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Principal Emeritus:
RICHARD D. McGOEY, P.E. (NY & PA)

TOWN OF NEWBURGH
PLANNING BOARD
TECHNICAL REVIEW COMMENTS

PROJECT: DOLLAR GENERAL-BALMVILLE
PROJECT NO.: 20-04
PROJECT LOCATION: SECTION 24, BLOCK 4, LOT 1.12
REVIEW DATE: 26 MARCH 2021
MEETING DATE: 1 APRIL 2021
PROJECT REPRESENTATIVE: BOHLER ENGINEERING/CARYN MLODZIANOWSKI

1. Several of our previous comments remain outstanding. A copy of the Wetland Delineation was requested previously. The response was the Wetland Delineation map by the surveyor which and is shown on the survey previously provided. The Wetland Delineation report should be provided consistent with the US Army Corps of Engineers 1987 manual.

2. The design of the subsurface sanitary sewer disposal system is required.

3. Detail sheets depicting all on site design elements must be provided including stormwater management, paving, sidewalks, curbs, drainage, subsurface sanitary sewer disposal system, water and sewer. Review of the plans is difficult without the corresponding site development details. The Stormwater Management report has been provided identifying the use of under parking storage. Details of the under parking storage system as well as outlet control structures must be provided consistent with the stormwater model provided.

4. The Traffic Report should be submitted to the NYSDOT for review and comment. It is noted that an adjoining land owner commented on the location of the site access drive with regard to their access drive.

5. The Planning Board recently discussed the placement of sidewalks along the property frontage.

6. Areas for any outdoor storage of products for sale should be delineated on the plans.

7. The Planning Board requires curbing within commercial site plans. All areas of the site should be provided with curbing. It appears that the northern side of the site does not contain curbing as well as the site access drive.

8. Design flow from the facility to the septic system should be identified. Utilizing 0.1 gallons per day per square foot it appears that the proposed 1000 gallon septic tank does not meet design

standards.

9. Project will require to be sprinklred for fire suppression. Sizing the water main should be confirmed as well as valves provided in accordance with Town Code where potable water is terminated if fire service water is terminated.

10. Additional review will be provided once site development details are provided.

11. Drainage pipe at entrance drive is identified as 12 inch. Town standards requires 15 inch minimum pipe.

12. A limit of disturbance should be identified on the plan. Disturbance limit amount should confirm less than one acre disturbance.

13. The Applicant should confirm that stone walls, fences and other landscaping features are permitted within the ten foot gas line easement.

14. Site lighting plan should be provided prior to submission to County Planning for 239 Referral.

Respectfully submitted,

McGoey, Hauser and Edsall
Consulting Engineers, D.P.C.

Patrick J. Hines
Principal

PJH/kbw

17 Computer Drive West
Albany, NY 12205
518.438.9900

70 Linden Oaks, Third Floor, Suite 15
Rochester, NY 14625
585.866.1000

Via Overnight Delivery

March 4, 2021

Town of Newburgh
21 Hudson Valley Professional Plaza
Newburgh, New York 12550

Attention: John Ewasutyn, Planning Board Chairman

Re: Response to Comments Summary
Proposed Dollar General
SE Corner of US Route 9W & North Hill Lane
Town of Newburgh, New York

Dear Mr. Ewasutyn:

On behalf of our client, HSC Balmville, LLC., we are pleased to submit this response to comments summary to the Town of Newburgh for the above referenced project. This summary is in response to the various comments received in the February 12, 2021, letter from McGoey, Hauser and Edsall Consulting Engineers, as noted below with our responses in italics. Please find the following items in support of our application:

A. Fourteen (14) copies of the revised Site Plan Documents entitled "Site Plan", "Grading & Drainage Plan", "Utility Plan" & Landscape Plan" prepared by Bohler Engineering, consisting of four (4) sheets, dated November 26, 2019, last revised March 3, 2021.
B. Fourteen (14) copies of the Stormwater Management Report prepared by Bohler Engineering, dated February 25, 2021.

Response to various comments summary as follows:

1. The application has received variances for parking count from the ZBA on 28 January 2021. The ZBA granted relief to allow 30 parking spaces where 62 were required.

   Comment acknowledged.

2. The Planning Board should declare its Intent for Lead Agency for review of the project. Other involved agencies include the NYS Department of Transportation, NYS Office of Parks, Recreation and Historic Preservation (noted they have issued No Impact letter), Orange County Planning Department will be an interested agency for the circulation. Orange County Planning referral will be required.

   Comment acknowledged.

3. The Applicants have addressed the issue of parking in the front yard setback identifying circumstances and operational requirements as the project has two front yards. Placing the parking in front of the structure will allow the structure to provide a buffer to nearby residential properties. Parking in front of the structure also reduces potential wetland impacts. Project identifies 58% of the site contains Federal Jurisdictional Wetlands. The Planning Board may wish

to address the requirement for other mitigation items prior to granting the design guideline waiver including placement of stone wall/landscape features between the state highway and the Town road frontages.

Comment acknowledged.

4. Our previous comments requested submission of the wetland delineation report to complete the Town's files. The Applicants representative have identified that .031 acres of wetland disturbance is proposed.

   The wetland delineation was mapped by the surveyor and is shown on the survey previously provided. The proposed wetland disturbance areas are shown on the Grading & Drainage Plan.

5. A Stormwater Pollution Prevention Plan in compliance with NYSDEC and Town of Newburgh requirements must be provided.

   A drainage report has been assembled and included within this submission. The proposed project will disturb less than 1-acre of land to minimize wetland disturbance and maintain a significant buffer to the residential properties to the rear.

6. Water service/sprinkler system valving should be per Town specifications. Sizing of the water line should be identified on the plan sheet. Exterior valving must be provided such that if fire flow supply is terminated to building potable water supply is also terminated.

   Comment acknowledged.

7. Design of the subsurface sanitary sewer disposal system must be provided for review.

   The subsurface sanitary sewer disposal system design will be finalized and submitted in the spring when percolation testing can be performed and permitted through the Orange County Department of Health.

Should you have any questions or any additional needs please do not hesitate to contact us at (518) 438-9900.

Sincerely,

BOHLER ENGINEERING MA, LLC

Caryn Mlodzianowski

cc: **HSC Balmville, LLC (via electronic-mail)**
Patrick J. Hines, MH&E Consulting Engineers, DPC (via electronic-mail)

17 Computer Drive West
Albany, NY 12205
518.438.9900

70 Linden Oaks, Third Floor, Suite 15
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585.866.1000

Via Overnight Delivery

March 22, 2021

Town of Newburgh
21 Hudson Valley Professional Plaza
Newburgh, New York 12550

Attention: John Ewasutyn, Planning Board Chairman

Re: Traffic Evaluation
Town Project #2020-04
Proposed Dollar General
SE Corner of US Route 9W & North Hill Lane
Town of Newburgh, New York

Dear Mr. Ewasutyn:

On behalf of our client, HSC Balmville, LLC., we are pleased to submit this response to comments summary to the Town of Newburgh for the above referenced project. This summary is in response to the various comments received in the February 12, 2021, letter from Creighton Manning Engineering, LLP, as noted below with our responses in italics. Please find the following items in support of our application:

- Fourteen (14) copies of the Traffic Evaluation, prepared by Maser Consulting (Colliers Engineering & Design), dated March 18, 2021.

1. The Route 9W northbound truck entry and exit movements should also be tested. The truck egress position should be described when stopped prior to entering Route 9W, i.e. does the tail of the trailer block ingress access to North Hill Lane? How frequent are deliveries? The reverse truck maneuver should be verified for entering the loading dock area. It appears the template tested driving forward, out to the left, but a reverse maneuver requires the cab to swing left then right to orient the trailer to the left in reverse.

   The truck turning movements were revised on the previous submittal dated March 4, 2021. The most conservative truck was used. Deliveries with the tenant's tractor-trailer are anticipated to occur 1-2 times per week.

2. A traffic analysis of Route 9W/North Hill Lane should be provided, with observations of queues on North Hill Lane and use of the adjacent Patty Cake Playhouse driveway.

   Please find the traffic analysis enclosed.

3. A utility permit from NYSDOT will be required for the gas and water line connections.

   Comment acknowledged. This will occur prior to construction.

Should you have any questions or any additional needs please do not hesitate to contact us at (518) 438-9900.

Sincerely,

BOHLER ENGINEERING MA, LLC

Caryn Mlodzianowski

cc: **HSC Balmville, LLC (via electronic-mail)**
Kenneth Wersted, PE, PTOE, Creighton Manning Engineering, LLP (via electronic-mail)
Patrick J. Hines, MH&E Consulting Engineers, DPC (via electronic-mail)

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March 18, 2021

VIA EMAIL

Mr. Kenneth Fioretti
Hix Snedeker Companies
805 Trione Street
Daphne, AL 36526

Re: Dollar General
U.S. Route 9W and North Hill Lane
Town of Newburgh, Orange County, New York
MC Project No. 21001250A

Dear Mr. Fioretti:

As requested, we have completed our preliminary traffic evaluation for the approximately 9,300 square foot Dollar General store, which is proposed on a parcel of land located immediately south of the North Hill Lane and U.S. Route 9W intersection in the Town of Newburgh (see Figure No. 1), New York. The site is proposed to be accessed via one entry/exit driveway on North Hill Lane. This evaluation is based on the analysis requirements of the Town of Newburgh Planning Board and the following sections describe of the tasks undertaken.

1. Description of Existing Roadway Conditions

   U.S. Route 9W along the frontage of the site consists of one travel lane in each direction plus paved shoulders on either side varying in width from approximately 6' to 10' in this area. The roadway varies in terms of sections that are curbed at developed driveways and no curbs in other areas. Note that opposite the site on the north side of North Hill Lane there is a small commercial development which contains the Pattycake Playhouse Early Childhood Learning Center. The proposed Dollar General driveway will be coordinated with this access. This section of U.S. Route 9W has an unposted speed limit of 55 MPH and along the frontage of the site there is an existing passing zone. The intersection of North Hill Lane and U.S. Route 9W is controlled by a stop sign and painted stop bar on the North Hill Lane approach. The speed limit on North Hill Lane is 30 MPH and there is currently no centerline striping on this roadway. The existing pavement width varies

between approximately 21' and 24' in this area. The project is proposed to be served by a single driveway consisting of one entering and one exiting lane on North Hill Lane.

2. 2021 Existing Traffic Volumes (Figure No.2 and 3)
   Turning movement traffic counts were conducted in the vicinity of the site and at the intersection of U.S. Route 9W and North Hill Lane in order to identify existing traffic conditions. The traffic volumes were collected on Thursday, March 11, Friday, March 12, and Saturday, March 13, 2021. Weekday AM, Weekday Midday, and Weekday PM counts were also collected on Tuesday, March 16, 2021. These counts were compared with historical data, including data collected in association with other projects along the corridor as well as data published by NYSDOT. Note that the roadway has a current ADT of approximately 16,000 vehicles per day with peak hour two-directional volumes in the order of 1,600 to 1,700 vehicles per hour during peak periods of the day. The existing traffic volumes included adjustments based on historical data to account for any variations in traffic due to the Covid-19 Pandemic at the time of the recent traffic counts. The resulting traffic volumes reflecting the critical Weekday AM (7:00 AM – 8:00 AM) and PM (4:15 PM – 5:15 PM) peak hour conditions are shown on Figures No. 2 and 3.

3. Year 2023 No-Build Traffic Volumes (Figure No. 3 and 4)
   The 2021 Existing Traffic Volumes were projected to a future design year to represent conditions without the proposed variety store, the Existing Traffic Volumes were increased by a growth factor of 1% per year to 2023. The resulting Year 2023 No-Build Traffic Volumes are shown on Figures No. 3 and 4.

4. Site Generated Traffic Volumes (Table No. 1)
   Estimates of the amount of traffic to be generated by the proposed approximately 9,300 square foot building during each of the peak hours were developed based on information published by the Institute of Transportation Engineers (ITE) as contained in the report entitled "Trip Generation", 10th Edition, 2017, based on Land Use Category – 814 Variety Store. This category includes this type of retail use and based on the data, would generate approximately 33 entering and 31 exiting vehicles during the Peak PM Highway Hour (one-hour period). Based on the traffic flows along U.S. Route 9W on a daily basis, the expected number of "new" trips to the roadway system would be even less. Based on ITE data for a use such as this, it can be expected that at least 25% of the vehicle trips would not be new to the system. Table No. 1 summarizes the trip generation rates and corresponding site generated traffic volumes for the Weekday Peak AM and Weekday Peak

PM Hours. Note that the PM Peak Highway Hour is the most critical time period in terms of overall traffic operations.

5. Arrival/Departure Distribution
   An arrival and departure distribution was established for the site based upon a review of the existing traffic flows along this section of U.S. Route 9W and location of over population in this vicinity.

6. 2023 Build Conditions Traffic Volumes (Figures No. 6 through 9)
   The site generated traffic volumes shown in Table No. 1 were assigned to the driveway based on the expected arrival and departure distributions referenced above. The resulting site generated traffic volumes are shown on Figures No. 6 and 7. The site generated traffic volumes were then added to the Year 2023 No-Build Traffic Volumes to obtain the Year 2023 Build Traffic Volumes for the driveway intersection. The resulting Year 2023 Build Traffic Volumes are shown on Figures No. 8 and 9 for each of the Peak Highway Hours.

7. Description of Analysis Procedures
   It was necessary to perform capacity analyses in order to determine existing and future traffic operating conditions at the study area intersections. The unsignalized intersection capacity analysis method utilized in this report was also performed in accordance with the procedures described in the *Highway Capacity Manual, 6th Edition*. The procedure is based on total elapsed time from when a vehicle stops at the end of the queue until the vehicle departs from the stop line. The average total delay for any particular critical movement is a function of the service rate or capacity of the approach and the degree of saturation. In order to identify the Level of Service, the average amount of vehicle delay is computed for each critical movement to the intersection.

   Additional information concerning both signalized and unsignalized Levels of Service can be found in Appendix "C" of this report.

8. Results of Capacity Analysis (Table No. 2)
   Capacity analyses which take into consideration the traffic control, truck percentages, any pedestrian activity, roadway grades and other factors were performed at the site access and adjacent intersection with U.S. Route 9W utilizing the procedures described above to determine the Levels of Service and average vehicle delays.

Table No. 2 AM and 2 PM summarize the results of the capacity analysis for the 2023 Build Conditions. Appendix "D" contains copies of the capacity analysis which also indicate the existing geometrics (including lane widths) and other characteristics for the driveway intersection.

Based on a review of the analysis of existing conditions, vehicles making left turns from North Hill Lane, many of which are leaving the Learning Center property, experience long delays during the peak hours and these will increase in the future with or without this project due to the heavy through traffic movements on U.S. Route 9W. To improve this delay, a traffic signal would have to be installed, however based on existing and future traffic volumes, it does not appear that a signal would be warranted.

9. Accident Evaluation (Table A)
   All available accident data has been requested from NYSDOT for the section of U.S. Route 9W from North Hill Lane north and south for 500 feet for the latest available three-year period. Once received, the accident information will be compiled, and a summary of those accidents will be contained in Table A.

10. Other Considerations
    The pavement width on North Hill Lane is currently limited in some portions. The section between U.S. Route 9W and the site driveway should be upgraded to provide a consistent full width pavement to accommodate vehicles turning to and from U.S. Route 9W. A double yellow centerline should also be added in this section of North Hill Lane. These items should be completed regardless of the proposed development.

Very truly yours,

MASER CONSULTING CONNECTICUT, P.C.

Philip J. Grealy, Ph.D., P.E.
Principal/Department Manager

PJG/ces
Enclosures

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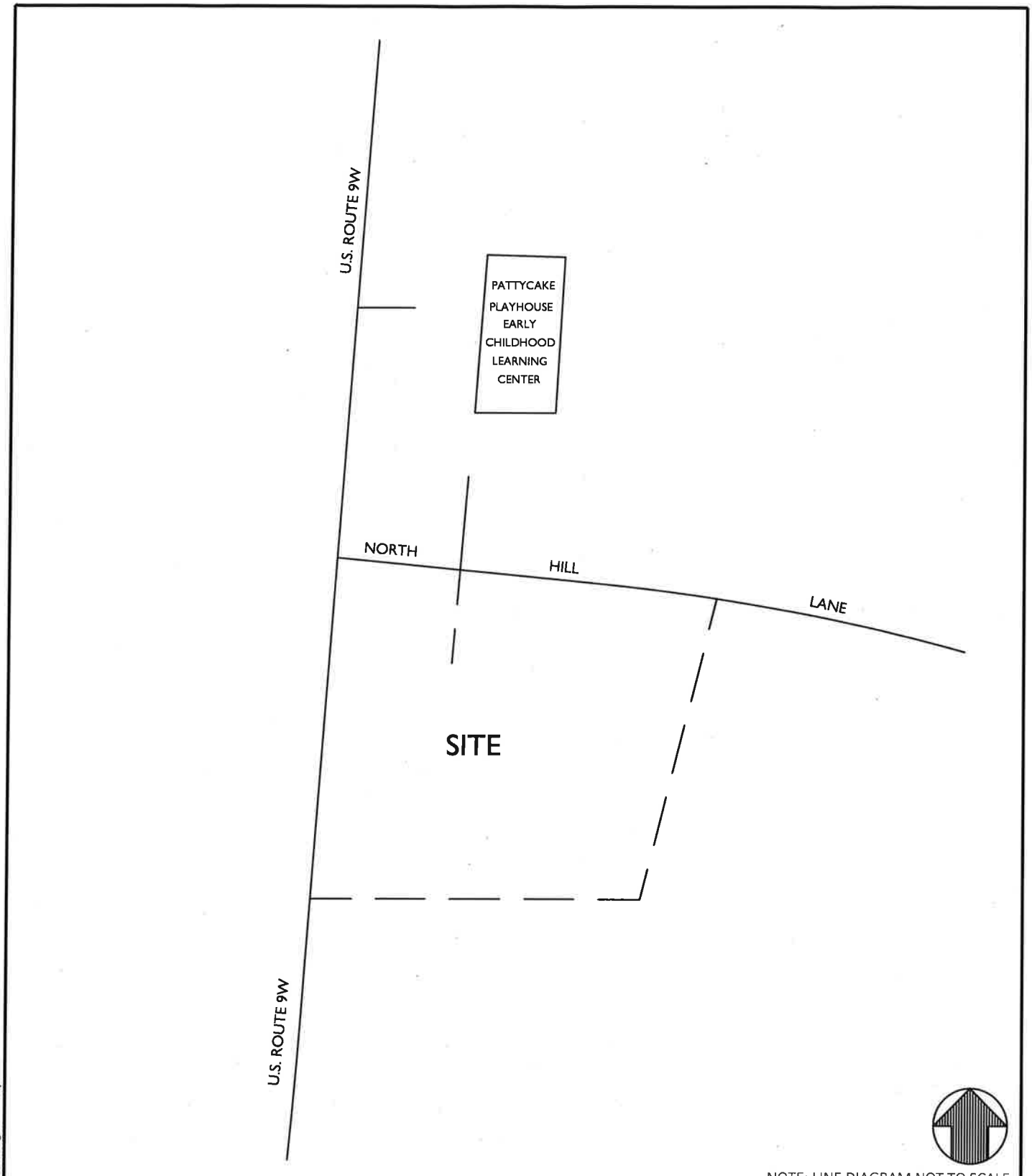
APPENDIX A

FIGURES



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PROJECT NUMBER:	DRAWING NAME:
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SHEET TITLE:
SITE LOCATION MAP

SHEET NUMBER:
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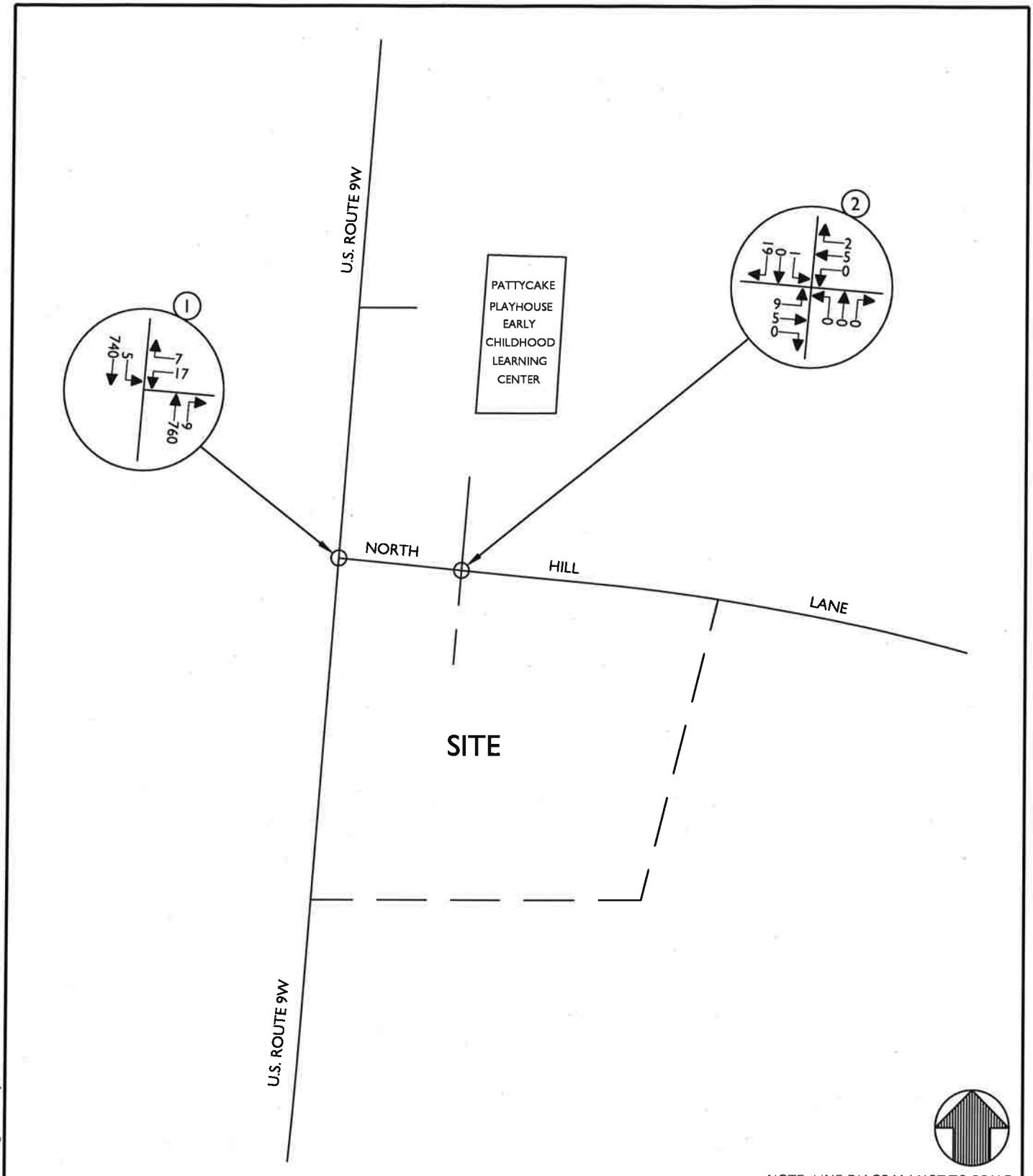

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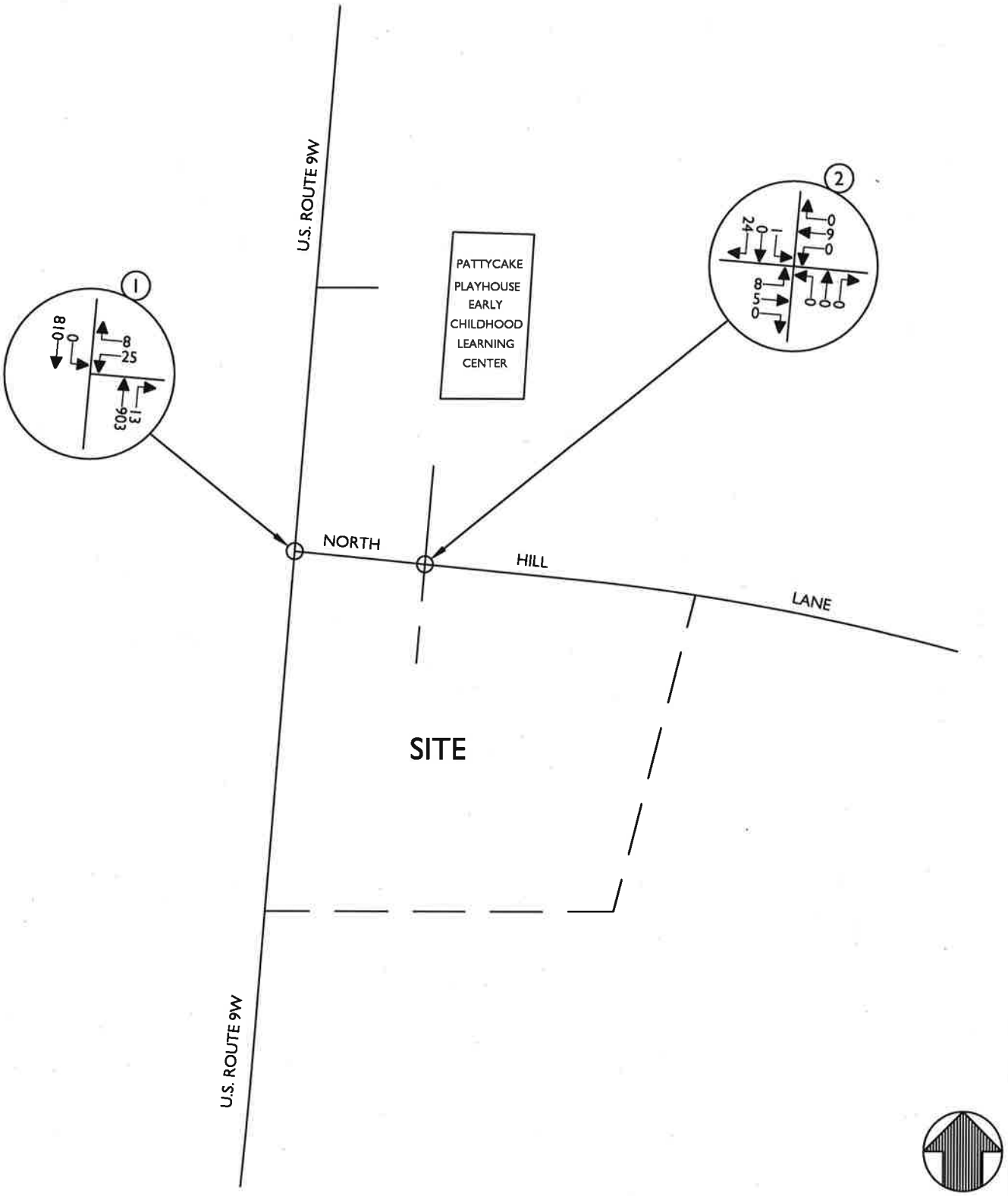

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SHEET TITLE:
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WEEKDAY PEAK PM HOUR

