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STORMWATER MANAGEMENT REPORT

Prepared For

PROPOSED SUBDIVISION DEVELOPMENT

183 WESTPORT ROAD, WILTON, CT

November 18, 2020

Revised: February 4, 2021

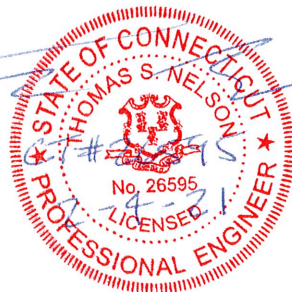


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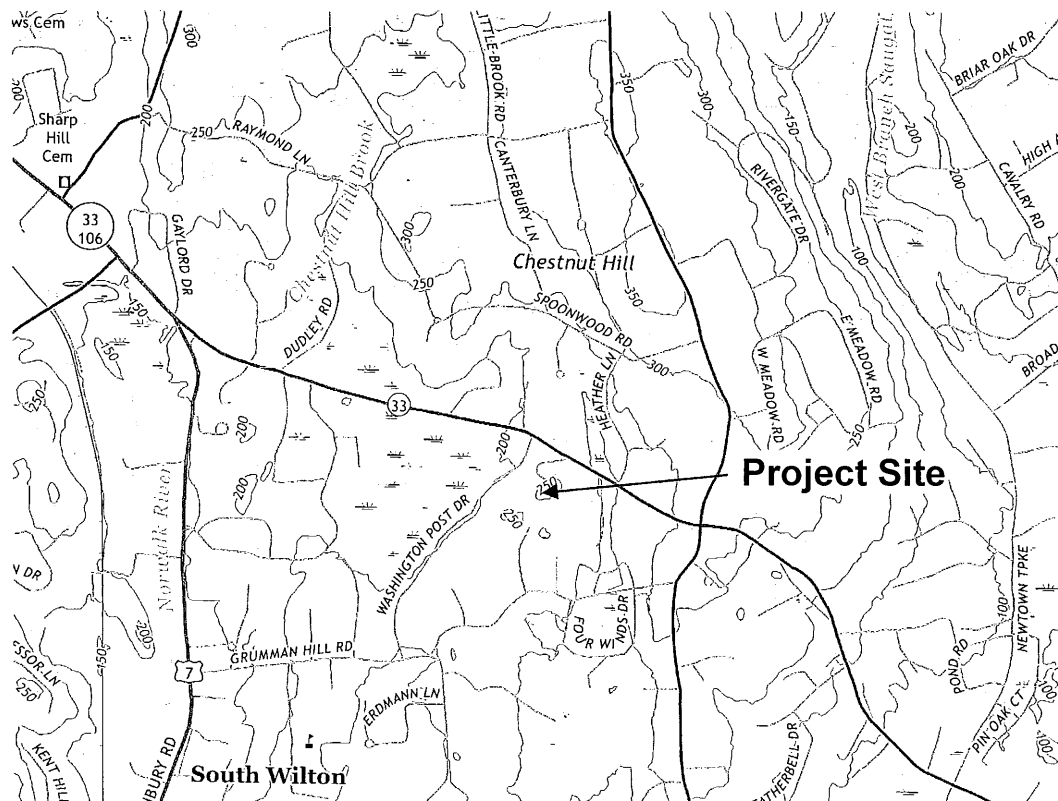
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1. INTRODUCTION

McChord Engineering Associates, Inc. has been commissioned by 183 Westport LLC to perform stormwater management computations for the proposed subdivision development at 183 Westport Road in Wilton, Connecticut. The property consists of 5.863-acres and is located in Wilton's R1A residential zone. The property is located within both the Saugatuck River and Norwalk River watershed basins and outside of any public water supply watersheds. Figure 1 shows the location of the property on the United States Geological Survey (USGS) map.

Figure 1: Location Map



The southern portion of the property is currently developed with a single-family residence, cottage, pool, hardscape and detached garage. A meandering driveway provides access from Westport Road. The edges of the property are woodland, Westport Road and Dirksen Drive. Topography on the site consists of steep slopes that drain away from the developed portion of the property, with a majority of the property draining north. The property is currently served by septic systems and private well.

The proposed project consists of subdividing the property into four (4) buildable lots. The existing structures will all remain on one (1) lot. The existing driveway will serve as a common driveway providing access to all four (4) lots and will be widened to a width of 16-ft by adding a gravel shoulder. The three (3) new lots will each be developed with a single-family residence and driveway providing access off of the common driveway. Retaining walls are proposed to mitigate the earthwork required to overcome steep slopes. A stormwater management system will be installed on each new lot to control runoff from the proposed development. The

existing septic systems and private wells serving the existing structures will remain. The three (3) new lots will each be served by their own septic system and public water.

2. SCOPE OF STUDY

This stormwater management report contains studies comparing peak flow and water quality. These studies seek to compare the existing conditions with the proposed development to ensure that the proposed development will have no adverse impact on adjoining property owners or downstream drainage systems. The subdivided properties will be developed with their own on-site stormwater management systems capable of renovating stormwater and controlling peak rates of runoff.

3. ANALYSIS METHODOLOGY

Runoff was modeled with HydroCAD 8.50 software produced by HydroCAD Software Solutions LLC. This software uses the NRCS TR-20 method for analyzing stormwater runoff. Soil characteristics, cover conditions, slope, time of concentration, and historical rainfall data are all parameters that are utilized by this method. The analysis considered the 2, 5, 10 and 25-year storm events. Precipitation data for each storm event was taken from the interactive web-tool "Extreme Precipitation in New York and New England", as prepared by a joint collaboration between the NRCC and the NRCS.

4. STORMWATER MANAGEMENT STRATEGY

Currently, all of the stormwater runoff on-site drains away from the southern center of the property. Due to this, three (3) Points of Concentration (POC) were analyzed. The first POC is Westport Road to the north, the second POC is the Konrad property to the west and the third POC is Dirksen Drive to the south. All of the rooftop runoff from the existing structures is discharged to the surface. Driveway runoff is not captured and follows the topography as there is no curbing. Runoff from the remainder of the property sheet flows overland to the aforementioned drainage paths following the topography.

The proposed stormwater management system maintains existing drainage patterns on the site. All three (3) of the new lots will have their own stormwater management systems to control runoff from the development. Rooftop runoff from the proposed residence on each lot will be captured by roof leaders and conveyed to its detention system. Runoff from the proposed driveway serving each lot will be captured by driveway drains and routed to its detention system. Each underground detention system will consist of twelve (12) units of 24" high x 48" wide x 96" long precast concrete galleries surrounded by crushed stone with a storage capacity of approximately 865 cubic feet. During typical storm events, stormwater will infiltrate into the underlying soils and there will be no discharge from the detention systems. In extreme storm events, a high level overflow pipe will control runoff and discharge to a level spreader promoting sheet flow on each property. Runoff from the remainder of the property will continue to flow overland following the topography conforming to existing conditions.

Detailed information on the size and configuration of the proposed stormwater management measures is available on the most recent revision of the "Subdivision Development Plan" prepared by this office. A Stormwater Facilities Maintenance Plan is also included in Appendix D.

5. ANALYSIS & RESULTS

5.1 PEAK FLOW CONTROL

Runoff from the property was analyzed under existing and proposed conditions. Runoff from offsite area will not be captured by the proposed stormwater management system and was therefore not factored into the analysis. The existing conditions analysis modeled the entire site into three (3) Points of Concentration. The proposed conditions analysis divided the POC's into area that is detained through the proposed detention systems and undetained areas. For drainage maps of the existing and proposed conditions see Appendix A.

