BARRETT HILL LLC OPEN SPACE DEVELOPMENT PLAN

SB# 08-23

STAFF REPORT

March 27, 2024

SITE: 75 Barretts Hill Road / Map 151 / Lot 059

ZONING: General – 1 (G-1)

PURPOSE OF PLAN: To depict a thirteen (13) lot open space subdivision on Map 151, lot 059 and all associated improvements.

PLANS UNDER REVIEW:

Barrett Hill Subdivision SB# 08-23, Map 151/Lot 059, 75 Barretts Hill Road, Hudson, New Hampshire; prepared by: Keach-Nordstrom Associates, 10 Commerce Park North Suite 3B, Bedford, NH 03110; prepared for: Barrett Hill, LLC, 21 Continental Boulevard, Merrimack NH 03054, consisting of twenty-four sheets, and general notes 1-28 on sheet 1; dated December 6, 2023, last revised March 4, 2024.

ATTACHMENTS:

1) Subdivision Application and applicable waiver date stamped December 11, 2023 – Attachment “**A**”.
2) Department Comments – Attachment “**B**.”
3) Peer Review, prepared by Fuss & O’Neill, dated January 4, 2024 – Attachment “**C**”
4) Applicant Response to Peer Review, prepared by Keach-Nordstrom Associates, dated March 4, 2024 – Attachment “**D**”.
5) Applicant Response to Town Comments, prepared by Keach-Nordstrom Associates, dated March 5, 2024 – Attachment “**E**”.
6) Stormwater Management Report, prepared by Keach-Nordstrom Associates, dated December 13, 2023 – Attachment ”**F**”.
7) CAP Fee Worksheet – Attachment “**G**.”
8) Subdivision plans

REQUESTED WAIVER:

1) §289-37.A – Plan Schedule and Form

APPLICATION TRACKING:

1. December 11, 2023 – Application received.
2. January 4, 2024 – Peer review received.
3. March 5, 2024 – Revisions and responses received.
4. March 27, 2024 – Public hearing scheduled

COMMENTS & RECOMMENDATIONS:

BACKGROUND

The subject lot is approximately 35.36 acres with approximately 1,160 feet of frontage along Barretts Hill Road. The lot is in the General-One (G-1) zone and directly abuts residential properties on three sides. The site contains no known wetlands and is not located within any flood zone. The site is served by neither municipal water nor sewer. The applicant proposes subdividing Map 151 Lot 059 into thirteen lots sized between 43,785 sq. ft and 77,869 sq. ft. All lots would have no less than 100 linear feet of frontage along the proposed Windsor lane. All of the lots are proposed to be developed with duplexes for a total of 26 units. The plan proposes 754,352 sq. ft. of open space to be preserved within the development, held within a 17.318 acre space that spans from the street frontage to the rear half of the property. A utility easement spans across the property within the rear third of the lot and is located entirely within the proposed open space.

STAFF COMMENTS

The lot meets all subdivision requirements of the town outside of a waiver that has been requested for phasing of construction. The applicant states that due to the smaller size of the project, it would be best suited to be completed within a year as opposed to the standard two years which would result in less disturbance to residential abutters.

PEER REVIEW

Fuss & O'Neill reviewed the subdivision plan on January 4, 2024 (**Attachment "C"**). The Applicant responded to the Peer Review comments in **Attachment "D."**

The Applicant has submitted a revised plan set addressing comments provided by Fuss & O'Neill and the Town alongside their response letter.

DEPARTMENT COMMENTS

Engineering provided the following comments:

1. Applicant shall provide driveway plan and profile for all proposed lots.
2. Applicant shall evaluate further improvement on Barretts Hill related to sight distance downhill site, including Barretts Hill Road relocation.

3. Applicant shall provide a bond for onsite and offsite improvements within the existing and proposed Right of Way, prior to recording the plans.
4. Applicant shall transfer the ownership of the road to the town and to the satisfaction of the Town prior to receiving the last Certificate of Occupancy of the last lot.

DPW has provided the following comments:

1. Station 5+25.00 add additional catch basin to opposite side of road.
2. Station 2+00.00 add additional catch basin to opposite side of road.
3. DMH # 17 should have a storm grate instead of a manhole cover since it is on the curb line.
4. All drainage on Barretts Hill Rd. shall be changed to enclosed drainage with catch basins until it outfalls at the existing drainage easement at 55 Barretts Hill Rd.

Zoning had provided the following comments:

1. Are there going to be Decks on the houses?
2. Proposed lot 151 lot 59-1 Looks really close to the front setback.
3. Are there garages and where are the driveways going to be located?
4. 151 lot 59-2 is this going to be a shared driveway with lot 59-8?

Fire has provided the following comments:

1. The State Adopted Fire Code, NFPA I requires a water supply of 1000 gallons per minute for one hour for firefighting. A 60,000 gallon cistern is required. Redesign the site plan showing the placement of the 60,000 gallon cistern. Provide a cistern drawing that meets Hudson Fire Department requirements. The cistern shall include 6"metal suction pipe, to 6" female, to 6" to 5" male reducer to be National Hose Thread. There shall also be a cap provided for the 6" to 5" reducer that will be left connected to the riser. Locks shall be provided for all access hatches. The cistern shall have a water level indicator.
2. The developer has the option of installing an NFPA 13D sprinkler systems in each dwelling in lieu of the cistern.
3. The proposed subdivision falls inside the 1000 foot distance from the center of the Tennessee Gas Pipeline. Advanced notification is required from the gas company per State of NH RSA 674:75. The advanced notification shall be sent to KMEncroachmentsNorth@kindermorgan.com. This is required prior to any sitework, blasting, or building permits being issued. Once approval has been received this approval shall be sent to Nashua Regional Planning Commission email at outreachnashuarpc.org. All approval documentation shall be submitted with the building permit applications. No permits will be issued without all approvals.

No department comments remain outstanding, and full comments are provided in **Attachment "B."** The applicant provided a response letter on March 5, 2024 (**Attachment "E"**) alongside the revised plan set.

RECOMMENDATIONS

Staff recommends accepting the application and holding a public hearing, followed by deliberation and consideration of the waiver required. Assuming the waiver is granted, staff recommends the board's consideration for approval.

The Applicant has addressed all comments issued by Peer Review and Town Staff, the application meets applicable zoning and land use regulation criteria.

DRAFT MOTIONS:

ACCEPT the subdivision application:

I move to accept the subdivision application for the Barrett Hill Subdivision SB# 08-23, Map 151/Lot 059.

DEFER the subdivision application:

I move to defer the further consideration of this subdivision application to the specific date of the April _______, 2024 Planning Board meeting.

Motion by: _______________Second: _________________Carried/Failed: ___________

To GRANT a waiver:

1) § 289-37.A – Plan schedule and form

I move to grant the requested waiver **§289-37.A –** Plan schedule and form, to not require a minimum construction time of two years, where it would typically be required, based on the Board's discussion, the testimony of the Applicant's representative, and in accordance with the language included in the submitted Waiver Request Form for said waiver.

Motion by: _______________Second: _________________Carried/Failed: ___________

APPROVE the subdivision application:

I move to approve the subdivision plan entitled: Barrett Hill Subdivision SB# 08-23, Map 151/Lot 059, 75 Barretts Hill Road, Hudson, NH; prepared by: Keach-Nordstrom Associates, 10 Commerce Park North Suite 3B, Bedford, NH 03110; prepared for: Barrett Hill, LLC, 21 Continental Boulevard, Merrimack NH 03054, consisting of twenty-four sheets, and general notes 1-28 on sheet 1; dated December 6, 2023, last revised March 4, 2024; and:

That the Planning Board finds that this application complies with the Zoning Ordinances, and with the Land Use Regulations; and for the reasons set forth in the written submissions, together with the testimony and factual representations made by the applicant during the public hearing;

Subject to, and revised per, the following stipulations:

1. All stipulations of approval shall be incorporated into the Notice of Decision, which shall be recorded at the HCRD, together with the Plan.
2. A cost allocation procedure (CAP) amount of $6,194.00 per single-family residential unit shall be paid prior to the issuance of a Certificate of Occupancy for the new house lots.
3. All monumentation shall be set or bonded for prior to Planning Board endorsement of the Plan-of-Record.
4. Prior to the Planning Board endorsement of the Plan, it shall be subject to final administrative review by Town Planner and Town Engineer.
5. Construction activities involving the proposed undeveloped lots shall be limited to the hours between 7:00 A.M. and 7:00 P.M., Monday through Saturday. No exterior construction activities shall occur on Sunday.

Motion by: _______________Second: _________________Carried/Failed: ___________

Attachment "A"

KNA *KEACH-NORDSTROM ASSOCIATES, INC.*

LETTER OF TRANSMITTAL

DATE: December 11, 2023

PROJECT NO: 23-0414-1

REFERENCE: Subdivision Application – Barrett Hill, LLC

TO: Town of Hudson – Planning Department
12 School Street
Hudson, NH 03051

ATTENTION: Mr. Brian Groth, AICP – Town Planner

WE ARE SENDING YOU THE FOLLOWING ITEMS:

- ☒ PLANS
- ☐ SPECIFICATIONS
- ☒ COPY OF LETTER
- ☒ APPLICATION
- ☐ CHANGE ORDER
- ☒ REPORT
- ☐ QUALIFICATIONS
- ☐ OTHER

THESE ARE TRANSMITTED AS FOLLOWS:

- ☐ FOR APPROVAL
- ☐ FOR YOUR USE
- ☒ AS REQUESTED
- ☐ FOR REVIEW & COMMENT
- ☐ RETURNED FOR CORRECTIONS
- ☐ APPROVED AS NOTED
- ☐ APPROVED AS SUBMITTED

NOTE: One (1) original & one (1) copy of completed Subdivision Application Package, Fee
One (1) original & one (1) copy of Narrative, Abutter's List and Two (2) Sets of
Labels, Three (3) Full Size Plan Sets, Three (3) copies of Stormwater Report, PDF

COPY TO:

SIGNED: Katherine Cooper

Katherine Cooper, Project Engineer

KNA KEACH-NORDSTROM ASSOCIATES, INC.

Attachment "A"

December 11, 2023

Town of Hudson
Planning Department
12 School Street
Hudson, New Hampshire 03051

Subject: **Subdivision Application – Barrett Hill, LLC**
Tax Map 151; Lot 59
75 Barretts Hill Road – Hudson, New Hampshire
KNA Project No. 23-0414-1

Dear Chairman and Board Members:

The above referenced project is being submitted for Subdivision approval from the Town of Hudson Planning Board. The property, located at 75 Barretts Hill Road, is approximately 35.36 acres in total area. The parcel, located entirely within the General (G-1) Zoning District, is currently undeveloped consisting mainly of woodlands with a powerline easement crossing the property. The Applicant is proposing a thirteen (13) lot residential open space subdivision and all associated site improvements. The attached documents outline the applicant's request for approval. All required information has been included within the submittal package. Keach Nordstrom Associates, Inc. will be present to further discuss the Subdivision Application at the scheduled hearing.

Enclosed is the following material for your review and approval:

1. Application for Subdivision Package (Original & Copy)
2. Application Fee: **$2,837.01**
3. Consultant Review Fee: **$2,892.00**
4. Narrative (Original & Copy)
5. Abutter's List & Two (2) Sets of Labels
6. Three (3) Full Size Plan Sets
7. Three (3) Copies of Stormwater Report
8. PDF

If you have any questions or comments, please contact me at (603) 627-2881.

Sincerely,

Katherine Cooper

Katherine Cooper
Project Engineer
Keach Nordstrom Associates
10 Commerce Park North, Suite 3
Bedford, NH 03110

Town of Hudson
12 School Street
Hudson, NH 03501

SUBDIVISION APPLICATION

Revised July 24, 2023

The following information must be filed with the Planning Department ***at the time of filing a site plan application***:

1. One (1) original completed application with original signatures, and one (1) copy.

2. Three (3) full plan sets (sheet size: 22" x 34").

3. One (1) original copy of the project narrative, and one (1) copy.

4. A list of direct abutters and a list of indirect abutters, and two (2) sets of mailing labels for abutter notifications.

5. All of the above application materials, including plans, shall also be submitted in electronic form as a PDF.

6. All plans shall be folded and all pertinent data shall be attached to the plans with an elastic band or other enclosure.

The following information is required to filed with the Planning Department ***no later than 10:00 A.M., Tuesday ONE WEEK prior to the scheduled Planning meeting. The purpose of these materials is hardcopy distribution to Planning Board members, not review. Any plan revisions that require staff review must be submitted no later than 10:00A.M., Tuesday TWO WEEKS prior to the scheduled Planning meeting. Depending on the complexity of changes, more time may be required for review. Please contact the Town Planner if you have any questions on this matter.***

1. Submission of fifteen (15) 11" X 17" plan sets, revised if applicable.

2. Submission of two (2) full plan sets (sheet size: 22" x 34"), if revised.

3. All of the above application materials, including plans, shall also be submitted in electronic form as a PDF.

Note: Prior to filing an application, it is recommended to schedule an appointment with the Town Planner.

Attachment "A"

SUBDIVISION APPLICATION

Date of Application: 12/11/23 Tax Map #: 151 Lot #: 59

Site Address: 75 Barretts Hill Road

Name of Project: Subdivision Barrett Hill, LLC

Zoning District: General (G-1) General SB#: ____________
(For Town Use Only)

Z.B.A. Action: ____________

PROPERTY OWNER:	DEVELOPER:
Name: Barrett Hill, LLC	
Address: 21 Continental Boulevard, Door #4	
Address: Merrimack, NH 03054	
Telephone # 603-320-5123	
Email: johngargasz@gmail.com	

PROJECT ENGINEER:	SURVEYOR:
Name: Keach-Nordstrom Associates, Inc.	Keach-Nordstrom Associates, Inc.
Address: 10 Commerce Park North, Suite 3	10 Commerce Park North, Suite 3
Address: Bedford, NH 03110	Bedford, NH 03110
Telephone # 603-627-2881	603-627-2881
Email: pchisholm@keachnordstrom.com	chickey@keachnordstrom.com

PURPOSE OF PLAN:

The purpose of this plan is to depict a thirteen (13) lot open space subdivision on the property and all associated improvements.

(For Town Use Only)

Routing Date: ________ Deadline Date: ________ Meeting Date: ________

________ I have no comments ________ I have comments (attach to form)

________ Title: ____________ Date: ________
(Initials)

Department:

Zoning: ___ Engineering: ___ Assessor: ___ Police: ___Fire: ___ DPW: ___ Consultant: ___

SUBDIVISION PLAN DATA SHEET

PLAN NAME: Barrett Hill, LLC

PLAN TYPE: Conventional Subdivision Plan or Open Space Development (Circle One)

LEGAL DESCRIPTION: MAP 151 LOT 59

DATE: December 11, 2023

Address:	75 Barretts Hill Road
Total Area:	S.F. 1,540,250 Acres: 35.36
Zoning:	General (G-1)
Required Lot Area:	566,280 SF (43,560 SF per Lot)
Required Lot Frontage:	100 FT
Number of Lots Proposed:	Thirteen (13) Residential Lots & One (1) Non-buildable open space lot
Water and Waste System Proposed:	Individual wells and septic systems
Area in Wetlands:	None
Existing Buildings To Be Removed:	None
Flood Zone Reference:	FIRM Map 33011C0517D
Proposed Linear Feet Of New Roadway:	1,213.17 LF

SUBDIVISION PLAN DATA SHEET

Dates/Case #/Description/
Stipulations of ZBA,
Conservation Commission,
NH Wetlands Board Action: ______________________

____

(Attach Stipulations on
Separate Sheet) ______________________

List Permits Required: NHDES AOT

NHDES Subdivision

NHDES Individual Subsurface Disposal

____

*Waivers Requested:	Hudson Town Code Reference	Regulation Description
	1.	
	2.	
	3.	
	4.	
	5.	
	6.	
	7.	

(Left Column for Town Use)

(For Town Use Only)

Data Sheets Checked By: ______________________ Date: __________

Attachment "A"

TOWN OF HUDSON
SUBDIVISION PLAN REVIEW CHECKLIST

This checklist is intended to help the applicant and staff to ensure application completeness. Please refer to the regulations on the exact language of each requirement.

Key: Y=Yes P =Pending W=Waiver Request

Relevant Regulations:
§ 276-11.1 General Plan Requirements
§§ 289-26 – 289-27 Subdivision Plan Requirements

	Y	P	W		Notes
1.	☒	☐	☐	- A list of the names and addresses of the owner(s) of the property, the applicant(s), and all abutters as indicated in the office of the Town Assessor records not more than five (5) days prior to the day of filing **[§ 276-11.1.A.]**	
2	☒	☐	☐	- Sets of plans and copies as indicated on application.	
3.	☒	☐	☐	- Scale no smaller than 50 feet to the inch (1" = 50') **[§ 276-11.1.B.(2)]**	
4.	☒	☐	☐	- Title block in the lower right-hand corner of the plan, containing: **[§ 276-11.1.B.(3)]**	
5.	☒	☐	☐	- Title, including the term "site plan" or "subdivision plan"	
6.	☒	☐	☐	- The name for whom the plan was prepared	
7.	☒	☐	☐	- Preparer of the plan	
8.	☒	☐	☐	- The scale(s) of the plan	
9.	☒	☐	☐	- Date of the plan	
10.	☒	☐	☐	- Appropriate revision block	
11.	☒	☐	☐	- Approval block (2"x6") located on the lower left corner of each sheet, with the required language and signature lines **[§ 276-11.1.B.(4) & § 289-27.A]**	
12.	☒	☐	☐	- A space (2"x1.5") adjacent to the approval block containing the required statement **[§ 276-11.1.B.(5)]**	
13.	☒	☐	☐	- Owner's printed name and address and signature **[§ 276-11.1.B.(6)]**	
14.	☒	☐	☐	- Name and address of all abutting property owners **[§ 276-11.1.B.(7)]**	
15.	☒	☐	☐	- A locus plan at one inch equals 1,000 feet (1" = 1,000') **[§ 276-11.1.B.(8)]**	

(Continue next page)

TOWN OF HUDSON
SUBDIVISION PLAN REVIEW CHECKLIST

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Key: Y=Yes P =Pending W=Waiver Request

Notes

	Y	P	W	
16.	☒	☐	☐	- Boundary of the entire parcel held in single ownership with boundary dimensions and bearings **[§ 276-11.1.B.(9)]**
17.	☒	☐	☐	- Error of closure shown and certified by a licensed land surveyor
18.	☒	☐	☐	- North point arrow
19.	☒	☐	☐	- Zoning classification note of the tract and location of the zoning district boundaries if the property is located in two or more zoning district **[§ 276-11.1.B.(10)]**
20.	☒	☐	☐	- The location of all buildings within 50 feet of the tract **[§ 276-11.1.B.(15)]**
21.	☒	☐	☐	- The location of roadways, driveways, travel areas or parking areas within 200 feet of the tract, in accordance with **§ 276-11.1.B.(16)**
22.	☒	☐	☐	- Existing topography at two-foot contour intervals of that portion of the tract being proposed for development from a topographic survey and contours on the remainder of the tract from a reliable plan source **[§ 276-11.1.B.(17)]**
23.	☒	☐	☐	- Proposed topography at two-foot contour intervals **[§ 276-11.1.B.(18)]**
24.	☒	☐	☐	- A note identifying the Tax Map and Lot Number of the tract **[§ 276-11.1.B.(19)]**
25.	☒	☐	☐	- The location of all existing buildings (including size and height), driveways, sidewalks, parking spaces, loading area, open spaces, large trees, open drainage courses, signs, exterior lighting, service areas, easements landscaping and other pertinent items. **[§ 276-11.1.B.(20)]**
26.	☒	☐	☐	- The location of all proposed construction, buildings, structures, pavement, etc. **[§ 276-11.1.B.(21)]**
27.	☒	☐	☐	- A green area shown between the right-of-way line and any pavement, gravel or structure meeting the required minimum width **[§ 276-11.1.B.(22)]**
N/A 28.	☐	☐	☐	- Note any pertinent highway projects. **[§ 276-11.1.B.(23)]**

(Continue next page)

TOWN OF HUDSON
SUBDIVISION PLAN REVIEW CHECKLIST

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Key: Y=Yes P =Pending W=Waiver Request NA=Not Applicable (please explain)

	Y	P	W	NA		Notes
29.	☒	☐	☐	☐	- Proposed subdivision name [§ **289-26.B.(1)**]	
30.	☒	☐	☐	☐	- Names of owners of record of abutting properties [§ **289-26.B.(2)**]	
31.	☒	☐	☐	☐	- Location of property lines and their approximate dimensions [§ **289-26.B.(3)**]	
32.	☒	☐	☐	☐	- Location and description of each permanent monument and benchmark, including primary control points and reference to a USGS benchmark [§ **289-27.B.(7)**]	
33.	☒	☐	☐	☐	- Existing and proposed easements shown on plan, as applicable [§ **289-26.B.(3)**]	
34.	☒	☐	☐	☐	- Buildings, watercourses, ponds or standing water, rock ledges and other essential features [§ **289-26.B.(3)**]	
35.	☒	☐	☐	☐	-Existing water mains, sewers, culverts, drains and proposed connections or alternative means of providing water supply and disposal of sewage and surface / stormwater drainage [§ **289-26.B.(4)** & § **289-27.B.(4)**]	
36.	☒	☐	☐	☐	- Location of each percolation test hole and the results, each proposed septic tank and drainage field, each proposed well and typical designs of proposed on-lot water and sewerage systems [§ **289-26.B.(4)**]	
37.	☒	☐	☐	☐	- Location, name, and right-of-way widths of existing and proposed streets within 200 feet, as described in § **289-26.B.(5)**	
38.	☒	☐	☐	☐	- Preliminary designs of any bridges or culverts which may be required [§ **289-26.B.(8)**]	
39.	☒	☐	☐	☐	- Street cross sections [§ **289-27.B.(3)**]	
40.	☒	☐	☐	☐	- Proposed lots, approximate square foot size of each lot and setback lines. [§ **289-26.B.(6)**]	
41.	☐	☐	☐	☒	- Location of all parcels of land proposed to be dedicated to public use and the conditions of such dedication [§ **289-26.B.(7)**]	

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TOWN OF HUDSON
SUBDIVISION PLAN REVIEW CHECKLIST

This checklist is intended to help the applicant and staff to ensure application completeness. Please refer to the regulations on the exact language of each requirement.

Key: Y=Yes P =Pending W=Waiver Request NA=Not Applicable (please explain)

	Y	P	W	NA		Notes
42.	☐	☐	☐	☒	- Where the plan submitted covers only a part of the subdivider's entire holding, a sketch of the prospective future street system of the unsubmitted part **[§ 289-26.B.(9)]**	

(End of checklist)

SUBDIVISION PLAN APPLICATION AUTHORIZATION

I hereby apply for *Subdivision Plan* Review and acknowledge I will comply with all of the Ordinances of the Town of Hudson, New Hampshire State Laws, as well as any stipulations of the Planning Board, in development and construction of this project. I understand that if any of the items listed under the *Subdivision Plan* specifications or application form are incomplete, the application will be considered rejected.

Pursuant to RSA 674:1-IV, the owner(s) by the filing of this application as indicated above, hereby given permission for any member of the Hudson Planning Board, the Town Planner, the Town Engineer, and such agents or employees of the Town or other persons as the Planning Board may authorize, to enter upon the property which is the subject of this application at all reasonable times for the purpose of such examinations, surveys, tests and inspections as may be appropriate. The owner(s) release(s) any claim to or right he/she (they) may now or hereafter possess against any of the above individuals as a result of any examinations, surveys, tests and/or inspections conducted on his/her (their) property in connection with this applications.

Signature of Owner: ____________________ Date: 12/11/2023

Print Name of Owner: JOHN GARGASZ

❖ If other than an individual, indicate name of organization and its principal owner, partners, or corporate officers.

Signature of Developer: ____________________ Date: 12/11/2023

Print Name of Developer: JOHN GARBASZ

❖ The developer/individual in charge must have control over all project work and be available to the Code Enforcement Officer/Building Inspector during the construction phase of the project. The individual in charge of the project must notify the Code Enforcement Officer/Building Inspector within two (2) working days of any change.

SCHEDULE OF FEES

A. **REVIEW FEES:**

1. $170.00 per proposed lot @13 LOTS — $ 2,210.00

CONSULTANT REVIEW FEE: (Separate Check)

Total 4.82 acres @ $600.00 per acre, or $1,250.00, whichever is greater. *Disturbed Acreage — $ 2,892.00

This is an estimate for cost of consultant review. The fee is expected to cover the amount. A complex project may require additional funds. A simple project may result in a refund.

LEGAL FEE:

The applicant shall be charged attorney costs billed to the Town for the Town's attorney review of any application plan set documents.

B. **POSTAGE:**

41 Direct Abutters Applicant, Professionals, etc. as required by RSA 676:4.1.d @$5.01 **(or Current Certified Mail Rate)** — $ 205.41

10 Indirect Abutters (property owners within 200 feet) @$0.66 **(or Current First Class Rate)** — $ 6.60

C. **TAX MAP UPDATE FEE**

2 to 7 lots (# of lots x $30.00) + $25.00 (min. $85.00) — $ ______

8 lots or more (min. $325.00) @13 LOTS — $ 415.00

TOTAL $ $2,837.01 CHECK #1
$2,892.00 CHECK #2

(For Town Use Only)

AMOUNT RECEIVED:	$______	DATE RECEIVED:	______
RECEIPT NO.:	______	RECEIVED BY:	______

NOTE: fees below apply only upon plan approval, NOT collected at time of application.

D. RECORDING:

*****The applicant shall be responsible for the recording of the approved plan, and all documents as required by an approval, at the Hillsborough County Registry of Deeds (HCRD), located at 19 Temple Street, Nashua, NH 03061. Additional fees associated with recording can be found at HCRD.*****

E. COST ALLOCATION PROCEDURE AMOUNT CONTRIBUTION AND OTHER IMPACT FEE PAYMENTS:

To be determined by the Planning Board at time of plan approval and shall be paid by the applicant at the time of submittal of the Certificate of Occupancy Permit requests.

*****The applicant shall be responsible for all fees incurred by the town for processing and review of the applicant's application, plan and related materials.*****

KNA KEACH-NORDSTROM ASSOCIATES, INC.

December 11, 2023

Town of Hudson
Planning Department
12 School Street
Hudson, New Hampshire 03051

Subject: **Subdivision Application – Barrett Hill, LLC**
Tax Map 151; Lot 59
75 Barretts Hill Road – Hudson, New Hampshire
KNA Project No. 23-0414-1

PROJECT NARRATIVE

The proposed subdivision application is being submitted for approval for an open space subdivision comprised of thirteen (13) residential lots and one (1) non-buildable open space lot on the property located at 75 Barretts Hill Road in Hudson, New Hampshire. The property, approximately 1,540,250-sf (35.36 acres) in total area, is located entirely within the General (G-1) Zoning District. It is currently undeveloped consisting mainly of woodlands with a powerline easement crossing the property. There are no wetlands onsite.

The proposed lots will have frontage off a proposed cul-de-sac roadway (Windsor Lane), approximately 1,213.17-lf in length. Each lot will be serviced by individual private wells and septic systems. Other site improvements will include stormwater management provisions, comprised of a closed conveyance system which outlets into a large pocket pond, and underground utilities.

Attachment "A"

Owner Affidavit

I, John Gargasz, authorized representative of Barrett Hill, LLC and owner of the property referenced on Tax Map 151 as Lot 59, located at 75 Barretts Hill Road, Hudson, New Hampshire, hereby verify that I have authorized Keach-Nordstrom Associates, Inc. to submit on my behalf, any and all applicable State and local permit applications as they pertain to improvements on said property.

Additionally, I authorize Keach-Nordstrom Associates, Inc. to aid in the representation of these applications throughout the approval process.

Signature of Owner: ______________________

Printed Name of Owner: John Gargasz

Address of Owner: 21 Continental Boulevard, Door #4

Merrimack, NH 03054

Date: 12/11/2023

Abutters List
Barrett Hill, LLC
Hudson, NH
KNA#23-0414-1

Tax Map	**Lot**	**Owner/Applicant**
151	59	Barrett Hill, LLC 21 Continental Boulevard, Door #4 Merrimack, NH 03054

Tax Map	**Lot**	**Direct Abutters**
152	13-1	Brian Surette 85A Barretts Hill Road Hudson, NH 03051
152	13-2	David Wilkins 85B Barretts Hill Road Hudson, NH 03051
152	13-3	Shana Marie Beland 87A Barretts Hill Road Hudson, NH 03051
152	13-4	Jennifer Buchanan 87B Barretts Hill Road Hudson, NH 03051
152	9	Jeffrey Rogers 95 Barretts Hill Road Hudson, NH 03051
152	8-1	Ryan Mcallister & Allysa Lamothe 97 Barretts Hill Road Hudson, NH 03051
152	8-2	Stephen Javier Diaz & Brittany Renee Desrocher 99 Barretts Hill Road Hudson, NH 03051
152	7	Donald & Aurelie Connors 101 Barretts Hill Road Hudson, NH 03051

152	5	Karen Brown 107 Barretts Hill Road Hudson, NH 03051
152	4	Conrad & Judith Gauthier 113 Barretts Hill Road Hudson, NH 03051
152	3	Sean Hamel Trust Sean Hamel, Trustee 115 Barretts Hill Road Hudson, NH 03051
152	2	Tulipani Revocable Trust Gail Marie Tulipani, Trustee 23 Mallard Drive Hudson, NH 03051
152	1	Christopher & Alexa Porembski 22 Mallard Drive Hudson, NH 03051
151	41	Thomas & Sharon Fincher 20 Mallard Drive Hudson, NH 03051
151	40	Jesse & Barbara Ciancetta 18 Mallard Drive Hudson, NH 03051
151	39	Beverly & David Salmon 16 Mallard Drive Hudson, NH 03051
151	42	Christine Byrnes PO Box 53 Nashua, NH 03061
151	43-1	Vernon & Sarah Thompson 22A Rangers Drive Hudson, NH 03051
151	43-2	Dominic Jarry & Kay Nash 5 Jarry Way Hudson, NH 03051

151	44-1	Jeremy & Bianca Hicks 20A Rangers Drive Hudson, NH 03051
151	44-2	Stephanie Ruszczyk 20B Rangers Drive Hudson, NH 03051
151	45	Wendy Lorentzen 18A Rangers Drive Hudson, NH 03051
151	46-1	Jasmine & Devon Malburne 16A Rangers Drive Hudson, NH 03051
151	46-2	Elizabeth Rocha 16B Rangers Drive Hudson, NH 03051
151	47-1	Gail Lafond 14A Rangers Drive Hudson, NH 03051
151	47-2	David & Kelly Mastroelli 14B Rangers Drive Hudson, NH 03051
151	48-1	Gary & Ellen-Jean Haugh 12A Rangers Drive Hudson, NH 03051
151	48-2	Jacqueline Smith 12B Rangers Drive Hudson, NH 03051
151	49-1	Dave & Nicole Mathieu 15 Lund Street Litchfield, NH 03052
151	49-2	Christine Mathieu 10 1/2B Rangers Drive Hudson, NH 03051

151	50-1	Susan Scalet 10A Rangers Drive Hudson, NH 03051
151	50-2	Shawn Patterson 10B Rangers Drive Hudson, NH 03051
151	51-1	Daniel & Karen Desmarais 8A Rangers Drive Hudson, NH 03051
151	51-2	Ryan Corkery 8B Rangers Drive Hudson, NH 03051
151	55	William & Kathleen Shea 65 Barretts Hill Road Hudson, NH 03051
151	56	David & Judith Silva 70 Barretts Hill Road Hudson, NH 03051
151	57	John & Kathryn Burke 2 Hilltop Drive Hudson, NH 03051
151	58	Nichole Sullivan 76 Barretts Hill Road Hudson, NH 03051
143	11	23 Land Holding, LLC 23 Woodcrest Drive Hudson, NH 03051
Tax Map	**Lot**	**Indirect Abutters**
160	77	Kenneth & June Kopka 14 Mallard Drive Hudson, NH 03051
160	76	Robert & Laura Lind 12 Mallard Drive Hudson, NH 03051

151	38-1	Alita Ann Wycoff 24A Rangers Drive Hudson, NH 03051
151	38-2	Sheila Ledoux 24B Rangers Drive Hudson, NH 03051
151	52-1	Lesa Hallbach 6A Rangers Drive Hudson, NH 03051
151	52-2	Kurt & Lisa Perry 6B Rangers Drive Hudson, NH 03051
151	53-1	Webber Revocable Trust of 2006 David Webber, Trustee 8400 Bridgeport Bay Cr Mount Dora, FL 32757
151	53-2	Karen & Sean Merrow 61 Sousa Boulevard Hudson, NH 03051
142	39	Damon & Janna Miller 3 Hilltop Drive Hudson, NH 03051
143 152	13 & 14 14	17 Hudson Associates c/o CPM Inc. 80 Nashua Road Londonderry, NH 03053

Professionals to be notified:

Engineer/Surveyor
Keach-Nordstrom Associates Inc.
10 Commerce Park North, Suite 3B
Bedford, NH 03110

Attachment "A"

KNA *KEACH-NORDSTROM ASSOCIATES, INC.*

March 4, 2024

Mr. Jay Minkarah
Acting Town Planner
Town of Hudson
12 School Street
Hudson, NH 03051

Subject: **Town of Hudson Planning Board Review**
Barrett Hill Subdivision Plan
Tax Map 151 Lot 59
KNA Project No. 23-0414-1

The Applicant is requesting a waiver from the following section of the Town of Hudson Site Plan Regulation: **Section 289-37(A) Plan Schedule and Form**

Hardship reason(s) for granting this waiver:
The applicant would like to construct the proposed roadway and develop the 13 lots as quickly and efficiently as possible and would prefer not to phase the development for two years as required. Adhering to this rule would cause an unnecessary hardship for the applicant and the surrounding residential abutters, as the overall small scale of the project makes it best suited to be developed within a year and disturbance from construction should be limited as such.

Reason(s) for granting this waiver, relative to not being contrary to the spirit and intent of the Land Use Regulations:
Granting this waiver would not be contrary to the spirit and intent of the regulation because requiring phased construction would only increase the amount and time of disturbance to the surrounding residential abutters, which there are many of.

Dubowik, Brooke

From:	Dhima, Elvis
Sent:	Monday, December 18, 2023 3:26 PM
To:	Dubowik, Brooke; Gradert Benjamin
Cc:	Hebert, David; Kirkland, Donald; McElhinney, Steven; Michaud, Jim; Sullivan, Christopher; Malley, Tim; Twardosky, Jason
Subject:	RE: DEPT SIGN OFF - SB# 08-23 Barrett Hill LLC OSD Subdivision Plan

Please see below

1. Applicant shall provide driveway plan and profile for all proposed lots
2. Applicant shall evaluate further improvement on Barrets Hill related to sight distance downhill site, including Barretts Hill Road relocation.
3. Applicant shall provide a bond for onsite and offsite improvements within the existing and proposed Right of Way, prior to recording the plans.
4. Applicant shall transfer the ownership of the road to the town and to the satisfaction of the Town prior to receiving the last Certificate of Occupancy of the last lot.

Thanks

E

Elvis Dhima, P.E.
Town Engineer

12 School Street
Hudson, NH 03051
Phone: (603) 886-6008
Mobile: (603) 318-8286

Town of Hudson
NEW HAMPSHIRE 03051

Attachment "B"

Dubowik, Brooke

From: Twardosky, Jason
Sent: Tuesday, December 19, 2023 1:41 PM
To: Dubowik, Brooke; Dhima, Elvis; Gradert Benjamin; Hebert, David; Kirkland, Donald; McElhinney, Steven; Michaud, Jim; Sullivan, Christopher; Malley, Tim
Subject: RE: DEPT SIGN OFF - SB# 08-23 Barrett Hill LLC OSD Subdivision Plan

1) Station 5+25.00 add additional catch basin to opposite side of road.
2) Station 2+00.00 add additional catch basin to opposite side of road.
3) DMH # 17 should have a storm grate instead of a manhole cover since it is on the curb line.
4) All drainage on Barretts Hill Rd. shall be changed to enclosed drainage with catch basins until it outfalls at the existing drainage easement at 55 Barretts Hill Rd.

SUBDIVISION APPLICATION

Date of Application: 12/11/23 Tax Map #: 151 Lot #: 59

Site Address: 75 Barretts Hill Road

Name of Project: Subdivision Barrett Hill, LLC

Zoning District: General (G-1) General SB#: 08-23
(For Town Use Only)

Z.B.A. Action: ______

PROPERTY OWNER:	DEVELOPER:
Name: Barrett Hill, LLC	
Address: 21 Continental Boulevard, Door #4	
Address: Merrimack, NH 03054	
Telephone # 603-320-5123	
Email: johngargasz@gmail.com	

PROJECT ENGINEER:	SURVEYOR:
Name: Keach-Nordstrom Associates, Inc.	Keach-Nordstrom Associates, Inc.
Address: 10 Commerce Park North, Suite 3	10 Commerce Park North, Suite 3
Address: Bedford, NH 03110	Bedford, NH 03110
Telephone # 603-627-2881	603-627-2881
Email: pchisholm@keachnordstrom.com	chickey@keachnordstrom.com

PURPOSE OF PLAN:
The purpose of this plan is to depict a thirteen (13) lot open space subdivision on the property and all associated improvements.

(For Town Use Only)

Routing Date: 12/18/23 Deadline Date: 12/26/23 Meeting Date: TBD

___ I have no comments X I have comments (attach to form)

GJS Title: Zoning Administrator Date: ______
(Initials)

Department:

Zoning: X Engineering: ___ Assessor: ___ Police: ___ Fire: ___ DPW: ___ Consultant: ___

Attachment "B"

TOWN OF HUDSON

Land Use Division

12 School Street • Hudson, New Hampshire 03051 • Tel: 603-886-6008 • Fax: 603-594-1142

Zoning
SB# 08-23 Review

December 20, 2023

1. Are there going to be Decks on the houses
2. Proposed lot 151 lot 59-1 Looks really close to the front setback
3. Are there garages and where are the driveways going to be located.
4. 151 lot 59-2 is this going to be a shared driveway with lot 59-8

Chris Sullivan
Zoning Administrator/Code Enforcement Officer
(603) 816-1275
csullivan@hudsonnh.gov

NOTE: this determination may be appealed to the Hudson Zoning Board of Adjustment within 30 days of the receipt of this letter.

SUBDIVISION APPLICATION

Date of Application: 12/11/23 Tax Map #: 151 Lot #: 59

Site Address: 75 Barretts Hill Road

Name of Project: Subdivision Barrett Hill, LLC

Zoning District: General (G-1) General SB#: 08-23 (For Town Use Only)

Z.B.A. Action: ______

PROPERTY OWNER:	DEVELOPER:
Name: Barrett Hill, LLC	
Address: 21 Continental Boulevard, Door #4	
Address: Merrimack, NH 03054	
Telephone # 603-320-5123	
Email: johngargasz@gmail.com	

PROJECT ENGINEER:	SURVEYOR:
Name: Keach-Nordstrom Associates, Inc.	Keach-Nordstrom Associates, Inc.
Address: 10 Commerce Park North, Suite 3	10 Commerce Park North, Suite 3
Address: Bedford, NH 03110	Bedford, NH 03110
Telephone # 603-627-2881	603-627-2881
Email: pchisholm@keachnordstrom.com	chickey@keachnordstrom.com

PURPOSE OF PLAN:

The purpose of this plan is to depict a thirteen (13) lot open space subdivision on the property and all associated improvements.

(For Town Use Only)

Routing Date: 12/18/23 Deadline Date: 12/26/23 Meeting Date: TBD

______ I have no comments ✓ I have comments (attach to form)

DRH Title: Fire Marshal Date: 12/19/23
(Initials)

Department:

Zoning: ___ Engineering: ___ Assessor: ___ Police: ___ Fire: ✓ DPW: ___ Consultant: ___

Attachment "B"

TOWN OF HUDSON

FIRE DEPARTMENT

INSPECTIONAL SERVICES DIVISION

12 SCHOOL STREET, HUDSON, NEW HAMPSHIRE 03051

Emergency 911
Business 603-886-6005
Fax 603-594-1142

Scott Tice
Chief of Department

TO: Town Planner

FR: David Hebert
Fire Marshal

DT: December 19, 2023

RE: 75 Barretts Hill Road Residential Subdivision

- The State Adopted Fire Code, NFPA 1 requires a water supply of 1000 gallons per minute for one hour for firefighting. A 60,000 gallon cistern is required. Redesign the site plan showing the placement of the 60,000 gallon cistern. Provide a cistern drawing that meets Hudson Fire Department requirements. The cistern shall include 6"metal suction pipe, to 6" female, to 6" to 5" male reducer to be National Hose Thread. There shall also be a cap provided for the 6" to 5" reducer that will be left connected to the riser. Locks shall be provided for all access hatches. The cistern shall have a water level indicator.

- The developer has the option of installing an NFPA 13D sprinkler systems in each dwelling in lieu of the cistern.

- The proposed subdivision falls inside the 1000 foot distance from the center of the Tennessee Gas Pipeline. Advanced notification is required from the gas company per State of NH RSA 674:75. The advanced notification shall be sent to KMEncroachmentsNorth@kindermorgan.com . This is required prior to any site work, blasting, or building permits being issued. Once approval has been received this approval shall be sent to Nashua Regional Planning Commission email at outreach@nashuarpc.org. All approval documentation shall be submitted with the building permit applications. No permits will be issued without all approvals.

David Hebert
Fire Marshal

Attachment "B"

Dubowik, Brooke

From: Hebert, David
Sent: Tuesday, March 5, 2024 2:17 PM
To: Dubowik, Brooke
Subject: RE: Barrett Hill Subdivision Resubmittal

I am all set with the proposed 30,000 gallon cistern shown on the revised plan. The advanced notification to Tennessee Gas shall be completed and the approval from Tennessee Gas shall be submitted to Nashua Regional Planning Commission and to the building department with permit applications. Last I spoke to Peter @ KNA he stated they sent in the notification. Someone on their end needs to follow thru to get the approval documents.

Dave Hebert
Fire Marshal
Hudson Fire Department
Inspectional Services Division

Town of Hudson | 12 School Street | Hudson, NH 03051
603-886-6005 (Main) | 603-816-1271 (Direct)

Attachment "B"

Dubowik, Brooke

From: McElhinney, Steven
Sent: Thursday, December 21, 2023 7:07 AM
To: Dubowik, Brooke
Subject: RE: DEPT SIGN OFF - SB# 08-23 Barrett Hill LLC OSD Subdivision Plan

No Comment

SUBDIVISION APPLICATION

Date of Application: 12/11/23 Tax Map #: 151 Lot #: 59

Site Address: 75 Barretts Hill Road

Name of Project: Subdivision Barrett Hill, LLC

Zoning District: General (G-1) General SB#: 08-23 (For Town Use Only)

Z.B.A. Action: ______

PROPERTY OWNER:	DEVELOPER:
Name: Barrett Hill, LLC	
Address: 21 Continental Boulevard, Door #4	
Address: Merrimack, NH 03054	
Telephone # 603-320-5123	
Email: johngargasz@gmail.com	

PROJECT ENGINEER:	SURVEYOR:
Name: Keach-Nordstrom Associates, Inc.	Keach-Nordstrom Associates, Inc.
Address: 10 Commerce Park North, Suite 3	10 Commerce Park North, Suite 3
Address: Bedford, NH 03110	Bedford, NH 03110
Telephone # 603-627-2881	603-627-2881
Email: pchisholm@keachnordstrom.com	chickey@keachnordstrom.com

PURPOSE OF PLAN:

The purpose of this plan is to depict a thirteen (13) lot open space subdivision on the property and all associated improvements.

(For Town Use Only)

Routing Date: 12/18/23 Deadline Date: 12/26/23 Meeting Date: TBD

___ I have no comments ___ I have comments (attach to form)

___ (Initials) Title: Chief Assessor Date: 12-18-23

Department:

Zoning: ___ Engineering: ___ Assessor: ___ Police: ___ Fire: ___ DPW: ___ Consultant: ___

Attachment "C"

FUSS & O'NEILL

January 4, 2024

Mr. Jay Minkarah
Acting Town Planner
Town of Hudson
12 School Street
Hudson, NH 03051

Re: Town of Hudson Planning Board Review
Barrett Hill Subdivision Plan
Tax Map 151, Lot 59; Acct. #1350-085
Reference No. 20030249.2330

Dear Mr. Minkarah:

Fuss & O'Neill, Inc. has reviewed the first submission of the materials received on December 15, 2023, related to the above-referenced project. Authorization to proceed was received on December 19, 2023. A list of items reviewed is enclosed. The scope of our review is based on the Subdivision Plan Review Codes, Stormwater Codes, Driveway Review Codes, Sewer Use Ordinance 77, Zoning Regulations, and criteria outlined in the CLD Consulting Engineers Proposal approved September 16, 2003, revised September 20, 2004, June 4, 2007, September 3, 2008, and October 2015.

We have included a copy of Fuss & O'Neill's evaluation of the checklist for your reference. We note that several items could not be verified by Fuss & O'Neill and require action by the Town.

The project appears to consist of subdividing the existing 35.36-acre existing lot to create a thirteen (13)-lot subdivision with open space. A new roadway with a cul-de-sac is proposed as part of the subdivision. The new subdivision lots are proposed to be serviced by private wells and subsurface disposal systems.

The following items are noted:

1. Administrative and Subdivision Review Codes (HR 276 & HR 289)

a. HR 276-11.1.B.(13). The applicant has not shown any signs other than traffic signs on the plan set.
b. HR 276-11.1.B.(14). The applicant has not shown any lighting on the plan set. The applicant should confirm if any lighting is proposed and provide locations and details, or add the required note if lighting is not proposed.
c. HR 276-11.1.B.(15). The applicant has not shown any buildings within 50 feet of the site.

The Gateway Building
50 Commercial Street
Manchester, NH
03101
t 603.668.8223
800.286.2469

www.fando.com

California
Connecticut
Maine
Massachusetts
New Hampshire
Rhode Island
Vermont

d. HR 276-11.1.B.(16). The applicant has not shown driveways and parking areas within 200 feet of the site on the plan set.
e. HR 276-11.1.B.(20). The applicant has not shown any existing buildings or features on the existing site. The applicant should confirm that the site was not previously developed in any way.
f. HR 289-15. The applicant has noted that the site is not located within a Flood Hazard area.
g. HR 289-22. The applicant shall coordinate with the Town of Hudson regarding the deeding of open space areas.
h. HR 289-28.A. The applicant should provide a detail for the proposed granite bounds to be set.
i. HR 289-37.A. The applicant has not provided any information on phasing of subdivision construction on the plan set. We note that subdivisions with between six and sixteen lots must be developed over two years per the Regulation.

2. Driveway Review Codes (HR 193-10)

a. HR 193-10. The applicant has shown proposed approximate driveway locations within the Right-of-Way on the plan set, but has not shown any of these further extended into the lots. Due to the extensive grading adjacent to the roadway some driveways may be difficult to construct to meet the Town's maximum slope requirements.
b. HR 193-10. Several proposed driveway locations are located at property lines (lot 6) or configured in such a way that the driveway may encroach on an adjacent lot (lot 8). Also there doesn't appear to be a proposed driveway location for lot 9.
c. HR 193-10.E. The applicant has provided sight distance information for the proposed roadway on the plan set. The sight distance looking left (west) from Windsor Lane may be obscured by brush if not maintained and also could be significantly impacted by snowbanks during winter periods. The applicant should clarify how this area is be maintained to provide sufficient sight distance in this direction.

3. Roadway Design

a. HR 289-18.B.(5). The applicant should add dead-end sign location to the plan set. Sign details have been provided.
b. The applicant should label the curb curve radii on the plan set.
c. HR 289-11.1.(21). The applicant has not shown a detectable warning paver at the sidewalk termination at the cul-de-sac.

4. Drainage Design /Stormwater Management (HR 289-20.C./Chapter 290)

a. HR 289-20.C.(1). The applicant should confirm that all off-site improvements were coordinated with the Town Engineer, included the runoff leaving the site via the rip-rap lined swale along Barretts Hill Road.
b. HR 290-5.B.2.b. The applicant should provide language in the Stormwater Management Report, stating if and how low impact development (LID) strategies for stormwater runoff were evaluated for this project.

c. HR 290-6.A.8. We note the requirement of the applicant to coordinate a pre-construction meeting with the Town Engineer.
d. HR 290.6.A.12. The applicant should provide a note for winter stabilization on the erosion control plans.
e. HR 290-8.A.4 & 5. We note the requirement of the applicant to coordinate the need for a Bond and/or Escrow with the Town Engineer.
f. In section D. Summary of the project narrative in the Stormwater Management Report the applicant references the Town of Goffstown Stormwater Regulations. This should be revised to the Town of Hudson.
g. The applicant should clarify how much of the existing 12" CMP is to be replaced at the Barretts Hill Road crossing near pole PSNH 21B/30.
h. The applicant should clarify if driveway aprons are being replaced as part of the off-site improvements for the drainage swale installation, and if so show this on the plans.
i. The applicant should forward any review comments received from the NHDES AoT Bureau to the Town for their review and records.
j. The applicant should confirm that the proposed pocket pond is not considered a dam per NHDES definitions.
k. The applicant should coordinate with the Town regarding the need for fencing or other means to prevent children, animals, etc. entering the water in the proposed pocket pond.
l. ETGTD 930.1. The applicant should review the depth of the drainage within the roadway, it does not maintain the Town minimum depth of 4' of cover for all pipes.
m. ETGTD 930.4. The applicant shall review the slope of the proposed drainage system with the Town Engineer. Slopes within the proposed Right-of-Way are less than the minimum 2% required.
n. ETGTD 930.10. We note the requirement for curb inlet drainage structures at all vertical sags. CB19 and CB20 are designed at a vertical sag.
o. ETGTD 930.11. CB18 and CB20 are shown as double catch basins on the plans. The applicant should review this design with the Town Engineer for approval.
p. The applicant will be required to comply with all provisions of the Town of Hudson's MS4 permit, including but not limited to annual reporting requirements, construction site stormwater runoff control, and record keeping requirements.
q. Please note that this review was carried out in accordance with applicable regulations and standards in place in New Hampshire at this time. Note that conditions at the site, including average weather conditions, patterns and trends, and design storm characteristics, may change in the future. In addition, future changes in federal, state or local laws, rules or regulations, or in generally accepted scientific or industry information concerning environmental, atmospheric and geotechnical conditions and developments may affect the information and conclusions set forth in this review. In no way shall Fuss & O'Neill be liable for any of these changed conditions that may impact the review, regardless of the source of or reason for such changed conditions. Other than as described herein, no other investigation or analysis has been requested by the Client or performed by Fuss & O'Neill in preparing this review.

5. **Zoning (HR 334)**
   a. HR 334-14 and HR 276-11.1.B.(20). The applicant has not noted the maximum proposed building heights on the plan set. The applicant should note the maximum building height of 38 feet on the plan set.
   b. HR 334-20. The site is located in the General (G-1) District. The applicant has noted that open space development is the proposed use. The applicant should confirm if the lots are to be single family homes.
   c. HR 334-27. We note that the conventional subdivision design appears to meet the lot size and frontage requirements for the district.
   d. HR 334-35. The applicant has noted that there are no wetlands located on the site.
   e. HR 334-50. The applicant has shown that 13 lots could be accommodated as part of the Conventional Subdivision plan. The applicant has proposed 13 lots reduced the minimum lot areas to 1.0 acre and the frontage to a minimum of 100 feet for each lot.

6. **Sewer/Water Design/Conflicts & Utility Design/Conflicts (HR 276-13.E.)**
   a. The applicant has not shown any provisions for fire protection (cisterns, etc.). The applicant should coordinate with the Hudson Fire Department to ensure adequate fire protection is provided for the site.
   b. The applicant has shown proposed 4k septic reserve areas and 75-foot protective well radii on the plans for the individual lots. Proposed well radii do not extend onto adjacent lots. They have also provided a typical 4-bedroom residential single family home detail, which shows a water service connection in the rear of the building and a septic tank in the front.

7. **Erosion Control/Wetland Impacts**
   a. The applicant has noted that the Town reserves the right to require additional erosion control measures should they be found necessary

.

8. **State and Local Permits**
   a. The applicant has noted the required permits on the plan set.
   b. HR 290-10.B. The applicant has noted the need for a NPDES Notice of Intent and a SWPPP on the plan.
   c. Additional local permitting may be required.

9. **Other**
   a. ETGTD Section 565.1.1. The applicant is reminded that the Town of Hudson has specific requirements for the importing of off-site fill materials for use in constructing this project. We recommended that these requirements be stated on the plans for the Contractors attention.

FUSS & O'NEILL

Please feel free to call if you have any questions.

Very truly yours,

Steven W. Reichert, PE

SWR:elc

Enclosure

cc: Town of Hudson Engineering Division – File
Keach-Nordstrom Associates, Inc.
pchisholm@keachnordstrom.com

Attachment "D"

KNA KEACH-NORDSTROM ASSOCIATES, INC.

March 4, 2024

Steven Reichert, PE
Fuss & O'Neill
50 Commercial Street, Unit 2S
Manchester, NH 03101

Subject: **Town of Hudson Planning Board Review**
Barrett Hill Subdivision
Tax Map 151 Lot 59
KNA Project No. 23-0414-1

Dear Mr. Reichert:

Our office is in receipt of a review letter, dated January 4, 2024. Based on the comments, we have made the required modifications and attached revisions for final review. A response to each comment has been provided below.

1. **Administrative and Subdivision Review Codes (HR 276 & HR 289)**

   a. HR 276-11.1.B.(13). The applicant has not shown any signs other than traffic signs on the plan set.

      No additional signage is proposed as part of the current application.

   b. HR 276-11.1.B.(14). The applicant has not shown any lighting on the plan set. The applicant should confirm if any lighting is proposed and provide locations and details, or add the required note if lighting is not proposed.

      No lighting is proposed as part of the current application. Note #23 on Sheet 1 has been added accordingly.

   c. HR 276-11.1.B.(15). The applicant has not shown any buildings within 50 feet of the site.

      The only building within 50 feet of the site is an existing single-family house on Map 152 Lot 13-1, which is now shown throughout the plan set.

   d. HR 276-11.1.B.(16). The applicant has not shown driveways and parking areas within 200 feet of the site on the plan set.

      A GIS image showing existing features within 200 feet of the site has been added to the cover sheet to satisfy the requirement.

e. HR 276-11.1.B.(20). The applicant has not shown any existing buildings or features on the existing site. The applicant should confirm that the site was not previously developed in any way.

The site has not been previously developed save for the existing power line easement.

f. HR 289-15. The applicant has noted that the site is not located within a Flood Hazard area.

No comment.

g. HR 289-22. The applicant shall coordinate with the Town of Hudson regarding the deeding of open space areas.

The applicant has noted this information and will continue to work with town staff during the subdivision approval process.

h. HR 289-28.A. The applicant should provide a detail for the proposed granite bounds to be set.

Note #18 on Sheet 1 provides details regarding monumentation to be set.

i. HR 289-37.A. The applicant has not provided any information on phasing of subdivision construction on the plan set. We note that subdivisions with between six and sixteen lots must be developed over two years per the Regulation.

The applicant is requesting a waiver for the phasing regulations (see attached).

2. **Driveway Review Codes (HR 193-10)**

a. HR 193-10. The applicant has shown proposed approximate driveway locations within the Right-of-Way on the plan set, but has not shown any of these further extended into the lots. Due to the extensive grading adjacent to the roadway some driveways may be difficult to construct to meet the Town's maximum slope requirements.

The plans have been revised to include potential driveway locations and their associated profiles showing proof of concept for each lot. Additionally, Note #6 on Sheet 10 has been modified to include similar information regarding conceptual driveway locations and potential lot development.

b. HR 193-10. Several proposed driveway locations are located at property lines (lot 6) or configured in such a way that the driveway may encroach on an adjacent lot (lot 8). Also there doesn't appear to be a proposed driveway location for lot 9.

Potential driveway locations have been updated and expanded for each lot. A driveway location has been added for Lot 9.

c. HR 193-10.E. The applicant has provided sight distance information for the proposed roadway on the plan set. The sight distance looking left (west) from Windsor Lane may be obscured by brush if not maintained and also could be significantly impacted by snowbanks during winter periods. The applicant should clarify how this area is be maintained to provide sufficient sight distance in this direction.

A sight distance easement has been provided over Lot 59-1 to ensure that sight distance can be adequately maintained.

3. **Roadway Design**

a. HR 289-18.B.(5). The applicant should add dead-end sign location to the plan set. Sign details have been provided.

A dead-end sign location has been provided on Sheet 8.

b. The applicant should label the curb curve radii on the plan set.

Curb curve radii are now labeled on Sheets 8 and 9.

c. HR 289-11.1.(21). The applicant has not shown a detectable warning paver at the sidewalk termination at the cul-de-sac.

A detectable warning plate has been added as requested (see Sheet 9).

4. **Drainage Design /Stormwater Management (HR 289-20.C./Chapter 290)**

a. HR 289-20.C.(1). The applicant should confirm that all off-site improvements were coordinated with the Town Engineer, included the runoff leaving the site via the rip-rap lined swale along Barretts Hill Road.

The design of all proposed off-site improvements shown on Sheet 10 has been coordinated with the Town Engineer accordingly (see attached email correspondence).

b. HR 290-5.B.2.b. The applicant should provide language in the Stormwater Management Report, stating if and how low impact development (LID) strategies for stormwater runoff were evaluated for this project.

The stormwater design minimizes the volume of stormwater discharged from the site. As such, appropriate language regarding LID is now included under the "Post-Development Drainage Conditions" within the Stormwater Management Report narrative (see attached).

c. HR 290-6.A.8. We note the requirement of the applicant to coordinate a pre-construction meeting with the Town Engineer.

The applicant has noted this information.

10 Commerce Park North, Suite 3B Bedford, NH 03110 Phone (603) 627-2881 Fax (603) 627-2915

d. HR 290.6.A.12. The applicant should provide a note for winter stabilization on the erosion control plans.

"Winter Construction Notes" have been added to Sheet 12 as requested.

e. HR 290-8.A.4 & 5. We note the requirement of the applicant to coordinate the need for a Bond and/or Escrow with the Town Engineer.

The applicant has noted this information.

f. In section D. Summary of the project narrative in the Stormwater Management Report the applicant references the Town of Goffstown Stormwater Regulations. This should be revised to the Town of Hudson.

This error has been revised accordingly.

g. The applicant should clarify how much of the existing 12" CMP is to be replaced at the Barretts Hill Road crossing near pole PSNH 21B/30.

The existing 12" CMP that crosses under Barretts Hill Road is not proposed to be replaced. However, the existing 12" CMP, which outlets from the existing catch basin on the south side of the road, will be upgraded to a 15" HDPE as shown on Sheet 11.

h. The applicant should clarify if driveway aprons are being replaced as part of the off-site improvements for the drainage swale installation, and if so show this on the plans.

Driveway aprons are being replaced as part of the drainage improvements. This is now noted on Sheet 11.

i. The applicant should forward any review comments received from the NHDES AoT Bureau to the Town for their review and records.

AoT review comments were forwarded to the town directly from NHDES.

j. The applicant should confirm that the proposed pocket pond is not considered a dam per NHDES definitions.

The proposed pocket pond is not considered a dam as it impounds less than 0.50 acre-feet of water during normal conditions (0.24 acre-feet), has a maximum storage of less than 6 acre-feet (2.91 acre-feet) and is less than 10 feet in height.

k. The applicant should coordinate with the Town regarding the need for fencing or other means to prevent children, animals, etc. entering the water in the proposed pocket pond.

Review letters have been received from the Zoning Administrator, Fire Marshall, Department of Public Works, and Town Engineer. Pond fencing was not an area of

concern for any of these departments, however if the planning board determines that fencing is preferred the applicant will accommodate the request.

l. ETGTD 930.1. The applicant should review the depth of the drainage within the roadway, it does not maintain the Town minimum depth of 4' of cover for all pipes.

Drainage pipes within the roadway have been lowered to accommodate the required four feet of cover.

m. ETGTD 930.4. The applicant shall review the slope of the proposed drainage system with the Town Engineer. Slopes within the proposed Right-of-Way are less than the minimum 2% required.

All drainage pipes within the proposed Right-of-Way have been revised to meet the minimum slope requirement of 2%. The drainage calculations have been updated accordingly to match the revised design (see attached).

n. ETGTD 930.10. We note the requirement for curb inlet drainage structures at all vertical sags. CB19 and CB20 are designed at a vertical sag.

The town engineer was consulted and has accepted the use of double catch basins in lieu of curb inlets with the stipulation that the sidewalk ramp location be shifted to not interfere with the grate location (see attached email correspondence).

o. ETGTD 930.11. CB18 and CB20 are shown as double catch basins on the plans. The applicant should review this design with the Town Engineer for approval.

The town engineer was consulted and has accepted the use of double catch basins in lieu of curb inlets with the stipulation that the sidewalk ramp location be shifted to not interfere with the grate location (see attached email correspondence).

p. The applicant will be required to comply with all provisions of the Town of Hudson's MS4 permit, including but not limited to annual reporting requirements, construction site stormwater runoff control, and record keeping requirements.

The applicant has noted this information. Additionally, Note #21 on Sheet 1 states, "This project meets the 2019 MS4 requirements."

q. Please note that this review was carried out in accordance with applicable regulations and standards in place in New Hampshire at this time. Note that conditions at the site, including average weather conditions, patterns and trends, and design storm characteristics, may change in the future. In addition, future changes in federal, state or local laws, rules or regulations, or in generally accepted scientific or industry information concerning environmental, atmospheric and geotechnical conditions and developments may affect the information and conclusions set forth in this review. In no way shall Fuss & O'Neill be liable for any of these changed conditions that may impact the review, regardless of the source of or reason for such changed conditions. Other than as described herein, no other investigation or analysis has been requested by the Client or performed by Fuss & O'Neill in preparing this review.

No comment.

5. **Zoning (HR 334)**

   a. HR 334-14 and HR 276-11.1.B.(20). The applicant has not noted the maximum proposed building heights on the plan set. The applicant should note the maximum building height of 38 feet on the plan set.

   Note #24 on Sheet 1 has been added as requested.

   b. HR 334-20. The site is located in the General (G-1) District. The applicant has noted that open space development is the proposed use. The applicant should confirm if the lots are to be single family homes.

   It is the intent of the applicant to construct individual condex units on each lot. Note #25 on Sheet 1 has been added to this effect.

   c. HR 334-27. We note that the conventional subdivision design appears to meet the lot size and frontage requirements for the district.

   No comment.

   d. HR 334-35. The applicant has noted that there are no wetlands located on the site.

   No comment.

   e. HR 334-50. The applicant has shown that 13 lots could be accommodated as part of the Conventional Subdivision plan. The applicant has proposed 13 lots reduced the minimum lot areas to 1.0 acre and the frontage to a minimum of 100 feet for each lot.

   No comment.

6. **Sewer/Water Design/Conflicts & Utility Design/Conflicts (HR 276-13.E.)**

   a. The applicant has not shown any provisions for fire protection (cisterns, etc.). The applicant should coordinate with the Hudson Fire Department to ensure adequate fire protection is provided for the site.

   A 30,000 gallon cistern and associated easement are now proposed on Lot 59-2 in accordance with the Fire Department's recommendations. Construction details for the cistern can be found on Sheet 18.

b. The applicant has shown proposed 4k septic reserve areas and 75-foot protective well radii on the plans for the individual lots. Proposed well radii do not extend onto adjacent lots. They have also provided a typical 4-bedroom residential single family home detail, which shows a water service connection in the rear of the building and a septic tank in the front.

The intent is to develop each lot with a condex unit, which will have six total bedrooms for a design flow of 900 GPD per unit. According to Table 1008-4 from Env-Wq, this requires well radii to be increased to 100 feet. The plan has been revised accordingly.

7. **Erosion Control/Wetland Impacts**

a. The applicant has noted that the Town reserves the right to require additional erosion control measures should they be found necessary.

No comment.

8. **State and Local Permits**

a. The applicant has noted the required permits on the plan set.

No comment.

b. HR 290-10.B. The applicant has noted the need for a NPDES Notice of Intent and a SWPPP on the plan.

No comment.

c. Additional local permitting may be required.

No comment.

9. **Other**

a. ETGTD Section 565.1.1. The applicant is reminded that the Town of Hudson has specific requirements for the importing of off-site fill materials for use in constructing this project. We recommended that these requirements be stated on the plans for the Contractors attention.

"Excavation and Embankment Notes" have been added to Sheet 8 as requested.

If you have any questions or comments, please reach out by phone at (603) 627-2881 or by email at pmadsen@keachnordstrom.com.

Respectfully,

Peter Madsen, EIT
Keach Nordstrom Associates, Inc.
10 Commerce Park North, Suite 3
Bedford, NH 03110

Attachment "D"

Peter Madsen

From:	Dhima, Elvis <edhima@hudsonnh.gov>
Sent:	Tuesday, February 13, 2024 10:28 AM
To:	Peter Madsen
Cc:	John Gargasz; Anthony Basso; Twardosky, Jason; Paul Chisholm; Kirkland, Donald
Subject:	RE: Barrett Hill Subdivision Offsite Drainage

Thanks Peter

E

Elvis Dhima, P.E.
Town Engineer

12 School Street
Hudson, NH 03051
Phone: (603) 886-6008
Mobile: (603) 318-8286
Town of Hudson
NEW HAMPSHIRE 03051

From: Peter Madsen <pmadsen@keachnordstrom.com>
Sent: Tuesday, February 13, 2024 10:28 AM
To: Dhima, Elvis <edhima@hudsonnh.gov>
Cc: John Gargasz <johngargasz@gmail.com>; Anthony Basso <abasso@keachnordstrom.com>; Twardosky, Jason <jtwardosky@hudsonnh.gov>; Paul Chisholm <pchisholm@keachnordstrom.com>; Kirkland, Donald <dkirkland@hudsonnh.gov>
Subject: RE: Barrett Hill Subdivision Offsite Drainage

Elvis,

Thanks for the review. The 10-year storm event was used for pipe sizing.

Peter Madsen
Project Engineer
Keach-Nordstrom Associates, Inc.
10 Commerce Park North, Ste 3
Bedford, NH 03110
t. (603)-627-2881 | f. (603)-627-2915
pmadsen@keachnordstrom.com www.keachnordstrom.com

From: Dhima, Elvis <edhima@hudsonnh.gov>
Sent: Tuesday, February 13, 2024 10:19 AM
To: Peter Madsen <pmadsen@keachnordstrom.com>
Cc: John Gargasz <johngargasz@gmail.com>; Anthony Basso <abasso@keachnordstrom.com>; Twardosky, Jason <jtwardosky@hudsonnh.gov>; Paul Chisholm <pchisholm@keachnordstrom.com>; Kirkland, Donald <dkirkland@hudsonnh.gov>
Subject: RE: Barrett Hill Subdivision Offsite Drainage

> **Caution:** This email originated from outside of the organization. Do not click links or open attachments you do not recognize!

Peter

This looks good

What storm event did you use for sizing the 15" pipe ? This might come up at PB meeting as well

J, what say you ?

Thank you

E

Elvis Dhima, P.E.
Town Engineer

12 School Street
Hudson, NH 03051
Phone: (603) 886-6008
Mobile: (603) 318-8286
Town of Hudson
NEW HAMPSHIRE 03051

From: Peter Madsen <pmadsen@keachnordstrom.com>
Sent: Monday, February 12, 2024 11:07 AM
To: Dhima, Elvis <edhima@hudsonnh.gov>
Cc: John Gargasz <johngargasz@gmail.com>; Anthony Basso <abasso@keachnordstrom.com>; Twardosky, Jason <jtwardosky@hudsonnh.gov>; Paul Chisholm <pchisholm@keachnordstrom.com>
Subject: Barrett Hill Subdivision Offsite Drainage

EXTERNAL: Do not open attachments or click links unless you recognize and trust the sender.

Good morning Elvis,

Please see the attached plan for the proposed drainage improvements along Barrett Hill Road. We are proposing a closed drainage system with drop inlets along the south shoulder of the road to provide an upgrade to the town's drainage while also addressing the outfall from our pond.

Attachment "D"

A revised plan set with the review engineer and AoT's comments is coming soon, however I wanted to get your opinion on the offsite work prior to submitting that.