SHEET NUMBER:
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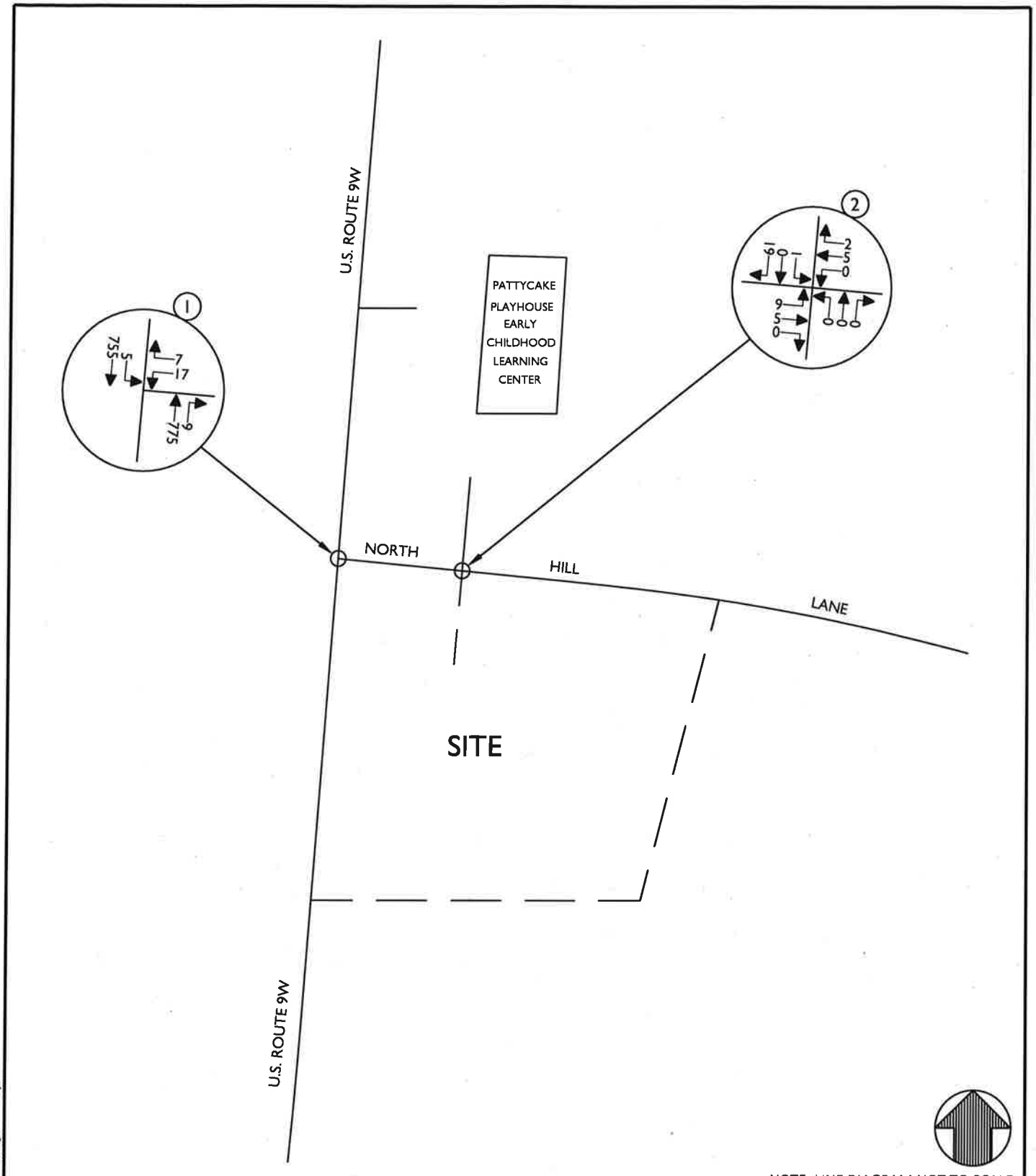

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WEEKDAY PEAK AM HOUR

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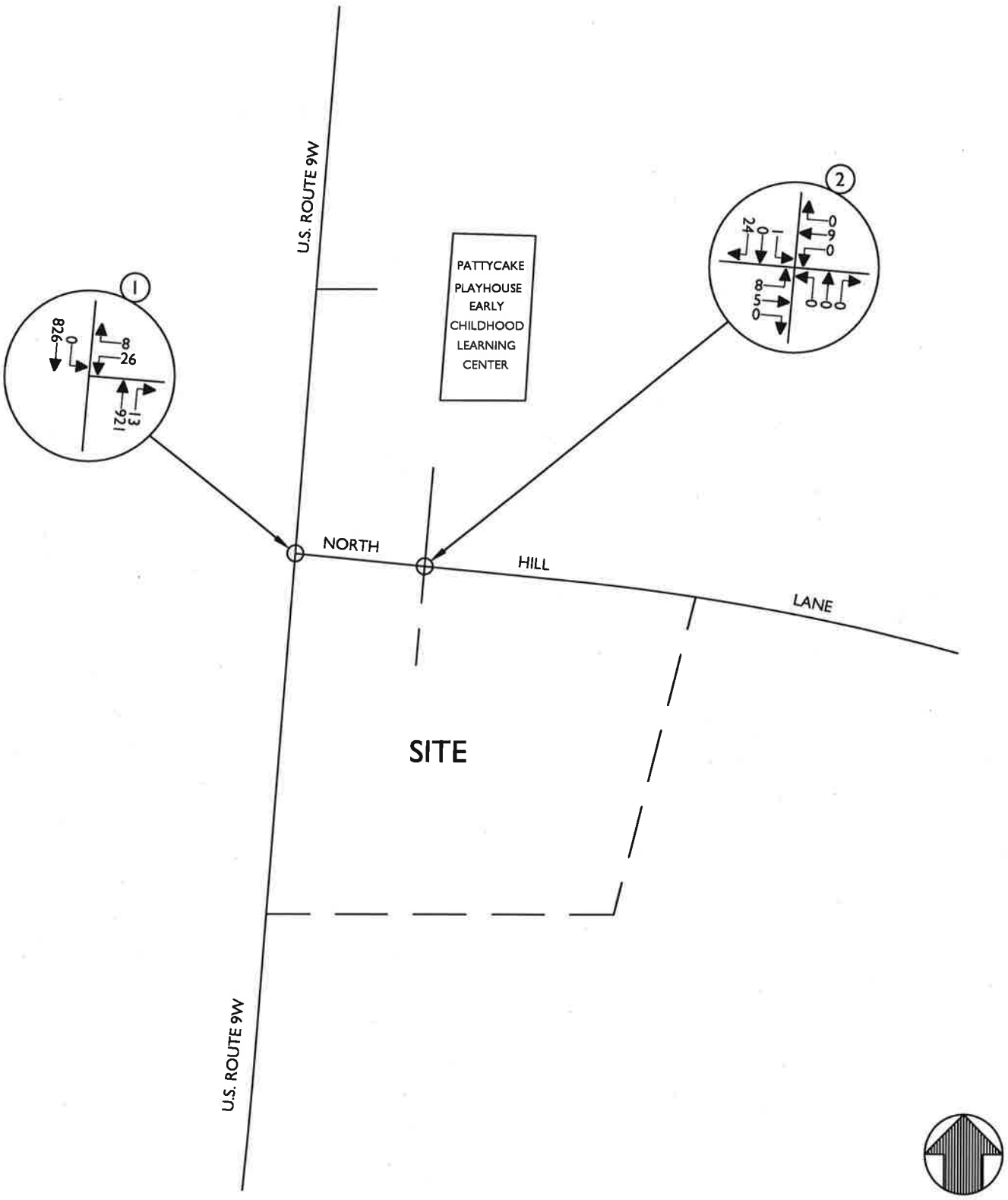

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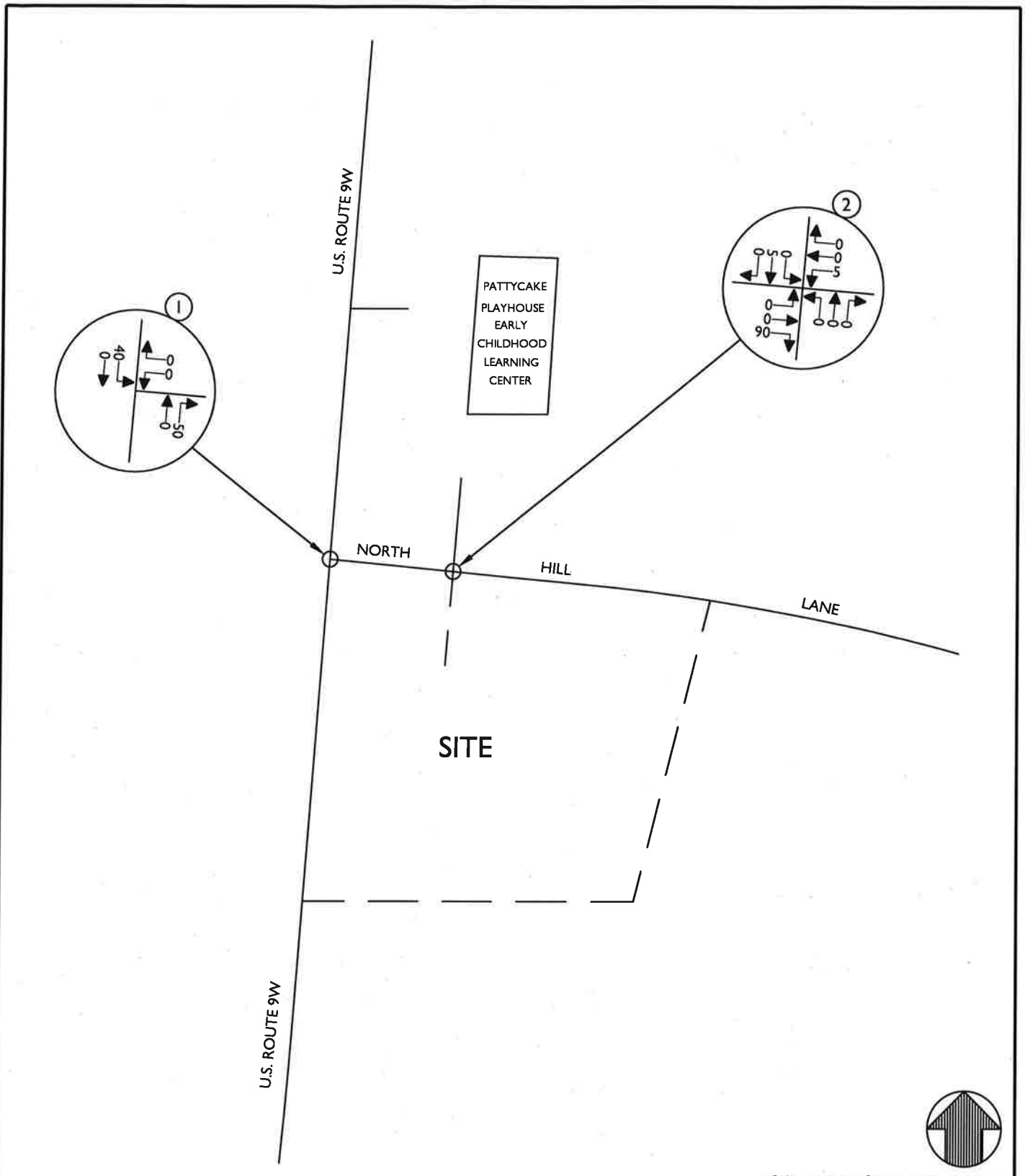

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SHEET NUMBER:
6

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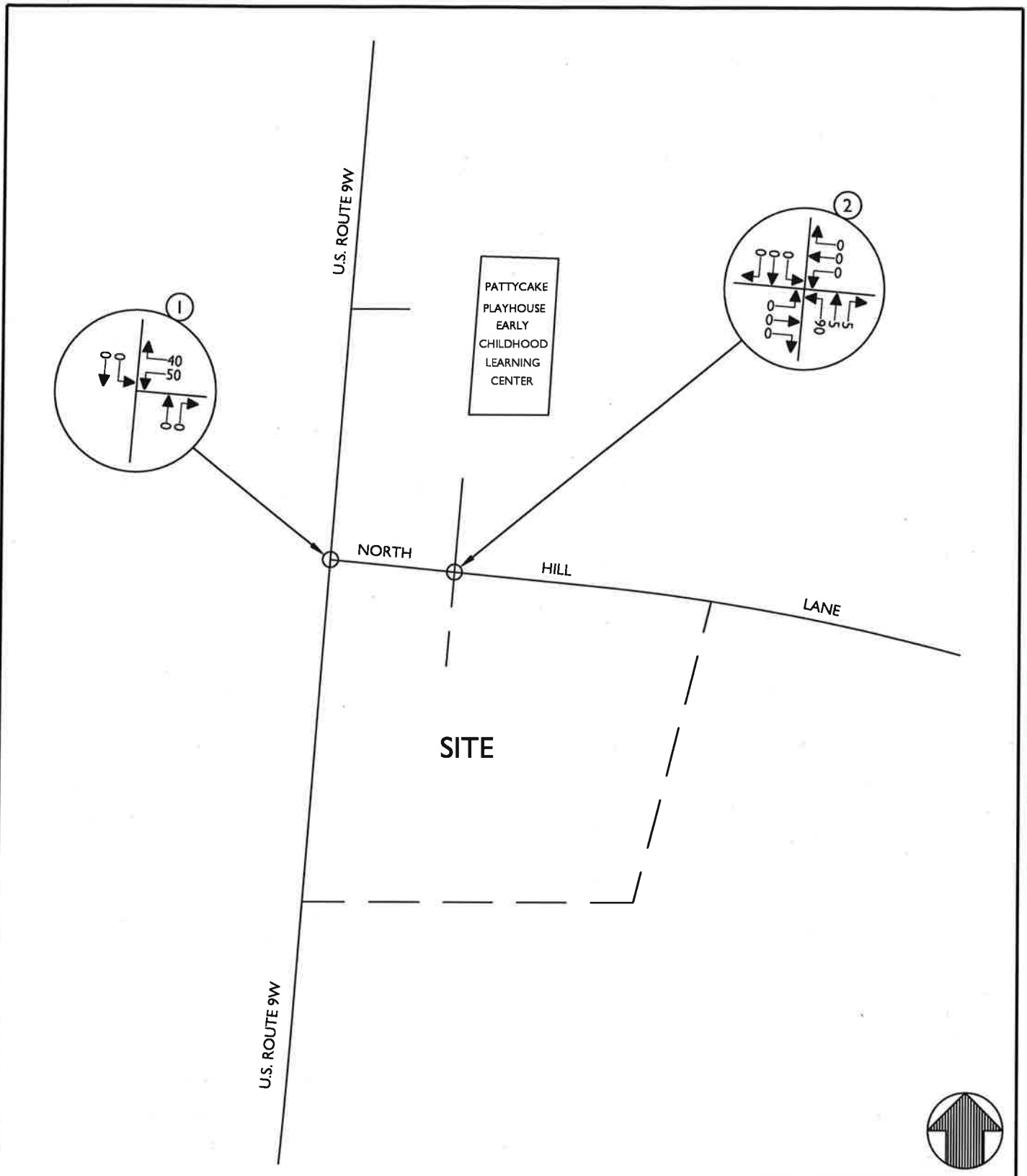

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21001250A	210315RH_FIGURE

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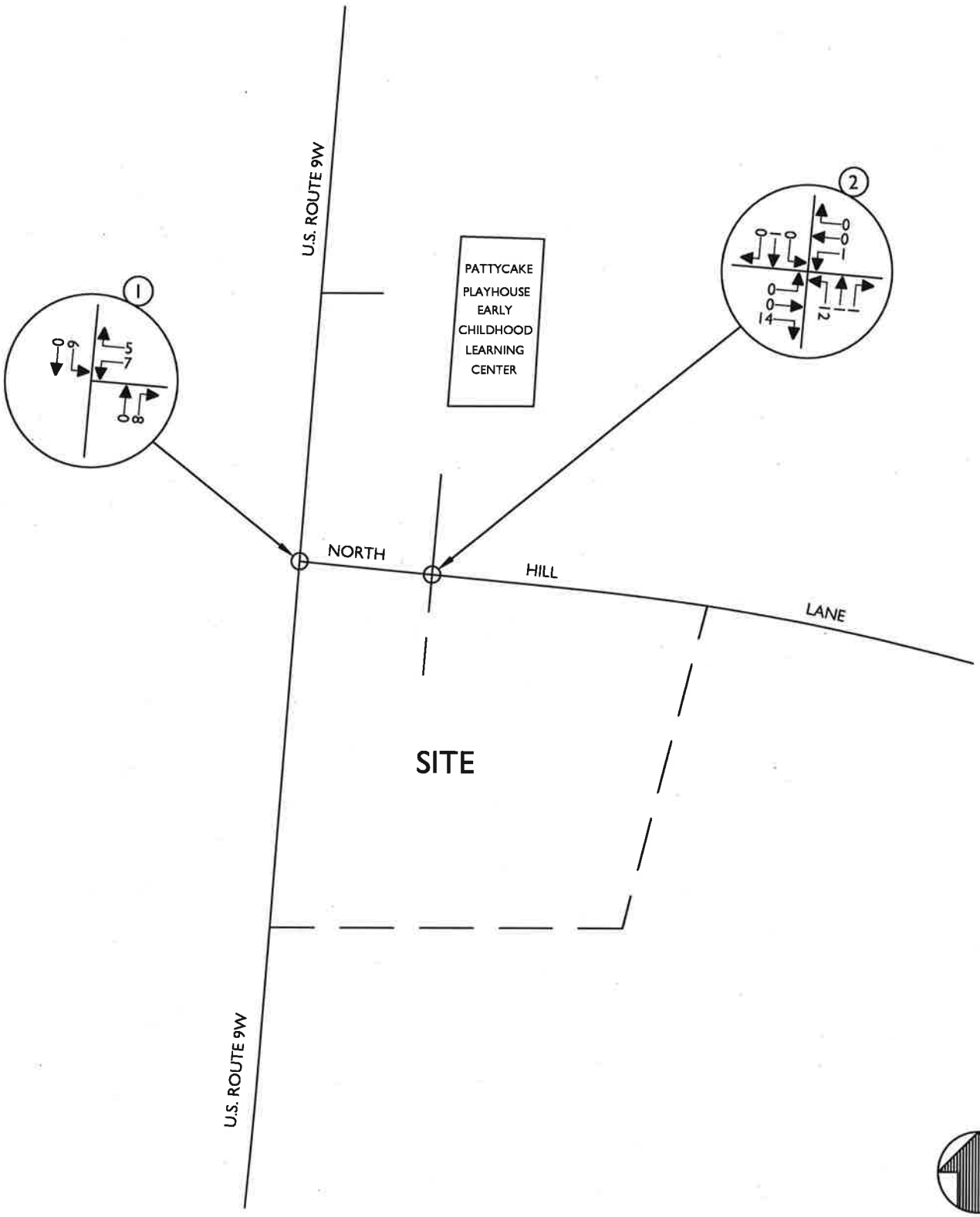

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PROJECT NUMBER:	DRAWING NAME:
21001250A	210315RH_FIGURE

SHEET TITLE:
SITE GENERATED TRAFFIC VOLUMES
WEEKDAY PEAK AM HOUR

SHEET NUMBER:
8

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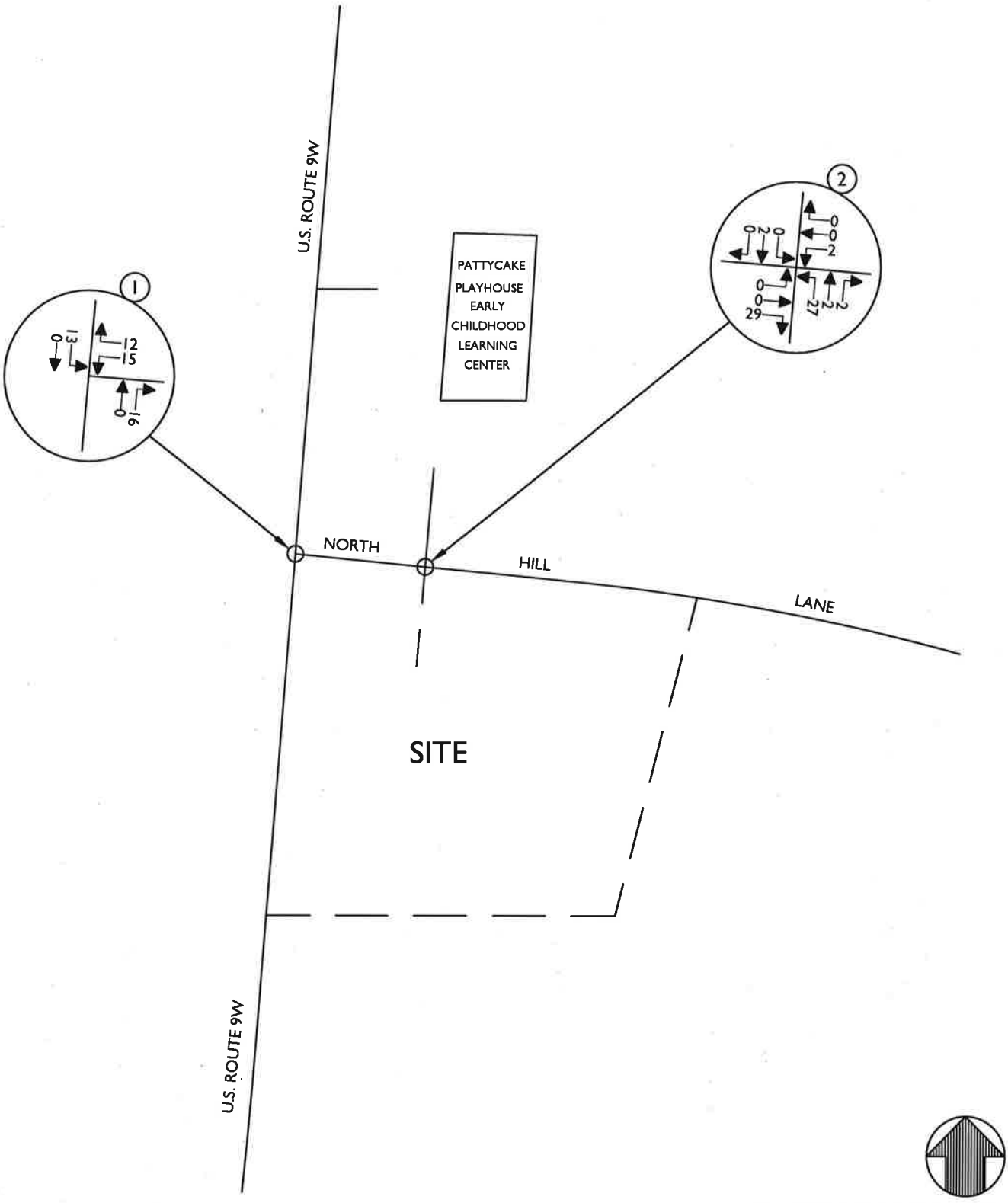

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PROJECT NUMBER:	DRAWING NAME:
21001250A	21031SRH_FIGURE

SHEET TITLE:
SITE GENERATED TRAFFIC VOLUMES
WEEKDAY PEAK PM HOUR

SHEET NUMBER:
9

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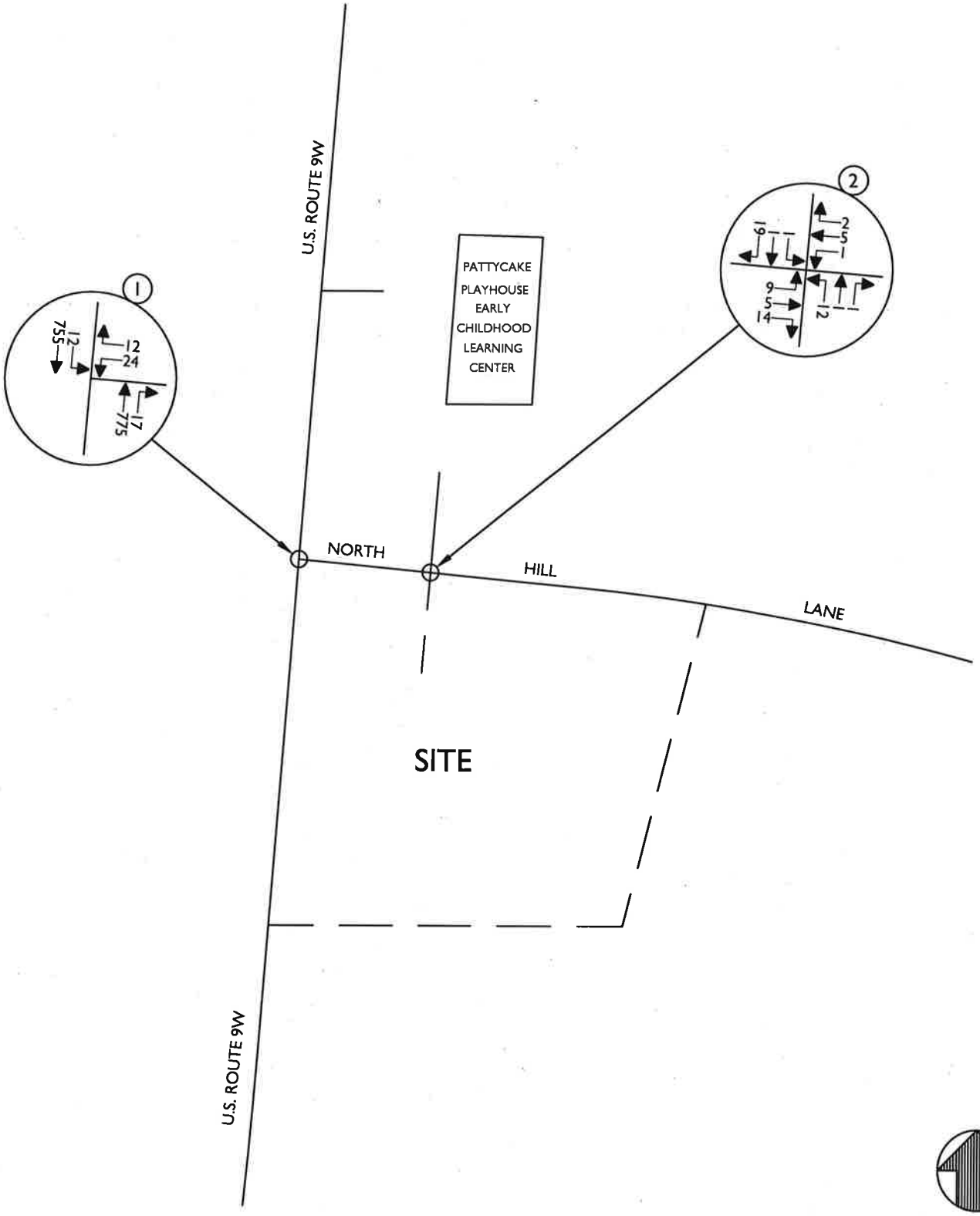

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PROJECT NUMBER:	DRAWING NAME:
21001250A	210315RH_FIGURE

SHEET TITLE:
2023 BUILD TRAFFIC VOLUMES
WEEKDAY PEAK AM HOUR

SHEET NUMBER:
10

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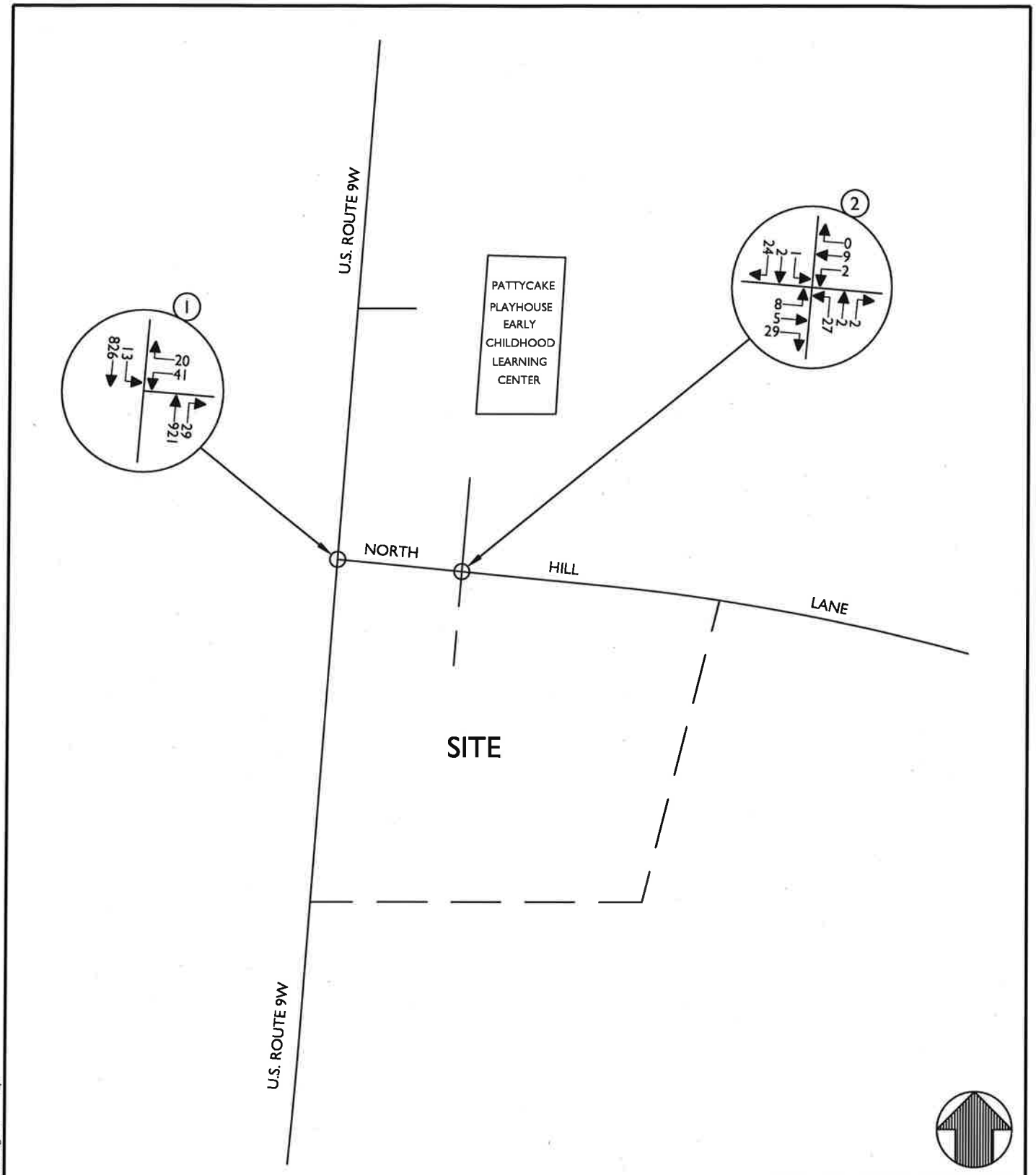

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2023 BUILD TRAFFIC VOLUMES
WEEKDAY PEAK PM HOUR

SHEET NUMBER:
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PROPOSED DOLLAR GENERAL

APPENDIX B

TABLES

TABLE NO. 1

HOURLY TRIP GENERATION RATES (HTGR) AND ANTICIPATED SITE GENERATED TRAFFIC VOLUMES

PROPOSED DOLLAR GENERAL TOWN OF NEWBURGH, NEW YORK	ENTRY		EXIT	
	HTGR[1]	VOLUME	HTGR[1]	VOLUME
VARIETY STORE (9,300 S.F.)				
PEAK AM HOUR	1.83	17	1.40	13
PEAK PM HOUR	3.55	33	3.33	31

NOTES:

1) THE HOURLY TRIP GENERATION RATES (HTGR) ARE BASED ON DATA PUBLISHED BY THE INSTITUTE OF TRANSPORTATION ENGINEERS (ITE) AS CONTAINED IN THE TRIP GENERATION HANDBOOK, 10TH EDITION, 2017. ITE LAND USE CODE - 814 - VARIETY STORE. NOTE THAT THE 9,300 S.F. SHOWN ABOVE INCLUDES THE 9,100 S.F. & 200 S.F. VESTIBULE.