Using the NRCS TR-20 method, the peak rate of runoff for the 2, 5, 10 and 25-year storm event was computed for the site. Soils on the property were determined using the NRCS Web Soil Survey. Cover conditions were derived from site observations and the "Subdivision Development Plan" prepared by this office, dated February 4, 2021. Soil testing was conducted on the property for the proposed septic systems. Deep test pits and percolation tests were performed and confirmed suitable infiltration rates. The soil testing yielded consistent results throughout the property which is suitable for the design of the detention systems. The resulting peak flow rates under both the existing and proposed conditions for all POC's are summarized in Tables 1 - 3. For detailed computations see Appendix B.

Table 1: Peak Flows – POC #1 Westport Road

Storm Event	Existing		Proposed	
	Rate (cfs)	Volume (ft ³)	Rate (cfs)	Volume (ft ³)
2-year	0.98	6,804	0.98	6,443
5-year	2.56	13,657	2.45	12,668
10-year	4.22	20,511	3.96	18,841
25-year	6.80	31,131	6.27	28,630

Table 2: Peak Flows – POC #2 Konrad Property

Storm Event	Existing		Proposed	
	Rate (cfs)	Volume (ft ³)	Rate (cfs)	Volume (ft ³)
2-year	0.24	1,509	0.24	1,497
5-year	0.58	2,909	0.58	2,887
10-year	0.92	4,287	0.91	4,255
25-year	1.43	6,397	1.43	6,349

Table 3: Peak Flows – POC #3 Dirksen Drive

Storm Event	Existing		Proposed	
	Rate (cfs)	Volume (ft ³)	Rate (cfs)	Volume (ft ³)
2-year	0.52	2,494	0.52	2,494
5-year	1.10	4,569	1.10	4,569
10-year	1.66	6,564	1.66	6,564
25-year	2.50	9,573	2.50	9,573

The analysis shows that there is no increase in the peak rate or volume of runoff from the property during any of the analyzed storm events to any of the POC's.

5.2 WATER QUALITY

The stormwater management system was also designed with an emphasis on water quality. The detention system was sized to accommodate the Water Quality Volume (WQV) of the runoff that is routed to it. The methods outlined in the Connecticut Stormwater Quality Manual were used to determine the WQV. Collecting the WQV and allowing it to infiltrate into the soils provides filtration of the runoff and is an effective means of stormwater renovation. The treatment capacity of the detention system and the WQV required is summarized in Table 2. For detailed computation see Appendix C.

Table 2: WQV Sizing

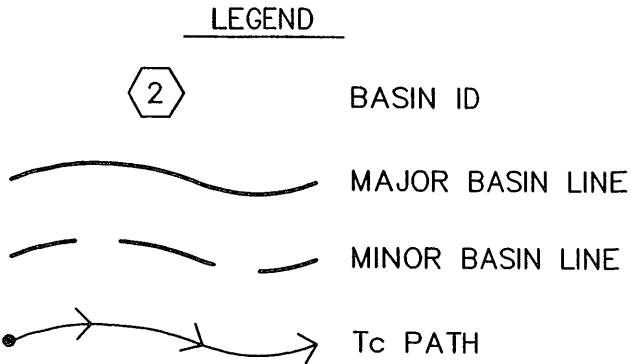
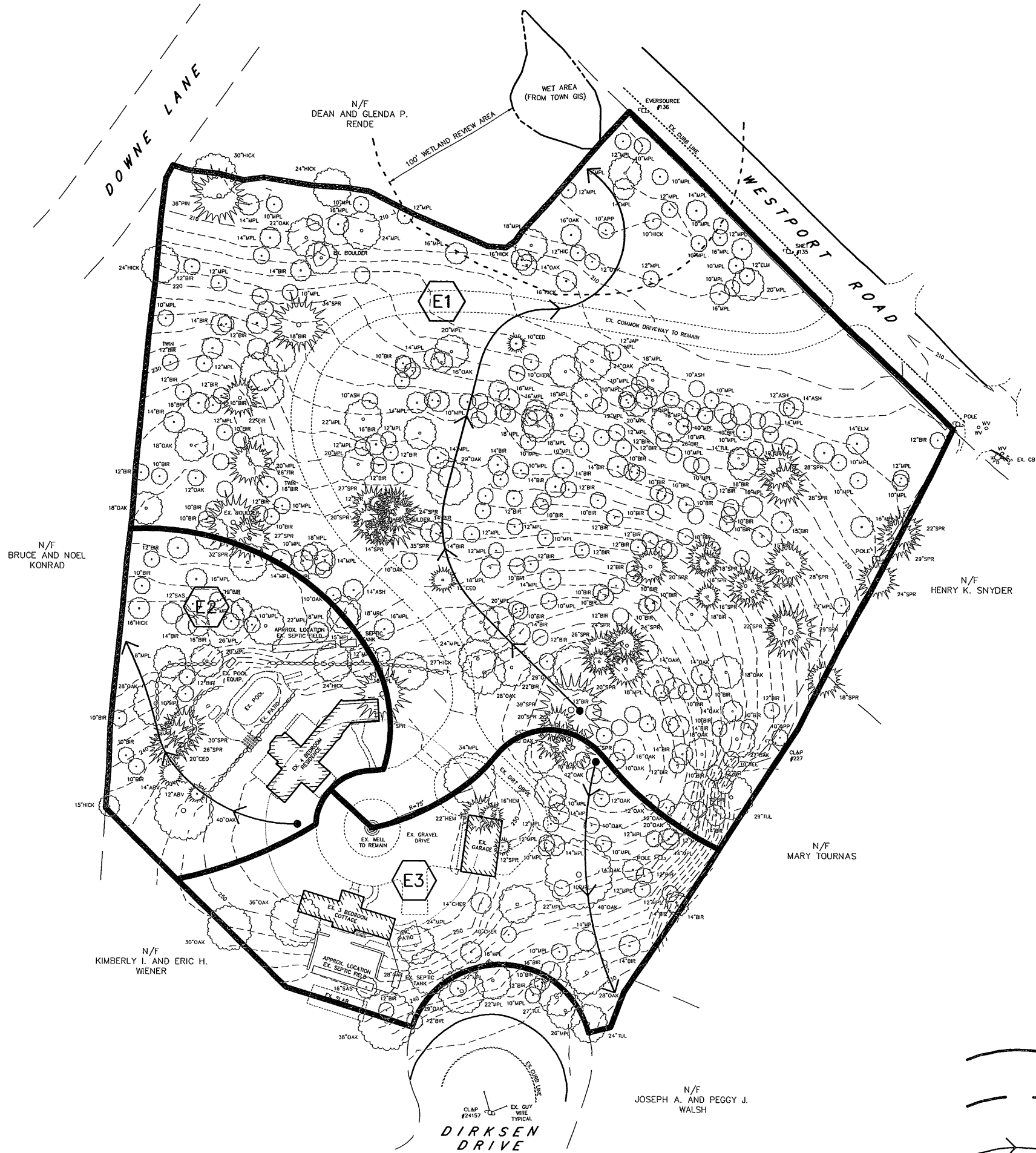
System Description	WQV (ft³)	Volume Provided Below Overflow Pipe (ft³)
288 LF of 24"x48" Concrete Galleries	1,800	2,410

