1-yr event
Inflow = 4.90 cfs @ 12.37 hrs, Volume= 0.677 af
Primary = 4.90 cfs @ 12.37 hrs, Volume= 0.677 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link DP: Design Point 1



Summary for Subcatchment 1.0S: 1.0S

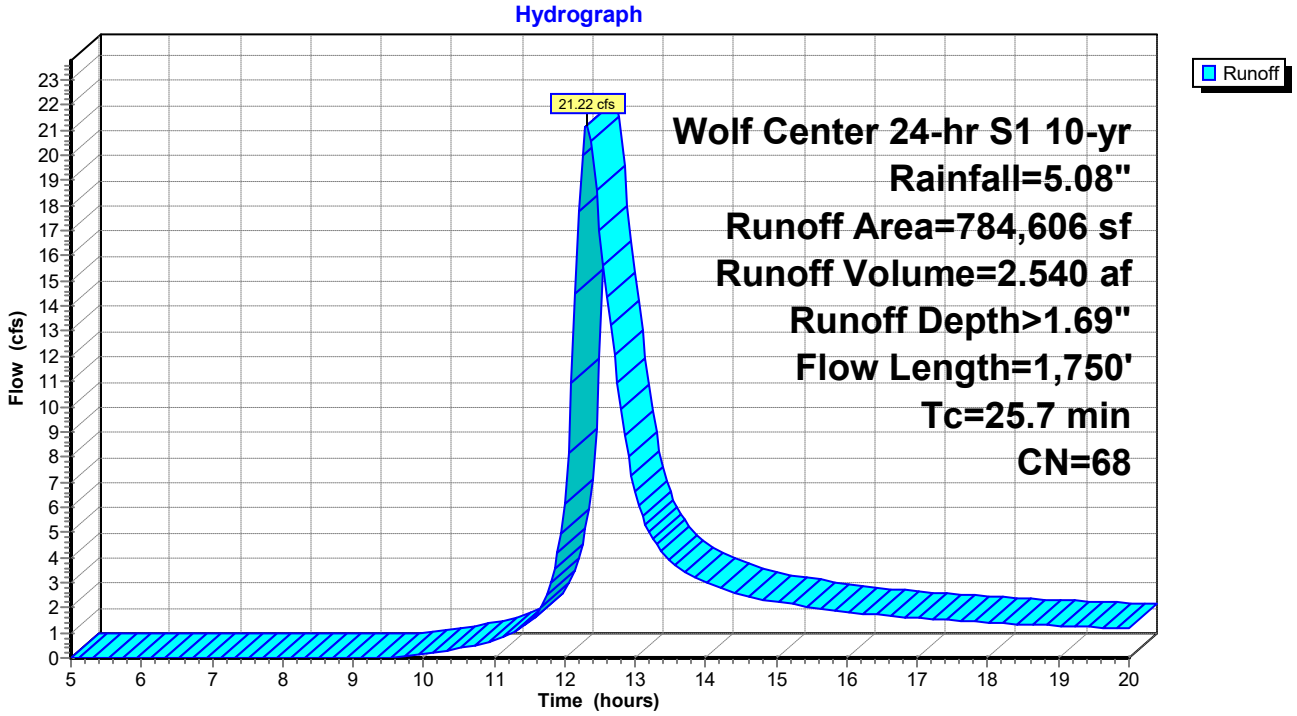
Runoff = 21.22 cfs @ 12.32 hrs, Volume= 2.540 af, Depth> 1.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Wolf Center 24-hr S1 10-yr Rainfall=5.08"

	Area (sf)	CN	Description
*	36,175	98	Existing Pavement
*	8,130	98	Existing Buildings
	18,678	61	>75% Grass cover, Good, HSG B
	13,090	74	>75% Grass cover, Good, HSG C
	1,182	89	Gravel roads, HSG C
	8,804	87	Dirt roads, HSG C
	191,290	55	Woods, Good, HSG B
	507,257	70	Woods, Good, HSG C
	784,606	68	Weighted Average
	740,301		94.35% Pervious Area
	44,305		5.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.0900	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.40"
6.8	860	0.1800	2.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.1	20	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
7.4	770	0.1200	1.73		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
25.7	1,750	Total			

Subcatchment 1.0S: 1.0S

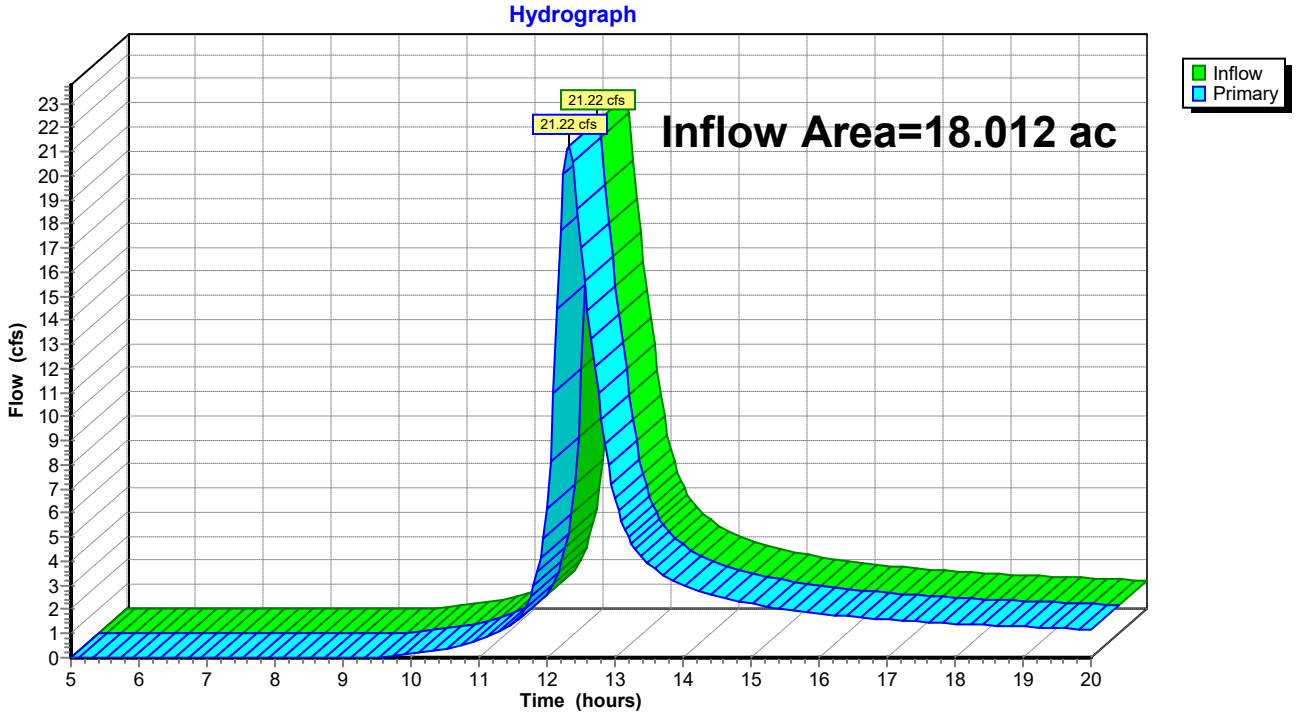


Summary for Link DP: Design Point 1

Inflow Area = 18.012 ac, 5.65% Impervious, Inflow Depth > 1.69" for 10-yr event
Inflow = 21.22 cfs @ 12.32 hrs, Volume= 2.540 af
Primary = 21.22 cfs @ 12.32 hrs, Volume= 2.540 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link DP: Design Point 1



Summary for Subcatchment 1.0S: 1.0S

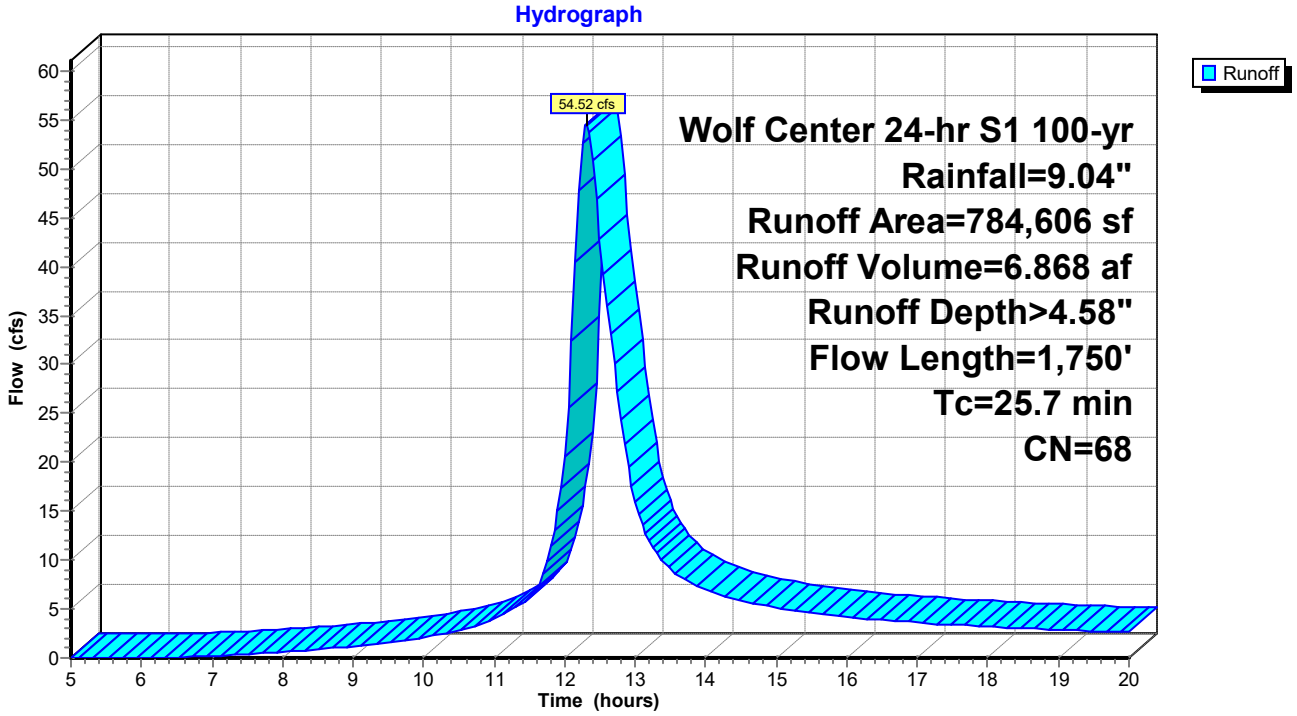
Runoff = 54.52 cfs @ 12.31 hrs, Volume= 6.868 af, Depth> 4.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Wolf Center 24-hr S1 100-yr Rainfall=9.04"

	Area (sf)	CN	Description
*	36,175	98	Existing Pavement
*	8,130	98	Existing Buildings
	18,678	61	>75% Grass cover, Good, HSG B
	13,090	74	>75% Grass cover, Good, HSG C
	1,182	89	Gravel roads, HSG C
	8,804	87	Dirt roads, HSG C
	191,290	55	Woods, Good, HSG B
	507,257	70	Woods, Good, HSG C
	784,606	68	Weighted Average
	740,301		94.35% Pervious Area
	44,305		5.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.0900	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.40"
6.8	860	0.1800	2.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.1	20	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
7.4	770	0.1200	1.73		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
25.7	1,750	Total			

Subcatchment 1.0S: 1.0S

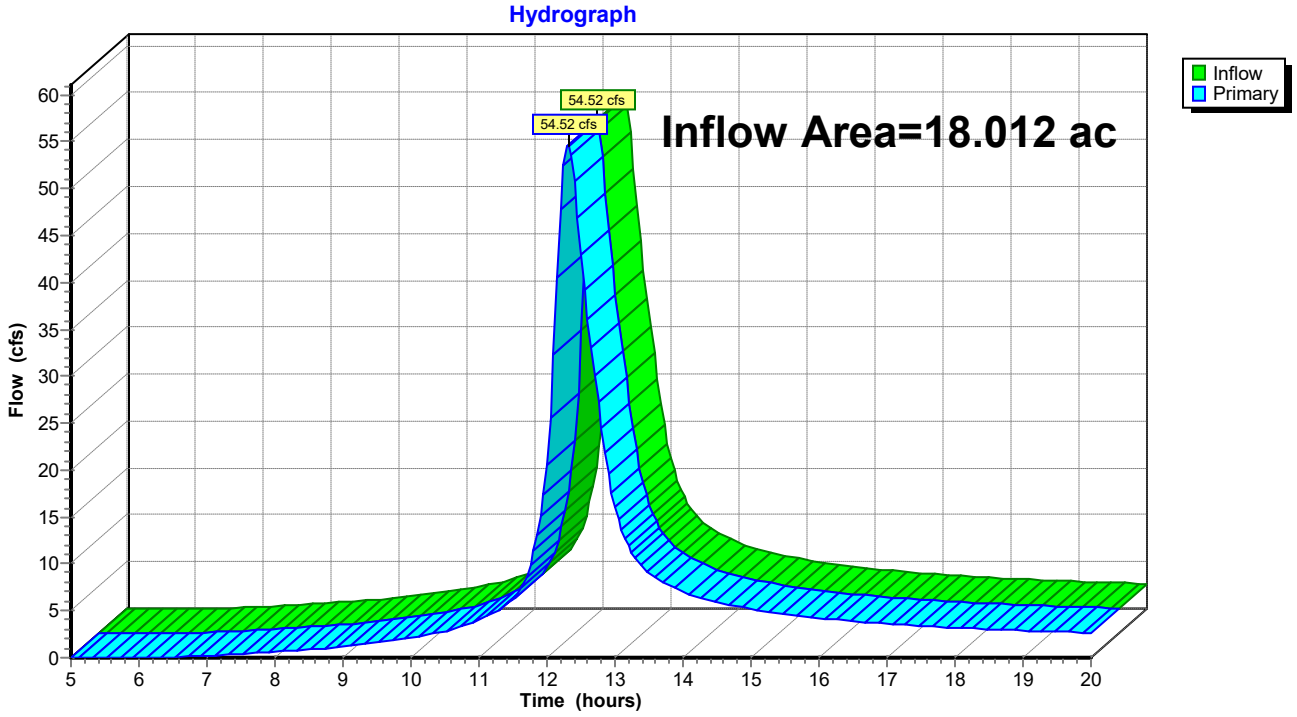


Summary for Link DP: Design Point 1

Inflow Area = 18.012 ac, 5.65% Impervious, Inflow Depth > 4.58" for 100-yr event
Inflow = 54.52 cfs @ 12.31 hrs, Volume= 6.868 af
Primary = 54.52 cfs @ 12.31 hrs, Volume= 6.868 af, Atten= 0%, Lag= 0.0 min

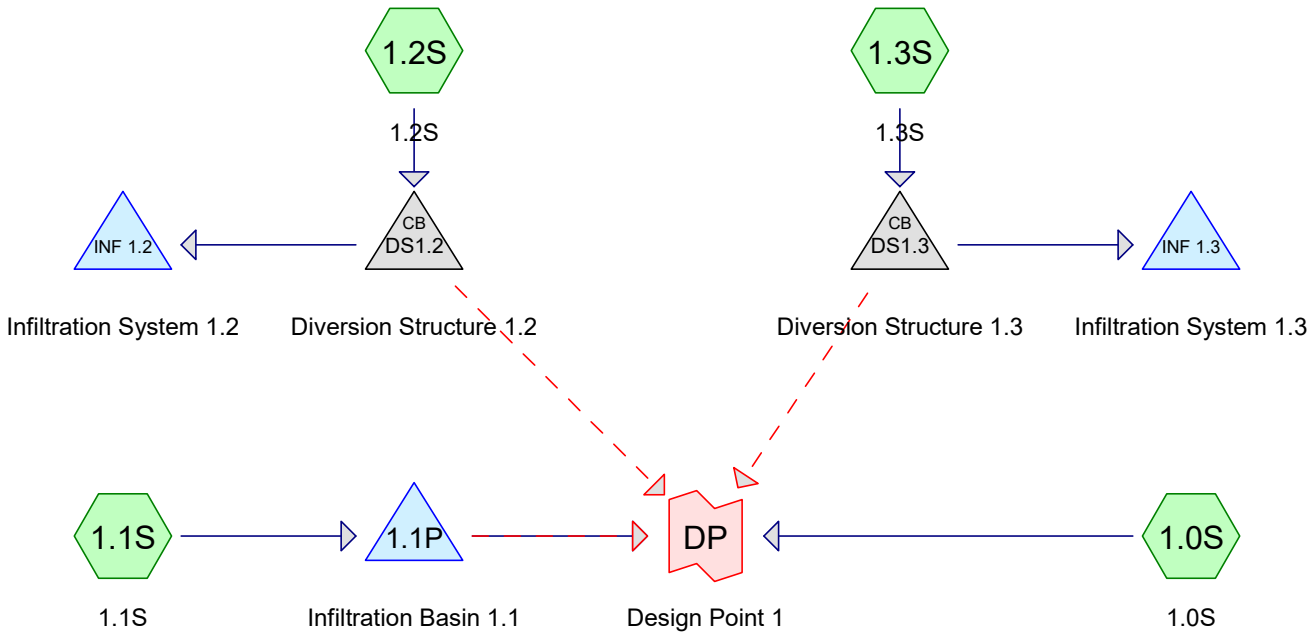
Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link DP: Design Point 1



Appendix C:

Post Development Peak Flow Analysis –
(HydroCAD Output for 1, 10 & 100-year Storm Events)



Subcat Reach Pond Link

Routing Diagram for Wolf Center - Post- 4-21-2020
Prepared by Bibbo Associates, LLP, Printed 12/28/2020

Summary for Subcatchment 1.0S: 1.0S

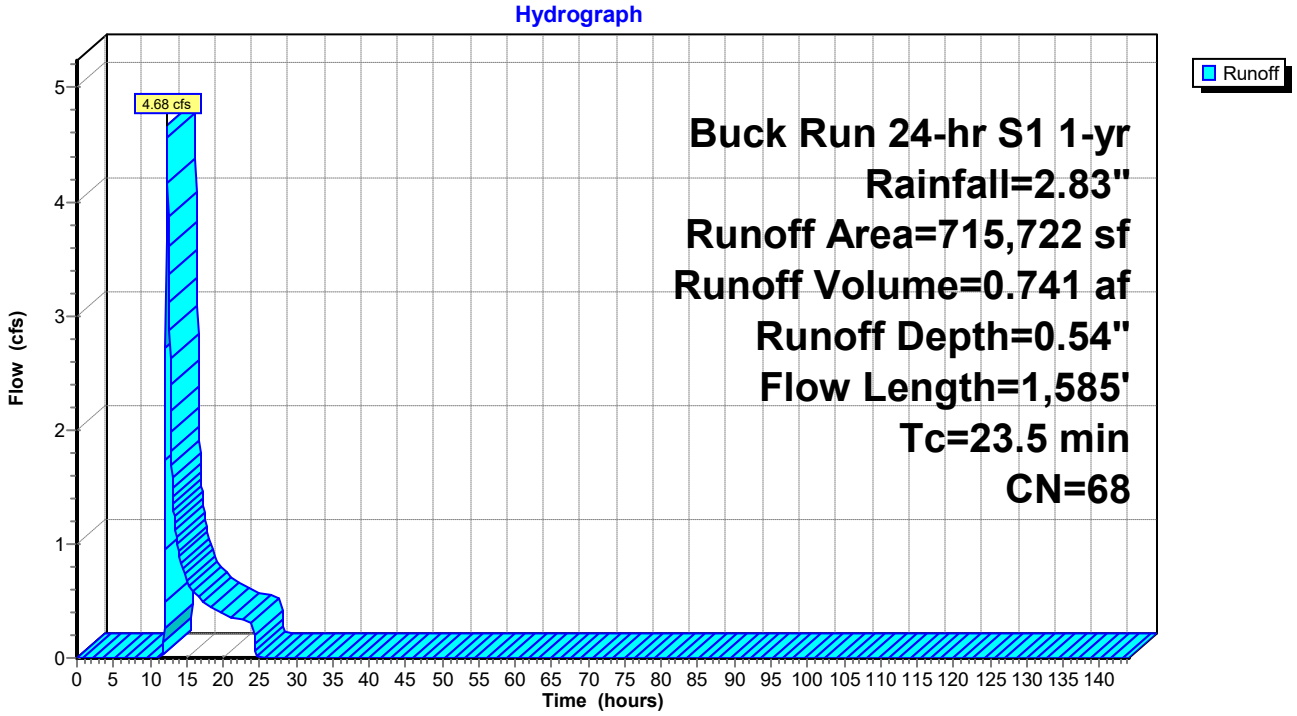
Runoff = 4.68 cfs @ 12.33 hrs, Volume= 0.741 af, Depth= 0.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-144.00 hrs, dt= 0.05 hrs
Buck Run 24-hr S1 1-yr Rainfall=2.83"

	Area (sf)	CN	Description
*	18,932	98	Existing Pavement
*	6,135	98	Existing Buildings
	5,607	87	Dirt roads, HSG C
*	6,970	98	Proposed Pavement
*	1,405	61	Existing>75% Grass cover, Good, HSG B
*	6,540	61	Proposed >75% Grass cover, Good, HSG B
*	2,900	74	Existing >75% Grass cover, Good, HSG C
*	27,898	74	Proposed >75% Grass cover, Good, HSG C
	13,520	89	Gravel roads, HSG C
	172,620	55	Woods, Good, HSG B
	417,935	70	Woods, Good, HSG C
	35,260	71	Meadow, non-grazed, HSG C
	715,722	68	Weighted Average
	683,685		95.52% Pervious Area
	32,037		4.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.0900	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.40"
12.1	1,485	0.1670	2.04		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
23.5	1,585	Total			

Subcatchment 1.0S: 1.0S



Summary for Subcatchment 1.1S: 1.1S

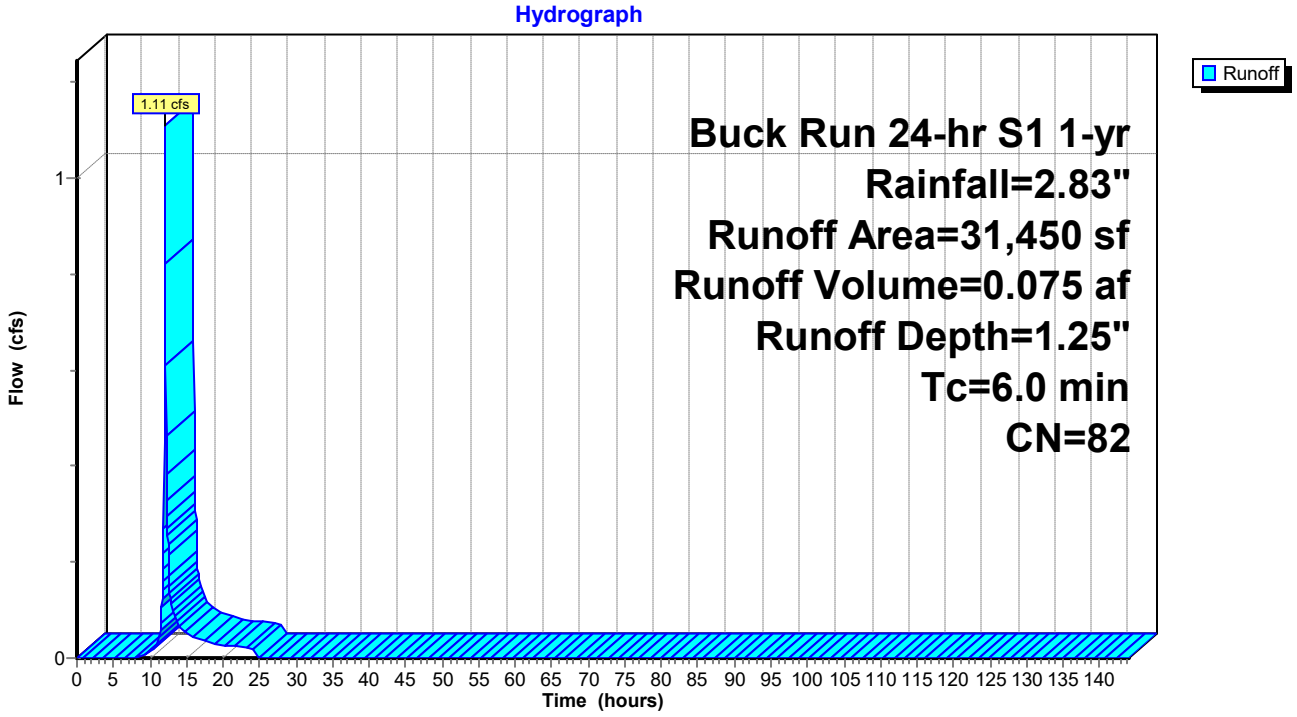
Runoff = 1.11 cfs @ 12.04 hrs, Volume= 0.075 af, Depth= 1.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-144.00 hrs, dt= 0.05 hrs
Buck Run 24-hr S1 1-yr Rainfall=2.83"

	Area (sf)	CN	Description
*	12,870	98	Proposed Pavement
*	340	98	Proposed Sidewalk
	5,235	61	>75% Grass cover, Good, HSG B
	13,005	74	>75% Grass cover, Good, HSG C
	31,450	82	Weighted Average
	18,240		58.00% Pervious Area
	13,210		42.00% Impervious Area

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

Subcatchment 1.1S: 1.1S



Summary for Subcatchment 1.2S: 1.2S

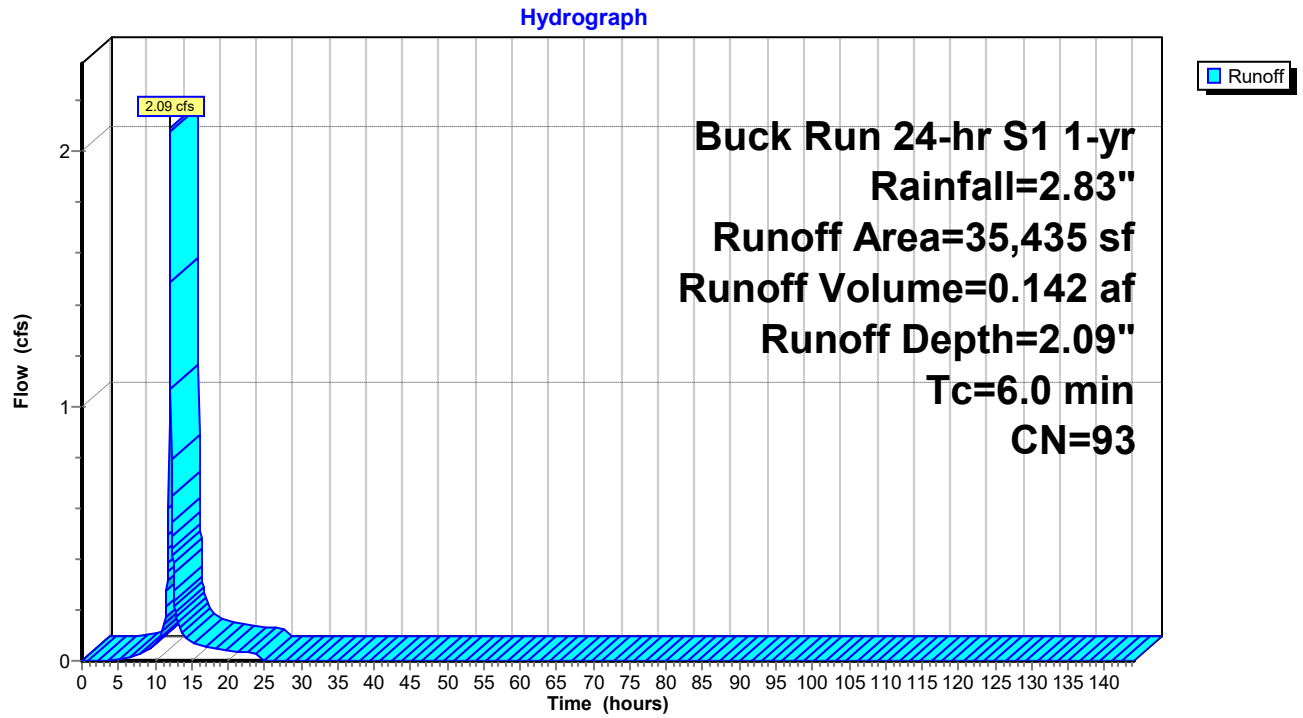
Runoff = 2.09 cfs @ 12.04 hrs, Volume= 0.142 af, Depth= 2.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-144.00 hrs, dt= 0.05 hrs
Buck Run 24-hr S1 1-yr Rainfall=2.83"

	Area (sf)	CN	Description
*	23,275	98	Proposed Pavement & Walkway
*	4,815	98	Proposed Building
	7,345	74	>75% Grass cover, Good, HSG C
	35,435	93	Weighted Average
	7,345		20.73% Pervious Area
	28,090		79.27% Impervious Area

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

Subcatchment 1.2S: 1.2S



Summary for Subcatchment 1.3S: 1.3S

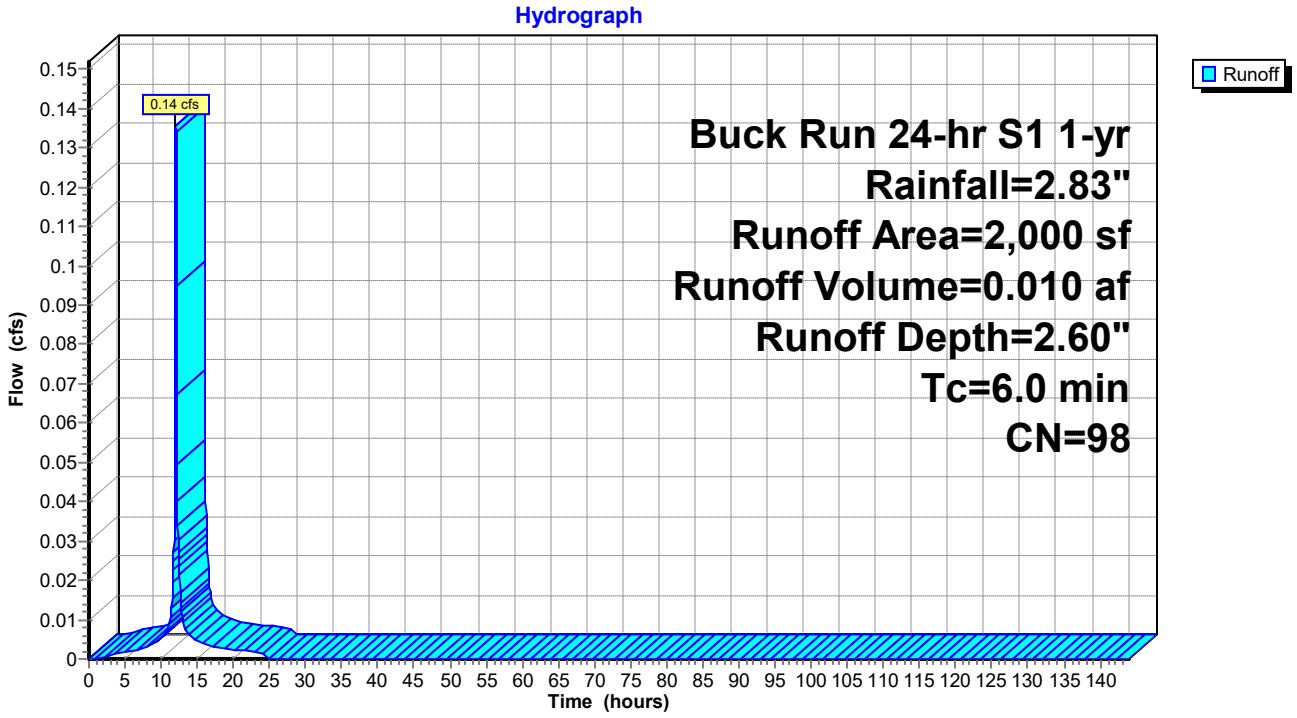
Runoff = 0.14 cfs @ 12.04 hrs, Volume= 0.010 af, Depth= 2.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-144.00 hrs, dt= 0.05 hrs
Buck Run 24-hr S1 1-yr Rainfall=2.83"