TABLE NO. 2 AM

LEVEL OF SERVICE SUMMARY TABLE

				2021 EXISTING			2023 NO-BUILD			2023 BUILD			CHANGE IN DELAY NO-BUILD TO BUILD
			AM	V/C	LOS	DELAY	V/C	LOS	DELAY	V/C	LOS	DELAY	
1	U.S. ROUTE 9W & NORTH HILL LANE	UNSIGNALIZED											
	NORTH HILL LANE	WB	LR	0.30	F	59.8	0.31	F	63.3	0.47	F	78.7	15.4
	U.S. ROUTE 9W	SB	LT	0.01	A	9.8	0.01	A	9.8	0.02	A	9.9	0.1
2	NORTH HILL LANE & PATTYCAKE PLAYHOUSE EARLY CHILDHOOD LEARNING CENTER/ SITE ACCESS	UNSIGNALIZED											
	NORTH HILL LANE	EB	LTR	0.01	A	7.3	0.01	A	7.3	0.01	A	7.3	0.0
	NORTH HILL LANE	WB	LTR	-	-	-	-	-	-	0.00	A	7.3	-
	SITE ACCESS DRIVEWAY	NB	LTR	-	-	-	-	-	-	0.02	A	9.0	-
	PATTYCAKE LEARNING CENTER	SB	LTR	0.02	A	8.5	0.02	A	8.5	0.02	A	8.5	0.0

NOTES:

1) THE ABOVE REPRESENTS THE LEVEL OF SERVICE AND VEHICLE DELAY IN SECONDS, C [16.2], FOR EACH KEY APPROACH OF THE UNSIGNALIZED INTERSECTIONS AS WELL AS FOR EACH APPROACH AND THE OVERALL INTERSECTION FOR THE SIGNALIZED INTERSECTIONS. SEE APPENDIX "C" FOR A DESCRIPTION OF THE LEVELS OF SERVICE.

TABLE NO. 2 PM

LEVEL OF SERVICE SUMMARY TABLE

				2021 EXISTING			2023 NO-BUILD			2023 BUILD			CHANGE IN DELAY NO-BUILD TO BUILD
			PM	V/C	LOS	DELAY	V/C	LOS	DELAY	V/C	LOS	DELAY	
1	U.S. ROUTE 9W & NORTH HILL LANE	UNSIGNALIZED											
	NORTH HILL LANE	WB	LR	0.45	F	83.9	0.50	F	96.7	0.88	F	169.5	72.8
	U.S. ROUTE 9W	SB	LT	0.00	A	0.0	0.00	A	0.0	0.02	B	10.4	10.4
2	NORTH HILL LANE & PATTYCAKE PLAYHOUSE EARLY CHILDHOOD LEARNING CENTER/ SITE ACCESS	UNSIGNALIZED											
	NORTH HILL LANE	EB	LTR	0.01	A	7.3	0.01	A	7.3	0.01	A	7.3	0.0
	NORTH HILL LANE	WB	LTR	-	-	-	-	-	-	0.00	A	7.3	-
	SITE ACCESS DRIVEWAY	NB	LTR	-	-	-	-	-	-	0.04	A	9.2	-
	PATTYCAKE LEARNING CENTER	SB	LTR	0.03	A	8.5	0.03	A	8.5	0.03	A	8.6	0.1

NOTES:

1) THE ABOVE REPRESENTS THE LEVEL OF SERVICE AND VEHICLE DELAY IN SECONDS, C [16.2], FOR EACH KEY APPROACH OF THE UNSIGNALIZED INTERSECTIONS AS WELL AS FOR EACH APPROACH AND THE OVERALL INTERSECTION FOR THE SIGNALIZED INTERSECTIONS. SEE APPENDIX "C" FOR A DESCRIPTION OF THE LEVELS OF SERVICE.

PROPOSED DOLLAR GENERAL

APPENDIX C

LEVEL OF SERVICE STANDARDS

LEVEL OF SERVICE STANDARDS

LEVEL OF SERVICE FOR SIGNALIZED INTERSECTIONS

Level of Service (LOS) can be characterized for the entire intersection, each intersection approach, and each lane group. Control delay alone is used to characterize LOS for the entire intersection or an approach. Control delay and volume-to-capacity (v/c) ratio are used to characterize LOS for a lane group. Delay quantifies the increase in travel time due to traffic signal control. It is also a measure of driver discomfort and fuel consumption. The volume-to-capacity ratio quantifies the degree to which a phase's capacity is utilized by a lane group.

LOS A describes operations with a control delay of 10 s/veh or less and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is low and either progression is exceptionally favorable or the cycle length is very short. If it is due to favorable progression, most vehicles arrive during the green indication and travel through the intersection without stopping.

LOS B describes operations with control delay between 10 and 20 s/veh and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is low and either progression is highly favorable or the cycle length is short. More vehicles stop than with LOS A.

LOS C describes operations with control delay between 20 and 35 s/veh and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when progression is favorable or the cycle length is moderate.

LOS D describes operations with control delay between 35 and 55 s/veh and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is high and either progression is ineffective or the cycle length is long.

LOS E describes operations with control delay between 55 and 80 s/veh and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is high, progression is unfavorable, and the cycle length is long.

LOS F describes operations with control delay exceeding 80 s/veh or a volume-to-capacity ratio greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is very high, progression is very poor, and the cycle length is long.

A lane group can incur a delay less than 80 s/veh when the volume-to-capacity ratio exceeds 1.0. This condition typically occurs when the cycle length is short, the signal progression is favorable, or both. As a result, both the delay and volume-to-capacity ratio are considered when lane group LOS is established. A ratio of 1.0 or more indicates that cycle capacity is fully utilized and represents failure from a capacity perspective (just as delay in excess of 80 s/veh represents failure from a delay perspective).

The Level of Service Criteria for signalized intersections are given in Exhibit 19-8 from the *Highway Capacity Manual, 6th Edition* published by the Transportation Research Board.

Exhibit 19-8

	LOS by Volume-to-Capacity Ratio	
Control Delay (s/veh)	**v/c ≤1.0**	**v/c >1.0**
≤10	A	F
>10-20	B	F
>20-35	C	F
>35-55	D	F
>55-80	E	F
>80	F	F

For approach-based and intersection wide assessments, LOS is defined solely by control delay.

LEVEL OF SERVICE CRITERIA
FOR TWO-WAY STOP-CONTROLLED (TWSC) UNSIGNALIZED INTERSECTIONS

Level of Service (LOS) for a two-way stop-controlled (TWSC) intersection is determined by the computed or measured control delay. For motor vehicles, LOS is determined for each minor-street movement (or shared movement) as well as major-street left turns. LOS is not defined for the intersection as a whole or for major-street approaches.

The Level of Service Criteria for TWSC unsignalized intersections are given in Exhibit 20-2 from the *Highway Capacity Manual, 6th Edition* published by the Transportation Research Board.

Exhibit 20-2

	LOS by Volume-to-Capacity Ratio	
Control Delay (s/veh)	**v/c ≤1.0**	**v/c >1.0**
0-10	A	F
>10-15	B	F
>15-25	C	F
>25-35	D	F
>35-50	E	F
>50	F	F

The LOS criteria apply to each lane on a given approach and to each approach on the minor street.
LOS is not calculated for major-street approaches or for the intersection as a whole.

As Exhibit 20-2 notes, LOS F is assigned to the movement if the volume-to-capacity ratio for the movement exceeds 1.0, regardless of the control delay.

The Level of Service Criteria for unsignalized intersections are somewhat different from the criteria for signalized intersections.

LEVEL OF SERVICE CRITERIA
FOR ALL-WAY STOP-CONTROLLED (AWSC) UNSIGNALIZED INTERSECTIONS

The Levels of Service (LOS) for all-way stop-controlled (AWSC) intersections are given in Exhibit 21-8. As the exhibit notes, LOS F is assigned if the volume-to-capacity (v/c) ratio of a lane exceeds 1.0, regardless of the control delay. For assessment of LOS at the approach and intersection levels, LOS is based solely on control delay.

The Level of Service Criteria for AWSC unsignalized intersections are given in Exhibit 21-8 from the *Highway Capacity Manual, 6th Edition* published by the Transportation Research Board.

Exhibit 21-8

	LOS by Volume-to-Capacity Ratio	
Control Delay (s/veh)	**v/c ≤1.0**	**v/c >1.0**
0-10	A	F
>10-15	B	F
>15-25	C	F
>25-35	D	F
>35-50	E	F
>50	F	F

For approaches and intersection wide assessment, LOS is defined solely by control delay.

PROPOSED DOLLAR GENERAL

APPENDIX D

CAPACITY ANALYSIS

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	17	7	760	9	5	740
Future Volume (vph)	17	7	760	9	5	740
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	13	12	12	12
Grade (%)	3%		0%			0%
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.960		0.998			
Flt Protected	0.966					
Satd. Flow (prot)	1653	0	1866	0	0	1810
Flt Permitted	0.966					
Satd. Flow (perm)	1653	0	1866	0	0	1810
Link Speed (mph)	30		40			40
Link Distance (ft)	122		242			300
Travel Time (s)	2.8		4.1			5.1
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Adj. Flow (vph)	19	8	864	10	6	841
Shared Lane Traffic (%)						
Lane Group Flow (vph)	27	0	874	0	0	847
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.02	1.02	0.96	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized

Intersection	
Int Delay, s/veh	1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	17	7	760	9	5	740
Future Vol, veh/h	17	7	760	9	5	740
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized		None		None		None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	3	-	0	-	-	0
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	19	8	864	10	6	841

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1722	869	0	0	874	0
Stage 1	869	-	-	-	-	-
Stage 2	853	-	-	-	-	-
Critical Hdwy	7.05	6.55	-	-	4.15	-
Critical Hdwy Stg 1	6.05	-	-	-	-	-
Critical Hdwy Stg 2	6.05	-	-	-	-	-
Follow-up Hdwy	3.545	3.345	-	-	2.245	-
Pot Cap-1 Maneuver	72	323	-	-	759	-
Stage 1	351	-	-	-	-	-
Stage 2	358	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	71	323	-	-	759	-
Mov Cap-2 Maneuver	71	-	-	-	-	-
Stage 1	346	-	-	-	-	-
Stage 2	358	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	59.8	0	0.1
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	92	759	-
HCM Lane V/C Ratio	-	-	0.296	0.007	-
HCM Control Delay (s)	-	-	59.8	9.8	0
HCM Lane LOS	-	-	F	A	A
HCM 95th %tile Q(veh)	-	-	1.1	0	-

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	9	5	5	2	1	19
Future Volume (vph)	9	5	5	2	1	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	11	12	10	12
Grade (%)		-2%	2%		0%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.966		0.871	
Flt Protected		0.970			0.998	
Satd. Flow (prot)	0	1773	1673	0	1468	0
Flt Permitted		0.970			0.998	
Satd. Flow (perm)	0	1773	1673	0	1468	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		122	105		66	
Travel Time (s)		2.8	2.4		1.5	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Adj. Flow (vph)	10	6	6	2	1	22
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	16	8	0	23	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		10	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	0.99	0.99	1.06	1.01	1.09	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	5.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		Y	
Traffic Vol, veh/h	9	5	5	2	1	19
Future Vol, veh/h	9	5	5	2	1	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-2	2	-	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	10	6	6	2	1	22

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	8	0	-	0	33	7
Stage 1	-	-	-	-	7	-
Stage 2	-	-	-	-	26	-
Critical Hdwy	4.15	-	-	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	2.245	-	-	-	3.545	3.345
Pot Cap-1 Maneuver	1593	-	-	-	973	1067
Stage 1	-	-	-	-	1008	-
Stage 2	-	-	-	-	989	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1593	-	-	-	967	1067
Mov Cap-2 Maneuver	-	-	-	-	967	-
Stage 1	-	-	-	-	1002	-
Stage 2	-	-	-	-	989	-

Approach	EB	WB	SB
HCM Control Delay, s	7	0	8.5
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1593	-	-	-	1062
HCM Lane V/C Ratio	0.006	-	-	-	0.021
HCM Control Delay (s)	7.3	0	-	-	8.5
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	25	8	903	13	0	810
Future Volume (vph)	25	8	903	13	0	810
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	13	12	12	12
Grade (%)	3%		0%			0%
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.968		0.998			
Flt Protected	0.963					
Satd. Flow (prot)	1662	0	1866	0	0	1810
Flt Permitted	0.963					
Satd. Flow (perm)	1662	0	1866	0	0	1810
Link Speed (mph)	30		40			40
Link Distance (ft)	122		242			300
Travel Time (s)	2.8		4.1			5.1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Adj. Flow (vph)	26	8	951	14	0	853
Shared Lane Traffic (%)						
Lane Group Flow (vph)	34	0	965	0	0	853
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.02	1.02	0.96	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized

Intersection	
Int Delay, s/veh	1.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	25	8	903	13	0	810
Future Vol, veh/h	25	8	903	13	0	810
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	3	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	26	8	951	14	0	853

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1811	958	0	0	965	0
Stage 1	958	-	-	-	-	-
Stage 2	853	-	-	-	-	-
Critical Hdwy	7.05	6.55	-	-	4.15	-
Critical Hdwy Stg 1	6.05	-	-	-	-	-
Critical Hdwy Stg 2	6.05	-	-	-	-	-
Follow-up Hdwy	3.545	3.345	-	-	2.245	-
Pot Cap-1 Maneuver	63	284	-	-	702	-
Stage 1	314	-	-	-	-	-
Stage 2	358	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	63	284	-	-	702	-
Mov Cap-2 Maneuver	63	-	-	-	-	-
Stage 1	314	-	-	-	-	-
Stage 2	358	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	88.9	0	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	78	702	-
HCM Lane V/C Ratio	-	-	0.445	-	-
HCM Control Delay (s)	-	-	83.9	0	-
HCM Lane LOS	-	-	F	A	-
HCM 95th %tile Q(veh)	-	-	1.8	0	-

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	8	5	9	0	1	24
Future Volume (vph)	8	5	9	0	1	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	11	12	10	12
Grade (%)		-2%	2%		0%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.870	
Flt Protected		0.971			0.998	
Satd. Flow (prot)	0	1775	1732	0	1466	0
Flt Permitted		0.971			0.998	
Satd. Flow (perm)	0	1775	1732	0	1466	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		122	105		66	
Travel Time (s)		2.8	2.4		1.5	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Adj. Flow (vph)	9	6	10	0	1	27
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	15	10	0	28	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		10	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	0.99	0.99	1.06	1.01	1.09	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	5.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰	↑		↰	
Traffic Vol, veh/h	8	5	9	0	1	24
Future Vol, veh/h	8	5	9	0	1	24
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-2	2	-	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	9	6	10	0	1	27

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	10	0	-	0	34	10
Stage 1	-	-	-	-	10	-
Stage 2	-	-	-	-	24	-
Critical Hdwy	4.15	-	-	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	2.245	-	-	-	3.545	3.345
Pot Cap-1 Maneuver	1590	-	-	-	972	1063
Stage 1	-	-	-	-	1005	-
Stage 2	-	-	-	-	991	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1590	-	-	-	966	1063
Mov Cap-2 Maneuver	-	-	-	-	966	-
Stage 1	-	-	-	-	999	-
Stage 2	-	-	-	-	991	-

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	8.5
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1590	-	-	-	1059
HCM Lane V/C Ratio	0.006	-	-	-	0.027
HCM Control Delay (s)	7.3	0	-	-	8.5
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	17	7	775	9	5	755
Future Volume (vph)	17	7	775	9	5	755
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	13	12	12	12
Grade (%)	3%		0%			0%
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.960		0.998			
Flt Protected	0.966					
Satd. Flow (prot)	1653	0	1866	0	0	1810
Flt Permitted	0.966					
Satd. Flow (perm)	1653	0	1866	0	0	1810
Link Speed (mph)	30		40			40
Link Distance (ft)	122		242			300
Travel Time (s)	2.8		4.1			5.1
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Adj. Flow (vph)	19	8	881	10	6	858
Shared Lane Traffic (%)						
Lane Group Flow (vph)	27	0	891	0	0	864
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.02	1.02	0.96	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized

Intersection	
Int Delay, s/veh	1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	17	7	775	9	5	755
Future Vol, veh/h	17	7	775	9	5	755
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized		None		None		None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	3	-	0	-	-	0
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	19	8	881	10	6	858

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1756	886	0	0	891	0
Stage 1	886	-	-	-	-	-
Stage 2	870	-	-	-	-	-
Critical Hdwy	7.05	6.55	-	-	4.15	-
Critical Hdwy Stg 1	6.05	-	-	-	-	-
Critical Hdwy Stg 2	6.05	-	-	-	-	-
Follow-up Hdwy	3.545	3.345	-	-	2.245	-
Pot Cap-1 Maneuver	69	315	-	-	748	-
Stage 1	343	-	-	-	-	-
Stage 2	350	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	68	315	-	-	748	-
Mov Cap-2 Maneuver	68	-	-	-	-	-
Stage 1	338	-	-	-	-	-
Stage 2	350	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	68.3	0	0.1
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	88	748	-
HCM Lane V/C Ratio	-	-	0.31	0.008	-
HCM Control Delay (s)	-	-	63.3	9.8	0
HCM Lane LOS	-	-	F	A	A
HCM 95th %tile Q(veh)	-	-	1.2	0	-

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	9	5	5	2	1	19
Future Volume (vph)	9	5	5	2	1	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	11	12	10	12
Grade (%)		-2%	2%		0%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.966		0.871	
Flt Protected		0.970			0.998	
Satd. Flow (prot)	0	1773	1673	0	1468	0
Flt Permitted		0.970			0.998	
Satd. Flow (perm)	0	1773	1673	0	1468	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		122	105		66	
Travel Time (s)		2.8	2.4		1.5	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Adj. Flow (vph)	10	6	6	2	1	22
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	16	8	0	23	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		10	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	0.99	0.99	1.06	1.01	1.09	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized

Intersection	
Int Delay, s/veh	5.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰	↑		↱	
Traffic Vol, veh/h	9	5	5	2	1	19
Future Vol, veh/h	9	5	5	2	1	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-2	2	-	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	10	6	6	2	1	22

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	8	0	-	0	33	7
Stage 1	-	-	-	-	7	-
Stage 2	-	-	-	-	26	-
Critical Hdwy	4.15	-	-	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	2.245	-	-	-	3.545	3.345
Pot Cap-1 Maneuver	1593	-	-	-	973	1067
Stage 1	-	-	-	-	1008	-
Stage 2	-	-	-	-	989	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1593	-	-	-	967	1067
Mov Cap-2 Maneuver	-	-	-	-	967	-
Stage 1	-	-	-	-	1002	-
Stage 2	-	-	-	-	989	-

Approach	EB	WB	SB
HCM Control Delay, s	8.7	0	8.5
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1593	-	-	-	1062
HCM Lane V/C Ratio	0.006	-	-	-	0.021
HCM Control Delay (s)	7.3	0	-	-	8.5
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	26	8	921	13	0	826
Future Volume (vph)	26	8	921	13	0	826
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	13	12	12	12
Grade (%)	3%		0%			0%
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.969		0.998			
Flt Protected	0.963					
Satd. Flow (prot)	1663	0	1866	0	0	1810
Flt Permitted	0.963					
Satd. Flow (perm)	1663	0	1866	0	0	1810
Link Speed (mph)	30		40			40
Link Distance (ft)	122		242			300
Travel Time (s)	2.8		4.1			5.1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Adj. Flow (vph)	27	8	969	14	0	869
Shared Lane Traffic (%)						
Lane Group Flow (vph)	35	0	983	0	0	869
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.02	1.02	0.96	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	1.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	26	8	921	13	0	826
Future Vol, veh/h	26	8	921	13	0	826
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized		None		None		None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	3	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	27	8	969	14	0	869

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1845	976	0	0	983	0
Stage 1	976	-	-	-	-	-
Stage 2	869	-	-	-	-	-
Critical Hdwy	7.05	6.55	-	-	4.15	-
Critical Hdwy Stg 1	6.05	-	-	-	-	-
Critical Hdwy Stg 2	6.05	-	-	-	-	-
Follow-up Hdwy	3.545	3.345	-	-	2.245	-
Pot Cap-1 Maneuver	59	277	-	-	691	-
Stage 1	307	-	-	-	-	-
Stage 2	351	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	59	277	-	-	691	-
Mov Cap-2 Maneuver	59	-	-	-	-	-
Stage 1	307	-	-	-	-	-
Stage 2	351	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay	96.7	0	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	72	691	-
HCM Lane V/C Ratio	-	-	0.497	-	-
HCM Control Delay (s)	-	-	96.7	0	-
HCM Lane LOS	-	-	F	A	-
HCM 95th %tile Q(veh)	-	-	2	0	-

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	8	5	9	0	1	24
Future Volume (vph)	8	5	9	0	1	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	11	12	10	12
Grade (%)		-2%	2%		0%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.870	
Flt Protected		0.971			0.998	
Satd. Flow (prot)	0	1775	1732	0	1466	0
Flt Permitted		0.971			0.998	
Satd. Flow (perm)	0	1775	1732	0	1466	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		122	105		66	
Travel Time (s)		2.8	2.4		1.5	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Adj. Flow (vph)	9	6	10	0	1	27
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	15	10	0	28	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		10	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	0.99	0.99	1.06	1.01	1.09	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized

Intersection	
Int Delay, s/veh	5.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰	↑		↾	
Traffic Vol, veh/h	8	5	9	0	1	24
Future Vol, veh/h	8	5	9	0	1	24
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None		None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-2	2	-	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	9	6	10	0	1	27

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	10	0	-	0	34	10
Stage 1	-	-	-	-	10	-
Stage 2	-	-	-	-	24	-
Critical Hdwy	4.15	-	-	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	2.245	-	-	-	3.545	3.345
Pot Cap-1 Maneuver	1590	-	-	-	972	1063
Stage 1	-	-	-	-	1005	-
Stage 2	-	-	-	-	991	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1590	-	-	-	966	1063
Mov Cap-2 Maneuver	-	-	-	-	966	-
Stage 1	-	-	-	-	999	-
Stage 2	-	-	-	-	991	-

Approach	EB	WB	SB
HCM Control Delay, s	4.5	0	8.5
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1590	-	-	-	1059
HCM Lane V/C Ratio	0.006	-	-	-	0.027
HCM Control Delay (s)	7.3	0	-	-	8.5
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	24	12	775	17	12	755
Future Volume (vph)	24	12	775	17	12	755
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	13	12	12	12
Grade (%)	3%		0%			0%
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.954		0.997			
Flt Protected	0.968					0.999
Satd. Flow (prot)	1646	0	1864	0	0	1808
Flt Permitted	0.968					0.999
Satd. Flow (perm)	1646	0	1864	0	0	1808
Link Speed (mph)	30		40			40
Link Distance (ft)	122		242			300
Travel Time (s)	2.8		4.1			5.1
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Adj. Flow (vph)	27	14	881	19	14	858
Shared Lane Traffic (%)						
Lane Group Flow (vph)	41	0	900	0	0	872
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.02	1.02	0.96	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	1.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	24	12	775	17	12	755
Future Vol, veh/h	24	12	775	17	12	755
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	3	-	0	-	-	0
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	27	14	881	19	14	858

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1777	891	0	0	900	0
Stage 1	891	-	-	-	-	-
Stage 2	886	-	-	-	-	-
Critical Hdwy	7.05	6.55	-	-	4.15	-
Critical Hdwy Stg 1	6.05	-	-	-	-	-
Critical Hdwy Stg 2	6.05	-	-	-	-	-
Follow-up Hdwy	3.545	3.345	-	-	2.245	-
Pot Cap-1 Maneuver	66	313	-	-	742	-
Stage 1	341	-	-	-	-	-
Stage 2	343	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	64	313	-	-	742	-
Mov Cap-2 Maneuver	64	-	-	-	-	-
Stage 1	329	-	-	-	-	-
Stage 2	343	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay	78.7	0	0.2
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	87	742	-
HCM Lane V/C Ratio	-	-	0.47	0.018	-
HCM Control Delay (s)	-	-	78.7	9.9	0
HCM Lane LOS	-	-	F	A	A
HCM 95th %tile Q(veh)	-	-	2	0.1	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	9	5	14	1	5	2	12	1	1	1	1	19
Future Volume (vph)	9	5	14	1	5	2	12	1	1	1	1	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	11	12	12	12	12	12	10	12
Grade (%)		-2%			2%			0%			0%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.932			0.970			0.992			0.876	
Flt Protected		0.985			0.994			0.958			0.998	
Satd. Flow (prot)	0	1678	0	0	1670	0	0	1720	0	0	1477	0
Flt Permitted		0.985			0.994			0.958			0.998	
Satd. Flow (perm)	0	1678	0	0	1670	0	0	1720	0	0	1477	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		122			105			74			66	
Travel Time (s)		2.8			2.4			1.7			1.5	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Adj. Flow (vph)	10	6	16	1	6	2	14	1	1	1	1	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	32	0	0	9	0	0	16	0	0	24	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	1.01	1.06	1.01	1.00	1.00	1.00	1.00	1.09	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized

Intersection	
Int Delay, s/veh	5.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	9	5	14	1	5	2	12	1	1	1	1	19
Future Vol, veh/h	9	5	14	1	5	2	12	1	1	1	1	19
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-2	-	-	2	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	10	6	16	1	6	2	14	1	1	1	1	22