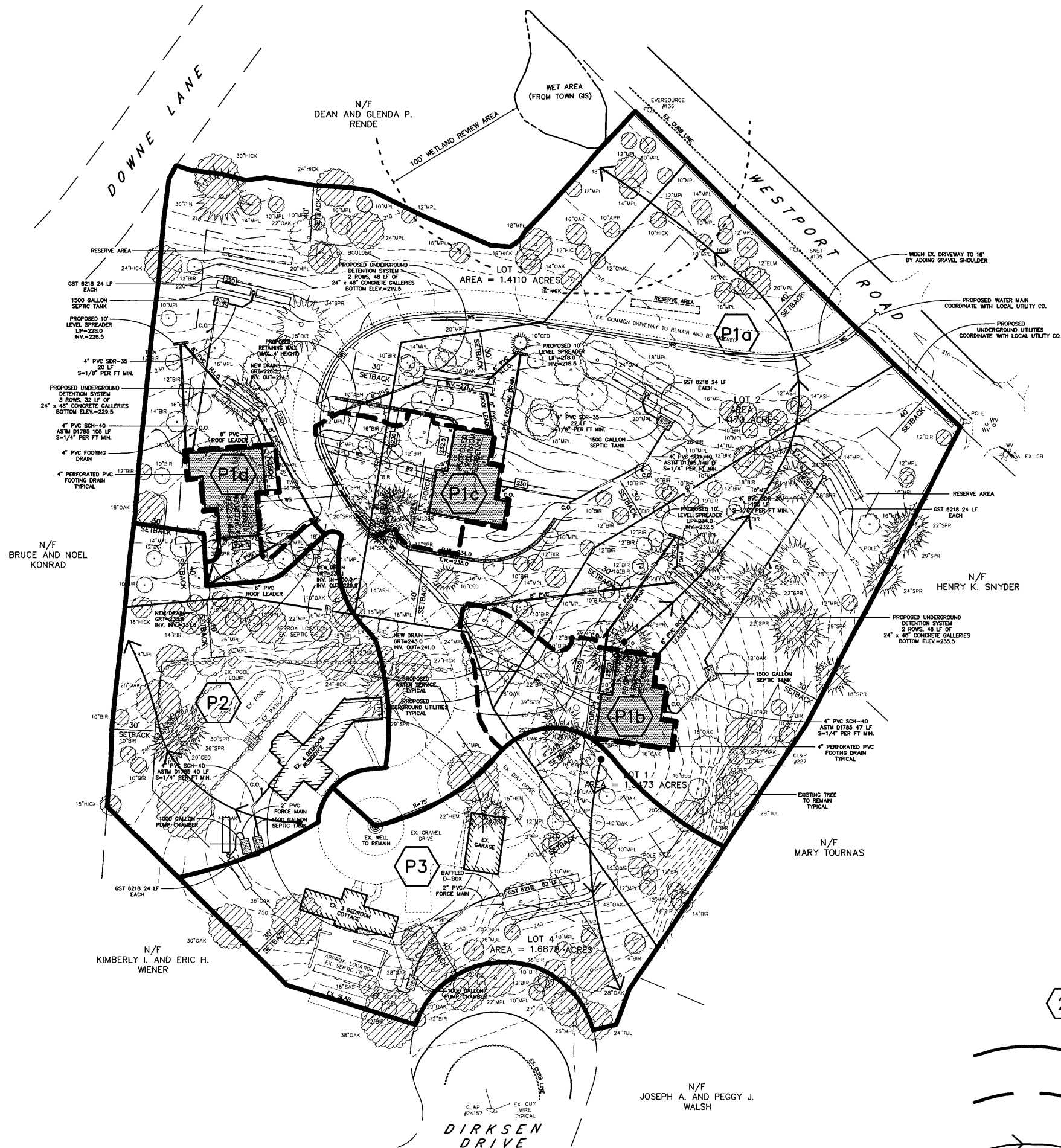
The analysis shows that the proposed detention system is sufficiently sized to treat runoff from the proposed development for water quality purposes.

6. CONCLUSIONS

Based on our analysis, McChord Engineering Associates, Inc. has demonstrated that the proposed stormwater management system will adequately control peak flow and renovate stormwater runoff from the proposed subdivision development at 183 Westport Road in Wilton, Connecticut. It is the opinion of this office and the conclusion of this report that the proposed site development will have no adverse impacts to the adjoining property owners or any downstream drainage systems.

APPENDIX A:
DRAINAGE MAPS





LEGEND



BASIN ID



MAJOR BASIN LINE



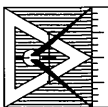
MINOR BASIN LINE



Tc PATH

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Wilton, CT 06897 (203) 834-0569



PROPOSED CONDITIONS
DRAINAGE MAP
183 WESTPORT ROAD
WILTON, CONNECTICUT

JOB No. 2140A-1

SCALE: 1" = 80'

DATE: 11-18-20

REVISED: 2-4-21

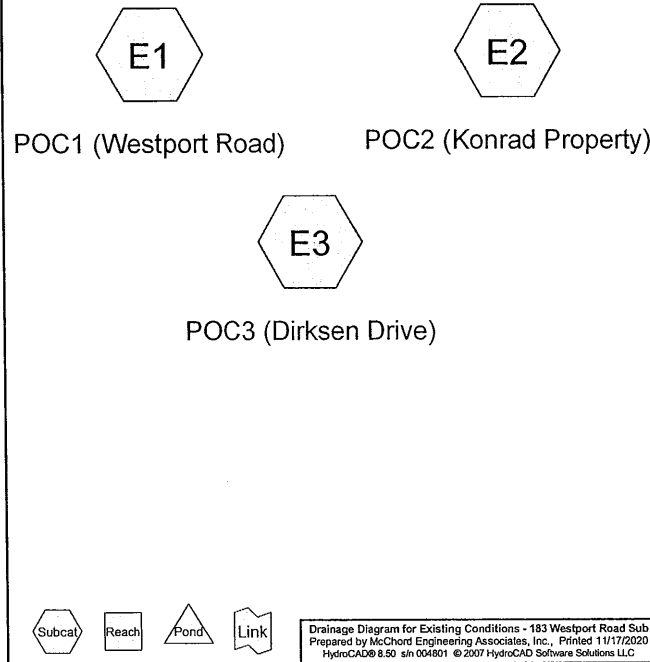
DWG. No.

SK-2

APPENDIX B:
PEAK FLOW COMPUTATIONS

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
230,350	55	Woods, Good, HSG B (E1,E2,E3)
1,196	82	Dirt roads, HSG B (E3)
16,679	98	Common Driveway (E1,E3)
1,200	98	Collage (E3)
952	98	Garage (E3)
2,313	98	Hardscape (E2,E3)
2,083	98	Main House (E2)
624	98	Pool (E2)



Existing Conditions - 183 Westport Road Sub Type III 24-hr 25-yr Rainfall=6.55"
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Summary for Subcatchment E1: POC1 (Westport Road)

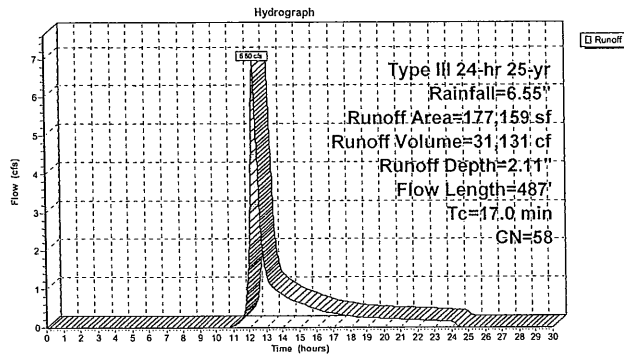
Runoff = 6.80 cfs @ 12.26 hrs, Volume= 31,131 cf, Depth= 2.11"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type III 24-hr 25-yr Rainfall=6.55"