	Area (sf)	CN	Description
*	2,000	98	Proposed Pods and Facilities
	2,000		100.00% Impervious Area

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

Subcatchment 1.3S: 1.3S



Summary for Pond 1.1P: Infiltration Basin 1.1

Inflow Area = 0.722 ac, 42.00% Impervious, Inflow Depth = 1.25" for 1-yr event
Inflow = 1.11 cfs @ 12.04 hrs, Volume= 0.075 af
Outflow = 0.23 cfs @ 12.51 hrs, Volume= 0.075 af, Atten= 79%, Lag= 28.0 min
Discarded = 0.23 cfs @ 12.51 hrs, Volume= 0.075 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-144.00 hrs, dt= 0.05 hrs
Peak Elev= 452.86' @ 12.51 hrs Surf.Area= 836 sf Storage= 835 cf

Plug-Flow detention time= 31.9 min calculated for 0.075 af (100% of inflow)
Center-of-Mass det. time= 31.9 min (896.2 - 864.2)

Volume	Invert	Avail.Storage	Storage Description
#1	451.00'	9,077 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
451.00	125	0	0
452.00	447	286	286
454.00	1,356	1,803	2,089
456.00	2,634	3,990	6,079
457.00	3,362	2,998	9,077

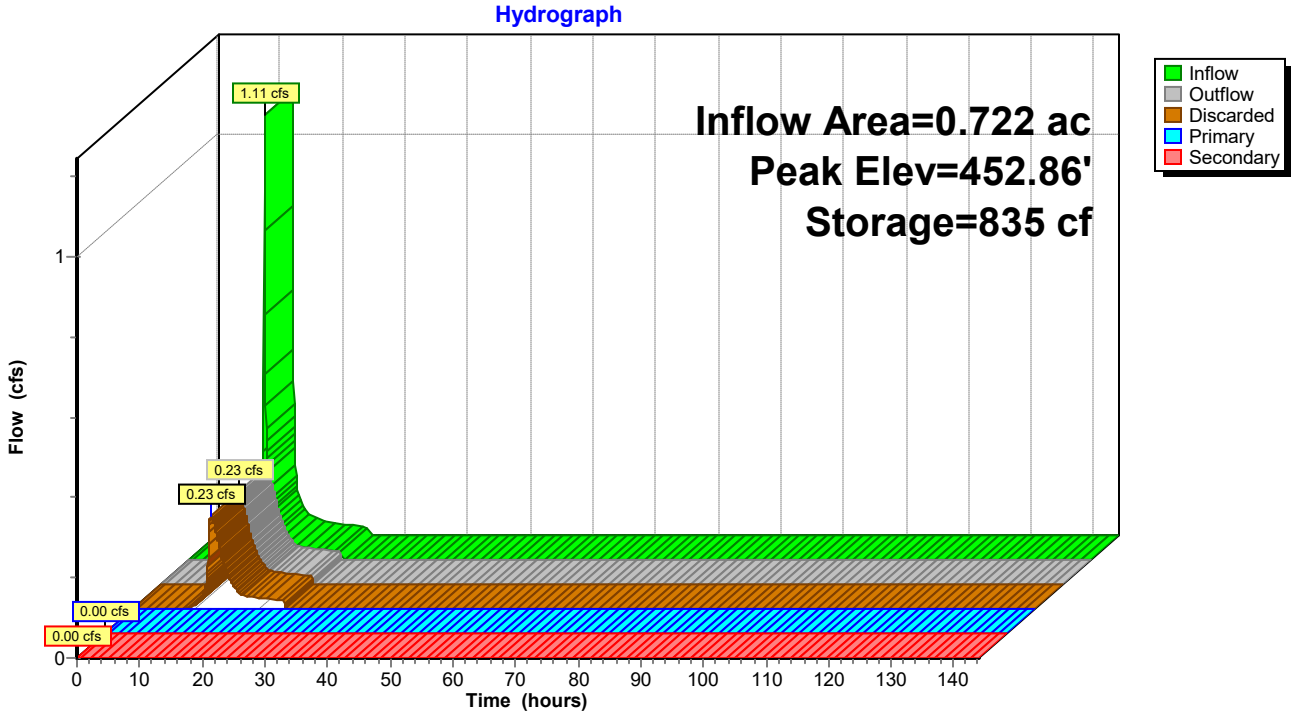
Device	Routing	Invert	Outlet Devices
#1	Primary	450.30'	**12.0" Round Culvert** L= 80.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 450.30' / 449.50' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	454.75'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	455.50'	**30.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Discarded	451.00'	**12.000 in/hr Exfiltration over Surface area** Phase-In= 0.10'
#5	Secondary	456.00'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.23 cfs @ 12.51 hrs HW=452.86' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.23 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=451.00' (Free Discharge)
└**1=Culvert** (Passes 0.00 cfs of 1.67 cfs potential flow)
  ├**2=Orifice/Grate** (Controls 0.00 cfs)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=451.00' (Free Discharge)
└**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1.1P: Infiltration Basin 1.1



Stage-Area-Storage for Pond 1.1P: Infiltration Basin 1.1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
451.00	125	0
451.10	157	14
451.20	189	31
451.30	222	52
451.40	254	76
451.50	286	103
451.60	318	133
451.70	350	166
451.80	383	203
451.90	415	243
452.00	447	286
452.10	492	333
452.20	538	384
452.30	583	441
452.40	629	501
452.50	674	566
452.60	720	636
452.70	765	710
452.80	811	789
452.90	856	872
453.00	902	960
453.10	947	1,053
453.20	992	1,150
453.30	1,038	1,251
453.40	1,083	1,357
453.50	1,129	1,468
453.60	1,174	1,583
453.70	1,220	1,703
453.80	1,265	1,827
453.90	1,311	1,956
454.00	1,356	2,089
454.10	1,420	2,228
454.20	1,484	2,373
454.30	1,548	2,525
454.40	1,612	2,683
454.50	1,676	2,847
454.60	1,739	3,018
454.70	1,803	3,195
454.80	1,867	3,378
454.90	1,931	3,568
455.00	1,995	3,765
455.10	2,059	3,967
455.20	2,123	4,176
455.30	2,187	4,392
455.40	2,251	4,614
455.50	2,315	4,842
455.60	2,378	5,077
455.70	2,442	5,318
455.80	2,506	5,565
455.90	2,570	5,819
456.00	2,634	6,079
456.10	2,707	6,346
456.20	2,780	6,620
456.30	2,852	6,902
456.40	2,925	7,191
456.50	2,998	7,487
456.60	3,071	7,790
456.70	3,144	8,101
456.80	3,216	8,419
456.90	3,289	8,744
457.00	**3,362**	**9,077**

Summary for Pond DS1.2: Diversion Structure 1.2

Inflow Area = 0.813 ac, 79.27% Impervious, Inflow Depth = 2.09" for 1-yr event
Inflow = 2.09 cfs @ 12.04 hrs, Volume= 0.142 af
Outflow = 2.09 cfs @ 12.04 hrs, Volume= 0.142 af, Atten= 0%, Lag= 0.0 min
Primary = 2.09 cfs @ 12.04 hrs, Volume= 0.142 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

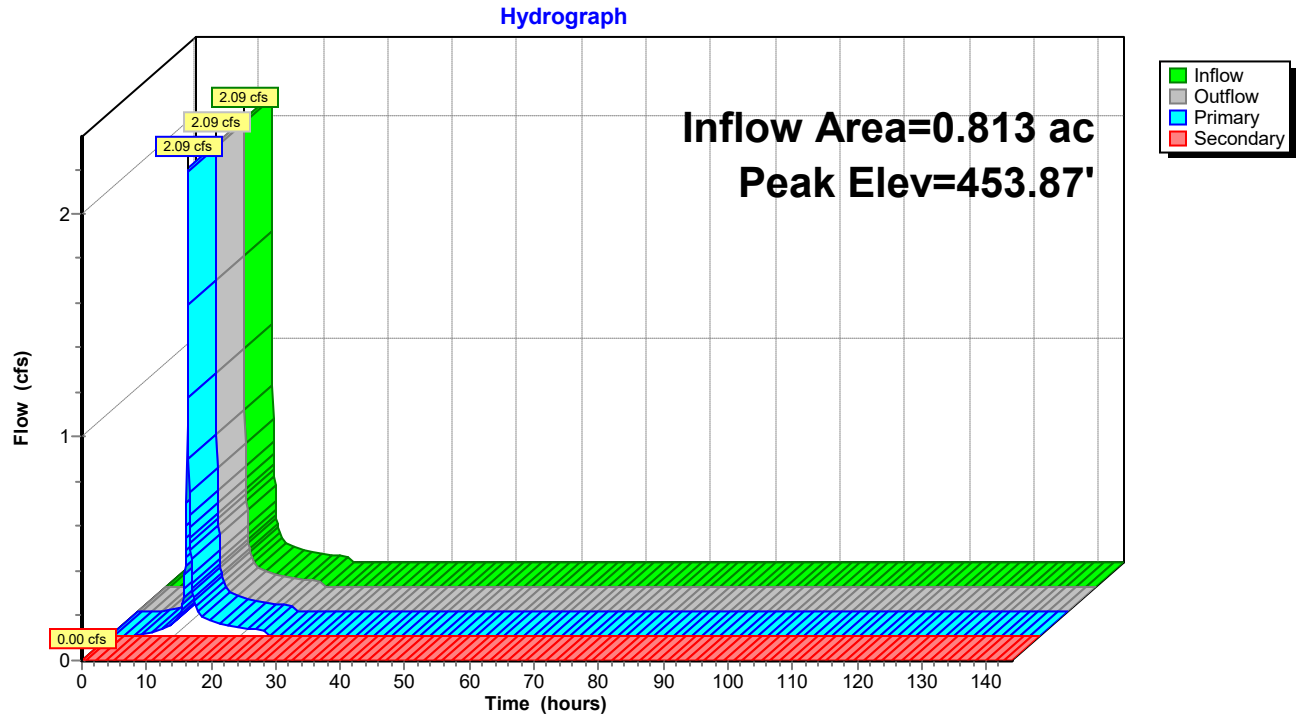
Routing by Stor-Ind method, Time Span= 0.00-144.00 hrs, dt= 0.05 hrs
Peak Elev= 453.87' @ 12.04 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	452.00'	**8.0" Round Culvert** L= 6.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 452.00' / 452.00' S= 0.0000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Secondary	455.20'	**8.0" Round Culvert** L= 27.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 455.20' / 454.60' S= 0.0222 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=2.03 cfs @ 12.04 hrs HW=453.79' (Free Discharge)
└**1=Culvert** (Inlet Controls 2.03 cfs @ 5.82 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=452.00' (Free Discharge)
└**2=Culvert** (Controls 0.00 cfs)

Pond DS1.2: Diversion Structure 1.2



Stage-Area-Storage for Pond DS1.2: Diversion Structure 1.2

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
452.00	**0**	454.55	0
452.05	0	454.60	0
452.10	0	454.65	0
452.15	0	454.70	0
452.20	0	454.75	0
452.25	0	454.80	0
452.30	0	454.85	0
452.35	0	454.90	0
452.40	0	454.95	0
452.45	0	455.00	0
452.50	0	455.05	0
452.55	0	455.10	0
452.60	0	455.15	0
452.65	0	455.20	0
452.70	0	455.25	0
452.75	0	455.30	0
452.80	0	455.35	0
452.85	0	455.40	0
452.90	0	455.45	0
452.95	0	455.50	0
453.00	0	455.55	0
453.05	0	455.60	0
453.10	0	455.65	0
453.15	0	455.70	0
453.20	0	455.75	0
453.25	0	455.80	0
453.30	0	455.85	0
453.35	0		
453.40	0		
453.45	0		
453.50	0		
453.55	0		
453.60	0		
453.65	0		
453.70	0		
453.75	0		
453.80	0		
453.85	0		
453.90	0		
453.95	0		
454.00	0		
454.05	0		
454.10	0		
454.15	0		
454.20	0		
454.25	0		
454.30	0		
454.35	0		
454.40	0		
454.45	0		
454.50	0		

Summary for Pond DS1.3: Diversion Structure 1.3

Inflow Area = 0.046 ac,100.00% Impervious, Inflow Depth = 2.60" for 1-yr event
Inflow = 0.14 cfs @ 12.04 hrs, Volume= 0.010 af
Outflow = 0.14 cfs @ 12.04 hrs, Volume= 0.010 af, Atten= 0%, Lag= 0.0 min
Primary = 0.14 cfs @ 12.04 hrs, Volume= 0.010 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

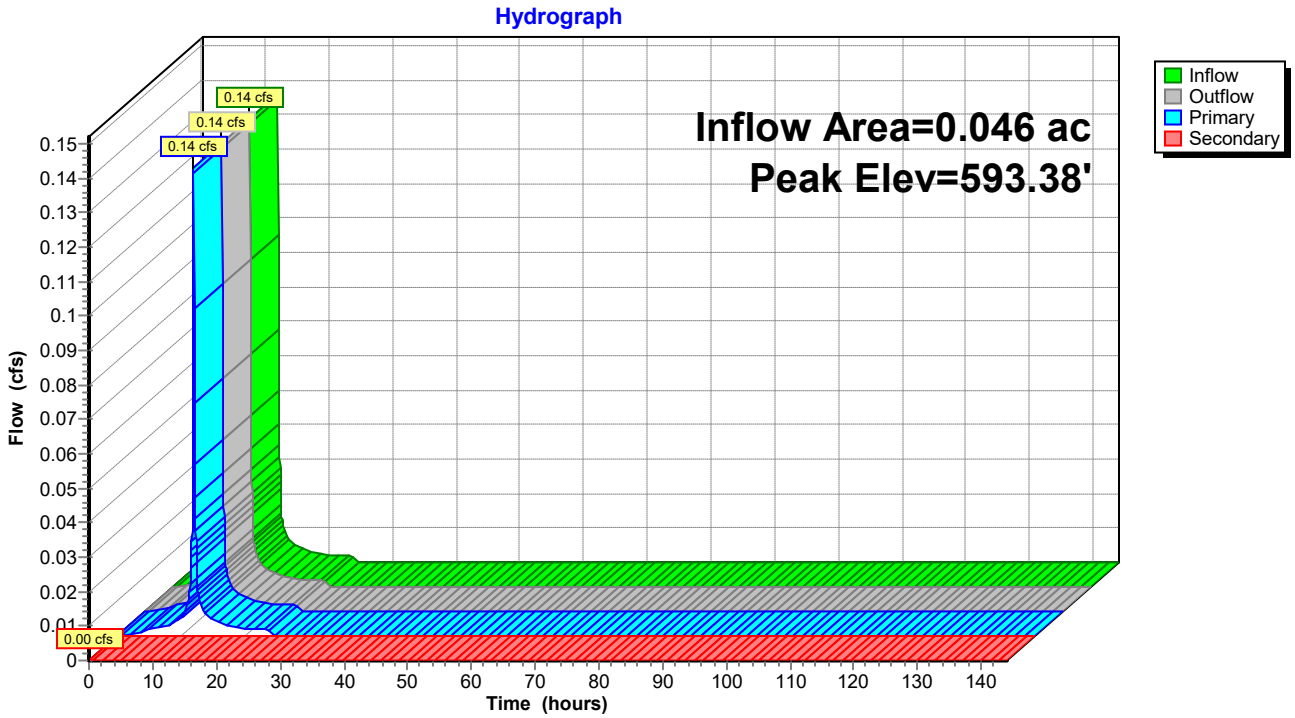
Routing by Stor-Ind method, Time Span= 0.00-144.00 hrs, dt= 0.05 hrs
Peak Elev= 593.38' @ 12.04 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	593.00'	**4.0" Round Culvert** L= 6.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 593.00' / 593.00' S= 0.0000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf
#2	Secondary	595.20'	**8.0" Round Culvert** L= 154.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 595.20' / 590.00' S= 0.0338 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.13 cfs @ 12.04 hrs HW=593.37' (Free Discharge)
└**1=Culvert** (Barrel Controls 0.13 cfs @ 1.68 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=593.00' (Free Discharge)
└**2=Culvert** (Controls 0.00 cfs)

Pond DS1.3: Diversion Structure 1.3



Stage-Area-Storage for Pond DS1.3: Diversion Structure 1.3

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
593.00	**0**	594.02	0	595.04	0
593.02	0	594.04	0	595.06	0
593.04	0	594.06	0	595.08	0
593.06	0	594.08	0	595.10	0
593.08	0	594.10	0	595.12	0
593.10	0	594.12	0	595.14	0
593.12	0	594.14	0	595.16	0
593.14	0	594.16	0	595.18	0
593.16	0	594.18	0	595.20	0
593.18	0	594.20	0	595.22	0
593.20	0	594.22	0	595.24	0
593.22	0	594.24	0	595.26	0
593.24	0	594.26	0	595.28	0
593.26	0	594.28	0	595.30	0
593.28	0	594.30	0	595.32	0
593.30	0	594.32	0	595.34	0
593.32	0	594.34	0	595.36	0
593.34	0	594.36	0	595.38	0
593.36	0	594.38	0	595.40	0
593.38	0	594.40	0	595.42	0
593.40	0	594.42	0	595.44	0
593.42	0	594.44	0	595.46	0
593.44	0	594.46	0	595.48	0
593.46	0	594.48	0	595.50	0
593.48	0	594.50	0	595.52	0
593.50	0	594.52	0	595.54	0
593.52	0	594.54	0	595.56	0
593.54	0	594.56	0	595.58	0
593.56	0	594.58	0	595.60	0
593.58	0	594.60	0	595.62	0
593.60	0	594.62	0	595.64	0
593.62	0	594.64	0	595.66	0
593.64	0	594.66	0	595.68	0
593.66	0	594.68	0	595.70	0
593.68	0	594.70	0	595.72	0
593.70	0	594.72	0	595.74	0
593.72	0	594.74	0	595.76	0
593.74	0	594.76	0	595.78	0
593.76	0	594.78	0	595.80	0
593.78	0	594.80	0	595.82	0
593.80	0	594.82	0	595.84	0
593.82	0	594.84	0	595.86	0
593.84	0	594.86	0		
593.86	0	594.88	0		
593.88	0	594.90	0		
593.90	0	594.92	0		
593.92	0	594.94	0		
593.94	0	594.96	0		
593.96	0	594.98	0		
593.98	0	595.00	0		
594.00	0	595.02	0		

Summary for Pond INF 1.2: Infiltration System 1.2

Inflow Area = 0.813 ac, 79.27% Impervious, Inflow Depth = 2.09" for 1-yr event
Inflow = 2.09 cfs @ 12.04 hrs, Volume= 0.142 af
Outflow = 0.80 cfs @ 12.00 hrs, Volume= 0.142 af, Atten= 62%, Lag= 0.0 min
Discarded = 0.80 cfs @ 12.00 hrs, Volume= 0.142 af

Routing by Stor-Ind method, Time Span= 0.00-144.00 hrs, dt= 0.05 hrs
Peak Elev= 452.55' @ 12.21 hrs Surf.Area= 0.066 ac Storage= 0.016 af

Plug-Flow detention time= 4.9 min calculated for 0.142 af (100% of inflow)
Center-of-Mass det. time= 4.9 min (812.8 - 807.9)

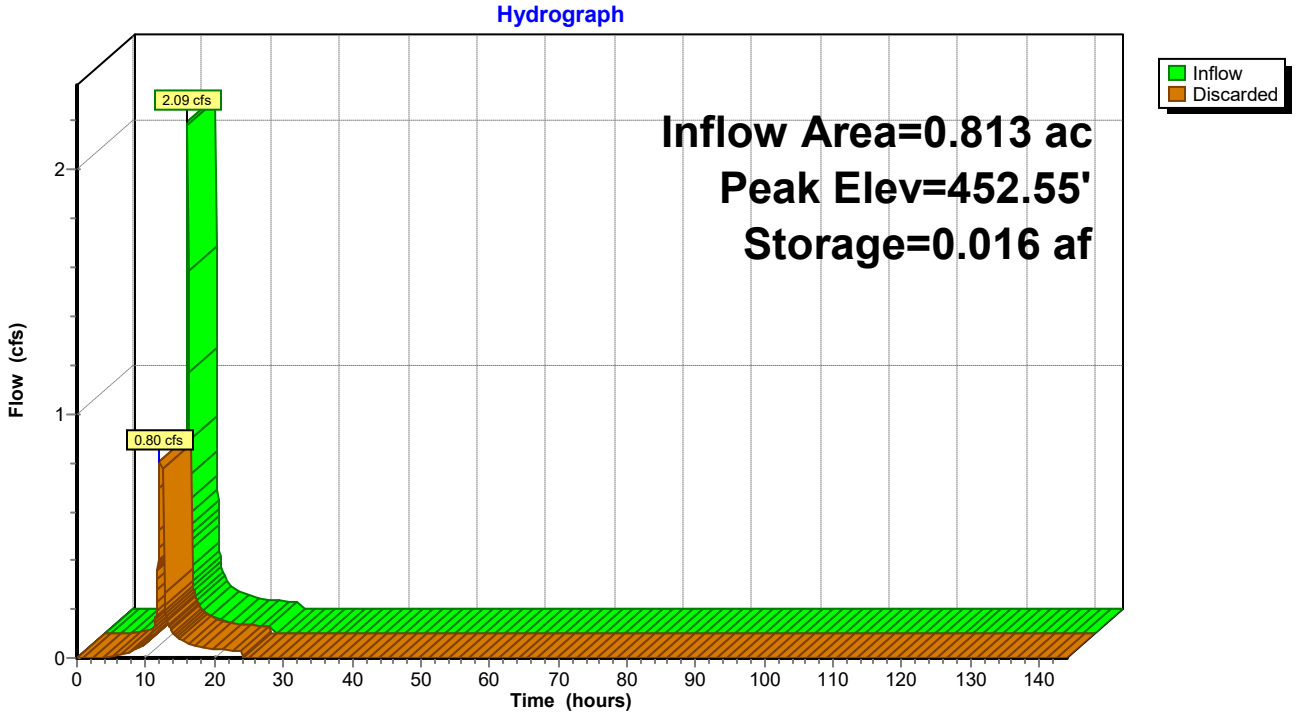
Volume	Invert	Avail.Storage	Storage Description
#1A	452.00'	0.056 af	**30.50'W x 94.50'L x 3.54'H Field A** 0.234 af Overall - 0.095 af Embedded = 0.139 af x 40.0% Voids
#2A	452.50'	0.095 af	**Cultec R-330XLHD** x 78 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 6 rows
		0.151 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	452.00'	**12.000 in/hr Exfiltration over Horizontal area** Phase-In= 0.10'

Discarded OutFlow Max=0.80 cfs @ 12.00 hrs HW=452.19' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.80 cfs)

Pond INF 1.2: Infiltration System 1.2



Stage-Area-Storage for Pond INF 1.2: Infiltration System 1.2

Elevation (feet)	Horizontal (acres)	Storage (acre-feet)
452.00	**0.066**	0.000
452.05	0.066	0.001
452.10	0.066	0.003
452.15	0.066	0.004
452.20	0.066	0.005
452.25	0.066	0.007
452.30	0.066	0.008
452.35	0.066	0.009
452.40	0.066	0.011
452.45	0.066	0.012
452.50	0.066	0.013
452.55	0.066	0.016
452.60	0.066	0.019
452.65	0.066	0.022
452.70	0.066	0.025
452.75	0.066	0.027
452.80	0.066	0.030
452.85	0.066	0.033
452.90	0.066	0.036
452.95	0.066	0.039
453.00	0.066	0.041
453.05	0.066	0.044
453.10	0.066	0.047
453.15	0.066	0.050
453.20	0.066	0.052
453.25	0.066	0.055
453.30	0.066	0.058
453.35	0.066	0.061
453.40	0.066	0.063
453.45	0.066	0.066
453.50	0.066	0.069
453.55	0.066	0.071
453.60	0.066	0.074
453.65	0.066	0.077
453.70	0.066	0.079
453.75	0.066	0.082
453.80	0.066	0.085
453.85	0.066	0.087
453.90	0.066	0.090
453.95	0.066	0.092
454.00	0.066	0.095
454.05	0.066	0.098
454.10	0.066	0.100
454.15	0.066	0.102
454.20	0.066	0.105
454.25	0.066	0.107
454.30	0.066	0.110
454.35	0.066	0.112
454.40	0.066	0.114
454.45	0.066	0.116
454.50	0.066	0.119
454.55	0.066	0.121
454.60	0.066	0.123
454.65	0.066	0.125
454.70	0.066	0.127
454.75	0.066	0.129
454.80	0.066	0.130
454.85	0.066	0.132
454.90	0.066	0.134
454.95	0.066	0.135
455.00	0.066	0.136
455.05	0.066	0.138
455.10	0.066	0.139
455.15	0.066	0.140
455.20	0.066	0.142
455.25	0.066	0.143
455.30	0.066	0.144
455.35	0.066	0.146
455.40	0.066	0.147
455.45	0.066	0.148
455.50	0.066	**0.150**

Summary for Pond INF 1.3: Infiltration System 1.3

Inflow Area = 0.046 ac,100.00% Impervious, Inflow Depth = 2.60" for 1-yr event
Inflow = 0.14 cfs @ 12.04 hrs, Volume= 0.010 af
Outflow = 0.08 cfs @ 12.00 hrs, Volume= 0.010 af, Atten= 43%, Lag= 0.0 min
Discarded = 0.08 cfs @ 12.00 hrs, Volume= 0.010 af

Routing by Stor-Ind method, Time Span= 0.00-144.00 hrs, dt= 0.05 hrs
Peak Elev= 593.25' @ 12.13 hrs Surf.Area= 0.006 ac Storage= 0.001 af

Plug-Flow detention time= 2.9 min calculated for 0.010 af (100% of inflow)
Center-of-Mass det. time= 2.8 min (764.6 - 761.8)

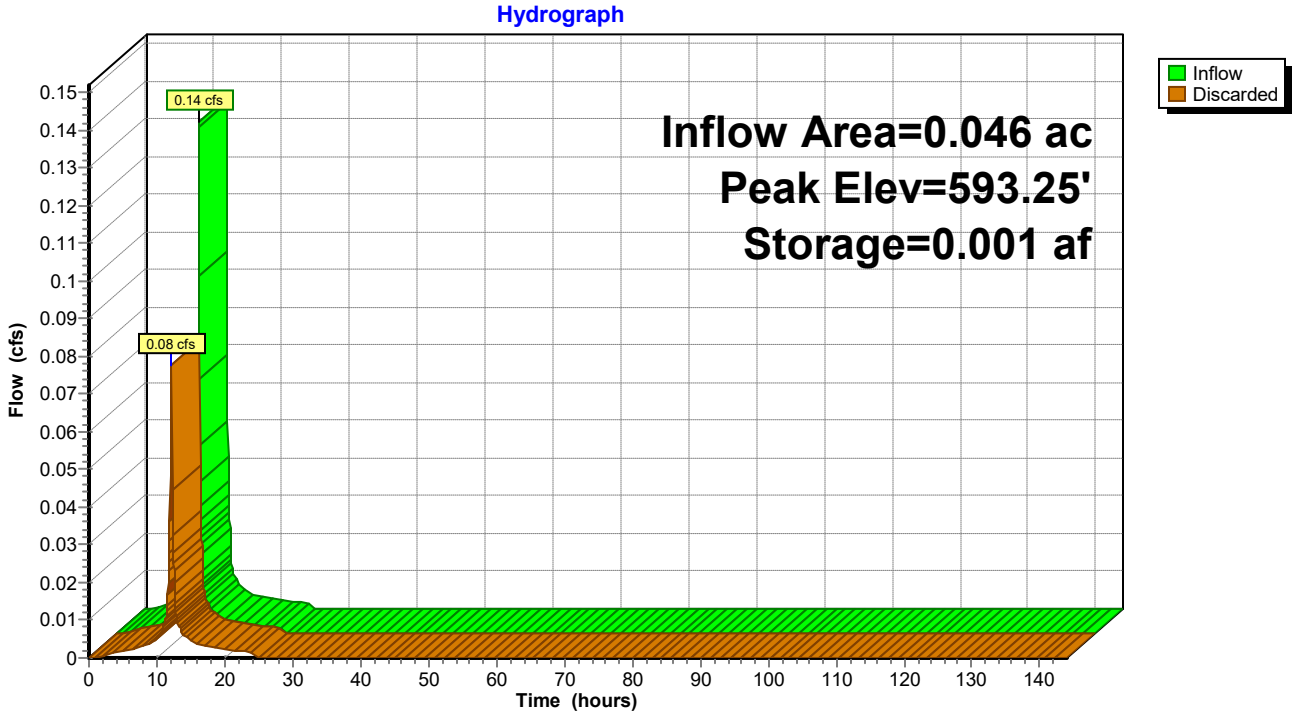
Volume	Invert	Avail.Storage	Storage Description
#1A	593.00'	0.006 af	**16.00'W x 17.50'L x 3.54'H Field A** 0.023 af Overall - 0.008 af Embedded = 0.015 af x 40.0% Voids
#2A	593.50'	0.008 af	**Cultec R-330XLHD** x 6 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 3 rows
		0.014 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	593.00'	**12.000 in/hr Exfiltration over Horizontal area** Phase-In= 0.10'

Discarded OutFlow Max=0.08 cfs @ 12.00 hrs HW=593.11' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.08 cfs)