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	8	0	0	22	0	0	55	44	14	44	51	7
Stage 1	-	-	-	-	-	-	34	34	-	9	9	-
Stage 2	-	-	-	-	-	-	21	10	-	35	42	-
Critical Hdwy	4.15	-	-	4.15	-	-	7.15	6.55	6.25	7.15	6.55	6.25
Critical Hdwy Stg 1	-	-	-	-	-	-	6.15	5.55	-	6.15	5.55	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.15	5.55	-	6.15	5.55	-
Follow-up Hdwy	2.245	-	-	2.245	-	-	3.545	4.045	3.345	3.545	4.045	3.345
Pot Cap-1 Maneuver	1593	-	-	1574	-	-	935	842	1057	951	835	1067
Stage 1	-	-	-	-	-	-	974	861	-	1004	882	-
Stage 2	-	-	-	-	-	-	990	881	-	973	854	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1593	-	-	1574	-	-	911	836	1057	944	829	1067
Mov Cap-2 Maneuver	-	-	-	-	-	-	911	836	-	944	829	-
Stage 1	-	-	-	-	-	-	968	856	-	998	881	-
Stage 2	-	-	-	-	-	-	968	880	-	965	849	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.3	0.9	9	8.5
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	914	1593	-	-	1574	-	-	1046
HCM Lane V/C Ratio	0.017	0.006	-	-	0.001	-	-	0.023
HCM Control Delay (s)	9	7.3	0	-	7.3	0	-	8.5
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	41	20	921	29	13	826
Future Volume (vph)	41	20	921	29	13	826
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	13	12	12	12
Grade (%)	3%		0%			0%
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.956		0.996			
Flt Protected	0.967					0.999
Satd. Flow (prot)	1648	0	1862	0	0	1808
Flt Permitted	0.967					0.999
Satd. Flow (perm)	1648	0	1862	0	0	1808
Link Speed (mph)	30		40			40
Link Distance (ft)	122		242			300
Travel Time (s)	2.8		4.1			5.1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Adj. Flow (vph)	43	21	969	31	14	869
Shared Lane Traffic (%)						
Lane Group Flow (vph)	64	0	1000	0	0	883
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.02	1.02	0.96	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	5.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	41	20	921	29	13	826
Future Vol, veh/h	41	20	921	29	13	826
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized		None		None		None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	3	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	43	21	969	31	14	869

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1882	985	0	0	1000	0
Stage 1	985	-	-	-	-	-
Stage 2	897	-	-	-	-	-
Critical Hdwy	7.05	6.55	-	-	4.15	-
Critical Hdwy Stg 1	6.05	-	-	-	-	-
Critical Hdwy Stg 2	6.05	-	-	-	-	-
Follow-up Hdwy	3.545	3.345	-	-	2.245	-
Pot Cap-1 Maneuver	56	274	-	-	681	-
Stage 1	303	-	-	-	-	-
Stage 2	339	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	54	274	-	-	681	-
Mov Cap-2 Maneuver	54	-	-	-	-	-
Stage 1	291	-	-	-	-	-
Stage 2	339	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	169.5	0	0.2
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	73	681	-
HCM Lane V/C Ratio	-	-	0.88	0.02	-
HCM Control Delay (s)	-	-	169.5	10.4	0
HCM Lane LOS	-	-	F	B	A
HCM 95th %tile Q(veh)	-	-	4.4	0.1	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	8	5	29	2	9	0	27	2	2	1	2	24
Future Volume (vph)	8	5	29	2	9	0	27	2	2	1	2	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	11	12	12	12	12	12	10	12
Grade (%)		-2%			2%			0%			0%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.907						0.992			0.878	
Flt Protected		0.991			0.992			0.958			0.998	
Satd. Flow (prot)	0	1643	0	0	1718	0	0	1720	0	0	1480	0
Flt Permitted		0.991			0.992			0.958			0.998	
Satd. Flow (perm)	0	1643	0	0	1718	0	0	1720	0	0	1480	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		122			105			74			66	
Travel Time (s)		2.8			2.4			1.7			1.5	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Adj. Flow (vph)	9	6	33	2	10	0	31	2	2	1	2	27
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	48	0	0	12	0	0	35	0	0	30	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	1.01	1.06	1.01	1.00	1.00	1.00	1.00	1.09	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	5.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	8	5	29	2	9	0	27	2	2	1	2	24
Future Vol, veh/h	8	5	29	2	9	0	27	2	2	1	2	24
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-2	-	-	2	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	9	6	33	2	10	0	31	2	2	1	2	27

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	10	0	0	39	0	0	70	55	23	57	71	10
Stage 1	-	-	-	-	-	-	41	41	-	14	14	-
Stage 2	-	-	-	-	-	-	29	14	-	43	57	-
Critical Hdwy	4.15	-	-	4.15	-	-	7.15	6.55	6.25	7.15	6.55	6.25
Critical Hdwy Stg 1	-	-	-	-	-	-	6.15	5.55	-	6.15	5.55	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.15	5.55	-	6.15	5.55	-
Follow-up Hdwy	2.245	-	-	2.245	-	-	3.545	4.045	3.345	3.545	4.045	3.345
Pot Cap-1 Maneuver	1590	-	-	1552	-	-	915	830	1045	933	814	1063
Stage 1	-	-	-	-	-	-	966	855	-	998	878	-
Stage 2	-	-	-	-	-	-	980	878	-	964	841	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1590	-	-	1552	-	-	885	824	1045	924	808	1063
Mov Cap-2 Maneuver	-	-	-	-	-	-	885	824	-	924	808	-
Stage 1	-	-	-	-	-	-	960	850	-	992	877	-
Stage 2	-	-	-	-	-	-	951	877	-	954	836	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	4.4	1.3	9.2	8.6
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	890	1590	-	-	1552	-	-	1033
HCM Lane V/C Ratio	0.04	0.006	-	-	0.001	-	-	0.03
HCM Control Delay (s)	9.2	7.3	0	-	7.3	0	-	8.6
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

Stormwater Management Report

HSC Balmville, LLC

Proposed Retail Development

US Route 9W & N. Hill Lane
Town of Newburgh
Orange County, NY

February 25, 2021

Prepared by:

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No. B190123

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SECTION

I. Introduction

HSC Balmville, LLC is proposing to purchase a 2.2+/- acre parcel to incorporate the construction of a 9,100+/- sq. ft. Retail Store. The site is located at the south east corner of intersection of US Route 9W & North Hill Lane, in the Town of Newburgh, Orange County, New York.

Proposed features include landscaping, lighting, paved parking and access drives, trash enclosure, utilities and storm water management practices as shown on the Site Plan drawings prepared by Bohler Engineering MA, LLC.

This report will briefly discuss the proposed site development and provide a detailed analysis of the existing and proposed site conditions and the proposed stormwater management system. Hydraulic calculations included in this report were generated for the 1, 10, 25 and 100 year storm events utilizing the SCS TR-20 and HydroCad Stormwater modeling software. Rainfall data provided within the Town Code was used for all HydroCad modeling.

II. Existing Stormwater Conditions Summary:

The 2.2 +/- acre parcel is currently undeveloped with woodlands in the north west corner and along the southern boundary of the site. A large portion of the site is covered in wetlands and has various brush/ scrub ground cover.

The topography of the site is sloped such that stormwater flows south and easterly from a high point of the site in the north west corner of the lot into on-site Federal Wetlands.

The existing project site was analyzed as one watershed area, designated as Watershed Area E-1.

Watershed Area E-1 is comprised of approximately 2.7 acres of the undeveloped existing site described above along with existing impervious cover from a portion of NYS Route 9W and North Hill Lame. Stormwater from E-1 travels northeast via overland and shallow concentrated flow towards an existing swale leading to an existing culvert, which has been designed as the design point, before running under North Hill Lane.

The existing watershed area and topography are illustrated on the Existing Watershed Plan included on the next page of this report.

WATERSHED AREAS	TOTAL	HSG D
WATERSHED AREA E-1	116,327 SQ. FT.	
WOODED	45,788 SQ. FT.	45,788 SQ. FT.
WOOD/GRASS COMBO	59,481 SQ. FT.	59,481 SQ. FT.
IMPERVIOUS	11,058 SQ. FT.	11,058 SQ. FT.

E-1

NORTH HILL LANE
(ASPHALT ROADWAY)
(PUBLIC R.O.W. = WIDTH VARIES)
TWO WAY TRAFFIC

NYS ROUTE 9W
(ASPHALT ROADWAY)
(PUBLIC R.O.W. = WIDTH VARIES)
TWO WAY TRAFFIC

S15°10'49"W 345.35'
(MAP REF. #6 S31°00'00"E)

S85°51'01"E
(MAP REF. #6
N47°28'10"E)
310.55'

DESIGN POINT 1
(DP-1)

TOC

EXIST. VEGETATION
(TO REMAIN)

6' STOCKADE FENCE

20' DRAINAGE EASEMENT

WOODED AREA

N59°24'55"W 241.62'
(MAP REF. #6 N45°54'16"E)

N14°08'55"E
(MAP REF. #6 S32°30'30"E)
344.87'

UP# CHGE N37939

UP# CHGE 154964

UP# CHGE N10440

GUY POLE# CHGE 117996 VZ15

UP# CHGE 38532

UP# CHGE N11472 VZ110

UP# CHGE 11471N

CONC. CURB

E.O.P.

S.W.L. (TYP.)

D.A.Y.L. (TYP.)

S.T.L. (TYP.)

6' C.L.F.

114"

110"

EXISTING DRAINAGE TRIBUTARY MAP

PREPARED BY

BOHLER

NOT TO SCALE

III. Proposed Stormwater Conditions Summary:

The proposed development is designed to mimic the existing drainage patterns and reduce the discharge flow rate from the pre-developed to post-developed condition.

The proposed project site was analyzed as one watershed with two sub catchment areas designated as Watershed Area P-1A and P-1B. The watersheds have unique flow paths and therefore have been analyzed individually.

Watershed Area P-1A is approximately 0.40 acres comprised of impervious material such as drives, walks and parking areas along with seeded or sodded grass areas used for stormwater management.

Stormwater from this area travels via overland flow to a catch basin leading to the underground treatment system for pretreatment.

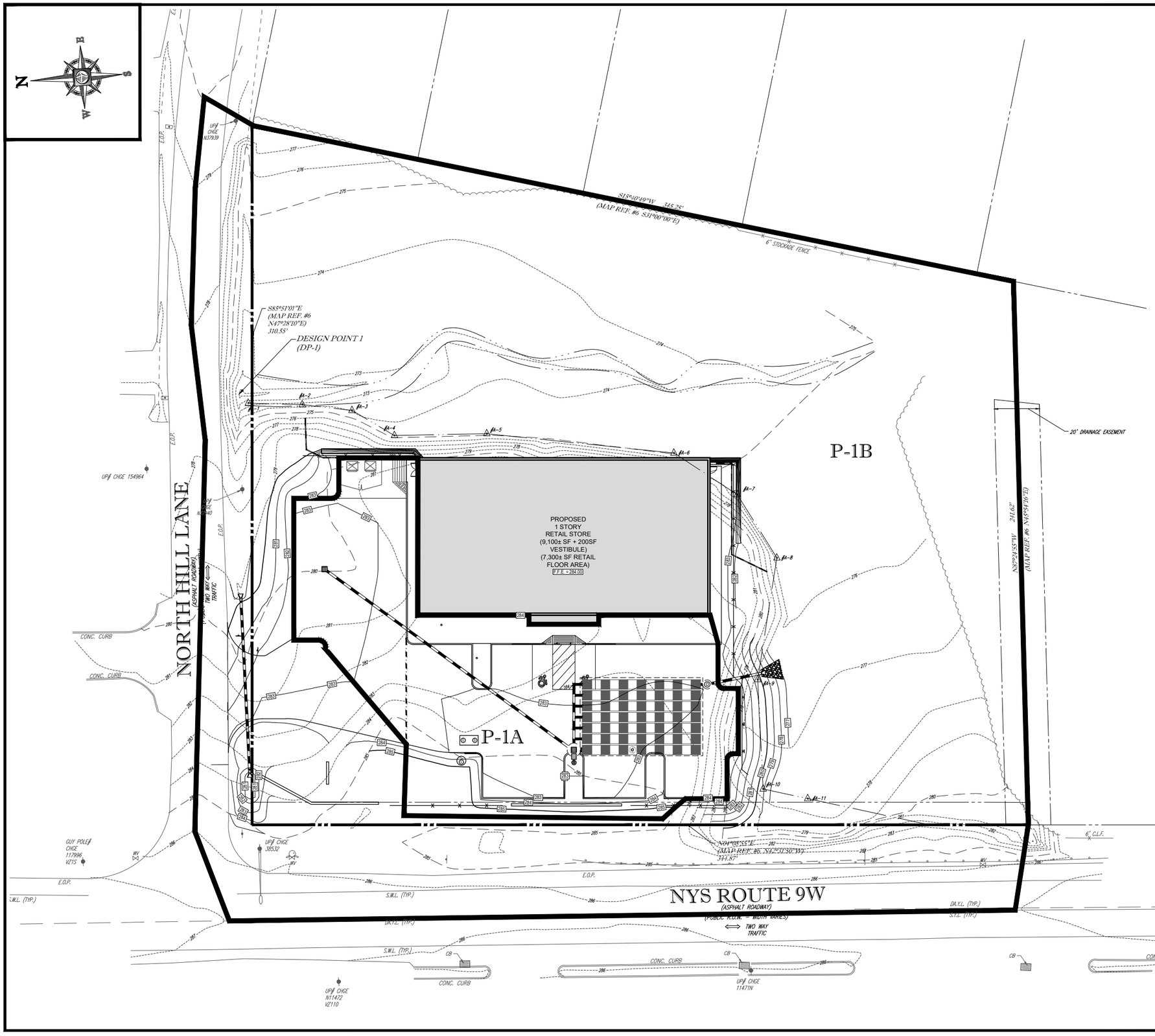
Once stormwater reaches the underground detention system it enters a isolator row, similar to the rest of the underground storm system but wrapped in filter fabric to prevent any sediment from leaving the row of chambers. From there hydrostatic pressure pushes the water through the filter fabric and voids in the stone to the detention chambers at an equal rate effectively pretreating all stormwater as it flows through the isolator row

The underground chambers detain stormwater and contains an outlet control structure that allows stormwater to flow to the existing wetlands at a reduced rate before traveling on to the Design Point.

Watershed Area P-1B is approximately 2.3 acre comprised of existing woodlands, brush, and scrub areas along with impervious areas from the building and existing and proposed pavement. Stormwater from this area travels via overland and shallow concentrated flow directly towards design point 1.

The proposed watershed area and topography are illustrated on the Proposed Watershed Plan included on the next page of this report.

WATERSHED AREAS	TOTAL	HSG D
WATERSHED AREA P-1A	17,500 SQ. FT.	
GREENSPACE	1,681 SQ. FT.	1,681 SQ. FT.
IMPERVIOUS	15,819 SQ. FT.	15,819 SQ. FT.
WATERSHED AREA P-1B	98,827 SQ. FT.	
WOODED	6,791 SQ. FT.	6,791 SQ. FT.
WOOD/GRASS COMBO	54,748 SQ. FT.	54,748 SQ. FT.
IMPERVIOUS	22,731 SQ. FT.	22,731 SQ. FT.
GREENSPACE	14,557 SQ. FT.	14,557 SQ. FT.



PROPOSED DRAINAGE TRIBUTARY MAP

PREPARED BY

BOHLER ENGINEERING

NOT TO SCALE

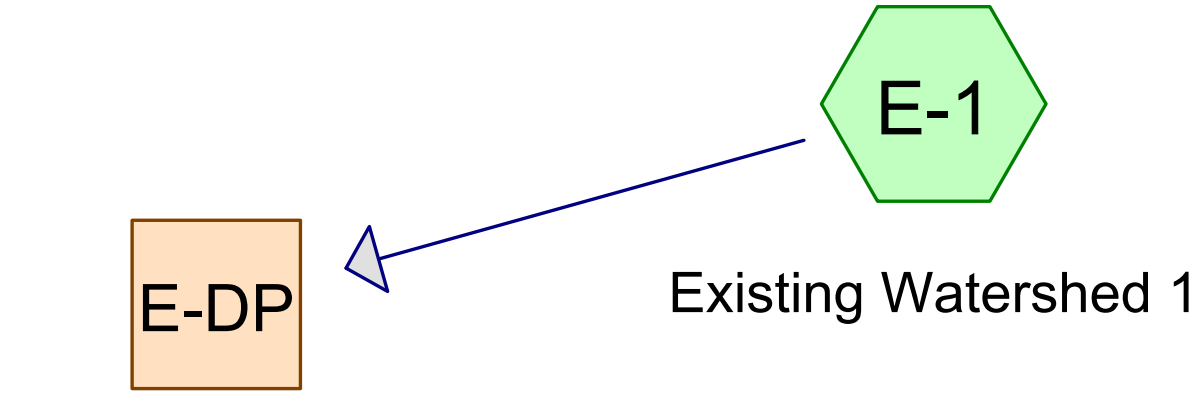
Conclusion:

The proposed development has been designed to release stormwater at a rate not to exceed pre-development conditions for each storm event. The facility is designed to provide stormwater detention storage and discharge control.

The reduced flow rate from the site ensures no negative effects from the proposed development on any down stream culverts.

The proposed stormwater management system as designed will serve to mitigate the effects of the development of the parcel, such that the proposed use will not adversely affect any downstream or adjacent properties.

WATERSHED 1 - PRE-DEVELOPMENT AND POST DEVELOPMENT STORM WATER DISCHARGE COMPARISON TABLE			
STORM EVENT	PRE-DEVELOPMENT PEAK DISCHARGE (CFS)	POST-DEVELOPMENT PEAK DISCHARGE (CFS)	% REDUCTION PRE TO POST
1 YEAR	3.26	3.11	4.6%
10 YEAR	8.91	8.57	3.8%
25 YEAR	11.17	10.72	4.0%
100 YEAR	14.56	14.08	3.3%



EX. Design Point

Subcat Reach Pond Link

Routing Diagram for DG Balmville - All Cond
Prepared by Bohler Engineering, Printed 2/26/2021

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.254	98	Unconnected pavement, HSG D (E-1)
1.051	79	Woods, Fair, HSG D (E-1)
1.365	82	Woods/grass comb., Fair, HSG D (E-1)
2.671	**82**	**TOTAL AREA**

Summary for Subcatchment E-1: Existing Watershed 1

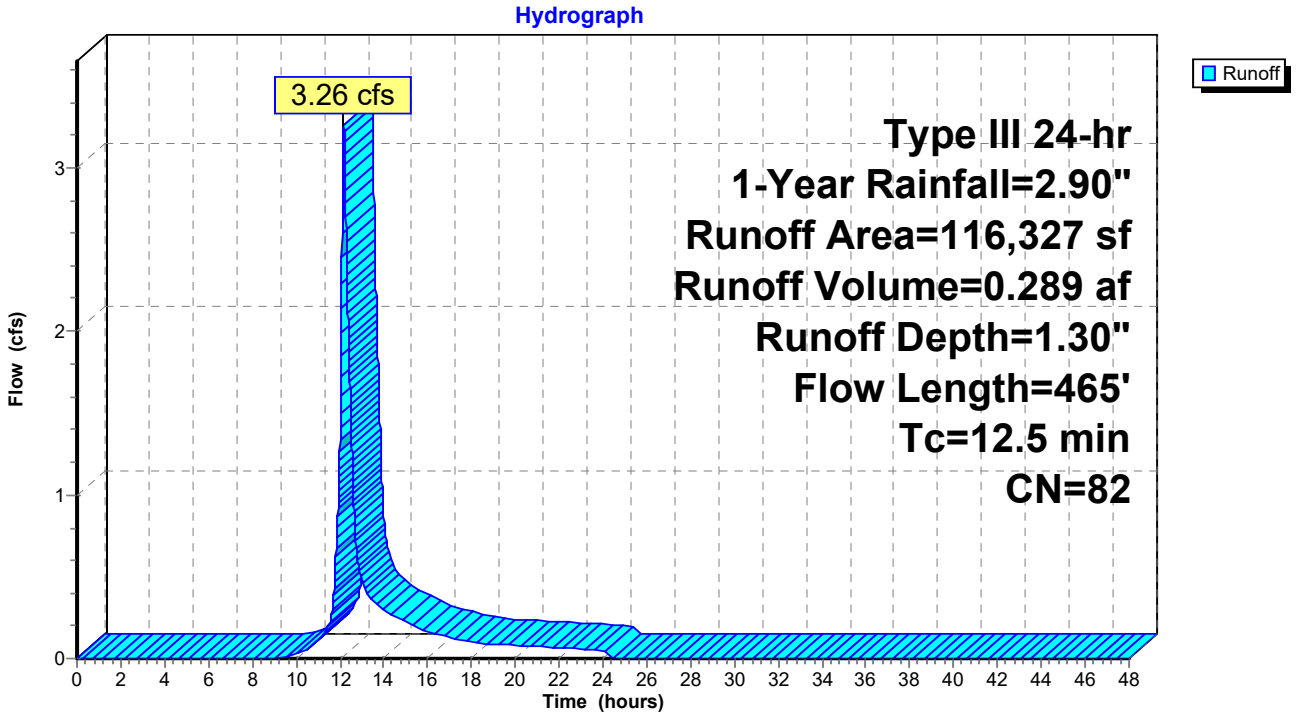
Runoff = 3.26 cfs @ 12.18 hrs, Volume= 0.289 af, Depth= 1.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-Year Rainfall=2.90"

Area (sf)	CN	Description
45,788	79	Woods, Fair, HSG D
59,481	82	Woods/grass comb., Fair, HSG D
11,058	98	Unconnected pavement, HSG D
116,327	82	Weighted Average
105,269		90.49% Pervious Area
11,058		9.51% Impervious Area
11,058		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	23	0.0550	1.53		**Sheet Flow, Sheet Flow - Roadway** Smooth surfaces n= 0.011 P2= 3.16"
9.0	77	0.1060	0.14		**Sheet Flow, Sheet Flow - Woods** Woods: Light underbrush n= 0.400 P2= 3.16"
1.0	158	0.2700	2.60		**Shallow Concentrated Flow, Shallow Concentrated - Woods** Woodland Kv= 5.0 fps
2.2	207	0.0111	1.58		**Shallow Concentrated Flow, Shallow Concentrated - Waterway** Grassed Waterway Kv= 15.0 fps
12.5	465	Total			

Subcatchment E-1: Existing Watershed 1

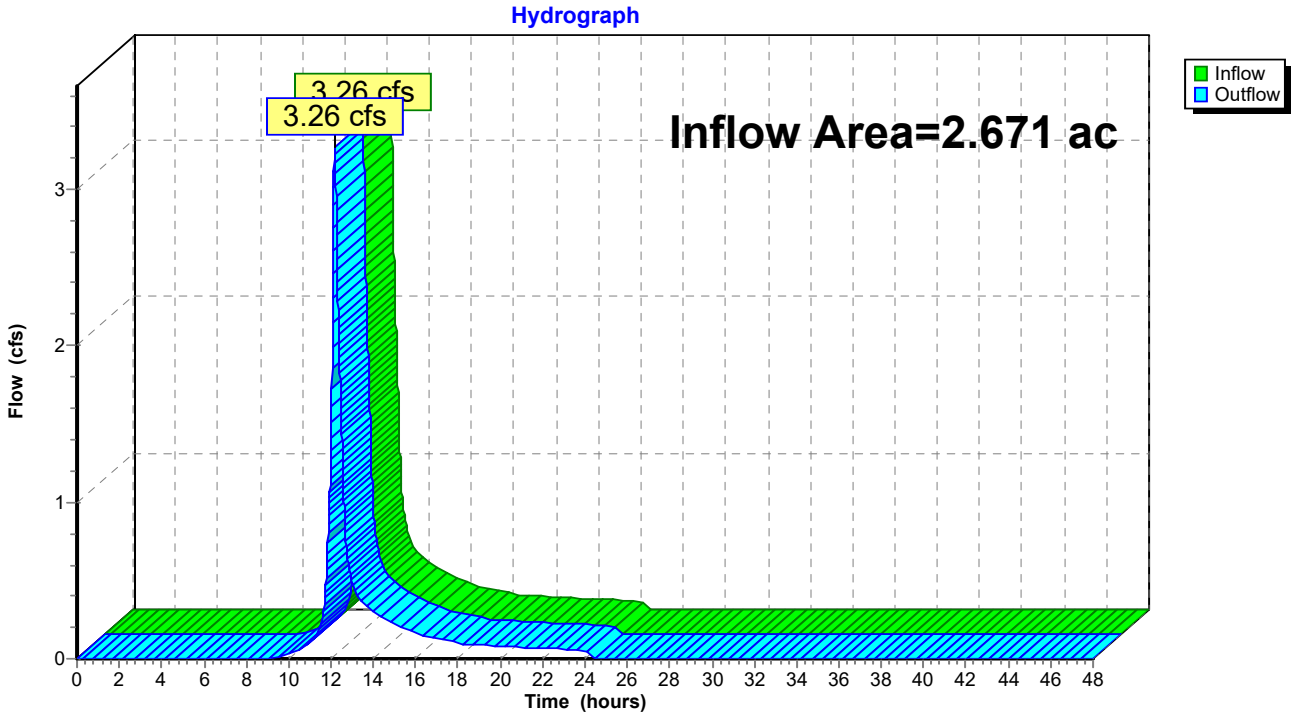


Summary for Reach E-DP: EX. Design Point

Inflow Area = 2.671 ac, 9.51% Impervious, Inflow Depth = 1.30" for 1-Year event
Inflow = 3.26 cfs @ 12.18 hrs, Volume= 0.289 af
Outflow = 3.26 cfs @ 12.18 hrs, Volume= 0.289 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Reach E-DP: EX. Design Point



Summary for Subcatchment E-1: Existing Watershed 1

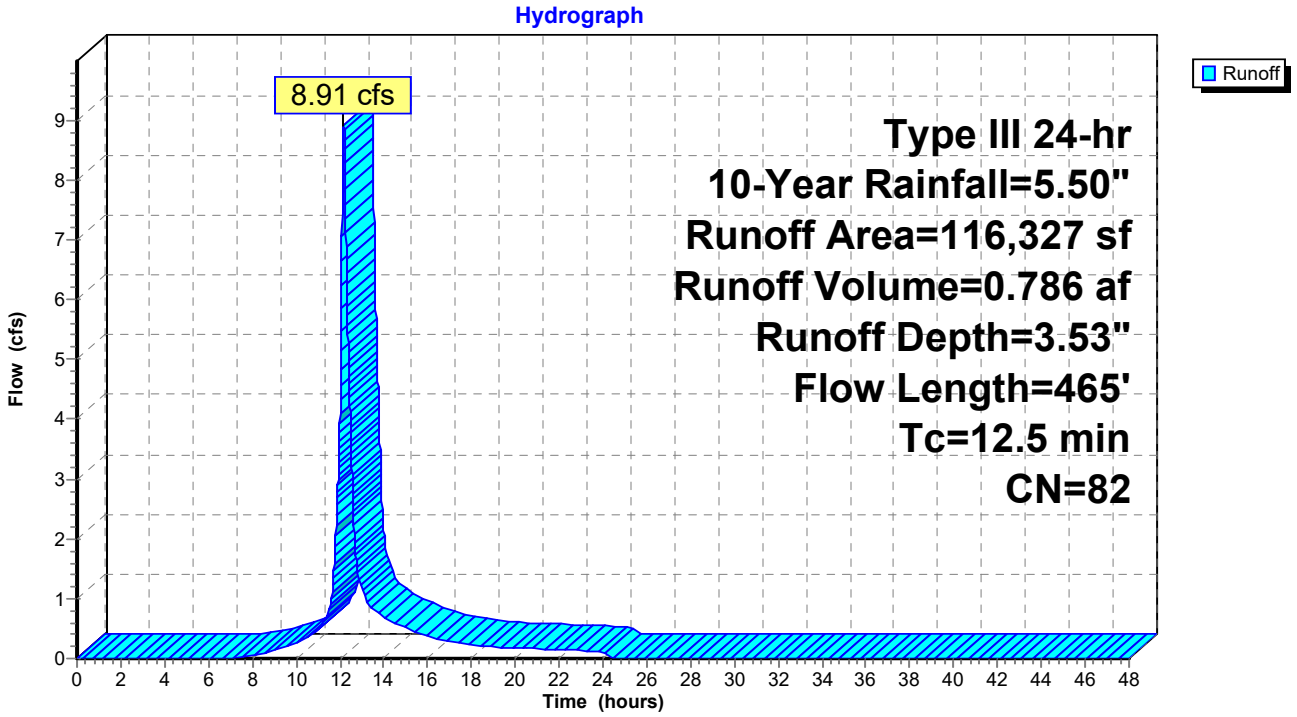
Runoff = 8.91 cfs @ 12.17 hrs, Volume= 0.786 af, Depth= 3.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.50"

Area (sf)	CN	Description
45,788	79	Woods, Fair, HSG D
59,481	82	Woods/grass comb., Fair, HSG D
11,058	98	Unconnected pavement, HSG D
116,327	82	Weighted Average
105,269		90.49% Pervious Area
11,058		9.51% Impervious Area
11,058		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	23	0.0550	1.53		**Sheet Flow, Sheet Flow - Roadway** Smooth surfaces n= 0.011 P2= 3.16"
9.0	77	0.1060	0.14		**Sheet Flow, Sheet Flow - Woods** Woods: Light underbrush n= 0.400 P2= 3.16"
1.0	158	0.2700	2.60		**Shallow Concentrated Flow, Shallow Concentrated - Woods** Woodland Kv= 5.0 fps
2.2	207	0.0111	1.58		**Shallow Concentrated Flow, Shallow Concentrated - Waterway** Grassed Waterway Kv= 15.0 fps
12.5	465	Total			

