Robert V. Baltramaitis, P.E.
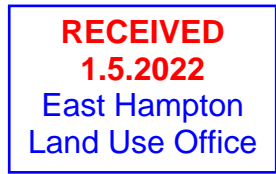
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REVISED STORM WATER ATTENUATION
GLOBAL SELF-STORAGE
265 West High Street
East Hampton, Connecticut
January 5, 2022

A surface detention basin/ rain garden was originally proposed to mitigate storm water impacts associated with the redevelopment and site work. The original site design has been modified to eliminate installing ANY storm water amenities within the 30-foot wide R-2 zoned portion of the site along the west side of the property. The surface basin was previously proposed in this area.

In lieu of a surface detention basin, the applicant proposes to fully mitigate storm water impacts with an underground storm water detention system. This system will include 182 linear feet of perforated 30"-dia. HDPE (plastic) pipe encased with stone. Outflows from the pipe will be metered by an outlet control structure consisting of two small diameter (8-inch) orifice ports and an overflow weir, all constructed within the downgradient storm structure. The outlet control structure is detailed on Sheet DN-2, Detail Sheet, revised Jan 5, 2022

The storm water calculations have been revised to route the storm water through the proposed system. The following table summarizes the Existing, Proposed and Proposed (w/ Detention) flows for the 2-, 10-, 25-, 50- and 100-year storm events:

	Design Storm				
Condition	2-Year	10-Year	25-Year	50-Year	100-Year
Existing	0.9 cfs	2.6 cfs	3.1 cfs	3.5 cfs	3.7 cfs
Proposed	1.4 cfs	3.3 cfs	3.9 cfs	4.3 cfs	4.4 cfs
Proposed (w/ Detention)	1.0 cfs	2.7 cfs	3.1 cfs	3.4 cfs	3.6 cfs

As demonstrated by the calculations and summarized above, the proposed underground detention system will actually decrease the peak flows from the site in all storm events. The detention system provides sufficient volume to capture and hold the anticipated 100-year storm event. During the 100-year storm, the water surface elevation within the pipe will reach 308.5, which is still below the spillway weir internal to the downgradient storm structure.

Existing, Proposed and Proposed w/ Detention hydrographs including the pond (underground detention system) report for the 100-year storm event are contained in the attachments. Summary sheets for the smaller storms are also provided for the 2-, 10-, and 25-, and 50-year storms.
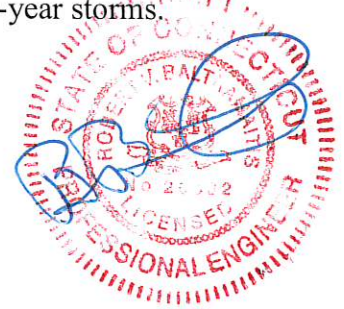
Hydrograph Return Period Recap

Hyd. No.	Hydrograph type (origin)	Inflow Hyd(s)	Peak Outflow (cfs)								Hydrograph description
			1-Yr	2-Yr	3-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	
1	SCS Runoff	-------	-------	0.887	-------	-------	2.619	3.162	3.525	3.710	Existing
2	SCS Runoff	-------	-------	1.447	-------	-------	3.337	3.896	4.265	4.453	Proposed
3	Reservoir	2	-------	0.966	-------	-------	2.680	3.133	3.448	3.605	30 INCH HDPE

Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	3.710	2	724	11,174	----	------	------	Existing
2	SCS Runoff	4.453	2	724	13,941	----	------	------	Proposed
3	Reservoir	3.605	2	726	10,468	2	308.49	1,182	30 INCH HDPE

UG Detention Calcs.gpw	Return Period: 100 Year	Wednesday, Jan 5, 2022

Hydrograph Report

Hyd. No. 3

30 INCH HDPE

Hydrograph type	= Reservoir		Peak discharge	= 3.605 cfs
Storm frequency	= 100 yrs		Time to peak	= 12.10 hrs
Time interval	= 2 min		Hyd. volume	= 10,468 cuft
Inflow hyd. No.	= 2 - Proposed		Max. Elevation	= 308.49 ft
Reservoir name	= UG Detention		Max. Storage	= 1,182 cuft

Storage Indication method used. Exfiltration extracted from Outflow.