Pond INF 1.3: Infiltration System 1.3



Stage-Area-Storage for Pond INF 1.3: Infiltration System 1.3

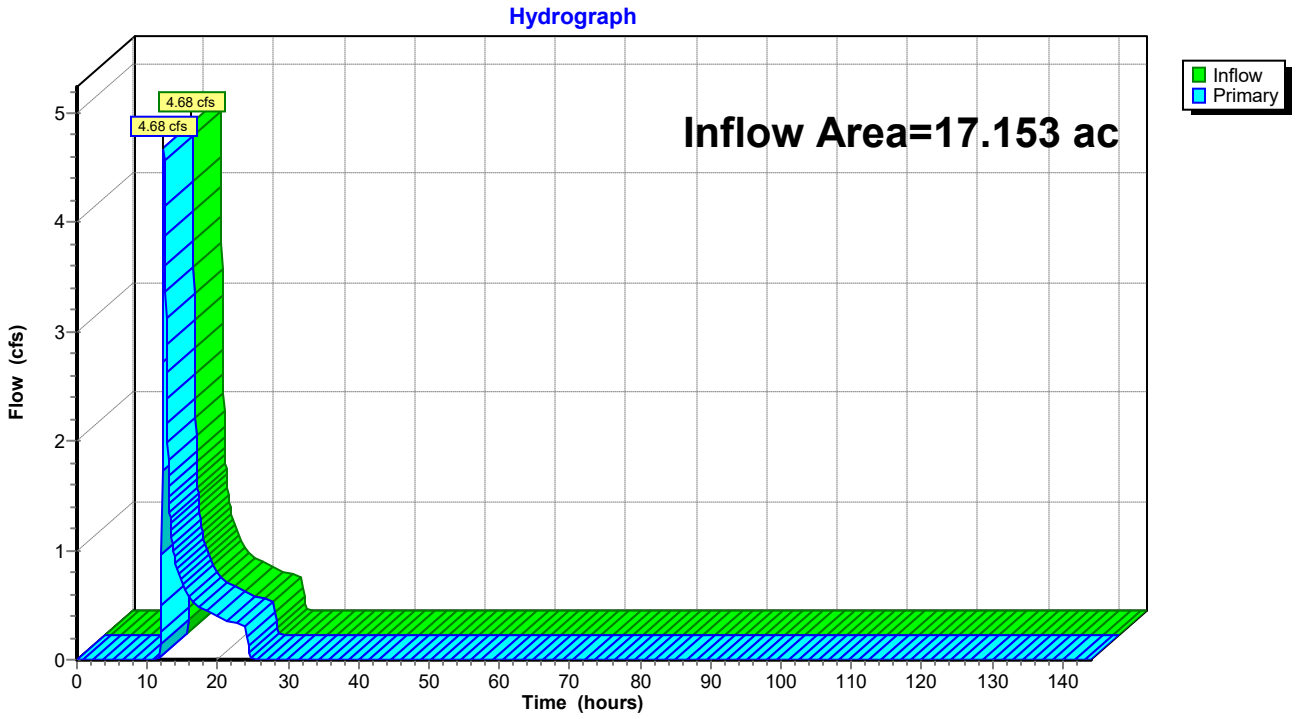
Elevation (feet)	Horizontal (acres)	Storage (acre-feet)
593.00	**0.006**	0.000
593.05	0.006	0.000
593.10	0.006	0.000
593.15	0.006	0.000
593.20	0.006	0.001
593.25	0.006	0.001
593.30	0.006	0.001
593.35	0.006	0.001
593.40	0.006	0.001
593.45	0.006	0.001
593.50	0.006	0.001
593.55	0.006	0.002
593.60	0.006	0.002
593.65	0.006	0.002
593.70	0.006	0.002
593.75	0.006	0.003
593.80	0.006	0.003
593.85	0.006	0.003
593.90	0.006	0.003
593.95	0.006	0.004
594.00	0.006	0.004
594.05	0.006	0.004
594.10	0.006	0.004
594.15	0.006	0.005
594.20	0.006	0.005
594.25	0.006	0.005
594.30	0.006	0.005
594.35	0.006	0.006
594.40	0.006	0.006
594.45	0.006	0.006
594.50	0.006	0.006
594.55	0.006	0.007
594.60	0.006	0.007
594.65	0.006	0.007
594.70	0.006	0.007
594.75	0.006	0.008
594.80	0.006	0.008
594.85	0.006	0.008
594.90	0.006	0.008
594.95	0.006	0.008
595.00	0.006	0.009
595.05	0.006	0.009
595.10	0.006	0.009
595.15	0.006	0.009
595.20	0.006	0.010
595.25	0.006	0.010
595.30	0.006	0.010
595.35	0.006	0.010
595.40	0.006	0.010
595.45	0.006	0.011
595.50	0.006	0.011
595.55	0.006	0.011
595.60	0.006	0.011
595.65	0.006	0.011
595.70	0.006	0.012
595.75	0.006	0.012
595.80	0.006	0.012
595.85	0.006	0.012
595.90	0.006	0.012
595.95	0.006	0.012
596.00	0.006	0.012
596.05	0.006	0.013
596.10	0.006	0.013
596.15	0.006	0.013
596.20	0.006	0.013
596.25	0.006	0.013
596.30	0.006	0.013
596.35	0.006	0.013
596.40	0.006	0.014
596.45	0.006	0.014
596.50	0.006	**0.014**

Summary for Link DP: Design Point 1

Inflow Area = 17.153 ac, 6.06% Impervious, Inflow Depth = 0.52" for 1-yr event
Inflow = 4.68 cfs @ 12.33 hrs, Volume= 0.741 af
Primary = 4.68 cfs @ 12.33 hrs, Volume= 0.741 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-144.00 hrs, dt= 0.05 hrs

Link DP: Design Point 1



Summary for Subcatchment 1.0S: 1.0S

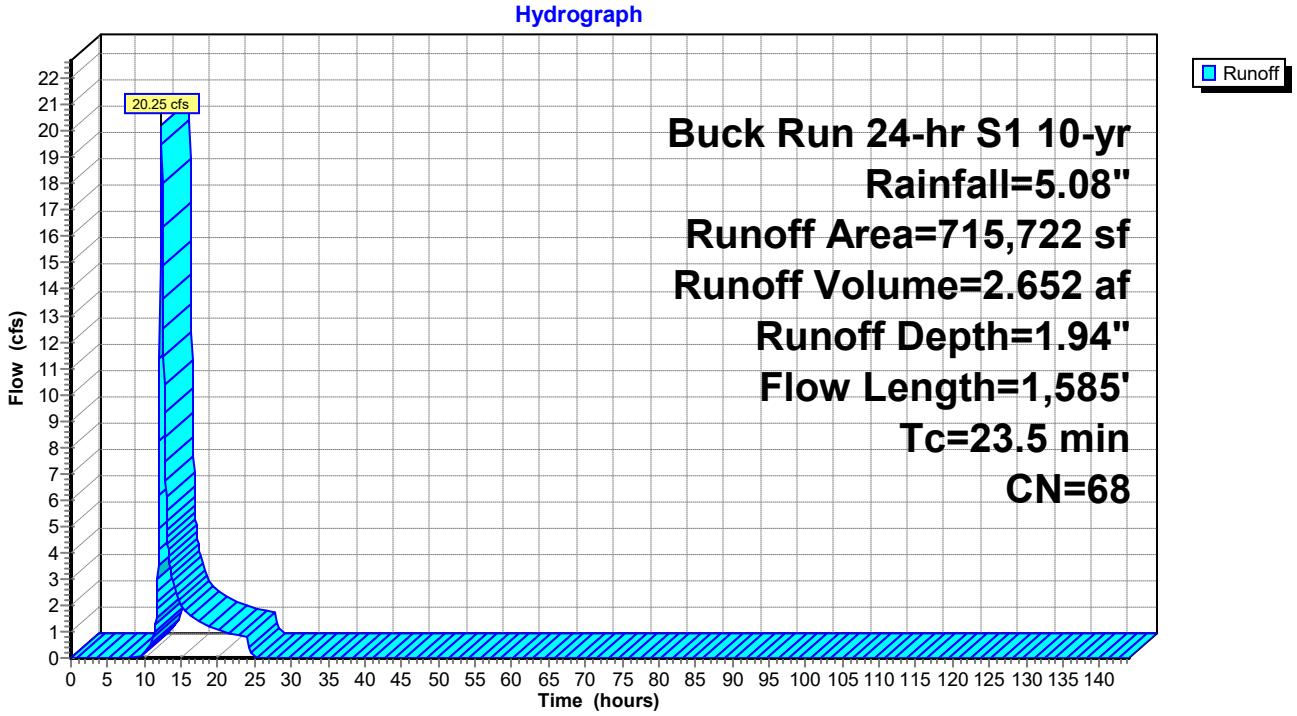
Runoff = 20.25 cfs @ 12.29 hrs, Volume= 2.652 af, Depth= 1.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-144.00 hrs, dt= 0.05 hrs
Buck Run 24-hr S1 10-yr Rainfall=5.08"

	Area (sf)	CN	Description
*	18,932	98	Existing Pavement
*	6,135	98	Existing Buildings
	5,607	87	Dirt roads, HSG C
*	6,970	98	Proposed Pavement
*	1,405	61	Existing>75% Grass cover, Good, HSG B
*	6,540	61	Proposed >75% Grass cover, Good, HSG B
*	2,900	74	Existing >75% Grass cover, Good, HSG C
*	27,898	74	Proposed >75% Grass cover, Good, HSG C
	13,520	89	Gravel roads, HSG C
	172,620	55	Woods, Good, HSG B
	417,935	70	Woods, Good, HSG C
	35,260	71	Meadow, non-grazed, HSG C
	715,722	68	Weighted Average
	683,685		95.52% Pervious Area
	32,037		4.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.0900	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.40"
12.1	1,485	0.1670	2.04		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
23.5	1,585	Total			

Subcatchment 1.0S: 1.0S



Summary for Subcatchment 1.1S: 1.1S

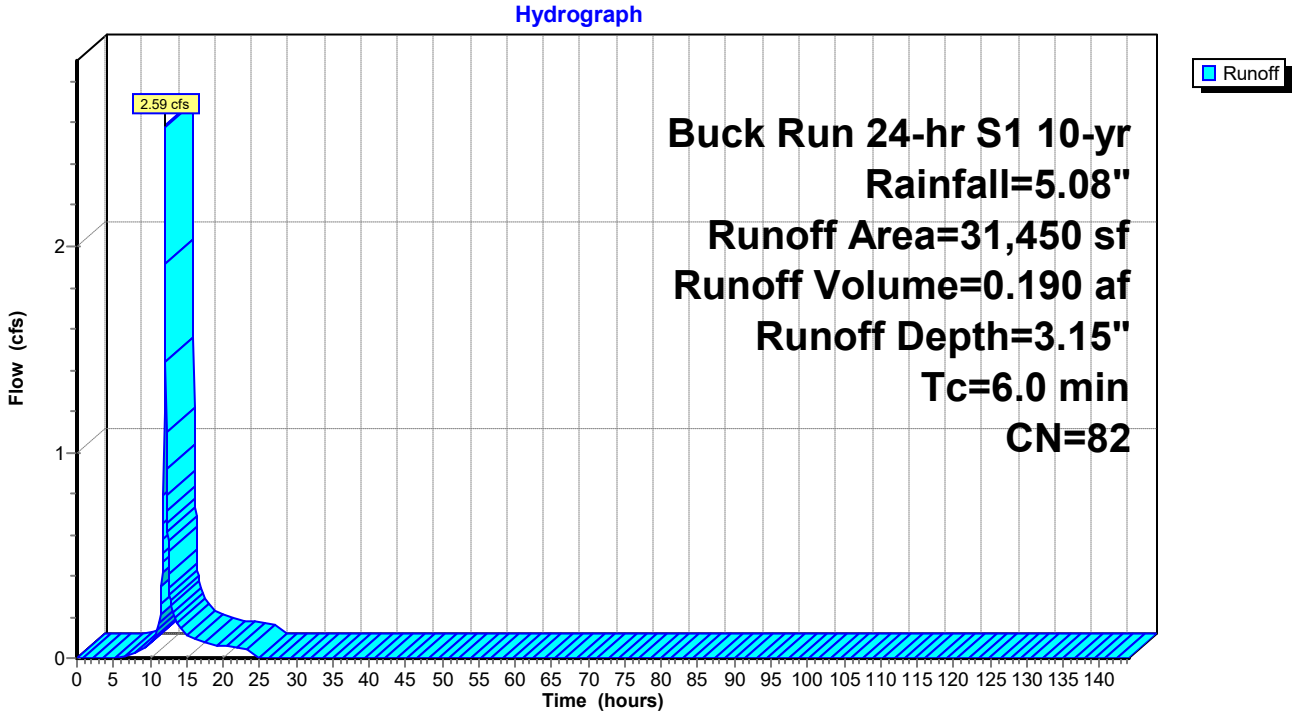
Runoff = 2.59 cfs @ 12.04 hrs, Volume= 0.190 af, Depth= 3.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-144.00 hrs, dt= 0.05 hrs
Buck Run 24-hr S1 10-yr Rainfall=5.08"

	Area (sf)	CN	Description
*	12,870	98	Proposed Pavement
*	340	98	Proposed Sidewalk
	5,235	61	>75% Grass cover, Good, HSG B
	13,005	74	>75% Grass cover, Good, HSG C
	31,450	82	Weighted Average
	18,240		58.00% Pervious Area
	13,210		42.00% Impervious Area

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

Subcatchment 1.1S: 1.1S



Summary for Subcatchment 1.2S: 1.2S

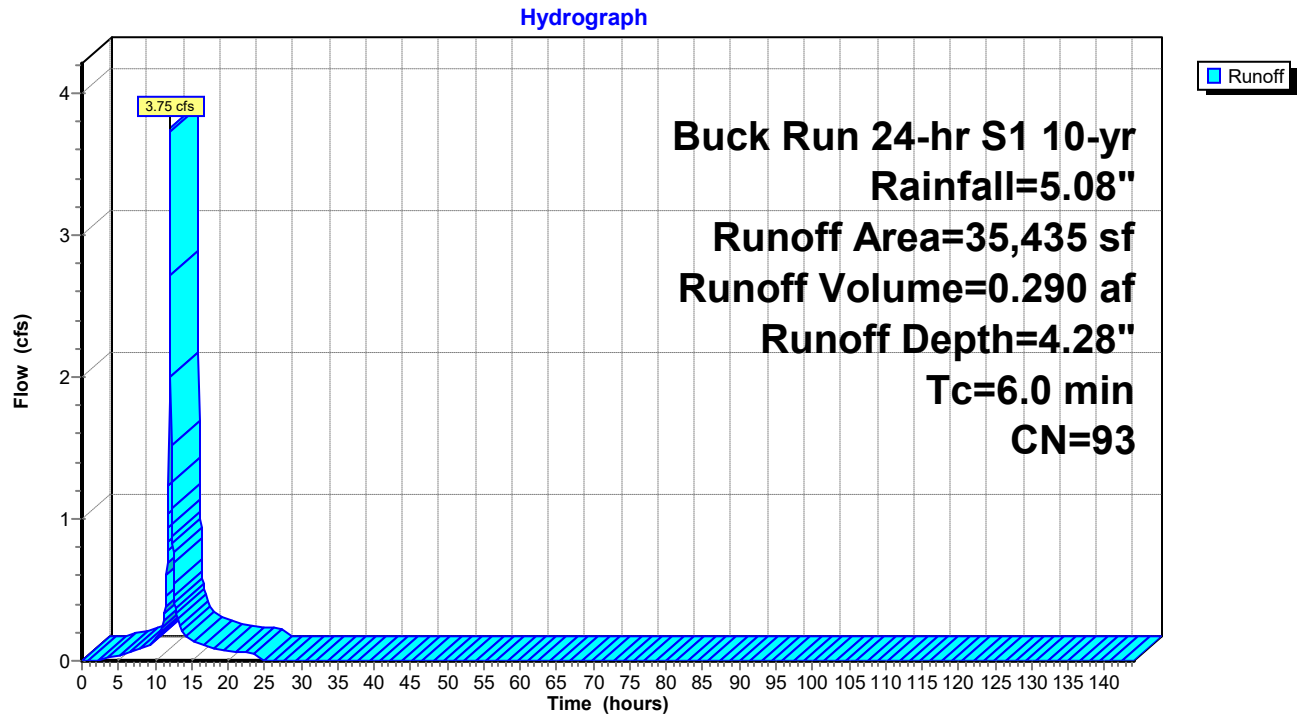
Runoff = 3.75 cfs @ 12.04 hrs, Volume= 0.290 af, Depth= 4.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-144.00 hrs, dt= 0.05 hrs
Buck Run 24-hr S1 10-yr Rainfall=5.08"

	Area (sf)	CN	Description
*	23,275	98	Proposed Pavement & Walkway
*	4,815	98	Proposed Building
	7,345	74	>75% Grass cover, Good, HSG C
	35,435	93	Weighted Average
	7,345		20.73% Pervious Area
	28,090		79.27% Impervious Area

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

Subcatchment 1.2S: 1.2S



Summary for Subcatchment 1.3S: 1.3S

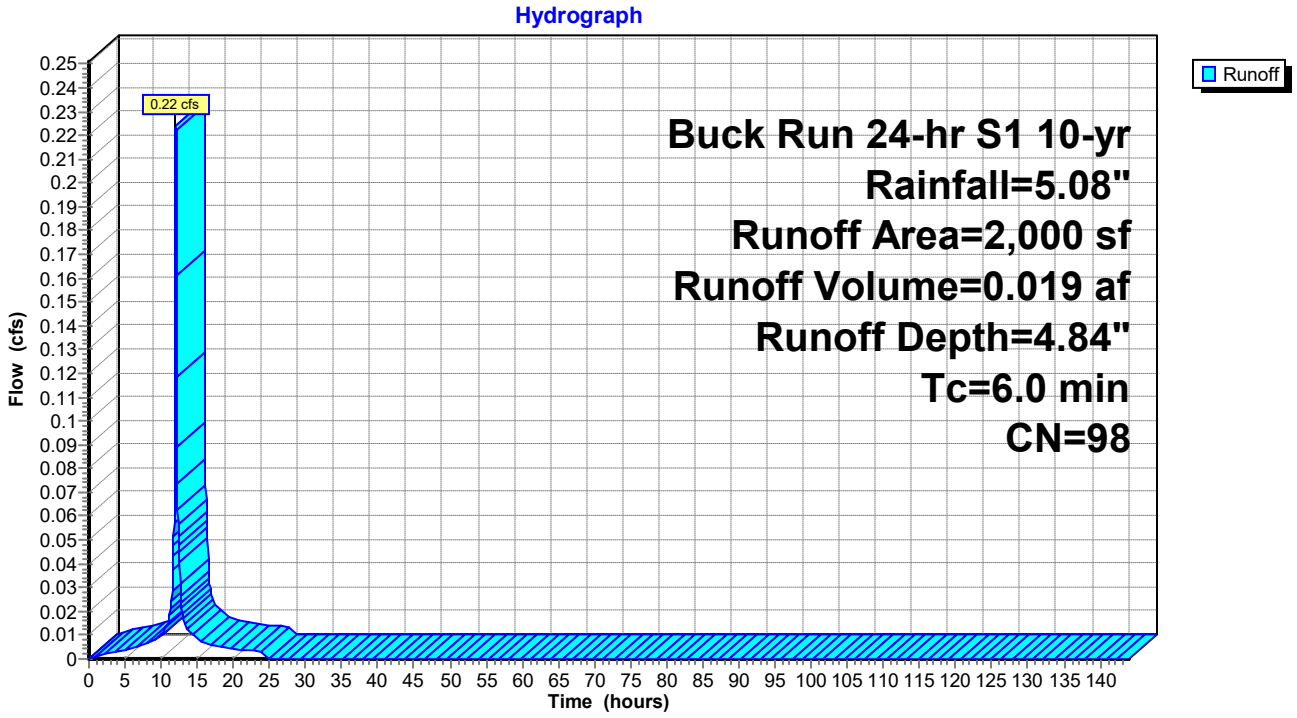
Runoff = 0.22 cfs @ 12.04 hrs, Volume= 0.019 af, Depth= 4.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-144.00 hrs, dt= 0.05 hrs
Buck Run 24-hr S1 10-yr Rainfall=5.08"

	Area (sf)	CN	Description
*	2,000	98	Proposed Pods and Facilities
	2,000		100.00% Impervious Area

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

Subcatchment 1.3S: 1.3S



Summary for Pond 1.1P: Infiltration Basin 1.1

Inflow Area = 0.722 ac, 42.00% Impervious, Inflow Depth = 3.15" for 10-yr event
Inflow = 2.59 cfs @ 12.04 hrs, Volume= 0.190 af
Outflow = 0.44 cfs @ 12.59 hrs, Volume= 0.190 af, Atten= 83%, Lag= 32.8 min
Discarded = 0.44 cfs @ 12.59 hrs, Volume= 0.190 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-144.00 hrs, dt= 0.05 hrs
Peak Elev= 454.35' @ 12.59 hrs Surf.Area= 1,582 sf Storage= 2,609 cf

Plug-Flow detention time= 59.2 min calculated for 0.190 af (100% of inflow)
Center-of-Mass det. time= 59.2 min (891.7 - 832.5)

Volume	Invert	Avail.Storage	Storage Description
#1	451.00'	9,077 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
451.00	125	0	0
452.00	447	286	286
454.00	1,356	1,803	2,089
456.00	2,634	3,990	6,079
457.00	3,362	2,998	9,077

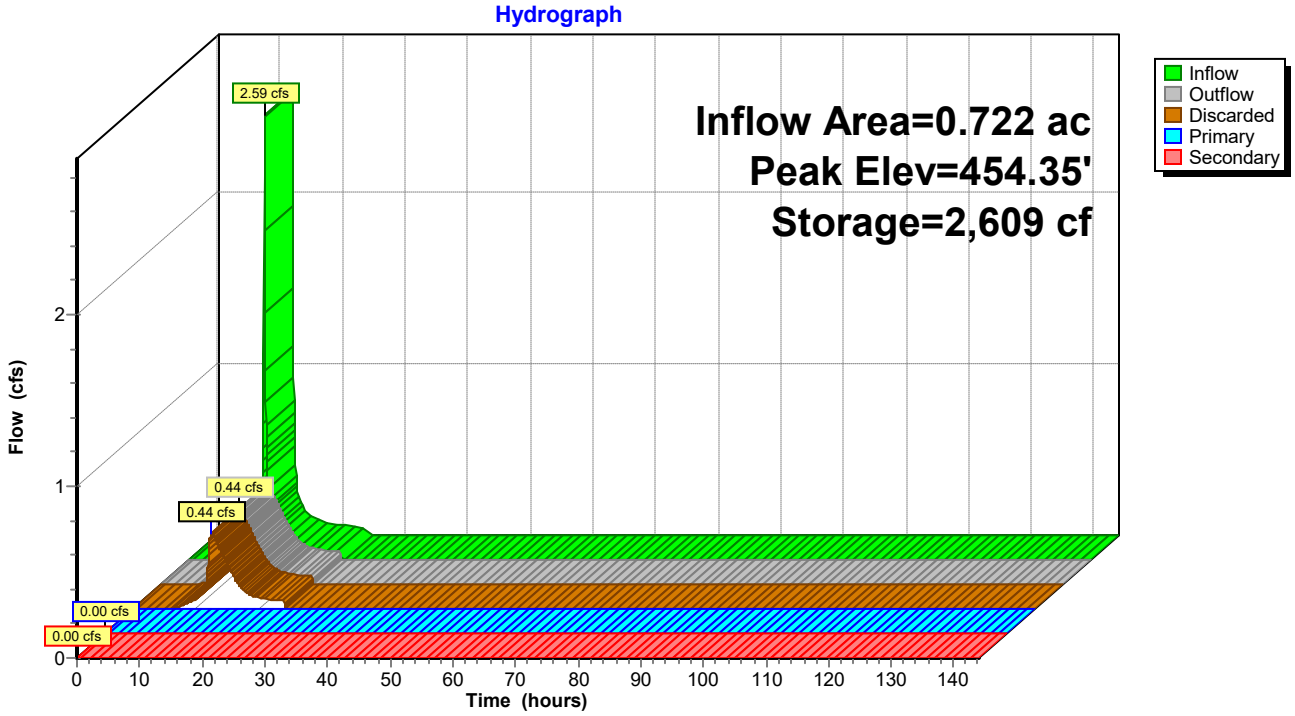
Device	Routing	Invert	Outlet Devices
#1	Primary	450.30'	**12.0" Round Culvert** L= 80.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 450.30' / 449.50' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	454.75'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	455.50'	**30.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Discarded	451.00'	**12.000 in/hr Exfiltration over Surface area** Phase-In= 0.10'
#5	Secondary	456.00'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.44 cfs @ 12.59 hrs HW=454.35' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.44 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=451.00' (Free Discharge)
└**1=Culvert** (Passes 0.00 cfs of 1.67 cfs potential flow)
  ├**2=Orifice/Grate** (Controls 0.00 cfs)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=451.00' (Free Discharge)
└**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1.1P: Infiltration Basin 1.1



Stage-Area-Storage for Pond 1.1P: Infiltration Basin 1.1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
451.00	125	0
451.10	157	14
451.20	189	31
451.30	222	52
451.40	254	76
451.50	286	103
451.60	318	133
451.70	350	166
451.80	383	203
451.90	415	243
452.00	447	286
452.10	492	333
452.20	538	384
452.30	583	441
452.40	629	501
452.50	674	566
452.60	720	636
452.70	765	710
452.80	811	789
452.90	856	872
453.00	902	960
453.10	947	1,053
453.20	992	1,150
453.30	1,038	1,251
453.40	1,083	1,357
453.50	1,129	1,468
453.60	1,174	1,583
453.70	1,220	1,703
453.80	1,265	1,827
453.90	1,311	1,956
454.00	1,356	2,089
454.10	1,420	2,228
454.20	1,484	2,373
454.30	1,548	2,525
454.40	1,612	2,683
454.50	1,676	2,847
454.60	1,739	3,018
454.70	1,803	3,195
454.80	1,867	3,378
454.90	1,931	3,568
455.00	1,995	3,765
455.10	2,059	3,967
455.20	2,123	4,176
455.30	2,187	4,392
455.40	2,251	4,614
455.50	2,315	4,842
455.60	2,378	5,077
455.70	2,442	5,318
455.80	2,506	5,565
455.90	2,570	5,819
456.00	2,634	6,079
456.10	2,707	6,346
456.20	2,780	6,620
456.30	2,852	6,902
456.40	2,925	7,191
456.50	2,998	7,487
456.60	3,071	7,790
456.70	3,144	8,101
456.80	3,216	8,419
456.90	3,289	8,744
457.00	**3,362**	**9,077**

Summary for Pond DS1.2: Diversion Structure 1.2

Inflow Area = 0.813 ac, 79.27% Impervious, Inflow Depth = 4.28" for 10-yr event
Inflow = 3.75 cfs @ 12.04 hrs, Volume= 0.290 af
Outflow = 3.75 cfs @ 12.04 hrs, Volume= 0.290 af, Atten= 0%, Lag= 0.0 min
Primary = 3.10 cfs @ 12.03 hrs, Volume= 0.286 af
Secondary = 0.66 cfs @ 12.04 hrs, Volume= 0.004 af

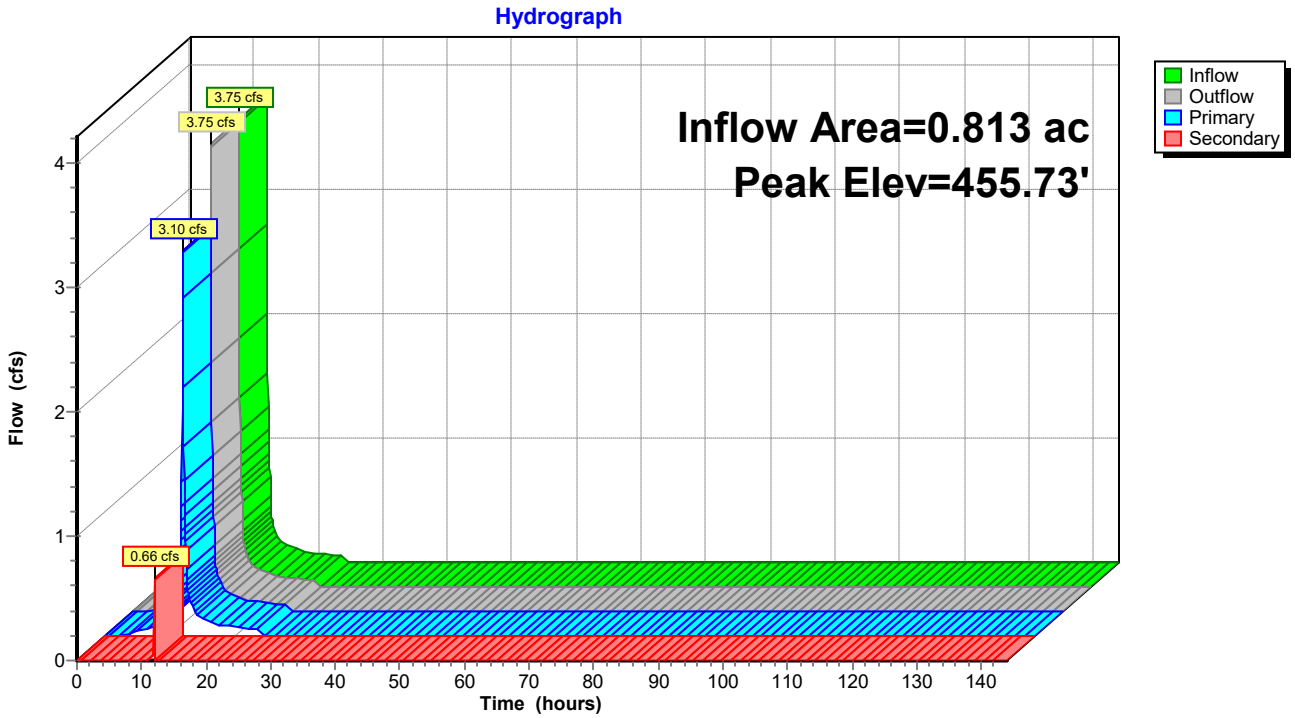
Routing by Stor-Ind method, Time Span= 0.00-144.00 hrs, dt= 0.05 hrs
Peak Elev= 455.73' @ 12.03 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	452.00'	**8.0" Round Culvert** L= 6.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 452.00' / 452.00' S= 0.0000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Secondary	455.20'	**8.0" Round Culvert** L= 27.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 455.20' / 454.60' S= 0.0222 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=3.05 cfs @ 12.03 hrs HW=455.63' (Free Discharge)
└**1=Culvert** (Inlet Controls 3.05 cfs @ 8.74 fps)

Secondary OutFlow Max=0.59 cfs @ 12.04 hrs HW=455.66' (Free Discharge)
└**2=Culvert** (Inlet Controls 0.59 cfs @ 2.31 fps)

Pond DS1.2: Diversion Structure 1.2



Stage-Area-Storage for Pond DS1.2: Diversion Structure 1.2

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
452.00	**0**	454.55	0
452.05	0	454.60	0
452.10	0	454.65	0
452.15	0	454.70	0
452.20	0	454.75	0
452.25	0	454.80	0
452.30	0	454.85	0
452.35	0	454.90	0
452.40	0	454.95	0
452.45	0	455.00	0
452.50	0	455.05	0
452.55	0	455.10	0
452.60	0	455.15	0
452.65	0	455.20	0
452.70	0	455.25	0
452.75	0	455.30	0
452.80	0	455.35	0
452.85	0	455.40	0
452.90	0	455.45	0
452.95	0	455.50	0
453.00	0	455.55	0
453.05	0	455.60	0
453.10	0	455.65	0
453.15	0	455.70	0
453.20	0	455.75	0
453.25	0	455.80	0
453.30	0	455.85	0
453.35	0		
453.40	0		
453.45	0		
453.50	0		
453.55	0		
453.60	0		
453.65	0		
453.70	0		
453.75	0		
453.80	0		
453.85	0		
453.90	0		
453.95	0		
454.00	0		
454.05	0		
454.10	0		
454.15	0		
454.20	0		
454.25	0		
454.30	0		
454.35	0		
454.40	0		
454.45	0		
454.50	0		