Subcatchment E-1: Existing Watershed 1

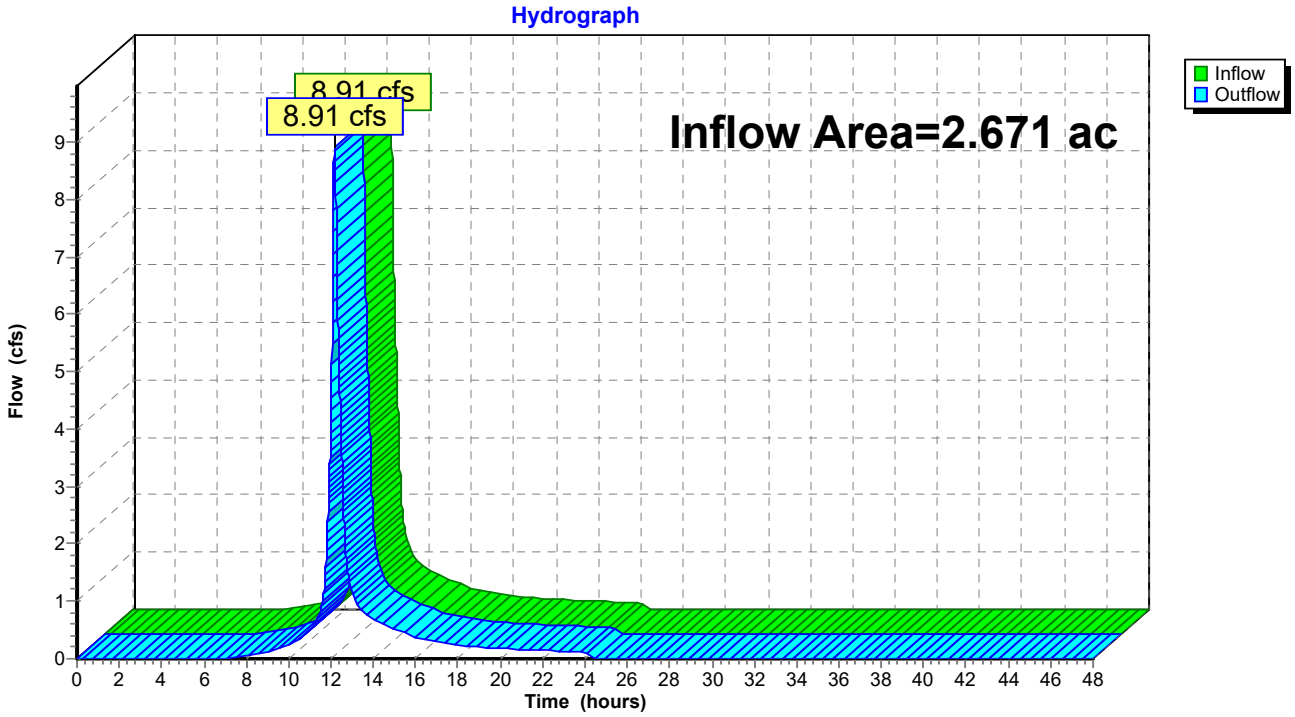


Summary for Reach E-DP: EX. Design Point

Inflow Area = 2.671 ac, 9.51% Impervious, Inflow Depth = 3.53" for 10-Year event
Inflow = 8.91 cfs @ 12.17 hrs, Volume= 0.786 af
Outflow = 8.91 cfs @ 12.17 hrs, Volume= 0.786 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Reach E-DP: EX. Design Point



Summary for Subcatchment E-1: Existing Watershed 1

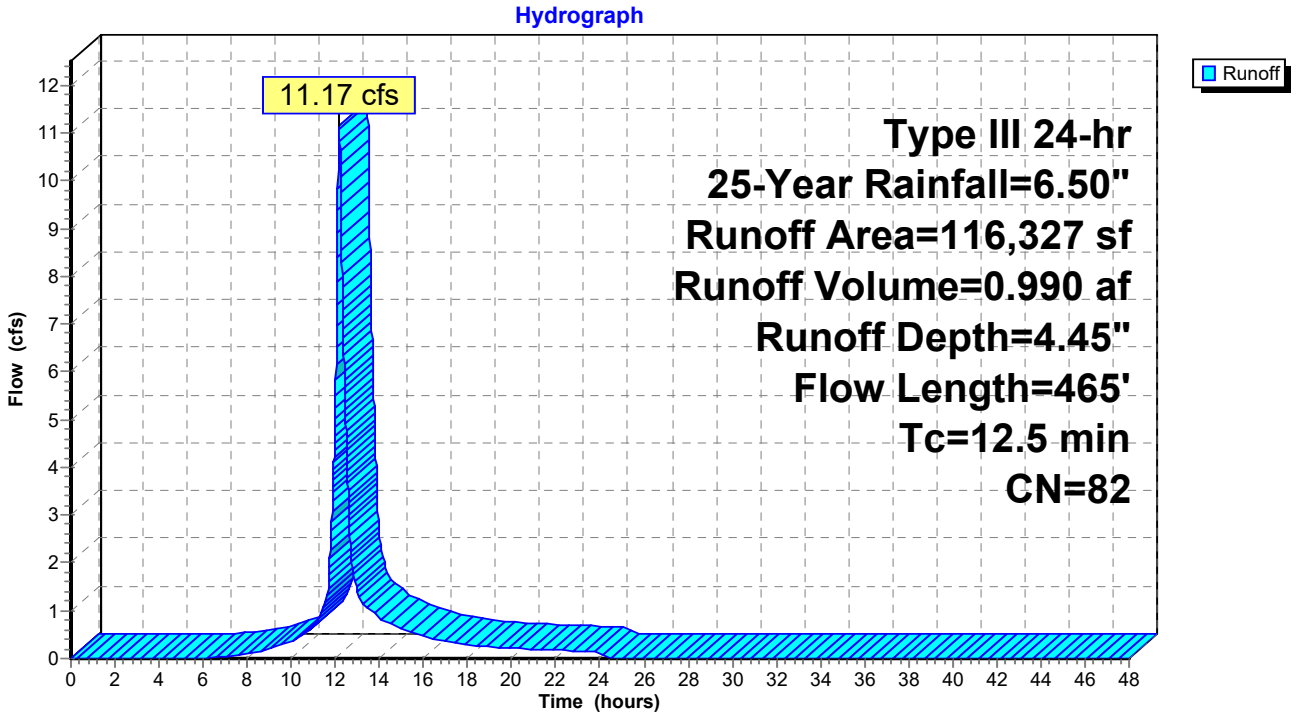
Runoff = 11.17 cfs @ 12.17 hrs, Volume= 0.990 af, Depth= 4.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=6.50"

Area (sf)	CN	Description
45,788	79	Woods, Fair, HSG D
59,481	82	Woods/grass comb., Fair, HSG D
11,058	98	Unconnected pavement, HSG D
116,327	82	Weighted Average
105,269		90.49% Pervious Area
11,058		9.51% Impervious Area
11,058		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	23	0.0550	1.53		**Sheet Flow, Sheet Flow - Roadway** Smooth surfaces n= 0.011 P2= 3.16"
9.0	77	0.1060	0.14		**Sheet Flow, Sheet Flow - Woods** Woods: Light underbrush n= 0.400 P2= 3.16"
1.0	158	0.2700	2.60		**Shallow Concentrated Flow, Shallow Concentrated - Woods** Woodland Kv= 5.0 fps
2.2	207	0.0111	1.58		**Shallow Concentrated Flow, Shallow Concentrated - Waterway** Grassed Waterway Kv= 15.0 fps
12.5	465	Total			

Subcatchment E-1: Existing Watershed 1

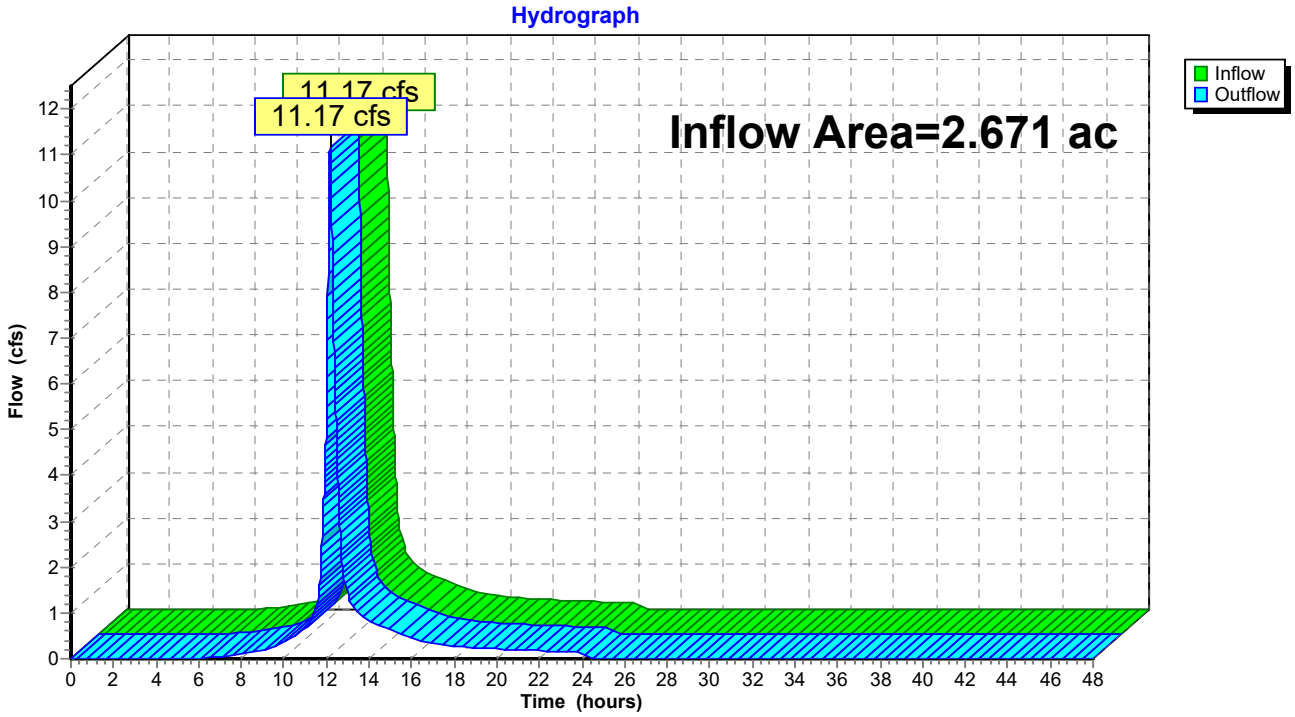


Summary for Reach E-DP: EX. Design Point

Inflow Area = 2.671 ac, 9.51% Impervious, Inflow Depth = 4.45" for 25-Year event
Inflow = 11.17 cfs @ 12.17 hrs, Volume= 0.990 af
Outflow = 11.17 cfs @ 12.17 hrs, Volume= 0.990 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Reach E-DP: EX. Design Point



Summary for Subcatchment E-1: Existing Watershed 1

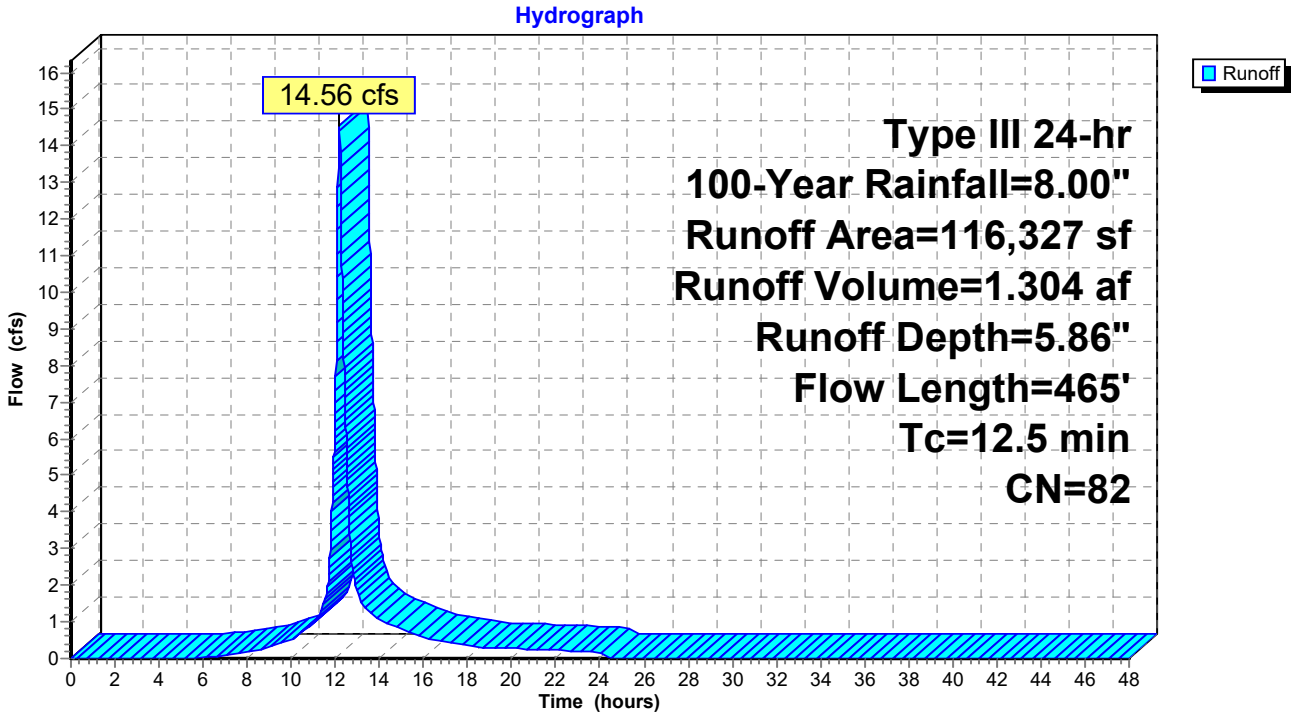
Runoff = 14.56 cfs @ 12.17 hrs, Volume= 1.304 af, Depth= 5.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.00"

Area (sf)	CN	Description
45,788	79	Woods, Fair, HSG D
59,481	82	Woods/grass comb., Fair, HSG D
11,058	98	Unconnected pavement, HSG D
116,327	82	Weighted Average
105,269		90.49% Pervious Area
11,058		9.51% Impervious Area
11,058		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	23	0.0550	1.53		**Sheet Flow, Sheet Flow - Roadway** Smooth surfaces n= 0.011 P2= 3.16"
9.0	77	0.1060	0.14		**Sheet Flow, Sheet Flow - Woods** Woods: Light underbrush n= 0.400 P2= 3.16"
1.0	158	0.2700	2.60		**Shallow Concentrated Flow, Shallow Concentrated - Woods** Woodland Kv= 5.0 fps
2.2	207	0.0111	1.58		**Shallow Concentrated Flow, Shallow Concentrated - Waterway** Grassed Waterway Kv= 15.0 fps
12.5	465	Total			

Subcatchment E-1: Existing Watershed 1

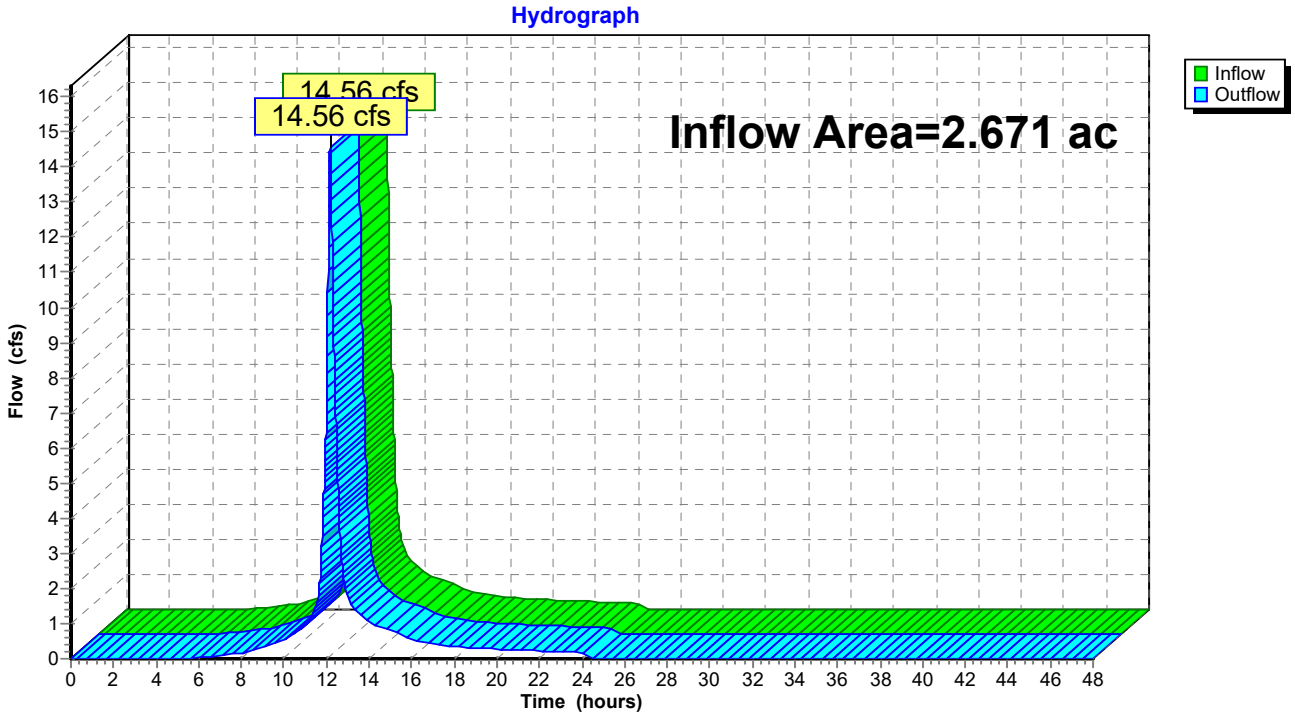


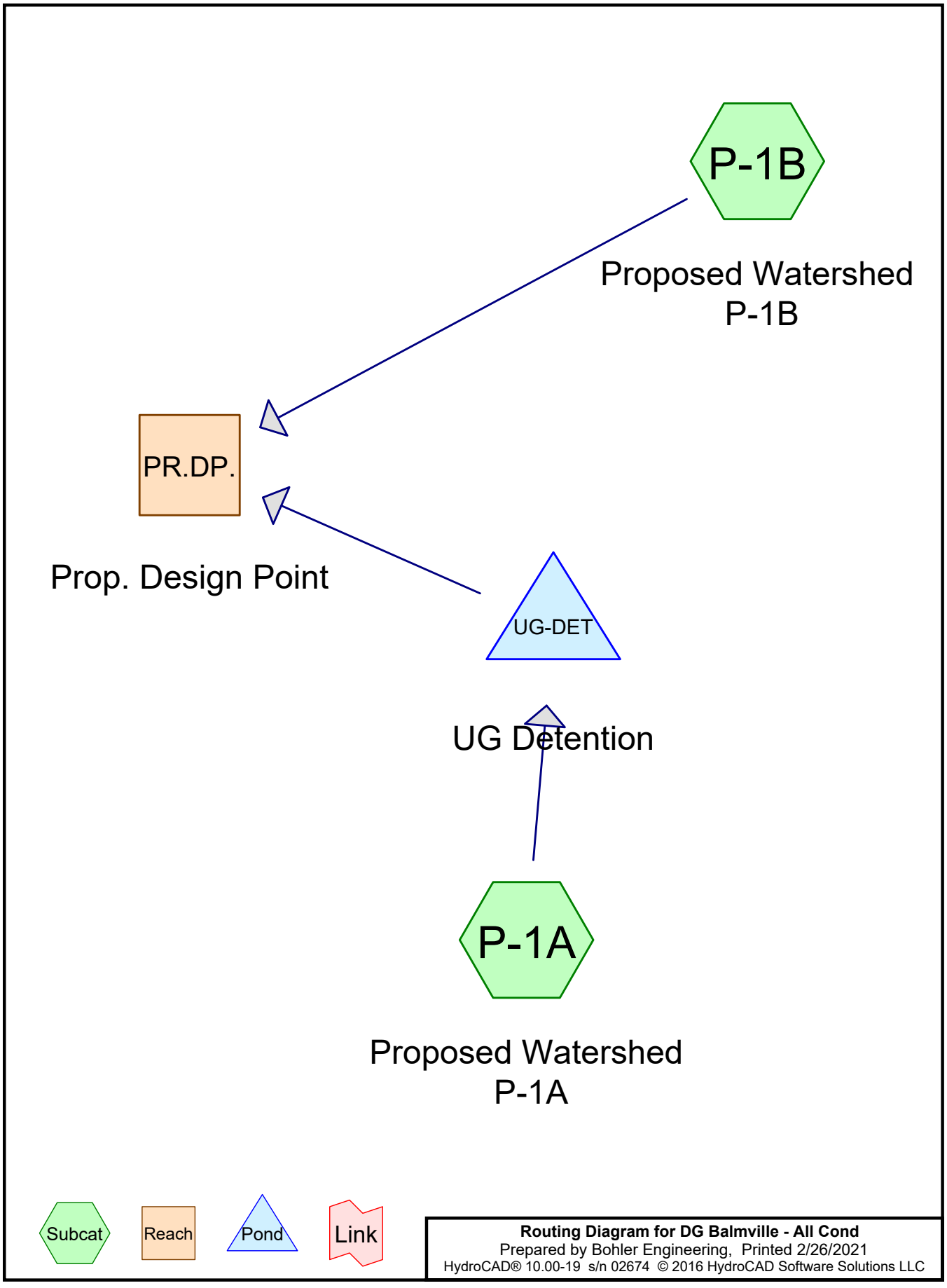
Summary for Reach E-DP: EX. Design Point

Inflow Area = 2.671 ac, 9.51% Impervious, Inflow Depth = 5.86" for 100-Year event
Inflow = 14.56 cfs @ 12.17 hrs, Volume= 1.304 af
Outflow = 14.56 cfs @ 12.17 hrs, Volume= 1.304 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Reach E-DP: EX. Design Point





Routing Diagram for DG Balmville - All Cond
Prepared by Bohler Engineering, Printed 2/26/2021

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.373	80	>75% Grass cover, Good, HSG D (P-1A, P-1B)
0.363	98	Paved parking, HSG D (P-1A)
0.522	98	Unconnected pavement, HSG D (P-1B)
0.156	79	Woods, Fair, HSG D (P-1B)
1.257	82	Woods/grass comb., Fair, HSG D (P-1B)
2.671	**87**	**TOTAL AREA**

Summary for Subcatchment P-1A: Proposed Watershed P-1A

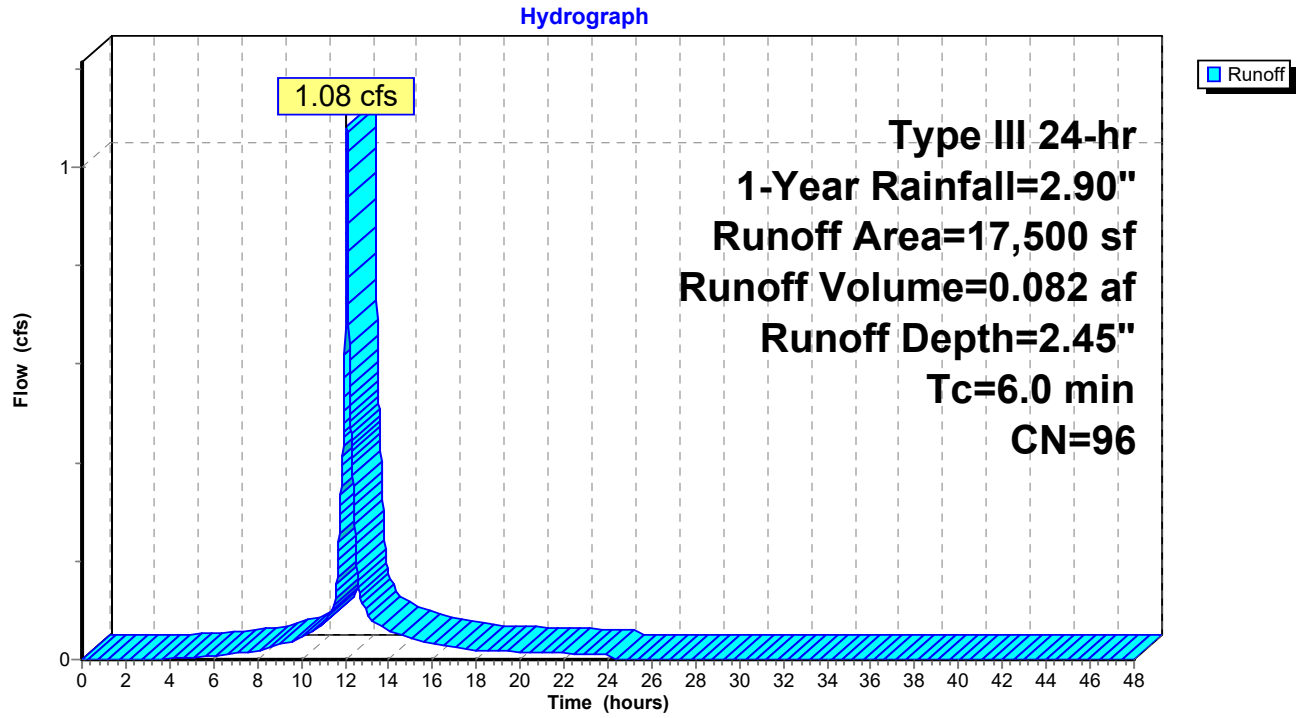
Runoff = 1.08 cfs @ 12.08 hrs, Volume= 0.082 af, Depth= 2.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-Year Rainfall=2.90"

Area (sf)	CN	Description
15,819	98	Paved parking, HSG D
1,681	80	>75% Grass cover, Good, HSG D
17,500	96	Weighted Average
1,681		9.61% Pervious Area
15,819		90.39% Impervious Area

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

Subcatchment P-1A: Proposed Watershed P-1A



Summary for Subcatchment P-1B: Proposed Watershed P-1B

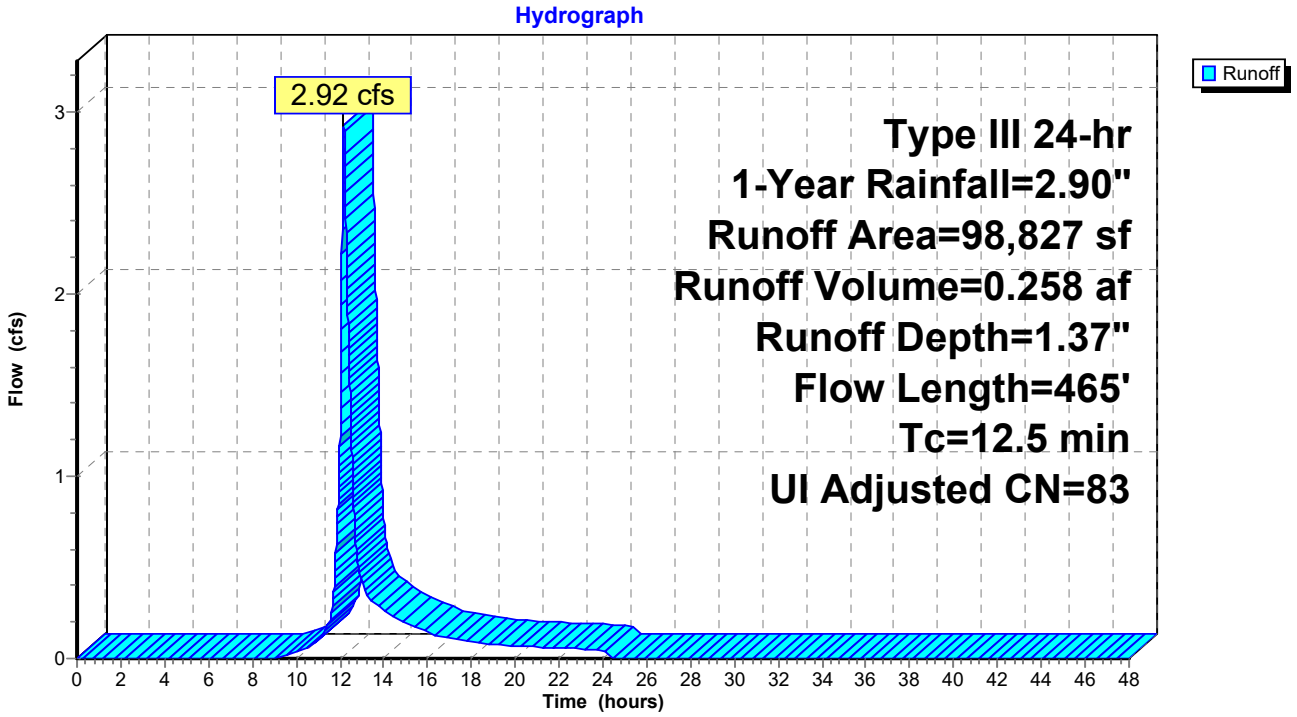
Runoff = 2.92 cfs @ 12.18 hrs, Volume= 0.258 af, Depth= 1.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-Year Rainfall=2.90"