Area (sf)	CN	Description
12,522	98	Common Driveway
164,637	55	Woods, Good, HSG B
177,159	58	Weighted Average
164,637		Pervious Area
12,522		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.0	150	0.1440	0.19		Sheet Flow, AB
					Woods: Light underbrush n= 0.400 P2= 3.45"
1.4	155	0.1420	1.88		Shallow Concentrated Flow, BC
					Woodland Kv= 5.0 fps
2.6	182	0.0550	1.17		Shallow Concentrated Flow, CD
					Woodland Kv= 5.0 fps
17.0	487	Total			

Subcatchment E1: POC1 (Westport Road)



Existing Conditions - 183 Westport Road Sub Type III 24-hr 25-yr Rainfall=6.55"
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Summary for Subcatchment E2: POC2 (Konrad Property)

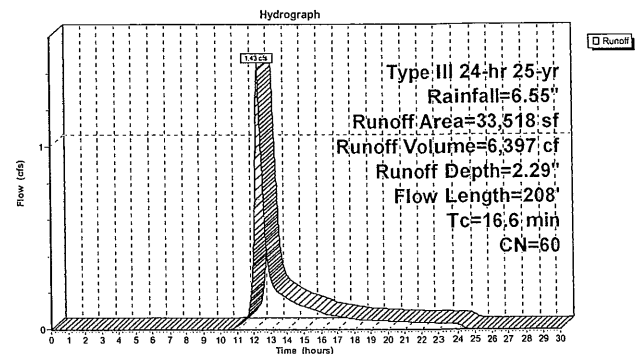
Runoff = 1.43 cfs @ 12.24 hrs, Volume= 6,397 cf, Depth= 2.29"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type III 24-hr 25-yr Rainfall=6.55"

Area (sf)	CN	Description
2,083	98	Main House
1,540	98	Hardscape
624	98	Pool
29,271	55	Woods, Good, HSG B
33,518	60	Weighted Average
29,271		Pervious Area
4,247		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	73	0.0340	0.14		Sheet Flow, AB
					Grass: Dense n= 0.240 P2= 3.45"
7.4	77	0.1550	0.17		Sheet Flow, BC
					Woods: Light underbrush n= 0.400 P2= 3.45"
0.6	58	0.1030	1.60		Shallow Concentrated Flow, CD
					Woodland Kv= 5.0 fps
16.6	208	Total			

Subcatchment E2: POC2 (Konrad Property)



Summary for Subcatchment E3: POC3 (Dirksen Drive)

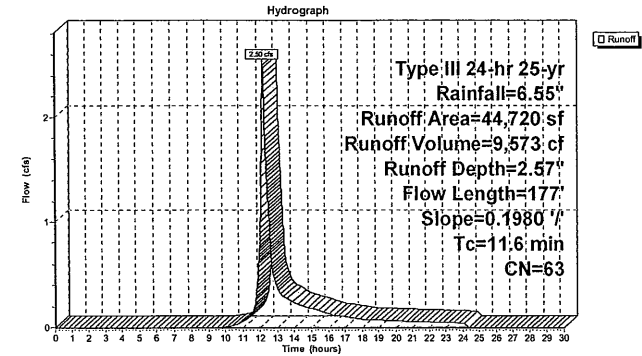
Runoff = 2.50 cfs @ 12.17 hrs, Volume= 9,573 cf, Depth= 2.57"

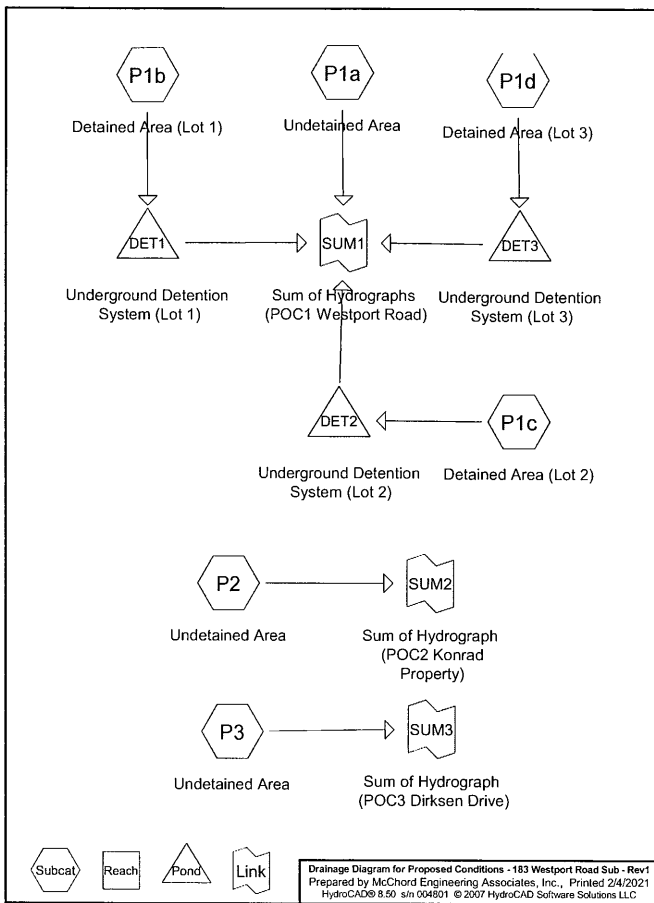
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=6.55"

Area (sf)	CN	Description
4,157	98	Common Driveway
1,200	98	Cottage
952	98	Garage
773	98	Hardscape
1,196	82	Dirt roads, HSG B
36,442	55	Woods, Good, HSG B
44,720	63	Weighted Average
37,638		Pervious Area
7,082		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	150	0.1980	0.22		Sheet Flow, AB Woods: Light underbrush n= 0.400 P2= 3.45"
0.2	27	0.1980	2.22		Shallow Concentrated Flow, BC Woodland Kv= 5.0 fps
11.6	177	Total			

Subcatchment E3: POC3 (Dirksen Drive)





Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
194,550	55	Woods, Good, HSG B (P1a,P2,P3)
12,000	61	>75% Grass cover, Good, HSG B (P1a)
1,196	82	Dirt roads, HSG B (P3)
16,679	98	Common Drive (P1a,P3)
1,200	98	Cottage (P3)
6,000	98	Driveway (P1b,P1c,P1d)
952	98	Garage (P3)
1,100	98	Gravel Shoulder (P1a)
2,313	98	Hardscape (P2,P3)
2,083	98	Main House (P2)
624	98	Pool (P2)
8,400	98	Residence (P1b,P1c,P1d)

Proposed Conditions - 183 Westport Road Sub - Rev1 Type III 24-hr 25-yr Rainfall=6.55"
 Prepared by McChord Engineering Associates, Inc. Printed 2/4/2021
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Summary for Subcatchment P1a: Undetained Area

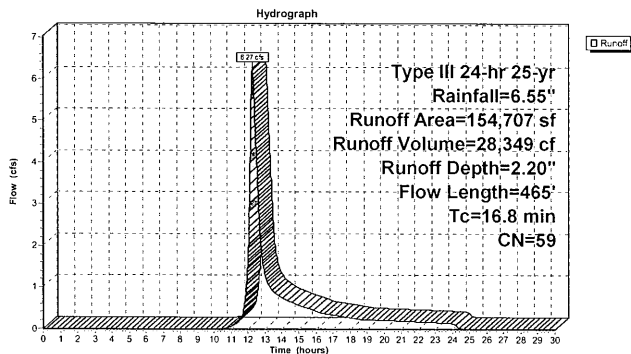
Runoff = 6.27 cfs @ 12.25 hrs, Volume= 28,349 cf, Depth= 2.20"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type III 24-hr 25-yr Rainfall=6.55"