Thanks

Peter Madsen
Project Engineer
Keach-Nordstrom Associates, Inc.
10 Commerce Park North, Ste 3
Bedford, NH 03110
t. (603)-627-2881 | f. (603)-627-2915
pmadsen@keachnordstrom.com www.keachnordstrom.com

Attachment "D"

Peter Madsen

From: Dhima, Elvis <edhima@hudsonnh.gov>
Sent: Wednesday, January 24, 2024 2:39 PM
To: Peter Madsen
Cc: Paul Chisholm; Twardosky, Jason
Subject: RE: Barrett Hill Subdivision Granite Curb Inlets
Attachments: Revisions.pdf

Caution: This email originated from outside of the organization. Do not click links or open attachments you do not recognize!

Peter

Double CB is fine , no issues signing off on the waiver

See attachment and make the revisions on your next submittal

Thanks

E

Elvis Dhima, P.E.
Town Engineer

12 School Street
Hudson, NH 03051
Phone: (603) 886-6008
Mobile: (603) 318-8286
Town of Hudson
NEW HAMPSHIRE 03051

From: Peter Madsen <pmadsen@keachnordstrom.com>
Sent: Tuesday, January 23, 2024 4:31 PM
To: Dhima, Elvis <edhima@hudsonnh.gov>
Cc: Paul Chisholm <pchisholm@keachnordstrom.com>
Subject: Barrett Hill Subdivision Granite Curb Inlets

EXTERNAL: Do not open attachments or click links unless you recognize and trust the sender.

Good afternoon Elvis,

I am currently working through the Fuss & O'Neill review letter for the Barrett Hill Subdivision and would like to get your opinion on the following comment:

n. ETGTD 930.10. We note the requirement for curb inlet drain sags. CB19 and CB20 are designed at a vertical sag.

CB#19 and #20 need to be double catch basins for grate capacity as they take a lot of flow from the hill and cul-de-sac (see PDF). Are you comfortable waiving the curb inlet requirement here or is there a different way to handle this that's been previously used in town?

Appreciate any input.

Thanks

Peter Madsen
Project Engineer
Keach-Nordstrom Associates, Inc.
10 Commerce Park North, Ste 3
Bedford, NH 03110
t. (603)-627-2881 | f. (603)-627-2915
pmadsen@keachnordstrom.com www.keachnordstrom.com

I. INTRODUCTION

A. Project Description

The project proposes to develop the existing property to accommodate a twelve (13) lot open space residential subdivision with an accompanying 1,200 linear foot public roadway. Site work includes clearing and grubbing the site, construction of the new roadway, individual lot development, and installation of a closed drainage system, pocket pond, and other associated stormwater management provisions.

B. Existing Site Conditions

The subject property consists of one lot, approximately 35.36 acres in total area, and is located at 75 Barretts Hill Road in Hudson's General 1 (G-1) Zoning District. The lot is currently undeveloped. The lot is comprised mostly of woodlands with a utility line easement on the back half of the lot. The subject lot is bordered by Barretts Hill Road to the north and residential lots to the east, west, and south.

A site-specific soil survey, performed onsite by GZA GeoEnvironmental, Inc. on October 4, 2023, listed the following soils as predominant soil types found onsite. Montauk classified as C soils with slopes ranging from 3-25%, Scituate classified as C soils with slopes ranging from 3-25%. The soil types are classified as HSG 'C' and therefore, C soils were used in drainage computations. According to the National Resources Conservation Service (NRCS) soil mapping, the remaining subcatchment areas consist of, Canton fine loamy sand with slopes ranging from 0-15%, Canton fine loamy sand, very stony with slopes ranging from 8-15%, Scarboro stony mucky loamy sand, Scituate fine sandy loam with slopes ranging from 3-8%, and Scituate stony fine sandy loam with slopes ranging from 3-8%. It is important to note that both Scituate and Montauk soils have infiltration rates below 0.50 in/hr, therefore, according to Env-Wq 1508.07(a)(1), infiltration is not permitted on this site.

II. STORM DRAINAGE ANALYSIS & DESIGN

A. Methodology

In accordance with the provisions of the NHDES, the Town of Hudson, and generally accepted engineering practice, the 2-year, 2-year frozen, 10-year, 25-year, and 50-year frequency storms have each been used in the various aspects of analysis and design of stormwater management considerations for the subject site. The closed drainage system has been designed for the 10-year frequency storm and the proposed pocket pond has been designed to not overtop in the 50-year frequency storm.

KNA utilizes HydroCAD version 10.0 to analyze both pre and post-development watershed characteristics. This computer software system is based largely on hydrology techniques (TR-20) developed by the Soil Conservation Service (now the Natural Resources Conservation Service). In addition, the software derives Time of Concentration values using the methodology contained within USDA-S.C.S. publication Urban Hydrology for Small Watersheds Technical Release No. 55 (TR 55).

All design and analysis calculations performed using the referenced methodologies are attached to this report. The minimum time of concentrations used for the analysis is 6 minutes. These calculations document each catchment area, a breakdown of surface type, time of concentration, rainfall intensity, peak discharge volume, Manning's "n" value, peak velocity, and other descriptive design data for each watershed and pipe segment evaluated. In addition, the "Pre/Post Development Drainage Area Plans" graphically define and illustrate the extent of each watershed or catchment area investigated.

B. Pre-Development Drainage Conditions

In the pre-development scenario, three (3) points of analysis (POA) have been identified as the appropriate points to compare pre vs. post development rates of stormwater discharge. These points of analysis reflect the main discharge points of the site and were analyzed to show the impact from the proposed improvements.

The pre-development drainage model's POA's are further described as follows:

- Link A — Barretts Hill Crossing
- Link B — Lot 57
- Link C — Lot 11

The property mainly slopes from southeast to northwest directing runoff to Barretts Hill Road and neighboring lots on the western side of the subject property. Runoff on the northeastern side of the property flows to Barretts Hill Road and is collected by an existing catch basin in the roadway before discharging to Lot 11. Runoff generated on the northwestern portion of the subject property flows to a different existing catch basin on Barretts Hill Road which discharges to Lot 57. Runoff generated from the western portion of the property ultimately flows to an existing drop inlet located at the bottom of Barretts Hill Road. This crossing is identified as Link A and directs runoff under the road towards an existing stream.

C. Post-Development Drainage Conditions:

The same three POA's that were identified in the pre-development scenario have been analyzed in the post-development scenario.

Overall, the design has maintained the drainage patterns to mimic the pre-development conditions. Stormwater will continue to discharge to the same points of analysis identified in the pre-development scenario. The improvements, however, also provide stormwater treatment for the new impervious areas created for the proposed development. These new impervious areas include the roadway, sidewalks, potential future driveways, and a 2,400 sf approximation for residential homes dedicated to each lot.

The proposed stormwater management system utilizes both open and closed drainage practices for the collection, detention, and treatment of runoff. Runoff generated from the entirety of the proposed roadway and the eastern portion of the property is collected by a series of deep sump catch basins and is piped to a proposed pocket pond situated in the northwest corner of the lot. This system is designed to provide stormwater treatment and detention for the site and will not overtop during a 50-year storm event. It is also designed to minimize the volume of stormwater runoff discharged from the site by reducing the volume of stormwater runoff in all modeled storm events, therefore satisfying the town Low-Impact Development requirement. The pond features an overflow structure, which directs outfall into a closed drainage system, that ultimately outlets to the existing drop inlet at the bottom of the hill (Link A). As previously stated, infiltration is not permitted on this site and has not been included in the drainage analysis. Lastly, to adequately account for proposed lot development, conceptual condex locations, driveway locations, and associated site grading are represented on the project plans. The final design and layout of each lot is subject to change however, the overall grading and associated drainage patterns will remain similar to what has been depicted.

The peak stormwater runoff rates and volume discharges for the specific storm frequencies are presented and analyzed in the subsequent summary section of this report (Tables 1 & 2). For a more visual description of the information presented in this section, please refer to the attached "Post-Development Drainage Areas Plan" attached in the appendix of this report.

D. Summary:

The subject site complies with both the Town of Hudson Stormwater Management and Erosion Control Regulations and NHDES Regulations Env-wq 1500 in regard to stormwater treatment and groundwater recharge volume. Proposed stormwater best management practices (BMP) are designed in accordance with the New Hampshire Stormwater Manual Volume 2: Post-Construction Best Management Practices Selection and Design and BMP worksheets provided by the New Hampshire Department of Environmental Services. In addition, stormwater discharges, in terms of peak rate of runoff and total volume, are consistent with the Town of Hudson Stormwater Regulations and NHDES Regulations Env-Wq 1500. The results are reported below in Table 1 and 2.

Table 1: Peak Flow Discharge Rate

Site Pre-Development vs. Post-Development (cfs)										
Description	**2-Year**		**2-Year Frozen**		**10-Year**		**25-Year**		**50-Year**	
24-hr Rainfall	2.95 in/hr		2.95 in/hr		4.47 in/hr		5.66 in/hr		6.77 in/hr	
	Pre	**Post**	Pre	**Post**	Pre	**Post**	Pre	**Post**	Pre	**Post**
A	7.79	**5.50**	51.93	**41.64**	25.69	**19.22**	43.08	**32.74**	60.85	**46.85**
B	2.63	**1.27**	10.22	**3.58**	6.88	**2.92**	10.73	**4.35**	14.53	**5.75**
C	2.29	**1.37**	8.99	**4.76**	6.03	**3.43**	9.42	**5.26**	12.77	**7.07**

Table 2: Volume Comparison

Site Pre-Development vs. Post-Development (Storm Volume in Acre-Feet)											
Description	**2-Year**		**2-Year Frozen**		**10-Year**		**25-Year**		**50-Year**		**Comments**
24-hr Rainfall	2.95 in/hr		2.95 in/hr		4.47 in/hr		5.66 in/hr		6.77 in/hr		
	Pre	**Post**	Pre	**Post**	Pre	**Post**	Pre	**Post**	Pre	**Post**	
A	1.43	**1.28**	7.99	**7.34**	3.86	**3.57**	6.19	**5.73**	8.59	**8.58**	Complies with NHDES 1507.05, (b), (1), a
B	0.34	**0.14**	1.29	**0.41**	0.81	**0.31**	1.23	**0.46**	1.66	**0.60**	Complies with NHDES 1507.05, (b), (1), a & b
C	0.28	**0.16**	1.06	**0.57**	0.66	**0.38**	1.01	**0.57**	1.36	**0.76**	Complies with NHDES 1507.05, (b), (1), a & b

III. EROSION & SEDIMENTATION CONTROL PROVISIONS

A. Temporary Erosion Control Measures

As an integral part of the engineering design of this site, an erosion and sedimentation control plan has been developed with the intent of limiting the potential for soil loss and associated receiving water quality degradation, both during and after the construction period. As the project plans indicate, traditional temporary erosion and sedimentation control devices and practices, such as siltation fencing, erosion control blankets, and seeding have been specified for use during the construction period. In preparation of these provisions, reference was made to the New Hampshire Stormwater Manual; Volume 3: Erosion and Sediment Temporary Controls During Construction. Construction details for each temporary erosion control measure and practice specified have been added to the project plans. These plans also contain a number of erosion control notes, which are offered to the selected contractor in order to supplement the specified measures and practices to the extent practical.

B. Construction Sequence

A site-specific construction sequence sensitive to limiting soil loss due to erosion and associated water quality degradation was prepared specifically for this project and is shown on the project plans. As pointed out in the erosion control notes, it is important for the contractor to recognize that proper judgment in the implementation of work will be essential if erosion is to be limited and protection of completed work is to be realized. Moreover, any specific changes in sequence and/or field conditions affecting the ability of specific erosion control measures to adequately serve their intended purpose should be reported to this office by the contractor. Further, the contractor is encouraged to supplement specified erosion control measures during the construction period where and when in his/ her best judgment additional protection is warranted.

C. Permanent Erosion Control Measures

In the design of this site, consideration was given to limiting the potential for long-term erosion of completed improvements. As a result, several permanent erosion control measures were incorporated into the site design. These provisions include:

1) Specification of a turf establishment schedule and seed mixture, utilizing materials and workmanship recognized as appropriate for the site conditions at hand; and

2) Construction of rip-rap at the outlet of the stormwater management areas; and

3) Design of a pocket pond to reduce runoff and volume.

Attachment "D"

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: SUBCATCHMENT Runoff Area=909,943 sf 3.54% Impervious Runoff Depth>1.24"
Flow Length=2,172' Tc=37.8 min CN=64.1 Runoff=14.23 cfs 2.16 af

Subcatchment 2S: SUBCATCHMENT Runoff Area=113,081 sf 12.76% Impervious Runoff Depth>1.08"
Flow Length=683' Tc=20.1 min CN=61.4 Runoff=1.94 cfs 0.23 af

Subcatchment 3S: SUBCATCHMENT Runoff Area=122,736 sf 7.22% Impervious Runoff Depth>1.08"
Flow Length=1,189' Tc=23.1 min CN=61.4 Runoff=1.99 cfs 0.25 af

Subcatchment 4S: SUBCATCHMENT Runoff Area=59,092 sf 16.60% Impervious Runoff Depth>1.43"
Flow Length=758' Tc=16.6 min CN=66.9 Runoff=1.55 cfs 0.16 af

Subcatchment 5S: SUBCATCHMENT Runoff Area=16,441 sf 34.30% Impervious Runoff Depth>1.92"
Flow Length=389' Tc=8.7 min CN=73.7 Runoff=0.77 cfs 0.06 af

Subcatchment 6S: SUBCATCHMENT Runoff Area=79,911 sf 11.18% Impervious Runoff Depth>2.03"
Flow Length=667' Tc=20.0 min CN=75.2 Runoff=2.92 cfs 0.31 af

Subcatchment 7S: SUBCATCHMENT Runoff Area=109,195 sf 5.17% Impervious Runoff Depth>1.81"
Flow Length=1,100' Tc=21.3 min CN=72.2 Runoff=3.43 cfs 0.38 af

Subcatchment 8S: SUBCATCHMENT Runoff Area=117,754 sf 20.59% Impervious Runoff Depth>2.19"
Flow Length=766' Tc=20.1 min CN=77.1 Runoff=4.66 cfs 0.49 af

Subcatchment 9S: SUBCATCHMENT Runoff Area=35,299 sf 21.66% Impervious Runoff Depth>2.20"
Flow Length=558' Tc=22.9 min CN=77.3 Runoff=1.34 cfs 0.15 af

Subcatchment 10S: SUBCATCHMENT Runoff Area=70,637 sf 8.47% Impervious Runoff Depth>1.89"
Flow Length=765' Tc=22.8 min CN=73.3 Runoff=2.26 cfs 0.26 af

Subcatchment 11S: SUBCATCHMENT Runoff Area=9,635 sf 44.10% Impervious Runoff Depth>2.84"
Tc=6.0 min CN=84.6 Runoff=0.73 cfs 0.05 af

Subcatchment 12S: SUBCATCHMENT Runoff Area=143,748 sf 5.17% Impervious Runoff Depth>1.80"
Flow Length=812' Tc=17.8 min CN=72.1 Runoff=4.83 cfs 0.49 af

Subcatchment 13S: SUBCATCHMENT Runoff Area=49,697 sf 12.99% Impervious Runoff Depth>2.05"
Flow Length=637' Tc=15.8 min CN=75.3 Runoff=2.01 cfs 0.19 af

Subcatchment 14S: SUBCATCHMENT Runoff Area=16,268 sf 33.80% Impervious Runoff Depth>2.57"
Flow Length=135' Tc=14.0 min CN=81.6 Runoff=0.88 cfs 0.08 af

Subcatchment 15S: SUBCATCHMENT Runoff Area=8,966 sf 35.77% Impervious Runoff Depth>2.66"
Tc=6.0 min CN=82.6 Runoff=0.64 cfs 0.05 af

Subcatchment 16S: SUBCATCHMENT Runoff Area=14,599 sf 43.85% Impervious Runoff Depth>2.83"
Tc=6.0 min CN=84.5 Runoff=1.11 cfs 0.08 af

Subcatchment 17S: SUBCATCHMENT Runoff Area=75,110 sf 13.37% Impervious Runoff Depth>2.24"
Flow Length=133' Tc=11.2 min CN=77.7 Runoff=3.80 cfs 0.32 af

Subcatchment 18S: SUBCATCHMENT Runoff Area=8,136 sf 46.52% Impervious Runoff Depth>2.89"
Tc=6.0 min CN=85.2 Runoff=0.63 cfs 0.05 af

Subcatchment 19S: SUBCATCHMENT Runoff Area=7,842 sf 46.45% Impervious Runoff Depth>2.89"
Tc=6.0 min CN=85.1 Runoff=0.61 cfs 0.04 af

Subcatchment 20S: SUBCATCHMENT Runoff Area=1,396 sf 43.41% Impervious Runoff Depth>2.82"
Tc=6.0 min CN=84.4 Runoff=0.11 cfs 0.01 af

Subcatchment 21S: SUBCATCHMENT Runoff Area=13,129 sf 15.63% Impervious Runoff Depth>2.06"
Flow Length=143' Tc=10.8 min CN=75.5 Runoff=0.62 cfs 0.05 af

Subcatchment 22S: SUBCATCHMENT Runoff Area=3,372 sf 55.90% Impervious Runoff Depth>2.58"
Tc=6.0 min CN=81.7 Runoff=0.23 cfs 0.02 af

Subcatchment 23S: SUBCATCHMENT Runoff Area=3,695 sf 57.02% Impervious Runoff Depth>2.62"
Tc=6.0 min CN=82.1 Runoff=0.26 cfs 0.02 af

Subcatchment 24S: SUBCATCHMENT Runoff Area=4,421 sf 60.03% Impervious Runoff Depth>2.71"
Tc=6.0 min CN=83.2 Runoff=0.32 cfs 0.02 af

Subcatchment 25S: SUBCATCHMENT Runoff Area=2,246 sf 0.00% Impervious Runoff Depth>1.01"
Tc=6.0 min CN=60.1 Runoff=0.05 cfs 0.00 af

Reach 1R: EXISTING ROADWAY DITCH Avg. Flow Depth=0.56' Max Vel=3.67 fps Inflow=3.46 cfs 0.92 af
n=0.022 L=230.0' S=0.0173 '/' Capacity=16.21 cfs Outflow=3.44 cfs 0.92 af

Pond 1P: EXISTING CB Inflow=14.23 cfs 2.16 af
Primary=14.23 cfs 2.16 af

Pond 2P: EXISTING DRIVEWAY CULVERT Peak Elev=293.20' Inflow=1.94 cfs 0.23 af
12.0" Round Culvert n=0.013 L=21.0' S=0.0143 '/' Outflow=1.94 cfs 0.23 af

Pond 3P: EXISTING DROP INLET Peak Elev=291.27' Inflow=19.22 cfs 3.57 af
24.0" Round Culvert n=0.011 L=92.1' S=0.0433 '/' Outflow=19.22 cfs 3.57 af

Pond 4P: EXISTING CB Peak Elev=297.98' Inflow=3.46 cfs 0.92 af
Primary=3.46 cfs 0.92 af Secondary=0.00 cfs 0.00 af Outflow=3.46 cfs 0.92 af

Pond 5P: EXISTING CB Peak Elev=298.34' Inflow=0.77 cfs 0.06 af
Primary=0.77 cfs 0.06 af Secondary=0.00 cfs 0.00 af Outflow=0.77 cfs 0.06 af

Pond 6P: EXISTING CB Peak Elev=364.80' Inflow=2.92 cfs 0.31 af
12.0" Round Culvert n=0.025 L=18.0' S=0.0689 '/' Outflow=2.92 cfs 0.31 af

Pond 7P: EXISTING CB Peak Elev=377.94' Inflow=3.43 cfs 0.38 af
12.0" Round Culvert n=0.011 L=31.9' S=0.0091 '/' Outflow=3.43 cfs 0.38 af

Attachment "D"

Pond 8P: CB#20 Peak Elev=350.58' Inflow=0.66 cfs 0.59 af
15.0" Round Culvert n=0.013 L=115.0' S=0.0800 '/' Outflow=0.66 cfs 0.59 af

Pond 9P: DMH#3 Peak Elev=376.48' Inflow=9.60 cfs 1.04 af
18.0" Round Culvert n=0.013 L=20.0' S=0.0075 '/' Outflow=9.60 cfs 1.04 af

Pond 10P: DMH#4 Peak Elev=378.18' Inflow=9.60 cfs 1.04 af
18.0" Round Culvert n=0.013 L=121.7' S=0.0075 '/' Outflow=9.60 cfs 1.04 af

Pond 11P: DMH#5 Peak Elev=380.76' Inflow=9.60 cfs 1.04 af
18.0" Round Culvert n=0.013 L=226.1' S=0.0075 '/' Outflow=9.60 cfs 1.04 af

Pond 12P: CB#6 Peak Elev=382.63' Inflow=9.60 cfs 1.04 af
18.0" Round Culvert n=0.013 L=141.2' S=0.0050 '/' Outflow=9.60 cfs 1.04 af

Pond 13P: CB#7 Peak Elev=383.80' Inflow=9.24 cfs 0.99 af
18.0" Round Culvert n=0.013 L=30.3' S=0.0201 '/' Outflow=9.24 cfs 0.99 af

Pond 14P: CB#8 Peak Elev=387.68' Inflow=8.39 cfs 0.91 af
15.0" Round Culvert n=0.013 L=165.7' S=0.0205 '/' Outflow=8.39 cfs 0.91 af

Pond 15P: CB#80 Peak Elev=387.69' Inflow=0.61 cfs 0.04 af
12.0" Round Culvert n=0.013 L=26.0' S=0.0200 '/' Outflow=0.61 cfs 0.04 af

Pond 16P: CB#10 Peak Elev=394.51' Inflow=6.06 cfs 0.67 af
12.0" Round Culvert n=0.013 L=165.5' S=0.0550 '/' Outflow=6.06 cfs 0.67 af

Pond 17P: CB#100 Peak Elev=394.53' Inflow=1.11 cfs 0.08 af
12.0" Round Culvert n=0.013 L=26.0' S=0.0200 '/' Outflow=1.11 cfs 0.08 af

Pond 18P: CB#11 Peak Elev=401.39' Inflow=1.36 cfs 0.10 af
12.0" Round Culvert n=0.013 L=167.8' S=0.0550 '/' Outflow=1.36 cfs 0.10 af

Pond 19P: CB#110 Peak Elev=402.03' Inflow=0.63 cfs 0.05 af
12.0" Round Culvert n=0.013 L=38.0' S=0.0200 '/' Outflow=0.63 cfs 0.05 af

Pond 20P: DMH#14 Peak Elev=376.89' Inflow=8.24 cfs 0.90 af
18.0" Round Culvert n=0.013 L=15.0' S=0.0800 '/' Outflow=8.24 cfs 0.90 af

Pond 21P: DMH#15 Peak Elev=383.15' Inflow=8.24 cfs 0.90 af
18.0" Round Culvert n=0.013 L=30.7' S=0.0801 '/' Outflow=8.24 cfs 0.90 af

Pond 22P: CB#16 Peak Elev=399.31' Inflow=8.24 cfs 0.90 af
18.0" Round Culvert n=0.013 L=44.5' S=0.0800 '/' Outflow=8.24 cfs 0.90 af

Pond 23P: CB#17 Peak Elev=402.68' Inflow=8.20 cfs 0.90 af
18.0" Round Culvert n=0.013 L=164.2' S=0.0200 '/' Outflow=8.20 cfs 0.90 af

Pond 24P: CB#18 Peak Elev=403.69' Inflow=5.97 cfs 0.64 af
15.0" Round Culvert n=0.013 L=36.5' S=0.0200 '/' Outflow=5.97 cfs 0.64 af

Pond 25P: CB#19 Peak Elev=405.19' Inflow=4.66 cfs 0.49 af
12.0" Round Culvert n=0.013 L=26.0' S=0.0200 '/' Outflow=4.66 cfs 0.49 af

Pond 26P: DI#24 Peak Elev=299.85' Inflow=1.55 cfs 0.70 af
15.0" Round Culvert n=0.013 L=50.8' S=0.0419 '/' Outflow=1.55 cfs 0.70 af

Pond 27P: DI#23 Peak Elev=317.48' Inflow=1.24 cfs 0.68 af
15.0" Round Culvert n=0.013 L=220.0' S=0.0800 '/' Outflow=1.24 cfs 0.68 af

Pond 28P: DI#22 Peak Elev=331.13' Inflow=1.01 cfs 0.66 af
15.0" Round Culvert n=0.013 L=181.4' S=0.0750 '/' Outflow=1.01 cfs 0.66 af

Pond 29P: DI#21 Peak Elev=340.68' Inflow=0.81 cfs 0.64 af
15.0" Round Culvert n=0.013 L=118.9' S=0.0800 '/' Outflow=0.81 cfs 0.64 af

Pond PP: POCKET POND Peak Elev=372.01' Storage=85,566 cf Inflow=20.55 cfs 2.26 af
Primary=0.66 cfs 0.59 af Secondary=0.00 cfs 0.00 af Outflow=0.66 cfs 0.59 af

Link A: BARRETTS HILL CROSSING Inflow=19.22 cfs 3.57 af
Primary=19.22 cfs 3.57 af

Link B: LOT 57 Inflow=2.92 cfs 0.31 af
Primary=2.92 cfs 0.31 af

Link C: LOT 11 Inflow=3.43 cfs 0.38 af
Primary=3.43 cfs 0.38 af

Total Runoff Area = 45.830 ac Runoff Volume = 5.93 af Average Runoff Depth = 1.55"
90.81% Pervious = 41.618 ac 9.19% Impervious = 4.212 ac

Summary for Subcatchment 1S: SUBCATCHMENT

Runoff = 14.23 cfs @ 12.59 hrs, Volume= 2.16 af, Depth> 1.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.47"

	Area (sf)	CN	Description
	7,670	30.0	Woods, Good, HSG A
	363,085	55.0	Woods, Good, HSG B
	377,077	70.0	Woods, Good, HSG C
	6,684	39.0	>75% Grass cover, Good, HSG A
	61,618	61.0	>75% Grass cover, Good, HSG B
	61,554	74.0	>75% Grass cover, Good, HSG C
*	17,897	98.0	Roofs
*	14,358	98.0	Paved parking
	909,943	64.1	Weighted Average
	877,688	62.9	96.46% Pervious Area
	32,255	98.0	3.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.3	100	0.0400	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
19.4	1,831	0.0988	1.57		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.3	30	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.8	211	0.0430	4.21		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
37.8	2,172	Total			

Summary for Subcatchment 2S: SUBCATCHMENT

Runoff = 1.94 cfs @ 12.32 hrs, Volume= 0.23 af, Depth> 1.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.47"

	Area (sf)	CN	Description
	28,414	30.0	Woods, Good, HSG A
	11,383	55.0	Woods, Good, HSG B
	33,808	70.0	Woods, Good, HSG C
	4,719	39.0	>75% Grass cover, Good, HSG A
	242	61.0	>75% Grass cover, Good, HSG B
	20,087	74.0	>75% Grass cover, Good, HSG C
*	3,849	98.0	Roofs
*	10,579	98.0	Paved parking
	113,081	61.4	Weighted Average
	98,653	56.1	87.24% Pervious Area
	14,428	98.0	12.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	100	0.1000	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
3.9	318	0.0750	1.37		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.7	48	0.0300	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.6	217	0.0410	1.01		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
20.1	683	Total			

Summary for Subcatchment 3S: SUBCATCHMENT

Runoff = 1.99 cfs @ 12.37 hrs, Volume= 0.25 af, Depth> 1.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.47"

	Area (sf)	CN	Description
	5,732	30.0	Woods, Good, HSG A
	49,737	55.0	Woods, Good, HSG B
	30,592	70.0	Woods, Good, HSG C
	4,799	39.0	>75% Grass cover, Good, HSG A
	20,628	61.0	>75% Grass cover, Good, HSG B
	2,391	74.0	>75% Grass cover, Good, HSG C
*	2,833	98.0	Roofs
*	6,024	98.0	Paved parking
	122,736	61.4	Weighted Average
	113,879	58.6	92.78% Pervious Area
	8,857	98.0	7.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.9	100	0.1600	0.17		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
13.2	1,089	0.0760	1.38		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
23.1	1,189	Total			

Summary for Subcatchment 4S: SUBCATCHMENT

Runoff = 1.55 cfs @ 12.24 hrs, Volume= 0.16 af, Depth> 1.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.47"

	Area (sf)	CN	Description
	9,614	55.0	Woods, Good, HSG B
	3,279	70.0	Woods, Good, HSG C
	35,548	61.0	>75% Grass cover, Good, HSG B
	841	74.0	>75% Grass cover, Good, HSG C
*	7,262	98.0	Paved parking, HSG B
*	2,548	98.0	Roofs
	59,092	66.9	Weighted Average
	49,282	60.7	83.40% Pervious Area
	9,810	98.0	16.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.1	100	0.1200	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
0.4	43	0.1400	1.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.3	145	0.0690	1.84		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	14	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.9	230	0.0830	2.02		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.2	63	0.0480	4.45		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.9	103	0.0780	1.95		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.7	60	0.0830	1.44		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
16.6	758	Total			

Summary for Subcatchment 5S: SUBCATCHMENT

Runoff = 0.77 cfs @ 12.13 hrs, Volume= 0.06 af, Depth> 1.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.47"

	Area (sf)	CN	Description
	10,801	61.0	>75% Grass cover, Good, HSG B
*	5,640	98.0	Paved parking
	16,441	73.7	Weighted Average
	10,801	61.0	65.70% Pervious Area
	5,640	98.0	34.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	100	0.0700	0.26		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
0.1	16	0.0400	4.06		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.5	162	0.0680	1.83		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	20	0.0400	4.06		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.8	91	0.0770	1.94		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.7	389	Total			

Summary for Subcatchment 6S: SUBCATCHMENT

Runoff = 2.92 cfs @ 12.28 hrs, Volume= 0.31 af, Depth> 2.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.47"

	Area (sf)	CN	Description
	31,776	70.0	Woods, Good, HSG C
	38,986	74.0	>75% Grass cover, Good, HSG C
*	6,498	98.0	Paved parking
*	2,434	98.0	Roofs
	217	96.0	Gravel surface, HSG C
	79,911	75.2	Weighted Average
	70,979	72.3	88.82% Pervious Area
	8,932	98.0	11.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	65	0.0150	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
8.6	35	0.0280	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
0.5	38	0.0550	1.17		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.4	62	0.1300	2.52		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.2	467	0.0300	3.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
20.0	667	Total			

Summary for Subcatchment 7S: SUBCATCHMENT

Runoff = 3.43 cfs @ 12.30 hrs, Volume= 0.38 af, Depth> 1.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.47"

	Area (sf)	CN	Description
	85,940	70.0	Woods, Good, HSG C
	16,846	74.0	>75% Grass cover, Good, HSG C
*	5,055	98.0	Paved parking
	764	96.0	Gravel surface, HSG C
*	590	98.0	Roofs
	109,195	72.2	Weighted Average
	103,550	70.8	94.83% Pervious Area
	5,645	98.0	5.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	100	0.0900	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
4.8	520	0.1290	1.80		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.3	125	0.0520	1.60		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.7	127	0.0590	1.21		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.1	13	0.3300	4.02		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.9	215	0.0375	3.93		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
21.3	1,100	Total			

Summary for Subcatchment 8S: SUBCATCHMENT

Runoff = 4.66 cfs @ 12.28 hrs, Volume= 0.49 af, Depth> 2.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.47"

	Area (sf)	CN	Description
	53,938	70.0	Woods, Good, HSG C
	39,569	74.0	>75% Grass cover, Good, HSG C
*	17,005	98.0	Paved parking
	7,242	98.0	Roofs, HSG C
	117,754	77.1	Weighted Average
	93,507	71.7	79.41% Pervious Area
	24,247	98.0	20.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.8	100	0.0500	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
1.8	246	0.2030	2.25		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.9	153	0.1570	2.77		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.0	5	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.1	5	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.5	257	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
20.1	766	Total			

Summary for Subcatchment 9S: SUBCATCHMENT

Runoff = 1.34 cfs @ 12.32 hrs, Volume= 0.15 af, Depth> 2.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.47"

	Area (sf)	CN	Description
	16,617	70.0	Woods, Good, HSG C
	11,038	74.0	>75% Grass cover, Good, HSG C
*	5,762	98.0	Paved parking
*	1,882	98.0	Roofs
	35,299	77.3	Weighted Average
	27,655	71.6	78.34% Pervious Area
	7,644	98.0	21.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.4	100	0.0300	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
2.5	350	0.2170	2.33		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.7	67	0.0520	1.60		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	12	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.1	5	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	24	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
22.9	558	Total			

Summary for Subcatchment 10S: SUBCATCHMENT

Runoff = 2.26 cfs @ 12.33 hrs, Volume= 0.26 af, Depth> 1.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.47"

	Area (sf)	CN	Description
	47,862	70.0	Woods, Good, HSG C
	16,792	74.0	>75% Grass cover, Good, HSG C
*	3,480	98.0	Paved parking
*	2,503	98.0	Roofs
	70,637	73.3	Weighted Average
	64,654	71.0	91.53% Pervious Area
	5,983	98.0	8.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.3	100	0.0400	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
3.1	390	0.1800	2.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.0	170	0.0410	1.42		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.5	105	0.0290	3.46		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
22.8	765	Total			

Summary for Subcatchment 11S: SUBCATCHMENT

Runoff = 0.73 cfs @ 12.09 hrs, Volume= 0.05 af, Depth> 2.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.47"

	Area (sf)	CN	Description
	5,386	74.0	>75% Grass cover, Good, HSG C
*	3,066	98.0	Paved parking
*	1,183	98.0	Roofs
	9,635	84.6	Weighted Average
	5,386	74.0	55.90% Pervious Area
	4,249	98.0	44.10% Impervious Area

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

Summary for Subcatchment 12S: SUBCATCHMENT

Runoff = 4.83 cfs @ 12.25 hrs, Volume= 0.49 af, Depth> 1.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.47"

	Area (sf)	CN	Description
	112,022	70.0	Woods, Good, HSG C
	24,301	74.0	>75% Grass cover, Good, HSG C
*	3,649	98.0	Paved parking
*	3,776	98.0	Roofs
	143,748	72.1	Weighted Average
	136,323	70.7	94.83% Pervious Area
	7,425	98.0	5.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	100	0.1000	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
3.2	391	0.1660	2.04		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.2	183	0.0410	1.42		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.5	138	0.0600	4.97		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
17.8	812	Total			

Summary for Subcatchment 13S: SUBCATCHMENT

Runoff = 2.01 cfs @ 12.22 hrs, Volume= 0.19 af, Depth> 2.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.47"

	Area (sf)	CN	Description
	22,024	70.0	Woods, Good, HSG C
	21,217	74.0	>75% Grass cover, Good, HSG C
*	3,956	98.0	Paved parking
*	2,500	98.0	Roofs
	49,697	75.3	Weighted Average
	43,241	72.0	87.01% Pervious Area
	6,456	98.0	12.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	100	0.1000	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
2.0	250	0.1720	2.07		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.7	235	0.1100	2.32		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.2	52	0.0600	4.97		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
15.8	637	Total			

Summary for Subcatchment 14S: SUBCATCHMENT

Runoff = 0.88 cfs @ 12.19 hrs, Volume= 0.08 af, Depth> 2.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.47"

	Area (sf)	CN	Description
	1,995	70.0	Woods, Good, HSG C
	8,774	74.0	>75% Grass cover, Good, HSG C
*	4,264	98.0	Paved parking
*	1,235	98.0	Roofs
	16,268	81.6	Weighted Average
	10,769	73.3	66.20% Pervious Area
	5,499	98.0	33.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8	100	0.0700	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
0.1	24	0.3300	4.02		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	11	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
14.0	135	Total			

Summary for Subcatchment 15S: SUBCATCHMENT

Runoff = 0.64 cfs @ 12.09 hrs, Volume= 0.05 af, Depth> 2.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.47"

	Area (sf)	CN	Description
	5,759	74.0	>75% Grass cover, Good, HSG C
*	3,207	98.0	Paved parking
	8,966	82.6	Weighted Average
	5,759	74.0	64.23% Pervious Area
	3,207	98.0	35.77% Impervious Area

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

Summary for Subcatchment 16S: SUBCATCHMENT

Runoff = 1.11 cfs @ 12.09 hrs, Volume= 0.08 af, Depth> 2.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.47"

	Area (sf)	CN	Description
	8,198	74.0	>75% Grass cover, Good, HSG C
*	5,322	98.0	Paved parking
*	1,079	98.0	Roofs
	14,599	84.5	Weighted Average
	8,198	74.0	56.15% Pervious Area
	6,401	98.0	43.85% Impervious Area

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

Summary for Subcatchment 17S: SUBCATCHMENT

Runoff = 3.80 cfs @ 12.16 hrs, Volume= 0.32 af, Depth> 2.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.47"

	Area (sf)	CN	Description
	9,732	70.0	Woods, Good, HSG C
	52,648	74.0	>75% Grass cover, Good, HSG C
*	2,665	98.0	Roofs
	2,687	96.0	Gravel surface, HSG C
*	7,378	100.0	Surface Water
	75,110	77.7	Weighted Average
	65,067	74.3	86.63% Pervious Area
	10,043	99.5	13.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	90	0.1110	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
0.5	10	0.3300	0.31		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
0.1	33	0.3300	4.02		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.2	133	Total			

Summary for Subcatchment 18S: SUBCATCHMENT

Runoff = 0.63 cfs @ 12.09 hrs, Volume= 0.05 af, Depth> 2.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.47"

	Area (sf)	CN	Description
	4,351	74.0	>75% Grass cover, Good, HSG C
*	2,848	98.0	Paved parking
*	937	98.0	Roofs
	8,136	85.2	Weighted Average
	4,351	74.0	53.48% Pervious Area
	3,785	98.0	46.52% Impervious Area

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

Summary for Subcatchment 19S: SUBCATCHMENT

Runoff = 0.61 cfs @ 12.09 hrs, Volume= 0.04 af, Depth> 2.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.47"

	Area (sf)	CN	Description
	4,199	74.0	>75% Grass cover, Good, HSG C
*	3,084	98.0	Paved parking
*	559	98.0	Roofs
	7,842	85.1	Weighted Average
	4,199	74.0	53.55% Pervious Area
	3,643	98.0	46.45% Impervious Area

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

Summary for Subcatchment 20S: SUBCATCHMENT

Runoff = 0.11 cfs @ 12.09 hrs, Volume= 0.01 af, Depth> 2.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.47"

	Area (sf)	CN	Description
	790	74.0	>75% Grass cover, Good, HSG C
*	499	98.0	Paved parking
*	107	98.0	Roofs
	1,396	84.4	Weighted Average
	790	74.0	56.59% Pervious Area
	606	98.0	43.41% Impervious Area

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

Summary for Subcatchment 21S: SUBCATCHMENT

Runoff = 0.62 cfs @ 12.15 hrs, Volume= 0.05 af, Depth> 2.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.47"

	Area (sf)	CN	Description
	860	61.0	>75% Grass cover, Good, HSG B
	6,744	74.0	>75% Grass cover, Good, HSG C
	270	55.0	Woods, Good, HSG B
	3,203	70.0	Woods, Good, HSG C
*	2,052	98.0	Paved parking
	13,129	75.5	Weighted Average
	11,077	71.4	84.37% Pervious Area
	2,052	98.0	15.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	100	0.1400	0.16		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
0.1	17	0.1800	2.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	26	0.0960	2.17		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.8	143	Total			

Summary for Subcatchment 22S: SUBCATCHMENT

Runoff = 0.23 cfs @ 12.09 hrs, Volume= 0.02 af, Depth> 2.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.47"

	Area (sf)	CN	Description
	1,487	61.0	>75% Grass cover, Good, HSG B
*	1,885	98.0	Paved parking
	3,372	81.7	Weighted Average
	1,487	61.0	44.10% Pervious Area
	1,885	98.0	55.90% Impervious Area

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

Summary for Subcatchment 23S: SUBCATCHMENT

Runoff = 0.26 cfs @ 12.09 hrs, Volume= 0.02 af, Depth> 2.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.47"

	Area (sf)	CN	Description
	1,588	61.0	>75% Grass cover, Good, HSG B
*	2,107	98.0	Paved parking
	3,695	82.1	Weighted Average
	1,588	61.0	42.98% Pervious Area
	2,107	98.0	57.02% Impervious Area

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

Summary for Subcatchment 24S: SUBCATCHMENT

Runoff = 0.32 cfs @ 12.09 hrs, Volume= 0.02 af, Depth> 2.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.47"

	Area (sf)	CN	Description
	1,725	61.0	>75% Grass cover, Good, HSG B
	42	55.0	Woods, Good, HSG B
*	2,654	98.0	Paved parking
	4,421	83.2	Weighted Average
	1,767	60.9	39.97% Pervious Area
	2,654	98.0	60.03% Impervious Area

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

Summary for Subcatchment 25S: SUBCATCHMENT

Runoff = 0.05 cfs @ 12.10 hrs, Volume= 0.00 af, Depth> 1.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.47"

Area (sf)	CN	Description
1,907	61.0	>75% Grass cover, Good, HSG B
339	55.0	Woods, Good, HSG B
2,246	60.1	Weighted Average
2,246	60.1	100.00% Pervious Area

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

Summary for Reach 1R: EXISTING ROADWAY DITCH

Inflow Area = 15.186 ac, 17.13% Impervious, Inflow Depth > 0.73" for 10-YEAR event
Inflow = 3.46 cfs @ 12.15 hrs, Volume= 0.92 af
Outflow = 3.44 cfs @ 12.17 hrs, Volume= 0.92 af, Atten= 0%, Lag= 0.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.67 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 2.17 fps, Avg. Travel Time= 1.8 min

Peak Storage= 216 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.56'
Bank-Full Depth= 1.00' Flow Area= 3.0 sf, Capacity= 16.21 cfs

0.00' x 1.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 6.00'
Length= 230.0' Slope= 0.0173 '/'
Inlet Invert= 295.64', Outlet Invert= 291.66'

Summary for Pond 1P: EXISTING CB

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 20.889 ac, 3.54% Impervious, Inflow Depth > 1.24" for 10-YEAR event
Inflow = 14.23 cfs @ 12.59 hrs, Volume= 2.16 af
Primary = 14.23 cfs @ 12.59 hrs, Volume= 2.16 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Pond 2P: EXISTING DRIVEWAY CULVERT

Inflow Area = 2.596 ac, 12.76% Impervious, Inflow Depth > 1.08" for 10-YEAR event
Inflow = 1.94 cfs @ 12.32 hrs, Volume= 0.23 af
Outflow = 1.94 cfs @ 12.32 hrs, Volume= 0.23 af, Atten= 0%, Lag= 0.0 min
Primary = 1.94 cfs @ 12.32 hrs, Volume= 0.23 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 293.20' @ 12.32 hrs
Flood Elev= 294.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	292.40'	**12.0" Round Culvert** L= 21.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 292.40' / 292.10' S= 0.0143 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=1.94 cfs @ 12.32 hrs HW=293.20' TW=290.79' (Dynamic Tailwater)
↑**1=Culvert** (Barrel Controls 1.94 cfs @ 3.94 fps)

Summary for Pond 3P: EXISTING DROP INLET

Inflow Area = 41.489 ac, 9.34% Impervious, Inflow Depth > 1.03" for 10-YEAR event
Inflow = 19.22 cfs @ 12.51 hrs, Volume= 3.57 af
Outflow = 19.22 cfs @ 12.51 hrs, Volume= 3.57 af, Atten= 0%, Lag= 0.0 min
Primary = 19.22 cfs @ 12.51 hrs, Volume= 3.57 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 291.27' @ 12.51 hrs
Flood Elev= 293.75'

Device	Routing	Invert	Outlet Devices
#1	Primary	288.66'	**24.0" Round Culvert** L= 92.1' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 288.66' / 284.67' S= 0.0433 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf

Primary OutFlow Max=19.21 cfs @ 12.51 hrs HW=291.27' TW=0.00' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 19.21 cfs @ 6.12 fps)

Summary for Pond 4P: EXISTING CB

Inflow Area = 15.186 ac, 17.13% Impervious, Inflow Depth > 0.73" for 10-YEAR event
Inflow = 3.46 cfs @ 12.15 hrs, Volume= 0.92 af
Outflow = 3.46 cfs @ 12.15 hrs, Volume= 0.92 af, Atten= 0%, Lag= 0.0 min
Primary = 3.46 cfs @ 12.15 hrs, Volume= 0.92 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 297.98' @ 12.15 hrs
Flood Elev= 300.17'

Device	Routing	Invert	Outlet Devices
#1	Primary	297.00'	**15.0" Round Culvert** L= 49.1' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 297.00' / 295.65' S= 0.0275 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Secondary	300.17'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=3.45 cfs @ 12.15 hrs HW=297.98' TW=296.20' (Dynamic Tailwater)
1=Culvert (Inlet Controls 3.45 cfs @ 3.36 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=297.00' TW=295.64' (Dynamic Tailwater)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 5P: EXISTING CB

Inflow Area = 0.377 ac, 34.30% Impervious, Inflow Depth > 1.92" for 10-YEAR event
Inflow = 0.77 cfs @ 12.13 hrs, Volume= 0.06 af
Outflow = 0.77 cfs @ 12.13 hrs, Volume= 0.06 af, Atten= 0%, Lag= 0.0 min
Primary = 0.77 cfs @ 12.13 hrs, Volume= 0.06 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 298.34' @ 12.14 hrs
Flood Elev= 301.16'

Device	Routing	Invert	Outlet Devices
#1	Primary	297.70'	**12.0" Round Culvert** L= 34.1' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 297.70' / 297.30' S= 0.0117 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	301.16'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.75 cfs @ 12.13 hrs HW=298.33' TW=297.96' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.75 cfs @ 2.05 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=297.70' TW=0.00' (Dynamic Tailwater)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 6P: EXISTING CB

Inflow Area = 1.835 ac, 11.18% Impervious, Inflow Depth > 2.03" for 10-YEAR event
Inflow = 2.92 cfs @ 12.28 hrs, Volume= 0.31 af
Outflow = 2.92 cfs @ 12.28 hrs, Volume= 0.31 af, Atten= 0%, Lag= 0.0 min
Primary = 2.92 cfs @ 12.28 hrs, Volume= 0.31 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 364.80' @ 12.28 hrs
Flood Elev= 366.35'

Device	Routing	Invert	Outlet Devices
#1	Primary	363.70'	**12.0" Round Culvert** L= 18.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 363.70' / 362.46' S= 0.0689 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf

Primary OutFlow Max=2.92 cfs @ 12.28 hrs HW=364.80' TW=0.00' (Dynamic Tailwater)
1=Culvert (Inlet Controls 2.92 cfs @ 3.72 fps)

Summary for Pond 7P: EXISTING CB

Inflow Area = 2.507 ac, 5.17% Impervious, Inflow Depth > 1.81" for 10-YEAR event
Inflow = 3.43 cfs @ 12.30 hrs, Volume= 0.38 af
Outflow = 3.43 cfs @ 12.30 hrs, Volume= 0.38 af, Atten= 0%, Lag= 0.0 min
Primary = 3.43 cfs @ 12.30 hrs, Volume= 0.38 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 377.94' @ 12.30 hrs
Flood Elev= 380.49'

Device	Routing	Invert	Outlet Devices
#1	Primary	376.57'	**12.0" Round Culvert** L= 31.9' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 376.57' / 376.28' S= 0.0091 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=3.43 cfs @ 12.30 hrs HW=377.94' TW=0.00' (Dynamic Tailwater)
1=Culvert (Barrel Controls 3.43 cfs @ 4.36 fps)

Summary for Pond 8P: CB#20

Inflow Area = 12.886 ac, 15.89% Impervious, Inflow Depth > 0.55" for 10-YEAR event
Inflow = 0.66 cfs @ 19.10 hrs, Volume= 0.59 af
Outflow = 0.66 cfs @ 19.10 hrs, Volume= 0.59 af, Atten= 0%, Lag= 0.1 min
Primary = 0.66 cfs @ 19.10 hrs, Volume= 0.59 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 350.58' @ 19.10 hrs
Flood Elev= 360.00'

Attachment "D"

Device	Routing	Invert	Outlet Devices
#1	Primary	350.20'	**15.0" Round Culvert** L= 115.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 350.20' / 341.00' S= 0.0800 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=0.66 cfs @ 19.10 hrs HW=350.58' TW=340.64' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 0.66 cfs @ 2.10 fps)

Summary for Pond 9P: DMH#3

Inflow Area = 5.943 ac, 15.71% Impervious, Inflow Depth > 2.09" for 10-YEAR event
Inflow = 9.60 cfs @ 12.21 hrs, Volume= 1.04 af
Outflow = 9.60 cfs @ 12.21 hrs, Volume= 1.04 af, Atten= 0%, Lag= 0.0 min
Primary = 9.60 cfs @ 12.21 hrs, Volume= 1.04 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 376.48' @ 12.21 hrs
Flood Elev= 377.79'

Device	Routing	Invert	Outlet Devices
#1	Primary	374.27'	**18.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 374.27' / 374.12' S= 0.0075 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=9.60 cfs @ 12.21 hrs HW=376.47' TW=368.49' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 9.60 cfs @ 5.43 fps)

Summary for Pond 10P: DMH#4

Inflow Area = 5.943 ac, 15.71% Impervious, Inflow Depth > 2.09" for 10-YEAR event
Inflow = 9.60 cfs @ 12.21 hrs, Volume= 1.04 af
Outflow = 9.60 cfs @ 12.21 hrs, Volume= 1.04 af, Atten= 0%, Lag= 0.0 min
Primary = 9.60 cfs @ 12.21 hrs, Volume= 1.04 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 378.18' @ 12.21 hrs
Flood Elev= 381.66'

Device	Routing	Invert	Outlet Devices
#1	Primary	375.28'	**18.0" Round Culvert** L= 121.7' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 375.28' / 374.37' S= 0.0075 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=9.59 cfs @ 12.21 hrs HW=378.18' TW=376.47' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 9.59 cfs @ 5.43 fps)

Summary for Pond 11P: DMH#5

Inflow Area = 5.943 ac, 15.71% Impervious, Inflow Depth > 2.09" for 10-YEAR event
Inflow = 9.60 cfs @ 12.21 hrs, Volume= 1.04 af
Outflow = 9.60 cfs @ 12.21 hrs, Volume= 1.04 af, Atten= 0%, Lag= 0.0 min
Primary = 9.60 cfs @ 12.21 hrs, Volume= 1.04 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 380.76' @ 12.21 hrs
Flood Elev= 384.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	377.08'	**18.0" Round Culvert** L= 226.1' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 377.08' / 375.38' S= 0.0075 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=9.58 cfs @ 12.21 hrs HW=380.75' TW=378.18' (Dynamic Tailwater)
1=Culvert (Outlet Controls 9.58 cfs @ 5.42 fps)

Summary for Pond 12P: CB#6

Inflow Area = 5.943 ac, 15.71% Impervious, Inflow Depth > 2.09" for 10-YEAR event
Inflow = 9.60 cfs @ 12.21 hrs, Volume= 1.04 af
Outflow = 9.60 cfs @ 12.21 hrs, Volume= 1.04 af, Atten= 0%, Lag= 0.0 min
Primary = 9.60 cfs @ 12.21 hrs, Volume= 1.04 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 382.63' @ 12.22 hrs
Flood Elev= 384.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	377.89'	**18.0" Round Culvert** L= 141.2' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 377.89' / 377.18' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=9.54 cfs @ 12.21 hrs HW=382.60' TW=380.75' (Dynamic Tailwater)
1=Culvert (Outlet Controls 9.54 cfs @ 5.40 fps)

Summary for Pond 13P: CB#7

Inflow Area = 5.737 ac, 14.99% Impervious, Inflow Depth > 2.07" for 10-YEAR event
Inflow = 9.24 cfs @ 12.22 hrs, Volume= 0.99 af
Outflow = 9.24 cfs @ 12.22 hrs, Volume= 0.99 af, Atten= 0%, Lag= 0.0 min
Primary = 9.24 cfs @ 12.22 hrs, Volume= 0.99 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 383.80' @ 12.23 hrs
Flood Elev= 384.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	378.60'	**18.0" Round Culvert** L= 30.3' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 378.60' / 377.99' S= 0.0201 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=9.17 cfs @ 12.22 hrs HW=383.78' TW=382.62' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 9.17 cfs @ 5.19 fps)

Summary for Pond 14P: CB#8

[80] Warning: Exceeded Pond 15P by 0.76' @ 12.13 hrs (3.29 cfs 0.03 af)

Inflow Area = 5.364 ac, 13.68% Impervious, Inflow Depth > 2.03" for 10-YEAR event
Inflow = 8.39 cfs @ 12.23 hrs, Volume= 0.91 af
Outflow = 8.39 cfs @ 12.23 hrs, Volume= 0.91 af, Atten= 0%, Lag= 0.0 min
Primary = 8.39 cfs @ 12.23 hrs, Volume= 0.91 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 387.68' @ 12.23 hrs
Flood Elev= 388.51'

Device	Routing	Invert	Outlet Devices
#1	Primary	382.24'	**15.0" Round Culvert** L= 165.7' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 382.24' / 378.85' S= 0.0205 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=8.36 cfs @ 12.23 hrs HW=387.67' TW=383.80' (Dynamic Tailwater)
↑**1=Culvert** (Outlet Controls 8.36 cfs @ 6.81 fps)

Summary for Pond 15P: CB#80

Inflow Area = 0.180 ac, 46.45% Impervious, Inflow Depth > 2.89" for 10-YEAR event
Inflow = 0.61 cfs @ 12.09 hrs, Volume= 0.04 af
Outflow = 0.61 cfs @ 12.09 hrs, Volume= 0.04 af, Atten= 0%, Lag= 0.0 min
Primary = 0.61 cfs @ 12.09 hrs, Volume= 0.04 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 387.69' @ 12.24 hrs
Flood Elev= 388.51'

Device	Routing	Invert	Outlet Devices
#1	Primary	382.86'	**12.0" Round Culvert** L= 26.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 382.86' / 382.34' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.09 hrs HW=384.19' TW=384.27' (Dynamic Tailwater)
↑**1=Culvert** (Controls 0.00 cfs)

Summary for Pond 16P: CB#10

[80] Warning: Exceeded Pond 17P by 0.09' @ 12.05 hrs (1.11 cfs 0.01 af)

Inflow Area =	4.043 ac, 12.41% Impervious,	Inflow Depth > 1.99"	for 10-YEAR event	
Inflow =	6.06 cfs @	12.23 hrs, Volume=	0.67 af	
Outflow =	6.06 cfs @	12.23 hrs, Volume=	0.67 af,	Atten= 0%, Lag= 0.0 min
Primary =	6.06 cfs @	12.23 hrs, Volume=	0.67 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 394.51' @ 12.23 hrs
Flood Elev= 397.31'

Device	Routing	Invert	Outlet Devices
#1	Primary	391.44'	**12.0" Round Culvert** L= 165.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 391.44' / 382.34' S= 0.0550 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=6.06 cfs @ 12.23 hrs HW=394.51' TW=387.68' (Dynamic Tailwater)
1=Culvert (Inlet Controls 6.06 cfs @ 7.71 fps)

Summary for Pond 17P: CB#100

Inflow Area =	0.335 ac, 43.85% Impervious,	Inflow Depth > 2.83"	for 10-YEAR event	
Inflow =	1.11 cfs @	12.09 hrs, Volume=	0.08 af	
Outflow =	1.11 cfs @	12.09 hrs, Volume=	0.08 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.11 cfs @	12.09 hrs, Volume=	0.08 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 394.53' @ 12.24 hrs
Flood Elev= 397.31'

Device	Routing	Invert	Outlet Devices
#1	Primary	392.06'	**12.0" Round Culvert** L= 26.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 392.06' / 391.54' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.09 hrs HW=393.75' TW=393.79' (Dynamic Tailwater)
1=Culvert (Controls 0.00 cfs)

Summary for Pond 18P: CB#11

Inflow Area =	0.408 ac, 45.21% Impervious,	Inflow Depth > 2.86"	for 10-YEAR event	
Inflow =	1.36 cfs @	12.09 hrs, Volume=	0.10 af	
Outflow =	1.36 cfs @	12.09 hrs, Volume=	0.10 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.36 cfs @	12.09 hrs, Volume=	0.10 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Peak Elev= 401.39' @ 12.09 hrs
Flood Elev= 406.88'

Device	Routing	Invert	Outlet Devices
#1	Primary	400.77'	**12.0" Round Culvert** L= 167.8' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 400.77' / 391.54' S= 0.0550 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=1.36 cfs @ 12.09 hrs HW=401.39' TW=393.79' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 1.36 cfs @ 2.68 fps)

Summary for Pond 19P: CB#110

Inflow Area = 0.187 ac, 46.52% Impervious, Inflow Depth > 2.89" for 10-YEAR event
Inflow = 0.63 cfs @ 12.09 hrs, Volume= 0.05 af
Outflow = 0.63 cfs @ 12.09 hrs, Volume= 0.05 af, Atten= 0%, Lag= 0.0 min
Primary = 0.63 cfs @ 12.09 hrs, Volume= 0.05 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 402.03' @ 12.09 hrs
Flood Elev= 406.64'

Device	Routing	Invert	Outlet Devices
#1	Primary	401.63'	**12.0" Round Culvert** L= 38.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 401.63' / 400.87' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.63 cfs @ 12.09 hrs HW=402.03' TW=401.39' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 0.63 cfs @ 2.15 fps)

Summary for Pond 20P: DMH#14

Inflow Area = 5.167 ac, 17.10% Impervious, Inflow Depth > 2.10" for 10-YEAR event
Inflow = 8.24 cfs @ 12.30 hrs, Volume= 0.90 af
Outflow = 8.24 cfs @ 12.30 hrs, Volume= 0.90 af, Atten= 0%, Lag= 0.0 min
Primary = 8.24 cfs @ 12.30 hrs, Volume= 0.90 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 376.89' @ 12.30 hrs
Flood Elev= 383.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	375.20'	**18.0" Round Culvert** L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 375.20' / 374.00' S= 0.0800 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=8.24 cfs @ 12.30 hrs HW=376.89' TW=369.08' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 8.24 cfs @ 4.66 fps)

Summary for Pond 21P: DMH#15

Inflow Area = 5.167 ac, 17.10% Impervious, Inflow Depth > 2.10" for 10-YEAR event
Inflow = 8.24 cfs @ 12.30 hrs, Volume= 0.90 af
Outflow = 8.24 cfs @ 12.30 hrs, Volume= 0.90 af, Atten= 0%, Lag= 0.0 min
Primary = 8.24 cfs @ 12.30 hrs, Volume= 0.90 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 383.15' @ 12.30 hrs
Flood Elev= 387.85'

Device	Routing	Invert	Outlet Devices
#1	Primary	381.46'	**18.0" Round Culvert** L= 30.7' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 381.46' / 379.00' S= 0.0801 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=8.24 cfs @ 12.30 hrs HW=383.15' TW=376.89' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 8.24 cfs @ 4.66 fps)

Summary for Pond 22P: CB#16

Inflow Area = 5.167 ac, 17.10% Impervious, Inflow Depth > 2.10" for 10-YEAR event
Inflow = 8.24 cfs @ 12.30 hrs, Volume= 0.90 af
Outflow = 8.24 cfs @ 12.30 hrs, Volume= 0.90 af, Atten= 0%, Lag= 0.0 min
Primary = 8.24 cfs @ 12.30 hrs, Volume= 0.90 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 399.31' @ 12.30 hrs
Flood Elev= 409.82'

Device	Routing	Invert	Outlet Devices
#1	Primary	397.62'	**18.0" Round Culvert** L= 44.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 397.62' / 394.06' S= 0.0800 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=8.24 cfs @ 12.30 hrs HW=399.31' TW=383.15' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 8.24 cfs @ 4.66 fps)

Summary for Pond 23P: CB#17

Inflow Area = 5.135 ac, 16.93% Impervious, Inflow Depth > 2.09" for 10-YEAR event
Inflow = 8.20 cfs @ 12.30 hrs, Volume= 0.90 af
Outflow = 8.20 cfs @ 12.30 hrs, Volume= 0.90 af, Atten= 0%, Lag= 0.0 min
Primary = 8.20 cfs @ 12.30 hrs, Volume= 0.90 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 402.68' @ 12.30 hrs
Flood Elev= 407.95'

Device	Routing	Invert	Outlet Devices
#1	Primary	401.00'	**18.0" Round Culvert** L= 164.2' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 401.00' / 397.72' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=8.20 cfs @ 12.30 hrs HW=402.68' TW=399.31' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 8.20 cfs @ 4.64 fps)

Summary for Pond 24P: CB#18

Inflow Area = 3.514 ac, 20.84% Impervious, Inflow Depth > 2.19" for 10-YEAR event
Inflow = 5.97 cfs @ 12.29 hrs, Volume= 0.64 af
Outflow = 5.97 cfs @ 12.29 hrs, Volume= 0.64 af, Atten= 0%, Lag= 0.0 min
Primary = 5.97 cfs @ 12.29 hrs, Volume= 0.64 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 403.69' @ 12.30 hrs
Flood Elev= 408.04'

Device	Routing	Invert	Outlet Devices
#1	Primary	401.98'	**15.0" Round Culvert** L= 36.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 401.98' / 401.25' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=5.95 cfs @ 12.29 hrs HW=403.69' TW=402.67' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 5.95 cfs @ 4.85 fps)

Summary for Pond 25P: CB#19

Inflow Area = 2.703 ac, 20.59% Impervious, Inflow Depth > 2.19" for 10-YEAR event
Inflow = 4.66 cfs @ 12.28 hrs, Volume= 0.49 af
Outflow = 4.66 cfs @ 12.28 hrs, Volume= 0.49 af, Atten= 0%, Lag= 0.0 min
Primary = 4.66 cfs @ 12.28 hrs, Volume= 0.49 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 405.19' @ 12.30 hrs
Flood Elev= 407.78'

Device	Routing	Invert	Outlet Devices
#1	Primary	402.75'	**12.0" Round Culvert** L= 26.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 402.75' / 402.23' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=4.62 cfs @ 12.28 hrs HW=405.17' TW=403.68' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 4.62 cfs @ 5.88 fps)

Summary for Pond 26P: DI#24

Inflow Area =	13.452 ac,	16.71% Impervious,	Inflow Depth > 0.63"	for 10-YEAR event	
Inflow =	1.55 cfs @	12.11 hrs,	Volume=	0.70 af	
Outflow =	1.55 cfs @	12.11 hrs,	Volume=	0.70 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.55 cfs @	12.11 hrs,	Volume=	0.70 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 299.85' @ 12.11 hrs
Flood Elev= 303.26'

Device	Routing	Invert	Outlet Devices
#1	Primary	299.25'	**15.0" Round Culvert** L= 50.8' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 299.25' / 297.12' S= 0.0419 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=1.55 cfs @ 12.11 hrs HW=299.85' TW=297.94' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 1.55 cfs @ 2.64 fps)

Summary for Pond 27P: DI#23

Inflow Area =	13.350 ac,	16.38% Impervious,	Inflow Depth > 0.61"	for 10-YEAR event	
Inflow =	1.24 cfs @	12.12 hrs,	Volume=	0.68 af	
Outflow =	1.24 cfs @	12.12 hrs,	Volume=	0.68 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.24 cfs @	12.12 hrs,	Volume=	0.68 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 317.48' @ 12.12 hrs
Flood Elev= 320.62'

Device	Routing	Invert	Outlet Devices
#1	Primary	316.95'	**15.0" Round Culvert** L= 220.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 316.95' / 299.35' S= 0.0800 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=1.24 cfs @ 12.12 hrs HW=317.48' TW=299.85' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 1.24 cfs @ 2.49 fps)

Summary for Pond 28P: DI#22

Inflow Area =	13.265 ac,	16.12% Impervious,	Inflow Depth > 0.60"	for 10-YEAR event	
Inflow =	1.01 cfs @	12.13 hrs,	Volume=	0.66 af	
Outflow =	1.01 cfs @	12.13 hrs,	Volume=	0.66 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.01 cfs @	12.13 hrs,	Volume=	0.66 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 331.13' @ 12.13 hrs
Flood Elev= 334.44'

Device	Routing	Invert	Outlet Devices
#1	Primary	330.65'	**15.0" Round Culvert** L= 181.4' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 330.65' / 317.05' S= 0.0750 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=1.01 cfs @ 12.13 hrs HW=331.13' TW=317.48' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 1.01 cfs @ 2.35 fps)

Summary for Pond 29P: DI#21

Inflow Area = 13.188 ac, 15.88% Impervious, Inflow Depth > 0.59" for 10-YEAR event
Inflow = 0.81 cfs @ 12.15 hrs, Volume= 0.64 af
Outflow = 0.81 cfs @ 12.15 hrs, Volume= 0.64 af, Atten= 0%, Lag= 0.0 min
Primary = 0.81 cfs @ 12.15 hrs, Volume= 0.64 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 340.68' @ 12.15 hrs
Flood Elev= 344.55'

Device	Routing	Invert	Outlet Devices
#1	Primary	340.26'	**15.0" Round Culvert** L= 118.9' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 340.26' / 330.75' S= 0.0800 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=0.81 cfs @ 12.15 hrs HW=340.68' TW=331.12' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 0.81 cfs @ 2.22 fps)

Summary for Pond PP: POCKET POND

Inflow Area = 12.835 ac, 15.95% Impervious, Inflow Depth > 2.11" for 10-YEAR event
Inflow = 20.55 cfs @ 12.23 hrs, Volume= 2.26 af
Outflow = 0.66 cfs @ 19.16 hrs, Volume= 0.59 af, Atten= 97%, Lag= 415.5 min
Primary = 0.66 cfs @ 19.16 hrs, Volume= 0.59 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 366.00' Surf.Area= 7,378 sf Storage= 10,599 cf
Peak Elev= 372.01' @ 19.16 hrs Surf.Area= 19,519 sf Storage= 85,566 cf (74,967 cf above start)
Flood Elev= 374.00' Surf.Area= 23,689 sf Storage= 127,049 cf (116,450 cf above start)

Plug-Flow detention time= 556.2 min calculated for 0.34 af (15% of inflow)
Center-of-Mass det. time= 261.2 min (1,104.7 - 843.5)

Volume	Invert	Avail.Storage	Storage Description
#1	363.00'	127,049 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
#2	369.00'	0 cf	**Sediment Forebay (No Storage) (Prismatic)** Listed below (Recalc) 870 cf Overall x 0.0% Voids
		127,049 cf	Total Available Storage

Attachment "D"

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
363.00	520	0	0
364.00	2,109	1,315	1,315
365.00	4,541	3,325	4,640
366.00	7,378	5,960	10,599
368.00	10,543	17,921	28,520
370.00	14,007	24,550	53,070
371.00	15,844	14,926	67,996
372.00	18,773	17,309	85,304
374.00	22,972	41,745	127,049

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
369.00	153	0	0
371.00	717	870	870

Device	Routing	Invert	Outlet Devices
#1	Primary	364.57'	**15.0" Round Culvert** L= 106.9' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 364.57' / 356.50' S= 0.0755 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	366.00'	**2.0" Vert. Orifice** C= 0.600
#3	Device 1	369.45'	**2.5" Vert. Orifice** C= 0.600
#4	Device 1	371.50'	**3.0" Vert. Orifice** C= 0.600
#5	Device 1	373.70'	**48.0" x 48.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#6	Secondary	373.90'	**5.0' long x 95.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=0.66 cfs @ 19.16 hrs HW=372.01' TW=350.58' (Dynamic Tailwater)
1=Culvert (Passes 0.66 cfs of 15.43 cfs potential flow)
- **2=Orifice** (Orifice Controls 0.26 cfs @ 11.73 fps)
- **3=Orifice** (Orifice Controls 0.26 cfs @ 7.55 fps)
- **4=Orifice** (Orifice Controls 0.15 cfs @ 3.00 fps)
- **5=Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=366.00' TW=350.20' (Dynamic Tailwater)
6=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Link A: BARRETTS HILL CROSSING

Inflow Area = 41.489 ac, 9.34% Impervious, Inflow Depth > 1.03" for 10-YEAR event
Inflow = 19.22 cfs @ 12.51 hrs, Volume= 3.57 af
Primary = 19.22 cfs @ 12.51 hrs, Volume= 3.57 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Attachment "D"

Summary for Link B: LOT 57

Inflow Area =	1.835 ac,	11.18% Impervious,	Inflow Depth > 2.03"	for 10-YEAR event
Inflow =	2.92 cfs @	12.28 hrs, Volume=	0.31 af	
Primary =	2.92 cfs @	12.28 hrs, Volume=	0.31 af, Atten= 0%,	Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link C: LOT 11

Inflow Area =	2.507 ac,	5.17% Impervious,	Inflow Depth > 1.81"	for 10-YEAR event
Inflow =	3.43 cfs @	12.30 hrs, Volume=	0.38 af	
Primary =	3.43 cfs @	12.30 hrs, Volume=	0.38 af, Atten= 0%,	Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

KNA KEACH-NORDSTROM ASSOCIATES, INC.