Summary for Pond DS1.3: Diversion Structure 1.3

Inflow Area = 0.046 ac,100.00% Impervious, Inflow Depth = 4.84" for 10-yr event
Inflow = 0.22 cfs @ 12.04 hrs, Volume= 0.019 af
Outflow = 0.22 cfs @ 12.04 hrs, Volume= 0.019 af, Atten= 0%, Lag= 0.0 min
Primary = 0.22 cfs @ 12.04 hrs, Volume= 0.019 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

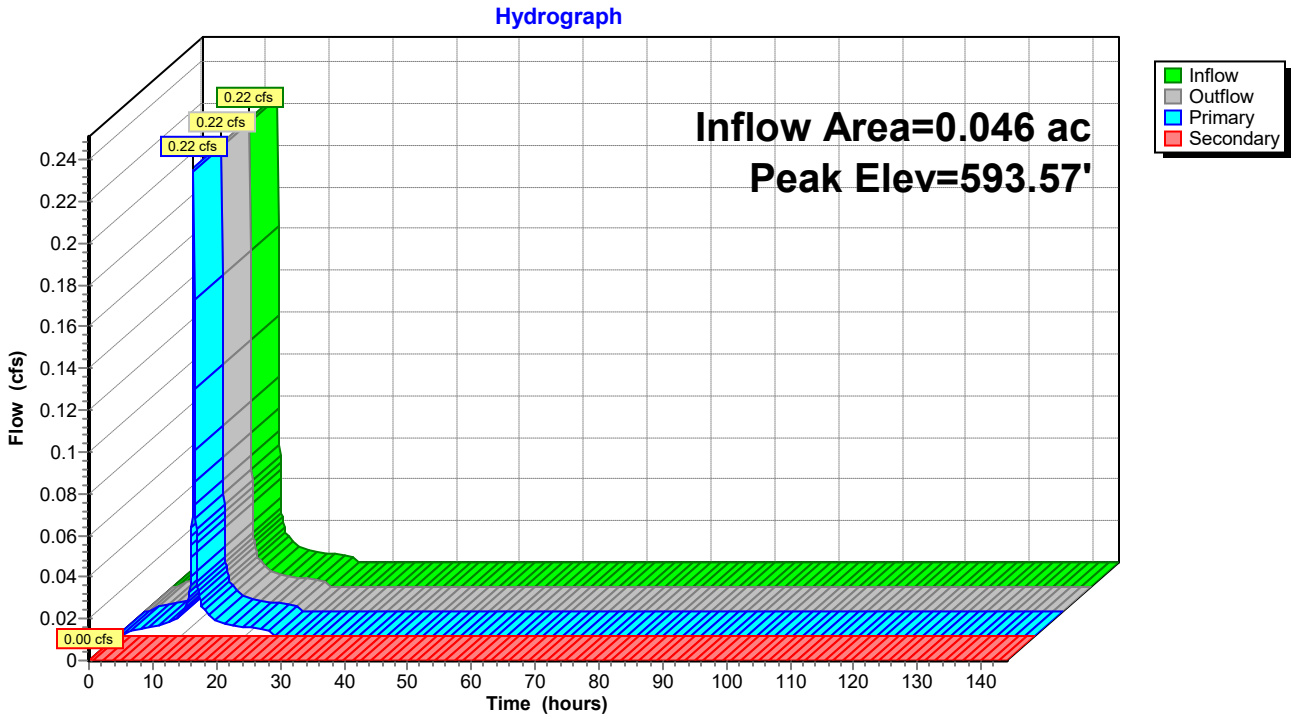
Routing by Stor-Ind method, Time Span= 0.00-144.00 hrs, dt= 0.05 hrs
Peak Elev= 593.57' @ 12.04 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	593.00'	**4.0" Round Culvert** L= 6.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 593.00' / 593.00' S= 0.0000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf
#2	Secondary	595.20'	**8.0" Round Culvert** L= 154.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 595.20' / 590.00' S= 0.0338 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.22 cfs @ 12.04 hrs HW=593.56' (Free Discharge)
└**1=Culvert** (Barrel Controls 0.22 cfs @ 2.49 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=593.00' (Free Discharge)
└**2=Culvert** (Controls 0.00 cfs)

Pond DS1.3: Diversion Structure 1.3



Stage-Area-Storage for Pond DS1.3: Diversion Structure 1.3

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
593.00	**0**	594.02	0	595.04	0
593.02	0	594.04	0	595.06	0
593.04	0	594.06	0	595.08	0
593.06	0	594.08	0	595.10	0
593.08	0	594.10	0	595.12	0
593.10	0	594.12	0	595.14	0
593.12	0	594.14	0	595.16	0
593.14	0	594.16	0	595.18	0
593.16	0	594.18	0	595.20	0
593.18	0	594.20	0	595.22	0
593.20	0	594.22	0	595.24	0
593.22	0	594.24	0	595.26	0
593.24	0	594.26	0	595.28	0
593.26	0	594.28	0	595.30	0
593.28	0	594.30	0	595.32	0
593.30	0	594.32	0	595.34	0
593.32	0	594.34	0	595.36	0
593.34	0	594.36	0	595.38	0
593.36	0	594.38	0	595.40	0
593.38	0	594.40	0	595.42	0
593.40	0	594.42	0	595.44	0
593.42	0	594.44	0	595.46	0
593.44	0	594.46	0	595.48	0
593.46	0	594.48	0	595.50	0
593.48	0	594.50	0	595.52	0
593.50	0	594.52	0	595.54	0
593.52	0	594.54	0	595.56	0
593.54	0	594.56	0	595.58	0
593.56	0	594.58	0	595.60	0
593.58	0	594.60	0	595.62	0
593.60	0	594.62	0	595.64	0
593.62	0	594.64	0	595.66	0
593.64	0	594.66	0	595.68	0
593.66	0	594.68	0	595.70	0
593.68	0	594.70	0	595.72	0
593.70	0	594.72	0	595.74	0
593.72	0	594.74	0	595.76	0
593.74	0	594.76	0	595.78	0
593.76	0	594.78	0	595.80	0
593.78	0	594.80	0	595.82	0
593.80	0	594.82	0	595.84	0
593.82	0	594.84	0	595.86	0
593.84	0	594.86	0		
593.86	0	594.88	0		
593.88	0	594.90	0		
593.90	0	594.92	0		
593.92	0	594.94	0		
593.94	0	594.96	0		
593.96	0	594.98	0		
593.98	0	595.00	0		
594.00	0	595.02	0		

Summary for Pond INF 1.2: Infiltration System 1.2

Inflow Area = 0.813 ac, 79.27% Impervious, Inflow Depth = 4.22" for 10-yr event
Inflow = 3.10 cfs @ 12.03 hrs, Volume= 0.286 af
Outflow = 0.80 cfs @ 11.80 hrs, Volume= 0.286 af, Atten= 74%, Lag= 0.0 min
Discarded = 0.80 cfs @ 11.80 hrs, Volume= 0.286 af

Routing by Stor-Ind method, Time Span= 0.00-144.00 hrs, dt= 0.05 hrs
Peak Elev= 453.13' @ 12.47 hrs Surf.Area= 0.066 ac Storage= 0.049 af

Plug-Flow detention time= 13.1 min calculated for 0.286 af (100% of inflow)
Center-of-Mass det. time= 13.1 min (798.8 - 785.7)

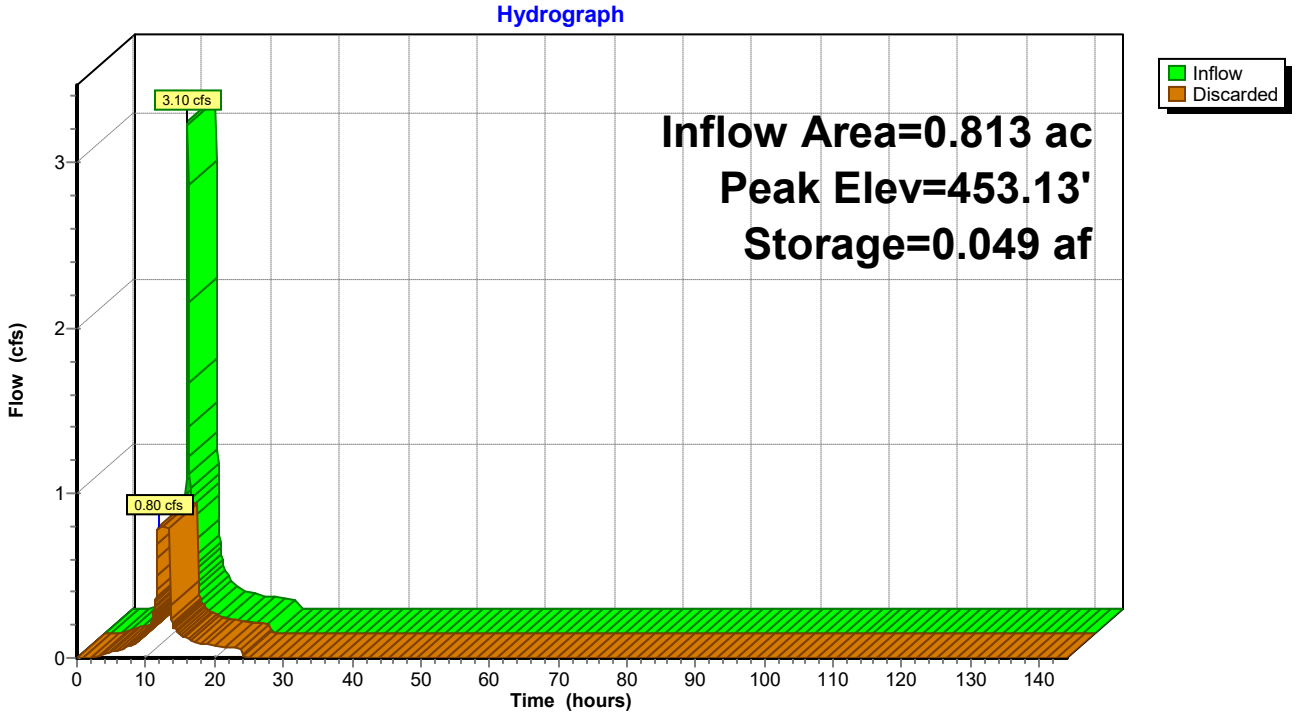
Volume	Invert	Avail.Storage	Storage Description
#1A	452.00'	0.056 af	**30.50'W x 94.50'L x 3.54'H Field A** 0.234 af Overall - 0.095 af Embedded = 0.139 af x 40.0% Voids
#2A	452.50'	0.095 af	**Cultec R-330XLHD** x 78 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 6 rows
		0.151 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	452.00'	**12.000 in/hr Exfiltration over Horizontal area** Phase-In= 0.10'

Discarded OutFlow Max=0.80 cfs @ 11.80 hrs HW=452.12' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.80 cfs)

Pond INF 1.2: Infiltration System 1.2



Stage-Area-Storage for Pond INF 1.2: Infiltration System 1.2

Elevation (feet)	Horizontal (acres)	Storage (acre-feet)
452.00	**0.066**	0.000
452.05	0.066	0.001
452.10	0.066	0.003
452.15	0.066	0.004
452.20	0.066	0.005
452.25	0.066	0.007
452.30	0.066	0.008
452.35	0.066	0.009
452.40	0.066	0.011
452.45	0.066	0.012
452.50	0.066	0.013
452.55	0.066	0.016
452.60	0.066	0.019
452.65	0.066	0.022
452.70	0.066	0.025
452.75	0.066	0.027
452.80	0.066	0.030
452.85	0.066	0.033
452.90	0.066	0.036
452.95	0.066	0.039
453.00	0.066	0.041
453.05	0.066	0.044
453.10	0.066	0.047
453.15	0.066	0.050
453.20	0.066	0.052
453.25	0.066	0.055
453.30	0.066	0.058
453.35	0.066	0.061
453.40	0.066	0.063
453.45	0.066	0.066
453.50	0.066	0.069
453.55	0.066	0.071
453.60	0.066	0.074
453.65	0.066	0.077
453.70	0.066	0.079
453.75	0.066	0.082
453.80	0.066	0.085
453.85	0.066	0.087
453.90	0.066	0.090
453.95	0.066	0.092
454.00	0.066	0.095
454.05	0.066	0.098
454.10	0.066	0.100
454.15	0.066	0.102
454.20	0.066	0.105
454.25	0.066	0.107
454.30	0.066	0.110
454.35	0.066	0.112
454.40	0.066	0.114
454.45	0.066	0.116
454.50	0.066	0.119
454.55	0.066	0.121
454.60	0.066	0.123
454.65	0.066	0.125
454.70	0.066	0.127
454.75	0.066	0.129
454.80	0.066	0.130
454.85	0.066	0.132
454.90	0.066	0.134
454.95	0.066	0.135
455.00	0.066	0.136
455.05	0.066	0.138
455.10	0.066	0.139
455.15	0.066	0.140
455.20	0.066	0.142
455.25	0.066	0.143
455.30	0.066	0.144
455.35	0.066	0.146
455.40	0.066	0.147
455.45	0.066	0.148
455.50	0.066	**0.150**

Summary for Pond INF 1.3: Infiltration System 1.3

Inflow Area = 0.046 ac,100.00% Impervious, Inflow Depth = 4.84" for 10-yr event
Inflow = 0.22 cfs @ 12.04 hrs, Volume= 0.019 af
Outflow = 0.08 cfs @ 11.95 hrs, Volume= 0.019 af, Atten= 65%, Lag= 0.0 min
Discarded = 0.08 cfs @ 11.95 hrs, Volume= 0.019 af

Routing by Stor-Ind method, Time Span= 0.00-144.00 hrs, dt= 0.05 hrs
Peak Elev= 593.64' @ 12.24 hrs Surf.Area= 0.006 ac Storage= 0.002 af

Plug-Flow detention time= 5.6 min calculated for 0.019 af (100% of inflow)
Center-of-Mass det. time= 5.6 min (754.4 - 748.8)

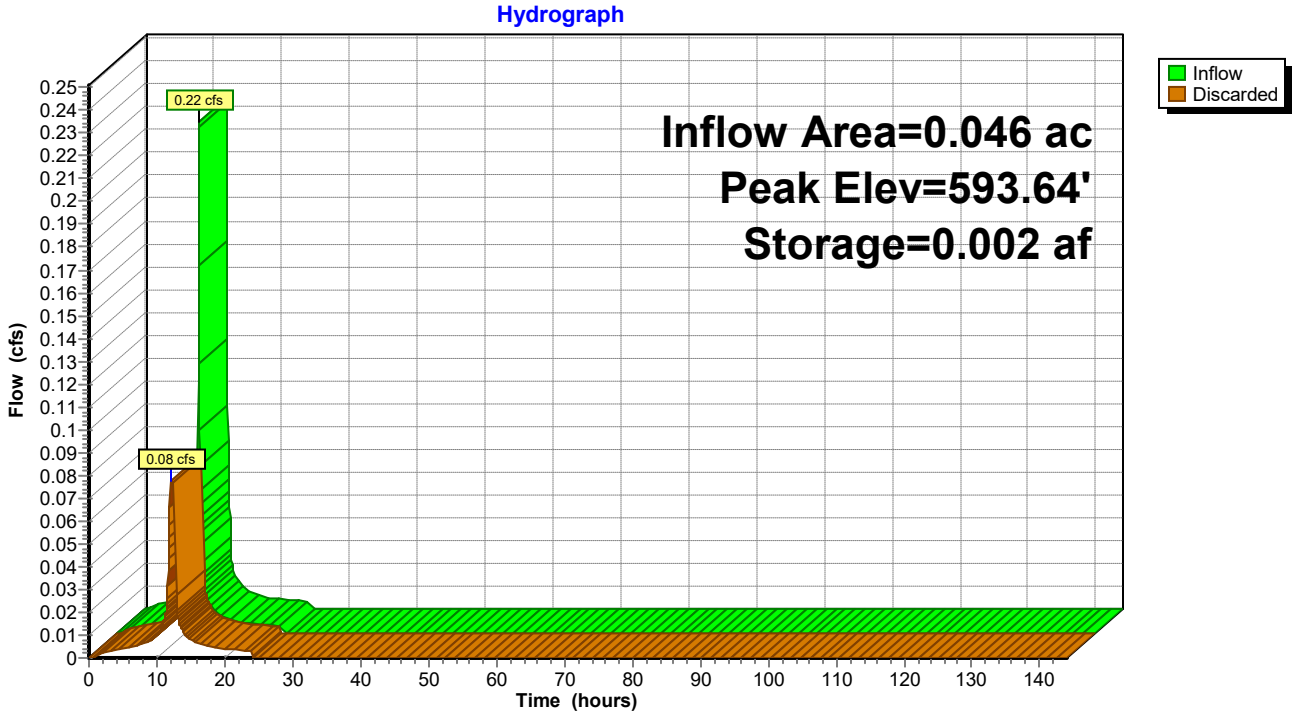
Volume	Invert	Avail.Storage	Storage Description
#1A	593.00'	0.006 af	**16.00'W x 17.50'L x 3.54'H Field A** 0.023 af Overall - 0.008 af Embedded = 0.015 af x 40.0% Voids
#2A	593.50'	0.008 af	**Cultec R-330XLHD** x 6 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 3 rows
		0.014 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	593.00'	**12.000 in/hr Exfiltration over Horizontal area** Phase-In= 0.10'

Discarded OutFlow Max=0.08 cfs @ 11.95 hrs HW=593.12' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.08 cfs)

Pond INF 1.3: Infiltration System 1.3



Stage-Area-Storage for Pond INF 1.3: Infiltration System 1.3

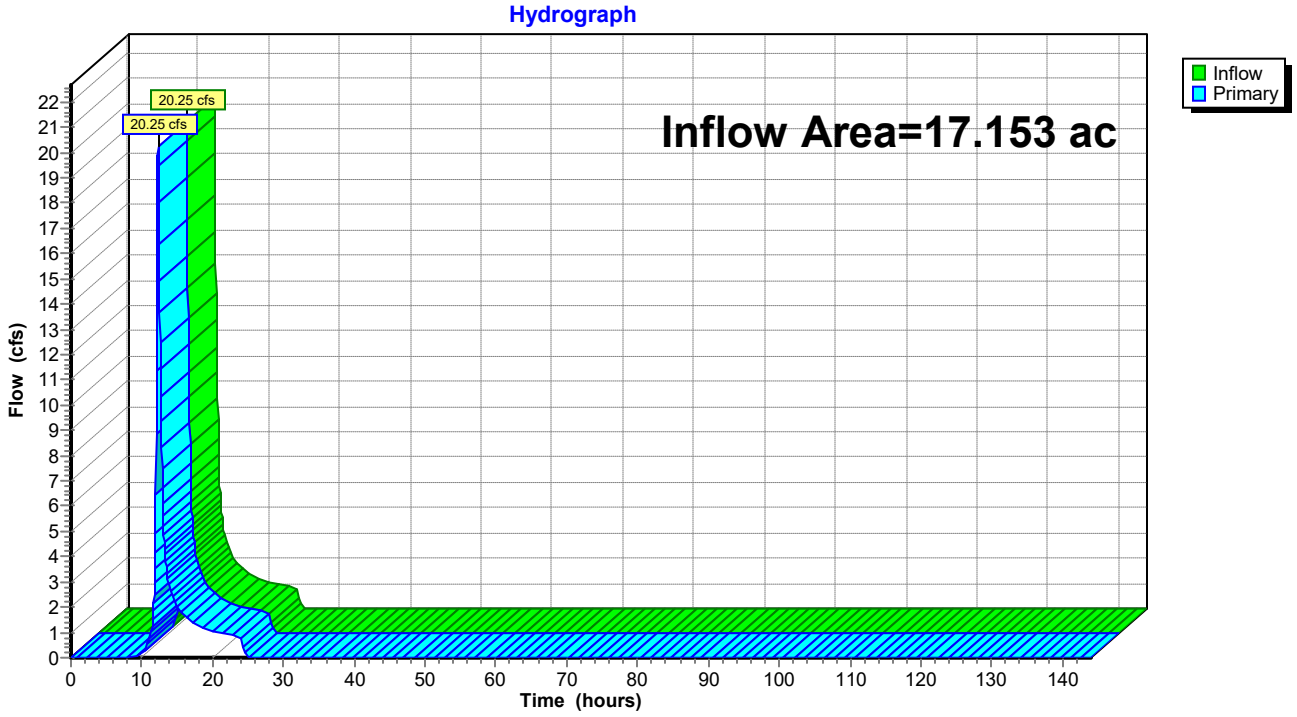
Elevation (feet)	Horizontal (acres)	Storage (acre-feet)
593.00	**0.006**	0.000
593.05	0.006	0.000
593.10	0.006	0.000
593.15	0.006	0.000
593.20	0.006	0.001
593.25	0.006	0.001
593.30	0.006	0.001
593.35	0.006	0.001
593.40	0.006	0.001
593.45	0.006	0.001
593.50	0.006	0.001
593.55	0.006	0.002
593.60	0.006	0.002
593.65	0.006	0.002
593.70	0.006	0.002
593.75	0.006	0.003
593.80	0.006	0.003
593.85	0.006	0.003
593.90	0.006	0.003
593.95	0.006	0.004
594.00	0.006	0.004
594.05	0.006	0.004
594.10	0.006	0.004
594.15	0.006	0.005
594.20	0.006	0.005
594.25	0.006	0.005
594.30	0.006	0.005
594.35	0.006	0.006
594.40	0.006	0.006
594.45	0.006	0.006
594.50	0.006	0.006
594.55	0.006	0.007
594.60	0.006	0.007
594.65	0.006	0.007
594.70	0.006	0.007
594.75	0.006	0.008
594.80	0.006	0.008
594.85	0.006	0.008
594.90	0.006	0.008
594.95	0.006	0.008
595.00	0.006	0.009
595.05	0.006	0.009
595.10	0.006	0.009
595.15	0.006	0.009
595.20	0.006	0.010
595.25	0.006	0.010
595.30	0.006	0.010
595.35	0.006	0.010
595.40	0.006	0.010
595.45	0.006	0.011
595.50	0.006	0.011
595.55	0.006	0.011
595.60	0.006	0.011
595.65	0.006	0.011
595.70	0.006	0.012
595.75	0.006	0.012
595.80	0.006	0.012
595.85	0.006	0.012
595.90	0.006	0.012
595.95	0.006	0.012
596.00	0.006	0.012
596.05	0.006	0.013
596.10	0.006	0.013
596.15	0.006	0.013
596.20	0.006	0.013
596.25	0.006	0.013
596.30	0.006	0.013
596.35	0.006	0.013
596.40	0.006	0.014
596.45	0.006	0.014
596.50	0.006	**0.014**

Summary for Link DP: Design Point 1

Inflow Area = 17.153 ac, 6.06% Impervious, Inflow Depth = 1.86" for 10-yr event
Inflow = 20.25 cfs @ 12.29 hrs, Volume= 2.656 af
Primary = 20.25 cfs @ 12.29 hrs, Volume= 2.656 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-144.00 hrs, dt= 0.05 hrs

Link DP: Design Point 1



Summary for Subcatchment 1.0S: 1.0S

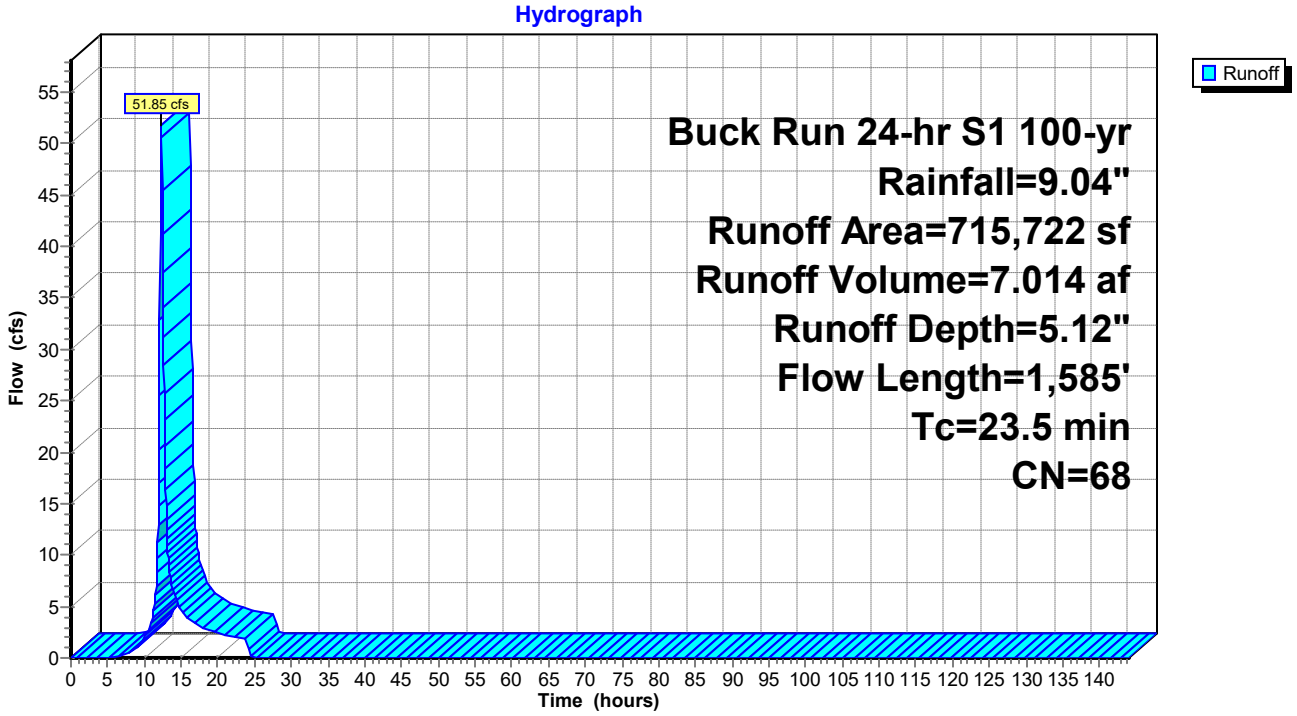
Runoff = 51.85 cfs @ 12.28 hrs, Volume= 7.014 af, Depth= 5.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-144.00 hrs, dt= 0.05 hrs
Buck Run 24-hr S1 100-yr Rainfall=9.04"

	Area (sf)	CN	Description
*	18,932	98	Existing Pavement
*	6,135	98	Existing Buildings
	5,607	87	Dirt roads, HSG C
*	6,970	98	Proposed Pavement
*	1,405	61	Existing>75% Grass cover, Good, HSG B
*	6,540	61	Proposed >75% Grass cover, Good, HSG B
*	2,900	74	Existing >75% Grass cover, Good, HSG C
*	27,898	74	Proposed >75% Grass cover, Good, HSG C
	13,520	89	Gravel roads, HSG C
	172,620	55	Woods, Good, HSG B
	417,935	70	Woods, Good, HSG C
	35,260	71	Meadow, non-grazed, HSG C
	715,722	68	Weighted Average
	683,685		95.52% Pervious Area
	32,037		4.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.0900	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.40"
12.1	1,485	0.1670	2.04		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
23.5	1,585	Total			

Subcatchment 1.0S: 1.0S



Summary for Subcatchment 1.1S: 1.1S

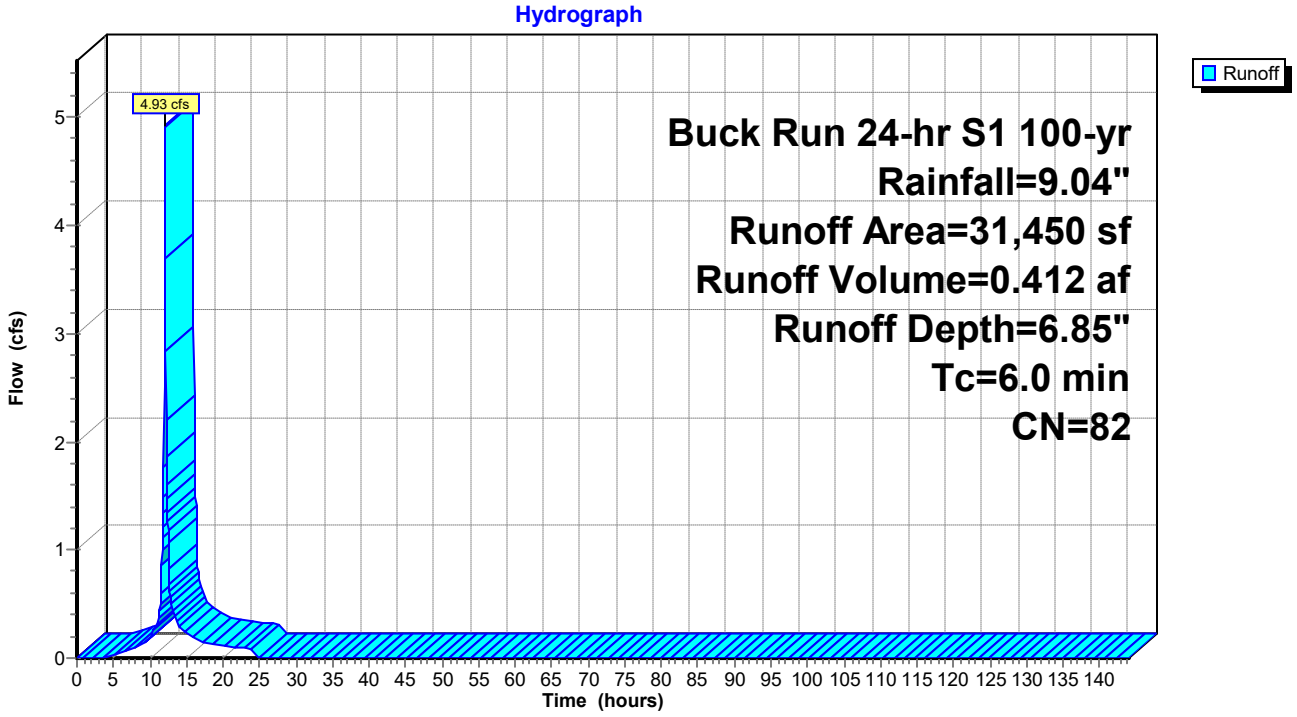
Runoff = 4.93 cfs @ 12.04 hrs, Volume= 0.412 af, Depth= 6.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-144.00 hrs, dt= 0.05 hrs
Buck Run 24-hr S1 100-yr Rainfall=9.04"

	Area (sf)	CN	Description
*	12,870	98	Proposed Pavement
*	340	98	Proposed Sidewalk
	5,235	61	>75% Grass cover, Good, HSG B
	13,005	74	>75% Grass cover, Good, HSG C
	31,450	82	Weighted Average
	18,240		58.00% Pervious Area
	13,210		42.00% Impervious Area