Area (sf)	CN	Adj	Description
6,791	79		Woods, Fair, HSG D
54,748	82		Woods/grass comb., Fair, HSG D
22,731	98		Unconnected pavement, HSG D
14,557	80		>75% Grass cover, Good, HSG D
98,827	85	83	Weighted Average, UI Adjusted
76,096			77.00% Pervious Area
22,731			23.00% Impervious Area
22,731			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	23	0.0550	1.53		**Sheet Flow, Sheet Flow - Roadway** Smooth surfaces n= 0.011 P2= 3.16"
9.0	77	0.1060	0.14		**Sheet Flow, Sheet Flow - Woods** Woods: Light underbrush n= 0.400 P2= 3.16"
1.0	158	0.2700	2.60		**Shallow Concentrated Flow, Shallow Concentrated - Woods** Woodland Kv= 5.0 fps
2.2	207	0.0111	1.58		**Shallow Concentrated Flow, Shallow Concentrated - Waterway** Grassed Waterway Kv= 15.0 fps
12.5	465	Total			

Subcatchment P-1B: Proposed Watershed P-1B

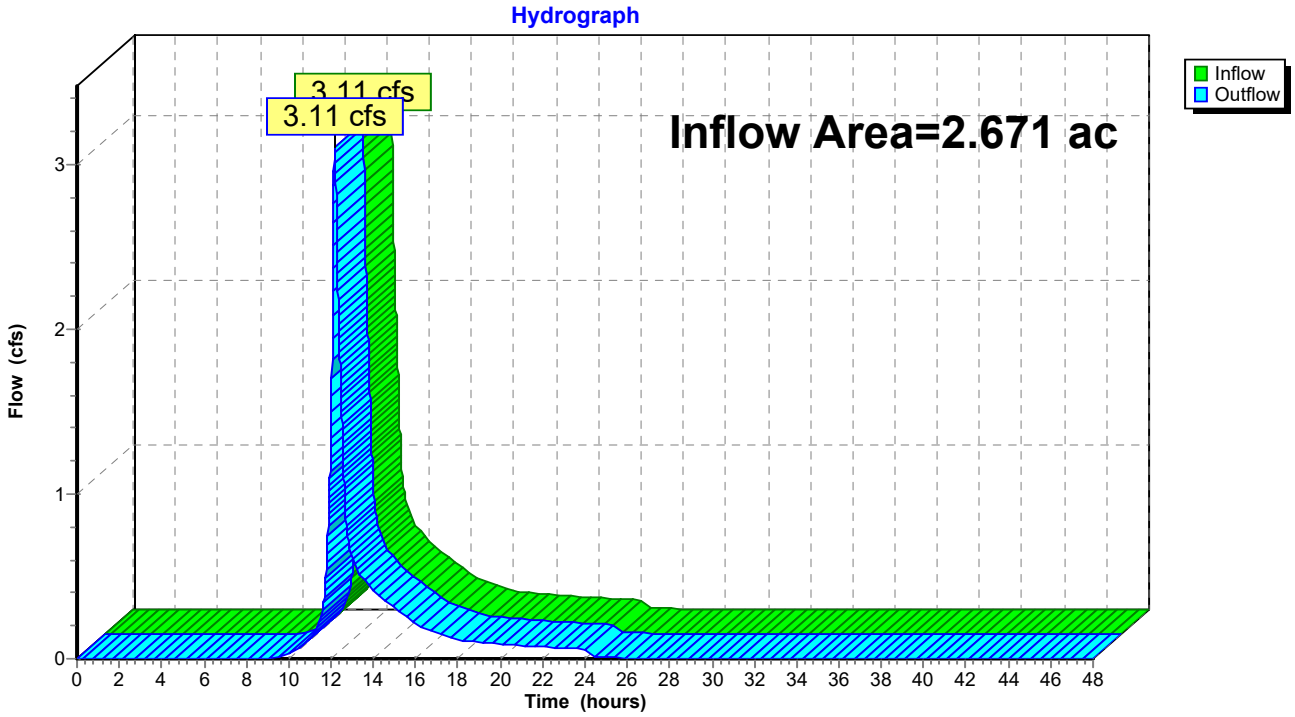


Summary for Reach PR.DP.: Prop. Design Point

Inflow Area = 2.671 ac, 33.14% Impervious, Inflow Depth = 1.49" for 1-Year event
Inflow = 3.11 cfs @ 12.18 hrs, Volume= 0.332 af
Outflow = 3.11 cfs @ 12.18 hrs, Volume= 0.332 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Reach PR.DP.: Prop. Design Point



Summary for Pond UG-DET: UG Detention

Inflow Area = 0.402 ac, 90.39% Impervious, Inflow Depth = 2.45" for 1-Year event
Inflow = 1.08 cfs @ 12.08 hrs, Volume= 0.082 af
Outflow = 0.21 cfs @ 12.52 hrs, Volume= 0.073 af, Atten= 81%, Lag= 26.1 min
Primary = 0.21 cfs @ 12.52 hrs, Volume= 0.073 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 279.66' @ 12.52 hrs Surf.Area= 1,858 sf Storage= 1,723 cf

Plug-Flow detention time= 184.1 min calculated for 0.073 af (89% of inflow)
Center-of-Mass det. time= 132.9 min (909.8 - 776.9)

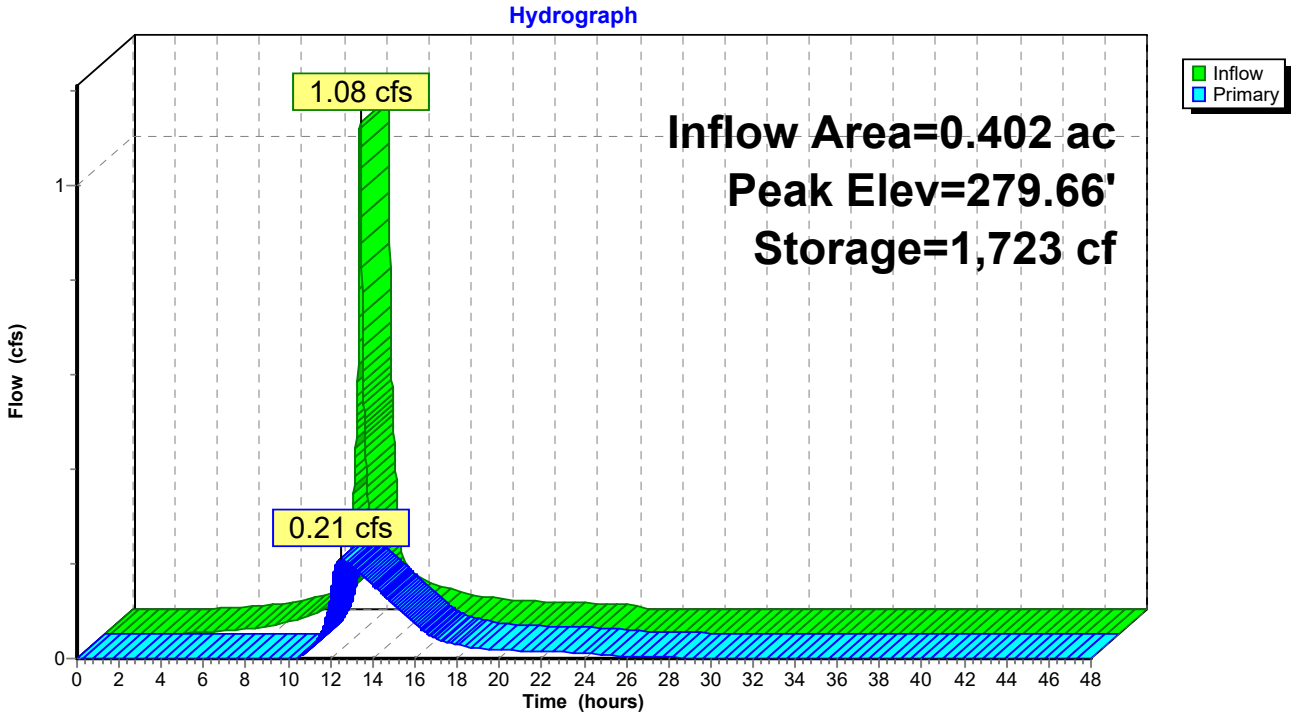
Volume	Invert	Avail.Storage	Storage Description
#1A	278.25'	1,700 cf	**34.75'W x 53.46'L x 3.50'H Field A** 6,502 cf Overall - 2,251 cf Embedded = 4,251 cf x 40.0% Voids
#2A	278.75'	2,251 cf	**ADS_StormTech SC-740 +Cap** x 49 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 7 Rows of 7 Chambers
		3,951 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	278.75'	**12.0" Round Culvert** L= 25.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 278.75' / 278.25' S= 0.0200 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Device 1	278.75'	**3.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	279.75'	**6.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	281.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Primary	282.15'	**2.5' long x 2.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 Coef. (English) 2.48 2.60 2.60 2.60 2.64 2.65 2.68 2.75 2.74 2.76 2.89 3.05 3.19 3.32

Primary OutFlow Max=0.21 cfs @ 12.52 hrs HW=279.66' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.21 cfs of 1.93 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 0.21 cfs @ 4.27 fps)
  - **3=Orifice/Grate** (Controls 0.00 cfs)
  - **4=Orifice/Grate** (Controls 0.00 cfs)
- **5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond UG-DET: UG Detention



Summary for Subcatchment P-1A: Proposed Watershed P-1A

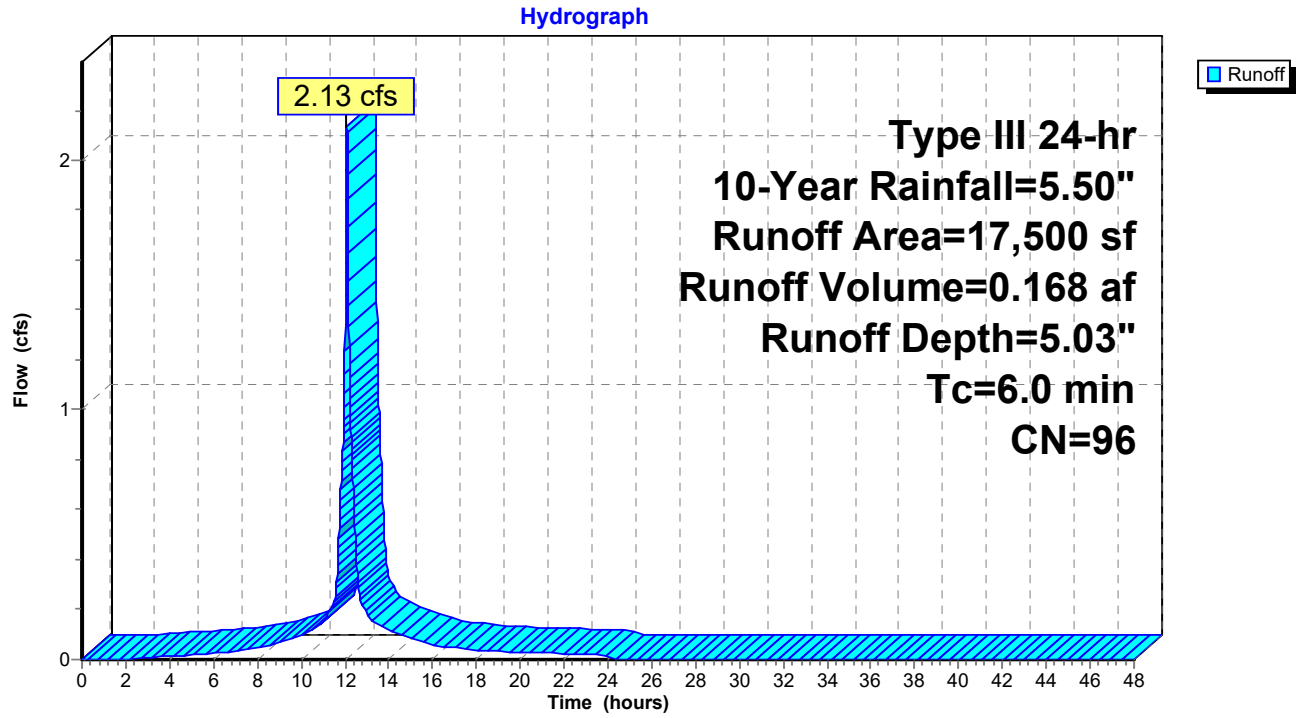
Runoff = 2.13 cfs @ 12.08 hrs, Volume= 0.168 af, Depth= 5.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.50"

Area (sf)	CN	Description
15,819	98	Paved parking, HSG D
1,681	80	>75% Grass cover, Good, HSG D
17,500	96	Weighted Average
1,681		9.61% Pervious Area
15,819		90.39% Impervious Area

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

Subcatchment P-1A: Proposed Watershed P-1A



Summary for Subcatchment P-1B: Proposed Watershed P-1B

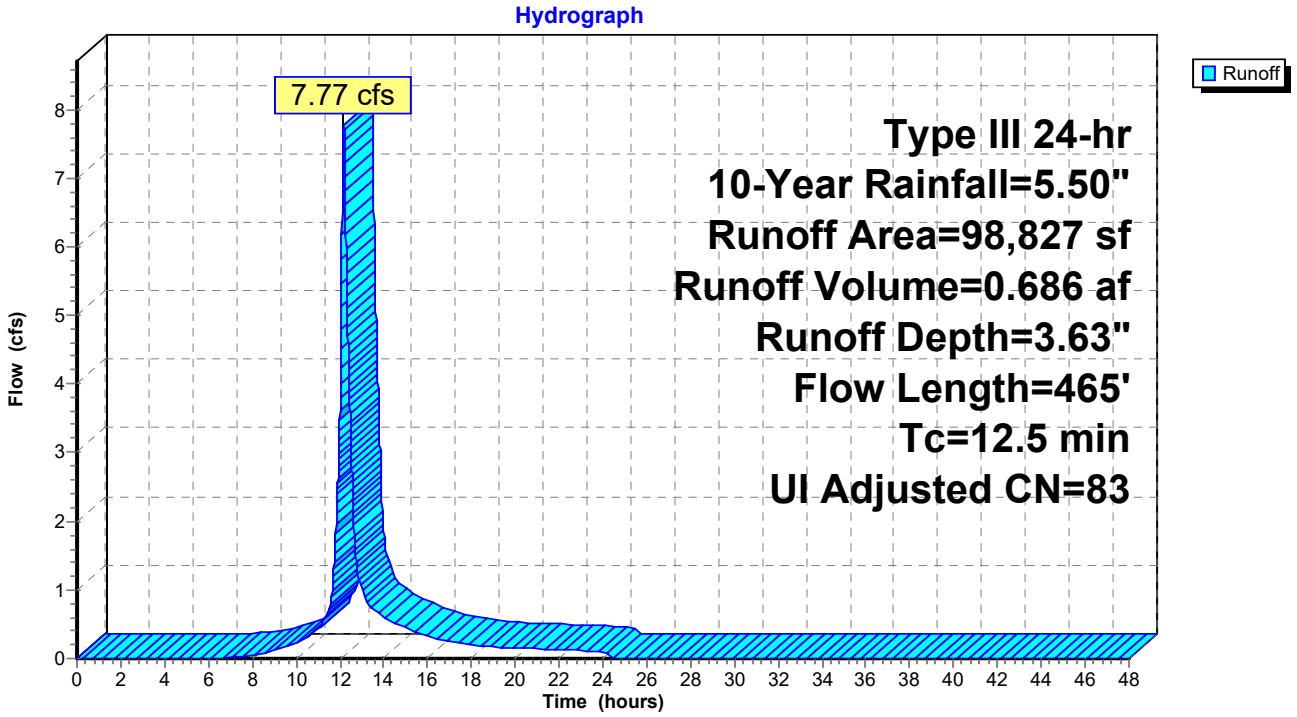
Runoff = 7.77 cfs @ 12.17 hrs, Volume= 0.686 af, Depth= 3.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.50"

Area (sf)	CN	Adj	Description
6,791	79		Woods, Fair, HSG D
54,748	82		Woods/grass comb., Fair, HSG D
22,731	98		Unconnected pavement, HSG D
14,557	80		>75% Grass cover, Good, HSG D
98,827	85	83	Weighted Average, UI Adjusted
76,096			77.00% Pervious Area
22,731			23.00% Impervious Area
22,731			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	23	0.0550	1.53		**Sheet Flow, Sheet Flow - Roadway** Smooth surfaces n= 0.011 P2= 3.16"
9.0	77	0.1060	0.14		**Sheet Flow, Sheet Flow - Woods** Woods: Light underbrush n= 0.400 P2= 3.16"
1.0	158	0.2700	2.60		**Shallow Concentrated Flow, Shallow Concentrated - Woods** Woodland Kv= 5.0 fps
2.2	207	0.0111	1.58		**Shallow Concentrated Flow, Shallow Concentrated - Waterway** Grassed Waterway Kv= 15.0 fps
12.5	465	Total			

Subcatchment P-1B: Proposed Watershed P-1B

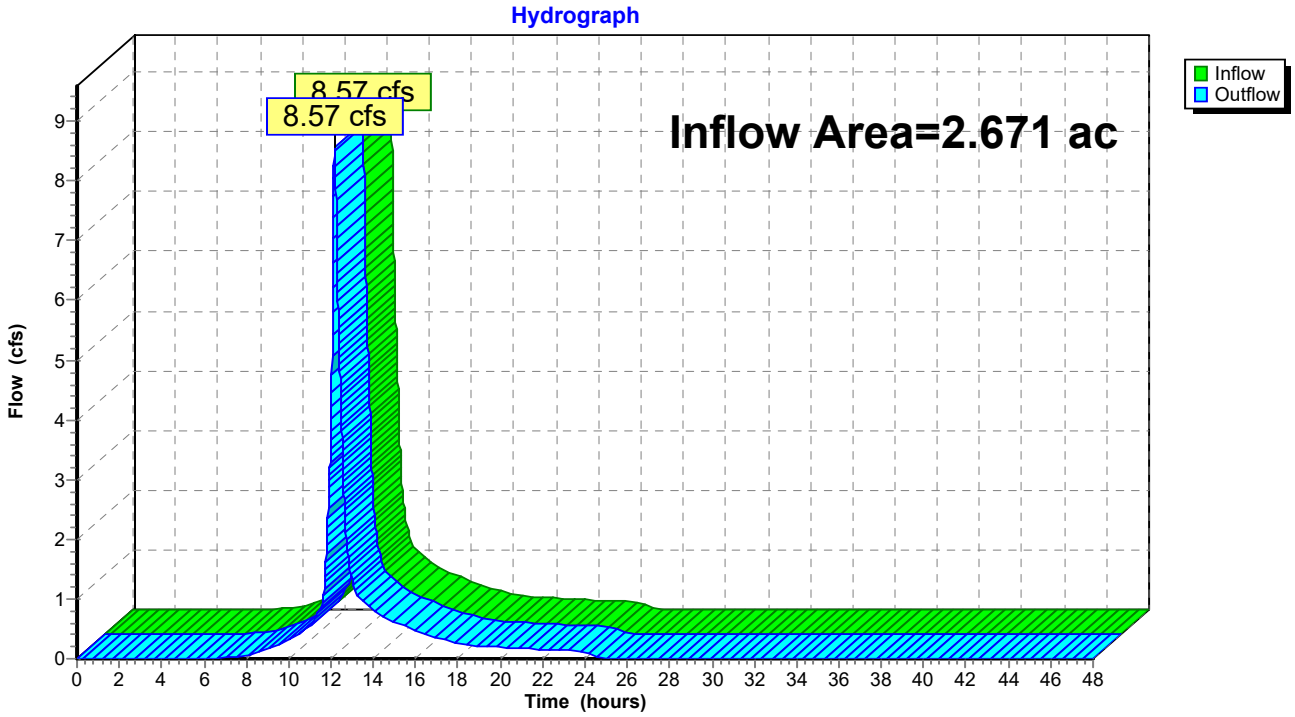


Summary for Reach PR.DP.: Prop. Design Point

Inflow Area = 2.671 ac, 33.14% Impervious, Inflow Depth = 3.80" for 10-Year event
Inflow = 8.57 cfs @ 12.17 hrs, Volume= 0.846 af
Outflow = 8.57 cfs @ 12.17 hrs, Volume= 0.846 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Reach PR.DP.: Prop. Design Point



Summary for Pond UG-DET: UG Detention

Inflow Area = 0.402 ac, 90.39% Impervious, Inflow Depth = 5.03" for 10-Year event
Inflow = 2.13 cfs @ 12.08 hrs, Volume= 0.168 af
Outflow = 0.86 cfs @ 12.29 hrs, Volume= 0.160 af, Atten= 60%, Lag= 12.5 min
Primary = 0.86 cfs @ 12.29 hrs, Volume= 0.160 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 280.37' @ 12.29 hrs Surf.Area= 1,858 sf Storage= 2,674 cf

Plug-Flow detention time= 135.0 min calculated for 0.160 af (95% of inflow)
Center-of-Mass det. time= 105.4 min (865.6 - 760.2)

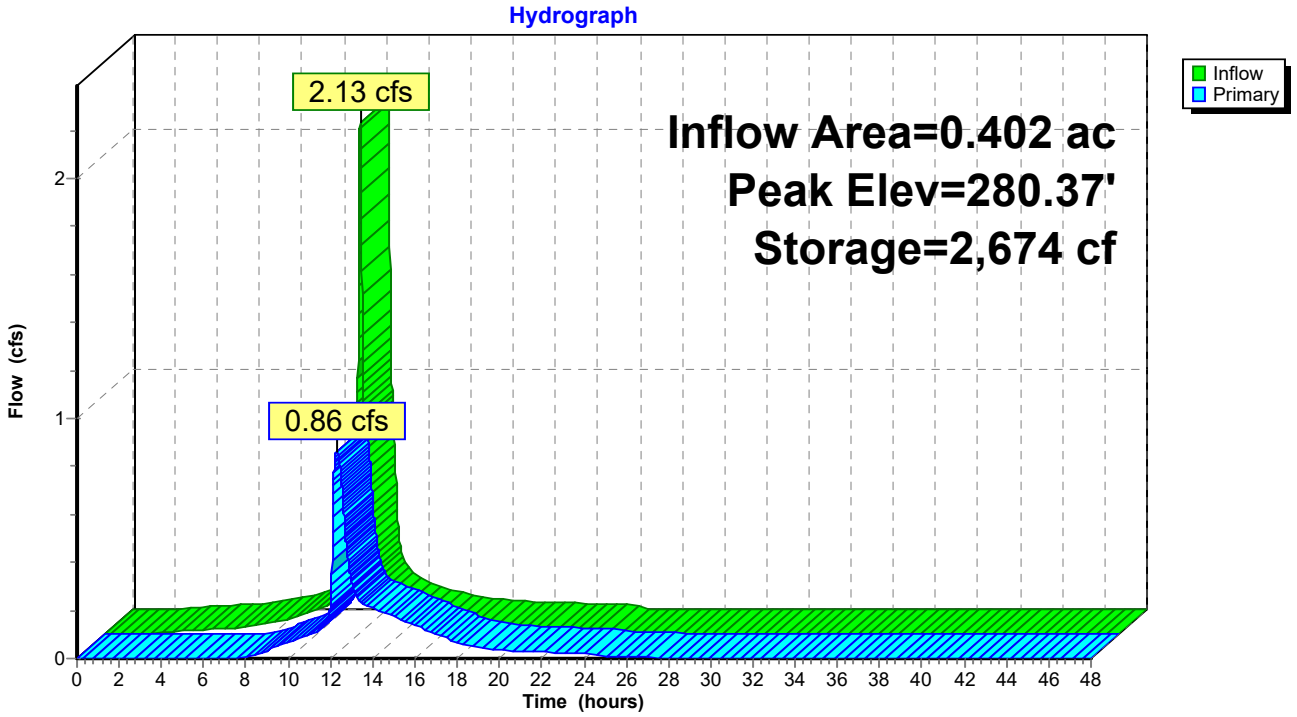
Volume	Invert	Avail.Storage	Storage Description
#1A	278.25'	1,700 cf	**34.75'W x 53.46'L x 3.50'H Field A** 6,502 cf Overall - 2,251 cf Embedded = 4,251 cf x 40.0% Voids
#2A	278.75'	2,251 cf	**ADS_StormTech SC-740 +Cap** x 49 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 7 Rows of 7 Chambers
		3,951 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	278.75'	**12.0" Round Culvert** L= 25.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 278.75' / 278.25' S= 0.0200 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Device 1	278.75'	**3.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	279.75'	**6.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	281.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Primary	282.15'	**2.5' long x 2.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 Coef. (English) 2.48 2.60 2.60 2.60 2.64 2.65 2.68 2.75 2.74 2.76 2.89 3.05 3.19 3.32

Primary OutFlow Max=0.86 cfs @ 12.29 hrs HW=280.37' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.86 cfs of 3.16 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 0.29 cfs @ 5.89 fps)
  - **3=Orifice/Grate** (Orifice Controls 0.57 cfs @ 2.93 fps)
  - **4=Orifice/Grate** (Controls 0.00 cfs)
- **5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond UG-DET: UG Detention



Summary for Subcatchment P-1A: Proposed Watershed P-1A

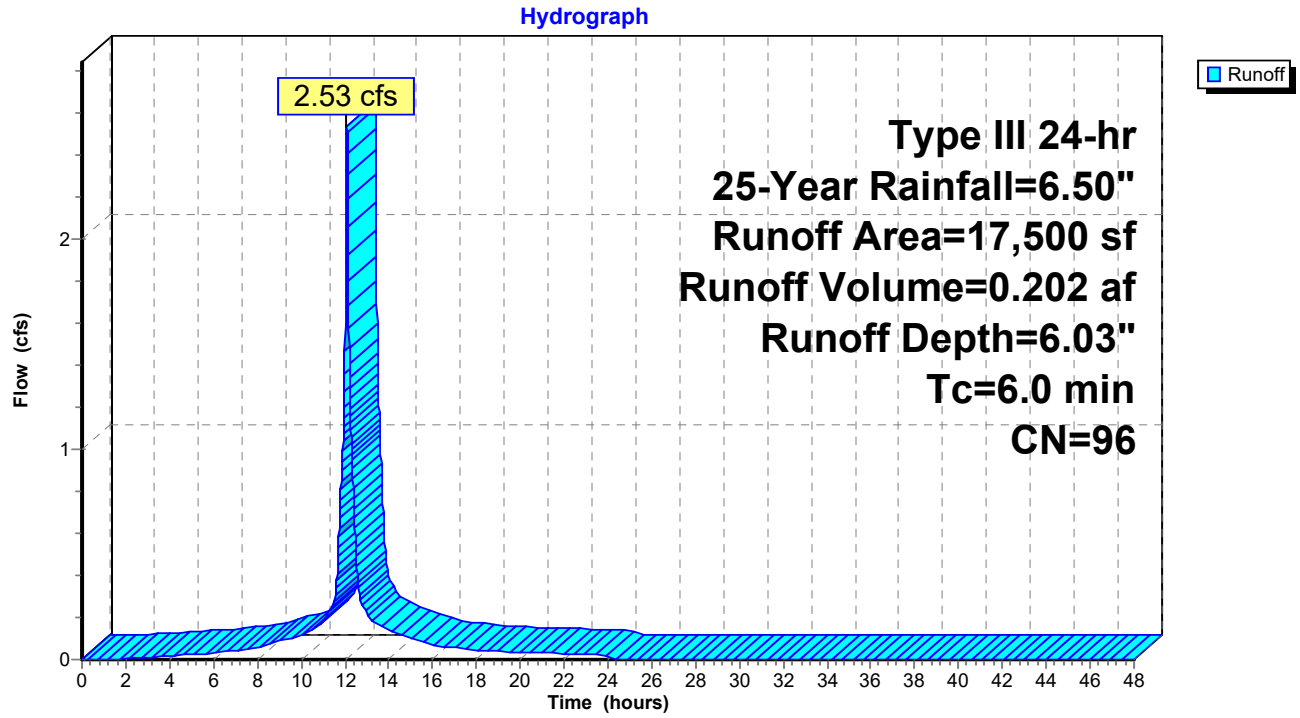
Runoff = 2.53 cfs @ 12.08 hrs, Volume= 0.202 af, Depth= 6.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=6.50"