March 5, 2024

Mr. Jay Minkarah
Acting Town Planner
Town of Hudson
12 School Street
Hudson, NH 03051

Subject: **Town of Hudson Planning Board Review**
Barrett Hill Subdivision Plan
Tax Map 151 Lot 59
KNA Project No. 23-0414-1

Dear Mr. Minkarah:

Our office is in receipt of four review letters, dated December 11, 18 & 19 of 2023. Based on the comments from town staff, we have made the required modifications and attached revisions for final review. A response to each comment has been provided below.

1. **Engineering**

   a. Applicant shall provide driveway plan and profile for all proposed lots.

   The plans have been revised to include potential lot development including driveway and condex locations as well as driveway and lot grading. The layout shown on the Grading & Drainage Plan is likely what will be constructed; however it is still subject to change slightly due to conditions present in the field. Note #6 on Sheet 10 has been modified accordingly.

   b. Applicant shall evaluate further improvement on Barretts Hill related to sight distance downhill site, including Barretts Hill Road relocation.

   A sight distance easement has been provided over proposed Lot 59-1 to ensure adequate sight distance can be maintained at all times.

   c. Applicant shall provide a bond for onsite and offsite improvements within the existing and proposed Right of Way, prior to recording the plans.

   Note #26 on Sheet 1 has been added to this effect.

   d. Applicant shall transfer the ownership of the road to the town and to the satisfaction of the Town prior to receiving the last Certificate of Occupancy of the last lot.

Note #27 on Sheet 1 has been added to this effect.

2. **DPW**

   a. Station 5+25.00 add additional catch basin to opposite side of road.

   An additional catch basin has been added as requested.

   b. Station 2+00.00 add additional catch basin to opposite side of road.

   An additional catch basin has been added as requested.

   c. DMH #17 should have a storm grate instead of a manhole cover since it is on the curb line.

   DMH#17 is located 20 feet from the high point of the roadway and is solely designed to provide a direction change for the drain pipe. A typical Type B frame and grate is not required in this location as the structure would receive almost no flow due to its vicinity to the high point of the roadway. The newly added CB #110, at Station 5+25, is in a much better location to intake stormwater runoff from said high point.

   d. All drainage on Barretts Hill Rd. shall be changed to enclosed drainage with catch basins until it outfalls at the existing drainage easement at 55 Barretts Hill Rd.

   The drainage design on Barretts Hill Road has been modified as requested according to recommendations from the Town Engineer and the DPW.

3. **Zoning**

   a. Are there going to be Decks on the houses.

   Patios/decks are proposed for each condex unit. All patios or decks will fall within the required setbacks.

   b. Proposed lot 151 lot 59-1 Looks really close to the front setback.

   The proposed lot adheres to all zoning requirements.

   c. Are there garages and where are the driveways going to be located.

   Each condex unit will have two garages either at grade or drive-under. The Grading & Drainage Plan has been revised to include future potential lot development.

   d. 151 lot 59-2 is this going to be a shared driveway with lot 59—8.

   The driveway locations are now shown on the plan to provide proof of concept. All

10 Commerce Park North, Suite 3B Bedford, NH 03110 Phone (603) 627-2881 Fax (603) 627-2915

lots will be accessed by their own individual driveways.

4. **Fire**

a. The State Adopted Fire Code, NFPA 1 requires a water supply of 1000 gallons per minute for one hour for firefighting. A 60,000 gallon cistern is required. Redesign the site plan showing the placement of the 60,000 gallon cistern. Provide a cistern drawing that meets Hudson Fire Department requirements. The cistern shall include 6"metal suction pipe, to 6" female, to 6" to 5" male reducer to be National Hose Thread. There shall also be a cap provided for the 6" to 5" reducer that will be left connected to the riser. Locks shall be provided for all access hatches. The cistern shall have a water level indicator.

A 30,000-gallon cistern is now proposed on Lot 59-2 with an associated easement per direction of the Hudson Fire Department. Construction details are located on Sheet 18.

b. The developer has the option of installing an NFPA 130 sprinkler systems in each dwelling in lieu of the cistern.

Sprinklers are not proposed as a cistern has been provided.

c. The proposed subdivision falls inside the 1000 foot distance from the center of the Tennessee Gas Pipeline. Advanced notification is required from the gas company per State of NH RSA 674:75. The advanced notification shall be sent to KMEncroachmentsNorth@kindermorgan.com . This is required prior to any site work, blasting, or building permits being issued. Once approval has been received this approval shall be sent to Nashua Regional Planning Commission email at outreach@nashuarpc.org. All approval documentation shall be submitted with the building permit applications. No permits will be issued without all approvals.

The applicant has noted this information. The gas company has been notified.

If you have any questions or comments, please reach out by phone at (603) 627-2881 or by email at pmadsen@keachnordstrom.com.

Respectfully,

Peter Madsen, EIT
Keach Nordstrom Associates, Inc.
10 Commerce Park North, Suite 3
Bedford, NH 03110

Attachment "F"

Alteration of Terrain Application

Barrett Hill Subdivision

Tax Map 151, Lot 59
75 Barretts Hill Road
Hudson, New Hampshire

12/13/2023

KNA Project No. 23-0414-1

STATE OF NEW HAMPSHIRE - PROFESSIONAL ENGINEER
PAUL CHISHOLM
No. 15076
LICENSED
12/13/23

Prepared For: Barrett Hill, LLC
21 Continental Blvd. Door #4
Merrimack, NH 03110

Prepared By: Keach-Nordstrom Associates, Inc.
10 Commerce Park North, Suite 3
Bedford, New Hampshire 03110
(603) 627-2881
(603) 627-2915 (fax)

KNA *KEACH-NORDSTROM ASSOCIATES, INC.*

Civil Engineering *Land Surveying* *Landscape Architecture*

Attachment "F"

Table of Contents

Attachment "F"

1. **SIGNED OWNER/APPLICANT AFFIDAVIT**

Attachment "F"

Owner Affidavit

I, John Gargasz, authorized representative of Barrett Hill, LLC and owner of the property referenced on Tax Map 151 as Lot 59, located at 75 Barretts Hill Road, Hudson, New Hampshire, hereby verify that I have authorized Keach-Nordstrom Associates, Inc. to submit on my behalf, any and all applicable State and local permit applications as they pertain to improvements on said property.

Additionally, I authorize Keach-Nordstrom Associates, Inc. to aid in the representation of these applications throughout the approval process.

Signature of Owner: ______________________

Printed Name of Owner: John Gargasz

Address of Owner: 21 Continental Boulevard, Door #4

Merrimack, NH 03054

Date: 12/11/2023

2. AOT APPLICATION

Attachment "F"

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

ALTERATION OF TERRAIN PERMIT APPLICATION

Water Division/ Alteration of Terrain Bureau/ Land Resources Management
Check the Status of your Application: www.des.nh.gov/onestop

RSA/ Rule: RSA 485-A:17, Env-Wq 1500

Administrative Use Only	Administrative Use Only	Administrative Use Only	File Number:
			Check No.
			Amount:
			Initials:

1. APPLICANT INFORMATION (INTENDED PERMIT HOLDER)		
Applicant Name: Barrett Hill, LLC	Contact Name: John Gargasz	
Email: johngargasz@gmail.com	Daytime Telephone: (603) 320-5123	
Mailing Address: 21 Continental Blvd. Door #4		
Town/City: Merrimack	State: NH	Zip Code: 03054
2. APPLICANT'S AGENT INFORMATION If none, check here: ☒		
Business Name:	Contact Name:	
Email:	Daytime Telephone:	
Address:		
Town/City:	State:	Zip Code:
3. PROPERTY OWNER INFORMATION (IF DIFFERENT FROM APPLICANT)		
Applicant Name:	Contact Name:	
Email:	Daytime Telephone:	
Mailing Address:		
Town/City:	State:	Zip Code:
4. PROPERTY OWNER'S AGENT INFORMATION If none, check here: ☒		
Business Name:	Contact Name:	
Email:	Daytime Telephone:	
Address:		
Town/City:	State:	Zip Code:
5. CONSULTANT INFORMATION If none, check here: ☐		
Engineering Firm: Keach-Nordstrom Associates, Inc.	Contact Name: Mitchell Heidler	
Email: mheidler@keachnordstrom.com	Daytime Telephone: (603) 627-2881	
Address: 10 Commerce Park North, Suite 3B		
Town/City: Bedford	State: NH	Zip Code: 03110

Attachment "F"

6. PROJECT TYPE

☐ Excavation Only ☒ Residential ☐ Commercial ☐ Golf Course ☐ School ☐ Municipal
☐ Agricultural ☐ Land Conversion ☐ Other:

7. PROJECT LOCATION INFORMATION

Project Name: Barrett Hill Subdivision

Street/Road Address: 75 Barretts Hill Road

Town/City: Hudson | County: Hillsborough

Tax Map: 151 | Block: | Lot Number: 59 | Unit:

Location Coordinates: 42.78803N, 71.39329W ☒ Latitude/Longitude ☐ UTM ☐ State Plane

Post-development, will the proposed project withdraw from or directly discharge to any of the following? If yes, identify the purpose.

1. Stream or Wetland Purpose:	☐ Yes ☒ No	☐ Withdrawal	☐ Discharge
2. Man-made pond created by impounding a stream or wetland Purpose:	☐ Yes ☒ No	☐ Withdrawal	☐ Discharge
3. Unlined pond dug into the water table Purpose:	☐ Yes ☒ No	☐ Withdrawal	☐ Discharge

Post-development, will the proposed project discharge to:

- A surface water impaired for phosphorus and/or nitrogen? ☒ No ☐ **Yes - include information to demonstrate that project will not cause net increase in phosphorus and/or nitrogen**
- A Class A surface water or Outstanding Resource Water? ☒ No ☐ **Yes - include information to demonstrate that project will not cause net increase in phosphorus and/or nitrogen**
- A lake or pond not covered previously? ☒ No ☐ **Yes - include information to demonstrate that project will not cause net increase in phosphorus in the lake or pond**

Is the project a High Load area? ☐ Yes ☒ No
If yes, specify the type of high load land use or activity: _____

Is the project within a Water Supply Intake Protection Area (WSIPA)? ☐ Yes ☒ No
Is the project within a Groundwater Protection Area (GPA)? ☐ Yes ☒ No
Will the well setbacks identified in Env-Wq 1508.02 be met? ☒ Yes ☐ No
Note: Guidance document titled "*Using NHDES's OneStop WebGIS to Locate Protection Areas*" is available online. For more details on the restrictions in these areas, read Chapter 3.1 in Volume 2 of the NH Stormwater Manual.

Is any part of the property within the 100-year floodplain? ☐ Yes ☒ No
If yes: Cut volume: ______ cubic feet within the 100-year floodplain
Fill volume: ______ cubic feet within the 100-year floodplain

☐ Project **IS** within **¼ mile of a designated river** Name of River:
☒ Project is **NOT** within ¼ mile of a designated river

☐ Project **IS** within **a Coastal/Great Bay Region community - include info required by Env-Wq 1503.08(l) if applicable**
☒ Project is **NOT** within a Coastal/Great Bay Region community

8. BRIEF PROJECT DESCRIPTION (PLEASE DO NOT REPLY "SEE ATTACHED")

The project purpose is to develop the site to accommadate 13 single-family residential lots.

9. IF APPLICABLE, DESCRIBE ANY WORK STARTED PRIOR TO RECEIVING PERMIT

N/A

Attachment "F"

10. ADDITIONAL REQUIRED INFORMATION
A. Date a copy of the application was sent to the municipality as required by Env-Wq 1503.05(e)[1]: 12/14/2023. **(Attach proof of delivery)**
B. Date a copy of the application was sent to the local river advisory committee if required by Env-Wq 1503.05(e)[2]: / / . **(Attach proof of delivery)**
C. Type of plan required: ☐ Land Conversion ☒ Detailed Development ☐ Excavation, Grading & Reclamation ☐ Steep Slope
D. Additional plans required: ☒ Stormwater Drainage & Hydrologic Soil Groups ☐ Source Control ☐ Chloride Management
E. Total area of disturbance: 209,800 square feet
F. Additional impervious cover as a result of the project: 40,697 square feet (use the "-" symbol to indicate a net reduction in impervious coverage). Total final impervious cover: 40,697 square feet
G. Total undisturbed cover: 1,330,450 square feet
H. Number of lots proposed: 13
I. Total length of roadway: 1,213 linear feet
J. Name(s) of receiving water(s): _____
K. Identify all other NHDES permits required for the project, and for each indicate whether an application has been filed and is pending, or if the required approval has been issued provide the permit number, registration date, or approval letter number, as applicable.

Type of Approval	**Application Filed?**	**Status**	
		Pending	**If Issued:**
1. Water Supply Approval	☐ Yes ☐ No ☒ N/A	☐	Permit number:
2. Wetlands Permit	☐ Yes ☐ No ☒ N/A	☐	Permit number:
3. Shoreland Permit	☐ Yes ☐ No ☒ N/A	☐	Permit number:
4. UIC Registration	☐ Yes ☐ No ☒ N/A	☐	Registration date:
5. Large/Small Community Well Approval	☐ Yes ☐ No ☒ N/A	☐	Approval letter date:
6. Large Groundwater Withdrawal Permit	☐ Yes ☐ No ☒ N/A	☐	Permit number:
7. Other:	☐ Yes ☐ No	☐	Permit number:

L. List all species identified by the Natural Heritage Bureau as threatened or endangered or of concern: Blandings Turtle
M. Using NHDES's Web GIS OneStop program (www2.des.state.nh.us/gis/onestop/), with the Surface Water Impairment layer turned on, list the impairments identified for each receiving water. If no pollutants are listed, enter "N/A." N/A
N. Did the applicant/applicant's agent have a pre-application meeting with AOT staff? ☐ Yes ☒ No. If yes, name of staff member:
O. Will blasting of bedrock be required? ☐ Yes ☒ No If yes, estimated quantity of blast rock: _____ cubic yards. If yes, standard blasting BMP notes must be placed on the plans, available at: http://des.nh.gov/organization/commissioner/pip/publications/wd/documents/wd-10-12.pdf **NOTE:** If greater than 5,000 cubic yards of blast rock will be generated, a groundwater monitoring program must be developed and submitted to NHDES. Contact AOT staff for additional detail.

[1] Env-Wq 1503.05(c)(6), requires proof that a completed application form, checklist, plans and specifications, and all other supporting materials have been sent or delivered to the governing body of each municipality in which the project is proposed.

[2] Env-Wq 1503.05(c)(6), requires proof that a completed application form, checklist, plans and specifications, and all other supporting materials have been sent or delivered to the Local River Advisory Committee, if the project is within ¼ mile of a designated river.

Attachment "F"

11. CHECK ALL APPLICATION ATTACHMENTS THAT APPLY (SUBMIT WITH APPLICATION IN ORDER LISTED)

LOOSE:

- ☒ Signed application form: des.nh.gov/organization/divisions/water/aot/index.htm (with attached proof(s) of delivery)
- ☒ Check for the application fee: des.nh.gov/organization/divisions/water/aot/fees.htm
- ☒ Color copy of a USGS map with the property boundaries outlined (1" = 2,000' scale)
- ☐ If Applicant is not the property owner, proof that the applicant will have a legal right to undertake the project on the property if a permit is issued to the applicant.

BIND IN A REPORT IN THE FOLLOWING ORDER:

- ☒ Copy of the signed application form & application checklist (des.nh.gov/organization/divisions/water/aot/index.htm)
- ☒ Copy of the check
- ☒ Copy of the USGS map with the property boundaries outlined (1" = 2,000' scale)
- ☒ Narrative of the project with a summary table of the peak discharge rate for the off-site discharge points
- ☒ Web GIS printout with the "Surface Water Impairments" layer turned on - http://www4.des.state.nh.us/onestopdatamapper/onestopmapper.aspx
- ☒ Web GIS printouts with the AOT screening layers turned on - http://www4.des.state.nh.us/onestopdatamapper/onestopmapper.aspx
- ☒ NHB letter using DataCheck Tool – www.nhdfl.org/about-forests-and-lands/bureaus/natural-heritage-bureau/
- ☒ The Web Soil Survey Map with project's watershed outlined – websoilsurvey.nrcs.usda.gov
- ☒ Aerial photograph (1" = 2,000' scale with the site boundaries outlined)
- ☒ Photographs representative of the site
- ☒ Groundwater Recharge Volume calculations (one worksheet for each permit application): des.nh.gov/organization/divisions/water/aot/documents/bmp_worksh.xls
- ☒ BMP worksheets (one worksheet for each treatment system): des.nh.gov/organization/divisions/water/aot/documents/bmp_worksh.xls
- ☒ Drainage analysis, stamped by a professional engineer (see Application Checklist for details)
- ☒ Riprap apron or other energy dissipation or stability calculations
- ☒ Site Specific Soil Survey report, stamped and with a certification note prepared by the soil scientist that the survey was done in accordance with the Site Specific Soil Mapping standards, *Site-Specific Soil Mapping Standards for NH & VT, SSSNNE Special Publication No. 3.*
- ☒ Infiltration Feasibility Report (example online) [Env-Wq 1503.08(f)(3)]
- ☐ Registration and Notification Form for Storm Water Infiltration to Groundwater (UIC Registration-for underground systems only, including drywells and trenches): (http://des.nh.gov/organization/divisions/water/dwgb/dwspp/gw_discharge)
- ☒ Inspection and maintenance manual with, if applicable, long term maintenance agreements [Env-Wq 1503.08(g)]
- ☐ Source control plan

PLANS:

- ☒ One set of design plans on 34 - 36" by 22 - 24" white paper (see Application Checklist for details)
- ☐ Pre & post-development color coded soil plans on 11" x 17" (see Application Checklist for details)
- ☒ Pre & post-development drainage area plans on 34 - 36" by 22 - 24" white paper (see Application Checklist for details)

100-YEAR FLOODPLAIN REPORT:

- ☐ All information required in Env-Wq 1503.09, submitted as a separate report.

ADDITIONAL INFORMATION RE: NUTRIENTS, CLIMATE

- ☐ See Checklist for Details

☒ **REVIEW APPLICATION FOR COMPLETENESS & CONFIRM INFORMATION LISTED ON THE APPLICATION IS INCLUDED WITH SUBMITTAL.**

Attachment "F"

12. REQUIRED SIGNATURES

PC By initialing here, I acknowledge that I am required by Env-Wq 1503.20(e) to submit a copy of all approved documents to the department in PDF format on a CD within one week after permit approval.

By signing below, I certify that:

- The information contained in or otherwise submitted with this application is true, complete, and not misleading to the best of my knowledge and belief;
- I understand that the submission of false, incomplete, or misleading information constitutes grounds for the department to deny the application, revoke any permit that is granted based on the information, and/or refer the matter to the board of professional engineers established by RSA 310-A:3 if I am a professional engineer; and
- I understand that I am subject to the penalties specified in New Hampshire law for falsification in official matters, currently RSA 641.

☒ **APPLICANT** ☐ **APPLICANT'S AGENT**:

Signature: [signature] Date: 12/11/2023

Name (print or type): JOHN GARGASZ Title: MANAGER

☒ PROPERTY OWNER ☐ PROPERTY OWNER'S AGENT:

Signature: [signature] Date: 12/11/2023

Name (print or type): JOHN GARGASZ Title: MANAGER

Attachment "F"

3. AOT APPLICATION CHECKLIST

Attachment "F"

ATTACHMENT A:
ALTERATION OF TERRAIN PERMIT APPLICATION CHECKLIST

Check the box to indicate the item has been provided or provide an explanation why the item does not apply.

DESIGN PLANS

☒ Plans printed on 34 - 36" by 22 - 24" white paper

☒ PE stamp

☐ Wetland delineation

☒ Temporary erosion control measures

☒ Treatment for all stormwater runoff from impervious surfaces such as roadways (including gravel roadways), parking areas, and non-residential roof runoff. Guidance on treatment BMPs can be found in Volume 2, Chapter 4 of the NH Stormwater Management Manual.

☒ Pre-existing 2-foot contours

☒ Proposed 2-foot contours

☐ Drainage easements protecting the drainage/treatment structures

☐ Compliance with the Wetlands Bureau, RSA 482- A http://des.nh.gov/organization/divisions/water/wetlands/index.htm. Note that artificial detention in wetlands is not allowed.

☐ Compliance with the Comprehensive Shoreland Protection Act, RSA 483-B. http://des.nh.gov/organization/divisions/water/wetlands/cspa

☐ Benches. Benching is needed if you have more than 20 feet change in elevation on a 2:1 slope, 30 feet change in elevation on a 3:1 slope, 40 feet change in elevation on a 4:1 slope.

☒ Check to see if any proposed ponds need state Dam permits. http://des.nh.gov/organization/divisions/water/dam/documents/damdef.pdf

DETAILS

☒ Typical roadway x-section

☒ Detention basin with inverts noted on the outlet structure

☒ Stone berm level spreader

☒ Outlet protection – riprap aprons

☒ A general installation detail for an erosion control blanket

☒ Silt fences or mulch berm

☒ Storm drain inlet protection. Note that since hay bales must be embedded 4 inches into the ground, they are not to be used on hard surfaces such as pavement.

☐ Hay bale barriers

☒ Stone check dams

☒ Gravel construction exit

☒ Temporary sediment trap

☒ The treatment BMP's proposed

☐ Any innovative BMP's proposed

CONSTRUCTION SEQUENCE/EROSION CONTROL **Attachment "F"**

☒ Note that the project is to be managed in a manner that meets the requirements and intent of RSA 430:53 and Chapter Agr 3800 relative to invasive species.

☒ Note that perimeter controls shall be installed prior to earth moving operations.

☒ Note that temporary water diversion (swales, basins, etc) must be used as necessary until areas are stabilized.

☒ Note that ponds and swales shall be installed early on in the construction sequence (before rough grading the site).

☒ Note that all ditches and swales shall be stabilized prior to directing runoff to them.

☒ Note that all roadways and parking lots shall be stabilized within 72 hours of achieving finished grade.

☒ Note that all cut and fill slopes shall be seeded/loamed within 72 hours of achieving finished grade

☒ Note that all erosion controls shall be inspected weekly AND after every half-inch of rainfall.

☒ Note the limits on the open area allowed, see Env-Wq 1505.02 for detailed information.

Example note: The smallest practical area shall be disturbed during construction, but in no case shall exceed 5 acres at any one time before disturbed areas are stabilized.

☒ Note the definition of the word "stable"

Example note: An area shall be considered stable if one of the following has occurred:

- Base course gravels have been installed in areas to be paved.
- A minimum of 85 percent vegetated growth has been established.
- A minimum of 3 inches of non-erosive material such stone or riprap has been installed.
- Or, erosion control blankets have been properly installed.

☒ Note the limit of time an area may be exposed
Example note: All areas shall be stabilized within 45 days of initial disturbance.

☒ Provide temporary and permanent seeding specifications. (Reed canary grass is listed in the Green Book; however, this is a problematic species according to the Wetlands Bureau and therefore should not be specified)

☒ Provide winter construction notes that meet or exceed our standards.

Standard Winter Notes:

- All proposed vegetated areas that do not exhibit a minimum of 85 percent vegetative growth by October 15, or which are disturbed after October 15, shall be stabilized by seeding and installing erosion control blankets on slopes greater than 3:1, and seeding and placing 3 to 4 tons of mulch per acre, secured with anchored netting, elsewhere. The installation of erosion control blankets or mulch and netting shall not occur over accumulated snow or on frozen ground and shall be completed in advance of thaw or spring melt events.
- All ditches or swales which do not exhibit a minimum of 85 percent vegetative growth by October 15, or which are disturbed after October 15, shall be stabilized temporarily with stone or erosion control blankets appropriate for the design flow conditions.
- After October 15, incomplete road or parking surfaces, where work has stopped for the winter season, shall be protected with a minimum of 3 inches of crushed gravel per NHDOT item 304.3.

☒ Note at the end of the construction sequence that "Lot disturbance, other than that shown on the approved plans, shall not commence until after the roadway has the base course to design elevation and the associated drainage is complete and stable." – This note is applicable to single/duplex family subdivisions, when lot development is not part of the permit.

DRAINAGE ANALYSES

Please double-side 8 ½" × 11" sheets where possible but, **do not** reduce the text such that more than one page fits on one side. **Attachment "F"**

☒ PE stamp

☒ Rainfall amount obtained from the Northeast Regional Climate Center- http://precip.eas.cornell.edu/. Include extreme precipitation table as obtained from the above referenced website.

☒ Drainage analyses, in the following order:

- Pre-development analysis: Drainage diagram.
- Pre-development analysis: Area Listing and Soil Listing.
- Pre-development analysis: Node listing 1-year (if applicable), 2-year, 10-year and 50-year.
- Pre-development analysis: Full summary of the 10-year storm.
- Post-development analysis: Drainage diagram.
- Post-development analysis: Area Listing and Soil Listing.
- Post-development analysis: Node listing for the 2-year, 10-year and 50-year.
- Post-development analysis: Full summary of the 10-year storm.

☒ Review the Area Listing and Soil Listing reports

- Hydrologic soil groups (HSG) match the HSGs on the soil maps provided.
- There is the same or less HSG A soil area after development (check for each HSG).
- There is the same or less "woods" cover in the post-development.
- Undeveloped land was assumed to be in "good" condition.
- The amount of impervious cover in the analyses is correct.

Note: A good check is to subtract the total impervious area used in the pre analysis from the total impervious area used in the post-analysis. For residential projects without demolition occurring, a good check is to take this change in impervious area, subtract out the roadway and divide the remaining by the number of houses/units proposed. Do these numbers make sense?

☒ Check the storage input used to model the ponds.

☒ Check to see if the artificial berms pass the 50-year storm, i.e., make sure the constructed berms on ponds are not overtopped.

☒ Check the outlet structure proposed and make sure it matches that modeled.

☒ Check to see if the total areas in the pre and post analyses are same.

☒ Confirm the correct NRCS storm type was modeled (Coos, Carroll & Grafton counties are Type II, all others Type III).

PRE- AND POST-DEVELOPMENT DRAINAGE AREA PLANS

☒ Plans printed on 34 - 36" by 22 - 24" on white paper.

☒ Submit these plans separate from the soil plans.

☒ A north arrow.

☒ A scale.

☒ Labeled subcatchments, reaches and ponds.

☒ Tc lines.

☒ A clear delineation of the subcatchment boundaries.

☒ Roadway station numbers.

☒ Culverts and other conveyance structures.

PRE AND POST-DEVELOPMENT COLOR-CODED SOIL PLANS

Attachment "F"

☒ 11" × 17"sheets suitable, as long as it is readable.

☒ Submit these plans separate from the drainage area plans.

☒ A north arrow.

☒ A scale.

☒ Name of the soil scientist who performed the survey and date the soil survey took place.

☒ 2-foot contours (5-foot contours if application is for a gravel pit) as well as other surveyed features.

☒ Delineation of the soil boundaries and wetland boundaries.

☒ Delineation of the subcatchment boundaries.

☒ Soil series symbols (e.g., 26).

☒ A key or legend which identifies each soil series symbol and its associated soil series name (e.g., 26 = Windsor).

☒ The hydrologic soil group color coding (A = Green, B = yellow, C= orange, D=red, Water=blue, & Impervious = gray).

Please note that excavation projects (e.g., gravel pits) have similar requirements to that above, however the following are common exceptions/additions:

☐ Drainage report is not needed if site does not have off-site flow.

☐ 5 foot contours allowed rather than 2 foot.

☐ No PE stamp needed on the plans.

☐ Add a note to the plans that the applicant must submit to the Department of Environmental Services a written update of the project and revised plans documenting the project status every five years from the date of the Alteration of Terrain permit.

☐ Add reclamation notes.

See NRCS publication titled: *Vegetating New Hampshire Sand and Gravel Pits* for a good resource, it is posted online at: http://des.nh.gov/organization/divisions/water/aot/categories/publications.

ADDITIONAL INFORMATION RE: NUTRIENTS, CLIMATE

☐ If project will discharge stormwater to a surface water impaired for phosphorus and/or nitrogen, include information to demonstrate that project will not cause net increase in phosphorus and/or nitrogen.

☐ If project will discharge stormwater to a Class A surface water or Outstanding Resource Water, include information to demonstrate that project will not cause net increase in phosphorus and/or nitrogen.

☐ If project will discharge stormwater to a lake or pond not covered previously, include information to demonstrate that project will not cause net increase in phosphorus in the lake or pond.

☐ If project is within a Coastal/Great Bay Region community, include info required by Env-Wq 1503.08(l) if applicable.

Attachment "F"

4. COPY OF AOT APPLICATION CHECK

Attachment "F"

THE FACE OF THIS DOCUMENT HAS A COLORED BACKGROUND ON WHITE PAPER AND ORIGINAL DOCUMENT SECURITY SCREEN ON BACK WITH PADLOCK SECURITY ICON.

Barrett Hill, LLC
21 Continental Blvd
Merrimack, NH 03054

Bank of America

54-49/114

1004

12/11/2023

PAY TO THE ORDER OF Treasurer, State of NH $ **4,375.00

Four Thousand Three Hundred Seventy-Five and 00/100** DOLLARS

Treasurer, State of NH

Security features included. Details on back.

IMAGE FADES WHEN HEAT IS APPLIED

MEMO

AOT APPLICATION FEE

AUTHORIZED SIGNATURE MP

⑈001004⑈ ⑆011400495⑆ 388004130685⑈

Barrett Hill, LLC 1004

Treasurer, State of NH 12/11/2023

Date	Type	Reference	Original Amt.	Balance Due	Discount	Payment
12/11/2023	Bill		4,375.00	4,375.00		4,375.00
					Check Amount	4,375.00

checking need to rena AOT APPLICATION FEE 4,375.00

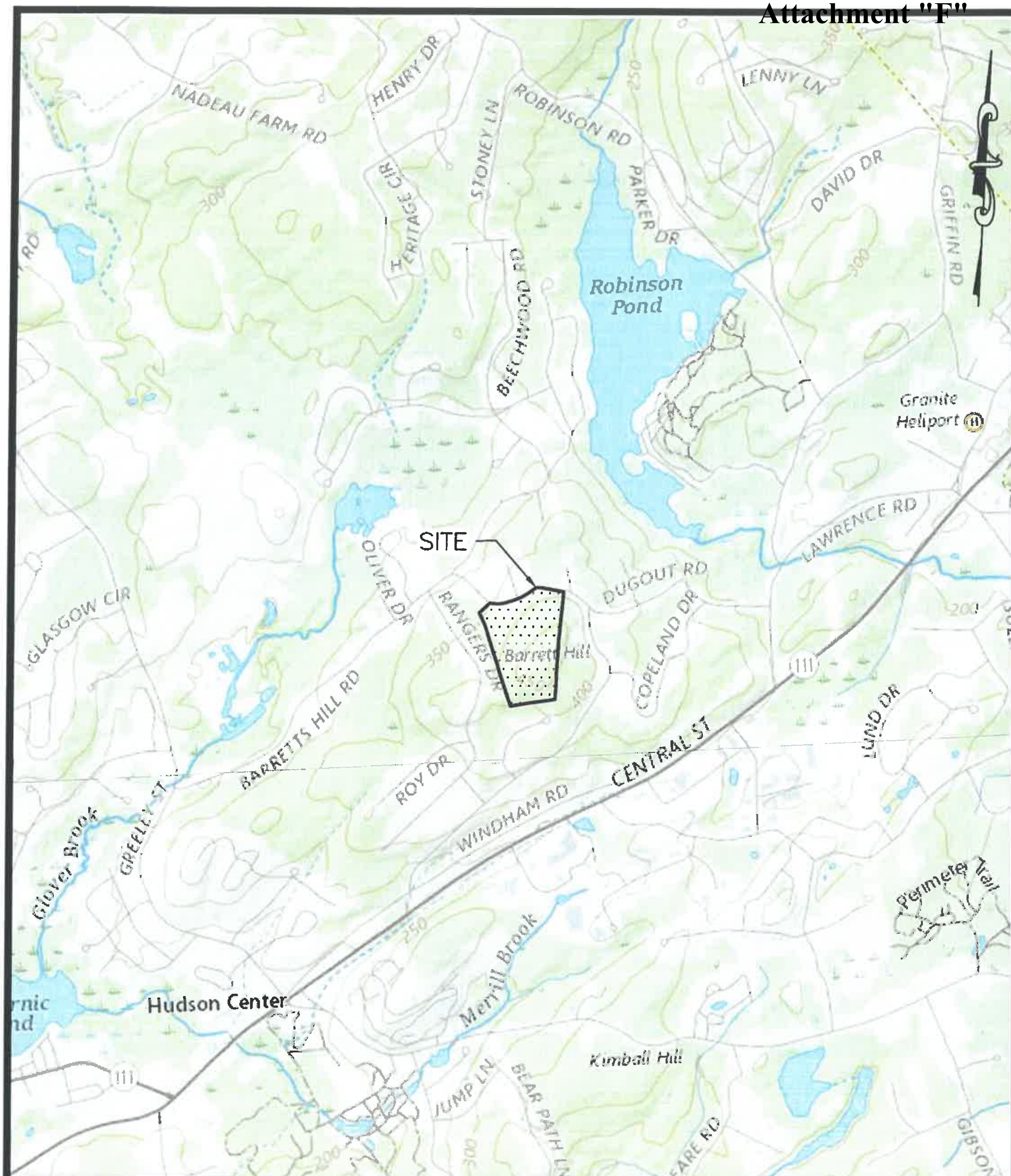
Attachment "F"

5. MUNICIPAL SUBMISSION: TOWN OF HUDSON

Attachment "F"

6. **USGS LOCATION MAP**

Attachment "F"



KNA KEACH-NORDSTROM ASSOCIATES, INC.

Civil Engineering Land Surveying Landscape Architecture
10 Commerce Park North, Suite 3B, Bedford, NH 03110
Phone (603) 627-2881

TITLE: USGS EXHIBIT PREPARED FOR: BARRETT HILL, LLC MAP 151; LOT 59 75 BARRETTS HILL ROAD - HUDSON, NEW HAMPSHIRE	
DATE: 09/25/2023	JOB. NO. 23-0414-1
SCALE: 1" = 2000'	SHEET 1 OF 1

Attachment "F"

7. PROJECT NARRATIVE

I. INTRODUCTION

A. Project Description

The project proposes to develop the existing property to accommodate a twelve (13) lot open space residential subdivision with an accompanying 1,200 linear foot public roadway. Site work includes clearing and grubbing the site, construction of the new roadway, individual lot development, and installation of a closed drainage system, pocket pond, and other associated stormwater management provisions.

B. Existing Site Conditions

The subject property consists of one lot, approximately 35.36 acres in total area, and is located at 75 Barretts Hill Road in Hudson's General 1 (G-1) Zoning District. The lot is currently undeveloped. The lot is comprised mostly of woodlands with a utility line easement on the back half of the lot. The subject lot is bordered by Barretts Hill Road to the north and residential lots to the east, west, and south.

A site-specific soil survey, performed onsite by GZA GeoEnvironmental, Inc. on October 4, 2023, listed the following soils as predominant soil types found onsite. Montauk classified as C soils with slopes ranging from 3-25%, Scituate classified as C soils with slopes ranging from 3-25%. The soil types are classified as HSG 'C' and therefore, C soils were used in drainage computations. According to the National Resources Conservation Service (NRCS) soil mapping, the remaining subcatchment areas consist of, Canton fine loamy sand with slopes ranging from 0-15%, Canton fine loamy sand, very stony with slopes ranging from 8-15%, Scarboro stony mucky loamy sand, Scituate fine sandy loam with slopes ranging from 3-8%, and Scituate stony fine sandy loam with slopes ranging from 3-8%. It is important to note that both Scituate and Montauk soils have infiltration rates below 0.50 in/hr, therefore, according to Env-Wq 1508.07(a)(1), infiltration is not permitted on this site.

II. STORM DRAINAGE ANALYSIS & DESIGN

A. Methodology

In accordance with the provisions of the NHDES, the Town of Hudson, and generally accepted engineering practice, the 2-year, 2-year frozen, 10-year, 25-year, and 50-year frequency storms have each been used in the various aspects of analysis and design of stormwater management considerations for the subject site. The closed drainage system has been designed for the 10-year frequency storm and the proposed pocket pond has been designed to not overtop in the 50-year frequency storm.

KNA utilizes HydroCAD version 10.0 to analyze both pre and post-development watershed characteristics. This computer software system is based largely on hydrology techniques (TR-20) developed by the Soil Conservation Service (now the Natural Resources Conservation Service). In addition, the software derives Time of Concentration values using the methodology contained within USDA-S.C.S. publication Urban Hydrology for Small Watersheds Technical Release No. 55 (TR 55).

All design and analysis calculations performed using the referenced methodologies are attached to this report. The minimum time of concentrations used for the analysis is 6 minutes. These calculations document each catchment area, a breakdown of surface type, time of concentration, rainfall intensity, peak discharge volume, Manning's "n" value, peak velocity, and other descriptive design data for each watershed and pipe segment evaluated. In addition, the "Pre/Post Development Drainage Area Plans" graphically define and illustrate the extent of each watershed or catchment area investigated.

B. Pre-Development Drainage Conditions

In the pre-development scenario, three (3) points of analysis (POA) have been identified as the appropriate points to compare pre vs. post development rates of stormwater discharge. These points of analysis reflect the main discharge points of the site and were analyzed to show the impact from the proposed improvements.

The pre-development drainage model's POA's are further described as follows:

- Link A — Barretts Hill Crossing
- Link B — Lot 57
- Link C — Lot 11

The property mainly slopes from southeast to northwest directing runoff to Barretts Hill Road and neighboring lots on the western side of the subject property. Runoff on the northeastern side of the property flows to Barretts Hill Road and is collected by an existing catch basin in the roadway before discharging to Lot 11. Runoff generated on the northwestern portion of the subject property flows to a different existing catch basin on Barretts Hill Road which discharges to Lot 57. Runoff generated from the western portion of the property ultimately flows to an existing drop inlet located at the bottom of Barretts Hill Road. This crossing is identified as Link A and directs runoff under the road towards an existing stream.

C. Post-Development Drainage Conditions:

The same three POA's that were identified in the pre-development scenario have been analyzed in the post-development scenario.

Overall, the design has maintained the drainage patterns to mimic the pre-development conditions. Stormwater will continue to discharge to the same points of analysis identified in the pre-development scenario. The improvements, however, also provide stormwater treatment for the new impervious areas created for the proposed development. These new impervious areas include the roadway, sidewalks, potential future driveways, and a 2,400 sf approximation for residential homes dedicated to each lot.

The proposed stormwater management system utilizes both open and closed drainage practices for the collection, detention, and treatment of runoff. Runoff generated from the entirety of the proposed roadway and the eastern portion of the property is collected by a series of deep sump catch basins and is piped to a proposed pocket pond situated in the northwest corner of the lot. This system is designed to provide stormwater treatment and detention for the site and will not overtop during a 50-year storm event. The pond features an overflow structure which directs flow to a proposed rip rap lined roadside swale along Barretts Hill Road. Runoff is conveyed down this swale and through two separate driveway culverts before it is collected by the existing drop inlet at the bottom of the hill and ultimately discharged to Link A. As previously stated, infiltration is not permitted on this site and has not been included in the drainage analysis.

The peak stormwater runoff rates and volume discharges for the specific storm frequencies are presented and analyzed in the subsequent summary section of this report (Tables 1 & 2). For a more visual description of the information presented in this section, please refer to the attached "Post-Development Drainage Areas Plan" attached in the appendix of this report.

D. Summary:

The subject site complies with both the Town of Hudson Stormwater Management and Erosion Control Regulations and NHDES Regulations Env-wq 1500 in regard to stormwater treatment and groundwater recharge volume. Proposed stormwater best management practices (BMP) are designed in accordance with the New Hampshire Stormwater Manual Volume 2: Post-Construction Best Management Practices Selection and Design and BMP worksheets provided by the New Hampshire Department of Environmental Services. In addition, stormwater discharges, in terms of peak rate of runoff and total volume, are consistent with the Town of Goffstown Stormwater Regulations and NHDES Regulations Env-Wq 1500. The results are reported below in Table 1 and 2.

Table 1: Peak Flow Discharge Rate

Site Pre-Development vs. Post-Development (cfs)										
Description	**2-Year**		**2-Year Frozen**		**10-Year**		**25-Year**		**50-Year**	
24-hr Rainfall	2.95 in/hr		2.95 in/hr		4.47 in/hr		5.66 in/hr		6.77 in/hr	
	Pre	**Post**	**Pre**	**Post**	**Pre**	**Post**	**Pre**	**Post**	**Pre**	**Post**
A	7.79	**5.83**	51.93	**42.48**	25.69	**19.97**	43.08	**33.99**	60.85	**48.31**
B	2.63	**1.52**	10.22	**4.14**	6.88	**3.45**	10.73	**5.12**	14.53	**6.74**
C	2.29	**1.57**	8.99	**4.99**	6.03	**3.80**	9.42	**5.76**	12.77	**7.67**

Table 1: Volume Comparison (2-Year Volume)

Site Pre-Development vs. Post-Development (Storm Volume in Acre-Feet)											
Description	**2-Year**		**2-Year Frozen**		**10-Year**		**25-Year**		**50-Year**		**Comments**
24-hr Rainfall	2.95 in/hr		2.95 in/hr		4.47 in/hr		5.66 in/hr		6.77 in/hr		
	Pre	**Post**	**Pre**	**Post**	**Pre**	**Post**	**Pre**	**Post**	**Pre**	**Post**	
A	1.43	**1.39**	7.99	**7.78**	3.86	**3.82**	6.19	**6.15**	8.59	**8.59**	Complies with NHDES 1507.05, (b), (1), a
B	0.34	**0.17**	1.29	**0.47**	0.81	**0.36**	1.23	**0.53**	1.66	**0.70**	Complies with NHDES 1507.05, (b), (1), a & b
C	0.28	**0.18**	1.06	**0.59**	0.66	**0.41**	1.01	**0.61**	1.36	**0.82**	Complies with NHDES 1507.05, (b), (1), a & b

III. EROSION & SEDIMENTATION CONTROL PROVISIONS

A. Temporary Erosion Control Measures

As an integral part of the engineering design of this site, an erosion and sedimentation control plan has been developed with the intent of limiting the potential for soil loss and associated receiving water quality degradation, both during and after the construction period. As the project plans indicate, traditional temporary erosion and sedimentation control devices and practices, such as siltation fencing, erosion control blankets, and seeding have been specified for use during the construction period. In preparation of these provisions, reference was made to the New Hampshire Stormwater Manual; Volume 3: Erosion and Sediment Temporary Controls During Construction. Construction details for each temporary erosion control measure and practice specified have been added to the project plans. These plans also contain a number of erosion control notes, which are offered to the selected contractor in order to supplement the specified measures and practices to the extent practical.

B. Construction Sequence

A site-specific construction sequence sensitive to limiting soil loss due to erosion and associated water quality degradation was prepared specifically for this project and is shown on the project plans. As pointed out in the erosion control notes, it is important for the contractor to recognize that proper judgment in the implementation of work will be essential if erosion is to be limited and protection of completed work is to be realized. Moreover, any specific changes in sequence and/or field conditions affecting the ability of specific erosion control measures to adequately serve their intended purpose should be reported to this office by the contractor. Further, the contractor is encouraged to supplement specified erosion control measures during the construction period where and when in his/ her best judgment additional protection is warranted.

C. Permanent Erosion Control Measures

In the design of this site, consideration was given to limiting the potential for long-term erosion of completed improvements. As a result, several permanent erosion control measures were incorporated into the site design. These provisions include:

1) Specification of a turf establishment schedule and seed mixture, utilizing materials and workmanship recognized as appropriate for the site conditions at hand; and

2) Construction of rip-rap at the outlet of the stormwater management areas; and

3) Design of a pocket pond to reduce runoff and volume.

8. SURFACE WATER IMPAIRMENTS

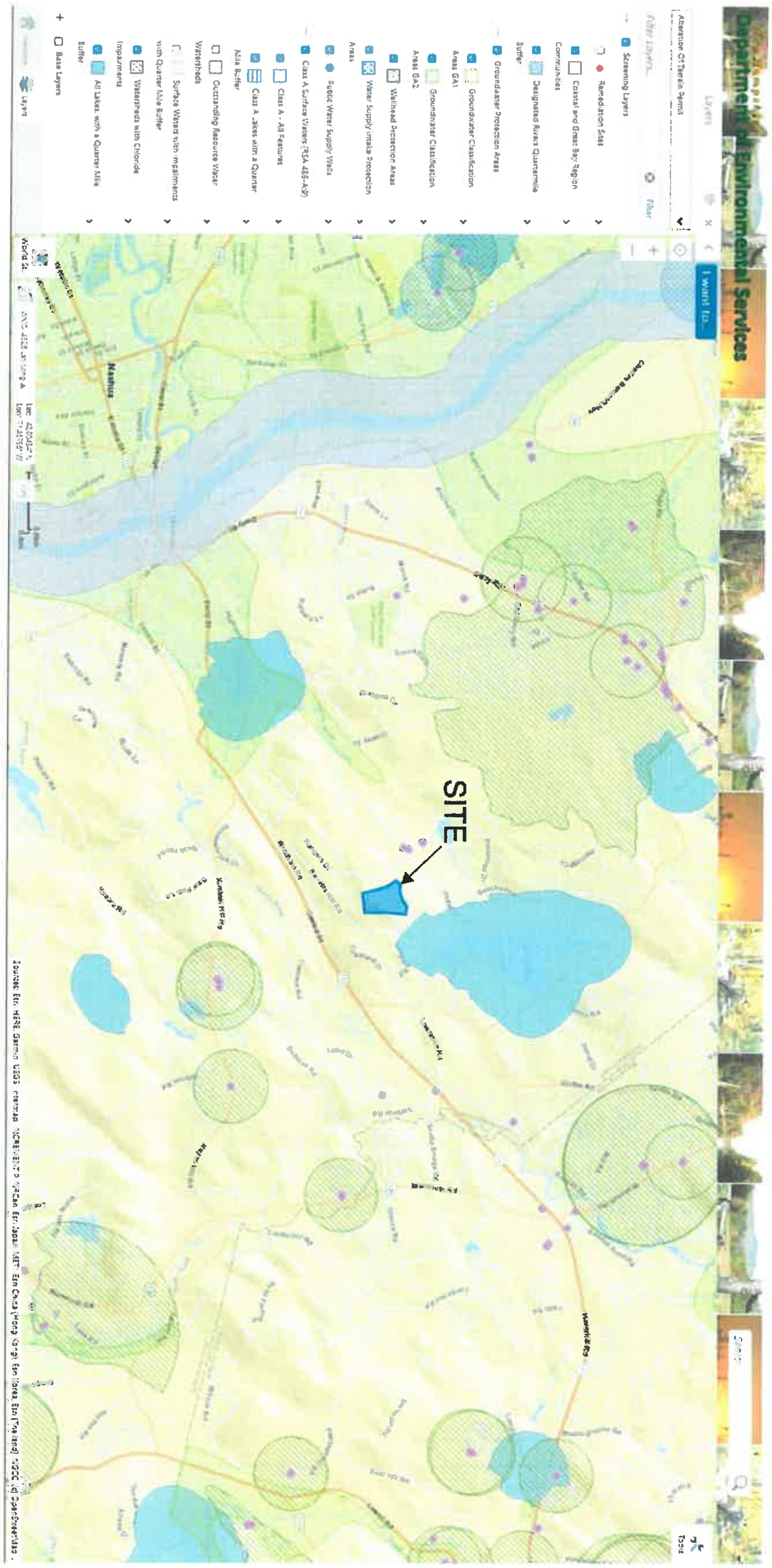
Attachment "F"

Surface Water Impairments:

9. SCREENING LAYERS

Attachment "F"

Screening Layers:



10. NEW HAMPSHIRE NATURAL HERITAGE INVENTORY LETTER

NHB DataCheck Results Letter
NH Natural Heritage Bureau
Please note: maps and NHB record pages are **confidential** and shall be redacted from public documents.

To: Mitchell Heidler, Keach-Nordstrom Associates Inc.
10 Commerce Park North Suite 3
Bedford, NH 03110
mheidler@keachnordstrom.com

From: NHB Review
NH Natural Heritage Bureau
Main Contact: Ashley Litwinenko - nhbreview@dncr.nh.gov

cc: NHFG Review

Date: 11/16/2023 (valid until 11/16/2024)
Re: DataCheck Review by NH Natural Heritage Bureau and NH Fish & Game
Permits: MUNICIPAL POR - Hudson, NHDES - Alteration of Terrain Permit, USEPA - Stormwater Pollution Prevention

NHB ID: NHB23-3253

Town: Hudson
Location: 75 Barretts Hill Road

Project Description: The purpose of this project is to develop a 12 lot subdivision, a singular access roadway with a cul-de-sac with closed drainage and a Stormwater Best Management Practice. The extent of the subdivision areas reach prior to the power line easement which runs across the back half of the lot.

Next Steps for Applicant:

NHB's database has been searched for records of rare species and exemplary natural communities. Please carefully read the comments and consultation requirements below.

NHB Comments: No comments at this time.

NHFG Comments: Please refer to NHFG consultation requirements below.

NHB Consultation

If this NHB DataCheck letter includes records of rare plants and/or natural communities/systems, please contact NHB and provide any requested supplementary materials by emailing nhbreview@dncr.nh.gov.

If this NHB DataCheck letter DOES NOT include any records of rare plants and/or natural communities/systems, no further consultation with NHB is required.

NH Fish and Game Department Consultation

If this NHB DataCheck letter DOES NOT include ANY wildlife species records, then, based on the information submitted, no further consultation with the NH Fish and Game Department pursuant to Fis 1004 is required.

If this NHB DataCheck letter includes a record for a threatened (T) or endangered (E) wildlife species, consultation with the New Hampshire Fish and Game Department under Fis 1004 may be required. To review the Fis 1000 rules (effective February 3, 2022), please go to https://www.wildlife.nh.gov/wildlife-and-habitat/nongame-and-endangered-species/environmental-review. All requests for consultation and submittals should be sent via email to NHFGreview@wildlife.nh.gov or can be sent by mail, and **must include the NHB DataCheck results letter number and "Fis 1004 consultation request" in the subject line**.

If the NHB DataCheck response letter does not include a threatened or endangered wildlife species but includes other wildlife species (e.g., Species of Special Concern), consultation under Fis 1004 is not required; however, some species are protected under other state laws or rules, so coordination with NH Fish & Game is highly recommended or may be required for certain permits. While some permitting processes are exempt from required consultation under Fis 1004 (e.g., *statutory permit by notification, permit by rule, permit by notification, routine roadway registration, docking structure registration, or conditional authorization by rule*), coordination with NH Fish & Game may still be required under the rules governing those specific permitting processes, and it is recommended you contact the applicable permitting agency. For projects not requiring consultation under Fis 1004, but where additional coordination with NH Fish and Game is requested, please email NHFGreview@wildlife.nh.gov, and include the NHB DataCheck results letter number and "review request" in the email subject line.
Contact NH Fish & Game at (603) 271-0467 with questions.

NHB DataCheck Results Letter

NH Natural Heritage Bureau

Please note: maps and NHB record pages are **confidential** and shall be redacted from public documents.

NHB Database Records:

The following record(s) have been documented in the vicinity of the proposed project.

Please see the map and detailed information about the record(s) on the following pages.

Vertebrate species	State[1]	Federal	Notes
Blanding's Turtle (*Emydoidea blandingii*)	E	--	Contact the NH Fish & Game Dept (see below).

[1]Codes: "E" = Endangered, "T" = Threatened, "SC" = Special Concern, "--" = an exemplary natural community, or a rare species tracked by NH Natural Heritage that has not yet been added to the official state list.

An asterisk (*) indicates that the most recent report for that occurrence was 20 or more years ago.

For all animal reviews, refer to 'IMPORTANT: NHFG Consultation' section above.

Disclaimer: NHB's database can only tell you of known occurrences that have been reported to NHFG/NHB. Known occurrences are based on information gathered by qualified biologists or members of the public, reported to our offices, and verified by NHB/NHFG.

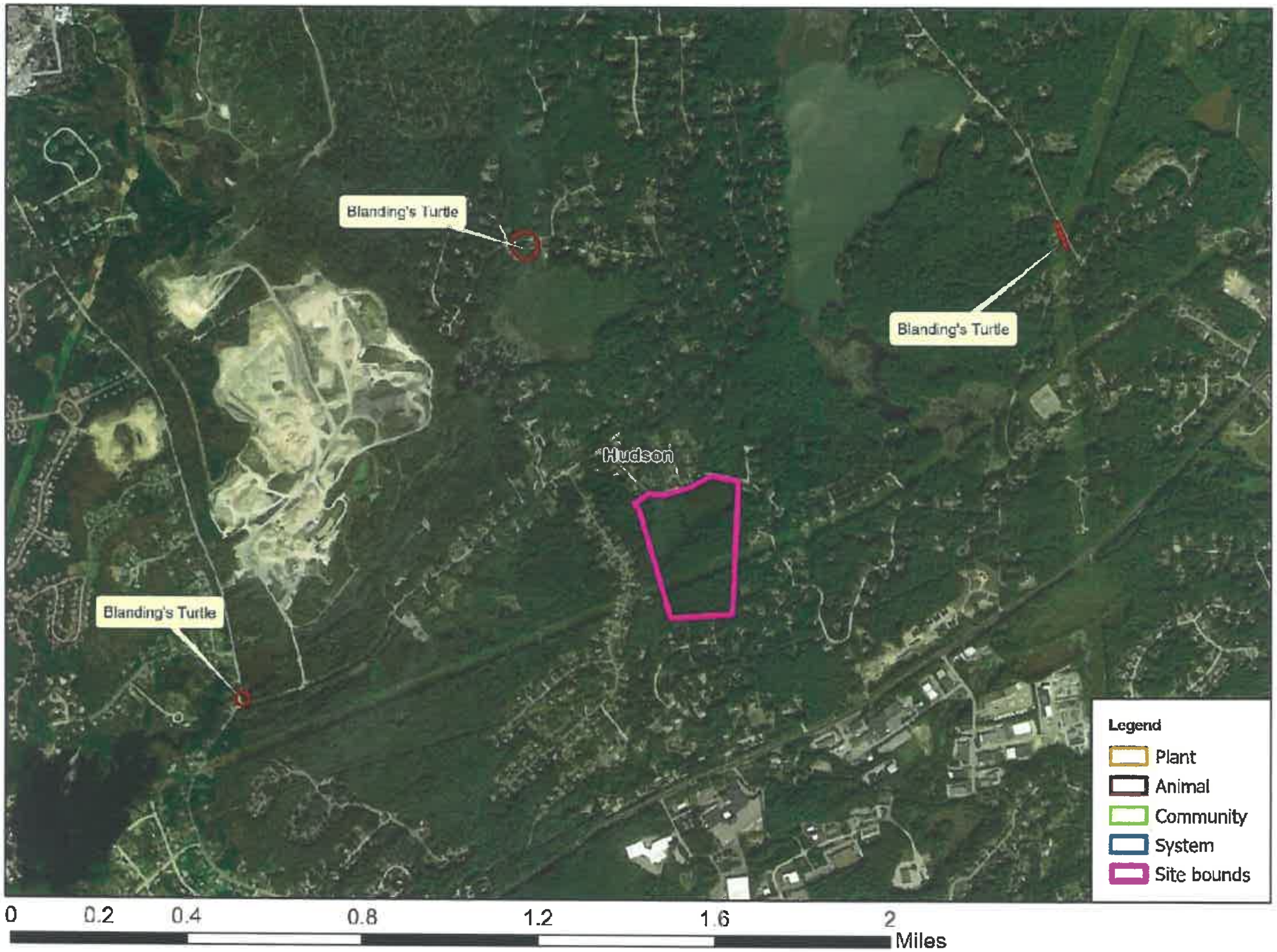
However, many areas have never been surveyed, or have only been surveyed for certain species.

NHB recommends surveys to determine what species/natural communities are present onsite.

Attachment "F"

NHB DataCheck Results Letter
NH Natural Heritage Bureau
Please note: maps and NHB record pages are **confidential** and shall be redacted from public documents.

NHB23-3253



NH Dept. of Natural & Cultural Resources
Natural Heritage Bureau - Division of Forests and Lands
nhbreview@dncr.nh.gov (603) 271- 2834

Attachment "F"

NHB23-3253 EOCODE: ARAAD04010*745*NH

New Hampshire Natural Heritage Bureau - Animal Record

Blanding's Turtle (*Emydoidea blandingii*)

Legal Status		Conservation Status	
Federal:	Not listed	Global:	Apparently secure but with cause for concern
State:	Listed Endangered	State:	Critically imperiled due to rarity or vulnerability

Description at this Location

Conservation Rank: Not ranked
Comments on Rank: --

Detailed Description: 2018: Area 13123M: 1 adult female observed, laying eggs. Eggs hatched on 9/4 or 9/5. 2011: Area 13123M: 1 adult female observed, laying 8-9 eggs.
General Area: 2018: Area 13123M: Property abuts a large marshy area and small stream. Quarry beyond the marsh. 2011: Area 13123M: Nesting in residential yard.
General Comments: --
Management Comments: --

Location

Survey Site Name: Robinson Pond
Managed By:

County: Hillsborough
Town(s): Hudson
Size: 1.9 acres Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: 2011: Area 13123M: 28 Pinewood Road, Hudson.

Dates documented

First reported: 2011-06-20 Last reported: 2018-06-13

The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

NHB23-3253 EOCODE: ARAAD04010*877*NH

New Hampshire Natural Heritage Bureau - Animal Record

Blanding's Turtle (*Emydoidea blandingii*)

Legal Status		**Conservation Status**	
Federal:	Not listed	Global:	Apparently secure but with cause for concern
State:	Listed Endangered	State:	Critically imperiled due to rarity or vulnerability

Description at this Location

Conservation Rank: Not ranked
Comments on Rank: --

Detailed Description: 2014: Area 13571: 1 adult male observed.
General Area: 2014: Area 13571: Marshy area leading to small stream. Roads surrounding the marshy area.
General Comments: --
Management Comments: --

Location

Survey Site Name: Robinson Pond
Managed By:

County: Hillsborough
Town(s): Hudson
Size: .4 acres Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: 2014: Area 13571: Greeley Street, Hudson, at crossing of Glover Brook.

Dates documented

First reported: 2014-05-02 Last reported: 2014-05-02

The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

NHB23-3253 EOCODE: ARAAD04010*082*NH

New Hampshire Natural Heritage Bureau - Animal Record

Blanding's Turtle (*Emydoidea blandingii*)

Legal Status		**Conservation Status**	
Federal:	Not listed	Global:	Apparently secure but with cause for concern
State:	Listed Endangered	State:	Critically imperiled due to rarity or vulnerability

Description at this Location

Conservation Rank: Fair quality, condition and/or landscape context ('C' on a scale of A-D).
Comments on Rank: --

Detailed Description: 1999: Area 1636: 1 turtle. 8.5 in. hinge across plastron.
General Area: 1999: Area 1636: Swampy wetland.
General Comments: 1999: Area 1636: Hissed whenever I picked it up. Confirmed identification using Conant's Field Guide Rep & Amphibs. Light spots on carapace not easily seen-very dark bright yellow on chin & throat.
Management Comments: --

Location

Survey Site Name: Robinson Pond
Managed By:

County: Hillsborough
Town(s): Hudson
Size: .0 acres Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: 1999: Area 1636: Crossing Robinson Road, just north of intersection with Griffin Rd, under power lines.

Dates documented

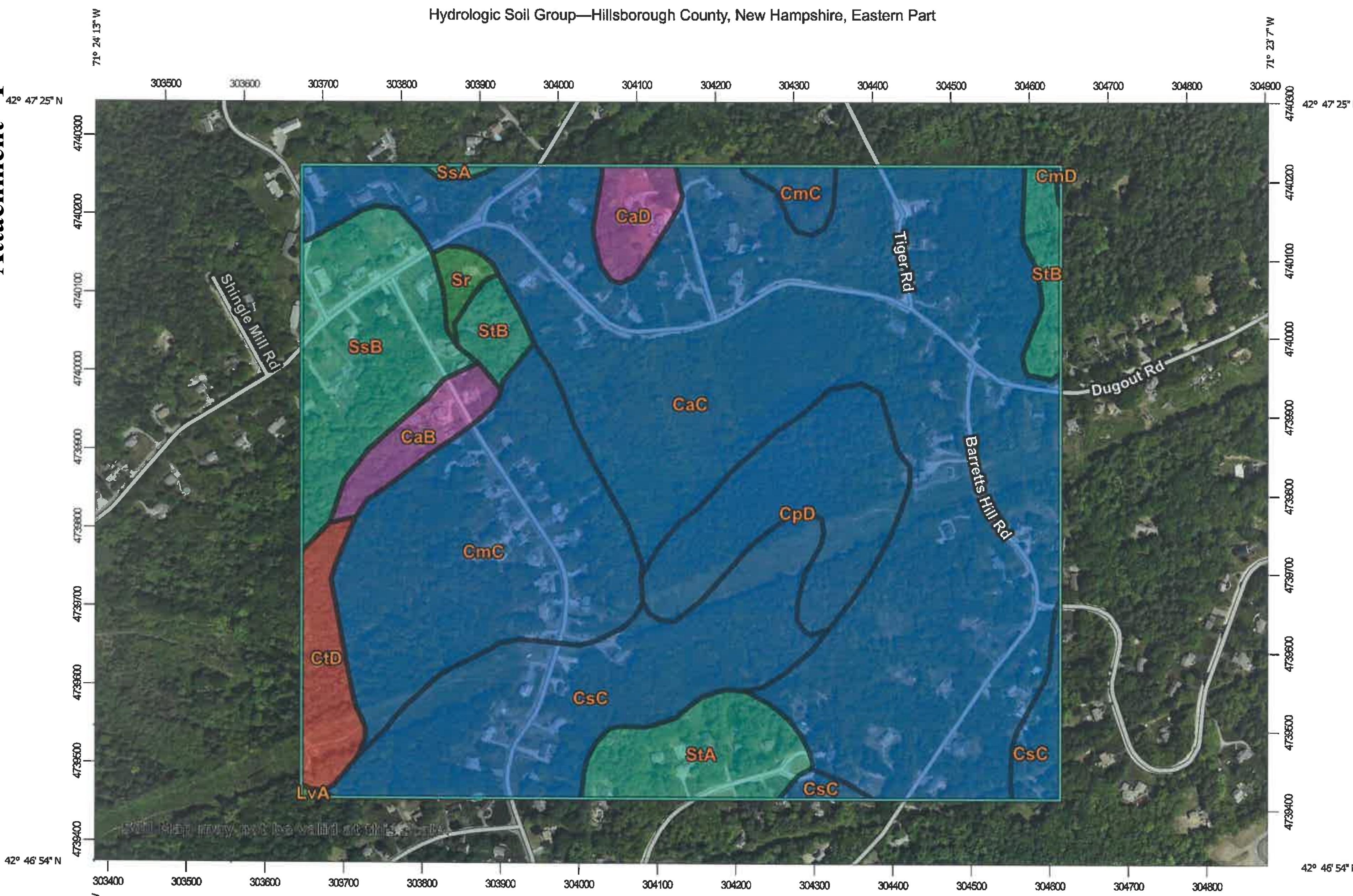
First reported: 1999-09-29 Last reported: 1999-09-29

The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

Attachment "F"

11. WEB SOIL SURVEY

Attachment "F"



Map Scale: 1:6,830 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0, 100, 200, 400, 600

Feet: 0, 300, 600, 1200, 1800

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

Attachment "F"

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

- Streams and Canals

Transportation

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

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

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

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

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
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: Hillsborough County, New Hampshire, Eastern Part
Survey Area Data: Version 26, Aug 22, 2023

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

Date(s) aerial images were photographed: May 22, 2022—Jun 5, 2022

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
CaB	Canton fine sandy loam, 0 to 8 percent slopes	A	3.4	1.8%
CaC	Canton fine sandy loam, 8 to 15 percent slopes	B	88.5	45.7%
CaD	Canton fine sandy loam, 15 to 25 percent slopes	A	3.1	1.6%
CmC	Canton fine sandy loam, 8 to 15 percent slopes, very stony	B	28.0	14.5%
CmD	Canton fine sandy loam, 15 to 25 percent slopes, very stony	B	0.1	0.0%
CpD	Chatfield-Hollis-Canton complex, 15 to 25 percent slopes, very rocky	B	13.2	6.8%
CsC	Chatfield-Hollis complex, 8 to 15 percent slopes, rocky	B	25.3	13.1%
CtD	Chatfield-Hollis-Rock outcrop complex, 15 to 35 percent slopes	D	4.7	2.4%
LvA	Leicester-Walpole complex stony, 0 to 3 percent slopes	A/D	0.1	0.0%
Sr	Scarboro stony mucky loamy sand	A/D	1.2	0.6%
SsA	Scituate fine sandy loam, 0 to 3 percent slopes	C	0.3	0.2%
SsB	Scituate fine sandy loam, 3 to 8 percent slopes	C	13.6	7.0%
StA	Scituate stony fine sandy loam, 0 to 3 percent slopes	C	7.4	3.8%
StB	Scituate stony fine sandy loam, 3 to 8 percent slopes	C	4.7	2.4%
Totals for Area of Interest			**193.5**	**100.0%**

Description

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

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

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

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

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

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

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

Rating Options

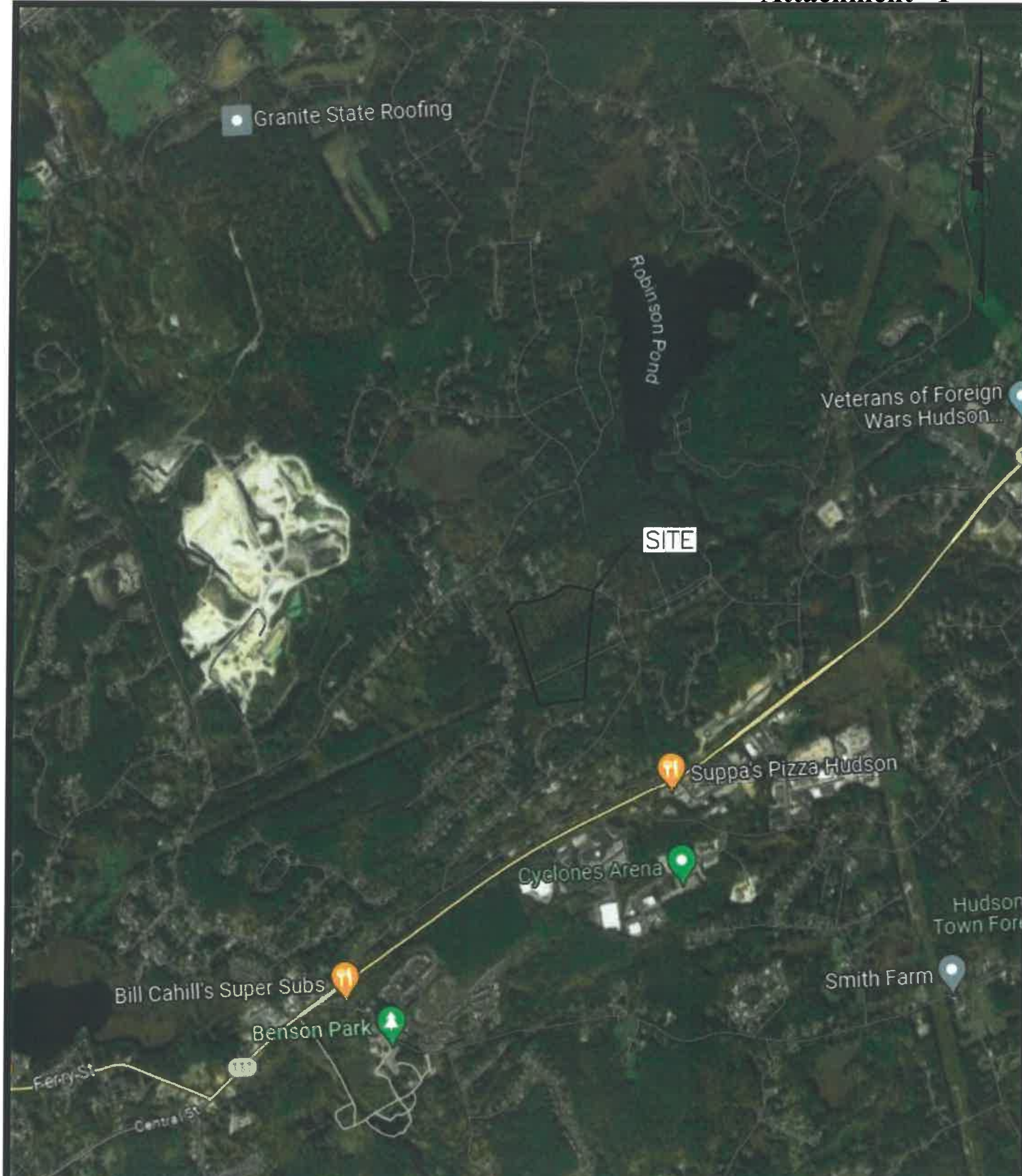
Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

12. AERIAL

Attachment "F"



KNA KEACH-NORDSTROM ASSOCIATES, INC. Civil Engineering Land Surveying Landscape Architecture 10 Commerce Park North, Suite 3B, Bedford, NH 03110 Phone (603) 627-2881	TITLE: AERIAL EXHIBIT PREPARED FOR: BARRETT HILL, LLC MAP 151; LOT 59 75 BARRETTS HILL ROAD - HUDSON, NEW HAMPSHIRE	
	DATE: 09/25/2023	JOB. NO. 23-0414-1
	SCALE: 1" = 2,000'	SHEET 1 OF 1

Attachment "F"

13. SITE PHOTOGRAPHS

Photo No. 1: Looking south onto the subject property from Barretts Hill Road.