Area (sf)	CN	Description
12,522	98	Common Drive
12,000	61	>75% Grass cover, Good, HSG B
129,085	55	Woods, Good, HSG B
1,100	98	Gravel Shoulder
154,707	59	Weighted Average
141,085		Pervious Area
13,622		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	150	0.2000	0.22		Sheet Flow, AB
0.9	98	0.1330	1.82		Woods: Light underbrush n= 0.400 P2= 3.45"
4.5	217	0.0260	0.81		Shallow Concentrated Flow, BC
					Woodland Kv= 5.0 fps
					Shallow Concentrated Flow, CD
					Woodland Kv= 5.0 fps
16.8	465	Total			

Subcatchment P1a: Undetained Area



Proposed Conditions - 183 Westport Road Sub - Rev1 Type III 24-hr 25-yr Rainfall=6.55"
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Summary for Subcatchment P1b: Detained Area (Lot 1)

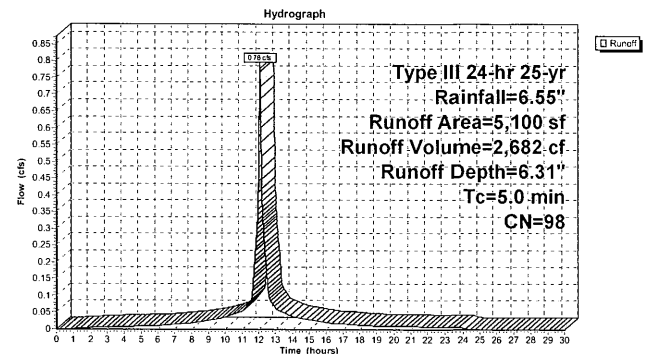
Runoff = 0.78 cfs @ 12.07 hrs, Volume= 2,682 cf, Depth= 6.31"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type III 24-hr 25-yr Rainfall=6.55"

Area (sf)	CN	Description
2,800	98	Residence
2,300	98	Driveway
5,100	98	Weighted Average
5,100		Impervious Area

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

Subcatchment P1b: Detained Area (Lot 1)



Summary for Subcatchment P1c: Detained Area (Lot 2)

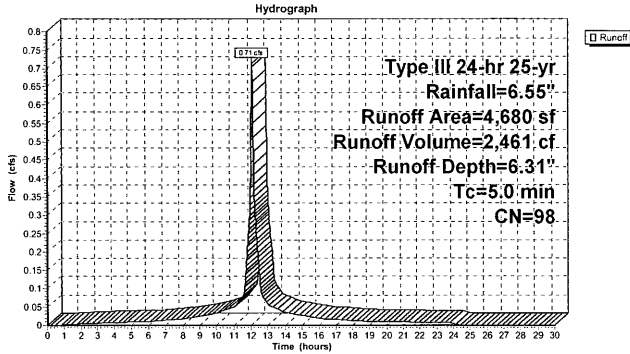
Runoff = 0.71 cfs @ 12.07 hrs, Volume= 2,461 cf, Depth= 6.31"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type III 24-hr 25-yr Rainfall=6.55"

Area (sf)	CN	Description
2,800	98	Residence
1,880	98	Driveway
4,680	98	Weighted Average
4,680		Impervious Area

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

Subcatchment P1c: Detained Area (Lot 2)



Summary for Subcatchment P1d: Detained Area (Lot 3)

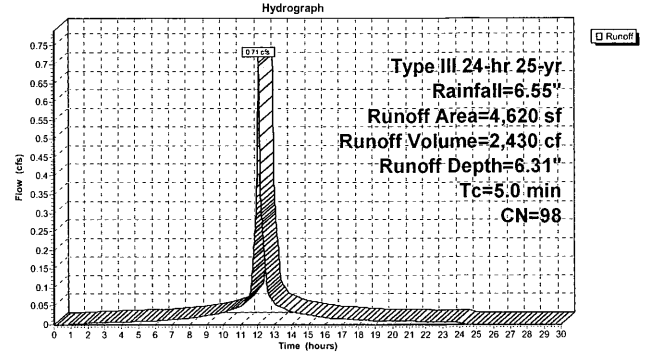
Runoff = 0.71 cfs @ 12.07 hrs, Volume= 2,430 cf, Depth= 6.31"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type III 24-hr 25-yr Rainfall=6.55"

Area (sf)	CN	Description
2,800	98	Residence
1,820	98	Driveway
4,620	98	Weighted Average
4,620		Impervious Area

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

Subcatchment P1d: Detained Area (Lot 3)



Summary for Subcatchment P2: Undetained Area

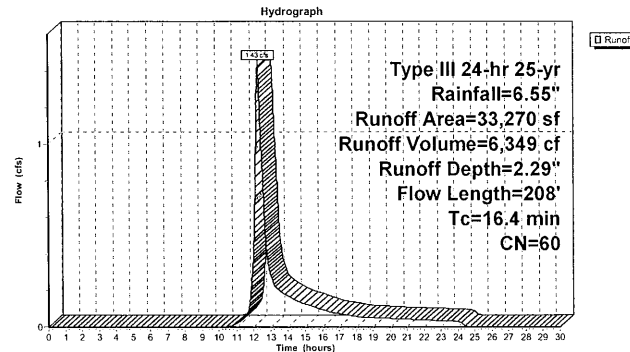
Runoff = 1.43 cfs @ 12.23 hrs, Volume= 6,349 cf, Depth= 2.29"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type III 24-hr 25-yr Rainfall=6.55"

Area (sf)	CN	Description
2,083	98	Main House
1,540	98	Hardscape
624	98	Pool
29,023	55	Woods, Good, HSG B
33,270	60	Weighted Average
29,023		Pervious Area
4,247		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	73	0.0340	0.14		Sheet Flow, AB Grass: Dense n= 0.240 P2= 3.45"
7.4	77	0.1550	0.17		Sheet Flow, BC Woods: Light underbrush n= 0.400 P2= 3.45"
0.4	58	0.1030	2.25		Shallow Concentrated Flow, CD Short Grass Pasture Kv= 7.0 fps
16.4	208				Total

Subcatchment P2: Undetained Area



Summary for Subcatchment P3: Undetained Area

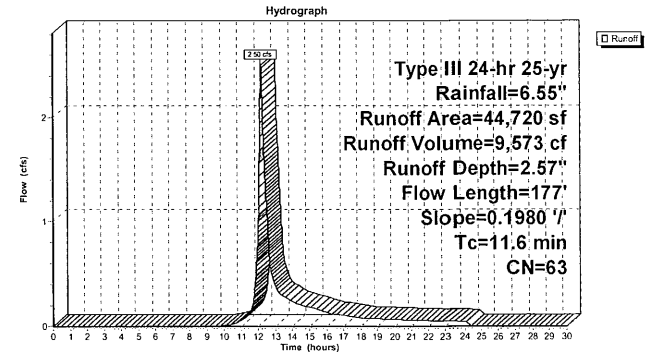
Runoff = 2.50 cfs @ 12.17 hrs, Volume= 9,573 cf, Depth= 2.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type III 24-hr 25-yr Rainfall=6.55"