Area (sf)	CN	Description
15,819	98	Paved parking, HSG D
1,681	80	>75% Grass cover, Good, HSG D
17,500	96	Weighted Average
1,681		9.61% Pervious Area
15,819		90.39% Impervious Area

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

Subcatchment P-1A: Proposed Watershed P-1A



Summary for Subcatchment P-1B: Proposed Watershed P-1B

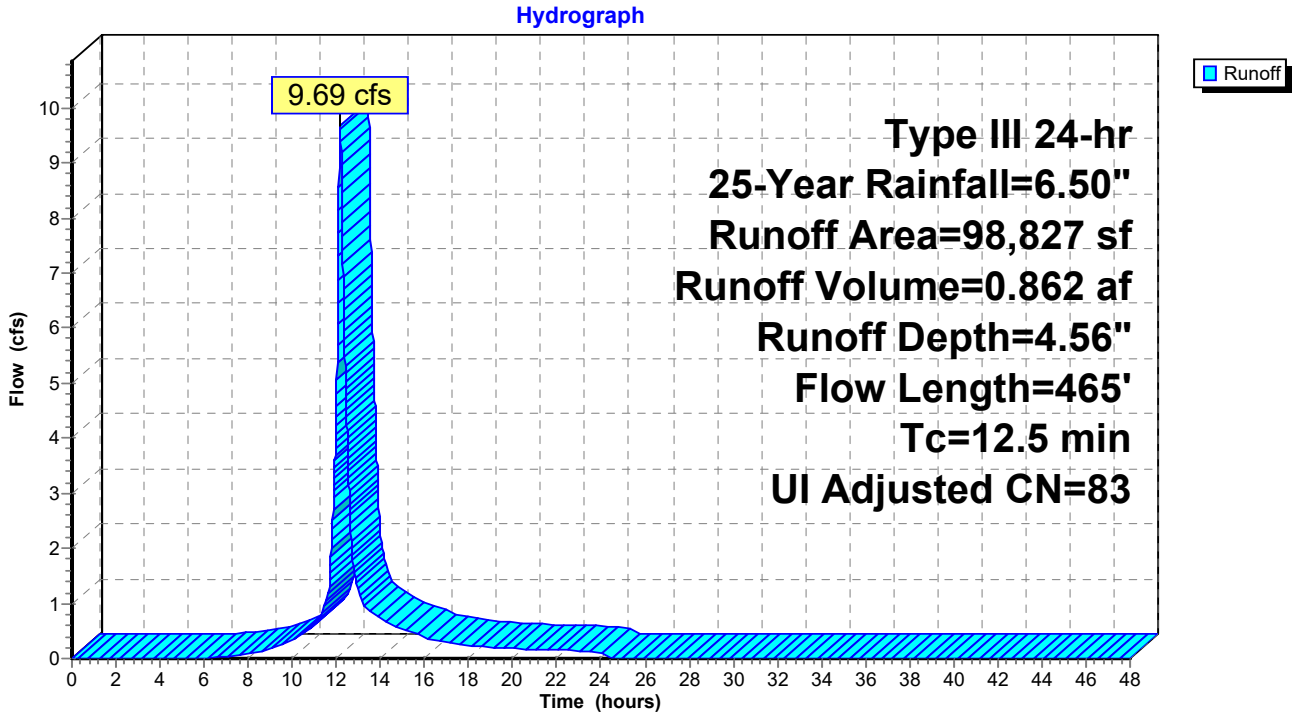
Runoff = 9.69 cfs @ 12.17 hrs, Volume= 0.862 af, Depth= 4.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=6.50"

Area (sf)	CN	Adj	Description
6,791	79		Woods, Fair, HSG D
54,748	82		Woods/grass comb., Fair, HSG D
22,731	98		Unconnected pavement, HSG D
14,557	80		>75% Grass cover, Good, HSG D
98,827	85	83	Weighted Average, UI Adjusted
76,096			77.00% Pervious Area
22,731			23.00% Impervious Area
22,731			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	23	0.0550	1.53		**Sheet Flow, Sheet Flow - Roadway** Smooth surfaces n= 0.011 P2= 3.16"
9.0	77	0.1060	0.14		**Sheet Flow, Sheet Flow - Woods** Woods: Light underbrush n= 0.400 P2= 3.16"
1.0	158	0.2700	2.60		**Shallow Concentrated Flow, Shallow Concentrated - Woods** Woodland Kv= 5.0 fps
2.2	207	0.0111	1.58		**Shallow Concentrated Flow, Shallow Concentrated - Waterway** Grassed Waterway Kv= 15.0 fps
12.5	465	Total			

Subcatchment P-1B: Proposed Watershed P-1B

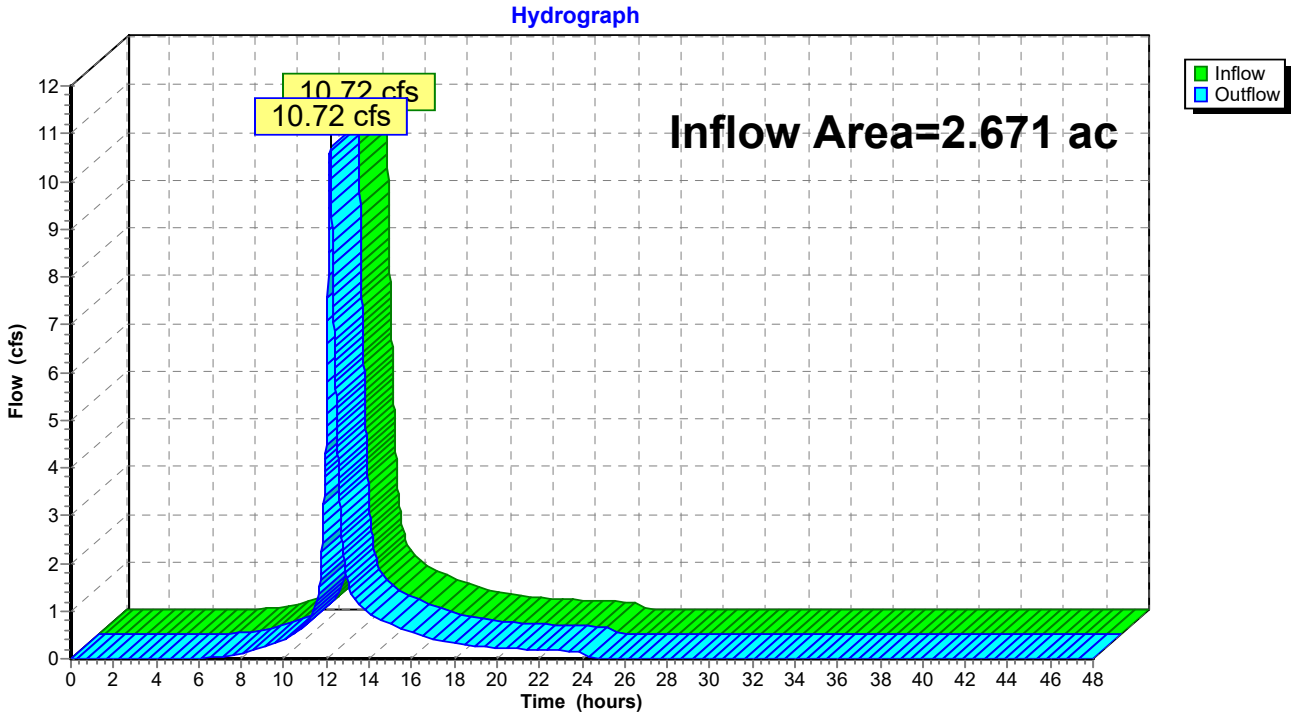


Summary for Reach PR.DP.: Prop. Design Point

Inflow Area = 2.671 ac, 33.14% Impervious, Inflow Depth = 4.74" for 25-Year event
Inflow = 10.72 cfs @ 12.17 hrs, Volume= 1.055 af
Outflow = 10.72 cfs @ 12.17 hrs, Volume= 1.055 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Reach PR.DP.: Prop. Design Point



Summary for Pond UG-DET: UG Detention

Inflow Area = 0.402 ac, 90.39% Impervious, Inflow Depth = 6.03" for 25-Year event
Inflow = 2.53 cfs @ 12.08 hrs, Volume= 0.202 af
Outflow = 1.08 cfs @ 12.27 hrs, Volume= 0.193 af, Atten= 57%, Lag= 11.3 min
Primary = 1.08 cfs @ 12.27 hrs, Volume= 0.193 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 280.65' @ 12.27 hrs Surf.Area= 1,858 sf Storage= 3,017 cf

Plug-Flow detention time= 124.0 min calculated for 0.193 af (96% of inflow)
Center-of-Mass det. time= 98.5 min (855.0 - 756.5)

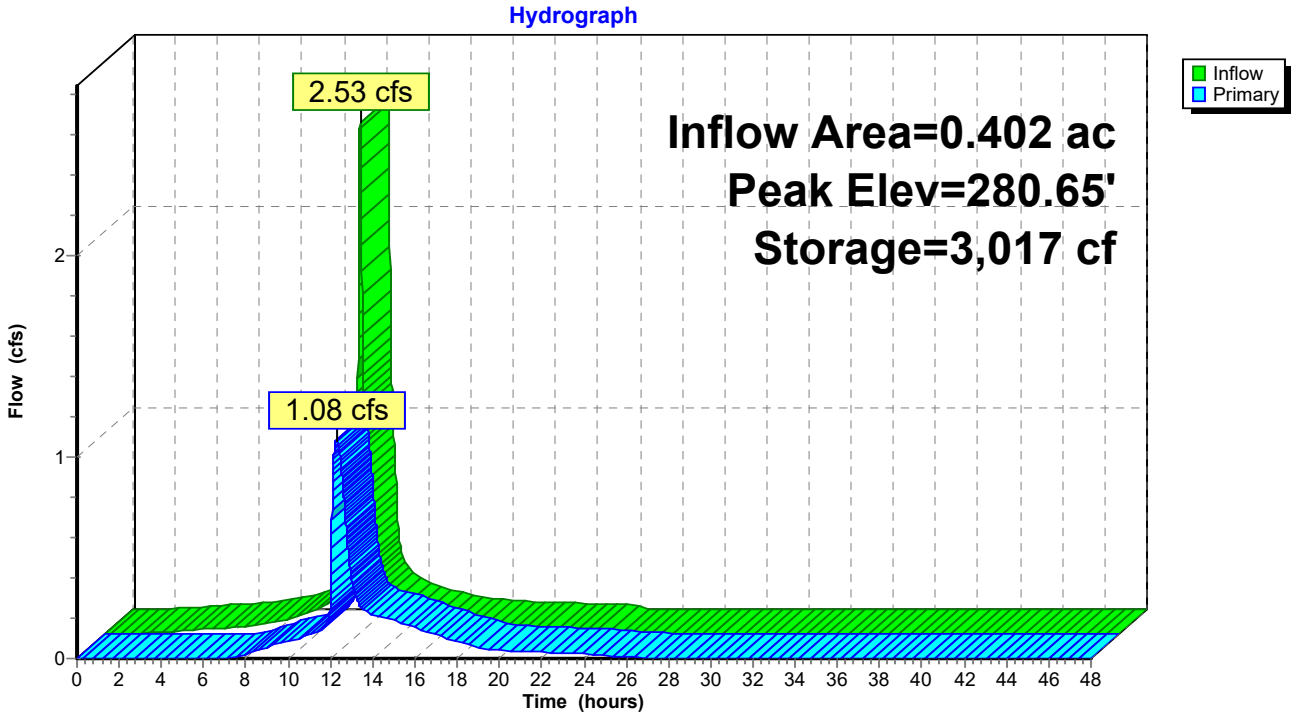
Volume	Invert	Avail.Storage	Storage Description
#1A	278.25'	1,700 cf	**34.75'W x 53.46'L x 3.50'H Field A** 6,502 cf Overall - 2,251 cf Embedded = 4,251 cf x 40.0% Voids
#2A	278.75'	2,251 cf	**ADS_StormTech SC-740 +Cap** x 49 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 7 Rows of 7 Chambers
		3,951 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	278.75'	**12.0" Round Culvert** L= 25.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 278.75' / 278.25' S= 0.0200 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Device 1	278.75'	**3.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	279.75'	**6.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	281.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Primary	282.15'	**2.5' long x 2.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 Coef. (English) 2.48 2.60 2.60 2.60 2.64 2.65 2.68 2.75 2.74 2.76 2.89 3.05 3.19 3.32

Primary OutFlow Max=1.08 cfs @ 12.27 hrs HW=280.65' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 1.08 cfs of 3.54 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 0.32 cfs @ 6.42 fps)
  - **3=Orifice/Grate** (Orifice Controls 0.76 cfs @ 3.90 fps)
  - **4=Orifice/Grate** (Controls 0.00 cfs)
- **5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond UG-DET: UG Detention



Summary for Subcatchment P-1A: Proposed Watershed P-1A

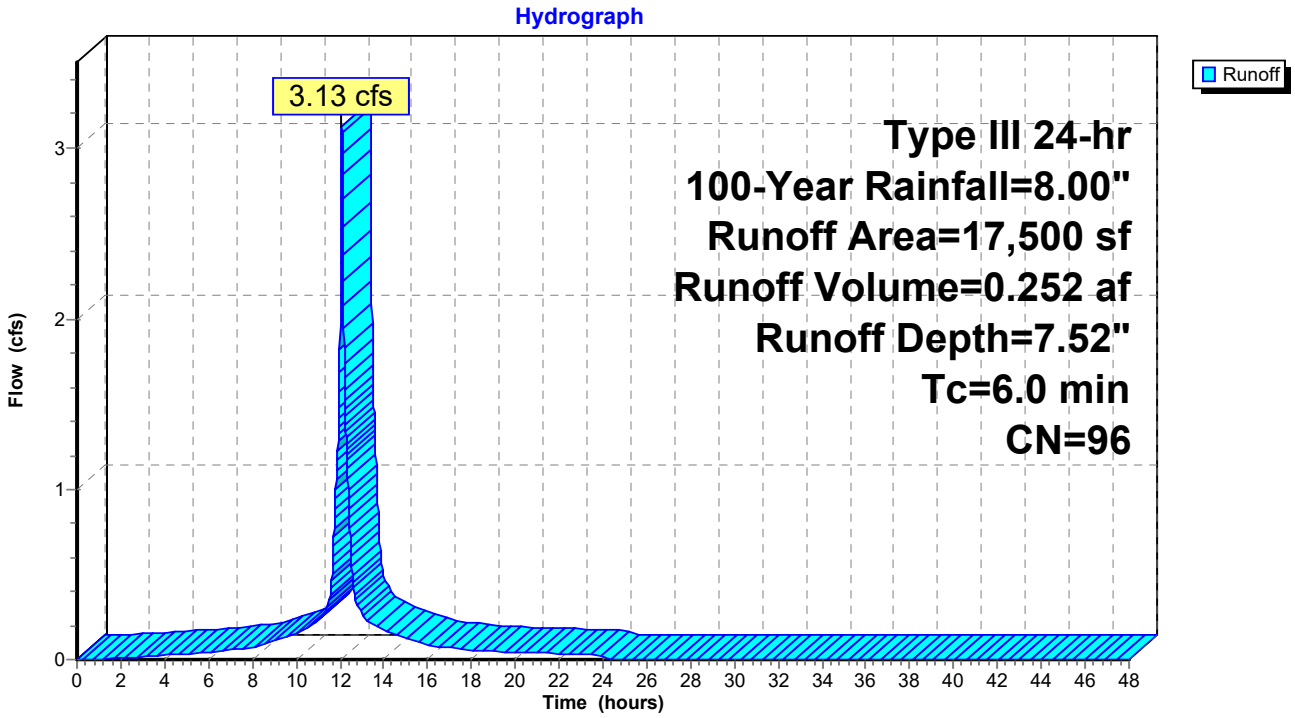
Runoff = 3.13 cfs @ 12.08 hrs, Volume= 0.252 af, Depth= 7.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.00"

Area (sf)	CN	Description
15,819	98	Paved parking, HSG D
1,681	80	>75% Grass cover, Good, HSG D
17,500	96	Weighted Average
1,681		9.61% Pervious Area
15,819		90.39% Impervious Area

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

Subcatchment P-1A: Proposed Watershed P-1A



Summary for Subcatchment P-1B: Proposed Watershed P-1B

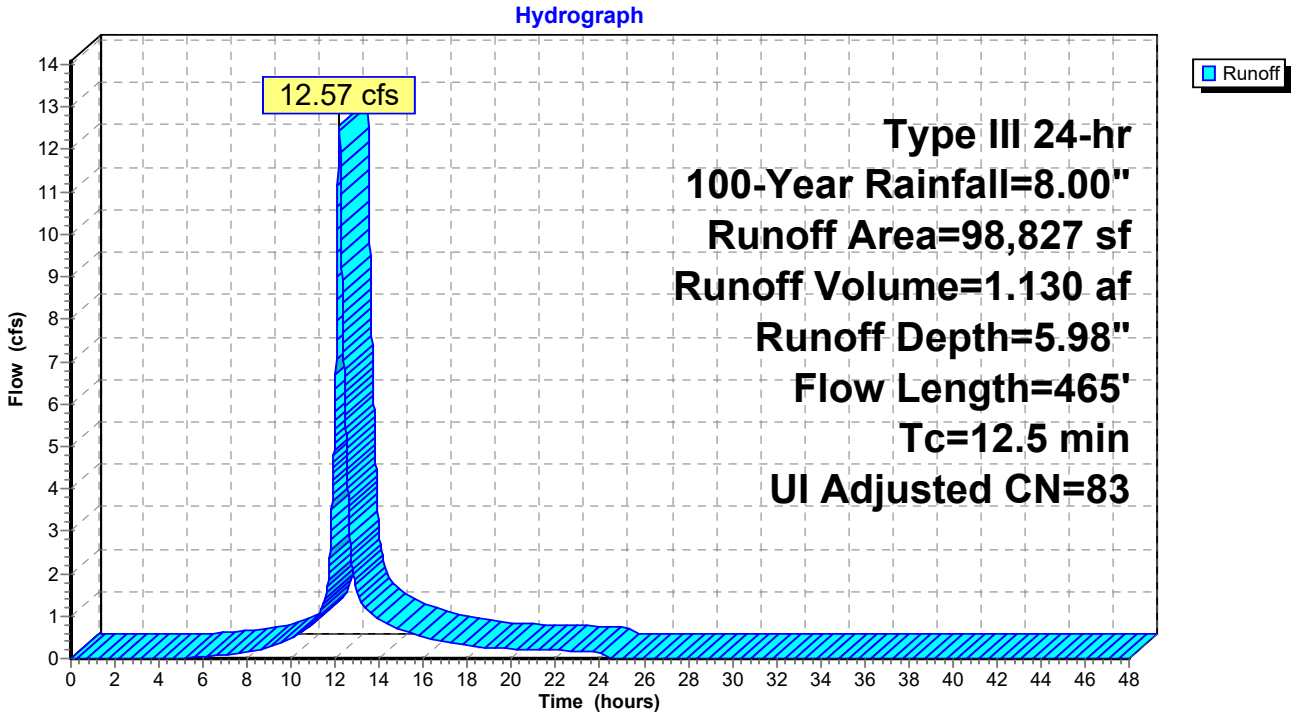
Runoff = 12.57 cfs @ 12.17 hrs, Volume= 1.130 af, Depth= 5.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.00"

Area (sf)	CN	Adj	Description
6,791	79		Woods, Fair, HSG D
54,748	82		Woods/grass comb., Fair, HSG D
22,731	98		Unconnected pavement, HSG D
14,557	80		>75% Grass cover, Good, HSG D
98,827	85	83	Weighted Average, UI Adjusted
76,096			77.00% Pervious Area
22,731			23.00% Impervious Area
22,731			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	23	0.0550	1.53		**Sheet Flow, Sheet Flow - Roadway** Smooth surfaces n= 0.011 P2= 3.16"
9.0	77	0.1060	0.14		**Sheet Flow, Sheet Flow - Woods** Woods: Light underbrush n= 0.400 P2= 3.16"
1.0	158	0.2700	2.60		**Shallow Concentrated Flow, Shallow Concentrated - Woods** Woodland Kv= 5.0 fps
2.2	207	0.0111	1.58		**Shallow Concentrated Flow, Shallow Concentrated - Waterway** Grassed Waterway Kv= 15.0 fps
12.5	465	Total			

Subcatchment P-1B: Proposed Watershed P-1B

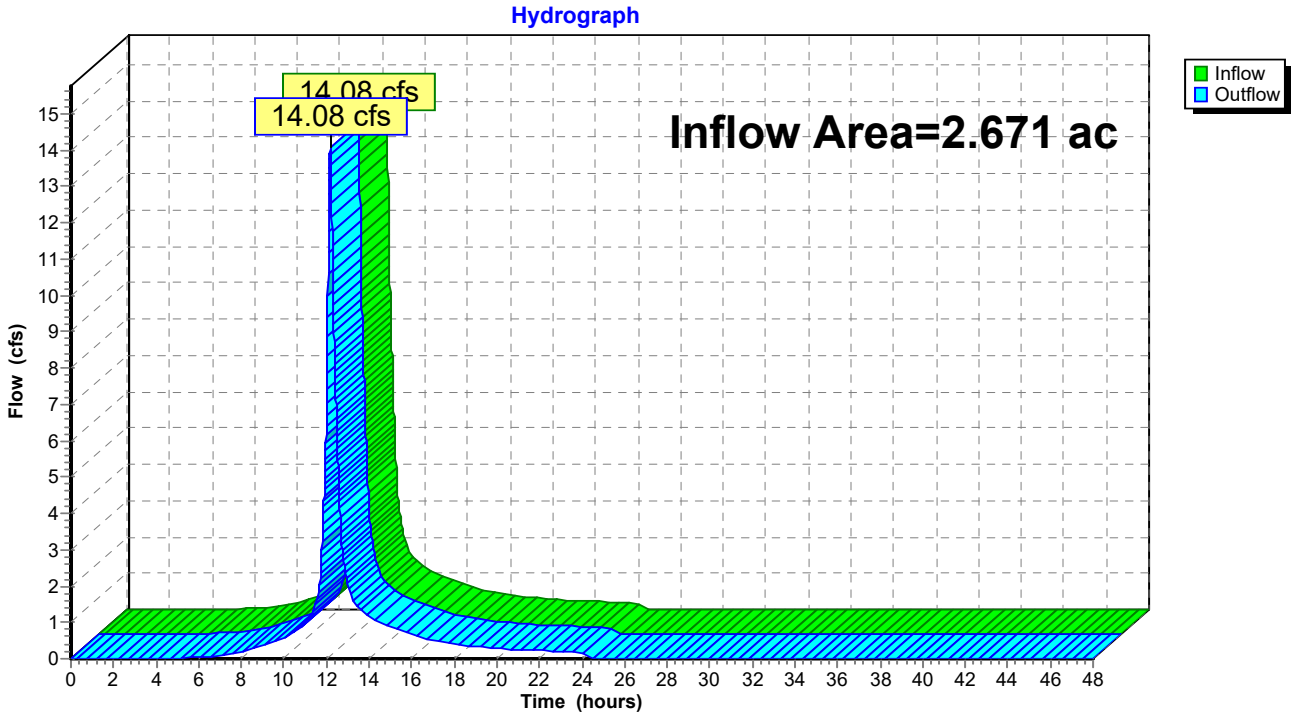


Summary for Reach PR.DP.: Prop. Design Point

Inflow Area = 2.671 ac, 33.14% Impervious, Inflow Depth = 6.17" for 100-Year event
Inflow = 14.08 cfs @ 12.18 hrs, Volume= 1.373 af
Outflow = 14.08 cfs @ 12.18 hrs, Volume= 1.373 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Reach PR.DP.: Prop. Design Point



Summary for Pond UG-DET: UG Detention

Inflow Area = 0.402 ac, 90.39% Impervious, Inflow Depth = 7.52" for 100-Year event
Inflow = 3.13 cfs @ 12.08 hrs, Volume= 0.252 af
Outflow = 1.66 cfs @ 12.21 hrs, Volume= 0.243 af, Atten= 47%, Lag= 7.6 min
Primary = 1.66 cfs @ 12.21 hrs, Volume= 0.243 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 281.10' @ 12.21 hrs Surf.Area= 1,858 sf Storage= 3,462 cf

Plug-Flow detention time= 112.2 min calculated for 0.243 af (97% of inflow)
Center-of-Mass det. time= 90.8 min (843.2 - 752.4)

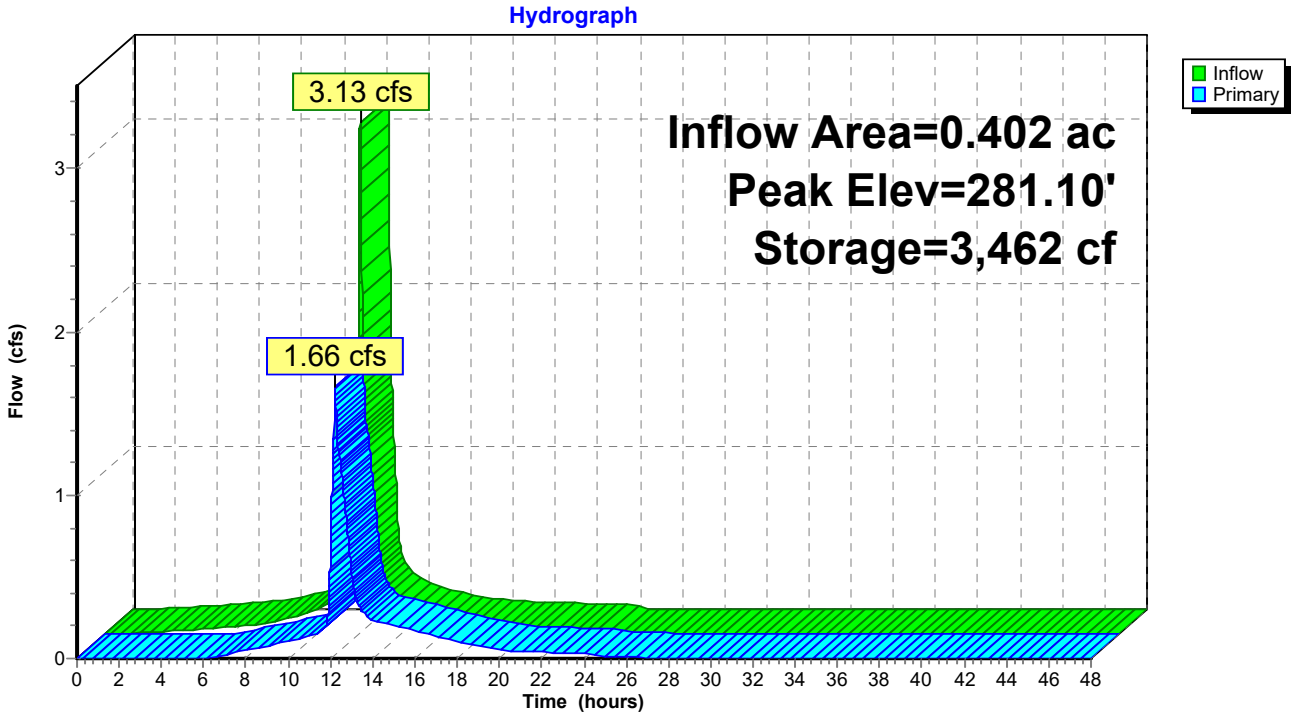
Volume	Invert	Avail.Storage	Storage Description
#1A	278.25'	1,700 cf	**34.75'W x 53.46'L x 3.50'H Field A** 6,502 cf Overall - 2,251 cf Embedded = 4,251 cf x 40.0% Voids
#2A	278.75'	2,251 cf	**ADS_StormTech SC-740 +Cap** x 49 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 7 Rows of 7 Chambers
		3,951 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	278.75'	**12.0" Round Culvert** L= 25.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 278.75' / 278.25' S= 0.0200 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Device 1	278.75'	**3.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	279.75'	**6.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	281.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Primary	282.15'	**2.5' long x 2.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 Coef. (English) 2.48 2.60 2.60 2.60 2.64 2.65 2.68 2.75 2.74 2.76 2.89 3.05 3.19 3.32

Primary OutFlow Max=1.66 cfs @ 12.21 hrs HW=281.10' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 1.66 cfs of 4.06 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 0.35 cfs @ 7.18 fps)
  - **3=Orifice/Grate** (Orifice Controls 0.99 cfs @ 5.05 fps)
  - **4=Orifice/Grate** (Weir Controls 0.32 cfs @ 1.03 fps)
- **5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond UG-DET: UG Detention



United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Orange County, New York

February 19, 2019

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:833 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 10 20 40 60

Feet: 0 40 80 160 240

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

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

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

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 1:15,800.