Photo No. 2: Looking northwest down Barretts Hill Road from existing gravel access.

Photo No. 3: Looking southeast down Barretts Hill from existing gravel access.

Photo No. 4: Looking at existing foliage located on the subject property.

Photo No. 5: Looking at existing pathway and foliage located on the subject property.

Photo No. 6: Looking southeast at an existing drop inlet located on the side of the road near the Barretts Hill Road crossing. This structure is located next to lots 55 and 61.

14. EXTREME PRECIPITATION TABLE

Attachment "F"

Extreme Precipitation Tables

Northeast Regional Climate Center

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

Metadata for Point	
Smoothing	Yes
State	
Location	
Latitude	42.786 degrees North
Longitude	71.393 degrees West
Elevation	130 feet
Date/Time	Mon Sep 25 2023 10:32:33 GMT-0400 (Eastern Daylight Time)

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.27	0.42	0.52	0.68	0.85	1.07	**1yr**	0.73	1.01	1.23	1.55	1.96	2.47	2.70	**1yr**	2.19	2.60	3.03	3.71	4.32	**1yr**
2yr	0.33	0.51	0.63	0.84	1.05	1.32	**2yr**	0.91	1.21	1.53	1.90	2.37	2.95	3.28	**2yr**	2.61	3.15	3.66	4.37	4.97	**2yr**
5yr	0.39	0.61	0.76	1.02	1.31	1.66	**5yr**	1.13	1.51	1.93	2.41	3.00	3.74	4.17	**5yr**	3.31	4.01	4.64	5.50	6.22	**5yr**
10yr	0.44	0.69	0.88	1.19	1.55	1.98	**10yr**	1.34	1.79	2.31	2.90	3.60	4.47	5.01	**10yr**	3.95	4.82	5.56	6.53	7.37	**10yr**
25yr	0.52	0.83	1.06	1.46	1.93	2.50	**25yr**	1.67	2.24	2.92	3.68	4.58	5.66	6.39	**25yr**	5.01	6.15	7.05	8.21	9.23	**25yr**
50yr	0.59	0.94	1.21	1.70	2.29	3.00	**50yr**	1.98	2.66	3.51	4.42	5.50	6.77	7.69	**50yr**	5.99	7.39	8.46	9.77	10.94	**50yr**
100yr	0.68	1.09	1.41	2.00	2.72	3.57	**100yr**	2.35	3.15	4.20	5.30	6.59	8.11	9.25	**100yr**	7.17	8.89	10.14	11.63	12.98	**100yr**
200yr	0.77	1.26	1.63	2.34	3.23	4.27	**200yr**	2.79	3.74	5.03	6.36	7.90	9.71	11.13	**200yr**	8.59	10.70	12.16	13.84	15.41	**200yr**
500yr	0.92	1.52	1.99	2.89	4.05	5.40	**500yr**	3.50	4.69	6.38	8.08	10.05	12.33	14.23	**500yr**	10.91	13.68	15.48	17.44	19.33	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.23	0.35	0.43	0.58	0.71	0.81	**1yr**	0.61	0.79	1.07	1.31	1.67	2.21	2.54	**1yr**	1.96	2.44	2.69	3.02	3.79	**1yr**
2yr	0.31	0.49	0.60	0.81	1.00	1.19	**2yr**	0.86	1.17	1.37	1.79	2.30	2.85	3.17	**2yr**	2.52	3.05	3.54	4.24	4.82	**2yr**
5yr	0.36	0.55	0.69	0.94	1.20	1.42	**5yr**	1.03	1.39	1.62	2.10	2.69	3.50	3.80	**5yr**	3.10	3.65	4.22	5.06	5.73	**5yr**
10yr	0.39	0.60	0.75	1.05	1.35	1.61	**10yr**	1.17	1.57	1.83	2.38	3.03	4.04	4.34	**10yr**	3.58	4.18	4.83	5.78	6.50	**10yr**
25yr	0.45	0.68	0.85	1.21	1.59	1.88	**25yr**	1.37	1.84	2.16	2.80	3.52	4.89	5.21	**25yr**	4.33	5.01	5.77	6.90	7.62	**25yr**
50yr	0.49	0.74	0.92	1.33	1.78	2.14	**50yr**	1.54	2.10	2.45	3.18	3.95	5.66	5.99	**50yr**	5.01	5.76	6.63	7.91	8.58	**50yr**
100yr	0.53	0.81	1.01	1.46	2.01	2.42	**100yr**	1.73	2.37	2.78	3.58	4.45	5.96	6.91	**100yr**	5.27	6.64	7.65	9.08	9.64	**100yr**
200yr	0.59	0.89	1.12	1.63	2.27	2.75	**200yr**	1.96	2.69	3.13	4.08	5.04	6.78	7.98	**200yr**	6.00	7.68	8.83	10.45	10.85	**200yr**
500yr	0.67	1.00	1.29	1.87	2.66	3.27	**500yr**	2.29	3.20	3.70	4.85	5.95	8.05	9.74	**500yr**	7.12	9.37	10.69	12.60	12.67	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.31	0.47	0.58	0.78	0.96	1.11	**1yr**	0.82	1.09	1.26	1.64	2.08	2.69	2.86	**1yr**	2.38	2.75	3.42	4.17	4.81	**1yr**
2yr	0.35	0.54	0.66	0.90	1.11	1.31	**2yr**	0.96	1.28	1.48	1.92	2.46	3.09	3.45	**2yr**	2.74	3.32	3.81	4.54	5.22	**2yr**
5yr	0.44	0.67	0.83	1.14	1.45	1.66	**5yr**	1.25	1.62	1.89	2.42	3.04	4.03	4.62	**5yr**	3.56	4.44	5.06	5.98	6.73	**5yr**
10yr	0.53	0.81	1.00	1.40	1.81	2.02	**10yr**	1.56	1.98	2.28	2.90	3.61	4.99	5.78	**10yr**	4.41	5.56	6.30	7.38	8.26	**10yr**
25yr	0.68	1.04	1.29	1.84	2.42	2.62	**25yr**	2.09	2.56	2.94	3.67	4.50	6.62	7.79	**25yr**	5.86	7.49	8.39	9.72	10.87	**25yr**
50yr	0.83	1.26	1.57	2.25	3.03	3.19	**50yr**	2.62	3.12	3.56	4.40	5.33	8.22	9.77	**50yr**	7.27	9.40	10.42	11.96	13.38	**50yr**
100yr	1.01	1.53	1.92	2.77	3.79	3.89	**100yr**	3.27	3.80	4.33	5.29	6.30	11.05	12.24	**100yr**	9.78	11.77	12.93	14.75	16.49	**100yr**
200yr	1.23	1.86	2.35	3.41	4.75	4.73	**200yr**	4.10	4.63	5.24	6.34	7.47	13.88	15.31	**200yr**	12.28	14.72	16.02	18.17	20.33	**200yr**
500yr	1.62	2.41	3.10	4.50	6.40	6.13	**500yr**	5.52	6.00	6.78	8.04	9.33	18.79	20.58	**500yr**	16.63	19.79	21.30	23.94	26.84	**500yr**

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Attachment "F"

15. BMP WORKSHEETS

Attachment "F"

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

STORMWATER POND DESIGN CRITERIA

Env-Wq 1508.03

Type/Node Name: **Pocket Pond**

Enter the type of stormwater pond (e.g., Wet Pond) and the node name in the drainage analysis, if applicable.

11.27	ac	A = Area draining to the practice	
1.35	ac	A_I = Impervious area draining to the practice	
0.12	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.16	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
1.78	ac-in	WQV= 1" x Rv x A	
6,464	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
646	cf	10% x WQV (check calc for sediment forebay and micropool volume)	
3,232	cf	50% x WQV (check calc for extended detention volume)	
1,678	cf	V_{SED} = Sediment forebay volume	**≥ 10%WQV**
7,477	cf	V_{PP} = Permanent pool volume (volume below the lowest invert of the outlet structure) Attach stage-storage table.	
no	cf	Extended Detention?[1]	**≤ 50% WQV**
-		V_{ED} = Volume of extended detention (if "yes" is given in box above)	
		E_{ED} = Elevation of WQV if "yes" is given in box above[2]	
-	cfs	$2Q_{avg}$ = 2* V_{ED} / 24 hrs * (1hr / 3600 sec) (used to check against Q_{EDmax} below)	
	cfs	Q_{EDmax} = Discharge at the E_{ED} (attach stage-discharge table)	**< $2Q_{avg}$**
-	hours	T_{ED} = Drawdown time of extended detention = $2V_{ED}/Q_{EDmax}$	**≥ 24-hrs**
3.00	:1	Pond side slopes	**≥3:1**
370.17	ft	Elevation of seasonal high water table	
367.00	ft	Elevation of lowest pond outlet	
364.00	ft	Max floor = Maximum elevation of pond bottom (ft)	
359.00	ft	Minimum floor (to maintain depth at less than 8')	**≤ 8 ft**
364.00	ft	Elevation of pond floor[3]	**≤ Max floor and > Min floor**
205.00	ft	Length of the flow path between the inlet and outlet at mid-depth	
66.00	ft	Average width ([average of the top width + average bottom width]/2)	
3.11	:1	Length to average width ratio	**≥ 3:1**
Yes	Yes/No	Is the perimeter curvilinear.	**← Yes**
Yes	Yes/No	Are the inlet and outlet located as far apart as possible.	**← Yes**
No	Yes/No	Is there a manually-controlled drain to dewater the pond over a 24hr period?	
If no state why:		Pond will be manually drained if maintenance is required	
Trash Rack		What mechanism is proposed to prevent the outlet structure from clogging (applicable for orifices/weirs with a dimension of <6")?	
373.79	ft	Peak elevation of the 50-year storm event	
374.00	ft	Berm elevation of the pond	
YES		50 peak elevation ≤ the berm elevation?	**←yes**

1. If the entire WQV is stored in the perm. pool, there is no extended det., and the following five lines do not apply.

2. This is the elevation of WQV if the hydrologic analysis is set up to include the permanent pool storage in the node description.

3. If the pond floor elevation is above the max floor elev., a hydrologic budget must be submitted to demonstrate that a minimum depth of 3 feet can be maintained. (First check whether a revised "lowest pond outlet" elev. will resolve the issue.)

Designer's Notes:

Pond will be lined with 30 mil PVC impervious liner

Attachment "F"

Stage-Area-Storage for Pond PP: POCKET POND

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
364.00	0	365.04	621	366.08	2,201
364.02	3	365.06	642	366.10	2,252
364.04	6	365.08	663	366.12	2,305
364.06	10	365.10	685	366.14	2,362
364.08	14	365.12	707	366.16	2,421
364.10	19	365.14	730	366.18	2,482
364.12	24	365.16	753	366.20	2,547
364.14	29	365.18	776	366.22	2,615
364.16	34	365.20	800	366.24	2,685
364.18	40	365.22	824	366.26	2,759
364.20	46	365.24	848	366.28	2,835
364.22	53	365.26	873	366.30	2,914
364.24	60	365.28	897	366.32	2,996
364.26	67	365.30	923	366.34	3,080
364.28	75	365.32	948	366.36	3,168
364.30	83	365.34	974	366.38	3,258
364.32	91	365.36	1,001	366.40	3,352
364.34	100	365.38	1,028	366.42	3,448
364.36	109	365.40	1,055	366.44	3,547
364.38	118	365.42	1,082	366.46	3,649
364.40	128	365.44	1,110	366.48	3,753
364.42	138	365.46	1,138	366.50	3,861
364.44	148	365.48	1,166	366.52	3,971
364.46	159	365.50	1,195	366.54	4,085
364.48	170	365.52	1,224	366.56	4,201
364.50	181	365.54	1,254	366.58	4,320
364.52	193	365.56	1,284	366.60	4,442
364.54	205	365.58	1,314	366.62	4,566
364.56	217	365.60	1,344	366.64	4,694
364.58	230	365.62	1,375	366.66	4,824
364.60	243	365.64	1,406	366.68	4,957
364.62	257	365.66	1,438	366.70	5,093
364.64	271	365.68	1,470	366.72	5,232
364.66	285	365.70	1,502	366.74	5,374
364.68	300	365.72	1,535	366.76	5,519
364.70	314	365.74	1,568	366.78	5,666
364.72	330	365.76	1,601	366.80	5,817
364.74	345	365.78	1,635	366.82	5,970
364.76	361	365.80	1,669	366.84	6,126
364.78	377	365.82	1,703	366.86	6,285
364.80	394	365.84	1,738	366.88	6,447
364.82	411	365.86	1,773	366.90	6,611
364.84	428	365.88	1,808	366.92	6,779
364.86	446	365.90	1,844	366.94	6,949
364.88	464	365.92	1,880	366.96	7,122
364.90	482	365.94	1,917	366.98	7,298
364.92	501	365.96	1,953	367.00	7,477
364.94	520	365.98	1,991	367.02	7,658
364.96	540	366.00	2,028	367.04	7,839
364.98	559	366.02	2,067	367.06	8,021
365.00	580	366.04	2,109	367.08	8,203
365.02	600	366.06	2,154	367.10	8,386

Stage-Area-Storage for Pond PP: POCKET POND (continued)

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
367.12	8,570	368.16	18,977	369.20	31,126
367.14	8,754	368.18	19,194	369.22	31,377
367.16	8,939	368.20	19,411	369.24	31,629
367.18	9,125	368.22	19,630	369.26	31,882
367.20	9,311	368.24	19,848	369.28	32,135
367.22	9,498	368.26	20,068	369.30	32,390
367.24	9,685	368.28	20,288	369.32	32,644
367.26	9,873	368.30	20,509	369.34	32,900
367.28	10,062	368.32	20,730	369.36	33,156
367.30	10,251	368.34	20,952	369.38	33,413
367.32	10,441	368.36	21,175	369.40	33,671
367.34	10,632	368.38	21,398	369.42	33,929
367.36	10,823	368.40	21,623	369.44	34,188
367.38	11,014	368.42	21,847	369.46	34,448
367.40	11,207	368.44	22,073	369.48	34,708
367.42	11,400	368.46	22,299	369.50	34,969
367.44	11,593	368.48	22,525	369.52	35,231
367.46	11,788	368.50	22,753	369.54	35,494
367.48	11,983	368.52	22,981	369.56	35,757
367.50	12,178	368.54	23,209	369.58	36,021
367.52	12,374	368.56	23,439	369.60	36,285
367.54	12,571	368.58	23,669	369.62	36,550
367.56	12,768	368.60	23,899	369.64	36,816
367.58	12,966	368.62	24,131	369.66	37,083
367.60	13,165	368.64	24,363	369.68	37,350
367.62	13,364	368.66	24,595	369.70	37,618
367.64	13,564	368.68	24,828	369.72	37,887
367.66	13,764	368.70	25,062	369.74	38,156
367.68	13,965	368.72	25,297	369.76	38,427
367.70	14,167	368.74	25,532	369.78	38,697
367.72	14,369	368.76	25,768	369.80	38,969
367.74	14,572	368.78	26,005	369.82	39,241
367.76	14,775	368.80	26,242	369.84	39,514
367.78	14,980	368.82	26,480	369.86	39,788
367.80	15,184	368.84	26,718	369.88	40,062
367.82	15,390	368.86	26,957	369.90	40,337
367.84	15,596	368.88	27,197	369.92	40,612
367.86	15,802	368.90	27,438	369.94	40,889
367.88	16,010	368.92	27,679	369.96	41,166
367.90	16,217	368.94	27,921	369.98	41,444
367.92	16,426	368.96	28,163	370.00	41,722
367.94	16,635	368.98	28,406	370.02	42,001
367.96	16,845	369.00	28,650	370.04	42,282
367.98	17,055	369.02	28,894	370.06	42,564
368.00	17,266	369.04	29,140	370.08	42,848
368.02	17,478	369.06	29,385	370.10	43,133
368.04	17,690	369.08	29,632	370.12	43,419
368.06	17,903	369.10	29,879	370.14	43,706
368.08	18,116	369.12	30,127	370.16	43,995
368.10	18,331	369.14	30,376	370.18	44,285
368.12	18,545	369.16	30,625	370.20	44,577
368.14	18,761	369.18	30,875	370.22	44,869

Stage-Area-Storage for Pond PP: POCKET POND (continued)

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
370.24	45,164	371.28	62,250	372.32	81,949
370.26	45,459	371.30	62,607	372.34	82,351
370.28	45,756	371.32	62,966	372.36	82,753
370.30	46,054	371.34	63,325	372.38	83,157
370.32	46,353	371.36	63,685	372.40	83,561
370.34	46,654	371.38	64,046	372.42	83,966
370.36	46,956	371.40	64,407	372.44	84,372
370.38	47,260	371.42	64,770	372.46	84,779
370.40	47,565	371.44	65,133	372.48	85,186
370.42	47,871	371.46	65,498	372.50	85,595
370.44	48,178	371.48	65,863	372.52	86,004
370.46	48,487	371.50	66,229	372.54	86,415
370.48	48,797	371.52	66,595	372.56	86,826
370.50	49,109	371.54	66,963	372.58	87,238
370.52	49,422	371.56	67,331	372.60	87,651
370.54	49,736	371.58	67,700	372.62	88,065
370.56	50,051	371.60	68,070	372.64	88,480
370.58	50,368	371.62	68,441	372.66	88,896
370.60	50,686	371.64	68,813	372.68	89,312
370.62	51,006	371.66	69,185	372.70	89,729
370.64	51,327	371.68	69,559	372.72	90,148
370.66	51,649	371.70	69,933	372.74	90,567
370.68	51,972	371.72	70,308	372.76	90,987
370.70	52,297	371.74	70,684	372.78	91,408
370.72	52,624	371.76	71,060	372.80	91,830
370.74	52,951	371.78	71,438	372.82	92,252
370.76	53,280	371.80	71,816	372.84	92,676
370.78	53,610	371.82	72,195	372.86	93,101
370.80	53,942	371.84	72,575	372.88	93,526
370.82	54,275	371.86	72,956	372.90	93,952
370.84	54,609	371.88	73,337	372.92	94,379
370.86	54,944	371.90	73,720	372.94	94,807
370.88	55,281	371.92	74,103	372.96	95,236
370.90	55,619	371.94	74,487	372.98	95,666
370.92	55,959	371.96	74,872	373.00	96,097
370.94	56,300	371.98	75,258	373.02	96,528
370.96	56,642	372.00	75,645	373.04	96,960
370.98	56,986	372.02	76,032	373.06	97,394
371.00	57,331	372.04	76,420	373.08	97,828
371.02	57,676	372.06	76,809	373.10	98,263
371.04	58,023	372.08	77,200	373.12	98,699
371.06	58,371	372.10	77,591	373.14	99,136
371.08	58,719	372.12	77,982	373.16	99,573
371.10	59,069	372.14	78,375	373.18	100,012
371.12	59,419	372.16	78,769	373.20	100,451
371.14	59,770	372.18	79,163	373.22	100,892
371.16	60,122	372.20	79,559	373.24	101,333
371.18	60,474	372.22	79,955	373.26	101,775
371.20	60,828	372.24	80,352	373.28	102,218
371.22	61,182	372.26	80,750	373.30	102,662
371.24	61,537	372.28	81,149	373.32	103,107
371.26	61,893	372.30	81,549	373.34	103,552

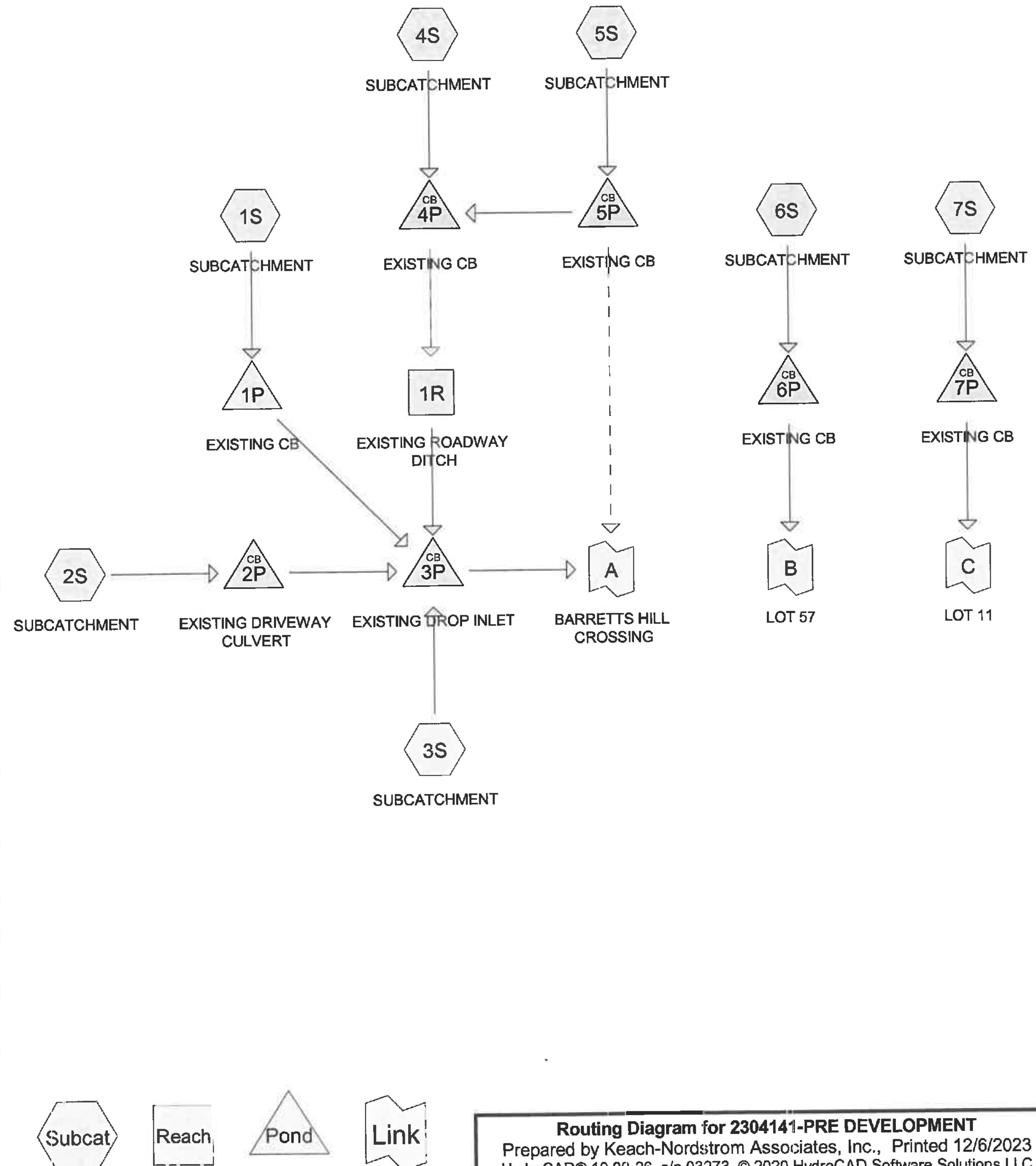
Stage-Area-Storage for Pond PP: POCKET POND (continued)

Elevation (feet)	Storage (cubic-feet)
373.36	103,999
373.38	104,446
373.40	104,894
373.42	105,344
373.44	105,794
373.46	106,245
373.48	106,696
373.50	107,149
373.52	107,603
373.54	108,057
373.56	108,512
373.58	108,969
373.60	109,426
373.62	109,884
373.64	110,342
373.66	110,802
373.68	111,263
373.70	111,724
373.72	112,187
373.74	112,650
373.76	113,114
373.78	113,579
373.80	114,045
373.82	114,512
373.84	114,979
373.86	115,448
373.88	115,917
373.90	116,388
373.92	116,859
373.94	117,331
373.96	117,804
373.98	118,278
374.00	**118,753**

Attachment "F"

16. HYDROCAD DRAINAGE ANALYSIS

Attachment "F"



Routing Diagram for 2304141-PRE DEVELOPMENT
Prepared by Keach-Nordstrom Associates, Inc., Printed 12/6/2023
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Attachment "F"

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.372	39.0	>75% Grass cover, Good, HSG A (1S, 2S, 3S)
3.099	61.0	>75% Grass cover, Good, HSG B (1S, 2S, 3S, 4S, 5S)
1.111	74.0	>75% Grass cover, Good, HSG C (1S, 2S, 6S, 7S)
0.018	96.0	Gravel surface, HSG C (7S)
1.364	98.0	Paved parking (1S, 2S, 3S, 4S, 5S, 6S)
0.099	98.0	Paved parking, HSG C (7S)
0.543	98.0	Roofs (1S, 2S, 3S, 4S)
0.960	30.0	Woods, Good, HSG A (1S, 2S, 3S)
10.021	55.0	Woods, Good, HSG B (1S, 2S, 3S, 4S)
28.244	70.0	Woods, Good, HSG C (1S, 2S, 3S, 4S, 6S, 7S)
45.830	**66.4**	**TOTAL AREA**

Attachment "F"

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
1.332	HSG A	1S, 2S, 3S
13.120	HSG B	1S, 2S, 3S, 4S, 5S
29.471	HSG C	1S, 2S, 3S, 4S, 6S, 7S
0.000	HSG D	
1.907	Other	1S, 2S, 3S, 4S, 5S, 6S
45.830		**TOTAL AREA**

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: SUBCATCHMENT Runoff Area=1,062,579 sf 2.71% Impervious Runoff Depth>0.47"
Flow Length=2,203' Tc=38.1 min CN=64.7 Runoff=5.06 cfs 0.95 af

Subcatchment 2S: SUBCATCHMENT Runoff Area=113,081 sf 12.76% Impervious Runoff Depth>0.36"
Flow Length=683' Tc=20.1 min CN=61.4 Runoff=0.44 cfs 0.08 af

Subcatchment 3S: SUBCATCHMENT Runoff Area=128,229 sf 6.91% Impervious Runoff Depth>0.37"
Flow Length=1,189' Tc=23.1 min CN=61.7 Runoff=0.51 cfs 0.09 af

Subcatchment 4S: SUBCATCHMENT Runoff Area=223,873 sf 8.43% Impervious Runoff Depth>0.67"
Flow Length=1,889' Tc=31.1 min CN=69.9 Runoff=1.97 cfs 0.29 af

Subcatchment 5S: SUBCATCHMENT Runoff Area=16,441 sf 34.30% Impervious Runoff Depth>0.86"
Flow Length=389' Tc=8.7 min CN=73.7 Runoff=0.32 cfs 0.03 af

Subcatchment 6S: SUBCATCHMENT Runoff Area=248,437 sf 2.62% Impervious Runoff Depth>0.72"
Flow Length=1,105' Tc=24.4 min CN=70.8 Runoff=2.63 cfs 0.34 af

Subcatchment 7S: SUBCATCHMENT Runoff Area=203,705 sf 2.12% Impervious Runoff Depth>0.72"
Flow Length=1,021' Tc=20.7 min CN=70.8 Runoff=2.29 cfs 0.28 af

Reach 1R: EXISTING ROADWAY DITCH Avg. Flow Depth=0.46' Max Vel=3.24 fps Inflow=2.09 cfs 0.32 af
n=0.022 L=230.0' S=0.0173 '/' Capacity=16.21 cfs Outflow=2.09 cfs 0.32 af

Pond 1P: EXISTING CB Inflow=5.06 cfs 0.95 af
Primary=5.06 cfs 0.95 af

Pond 2P: EXISTING DRIVEWAY CULVERT Peak Elev=292.73' Inflow=0.44 cfs 0.08 af
12.0" Round Culvert n=0.013 L=21.0' S=0.0143 '/' Outflow=0.44 cfs 0.08 af

Pond 3P: EXISTING DROP INLET Peak Elev=289.90' Inflow=7.79 cfs 1.43 af
24.0" Round Culvert n=0.011 L=92.1' S=0.0433 '/' Outflow=7.79 cfs 1.43 af

Pond 4P: EXISTING CB Peak Elev=297.84' Inflow=2.09 cfs 0.32 af
Primary=2.09 cfs 0.32 af Secondary=0.00 cfs 0.00 af Outflow=2.09 cfs 0.32 af

Pond 5P: EXISTING CB Peak Elev=298.06' Inflow=0.32 cfs 0.03 af
Primary=0.32 cfs 0.03 af Secondary=0.00 cfs 0.00 af Outflow=0.32 cfs 0.03 af

Pond 6P: EXISTING CB Peak Elev=364.68' Inflow=2.63 cfs 0.34 af
12.0" Round Culvert n=0.025 L=18.0' S=0.0689 '/' Outflow=2.63 cfs 0.34 af

Pond 7P: EXISTING CB Peak Elev=377.48' Inflow=2.29 cfs 0.28 af
12.0" Round Culvert n=0.011 L=31.9' S=0.0091 '/' Outflow=2.29 cfs 0.28 af

Link A: BARRETTS HILL CROSSING Inflow=7.79 cfs 1.43 af
Primary=7.79 cfs 1.43 af

Link B: LOT 57 Inflow=2.63 cfs 0.34 af
Primary=2.63 cfs 0.34 af

Link C: LOT 11 Inflow=2.29 cfs 0.28 af
Primary=2.29 cfs 0.28 af

Total Runoff Area = 45.830 ac Runoff Volume = 2.05 af Average Runoff Depth = 0.54"
95.62% Pervious = 43.824 ac 4.38% Impervious = 2.006 ac

Summary for Subcatchment 1S: SUBCATCHMENT

Runoff = 5.06 cfs @ 12.66 hrs, Volume= 0.95 af, Depth> 0.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=2.95"

	Area (sf)	CN	Description
	7,670	30.0	Woods, Good, HSG A
	363,085	55.0	Woods, Good, HSG B
	574,693	70.0	Woods, Good, HSG C
	6,684	39.0	>75% Grass cover, Good, HSG A
	61,618	61.0	>75% Grass cover, Good, HSG B
	20,067	74.0	>75% Grass cover, Good, HSG C
*	14,404	98.0	Roofs
*	14,358	98.0	Paved parking
	1,062,579	64.7	Weighted Average
	1,033,817	63.8	97.29% Pervious Area
	28,762	98.0	2.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.3	100	0.0400	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
19.7	1,862	0.0988	1.57		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.3	30	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.8	211	0.0430	4.21		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
38.1	2,203	Total			

Summary for Subcatchment 2S: SUBCATCHMENT

Runoff = 0.44 cfs @ 12.43 hrs, Volume= 0.08 af, Depth> 0.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=2.95"

	Area (sf)	CN	Description
	28,414	30.0	Woods, Good, HSG A
	11,383	55.0	Woods, Good, HSG B
	33,808	70.0	Woods, Good, HSG C
	4,719	39.0	>75% Grass cover, Good, HSG A
	242	61.0	>75% Grass cover, Good, HSG B
	20,087	74.0	>75% Grass cover, Good, HSG C
*	3,849	98.0	Roofs
*	10,579	98.0	Paved parking
	113,081	61.4	Weighted Average
	98,653	56.1	87.24% Pervious Area
	14,428	98.0	12.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	100	0.1000	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
3.9	318	0.0750	1.37		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.7	48	0.0300	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.6	217	0.0410	1.01		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
20.1	683	Total			

Summary for Subcatchment 3S: SUBCATCHMENT

Runoff = 0.51 cfs @ 12.49 hrs, Volume= 0.09 af, Depth> 0.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=2.95"

	Area (sf)	CN	Description
	5,732	30.0	Woods, Good, HSG A
	49,737	55.0	Woods, Good, HSG B
	38,476	70.0	Woods, Good, HSG C
	4,799	39.0	>75% Grass cover, Good, HSG A
	20,628	61.0	>75% Grass cover, Good, HSG B
*	2,833	98.0	Roofs
*	6,024	98.0	Paved parking
	128,229	61.7	Weighted Average
	119,372	59.0	93.09% Pervious Area
	8,857	98.0	6.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.9	100	0.1600	0.17		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
13.2	1,089	0.0760	1.38		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
23.1	1,189	Total			

Summary for Subcatchment 4S: SUBCATCHMENT

Runoff = 1.97 cfs @ 12.51 hrs, Volume= 0.29 af, Depth> 0.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=2.95"

	Area (sf)	CN	Description
	12,309	55.0	Woods, Good, HSG B
	150,990	70.0	Woods, Good, HSG C
	41,699	61.0	>75% Grass cover, Good, HSG B
*	2,548	98.0	Roofs
*	16,327	98.0	Paved parking
	223,873	69.9	Weighted Average
	204,998	67.3	91.57% Pervious Area
	18,875	98.0	8.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.8	100	0.0500	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
10.6	1,127	0.1250	1.77		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.5	55	0.0730	1.89		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.9	68	0.0590	1.21		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	30	0.1000	2.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	16	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.1	240	0.0750	1.92		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.3	73	0.0410	4.11		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.6	180	0.0720	5.45		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
31.1	1,889	Total			

Summary for Subcatchment 5S: SUBCATCHMENT

Runoff = 0.32 cfs @ 12.13 hrs, Volume= 0.03 af, Depth> 0.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=2.95"

	Area (sf)	CN	Description
	10,801	61.0	>75% Grass cover, Good, HSG B
*	5,640	98.0	Paved parking
	16,441	73.7	Weighted Average
	10,801	61.0	65.70% Pervious Area
	5,640	98.0	34.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	100	0.0700	0.26		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
0.1	16	0.0400	4.06		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.5	162	0.0680	1.83		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	20	0.0400	4.06		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.8	91	0.0770	1.94		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.7	389	Total			

Summary for Subcatchment 6S: SUBCATCHMENT

Runoff = 2.63 cfs @ 12.40 hrs, Volume= 0.34 af, Depth> 0.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=2.95"

	Area (sf)	CN	Description
	237,230	70.0	Woods, Good, HSG C
*	4,709	74.0	>75% Grass cover, Good, HSG C
*	6,498	98.0	Paved parking
	248,437	70.8	Weighted Average
	241,939	70.1	97.38% Pervious Area
	6,498	98.0	2.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.8	100	0.0500	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
8.1	856	0.1250	1.77		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.0	10	0.3000	3.83		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.5	139	0.0500	4.54		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
24.4	1,105	Total			

Summary for Subcatchment 7S: SUBCATCHMENT

Runoff = 2.29 cfs @ 12.33 hrs, Volume= 0.28 af, Depth> 0.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=2.95"

Area (sf)	CN	Description
195,095	70.0	Woods, Good, HSG C
3,533	74.0	>75% Grass cover, Good, HSG C
4,313	98.0	Paved parking, HSG C
764	96.0	Gravel surface, HSG C
203,705	70.8	Weighted Average
199,392	70.2	97.88% Pervious Area
4,313	98.0	2.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	100	0.0900	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
7.5	755	0.1130	1.68		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.0	6	0.3000	3.83		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.7	160	0.0375	3.93		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
20.7	1,021	Total			

Summary for Reach 1R: EXISTING ROADWAY DITCH

Inflow Area = 5.517 ac, 10.20% Impervious, Inflow Depth > 0.69" for 2-YEAR event
Inflow = 2.09 cfs @ 12.48 hrs, Volume= 0.32 af
Outflow = 2.09 cfs @ 12.50 hrs, Volume= 0.32 af, Atten= 0%, Lag= 1.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.24 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 1.78 fps, Avg. Travel Time= 2.2 min

Peak Storage= 148 cf @ 12.50 hrs
Average Depth at Peak Storage= 0.46'
Bank-Full Depth= 1.00' Flow Area= 3.0 sf, Capacity= 16.21 cfs

0.00' x 1.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 6.00'
Length= 230.0' Slope= 0.0173 '/'
Inlet Invert= 295.64', Outlet Invert= 291.66'

Summary for Pond 1P: EXISTING CB

Inflow Area = 24.393 ac, 2.71% Impervious, Inflow Depth > 0.47" for 2-YEAR event
Inflow = 5.06 cfs @ 12.66 hrs, Volume= 0.95 af
Primary = 5.06 cfs @ 12.66 hrs, Volume= 0.95 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Pond 2P: EXISTING DRIVEWAY CULVERT

Inflow Area = 2.596 ac, 12.76% Impervious, Inflow Depth > 0.36" for 2-YEAR event
Inflow = 0.44 cfs @ 12.43 hrs, Volume= 0.08 af
Outflow = 0.44 cfs @ 12.43 hrs, Volume= 0.08 af, Atten= 0%, Lag= 0.0 min
Primary = 0.44 cfs @ 12.43 hrs, Volume= 0.08 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 292.73' @ 12.43 hrs
Flood Elev= 294.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	292.40'	**12.0" Round Culvert** L= 21.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 292.40' / 292.10' S= 0.0143 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.44 cfs @ 12.43 hrs HW=292.73' TW=289.79' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 0.44 cfs @ 1.96 fps)

Summary for Pond 3P: EXISTING DROP INLET

Inflow Area = 35.450 ac, 4.96% Impervious, Inflow Depth > 0.48" for 2-YEAR event
Inflow = 7.79 cfs @ 12.60 hrs, Volume= 1.43 af
Outflow = 7.79 cfs @ 12.60 hrs, Volume= 1.43 af, Atten= 0%, Lag= 0.0 min
Primary = 7.79 cfs @ 12.60 hrs, Volume= 1.43 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 289.90' @ 12.60 hrs
Flood Elev= 293.75'

Device	Routing	Invert	Outlet Devices
#1	Primary	288.66'	**24.0" Round Culvert** L= 92.1' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 288.66' / 284.67' S= 0.0433 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf

Primary OutFlow Max=7.79 cfs @ 12.60 hrs HW=289.90' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 7.79 cfs @ 3.80 fps)

Summary for Pond 4P: EXISTING CB

Inflow Area =	5.517 ac, 10.20% Impervious, Inflow Depth > 0.69"		for 2-YEAR event
Inflow =	2.09 cfs @ 12.48 hrs, Volume=	0.32 af	
Outflow =	2.09 cfs @ 12.48 hrs, Volume=	0.32 af,	Atten= 0%, Lag= 0.0 min
Primary =	2.09 cfs @ 12.48 hrs, Volume=	0.32 af	
Secondary =	0.00 cfs @ 0.00 hrs, Volume=	0.00 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 297.84' @ 12.48 hrs
Flood Elev= 300.17'

Device	Routing	Invert	Outlet Devices
#1	Primary	297.00'	**12.0" Round Culvert** L= 49.1' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 297.00' / 295.64' S= 0.0277 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	300.17'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.09 cfs @ 12.48 hrs HW=297.84' TW=296.10' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 2.09 cfs @ 4.01 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=297.00' TW=295.64' (Dynamic Tailwater)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 5P: EXISTING CB

Inflow Area =	0.377 ac, 34.30% Impervious, Inflow Depth > 0.86"		for 2-YEAR event
Inflow =	0.32 cfs @ 12.13 hrs, Volume=	0.03 af	
Outflow =	0.32 cfs @ 12.13 hrs, Volume=	0.03 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.32 cfs @ 12.13 hrs, Volume=	0.03 af	
Secondary =	0.00 cfs @ 0.00 hrs, Volume=	0.00 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 298.06' @ 12.13 hrs
Flood Elev= 301.16'

Device	Routing	Invert	Outlet Devices
#1	Primary	297.70'	**12.0" Round Culvert** L= 34.1' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 297.70' / 297.30' S= 0.0117 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	301.16'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.32 cfs @ 12.13 hrs HW=298.06' TW=297.49' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 0.32 cfs @ 1.88 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=297.70' TW=0.00' (Dynamic Tailwater)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 6P: EXISTING CB

Inflow Area = 5.703 ac, 2.62% Impervious, Inflow Depth > 0.72" for 2-YEAR event
Inflow = 2.63 cfs @ 12.40 hrs, Volume= 0.34 af
Outflow = 2.63 cfs @ 12.40 hrs, Volume= 0.34 af, Atten= 0%, Lag= 0.0 min
Primary = 2.63 cfs @ 12.40 hrs, Volume= 0.34 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 364.68' @ 12.40 hrs
Flood Elev= 366.35'

Device	Routing	Invert	Outlet Devices
#1	Primary	363.70'	**12.0" Round Culvert** L= 18.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 363.70' / 362.46' S= 0.0689 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf

Primary OutFlow Max=2.63 cfs @ 12.40 hrs HW=364.68' TW=0.00' (Dynamic Tailwater)
1=Culvert (Inlet Controls 2.63 cfs @ 3.36 fps)

Summary for Pond 7P: EXISTING CB

Inflow Area = 4.676 ac, 2.12% Impervious, Inflow Depth > 0.72" for 2-YEAR event
Inflow = 2.29 cfs @ 12.33 hrs, Volume= 0.28 af
Outflow = 2.29 cfs @ 12.33 hrs, Volume= 0.28 af, Atten= 0%, Lag= 0.0 min
Primary = 2.29 cfs @ 12.33 hrs, Volume= 0.28 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 377.48' @ 12.33 hrs
Flood Elev= 380.49'

Device	Routing	Invert	Outlet Devices
#1	Primary	376.57'	**12.0" Round Culvert** L= 31.9' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 376.57' / 376.28' S= 0.0091 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=2.29 cfs @ 12.33 hrs HW=377.48' TW=0.00' (Dynamic Tailwater)
1=Culvert (Barrel Controls 2.29 cfs @ 4.01 fps)

Summary for Link A: BARRETTS HILL CROSSING

Inflow Area = 35.450 ac, 4.96% Impervious, Inflow Depth > 0.48" for 2-YEAR event
Inflow = 7.79 cfs @ 12.60 hrs, Volume= 1.43 af
Primary = 7.79 cfs @ 12.60 hrs, Volume= 1.43 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link B: LOT 57

Inflow Area =	5.703 ac,	2.62% Impervious, Inflow Depth > 0.72"		for 2-YEAR event
Inflow =	2.63 cfs @	12.40 hrs, Volume=	0.34 af	
Primary =	2.63 cfs @	12.40 hrs, Volume=	0.34 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link C: LOT 11

Inflow Area =	4.676 ac,	2.12% Impervious, Inflow Depth > 0.72"		for 2-YEAR event
Inflow =	2.29 cfs @	12.33 hrs, Volume=	0.28 af	
Primary =	2.29 cfs @	12.33 hrs, Volume=	0.28 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: SUBCATCHMENT Runoff Area=1,062,579 sf 2.71% Impervious Runoff Depth>1.28"
Flow Length=2,203' Tc=38.1 min CN=64.7 Runoff=17.21 cfs 2.60 af

Subcatchment 2S: SUBCATCHMENT Runoff Area=113,081 sf 12.76% Impervious Runoff Depth>1.08"
Flow Length=683' Tc=20.1 min CN=61.4 Runoff=1.94 cfs 0.23 af

Subcatchment 3S: SUBCATCHMENT Runoff Area=128,229 sf 6.91% Impervious Runoff Depth>1.10"
Flow Length=1,189' Tc=23.1 min CN=61.7 Runoff=2.12 cfs 0.27 af

Subcatchment 4S: SUBCATCHMENT Runoff Area=223,873 sf 8.43% Impervious Runoff Depth>1.63"
Flow Length=1,889' Tc=31.1 min CN=69.9 Runoff=5.32 cfs 0.70 af

Subcatchment 5S: SUBCATCHMENT Runoff Area=16,441 sf 34.30% Impervious Runoff Depth>1.92"
Flow Length=389' Tc=8.7 min CN=73.7 Runoff=0.77 cfs 0.06 af

Subcatchment 6S: SUBCATCHMENT Runoff Area=248,437 sf 2.62% Impervious Runoff Depth>1.70"
Flow Length=1,105' Tc=24.4 min CN=70.8 Runoff=6.88 cfs 0.81 af

Subcatchment 7S: SUBCATCHMENT Runoff Area=203,705 sf 2.12% Impervious Runoff Depth>1.70"
Flow Length=1,021' Tc=20.7 min CN=70.8 Runoff=6.03 cfs 0.66 af

Reach 1R: EXISTING ROADWAY DITCH Avg. Flow Depth=0.67' Max Vel=4.14 fps Inflow=5.61 cfs 0.76 af
n=0.022 L=230.0' S=0.0173 '/' Capacity=16.21 cfs Outflow=5.60 cfs 0.76 af

Pond 1P: EXISTING CB Inflow=17.21 cfs 2.60 af
Primary=17.21 cfs 2.60 af

Pond 2P: EXISTING DRIVEWAY CULVERT Peak Elev=293.20' Inflow=1.94 cfs 0.23 af
12.0" Round Culvert n=0.013 L=21.0' S=0.0143 '/' Outflow=1.94 cfs 0.23 af

Pond 3P: EXISTING DROP INLET Peak Elev=292.54' Inflow=25.69 cfs 3.86 af
24.0" Round Culvert n=0.011 L=92.1' S=0.0433 '/' Outflow=25.69 cfs 3.86 af

Pond 4P: EXISTING CB Peak Elev=300.29' Inflow=5.61 cfs 0.76 af
Primary=4.49 cfs 0.73 af Secondary=1.12 cfs 0.02 af Outflow=5.61 cfs 0.76 af

Pond 5P: EXISTING CB Peak Elev=300.30' Inflow=0.77 cfs 0.06 af
Primary=0.77 cfs 0.06 af Secondary=0.00 cfs 0.00 af Outflow=0.77 cfs 0.06 af

Pond 6P: EXISTING CB Peak Elev=367.74' Inflow=6.88 cfs 0.81 af
12.0" Round Culvert n=0.025 L=18.0' S=0.0689 '/' Outflow=6.88 cfs 0.81 af

Pond 7P: EXISTING CB Peak Elev=379.62' Inflow=6.03 cfs 0.66 af
12.0" Round Culvert n=0.011 L=31.9' S=0.0091 '/' Outflow=6.03 cfs 0.66 af

Link A: BARRETTS HILL CROSSING Inflow=25.69 cfs 3.86 af
Primary=25.69 cfs 3.86 af

Link B: LOT 57

Inflow=6.88 cfs 0.81 af
Primary=6.88 cfs 0.81 af

Link C: LOT 11

Inflow=6.03 cfs 0.66 af
Primary=6.03 cfs 0.66 af

Total Runoff Area = 45.830 ac Runoff Volume = 5.33 af Average Runoff Depth = 1.40"
95.62% Pervious = 43.824 ac 4.38% Impervious = 2.006 ac

Summary for Subcatchment 1S: SUBCATCHMENT

Runoff = 17.21 cfs @ 12.58 hrs, Volume= 2.60 af, Depth> 1.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.47"

	Area (sf)	CN	Description
	7,670	30.0	Woods, Good, HSG A
	363,085	55.0	Woods, Good, HSG B
	574,693	70.0	Woods, Good, HSG C
	6,684	39.0	>75% Grass cover, Good, HSG A
	61,618	61.0	>75% Grass cover, Good, HSG B
	20,067	74.0	>75% Grass cover, Good, HSG C
*	14,404	98.0	Roofs
*	14,358	98.0	Paved parking
	1,062,579	64.7	Weighted Average
	1,033,817	63.8	97.29% Pervious Area
	28,762	98.0	2.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.3	100	0.0400	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
19.7	1,862	0.0988	1.57		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.3	30	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.8	211	0.0430	4.21		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
38.1	2,203	Total			

Summary for Subcatchment 2S: SUBCATCHMENT

Runoff = 1.94 cfs @ 12.32 hrs, Volume= 0.23 af, Depth> 1.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.47"

	Area (sf)	CN	Description
	28,414	30.0	Woods, Good, HSG A
	11,383	55.0	Woods, Good, HSG B
	33,808	70.0	Woods, Good, HSG C
	4,719	39.0	>75% Grass cover, Good, HSG A
	242	61.0	>75% Grass cover, Good, HSG B
	20,087	74.0	>75% Grass cover, Good, HSG C
*	3,849	98.0	Roofs
*	10,579	98.0	Paved parking
	113,081	61.4	Weighted Average
	98,653	56.1	87.24% Pervious Area
	14,428	98.0	12.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	100	0.1000	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
3.9	318	0.0750	1.37		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.7	48	0.0300	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.6	217	0.0410	1.01		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
20.1	683	Total			

Summary for Subcatchment 3S: SUBCATCHMENT

Runoff = 2.12 cfs @ 12.37 hrs, Volume= 0.27 af, Depth> 1.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.47"

	Area (sf)	CN	Description
	5,732	30.0	Woods, Good, HSG A
	49,737	55.0	Woods, Good, HSG B
	38,476	70.0	Woods, Good, HSG C
	4,799	39.0	>75% Grass cover, Good, HSG A
	20,628	61.0	>75% Grass cover, Good, HSG B
*	2,833	98.0	Roofs
*	6,024	98.0	Paved parking
	128,229	61.7	Weighted Average
	119,372	59.0	93.09% Pervious Area
	8,857	98.0	6.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.9	100	0.1600	0.17		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
13.2	1,089	0.0760	1.38		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
23.1	1,189	Total			

Summary for Subcatchment 4S: SUBCATCHMENT

Runoff = 5.32 cfs @ 12.47 hrs, Volume= 0.70 af, Depth> 1.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.47"

	Area (sf)	CN	Description
	12,309	55.0	Woods, Good, HSG B
	150,990	70.0	Woods, Good, HSG C
	41,699	61.0	>75% Grass cover, Good, HSG B
*	2,548	98.0	Roofs
*	16,327	98.0	Paved parking
	223,873	69.9	Weighted Average
	204,998	67.3	91.57% Pervious Area
	18,875	98.0	8.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.8	100	0.0500	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
10.6	1,127	0.1250	1.77		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.5	55	0.0730	1.89		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.9	68	0.0590	1.21		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	30	0.1000	2.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	16	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.1	240	0.0750	1.92		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.3	73	0.0410	4.11		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.6	180	0.0720	5.45		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
31.1	1,889	Total			

Summary for Subcatchment 5S: SUBCATCHMENT

Runoff = 0.77 cfs @ 12.13 hrs, Volume= 0.06 af, Depth> 1.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.47"

	Area (sf)	CN	Description
	10,801	61.0	>75% Grass cover, Good, HSG B
*	5,640	98.0	Paved parking
	16,441	73.7	Weighted Average
	10,801	61.0	65.70% Pervious Area
	5,640	98.0	34.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	100	0.0700	0.26		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
0.1	16	0.0400	4.06		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.5	162	0.0680	1.83		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	20	0.0400	4.06		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.8	91	0.0770	1.94		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.7	389	Total			

Summary for Subcatchment 6S: SUBCATCHMENT

Runoff = 6.88 cfs @ 12.35 hrs, Volume= 0.81 af, Depth> 1.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.47"

	Area (sf)	CN	Description
	237,230	70.0	Woods, Good, HSG C
*	4,709	74.0	>75% Grass cover, Good, HSG C
*	6,498	98.0	Paved parking
	248,437	70.8	Weighted Average
	241,939	70.1	97.38% Pervious Area
	6,498	98.0	2.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.8	100	0.0500	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
8.1	856	0.1250	1.77		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.0	10	0.3000	3.83		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.5	139	0.0500	4.54		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
24.4	1,105	Total			

Summary for Subcatchment 7S: SUBCATCHMENT

Runoff = 6.03 cfs @ 12.30 hrs, Volume= 0.66 af, Depth> 1.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.47"

Area (sf)	CN	Description
195,095	70.0	Woods, Good, HSG C
3,533	74.0	>75% Grass cover, Good, HSG C
4,313	98.0	Paved parking, HSG C
764	96.0	Gravel surface, HSG C
203,705	70.8	Weighted Average
199,392	70.2	97.88% Pervious Area
4,313	98.0	2.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	100	0.0900	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
7.5	755	0.1130	1.68		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.0	6	0.3000	3.83		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.7	160	0.0375	3.93		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
20.7	1,021	Total			

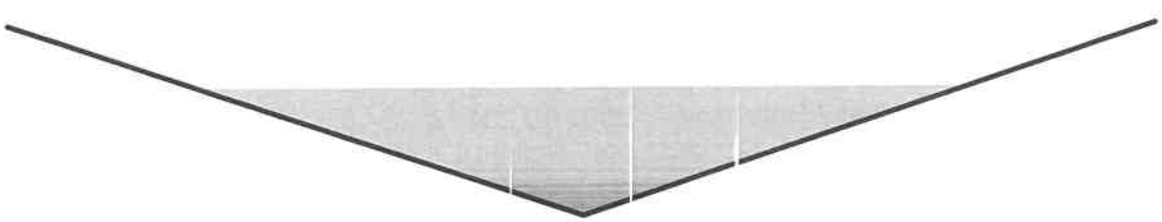
Summary for Reach 1R: EXISTING ROADWAY DITCH

Inflow Area = 5.517 ac, 10.20% Impervious, Inflow Depth > 1.65" for 10-YEAR event
Inflow = 5.61 cfs @ 12.44 hrs, Volume= 0.76 af
Outflow = 5.60 cfs @ 12.46 hrs, Volume= 0.76 af, Atten= 0%, Lag= 1.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.14 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 2.07 fps, Avg. Travel Time= 1.8 min

Peak Storage= 311 cf @ 12.46 hrs
Average Depth at Peak Storage= 0.67'
Bank-Full Depth= 1.00' Flow Area= 3.0 sf, Capacity= 16.21 cfs

0.00' x 1.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 6.00'
Length= 230.0' Slope= 0.0173 '/'
Inlet Invert= 295.64', Outlet Invert= 291.66'



Summary for Pond 1P: EXISTING CB

Inflow Area = 24.393 ac, 2.71% Impervious, Inflow Depth > 1.28" for 10-YEAR event
Inflow = 17.21 cfs @ 12.58 hrs, Volume= 2.60 af
Primary = 17.21 cfs @ 12.58 hrs, Volume= 2.60 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Pond 2P: EXISTING DRIVEWAY CULVERT

Inflow Area = 2.596 ac, 12.76% Impervious, Inflow Depth > 1.08" for 10-YEAR event
Inflow = 1.94 cfs @ 12.32 hrs, Volume= 0.23 af
Outflow = 1.94 cfs @ 12.32 hrs, Volume= 0.23 af, Atten= 0%, Lag= 0.0 min
Primary = 1.94 cfs @ 12.32 hrs, Volume= 0.23 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 293.20' @ 12.32 hrs
Flood Elev= 294.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	292.40'	**12.0" Round Culvert** L= 21.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 292.40' / 292.10' S= 0.0143 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=1.94 cfs @ 12.32 hrs HW=293.20' TW=291.44' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 1.94 cfs @ 3.94 fps)

Summary for Pond 3P: EXISTING DROP INLET

Inflow Area = 35.450 ac, 4.96% Impervious, Inflow Depth > 1.31" for 10-YEAR event
Inflow = 25.69 cfs @ 12.53 hrs, Volume= 3.86 af
Outflow = 25.69 cfs @ 12.53 hrs, Volume= 3.86 af, Atten= 0%, Lag= 0.0 min
Primary = 25.69 cfs @ 12.53 hrs, Volume= 3.86 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 292.54' @ 12.53 hrs
Flood Elev= 293.75'

Device	Routing	Invert	Outlet Devices
#1	Primary	288.66'	**24.0" Round Culvert** L= 92.1' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 288.66' / 284.67' S= 0.0433 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf

Primary OutFlow Max=25.69 cfs @ 12.53 hrs HW=292.54' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 25.69 cfs @ 8.18 fps)

Summary for Pond 4P: EXISTING CB

Inflow Area = 5.517 ac, 10.20% Impervious, Inflow Depth > 1.65" for 10-YEAR event
Inflow = 5.61 cfs @ 12.44 hrs, Volume= 0.76 af
Outflow = 5.61 cfs @ 12.44 hrs, Volume= 0.76 af, Atten= 0%, Lag= 0.0 min
Primary = 4.49 cfs @ 12.44 hrs, Volume= 0.73 af
Secondary = 1.12 cfs @ 12.44 hrs, Volume= 0.02 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 300.29' @ 12.44 hrs
Flood Elev= 300.17'

Device	Routing	Invert	Outlet Devices
#1	Primary	297.00'	**12.0" Round Culvert** L= 49.1' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 297.00' / 295.64' S= 0.0277 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	300.17'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=4.49 cfs @ 12.44 hrs HW=300.29' TW=296.31' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 4.49 cfs @ 5.71 fps)

Secondary OutFlow Max=1.12 cfs @ 12.44 hrs HW=300.29' TW=296.31' (Dynamic Tailwater)
└─**2=Orifice/Grate** (Weir Controls 1.12 cfs @ 1.14 fps)

Summary for Pond 5P: EXISTING CB

Inflow Area = 0.377 ac, 34.30% Impervious, Inflow Depth > 1.92" for 10-YEAR event
Inflow = 0.77 cfs @ 12.13 hrs, Volume= 0.06 af
Outflow = 0.77 cfs @ 12.13 hrs, Volume= 0.06 af, Atten= 0%, Lag= 0.0 min
Primary = 0.77 cfs @ 12.13 hrs, Volume= 0.06 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 300.30' @ 12.44 hrs
Flood Elev= 301.16'

Device	Routing	Invert	Outlet Devices
#1	Primary	297.70'	**12.0" Round Culvert** L= 34.1' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 297.70' / 297.30' S= 0.0117 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	301.16'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.72 cfs @ 12.13 hrs HW=298.36' TW=298.06' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 0.72 cfs @ 1.87 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=297.70' TW=0.00' (Dynamic Tailwater)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 6P: EXISTING CB

Inflow Area =	5.703 ac,	2.62% Impervious,	Inflow Depth > 1.70"	for 10-YEAR event
Inflow =	6.88 cfs @	12.35 hrs, Volume=	0.81 af	
Outflow =	6.88 cfs @	12.35 hrs, Volume=	0.81 af, Atten= 0%,	Lag= 0.0 min
Primary =	6.88 cfs @	12.35 hrs, Volume=	0.81 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 367.74' @ 12.35 hrs
Flood Elev= 366.35'

Device	Routing	Invert	Outlet Devices
#1	Primary	363.70'	**12.0" Round Culvert** L= 18.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 363.70' / 362.46' S= 0.0689 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf

Primary OutFlow Max=6.88 cfs @ 12.35 hrs HW=367.74' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 6.88 cfs @ 8.76 fps)

Summary for Pond 7P: EXISTING CB

Inflow Area =	4.676 ac,	2.12% Impervious,	Inflow Depth > 1.70"	for 10-YEAR event
Inflow =	6.03 cfs @	12.30 hrs, Volume=	0.66 af	
Outflow =	6.03 cfs @	12.30 hrs, Volume=	0.66 af, Atten= 0%,	Lag= 0.0 min
Primary =	6.03 cfs @	12.30 hrs, Volume=	0.66 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 379.62' @ 12.30 hrs
Flood Elev= 380.49'

Device	Routing	Invert	Outlet Devices
#1	Primary	376.57'	**12.0" Round Culvert** L= 31.9' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 376.57' / 376.28' S= 0.0091 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=6.03 cfs @ 12.30 hrs HW=379.61' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 6.03 cfs @ 7.68 fps)

Summary for Link A: BARRETTS HILL CROSSING

Inflow Area =	35.450 ac,	4.96% Impervious,	Inflow Depth > 1.31"	for 10-YEAR event
Inflow =	25.69 cfs @	12.53 hrs, Volume=	3.86 af	
Primary =	25.69 cfs @	12.53 hrs, Volume=	3.86 af, Atten= 0%,	Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link B: LOT 57

Inflow Area = 5.703 ac, 2.62% Impervious, Inflow Depth > 1.70" for 10-YEAR event
Inflow = 6.88 cfs @ 12.35 hrs, Volume= 0.81 af
Primary = 6.88 cfs @ 12.35 hrs, Volume= 0.81 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link C: LOT 11

Inflow Area = 4.676 ac, 2.12% Impervious, Inflow Depth > 1.70" for 10-YEAR event
Inflow = 6.03 cfs @ 12.30 hrs, Volume= 0.66 af
Primary = 6.03 cfs @ 12.30 hrs, Volume= 0.66 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Attachment "F"

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: SUBCATCHMENT Runoff Area=1,062,579 sf 2.71% Impervious Runoff Depth>2.06"
Flow Length=2,203' Tc=38.1 min CN=64.7 Runoff=29.03 cfs 4.19 af

Subcatchment 2S: SUBCATCHMENT Runoff Area=113,081 sf 12.76% Impervious Runoff Depth>1.80"
Flow Length=683' Tc=20.1 min CN=61.4 Runoff=3.49 cfs 0.39 af

Subcatchment 3S: SUBCATCHMENT Runoff Area=128,229 sf 6.91% Impervious Runoff Depth>1.83"
Flow Length=1,189' Tc=23.1 min CN=61.7 Runoff=3.80 cfs 0.45 af

Subcatchment 4S: SUBCATCHMENT Runoff Area=223,873 sf 8.43% Impervious Runoff Depth>2.51"
Flow Length=1,889' Tc=31.1 min CN=69.9 Runoff=8.36 cfs 1.07 af

Subcatchment 5S: SUBCATCHMENT Runoff Area=16,441 sf 34.30% Impervious Runoff Depth>2.87"
Flow Length=389' Tc=8.7 min CN=73.7 Runoff=1.16 cfs 0.09 af

Subcatchment 6S: SUBCATCHMENT Runoff Area=248,437 sf 2.62% Impervious Runoff Depth>2.60"
Flow Length=1,105' Tc=24.4 min CN=70.8 Runoff=10.73 cfs 1.23 af

Subcatchment 7S: SUBCATCHMENT Runoff Area=203,705 sf 2.12% Impervious Runoff Depth>2.59"
Flow Length=1,021' Tc=20.7 min CN=70.8 Runoff=9.42 cfs 1.01 af

Reach 1R: EXISTING ROADWAY DITCH Avg. Flow Depth=0.80' Max Vel=4.64 fps Inflow=8.80 cfs 1.16 af
n=0.022 L=230.0' S=0.0173 '/' Capacity=16.21 cfs Outflow=8.80 cfs 1.16 af

Pond 1P: EXISTING CB Inflow=29.03 cfs 4.19 af
Primary=29.03 cfs 4.19 af

Pond 2P: EXISTING DRIVEWAY CULVERT Peak Elev=298.26' Inflow=3.49 cfs 0.39 af
12.0" Round Culvert n=0.013 L=21.0' S=0.0143 '/' Outflow=3.49 cfs 0.39 af

Pond 3P: EXISTING DROP INLET Peak Elev=297.77' Inflow=43.08 cfs 6.19 af
24.0" Round Culvert n=0.011 L=92.1' S=0.0433 '/' Outflow=43.08 cfs 6.19 af

Pond 4P: EXISTING CB Peak Elev=300.47' Inflow=8.80 cfs 1.16 af
Primary=4.59 cfs 1.01 af Secondary=4.21 cfs 0.15 af Outflow=8.80 cfs 1.16 af

Pond 5P: EXISTING CB Peak Elev=300.50' Inflow=1.16 cfs 0.09 af
Primary=1.16 cfs 0.09 af Secondary=0.00 cfs 0.00 af Outflow=1.16 cfs 0.09 af

Pond 6P: EXISTING CB Peak Elev=373.86' Inflow=10.73 cfs 1.23 af
12.0" Round Culvert n=0.025 L=18.0' S=0.0689 '/' Outflow=10.73 cfs 1.23 af

Pond 7P: EXISTING CB Peak Elev=383.28' Inflow=9.42 cfs 1.01 af
12.0" Round Culvert n=0.011 L=31.9' S=0.0091 '/' Outflow=9.42 cfs 1.01 af

Link A: BARRETTS HILL CROSSING Inflow=43.08 cfs 6.19 af
Primary=43.08 cfs 6.19 af

Link B: LOT 57

Inflow=10.73 cfs 1.23 af
Primary=10.73 cfs 1.23 af

Link C: LOT 11

Inflow=9.42 cfs 1.01 af
Primary=9.42 cfs 1.01 af

Total Runoff Area = 45.830 ac Runoff Volume = 8.44 af Average Runoff Depth = 2.21"
95.62% Pervious = 43.824 ac 4.38% Impervious = 2.006 ac

Summary for Subcatchment 1S: SUBCATCHMENT

Runoff = 29.03 cfs @ 12.57 hrs, Volume= 4.19 af, Depth> 2.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=5.66"

	Area (sf)	CN	Description
	7,670	30.0	Woods, Good, HSG A
	363,085	55.0	Woods, Good, HSG B
	574,693	70.0	Woods, Good, HSG C
	6,684	39.0	>75% Grass cover, Good, HSG A
	61,618	61.0	>75% Grass cover, Good, HSG B
	20,067	74.0	>75% Grass cover, Good, HSG C
*	14,404	98.0	Roofs
*	14,358	98.0	Paved parking
	1,062,579	64.7	Weighted Average
	1,033,817	63.8	97.29% Pervious Area
	28,762	98.0	2.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.3	100	0.0400	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
19.7	1,862	0.0988	1.57		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.3	30	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.8	211	0.0430	4.21		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
38.1	2,203	Total			

Summary for Subcatchment 2S: SUBCATCHMENT

Runoff = 3.49 cfs @ 12.29 hrs, Volume= 0.39 af, Depth> 1.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=5.66"

	Area (sf)	CN	Description
	28,414	30.0	Woods, Good, HSG A
	11,383	55.0	Woods, Good, HSG B
	33,808	70.0	Woods, Good, HSG C
	4,719	39.0	>75% Grass cover, Good, HSG A
	242	61.0	>75% Grass cover, Good, HSG B
	20,087	74.0	>75% Grass cover, Good, HSG C
*	3,849	98.0	Roofs
*	10,579	98.0	Paved parking
	113,081	61.4	Weighted Average
	98,653	56.1	87.24% Pervious Area
	14,428	98.0	12.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	100	0.1000	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
3.9	318	0.0750	1.37		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.7	48	0.0300	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.6	217	0.0410	1.01		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
20.1	683	Total			

Summary for Subcatchment 3S: SUBCATCHMENT

Runoff = 3.80 cfs @ 12.34 hrs, Volume= 0.45 af, Depth> 1.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=5.66"

	Area (sf)	CN	Description
	5,732	30.0	Woods, Good, HSG A
	49,737	55.0	Woods, Good, HSG B
	38,476	70.0	Woods, Good, HSG C
	4,799	39.0	>75% Grass cover, Good, HSG A
	20,628	61.0	>75% Grass cover, Good, HSG B
*	2,833	98.0	Roofs
*	6,024	98.0	Paved parking
	128,229	61.7	Weighted Average
	119,372	59.0	93.09% Pervious Area
	8,857	98.0	6.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.9	100	0.1600	0.17		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
13.2	1,089	0.0760	1.38		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
23.1	1,189	Total			

Summary for Subcatchment 4S: SUBCATCHMENT

Runoff = 8.36 cfs @ 12.44 hrs, Volume= 1.07 af, Depth> 2.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=5.66"