crest is 308.6 OK

30 INCH HDPE

Hyd. No. 3 -- 100 Year

Hyd No. 3   Hyd No. 2   Total storage used = 1,182 cuft
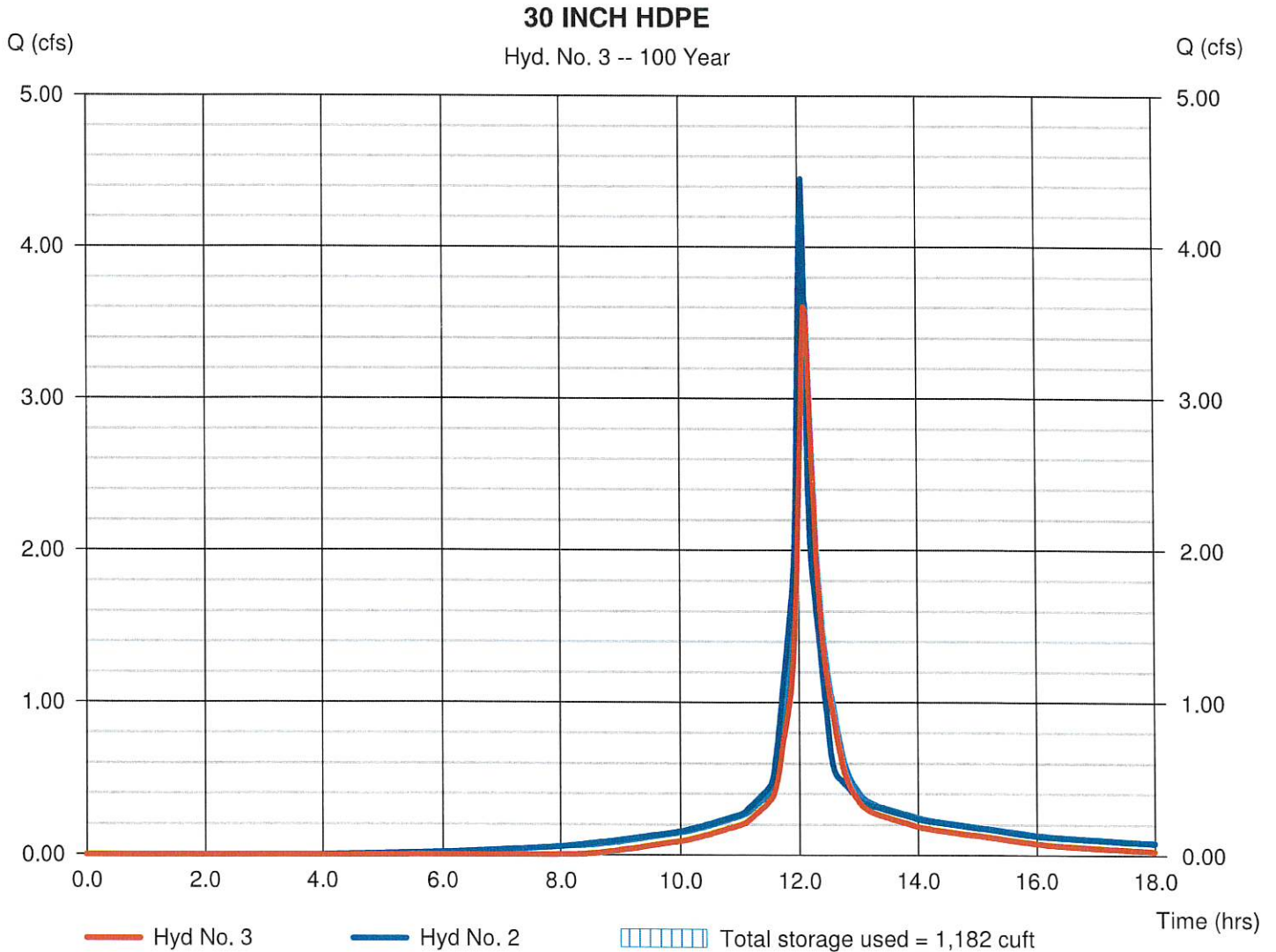
Pond No. 1 - UG Detention

Pond Data

UG Chambers - Invert elev. = 306.10 ft, Rise x Span = 2.50 x 2.50 ft, Barrel Len = 182.00 ft, No. Barrels = 1, Slope = 0.00%, Headers = No
Encasement - Invert elev. = 306.10 ft, Width = 4.50 ft, Height = 3.50 ft, Voids = 30.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	306.10	n/a	0	0
0.35	306.45	n/a	139	139
0.70	306.80	n/a	176	315
1.05	307.15	n/a	192	507
1.40	307.50	n/a	197	705
1.75	307.85	n/a	193	898
2.10	308.20	n/a	179	1,077
2.45	308.55	n/a	148	1,225
2.80	308.90	n/a	89	1,314
3.15	309.25	n/a	86	1,400
3.50	309.60	n/a	86	1,486

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 12.00	8.00	8.00	0.00
Span (in)	= 12.00	8.00	8.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 306.10	306.10	307.10	0.00
Length (ft)	= 5.00	0.00	0.00	0.00
Slope (%)	= 2.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 5.00	0.00	0.00	0.00
Crest El. (ft)	= 308.60	0.00	0.00	0.00
Weir Coeff.	= 2.60	3.33	3.33	3.33
Weir Type	= Broad	---	---	---
Multi-Stage	= Yes	No	No	No
Exfil.(in/hr)	= 3.000 (by Contour)			
TW Elev. (ft)	= 0.00			

Note: Culvert/Orifice outflows are analyzed under inlet and outlet control. Weir risers are checked for orifice conditions.

Stage / Discharge