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

Subcatchment 1.1S: 1.1S



Summary for Subcatchment 1.2S: 1.2S

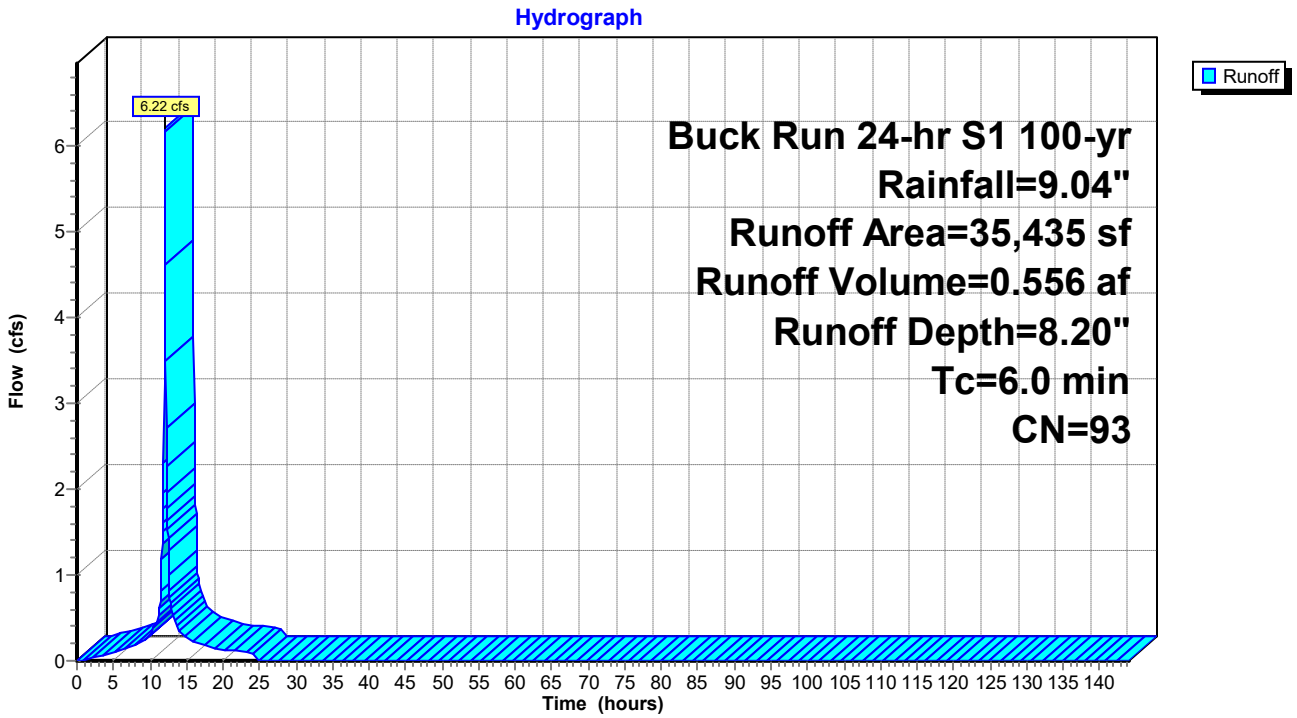
Runoff = 6.22 cfs @ 12.04 hrs, Volume= 0.556 af, Depth= 8.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-144.00 hrs, dt= 0.05 hrs
Buck Run 24-hr S1 100-yr Rainfall=9.04"

	Area (sf)	CN	Description
*	23,275	98	Proposed Pavement & Walkway
*	4,815	98	Proposed Building
	7,345	74	>75% Grass cover, Good, HSG C
	35,435	93	Weighted Average
	7,345		20.73% Pervious Area
	28,090		79.27% Impervious Area

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

Subcatchment 1.2S: 1.2S



Summary for Subcatchment 1.3S: 1.3S

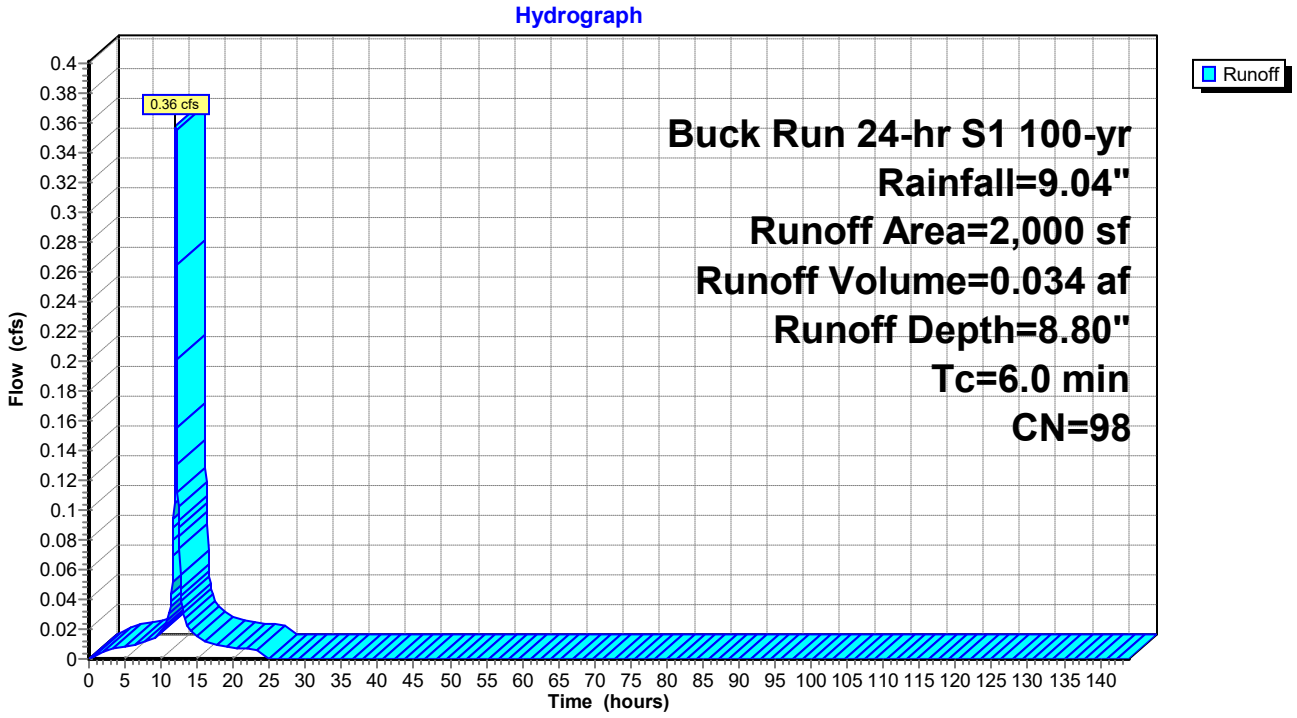
Runoff = 0.36 cfs @ 12.04 hrs, Volume= 0.034 af, Depth= 8.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-144.00 hrs, dt= 0.05 hrs
Buck Run 24-hr S1 100-yr Rainfall=9.04"

	Area (sf)	CN	Description
*	2,000	98	Proposed Pods and Facilities
	2,000		100.00% Impervious Area

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

Subcatchment 1.3S: 1.3S



Summary for Pond 1.1P: Infiltration Basin 1.1

Inflow Area = 0.722 ac, 42.00% Impervious, Inflow Depth = 6.85" for 100-yr event
Inflow = 4.93 cfs @ 12.04 hrs, Volume= 0.412 af
Outflow = 1.98 cfs @ 12.25 hrs, Volume= 0.412 af, Atten= 60%, Lag= 12.7 min
Discarded = 0.66 cfs @ 12.25 hrs, Volume= 0.360 af
Primary = 1.33 cfs @ 12.25 hrs, Volume= 0.052 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-144.00 hrs, dt= 0.05 hrs
Peak Elev= 455.58' @ 12.25 hrs Surf.Area= 2,365 sf Storage= 5,027 cf

Plug-Flow detention time= 68.6 min calculated for 0.412 af (100% of inflow)
Center-of-Mass det. time= 68.6 min (874.7 - 806.1)

Volume	Invert	Avail.Storage	Storage Description
#1	451.00'	9,077 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
451.00	125	0	0
452.00	447	286	286
454.00	1,356	1,803	2,089
456.00	2,634	3,990	6,079
457.00	3,362	2,998	9,077

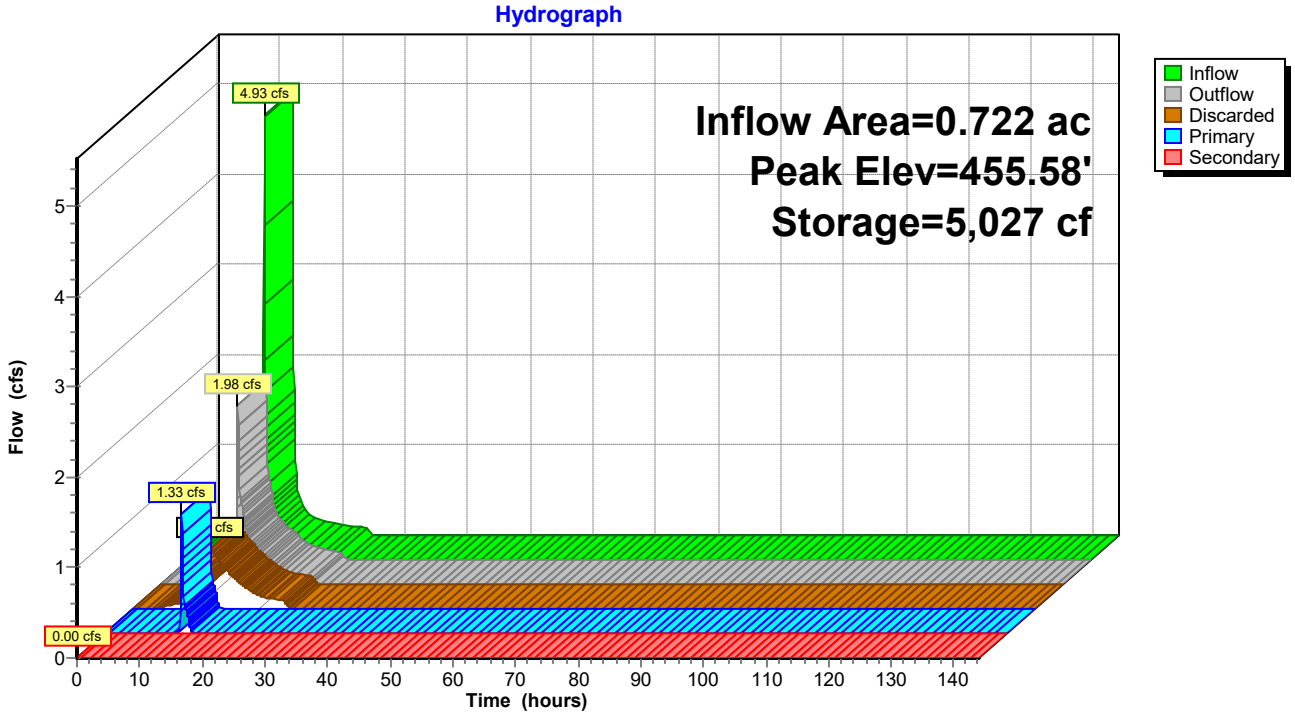
Device	Routing	Invert	Outlet Devices
#1	Primary	450.30'	**12.0" Round Culvert** L= 80.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 450.30' / 449.50' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	454.75'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	455.50'	**30.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Discarded	451.00'	**12.000 in/hr Exfiltration over Surface area** Phase-In= 0.10'
#5	Secondary	456.00'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.66 cfs @ 12.25 hrs HW=455.58' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.66 cfs)

Primary OutFlow Max=1.28 cfs @ 12.25 hrs HW=455.58' (Free Discharge)
└**1=Culvert** (Passes 1.28 cfs of 7.09 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.34 cfs @ 3.92 fps)
  └**3=Orifice/Grate** (Weir Controls 0.93 cfs @ 0.92 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=451.00' (Free Discharge)
└**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1.1P: Infiltration Basin 1.1



Stage-Area-Storage for Pond 1.1P: Infiltration Basin 1.1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
451.00	125	0
451.10	157	14
451.20	189	31
451.30	222	52
451.40	254	76
451.50	286	103
451.60	318	133
451.70	350	166
451.80	383	203
451.90	415	243
452.00	447	286
452.10	492	333
452.20	538	384
452.30	583	441
452.40	629	501
452.50	674	566
452.60	720	636
452.70	765	710
452.80	811	789
452.90	856	872
453.00	902	960
453.10	947	1,053
453.20	992	1,150
453.30	1,038	1,251
453.40	1,083	1,357
453.50	1,129	1,468
453.60	1,174	1,583
453.70	1,220	1,703
453.80	1,265	1,827
453.90	1,311	1,956
454.00	1,356	2,089
454.10	1,420	2,228
454.20	1,484	2,373
454.30	1,548	2,525
454.40	1,612	2,683
454.50	1,676	2,847
454.60	1,739	3,018
454.70	1,803	3,195
454.80	1,867	3,378
454.90	1,931	3,568
455.00	1,995	3,765
455.10	2,059	3,967
455.20	2,123	4,176
455.30	2,187	4,392
455.40	2,251	4,614
455.50	2,315	4,842
455.60	2,378	5,077
455.70	2,442	5,318
455.80	2,506	5,565
455.90	2,570	5,819
456.00	2,634	6,079
456.10	2,707	6,346
456.20	2,780	6,620
456.30	2,852	6,902
456.40	2,925	7,191
456.50	2,998	7,487
456.60	3,071	7,790
456.70	3,144	8,101
456.80	3,216	8,419
456.90	3,289	8,744
457.00	**3,362**	**9,077**

Summary for Pond DS1.2: Diversion Structure 1.2

Inflow Area = 0.813 ac, 79.27% Impervious, Inflow Depth = 8.20" for 100-yr event
Inflow = 6.22 cfs @ 12.04 hrs, Volume= 0.556 af
Outflow = 6.22 cfs @ 12.04 hrs, Volume= 0.556 af, Atten= 0%, Lag= 0.0 min
Primary = 3.83 cfs @ 12.04 hrs, Volume= 0.529 af
Secondary = 2.39 cfs @ 12.04 hrs, Volume= 0.026 af

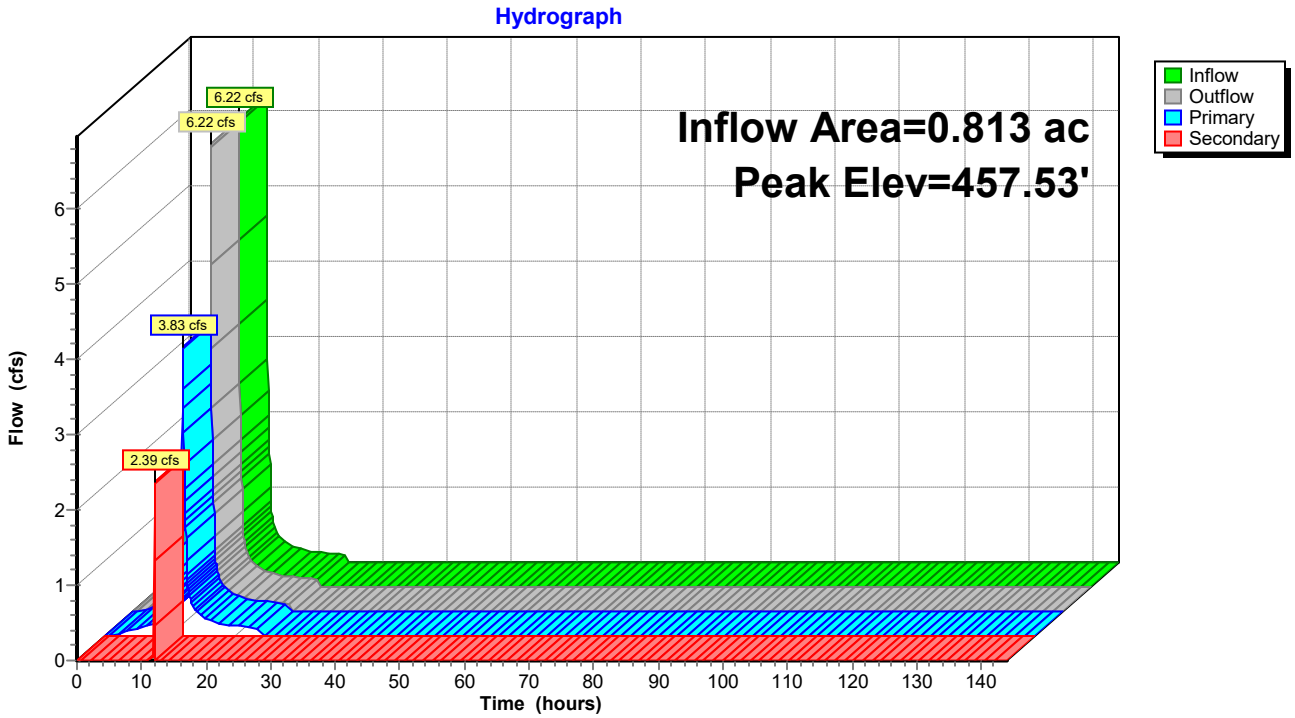
Routing by Stor-Ind method, Time Span= 0.00-144.00 hrs, dt= 0.05 hrs
Peak Elev= 457.53' @ 12.04 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	452.00'	**8.0" Round Culvert** L= 6.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 452.00' / 452.00' S= 0.0000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Secondary	455.20'	**8.0" Round Culvert** L= 27.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 455.20' / 454.60' S= 0.0222 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=3.77 cfs @ 12.04 hrs HW=457.37' (Free Discharge)
└**1=Culvert** (Inlet Controls 3.77 cfs @ 10.81 fps)

Secondary OutFlow Max=2.27 cfs @ 12.04 hrs HW=457.36' (Free Discharge)
└**2=Culvert** (Inlet Controls 2.27 cfs @ 6.51 fps)

Pond DS1.2: Diversion Structure 1.2



Stage-Area-Storage for Pond DS1.2: Diversion Structure 1.2

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
452.00	**0**	454.04	0	456.08	0
452.04	0	454.08	0	456.12	0
452.08	0	454.12	0	456.16	0
452.12	0	454.16	0	456.20	0
452.16	0	454.20	0	456.24	0
452.20	0	454.24	0	456.28	0
452.24	0	454.28	0	456.32	0
452.28	0	454.32	0	456.36	0
452.32	0	454.36	0	456.40	0
452.36	0	454.40	0	456.44	0
452.40	0	454.44	0	456.48	0
452.44	0	454.48	0	456.52	0
452.48	0	454.52	0	456.56	0
452.52	0	454.56	0	456.60	0
452.56	0	454.60	0	456.64	0
452.60	0	454.64	0	456.68	0
452.64	0	454.68	0	456.72	0
452.68	0	454.72	0	456.76	0
452.72	0	454.76	0	456.80	0
452.76	0	454.80	0	456.84	0
452.80	0	454.84	0	456.88	0
452.84	0	454.88	0	456.92	0
452.88	0	454.92	0	456.96	0
452.92	0	454.96	0	457.00	0
452.96	0	455.00	0	457.04	0
453.00	0	455.04	0	457.08	0
453.04	0	455.08	0	457.12	0
453.08	0	455.12	0	457.16	0
453.12	0	455.16	0	457.20	0
453.16	0	455.20	0	457.24	0
453.20	0	455.24	0	457.28	0
453.24	0	455.28	0	457.32	0
453.28	0	455.32	0	457.36	0
453.32	0	455.36	0	457.40	0
453.36	0	455.40	0	457.44	0
453.40	0	455.44	0	457.48	0
453.44	0	455.48	0	457.52	0
453.48	0	455.52	0		
453.52	0	455.56	0		
453.56	0	455.60	0		
453.60	0	455.64	0		
453.64	0	455.68	0		
453.68	0	455.72	0		
453.72	0	455.76	0		
453.76	0	455.80	0		
453.80	0	455.84	0		
453.84	0	455.88	0		
453.88	0	455.92	0		
453.92	0	455.96	0		
453.96	0	456.00	0		
454.00	0	456.04	0		

Summary for Pond DS1.3: Diversion Structure 1.3

Inflow Area = 0.046 ac,100.00% Impervious, Inflow Depth = 8.80" for 100-yr event
Inflow = 0.36 cfs @ 12.04 hrs, Volume= 0.034 af
Outflow = 0.36 cfs @ 12.04 hrs, Volume= 0.034 af, Atten= 0%, Lag= 0.0 min
Primary = 0.36 cfs @ 12.04 hrs, Volume= 0.034 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

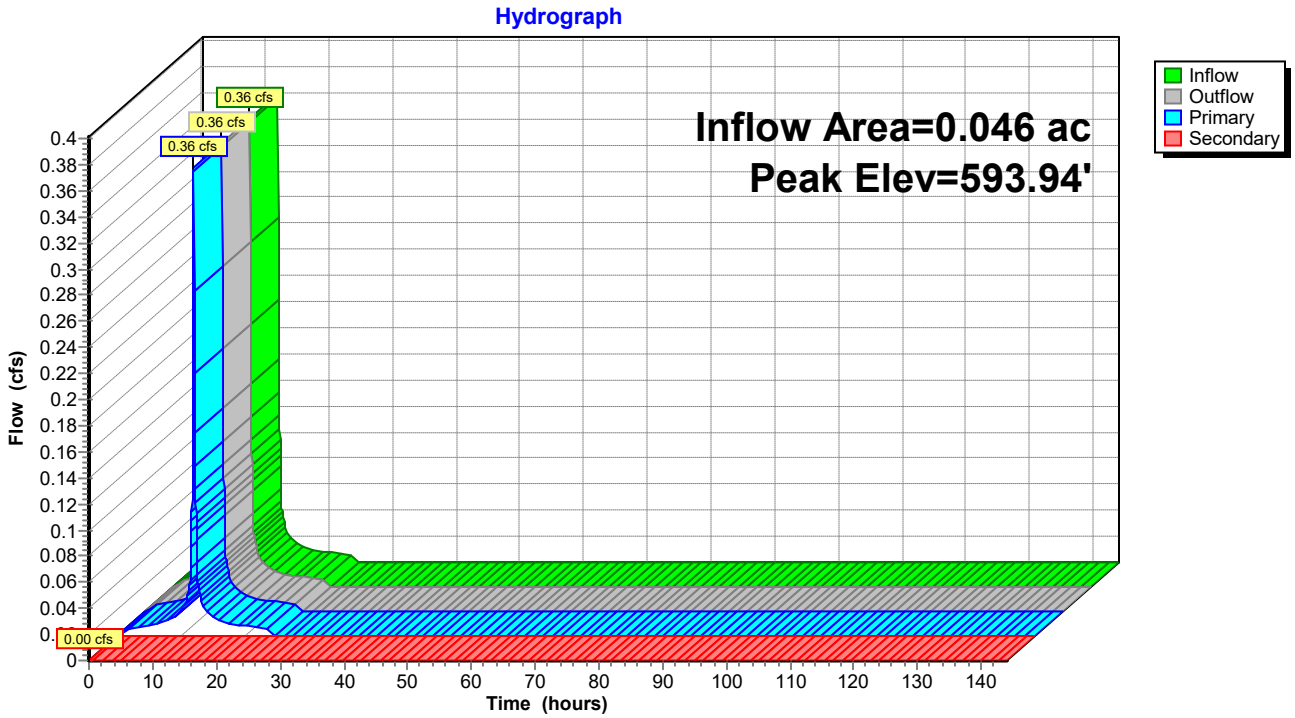
Routing by Stor-Ind method, Time Span= 0.00-144.00 hrs, dt= 0.05 hrs
Peak Elev= 593.94' @ 12.04 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	593.00'	**4.0" Round Culvert** L= 6.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 593.00' / 593.00' S= 0.0000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf
#2	Secondary	595.20'	**8.0" Round Culvert** L= 154.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 595.20' / 590.00' S= 0.0338 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.35 cfs @ 12.04 hrs HW=593.91' (Free Discharge)
└**1=Culvert** (Barrel Controls 0.35 cfs @ 3.99 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=593.00' (Free Discharge)
└**2=Culvert** (Controls 0.00 cfs)

Pond DS1.3: Diversion Structure 1.3



Stage-Area-Storage for Pond DS1.3: Diversion Structure 1.3

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
593.00	**0**	594.02	0	595.04	0
593.02	0	594.04	0	595.06	0
593.04	0	594.06	0	595.08	0
593.06	0	594.08	0	595.10	0
593.08	0	594.10	0	595.12	0
593.10	0	594.12	0	595.14	0
593.12	0	594.14	0	595.16	0
593.14	0	594.16	0	595.18	0
593.16	0	594.18	0	595.20	0
593.18	0	594.20	0	595.22	0
593.20	0	594.22	0	595.24	0
593.22	0	594.24	0	595.26	0
593.24	0	594.26	0	595.28	0
593.26	0	594.28	0	595.30	0
593.28	0	594.30	0	595.32	0
593.30	0	594.32	0	595.34	0
593.32	0	594.34	0	595.36	0
593.34	0	594.36	0	595.38	0
593.36	0	594.38	0	595.40	0
593.38	0	594.40	0	595.42	0
593.40	0	594.42	0	595.44	0
593.42	0	594.44	0	595.46	0
593.44	0	594.46	0	595.48	0
593.46	0	594.48	0	595.50	0
593.48	0	594.50	0	595.52	0
593.50	0	594.52	0	595.54	0
593.52	0	594.54	0	595.56	0
593.54	0	594.56	0	595.58	0
593.56	0	594.58	0	595.60	0
593.58	0	594.60	0	595.62	0
593.60	0	594.62	0	595.64	0
593.62	0	594.64	0	595.66	0
593.64	0	594.66	0	595.68	0
593.66	0	594.68	0	595.70	0
593.68	0	594.70	0	595.72	0
593.70	0	594.72	0	595.74	0
593.72	0	594.74	0	595.76	0
593.74	0	594.76	0	595.78	0
593.76	0	594.78	0	595.80	0
593.78	0	594.80	0	595.82	0
593.80	0	594.82	0	595.84	0
593.82	0	594.84	0	595.86	0
593.84	0	594.86	0		
593.86	0	594.88	0		
593.88	0	594.90	0		
593.90	0	594.92	0		
593.92	0	594.94	0		
593.94	0	594.96	0		
593.96	0	594.98	0		
593.98	0	595.00	0		
594.00	0	595.02	0		

Summary for Pond INF 1.2: Infiltration System 1.2

Inflow Area = 0.813 ac, 79.27% Impervious, Inflow Depth = 7.81" for 100-yr event
Inflow = 3.83 cfs @ 12.04 hrs, Volume= 0.529 af
Outflow = 0.80 cfs @ 11.60 hrs, Volume= 0.529 af, Atten= 79%, Lag= 0.0 min
Discarded = 0.80 cfs @ 11.60 hrs, Volume= 0.529 af

Routing by Stor-Ind method, Time Span= 0.00-144.00 hrs, dt= 0.05 hrs
Peak Elev= 454.43' @ 12.67 hrs Surf.Area= 0.066 ac Storage= 0.116 af

Plug-Flow detention time= 33.2 min calculated for 0.529 af (100% of inflow)
Center-of-Mass det. time= 33.2 min (801.8 - 768.6)

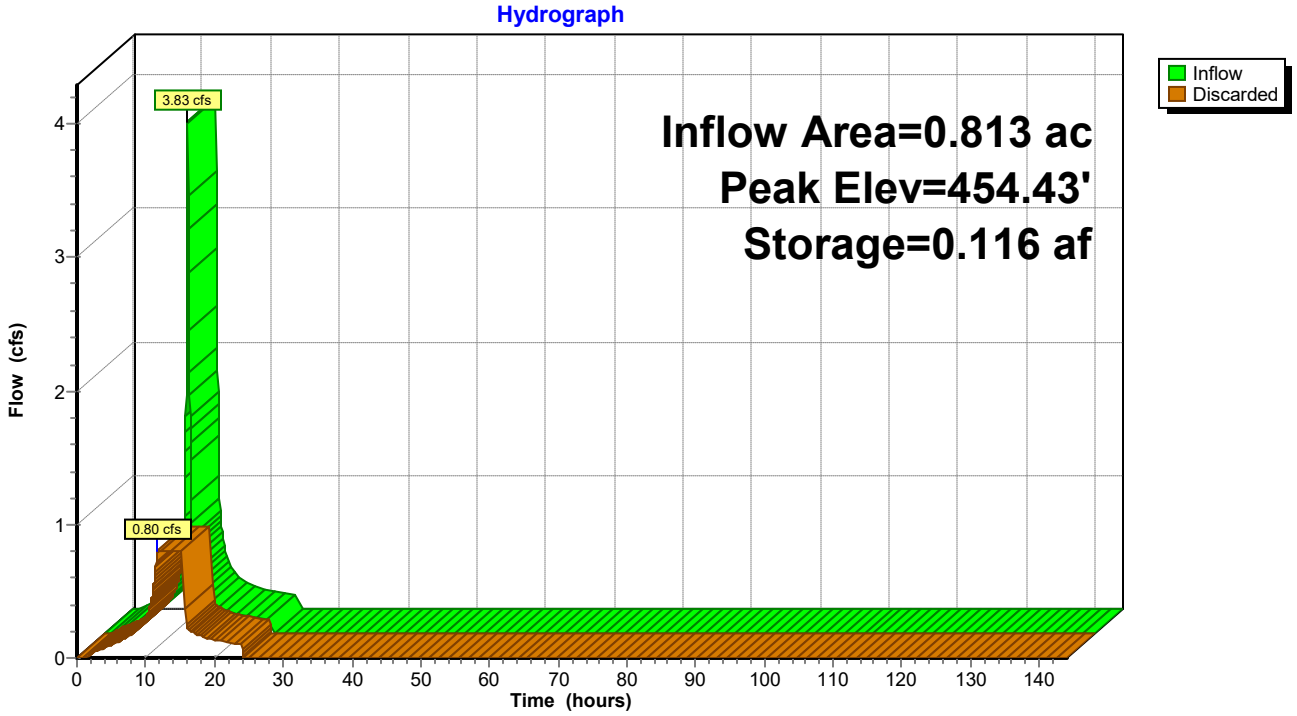
Volume	Invert	Avail.Storage	Storage Description
#1A	452.00'	0.056 af	**30.50'W x 94.50'L x 3.54'H Field A** 0.234 af Overall - 0.095 af Embedded = 0.139 af x 40.0% Voids
#2A	452.50'	0.095 af	**Cultec R-330XLHD** x 78 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 6 rows
		0.151 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	452.00'	**12.000 in/hr Exfiltration over Horizontal area** Phase-In= 0.10'

Discarded OutFlow Max=0.80 cfs @ 11.60 hrs HW=452.14' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.80 cfs)