Area (sf)	CN	Description
4,157	98	Common Drive
1,200	98	Cottage
952	98	Garage
773	98	Hardscape
1,196	82	Dirt roads, HSG B
36,442	55	Woods, Good, HSG B
44,720	63	Weighted Average
37,638		Pervious Area
7,082		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	150	0.1980	0.22		Sheet Flow, AB Woods: Light underbrush n= 0.400 P2= 3.45"
0.2	27	0.1980	2.22		Shallow Concentrated Flow, BC Woodland Kv= 5.0 fps
11.6	177				Total

Subcatchment P3: Undetained Area



Summary for Pond DET1: Underground Detention System (Lot 1)

Inflow Area = 5,100 sf, 100.00% Impervious, Inflow Depth = 6.31" for 25-yr event
 Inflow = 0.78 cfs @ 12.07 hrs, Volume= 2,682 cf
 Outflow = 0.24 cfs @ 12.36 hrs, Volume= 2,682 cf, Atten= 69%, Lag= 17.2 min
 Discarded = 0.06 cfs @ 11.09 hrs, Volume= 2,501 cf
 Primary = 0.19 cfs @ 12.36 hrs, Volume= 181 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 237.47' @ 12.36 hrs Surf.Area= 600 sf Storage= 836 cf

Plug-Flow detention time= 96.4 min calculated for 2,682 cf (100% of inflow)
 Center-of-Mass det. time= 96.4 min (839.3 - 742.9)

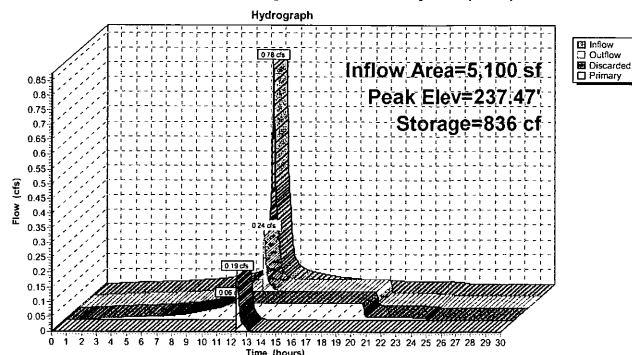
Volume	Invert	Avail.Storage	Storage Description
#1	235.00'	320 cf	6.00'W x 50.00'L x 2.60'H Gravel Bed x 2
			1,560 cf Overall - 760 cf Embedded = 800 cf x 40.0% Voids
#2	235.50'	544 cf	48.0"W x 24.0"H x 48.00'L Galley 4x8x2 x 2 Inside #1
		863 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	235.00'	4,000 in/hr Exfiltration over Surface area
#2	Primary	237.20'	6.0" Vert. High Level Overflow Pipe C= 0.600

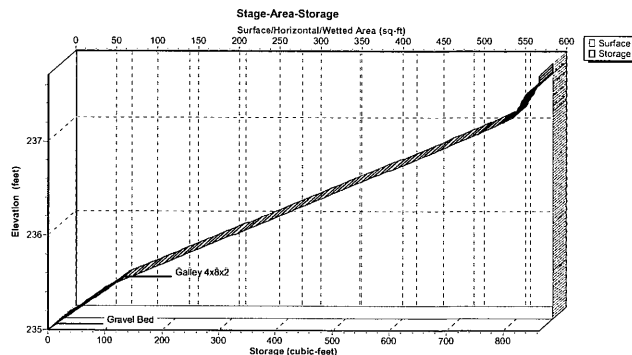
Discarded OutFlow Max=0.06 cfs @ 11.09 hrs HW=235.03' (Free Discharge)
 1=Exfiltration (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.19 cfs @ 12.36 hrs HW=237.47' (Free Discharge)
 2=High Level Overflow Pipe (Orifice Controls 0.19 cfs @ 1.76 fps)

Pond DET1: Underground Detention System (Lot 1)



Pond DET1: Underground Detention System (Lot 1)



Summary for Pond DET2: Underground Detention System (Lot 2)

Inflow Area = 4,680 sf, 100.00% Impervious, Inflow Depth = 6.31" for 25-yr event
 Inflow = 0.71 cfs @ 12.07 hrs, Volume= 2,461 cf
 Outflow = 0.13 cfs @ 12.50 hrs, Volume= 2,461 cf, Atten= 82%, Lag= 25.9 min
 Discarded = 0.06 cfs @ 11.18 hrs, Volume= 2,395 cf
 Primary = 0.08 cfs @ 12.50 hrs, Volume= 67 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 221.36' @ 12.50 hrs Surf.Area= 600 sf Storage= 827 cf

Plug-Flow detention time= 99.2 min calculated for 2,461 cf (100% of inflow)
 Center-of-Mass det. time= 99.2 min (842.1 - 742.9)

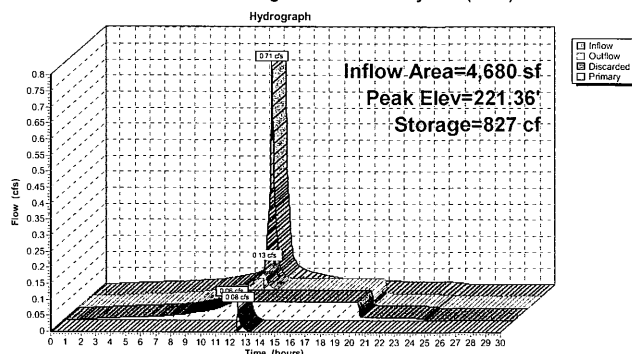
Volume	Invert	Avail.Storage	Storage Description
#1	219.00'	320 cf	6.00'W x 50.00'L x 2.60'H Gravel Bed x 2
			1,560 cf Overall - 760 cf Embedded = 800 cf x 40.0% Voids
#2	219.50'	544 cf	48.0"W x 24.0"H x 48.00'L Galley 4x8x2 x 2 Inside #1
		863 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	219.00'	4,000 in/hr Exfiltration over Surface area
#2	Primary	221.20'	6.0" Vert. High Level Overflow Pipe C= 0.600

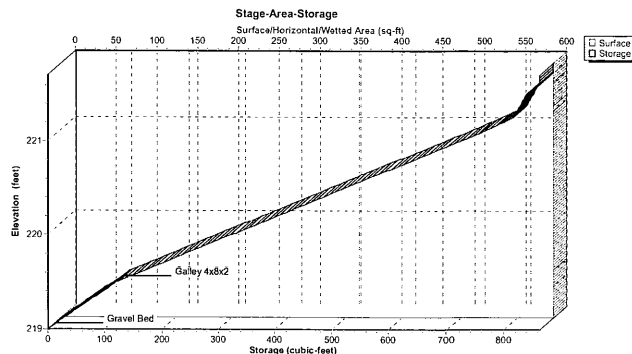
Discarded OutFlow Max=0.06 cfs @ 11.18 hrs HW=219.03' (Free Discharge)
 1=Exfiltration (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.08 cfs @ 12.50 hrs HW=221.36' (Free Discharge)
 2=High Level Overflow Pipe (Orifice Controls 0.08 cfs @ 1.37 fps)

Pond DET2: Underground Detention System (Lot 2)



Pond DET2: Underground Detention System (Lot 2)



Summary for Pond DET3: Underground Detention System (Lot 3)