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:
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: Orange County, New York
Survey Area Data: Version 19, Sep 3, 2018

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

Date(s) aerial images were photographed: Oct 7, 2013—Feb 26, 2017

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.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Du	Dumps	0.5	21.2%
ErA	Erie gravelly silt loam, 0 to 3 percent slopes	0.8	33.6%
MdD	Mardin gravelly silt loam, 15 to 25 percent slopes	0.2	7.6%
PtB	Pittsfield gravelly loam, 3 to 8 percent slopes	0.1	2.9%
Wd	Wayland soils complex, non-calcareous substratum, 0 to 3 percent slopes, frequently flooded	0.9	34.7%
Totals for Area of Interest		**2.5**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it

was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Orange County, New York

Du—Dumps

Map Unit Setting

National map unit symbol: 9vv7
Elevation: 100 to 1,600 feet
Mean annual precipitation: 42 to 52 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 135 to 215 days
Farmland classification: Not prime farmland

Map Unit Composition

Dumps: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Dumps

Typical profile

H1 - 0 to 24 inches: very gravelly silt loam
H2 - 24 to 70 inches: variable

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydric soil rating: No

Minor Components

Alden

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Bath

Percent of map unit: 5 percent
Hydric soil rating: No

Chenango

Percent of map unit: 5 percent
Hydric soil rating: No

Raynham

Percent of map unit: 5 percent
Hydric soil rating: No

ErA—Erie gravelly silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 9vv8

Mean annual precipitation: 42 to 52 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 135 to 215 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Erie and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Erie

Setting

Landform: Drumlinoid ridges, hills, till plains
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy till derived from siltstone, sandstone, shale, and limestone

Typical profile

H1 - 0 to 10 inches: gravelly silt loam
H2 - 10 to 18 inches: channery silt loam
H3 - 18 to 56 inches: channery silt loam
H4 - 56 to 70 inches: channery silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 10 to 21 inches to fragipan
Natural drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Available water storage in profile: Very low (about 2.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Bath

Percent of map unit: 5 percent
Hydric soil rating: No

Alden

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Swartswood

Percent of map unit: 5 percent
Landform: Depressions

Hydric soil rating: No

Mardin

Percent of map unit: 5 percent
Hydric soil rating: No

Wurtsboro

Percent of map unit: 5 percent
Hydric soil rating: No

MdD—Mardin gravelly silt loam, 15 to 25 percent slopes

Map Unit Setting

National map unit symbol: 2v30p
Elevation: 330 to 2,460 feet
Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 39 to 52 degrees F
Frost-free period: 105 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Mardin and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Mardin

Setting

Landform: Hills, mountains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, head slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

Ap - 0 to 8 inches: gravelly silt loam
Bw - 8 to 15 inches: gravelly silt loam
E - 15 to 20 inches: gravelly silt loam
Bx - 20 to 72 inches: gravelly silt loam

Properties and qualities

Slope: 15 to 25 percent
Percent of area covered with surface fragments: 0.0 percent
Depth to restrictive feature: 14 to 26 inches to fragipan
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 13 to 24 inches
Frequency of flooding: None
Frequency of ponding: None

Available water storage in profile: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Volusia

Percent of map unit: 5 percent
Landform: Mountains, hills
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Bath

Percent of map unit: 5 percent
Landform: Hills, mountains
Landform position (two-dimensional): Summit, backslope, shoulder
Landform position (three-dimensional): Interfluve, side slope, nose slope
Down-slope shape: Concave, linear
Across-slope shape: Linear
Hydric soil rating: No

Lordstown

Percent of map unit: 5 percent
Landform: Hills, mountains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountainflank, side slope, nose slope
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

PtB—Pittsfield gravelly loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9vw8
Elevation: 0 to 1,000 feet
Mean annual precipitation: 42 to 52 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 135 to 215 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Pittsfield and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pittsfield

Setting

Landform: Drumlinoid ridges, hills, till plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Calcareous loamy till

Typical profile

H1 - 0 to 10 inches: gravelly loam
H2 - 10 to 34 inches: gravelly loam
H3 - 34 to 60 inches: gravelly sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Available water storage in profile: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Bath

Percent of map unit: 5 percent
Hydric soil rating: No

Charlton

Percent of map unit: 5 percent
Hydric soil rating: No

Hollis

Percent of map unit: 5 percent
Hydric soil rating: No

Mardin

Percent of map unit: 5 percent
Hydric soil rating: No

Paxton

Percent of map unit: 5 percent
Hydric soil rating: No

Wd—Wayland soils complex, non-calcareous substratum, 0 to 3 percent slopes, frequently flooded

Map Unit Setting

National map unit symbol: 2srgt
Elevation: 160 to 1,970 feet
Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 43 to 52 degrees F
Frost-free period: 105 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Wayland and similar soils: 60 percent
Wayland, very poorly drained, and similar soils: 30 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wayland

Setting

Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Silty and clayey alluvium derived from interbedded sedimentary rock

Typical profile

Ap - 0 to 9 inches: silt loam
Bg - 9 to 21 inches: silt loam
Cg1 - 21 to 28 inches: silt loam
Cg2 - 28 to 47 inches: silt loam
Cg3 - 47 to 54 inches: silt loam
Cg4 - 54 to 60 inches: silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Very high (about 13.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Hydric soil rating: Yes

Description of Wayland, Very Poorly Drained

Setting

Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Silty and clayey alluvium derived from interbedded sedimentary rock

Typical profile

A - 0 to 9 inches: mucky silt loam
Bg - 9 to 21 inches: silt loam
Cg1 - 21 to 28 inches: silt loam
Cg2 - 28 to 47 inches: silt loam
Cg3 - 47 to 54 inches: silt loam
Cg4 - 54 to 60 inches: silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Frequent
Frequency of ponding: Frequent
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Very high (about 13.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Hydric soil rating: Yes

Minor Components

Holderton

Percent of map unit: 10 percent
Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

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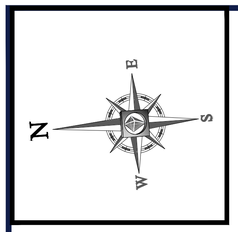

LANDS N/F
JULIANA M. RHINEFIELD
BK. 11205 PG. 1138
(TM# 24-4-2)

ZONE: R3
(RESIDENTIAL)
USE: RESIDENTIAL

LANDS N/F
AIDA J. ALICEA
BK. 13168 PG. 1081
(TM# 24-4-3)

ZONE: R3
(RESIDENTIAL)
USE: RESIDENTIAL

LANDS N/F
KAREN L. KOHANSKI
BK. 4946 PG. 232
(TM# 24-4-4)

ZONE: R3
(RESIDENTIAL)
USE: RESIDENTIAL

LANDS N/F
DAVID HOEY
BK. 14470 PG. 613
(TM# 24-4-5.2)

ZONE: R3
(RESIDENTIAL)
USE: RESIDENTIAL

LANDS N/F
JACQUELINE SHEPPARD
BK. 14329 PG. 1523
(TM# 24-4-7.2)

ZONE: R3
(RESIDENTIAL)
USE: RESIDENTIAL

UP/ CHCE N37939

E.O.P.

DITCH

S15°40'49"W 345.25'
(MAP REF. #6 S31°00'00"E)

15' MIN. BUFFER STRIP

30' MIN. REAR YARD SETBACK

6" STOCKADE FENCE

T14"

ZONING DISTRICT R3 RESIDENTIAL

ZONING DISTRICT B. BUSINESS
LHI OVERLAY DISTRICT

S85°51'01"E
(MAP REF. #6
N47°28'10"E)
310.55'

EXIST. VEGETATION
(TO REMAIN)

103.8'

30.0'
PROP. UTILITY EASEMENT

A-1 A-2 A-3 A-4 A-5 A-6 A-7 A-8 A-9 A-10 A-11

PROP. HEAVY DUTY
CONC. PAD

EXIST. WETLAND FLAG (TYP.)

EXIST. WETLAND BOUNDARY (TYP.)

PROP. RETAINING WALL
(SEE DESIGN PLAN BY
OTHERS)

30.0'

5.0'

136.8'

20' DRAINAGE EASEMENT

50 LF OF 4' CHAIN LINK
FENCE

PROP. 18'x12'
DUMPSTER ENCLOSURE

18.0'

PROP. SERVICE RAMP

PROPOSED
1 STORY
RETAIL STORE
(9,100± SF + 200SF
VESTIBULE)
(7,300± SF RETAIL
FLOOR AREA)

WOODED
AREA

LANDS N/F
STEVE CRISCI
BK. 2705 PG. 144
(TM# 24-4-1.21)

ZONE: B
(BUSINESS)
USE: COMMERCIAL

241.62'
N87°31'55"W
(MAP REF. #6 N45°54'16"E)

UP/ CHCE 154964

UP/ CHCE N37940

NORTH HILL LANE
(ASPHALT ROADWAY)
(PUBLIC R.O.W. – 50' WIDTH)
TWO WAY
TRAFFIC

PROP. EDGE OF
PAVEMENT

PROP. CB
(TYP.)

PROP.
LIGHT DUTY
ASPHALT
(TYP.)

PROP.
HEAVY DUTY
ASPHALT
(TYP.)

40' MIN. FRONT YARD BUILDING & PARKING SETBACK

PROP. ACCESSIBLE
AISLE (PAINTED BLUE)

PROP. "NO PARKING"
SIGN IN BOLLARD

PROP. VAN ACCESSIBLE
PARKING SIGN IN
BOLLARD

PROP. ACCESSIBLE RAMP

PROP. BOLLARD

PROP. BUILDING
MOUNTED SIGN
LOCATION

PROP. ACCESSIBLE
PARKING SIGN IN BOLLARD

PROP. CLEAN OUT
(TYP.)

105 LF OF 4' CHAIN LINK
FENCE

15' MIN. SIDE YARD SETBACK

CONC. CURB

PROP. CONC. SIDEWALK
WITH MONOLITHIC CURB

PROP. CONC. SIDEWALK
WITH MONOLITHIC CURB

PROP. RIP-RAP
(TYP.)

PROP. DRAINAGE
MANHOLE

PROP. FES
(TYP.)

60' MIN. FRONT YARD BUILDING & PARKING SETBACK

PROP. LOCATION OF
RELOCATED SIGN

PROP. STOP
BAR, STOP
SIGN, AND
STOP TEXT

PROP. DIRECTIONAL
ARROW (TYP.)

PROP. PAINTED
DOUBLE YELLOW
LINE

PROP. LANDSCAPE
ISLAND

PROP. TRANSITION CURB
(TO BE PAINTED YELLOW
WHEN LESS THAN 6" REVEAL)
(TYP.)

PROP. CONC.
CURB (TYP.)

PROP. 1,000 GAL
SEPTIC TANK

PROP. EDGE OF
PAVEMENT

PROP. ACCESSIBLE
PARKING (TYP. OF 2)
PAINTED BLUE

PROP.
HEAVY DUTY
ASPHALT
(TYP.)

PROP. CB
(TYP.)

PROP. LANDSCAPE
ISLANDS

PROP. 50-LF OF
WOODEN
GUIDERAIL

PROP. EFFLUENT PUMP STATION

PROP. SEPTIC
AREA

PROP. LIGHTPOLE
(BY OTHERS)

PROP. FES
(TYP.)

PROP. STONE
WALL

PROP.
MONUMENT
SIGN

10' GAS LINE EASEMENT

PROP. PARKING
COUNT (TYP.)

PROP. STONE
WALL

PROP. CONC.
CURB (TYP.)

50-LF OF 4' SPLIT
RAIL FENCE

50-LF OF 4' SPLIT
RAIL FENCE

T10"

N04°08'55"E
(MAP REF. #6 N42°31'50"W)
344.87'

6' C.L.F.

BOX BEAM GUIDE RAIL

GUY POLE#
CHCE
117996
VZ15

UP/ CHCE
38532

E.O.P.

S.W.L. (TYP.)

D.W.L. (TYP.)

D.Y.L. (TYP.)

S.Y.L. (TYP.)

NYS ROUTE 9W
(ASPHALT ROADWAY)
(PUBLIC R.O.W. – WIDTH VARIES)
TWO WAY
TRAFFIC

CB

CONC. CURB

UP/ CHCE
N11472
VZ110

UP/ CHCE
11471N

CONC.

811
Know what's below.
Call before you dig.

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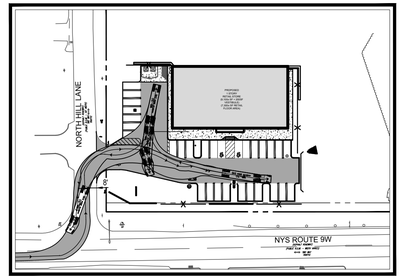
LAYOUT PURPOSES ONLY

20 10 5 0 20
1"= 20'

ZONING ANALYSIS TABLE

ZONING DISTRICT	- B, BUSINESS & LHI OVERLAY (LIGHT, HEAVY AND RECREATIONAL EQUIPMENT SALES/SERVICE/REPAIR)		
USE AND REQUIRED PERMIT	- RETAIL IS AN ALLOWED USE SUBJECT TO SITE PLAN REVIEW		
ZONE CRITERIA	REQUIRED	EXISTING	PROPOSED
MINIMUM LOT SIZE	15,000 SQFT	2.16 ACRES	NO CHANGE
MINIMUM LOT WIDTH	100 FT	344.87 FT	NO CHANGE
MINIMUM LOT DEPTH	125 FT	241.62 FT	NO CHANGE
MIN. FRONT YARD SETBACK	60 FT	N/A	89.1 FT
MIN. SIDE YARD SETBACK (1 SIDE)	15 FT	N/A	73.5 FT
MIN. REAR YARD SETBACK	30 FT	N/A	103.8 FT
LOT BUILDING COVERAGE	40 %	N/A	9.7 %
LOT SURFACE COVERAGE	80 %	N/A	30.0 %
MAX. BUILDING HEIGHT	35 FT	N/A	19.0 FT
PARKING SPACES	61 SPACES	N/A	30 SPACES (V)

(V) - VARIANCE APPROVED BY THE TOWN OF NEWBURGH ZONING BOARD ON JANUARY 28, 2021.



TRUCK TURN

TRUCK: WB-50
SCALE: 1"=80'

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LANDSCAPE ARCHITECTURE
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5	03/03/21	PER TDE COMMENTS	MDL /

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PROJECT No.: B190123
DRAWN BY: NCN
CHECKED BY: CVM
DATE: 11/26/2019
CAD I.D.: B190123SS00

PROJECT:

PROPOSED SITE PLAN DOCUMENTS

FOR

HSC BALMVILLE, LLC

PROPOSED DEVELOPMENT

U.S. ROUTE 9W & N. HILL LANE
TOWN OF NEWBURGH
ORANGE COUNTY
STATE OF NEW YORK

BOHLER
17 COMPUTER DRIVE WEST
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NEW HAMPSHIRE LICENSE No. 19640
MAINE LICENSE No. 9496
NEW YORK LICENSE No. 075334-1
FLORIDA LICENSE No. 82022

SHEET TITLE:

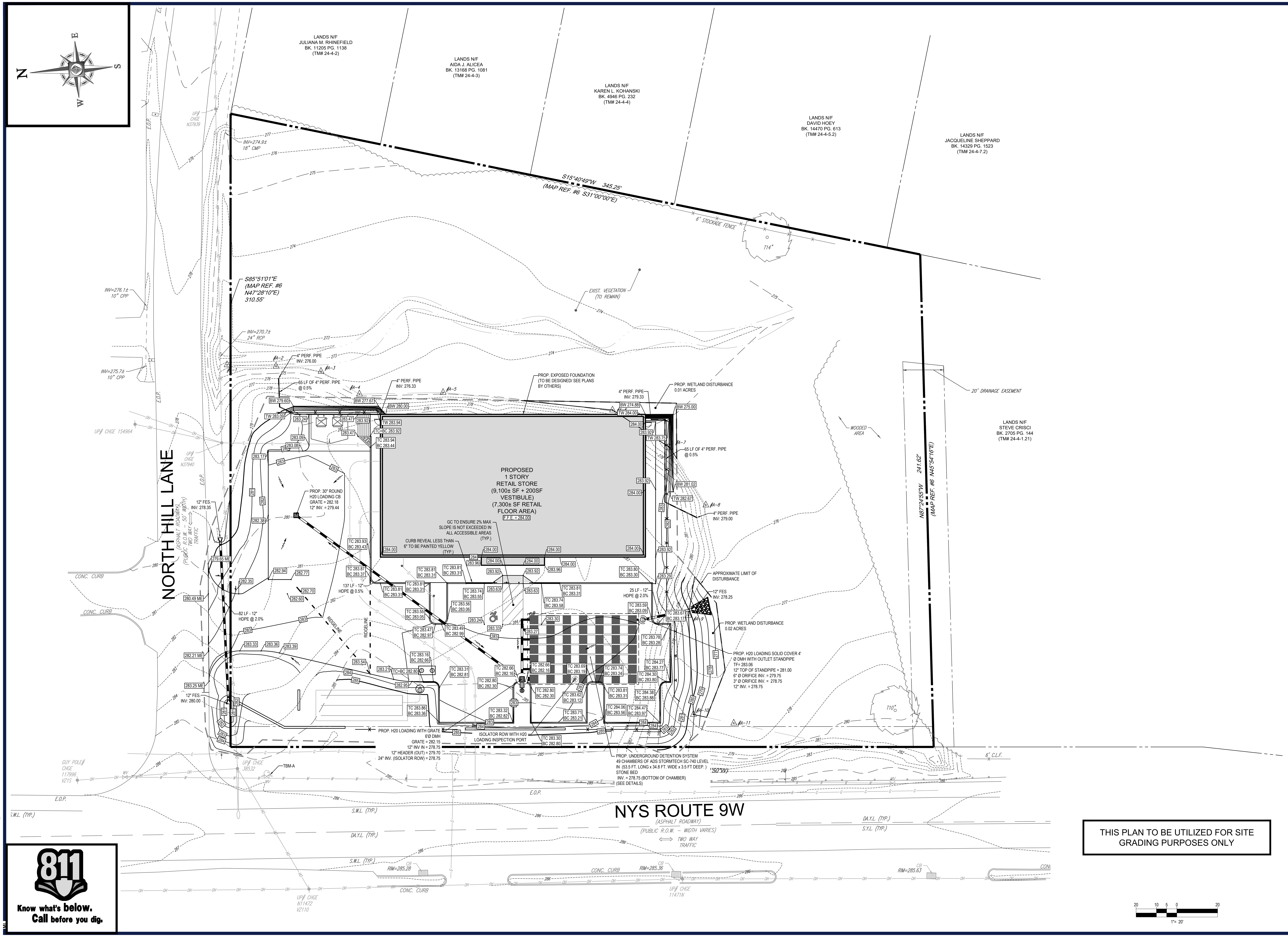
SITE PLAN

SHEET NUMBER:

C-4

REVISION 5 - 03/03/2021

C:\USERS\MLESSARD\APPDATA\LOCAL\TEMP\ACPUBLISH_16304\B190123SS00-----LAYOUT1 814-SITE PLAN.DWG



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4	02/07/21	TOWN SUBMITTAL	MDL
5	03/03/21	PER TDE COMMENTS	MDL

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CONNECTICUT LICENSE No. 21854
NEW HAMPSHIRE LICENSE No. 10280
MAINE LICENSE No. 9490
NEW YORK LICENSE No. 071284-1
FLORIDA LICENSE No. 66202

SHEET TITLE:

GRADING & DRAINAGE PLAN

SHEET NUMBER:

C-5

REVISION 5 - 03/03/2021

N

W E

S

LANDS N/F
JULIANA M. RHINEFIELD
BK. 11205 PG. 1138
(TM# 24-4-2)

LANDS N/F
AIDA J. ALICEA
BK. 13168 PG. 1081
(TM# 24-4-3)

LANDS N/F
KAREN L. KOHANSKI
BK. 4946 PG. 232
(TM# 24-4-4)

LANDS N/F
DAVID HOEY
BK. 14470 PG. 613
(TM# 24-4-5.2)

LANDS N/F
JACQUELINE SHEPPARD
BK. 14329 PG. 1523
(TM# 24-4-7.2)

LANDS N/F
STEVE CRISCI
BK. 2705 PG. 144
(TM# 24-4-1.21)

UP# CHCE N37939

E.O.P.

S15°40'49"W 345.25'
(MAP REF. #6 S31°00'00"E)

6" STOCKADE FENCE

T14"

S85°51'01"E
(MAP REF. #6
N47°28'10"E)
310.55'

30.0'
PROP. UTILITY EASEMENT

EXIST. VEGETATION
(TO REMAIN)

20' DRAINAGE EASEMENT

WOODED AREA

N87°31'55"W 241.62'
(MAP REF. #6 N45°54'16"E)

T10"

GC TO COORDINATE PROPOSED SITE UTILITY POLE(S), GUY WIRES AND TRANSFORMER (IF REQUIRED) LOCATIONS AND OVERHEAD TELEPHONE AND ELECTRIC SERVICES WITH UTILITY PROVIDERS PRIOR TO CONSTRUCTION (TYP.)

UP# CHCE 154964

UP# CHCE N37940

NORTH HILL LANE
(ASPHALT ROADWAY)
(PUBLIC R.O.W. – 50' WIDTH)
TWO WAY TRAFFIC

CONC. CURB

PROP. ELECTRIC METER. GC TO COORDINATE WITH ARCHITECTURAL PLANS

PROP. UNDERGROUND ELECTRIC SERVICE

PROP. GAS SERVICE CONNECTION. GC TO COORDINATE WITH ARCHITECTURAL PLANS

PROP. WATER SERVICE TO BUILDING. GC TO COORDINATE WITH ARCHITECTURAL PLANS. FOR WATER SERVICE SIZING, CONTINUATION, ETC.

PROPOSED
1 STORY
RETAIL STORE
(9,100± SF + 200SF VESTIBULE)
(7,300± SF RETAIL FLOOR AREA)
F.F.E. = 284.00

PROP. UNDERGROUND GAS SERVICE

PROP. 4" SAN
INV. = 280.50

PROP. SANITARY CLEAN OUT

PROP. SANITARY CLEAN OUT

PROP. DOMESTIC WATER SERVICE LINE (MIN. 5' COVER)

PROP. 1,000 GAL SEPTIC TANK
RIM = 282.74
INV. IN= 279.60
INV. OUT= 279.35

PROP. 4' DIA. EFFLUENT PUMP STATION
RIM =284.00
INV. IN = 279.25
INV. OUT = 278.75

PROP. SEPTIC SYSTEM

60 LF - 4" PVC @ 1.5%

5 LF - 4" PVC @ 1.5%

PROP. 15 LF 1.5" FORCE MAIN (4" MIN COVER)

PROP. WATER SHUTOFF VALVE

GC TO COORDINATE LOCATION OF GAS CONNECTION WITH UTILITY COMPANY PRIOR TO CONSTRUCTION.

GC TO CONNECT TO EXISTING WATER MAIN. GC TO COORDINATE WITH TOWN AND WATER PROVIDER PRIOR TO CONSTRUCTION AND NOTIFY DESIGN ENGINEER OF ANY CONFLICTS.

GUY POLE# CHCE 117996 VZ15

UP# CHCE 38532

APPROXIMATE WATERLINE LOCATION

N04°08'55"E
(MAP REF. #6 N42°31'50"W)
344.87'

6' C.L.F.

E.O.P.

S.W.L. (TYP.)

D.W.L. (TYP.)

NYS ROUTE 9W
(ASPHALT ROADWAY)
(PUBLIC R.O.W. – WIDTH VARIES)
TWO WAY TRAFFIC

D.W.L. (TYP.)

S.W.L. (TYP.)

CB

CONC. CURB

UP# CHCE N11472 VZ110

UP# CHCE 11471N

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20 10 5 0 20
1"= 20'

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C:\USERS\MLESSARD\APPDATA\LOCAL\TEMP\ACPUBLISH_16364\B190123SS00-----LAYOUT: 01-UTIL

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5	03/03/21	PER TDE COMMENTS	

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FOR

HSC BALMVILLE, LLC

PROPOSED DEVELOPMENT

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MAINE LICENSE No. 9496
NEW YORK LICENSE No. 075334-1
FLORIDA LICENSE No. 82922

SHEET TITLE:

UTILITY PLAN

SHEET NUMBER:

C-6

REVISION 5 - 03/03/2021

LANDSCAPE SCHEDULE

KEY	QTY	BOTANICAL NAME	COMMON NAME	SIZE	REMARKS
DECIDUOUS SHRUB					
SJLP	29	SPIREA JAPONICA 'LITTLE PRINCESS'	LITTLE PRINCESS SPIREA	15-18"	#3 CAN
LB	40	LINDERA BENZOIN	COMMON SPICEBUSH	30-36"	#5 CAN
ORNAMENTAL GRASSES					
PAH	12	PENNISETUM ALOPECUROIDES 'HAMELN'	DWARF FOUNTAIN GRASS	2 GAL.	CONTAINER
SHADE TREES					
AS	3	ACER RUBRUM 'ARMSTRONG'	ARMSTRONG MAPLE	2 1/2-3" CAL.	B+B

NOTE: IF ANY DISCREPANCIES OCCUR BETWEEN AMOUNTS SHOWN IN THE PLAN AND THE PLANT LIST, THE PLAN SHALL DICTATE.

N
E
S
W

NORTH HILL LANE
(ASPHALT ROADWAY)
(PUBLIC R.O.W. – 50' WIDTH)
⟺ TWO WAY TRAFFIC

NYS ROUTE 9W
(ASPHALT ROADWAY)
(PUBLIC R.O.W. – WIDTH VARIES)
⟺ TWO WAY TRAFFIC

PROPOSED 1 STORY RETAIL STORE (9,100± SF + 200SF VESTIBULE) (7,300± SF RETAIL FLOOR AREA)

S15°40'49"W 345.25'
(MAP REF. #6 S31°00'00"E)

S85°51'01"E
(MAP REF. #6 N47°28'10"E)
310.55'

N87°23'55"W 241.62'
(MAP REF. #6 N45°54'16"E)

N04°08'55"E
(MAP REF. #6 N42°31'50"W)
344.87'

6' STOCKADE FENCE

20' DRAINAGE EASEMENT

30.0' PROP. UTILITY EASEMENT

APPROXIMATE LIMIT OF DISTURBANCE

EXIST. VEGETATION (TO REMAIN)

WOODED AREA

APPROXIMATE WATERLINE LOCATION

PROP. SOD AND IRRIGATION SYSTEM DESIGNED AND INSTALLED BY LANDSCAPE CONTRACTOR (TYP.)

PROP. LANDSCAPED/ MULCHED AREA
(10) SJLP

PROP. LANDSCAPED/ MULCHED AREA
(8) SJLP
(40) LB

PROP. LANDSCAPED/ MULCHED AREA
(8) SJLP
(3) AS

(3) SJLP

(13) IGS

(12) PAH

PROP. HYDROSEED OVER 6" TOPSOIL DEPTH IN DISTURBED AREAS (TYP.)

SEED

SOD

PROP. LANDSCAPED/ MULCHED AREA

A-1 A-2 A-3 A-4 A-5 A-6 A-7 A-8 A-9 A-10 A-11

T14"

T10"

UP/ CHGE N37939

UP/ CHGE 154964

UP/ CHGE N37940

UP/ CHGE 38532

GUY POLE/ CHGE 117996 VZ15

UP/ CHGE N11472 VZ110

UP/ CHGE 11471N

E.O.P.

CONC. CURB

S.W.L. (TYP.)

D.A.Y.L. (TYP.)

CB

W

OH

6' C.L.F.

20 10 5 0 20
1"= 20'

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C:\USERS\MLESSARD\APPDATA\LOCAL\TEMP\ACPUBLISH_16364\B190123SS00-----LAYOUT 09- LANDSCAPE.DWG

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MAINE LICENSE No. 9496
NEW YORK LICENSE No. 075144-1
FLORIDA LICENSE No. 82852

SHEET TITLE:

LANDSCAPE PLAN

SHEET NUMBER:

C-9

REVISION 5 - 03/03/2021