	Area (sf)	CN	Description
	12,309	55.0	Woods, Good, HSG B
	150,990	70.0	Woods, Good, HSG C
	41,699	61.0	>75% Grass cover, Good, HSG B
*	2,548	98.0	Roofs
*	16,327	98.0	Paved parking
	223,873	69.9	Weighted Average
	204,998	67.3	91.57% Pervious Area
	18,875	98.0	8.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.8	100	0.0500	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
10.6	1,127	0.1250	1.77		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.5	55	0.0730	1.89		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.9	68	0.0590	1.21		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	30	0.1000	2.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	16	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.1	240	0.0750	1.92		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.3	73	0.0410	4.11		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.6	180	0.0720	5.45		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
31.1	1,889	Total			

Summary for Subcatchment 5S: SUBCATCHMENT

Runoff = 1.16 cfs @ 12.12 hrs, Volume= 0.09 af, Depth> 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=5.66"

	Area (sf)	CN	Description
	10,801	61.0	>75% Grass cover, Good, HSG B
*	5,640	98.0	Paved parking
	16,441	73.7	Weighted Average
	10,801	61.0	65.70% Pervious Area
	5,640	98.0	34.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	100	0.0700	0.26		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
0.1	16	0.0400	4.06		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.5	162	0.0680	1.83		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	20	0.0400	4.06		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.8	91	0.0770	1.94		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.7	389	Total			

Summary for Subcatchment 6S: SUBCATCHMENT

Runoff = 10.73 cfs @ 12.35 hrs, Volume= 1.23 af, Depth> 2.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=5.66"

	Area (sf)	CN	Description
	237,230	70.0	Woods, Good, HSG C
*	4,709	74.0	>75% Grass cover, Good, HSG C
*	6,498	98.0	Paved parking
	248,437	70.8	Weighted Average
	241,939	70.1	97.38% Pervious Area
	6,498	98.0	2.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.8	100	0.0500	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
8.1	856	0.1250	1.77		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.0	10	0.3000	3.83		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.5	139	0.0500	4.54		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
24.4	1,105	Total			

Summary for Subcatchment 7S: SUBCATCHMENT

Runoff = 9.42 cfs @ 12.29 hrs, Volume= 1.01 af, Depth> 2.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=5.66"

Area (sf)	CN	Description
195,095	70.0	Woods, Good, HSG C
3,533	74.0	>75% Grass cover, Good, HSG C
4,313	98.0	Paved parking, HSG C
764	96.0	Gravel surface, HSG C
203,705	70.8	Weighted Average
199,392	70.2	97.88% Pervious Area
4,313	98.0	2.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	100	0.0900	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
7.5	755	0.1130	1.68		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.0	6	0.3000	3.83		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.7	160	0.0375	3.93		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
20.7	1,021	Total			

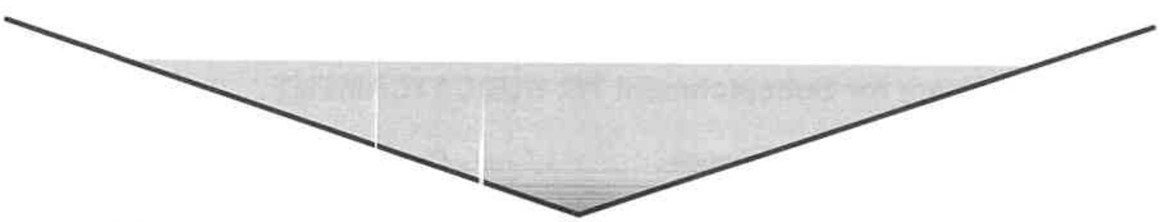
Summary for Reach 1R: EXISTING ROADWAY DITCH

Inflow Area = 5.517 ac, 10.20% Impervious, Inflow Depth > 2.53" for 25-YEAR event
Inflow = 8.80 cfs @ 12.44 hrs, Volume= 1.16 af
Outflow = 8.80 cfs @ 12.44 hrs, Volume= 1.16 af, Atten= 0%, Lag= 0.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.64 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 2.25 fps, Avg. Travel Time= 1.7 min

Peak Storage= 436 cf @ 12.44 hrs
Average Depth at Peak Storage= 0.80'
Bank-Full Depth= 1.00' Flow Area= 3.0 sf, Capacity= 16.21 cfs

0.00' x 1.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 6.00'
Length= 230.0' Slope= 0.0173 '/'
Inlet Invert= 295.64', Outlet Invert= 291.66'



Summary for Pond 1P: EXISTING CB

Inflow Area = 24.393 ac, 2.71% Impervious, Inflow Depth > 2.06" for 25-YEAR event
Inflow = 29.03 cfs @ 12.57 hrs, Volume= 4.19 af
Primary = 29.03 cfs @ 12.57 hrs, Volume= 4.19 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Pond 2P: EXISTING DRIVEWAY CULVERT

Inflow Area = 2.596 ac, 12.76% Impervious, Inflow Depth > 1.80" for 25-YEAR event
Inflow = 3.49 cfs @ 12.29 hrs, Volume= 0.39 af
Outflow = 3.49 cfs @ 12.29 hrs, Volume= 0.39 af, Atten= 0%, Lag= 0.0 min
Primary = 3.49 cfs @ 12.29 hrs, Volume= 0.39 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 298.26' @ 12.50 hrs
Flood Elev= 294.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	292.40'	**12.0" Round Culvert** L= 21.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 292.40' / 292.10' S= 0.0143 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=2.90 cfs @ 12.29 hrs HW=295.16' TW=294.58' (Dynamic Tailwater)
1=Culvert (Inlet Controls 2.90 cfs @ 3.69 fps)

Summary for Pond 3P: EXISTING DROP INLET

Inflow Area = 35.450 ac, 4.96% Impervious, Inflow Depth > 2.10" for 25-YEAR event
Inflow = 43.08 cfs @ 12.49 hrs, Volume= 6.19 af
Outflow = 43.08 cfs @ 12.49 hrs, Volume= 6.19 af, Atten= 0%, Lag= 0.0 min
Primary = 43.08 cfs @ 12.49 hrs, Volume= 6.19 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 297.77' @ 12.49 hrs
Flood Elev= 293.75'

Device	Routing	Invert	Outlet Devices
#1	Primary	288.66'	**24.0" Round Culvert** L= 92.1' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 288.66' / 284.67' S= 0.0433 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf

Primary OutFlow Max=43.06 cfs @ 12.49 hrs HW=297.76' TW=0.00' (Dynamic Tailwater)
1=Culvert (Inlet Controls 43.06 cfs @ 13.71 fps)

Summary for Pond 4P: EXISTING CB

Inflow Area = 5.517 ac, 10.20% Impervious, Inflow Depth > 2.53" for 25-YEAR event
Inflow = 8.80 cfs @ 12.44 hrs, Volume= 1.16 af
Outflow = 8.80 cfs @ 12.44 hrs, Volume= 1.16 af, Atten= 0%, Lag= 0.0 min
Primary = 4.59 cfs @ 12.44 hrs, Volume= 1.01 af
Secondary = 4.21 cfs @ 12.44 hrs, Volume= 0.15 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 300.47' @ 12.44 hrs
Flood Elev= 300.17'

Device	Routing	Invert	Outlet Devices
#1	Primary	297.00'	**12.0" Round Culvert** L= 49.1' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 297.00' / 295.64' S= 0.0277 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	300.17'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=4.59 cfs @ 12.44 hrs HW=300.47' TW=296.43' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 4.59 cfs @ 5.85 fps)

Secondary OutFlow Max=4.21 cfs @ 12.44 hrs HW=300.47' TW=296.43' (Dynamic Tailwater)
└**2=Orifice/Grate** (Weir Controls 4.21 cfs @ 1.78 fps)

Summary for Pond 5P: EXISTING CB

Inflow Area = 0.377 ac, 34.30% Impervious, Inflow Depth > 2.87" for 25-YEAR event
Inflow = 1.16 cfs @ 12.12 hrs, Volume= 0.09 af
Outflow = 1.16 cfs @ 12.12 hrs, Volume= 0.09 af, Atten= 0%, Lag= 0.0 min
Primary = 1.16 cfs @ 12.12 hrs, Volume= 0.09 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 300.50' @ 12.41 hrs
Flood Elev= 301.16'

Device	Routing	Invert	Outlet Devices
#1	Primary	297.70'	**12.0" Round Culvert** L= 34.1' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 297.70' / 297.30' S= 0.0117 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	301.16'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.08 cfs @ 12.12 hrs HW=300.38' TW=300.22' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 1.08 cfs @ 1.37 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=297.70' TW=0.00' (Dynamic Tailwater)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Attachment "F"

Summary for Pond 6P: EXISTING CB

Inflow Area =	5.703 ac,	2.62% Impervious,	Inflow Depth > 2.60"	for 25-YEAR event	
Inflow =	10.73 cfs @	12.35 hrs,	Volume=	1.23 af	
Outflow =	10.73 cfs @	12.35 hrs,	Volume=	1.23 af,	Atten= 0%, Lag= 0.0 min
Primary =	10.73 cfs @	12.35 hrs,	Volume=	1.23 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 373.86' @ 12.35 hrs
Flood Elev= 366.35'

Device	Routing	Invert	Outlet Devices
#1	Primary	363.70'	**12.0" Round Culvert** L= 18.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 363.70' / 362.46' S= 0.0689 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf

Primary OutFlow Max=10.72 cfs @ 12.35 hrs HW=373.85' TW=0.00' (Dynamic Tailwater)
1=Culvert (Barrel Controls 10.72 cfs @ 13.65 fps)

Summary for Pond 7P: EXISTING CB

Inflow Area =	4.676 ac,	2.12% Impervious,	Inflow Depth > 2.59"	for 25-YEAR event	
Inflow =	9.42 cfs @	12.29 hrs,	Volume=	1.01 af	
Outflow =	9.42 cfs @	12.29 hrs,	Volume=	1.01 af,	Atten= 0%, Lag= 0.0 min
Primary =	9.42 cfs @	12.29 hrs,	Volume=	1.01 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 383.28' @ 12.29 hrs
Flood Elev= 380.49'

Device	Routing	Invert	Outlet Devices
#1	Primary	376.57'	**12.0" Round Culvert** L= 31.9' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 376.57' / 376.28' S= 0.0091 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=9.42 cfs @ 12.29 hrs HW=383.27' TW=0.00' (Dynamic Tailwater)
1=Culvert (Inlet Controls 9.42 cfs @ 11.99 fps)

Summary for Link A: BARRETTS HILL CROSSING

Inflow Area =	35.450 ac,	4.96% Impervious,	Inflow Depth > 2.10"	for 25-YEAR event	
Inflow =	43.08 cfs @	12.49 hrs,	Volume=	6.19 af	
Primary =	43.08 cfs @	12.49 hrs,	Volume=	6.19 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Attachment "F"

Summary for Link B: LOT 57

Inflow Area =	5.703 ac,	2.62% Impervious, Inflow Depth >	2.60"	for 25-YEAR event
Inflow =	10.73 cfs @	12.35 hrs, Volume=	1.23 af	
Primary =	10.73 cfs @	12.35 hrs, Volume=	1.23 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link C: LOT 11

Inflow Area =	4.676 ac,	2.12% Impervious, Inflow Depth >	2.59"	for 25-YEAR event
Inflow =	9.42 cfs @	12.29 hrs, Volume=	1.01 af	
Primary =	9.42 cfs @	12.29 hrs, Volume=	1.01 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: SUBCATCHMENT Runoff Area=1,062,579 sf 2.71% Impervious Runoff Depth>2.87"
Flow Length=2,203' Tc=38.1 min CN=64.7 Runoff=41.09 cfs 5.83 af

Subcatchment 2S: SUBCATCHMENT Runoff Area=113,081 sf 12.76% Impervious Runoff Depth>2.56"
Flow Length=683' Tc=20.1 min CN=61.4 Runoff=5.12 cfs 0.55 af

Subcatchment 3S: SUBCATCHMENT Runoff Area=128,229 sf 6.91% Impervious Runoff Depth>2.59"
Flow Length=1,189' Tc=23.1 min CN=61.7 Runoff=5.55 cfs 0.64 af

Subcatchment 4S: SUBCATCHMENT Runoff Area=223,873 sf 8.43% Impervious Runoff Depth>3.39"
Flow Length=1,889' Tc=31.1 min CN=69.9 Runoff=11.40 cfs 1.45 af

Subcatchment 5S: SUBCATCHMENT Runoff Area=16,441 sf 34.30% Impervious Runoff Depth>3.80"
Flow Length=389' Tc=8.7 min CN=73.7 Runoff=1.54 cfs 0.12 af

Subcatchment 6S: SUBCATCHMENT Runoff Area=248,437 sf 2.62% Impervious Runoff Depth>3.49"
Flow Length=1,105' Tc=24.4 min CN=70.8 Runoff=14.53 cfs 1.66 af

Subcatchment 7S: SUBCATCHMENT Runoff Area=203,705 sf 2.12% Impervious Runoff Depth>3.49"
Flow Length=1,021' Tc=20.7 min CN=70.8 Runoff=12.77 cfs 1.36 af

Reach 1R: EXISTING ROADWAY DITCH Avg. Flow Depth=0.89' Max Vel=5.01 fps Inflow=11.98 cfs 1.57 af
n=0.022 L=230.0' S=0.0173 '/' Capacity=16.21 cfs Outflow=11.98 cfs 1.57 af

Pond 1P: EXISTING CB Inflow=41.09 cfs 5.83 af
Primary=41.09 cfs 5.83 af

Pond 2P: EXISTING DRIVEWAY CULVERT Peak Elev=306.84' Inflow=5.12 cfs 0.55 af
12.0" Round Culvert n=0.013 L=21.0' S=0.0143 '/' Outflow=5.12 cfs 0.55 af

Pond 3P: EXISTING DROP INLET Peak Elev=305.84' Inflow=60.85 cfs 8.59 af
24.0" Round Culvert n=0.011 L=92.1' S=0.0433 '/' Outflow=60.85 cfs 8.59 af

Pond 4P: EXISTING CB Peak Elev=300.60' Inflow=11.98 cfs 1.57 af
Primary=4.67 cfs 1.25 af Secondary=7.31 cfs 0.32 af Outflow=11.98 cfs 1.57 af

Pond 5P: EXISTING CB Peak Elev=300.68' Inflow=1.54 cfs 0.12 af
Primary=1.54 cfs 0.12 af Secondary=0.00 cfs 0.00 af Outflow=1.54 cfs 0.12 af

Pond 6P: EXISTING CB Peak Elev=382.54' Inflow=14.53 cfs 1.66 af
12.0" Round Culvert n=0.025 L=18.0' S=0.0689 '/' Outflow=14.53 cfs 1.66 af

Pond 7P: EXISTING CB Peak Elev=388.48' Inflow=12.77 cfs 1.36 af
12.0" Round Culvert n=0.011 L=31.9' S=0.0091 '/' Outflow=12.77 cfs 1.36 af

Link A: BARRETTS HILL CROSSING Inflow=60.85 cfs 8.59 af
Primary=60.85 cfs 8.59 af

Link B: LOT 57

Inflow=14.53 cfs 1.66 af
Primary=14.53 cfs 1.66 af

Link C: LOT 11

Inflow=12.77 cfs 1.36 af
Primary=12.77 cfs 1.36 af

Total Runoff Area = 45.830 ac Runoff Volume = 11.62 af Average Runoff Depth = 3.04"
95.62% Pervious = 43.824 ac 4.38% Impervious = 2.006 ac

Summary for Subcatchment 1S: SUBCATCHMENT

Runoff = 41.09 cfs @ 12.57 hrs, Volume= 5.83 af, Depth> 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-YEAR Rainfall=6.77"

	Area (sf)	CN	Description
	7,670	30.0	Woods, Good, HSG A
	363,085	55.0	Woods, Good, HSG B
	574,693	70.0	Woods, Good, HSG C
	6,684	39.0	>75% Grass cover, Good, HSG A
	61,618	61.0	>75% Grass cover, Good, HSG B
	20,067	74.0	>75% Grass cover, Good, HSG C
*	14,404	98.0	Roofs
*	14,358	98.0	Paved parking
	1,062,579	64.7	Weighted Average
	1,033,817	63.8	97.29% Pervious Area
	28,762	98.0	2.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.3	100	0.0400	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
19.7	1,862	0.0988	1.57		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.3	30	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.8	211	0.0430	4.21		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
38.1	2,203	Total			

Summary for Subcatchment 2S: SUBCATCHMENT

Runoff = 5.12 cfs @ 12.29 hrs, Volume= 0.55 af, Depth> 2.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-YEAR Rainfall=6.77"

	Area (sf)	CN	Description
	28,414	30.0	Woods, Good, HSG A
	11,383	55.0	Woods, Good, HSG B
	33,808	70.0	Woods, Good, HSG C
	4,719	39.0	>75% Grass cover, Good, HSG A
	242	61.0	>75% Grass cover, Good, HSG B
	20,087	74.0	>75% Grass cover, Good, HSG C
*	3,849	98.0	Roofs
*	10,579	98.0	Paved parking
	113,081	61.4	Weighted Average
	98,653	56.1	87.24% Pervious Area
	14,428	98.0	12.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	100	0.1000	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
3.9	318	0.0750	1.37		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.7	48	0.0300	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.6	217	0.0410	1.01		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
20.1	683	Total			

Summary for Subcatchment 3S: SUBCATCHMENT

Runoff = 5.55 cfs @ 12.34 hrs, Volume= 0.64 af, Depth> 2.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-YEAR Rainfall=6.77"

	Area (sf)	CN	Description
	5,732	30.0	Woods, Good, HSG A
	49,737	55.0	Woods, Good, HSG B
	38,476	70.0	Woods, Good, HSG C
	4,799	39.0	>75% Grass cover, Good, HSG A
	20,628	61.0	>75% Grass cover, Good, HSG B
*	2,833	98.0	Roofs
*	6,024	98.0	Paved parking
	128,229	61.7	Weighted Average
	119,372	59.0	93.09% Pervious Area
	8,857	98.0	6.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.9	100	0.1600	0.17		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
13.2	1,089	0.0760	1.38		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
23.1	1,189	Total			

Summary for Subcatchment 4S: SUBCATCHMENT

Runoff = 11.40 cfs @ 12.44 hrs, Volume= 1.45 af, Depth> 3.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-YEAR Rainfall=6.77"

	Area (sf)	CN	Description
	12,309	55.0	Woods, Good, HSG B
	150,990	70.0	Woods, Good, HSG C
	41,699	61.0	>75% Grass cover, Good, HSG B
*	2,548	98.0	Roofs
*	16,327	98.0	Paved parking
	223,873	69.9	Weighted Average
	204,998	67.3	91.57% Pervious Area
	18,875	98.0	8.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.8	100	0.0500	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
10.6	1,127	0.1250	1.77		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.5	55	0.0730	1.89		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.9	68	0.0590	1.21		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	30	0.1000	2.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	16	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.1	240	0.0750	1.92		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.3	73	0.0410	4.11		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.6	180	0.0720	5.45		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
31.1	1,889	Total			

Summary for Subcatchment 5S: SUBCATCHMENT

Runoff = 1.54 cfs @ 12.12 hrs, Volume= 0.12 af, Depth> 3.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-YEAR Rainfall=6.77"

	Area (sf)	CN	Description
	10,801	61.0	>75% Grass cover, Good, HSG B
*	5,640	98.0	Paved parking
	16,441	73.7	Weighted Average
	10,801	61.0	65.70% Pervious Area
	5,640	98.0	34.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	100	0.0700	0.26		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
0.1	16	0.0400	4.06		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.5	162	0.0680	1.83		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	20	0.0400	4.06		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.8	91	0.0770	1.94		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.7	389	Total			

Summary for Subcatchment 6S: SUBCATCHMENT

Runoff = 14.53 cfs @ 12.35 hrs, Volume= 1.66 af, Depth> 3.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-YEAR Rainfall=6.77"

	Area (sf)	CN	Description
	237,230	70.0	Woods, Good, HSG C
*	4,709	74.0	>75% Grass cover, Good, HSG C
*	6,498	98.0	Paved parking
	248,437	70.8	Weighted Average
	241,939	70.1	97.38% Pervious Area
	6,498	98.0	2.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.8	100	0.0500	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
8.1	856	0.1250	1.77		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.0	10	0.3000	3.83		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.5	139	0.0500	4.54		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
24.4	1,105	Total			

Summary for Subcatchment 7S: SUBCATCHMENT

Runoff = 12.77 cfs @ 12.29 hrs, Volume= 1.36 af, Depth> 3.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-YEAR Rainfall=6.77"

Attachment "F"

Area (sf)	CN	Description
195,095	70.0	Woods, Good, HSG C
3,533	74.0	>75% Grass cover, Good, HSG C
4,313	98.0	Paved parking, HSG C
764	96.0	Gravel surface, HSG C
203,705	70.8	Weighted Average
199,392	70.2	97.88% Pervious Area
4,313	98.0	2.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	100	0.0900	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
7.5	755	0.1130	1.68		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.0	6	0.3000	3.83		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.7	160	0.0375	3.93		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
20.7	1,021	Total			

Summary for Reach 1R: EXISTING ROADWAY DITCH

Inflow Area = 5.517 ac, 10.20% Impervious, Inflow Depth > 3.42" for 50-YEAR event
Inflow = 11.98 cfs @ 12.41 hrs, Volume= 1.57 af
Outflow = 11.98 cfs @ 12.43 hrs, Volume= 1.57 af, Atten= 0%, Lag= 1.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.01 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 2.37 fps, Avg. Travel Time= 1.6 min

Peak Storage= 550 cf @ 12.43 hrs
Average Depth at Peak Storage= 0.89'
Bank-Full Depth= 1.00' Flow Area= 3.0 sf, Capacity= 16.21 cfs

0.00' x 1.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 6.00'
Length= 230.0' Slope= 0.0173 '/'
Inlet Invert= 295.64', Outlet Invert= 291.66'

Summary for Pond 1P: EXISTING CB

Inflow Area = 24.393 ac, 2.71% Impervious, Inflow Depth > 2.87" for 50-YEAR event
Inflow = 41.09 cfs @ 12.57 hrs, Volume= 5.83 af
Primary = 41.09 cfs @ 12.57 hrs, Volume= 5.83 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Pond 2P: EXISTING DRIVEWAY CULVERT

Inflow Area = 2.596 ac, 12.76% Impervious, Inflow Depth > 2.56" for 50-YEAR event
Inflow = 5.12 cfs @ 12.29 hrs, Volume= 0.55 af
Outflow = 5.12 cfs @ 12.29 hrs, Volume= 0.55 af, Atten= 0%, Lag= 0.0 min
Primary = 5.12 cfs @ 12.29 hrs, Volume= 0.55 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 306.84' @ 12.50 hrs
Flood Elev= 294.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	292.40'	**12.0" Round Culvert** L= 21.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 292.40' / 292.10' S= 0.0143 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=4.32 cfs @ 12.29 hrs HW=301.22' TW=299.91' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 4.32 cfs @ 5.51 fps)

Summary for Pond 3P: EXISTING DROP INLET

Inflow Area = 35.450 ac, 4.96% Impervious, Inflow Depth > 2.91" for 50-YEAR event
Inflow = 60.85 cfs @ 12.49 hrs, Volume= 8.59 af
Outflow = 60.85 cfs @ 12.49 hrs, Volume= 8.59 af, Atten= 0%, Lag= 0.0 min
Primary = 60.85 cfs @ 12.49 hrs, Volume= 8.59 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 305.84' @ 12.49 hrs
Flood Elev= 293.75'

Device	Routing	Invert	Outlet Devices
#1	Primary	288.66'	**24.0" Round Culvert** L= 92.1' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 288.66' / 284.67' S= 0.0433 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf

Primary OutFlow Max=60.85 cfs @ 12.49 hrs HW=305.84' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 60.85 cfs @ 19.37 fps)

Summary for Pond 4P: EXISTING CB

Inflow Area = 5.517 ac, 10.20% Impervious, Inflow Depth > 3.42" for 50-YEAR event
Inflow = 11.98 cfs @ 12.41 hrs, Volume= 1.57 af
Outflow = 11.98 cfs @ 12.41 hrs, Volume= 1.57 af, Atten= 0%, Lag= 0.0 min
Primary = 4.67 cfs @ 12.41 hrs, Volume= 1.25 af
Secondary = 7.31 cfs @ 12.41 hrs, Volume= 0.32 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 300.60' @ 12.41 hrs
Flood Elev= 300.17'

Device	Routing	Invert	Outlet Devices
#1	Primary	297.00'	**12.0" Round Culvert** L= 49.1' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 297.00' / 295.64' S= 0.0277 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	300.17'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=4.67 cfs @ 12.41 hrs HW=300.60' TW=296.53' (Dynamic Tailwater)
└─1=Culvert (Barrel Controls 4.67 cfs @ 5.95 fps)

Secondary OutFlow Max=7.31 cfs @ 12.41 hrs HW=300.60' TW=296.53' (Dynamic Tailwater)
└─2=Orifice/Grate (Weir Controls 7.31 cfs @ 2.14 fps)

Summary for Pond 5P: EXISTING CB

Inflow Area = 0.377 ac, 34.30% Impervious, Inflow Depth > 3.80" for 50-YEAR event
Inflow = 1.54 cfs @ 12.12 hrs, Volume= 0.12 af
Outflow = 1.54 cfs @ 12.12 hrs, Volume= 0.12 af, Atten= 0%, Lag= 0.0 min
Primary = 1.54 cfs @ 12.12 hrs, Volume= 0.12 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 300.68' @ 12.14 hrs
Flood Elev= 301.16'

Device	Routing	Invert	Outlet Devices
#1	Primary	297.70'	**12.0" Round Culvert** L= 34.1' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 297.70' / 297.30' S= 0.0117 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	301.16'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.50 cfs @ 12.12 hrs HW=300.66' TW=300.35' (Dynamic Tailwater)
└─1=Culvert (Outlet Controls 1.50 cfs @ 1.91 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=297.70' TW=0.00' (Dynamic Tailwater)
└─2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 6P: EXISTING CB

Inflow Area =	5.703 ac,	2.62% Impervious,	Inflow Depth > 3.49"	for 50-YEAR event
Inflow =	14.53 cfs @	12.35 hrs, Volume=	1.66 af	
Outflow =	14.53 cfs @	12.35 hrs, Volume=	1.66 af,	Atten= 0%, Lag= 0.0 min
Primary =	14.53 cfs @	12.35 hrs, Volume=	1.66 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 382.54' @ 12.35 hrs
Flood Elev= 366.35'

Device	Routing	Invert	Outlet Devices
#1	Primary	363.70'	**12.0" Round Culvert** L= 18.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 363.70' / 362.46' S= 0.0689 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf

Primary OutFlow Max=14.52 cfs @ 12.35 hrs HW=382.52' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 14.52 cfs @ 18.49 fps)

Summary for Pond 7P: EXISTING CB

Inflow Area =	4.676 ac,	2.12% Impervious,	Inflow Depth > 3.49"	for 50-YEAR event
Inflow =	12.77 cfs @	12.29 hrs, Volume=	1.36 af	
Outflow =	12.77 cfs @	12.29 hrs, Volume=	1.36 af,	Atten= 0%, Lag= 0.0 min
Primary =	12.77 cfs @	12.29 hrs, Volume=	1.36 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 388.48' @ 12.29 hrs
Flood Elev= 380.49'

Device	Routing	Invert	Outlet Devices
#1	Primary	376.57'	**12.0" Round Culvert** L= 31.9' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 376.57' / 376.28' S= 0.0091 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=12.77 cfs @ 12.29 hrs HW=388.47' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 12.77 cfs @ 16.26 fps)

Summary for Link A: BARRETTS HILL CROSSING

Inflow Area =	35.450 ac,	4.96% Impervious,	Inflow Depth > 2.91"	for 50-YEAR event
Inflow =	60.85 cfs @	12.49 hrs, Volume=	8.59 af	
Primary =	60.85 cfs @	12.49 hrs, Volume=	8.59 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link B: LOT 57

Inflow Area =	5.703 ac,	2.62% Impervious, Inflow Depth > 3.49"	for 50-YEAR event
Inflow =	14.53 cfs @	12.35 hrs, Volume=	1.66 af
Primary =	14.53 cfs @	12.35 hrs, Volume=	1.66 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

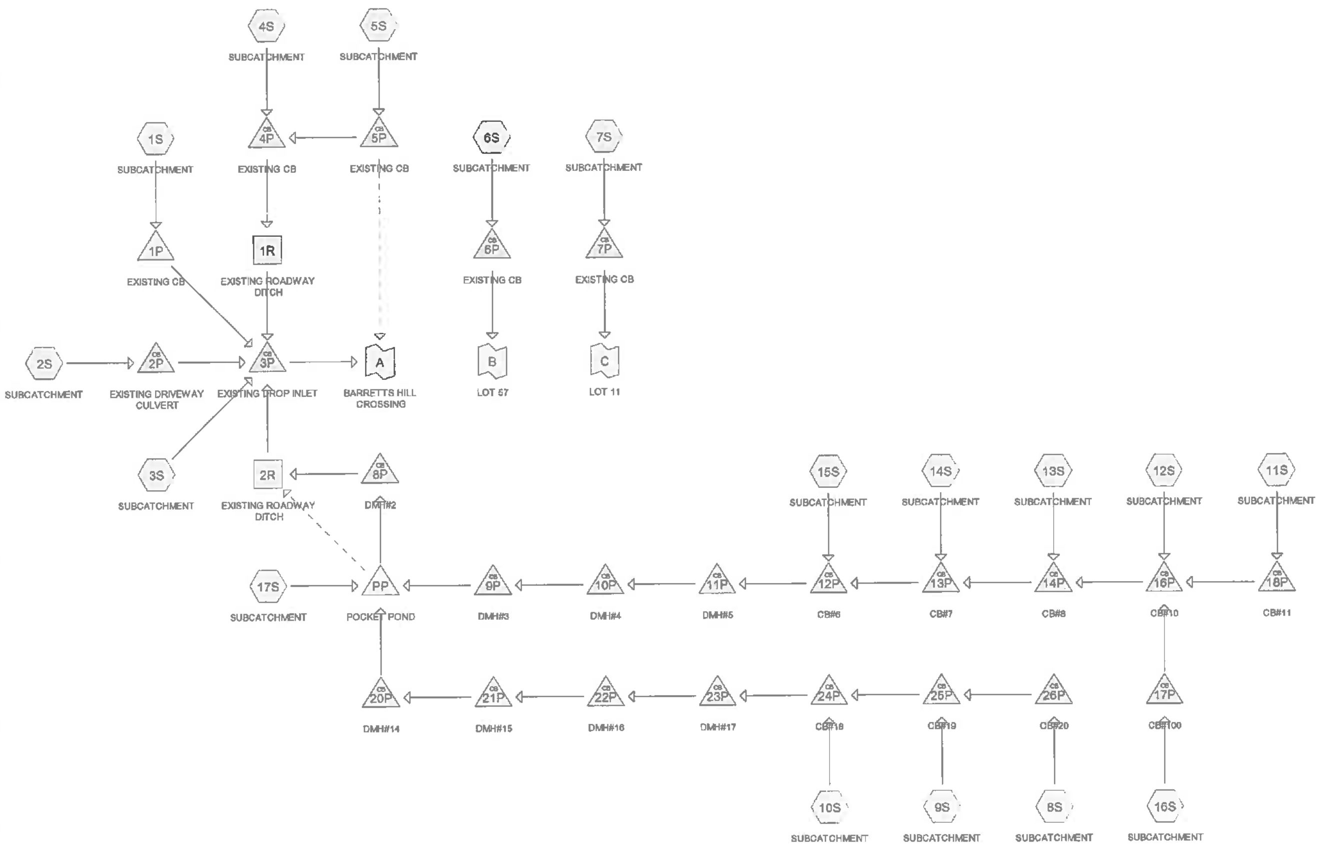
Summary for Link C: LOT 11

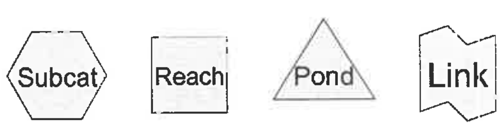
Inflow Area =	4.676 ac,	2.12% Impervious, Inflow Depth > 3.49"	for 50-YEAR event
Inflow =	12.77 cfs @	12.29 hrs, Volume=	1.36 af
Primary =	12.77 cfs @	12.29 hrs, Volume=	1.36 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Attachment "F"

Attachment "F"





Routing Diagram for 2304141-POST DEVELOPMENT
Prepared by Keach-Nordstrom Associates, Inc., Printed 12/6/2023
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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.372	39.0	>75% Grass cover, Good, HSG A (1S, 2S, 3S)
3.066	61.0	>75% Grass cover, Good, HSG B (1S, 2S, 3S, 4S, 5S)
6.687	74.0	>75% Grass cover, Good, HSG C (1S, 2S, 3S, 4S, 6S, 7S, 8S, 9S, 10S, 11S, 12S, 13S, 14S, 15S, 16S, 17S)
0.058	96.0	Gravel surface, HSG C (6S, 7S, 17S)
2.320	98.0	Paved parking (1S, 2S, 3S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S, 13S, 14S, 15S, 16S, 17S)
0.375	98.0	Paved parking, HSG C (4S)
1.204	98.0	Roofs (1S, 2S, 3S, 4S, 6S, 7S, 9S, 10S, 12S, 17S)
0.960	30.0	Woods, Good, HSG A (1S, 2S, 3S)
9.984	55.0	Woods, Good, HSG B (1S, 2S, 3S, 4S)
20.805	70.0	Woods, Good, HSG C (1S, 2S, 3S, 4S, 6S, 7S, 8S, 9S, 10S, 11S, 12S, 13S, 14S, 17S)
45.830	**68.0**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
1.332	HSG A	1S, 2S, 3S
13.050	HSG B	1S, 2S, 3S, 4S, 5S
27.924	HSG C	1S, 2S, 3S, 4S, 6S, 7S, 8S, 9S, 10S, 11S, 12S, 13S, 14S, 15S, 16S, 17S
0.000	HSG D	
3.524	Other	1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S, 13S, 14S, 15S, 16S, 17S
45.830		**TOTAL AREA**

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: SUBCATCHMENT Runoff Area=961,091 sf 4.08% Impervious Runoff Depth>0.46"
Flow Length=2,203' Tc=38.1 min CN=64.6 Runoff=4.52 cfs 0.85 af

Subcatchment 2S: SUBCATCHMENT Runoff Area=113,081 sf 12.76% Impervious Runoff Depth>0.36"
Flow Length=683' Tc=20.1 min CN=61.4 Runoff=0.44 cfs 0.08 af

Subcatchment 3S: SUBCATCHMENT Runoff Area=124,041 sf 7.14% Impervious Runoff Depth>0.36"
Flow Length=1,189' Tc=23.1 min CN=61.5 Runoff=0.48 cfs 0.09 af

Subcatchment 4S: SUBCATCHMENT Runoff Area=86,429 sf 21.84% Impervious Runoff Depth>0.71"
Tc=6.0 min CN=70.6 Runoff=1.45 cfs 0.12 af

Subcatchment 5S: SUBCATCHMENT Runoff Area=16,441 sf 34.30% Impervious Runoff Depth>0.86"
Flow Length=389' Tc=8.7 min CN=73.7 Runoff=0.32 cfs 0.03 af

Subcatchment 6S: SUBCATCHMENT Runoff Area=91,362 sf 14.39% Impervious Runoff Depth>0.96"
Flow Length=692' Tc=19.5 min CN=75.7 Runoff=1.52 cfs 0.17 af

Subcatchment 7S: SUBCATCHMENT Runoff Area=112,988 sf 9.49% Impervious Runoff Depth>0.85"
Flow Length=1,021' Tc=20.7 min CN=73.5 Runoff=1.57 cfs 0.18 af

Subcatchment 8S: SUBCATCHMENT Runoff Area=30,577 sf 34.65% Impervious Runoff Depth>1.24"
Flow Length=719' Tc=20.3 min CN=80.6 Runoff=0.68 cfs 0.07 af

Subcatchment 9S: SUBCATCHMENT Runoff Area=67,824 sf 18.27% Impervious Runoff Depth>0.99"
Flow Length=1,293' Tc=26.9 min CN=76.4 Runoff=1.03 cfs 0.13 af

Subcatchment 10S: SUBCATCHMENT Runoff Area=68,434 sf 8.00% Impervious Runoff Depth>0.82"
Flow Length=676' Tc=23.0 min CN=73.0 Runoff=0.88 cfs 0.11 af

Subcatchment 11S: SUBCATCHMENT Runoff Area=66,396 sf 2.68% Impervious Runoff Depth>0.74"
Flow Length=690' Tc=20.7 min CN=71.4 Runoff=0.79 cfs 0.09 af

Subcatchment 12S: SUBCATCHMENT Runoff Area=59,686 sf 10.36% Impervious Runoff Depth>0.87"
Flow Length=753' Tc=18.7 min CN=73.9 Runoff=0.89 cfs 0.10 af

Subcatchment 13S: SUBCATCHMENT Runoff Area=54,469 sf 6.63% Impervious Runoff Depth>0.81"
Flow Length=680' Tc=16.3 min CN=72.6 Runoff=0.78 cfs 0.08 af

Subcatchment 14S: SUBCATCHMENT Runoff Area=38,021 sf 9.74% Impervious Runoff Depth>0.86"
Flow Length=731' Tc=17.2 min CN=73.7 Runoff=0.58 cfs 0.06 af

Subcatchment 15S: SUBCATCHMENT Runoff Area=14,603 sf 40.57% Impervious Runoff Depth>1.46"
Tc=6.0 min CN=83.7 Runoff=0.57 cfs 0.04 af

Subcatchment 16S: SUBCATCHMENT Runoff Area=7,988 sf 70.27% Impervious Runoff Depth>2.01"
Tc=6.0 min CN=90.9 Runoff=0.43 cfs 0.03 af

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Subcatchment 17S: SUBCATCHMENT Runoff Area=82,926 sf 4.39% Impervious Runoff Depth>0.88"
Flow Length=230' Tc=13.2 min CN=74.2 Runoff=1.45 cfs 0.14 af

Reach 1R: EXISTING ROADWAY DITCH Avg. Flow Depth=0.43' Max Vel=3.08 fps Inflow=1.75 cfs 0.14 af
n=0.022 L=230.0' S=0.0173 '/' Capacity=16.21 cfs Outflow=1.72 cfs 0.14 af

Reach 2R: EXISTING ROADWAY DITCH Avg. Flow Depth=0.19' Max Vel=1.29 fps Inflow=0.26 cfs 0.24 af
n=0.069 L=915.0' S=0.0621 '/' Capacity=12.04 cfs Outflow=0.26 cfs 0.24 af

Pond 1P: EXISTING CB Inflow=4.52 cfs 0.85 af
Primary=4.52 cfs 0.85 af

Pond 2P: EXISTING DRIVEWAY CULVERT Peak Elev=292.73' Inflow=0.44 cfs 0.08 af
12.0" Round Culvert n=0.013 L=21.0' S=0.0143 '/' Outflow=0.44 cfs 0.08 af

Pond 3P: EXISTING DROP INLET Peak Elev=289.71' Inflow=5.83 cfs 1.39 af
24.0" Round Culvert n=0.011 L=92.1' S=0.0433 '/' Outflow=5.83 cfs 1.39 af

Pond 4P: EXISTING CB Peak Elev=297.75' Inflow=1.75 cfs 0.14 af
Primary=1.75 cfs 0.14 af Secondary=0.00 cfs 0.00 af Outflow=1.75 cfs 0.14 af

Pond 5P: EXISTING CB Peak Elev=298.09' Inflow=0.32 cfs 0.03 af
Primary=0.32 cfs 0.03 af Secondary=0.00 cfs 0.00 af Outflow=0.32 cfs 0.03 af

Pond 6P: EXISTING CB Peak Elev=364.36' Inflow=1.52 cfs 0.17 af
12.0" Round Culvert n=0.025 L=18.0' S=0.0689 '/' Outflow=1.52 cfs 0.17 af

Pond 7P: EXISTING CB Peak Elev=377.28' Inflow=1.57 cfs 0.18 af
12.0" Round Culvert n=0.011 L=31.9' S=0.0091 '/' Outflow=1.57 cfs 0.18 af

Pond 8P: DMH#2 Peak Elev=349.93' Inflow=0.26 cfs 0.24 af
15.0" Round Culvert n=0.013 L=15.0' S=0.0800 '/' Outflow=0.26 cfs 0.24 af

Pond 9P: DMH#3 Peak Elev=375.27' Inflow=3.47 cfs 0.41 af
18.0" Round Culvert n=0.013 L=30.0' S=0.0073 '/' Outflow=3.47 cfs 0.41 af

Pond 10P: DMH#4 Peak Elev=376.49' Inflow=3.47 cfs 0.41 af
18.0" Round Culvert n=0.013 L=121.7' S=0.0100 '/' Outflow=3.47 cfs 0.41 af

Pond 11P: DMH#5 Peak Elev=378.82' Inflow=3.47 cfs 0.41 af
18.0" Round Culvert n=0.013 L=226.1' S=0.0100 '/' Outflow=3.47 cfs 0.41 af

Pond 12P: CB#6 Peak Elev=380.33' Inflow=3.47 cfs 0.41 af
18.0" Round Culvert n=0.013 L=141.2' S=0.0100 '/' Outflow=3.47 cfs 0.41 af

Pond 13P: CB#7 Peak Elev=381.26' Inflow=3.20 cfs 0.37 af
15.0" Round Culvert n=0.013 L=30.3' S=0.0099 '/' Outflow=3.20 cfs 0.37 af

Pond 14P: CB#8 Peak Elev=385.31' Inflow=2.62 cfs 0.31 af
15.0" Round Culvert n=0.013 L=165.7' S=0.0250 '/' Outflow=2.62 cfs 0.31 af

Pond 16P: CB#10
Peak Elev=392.86' Inflow=1.85 cfs 0.22 af
12.0" Round Culvert n=0.013 L=165.5' S=0.0500 '/' Outflow=1.85 cfs 0.22 af

Pond 17P: CB#100
Peak Elev=393.57' Inflow=0.43 cfs 0.03 af
12.0" Round Culvert n=0.013 L=26.0' S=0.0200 '/' Outflow=0.43 cfs 0.03 af

Pond 18P: CB#11
Peak Elev=403.25' Inflow=0.79 cfs 0.09 af
12.0" Round Culvert n=0.013 L=167.8' S=0.0600 '/' Outflow=0.79 cfs 0.09 af

Pond 20P: DMH#14
Peak Elev=375.94' Inflow=2.54 cfs 0.31 af
18.0" Round Culvert n=0.013 L=15.0' S=0.0800 '/' Outflow=2.54 cfs 0.31 af

Pond 21P: DMH#15
Peak Elev=382.20' Inflow=2.54 cfs 0.31 af
18.0" Round Culvert n=0.013 L=30.7' S=0.0801 '/' Outflow=2.54 cfs 0.31 af

Pond 22P: DMH#16
Peak Elev=393.66' Inflow=2.54 cfs 0.31 af
18.0" Round Culvert n=0.013 L=111.5' S=0.0800 '/' Outflow=2.54 cfs 0.31 af

Pond 23P: DMH#17
Peak Elev=401.87' Inflow=2.54 cfs 0.31 af
18.0" Round Culvert n=0.013 L=45.0' S=0.0800 '/' Outflow=2.54 cfs 0.31 af

Pond 24P: CB#18
Peak Elev=403.61' Inflow=2.54 cfs 0.31 af
18.0" Round Culvert n=0.013 L=164.2' S=0.0100 '/' Outflow=2.54 cfs 0.31 af

Pond 25P: CB#19
Peak Elev=404.05' Inflow=1.66 cfs 0.20 af
15.0" Round Culvert n=0.013 L=36.5' S=0.0101 '/' Outflow=1.66 cfs 0.20 af

Pond 26P: CB#20
Peak Elev=404.24' Inflow=0.68 cfs 0.07 af
12.0" Round Culvert n=0.013 L=26.0' S=0.0100 '/' Outflow=0.68 cfs 0.07 af

Pond PP: POCKET POND
Peak Elev=369.49' Storage=34,886 cf Inflow=7.14 cfs 0.86 af
Primary=0.26 cfs 0.24 af Secondary=0.00 cfs 0.00 af Outflow=0.26 cfs 0.24 af

Link A: BARRETTS HILL CROSSING
Inflow=5.83 cfs 1.39 af
Primary=5.83 cfs 1.39 af

Link B: LOT 57
Inflow=1.52 cfs 0.17 af
Primary=1.52 cfs 0.17 af

Link C: LOT 11
Inflow=1.57 cfs 0.18 af
Primary=1.57 cfs 0.18 af

Total Runoff Area = 45.830 ac Runoff Volume = 2.37 af Average Runoff Depth = 0.62"
91.49% Pervious = 41.932 ac 8.51% Impervious = 3.898 ac

Attachment "F"

Summary for Subcatchment 1S: SUBCATCHMENT

Runoff = 4.52 cfs @ 12.66 hrs, Volume= 0.85 af, Depth> 0.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=2.95"

	Area (sf)	CN	Description
	7,670	30.0	Woods, Good, HSG A
	363,085	55.0	Woods, Good, HSG B
	427,890	70.0	Woods, Good, HSG C
	6,684	39.0	>75% Grass cover, Good, HSG A
	61,618	61.0	>75% Grass cover, Good, HSG B
	54,927	74.0	>75% Grass cover, Good, HSG C
*	21,604	98.0	Roofs
*	17,613	98.0	Paved parking
	961,091	64.6	Weighted Average
	921,874	63.2	95.92% Pervious Area
	39,217	98.0	4.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.3	100	0.0400	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
19.7	1,862	0.0988	1.57		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.3	30	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.8	211	0.0430	4.21		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
38.1	2,203	Total			

Summary for Subcatchment 2S: SUBCATCHMENT

Runoff = 0.44 cfs @ 12.43 hrs, Volume= 0.08 af, Depth> 0.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=2.95"

	Area (sf)	CN	Description
	28,414	30.0	Woods, Good, HSG A
	11,383	55.0	Woods, Good, HSG B
	33,808	70.0	Woods, Good, HSG C
	4,719	39.0	>75% Grass cover, Good, HSG A
	242	61.0	>75% Grass cover, Good, HSG B
	20,087	74.0	>75% Grass cover, Good, HSG C
*	3,849	98.0	Roofs
*	10,579	98.0	Paved parking
	113,081	61.4	Weighted Average
	98,653	56.1	87.24% Pervious Area
	14,428	98.0	12.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	100	0.1000	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
3.9	318	0.0750	1.37		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.7	48	0.0300	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.6	217	0.0410	1.01		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
20.1	683	Total			

Summary for Subcatchment 3S: SUBCATCHMENT

Runoff = 0.48 cfs @ 12.49 hrs, Volume= 0.09 af, Depth> 0.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=2.95"

	Area (sf)	CN	Description
	5,732	30.0	Woods, Good, HSG A
	49,946	55.0	Woods, Good, HSG B
	30,651	70.0	Woods, Good, HSG C
	4,799	39.0	>75% Grass cover, Good, HSG A
	20,628	61.0	>75% Grass cover, Good, HSG B
	3,428	74.0	>75% Grass cover, Good, HSG C
*	2,833	98.0	Roofs
*	6,024	98.0	Paved parking
	124,041	61.5	Weighted Average
	115,184	58.7	92.86% Pervious Area
	8,857	98.0	7.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.9	100	0.1600	0.17		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
13.2	1,089	0.0760	1.38		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
23.1	1,189	Total			

Summary for Subcatchment 4S: SUBCATCHMENT

Runoff = 1.45 cfs @ 12.10 hrs, Volume= 0.12 af, Depth> 0.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=2.95"

	Area (sf)	CN	Description
	10,510	55.0	Woods, Good, HSG B
	6,756	70.0	Woods, Good, HSG C
	40,259	61.0	>75% Grass cover, Good, HSG B
	10,029	74.0	>75% Grass cover, Good, HSG C
	16,327	98.0	Paved parking, HSG C
*	2,548	98.0	Roofs
	86,429	70.6	Weighted Average
	67,554	62.9	78.16% Pervious Area
	18,875	98.0	21.84% Impervious Area

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

Summary for Subcatchment 5S: SUBCATCHMENT

Runoff = 0.32 cfs @ 12.13 hrs, Volume= 0.03 af, Depth> 0.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=2.95"

	Area (sf)	CN	Description
	10,801	61.0	>75% Grass cover, Good, HSG B
*	5,640	98.0	Paved parking
	16,441	73.7	Weighted Average
	10,801	61.0	65.70% Pervious Area
	5,640	98.0	34.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	100	0.0700	0.26		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
0.1	16	0.0400	4.06		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.5	162	0.0680	1.83		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	20	0.0400	4.06		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.8	91	0.0770	1.94		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.7	389	Total			

Summary for Subcatchment 6S: SUBCATCHMENT

Runoff = 1.52 cfs @ 12.29 hrs, Volume= 0.17 af, Depth> 0.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=2.95"

	Area (sf)	CN	Description
	42,274	70.0	Woods, Good, HSG C
	35,721	74.0	>75% Grass cover, Good, HSG C
*	8,350	98.0	Paved parking
*	4,800	98.0	Roofs
	217	96.0	Gravel surface, HSG C
	91,362	75.7	Weighted Average
	78,212	71.9	85.61% Pervious Area
	13,150	98.0	14.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.8	100	0.0500	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
1.0	80	0.0750	1.37		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	18	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.2	12	0.0400	1.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.1	15	0.3000	3.83		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.2	467	0.0300	3.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
19.5	692	Total			

Summary for Subcatchment 7S: SUBCATCHMENT

Runoff = 1.57 cfs @ 12.32 hrs, Volume= 0.18 af, Depth> 0.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=2.95"

	Area (sf)	CN	Description
	83,250	70.0	Woods, Good, HSG C
	18,246	74.0	>75% Grass cover, Good, HSG C
*	5,928	98.0	Paved parking
	764	96.0	Gravel surface, HSG C
*	4,800	98.0	Roofs
	112,988	73.5	Weighted Average
	102,260	70.9	90.51% Pervious Area
	10,728	98.0	9.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	100	0.0900	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
7.5	755	0.1130	1.68		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.0	6	0.3000	3.83		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.7	160	0.0375	3.93		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
20.7	1,021	Total			

Summary for Subcatchment 8S: SUBCATCHMENT

Runoff = 0.68 cfs @ 12.28 hrs, Volume= 0.07 af, Depth> 1.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=2.95"

	Area (sf)	CN	Description
	13,046	70.0	Woods, Good, HSG C
	6,935	74.0	>75% Grass cover, Good, HSG C
*	10,596	98.0	Paved parking
	30,577	80.6	Weighted Average
	19,981	71.4	65.35% Pervious Area
	10,596	98.0	34.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.8	100	0.0500	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
2.9	329	0.1480	1.92		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.1	33	0.3330	4.04		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.5	257	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
20.3	719	Total			

Summary for Subcatchment 9S: SUBCATCHMENT

Runoff = 1.03 cfs @ 12.40 hrs, Volume= 0.13 af, Depth> 0.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=2.95"

	Area (sf)	CN	Description
	34,147	70.0	Woods, Good, HSG C
	21,287	74.0	>75% Grass cover, Good, HSG C
*	7,590	98.0	Paved parking
*	4,800	98.0	Roofs
	67,824	76.4	Weighted Average
	55,434	71.5	81.73% Pervious Area
	12,390	98.0	18.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.4	100	0.0300	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
2.6	350	0.1940	2.20		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	43	0.3330	4.04		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.6	800	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
26.9	1,293	Total			

Summary for Subcatchment 10S: SUBCATCHMENT

Runoff = 0.88 cfs @ 12.36 hrs, Volume= 0.11 af, Depth> 0.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=2.95"

	Area (sf)	CN	Description
	49,642	70.0	Woods, Good, HSG C
	13,315	74.0	>75% Grass cover, Good, HSG C
*	3,077	98.0	Paved parking
*	2,400	98.0	Roofs
	68,434	73.0	Weighted Average
	62,957	70.8	92.00% Pervious Area
	5,477	98.0	8.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.3	100	0.0400	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
4.0	479	0.1610	2.01		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.5	65	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.2	32	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
23.0	676	Total			

Summary for Subcatchment 11S: SUBCATCHMENT

Runoff = 0.79 cfs @ 12.33 hrs, Volume= 0.09 af, Depth> 0.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=2.95"

	Area (sf)	CN	Description
	54,267	70.0	Woods, Good, HSG C
	10,350	74.0	>75% Grass cover, Good, HSG C
*	1,779	98.0	Paved parking
	66,396	71.4	Weighted Average
	64,617	70.6	97.32% Pervious Area
	1,779	98.0	2.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.8	100	0.0500	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
4.2	485	0.1510	1.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.6	73	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	32	0.0600	4.97		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
20.7	690	Total			

Summary for Subcatchment 12S: SUBCATCHMENT

Runoff = 0.89 cfs @ 12.28 hrs, Volume= 0.10 af, Depth> 0.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=2.95"

	Area (sf)	CN	Description
	38,779	70.0	Woods, Good, HSG C
	14,722	74.0	>75% Grass cover, Good, HSG C
*	3,785	98.0	Paved parking
*	2,400	98.0	Roofs
	59,686	73.9	Weighted Average
	53,501	71.1	89.64% Pervious Area
	6,185	98.0	10.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8	100	0.0700	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
4.0	462	0.1470	1.92		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.4	55	0.1100	2.32		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.5	136	0.0600	4.97		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
18.7	753	Total			

Summary for Subcatchment 13S: SUBCATCHMENT

Runoff = 0.78 cfs @ 12.24 hrs, Volume= 0.08 af, Depth> 0.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=2.95"

	Area (sf)	CN	Description
	40,261	70.0	Woods, Good, HSG C
	10,598	74.0	>75% Grass cover, Good, HSG C
*	3,610	98.0	Paved parking
	54,469	72.6	Weighted Average
	50,859	70.8	93.37% Pervious Area
	3,610	98.0	6.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	100	0.1000	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
3.8	425	0.1410	1.88		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.3	61	0.3300	4.02		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.3	94	0.0600	4.97		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
16.3	680	Total			

Summary for Subcatchment 14S: SUBCATCHMENT

Runoff = 0.58 cfs @ 12.26 hrs, Volume= 0.06 af, Depth> 0.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=2.95"

Attachment "F"

	Area (sf)	CN	Description
	25,189	70.0	Woods, Good, HSG C
	9,128	74.0	>75% Grass cover, Good, HSG C
*	3,704	98.0	Paved parking
	38,021	73.7	Weighted Average
	34,317	71.1	90.26% Pervious Area
	3,704	98.0	9.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.1	100	0.1200	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
5.5	529	0.1020	1.60		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	46	0.3300	4.02		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.3	56	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
17.2	731	Total			

Summary for Subcatchment 15S: SUBCATCHMENT

Runoff = 0.57 cfs @ 12.09 hrs, Volume= 0.04 af, Depth> 1.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=2.95"

	Area (sf)	CN	Description
	8,678	74.0	>75% Grass cover, Good, HSG C
*	5,925	98.0	Paved parking
	14,603	83.7	Weighted Average
	8,678	74.0	59.43% Pervious Area
	5,925	98.0	40.57% Impervious Area

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

Summary for Subcatchment 16S: SUBCATCHMENT

Runoff = 0.43 cfs @ 12.09 hrs, Volume= 0.03 af, Depth> 2.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=2.95"

	Area (sf)	CN	Description
	2,375	74.0	>75% Grass cover, Good, HSG C
*	5,613	98.0	Paved parking
	7,988	90.9	Weighted Average
	2,375	74.0	29.73% Pervious Area
	5,613	98.0	70.27% Impervious Area

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

Summary for Subcatchment 17S: SUBCATCHMENT

Runoff = 1.45 cfs @ 12.20 hrs, Volume= 0.14 af, Depth> 0.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=2.95"

	Area (sf)	CN	Description
	26,296	70.0	Woods, Good, HSG C
	51,457	74.0	>75% Grass cover, Good, HSG C
*	1,238	98.0	Paved parking
*	2,400	98.0	Roofs
	1,535	96.0	Gravel surface, HSG C
	82,926	74.2	Weighted Average
	79,288	73.1	95.61% Pervious Area
	3,638	98.0	4.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	100	0.1000	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
1.0	90	0.0860	1.47		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	40	0.3300	4.02		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
13.2	230	Total			

Summary for Reach 1R: EXISTING ROADWAY DITCH

Inflow Area = 2.362 ac, 23.83% Impervious, Inflow Depth > 0.73" for 2-YEAR event
Inflow = 1.75 cfs @ 12.11 hrs, Volume= 0.14 af
Outflow = 1.72 cfs @ 12.12 hrs, Volume= 0.14 af, Atten= 2%, Lag= 1.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.08 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 1.46 fps, Avg. Travel Time= 2.6 min

Peak Storage= 128 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.43'
Bank-Full Depth= 1.00' Flow Area= 3.0 sf, Capacity= 16.21 cfs

0.00' x 1.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 6.00'
Length= 230.0' Slope= 0.0173 '/'
Inlet Invert= 295.64', Outlet Invert= 291.66'

Summary for Reach 2R: EXISTING ROADWAY DITCH

Inflow Area =	11.270 ac, 12.00% Impervious, Inflow Depth > 0.26"	for 2-YEAR event	
Inflow =	0.26 cfs @ 20.94 hrs, Volume=	0.24 af	
Outflow =	0.26 cfs @ 21.08 hrs, Volume=	0.24 af, Atten= 0%, Lag= 8.3 min	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 1.29 fps, Min. Travel Time= 11.8 min
Avg. Velocity = 1.10 fps, Avg. Travel Time= 13.9 min

Peak Storage= 182 cf @ 21.08 hrs
Average Depth at Peak Storage= 0.19'
Bank-Full Depth= 1.00' Flow Area= 3.5 sf, Capacity= 12.04 cfs

0.50' x 1.00' deep channel, n= 0.069 Riprap, 6-inch
Side Slope Z-value= 3.0 '/' Top Width= 6.50'
Length= 915.0' Slope= 0.0621 '/'
Inlet Invert= 348.50', Outlet Invert= 291.66'

Summary for Pond 1P: EXISTING CB

Inflow Area =	22.064 ac, 4.08% Impervious, Inflow Depth > 0.46"	for 2-YEAR event	
Inflow =	4.52 cfs @ 12.66 hrs, Volume=	0.85 af	
Primary =	4.52 cfs @ 12.66 hrs, Volume=	0.85 af, Atten= 0%, Lag= 0.0 min	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Pond 2P: EXISTING DRIVEWAY CULVERT

Inflow Area =	2.596 ac,	12.76% Impervious,	Inflow Depth > 0.36"	for 2-YEAR event
Inflow =	0.44 cfs @	12.43 hrs, Volume=	0.08 af	
Outflow =	0.44 cfs @	12.43 hrs, Volume=	0.08 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.44 cfs @	12.43 hrs, Volume=	0.08 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 292.73' @ 12.43 hrs
Flood Elev= 294.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	292.40'	**12.0" Round Culvert** L= 21.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 292.40' / 292.10' S= 0.0143 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.44 cfs @ 12.43 hrs HW=292.73' TW=289.63' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 0.44 cfs @ 1.96 fps)

Summary for Pond 3P: EXISTING DROP INLET

Inflow Area =	41.139 ac,	8.14% Impervious,	Inflow Depth > 0.41"	for 2-YEAR event
Inflow =	5.83 cfs @	12.62 hrs, Volume=	1.39 af	
Outflow =	5.83 cfs @	12.62 hrs, Volume=	1.39 af,	Atten= 0%, Lag= 0.0 min
Primary =	5.83 cfs @	12.62 hrs, Volume=	1.39 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 289.71' @ 12.62 hrs
Flood Elev= 293.75'

Device	Routing	Invert	Outlet Devices
#1	Primary	288.66'	**24.0" Round Culvert** L= 92.1' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 288.66' / 284.67' S= 0.0433 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf

Primary OutFlow Max=5.83 cfs @ 12.62 hrs HW=289.71' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 5.83 cfs @ 3.49 fps)

Summary for Pond 4P: EXISTING CB

Inflow Area =	2.362 ac,	23.83% Impervious,	Inflow Depth > 0.73"	for 2-YEAR event
Inflow =	1.75 cfs @	12.11 hrs, Volume=	0.14 af	
Outflow =	1.75 cfs @	12.11 hrs, Volume=	0.14 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.75 cfs @	12.11 hrs, Volume=	0.14 af	
Secondary =	0.00 cfs @	0.00 hrs, Volume=	0.00 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Peak Elev= 297.75' @ 12.11 hrs
Flood Elev= 300.17'

Device	Routing	Invert	Outlet Devices
#1	Primary	297.00'	**12.0" Round Culvert** L= 49.1' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 297.00' / 295.64' S= 0.0277 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	300.17'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.75 cfs @ 12.11 hrs HW=297.75' TW=296.07' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 1.75 cfs @ 3.86 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=297.00' TW=295.64' (Dynamic Tailwater)
↑—**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 5P: EXISTING CB

Inflow Area = 0.377 ac, 34.30% Impervious, Inflow Depth > 0.86" for 2-YEAR event
Inflow = 0.32 cfs @ 12.13 hrs, Volume= 0.03 af
Outflow = 0.32 cfs @ 12.13 hrs, Volume= 0.03 af, Atten= 0%, Lag= 0.0 min
Primary = 0.32 cfs @ 12.13 hrs, Volume= 0.03 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 298.09' @ 12.13 hrs
Flood Elev= 301.16'

Device	Routing	Invert	Outlet Devices
#1	Primary	297.70'	**12.0" Round Culvert** L= 34.1' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 297.70' / 297.30' S= 0.0117 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	301.16'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.33 cfs @ 12.13 hrs HW=298.09' TW=297.72' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 0.33 cfs @ 1.69 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=297.70' TW=0.00' (Dynamic Tailwater)
↑—**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 6P: EXISTING CB

Inflow Area = 2.097 ac, 14.39% Impervious, Inflow Depth > 0.96" for 2-YEAR event
Inflow = 1.52 cfs @ 12.29 hrs, Volume= 0.17 af
Outflow = 1.52 cfs @ 12.29 hrs, Volume= 0.17 af, Atten= 0%, Lag= 0.0 min
Primary = 1.52 cfs @ 12.29 hrs, Volume= 0.17 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Peak Elev= 364.36' @ 12.29 hrs
Flood Elev= 366.35'

Device	Routing	Invert	Outlet Devices
#1	Primary	363.70'	**12.0" Round Culvert** L= 18.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 363.70' / 362.46' S= 0.0689 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf

Primary OutFlow Max=1.52 cfs @ 12.29 hrs HW=364.36' TW=0.00' (Dynamic Tailwater)
1=Culvert (Inlet Controls 1.52 cfs @ 2.76 fps)

Summary for Pond 7P: EXISTING CB

Inflow Area =	2.594 ac,	9.49% Impervious, Inflow Depth > 0.85"	for 2-YEAR event
Inflow =	1.57 cfs @	12.32 hrs, Volume=	0.18 af
Outflow =	1.57 cfs @	12.32 hrs, Volume=	0.18 af, Atten= 0%, Lag= 0.0 min
Primary =	1.57 cfs @	12.32 hrs, Volume=	0.18 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 377.28' @ 12.32 hrs
Flood Elev= 380.49'

Device	Routing	Invert	Outlet Devices
#1	Primary	376.57'	**12.0" Round Culvert** L= 31.9' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 376.57' / 376.28' S= 0.0091 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=1.57 cfs @ 12.32 hrs HW=377.28' TW=0.00' (Dynamic Tailwater)
1=Culvert (Barrel Controls 1.57 cfs @ 3.71 fps)

Summary for Pond 8P: DMH#2

Inflow Area =	11.270 ac,	12.00% Impervious, Inflow Depth > 0.26"	for 2-YEAR event
Inflow =	0.26 cfs @	20.93 hrs, Volume=	0.24 af
Outflow =	0.26 cfs @	20.94 hrs, Volume=	0.24 af, Atten= 0%, Lag= 0.4 min
Primary =	0.26 cfs @	20.94 hrs, Volume=	0.24 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 349.93' @ 20.94 hrs
Flood Elev= 353.05'

Device	Routing	Invert	Outlet Devices
#1	Primary	349.70'	**15.0" Round Culvert** L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 349.70' / 348.50' S= 0.0800 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=0.26 cfs @ 20.94 hrs HW=349.93' TW=348.69' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.26 cfs @ 1.64 fps)

Summary for Pond 9P: DMH#3

Inflow Area = 5.536 ac, 11.12% Impervious, Inflow Depth > 0.89" for 2-YEAR event
Inflow = 3.47 cfs @ 12.27 hrs, Volume= 0.41 af
Outflow = 3.47 cfs @ 12.27 hrs, Volume= 0.41 af, Atten= 0%, Lag= 0.0 min
Primary = 3.47 cfs @ 12.27 hrs, Volume= 0.41 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 375.27' @ 12.27 hrs
Flood Elev= 377.79'

Device	Routing	Invert	Outlet Devices
#1	Primary	374.26'	**18.0" Round Culvert** L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 374.26' / 374.04' S= 0.0073 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=3.47 cfs @ 12.27 hrs HW=375.27' TW=367.71' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 3.47 cfs @ 3.86 fps)

Summary for Pond 10P: DMH#4

Inflow Area = 5.536 ac, 11.12% Impervious, Inflow Depth > 0.89" for 2-YEAR event
Inflow = 3.47 cfs @ 12.27 hrs, Volume= 0.41 af
Outflow = 3.47 cfs @ 12.27 hrs, Volume= 0.41 af, Atten= 0%, Lag= 0.0 min
Primary = 3.47 cfs @ 12.27 hrs, Volume= 0.41 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 376.49' @ 12.27 hrs
Flood Elev= 381.66'

Device	Routing	Invert	Outlet Devices
#1	Primary	375.58'	**18.0" Round Culvert** L= 121.7' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 375.58' / 374.36' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=3.47 cfs @ 12.27 hrs HW=376.49' TW=375.27' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 3.47 cfs @ 4.46 fps)

Summary for Pond 11P: DMH#5

Inflow Area = 5.536 ac, 11.12% Impervious, Inflow Depth > 0.89" for 2-YEAR event
Inflow = 3.47 cfs @ 12.27 hrs, Volume= 0.41 af
Outflow = 3.47 cfs @ 12.27 hrs, Volume= 0.41 af, Atten= 0%, Lag= 0.0 min
Primary = 3.47 cfs @ 12.27 hrs, Volume= 0.41 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 378.82' @ 12.27 hrs
Flood Elev= 384.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	377.94'	**18.0" Round Culvert** L= 226.1' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 377.94' / 375.68' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=3.47 cfs @ 12.27 hrs HW=378.82' TW=376.49' (Dynamic Tailwater)
1=Culvert (Inlet Controls 3.47 cfs @ 3.20 fps)

Summary for Pond 12P: CB#6

Inflow Area = 5.536 ac, 11.12% Impervious, Inflow Depth > 0.89" for 2-YEAR event
Inflow = 3.47 cfs @ 12.27 hrs, Volume= 0.41 af
Outflow = 3.47 cfs @ 12.27 hrs, Volume= 0.41 af, Atten= 0%, Lag= 0.0 min
Primary = 3.47 cfs @ 12.27 hrs, Volume= 0.41 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 380.33' @ 12.27 hrs
Flood Elev= 384.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	379.45'	**18.0" Round Culvert** L= 141.2' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 379.45' / 378.04' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=3.47 cfs @ 12.27 hrs HW=380.33' TW=378.82' (Dynamic Tailwater)
1=Culvert (Inlet Controls 3.47 cfs @ 3.20 fps)

Summary for Pond 13P: CB#7

Inflow Area = 5.201 ac, 9.22% Impervious, Inflow Depth > 0.85" for 2-YEAR event
Inflow = 3.20 cfs @ 12.27 hrs, Volume= 0.37 af
Outflow = 3.20 cfs @ 12.27 hrs, Volume= 0.37 af, Atten= 0%, Lag= 0.0 min
Primary = 3.20 cfs @ 12.27 hrs, Volume= 0.37 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 381.26' @ 12.27 hrs
Flood Elev= 384.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	380.25'	**15.0" Round Culvert** L= 30.3' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 380.25' / 379.95' S= 0.0099 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=3.19 cfs @ 12.27 hrs HW=381.26' TW=380.33' (Dynamic Tailwater)
1=Culvert (Barrel Controls 3.19 cfs @ 4.11 fps)