Inflow Area = 4,620 sf, 100.00% Impervious, Inflow Depth = 6.31" for 25-yr event
 Inflow = 0.71 cfs @ 12.07 hrs, Volume= 2,430 cf
 Outflow = 0.08 cfs @ 12.62 hrs, Volume= 2,430 cf, Atten= 88%, Lag= 32.9 min
 Discarded = 0.06 cfs @ 11.21 hrs, Volume= 2,397 cf
 Primary = 0.03 cfs @ 12.62 hrs, Volume= 33 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 231.29' @ 12.62 hrs Surf.Area= 612 sf Storage= 832 cf

Plug-Flow detention time= 99.2 min calculated for 2,429 cf (100% of inflow)
 Center-of-Mass det. time= 99.2 min (842.2 - 742.9)

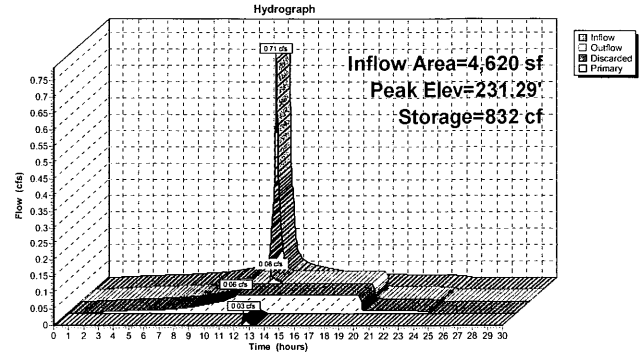
Volume	Invert	Avail. Storage	Storage Description
#1	229.00'	332 cf	6.00'W x 34.00'L x 2.60'H Gravel Bed x 3
			1,591 cf Overall - 760 cf Embedded = 831 cf x 40.0% Voids
#2	229.50'	544 cf	48.0'W x 24.0'H x 32.00'L Galley 4x8x2 x 3 Inside #1
		876 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	229.00'	4,000 in/hr Exfiltration over Surface area
#2	Primary	231.20'	6.0" Vert. High Level Overflow Pipe C= 0.600

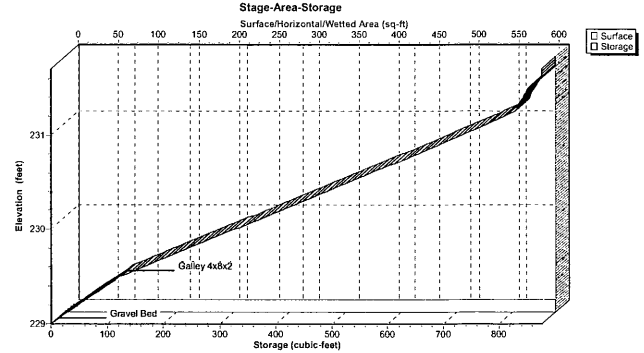
Discarded OutFlow Max=0.06 cfs @ 11.21 hrs HW=229.03' (Free Discharge)
 1=Exfiltration (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.03 cfs @ 12.62 hrs HW=231.29' (Free Discharge)
 2=High Level Overflow Pipe (Orifice Controls 0.03 cfs @ 1.04 fps)

Pond DET3: Underground Detention System (Lot 3)



Pond DET3: Underground Detention System (Lot 3)

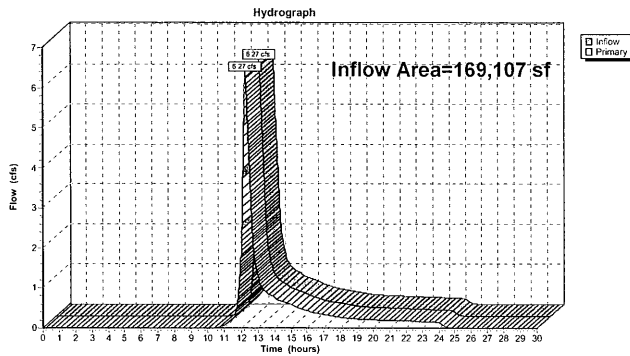


Summary for Link SUM1: Sum of Hydrographs (POC1 Westport Road)

Inflow Area = 169,107 sf, 16.57% Impervious, Inflow Depth = 2.03" for 25-yr event
 Inflow = 6.27 cfs @ 12.25 hrs, Volume= 28,630 cf
 Primary = 6.27 cfs @ 12.25 hrs, Volume= 28,630 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Link SUM1: Sum of Hydrographs (POC1 Westport Road)

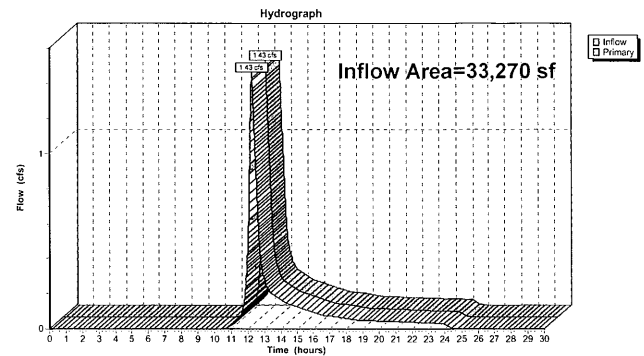


Summary for Link SUM2: Sum of Hydrograph (POC2 Konrad Property)

Inflow Area = 33,270 sf, 12.77% Impervious, Inflow Depth = 2.29" for 25-yr event
 Inflow = 1.43 cfs @ 12.23 hrs, Volume= 6,349 cf
 Primary = 1.43 cfs @ 12.23 hrs, Volume= 6,349 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Link SUM2: Sum of Hydrograph (POC2 Konrad Property)

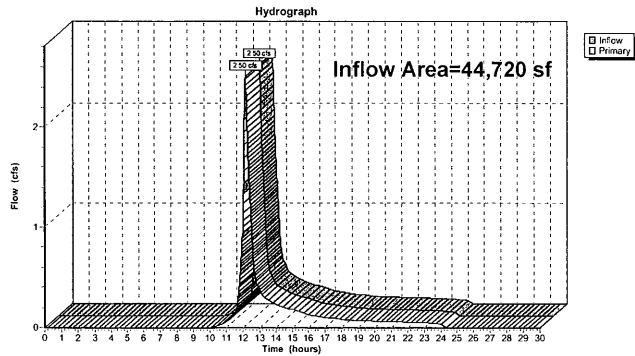


Summary for Link SUM3: Sum of Hydrograph (POC3 Dirksen Drive)

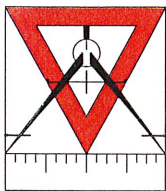
Inflow Area = 44,720 sf, 15.84% Impervious, Inflow Depth = 2.57" for 25-yr event
Inflow = 2.50 cfs @ 12.17 hrs, Volume= 9,573 cf
Primary = 2.50 cfs @ 12.17 hrs, Volume= 9,573 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Link SUM3: Sum of Hydrograph (POC3 Dirksen Drive)



APPENDIX C:
WQV COMPUTATION



McChord Engineering Associates, Inc.

Civil Engineers and Land Planners

1 Grumman Hill Rd, Wilton, CT 06897

Tel: (203) 834-0569 Fax: (203) 834-2789

Water Quality Volume Computation

183 Westport Road, Wilton, CT

AREA OF PROPOSED DEVELOPMENT TO BE CAPTURED

Location	Area, (ft ²)
Lot 1 House	2,800
Lot 1 Driveway	2,300
Lot 2 House	2,800
Lot 2 Driveway	1,880
Lot 3 House	2,800
Lot 3 Driveway	1,820

Total Impervious Area, (ft ²)	14,400
Water Quality Volume Required, (ft ³)	1,800

The Water Quality Volume (WQV) shall be calculated based on the precipitation depth of 1.0 inches multiplied by the area of

Volume Provided By Proposed Detention Systems Below Highlevel Overflow Pipe Invert, (ft ³)	2,410
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The storage provided by the proposed detention system exceeds the Water Quality Volume required.