Pond INF 1.2: Infiltration System 1.2



Stage-Area-Storage for Pond INF 1.2: Infiltration System 1.2

Elevation (feet)	Horizontal (acres)	Storage (acre-feet)
452.00	**0.066**	0.000
452.05	0.066	0.001
452.10	0.066	0.003
452.15	0.066	0.004
452.20	0.066	0.005
452.25	0.066	0.007
452.30	0.066	0.008
452.35	0.066	0.009
452.40	0.066	0.011
452.45	0.066	0.012
452.50	0.066	0.013
452.55	0.066	0.016
452.60	0.066	0.019
452.65	0.066	0.022
452.70	0.066	0.025
452.75	0.066	0.027
452.80	0.066	0.030
452.85	0.066	0.033
452.90	0.066	0.036
452.95	0.066	0.039
453.00	0.066	0.041
453.05	0.066	0.044
453.10	0.066	0.047
453.15	0.066	0.050
453.20	0.066	0.052
453.25	0.066	0.055
453.30	0.066	0.058
453.35	0.066	0.061
453.40	0.066	0.063
453.45	0.066	0.066
453.50	0.066	0.069
453.55	0.066	0.071
453.60	0.066	0.074
453.65	0.066	0.077
453.70	0.066	0.079
453.75	0.066	0.082
453.80	0.066	0.085
453.85	0.066	0.087
453.90	0.066	0.090
453.95	0.066	0.092
454.00	0.066	0.095
454.05	0.066	0.098
454.10	0.066	0.100
454.15	0.066	0.102
454.20	0.066	0.105
454.25	0.066	0.107
454.30	0.066	0.110
454.35	0.066	0.112
454.40	0.066	0.114
454.45	0.066	0.116
454.50	0.066	0.119
454.55	0.066	0.121
454.60	0.066	0.123
454.65	0.066	0.125
454.70	0.066	0.127
454.75	0.066	0.129
454.80	0.066	0.130
454.85	0.066	0.132
454.90	0.066	0.134
454.95	0.066	0.135
455.00	0.066	0.136
455.05	0.066	0.138
455.10	0.066	0.139
455.15	0.066	0.140
455.20	0.066	0.142
455.25	0.066	0.143
455.30	0.066	0.144
455.35	0.066	0.146
455.40	0.066	0.147
455.45	0.066	0.148
455.50	0.066	**0.150**

Summary for Pond INF 1.3: Infiltration System 1.3

Inflow Area = 0.046 ac,100.00% Impervious, Inflow Depth = 8.80" for 100-yr event
Inflow = 0.36 cfs @ 12.04 hrs, Volume= 0.034 af
Outflow = 0.08 cfs @ 11.70 hrs, Volume= 0.034 af, Atten= 78%, Lag= 0.0 min
Discarded = 0.08 cfs @ 11.70 hrs, Volume= 0.034 af

Routing by Stor-Ind method, Time Span= 0.00-144.00 hrs, dt= 0.05 hrs
Peak Elev= 594.37' @ 12.53 hrs Surf.Area= 0.006 ac Storage= 0.006 af

Plug-Flow detention time= 14.5 min calculated for 0.034 af (100% of inflow)
Center-of-Mass det. time= 14.5 min (754.4 - 739.9)

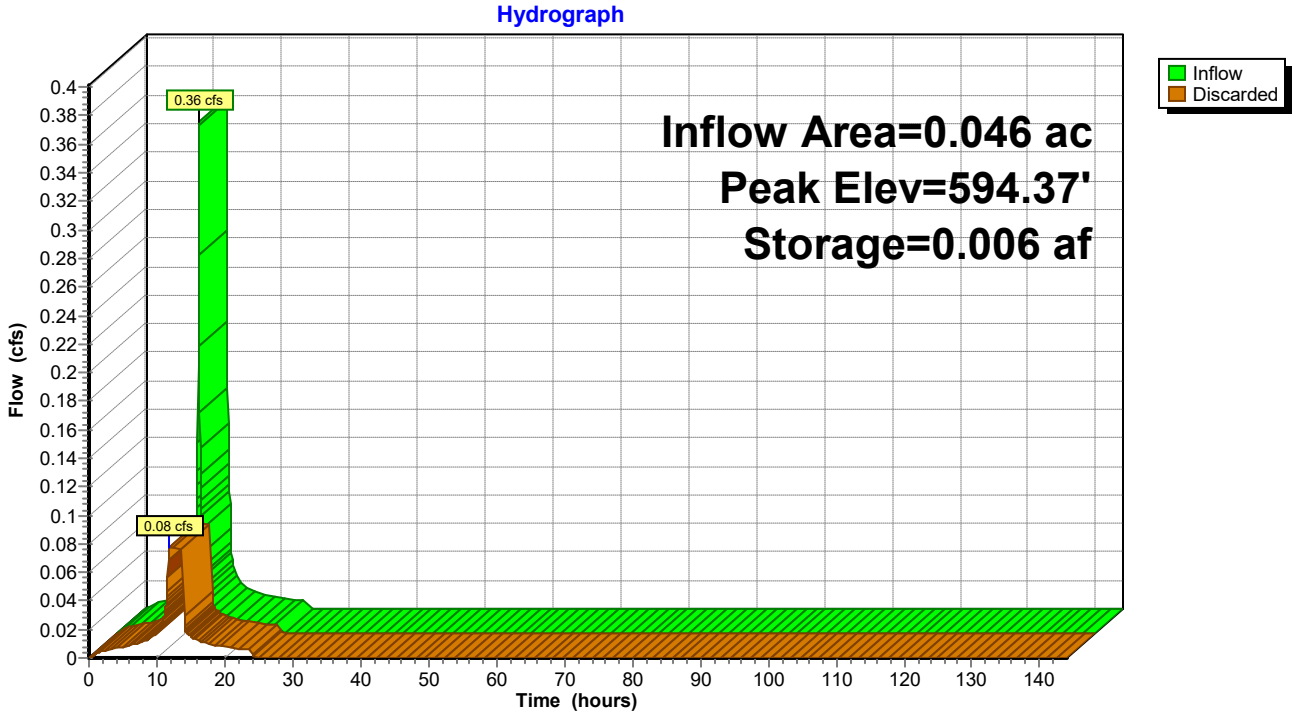
Volume	Invert	Avail.Storage	Storage Description
#1A	593.00'	0.006 af	**16.00'W x 17.50'L x 3.54'H Field A** 0.023 af Overall - 0.008 af Embedded = 0.015 af x 40.0% Voids
#2A	593.50'	0.008 af	**Cultec R-330XLHD** x 6 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 3 rows
		0.014 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	593.00'	**12.000 in/hr Exfiltration over Horizontal area** Phase-In= 0.10'

Discarded OutFlow Max=0.08 cfs @ 11.70 hrs HW=593.11' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.08 cfs)

Pond INF 1.3: Infiltration System 1.3



Stage-Area-Storage for Pond INF 1.3: Infiltration System 1.3

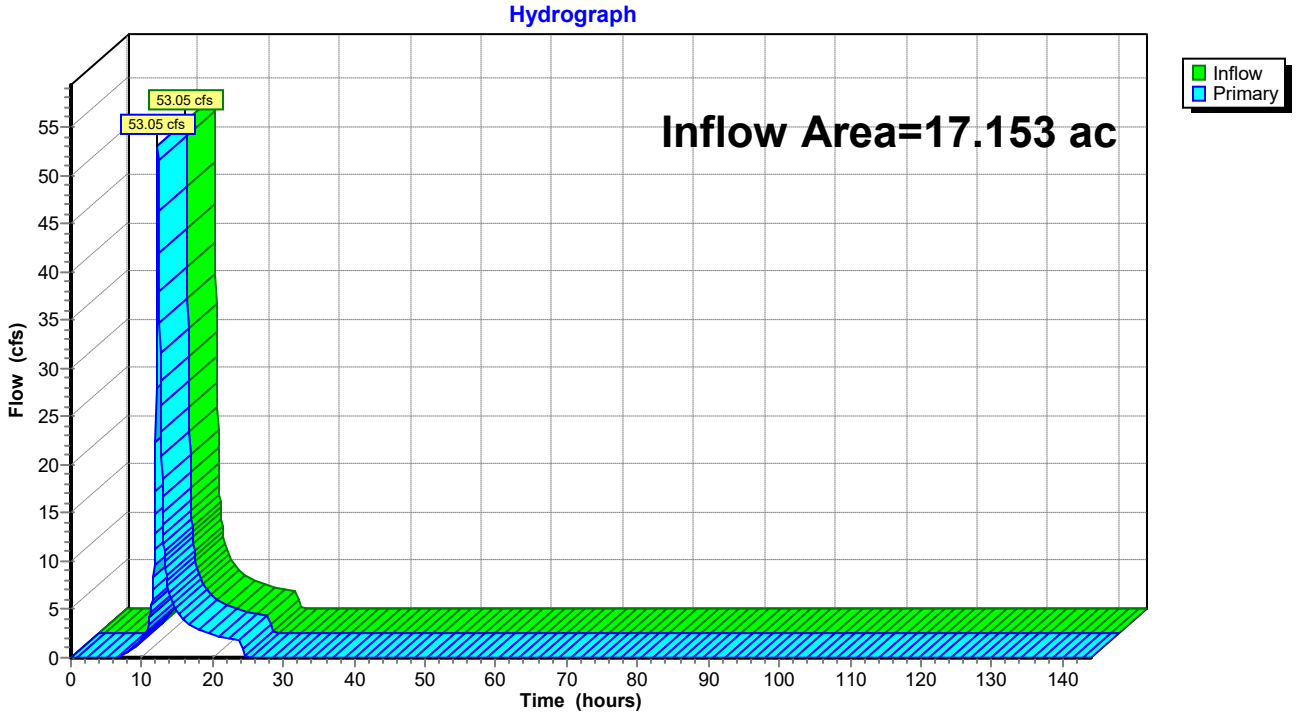
Elevation (feet)	Horizontal (acres)	Storage (acre-feet)
593.00	**0.006**	0.000
593.05	0.006	0.000
593.10	0.006	0.000
593.15	0.006	0.000
593.20	0.006	0.001
593.25	0.006	0.001
593.30	0.006	0.001
593.35	0.006	0.001
593.40	0.006	0.001
593.45	0.006	0.001
593.50	0.006	0.001
593.55	0.006	0.002
593.60	0.006	0.002
593.65	0.006	0.002
593.70	0.006	0.002
593.75	0.006	0.003
593.80	0.006	0.003
593.85	0.006	0.003
593.90	0.006	0.003
593.95	0.006	0.004
594.00	0.006	0.004
594.05	0.006	0.004
594.10	0.006	0.004
594.15	0.006	0.005
594.20	0.006	0.005
594.25	0.006	0.005
594.30	0.006	0.005
594.35	0.006	0.006
594.40	0.006	0.006
594.45	0.006	0.006
594.50	0.006	0.006
594.55	0.006	0.007
594.60	0.006	0.007
594.65	0.006	0.007
594.70	0.006	0.007
594.75	0.006	0.008
594.80	0.006	0.008
594.85	0.006	0.008
594.90	0.006	0.008
594.95	0.006	0.008
595.00	0.006	0.009
595.05	0.006	0.009
595.10	0.006	0.009
595.15	0.006	0.009
595.20	0.006	0.010
595.25	0.006	0.010
595.30	0.006	0.010
595.35	0.006	0.010
595.40	0.006	0.010
595.45	0.006	0.011
595.50	0.006	0.011
595.55	0.006	0.011
595.60	0.006	0.011
595.65	0.006	0.011
595.70	0.006	0.012
595.75	0.006	0.012
595.80	0.006	0.012
595.85	0.006	0.012
595.90	0.006	0.012
595.95	0.006	0.012
596.00	0.006	0.012
596.05	0.006	0.013
596.10	0.006	0.013
596.15	0.006	0.013
596.20	0.006	0.013
596.25	0.006	0.013
596.30	0.006	0.013
596.35	0.006	0.013
596.40	0.006	0.014
596.45	0.006	0.014
596.50	0.006	**0.014**

Summary for Link DP: Design Point 1

Inflow Area = 17.153 ac, 6.06% Impervious, Inflow Depth = 4.96" for 100-yr event
Inflow = 53.05 cfs @ 12.28 hrs, Volume= 7.092 af
Primary = 53.05 cfs @ 12.28 hrs, Volume= 7.092 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-144.00 hrs, dt= 0.05 hrs

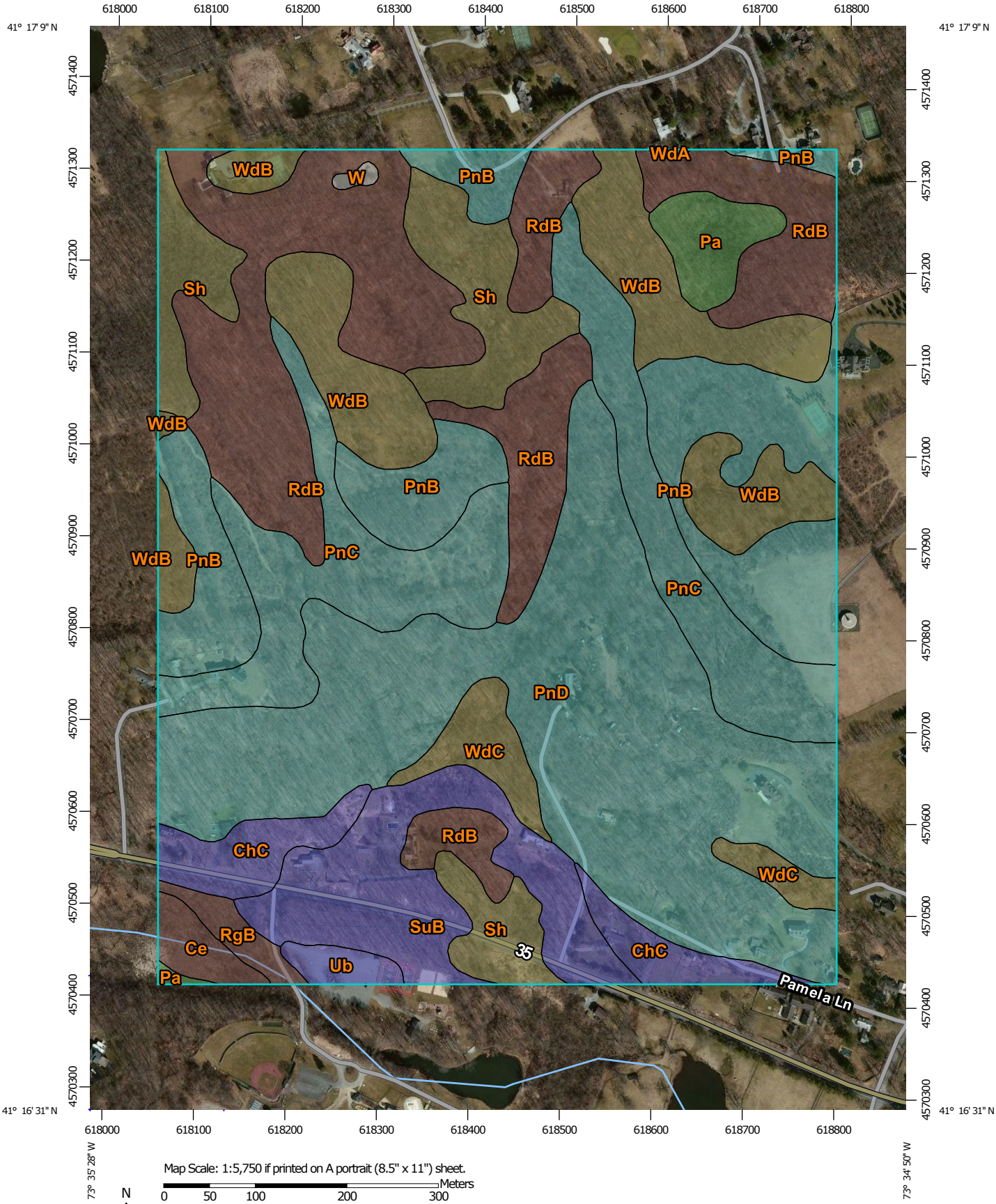
Link DP: Design Point 1



Appendix D:

NRCS Soil Mapping

Hydrologic Soil Group—Westchester County, New York
(WOLF CENTER SOILS)



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

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

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

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Westchester County, New York
Survey Area Data: Version 11, Sep 25, 2015

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

Date(s) aerial images were photographed: Mar 26, 2011—Apr 16, 2012

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

Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Westchester County, New York (NY119)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
Ce	Catden muck, 0 to 2 percent slopes	B/D	1.5	0.9%
ChC	Charlton loam, 8 to 15 percent slopes	B	5.4	3.2%
Pa	Palms muck	A/D	2.9	1.8%
PnB	Paxton fine sandy loam, 3 to 8 percent slopes	C	20.0	12.0%
PnC	Paxton fine sandy loam, 8 to 15 percent slopes	C	20.1	12.0%
PnD	Paxton fine sandy loam, 15 to 25 percent slopes	C	41.1	24.6%
RdB	Ridgebury loam, 3 to 8 percent slopes	B/D	30.7	18.3%
RgB	Ridgebury loam, 2 to 8 percent slopes, very stony	B/D	1.3	0.8%
Sh	Sun loam	C/D	11.4	6.8%
SuB	Sutton loam, 3 to 8 percent slopes	B	10.9	6.5%
Ub	Udorthents, smoothed	B	1.1	0.7%
W	Water		0.2	0.1%
WdA	Woodbridge loam, 0 to 3 percent slopes	C/D	0.1	0.0%
WdB	Woodbridge loam, 3 to 8 percent slopes	C/D	16.6	9.9%
WdC	Woodbridge loam, 8 to 15 percent slopes	C/D	3.8	2.2%
Totals for Area of Interest			**167.2**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Appendix E:

New York Standards and Specifications for Erosion and Sediment Control Construction Site Log Book

APPENDIX F
CONSTRUCTION SITE INSPECTION AND MAINTENANCE LOG BOOK

STATE POLLUTANT DISCHARGE ELIMINATION SYSTEM FOR CONSTRUCTION ACTIVITIES

SAMPLE CONSTRUCTION SITE LOG BOOK

Table of Contents

I. **PRE-CONSTRUCTION MEETING DOCUMENTS**

Project Name _____

Permit No. _____ **Date of Authorization** _____

Name of Operator _____

Prime Contractor _____

a. **Preamble to Site Assessment and Inspections**

The Following Information To Be Read By All Person's Involved in The Construction of Stormwater Related Activities:

The Operator agrees to have a qualified inspector[1] conduct an assessment of the site prior to the commencement of construction[2] and certify in this inspection report that the appropriate erosion and sediment controls described in the SWPPP have been adequately installed or implemented to ensure overall preparedness of the site for the commencement of construction.

Prior to the commencement of construction, the Operator shall certify in this site logbook that the SWPPP has been prepared in accordance with the State's standards and meets all Federal, State and local erosion and sediment control requirements. A preconstruction meeting should be held to review all of the SWPPP requirements with construction personnel.

When construction starts, site inspections shall be conducted by the qualified inspector at least every 7 calendar days. The Operator shall maintain a record of all inspection reports in this site logbook. The site logbook shall be maintained on site and be made available to the permitting authorities upon request.

Prior to filing the Notice of Termination or the end of permit term, the Operator shall have a qualified inspector perform a final site inspection. The qualified inspector shall certify that the site has undergone final stabilization[3] using either vegetative or structural stabilization methods and that all temporary erosion and sediment controls (such as silt fencing) not needed for long-term erosion control have been removed. In addition, the Operator must identify and certify that all permanent structures described in the SWPPP have been constructed and provide the owner(s) with an operation and maintenance plan that ensures the structure(s) continuously functions as designed.

1 Refer to "Qualified Inspector" inspection requirements in the current SPDES General Permit for Stormwater Discharges from Construction Activity for complete list of inspection requirements.
2 "Commencement of construction" means the initial removal of vegetation and disturbance of soils associated with clearing, grading or excavating activities or other construction activities.
3 "Final stabilization" means that all soil-disturbing activities at the site have been completed and a uniform, perennial vegetative cover with a density of eighty (80) percent has been established or equivalent stabilization measures (such as the use of mulches or geotextiles) have been employed on all unpaved areas and areas not covered by permanent structures.

b. Pre-construction Site Assessment Checklist
(NOTE: Provide comments below as necessary)

1. Notice of Intent, SWPPP, and Contractors Certification:

Yes No NA

[ ] [ ] [ ] Has a Notice of Intent been filed with the NYS Department of Conservation?
[ ] [ ] [ ] Is the SWPPP on-site? Where?_____
[ ] [ ] [ ] Is the Plan current? What is the latest revision date?_____
[ ] [ ] [ ] Is a copy of the NOI (with brief description) onsite? Where?_____
[ ] [ ] [ ] Have all contractors involved with stormwater related activities signed a contractor's certification?

2. Resource Protection

Yes No NA

[ ] [ ] [ ] Are construction limits clearly flagged or fenced?
[ ] [ ] [ ] Important trees and associated rooting zones, on-site septic system absorption fields, existing vegetated areas suitable for filter strips, especially in perimeter areas, have been flagged for protection.
[ ] [ ] [ ] Creek crossings installed prior to land-disturbing activity, including clearing and blasting.

3. Surface Water Protection

Yes No NA

[ ] [ ] [ ] Clean stormwater runoff has been diverted from areas to be disturbed.
[ ] [ ] [ ] Bodies of water located either on site or in the vicinity of the site have been identified and protected.
[ ] [ ] [ ] Appropriate practices to protect on-site or downstream surface water are installed.
[ ] [ ] [ ] Are clearing and grading operations divided into areas <5 acres?

4. Stabilized Construction Access

Yes No NA

[ ] [ ] [ ] A temporary construction entrance to capture mud and debris from construction vehicles before they enter the public highway has been installed.
[ ] [ ] [ ] Other access areas (entrances, construction routes, equipment parking areas) are stabilized immediately as work takes place with gravel or other cover.
[ ] [ ] [ ] Sediment tracked onto public streets is removed or cleaned on a regular basis.

5. Sediment Controls

Yes No NA

[ ] [ ] [ ] Silt fence material and installation comply with the standard drawing and specifications.
[ ] [ ] [ ] Silt fences are installed at appropriate spacing intervals
[ ] [ ] [ ] Sediment/detention basin was installed as first land disturbing activity.
[ ] [ ] [ ] Sediment traps and barriers are installed.

6. Pollution Prevention for Waste and Hazardous Materials

Yes No NA

[ ] [ ] [ ] The Operator or designated representative has been assigned to implement the spill prevention avoidance and response plan.
[ ] [ ] [ ] The plan is contained in the SWPPP on page _____
[ ] [ ] [ ] Appropriate materials to control spills are onsite. Where? _____

II. CONSTRUCTION DURATION INSPECTIONS

a. Directions:

Inspection Forms will be filled out during the entire construction phase of the project.

Required Elements:

1) On a site map, indicate the extent of all disturbed site areas and drainage pathways. Indicate site areas that are expected to undergo initial disturbance or significant site work within the next 14-day period;

2) Indicate on a site map all areas of the site that have undergone temporary or permanent stabilization;

3) Indicate all disturbed site areas that have not undergone active site work during the previous 14-day period;

4) Inspect all sediment control practices and record the approximate degree of sediment accumulation as a percentage of sediment storage volume (for example, 10 percent, 20 percent, 50 percent);

5) Inspect all erosion and sediment control practices and record all maintenance requirements such as verifying the integrity of barrier or diversion systems (earthen berms or silt fencing) and containment systems (sediment basins and sediment traps). Identify any evidence of rill or gully erosion occurring on slopes and any loss of stabilizing vegetation or seeding/mulching. Document any excessive deposition of sediment or ponding water along barrier or diversion systems. Record the depth of sediment within containment structures, any erosion near outlet and overflow structures, and verify the ability of rock filters around perforated riser pipes to pass water; and

6) Immediately report to the Operator any deficiencies that are identified with the implementation of the SWPPP.

SITE PLAN/SKETCH

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

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

Maintaining Water Quality

Yes No NA

[ ] [ ] [ ] Is there an increase in turbidity causing a substantial visible contrast to natural conditions at the outfalls?
[ ] [ ] [ ] Is there residue from oil and floating substances, visible oil film, or globules or grease at the outfalls?
[ ] [ ] [ ] All disturbance is within the limits of the approved plans.
[ ] [ ] [ ] Have receiving lake/bay, stream, and/or wetland been impacted by silt from project?

Housekeeping

1. General Site Conditions

Yes No NA

[ ] [ ] [ ] Is construction site litter, debris and spoils appropriately managed?
[ ] [ ] [ ] Are facilities and equipment necessary for implementation of erosion and sediment control in working order and/or properly maintained?
[ ] [ ] [ ] Is construction impacting the adjacent property?
[ ] [ ] [ ] Is dust adequately controlled?

2. Temporary Stream Crossing

Yes No NA

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

3. Stabilized Construction Access

Yes No NA

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

Runoff Control Practices

1. Excavation Dewatering

Yes No NA

[ ] [ ] [ ] Upstream and downstream berms (sandbags, inflatable dams, etc.) are installed per plan.
[ ] [ ] [ ] Clean water from upstream pool is being pumped to the downstream pool.
[ ] [ ] [ ] Sediment laden water from work area is being discharged to a silt-trapping device.
[ ] [ ] [ ] Constructed upstream berm with one-foot minimum freeboard.

Runoff Control Practices (continued)

2. Flow Spreader

Yes No NA

[ ] [ ] [ ] Installed per plan.
[ ] [ ] [ ] Constructed on undisturbed soil, not on fill, receiving only clear, non-sediment laden flow.
[ ] [ ] [ ] Flow sheets out of level spreader without erosion on downstream edge.

3. Interceptor Dikes and Swales

Yes No NA

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

4. Stone Check Dam

Yes No NA

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

5. Rock Outlet Protection

Yes No NA

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

Soil Stabilization

1. Topsoil and Spoil Stockpiles

Yes No NA

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

2. Revegetation

Yes No NA

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

Sediment Control Practices

1. Silt Fence and Linear Barriers

Yes No NA

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

Sediment Control Practices (continued)

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

Yes No NA

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

Sediment accumulation ___% of design capacity.

3. Temporary Sediment Trap

Yes No NA

[ ] [ ] [ ] Outlet structure is constructed per the approved plan or drawing.
[ ] [ ] [ ] Geotextile fabric has been placed beneath rock fill.
[ ] [ ] [ ] Sediment trap slopes and disturbed areas are stabilized.

Sediment accumulation is ___% of design capacity.

4. Temporary Sediment Basin

Yes No NA

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

Sediment accumulation is ___% of design capacity.

Note: Not all erosion and sediment control practices are included in this listing. Add additional pages to this list as required by site specific design. All practices shall be maintained in accordance with their respective standards.

Construction inspection checklists for post-development stormwater management practices can be found in Appendix F of the New York Stormwater Management Design Manual.

CONSTRUCTION DURATION INSPECTIONS

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

The Operator shall amend the SWPPP whenever:

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

Modification & Reason:

Appendix F:

Northeast Regional Climate Center Precipitation Estimates

Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Smoothing	No
State	New York
Location	
Longitude	73.585 degrees West
Latitude	41.279 degrees North
Elevation	0 feet
Date/Time	Mon, 28 Dec 2020 10:36:47 -0500

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.33	0.51	0.63	0.84	1.03	1.25	**1yr**	0.89	1.22	1.43	1.82	2.28	2.83	3.18	**1yr**	2.50	3.06	3.53	4.23	4.87	**1yr**
2yr	0.39	0.61	0.75	1.02	1.25	1.50	**2yr**	1.08	1.46	1.71	2.20	2.76	3.40	3.82	**2yr**	3.01	3.67	4.21	4.98	5.63	**2yr**
5yr	0.46	0.71	0.89	1.22	1.55	1.84	**5yr**	1.33	1.80	2.11	2.72	3.42	4.27	4.82	**5yr**	3.78	4.64	5.35	6.23	7.00	**5yr**
10yr	0.53	0.81	1.00	1.40	1.81	2.16	**10yr**	1.56	2.11	2.46	3.20	4.03	5.08	5.76	**10yr**	4.49	5.54	6.41	7.38	8.25	**10yr**
25yr	0.63	0.96	1.19	1.71	2.24	2.67	**25yr**	1.94	2.61	3.03	3.97	5.00	6.38	7.29	**25yr**	5.65	7.01	8.16	9.24	10.25	**25yr**
50yr	0.72	1.10	1.37	1.96	2.64	3.13	**50yr**	2.28	3.06	3.55	4.68	5.90	7.59	8.71	**50yr**	6.72	8.37	9.80	10.96	12.09	**50yr**
100yr	0.83	1.26	1.57	2.27	3.11	3.68	**100yr**	2.69	3.60	4.16	5.52	6.96	9.04	10.41	**100yr**	8.00	10.01	11.78	13.00	14.27	**100yr**
200yr	0.96	1.44	1.82	2.63	3.67	4.33	**200yr**	3.17	4.23	4.88	6.52	8.21	10.76	12.46	**200yr**	9.52	11.98	14.15	15.43	16.84	**200yr**
500yr	1.16	1.72	2.22	3.22	4.58	5.36	**500yr**	3.96	5.24	6.03	8.13	10.23	13.56	15.80	**500yr**	12.00	15.19	18.06	19.35	20.98	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.24	0.37	0.45	0.61	0.75	0.95	**1yr**	0.65	0.93	1.21	1.58	2.03	2.53	2.77	**1yr**	2.24	2.66	3.28	3.71	4.57	**1yr**
2yr	0.38	0.59	0.73	0.98	1.21	1.46	**2yr**	1.05	1.42	1.66	2.12	2.69	3.31	3.70	**2yr**	2.93	3.56	4.09	4.83	5.47	**2yr**
5yr	0.42	0.65	0.80	1.10	1.40	1.71	**5yr**	1.21	1.67	1.95	2.51	3.15	3.93	4.44	**5yr**	3.48	4.27	4.93	5.72	6.44	**5yr**
10yr	0.45	0.70	0.86	1.20	1.56	1.92	**10yr**	1.34	1.88	2.20	2.87	3.55	4.48	5.06	**10yr**	3.96	4.87	5.68	6.47	7.27	**10yr**
25yr	0.49	0.74	0.92	1.32	1.74	2.20	**25yr**	1.50	2.15	2.57	3.41	4.15	5.31	6.01	**25yr**	4.70	5.78	6.85	7.65	8.53	**25yr**
50yr	0.51	0.78	0.97	1.39	1.88	2.42	**50yr**	1.62	2.36	2.93	3.90	4.67	6.05	6.86	**50yr**	5.36	6.60	7.91	8.68	9.62	**50yr**
100yr	0.54	0.82	1.03	1.48	2.03	2.65	**100yr**	1.76	2.59	3.33	4.47	5.16	6.92	7.83	**100yr**	6.12	7.53	9.18	9.85	10.86	**100yr**
200yr	0.57	0.86	1.09	1.57	2.19	2.91	**200yr**	1.89	2.84	3.79	5.15	5.81	7.88	8.98	**200yr**	6.98	8.63	10.67	11.18	12.28	**200yr**
500yr	0.61	0.90	1.16	1.69	2.40	3.30	**500yr**	2.08	3.23	4.53	6.26	6.79	9.38	10.80	**500yr**	8.30	10.38	13.05	13.27	14.44	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.37	0.57	0.70	0.94	1.15	1.38	**1yr**	0.99	1.35	1.59	2.03	2.53	3.07	3.43	**1yr**	2.72	3.30	3.80	4.51	5.19	**1yr**
2yr	0.42	0.65	0.80	1.09	1.34	1.56	**2yr**	1.16	1.52	1.78	2.27	2.85	3.52	4.01	**2yr**	3.12	3.85	4.38	5.18	5.84	**2yr**
5yr	0.50	0.77	0.96	1.32	1.68	1.98	**5yr**	1.45	1.93	2.28	2.94	3.68	4.63	5.24	**5yr**	4.10	5.04	5.78	6.75	7.54	**5yr**
10yr	0.59	0.91	1.12	1.57	2.03	2.38	**10yr**	1.75	2.33	2.77	3.57	4.50	5.71	6.47	**10yr**	5.05	6.22	7.16	8.28	9.18	**10yr**
25yr	0.74	1.13	1.40	2.01	2.64	3.08	**25yr**	2.28	3.01	3.56	4.62	5.85	7.53	8.57	**25yr**	6.66	8.24	9.49	10.83	11.91	**25yr**
50yr	0.88	1.34	1.66	2.39	3.22	3.73	**50yr**	2.78	3.65	4.32	5.59	7.16	9.29	10.58	**50yr**	8.22	10.18	11.74	13.30	14.52	**50yr**
100yr	1.05	1.59	1.99	2.88	3.95	4.53	**100yr**	3.41	4.43	5.23	6.79	9.35	11.46	13.08	**100yr**	10.14	12.58	14.47	16.33	17.71	**100yr**
200yr	1.26	1.89	2.40	3.47	4.85	5.50	**200yr**	4.18	5.38	6.32	8.22	11.55	14.14	16.18	**200yr**	12.52	15.55	17.89	20.02	21.60	**200yr**
500yr	1.62	2.41	3.10	4.50	6.40	7.10	**500yr**	5.52	6.94	8.13	10.58	15.34	18.66	21.41	**500yr**	16.51	20.59	23.57	26.16	28.04	**500yr**

Powered by ACIS Northeast Regional Climate Center

Appendix G:

New York State Stormwater Management Design Manual
Maintenance and Inspection Checklist.