Summary for Pond 14P: CB#8

Inflow Area = 4.328 ac, 9.12% Impervious, Inflow Depth > 0.85" for 2-YEAR event
Inflow = 2.62 cfs @ 12.27 hrs, Volume= 0.31 af
Outflow = 2.62 cfs @ 12.27 hrs, Volume= 0.31 af, Atten= 0%, Lag= 0.0 min
Primary = 2.62 cfs @ 12.27 hrs, Volume= 0.31 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 385.31' @ 12.27 hrs
Flood Elev= 388.51'

Device	Routing	Invert	Outlet Devices
#1	Primary	384.49'	**15.0" Round Culvert** L= 165.7' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 384.49' / 380.35' S= 0.0250 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=2.62 cfs @ 12.27 hrs HW=385.31' TW=381.26' (Dynamic Tailwater)
1=Culvert (Inlet Controls 2.62 cfs @ 3.08 fps)

Summary for Pond 16P: CB#10

Inflow Area = 3.078 ac, 10.13% Impervious, Inflow Depth > 0.87" for 2-YEAR event
Inflow = 1.85 cfs @ 12.29 hrs, Volume= 0.22 af
Outflow = 1.85 cfs @ 12.29 hrs, Volume= 0.22 af, Atten= 0%, Lag= 0.0 min
Primary = 1.85 cfs @ 12.29 hrs, Volume= 0.22 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 392.86' @ 12.29 hrs
Flood Elev= 397.31'

Device	Routing	Invert	Outlet Devices
#1	Primary	392.11'	**12.0" Round Culvert** L= 165.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 392.11' / 383.83' S= 0.0500 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=1.85 cfs @ 12.29 hrs HW=392.86' TW=385.31' (Dynamic Tailwater)
1=Culvert (Inlet Controls 1.85 cfs @ 2.94 fps)

Summary for Pond 17P: CB#100

Inflow Area = 0.183 ac, 70.27% Impervious, Inflow Depth > 2.01" for 2-YEAR event
Inflow = 0.43 cfs @ 12.09 hrs, Volume= 0.03 af
Outflow = 0.43 cfs @ 12.09 hrs, Volume= 0.03 af, Atten= 0%, Lag= 0.0 min
Primary = 0.43 cfs @ 12.09 hrs, Volume= 0.03 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 393.57' @ 12.09 hrs
Flood Elev= 397.31'

Device	Routing	Invert	Outlet Devices
#1	Primary	393.25'	**12.0" Round Culvert** L= 26.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 393.25' / 392.73' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.43 cfs @ 12.09 hrs HW=393.57' TW=392.66' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 0.43 cfs @ 1.94 fps)

Summary for Pond 18P: CB#11

Inflow Area = 1.524 ac, 2.68% Impervious, Inflow Depth > 0.74" for 2-YEAR event
Inflow = 0.79 cfs @ 12.33 hrs, Volume= 0.09 af
Outflow = 0.79 cfs @ 12.33 hrs, Volume= 0.09 af, Atten= 0%, Lag= 0.0 min
Primary = 0.79 cfs @ 12.33 hrs, Volume= 0.09 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 403.25' @ 12.33 hrs
Flood Elev= 406.88'

Device	Routing	Invert	Outlet Devices
#1	Primary	402.80'	**12.0" Round Culvert** L= 167.8' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 402.80' / 392.73' S= 0.0600 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.79 cfs @ 12.33 hrs HW=403.25' TW=392.85' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 0.79 cfs @ 2.29 fps)

Summary for Pond 20P: DMH#14

Inflow Area = 3.830 ac, 17.06% Impervious, Inflow Depth > 0.97" for 2-YEAR event
Inflow = 2.54 cfs @ 12.35 hrs, Volume= 0.31 af
Outflow = 2.54 cfs @ 12.35 hrs, Volume= 0.31 af, Atten= 0%, Lag= 0.0 min
Primary = 2.54 cfs @ 12.35 hrs, Volume= 0.31 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 375.94' @ 12.35 hrs
Flood Elev= 383.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	375.20'	**18.0" Round Culvert** L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 375.20' / 374.00' S= 0.0800 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=2.54 cfs @ 12.35 hrs HW=375.94' TW=367.93' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 2.54 cfs @ 2.93 fps)

Summary for Pond 21P: DMH#15

Inflow Area =	3.830 ac,	17.06% Impervious,	Inflow Depth > 0.97"	for 2-YEAR event
Inflow =	2.54 cfs @	12.35 hrs, Volume=	0.31 af	
Outflow =	2.54 cfs @	12.35 hrs, Volume=	0.31 af,	Atten= 0%, Lag= 0.0 min
Primary =	2.54 cfs @	12.35 hrs, Volume=	0.31 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 382.20' @ 12.35 hrs
Flood Elev= 387.85'

Device	Routing	Invert	Outlet Devices
#1	Primary	381.46'	**18.0" Round Culvert** L= 30.7' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 381.46' / 379.00' S= 0.0801 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=2.54 cfs @ 12.35 hrs HW=382.20' TW=375.94' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 2.54 cfs @ 2.93 fps)

Summary for Pond 22P: DMH#16

Inflow Area =	3.830 ac,	17.06% Impervious,	Inflow Depth > 0.97"	for 2-YEAR event
Inflow =	2.54 cfs @	12.35 hrs, Volume=	0.31 af	
Outflow =	2.54 cfs @	12.35 hrs, Volume=	0.31 af,	Atten= 0%, Lag= 0.0 min
Primary =	2.54 cfs @	12.35 hrs, Volume=	0.31 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 393.66' @ 12.35 hrs
Flood Elev= 400.42'

Device	Routing	Invert	Outlet Devices
#1	Primary	392.92'	**18.0" Round Culvert** L= 111.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 392.92' / 384.00' S= 0.0800 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=2.54 cfs @ 12.35 hrs HW=393.66' TW=382.20' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 2.54 cfs @ 2.93 fps)

Summary for Pond 23P: DMH#17

Inflow Area =	3.830 ac,	17.06% Impervious,	Inflow Depth > 0.97"	for 2-YEAR event
Inflow =	2.54 cfs @	12.35 hrs, Volume=	0.31 af	
Outflow =	2.54 cfs @	12.35 hrs, Volume=	0.31 af,	Atten= 0%, Lag= 0.0 min
Primary =	2.54 cfs @	12.35 hrs, Volume=	0.31 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 401.87' @ 12.35 hrs
Flood Elev= 409.83'

Device	Routing	Invert	Outlet Devices
#1	Primary	401.13'	**18.0" Round Culvert** L= 45.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 401.13' / 397.53' S= 0.0800 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=2.54 cfs @ 12.35 hrs HW=401.87' TW=393.66' (Dynamic Tailwater)
└─1=Culvert (Inlet Controls 2.54 cfs @ 2.93 fps)

Summary for Pond 24P: CB#18

Inflow Area =	3.830 ac, 17.06% Impervious,	Inflow Depth > 0.97"	for 2-YEAR event
Inflow =	2.54 cfs @ 12.35 hrs, Volume=	0.31 af	
Outflow =	2.54 cfs @ 12.35 hrs, Volume=	0.31 af, Atten= 0%, Lag= 0.0 min	
Primary =	2.54 cfs @ 12.35 hrs, Volume=	0.31 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 403.61' @ 12.35 hrs
Flood Elev= 407.95'

Device	Routing	Invert	Outlet Devices
#1	Primary	402.87'	**18.0" Round Culvert** L= 164.2' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 402.87' / 401.23' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=2.54 cfs @ 12.35 hrs HW=403.61' TW=401.87' (Dynamic Tailwater)
└─1=Culvert (Inlet Controls 2.54 cfs @ 2.93 fps)

Summary for Pond 25P: CB#19

Inflow Area =	2.259 ac, 23.36% Impervious,	Inflow Depth > 1.07"	for 2-YEAR event
Inflow =	1.66 cfs @ 12.35 hrs, Volume=	0.20 af	
Outflow =	1.66 cfs @ 12.35 hrs, Volume=	0.20 af, Atten= 0%, Lag= 0.0 min	
Primary =	1.66 cfs @ 12.35 hrs, Volume=	0.20 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 404.05' @ 12.36 hrs
Flood Elev= 408.04'

Device	Routing	Invert	Outlet Devices
#1	Primary	403.34'	**15.0" Round Culvert** L= 36.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 403.34' / 402.97' S= 0.0101 '/' Cc= 0.900 n= 0 013, Flow Area= 1.23 sf

Primary OutFlow Max=1.66 cfs @ 12.35 hrs HW=404.05' TW=403.61' (Dynamic Tailwater)
└─1=Culvert (Outlet Controls 1.66 cfs @ 3.36 fps)

Summary for Pond 26P: CB#20

Inflow Area = 0.702 ac, 34.65% Impervious, Inflow Depth > 1.24" for 2-YEAR event
Inflow = 0.68 cfs @ 12.28 hrs, Volume= 0.07 af
Outflow = 0.68 cfs @ 12.28 hrs, Volume= 0.07 af, Atten= 0%, Lag= 0.0 min
Primary = 0.68 cfs @ 12.28 hrs, Volume= 0.07 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 404.24' @ 12.33 hrs
Flood Elev= 407.78'

Device	Routing	Invert	Outlet Devices
#1	Primary	403.70'	**12.0" Round Culvert** L= 26.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 403.70' / 403.44' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.67 cfs @ 12.28 hrs HW=404.23' TW=404.02' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 0.67 cfs @ 2.30 fps)

Summary for Pond PP: POCKET POND

Inflow Area = 11.270 ac, 12.00% Impervious, Inflow Depth > 0.92" for 2-YEAR event
Inflow = 7.14 cfs @ 12.28 hrs, Volume= 0.86 af
Outflow = 0.26 cfs @ 20.93 hrs, Volume= 0.24 af, Atten= 96%, Lag= 519.4 min
Primary = 0.26 cfs @ 20.93 hrs, Volume= 0.24 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 367.00' Surf.Area= 9,015 sf Storage= 7,477 cf
Peak Elev= 369.49' @ 20.93 hrs Surf.Area= 13,714 sf Storage= 34,886 cf (27,409 cf above start)
Flood Elev= 374.00' Surf.Area= 24,964 sf Storage= 118,753 cf (111,276 cf above start)

Plug-Flow detention time= 639.5 min calculated for 0.07 af (8% of inflow)
Center-of-Mass det. time= 225.2 min (1,096.3 - 871.2)

Volume	Invert	Avail.Storage	Storage Description
#1	364.00'	118,753 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
#2	369.00'	0 cf	**Sediment Forebay (No Storage) (Prismatic)** Listed below (Recalc) 1,678 cf Overall x 0.0% Voids
		118,753 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
364.00	145	0	0
366.00	1,883	2,028	2,028
367.00	9,015	5,449	7,477
368.00	10,563	9,789	17,266
369.00	12,205	11,384	28,650
370.00	13,939	13,072	41,722
371.00	17,278	15,609	57,331
372.00	19,350	18,314	75,645
374.00	23,758	43,108	118,753

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
369.00	472	0	0
371.00	1,206	1,678	1,678

Device	Routing	Invert	Outlet Devices
#1	Primary	365.00'	**15.0" Round Culvert** L= 190.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 365.00' / 349.80' S= 0.0800 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	367.00'	**2.5" Vert. Orifice** C= 0.600
#3	Device 1	369.45'	**3.2" Vert. Orifice** C= 0.600
#4	Device 1	371.50'	**3.0" Vert. Orifice** C= 0.600
#5	Device 1	373.70'	**48.0" x 48.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#6	Secondary	373.80'	**10.0' long x 27.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=0.26 cfs @ 20.93 hrs HW=369.49' TW=349.93' (Dynamic Tailwater)
1=Culvert (Passes 0.26 cfs of 11.62 cfs potential flow)
2=Orifice (Orifice Controls 0.25 cfs @ 7.44 fps)
3=Orifice (Orifice Controls 0.00 cfs @ 0.71 fps)
4=Orifice (Controls 0.00 cfs)
5=Grate (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=367.00' TW=348.50' (Dynamic Tailwater)
6=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Link A: BARRETTS HILL CROSSING

Inflow Area =	41.139 ac,	8.14% Impervious, Inflow Depth > 0.41"	for 2-YEAR event
Inflow =	5.83 cfs @	12.62 hrs, Volume=	1.39 af
Primary =	5.83 cfs @	12.62 hrs, Volume=	1.39 af, Atten= 0%, Lag= 0 0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link B: LOT 57

Inflow Area =	2.097 ac,	14.39% Impervious,	Inflow Depth > 0.96"	for 2-YEAR event
Inflow =	1.52 cfs @	12.29 hrs,	Volume=	0.17 af
Primary =	1.52 cfs @	12.29 hrs,	Volume=	0.17 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link C: LOT 11

Inflow Area =	2.594 ac,	9.49% Impervious,	Inflow Depth > 0.85"	for 2-YEAR event
Inflow =	1.57 cfs @	12.32 hrs,	Volume=	0.18 af
Primary =	1.57 cfs @	12.32 hrs,	Volume=	0.18 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: SUBCATCHMENT Runoff Area=961,091 sf 4.08% Impervious Runoff Depth>1.27"
Flow Length=2,203' Tc=38.1 min CN=64.6 Runoff=15.46 cfs 2.34 af

Subcatchment 2S: SUBCATCHMENT Runoff Area=113,081 sf 12.76% Impervious Runoff Depth>1.08"
Flow Length=683' Tc=20.1 min CN=61.4 Runoff=1.94 cfs 0.23 af

Subcatchment 3S: SUBCATCHMENT Runoff Area=124,041 sf 7.14% Impervious Runoff Depth>1.09"
Flow Length=1,189' Tc=23.1 min CN=61.5 Runoff=2.03 cfs 0.26 af

Subcatchment 4S: SUBCATCHMENT Runoff Area=86,429 sf 21.84% Impervious Runoff Depth>1.69"
Tc=6.0 min CN=70.6 Runoff=3.83 cfs 0.28 af

Subcatchment 5S: SUBCATCHMENT Runoff Area=16,441 sf 34.30% Impervious Runoff Depth>1.92"
Flow Length=389' Tc=8.7 min CN=73.7 Runoff=0.77 cfs 0.06 af

Subcatchment 6S: SUBCATCHMENT Runoff Area=91,362 sf 14.39% Impervious Runoff Depth>2.07"
Flow Length=692' Tc=19.5 min CN=75.7 Runoff=3.45 cfs 0.36 af

Subcatchment 7S: SUBCATCHMENT Runoff Area=112,988 sf 9.49% Impervious Runoff Depth>1.90"
Flow Length=1,021' Tc=20.7 min CN=73.5 Runoff=3.80 cfs 0.41 af

Subcatchment 8S: SUBCATCHMENT Runoff Area=30,577 sf 34.65% Impervious Runoff Depth>2.48"
Flow Length=719' Tc=20.3 min CN=80.6 Runoff=1.38 cfs 0.14 af

Subcatchment 9S: SUBCATCHMENT Runoff Area=67,824 sf 18.27% Impervious Runoff Depth>2.12"
Flow Length=1,293' Tc=26.9 min CN=76.4 Runoff=2.31 cfs 0.28 af

Subcatchment 10S: SUBCATCHMENT Runoff Area=68,434 sf 8.00% Impervious Runoff Depth>1.86"
Flow Length=676' Tc=23.0 min CN=73.0 Runoff=2.16 cfs 0.24 af

Subcatchment 11S: SUBCATCHMENT Runoff Area=66,396 sf 2.68% Impervious Runoff Depth>1.74"
Flow Length=690' Tc=20.7 min CN=71.4 Runoff=2.03 cfs 0.22 af

Subcatchment 12S: SUBCATCHMENT Runoff Area=59,686 sf 10.36% Impervious Runoff Depth>1.93"
Flow Length=753' Tc=18.7 min CN=73.9 Runoff=2.13 cfs 0.22 af

Subcatchment 13S: SUBCATCHMENT Runoff Area=54,469 sf 6.63% Impervious Runoff Depth>1.84"
Flow Length=680' Tc=16.3 min CN=72.6 Runoff=1.94 cfs 0.19 af

Subcatchment 14S: SUBCATCHMENT Runoff Area=38,021 sf 9.74% Impervious Runoff Depth>1.92"
Flow Length=731' Tc=17.2 min CN=73.7 Runoff=1.39 cfs 0.14 af

Subcatchment 15S: SUBCATCHMENT Runoff Area=14,603 sf 40.57% Impervious Runoff Depth>2.76"
Tc=6.0 min CN=83.7 Runoff=1.08 cfs 0.08 af

Subcatchment 16S: SUBCATCHMENT Runoff Area=7,988 sf 70.27% Impervious Runoff Depth>3.45"
Tc=6.0 min CN=90.9 Runoff=0.72 cfs 0.05 af

Attachment "F"

Subcatchment 17S: SUBCATCHMENT Runoff Area=82,926 sf 4.39% Impervious Runoff Depth>1.96"
Flow Length=230' Tc=13.2 min CN=74.2 Runoff=3.44 cfs 0.31 af

Reach 1R: EXISTING ROADWAY DITCH Avg. Flow Depth=0.62' Max Vel=3.92 fps Inflow=4.56 cfs 0.34 af
n=0.022 L=230.0' S=0.0173 '/' Capacity=16.21 cfs Outflow=4.51 cfs 0.34 af

Reach 2R: EXISTING ROADWAY DITCH Avg. Flow Depth=0.30' Max Vel=1.68 fps Inflow=0.71 cfs 0.66 af
n=0.069 L=915.0' S=0.0621 '/' Capacity=12.04 cfs Outflow=0.71 cfs 0.65 af

Pond 1P: EXISTING CB Inflow=15.46 cfs 2.34 af
Primary=15.46 cfs 2.34 af

Pond 2P: EXISTING DRIVEWAY CULVERT Peak Elev=293.20' Inflow=1.94 cfs 0.23 af
12.0" Round Culvert n=0.013 L=21.0' S=0.0143 '/' Outflow=1.94 cfs 0.23 af

Pond 3P: EXISTING DROP INLET Peak Elev=291.40' Inflow=19.97 cfs 3.82 af
24.0" Round Culvert n=0.011 L=92.1' S=0.0433 '/' Outflow=19.97 cfs 3.82 af

Pond 4P: EXISTING CB Peak Elev=300.20' Inflow=4.56 cfs 0.34 af
Primary=4.43 cfs 0.34 af Secondary=0.13 cfs 0.00 af Outflow=4.56 cfs 0.34 af

Pond 5P: EXISTING CB Peak Elev=300.28' Inflow=0.77 cfs 0.06 af
Primary=0.77 cfs 0.06 af Secondary=0.00 cfs 0.00 af Outflow=0.77 cfs 0.06 af

Pond 6P: EXISTING CB Peak Elev=365.03' Inflow=3.45 cfs 0.36 af
12.0" Round Culvert n=0.025 L=18.0' S=0.0689 '/' Outflow=3.45 cfs 0.36 af

Pond 7P: EXISTING CB Peak Elev=378.09' Inflow=3.80 cfs 0.41 af
12.0" Round Culvert n=0.011 L=31.9' S=0.0091 '/' Outflow=3.80 cfs 0.41 af

Pond 8P: DMH#2 Peak Elev=350.09' Inflow=0.71 cfs 0.66 af
15.0" Round Culvert n=0.013 L=15.0' S=0.0800 '/' Outflow=0.71 cfs 0.66 af

Pond 9P: DMH#3 Peak Elev=376.15' Inflow=8.26 cfs 0.90 af
18.0" Round Culvert n=0.013 L=30.0' S=0.0073 '/' Outflow=8.26 cfs 0.90 af

Pond 10P: DMH#4 Peak Elev=377.38' Inflow=8.26 cfs 0.90 af
18.0" Round Culvert n=0.013 L=121.7' S=0.0100 '/' Outflow=8.26 cfs 0.90 af

Pond 11P: DMH#5 Peak Elev=379.63' Inflow=8.26 cfs 0.90 af
18.0" Round Culvert n=0.013 L=226.1' S=0.0100 '/' Outflow=8.26 cfs 0.90 af

Pond 12P: CB#6 Peak Elev=381.14' Inflow=8.26 cfs 0.90 af
18.0" Round Culvert n=0.013 L=141.2' S=0.0100 '/' Outflow=8.26 cfs 0.90 af

Pond 13P: CB#7 Peak Elev=382.86' Inflow=7.73 cfs 0.83 af
15.0" Round Culvert n=0.013 L=30.3' S=0.0099 '/' Outflow=7.73 cfs 0.83 af

Pond 14P: CB#8 Peak Elev=386.27' Inflow=6.35 cfs 0.69 af
15.0" Round Culvert n=0.013 L=165.7' S=0.0250 '/' Outflow=6.35 cfs 0.69 af

Pond 16P: CB#10
Peak Elev=393.99' Inflow=4.45 cfs 0.49 af
12.0" Round Culvert n=0.013 L=165.5' S=0.0500 '/' Outflow=4.45 cfs 0.49 af

Pond 17P: CB#100
Peak Elev=394.01' Inflow=0.72 cfs 0.05 af
12.0" Round Culvert n=0.013 L=26.0' S=0.0200 '/' Outflow=0.72 cfs 0.05 af

Pond 18P: CB#11
Peak Elev=403.59' Inflow=2.03 cfs 0.22 af
12.0" Round Culvert n=0.013 L=167.8' S=0.0600 '/' Outflow=2.03 cfs 0.22 af

Pond 20P: DMH#14
Peak Elev=376.41' Inflow=5.74 cfs 0.66 af
18.0" Round Culvert n=0.013 L=15.0' S=0.0800 '/' Outflow=5.74 cfs 0.66 af

Pond 21P: DMH#15
Peak Elev=382.67' Inflow=5.74 cfs 0.66 af
18.0" Round Culvert n=0.013 L=30.7' S=0.0801 '/' Outflow=5.74 cfs 0.66 af

Pond 22P: DMH#16
Peak Elev=394.13' Inflow=5.74 cfs 0.66 af
18.0" Round Culvert n=0.013 L=111.5' S=0.0800 '/' Outflow=5.74 cfs 0.66 af

Pond 23P: DMH#17
Peak Elev=402.34' Inflow=5.74 cfs 0.66 af
18.0" Round Culvert n=0.013 L=45.0' S=0.0800 '/' Outflow=5.74 cfs 0.66 af

Pond 24P: CB#18
Peak Elev=404.08' Inflow=5.74 cfs 0.66 af
18.0" Round Culvert n=0.013 L=164.2' S=0.0100 '/' Outflow=5.74 cfs 0.66 af

Pond 25P: CB#19
Peak Elev=404.55' Inflow=3.58 cfs 0.42 af
15.0" Round Culvert n=0.013 L=36.5' S=0.0101 '/' Outflow=3.58 cfs 0.42 af

Pond 26P: CB#20
Peak Elev=404.70' Inflow=1.38 cfs 0.14 af
12.0" Round Culvert n=0.013 L=26.0' S=0.0100 '/' Outflow=1.38 cfs 0.14 af

Pond PP: POCKET POND
Peak Elev=371.43' Storage=64,996 cf Inflow=16.68 cfs 1.88 af
Primary=0.71 cfs 0.66 af Secondary=0.00 cfs 0.00 af Outflow=0.71 cfs 0.66 af

Link A: BARRETTS HILL CROSSING
Inflow=19.97 cfs 3.82 af
Primary=19.97 cfs 3.82 af

Link B: LOT 57
Inflow=3.45 cfs 0.36 af
Primary=3.45 cfs 0.36 af

Link C: LOT 11
Inflow=3.80 cfs 0.41 af
Primary=3.80 cfs 0.41 af

Total Runoff Area = 45.830 ac Runoff Volume = 5.82 af Average Runoff Depth = 1.52"
91.49% Pervious = 41.932 ac 8.51% Impervious = 3.898 ac

Summary for Subcatchment 1S: SUBCATCHMENT

Runoff = 15.46 cfs @ 12.58 hrs, Volume= 2.34 af, Depth> 1.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.47"

	Area (sf)	CN	Description
	7,670	30.0	Woods, Good, HSG A
	363,085	55.0	Woods, Good, HSG B
	427,890	70.0	Woods, Good, HSG C
	6,684	39.0	>75% Grass cover, Good, HSG A
	61,618	61.0	>75% Grass cover, Good, HSG B
	54,927	74.0	>75% Grass cover, Good, HSG C
*	21,604	98.0	Roofs
*	17,613	98.0	Paved parking
	961,091	64.6	Weighted Average
	921,874	63.2	95.92% Pervious Area
	39,217	98.0	4.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.3	100	0.0400	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
19.7	1,862	0.0988	1.57		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.3	30	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.8	211	0.0430	4.21		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
38.1	2,203	Total			

Summary for Subcatchment 2S: SUBCATCHMENT

Runoff = 1.94 cfs @ 12.32 hrs, Volume= 0.23 af, Depth> 1.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.47"

	Area (sf)	CN	Description
	28,414	30.0	Woods, Good, HSG A
	11,383	55.0	Woods, Good, HSG B
	33,808	70.0	Woods, Good, HSG C
	4,719	39.0	>75% Grass cover, Good, HSG A
	242	61.0	>75% Grass cover, Good, HSG B
	20,087	74.0	>75% Grass cover, Good, HSG C
*	3,849	98.0	Roofs
*	10,579	98.0	Paved parking
	113,081	61.4	Weighted Average
	98,653	56.1	87.24% Pervious Area
	14,428	98.0	12.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	100	0.1000	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
3.9	318	0.0750	1.37		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.7	48	0.0300	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.6	217	0.0410	1.01		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
20.1	683	Total			

Summary for Subcatchment 3S: SUBCATCHMENT

Runoff = 2.03 cfs @ 12.37 hrs, Volume= 0.26 af, Depth> 1.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.47"

	Area (sf)	CN	Description
	5,732	30.0	Woods, Good, HSG A
	49,946	55.0	Woods, Good, HSG B
	30,651	70.0	Woods, Good, HSG C
	4,799	39.0	>75% Grass cover, Good, HSG A
	20,628	61.0	>75% Grass cover, Good, HSG B
	3,428	74.0	>75% Grass cover, Good, HSG C
*	2,833	98.0	Roofs
*	6,024	98.0	Paved parking
	124,041	61.5	Weighted Average
	115,184	58.7	92.86% Pervious Area
	8,857	98.0	7.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.9	100	0.1600	0.17		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
13.2	1,089	0.0760	1.38		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
23.1	1,189	Total			

Summary for Subcatchment 4S: SUBCATCHMENT

Runoff = 3.83 cfs @ 12.09 hrs, Volume= 0.28 af, Depth> 1.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.47"

	Area (sf)	CN	Description
	10,510	55.0	Woods, Good, HSG B
	6,756	70.0	Woods, Good, HSG C
	40,259	61.0	>75% Grass cover, Good, HSG B
	10,029	74.0	>75% Grass cover, Good, HSG C
	16,327	98.0	Paved parking, HSG C
*	2,548	98.0	Roofs
	86,429	70.6	Weighted Average
	67,554	62.9	78.16% Pervious Area
	18,875	98.0	21.84% Impervious Area

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

Summary for Subcatchment 5S: SUBCATCHMENT

Runoff = 0.77 cfs @ 12.13 hrs, Volume= 0.06 af, Depth> 1.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.47"

	Area (sf)	CN	Description
	10,801	61.0	>75% Grass cover, Good, HSG B
*	5,640	98.0	Paved parking
	16,441	73.7	Weighted Average
	10,801	61.0	65.70% Pervious Area
	5,640	98.0	34.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	100	0.0700	0.26		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
0.1	16	0.0400	4.06		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.5	162	0.0680	1.83		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	20	0.0400	4.06		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.8	91	0.0770	1.94		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.7	389	Total			

Summary for Subcatchment 6S: SUBCATCHMENT

Runoff = 3.45 cfs @ 12.27 hrs, Volume= 0.36 af, Depth> 2.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.47"

Attachment "F"

	Area (sf)	CN	Description
	42,274	70.0	Woods, Good, HSG C
	35,721	74.0	>75% Grass cover, Good, HSG C
*	8,350	98.0	Paved parking
*	4,800	98.0	Roofs
	217	96.0	Gravel surface, HSG C
	91,362	75.7	Weighted Average
	78,212	71.9	85.61% Pervious Area
	13,150	98.0	14.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.8	100	0.0500	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
1.0	80	0.0750	1.37		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	18	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.2	12	0.0400	1.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.1	15	0.3000	3.83		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.2	467	0.0300	3.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
19.5	692	Total			

Summary for Subcatchment 7S: SUBCATCHMENT

Runoff = 3.80 cfs @ 12.29 hrs, Volume= 0.41 af, Depth> 1.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.47"

	Area (sf)	CN	Description
	83,250	70.0	Woods, Good, HSG C
	18,246	74.0	>75% Grass cover, Good, HSG C
*	5,928	98.0	Paved parking
	764	96.0	Gravel surface, HSG C
*	4,800	98.0	Roofs
	112,988	73.5	Weighted Average
	102,260	70.9	90.51% Pervious Area
	10,728	98.0	9.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	100	0.0900	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
7.5	755	0.1130	1.68		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.0	6	0.3000	3.83		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.7	160	0.0375	3.93		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
20.7	1,021	Total			

Summary for Subcatchment 8S: SUBCATCHMENT

Runoff = 1.38 cfs @ 12.28 hrs, Volume= 0.14 af, Depth> 2.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.47"

	Area (sf)	CN	Description
	13,046	70.0	Woods, Good, HSG C
	6,935	74.0	>75% Grass cover, Good, HSG C
*	10,596	98.0	Paved parking
	30,577	80.6	Weighted Average
	19,981	71.4	65.35% Pervious Area
	10,596	98.0	34.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.8	100	0.0500	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
2.9	329	0.1480	1.92		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.1	33	0.3330	4.04		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.5	257	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
20.3	719	Total			

Summary for Subcatchment 9S: SUBCATCHMENT

Runoff = 2.31 cfs @ 12.38 hrs, Volume= 0.28 af, Depth> 2.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.47"

	Area (sf)	CN	Description
	34,147	70.0	Woods, Good, HSG C
	21,287	74.0	>75% Grass cover, Good, HSG C
*	7,590	98.0	Paved parking
*	4,800	98.0	Roofs
	67,824	76.4	Weighted Average
	55,434	71.5	81.73% Pervious Area
	12,390	98.0	18.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.4	100	0.0300	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
2.6	350	0.1940	2.20		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	43	0.3330	4.04		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.6	800	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
26.9	1,293	Total			

Summary for Subcatchment 10S: SUBCATCHMENT

Runoff = 2.16 cfs @ 12.34 hrs, Volume= 0.24 af, Depth> 1.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.47"

	Area (sf)	CN	Description
	49,642	70.0	Woods, Good, HSG C
	13,315	74.0	>75% Grass cover, Good, HSG C
*	3,077	98.0	Paved parking
*	2,400	98.0	Roofs
	68,434	73.0	Weighted Average
	62,957	70.8	92.00% Pervious Area
	5,477	98.0	8.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.3	100	0.0400	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
4.0	479	0.1610	2.01		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.5	65	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.2	32	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
23.0	676	Total			

Attachment "F"

Summary for Subcatchment 11S: SUBCATCHMENT

Runoff = 2.03 cfs @ 12.30 hrs, Volume= 0.22 af, Depth> 1.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.47"

	Area (sf)	CN	Description
	54,267	70.0	Woods, Good, HSG C
	10,350	74.0	>75% Grass cover, Good, HSG C
*	1,779	98.0	Paved parking
	66,396	71.4	Weighted Average
	64,617	70.6	97.32% Pervious Area
	1,779	98.0	2.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.8	100	0.0500	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
4.2	485	0.1510	1.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.6	73	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	32	0.0600	4.97		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
20.7	690	Total			

Summary for Subcatchment 12S: SUBCATCHMENT

Runoff = 2.13 cfs @ 12.27 hrs, Volume= 0.22 af, Depth> 1.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.47"

	Area (sf)	CN	Description
	38,779	70.0	Woods, Good, HSG C
	14,722	74.0	>75% Grass cover, Good, HSG C
*	3,785	98.0	Paved parking
*	2,400	98.0	Roofs
	59,686	73.9	Weighted Average
	53,501	71.1	89.64% Pervious Area
	6,185	98.0	10.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8	100	0.0700	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
4.0	462	0.1470	1.92		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.4	55	0.1100	2.32		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.5	136	0.0600	4.97		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
18.7	753	Total			

Summary for Subcatchment 13S: SUBCATCHMENT

Runoff = 1.94 cfs @ 12.23 hrs, Volume= 0.19 af, Depth> 1.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.47"

	Area (sf)	CN	Description
	40,261	70.0	Woods, Good, HSG C
	10,598	74.0	>75% Grass cover, Good, HSG C
*	3,610	98.0	Paved parking
	54,469	72.6	Weighted Average
	50,859	70.8	93.37% Pervious Area
	3,610	98.0	6.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	100	0.1000	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
3.8	425	0.1410	1.88		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.3	61	0.3300	4.02		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.3	94	0.0600	4.97		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
16.3	680	Total			

Summary for Subcatchment 14S: SUBCATCHMENT

Runoff = 1.39 cfs @ 12.24 hrs, Volume= 0.14 af, Depth> 1.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.47"

	Area (sf)	CN	Description
	25,189	70.0	Woods, Good, HSG C
	9,128	74.0	>75% Grass cover, Good, HSG C
*	3,704	98.0	Paved parking
	38,021	73.7	Weighted Average
	34,317	71.1	90.26% Pervious Area
	3,704	98.0	9.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.1	100	0.1200	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
5.5	529	0.1020	1.60		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	46	0.3300	4.02		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.3	56	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
17.2	731	Total			

Summary for Subcatchment 15S: SUBCATCHMENT

Runoff = 1.08 cfs @ 12.09 hrs, Volume= 0.08 af, Depth> 2.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.47"

	Area (sf)	CN	Description
	8,678	74.0	>75% Grass cover, Good, HSG C
*	5,925	98.0	Paved parking
	14,603	83.7	Weighted Average
	8,678	74.0	59.43% Pervious Area
	5,925	98.0	40.57% Impervious Area

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

Summary for Subcatchment 16S: SUBCATCHMENT

Runoff = 0.72 cfs @ 12.09 hrs, Volume= 0.05 af, Depth> 3.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.47"

	Area (sf)	CN	Description
	2,375	74.0	>75% Grass cover, Good, HSG C
*	5,613	98.0	Paved parking
	7,988	90.9	Weighted Average
	2,375	74.0	29.73% Pervious Area
	5,613	98.0	70.27% Impervious Area

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

Summary for Subcatchment 17S: SUBCATCHMENT

Runoff = 3.44 cfs @ 12.18 hrs, Volume= 0.31 af, Depth> 1.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.47"

	Area (sf)	CN	Description
	26,296	70.0	Woods, Good, HSG C
	51,457	74.0	>75% Grass cover, Good, HSG C
*	1,238	98.0	Paved parking
*	2,400	98.0	Roofs
	1,535	96.0	Gravel surface, HSG C
	82,926	74.2	Weighted Average
	79,288	73.1	95.61% Pervious Area
	3,638	98.0	4.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	100	0.1000	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
1.0	90	0.0860	1.47		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	40	0.3300	4.02		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
13.2	230	Total			

Summary for Reach 1R: EXISTING ROADWAY DITCH

Inflow Area = 2.362 ac, 23.83% Impervious, Inflow Depth > 1.73" for 10-YEAR event
Inflow = 4.56 cfs @ 12.10 hrs, Volume= 0.34 af
Outflow = 4.51 cfs @ 12.11 hrs, Volume= 0.34 af, Atten= 1%, Lag= 0.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.92 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 1.70 fps, Avg. Travel Time= 2.2 min

Peak Storage= 264 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.62'
Bank-Full Depth= 1.00' Flow Area= 3.0 sf, Capacity= 16.21 cfs

0.00' x 1.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 6.00'
Length= 230.0' Slope= 0.0173 '/'
Inlet Invert= 295.64', Outlet Invert= 291.66'

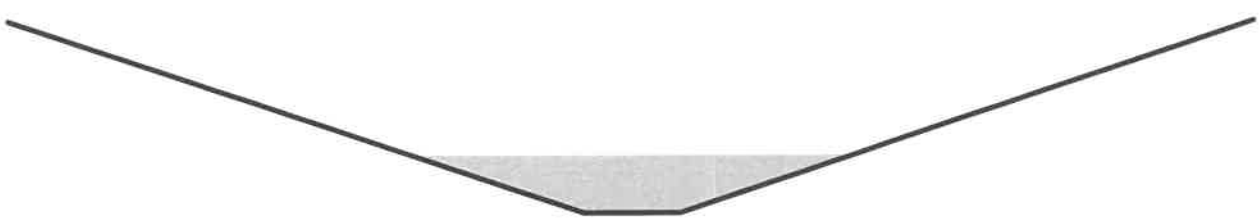
Summary for Reach 2R: EXISTING ROADWAY DITCH

Inflow Area = 11.270 ac, 12.00% Impervious, Inflow Depth > 0.71" for 10-YEAR event
Inflow = 0.71 cfs @ 17.78 hrs, Volume= 0.66 af
Outflow = 0.71 cfs @ 17.89 hrs, Volume= 0.65 af, Atten= 0%, Lag= 6.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 1.68 fps, Min. Travel Time= 9.1 min
Avg. Velocity = 1.34 fps, Avg. Travel Time= 11.4 min

Peak Storage= 385 cf @ 17.89 hrs
Average Depth at Peak Storage= 0.30'
Bank-Full Depth= 1.00' Flow Area= 3.5 sf, Capacity= 12.04 cfs

0.50' x 1.00' deep channel, n= 0.069 Riprap, 6-inch
Side Slope Z-value= 3.0 '/' Top Width= 6.50'
Length= 915.0' Slope= 0.0621 '/'
Inlet Invert= 348.50', Outlet Invert= 291.66'



Summary for Pond 1P: EXISTING CB

Inflow Area = 22.064 ac, 4.08% Impervious, Inflow Depth > 1.27" for 10-YEAR event
Inflow = 15.46 cfs @ 12.58 hrs, Volume= 2.34 af
Primary = 15.46 cfs @ 12.58 hrs, Volume= 2.34 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Pond 2P: EXISTING DRIVEWAY CULVERT

Inflow Area = 2.596 ac, 12.76% Impervious, Inflow Depth > 1.08" for 10-YEAR event
Inflow = 1.94 cfs @ 12.32 hrs, Volume= 0.23 af
Outflow = 1.94 cfs @ 12.32 hrs, Volume= 0.23 af, Atten= 0%, Lag= 0.0 min
Primary = 1.94 cfs @ 12.32 hrs, Volume= 0.23 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 293.20' @ 12.32 hrs
Flood Elev= 294.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	292.40'	**12.0" Round Culvert** L= 21.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 292.40' / 292.10' S= 0.0143 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=1.94 cfs @ 12.32 hrs HW=293.20' TW=290.85' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 1.94 cfs @ 3.94 fps)

Summary for Pond 3P: EXISTING DROP INLET

Inflow Area = 41.139 ac, 8.14% Impervious, Inflow Depth > 1.12" for 10-YEAR event
Inflow = 19.97 cfs @ 12.53 hrs, Volume= 3.82 af
Outflow = 19.97 cfs @ 12.53 hrs, Volume= 3.82 af, Atten= 0%, Lag= 0.0 min
Primary = 19.97 cfs @ 12.53 hrs, Volume= 3.82 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 291.40' @ 12.53 hrs
Flood Elev= 293.75'

Device	Routing	Invert	Outlet Devices
#1	Primary	288.66'	**24.0" Round Culvert** L= 92.1' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 288.66' / 284.67' S= 0.0433 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf

Primary OutFlow Max=19.96 cfs @ 12.53 hrs HW=291.40' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 19.96 cfs @ 6.35 fps)

Summary for Pond 4P: EXISTING CB

Inflow Area = 2.362 ac, 23.83% Impervious, Inflow Depth > 1.73" for 10-YEAR event
Inflow = 4.56 cfs @ 12.10 hrs, Volume= 0.34 af
Outflow = 4.56 cfs @ 12.10 hrs, Volume= 0.34 af, Atten= 0%, Lag= 0.0 min
Primary = 4.43 cfs @ 12.10 hrs, Volume= 0.34 af
Secondary = 0.13 cfs @ 12.10 hrs, Volume= 0.00 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Peak Elev= 300.20' @ 12.10 hrs
Flood Elev= 300.17'

Device	Routing	Invert	Outlet Devices
#1	Primary	297.00'	**12.0" Round Culvert** L= 49.1' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 297.00' / 295.64' S= 0.0277 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	300.17'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=4.43 cfs @ 12.10 hrs HW=300.20' TW=296.26' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 4.43 cfs @ 5.64 fps)

Secondary OutFlow Max=0.12 cfs @ 12.10 hrs HW=300.20' TW=296.26' (Dynamic Tailwater)
↑—**2=Orifice/Grate** (Weir Controls 0.12 cfs @ 0.54 fps)

Summary for Pond 5P: EXISTING CB

Inflow Area =	0.377 ac, 34.30% Impervious,	Inflow Depth > 1.92"	for 10-YEAR event
Inflow =	0.77 cfs @ 12.13 hrs,	Volume=	0.06 af
Outflow =	0.77 cfs @ 12.13 hrs,	Volume=	0.06 af, Atten= 0%, Lag= 0.0 min
Primary =	0.77 cfs @ 12.13 hrs,	Volume=	0.06 af
Secondary =	0.00 cfs @ 0.00 hrs,	Volume=	0.00 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 300.28' @ 12.11 hrs
Flood Elev= 301.16'

Device	Routing	Invert	Outlet Devices
#1	Primary	297.70'	**12.0" Round Culvert** L= 34.1' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 297.70' / 297.30' S= 0.0117 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	301.16'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.36 cfs @ 12.13 hrs HW=300.25' TW=300.00' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 1.36 cfs @ 1.73 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=297.70' TW=0.00' (Dynamic Tailwater)
↑—**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 6P: EXISTING CB

Inflow Area =	2.097 ac, 14.39% Impervious,	Inflow Depth > 2.07"	for 10-YEAR event
Inflow =	3.45 cfs @ 12.27 hrs,	Volume=	0.36 af
Outflow =	3.45 cfs @ 12.27 hrs,	Volume=	0.36 af, Atten= 0%, Lag= 0.0 min
Primary =	3.45 cfs @ 12.27 hrs,	Volume=	0.36 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Peak Elev= 365.03' @ 12.27 hrs
Flood Elev= 366.35'

Device	Routing	Invert	Outlet Devices
#1	Primary	363.70'	**12.0" Round Culvert** L= 18.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 363.70' / 362.46' S= 0.0689 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf

Primary OutFlow Max=3.45 cfs @ 12.27 hrs HW=365.03' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 3.45 cfs @ 4.40 fps)

Summary for Pond 7P: EXISTING CB

Inflow Area =	2.594 ac,	9.49% Impervious, Inflow Depth > 1.90"	for 10-YEAR event
Inflow =	3.80 cfs @	12.29 hrs, Volume=	0.41 af
Outflow =	3.80 cfs @	12.29 hrs, Volume=	0.41 af, Atten= 0%, Lag= 0.0 min
Primary =	3.80 cfs @	12.29 hrs, Volume=	0.41 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 378.09' @ 12.29 hrs
Flood Elev= 380.49'

Device	Routing	Invert	Outlet Devices
#1	Primary	376.57'	**12.0" Round Culvert** L= 31.9' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 376.57' / 376.28' S= 0.0091 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=3.80 cfs @ 12.29 hrs HW=378.09' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 3.80 cfs @ 4.84 fps)

Summary for Pond 8P: DMH#2

Inflow Area =	11.270 ac,	12.00% Impervious, Inflow Depth > 0.71"	for 10-YEAR event
Inflow =	0.71 cfs @	17.78 hrs, Volume=	0.66 af
Outflow =	0.71 cfs @	17.78 hrs, Volume=	0.66 af, Atten= 0%, Lag= 0.0 min
Primary =	0.71 cfs @	17.78 hrs, Volume=	0.66 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 350.09' @ 17.78 hrs
Flood Elev= 353.05'

Device	Routing	Invert	Outlet Devices
#1	Primary	349.70'	**15.0" Round Culvert** L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 349.70' / 348.50' S= 0.0800 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=0.71 cfs @ 17.78 hrs HW=350.09' TW=348.80' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 0.71 cfs @ 2.14 fps)

Summary for Pond 9P: DMH#3

Inflow Area =	5.536 ac,	11.12% Impervious,	Inflow Depth > 1.96"	for 10-YEAR event
Inflow =	8.26 cfs @	12.25 hrs,	Volume=	0.90 af
Outflow =	8.26 cfs @	12.25 hrs,	Volume=	0.90 af, Atten= 0%, Lag= 0.0 min
Primary =	8.26 cfs @	12.25 hrs,	Volume=	0.90 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 376.15' @ 12.25 hrs
Flood Elev= 377.79'

Device	Routing	Invert	Outlet Devices
#1	Primary	374.26'	**18.0" Round Culvert** L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 374.26' / 374.04' S= 0.0073 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=8.26 cfs @ 12.25 hrs HW=376.15' TW=368.83' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 8.26 cfs @ 4.78 fps)

Summary for Pond 10P: DMH#4

Inflow Area =	5.536 ac,	11.12% Impervious,	Inflow Depth > 1.96"	for 10-YEAR event
Inflow =	8.26 cfs @	12.25 hrs,	Volume=	0.90 af
Outflow =	8.26 cfs @	12.25 hrs,	Volume=	0.90 af, Atten= 0%, Lag= 0.0 min
Primary =	8.26 cfs @	12.25 hrs,	Volume=	0.90 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 377.38' @ 12.25 hrs
Flood Elev= 381.66'

Device	Routing	Invert	Outlet Devices
#1	Primary	375.58'	**18.0" Round Culvert** L= 121.7' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 375.58' / 374.36' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=8.25 cfs @ 12.25 hrs HW=377.38' TW=376.15' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 8.25 cfs @ 4.93 fps)

Summary for Pond 11P: DMH#5

Inflow Area =	5.536 ac,	11.12% Impervious,	Inflow Depth > 1.96"	for 10-YEAR event
Inflow =	8.26 cfs @	12.25 hrs,	Volume=	0.90 af
Outflow =	8.26 cfs @	12.25 hrs,	Volume=	0.90 af, Atten= 0%, Lag= 0.0 min
Primary =	8.26 cfs @	12.25 hrs,	Volume=	0.90 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 379.63' @ 12.25 hrs
Flood Elev= 384.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	377.94'	**18.0" Round Culvert** L= 226.1' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 377.94' / 375.68' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=8.26 cfs @ 12.25 hrs HW=379.63' TW=377.38' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 8.26 cfs @ 4.67 fps)

Summary for Pond 12P: CB#6

Inflow Area =	5.536 ac, 11.12% Impervious,	Inflow Depth > 1.96"	for 10-YEAR event
Inflow =	8.26 cfs @ 12.25 hrs, Volume=	0.90 af	
Outflow =	8.26 cfs @ 12.25 hrs, Volume=	0.90 af,	Atten= 0%, Lag= 0.0 min
Primary =	8.26 cfs @ 12.25 hrs, Volume=	0.90 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 381.14' @ 12.25 hrs
Flood Elev= 384.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	379.45'	**18.0" Round Culvert** L= 141.2' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 379.45' / 378.04' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=8.26 cfs @ 12.25 hrs HW=381.14' TW=379.63' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 8.26 cfs @ 4.67 fps)

Summary for Pond 13P: CB#7

Inflow Area =	5.201 ac, 9.22% Impervious,	Inflow Depth > 1.91"	for 10-YEAR event
Inflow =	7.73 cfs @ 12.26 hrs, Volume=	0.83 af	
Outflow =	7.73 cfs @ 12.26 hrs, Volume=	0.83 af,	Atten= 0%, Lag= 0.0 min
Primary =	7.73 cfs @ 12.26 hrs, Volume=	0.83 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 382.86' @ 12.26 hrs
Flood Elev= 384.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	380.25'	**15.0" Round Culvert** L= 30.3' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 380.25' / 379.95' S= 0.0099 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=7.73 cfs @ 12.26 hrs HW=382.85' TW=381.14' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 7.73 cfs @ 6.30 fps)

Summary for Pond 14P: CB#8

Inflow Area = 4.328 ac, 9.12% Impervious, Inflow Depth > 1.90" for 10-YEAR event
Inflow = 6.35 cfs @ 12.26 hrs, Volume= 0.69 af
Outflow = 6.35 cfs @ 12.26 hrs, Volume= 0.69 af, Atten= 0%, Lag= 0.0 min
Primary = 6.35 cfs @ 12.26 hrs, Volume= 0.69 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 386.27' @ 12.26 hrs
Flood Elev= 388.51'

Device	Routing	Invert	Outlet Devices
#1	Primary	384.49'	**15.0" Round Culvert** L= 165.7' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 384.49' / 380.35' S= 0.0250 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=6.35 cfs @ 12.26 hrs HW=386.27' TW=382.85' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 6.35 cfs @ 5.17 fps)

Summary for Pond 16P: CB#10

Inflow Area = 3.078 ac, 10.13% Impervious, Inflow Depth > 1.93" for 10-YEAR event
Inflow = 4.45 cfs @ 12.27 hrs, Volume= 0.49 af
Outflow = 4.45 cfs @ 12.27 hrs, Volume= 0.49 af, Atten= 0%, Lag= 0.0 min
Primary = 4.45 cfs @ 12.27 hrs, Volume= 0.49 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 393.99' @ 12.27 hrs
Flood Elev= 397.31'

Device	Routing	Invert	Outlet Devices
#1	Primary	392.11'	**12.0" Round Culvert** L= 165.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 392.11' / 383.83' S= 0.0500 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=4.45 cfs @ 12.27 hrs HW=393.99' TW=386.26' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 4.45 cfs @ 5.66 fps)

Summary for Pond 17P: CB#100

Inflow Area = 0.183 ac, 70.27% Impervious, Inflow Depth > 3.45" for 10-YEAR event
Inflow = 0.72 cfs @ 12.09 hrs, Volume= 0.05 af
Outflow = 0.72 cfs @ 12.09 hrs, Volume= 0.05 af, Atten= 0%, Lag= 0.0 min
Primary = 0.72 cfs @ 12.09 hrs, Volume= 0.05 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 394.01' @ 12.28 hrs
Flood Elev= 397.31'

Device	Routing	Invert	Outlet Devices
#1	Primary	393.25'	**12.0" Round Culvert** L= 26.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 393.25' / 392.73' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.72 cfs @ 12.09 hrs HW=393.68' TW=393.17' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 0.72 cfs @ 2.23 fps)

Summary for Pond 18P: CB#11

Inflow Area = 1.524 ac, 2.68% Impervious, Inflow Depth > 1.74" for 10-YEAR event
Inflow = 2.03 cfs @ 12.30 hrs, Volume= 0.22 af
Outflow = 2.03 cfs @ 12.30 hrs, Volume= 0.22 af, Atten= 0%, Lag= 0.0 min
Primary = 2.03 cfs @ 12.30 hrs, Volume= 0.22 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 403.59' @ 12.30 hrs
Flood Elev= 406.88'

Device	Routing	Invert	Outlet Devices
#1	Primary	402.80'	**12.0" Round Culvert** L= 167.8' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 402.80' / 392.73' S= 0.0600 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=2.03 cfs @ 12.30 hrs HW=403.59' TW=393.97' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 2.03 cfs @ 3.03 fps)

Summary for Pond 20P: DMH#14

Inflow Area = 3.830 ac, 17.06% Impervious, Inflow Depth > 2.08" for 10-YEAR event
Inflow = 5.74 cfs @ 12.33 hrs, Volume= 0.66 af
Outflow = 5.74 cfs @ 12.33 hrs, Volume= 0.66 af, Atten= 0%, Lag= 0.0 min
Primary = 5.74 cfs @ 12.33 hrs, Volume= 0.66 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 376.41' @ 12.33 hrs
Flood Elev= 383.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	375.20'	**18.0" Round Culvert** L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 375.20' / 374.00' S= 0.0800 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=5.74 cfs @ 12.33 hrs HW=376.41' TW=369.23' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 5.74 cfs @ 3.75 fps)

Summary for Pond 21P: DMH#15

Inflow Area =	3.830 ac,	17.06% Impervious,	Inflow Depth > 2.08"	for 10-YEAR event	
Inflow =	5.74 cfs @	12.33 hrs,	Volume=	0.66 af	
Outflow =	5.74 cfs @	12.33 hrs,	Volume=	0.66 af,	Atten= 0%, Lag= 0.0 min
Primary =	5.74 cfs @	12.33 hrs,	Volume=	0.66 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 382.67' @ 12.33 hrs
Flood Elev= 387.85'

Device	Routing	Invert	Outlet Devices
#1	Primary	381.46'	**18.0" Round Culvert** L= 30.7' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 381.46' / 379.00' S= 0.0801 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=5.74 cfs @ 12.33 hrs HW=382.67' TW=376.41' (Dynamic Tailwater)
1=Culvert (Inlet Controls 5.74 cfs @ 3.75 fps)

Summary for Pond 22P: DMH#16

Inflow Area =	3.830 ac,	17.06% Impervious,	Inflow Depth > 2.08"	for 10-YEAR event	
Inflow =	5.74 cfs @	12.33 hrs,	Volume=	0.66 af	
Outflow =	5.74 cfs @	12.33 hrs,	Volume=	0.66 af,	Atten= 0%, Lag= 0.0 min
Primary =	5.74 cfs @	12.33 hrs,	Volume=	0.66 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 394.13' @ 12.33 hrs
Flood Elev= 400.42'

Device	Routing	Invert	Outlet Devices
#1	Primary	392.92'	**18.0" Round Culvert** L= 111.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 392.92' / 384.00' S= 0.0800 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=5.74 cfs @ 12.33 hrs HW=394.13' TW=382.67' (Dynamic Tailwater)
1=Culvert (Inlet Controls 5.74 cfs @ 3.75 fps)

Summary for Pond 23P: DMH#17

Inflow Area =	3.830 ac,	17.06% Impervious,	Inflow Depth > 2.08"	for 10-YEAR event	
Inflow =	5.74 cfs @	12.33 hrs,	Volume=	0.66 af	
Outflow =	5.74 cfs @	12.33 hrs,	Volume=	0.66 af,	Atten= 0%, Lag= 0.0 min
Primary =	5.74 cfs @	12.33 hrs,	Volume=	0.66 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 402.34' @ 12.33 hrs
Flood Elev= 409.83'

Device	Routing	Invert	Outlet Devices
#1	Primary	401.13'	**18.0" Round Culvert** L= 45.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 401.13' / 397.53' S= 0.0800 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=5.74 cfs @ 12.33 hrs HW=402.34' TW=394.13' (Dynamic Tailwater)
1=Culvert (Inlet Controls 5.74 cfs @ 3.75 fps)

Summary for Pond 24P: CB#18

Inflow Area = 3.830 ac, 17.06% Impervious, Inflow Depth > 2.08" for 10-YEAR event
Inflow = 5.74 cfs @ 12.33 hrs, Volume= 0.66 af
Outflow = 5.74 cfs @ 12.33 hrs, Volume= 0.66 af, Atten= 0%, Lag= 0.0 min
Primary = 5.74 cfs @ 12.33 hrs, Volume= 0.66 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 404.08' @ 12.33 hrs
Flood Elev= 407.95'

Device	Routing	Invert	Outlet Devices
#1	Primary	402.87'	**18.0" Round Culvert** L= 164.2' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 402.87' / 401.23' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=5.74 cfs @ 12.33 hrs HW=404.08' TW=402.34' (Dynamic Tailwater)
1=Culvert (Inlet Controls 5.74 cfs @ 3.75 fps)

Summary for Pond 25P: CB#19

Inflow Area = 2.259 ac, 23.36% Impervious, Inflow Depth > 2.23" for 10-YEAR event
Inflow = 3.58 cfs @ 12.33 hrs, Volume= 0.42 af
Outflow = 3.58 cfs @ 12.33 hrs, Volume= 0.42 af, Atten= 0%, Lag= 0.0 min
Primary = 3.58 cfs @ 12.33 hrs, Volume= 0.42 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 404.55' @ 12.34 hrs
Flood Elev= 408.04'

Device	Routing	Invert	Outlet Devices
#1	Primary	403.34'	**15.0" Round Culvert** L= 36.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 403.34' / 402.97' S= 0.0101 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=3.58 cfs @ 12.33 hrs HW=404.55' TW=404.08' (Dynamic Tailwater)
1=Culvert (Outlet Controls 3.58 cfs @ 3.74 fps)

Summary for Pond 26P: CB#20

Inflow Area = 0.702 ac, 34.65% Impervious, Inflow Depth > 2.48" for 10-YEAR event
Inflow = 1.38 cfs @ 12.28 hrs, Volume= 0.14 af
Outflow = 1.38 cfs @ 12.28 hrs, Volume= 0.14 af, Atten= 0%, Lag= 0.0 min
Primary = 1.38 cfs @ 12.28 hrs, Volume= 0.14 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 404.70' @ 12.33 hrs
Flood Elev= 407.78'

Device	Routing	Invert	Outlet Devices
#1	Primary	403.70'	**12.0" Round Culvert** L= 26.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 403.70' / 403.44' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=1.32 cfs @ 12.28 hrs HW=404.67' TW=404.52' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 1.32 cfs @ 2.15 fps)

Summary for Pond PP: POCKET POND

Inflow Area = 11.270 ac, 12.00% Impervious, Inflow Depth > 2.00" for 10-YEAR event
Inflow = 16.68 cfs @ 12.26 hrs, Volume= 1.88 af
Outflow = 0.71 cfs @ 17.78 hrs, Volume= 0.66 af, Atten= 96%, Lag= 331.3 min
Primary = 0.71 cfs @ 17.78 hrs, Volume= 0.66 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 367.00' Surf.Area= 9,015 sf Storage= 7,477 cf
Peak Elev= 371.43' @ 17.78 hrs Surf.Area= 19,380 sf Storage= 64,996 cf (57,519 cf above start)
Flood Elev= 374.00' Surf.Area= 24,964 sf Storage= 118,753 cf (111,276 cf above start)

Plug-Flow detention time= 470.3 min calculated for 0.49 af (26% of inflow)
Center-of-Mass det. time= 241.8 min (1,090.7 - 848.9)

Volume	Invert	Avail.Storage	Storage Description
#1	364.00'	118,753 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
#2	369.00'	0 cf	**Sediment Forebay (No Storage) (Prismatic)** Listed below (Recalc) 1,678 cf Overall x 0.0% Voids
		118,753 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
364.00	145	0	0
366.00	1,883	2,028	2,028
367.00	9,015	5,449	7,477
368.00	10,563	9,789	17,266
369.00	12,205	11,384	28,650
370.00	13,939	13,072	41,722
371.00	17,278	15,609	57,331
372.00	19,350	18,314	75,645
374.00	23,758	43,108	118,753

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
369.00	472	0	0
371.00	1,206	1,678	1,678

Device	Routing	Invert	Outlet Devices
#1	Primary	365.00'	**15.0" Round Culvert** L= 190.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 365.00' / 349.80' S= 0.0800 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	367.00'	**2.5" Vert. Orifice** C= 0.600
#3	Device 1	369.45'	**3.2" Vert. Orifice** C= 0.600
#4	Device 1	371.50'	**3.0" Vert. Orifice** C= 0.600
#5	Device 1	373.70'	**48.0" x 48.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#6	Secondary	373.80'	**10.0' long x 27.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=0.71 cfs @ 17.78 hrs HW=371.43' TW=350.09' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.71 cfs of 14.24 cfs potential flow)
  ├─**2=Orifice** (Orifice Controls 0.34 cfs @ 10.02 fps)
  ├─**3=Orifice** (Orifice Controls 0.37 cfs @ 6.55 fps)
  ├─**4=Orifice** (Controls 0.00 cfs)
  └─**5=Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=367.00' TW=348.50' (Dynamic Tailwater)
└─**6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link A: BARRETTS HILL CROSSING

Inflow Area = 41.139 ac, 8.14% Impervious, Inflow Depth > 1.12" for 10-YEAR event
Inflow = 19.97 cfs @ 12.53 hrs, Volume= 3.82 af
Primary = 19.97 cfs @ 12.53 hrs, Volume= 3.82 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link B: LOT 57

Inflow Area =	2.097 ac,	14.39% Impervious,	Inflow Depth > 2.07"	for 10-YEAR event
Inflow =	3.45 cfs @	12.27 hrs, Volume=	0.36 af	
Primary =	3.45 cfs @	12.27 hrs, Volume=	0.36 af, Atten= 0%,	Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link C: LOT 11

Inflow Area =	2.594 ac,	9.49% Impervious,	Inflow Depth > 1.90"	for 10-YEAR event
Inflow =	3.80 cfs @	12.29 hrs, Volume=	0.41 af	
Primary =	3.80 cfs @	12.29 hrs, Volume=	0.41 af, Atten= 0%,	Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Attachment "F"

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: SUBCATCHMENT Runoff Area=961,091 sf 4.08% Impervious Runoff Depth>2.05"
Flow Length=2,203' Tc=38.1 min CN=64.6 Runoff=26.13 cfs 3.77 af

Subcatchment 2S: SUBCATCHMENT Runoff Area=113,081 sf 12.76% Impervious Runoff Depth>1.80"
Flow Length=683' Tc=20.1 min CN=61.4 Runoff=3.49 cfs 0.39 af

Subcatchment 3S: SUBCATCHMENT Runoff Area=124,041 sf 7.14% Impervious Runoff Depth>1.81"
Flow Length=1,189' Tc=23.1 min CN=61.5 Runoff=3.64 cfs 0.43 af

Subcatchment 4S: SUBCATCHMENT Runoff Area=86,429 sf 21.84% Impervious Runoff Depth>2.58"
Tc=6.0 min CN=70.6 Runoff=5.98 cfs 0.43 af

Subcatchment 5S: SUBCATCHMENT Runoff Area=16,441 sf 34.30% Impervious Runoff Depth>2.87"
Flow Length=389' Tc=8.7 min CN=73.7 Runoff=1.16 cfs 0.09 af

Subcatchment 6S: SUBCATCHMENT Runoff Area=91,362 sf 14.39% Impervious Runoff Depth>3.04"
Flow Length=692' Tc=19.5 min CN=75.7 Runoff=5.12 cfs 0.53 af

Subcatchment 7S: SUBCATCHMENT Runoff Area=112,988 sf 9.49% Impervious Runoff Depth>2.84"
Flow Length=1,021' Tc=20.7 min CN=73.5 Runoff=5.76 cfs 0.61 af

Subcatchment 8S: SUBCATCHMENT Runoff Area=30,577 sf 34.65% Impervious Runoff Depth>3.52"
Flow Length=719' Tc=20.3 min CN=80.6 Runoff=1.95 cfs 0.21 af

Subcatchment 9S: SUBCATCHMENT Runoff Area=67,824 sf 18.27% Impervious Runoff Depth>3.11"
Flow Length=1,293' Tc=26.9 min CN=76.4 Runoff=3.39 cfs 0.40 af

Subcatchment 10S: SUBCATCHMENT Runoff Area=68,434 sf 8.00% Impervious Runoff Depth>2.80"
Flow Length=676' Tc=23.0 min CN=73.0 Runoff=3.28 cfs 0.37 af

Subcatchment 11S: SUBCATCHMENT Runoff Area=66,396 sf 2.68% Impervious Runoff Depth>2.65"
Flow Length=690' Tc=20.7 min CN=71.4 Runoff=3.14 cfs 0.34 af

Subcatchment 12S: SUBCATCHMENT Runoff Area=59,686 sf 10.36% Impervious Runoff Depth>2.88"
Flow Length=753' Tc=18.7 min CN=73.9 Runoff=3.21 cfs 0.33 af

Subcatchment 13S: SUBCATCHMENT Runoff Area=54,469 sf 6.63% Impervious Runoff Depth>2.77"
Flow Length=680' Tc=16.3 min CN=72.6 Runoff=2.96 cfs 0.29 af

Subcatchment 14S: SUBCATCHMENT Runoff Area=38,021 sf 9.74% Impervious Runoff Depth>2.86"
Flow Length=731' Tc=17.2 min CN=73.7 Runoff=2.10 cfs 0.21 af

Subcatchment 15S: SUBCATCHMENT Runoff Area=14,603 sf 40.57% Impervious Runoff Depth>3.85"
Tc=6.0 min CN=83.7 Runoff=1.50 cfs 0.11 af

Subcatchment 16S: SUBCATCHMENT Runoff Area=7,988 sf 70.27% Impervious Runoff Depth>4.61"
Tc=6.0 min CN=90.9 Runoff=0.94 cfs 0.07 af

Subcatchment 17S: SUBCATCHMENT Runoff Area=82,926 sf 4.39% Impervious Runoff Depth>2.91"
Flow Length=230' Tc=13.2 min CN=74.2 Runoff=5.17 cfs 0.46 af

Reach 1R: EXISTING ROADWAY DITCH Avg. Flow Depth=0.73' Max Vel=4.38 fps Inflow=7.07 cfs 0.52 af
n=0.022 L=230.0' S=0.0173 '/' Capacity=16.21 cfs Outflow=7.01 cfs 0.52 af

Reach 2R: EXISTING ROADWAY DITCH Avg. Flow Depth=0.37' Max Vel=1.90 fps Inflow=1.13 cfs 1.05 af
n=0.069 L=915.0' S=0.0621 '/' Capacity=12.04 cfs Outflow=1.13 cfs 1.04 af

Pond 1P: EXISTING CB Inflow=26.13 cfs 3.77 af
Primary=26.13 cfs 3.77 af

Pond 2P: EXISTING DRIVEWAY CULVERT Peak Elev=295.21' Inflow=3.49 cfs 0.39 af
12.0" Round Culvert n=0.013 L=21.0' S=0.0143 '/' Outflow=3.49 cfs 0.39 af

Pond 3P: EXISTING DROP INLET Peak Elev=294.71' Inflow=33.99 cfs 6.15 af
24.0" Round Culvert n=0.011 L=92.1' S=0.0433 '/' Outflow=33.99 cfs 6.15 af

Pond 4P: EXISTING CB Peak Elev=300.38' Inflow=7.07 cfs 0.52 af
Primary=4.54 cfs 0.49 af Secondary=2.53 cfs 0.02 af Outflow=7.07 cfs 0.52 af

Pond 5P: EXISTING CB Peak Elev=300.56' Inflow=1.16 cfs 0.09 af
Primary=1.16 cfs 0.09 af Secondary=0.00 cfs 0.00 af Outflow=1.16 cfs 0.09 af

Pond 6P: EXISTING CB Peak Elev=366.04' Inflow=5.12 cfs 0.53 af
12.0" Round Culvert n=0.025 L=18.0' S=0.0689 '/' Outflow=5.12 cfs 0.53 af

Pond 7P: EXISTING CB Peak Elev=379.39' Inflow=5.76 cfs 0.61 af
12.0" Round Culvert n=0.011 L=31.9' S=0.0091 '/' Outflow=5.76 cfs 0.61 af

Pond 8P: DMH#2 Peak Elev=350.21' Inflow=1.13 cfs 1.05 af
15.0" Round Culvert n=0.013 L=15.0' S=0.0800 '/' Outflow=1.13 cfs 1.05 af

Pond 9P: DMH#3 Peak Elev=377.15' Inflow=12.46 cfs 1.34 af
18.0" Round Culvert n=0.013 L=30.0' S=0.0073 '/' Outflow=12.46 cfs 1.34 af

Pond 10P: DMH#4 Peak Elev=380.03' Inflow=12.46 cfs 1.34 af
18.0" Round Culvert n=0.013 L=121.7' S=0.0100 '/' Outflow=12.46 cfs 1.34 af

Pond 11P: DMH#5 Peak Elev=384.37' Inflow=12.46 cfs 1.34 af
18.0" Round Culvert n=0.013 L=226.1' S=0.0100 '/' Outflow=12.46 cfs 1.34 af

Pond 12P: CB#6 Peak Elev=387.50' Inflow=12.46 cfs 1.34 af
18.0" Round Culvert n=0.013 L=141.2' S=0.0100 '/' Outflow=12.46 cfs 1.34 af

Pond 13P: CB#7 Peak Elev=391.42' Inflow=11.74 cfs 1.23 af
15.0" Round Culvert n=0.013 L=30.3' S=0.0099 '/' Outflow=11.74 cfs 1.23 af