Proposed Conditions - 183 Westport Road Sub

Prepared by McChord Engineering Associates, Inc.

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Type III 24-hr 25-yr Rainfall=6.55"

Printed 11/17/2020

Stage-Area-Storage for Pond DET1: Underground Detention System (Lot 1)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
235.00	600	0	237.60	600	863
235.05	600	12	237.65	600	863
235.10	600	24	237.70	600	863
235.15	600	36			
235.20	600	48			
235.25	600	60			
235.30	600	72			
235.35	600	84			
235.40	600	96			
235.45	600	108			
235.50	600	120			
235.55	600	140			
235.60	600	160			
235.65	600	180			
235.70	600	201			
235.75	600	221			
235.80	600	241			
235.85	600	261			
235.90	600	281			
235.95	600	301			
236.00	600	321			
236.05	600	342			
236.10	600	362			
236.15	600	382			
236.20	600	402			
236.25	600	422			
236.30	600	442			
236.35	600	462			
236.40	600	483			
236.45	600	503			
236.50	600	523			
236.55	600	543			
236.60	600	563			
236.65	600	583			
236.70	600	604			
236.75	600	624			
236.80	600	644			
236.85	600	664			
236.90	600	684			
236.95	600	704			
237.00	600	724			
237.05	600	745			
237.10	600	764			
237.15	600	782			
237.20	600	800			
237.25	600	817			
237.30	600	822			
237.35	600	826			
237.40	600	831			
237.45	600	835			
237.50	600	839			
237.55	600	851			

Proposed Conditions - 183 Westport Road Sub*Type III 24-hr 25-yr Rainfall=6.55"*

Prepared by McChord Engineering Associates, Inc.

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Stage-Area-Storage for Pond DET2: Underground Detention System (Lot 2)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
219.00	600	0	221.60	600	863
219.05	600	12	221.65	600	863
219.10	600	24	221.70	600	863
219.15	600	36			
219.20	600	48			
219.25	600	60			
219.30	600	72			
219.35	600	84			
219.40	600	96			
219.45	600	108			
219.50	600	120			
219.55	600	140			
219.60	600	160			
219.65	600	180			
219.70	600	201			
219.75	600	221			
219.80	600	241			
219.85	600	261			
219.90	600	281			
219.95	600	301			
220.00	600	321			
220.05	600	342			
220.10	600	362			
220.15	600	382			
220.20	600	402			
220.25	600	422			
220.30	600	442			
220.35	600	462			
220.40	600	483			
220.45	600	503			
220.50	600	523			
220.55	600	543			
220.60	600	563			
220.65	600	583			
220.70	600	604			
220.75	600	624			
220.80	600	644			
220.85	600	664			
220.90	600	684			
220.95	600	704			
221.00	600	724			
221.05	600	745			
221.10	600	764			
221.15	600	782			
221.20	600	800			
221.25	600	817			
221.30	600	822			
221.35	600	826			
221.40	600	831			
221.45	600	835			
221.50	600	839			
221.55	600	851			

Proposed Conditions - 183 Westport Road Sub*Type III 24-hr 25-yr Rainfall=6.55"*

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Stage-Area-Storage for Pond DET3: Underground Detention System (Lot 3)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
229.00	612	0	231.60	612	876
229.05	612	12	231.65	612	876
229.10	612	24	231.70	612	876
229.15	612	37			
229.20	612	49			
229.25	612	61			
229.30	612	73			
229.35	612	86			
229.40	612	98			
229.45	612	110			
229.50	612	122			
229.55	612	143			
229.60	612	163			
229.65	612	184			
229.70	612	204			
229.75	612	224			
229.80	612	245			
229.85	612	265			
229.90	612	285			
229.95	612	306			
230.00	612	326			
230.05	612	347			
230.10	612	367			
230.15	612	387			
230.20	612	408			
230.25	612	428			
230.30	612	449			
230.35	612	469			
230.40	612	489			
230.45	612	510			
230.50	612	530			
230.55	612	551			
230.60	612	571			
230.65	612	591			
230.70	612	612			
230.75	612	632			
230.80	612	652			
230.85	612	673			
230.90	612	693			
230.95	612	714			
231.00	612	734			
231.05	612	754			
231.10	612	774			
231.15	612	792			
231.20	612	810			
231.25	612	828			
231.30	612	833			
231.35	612	838			
231.40	612	842			
231.45	612	847			
231.50	612	851			
231.55	612	864			

APPENDIX D:
STORMWATER FACILITIES MAINTENANCE PLAN

Stormwater Facilities Maintenance Plan

183 Westport Road, Wilton, CT

Map 41, Lot 37

Scope:

The purpose of the Stormwater Facilities Maintenance Plan is to insure that the proposed stormwater components installed for the proposed four lot subdivision at 183 Westport Road are maintained in operational condition throughout the life of the home. The service procedures associated with this plan shall be performed as required by the parties legally responsible for their maintenance on each lot.

Typical Description of Stormwater Facilities:

The proposed stormwater facilities are designed to collect, convey, detain and treat the runoff from the sites in order to minimize adverse impacts to the adjoining properties. A description of the stormwater facilities that are typical on each new lot are as follows:

1. **Roof Leaders/Gutters:** Roof leaders (also known as downspouts) from the house will convey roof runoff collected by the roof gutters on the proposed residence to the underground detention chambers.
2. **Driveway Drains:** Driveway drains will collect runoff from the proposed driveway and convey it to the proposed detention system. Driveway drains are equipped with a sump designed to capture sediment and debris from the runoff.
3. **Underground Detention Chambers:** The underground detention system consists of a series of concrete chambers which provide storage volume for the stormwater runoff. Stormwater in the underground detention system is designed to infiltrate into the underlying soils. The detention chambers are designed to overflow from a pipe to a level spreader during extreme storm events.

Recommended Frequency of Service:

All of the stormwater components installed for the new lots should be checked periodically and kept in full working order. Ultimately the frequency of inspection and service cleaning depends on the amount of runoff, pollutant loading and interference from debris (leaves, vegetation, trash, etc.); however it is recommended that each facility be inspected and cleaned a minimum of two times a year. The guidelines for the timing of service include early spring after the winter season and late fall after the leaves have fallen from the trees.

Typical Service Procedures:

Service can be performed by the homeowner, landscape contractor or handyman since no specialized equipment is required. Specific service procedures for the stormwater facilities are as follows:

1. **Roof Leaders/Gutters:** Roof gutters shall be inspected twice a year during the spring and fall service inspections to ensure that roof leaders are kept free of leaves and debris that could clog the detention chambers. At a minimum, leaves should be cleaned from the gutters during the fall service inspection.
2. **Driveway Drains:** Driveway drains shall be inspected and cleaned twice a year during the spring and fall service inspections. The cleaning shall include both removal of sediment from the sumps and removal of any trash and/or debris from the grate.
3. **Underground Detention Chambers:** Functionality of the underground detention chambers ultimately depends on keeping sediment and debris out of the chambers. This is accomplished through proper maintenance of the roof leaders and gutters. These components should be maintained as described above, but more frequent maintenance may be required if excessive accumulation of debris is observed. Debris should be removed from the overflow grate during the spring and fall service inspections.