Stormwater Pond/Wetland Operation, Maintenance and Management Inspection Checklist

Project _____
Location: _____
Site Status: _____

Date: _____
Time: _____

Inspector: _____

Maintenance Item	Satisfactory/ Unsatisfactory	Comments
1. Embankment and emergency spillway (Annual, After Major Storms)		
1. Vegetation and ground cover adequate		
2. Embankment erosion		
3. Animal burrows		
4. Unauthorized planting		
5. Cracking, bulging, or sliding of dam		
a. Upstream face		
b. Downstream face		
c. At or beyond toe		
downstream		
upstream		
d. Emergency spillway		
6.Pond, toe & chimney drains clear and functioning		
7.Seeps/leaks on downstream face		
8.Slope protection or riprap failure		
9. Vertical/horizontal alignment of top of dam “As-Built”		

Maintenance Item	Satisfactory/ Unsatisfactory	Comments
10. Emergency spillway clear of obstructions and debris		
11. Other (specify)		
2. Riser and principal spillway (Annual)		
Type: Reinforced concrete _____ Corrugated pipe _____ Masonry _____ 1. Low flow orifice obstructed		
2. Low flow trash rack. a. Debris removal necessary		
b. Corrosion control		
3. Weir trash rack maintenance a. Debris removal necessary		
b. corrosion control		
4. Excessive sediment accumulation insider riser		
5. Concrete/masonry condition riser and barrels a. cracks or displacement		
b. Minor spalling (<1")		
c. Major spalling (rebars exposed)		
d. Joint failures		
e. Water tightness		
6. Metal pipe condition		
7. Control valve a. Operational/exercised		
b. Chained and locked		
8. Pond drain valve a. Operational/exercised		
b. Chained and locked		
9. Outfall channels functioning		
10. Other (specify)		

Maintenance Item	Satisfactory/ Unsatisfactory	Comments
3. Permanent Pool (Wet Ponds) (monthly)		
1. Undesirable vegetative growth		
2. Floating or floatable debris removal required		
3. Visible pollution		
4. Shoreline problem		
5. Other (specify)		
4. Sediment Forebays		
1.Sedimentation noted		
2. Sediment cleanout when depth < 50% design depth		
5. Dry Pond Areas		
1. Vegetation adequate		
2. Undesirable vegetative growth		
3. Undesirable woody vegetation		
4. Low flow channels clear of obstructions		
5. Standing water or wet spots		
6. Sediment and / or trash accumulation		
7. Other (specify)		
6. Condition of Outfalls (Annual , After Major Storms)		
1. Riprap failures		
2. Slope erosion		
3. Storm drain pipes		
4.Endwalls / Headwalls		
5. Other (specify)		
7. Other (Monthly)		
1. Encroachment on pond, wetland or easement area		

Maintenance Item	Satisfactory/ Unsatisfactory	Comments
2. Complaints from residents		
3.Aesthetics a. Grass growing required		
b. Graffiti removal needed		
c. Other (specify)		
4. Conditions of maintenance access routes.		
5. Signs of hydrocarbon build-up		
6. Any public hazards (specify)		
8. Wetland Vegetation (Annual)		
1. Vegetation healthy and growing Wetland maintaining 50% surface area coverage of wetland plants after the second growing season. (If unsatisfactory, reinforcement plantings needed)		
2. Dominant wetland plants: Survival of desired wetland plant species Distribution according to landscaping plan?		
3. Evidence of invasive species		
4. Maintenance of adequate water depths for desired wetland plant species		
5. Harvesting of emergent plantings needed		
6. Have sediment accumulations reduced pool volume significantly or are plants “choked” with sediment		
7. Eutrophication level of the wetland.		
8. Other (specify)		

Comments:

Actions to be Taken:

Infiltration Trench Operation, Maintenance, and Management Inspection Checklist

Project:
Location:
Site Status:

Date:

Time:

Inspector:

MAINTENANCE ITEM	SATISFACTORY / UNSATISFACTORY	COMMENTS
1. Debris Cleanout (Monthly)		
Trench surface clear of debris		
Inflow pipes clear of debris		
Overflow spillway clear of debris		
Inlet area clear of debris		
2. Sediment Traps or Forebays (Annual)		
Obviously trapping sediment		
Greater than 50% of storage volume remaining		
3. Dewatering (Monthly)		
Trench dewaters between storms		
4. Sediment Cleanout of Trench (Annual)		
No evidence of sedimentation in trench		
Sediment accumulation doesn't yet require cleanout		
5. Inlets (Annual)		

MAINTENANCE ITEM	SATISFACTORY / UNSATISFACTORY	COMMENTS
Good condition		
No evidence of erosion		
6. Outlet/Overflow Spillway (Annual)		
Good condition, no need for repair		
No evidence of erosion		
7. Aggregate Repairs (Annual)		
Surface of aggregate clean		
Top layer of stone does not need replacement		
Trench does not need rehabilitation		

Comments:

Actions to be Taken:

Open Channel Operation, Maintenance, and Management Inspection Checklist

Project:
Location:
Site Status:

Date:

Time:

Inspector:

MAINTENANCE ITEM	SATISFACTORY/ UNSATISFACTORY	COMMENTS
1. Debris Cleanout (Monthly)		
Contributing areas clean of debris		
2. Check Dams or Energy Dissipators (Annual, After Major Storms)		
No evidence of flow going around structures		
No evidence of erosion at downstream toe		
Soil permeability		
Groundwater / bedrock		
3. Vegetation (Monthly)		
Mowing done when needed		
Minimum mowing depth not exceeded		
No evidence of erosion		
Fertilized per specification		
4. Dewatering (Monthly)		
Dewaters between storms		

MAINTENANCE ITEM	SATISFACTORY/ UNSATISFACTORY	COMMENTS
5. Sediment deposition (Annual)		
Clean of sediment		
6. Outlet/Overflow Spillway (Annual)		
Good condition, no need for repairs		
No evidence of erosion		

Comments:

Actions to be Taken:

Appendix H:

Cultec Infiltration Chamber Operation and Maintenance Requirements.

Contactor® & Recharger®
Stormwater Chambers

Operation and Maintenance Guidelines
for CULTEC Stormwater Management Systems

The Founder of Plastic Chamber Technology

www.cultec.com | 1(800) 4-CULTEC |

CULTEC®

Published by
CULTEC, Inc.
P.O. Box 280
878 Federal Road
Brookfield, Connecticut 06804 USA
www.cultec.com

Disclaimers:
The drawings, photographs and illustrations shown in this document are for illustrative purposes only and are not necessarily to scale. Actual designs may vary.

CULTEC reserves the right to make design and/or specification changes at any time without notice at CULTEC's sole discretion.

CULTEC is not responsible for typographical errors.

Protected by one or more of the following patents:
Protected by one or more of the following patents:
U.S. Patents 6,129,482; 6,322,288; 6,854,925; 7,226,241; 7,806,627; 8,366,346; 8,425,148; and others; U.S. Designs D613819; D638,095; D668,318 and others; Canadian Patent 2,591,255 and others; Community Designs 1092191; 1745209; and others.

Contact Information:
For general information on our other products and services, please contact our offices within the United States at (800)428-5832, (203)775-4416 ext. 202, or e-mail us at custservice@cultec.com.

For technical support, please call (203)775-4416 ext. 203 or e-mail tech@cultec.com.

Visit www.cultec.com/downloads.html for Product Downloads and CAD details.

Doc ID: CULG008 05-17
May 2017

These instructions are for single-layer traffic applications only. For multi-layer applications, contact CULTEC.
All illustrations and photos shown herein are examples of typical situations. Be sure to follow the engineer's drawings.
Actual designs may vary.

This manual contains guidelines recommended by CULTEC, Inc. and may be used in conjunction with, but not to supersede, local regulations or regulatory authorities. OSHA Guidelines must be followed when inspecting or cleaning any structure.

Introduction

The CULTEC Subsurface Stormwater Management System is a high-density polyethylene (HDPE) chamber system arranged in parallel rows surrounded by washed stone. The CULTEC chambers create arch-shaped voids within the washed stone to provide stormwater detention, retention, infiltration, and reclamation. Filter fabric is placed between the native soil and stone interface to prevent the intrusion of fines into the system. In order to minimize the amount of sediment which may enter the CULTEC system, a sediment collection device (stormwater pretreatment device) is recommended upstream from the CULTEC chamber system. Examples of pretreatment devices include, but are not limited to, an appropriately sized catch basin with sump, pretreatment catchment device, oil grit separator, or baffled distribution box. Manufactured pretreatment devices may also be used in accordance with CULTEC chambers. Installation, operation, and maintenance of these devices shall be in accordance with manufacturer's recommendations. Almost all of the sediment entering the stormwater management system will be collected within the pretreatment device.

Best Management Practices allow for the maintenance of the preliminary collection systems prior to feeding the CULTEC chambers. The pretreatment structures shall be inspected for any debris that will restrict inlet flow rates. Outfall structures, if any, such as outlet control must also be inspected for any obstructions that would restrict outlet flow rates. OSHA Guidelines must be followed when inspecting or cleaning any structure.

Operation and Maintenance Requirements

I. Operation

CULTEC stormwater management systems shall be operated to receive only stormwater run-off in accordance with applicable local regulations. CULTEC subsurface stormwater management chambers operate at peak performance when installed in series with pretreatment. Pretreatment of suspended solids is superior to treatment of solids once they have been introduced into the system. The use of pretreatment is adequate as long as the structure is maintained and the site remains stable with finished impervious surfaces such as parking lots, walkways, and pervious areas are properly maintained. If there is to be an unstable condition, such as improvements to buildings or parking areas, all proper silt control measures shall be implemented according to local regulations.

II. Inspection and Maintenance Options

A. The CULTEC system may be equipped with an inspection port located on the inlet row. The inspection port is a circular cast box placed in a rectangular concrete collar. When the lid is removed, a 6-inch (150 mm) pipe with a screw-in plug will be exposed. Remove the plug. This will provide access to the CULTEC Chamber row below. From the surface, through this access, the sediment may be measured at this location. A stadia rod may be used to measure the depth of sediment if any in this row. If the depth of sediment is in excess of 3 inches (76 mm), then this row should be cleaned with high pressure water through a culvert cleaning nozzle. This would be carried out through an upstream manhole or through the CULTEC StormFilter Unit (or other pretreatment device). CCTV inspection of this row can be deployed through this access port to deter mine if any sediment has accumulated in the inlet row.

B. If the CULTEC bed is not equipped with an inspection port, then access to the inlet row will be through an upstream manhole or the CULTEC StormFilter.

1. Manhole Access
This inspection should only be carried out by persons trained in confined space entry and sewer inspection services. After the manhole cover has been removed a gas detector must be lowered into the manhole to ensure that there are not high concentrations of toxic gases present. The inspector should be lowered into the manhole with the proper safety equipment as per OSHA requirements. The inspector may be able to observe sediment from this location. If this is not possible, the inspector will need to deploy a CCTV robot to permit viewing of the sediment.

2. StormFilter Access
Remove the manhole cover to allow access to the unit. Typically a 30-inch (750 mm) pipe is used as a riser from the StormFilter to the surface. As in the case with manhole access, this access point requires a technician trained in confined space entry with proper gas detection equipment. This individual must be equipped with the proper safety equipment for entry into the StormFilter. The technician will be lowered onto the StormFilter unit. The hatch on the unit must be removed. Inside the unit are two filters which may be removed according to StormFilter maintenance guidelines. Once these filters are removed the inspector can enter the StormFilter unit to launch the CCTV camera robot.

C. The inlet row of the CULTEC system is placed on a polyethylene liner to prevent scouring of the washed stone beneath this row. This also facilitates the flushing of this row with high pressure water through a culvert cleaning nozzle. The nozzle is deployed through a manhole or the StormFilter and extended to the end of the row. The water is turned on and the inlet row is back-flushed into the manhole or StormFilter. This water is to be removed from the manhole or StormFilter using a vacuum truck.

III. Maintenance Guidelines

The following guidelines shall be adhered to for the operation and maintenance of the CULTEC stormwater management system:

A. The owner shall keep a maintenance log which shall include details of any events which would have an effect on the system's operational capacity.

B. The operation and maintenance procedure shall be reviewed periodically and changed to meet site conditions.

C. Maintenance of the stormwater management system shall be performed by qualified workers and shall follow applicable occupational health and safety requirements.

D. Debris removed from the stormwater management system shall be disposed of in accordance with applicable laws and regulations.

IV. Suggested Maintenance Schedules

A. Minor Maintenance
The following suggested schedule shall be followed for routine maintenance during the regular operation of the stormwater system:

Frequency	Action
Monthly in first year	Check inlets and outlets for clogging and remove any debris, as required.
Spring and Fall	Check inlets and outlets for clogging and remove any debris, as required.
One year after commissioning and every third year following	Check inlets and outlets for clogging and remove any debris, as required.

B. Major Maintenance
The following suggested maintenance schedule shall be followed to maintain the performance of the CULTEC stormwater management chambers. Additional work may be necessary due to insufficient performance and other issues that might be found during the inspection of the stormwater management chambers. (See table on next page)

	Frequency	Action
Inlets and Outlets	Every 3 years	• Obtain documentation that the inlets, outlets and vents have been cleaned and will function as intended.
	Spring and Fall	• Check inlet and outlets for clogging and remove any debris as required.
CULTEC Stormwater Chambers	2 years after commissioning	• Inspect the interior of the stormwater management chambers through inspection port for deficiencies using CCTV or comparable technique. • Obtain documentation that the stormwater management chambers and feed connectors will function as anticipated.
	9 years after commissioning every 9 years following	• Clean stormwater management chambers and feed connectors of any debris. • Inspect the interior of the stormwater management structures for deficiencies using CCTV or comparable technique. • Obtain documentation that the stormwater management chambers and feed connectors have been cleaned and will function as intended.
	45 years after commissioning	• Clean stormwater management chambers and feed connectors of any debris. • Determine the remaining life expectancy of the stormwater management chambers and recommended schedule and actions to rehabilitate the stormwater management chambers as required. • Inspect the interior of the stormwater management chambers for deficiencies using CCTV or comparable technique. • Replace or restore the stormwater management chambers in accordance with the schedule determined at the 45-year inspection. • Attain the appropriate approvals as required. • Establish a new operation and maintenance schedule.
Surrounding Site	Monthly in 1st year	• Check for depressions in areas over and surrounding the stormwater management system.
	Spring and Fall	• Check for depressions in areas over and surrounding the stormwater management system.
	Yearly	• Confirm that no unauthorized modifications have been performed to the site.

For additional information concerning the maintenance of CULTEC Subsurface Stormwater Management Chambers, please contact CULTEC, Inc. at 1-800-428-5832.

WQMP
Operation & Maintenance (O&M) Plan

Project Name:_____

Prepared for:

Project Name: _____

Address:_____

City, State Zip:_____

Prepared on:

Date:_____

This O&M Plan describes the designated responsible party for implementation of this WQMP, including: operation and maintenance of all the structural BMP(s), conducting the training/educational program and duties, and any other necessary activities. The O&M Plan includes detailed inspection and maintenance requirements for all structural BMPs, including copies of any maintenance contract agreements, manufacturer's maintenance requirements, permits, etc.

8.1.1 Project Information

Project name	
Address	
City, State Zip	
Site size	
List of structural BMPs, number of each	
Other notes	

8.1.2 Responsible Party

The responsible party for implementation of this WQMP is:

Name of Person or HOA Property Manager	
Address	
City, State Zip	
Phone number	
24-Hour Emergency Contact number	
Email	

8.1.3 Record Keeping

Parties responsible for the O&M plan shall retain records for at least 5 years.

All training and educational activities and BMP operation and maintenance shall be documented to verify compliance with this O&M Plan. A sample Training Log and Inspection and Maintenance Log are included in this document.

8.1.4 Electronic Data Submittal

This document along with the Site Plan and Attachments shall be provided in PDF format. AutoCAD files and/or GIS coordinates of BMPs shall also be submitted to the City.

Appendix ____

BMP SITE PLAN

Site plan is preferred on minimum 11” by 17” colored sheets, as long as legible.

BMP OPERATION & MAINTENANCE LOG

Project Name: _____

Today's Date: _____

Name of Person Performing Activity (Printed): _____

Signature: _____

BMP Name (As Shown in O&M Plan)	Brief Description of Implementation, Maintenance, and Inspection Activity Performed

Minor Maintenance

Frequency		Action
Monthly in first year		Check inlets and outlets for clogging and remove any debris, as required.
		Notes
□ Month 1	Date:	
□ Month 2	Date:	
□ Month 3	Date:	
□ Month 4	Date	
□ Month 5	Date:	
□ Month 6	Date:	
□ Month 7	Date:	
□ Month 8	Date:	
□ Month 9	Date:	
□ Month 10	Date:	
□ Month 11	Date:	
□ Month 12	Date:	
Spring and Fall		Check inlets and outlets for clogging and remove any debris, as required.
		Notes
□ Spring	Date:	
□ Fall	Date:	
□ Spring	Date:	
□ Fall	Date:	
□ Spring	Date:	
□ Fall	Date:	
□ Spring	Date:	
□ Fall	Date:	
□ Spring	Date:	
□ Fall	Date:	
□ Spring	Date:	
□ Fall	Date:	
One year after commissioning and every third year following		Check inlets and outlets for clogging and remove any debris, as required.
		Notes
□ Year 1	Date:	
□ Year 4	Date:	
□ Year 7	Date:	
□ Year 10	Date:	
□ Year 13	Date:	
□ Year 16	Date:	
□ Year 19	Date:	
□ Year 22	Date:	

Major Maintenance

	Frequency		Action
Inlets and Outlets	**Every 3 years**		Obtain documentation that the inlets, outlets and vents have been cleaned and will function as intended.
			Notes
	□ Year 1	Date:	
	□ Year 4	Date:	
	□ Year 7	Date:	
	□ Year 10	Date:	
	□ Year 13	Date:	
	□ Year 16	Date:	
	□ Year 19	Date:	
	□ Year 22	Date:	
	Spring and Fall		Check inlet and outlets for clogging and remove any debris, as required.
			Notes
	□ Spring	Date:	
	□ Fall	Date:	
	□ Spring	Date:	
	□ Fall	Date:	
	□ Spring	Date:	
	□ Fall	Date:	
	□ Spring	Date:	
	□ Fall	Date:	
	□ Spring	Date:	
	□ Fall	Date:	
	□ Spring	Date:	
	□ Fall	Date:	
CULTEC Stormwater Chambers	**2 years after commissioning**		□ Inspect the interior of the stormwater management chambers through inspection port for deficiencies using CCTV or comparable technique. □ Obtain documentation that the stormwater management chambers and feed connectors will function as anticipated.
			Notes
	□ Year 2	Date:	

Major Maintenance

	Frequency		Action
CULTEC Stormwater Chambers	**9 years after commissioning every 9 years following**		□ Clean stormwater management chambers and feed connectors of any debris. □ Inspect the interior of the stormwater management structures for deficiencies using CCTV or comparable technique. □ Obtain documentation that the stormwater management chambers and feed connectors have been cleaned and will function as intended.
			Notes
	□ Year 9	Date:	
	□ Year 18	Date:	
	□ Year 27	Date:	
	□ Year 36	Date:	
	45 years after commissioning		□ Clean stormwater management chambers and feed connectors of any debris. □ Determine the remaining life expectancy of the stormwater management chambers and recommended schedule and actions to rehabilitate the stormwater management chambers as required. □ Inspect the interior of the stormwater management chambers for deficiencies using CCTV or comparable technique. □ Replace or restore the stormwater management chambers in accordance with the schedule determined at the 45-year inspection. □ Attain the appropriate approvals as required. □ Establish a new operation and maintenance schedule.
			Notes
	□ Year 45	Date:	

Major Maintenance

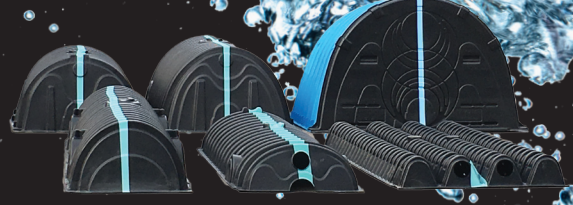
	Frequency		Action
Surrounding Site	**Monthly in 1st year**		□ Check for depressions in areas over and surrounding the stormwater management system.
			Notes
	□ Month 1	Date:	
	□ Month 2	Date:	
	□ Month 3	Date:	
	□ Month 4	Date:	
	□ Month 5	Date:	
	□ Month 6	Date:	
	□ Month 7	Date:	
	□ Month 8	Date:	
	□ Month 9	Date:	
	□ Month 10	Date:	
	□ Month 11	Date:	
	□ Month 12	Date:	
	Spring and Fall		□ Check for depressions in areas over and surrounding the stormwater management system.
			Notes
	□ Spring	Date:	
	□ Fall	Date:	
	□ Spring	Date:	
	□ Fall	Date:	
	□ Spring	Date:	
	□ Fall	Date:	
	□ Spring	Date:	
	□ Fall	Date:	
	□ Spring	Date:	
	□ Fall	Date:	
	□ Spring	Date:	
	□ Fall	Date:	
	Yearly		□ Confirm that no unauthorized modifications have been performed to the site.
			Notes
	□ Year 1	Date:	
	□ Year 2	Date:	
	□ Year 3	Date:	
	□ Year 4	Date:	
	□ Year 5	Date:	
	□ Year 6	Date:	
	□ Year 7	Date:	

CULTEC®

The Founder of Plastic Chamber Technology

www.cultec.com | 1(800) 4-CULTEC |

878 Federal Road | P.O. Box 280 | Brookfield , CT 06804 USA



Appendix I:

Preliminary Soil Testing Data

BIBBO ASSOCIATES, LLP

Consulting Engineers

Sheet: 1 of 3

Project: Wolf Conservation Center
Feature: Deep Test Results

Recorded By: Nick Hawvermale
Date: February 5, 2018

Hole ID:	TP S-1	Hole ID:	TP S-2
Depth:	Description:	Depth:	Description:
0 - 48"	Wood Mulch	0 - 36"	Wood Mulch
48" - 72"	Grey Medium/Fine Sands	36" - 48"	Brown Loamy Sand
72" - 156"	Brown Medium/Fine Sands w/ Minor traces of Silt near Bottom No Rock or Water at Full Depth	48" - 72"	Grey Medium/Fine Sands w/ traces of Silt
		72" - 150"	Brown Medium/Fine Sands w/ traces of Silt No Rock / Water Seep at 108"

Hole ID:	TP S-3	Hole ID:	TP S-4
Depth:	Description:	Depth:	Description:
0 - 6"	Top Soil	0 - 12"	Compact Gravel
6" - 24"	Grey / Brown Sands	12" - 24"	Brown Compact Sands
24" - 108"	Brown Medium/Fine Sands No Rock or Water at Full Depth	24" - 84"	Compact Sands w/ some Small Stones
		84" - 132"	Fine Sands No Rock or Water at Full Depth

BIBBO ASSOCIATES, LLP

Consulting Engineers

Sheet: 2 of 3

Project: Wolf Conservation Center
Feature: Deep Test Results

Recorded By: Nick Hawvermale
Date: February 5, 2018

Hole ID:	TP S-5	Hole ID:	TP S-6
Depth:	Description:	Depth:	Description:
0 - 6"	Top Soil	0 - 12"	Top Soil
6" - 48"	Brown Medium/Fine Sandy Loam	12" -48"	Dark Brown Sandy Loam
48" - 132"	Brown Sands w/ traces of Silt No Rock or Water at Full Depth	48" - 120"	Compact Brown Sands w/ traces of Silt No Rock or Water at Full Depth
Hole ID:		Hole ID:	
Depth:	Description:	Depth:	Description:

Appendix J:

First Defense Stormwater Treatment Unit Operation and Maintenance Manual

BIBBO ASSOCIATES, LLP
Consulting Engineers - Planners

Cobbling Rock Estates

Hydrointernational First Defense Sizing Summary

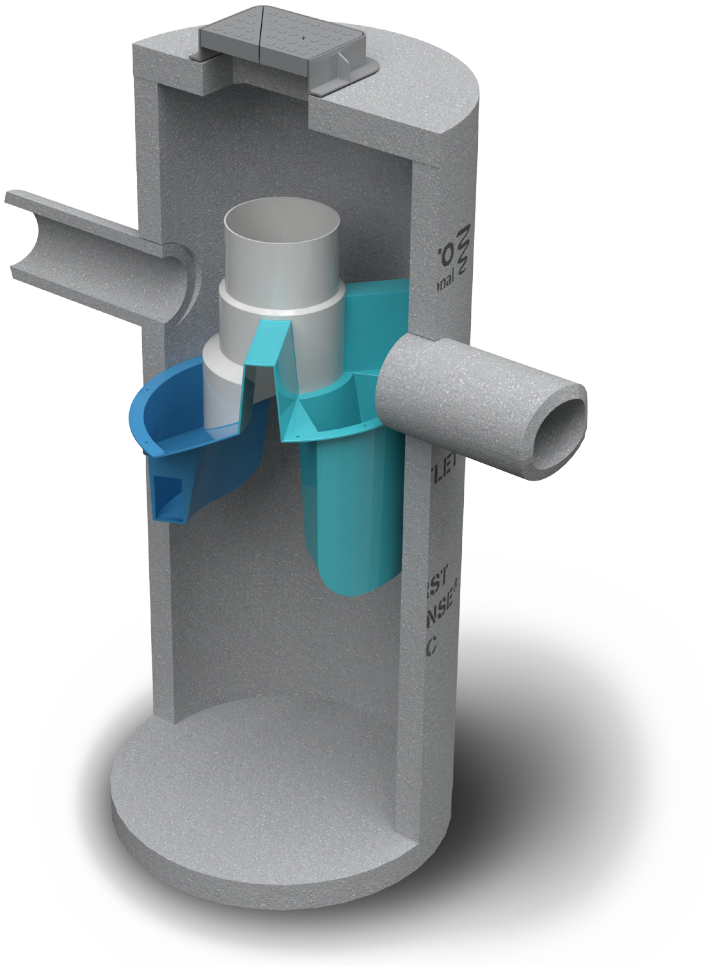
Structure Number	*First Defense HDS Unit Model No.*	*NJDEP Certified Treatment Capacity * (cfs)*	*1-Year Storm Peak Flow ** (cfs)*	*100-Year Storm Peak Flow *** (cfs)*
HDS #1.1	FD-3HC	1.06	0.52	1.29
H.D.S. #1.2	FD-3HC	1.06	0.14	3.26
H.D.S. #1.3	FD-3HC	1.06	0.21	1.78
H.D.S. #1.4	FD-3HC	1.06	0.37	0.91
H.D.S. #1.5	FD-6HC	4.23	1.74	16.10
H.D.S. #2.1	FD-3HC	1.06	0.33	1.73
H.D.S. #2.2	FD-3HC	1.06	0.41	2.06
H.D.S. #2.3	FD-3HC	1.06	0.35	2.03
H.D.S. #2.4	FD-3HC	1.06	0.68	9.18
H.D.S. #2.5	FD-3HC	1.06	0.13	1.82
H.D.S. #2.6	FD-3HC	1.06	0.49	1.22

* NJDEP Certified Treatment Rates Provided by manufacturer. Refer to detail provided on project drawings

** 1-Year Storm Peak Flow rates obtained from HydroCAD model inculded in Appendix C

*** 100 Year Peak Flow obtained from HydroCAD model in Appendix C. Manufacturer rated Peak Hydraulic Flow for Model # FD-3HC = 15.0 cfs. Manufacturer rated Peak Hydraulic Flow for Model # FD-6HC = 32.0 cfs.

Hydro International



Operation and Maintenance Manual

First Defense® and First Defense® High Capacity

Vortex Separator for Stormwater Treatment

Table of Contents

I. First Defense® by Hydro International

Introduction

The First Defense® is an enhanced vortex separator that combines an effective and economical stormwater treatment chamber with an integral peak flow bypass. It efficiently removes total suspended solids (TSS), trash and hydrocarbons from stormwater runoff without washing out previously captured pollutants. The First Defense® is available in several model configurations (refer to *Section II. Model Sizes & Configurations*, page 4) to accommodate a wide range of pipe sizes, peak flows and depth constraints.

Operation

The First Defense® operates on simple fluid hydraulics. It is self-activating, has no moving parts, no external power requirement and is fabricated with durable non-corrosive components. No manual procedures are required to operate the unit and maintenance is limited to monitoring accumulations of stored pollutants and periodic clean-outs. The First Defense® has been designed to allow for easy and safe access for inspection, monitoring and clean-out procedures. Neither entry into the unit nor removal of the internal components is necessary for maintenance, thus safety concerns related to confined-space-entry are avoided.

Pollutant Capture and Retention

The internal components of the First Defense® have been designed to optimize pollutant capture. Sediment is captured and retained in the base of the unit, while oil and floatables are stored on the water surface in the inner volume (Fig.1).

The pollutant storage volumes are isolated from the built-in bypass chamber to prevent washout during high-flow storm events. The sump of the First Defense® retains a standing water level between storm events. This ensures a quiescent flow regime at the onset of a storm, preventing resuspension and washout of pollutants captured during previous events.

Accessories such as oil absorbent pads are available for enhanced oil removal and storage. Due to the separation of the oil and floatable storage volume from the outlet, the potential for washout of stored pollutants between clean-outs is minimized.