Pond 14P: CB#8 Peak Elev=396.52' Inflow=9.64 cfs 1.02 af
15.0" Round Culvert n=0.013 L=165.7' S=0.0250 '/' Outflow=9.64 cfs 1.02 af

Pond 16P: CB#10 Peak Elev=404.14' Inflow=6.74 cfs 0.74 af
12.0" Round Culvert n=0.013 L=165.5' S=0.0500 '/' Outflow=6.74 cfs 0.74 af

Pond 17P: CB#100 Peak Elev=404.15' Inflow=0.94 cfs 0.07 af
12.0" Round Culvert n=0.013 L=26.0' S=0.0200 '/' Outflow=0.94 cfs 0.07 af

Pond 18P: CB#11 Peak Elev=405.82' Inflow=3.14 cfs 0.34 af
12.0" Round Culvert n=0.013 L=167.8' S=0.0600 '/' Outflow=3.14 cfs 0.34 af

Pond 20P: DMH#14 Peak Elev=376.95' Inflow=8.49 cfs 0.98 af
18.0" Round Culvert n=0.013 L=15.0' S=0.0800 '/' Outflow=8.49 cfs 0.98 af

Pond 21P: DMH#15 Peak Elev=383.21' Inflow=8.49 cfs 0.98 af
18.0" Round Culvert n=0.013 L=30.7' S=0.0801 '/' Outflow=8.49 cfs 0.98 af

Pond 22P: DMH#16 Peak Elev=394.67' Inflow=8.49 cfs 0.98 af
18.0" Round Culvert n=0.013 L=111.5' S=0.0800 '/' Outflow=8.49 cfs 0.98 af

Pond 23P: DMH#17 Peak Elev=402.88' Inflow=8.49 cfs 0.98 af
18.0" Round Culvert n=0.013 L=45.0' S=0.0800 '/' Outflow=8.49 cfs 0.98 af

Pond 24P: CB#18 Peak Elev=404.62' Inflow=8.49 cfs 0.98 af
18.0" Round Culvert n=0.013 L=164.2' S=0.0100 '/' Outflow=8.49 cfs 0.98 af

Pond 25P: CB#19 Peak Elev=405.39' Inflow=5.21 cfs 0.61 af
15.0" Round Culvert n=0.013 L=36.5' S=0.0101 '/' Outflow=5.21 cfs 0.61 af

Pond 26P: CB#20 Peak Elev=405.63' Inflow=1.95 cfs 0.21 af
12.0" Round Culvert n=0.013 L=26.0' S=0.0100 '/' Outflow=1.95 cfs 0.21 af

Pond PP: POCKET POND Peak Elev=372.81' Storage=92,034 cf Inflow=25.01 cfs 2.78 af
Primary=1.13 cfs 1.05 af Secondary=0.00 cfs 0.00 af Outflow=1.13 cfs 1.05 af

Link A: BARRETTS HILL CROSSING Inflow=33.99 cfs 6.15 af
Primary=33.99 cfs 6.15 af

Link B: LOT 57 Inflow=5.12 cfs 0.53 af
Primary=5.12 cfs 0.53 af

Link C: LOT 11 Inflow=5.76 cfs 0.61 af
Primary=5.76 cfs 0.61 af

Total Runoff Area = 45.830 ac Runoff Volume = 9.03 af Average Runoff Depth = 2.37"
91.49% Pervious = 41.932 ac 8.51% Impervious = 3.898 ac

Attachment "F"

Summary for Subcatchment 1S: SUBCATCHMENT

Runoff = 26.13 cfs @ 12.57 hrs, Volume= 3.77 af, Depth> 2.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=5.66"

	Area (sf)	CN	Description
	7,670	30.0	Woods, Good, HSG A
	363,085	55.0	Woods, Good, HSG B
	427,890	70.0	Woods, Good, HSG C
	6,684	39.0	>75% Grass cover, Good, HSG A
	61,618	61.0	>75% Grass cover, Good, HSG B
	54,927	74.0	>75% Grass cover, Good, HSG C
*	21,604	98.0	Roofs
*	17,613	98.0	Paved parking
	961,091	64.6	Weighted Average
	921,874	63.2	95.92% Pervious Area
	39,217	98.0	4.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.3	100	0.0400	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
19.7	1,862	0.0988	1.57		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.3	30	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.8	211	0.0430	4.21		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
38.1	2,203	Total			

Summary for Subcatchment 2S: SUBCATCHMENT

Runoff = 3.49 cfs @ 12.29 hrs, Volume= 0.39 af, Depth> 1.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=5.66"

	Area (sf)	CN	Description
	28,414	30.0	Woods, Good, HSG A
	11,383	55.0	Woods, Good, HSG B
	33,808	70.0	Woods, Good, HSG C
	4,719	39.0	>75% Grass cover, Good, HSG A
	242	61.0	>75% Grass cover, Good, HSG B
	20,087	74.0	>75% Grass cover, Good, HSG C
*	3,849	98.0	Roofs
*	10,579	98.0	Paved parking
	113,081	61.4	Weighted Average
	98,653	56.1	87.24% Pervious Area
	14,428	98.0	12.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	100	0.1000	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
3.9	318	0.0750	1.37		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.7	48	0.0300	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.6	217	0.0410	1.01		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
20.1	683	Total			

Summary for Subcatchment 3S: SUBCATCHMENT

Runoff = 3.64 cfs @ 12.34 hrs, Volume= 0.43 af, Depth> 1.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=5.66"

	Area (sf)	CN	Description
	5,732	30.0	Woods, Good, HSG A
	49,946	55.0	Woods, Good, HSG B
	30,651	70.0	Woods, Good, HSG C
	4,799	39.0	>75% Grass cover, Good, HSG A
	20,628	61.0	>75% Grass cover, Good, HSG B
	3,428	74.0	>75% Grass cover, Good, HSG C
*	2,833	98.0	Roofs
*	6,024	98.0	Paved parking
	124,041	61.5	Weighted Average
	115,184	58.7	92.86% Pervious Area
	8,857	98.0	7.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.9	100	0.1600	0.17		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
13.2	1,089	0.0760	1.38		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
23.1	1,189	Total			

Summary for Subcatchment 4S: SUBCATCHMENT

Runoff = 5.98 cfs @ 12.09 hrs, Volume= 0.43 af, Depth> 2.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=5.66"

	Area (sf)	CN	Description
	10,510	55.0	Woods, Good, HSG B
	6,756	70.0	Woods, Good, HSG C
	40,259	61.0	>75% Grass cover, Good, HSG B
	10,029	74.0	>75% Grass cover, Good, HSG C
	16,327	98.0	Paved parking, HSG C
*	2,548	98.0	Roofs
	86,429	70.6	Weighted Average
	67,554	62.9	78.16% Pervious Area
	18,875	98.0	21.84% Impervious Area

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

Summary for Subcatchment 5S: SUBCATCHMENT

Runoff = 1.16 cfs @ 12.12 hrs, Volume= 0.09 af, Depth> 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=5.66"

	Area (sf)	CN	Description
	10,801	61.0	>75% Grass cover, Good, HSG B
*	5,640	98.0	Paved parking
	16,441	73.7	Weighted Average
	10,801	61.0	65.70% Pervious Area
	5,640	98.0	34.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	100	0.0700	0.26		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
0.1	16	0.0400	4.06		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.5	162	0.0680	1.83		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	20	0.0400	4.06		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.8	91	0.0770	1.94		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.7	389	Total			

Summary for Subcatchment 6S: SUBCATCHMENT

Runoff = 5.12 cfs @ 12.27 hrs, Volume= 0.53 af, Depth> 3.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=5.66"

	Area (sf)	CN	Description
	42,274	70.0	Woods, Good, HSG C
	35,721	74.0	>75% Grass cover, Good, HSG C
*	8,350	98.0	Paved parking
*	4,800	98.0	Roofs
	217	96.0	Gravel surface, HSG C
	91,362	75.7	Weighted Average
	78,212	71.9	85.61% Pervious Area
	13,150	98.0	14.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.8	100	0.0500	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
1.0	80	0.0750	1.37		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	18	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.2	12	0.0400	1.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.1	15	0.3000	3.83		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.2	467	0.0300	3.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
19.5	692	Total			

Summary for Subcatchment 7S: SUBCATCHMENT

Runoff = 5.76 cfs @ 12.29 hrs, Volume= 0.61 af, Depth> 2.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=5.66"

	Area (sf)	CN	Description
	83,250	70.0	Woods, Good, HSG C
	18,246	74.0	>75% Grass cover, Good, HSG C
*	5,928	98.0	Paved parking
	764	96.0	Gravel surface, HSG C
*	4,800	98.0	Roofs
	112,988	73.5	Weighted Average
	102,260	70.9	90.51% Pervious Area
	10,728	98.0	9.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	100	0.0900	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
7.5	755	0.1130	1.68		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.0	6	0.3000	3.83		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.7	160	0.0375	3.93		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
20.7	1,021	Total			

Summary for Subcatchment 8S: SUBCATCHMENT

Runoff = 1.95 cfs @ 12.28 hrs, Volume= 0.21 af, Depth> 3.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=5.66"

	Area (sf)	CN	Description
	13,046	70.0	Woods, Good, HSG C
	6,935	74.0	>75% Grass cover, Good, HSG C
*	10,596	98.0	Paved parking
	30,577	80.6	Weighted Average
	19,981	71.4	65.35% Pervious Area
	10,596	98.0	34.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.8	100	0.0500	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
2.9	329	0.1480	1.92		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.1	33	0.3330	4.04		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.5	257	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
20.3	719	Total			

Summary for Subcatchment 9S: SUBCATCHMENT

Runoff = 3.39 cfs @ 12.38 hrs, Volume= 0.40 af, Depth> 3.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=5.66"

	Area (sf)	CN	Description
	34,147	70.0	Woods, Good, HSG C
	21,287	74.0	>75% Grass cover, Good, HSG C
*	7,590	98.0	Paved parking
*	4,800	98.0	Roofs
	67,824	76.4	Weighted Average
	55,434	71.5	81.73% Pervious Area
	12,390	98.0	18.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.4	100	0.0300	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
2.6	350	0.1940	2.20		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	43	0.3330	4.04		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.6	800	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
26.9	1,293	Total			

Summary for Subcatchment 10S: SUBCATCHMENT

Runoff = 3.28 cfs @ 12.33 hrs, Volume= 0.37 af, Depth> 2.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=5.66"

	Area (sf)	CN	Description
	49,642	70.0	Woods, Good, HSG C
	13,315	74.0	>75% Grass cover, Good, HSG C
*	3,077	98.0	Paved parking
*	2,400	98.0	Roofs
	68,434	73.0	Weighted Average
	62,957	70.8	92.00% Pervious Area
	5,477	98.0	8.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.3	100	0.0400	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
4.0	479	0.1610	2.01		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.5	65	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.2	32	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
23.0	676	Total			

Summary for Subcatchment 11S: SUBCATCHMENT

Runoff = 3.14 cfs @ 12.29 hrs, Volume= 0.34 af, Depth> 2.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=5.66"

	Area (sf)	CN	Description
	54,267	70.0	Woods, Good, HSG C
	10,350	74.0	>75% Grass cover, Good, HSG C
*	1,779	98.0	Paved parking
	66,396	71.4	Weighted Average
	64,617	70.6	97.32% Pervious Area
	1,779	98.0	2.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.8	100	0.0500	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
4.2	485	0.1510	1.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.6	73	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	32	0.0600	4.97		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
20.7	690	Total			

Summary for Subcatchment 12S: SUBCATCHMENT

Runoff = 3.21 cfs @ 12.26 hrs, Volume= 0.33 af, Depth> 2.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=5.66"

	Area (sf)	CN	Description
	38,779	70.0	Woods, Good, HSG C
	14,722	74.0	>75% Grass cover, Good, HSG C
*	3,785	98.0	Paved parking
*	2,400	98.0	Roofs
	59,686	73.9	Weighted Average
	53,501	71.1	89.64% Pervious Area
	6,185	98.0	10.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8	100	0.0700	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
4.0	462	0.1470	1.92		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.4	55	0.1100	2.32		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.5	136	0.0600	4.97		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
18.7	753	Total			

Summary for Subcatchment 13S: SUBCATCHMENT

Runoff = 2.96 cfs @ 12.23 hrs, Volume= 0.29 af, Depth> 2.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=5.66"

	Area (sf)	CN	Description
	40,261	70.0	Woods, Good, HSG C
	10,598	74.0	>75% Grass cover, Good, HSG C
*	3,610	98.0	Paved parking
	54,469	72.6	Weighted Average
	50,859	70.8	93.37% Pervious Area
	3,610	98.0	6.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	100	0.1000	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
3.8	425	0.1410	1.88		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.3	61	0.3300	4.02		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.3	94	0.0600	4.97		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
16.3	680	Total			

Summary for Subcatchment 14S: SUBCATCHMENT

Runoff = 2.10 cfs @ 12.23 hrs, Volume= 0.21 af, Depth> 2.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=5.66"

	Area (sf)	CN	Description
	25,189	70.0	Woods, Good, HSG C
	9,128	74.0	>75% Grass cover, Good, HSG C
*	3,704	98.0	Paved parking
	38,021	73.7	Weighted Average
	34,317	71.1	90.26% Pervious Area
	3,704	98.0	9.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.1	100	0.1200	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
5.5	529	0.1020	1.60		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	46	0.3300	4.02		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.3	56	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
17.2	731	Total			

Summary for Subcatchment 15S: SUBCATCHMENT

Runoff = 1.50 cfs @ 12.09 hrs, Volume= 0.11 af, Depth> 3.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=5.66"

	Area (sf)	CN	Description
	8,678	74.0	>75% Grass cover, Good, HSG C
*	5,925	98.0	Paved parking
	14,603	83.7	Weighted Average
	8,678	74.0	59.43% Pervious Area
	5,925	98.0	40.57% Impervious Area

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

Summary for Subcatchment 16S: SUBCATCHMENT

Runoff = 0.94 cfs @ 12.08 hrs, Volume= 0.07 af, Depth> 4.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=5.66"

	Area (sf)	CN	Description
	2,375	74.0	>75% Grass cover, Good, HSG C
*	5,613	98.0	Paved parking
	7,988	90.9	Weighted Average
	2,375	74.0	29.73% Pervious Area
	5,613	98.0	70.27% Impervious Area

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

Summary for Subcatchment 17S: SUBCATCHMENT

Runoff = 5.17 cfs @ 12.18 hrs, Volume= 0.46 af, Depth> 2.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=5.66"

	Area (sf)	CN	Description
	26,296	70.0	Woods, Good, HSG C
	51,457	74.0	>75% Grass cover, Good, HSG C
*	1,238	98.0	Paved parking
*	2,400	98.0	Roofs
	1,535	96.0	Gravel surface, HSG C
	82,926	74.2	Weighted Average
	79,288	73.1	95.61% Pervious Area
	3,638	98.0	4.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	100	0.1000	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
1.0	90	0.0860	1.47		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	40	0.3300	4.02		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
13.2	230	Total			

Summary for Reach 1R: EXISTING ROADWAY DITCH

Inflow Area = 2.362 ac, 23.83% Impervious, Inflow Depth > 2.63" for 25-YEAR event
Inflow = 7.07 cfs @ 12.10 hrs, Volume= 0.52 af
Outflow = 7.01 cfs @ 12.11 hrs, Volume= 0.52 af, Atten= 1%, Lag= 0.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.38 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 1.85 fps, Avg. Travel Time= 2.1 min

Peak Storage= 368 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.73'
Bank-Full Depth= 1.00' Flow Area= 3.0 sf, Capacity= 16.21 cfs

0.00' x 1.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 6.00'
Length= 230.0' Slope= 0.0173 '/'
Inlet Invert= 295.64', Outlet Invert= 291.66'

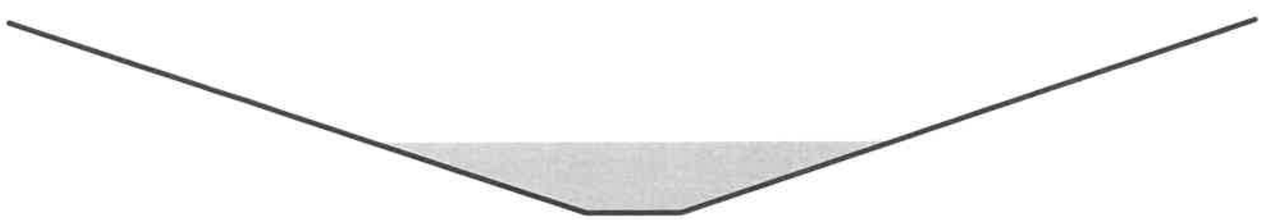
Summary for Reach 2R: EXISTING ROADWAY DITCH

Inflow Area = 11.270 ac, 12.00% Impervious, Inflow Depth > 1.12" for 25-YEAR event
Inflow = 1.13 cfs @ 17.14 hrs, Volume= 1.05 af
Outflow = 1.13 cfs @ 17.25 hrs, Volume= 1.04 af, Atten= 0%, Lag= 6.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 1.90 fps, Min. Travel Time= 8.0 min
Avg. Velocity = 1.46 fps, Avg. Travel Time= 10.4 min

Peak Storage= 546 cf @ 17.25 hrs
Average Depth at Peak Storage= 0.37'
Bank-Full Depth= 1.00' Flow Area= 3.5 sf, Capacity= 12.04 cfs

0.50' x 1.00' deep channel, n= 0.069 Riprap, 6-inch
Side Slope Z-value= 3.0 '/' Top Width= 6.50'
Length= 915.0' Slope= 0.0621 '/'
Inlet Invert= 348.50', Outlet Invert= 291.66'



Summary for Pond 1P: EXISTING CB

Inflow Area = 22.064 ac, 4.08% Impervious, Inflow Depth > 2.05" for 25-YEAR event
Inflow = 26.13 cfs @ 12.57 hrs, Volume= 3.77 af
Primary = 26.13 cfs @ 12.57 hrs, Volume= 3.77 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Pond 2P: EXISTING DRIVEWAY CULVERT

Inflow Area = 2.596 ac, 12.76% Impervious, Inflow Depth > 1.80" for 25-YEAR event
Inflow = 3.49 cfs @ 12.29 hrs, Volume= 0.39 af
Outflow = 3.49 cfs @ 12.29 hrs, Volume= 0.39 af, Atten= 0%, Lag= 0.0 min
Primary = 3.49 cfs @ 12.29 hrs, Volume= 0.39 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 295.21' @ 12.50 hrs
Flood Elev= 294.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	292.40'	**12.0" Round Culvert** L= 21.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 292.40' / 292.10' S= 0.0143 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=3.27 cfs @ 12.29 hrs HW=293.79' TW=293.04' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 3.27 cfs @ 4.17 fps)

Summary for Pond 3P: EXISTING DROP INLET

Inflow Area = 41.139 ac, 8.14% Impervious, Inflow Depth > 1.80" for 25-YEAR event
Inflow = 33.99 cfs @ 12.49 hrs, Volume= 6.15 af
Outflow = 33.99 cfs @ 12.49 hrs, Volume= 6.15 af, Atten= 0%, Lag= 0.0 min
Primary = 33.99 cfs @ 12.49 hrs, Volume= 6.15 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 294.71' @ 12.49 hrs
Flood Elev= 293.75'

Device	Routing	Invert	Outlet Devices
#1	Primary	288.66'	**24.0" Round Culvert** L= 92.1' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 288.66' / 284.67' S= 0.0433 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf

Primary OutFlow Max=33.98 cfs @ 12.49 hrs HW=294.71' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 33.98 cfs @ 10.82 fps)

Summary for Pond 4P: EXISTING CB

Inflow Area = 2.362 ac, 23.83% Impervious, Inflow Depth > 2.63" for 25-YEAR event
Inflow = 7.07 cfs @ 12.10 hrs, Volume= 0.52 af
Outflow = 7.07 cfs @ 12.10 hrs, Volume= 0.52 af, Atten= 0%, Lag= 0.0 min
Primary = 4.54 cfs @ 12.10 hrs, Volume= 0.49 af
Secondary = 2.53 cfs @ 12.10 hrs, Volume= 0.02 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Peak Elev= 300.38' @ 12.10 hrs
Flood Elev= 300.17'

Device	Routing	Invert	Outlet Devices
#1	Primary	297.00'	**12.0" Round Culvert** L= 49.1' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 297.00' / 295.64' S= 0.0277 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	300.17'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=4.54 cfs @ 12.10 hrs HW=300.38' TW=296.37' (Dynamic Tailwater)
1=Culvert (Barrel Controls 4.54 cfs @ 5.78 fps)

Secondary OutFlow Max=2.52 cfs @ 12.10 hrs HW=300.38' TW=296.37' (Dynamic Tailwater)
2=Orifice/Grate (Weir Controls 2.52 cfs @ 1.50 fps)

Summary for Pond 5P: EXISTING CB

Inflow Area = 0.377 ac, 34.30% Impervious, Inflow Depth > 2.87" for 25-YEAR event
Inflow = 1.16 cfs @ 12.12 hrs, Volume= 0.09 af
Outflow = 1.16 cfs @ 12.12 hrs, Volume= 0.09 af, Atten= 0%, Lag= 0.0 min
Primary = 1.16 cfs @ 12.12 hrs, Volume= 0.09 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 300.56' @ 12.11 hrs
Flood Elev= 301.16'

Device	Routing	Invert	Outlet Devices
#1	Primary	297.70'	**12.0" Round Culvert** L= 34.1' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 297.70' / 297.30' S= 0.0117 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	301.16'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.19 cfs @ 12.12 hrs HW=300.55' TW=300.36' (Dynamic Tailwater)
1=Culvert (Outlet Controls 1.19 cfs @ 1.52 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=297.70' TW=0.00' (Dynamic Tailwater)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 6P: EXISTING CB

Inflow Area = 2.097 ac, 14.39% Impervious, Inflow Depth > 3.04" for 25-YEAR event
Inflow = 5.12 cfs @ 12.27 hrs, Volume= 0.53 af
Outflow = 5.12 cfs @ 12.27 hrs, Volume= 0.53 af, Atten= 0%, Lag= 0.0 min
Primary = 5.12 cfs @ 12.27 hrs, Volume= 0.53 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Peak Elev= 366.04' @ 12.27 hrs
Flood Elev= 366.35'

Device	Routing	Invert	Outlet Devices
#1	Primary	363.70'	**12.0" Round Culvert** L= 18.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 363.70' / 362.46' S= 0.0689 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf

Primary OutFlow Max=5.12 cfs @ 12.27 hrs HW=366.03' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 5.12 cfs @ 6.52 fps)

Summary for Pond 7P: EXISTING CB

Inflow Area =	2.594 ac,	9.49% Impervious, Inflow Depth > 2.84"	for 25-YEAR event
Inflow =	5.76 cfs @	12.29 hrs, Volume=	0.61 af
Outflow =	5.76 cfs @	12.29 hrs, Volume=	0.61 af, Atten= 0%, Lag= 0.0 min
Primary =	5.76 cfs @	12.29 hrs, Volume=	0.61 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 379.39' @ 12.29 hrs
Flood Elev= 380.49'

Device	Routing	Invert	Outlet Devices
#1	Primary	376.57'	**12.0" Round Culvert** L= 31.9' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 376.57' / 376.28' S= 0.0091 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=5.76 cfs @ 12.29 hrs HW=379.39' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 5.76 cfs @ 7.33 fps)

Summary for Pond 8P: DMH#2

Inflow Area =	11.270 ac,	12.00% Impervious, Inflow Depth > 1.12"	for 25-YEAR event
Inflow =	1.13 cfs @	17.15 hrs, Volume=	1.05 af
Outflow =	1.13 cfs @	17.14 hrs, Volume=	1.05 af, Atten= 0%, Lag= 0.0 min
Primary =	1.13 cfs @	17.14 hrs, Volume=	1.05 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 350.21' @ 17.14 hrs
Flood Elev= 353.05'

Device	Routing	Invert	Outlet Devices
#1	Primary	349.70'	**15.0" Round Culvert** L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 349.70' / 348.50' S= 0.0800 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=1.13 cfs @ 17.14 hrs HW=350.21' TW=348.87' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 1.13 cfs @ 2.42 fps)

Summary for Pond 9P: DMH#3

Inflow Area = 5.536 ac, 11.12% Impervious, Inflow Depth > 2.90" for 25-YEAR event
Inflow = 12.46 cfs @ 12.24 hrs, Volume= 1.34 af
Outflow = 12.46 cfs @ 12.24 hrs, Volume= 1.34 af, Atten= 0%, Lag= 0.0 min
Primary = 12.46 cfs @ 12.24 hrs, Volume= 1.34 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 377.15' @ 12.24 hrs
Flood Elev= 377.79'

Device	Routing	Invert	Outlet Devices
#1	Primary	374.26'	**18.0" Round Culvert** L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 374.26' / 374.04' S= 0.0073 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=12.46 cfs @ 12.24 hrs HW=377.15' TW=369.81' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 12.46 cfs @ 7.05 fps)

Summary for Pond 10P: DMH#4

Inflow Area = 5.536 ac, 11.12% Impervious, Inflow Depth > 2.90" for 25-YEAR event
Inflow = 12.46 cfs @ 12.24 hrs, Volume= 1.34 af
Outflow = 12.46 cfs @ 12.24 hrs, Volume= 1.34 af, Atten= 0%, Lag= 0.0 min
Primary = 12.46 cfs @ 12.24 hrs, Volume= 1.34 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 380.03' @ 12.25 hrs
Flood Elev= 381.66'

Device	Routing	Invert	Outlet Devices
#1	Primary	375.58'	**18.0" Round Culvert** L= 121.7' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 375.58' / 374.36' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=12.44 cfs @ 12.24 hrs HW=380.02' TW=377.15' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 12.44 cfs @ 7.04 fps)

Summary for Pond 11P: DMH#5

Inflow Area = 5.536 ac, 11.12% Impervious, Inflow Depth > 2.90" for 25-YEAR event
Inflow = 12.46 cfs @ 12.24 hrs, Volume= 1.34 af
Outflow = 12.46 cfs @ 12.24 hrs, Volume= 1.34 af, Atten= 0%, Lag= 0.0 min
Primary = 12.46 cfs @ 12.24 hrs, Volume= 1.34 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 384.37' @ 12.25 hrs
Flood Elev= 384.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	377.94'	**18.0" Round Culvert** L= 226.1' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 377.94' / 375.68' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=12.42 cfs @ 12.24 hrs HW=384.34' TW=380.02' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 12.42 cfs @ 7.03 fps)

Summary for Pond 12P: CB#6

Inflow Area = 5.536 ac, 11.12% Impervious, Inflow Depth > 2.90" for 25-YEAR event
Inflow = 12.46 cfs @ 12.24 hrs, Volume= 1.34 af
Outflow = 12.46 cfs @ 12.24 hrs, Volume= 1.34 af, Atten= 0%, Lag= 0.0 min
Primary = 12.46 cfs @ 12.24 hrs, Volume= 1.34 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 387.50' @ 12.26 hrs
Flood Elev= 384.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	379.45'	**18.0" Round Culvert** L= 141.2' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 379.45' / 378.04' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=12.32 cfs @ 12.24 hrs HW=387.43' TW=384.34' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 12.32 cfs @ 6.97 fps)

Summary for Pond 13P: CB#7

Inflow Area = 5.201 ac, 9.22% Impervious, Inflow Depth > 2.84" for 25-YEAR event
Inflow = 11.74 cfs @ 12.25 hrs, Volume= 1.23 af
Outflow = 11.74 cfs @ 12.25 hrs, Volume= 1.23 af, Atten= 0%, Lag= 0.0 min
Primary = 11.74 cfs @ 12.25 hrs, Volume= 1.23 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 391.42' @ 12.26 hrs
Flood Elev= 384.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	380.25'	**15.0" Round Culvert** L= 30.3' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 380.25' / 379.95' S= 0.0099 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=11.61 cfs @ 12.25 hrs HW=391.34' TW=387.48' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 11.61 cfs @ 9.46 fps)

Attachment "F"

Summary for Pond 14P: CB#8

Inflow Area = 4.328 ac, 9.12% Impervious, Inflow Depth > 2.84" for 25-YEAR event
Inflow = 9.64 cfs @ 12.25 hrs, Volume= 1.02 af
Outflow = 9.64 cfs @ 12.25 hrs, Volume= 1.02 af, Atten= 0%, Lag= 0.0 min
Primary = 9.64 cfs @ 12.25 hrs, Volume= 1.02 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 396.52' @ 12.27 hrs
Flood Elev= 388.51'

Device	Routing	Invert	Outlet Devices
#1	Primary	384.49'	**15.0" Round Culvert** L= 165.7' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 384.49' / 380.35' S= 0.0250 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=9.50 cfs @ 12.25 hrs HW=396.35' TW=391.36' (Dynamic Tailwater)
1=Culvert (Outlet Controls 9.50 cfs @ 7.74 fps)

Summary for Pond 16P: CB#10

Inflow Area = 3.078 ac, 10.13% Impervious, Inflow Depth > 2.87" for 25-YEAR event
Inflow = 6.74 cfs @ 12.27 hrs, Volume= 0.74 af
Outflow = 6.74 cfs @ 12.27 hrs, Volume= 0.74 af, Atten= 0%, Lag= 0.0 min
Primary = 6.74 cfs @ 12.27 hrs, Volume= 0.74 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 404.14' @ 12.28 hrs
Flood Elev= 397.31'

Device	Routing	Invert	Outlet Devices
#1	Primary	392.11'	**12.0" Round Culvert** L= 165.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 392.11' / 383.83' S= 0.0500 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=6.70 cfs @ 12.27 hrs HW=404.08' TW=396.51' (Dynamic Tailwater)
1=Culvert (Outlet Controls 6.70 cfs @ 8.53 fps)

Summary for Pond 17P: CB#100

Inflow Area = 0.183 ac, 70.27% Impervious, Inflow Depth > 4.61" for 25-YEAR event
Inflow = 0.94 cfs @ 12.08 hrs, Volume= 0.07 af
Outflow = 0.94 cfs @ 12.08 hrs, Volume= 0.07 af, Atten= 0%, Lag= 0.0 min
Primary = 0.94 cfs @ 12.08 hrs, Volume= 0.07 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 404.15' @ 12.29 hrs
Flood Elev= 397.31'

Device	Routing	Invert	Outlet Devices
#1	Primary	393.25'	**12.0" Round Culvert** L= 26.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 393.25' / 392.73' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.53 cfs @ 12.08 hrs HW=393.97' TW=393.92' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 0.53 cfs @ 1.22 fps)

Summary for Pond 18P: CB#11

Inflow Area = 1.524 ac, 2.68% Impervious, Inflow Depth > 2.65" for 25-YEAR event
Inflow = 3.14 cfs @ 12.29 hrs, Volume= 0.34 af
Outflow = 3.14 cfs @ 12.29 hrs, Volume= 0.34 af, Atten= 0%, Lag= 0.0 min
Primary = 3.14 cfs @ 12.29 hrs, Volume= 0.34 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 405.82' @ 12.29 hrs
Flood Elev= 406.88'

Device	Routing	Invert	Outlet Devices
#1	Primary	402.80'	**12.0" Round Culvert** L= 167.8' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 402.80' / 392.73' S= 0.0600 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=3.29 cfs @ 12.29 hrs HW=405.77' TW=403.92' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 3.29 cfs @ 4.19 fps)

Summary for Pond 20P: DMH#14

Inflow Area = 3.830 ac, 17.06% Impervious, Inflow Depth > 3.06" for 25-YEAR event
Inflow = 8.49 cfs @ 12.33 hrs, Volume= 0.98 af
Outflow = 8.49 cfs @ 12.33 hrs, Volume= 0.98 af, Atten= 0%, Lag= 0.0 min
Primary = 8.49 cfs @ 12.33 hrs, Volume= 0.98 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 376.95' @ 12.33 hrs
Flood Elev= 383.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	375.20'	**18.0" Round Culvert** L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 375.20' / 374.00' S= 0.0800 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=8.49 cfs @ 12.33 hrs HW=376.95' TW=370.32' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 8.49 cfs @ 4.80 fps)

Summary for Pond 21P: DMH#15

Inflow Area = 3.830 ac, 17.06% Impervious, Inflow Depth > 3.06" for 25-YEAR event
Inflow = 8.49 cfs @ 12.33 hrs, Volume= 0.98 af
Outflow = 8.49 cfs @ 12.33 hrs, Volume= 0.98 af, Atten= 0%, Lag= 0.0 min
Primary = 8.49 cfs @ 12.33 hrs, Volume= 0.98 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 383.21' @ 12.33 hrs
Flood Elev= 387.85'

Device	Routing	Invert	Outlet Devices
#1	Primary	381.46'	**18.0" Round Culvert** L= 30.7' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 381.46' / 379.00' S= 0.0801 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=8.49 cfs @ 12.33 hrs HW=383.21' TW=376.95' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 8.49 cfs @ 4.80 fps)

Summary for Pond 22P: DMH#16

Inflow Area = 3.830 ac, 17.06% Impervious, Inflow Depth > 3.06" for 25-YEAR event
Inflow = 8.49 cfs @ 12.33 hrs, Volume= 0.98 af
Outflow = 8.49 cfs @ 12.33 hrs, Volume= 0.98 af, Atten= 0%, Lag= 0.0 min
Primary = 8.49 cfs @ 12.33 hrs, Volume= 0.98 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 394.67' @ 12.33 hrs
Flood Elev= 400.42'

Device	Routing	Invert	Outlet Devices
#1	Primary	392.92'	**18.0" Round Culvert** L= 111.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 392.92' / 384.00' S= 0.0800 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=8.49 cfs @ 12.33 hrs HW=394.67' TW=383.21' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 8.49 cfs @ 4.80 fps)

Summary for Pond 23P: DMH#17

Inflow Area = 3.830 ac, 17.06% Impervious, Inflow Depth > 3.06" for 25-YEAR event
Inflow = 8.49 cfs @ 12.33 hrs, Volume= 0.98 af
Outflow = 8.49 cfs @ 12.33 hrs, Volume= 0.98 af, Atten= 0%, Lag= 0.0 min
Primary = 8.49 cfs @ 12.33 hrs, Volume= 0.98 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 402.88' @ 12.33 hrs
Flood Elev= 409.83'

Device	Routing	Invert	Outlet Devices
#1	Primary	401.13'	**18.0" Round Culvert** L= 45.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 401.13' / 397.53' S= 0.0800 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=8.49 cfs @ 12.33 hrs HW=402.88' TW=394.67' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 8.49 cfs @ 4.80 fps)

Summary for Pond 24P: CB#18

Inflow Area = 3.830 ac, 17.06% Impervious, Inflow Depth > 3.06" for 25-YEAR event
Inflow = 8.49 cfs @ 12.33 hrs, Volume= 0.98 af
Outflow = 8.49 cfs @ 12.33 hrs, Volume= 0.98 af, Atten= 0%, Lag= 0.0 min
Primary = 8.49 cfs @ 12.33 hrs, Volume= 0.98 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 404.62' @ 12.33 hrs
Flood Elev= 407.95'

Device	Routing	Invert	Outlet Devices
#1	Primary	402.87'	**18.0" Round Culvert** L= 164.2' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 402.87' / 401.23' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=8.49 cfs @ 12.33 hrs HW=404.62' TW=402.88' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 8.49 cfs @ 4.80 fps)

Summary for Pond 25P: CB#19

Inflow Area = 2.259 ac, 23.36% Impervious, Inflow Depth > 3.24" for 25-YEAR event
Inflow = 5.21 cfs @ 12.33 hrs, Volume= 0.61 af
Outflow = 5.21 cfs @ 12.33 hrs, Volume= 0.61 af, Atten= 0%, Lag= 0.0 min
Primary = 5.21 cfs @ 12.33 hrs, Volume= 0.61 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 405.39' @ 12.33 hrs
Flood Elev= 408.04'

Device	Routing	Invert	Outlet Devices
#1	Primary	403.34'	**15.0" Round Culvert** L= 36.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 403.34' / 402.97' S= 0.0101 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=5.20 cfs @ 12.33 hrs HW=405.39' TW=404.62' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 5.20 cfs @ 4.24 fps)

Summary for Pond 26P: CB#20

Inflow Area =	0.702 ac,	34.65% Impervious,	Inflow Depth > 3.52"	for 25-YEAR event	
Inflow =	1.95 cfs @	12.28 hrs,	Volume=	0.21 af	
Outflow =	1.95 cfs @	12.28 hrs,	Volume=	0.21 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.95 cfs @	12.28 hrs,	Volume=	0.21 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 405.63' @ 12.34 hrs
Flood Elev= 407.78'

Device	Routing	Invert	Outlet Devices
#1	Primary	403.70'	**12.0" Round Culvert** L= 26.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 403.70' / 403.44' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=1.78 cfs @ 12.28 hrs HW=405.49' TW=405.27' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 1.78 cfs @ 2.26 fps)

Summary for Pond PP: POCKET POND

Inflow Area =	11.270 ac,	12.00% Impervious,	Inflow Depth > 2.96"	for 25-YEAR event	
Inflow =	25.01 cfs @	12.25 hrs,	Volume=	2.78 af	
Outflow =	1.13 cfs @	17.15 hrs,	Volume=	1.05 af,	Atten= 95%, Lag= 293.8 min
Primary =	1.13 cfs @	17.15 hrs,	Volume=	1.05 af	
Secondary =	0.00 cfs @	0.00 hrs,	Volume=	0.00 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 367.00' Surf.Area= 9,015 sf Storage= 7,477 cf
Peak Elev= 372.81' @ 17.15 hrs Surf.Area= 22,341 sf Storage= 92,034 cf (84,557 cf above start)
Flood Elev= 374.00' Surf.Area= 24,964 sf Storage= 118,753 cf (111,276 cf above start)

Plug-Flow detention time= 437.0 min calculated for 0.88 af (32% of inflow)
Center-of-Mass det. time= 248.0 min (1,086.1 - 838.0)

Volume	Invert	Avail.Storage	Storage Description
#1	364.00'	118,753 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
#2	369.00'	0 cf	**Sediment Forebay (No Storage) (Prismatic)** Listed below (Recalc) 1,678 cf Overall x 0.0% Voids
		118,753 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
364.00	145	0	0
366.00	1,883	2,028	2,028
367.00	9,015	5,449	7,477
368.00	10,563	9,789	17,266
369.00	12,205	11,384	28,650
370.00	13,939	13,072	41,722
371.00	17,278	15,609	57,331
372.00	19,350	18,314	75,645
374.00	23,758	43,108	118,753

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
369.00	472	0	0
371.00	1,206	1,678	1,678

Device	Routing	Invert	Outlet Devices
#1	Primary	365.00'	**15.0" Round Culvert** L= 190.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 365.00' / 349.80' S= 0.0800 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	367.00'	**2.5" Vert. Orifice** C= 0.600
#3	Device 1	369.45'	**3.2" Vert. Orifice** C= 0.600
#4	Device 1	371.50'	**3.0" Vert. Orifice** C= 0.600
#5	Device 1	373.70'	**48.0" x 48.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#6	Secondary	373.80'	**10.0' long x 27.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=1.13 cfs @ 17.15 hrs HW=372.81' TW=350.21' (Dynamic Tailwater)
1=Culvert (Passes 1.13 cfs of 15.84 cfs potential flow)
2=Orifice (Orifice Controls 0.39 cfs @ 11.50 fps)
3=Orifice (Orifice Controls 0.48 cfs @ 8.65 fps)
4=Orifice (Orifice Controls 0.26 cfs @ 5.24 fps)
5=Grate (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=367.00' TW=348.50' (Dynamic Tailwater)
6=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Link A: BARRETTS HILL CROSSING

Inflow Area = 41.139 ac, 8.14% Impervious, Inflow Depth > 1.80" for 25-YEAR event
Inflow = 33.99 cfs @ 12.49 hrs, Volume= 6.15 af
Primary = 33.99 cfs @ 12.49 hrs, Volume= 6.15 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link B: LOT 57

Inflow Area =	2.097 ac,	14.39% Impervious,	Inflow Depth > 3.04"	for 25-YEAR event	
Inflow =	5.12 cfs @	12.27 hrs,	Volume=	0.53 af	
Primary =	5.12 cfs @	12.27 hrs,	Volume=	0.53 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link C: LOT 11

Inflow Area =	2.594 ac,	9.49% Impervious,	Inflow Depth > 2.84"	for 25-YEAR event	
Inflow =	5.76 cfs @	12.29 hrs,	Volume=	0.61 af	
Primary =	5.76 cfs @	12.29 hrs,	Volume=	0.61 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Attachment "F"

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: SUBCATCHMENT Runoff Area=961,091 sf 4.08% Impervious Runoff Depth>2.86"
Flow Length=2,203' Tc=38.1 min CN=64.6 Runoff=37.01 cfs 5.26 af

Subcatchment 2S: SUBCATCHMENT Runoff Area=113,081 sf 12.76% Impervious Runoff Depth>2.56"
Flow Length=683' Tc=20.1 min CN=61.4 Runoff=5.12 cfs 0.55 af

Subcatchment 3S: SUBCATCHMENT Runoff Area=124,041 sf 7.14% Impervious Runoff Depth>2.57"
Flow Length=1,189' Tc=23.1 min CN=61.5 Runoff=5.32 cfs 0.61 af

Subcatchment 4S: SUBCATCHMENT Runoff Area=86,429 sf 21.84% Impervious Runoff Depth>3.48"
Tc=6.0 min CN=70.6 Runoff=8.11 cfs 0.58 af

Subcatchment 5S: SUBCATCHMENT Runoff Area=16,441 sf 34.30% Impervious Runoff Depth>3.80"
Flow Length=389' Tc=8.7 min CN=73.7 Runoff=1.54 cfs 0.12 af

Subcatchment 6S: SUBCATCHMENT Runoff Area=91,362 sf 14.39% Impervious Runoff Depth>4.00"
Flow Length=692' Tc=19.5 min CN=75.7 Runoff=6.74 cfs 0.70 af

Subcatchment 7S: SUBCATCHMENT Runoff Area=112,988 sf 9.49% Impervious Runoff Depth>3.77"
Flow Length=1,021' Tc=20.7 min CN=73.5 Runoff=7.67 cfs 0.82 af

Subcatchment 8S: SUBCATCHMENT Runoff Area=30,577 sf 34.65% Impervious Runoff Depth>4.53"
Flow Length=719' Tc=20.3 min CN=80.6 Runoff=2.50 cfs 0.27 af

Subcatchment 9S: SUBCATCHMENT Runoff Area=67,824 sf 18.27% Impervious Runoff Depth>4.07"
Flow Length=1,293' Tc=26.9 min CN=76.4 Runoff=4.44 cfs 0.53 af

Subcatchment 10S: SUBCATCHMENT Runoff Area=68,434 sf 8.00% Impervious Runoff Depth>3.72"
Flow Length=676' Tc=23.0 min CN=73.0 Runoff=4.37 cfs 0.49 af

Subcatchment 11S: SUBCATCHMENT Runoff Area=66,396 sf 2.68% Impervious Runoff Depth>3.55"
Flow Length=690' Tc=20.7 min CN=71.4 Runoff=4.24 cfs 0.45 af

Subcatchment 12S: SUBCATCHMENT Runoff Area=59,686 sf 10.36% Impervious Runoff Depth>3.82"
Flow Length=753' Tc=18.7 min CN=73.9 Runoff=4.27 cfs 0.44 af

Subcatchment 13S: SUBCATCHMENT Runoff Area=54,469 sf 6.63% Impervious Runoff Depth>3.69"
Flow Length=680' Tc=16.3 min CN=72.6 Runoff=3.97 cfs 0.38 af

Subcatchment 14S: SUBCATCHMENT Runoff Area=38,021 sf 9.74% Impervious Runoff Depth>3.80"
Flow Length=731' Tc=17.2 min CN=73.7 Runoff=2.80 cfs 0.28 af

Subcatchment 15S: SUBCATCHMENT Runoff Area=14,603 sf 40.57% Impervious Runoff Depth>4.89"
Tc=6.0 min CN=83.7 Runoff=1.88 cfs 0.14 af

Subcatchment 16S: SUBCATCHMENT Runoff Area=7,988 sf 70.27% Impervious Runoff Depth>5.69"
Tc=6.0 min CN=90.9 Runoff=1.15 cfs 0.09 af

Subcatchment 17S: SUBCATCHMENT Runoff Area=82,926 sf 4.39% Impervious Runoff Depth>3.85"
Flow Length=230' Tc=13.2 min CN=74.2 Runoff=6.86 cfs 0.61 af

Reach 1R: EXISTING ROADWAY DITCH Avg. Flow Depth=0.82' Max Vel=4.72 fps Inflow=9.56 cfs 0.70 af
n=0.022 L=230.0' S=0.0173 '/' Capacity=16.21 cfs Outflow=9.48 cfs 0.69 af

Reach 2R: EXISTING ROADWAY DITCH Avg. Flow Depth=0.54' Max Vel=2.36 fps Inflow=2.71 cfs 1.49 af
n=0.069 L=915.0' S=0.0621 '/' Capacity=12.04 cfs Outflow=2.70 cfs 1.48 af

Pond 1P: EXISTING CB Inflow=37.01 cfs 5.26 af
Primary=37.01 cfs 5.26 af

Pond 2P: EXISTING DRIVEWAY CULVERT Peak Elev=300.88' Inflow=5.12 cfs 0.55 af
12.0" Round Culvert n=0.013 L=21.0' S=0.0143 '/' Outflow=5.12 cfs 0.55 af

Pond 3P: EXISTING DROP INLET Peak Elev=299.86' Inflow=48.31 cfs 8.59 af
24.0" Round Culvert n=0.011 L=92.1' S=0.0433 '/' Outflow=48.31 cfs 8.59 af

Pond 4P: EXISTING CB Peak Elev=300.50' Inflow=9.56 cfs 0.70 af
Primary=4.61 cfs 0.63 af Secondary=4.94 cfs 0.06 af Outflow=9.56 cfs 0.70 af

Pond 5P: EXISTING CB Peak Elev=300.82' Inflow=1.54 cfs 0.12 af
Primary=1.54 cfs 0.12 af Secondary=0.00 cfs 0.00 af Outflow=1.54 cfs 0.12 af

Pond 6P: EXISTING CB Peak Elev=367.57' Inflow=6.74 cfs 0.70 af
12.0" Round Culvert n=0.025 L=18.0' S=0.0689 '/' Outflow=6.74 cfs 0.70 af

Pond 7P: EXISTING CB Peak Elev=381.18' Inflow=7.67 cfs 0.82 af
12.0" Round Culvert n=0.011 L=31.9' S=0.0091 '/' Outflow=7.67 cfs 0.82 af

Pond 8P: DMH#2 Peak Elev=350.54' Inflow=2.71 cfs 1.49 af
15.0" Round Culvert n=0.013 L=15.0' S=0.0800 '/' Outflow=2.71 cfs 1.49 af

Pond 9P: DMH#3 Peak Elev=378.80' Inflow=16.57 cfs 1.77 af
18.0" Round Culvert n=0.013 L=30.0' S=0.0073 '/' Outflow=16.57 cfs 1.77 af

Pond 10P: DMH#4 Peak Elev=383.88' Inflow=16.57 cfs 1.77 af
18.0" Round Culvert n=0.013 L=121.7' S=0.0100 '/' Outflow=16.57 cfs 1.77 af

Pond 11P: DMH#5 Peak Elev=391.55' Inflow=16.57 cfs 1.77 af
18.0" Round Culvert n=0.013 L=226.1' S=0.0100 '/' Outflow=16.57 cfs 1.77 af

Pond 12P: CB#6 Peak Elev=397.09' Inflow=16.57 cfs 1.77 af
18.0" Round Culvert n=0.013 L=141.2' S=0.0100 '/' Outflow=16.57 cfs 1.77 af

Pond 13P: CB#7 Peak Elev=404.06' Inflow=15.66 cfs 1.63 af
15.0" Round Culvert n=0.013 L=30.3' S=0.0099 '/' Outflow=15.66 cfs 1.63 af

Pond 14P: CB#8 Peak Elev=413.14' Inflow=12.87 cfs 1.36 af
15.0" Round Culvert n=0.013 L=165.7' S=0.0250 '/' Outflow=12.87 cfs 1.36 af

Attachment "F"

Pond 16P: CB#10 Peak Elev=426.70' Inflow=8.98 cfs 0.97 af
12.0" Round Culvert n=0.013 L=165.5' S=0.0500 '/' Outflow=8.98 cfs 0.97 af

Pond 17P: CB#100 Peak Elev=426.71' Inflow=1.15 cfs 0.09 af
12.0" Round Culvert n=0.013 L=26.0' S=0.0200 '/' Outflow=1.15 cfs 0.09 af

Pond 18P: CB#11 Peak Elev=429.75' Inflow=4.24 cfs 0.45 af
12.0" Round Culvert n=0.013 L=167.8' S=0.0600 '/' Outflow=4.24 cfs 0.45 af

Pond 20P: DMH#14 Peak Elev=377.67' Inflow=11.16 cfs 1.28 af
18.0" Round Culvert n=0.013 L=15.0' S=0.0800 '/' Outflow=11.16 cfs 1.28 af

Pond 21P: DMH#15 Peak Elev=383.93' Inflow=11.16 cfs 1.28 af
18.0" Round Culvert n=0.013 L=30.7' S=0.0801 '/' Outflow=11.16 cfs 1.28 af

Pond 22P: DMH#16 Peak Elev=395.39' Inflow=11.16 cfs 1.28 af
18.0" Round Culvert n=0.013 L=111.5' S=0.0800 '/' Outflow=11.16 cfs 1.28 af

Pond 23P: DMH#17 Peak Elev=403.60' Inflow=11.16 cfs 1.28 af
18.0" Round Culvert n=0.013 L=45.0' S=0.0800 '/' Outflow=11.16 cfs 1.28 af

Pond 24P: CB#18 Peak Elev=406.38' Inflow=11.16 cfs 1.28 af
18.0" Round Culvert n=0.013 L=164.2' S=0.0100 '/' Outflow=11.16 cfs 1.28 af

Pond 25P: CB#19 Peak Elev=407.69' Inflow=6.78 cfs 0.79 af
15.0" Round Culvert n=0.013 L=36.5' S=0.0101 '/' Outflow=6.78 cfs 0.79 af

Pond 26P: CB#20 Peak Elev=408.08' Inflow=2.50 cfs 0.27 af
12.0" Round Culvert n=0.013 L=26.0' S=0.0100 '/' Outflow=2.50 cfs 0.27 af

Pond PP: POCKET POND Peak Elev=373.79' Storage=113,786 cf Inflow=33.13 cfs 3.66 af
Primary=2.71 cfs 1.49 af Secondary=0.00 cfs 0.00 af Outflow=2.71 cfs 1.49 af

Link A: BARRETTS HILL CROSSING Inflow=48.31 cfs 8.59 af
Primary=48.31 cfs 8.59 af

Link B: LOT 57 Inflow=6.74 cfs 0.70 af
Primary=6.74 cfs 0.70 af

Link C: LOT 11 Inflow=7.67 cfs 0.82 af
Primary=7.67 cfs 0.82 af

Total Runoff Area = 45.830 ac Runoff Volume = 12.29 af Average Runoff Depth = 3.22"
91.49% Pervious = 41.932 ac 8.51% Impervious = 3.898 ac

Summary for Subcatchment 1S: SUBCATCHMENT

Runoff = 37.01 cfs @ 12.57 hrs, Volume= 5.26 af, Depth> 2.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-YEAR Rainfall=6.77"

	Area (sf)	CN	Description
	7,670	30.0	Woods, Good, HSG A
	363,085	55.0	Woods, Good, HSG B
	427,890	70.0	Woods, Good, HSG C
	6,684	39.0	>75% Grass cover, Good, HSG A
	61,618	61.0	>75% Grass cover, Good, HSG B
	54,927	74.0	>75% Grass cover, Good, HSG C
*	21,604	98.0	Roofs
*	17,613	98.0	Paved parking
	961,091	64.6	Weighted Average
	921,874	63.2	95.92% Pervious Area
	39,217	98.0	4.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.3	100	0.0400	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
19.7	1,862	0.0988	1.57		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.3	30	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.8	211	0.0430	4.21		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
38.1	2,203	Total			

Summary for Subcatchment 2S: SUBCATCHMENT

Runoff = 5.12 cfs @ 12.29 hrs, Volume= 0.55 af, Depth> 2.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-YEAR Rainfall=6.77"

	Area (sf)	CN	Description
	28,414	30.0	Woods, Good, HSG A
	11,383	55.0	Woods, Good, HSG B
	33,808	70.0	Woods, Good, HSG C
	4,719	39.0	>75% Grass cover, Good, HSG A
	242	61.0	>75% Grass cover, Good, HSG B
	20,087	74.0	>75% Grass cover, Good, HSG C
*	3,849	98.0	Roofs
*	10,579	98.0	Paved parking
	113,081	61.4	Weighted Average
	98,653	56.1	87.24% Pervious Area
	14,428	98.0	12.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	100	0.1000	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
3.9	318	0.0750	1.37		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.7	48	0.0300	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.6	217	0.0410	1.01		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
20.1	683	Total			

Summary for Subcatchment 3S: SUBCATCHMENT

Runoff = 5.32 cfs @ 12.34 hrs, Volume= 0.61 af, Depth> 2.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-YEAR Rainfall=6.77"

	Area (sf)	CN	Description
	5,732	30.0	Woods, Good, HSG A
	49,946	55.0	Woods, Good, HSG B
	30,651	70.0	Woods, Good, HSG C
	4,799	39.0	>75% Grass cover, Good, HSG A
	20,628	61.0	>75% Grass cover, Good, HSG B
	3,428	74.0	>75% Grass cover, Good, HSG C
*	2,833	98.0	Roofs
*	6,024	98.0	Paved parking
	124,041	61.5	Weighted Average
	115,184	58.7	92.86% Pervious Area
	8,857	98.0	7.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.9	100	0.1600	0.17		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
13.2	1,089	0.0760	1.38		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
23.1	1,189	Total			

Summary for Subcatchment 4S: SUBCATCHMENT

Runoff = 8.11 cfs @ 12.09 hrs, Volume= 0.58 af, Depth> 3.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-YEAR Rainfall=6.77"

	Area (sf)	CN	Description
	10,510	55.0	Woods, Good, HSG B
	6,756	70.0	Woods, Good, HSG C
	40,259	61.0	>75% Grass cover, Good, HSG B
	10,029	74.0	>75% Grass cover, Good, HSG C
	16,327	98.0	Paved parking, HSG C
*	2,548	98.0	Roofs
	86,429	70.6	Weighted Average
	67,554	62.9	78.16% Pervious Area
	18,875	98.0	21.84% Impervious Area

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

Summary for Subcatchment 5S: SUBCATCHMENT

Runoff = 1.54 cfs @ 12.12 hrs, Volume= 0.12 af, Depth> 3.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-YEAR Rainfall=6.77"

	Area (sf)	CN	Description
	10,801	61.0	>75% Grass cover, Good, HSG B
*	5,640	98.0	Paved parking
	16,441	73.7	Weighted Average
	10,801	61.0	65.70% Pervious Area
	5,640	98.0	34.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	100	0.0700	0.26		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
0.1	16	0.0400	4.06		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.5	162	0.0680	1.83		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	20	0.0400	4.06		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.8	91	0.0770	1.94		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.7	389	Total			

Summary for Subcatchment 6S: SUBCATCHMENT

Runoff = 6.74 cfs @ 12.26 hrs, Volume= 0.70 af, Depth> 4.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-YEAR Rainfall=6.77"

	Area (sf)	CN	Description
	42,274	70.0	Woods, Good, HSG C
	35,721	74.0	>75% Grass cover, Good, HSG C
*	8,350	98.0	Paved parking
*	4,800	98.0	Roofs
	217	96.0	Gravel surface, HSG C
	91,362	75.7	Weighted Average
	78,212	71.9	85.61% Pervious Area
	13,150	98.0	14.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.8	100	0.0500	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
1.0	80	0.0750	1.37		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	18	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.2	12	0.0400	1.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.1	15	0.3000	3.83		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.2	467	0.0300	3.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
19.5	692	Total			

Summary for Subcatchment 7S: SUBCATCHMENT

Runoff = 7.67 cfs @ 12.29 hrs, Volume= 0.82 af, Depth> 3.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-YEAR Rainfall=6.77"

	Area (sf)	CN	Description
	83,250	70.0	Woods, Good, HSG C
	18,246	74.0	>75% Grass cover, Good, HSG C
*	5,928	98.0	Paved parking
	764	96.0	Gravel surface, HSG C
*	4,800	98.0	Roofs
	112,988	73.5	Weighted Average
	102,260	70.9	90.51% Pervious Area
	10,728	98.0	9.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	100	0.0900	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
7.5	755	0.1130	1.68		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.0	6	0.3000	3.83		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.7	160	0.0375	3.93		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
20.7	1,021	Total			

Summary for Subcatchment 8S: SUBCATCHMENT

Runoff = 2.50 cfs @ 12.28 hrs, Volume= 0.27 af, Depth> 4.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-YEAR Rainfall=6.77"

	Area (sf)	CN	Description
	13,046	70.0	Woods, Good, HSG C
	6,935	74.0	>75% Grass cover, Good, HSG C
*	10,596	98.0	Paved parking
	30,577	80.6	Weighted Average
	19,981	71.4	65.35% Pervious Area
	10,596	98.0	34.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.8	100	0.0500	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
2.9	329	0.1480	1.92		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.1	33	0.3330	4.04		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.5	257	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
20.3	719	Total			

Summary for Subcatchment 9S: SUBCATCHMENT

Runoff = 4.44 cfs @ 12.38 hrs, Volume= 0.53 af, Depth> 4.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-YEAR Rainfall=6.77"

	Area (sf)	CN	Description
	34,147	70.0	Woods, Good, HSG C
	21,287	74.0	>75% Grass cover, Good, HSG C
*	7,590	98.0	Paved parking
*	4,800	98.0	Roofs
	67,824	76.4	Weighted Average
	55,434	71.5	81.73% Pervious Area
	12,390	98.0	18.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.4	100	0.0300	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
2.6	350	0.1940	2.20		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	43	0.3330	4.04		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.6	800	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
26.9	1,293	Total			

Summary for Subcatchment 10S: SUBCATCHMENT

Runoff = 4.37 cfs @ 12.32 hrs, Volume= 0.49 af, Depth> 3.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-YEAR Rainfall=6.77"

	Area (sf)	CN	Description
	49,642	70.0	Woods, Good, HSG C
	13,315	74.0	>75% Grass cover, Good, HSG C
*	3,077	98.0	Paved parking
*	2,400	98.0	Roofs
	68,434	73.0	Weighted Average
	62,957	70.8	92.00% Pervious Area
	5,477	98.0	8.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.3	100	0.0400	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
4.0	479	0.1610	2.01		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.5	65	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.2	32	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
23.0	676	Total			

Attachment "F"

Summary for Subcatchment 11S: SUBCATCHMENT

Runoff = 4.24 cfs @ 12.29 hrs, Volume= 0.45 af, Depth> 3.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-YEAR Rainfall=6.77"

	Area (sf)	CN	Description
	54,267	70.0	Woods, Good, HSG C
	10,350	74.0	>75% Grass cover, Good, HSG C
*	1,779	98.0	Paved parking
	66,396	71.4	Weighted Average
	64,617	70.6	97.32% Pervious Area
	1,779	98.0	2.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.8	100	0.0500	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
4.2	485	0.1510	1.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.6	73	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	32	0.0600	4.97		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
20.7	690	Total			

Summary for Subcatchment 12S: SUBCATCHMENT

Runoff = 4.27 cfs @ 12.26 hrs, Volume= 0.44 af, Depth> 3.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-YEAR Rainfall=6.77"

	Area (sf)	CN	Description
	38,779	70.0	Woods, Good, HSG C
	14,722	74.0	>75% Grass cover, Good, HSG C
*	3,785	98.0	Paved parking
*	2,400	98.0	Roofs
	59,686	73.9	Weighted Average
	53,501	71.1	89.64% Pervious Area
	6,185	98.0	10.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8	100	0.0700	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
4.0	462	0.1470	1.92		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.4	55	0.1100	2.32		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.5	136	0.0600	4.97		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
18.7	753	Total			

Summary for Subcatchment 13S: SUBCATCHMENT

Runoff = 3.97 cfs @ 12.23 hrs, Volume= 0.38 af, Depth> 3.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-YEAR Rainfall=6.77"

	Area (sf)	CN	Description
	40,261	70.0	Woods, Good, HSG C
	10,598	74.0	>75% Grass cover, Good, HSG C
*	3,610	98.0	Paved parking
	54,469	72.6	Weighted Average
	50,859	70.8	93.37% Pervious Area
	3,610	98.0	6.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	100	0.1000	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
3.8	425	0.1410	1.88		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.3	61	0.3300	4.02		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.3	94	0.0600	4.97		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
16.3	680	Total			

Summary for Subcatchment 14S: SUBCATCHMENT

Runoff = 2.80 cfs @ 12.23 hrs, Volume= 0.28 af, Depth> 3.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-YEAR Rainfall=6.77"

	Area (sf)	CN	Description
	25,189	70.0	Woods, Good, HSG C
	9,128	74.0	>75% Grass cover, Good, HSG C
*	3,704	98.0	Paved parking
	38,021	73.7	Weighted Average
	34,317	71.1	90.26% Pervious Area
	3,704	98.0	9.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.1	100	0.1200	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
5.5	529	0.1020	1.60		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	46	0.3300	4.02		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.3	56	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
17.2	731	Total			

Summary for Subcatchment 15S: SUBCATCHMENT

Runoff = 1.88 cfs @ 12.09 hrs, Volume= 0.14 af, Depth> 4.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-YEAR Rainfall=6.77"

	Area (sf)	CN	Description
	8,678	74.0	>75% Grass cover, Good, HSG C
*	5,925	98.0	Paved parking
	14,603	83.7	Weighted Average
	8,678	74.0	59.43% Pervious Area
	5,925	98.0	40.57% Impervious Area

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

Summary for Subcatchment 16S: SUBCATCHMENT

Runoff = 1.15 cfs @ 12.08 hrs, Volume= 0.09 af, Depth> 5.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-YEAR Rainfall=6.77"

	Area (sf)	CN	Description
	2,375	74.0	>75% Grass cover, Good, HSG C
*	5,613	98.0	Paved parking
	7,988	90.9	Weighted Average
	2,375	74.0	29.73% Pervious Area
	5,613	98.0	70.27% Impervious Area

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

Summary for Subcatchment 17S: SUBCATCHMENT

Runoff = 6.86 cfs @ 12.18 hrs, Volume= 0.61 af, Depth> 3.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-YEAR Rainfall=6.77"

	Area (sf)	CN	Description
	26,296	70.0	Woods, Good, HSG C
	51,457	74.0	>75% Grass cover, Good, HSG C
*	1,238	98.0	Paved parking
*	2,400	98.0	Roofs
	1,535	96.0	Gravel surface, HSG C
	82,926	74.2	Weighted Average
	79,288	73.1	95.61% Pervious Area
	3,638	98.0	4.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	100	0.1000	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
1.0	90	0.0860	1.47		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	40	0.3300	4.02		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
13.2	230	Total			

Summary for Reach 1R: EXISTING ROADWAY DITCH

Inflow Area = 2.362 ac, 23.83% Impervious, Inflow Depth > 3.53" for 50-YEAR event
Inflow = 9.56 cfs @ 12.09 hrs, Volume= 0.70 af
Outflow = 9.48 cfs @ 12.10 hrs, Volume= 0.69 af, Atten= 1%, Lag= 0.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.72 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 1.95 fps, Avg. Travel Time= 2.0 min

Peak Storage= 462 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.82'
Bank-Full Depth= 1.00' Flow Area= 3.0 sf, Capacity= 16.21 cfs

0.00' x 1.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 6.00'
Length= 230.0' Slope= 0.0173 '/'
Inlet Invert= 295.64', Outlet Invert= 291.66'

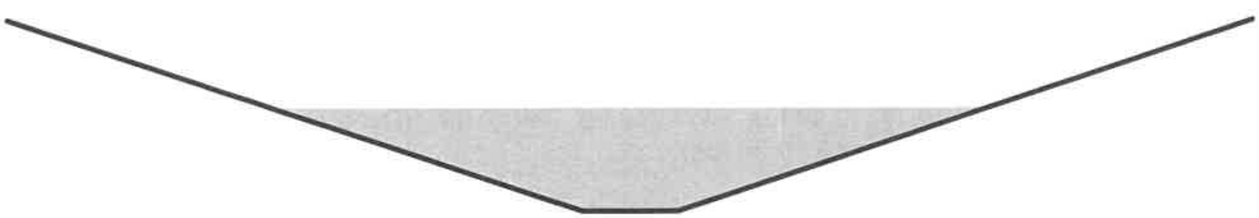
Summary for Reach 2R: EXISTING ROADWAY DITCH

Inflow Area = 11.270 ac, 12.00% Impervious, Inflow Depth > 1.59" for 50-YEAR event
Inflow = 2.71 cfs @ 14.88 hrs, Volume= 1.49 af
Outflow = 2.70 cfs @ 14.97 hrs, Volume= 1.48 af, Atten= 0%, Lag= 5.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.36 fps, Min. Travel Time= 6.5 min
Avg. Velocity = 1.55 fps, Avg. Travel Time= 9.8 min

Peak Storage= 1,045 cf @ 14.97 hrs
Average Depth at Peak Storage= 0.54'
Bank-Full Depth= 1.00' Flow Area= 3.5 sf, Capacity= 12.04 cfs

0.50' x 1.00' deep channel, n= 0.069 Riprap, 6-inch
Side Slope Z-value= 3.0 '/' Top Width= 6.50'
Length= 915.0' Slope= 0.0621 '/'
Inlet Invert= 348.50', Outlet Invert= 291.66'



Summary for Pond 1P: EXISTING CB

Inflow Area = 22.064 ac, 4.08% Impervious, Inflow Depth > 2.86" for 50-YEAR event
Inflow = 37.01 cfs @ 12.57 hrs, Volume= 5.26 af
Primary = 37.01 cfs @ 12.57 hrs, Volume= 5.26 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Pond 2P: EXISTING DRIVEWAY CULVERT

Inflow Area = 2.596 ac, 12.76% Impervious, Inflow Depth > 2.56" for 50-YEAR event
Inflow = 5.12 cfs @ 12.29 hrs, Volume= 0.55 af
Outflow = 5.12 cfs @ 12.29 hrs, Volume= 0.55 af, Atten= 0%, Lag= 0.0 min
Primary = 5.12 cfs @ 12.29 hrs, Volume= 0.55 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 300.88' @ 12.46 hrs
Flood Elev= 294.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	292.40'	**12.0" Round Culvert** L= 21.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 292.40' / 292.10' S= 0.0143 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=4.70 cfs @ 12.29 hrs HW=298.31' TW=296.77' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 4.70 cfs @ 5.99 fps)

Summary for Pond 3P: EXISTING DROP INLET

Inflow Area = 41.139 ac, 8.14% Impervious, Inflow Depth > 2.51" for 50-YEAR event
Inflow = 48.31 cfs @ 12.49 hrs, Volume= 8.59 af
Outflow = 48.31 cfs @ 12.49 hrs, Volume= 8.59 af, Atten= 0%, Lag= 0.0 min
Primary = 48.31 cfs @ 12.49 hrs, Volume= 8.59 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 299.86' @ 12.49 hrs
Flood Elev= 293.75'

Device	Routing	Invert	Outlet Devices
#1	Primary	288.66'	**24.0" Round Culvert** L= 92.1' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 288.66' / 284.67' S= 0.0433 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf

Primary OutFlow Max=48.30 cfs @ 12.49 hrs HW=299.86' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 48.30 cfs @ 15.38 fps)

Summary for Pond 4P: EXISTING CB

Inflow Area = 2.362 ac, 23.83% Impervious, Inflow Depth > 3.53" for 50-YEAR event
Inflow = 9.56 cfs @ 12.09 hrs, Volume= 0.70 af
Outflow = 9.56 cfs @ 12.09 hrs, Volume= 0.70 af, Atten= 0%, Lag= 0.0 min
Primary = 4.61 cfs @ 12.09 hrs, Volume= 0.63 af
Secondary = 4.94 cfs @ 12.09 hrs, Volume= 0.06 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Attachment "F"

Peak Elev= 300.50' @ 12.09 hrs
Flood Elev= 300.17'