Applications

- Stormwater treatment at the point of entry into the drainage line
- Sites constrained by space, topography or drainage profiles with limited slope and depth of cover
- Retrofit installations where stormwater treatment is placed on or tied into an existing storm drain line
- Pretreatment for filters, infiltration and storage

Advantages

- Inlet options include surface grate or multiple inlet pipes
- Integral high capacity bypass conveys large peak flows without the need for “offline” arrangements using separate junction manholes
- Proven to prevent pollutant washout at up to 500% of its treatment flow
- Long flow path through the device ensures a long residence time within the treatment chamber, enhancing pollutant settling
- Delivered to site pre-assembled and ready for installation

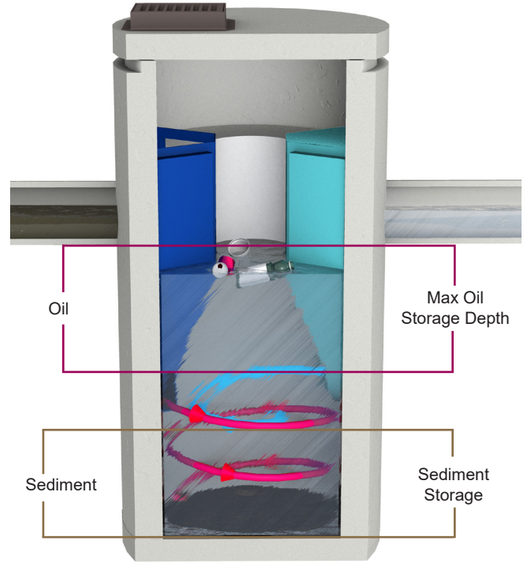


Fig.1 Pollutant storage volumes in the First Defense®.

II. Model Sizes & Configurations

The First Defense® inlet and internal bypass arrangements are available in several model sizes and configurations. The components of the First Defense®-4HC and First Defense®-6HC have modified geometries as to allow greater design flexibility needed to accommodate various site constraints.

All First Defense® models include the internal components that are designed to remove and retain total suspended solids (TSS), gross solids, floatable trash and hydrocarbons (Fig.2a - 2b). First Defense® model parameters and design criteria are shown in Table 1.

First Defense® Components

1. **Built-In Bypass**
2. **Inlet Pipe**
3. **Inlet Chute**
4. **Floatables Draw-off Port**
5. **Outlet Pipe**
6. **Floatables Storage**
7. **Sediment Storage**
8. **Inlet Grate or Cover**

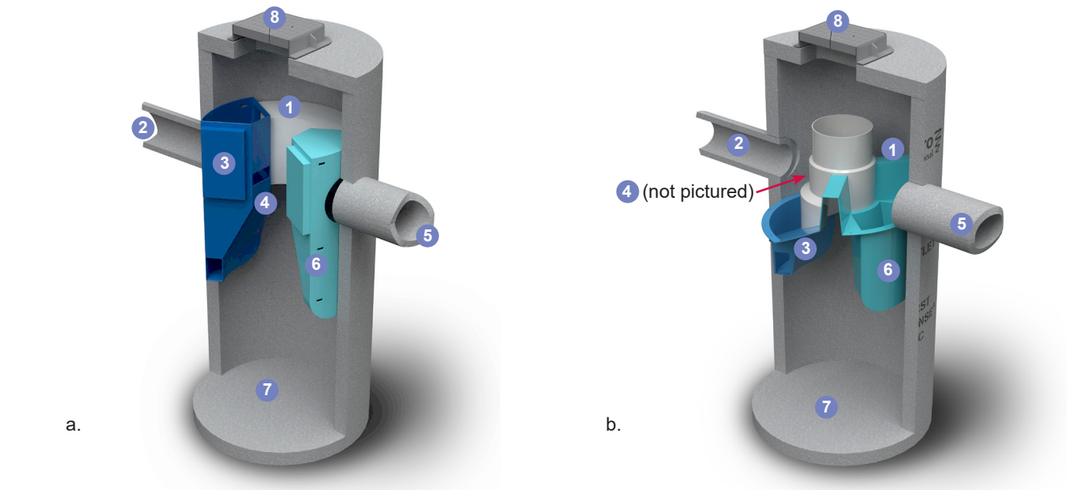


Fig.2a) First Defense®-4 and First Defense®-6; b) First Defense®-4HC and First Defense®-6HC, with higher capacity dual internal bypass and larger maximum pipe diameter.

First Defense® High Capacity Model Number	Diameter	Typical TSS Treatment Flow Rates NJDEP Certified	Peak Online Flow Rate	Maximum Pipe Diameter[1]	Oil Storage Capacity	Typical Sediment Storage Capacity[2]	Minimum Distance from Outlet Invert to Top of Rim[3]	Chamber Depth
	(ft / m)	(cfs / L/s)	(cfs / L/s)	(in / mm)	(gal / L)	(yd^3 / m^3)	(ft / m)	(ft / m)
FD-3HC	3 / 0.9	0.85 / 24.0	15 / 424	18 / 457	125 / 473	0.4 / 0.3	2.0 - 3.5 / 0.6 - 1.0	3.75 / 1.14
FD-4HC	4 / 1.2	1.50 / 42.4	18 / 510	24 / 600	191 / 723	0.7 / 0.5	2.3 - 3.9 / 0.7 - 1.2	5.00 / 1.52
FD-5HC	5 / 1.5	2.35 / 66.2	20 / 566	24 / 609	300 / 1135	1.1 / .84	2.5 - 4.5 / 0.7 - 1.3	5.25 / 1.60
FD-6HC	6 / 1.8	3.38 / 95.7	32 / 906	30 / 750	496 / 1878	1.6 / 1.2	3.0 - 5.1 / 0.9 - 1.6	6.25 / 1.90
FD-7HC	7 / 2.1	4.60 / 130.2	40 / 1133	42 / 1067	750 / 2839	2.1 / 1.9	3.0 - 5.5 / 0.9 - 1.7	7.25 / 2.20
FD-8HC	8 / 2.4	6.00 / 169.9	50 / 1,415	48 / 1219	1120 / 4239	2.8 / 2.1	3.0 - 6.0 / 0.9 -1.8	8.00 / 2.43

[1]Contact Hydro International when larger pipe sizes are required.
[2]Contact Hydro International when custom sediment storage capacity is required.
[3]Minimum distance for models depends on pipe diameter.

III. Maintenance

Overview

The First Defense® protects the environment by removing a wide range of pollutants from stormwater runoff. Periodic removal of these captured pollutants is essential to the continuous, long-term functioning of the First Defense®. The First Defense® will capture and retain sediment and oil until the sediment and oil storage volumes are full to capacity. When sediment and oil storage capacities are reached, the First Defense® will no longer be able to store removed sediment and oil. Maximum pollutant storage capacities are provided in Table 1.

The First Defense® allows for easy and safe inspection, monitoring and clean-out procedures. A commercially or municipally owned sump-vac is used to remove captured sediment and floatables. Access ports are located in the top of the manhole.

Maintenance events may include Inspection, Oil & Floatables Removal, and Sediment Removal. Maintenance events do not require entry into the First Defense®, nor do they require the internal components of the First Defense® to be removed. In the case of inspection and floatables removal, a vactor truck is not required. However, a vactor truck is required if the maintenance event is to include oil removal and/or sediment removal.

Maintenance Equipment Considerations

The internal components of the First Defense®-HC have a centrally located circular shaft through which the sediment storage sump can be accessed with a sump vac hose. The open diameter of this access shaft is 15 inches in diameter (Fig.3). Therefore, the nozzle fitting of any vactor hose used for maintenance should be less than 15 inches in diameter.

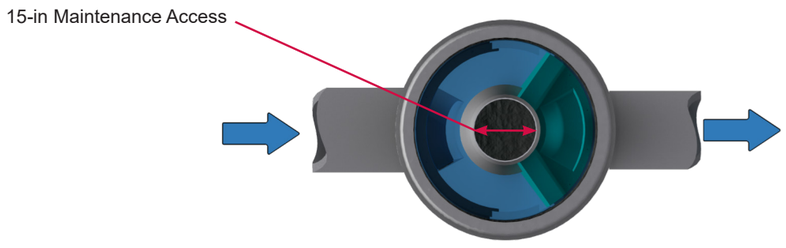


Fig.3 The central opening to the sump of the First Defense®-HC is 15 inches in diameter.

Determining Your Maintenance Schedule

The frequency of clean out is determined in the field after installation. During the first year of operation, the unit should be inspected every six months to determine the rate of sediment and floatables accumulation. A simple probe such as a Sludge-Judge® can be used to determine the level of accumulated solids stored in the sump. This information can be recorded in the maintenance log (see page 9) to establish a routine maintenance schedule.

The vactor procedure, including both sediment and oil / flotables removal, for a 6-ft First Defense® typically takes less than 30 minutes and removes a combined water/oil volume of about 765 gallons.

Inspection Procedures

1. Set up any necessary safety equipment around the access port or grate of the First Defense® as stipulated by local ordinances. Safety equipment should notify passing pedestrian and road traffic that work is being done.

2. Remove the grate or lid to the manhole.

3. Without entering the vessel, look down into the chamber to inspect the inside. Make note of any irregularities. Fig.4 shows the standing water level that should be observed.

4. Without entering the vessel, use the pole with the skimmer net to remove floatables and loose debris from the components and water surface.

5. Using a sediment probe such as a Sludge Judge®, measure the depth of sediment that has collected in the sump of the vessel.

6. On the Maintenance Log (see page 9), record the date, unit location, estimated volume of floatables and gross debris removed, and the depth of sediment measured. Also note any apparent irregularities such as damaged components or blockages.

7. Securely replace the grate or lid.

8. Take down safety equipment.

9. Notify Hydro International of any irregularities noted during inspection.

Floatables and Sediment Clean Out

Floatables clean out is typically done in conjunction with sediment removal. A commercially or municipally owned sump-vac is used to remove captured sediment and floatables (Fig.5).

Floatables and loose debris can also be netted with a skimmer and pole. The access port located at the top of the manhole provides unobstructed access for a vactor hose and skimmer pole to be lowered to the base of the sump.

Scheduling

- Floatables and sump clean out are typically conducted once a year during any season.

- Floatables and sump clean out should occur as soon as possible following a spill in the contributing drainage area.

Fig.4 Floatables are removed with a vactor hose (First Defense model FD-4, shown).

Recommended Equipment

- Safety Equipment (traffic cones, etc)

- Crow bar or other tool to remove grate or lid

- Pole with skimmer or net (if only floatables are being removed)

- Sediment probe (such as a Sludge Judge®)

- Vactor truck (flexible hose recommended)

- First Defense® Maintenance Log

Floatables and sediment Clean Out Procedures

1. Set up any necessary safety equipment around the access port or grate of the First Defense® as stipulated by local ordinances. Safety equipment should notify passing pedestrian and road traffic that work is being done.

2. Remove the grate or lid to the manhole.

3. Without entering the vessel, look down into the chamber to inspect the inside. Make note of any irregularities.

4. Remove oil and floatables stored on the surface of the water with the vactor hose (Fig.5) or with the skimmer or net (not pictured).

5. Using a sediment probe such as a Sludge Judge®, measure the depth of sediment that has collected in the sump of the vessel and record it in the Maintenance Log (page 9).

6. Once all floatables have been removed, drop the vactor hose to the base of the sump. Vactor out the sediment and gross debris off the sump floor (Fig.5).

7. Retract the vactor hose from the vessel.

8. On the Maintenance Log provided by Hydro International, record the date, unit location, estimated volume of floatables and gross debris removed, and the depth of sediment measured. Also note any apparent irregularities such as damaged components, blockages, or irregularly high or low water levels.

9. Securely replace the grate or lid.

Fig.5 Sediment is removed with a vactor hose (First Defense model FD-4, shown).

Maintenance at a Glance

Inspection	- Regularly during first year of installation - Every 6 months after the first year of installation
Oil and Floatables Removal	- Once per year, with sediment removal - Following a spill in the drainage area
Sediment Removal	- Once per year or as needed - Following a spill in the drainage area
NOTE: For most clean outs the entire volume of liquid does not need to be removed from the manhole. Only remove the first few inches of oils and floatables from the water surface to reduce the total volume of liquid removed during a clean out.	

First Defense® Installation Log

HYDRO INTERNATIONAL REFERENCE NUMBER:	
SITE NAME:	
SITE LOCATION:	
OWNER:	CONTRACTOR:
CONTACT NAME:	CONTACT NAME:
COMPANY NAME:	COMPANY NAME:
ADDRESS:	ADDRESS:
TELEPHONE:	TELEPHONE:
FAX:	FAX:

INSTALLATION DATE: / /

MODEL SIZE (CIRCLE ONE): **FD-3HC** **FD-4** **FD-4HC** **FD-5HC** **FD-6** **FD-6HC** **FD-7HC** **FD-8HC**

INLET (CIRCLE ALL THAT APPLY): **GRATED INLET (CATCH BASIN)** **INLET PIPE (FLOW THROUGH)**

Hydro International (Stormwater), 94 Hutchins Drive, Portland ME 04102
Tel: (207) 756-6200 Fax: (207) 756-6212 Web: www.hydro-int.com

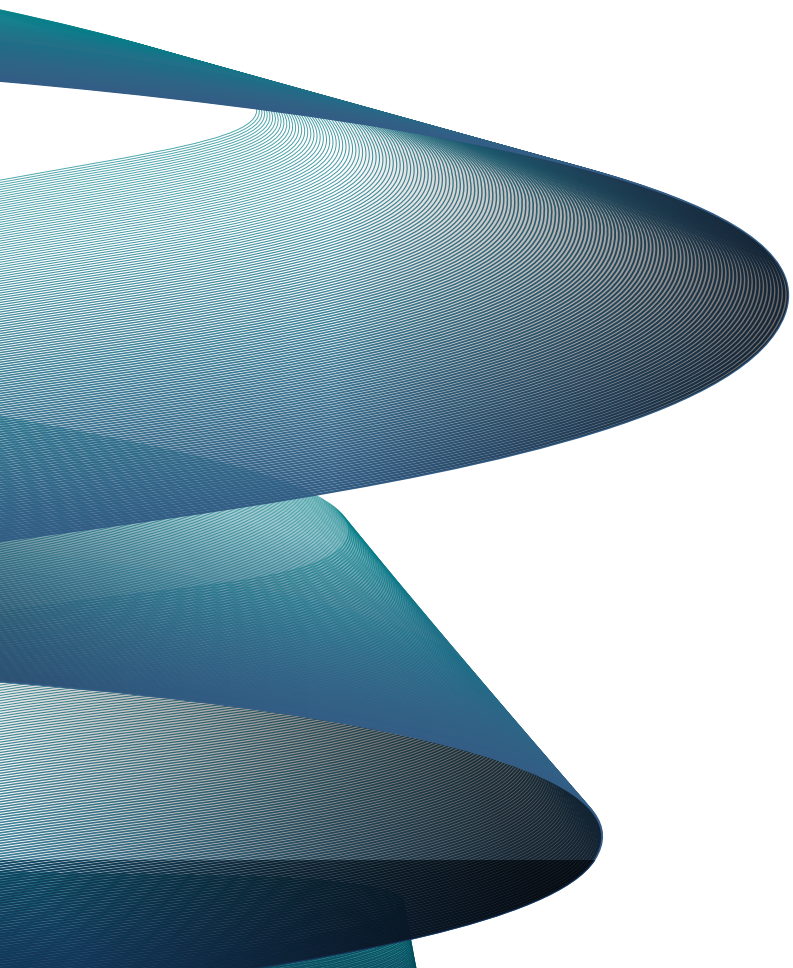
First Defense® Inspection and Maintenance Log

Date	Initials	Depth of Floatables and Oils	Sediment Depth Measured	Volume of Sediment Removed	Site Activity and Comments

Hydro International (Stormwater), 94 Hutchins Drive, Portland ME 04102
Tel: (207) 756-6200 Fax: (207) 756-6212 Web: www.hydro-int.com

Notes

Hydro International®



Stormwater Solutions

94 Hutchins Drive
Portland, ME 04102

Tel: (207) 756-6200
Fax: (207) 756-6212
stormwaterinquiry@hydro-int.com

www.hydro-int.com

Turning Water Around...®

FDHC_O+M_H_1703

Figure 1:

Pre-development Drainage Basin Plan

LEGEND

EXISTING PROPERTY LINE

WETLAND BUFFER LINE

WETLAND BOUNDARY LINE

EXISTING WOLF ENCLOSURE FENCE

EXISTING EASEMENT LINE

BUCK RUN
(PRIVATE 50 R.O.W.)

PROPERTY LINE (TYP.)

EASEMENT "A" (REFER TO SURVEY)

EASEMENT "B" (REFER TO SURVEY)

EASEMENT "C" (REFER TO SURVEY)

ACCESS & UTILITY EASEMENT

1.0S

PnD

PnC

SuB

WdC

RdB

Sh

ChC

150' LOCAL WETLAND BUFFER

100' STATE WETLAND BUFFER

APPROXIMATE LOCATION OF NYSDEC WETLAND — 20
DETERMINED BY OBSERVATION BY BETH EVANS,PWS 9/17/20

DESIGN POINT
(EXISTING CULVERT)

EXISTING GRAVEL PARKING AREA

EXISTING GRAVEL DRIVE (TYP.)

EXISTING DIRT TRAVELED WAY

EXISTING STONE CROSSING OVER STREAM

EXISTING WELL

EXISTING SEPTIC TANK

EXISTING GENERATOR PROPANE

EXISTING 1-STORY FRAME HOUSE TO REMAIN

EXISTING STONE FRAME H.R.

EXISTING BARN

ASPHALT DRIVE

APPROXIMATE LOCATION OF DRIVE WAY

APPROXIMATE LOCATION OF CULVERT

STOCKPILE

TRAIL

ROCK OUTCROPS

DRAINAGE BASIN LEGEND:

ChC — SOIL TYPE

B — SOIL CLASSIFICATION

SOIL BOUNDARY

BASIN BOUNDARY

TIME OF CONCENTRATION PATH (TC)

PLAN
GRAPHIC SCALE

40 0 40 40 80 160

(IN FEET)
1 inch = 40 ft.

CALL BEFORE YOU DIG 1-800-962-7962

UNDER THE NY STATE LAW PROTECTING UNDERGROUND FACILITIES, THE FOLLOWING RULES AND REGULATIONS ARE IN EFFECT FOR ALL EXCAVATORS:

* THEY MUST CALL FOR A UTILITY STAKE-OUT (2) TWO FULL WORKING DAYS PRIOR TO AN EXCAVATION.
* THEY MUST CONFIRM PRECISE LOCATIONS OF UNDERGROUND FACILITIES.
* THEY MUST PRESERVE STAKES AND MARKINGS UNTIL NO LONGER NEEDED AT SITE.
* THEY MUST CONTACT NON-UFPO MEMBER UTILITY OWNERS FOR STAKE-OUTS.

REVISIONS					
DATE:	DESCRIPTION	BY/CK	DATE:	DESCRIPTION	BY/CK

MATTHEW J. GIRONDA P.E.

PREDEVELOPMENT DRAINAGE BASIN MAP

WOLF CONSERVATION CENTER

7 BUCK RUN, SOUTH SALEM, NY 10590
TOWN OF LEWISBORO, WESTCHESTER COUNTY, NY

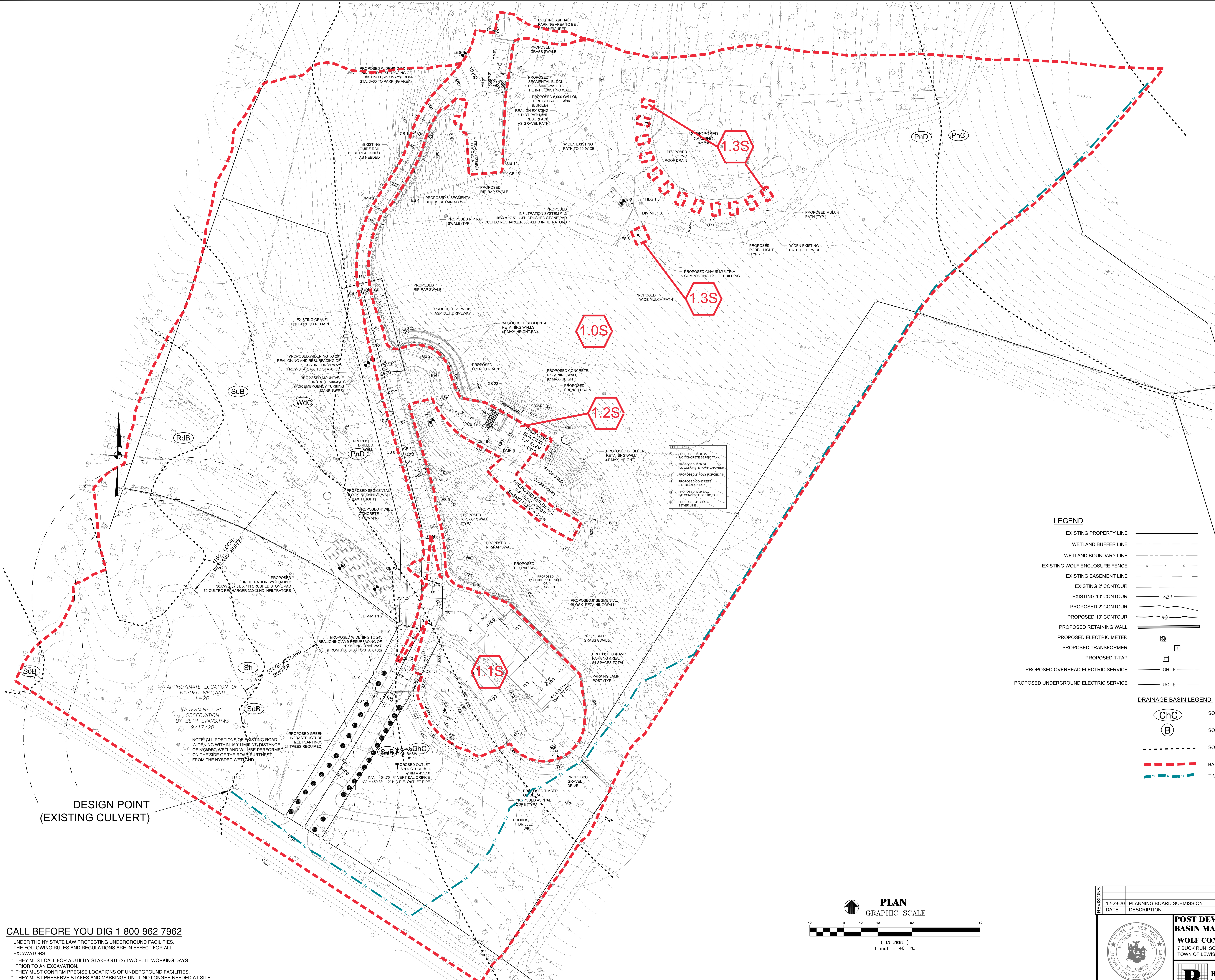
BIBBO ASSOCIATES, LLP
293 ROUTE 100 SUITE 203
SOMERS, NEW YORK 10589
TEL. 914 277 5805

DATE:	12-29-2020
SCALE:	1" = 60'
FILE:	L5
DSGN / CHK:	MG/RH
DRN. BY:	RH
SHT NO.	FIGURE 1
DWG NO.	PRE

P:\Projects\WOLF CONSERV. CENTER\Engr\Wolf Center Site Plan 12-29-20 PB.dwg, 12/28/2020 4:27:05 PM

Figure 2:

Post-development Drainage Basin Plan



LEGEND

EXISTING PROPERTY LINE	
WETLAND BUFFER LINE	
WETLAND BOUNDARY LINE	
EXISTING WOLF ENCLOSURE FENCE	— x — x — x —
EXISTING EASEMENT LINE	
EXISTING 2' CONTOUR	
EXISTING 10' CONTOUR	420
PROPOSED 2' CONTOUR	
PROPOSED 10' CONTOUR	420
PROPOSED RETAINING WALL	
PROPOSED ELECTRIC METER	M
PROPOSED TRANSFORMER	T
PROPOSED T-TAP	TT
PROPOSED OVERHEAD ELECTRIC SERVICE	OH—E
PROPOSED UNDERGROUND ELECTRIC SERVICE	UG—E

DRAINAGE BASIN LEGEND:

ChC	SOIL TYPE
B	SOIL CLASSIFICATION
	SOIL BOUNDARY
	BASIN BOUNDARY
Tc	TIME OF CONCENTRATION PATH (TC)

PLAN

GRAPHIC SCALE

(IN FEET)
1 inch = 40 ft.

CALL BEFORE YOU DIG 1-800-962-7962

UNDER THE NY STATE LAW PROTECTING UNDERGROUND FACILITIES, THE FOLLOWING RULES AND REGULATIONS ARE IN EFFECT FOR ALL EXCAVATORS:

- THEY MUST CALL FOR A UTILITY STAKE-OUT (2) TWO FULL WORKING DAYS PRIOR TO AN EXCAVATION.
- THEY MUST CONFIRM PRECISE LOCATIONS OF UNDERGROUND FACILITIES.
- THEY MUST PRESERVE STAKES AND MARKINGS UNTIL NO LONGER NEEDED AT SITE.
- THEY MUST CONTACT NON-UFPO MEMBER UTILITY OWNERS FOR STAKE-OUTS.

REVISIONS:

DATE:	DESCRIPTION	BY/CK	DATE:	DESCRIPTION	BY/CK
			11-12-20	DESIGN DEVELOPMENT PRICING SET	RH MG
			3-13-20	REVISE EDUCATION PAVILION	RH MG
12-29-20	PLANNING BOARD SUBMISSION	RH/MG	3-7-19	ADD EDUCATION PAVILION	RH MG

STATE OF NEW YORK · MATTHEW J. GIRONDA · No. 096030 · LICENSED PROFESSIONAL ENGINEER

MATTHEW J. GIRONDA P.E.

POST DEVELOPMENT DRAINAGE BASIN MAP

WOLF CONSERVATION CENTER
7 BUCK RUN, SOUTH SALEM, NY 10590
TOWN OF LEWISBORO, WESTCHESTER COUNTY, NY

BIBBO ASSOCIATES, LLP
293 ROUTE 100 SUITE 203
SOMERS, NEW YORK 10589
TEL. 914 277 5805

DATE:	1-31-2019
SCALE:	1" = 60'
FILE:	L5
DSGN / CHK:	MG/RH
DRN. BY:	RH
SHT NO.	FIGURE 2
DWG NO.	POST

Figure 3:

Redevelopment Map

LEGEND

- EXISTING PROPERTY LINE
- WETLAND BUFFER LINE
- WETLAND BOUNDARY LINE
- EXISTING WOLF ENCLOSURE FENCE
- EXISTING EASEMENT LINE
- EXISTING 2' CONTOUR
- EXISTING 10' CONTOUR (420)
- PROPOSED 2' CONTOUR
- PROPOSED 10' CONTOUR (420)
- PROPOSED RETAINING WALL
- PROPOSED ELECTRIC METER (M)
- PROPOSED TRANSFORMER (T)
- PROPOSED T-TAP (TT)
- PROPOSED OVERHEAD ELECTRIC SERVICE (OH—E)
- PROPOSED UNDERGROUND ELECTRIC SERVICE (UG—E)

DRAINAGE BASIN LEGEND:

- ChC — SOIL TYPE
- B — SOIL CLASSIFICATION
- SOIL BOUNDARY
- BASIN BOUNDARY
- TIME OF CONCENTRATION PATH (TC)

PLAN

GRAPHIC SCALE

40 0 40 40 80 160

(IN FEET)

1 inch = 40 ft.

CALL BEFORE YOU DIG 1-800-962-7962

UNDER THE NY STATE LAW PROTECTING UNDERGROUND FACILITIES, THE FOLLOWING RULES AND REGULATIONS ARE IN EFFECT FOR ALL EXCAVATORS:

- THEY MUST CALL FOR A UTILITY STAKE-OUT (2) TWO FULL WORKING DAYS PRIOR TO AN EXCAVATION.
- THEY MUST CONFIRM PRECISE LOCATIONS OF UNDERGROUND FACILITIES.
- THEY MUST PRESERVE STAKES AND MARKINGS UNTIL NO LONGER NEEDED AT SITE.
- THEY MUST CONTACT NON-UFPO MEMBER UTILITY OWNERS FOR STAKE-OUTS.

REVISIONS						
				11-12-20	DESIGN DEVELOPMENT PRICING SET	RH MG
				3-13-20	REVISE EDUCATION PAVILION	RH MG
12-29-20	PLANNING BOARD SUBMISSION	RH/MG	3-7-19	ADD EDUCATION PAVILION		RH MG
DATE:	DESCRIPTION	BY/CK	DATE:	DESCRIPTION		BY/CK

STATE OF NEW YORK · MATTHEW J. GIRONDA · LICENSED PROFESSIONAL ENGINEER · No. 095020

MATTHEW J. GIRONDA P.E.

REDEVELOPMENT DRAINAGE BASIN MAP

WOLF CONSERVATION CENTER

7 BUCK RUN, SOUTH SALEM, NY 10590
TOWN OF LEWISBORO, WESTCHESTER COUNTY, NY

BIBBO ASSOCIATES, LLP
293 ROUTE 100 SUITE 203
SOMERS, NEW YORK 10589
TEL. 914 277 5805

DATE:	4-24-2020
SCALE:	1" = 40'
FILE:	L5
DSGN / CHK:	MG/RH
DRN. BY:	RH
SHT NO.	1 OF 1
DWG NO.	FIGURE 3

ARCHITECTURE AND COMMUNITY APPEARANCE REVIEW COUNCIL

TOWN OF LEWISBORO

CAL. NO. 24-18-ACARC/PB

Applicant(s):		Spencer Wilhelm, Wolf Conservation Center (WCC)
Owner(s) of Record:		Wolf Conservation Center, LLC
Reason for Referral:		Planning Board
Tax Map I.D.:		Sheet 21, Block 10803, Lot 81
Zone:		R-2A
Address:		7 Buck Run, South Salem
Decision Date:		November 14, 2018
The Vote:	To Approve:	Virginia LoBosco, Chair Rose Bonanno Christine Carrié Alan Kaufman Craig Pillon
Presentation by:		Spencer Wilhelm, Wolf Conservation Center (WCC); and Kevin Baxter, AIA, Baxter Projects
Nature of Application:		Construction of an education pavilion.
Evidence Presented:		Site plan (Bibbo Associates, dated September 26, 2018), architectural drawings (Baxter Projects, dated September 24, 2018) and renderings (Baxter Projects, dated October 25, 2018)

Based on the foregoing, the members of ACARC resolved to approve the application for the concrete, single-story education pavilion, as submitted:

- 5,000 sf footprint;
- 3,500 sf of interior space;
- located at the 3 Buck Run site;
- the concrete is to be light grey or anodized in color;
- the window system is to be steel or aluminum, also light grey or anodized in color;
- the roof will have solar panels and a pea gravel trail;
- the green roof is to be planted with indigenous shrubs;
- the roof's 5'5" parapet will have a rear exposure of 3'6" plus a hand rail and guard rail;
- the front elevation will have a metal sun visor, an open-air exterior staircase to the roof and three garage-type doors;
- the front deck is to be made of composite materials; and
- the retaining wall is to be either concrete or Gabion blocks.

By motion Virginia LoBosco; seconded by Alan Kaufman; All in favor: Rose Bonanno, Christine Carrié, Alan Kaufman, Virginia LoBosco and Craig Pillon.

Virginia LoBosco, Chair

Dated in South Salem, New York
This 19th day of November, 2018