Device	Routing	Invert	Outlet Devices
#1	Primary	297.00'	**12.0" Round Culvert** L= 49.1' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 297.00' / 295.64' S= 0.0277 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	300.17'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=4.61 cfs @ 12.09 hrs HW=300.50' TW=296.45' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 4.61 cfs @ 5.87 fps)

Secondary OutFlow Max=4.93 cfs @ 12.09 hrs HW=300.50' TW=296.45' (Dynamic Tailwater)
↑—**2=Orifice/Grate** (Weir Controls 4.93 cfs @ 1.87 fps)

Summary for Pond 5P: EXISTING CB

Inflow Area = 0.377 ac, 34.30% Impervious, Inflow Depth > 3.80" for 50-YEAR event
Inflow = 1.54 cfs @ 12.12 hrs, Volume= 0.12 af
Outflow = 1.54 cfs @ 12.12 hrs, Volume= 0.12 af, Atten= 0%, Lag= 0.0 min
Primary = 1.54 cfs @ 12.12 hrs, Volume= 0.12 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 300.82' @ 12.11 hrs
Flood Elev= 301.16'

Device	Routing	Invert	Outlet Devices
#1	Primary	297.70'	**12.0" Round Culvert** L= 34.1' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 297.70' / 297.30' S= 0.0117 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	301.16'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.56 cfs @ 12.12 hrs HW=300.81' TW=300.47' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 1.56 cfs @ 1.99 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=297.70' TW=0.00' (Dynamic Tailwater)
↑—**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 6P: EXISTING CB

Inflow Area = 2.097 ac, 14.39% Impervious, Inflow Depth > 4.00" for 50-YEAR event
Inflow = 6.74 cfs @ 12.26 hrs, Volume= 0.70 af
Outflow = 6.74 cfs @ 12.26 hrs, Volume= 0.70 af, Atten= 0%, Lag= 0.0 min
Primary = 6.74 cfs @ 12.26 hrs, Volume= 0.70 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Peak Elev= 367.57' @ 12.26 hrs
Flood Elev= 366.35'

Device	Routing	Invert	Outlet Devices
#1	Primary	363.70'	**12.0" Round Culvert** L= 18.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 363.70' / 362.46' S= 0.0689 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf

Primary OutFlow Max=6.74 cfs @ 12.26 hrs HW=367.56' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 6.74 cfs @ 8.58 fps)

Summary for Pond 7P: EXISTING CB

Inflow Area =	2.594 ac,	9.49% Impervious, Inflow Depth > 3.77"	for 50-YEAR event
Inflow =	7.67 cfs @	12.29 hrs, Volume=	0.82 af
Outflow =	7.67 cfs @	12.29 hrs, Volume=	0.82 af, Atten= 0%, Lag= 0.0 min
Primary =	7.67 cfs @	12.29 hrs, Volume=	0.82 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 381.18' @ 12.29 hrs
Flood Elev= 380.49'

Device	Routing	Invert	Outlet Devices
#1	Primary	376.57'	**12.0" Round Culvert** L= 31.9' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 376.57' / 376.28' S= 0.0091 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=7.67 cfs @ 12.29 hrs HW=381.18' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 7.67 cfs @ 9.76 fps)

Summary for Pond 8P: DMH#2

Inflow Area =	11.270 ac,	12.00% Impervious, Inflow Depth > 1.59"	for 50-YEAR event
Inflow =	2.71 cfs @	14.88 hrs, Volume=	1.49 af
Outflow =	2.71 cfs @	14.88 hrs, Volume=	1.49 af, Atten= 0%, Lag= 0.0 min
Primary =	2.71 cfs @	14.88 hrs, Volume=	1.49 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 350.54' @ 14.88 hrs
Flood Elev= 353.05'

Device	Routing	Invert	Outlet Devices
#1	Primary	349.70'	**15.0" Round Culvert** L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 349.70' / 348.50' S= 0.0800 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=2.71 cfs @ 14.88 hrs HW=350.54' TW=349.04' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 2.71 cfs @ 3.11 fps)

Summary for Pond 9P: DMH#3

Inflow Area = 5.536 ac, 11.12% Impervious, Inflow Depth > 3.84" for 50-YEAR event
Inflow = 16.57 cfs @ 12.24 hrs, Volume= 1.77 af
Outflow = 16.57 cfs @ 12.24 hrs, Volume= 1.77 af, Atten= 0%, Lag= 0.0 min
Primary = 16.57 cfs @ 12.24 hrs, Volume= 1.77 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 378.80' @ 12.24 hrs
Flood Elev= 377.79'

Device	Routing	Invert	Outlet Devices
#1	Primary	374.26'	**18.0" Round Culvert** L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 374.26' / 374.04' S= 0.0073 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=16.57 cfs @ 12.24 hrs HW=378.80' TW=370.70' (Dynamic Tailwater)
1=Culvert (Inlet Controls 16.57 cfs @ 9.37 fps)

Summary for Pond 10P: DMH#4

Inflow Area = 5.536 ac, 11.12% Impervious, Inflow Depth > 3.84" for 50-YEAR event
Inflow = 16.57 cfs @ 12.24 hrs, Volume= 1.77 af
Outflow = 16.57 cfs @ 12.24 hrs, Volume= 1.77 af, Atten= 0%, Lag= 0.0 min
Primary = 16.57 cfs @ 12.24 hrs, Volume= 1.77 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 383.88' @ 12.25 hrs
Flood Elev= 381.66'

Device	Routing	Invert	Outlet Devices
#1	Primary	375.58'	**18.0" Round Culvert** L= 121.7' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 375.58' / 374.36' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=16.55 cfs @ 12.24 hrs HW=383.87' TW=378.80' (Dynamic Tailwater)
1=Culvert (Outlet Controls 16.55 cfs @ 9.37 fps)

Summary for Pond 11P: DMH#5

Inflow Area = 5.536 ac, 11.12% Impervious, Inflow Depth > 3.84" for 50-YEAR event
Inflow = 16.57 cfs @ 12.24 hrs, Volume= 1.77 af
Outflow = 16.57 cfs @ 12.24 hrs, Volume= 1.77 af, Atten= 0%, Lag= 0.0 min
Primary = 16.57 cfs @ 12.24 hrs, Volume= 1.77 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 391.55' @ 12.25 hrs
Flood Elev= 384.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	377.94'	**18.0" Round Culvert** L= 226.1' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 377.94' / 375.68' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=16.51 cfs @ 12.24 hrs HW=391.52' TW=383.87' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 16.51 cfs @ 9.34 fps)

Summary for Pond 12P: CB#6

Inflow Area = 5.536 ac, 11.12% Impervious, Inflow Depth > 3.84" for 50-YEAR event
Inflow = 16.57 cfs @ 12.24 hrs, Volume= 1.77 af
Outflow = 16.57 cfs @ 12.24 hrs, Volume= 1.77 af, Atten= 0%, Lag= 0.0 min
Primary = 16.57 cfs @ 12.24 hrs, Volume= 1.77 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 397.09' @ 12.25 hrs
Flood Elev= 384.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	379.45'	**18.0" Round Culvert** L= 141.2' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 379.45' / 378.04' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=16.38 cfs @ 12.24 hrs HW=396.96' TW=391.52' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 16.38 cfs @ 9.27 fps)

Summary for Pond 13P: CB#7

Inflow Area = 5.201 ac, 9.22% Impervious, Inflow Depth > 3.77" for 50-YEAR event
Inflow = 15.66 cfs @ 12.25 hrs, Volume= 1.63 af
Outflow = 15.66 cfs @ 12.25 hrs, Volume= 1.63 af, Atten= 0%, Lag= 0.0 min
Primary = 15.66 cfs @ 12.25 hrs, Volume= 1.63 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 404.06' @ 12.26 hrs
Flood Elev= 384.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	380.25'	**15.0" Round Culvert** L= 30.3' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 380.25' / 379.95' S= 0.0099 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=15.48 cfs @ 12.25 hrs HW=403.90' TW=397.04' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 15.48 cfs @ 12.61 fps)

Summary for Pond 14P: CB#8

Inflow Area = 4.328 ac, 9.12% Impervious, Inflow Depth > 3.77" for 50-YEAR event
Inflow = 12.87 cfs @ 12.25 hrs, Volume= 1.36 af
Outflow = 12.87 cfs @ 12.25 hrs, Volume= 1.36 af, Atten= 0%, Lag= 0.0 min
Primary = 12.87 cfs @ 12.25 hrs, Volume= 1.36 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 413.14' @ 12.27 hrs
Flood Elev= 388.51'

Device	Routing	Invert	Outlet Devices
#1	Primary	384.49'	**15.0" Round Culvert** L= 165.7' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 384.49' / 380.35' S= 0.0250 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=12.69 cfs @ 12.25 hrs HW=412.88' TW=403.97' (Dynamic Tailwater)
1=Culvert (Outlet Controls 12.69 cfs @ 10.34 fps)

Summary for Pond 16P: CB#10

Inflow Area = 3.078 ac, 10.13% Impervious, Inflow Depth > 3.80" for 50-YEAR event
Inflow = 8.98 cfs @ 12.27 hrs, Volume= 0.97 af
Outflow = 8.98 cfs @ 12.27 hrs, Volume= 0.97 af, Atten= 0%, Lag= 0.0 min
Primary = 8.98 cfs @ 12.27 hrs, Volume= 0.97 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 426.70' @ 12.27 hrs
Flood Elev= 397.31'

Device	Routing	Invert	Outlet Devices
#1	Primary	392.11'	**12.0" Round Culvert** L= 165.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 392.11' / 383.83' S= 0.0500 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=8.94 cfs @ 12.27 hrs HW=426.57' TW=413.11' (Dynamic Tailwater)
1=Culvert (Outlet Controls 8.94 cfs @ 11.38 fps)

Summary for Pond 17P: CB#100

Inflow Area = 0.183 ac, 70.27% Impervious, Inflow Depth > 5.69" for 50-YEAR event
Inflow = 1.15 cfs @ 12.08 hrs, Volume= 0.09 af
Outflow = 1.15 cfs @ 12.08 hrs, Volume= 0.09 af, Atten= 0%, Lag= 0.0 min
Primary = 1.15 cfs @ 12.08 hrs, Volume= 0.09 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 426.71' @ 12.28 hrs
Flood Elev= 397.31'

Device	Routing	Invert	Outlet Devices
#1	Primary	393.25'	**12.0" Round Culvert** L= 26.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 393.25' / 392.73' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.08 hrs HW=394.88' TW=395.11' (Dynamic Tailwater)
↑—**1=Culvert** (Controls 0.00 cfs)

Summary for Pond 18P: CB#11

Inflow Area =	1.524 ac,	2.68% Impervious, Inflow Depth >	3.55"	for 50-YEAR event
Inflow =	4.24 cfs @	12.29 hrs, Volume=	0.45 af	
Outflow =	4.24 cfs @	12.29 hrs, Volume=	0.45 af,	Atten= 0%, Lag= 0.0 min
Primary =	4.24 cfs @	12.29 hrs, Volume=	0.45 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 429.75' @ 12.28 hrs
Flood Elev= 406.88'

Device	Routing	Invert	Outlet Devices
#1	Primary	402.80'	**12.0" Round Culvert** L= 167.8' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 402.80' / 392.73' S= 0.0600 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=4.46 cfs @ 12.29 hrs HW=429.67' TW=426.29' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 4.46 cfs @ 5.68 fps)

Summary for Pond 20P: DMH#14

Inflow Area =	3.830 ac,	17.06% Impervious, Inflow Depth >	4.01"	for 50-YEAR event
Inflow =	11.16 cfs @	12.32 hrs, Volume=	1.28 af	
Outflow =	11.16 cfs @	12.32 hrs, Volume=	1.28 af,	Atten= 0%, Lag= 0.0 min
Primary =	11.16 cfs @	12.32 hrs, Volume=	1.28 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 377.67' @ 12.32 hrs
Flood Elev= 383.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	375.20'	**18.0" Round Culvert** L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 375.20' / 374.00' S= 0.0800 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=11.15 cfs @ 12.32 hrs HW=377.67' TW=371.26' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 11.15 cfs @ 6.31 fps)

Summary for Pond 21P: DMH#15

Inflow Area = 3.830 ac, 17.06% Impervious, Inflow Depth > 4.01" for 50-YEAR event
Inflow = 11.16 cfs @ 12.32 hrs, Volume= 1.28 af
Outflow = 11.16 cfs @ 12.32 hrs, Volume= 1.28 af, Atten= 0%, Lag= 0.0 min
Primary = 11.16 cfs @ 12.32 hrs, Volume= 1.28 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 383.93' @ 12.32 hrs
Flood Elev= 387.85'

Device	Routing	Invert	Outlet Devices
#1	Primary	381.46'	**18.0" Round Culvert** L= 30.7' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 381.46' / 379.00' S= 0.0801 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=11.15 cfs @ 12.32 hrs HW=383.93' TW=377.67' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 11.15 cfs @ 6.31 fps)

Summary for Pond 22P: DMH#16

Inflow Area = 3.830 ac, 17.06% Impervious, Inflow Depth > 4.01" for 50-YEAR event
Inflow = 11.16 cfs @ 12.32 hrs, Volume= 1.28 af
Outflow = 11.16 cfs @ 12.32 hrs, Volume= 1.28 af, Atten= 0%, Lag= 0.0 min
Primary = 11.16 cfs @ 12.32 hrs, Volume= 1.28 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 395.39' @ 12.32 hrs
Flood Elev= 400.42'

Device	Routing	Invert	Outlet Devices
#1	Primary	392.92'	**18.0" Round Culvert** L= 111.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 392.92' / 384.00' S= 0.0800 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=11.15 cfs @ 12.32 hrs HW=395.39' TW=383.93' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 11.15 cfs @ 6.31 fps)

Summary for Pond 23P: DMH#17

Inflow Area = 3.830 ac, 17.06% Impervious, Inflow Depth > 4.01" for 50-YEAR event
Inflow = 11.16 cfs @ 12.32 hrs, Volume= 1.28 af
Outflow = 11.16 cfs @ 12.32 hrs, Volume= 1.28 af, Atten= 0%, Lag= 0.0 min
Primary = 11.16 cfs @ 12.32 hrs, Volume= 1.28 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 403.60' @ 12.32 hrs
Flood Elev= 409.83'

Device	Routing	Invert	Outlet Devices
#1	Primary	401.13'	**18.0" Round Culvert** L= 45.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 401.13' / 397.53' S= 0.0800 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=11.15 cfs @ 12.32 hrs HW=403.60' TW=395.39' (Dynamic Tailwater)
1=Culvert (Inlet Controls 11.15 cfs @ 6.31 fps)

Summary for Pond 24P: CB#18

Inflow Area = 3.830 ac, 17.06% Impervious, Inflow Depth > 4.01" for 50-YEAR event
Inflow = 11.16 cfs @ 12.32 hrs, Volume= 1.28 af
Outflow = 11.16 cfs @ 12.32 hrs, Volume= 1.28 af, Atten= 0%, Lag= 0.0 min
Primary = 11.16 cfs @ 12.32 hrs, Volume= 1.28 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 406.38' @ 12.33 hrs
Flood Elev= 407.95'

Device	Routing	Invert	Outlet Devices
#1	Primary	402.87'	**18.0" Round Culvert** L= 164.2' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 402.87' / 401.23' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=11.14 cfs @ 12.32 hrs HW=406.38' TW=403.60' (Dynamic Tailwater)
1=Culvert (Outlet Controls 11.14 cfs @ 6.30 fps)

Summary for Pond 25P: CB#19

Inflow Area = 2.259 ac, 23.36% Impervious, Inflow Depth > 4.21" for 50-YEAR event
Inflow = 6.78 cfs @ 12.32 hrs, Volume= 0.79 af
Outflow = 6.78 cfs @ 12.32 hrs, Volume= 0.79 af, Atten= 0%, Lag= 0.0 min
Primary = 6.78 cfs @ 12.32 hrs, Volume= 0.79 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 407.69' @ 12.34 hrs
Flood Elev= 408.04'

Device	Routing	Invert	Outlet Devices
#1	Primary	403.34'	**15.0" Round Culvert** L= 36.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 403.34' / 402.97' S= 0.0101 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=6.72 cfs @ 12.32 hrs HW=407.67' TW=406.38' (Dynamic Tailwater)
1=Culvert (Inlet Controls 6.72 cfs @ 5.48 fps)

Summary for Pond 26P: CB#20

Inflow Area = 0.702 ac, 34.65% Impervious, Inflow Depth > 4.53" for 50-YEAR event
Inflow = 2.50 cfs @ 12.28 hrs, Volume= 0.27 af
Outflow = 2.50 cfs @ 12.28 hrs, Volume= 0.27 af, Atten= 0%, Lag= 0.0 min
Primary = 2.50 cfs @ 12.28 hrs, Volume= 0.27 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 408.08' @ 12.34 hrs
Flood Elev= 407.78'

Device	Routing	Invert	Outlet Devices
#1	Primary	403.70'	**12.0" Round Culvert** L= 26.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 403.70' / 403.44' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=1.99 cfs @ 12.28 hrs HW=407.53' TW=407.26' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 1.99 cfs @ 2.54 fps)

Summary for Pond PP: POCKET POND

Inflow Area = 11.270 ac, 12.00% Impervious, Inflow Depth > 3.90" for 50-YEAR event
Inflow = 33.13 cfs @ 12.25 hrs, Volume= 3.66 af
Outflow = 2.71 cfs @ 14.88 hrs, Volume= 1.49 af, Atten= 92%, Lag= 158.0 min
Primary = 2.71 cfs @ 14.88 hrs, Volume= 1.49 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 367.00' Surf.Area= 9,015 sf Storage= 7,477 cf
Peak Elev= 373.79' @ 14.88 hrs Surf.Area= 24,499 sf Storage= 113,786 cf (106,309 cf above start)
Flood Elev= 374.00' Surf.Area= 24,964 sf Storage= 118,753 cf (111,276 cf above start)

Plug-Flow detention time= 390.6 min calculated for 1.32 af (36% of inflow)
Center-of-Mass det. time= 226.1 min (1,056.5 - 830.4)

Volume	Invert	Avail.Storage	Storage Description
#1	364.00'	118,753 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
#2	369.00'	0 cf	**Sediment Forebay (No Storage) (Prismatic)** Listed below (Recalc) 1,678 cf Overall x 0.0% Voids
		118,753 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
364.00	145	0	0
366.00	1,883	2,028	2,028
367.00	9,015	5,449	7,477
368.00	10,563	9,789	17,266
369.00	12,205	11,384	28,650
370.00	13,939	13,072	41,722
371.00	17,278	15,609	57,331
372.00	19,350	18,314	75,645
374.00	23,758	43,108	118,753

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
369.00	472	0	0
371.00	1,206	1,678	1,678

Device	Routing	Invert	Outlet Devices
#1	Primary	365.00'	**15.0" Round Culvert** L= 190.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 365.00' / 349.80' S= 0.0800 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	367.00'	**2.5" Vert. Orifice** C= 0.600
#3	Device 1	369.45'	**3.2" Vert. Orifice** C= 0.600
#4	Device 1	371.50'	**3.0" Vert. Orifice** C= 0.600
#5	Device 1	373.70'	**48.0" x 48.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#6	Secondary	373.80'	**10.0' long x 27.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=2.71 cfs @ 14.88 hrs HW=373.79' TW=350.54' (Dynamic Tailwater)
1=Culvert (Passes 2.71 cfs of 16.88 cfs potential flow)
2=Orifice (Orifice Controls 0.42 cfs @ 12.45 fps)
3=Orifice (Orifice Controls 0.55 cfs @ 9.87 fps)
4=Orifice (Orifice Controls 0.35 cfs @ 7.08 fps)
5=Grate (Weir Controls 1.39 cfs @ 0.98 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=367.00' TW=348.50' (Dynamic Tailwater)
6=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Link A: BARRETTS HILL CROSSING

Inflow Area = 41.139 ac, 8.14% Impervious, Inflow Depth > 2.51" for 50-YEAR event
Inflow = 48.31 cfs @ 12.49 hrs, Volume= 8.59 af
Primary = 48.31 cfs @ 12.49 hrs, Volume= 8.59 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link B: LOT 57

Inflow Area = 2.097 ac, 14.39% Impervious, Inflow Depth > 4.00" for 50-YEAR event
Inflow = 6.74 cfs @ 12.26 hrs, Volume= 0.70 af
Primary = 6.74 cfs @ 12.26 hrs, Volume= 0.70 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link C: LOT 11

Inflow Area = 2.594 ac, 9.49% Impervious, Inflow Depth > 3.77" for 50-YEAR event
Inflow = 7.67 cfs @ 12.29 hrs, Volume= 0.82 af
Primary = 7.67 cfs @ 12.29 hrs, Volume= 0.82 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

17. RIP RAP APRON CALCULATIONS

Attachment "F"

KNA KEACH-NORDSTROM ASSOCIATES, INC.

RIP RAP OUTLET PROTECTION APRON CALCULATIONS

Project: **Barrett Hill, LLC** Date: **12/6/2023**
KNA #: 23-0414-1

The purpose of this spreadsheet is to calculate the dimensions of Inlet/Outlet Protection apron (riprap) required during the SCS/NRCS 10-year type III 24-hr storm event. The spillway weir(s) inlet/outlet apron protection will be sized for the SCS/NRCS **10-year type III 24-hr storm event.**

Required In		
	Q	peak flow in CFS
	Do	diameter in feet of outlet or width of channel
	Tw	tail water at end of apron

Depending on the tail water conditions, either **column 1** or **column 2** is used for calculations

	Column One where Tw<1/2Do	Column Two where Tw>1/2Do
Length of Apron	**La = (1.8Q/Do^3/2)+7Do**	**La = 3*Q/Do^3/2+7Do**
Width of Apron at outfall	W1 = 3*Do W2 = 3*Do + La	W1 = 3*Do W2 = 3*Do+0.4*La

If defined channel, then use channel width for W1 and W2

Rock Rip Rap Size:
d50 = (0.02*Q^4/3)/(Tw*Do)

Calculation Summary Table:

RIRAP GRADATION ENVELOPE

Input to Chart Description (Optional)		Q-25 (cfs)	Do (ft)	Tw (ft)	Calculated Output La	W1	W2 no channel	d50, ft	d50 in	USE d50 in.	d100 FROM in	d100 TO in	d85 FROM in	d85 TO in	d50 FROM in	d50 TO in	d15 FROM in	d15 TO in	depth in	USE Depth in.	USE Length ft.	USE W1 ft.	USE W2 ft.
HW#1	Pond Outlet	0.70	1.25	0.17	10	4	13	0.1	0.70	4	6	8	5	7	4	6	1	2	10	10	10	4	13
HW#4	Pond Inlet	8.26	1.50	1.13	24	5	14	0.2	2.36	4	6	8	5	7	4	6	1	2	10	10	24	5	14
HW#13	Pond Inlet	5.74	1.50	0.45	16	5	21	0.3	3.65	4	6	8	5	7	4	6	1	2	10	10	16	5	21

* Center Apron with Headwall and Outlet Pipe (All Cases)

* Line Apron with 6.0 oz. Geotextile Fabric (All Cases)

Attachment "F"

18. SITE SPECIFIC SOIL SURVEY REPORT

Attachment "F"

GZA
Known for excellence.
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SITE-SPECIFIC SOIL MAPPING REPORT
75 Barretts Hill Road
Tax Map 151, Lot 59
Hudson, New Hampshire

October 2023
File No. 04.0191600.00

PREPARED FOR:
Keach-Nordstrom Associates, Inc.
Bedford, New Hampshire

GZA GeoEnvironmental, Inc.
5 Commerce Park North, Suite 201 | Bedford, NH 03110-6984
603-623-3600

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Bedford, NH 03110
T: 603.623.3600
F: 603.624.9463
www.gza.com

VIA EMAIL

October 4, 2023
File No. 04.0191600.00

Mr. Paul Chisholm, PE
Keach – Nordstrom Associates, Inc.
10 Commerce Park North, Suite 3
Bedford, New Hampshire 03110

Re: Site-Specific Soil Mapping Report
75 Barretts Hill Road
Tax Map 151, Lot 59
Hudson, New Hampshire

Dear Mr. Chisholm:

This report presents the findings of a Site-Specific Soil Survey completed by GZA GeoEnvironmental, Inc. (GZA) for the parcel identified as Tax Map 151, Lot 59, located on Barretts Hill Road in Hudson, New Hampshire ("Site"). This report summarizes the results of fieldwork completed on August 22, 2023, to identify Site soils and develop mapping.

Should you have any questions, please feel free to contact Ms. Lindsey White at 603-232-8753 or lindsey.white@gza.com.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

Lindsey White, CPSS
Project Manager

Deborah M. Zarta-Gier, CNRP
Consultant/Reviewer

Tracy L. Tarr, CWS, CWB, CESSWI
Associate Principal

James Long, CWS, CSS
Certified Soil Scientist

LEW/DMZ/TLT/JHL: jkm
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Attachment: Site-Specific Soil Mapping Report

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1.0 INTRODUCTION

This report presents the findings of Site-Specific Soil Mapping fieldwork conducted by GZA GeoEnvironmental, Inc. (GZA) on Barretts Hill Road in Hudson, New Hampshire (Tax Map 151, Lot 59) (**see Figure 1- Tax Map**) during August, 2023. GZA was retained by Keach – Nordstrom Associates, Inc. (KNA) to complete Site-Specific Soil mapping. Wetland delineation was completed separately by KNA. Based on assessing data, the Tax Map 151, Lot 59 is approximately 35-acres in size. Site-Specific Soil Mapping was requested on 24 acres, extending southerly from Barretts Hill Road to the utility line easement as outlined on the attached figure (i.e. the "Site") (see **Figure 2 – Aerial Overview Plan**). The Site is located in the northern portion of the Town of Hudson, New Hampshire, and is bordered to the north by Barretts Hill Road and to the east and west by residential properties. An existing maintained electric transmission utility easement is located on the southern boundary of the Site. The Site is primarily forested, with a mix of forested and shrub vegetation located in the central and northern portions of the Site. There are no building or other structures on the property, and appears undeveloped. Access is directly off Barretts Hill Road.

GZA understands the Site is currently owned by Helen Stabler. GZA also understands a Site-Specific Soil Map is required to support a New Hampshire Department of Environmental Services Alteration of Terrain Permitting Application, to be completed by KNA (see **Figure 3 – Site-Specific Soil Map**). This report is subject to the Limitations in **Appendix A**.

2.0 METHODOLOGY

The soil mapping of the Site was conducted in accordance with the standards set forth in the Society of Soil Scientists of Northern New England (SSSNNE) Publication No. 3 "Site-Specific Soil Mapping Standards for New Hampshire and Vermont, Version 7.0" dated July 2021 by New Hampshire Certified Soil Scientist James H. Long (CSS #15). The Site-Specific Soil Mapping Standards are based on a universally recognized taxonomic system of soil classification and are supported by national soil mapping standards established by the USDA National Cooperative Soil Survey.

This mapping has been completed based on a combination of publicly available databases and Site-specific data collected by on-Site observations. This report provides soil information including soil drainage classification, physical characteristics, and depth to bedrock (if encountered). GZA assessed soil characteristics through the evaluation of hand-dug soil evaluation units conducted during field investigations on August 22, 2023. In addition, GZA utilized 19 test pit logs provided by KNA for depths to bedrock. GZA completed hand-dug test pits with a tile spade and soil auger. Test pits were dug to a minimum depth of 40 inches for the purpose of evaluating and identifying the soil's characteristics. Locations were selected when changes in slope, vegetation, or soil surface were observed. When changes were noted from one hole to the next involving soil drainage or parent material, a soil boundary was placed on the map between the holes to reflect the transition between the soils as it occurs on the landscape. The slopes of the soil map units were measured in the field using a clinometer and augmented by the topography shown on the Existing Conditions Plan prepared by KNA dated July 26, 2023 (see **Figure 1 – Site-Specific Soil Map**). For purposes of this report, GZA considered the minimum size delineation area of a Site-Specific Soil Survey map unit as 2,000 square feet.

GZA used the following resources during data collection to supplement on-Site observations:

- Natural Resource Conservation Service (NRCS) Web Soil Survey;[1] and
- New Hampshire Statewide Geographic Information System Clearinghouse (NH GRANIT) LIDAR-based Bare Earth Hillshade of the Site[2].

The NRCS Web Soil Survey (WSS) provides soil data and information produced by the National Cooperative Soil Survey. The WSS data was used to gather information prior to field work to use as a baseline of soil units that may be observed during field investigations. Use of the online resource NH GRANIT LIDAR-Based Bare Earth Hillshade of the project area provided imagery to assist in soil unit delineation, to identify changes in topography to help identify ideal locations to dig auger holes.

The on-Site investigation was conducted on August 22, 2023 using a base plan provided by KNA with a 1:100 scale and 2-foot topographic contours. In accordance with the Site-Specific Soil Mapping standards, the identified individual soil map units were correlated to the New Hampshire State-Wide Numerical Soils Legend maintained by the New Hampshire State Office of the NRCS. Soil characteristics for each of the units comply with the Range in Characteristics described in the Official Series Descriptions for each map unit. In addition, GZA has provided High-Intensity Soil Survey (HISS) soil unit correlations in the event local or State agencies request this data.

3.0 RESULTS

3.1 SITE DESCRIPTION

Based on field observations, the Site is primarily forested in the southern portion of the Site, and primarily dominated by a mix of forested and shrub vegetation in the central and northern portion of the Site. The northern portion of the Site is dominated by Scituate soils (Soil Unit #448). The southern portion of the Site is dominated by Montauk (Soil Unit #44) (**see Figure 1 – Site-Specific Soil Map**). No human-disturbed soil units observed on Site.

3.2 SOIL MAP UNIT DESCRIPTIONS

Individual soil map units are summarized in **Table 1 – Soil Map Units** below:

Table 1 – Site-Specific Soil Map Soil Types

Soil ID (SSSM)	Soil Type	Soil ID (HISS)
44	Montauk (well drained)	223
448	Scituate (moderately well drained)	323

[1] www.websoilsurvey.sc.egov.usda.gov/App/HomePage.htm

[2] https://granitview.unh.edu/html5viewer/index.html?viewer=granit_view

Slope designations are itemized below in **Table 2**.

Table 2 – Site-Specific Soil Map Slope Classifications

Slope Class	SSSM
A	0-3%
B	3-8%
C	8-15%
D	15-25%
E	25-50%
F	>50%

The individual soil map unit descriptions of the soils identified on the Site and summarized in **Table 1** are as follows:

44B - Montauk, 3 to 8 percent slopes

This map unit consists of well drained loamy soils formed in lodgment till. They are very deep to bedrock and moderately deep to a densic contact. These soils are typically located on upland hills and moraines.

Typically, the fine sandy loam surface layer is dark brown and about four inches thick. The subsoil is dark yellowish brown and about 30 inches thick. The substratum, to a depth of 40 inches or more, is yellowish brown loamy sand.

Included with this mapping are small areas of slopes less than 3 percent and greater than 8 percent and may contain moderately well-drained Scituate soils. These inclusions make up as much as 5 percent of the map unit.

44C - Montauk, 8 to 15 percent slopes

This map unit consists of well-drained loamy soils formed in lodgment till. They are very deep to bedrock and moderately deep to a densic contact. These soils are typically located on upland hills and moraines.

Typically, the fine sandy loam surface layer is dark brown and about four inches thick. The subsoil is dark yellowish brown and about 30 inches thick. The substratum, to a depth of 40 inches or more, is yellowish brown loamy sand.

Included with this mapping are small areas of slopes less than 8 percent and greater than 15 percent; and may contain moderately well-drained Scituate soils. These inclusions make up as much as 5 percent of the map unit.

44D - Montauk, 15 to 25 percent slopes

This map unit consists of well drained loamy soils formed in lodgment till. They are very deep to bedrock and moderately deep to a densic contact. These soils are typically located on upland hills and moraines.

Typically, the fine sandy loam surface layer is dark brown and about four inches thick. The subsoil is dark yellowish brown and about 30 inches thick. The substratum, to a depth of 40 inches or more, is yellowish brown loamy sand.

Included with this mapping are small areas of slopes less than 15 percent and greater than 25 percent and may contain moderately well-drained Scituate soils. These inclusions make up as much as 5 percent of the map unit.

448B - Scituate, 3 to 8 percent slopes

This map unit consists of moderately well drained loamy soils formed in lodgment till. They are very deep to bedrock and moderately deep to a densic contact. These soils are nearly level through moderately steep soils on glaciated uplands.

Typically, the fine sandy loam surface layer is a very dark greyish brown to dark brown about four inches thick. The subsoil is strong brown fine sandy loam and up to 27 inches thick. The substratum, to a depth of 40 inches or more, is yellowish brown loamy sand.

Included with this mapping are small areas of slopes less than 3 percent and greater than 8 percent; and may contain well drained Montauk soils. These inclusions make up as much as 10 percent of the map unit.

448C - Scituate, 8 to 15 percent slopes

This map unit consists of moderately well drained loamy soils formed in lodgment till. They are very deep to bedrock and moderately deep to a densic contact. These soils are nearly level through moderately steep soils on glaciated uplands.

Typically, the fine sandy loam surface layer is a very dark greyish brown to dark brown about four inches thick. The subsoil is strong brown fine sandy loam and up to 27 inches thick. The substratum, to a depth of 40 inches or more, is yellowish-brown loamy sand.

Included with this mapping are small areas of slopes less than 8 percent and greater than 15 percent; and may contain well drained Montauk soils. These inclusions make up as much as 10 percent of the map unit.

448D - Scituate, 15 to 25 percent slopes

This map unit consists of moderately well drained loamy soils formed in lodgment till. They are very deep to bedrock and moderately deep to a densic contact. These soils are nearly level through moderately steep soils on glaciated uplands.

Typically, the fine sandy loam surface layer is a very dark greyish brown to dark brown about four inches thick. The subsoil is strong brown fine sandy loam and up to 27 inches thick. The substratum, to a depth of 40 inches or more, is yellowish brown loamy sand.

Included with this mapping are small areas of slopes less than 15 percent and greater than 25 percent and may contain well-drained Montauk soils. These inclusions make up as much as 10 percent of the map unit.

3.3 HYDROLOGIC SOIL GROUP CORRELATION

In order to correlate the soil map units identified, as part of this soil survey, to the appropriate hydrologic soil group, we referenced the SSSNNE "Ksat Values for New Hampshire Soils, Special Publication No. 5, September 2009."[3] Below Table 3 – Hydrologic Soil Group Correlation provides the correlation of the identified soil map units to the appropriate hydrologic soil group. Identification of correlating hydrologic soil group provides context for infiltration rates for stormwater management planning.

[3] www.sssnne.org/publications.html

Table 3 – Hydrologic Soil Group and KSat Values

Soil ID (SSSM)	Soil Type	Hydrologic Soil Group	Ksat Value (low C) Inch/Hour
44	Montauk	C	0.06 in/hr
448	Scituate	C	0.06 in/hr

4.0 FINDINGS AND CONCLUSIONS

GZA has completed Site-Specific Soil Mapping of the Site in support of the proposed residential subdivision project permitting being prepared by KNA. The following is a summary of our findings and conclusions:

- The Site consists of well drained and moderately well drained soils;
- Moderately well drained Scituate soils were dominant in the northern portion of the Site and well drained Montauk soils were dominant in the southern part of the Site; and
- No poorly drained or very poorly drained soils (i.e. hydric soils) were identified on Site.

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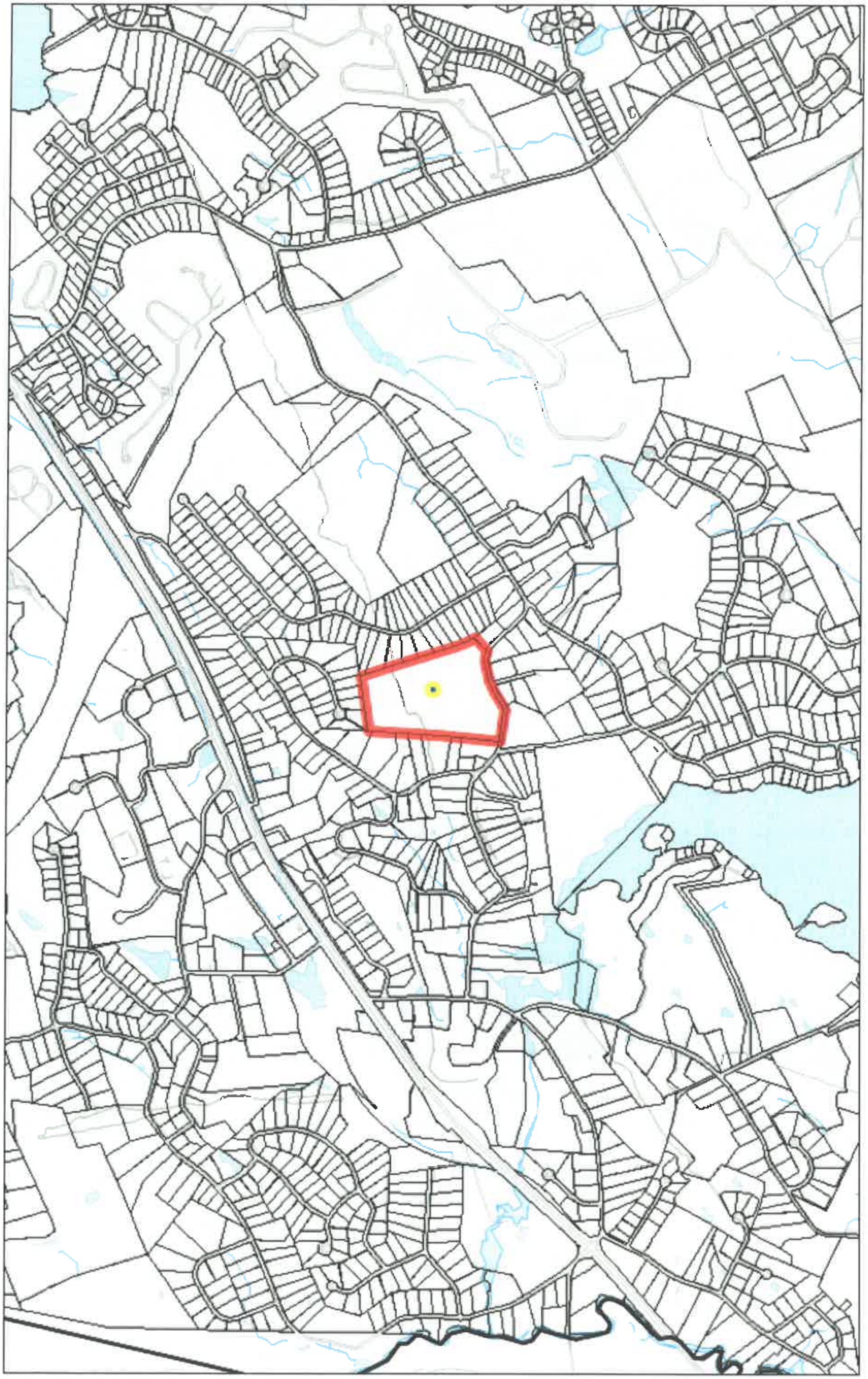
Attachment "F"

Figures

Attachment "F"

9/22/2023



Letter ANSI A Landscape

1:27,216

0 0.15 0.3 0.6 mi

0 0.28 0.55 1.1 km

Attachment "F"

N W E S

Legend

PARCEL BOUNDARY

NHDOT ROADS

NOTES:
1. NHDOT ROADS, NHD FLOWLINES, AND TOWN BOUNDARY, WERE OBTAINED FROM NH GRANIT CLEARINGHOUSE.
2. 2FT ELEVATION CONTOURS WERE PROVIDED BY KEACH-NORDSTROM ASSOCIATES.
3. SITE SPECIFIC SOIL MAPPING WAS COMPLETED BY GZA GEOENVIRONMENTAL INC. IN AUGUST 2023.

0 100 200 400 Feet

INDEX MAP

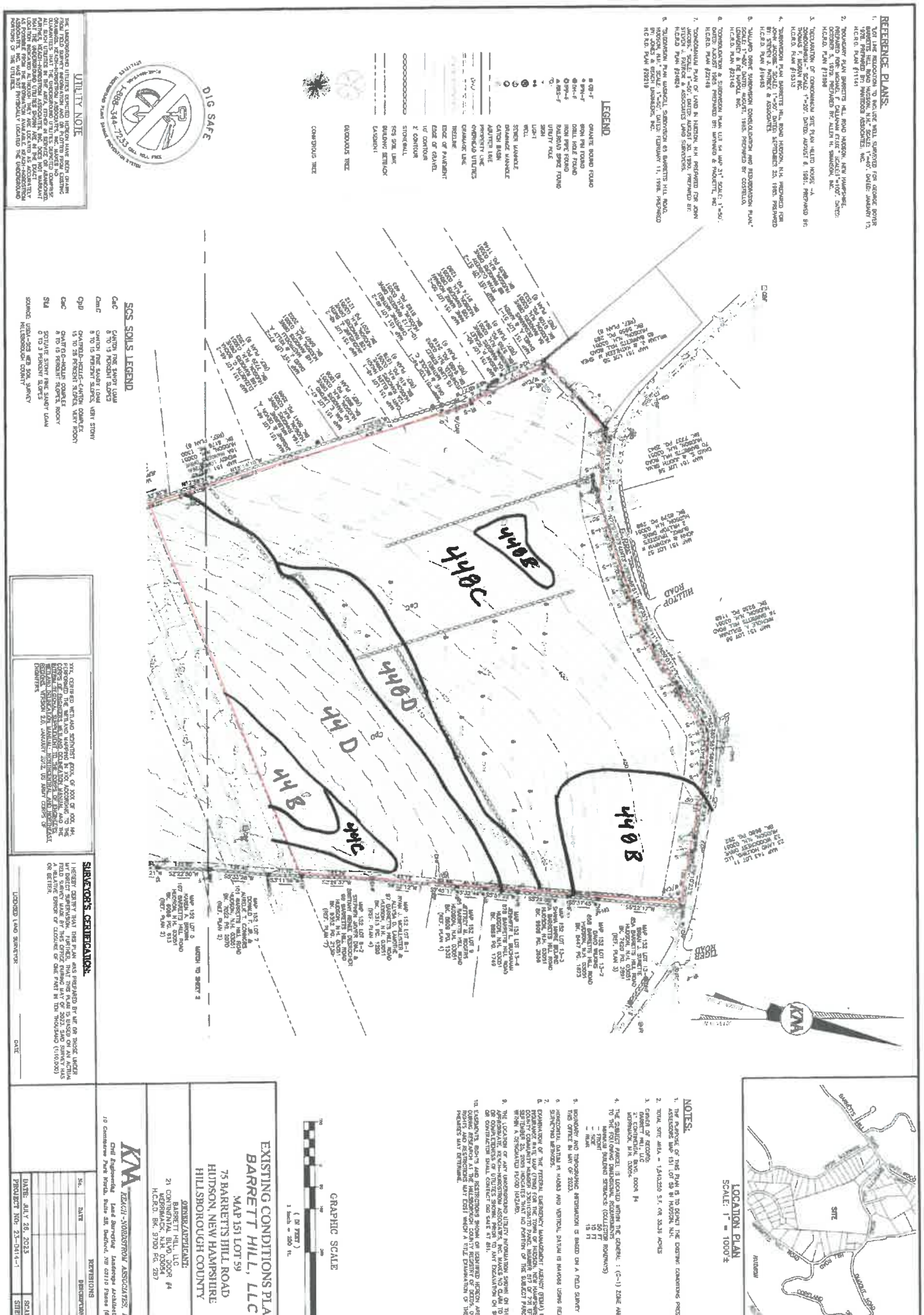
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

BARRETTS HILL ROAD
HUDSON, NH

AERIAL MAP

PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		PREPARED FOR: KEACH-NORDSTROM ASSOCIATES, INC.	
PROJ MGR: LEW	REVIEWED BY: DMZ	CHECKED BY: TLT	PAGE
DESIGNED BY: LEW	DRAWN BY: LEW	SCALE: 1 INCH = 142 FT	1
DATE: 09-22-2023	PROJECT NO. 04.0191600.00	REVISION NO.	

Attachment "F"



Appendix A - Natural Resource Limitations

USE OF REPORT

1. GZA GeoEnvironmental, Inc. (GZA) has prepared this report on behalf of, and for the exclusive use of Main Street Franklin Solar, LLC ("Client") for the stated purpose(s) and location(s) identified in the report. Use of this report, in whole or in part, at other locations, or for other purposes, may lead to inappropriate conclusions; and we do not accept any responsibility for the consequences of such use(s). Further, reliance by any party not identified in the agreement, for any use, without our prior written permission, shall be at that party's risk, and without any liability to GZA.

STANDARD OF CARE

2. GZA's findings and conclusions are based on the work conducted as part of the Scope of Services set forth in the Report and/or proposal, and reflect our professional judgment. These findings and conclusions must be considered not as scientific or engineering certainties, but rather as our professional opinions concerning the data gathered and observations made during the course of our work. Conditions other than described in this report may be found at the subject location(s).

3. GZA's services were performed using the degree of skill and care ordinarily exercised by qualified professionals performing the same type of services, at the same time, under similar conditions, at the same or a similar property. No warranty, expressed or implied, is made.

LIMITS TO OBSERVATIONS

4. Natural resource characteristics are inherently variable. Biological community composition and diversity can be affected by seasonal, annual or anthropogenic influences. In addition, soil conditions are reflective of subsurface geologic materials, the composition and distribution of which vary spatially.

5. The observations described in this report were made on the dates referenced and under the conditions stated therein. Conditions observed and reported by GZA reflect the conditions that could be reasonably observed based upon the visual observations of surface conditions and/or a limited observation of subsurface conditions at the specific time of observation. Such conditions are subject to environmental and circumstantial alteration and may not reflect conditions observable at another time.

6. The conclusions and recommendations contained in this report are based upon the data obtained from a limited number of surveys performed during the course of our work on the site, as described in the Report. There may be variations between these surveys and other past or future surveys due to inherent environmental and circumstantial variability.

RELIANCE ON INFORMATION FROM OTHERS

7. Preparation of this Report may have relied upon information made available by Federal, state and local authorities; and/or work products prepared by other professionals as specified in the report. Unless specifically stated, GZA did not attempt to independently verify the accuracy or completeness of that information.

COMPLIANCE WITH REGULATIONS AND CODES

8. GZA's services were performed to render an opinion on the presence and/or condition of natural resources as described in the Report. Standards used to identify or assess these resources as well as regulatory jurisdiction, if any, are stated in the Report. Standards for identification of jurisdictional resources and regulatory control over them may vary between governmental agencies at Federal, state and local levels and are subject to change over time which may affect the conclusions and findings of this report.

NEW INFORMATION

9. In the event that the Client or others authorized to use this report obtain information on environmental regulatory compliance issues at the site not contained in this report, such information shall be brought to GZA's attention forthwith. GZA will evaluate such information and, on the basis of this work, may modify the conclusions stated in this report.

ADDITIONAL SERVICES

10. GZA recommends that we be retained to provide further investigation, if necessary, which would allow GZA to (1) observe compliance with the concepts and recommendations contained herein; (2) evaluate whether the manner of implementation creates a potential new finding; and (3) evaluate whether the manner of implementation affects or changes the conditions on which our opinions were made.

Attachment "F"

Appendix B - Photograph Log

Attachment "F"

PHOTOGRAPH LOG
Barretts Hill Road
Hudson, New Hampshire
Photos Taken: August 22, 2023

Photograph No. 1: View facing easterly of landscape in southeastern portion of the Site.

Photograph No. 2: View facing northeasterly of landscape in southwestern portion of the Site.

Attachment "F"

PHOTOGRAPH LOG
Barretts Hill Road
Hudson, New Hampshire
Photos Taken: August 22, 2023

Photograph No. 3: View of landscape in northwestern portion of the Site.

Photograph No. 4: View of Scituate soils from the center portion of the Site.

Attachment "F"

PHOTOGRAPH LOG
Barretts Hill Road
Hudson, New Hampshire
Photos Taken: August 22, 2023

Photograph No. 5: View of Montauk soils from the southern portion of the Site.

Attachment "F"

GZA GeoEnvironmental, Inc.

19. OPERATION and MAINTENANCE PLAN with CHECKLIST

Attachment "F"

STORMWATER
OPERATION & MAINTENANCE PLAN

Barrett Hill Subdivision
75 Barretts Hill Road
Hudson, New Hampshire

Map 151; Lot 59

Date: December 6, 2023

KNA KEACH-NORDSTROM ASSOCIATES, INC.

Attachment "F"

TABLE OF CONTENTS:

I. General

Introduction

The project owner or their assigned heirs will maintain the stormwater treatment facilities after construction is completed. The applicant of the project is Barrett Hill, LLC located at 21 Continental Blvd. Door #4, Merrimack, NH. Upon completion of construction, the Homeowner's Association will assume ownership of long-term maintenance.

The subject property is referenced on Map 151; Lot 59 in Hudson, New Hampshire. Any transfer of responsibility for inspection and maintenance activities or transfer of ownership shall be documented to the New Hampshire Department of Environmental Services and the town of Hudson in writing. The contract documents will require the contractor to designate a person responsible for maintenance of the sedimentation control features during construction. Long-term operation and maintenance for the stormwater management facilities are presented below.

Maintenance will be performed as described and required in the Alteration of Terrain Permit unless and until the system is formally accepted by a municipality or quasi-municipal district or is placed under the jurisdiction of a legally created association that will be responsible for the maintenance of the system.

<u>Post Construction:</u>

The following standards will be met after construction is complete:

<u>Documentation:</u>

A maintenance log will be kept summarizing inspections, maintenance, and any corrective actions taken. The log will include the date on which each inspection or maintenance task was performed, a description of the inspection findings or maintenance completed, and the name of the inspector or maintenance personnel performing the task. If a maintenance task requires the clean out of any sediments or debris, the location where the sediment and debris was disposed after removal will be indicated. The log will be made accessible to department and/or Hudson staff and a copy provided upon request.

Maintenance Requirements

Pocket Ponds:

- Systems should be inspected at least twice annually, and following any rainfall event exceeding 2.5 inches in a 24-hour period, with maintenance or rehabilitation conducted as warranted by such inspection.
- System embankments should be mowed periodically to maintain grass cover and any other vegetation found on the embankment should be removed at each inspection.
- Trash and debris found within the pond or in the outlet structure should be removed at each inspection.
- Removal of accumulated sediment
- Inspection and repair of embankments, inlet and outlet structures, and appurtenances

Sediment Forebays:

- Forebays help reduce the sediment load to downstream BMP's, and will therefore require more frequent cleaning.
- Systems should be inspected at least annually.
- Conduct periodic mowing of embankments (generally two times per year) to control growth of woody vegetation.
- Trash and debris should be removed at each inspection.
- Accumulated sediment should be removed as warranted by such inspection.
- Install and maintain a staff gage or other measuring device, to indicate depth of sediment accumulation and level at which clean-out is required.

Catch Basins and Closed Drainage Network:

- Catch basins may require frequent maintenance. This may require several cleanings of the sumps each year. At a minimum, it is recommended that catch basins be inspected at least twice annually.
- Sediment should be removed when it approaches half of the sump depth.
- If floating hydrocarbons are observed during an inspection, the material should be removed immediately by skimming, absorbent materials, or other methods and disposed in conformance with the applicable state and federal regulations.

Outlet Protection:

- Inspect the outlet protection annually for damage and deterioration. Repair damages immediately.

General:

- If any invasive species begin to grow in the stormwater management practices the species shall be disposed of in an appropriate manner that will not allow the pest to survive or spread. The disposal of such species shall be witnessed or approved by a state inspector. Methods for disposal may include, but not be limited to:
  - Encapsulating the plant(s) in plastic bags and disposing of the plant material in one of the following ways:
    - Trash pickup;
    - Discarding;
    - Open burning;
    - Incineration; or
    - Burial of infested nursery.

II. Supporting Documents

Annual Inspection and Maintenance Reporting Form
for
Barrett Hill Subdivision
Hudson, New Hampshire

Date: ____________________

To: **Barrett Hill, LLC**

Re: **Certification of Inspection and Maintenance; Submittal of Forms**

Property Name: ______________________________________

Property Address: ______________________________________

Contact Name: ______________________________________

Contact Phone #: ______________________________________

Contact Email Address: ______________________________________

I verify that the required stormwater facility inspections and required maintenance have been completed in accordance with the Operation & Maintenance Plan associated with the above referenced property.

The required Long-Term Inspection & Maintenance Plan Checklist is attached to this form.

____
Name of Party Responsible for Inspection & Maintenance

____
Property Owner

____
Authorized Signature

____
Signature

Attachment "F"

Long-Term Inspection & Maintenance Plan Checklist
Barrett Hill Subdivision – Hudson, NH

Current Owner Name:	Date:
Business Address:	Inspector:
Weather:	
Date of Last Rainfall:	Amount: Inches:
Best Management Practice	

Pocket Pond	Reason for Inspection		
	Spring ☐	Fall/Yearly ☐	After Major Storm ☐

Maintenance Required? Yes ☐ No ☐
Corrective Action Needed & Notes:

Sideslopes & berms need repair? Yes ☐ No ☐
Clean inlet & outlet structures? Yes ☐ No ☐

Sediment Forebays	Reason for Inspection		
	Spring ☐	Fall/Yearly ☐	After Major Storm ☐

Maintenance Required? Yes ☐ No ☐
Corrective Action Needed & Notes:

Catch Basins & Closed Drainage Network	Reason for Inspection		
	Spring ☐	Fall/Yearly ☐	After Major Storm ☐

Maintenance Required? Yes ☐ No ☐
Corrective Action Needed & Notes:

Outlet Protection	Reason for Inspection		
	Spring ☐	Fall/Yearly ☐	After Major Storm ☐

Maintenance Required? Yes ☐ No ☐
Corrective Action Needed & Notes:

Attachment "F"

General	Reason for Inspection		
	Spring ☐	Fall/Yearly ☐	After Major Storm ☐
Maintenance Required? Corrective Action Needed & Notes:	Yes ☐ No ☐		

Long-Term Inspection & Maintenance Log
Barrett Hill Subdivision – Hudson, NH

Date	Inspection (Yes or No)	Maintenance (Yes or No)	List BMPs Inspected and/or Provide Comments	Inspected By:

Anti-icing Route Data Form
Barrett Hill Subdivision – Hudson, NH

Truck Station:				
Date:				
Temperature:	Pavement Temperature:	Relative Humidity:	Dew Point:	Sky:
Reason For Applying:				
Route:				
Chemical:				
Application Time:				
Application Amount:				
Observation (first day):				
Observation (after event):				
Observation (before next application):				
Name:				

III. Control of Invasive Plants

Invasive plants are introduced, alien, or non-native plants, which have been moved by people from their native habitat to a new area. Some Exotic plants are imported for human use such as landscaping, erosion control, or food crops. They also can arrive as “hitchhikers” among shipments of other plants, seeds, packing materials, or fresh produce. Some exotic plants become invasive and cause harm by:

- becoming weedy and overgrown;
- killing established shade trees;
- obstructing pipes and drainage systems;
- forming dense beds in water;
- lowering water levels in lakes, streams, and wetlands;
- destroying natural communities;
- promoting erosion on stream banks and hillsides; and
- resisting control except by hazardous chemical.

During maintenance activities, check for the presence of invasive plants and suitably remove according to the methods provided in the table below. The following table, based on the “Control of Invasive Plants” published by the New Hampshire Department of Agriculture, describes the most common invasive plants in this region and proper methods of disposal.

Attachment "F"

Name	Description	Invasive Qualities	Control Methods
Invasive Trees			
Norway Maple	- Large leaves - Will exude milky white sap when leaves are broken - Leaves turn color in Late October (fall foliage is yellow)	- Suppresses growth of grass, garden plants, and forest understory -Wind-borne seeds can germinate and grow in deep shade	- Pull seedlings and small or shallow-rooted plants when soil is moist. Dig out plants, including the root systems. Use a forked spade or weed wrench. - Cut down the tree. Grind out the stump, or clip off re-growth. - Girdle[1] - Frill[2] - Cut stem/ cut stump with glyphosate. Follow label directions for cut stump application. Clip off sucker sprouts or paint with glyphosate.* - Foliar spray with glyphosate [3*] (mid-October to early November).
Tree of Heaven	- Long compound leaves with 11-25 lance shaped leaflets - Smell like peanut butter or burnt coffee when crushed	- Tough, can grow in poor conditions - Produces large quantities of wind-borne seeds - Grows rapidly - Secretes a toxin that kills other plants - Cannot be removed by mechanical means alone	- Pull seedlings when soil is moist. - Frill[2] (no more than 1" gap between cuts). Use Garlon 3a herbicide. - Cut stem/ cut stump with Garlon 3a. Follow label directions for cut stump application. Clip off sucker sprouts or paint with Garlon 3a.* - Foliar spray[3*] (on regrowth) - Paint bottom 12" of bark with Garlon 4 Ultra (February/March). Use maximum strength specified on label for all herbicide applications.
Invasive Shrubs			
Autumn Olive	- Formerly recommended for erosion control and wildlife value	- Highly invasive, diminishes the overall quality of wildlife habitat	- Pull seedlings and small or shallow-rooted plants when soil is moist. Dig out larger plants, including the root systems. Use a forked spade or weed wrench for trees or shrubs (up to 4" diameter trunks). - Cut down the tree. Grind out the stump, or clip off re-growth. - Cut stem/ cut stump with glyphosate. Follow label directions for cut stump application. Clip off sucker sprouts or paint with glyphosate.* - Bury stump - Do not mow

Invasive Shrubs (continued)			
Multiflora Rose	- Formerly recommended for erosion control, hedges, and wildlife habitat - Covered in white flowers in June - Very hard, curved thorns - Fringed edge to leaf stalk	- Huge shrub that chokes out all other vegetation - Too dense for most birds to nest in - Grows up trees like a vine in Shade	- Pull seedlings and small or shallow-rooted plants when soil is moist. Dig out larger plants, including the root systems (at least 6" from the crown and 6" down). Use a forked spade or weed wrench for trees or shrubs. - Controlled burning[4] (on extensive infestations) - Cut stem/ cut stump with glyphosate. Follow label directions for cut stump application. Clip off sucker sprouts or paint with glyphosate.* - Foliar spray[3]* (mix Rodeo with extra sticker-spreader, or use Roundup Sure Shot Foam on small plants) - Herbicide may be applied in winter when other plants are dormant.
Bush Honeysuckles	- Includes Belle, Amur, Morrow's, and Tatarian Honeysuckle	- Creates dense shade reducing plant diversity and eliminating nest sites in forest interior spaces	- Deadhead to prevent spread of seeds (on ornamentals). Cut off seeds or fruits before they ripen. Bag and burn, or send to a landfill. - Pull seedlings and small or shallow-rooted plants when soil is moist. Dig out larger plants, including the root systems. Use a forked spade or weed wrench for trees or shrubs. - Mow or cutting at least 4 times a season to deplete plants' store of nutrients and carbohydrates, reduce seed formation, and kill or minimize spread of plants. If necessary, repeat each year (on shady sites only, brush cut in early spring and fall). - Controlled burning[4] (during growing season) - Cut down the tree. Grind out the stump, or clip off re-growth. - Cut stem/ cut stump with Glyphosate (late in the growing season). Follow label directions for cut stump application. Clip off sucker sprouts or paint with glyphosate.*

Invasive Shrubs (continued)			
Blunt-Leaved Privet	- Medium sized shrub - Simple, oblong, dark green leaves 1-2" in length - Fragrant white flowers (spring) - Blackish-purple fruit (late summer)	- Toxic to mammals - Loss of valuable habitat	- Pull seedlings and small or shallow-rooted plants when soil is moist. Dig out larger plants, including the root systems. Use a forked spade or weed wrench for trees or shrubs. - Cut down the tree. Grind out the stump, or clip off re-growth. - Cut stem/ cut stump with Glyphosate. Follow label directions for cut stump application. Clip off sucker sprouts or paint with glyphosate.* - Trim off all flowers - Do not cut back or mow
Burning Bush, Winged Euonymus	- Wide, corky wings on the Branches - Brilliant red autumn leaves - Fruit	- High seed production	- Pull seedlings and small or shallow-rooted plants when soil is moist. Dig out larger plants, including the root systems. Use a forked spade or weed wrench for trees or shrubs. - Cut down the tree. Grind out the stump, or clip off re-growth. - Cut stem/ cut stump with Glyphosate. Follow label directions for cut stump application. Clip off sucker sprouts or paint with glyphosate.* - Trim off all flowers
Japanese Barberry	- Spiny deciduous shrub - Small leaves	- Very dense, displaces native plants - Can change chemistry of soil	- Pull seedlings and small or shallow-rooted plants when soil is moist. Dig out larger plants, including the root systems. Use a forked spade or weed wrench for trees or shrubs. - Cut down the tree. Grind out the stump, or clip off re-growth. - Cut stem/ cut stump with Glyphosate. Follow label directions for cut stump application. Clip off sucker sprouts or paint with glyphosate.* - Trim off all flowers

Invasive Woody Vines			
Japanese Honeysuckle	- Gold and White flowers - Heavy scent and sweet nectar in June	- Shade shrubs and young trees of the forest understory, eventually killing them, and changing the open structure of the forest into a dense tangle - Rampant grower - Spirals around trees, often strangling them	- Pull seedlings and small or shallow-rooted plants when soil is moist. Dig out larger plants, including the root systems. Use a forked spade or weed wrench for trees or shrubs. - Mow or cutting at least 4 times a season to deplete plants' store of nutrients and carbohydrates, reduce seed formation, and kill or minimize spread of plants. If necessary, repeat each year. - Cut stem/ cut stump with Glyphosate. Follow label directions for cut stump application. Clip off sucker sprouts or paint with glyphosate.* - Foliar spray[3]* (fall or early spring when native vegetation is dormant) Plan to re-treat repeatedly
Oriental Bittersweet	- Bright orange seed capsules in clusters all along the stem - Flowers	- Shade shrubs and young trees of the forest understory, eventually killing them, and changing the open structure of the forest into a dense tangle	- Pull seedlings and small or shallow-rooted plants when soil is moist. Dig out larger plants, including the root systems. Use a forked spade or weed wrench for trees or shrubs. - Keep ornamental plants cut back, remove all fruits as soon as they open, and bag or burn fruits. - Cut stem/ cut stump with Garlon 3a. Follow label directions for cut stump application. Clip off sucker sprouts or paint with Garlon 3a.*
Japanese Knotweed, Mexican Bamboo	- The stems have knotty joints, similar to bamboo - Grows 6-10' tall - Large, pointed oval or triangular leaves	- Shade shrubs and young trees of the forest understory, eventually killing them, and changing the open structure of the forest into a dense tangle - Can grow in shade	- Cut stem/ cut stump with Glyphosate (at least 3 times each during growing season). Follow label directions for cut stump application. Clip off sucker sprouts or paint with glyphosate.* - Foliar spray[3]* - Treat with Rodeo - In gardens, heavy mulch or dense shade may kill it.

Attachment "F"

Invasive Herbaceous Plants			
Garlic Mustard	- White-flowered biennial - Rough scalloped leaves (kidney, heart, or arrow shaped) - Garlic smell, mustard taste when its leaves are crushed	- Shade shrubs and young trees of the forest understory, eventually killing them, and changing the open structure of the forest into a dense tangle - Rampant grower - Spirals around trees, often strangling them	- Pull seedlings and small or shallow-rooted plants when soil is moist (before it flowers in spring). Dig out larger plants, including the crown and root systems. Use a forked spade or weed wrench for trees or shrubs. Tamp down soil afterwards. - Deadhead to prevent spread of seeds. Cut off seeds or fruits before they ripen. Bag and burn or send to a landfill. - Foliar spray[3*] (may be appropriate in some settings)
Japanese Stilt Grass	- Lime green color - Line of silvery hairs down the middle of the 2-3" long blade	- Tolerates sun or dense shade -Quickly invades areas left bare or disturbed by tilling or flooding - Builds a large seed bank in the soil	- Pull seedlings and small or shallow-rooted plants when soil is moist (pulled easily in early to mid-summer).Dig out larger plants, including root systems. Use a forked spade or weed wrench for trees or shrubs. Be sure to pull before it goes to seed. If seeds have formed, bag and burn or send to a landfill. - Mow or cutting at least 4 times a season to deplete plants' store of nutrients and carbohydrates, reduce seed formation, and kill or minimize spread of plants. If necessary, repeat each year. Mowing weekly or when it has just begun to flower may prevent it from setting seed. - Foliar spray[3*] (use glyphosate or herbicidal soap on large infestations. - Use a corn-based pre-emergence herbicide on annual weeds (spring). This product is also an organic fertilizer, i.e., it can stimulate growth of existing plants, including weeds, so it is appropriate for lawns and gardens but may not be appropriate in woodlands.

Invasive Herbaceous Plants (continued)			
Mile-A-Minute Vine, Devil's Tail Tearthumb	- Triangular leaves - Barbed stems - Turquoise berries	- Rapid growth - Quickly covers and shades out herbaceous plants	- Pull seedlings and small or shallow-rooted plants when soil is moist (pulled easily in early to mid-summer).Dig out larger plants, including root systems. Use a forked spade or weed wrench for trees or shrubs. Be sure to pull before it goes to seed. If seeds have formed, bag and burn or send to a landfill. - Mow or cutting at least 4 times a season to deplete plants' store of nutrients and carbohydrates, reduce seed formation, and kill or minimize spread of plants. If necessary, repeat each year. Mowing weekly or when it has just begun to flower may prevent it from setting seed. - Foliar spray[3]* (use glyphosate or herbicidal soap on large infestations. - Use a corn-based pre-emergence herbicide on annual weeds (spring). This product is also an organic fertilizer, i.e., it can stimulate growth of existing plants, including weeds, so it is appropriate for lawns and gardens but may not be appropriate in woodlands.
Spotted Knapweed	- Thistle-like flowers	- Dense, crowds out native species	- Do not pull unless the plant is young and the ground is very soft. The root will break and produce several new plants. - Wear sturdy gloves - Deadhead to prevent spread of seeds. Cut off seeds or fruits before they ripen. Bag and burn, or send to a landfill. - In lawns, spot treat with broad-leaf weed killer. Good lawn care practices (test soil; use lime and fertilizer only when soil test shows a need; mow high and frequently; leave clippings on lawn) reduce weed infestations. - Cut stem/ cut stump with Glyphosate. Follow label directions for cut stump application. Clip off sucker sprouts or paint with glyphosate.* - Foliar spray[3]*

[1]Girdle: Cut through the bark and growing layer all around the trunk, about 6" above the ground. Girdling is most effective in spring (when the sap is rising) & middle-late summer (when the tree is sending food to the roots). Clip off sucker sprouts.

[2]Frill: Using a machete, hatchet, or similar device, hack scars (several holes in larger trees) downward into the growing layer, and squirt in glyphosate (or triclopyr if specified in table). Follow label directions for injection and frill applications. This is most effective from middle to late summer. Clip off any sucker sprouts or treat with glyphosate.

[3]Foliar Spray: Use a backpack or garden sprayer or mist blower, following label directions. Avoid overspray and/or dripping onto non-target plants, because glyphosate kills most plants except moss. If it rolls off waxy or grass-like foliage, use additional sticker-spreader. Deciduous trees, shrubs, and perennials move nutrients down to the roots in late summer. Glyphosate is particularly effective at this time and when plants have just gone out of flowering. Several invasive species retain their foliage after native plants have lost theirs, and resume growth earlier in spring than most natives. This allows you to treat them without harming the natives. However, the plant must be actively growing for the herbicide to work. Retreatments may be necessary the following year if suckering occurs or the plant hasn't been entirely killed.

[4]Controlled Burning: Burning during the spring (repeated over several years) will allow native vegetation to compete more effectively with the invasive species. This requires a permit. Spot treatment with glyphosate in late fall can be used to make this method more effective

*Herbicides: It is highly recommended that small populations try to be controlled using non-chemical methods where feasible. However, for large infestations, and for a few plants herbicide use is essential. Apply herbicides carefully to avoid non-target plants, glyphosate is the least environmentally damaging herbicide in most cases. Add food coloring for visibility, and a soap-based sticker such as Cide-Kick. Glyphosate is ineffective on some plants; for these, triclopyr or Garlon 3a may be indicated. When using herbicides read the entire label and observe all precautions listed, including proper disposal. If in doubt, call your local Cooperative Extension Service.

Attachment "F"

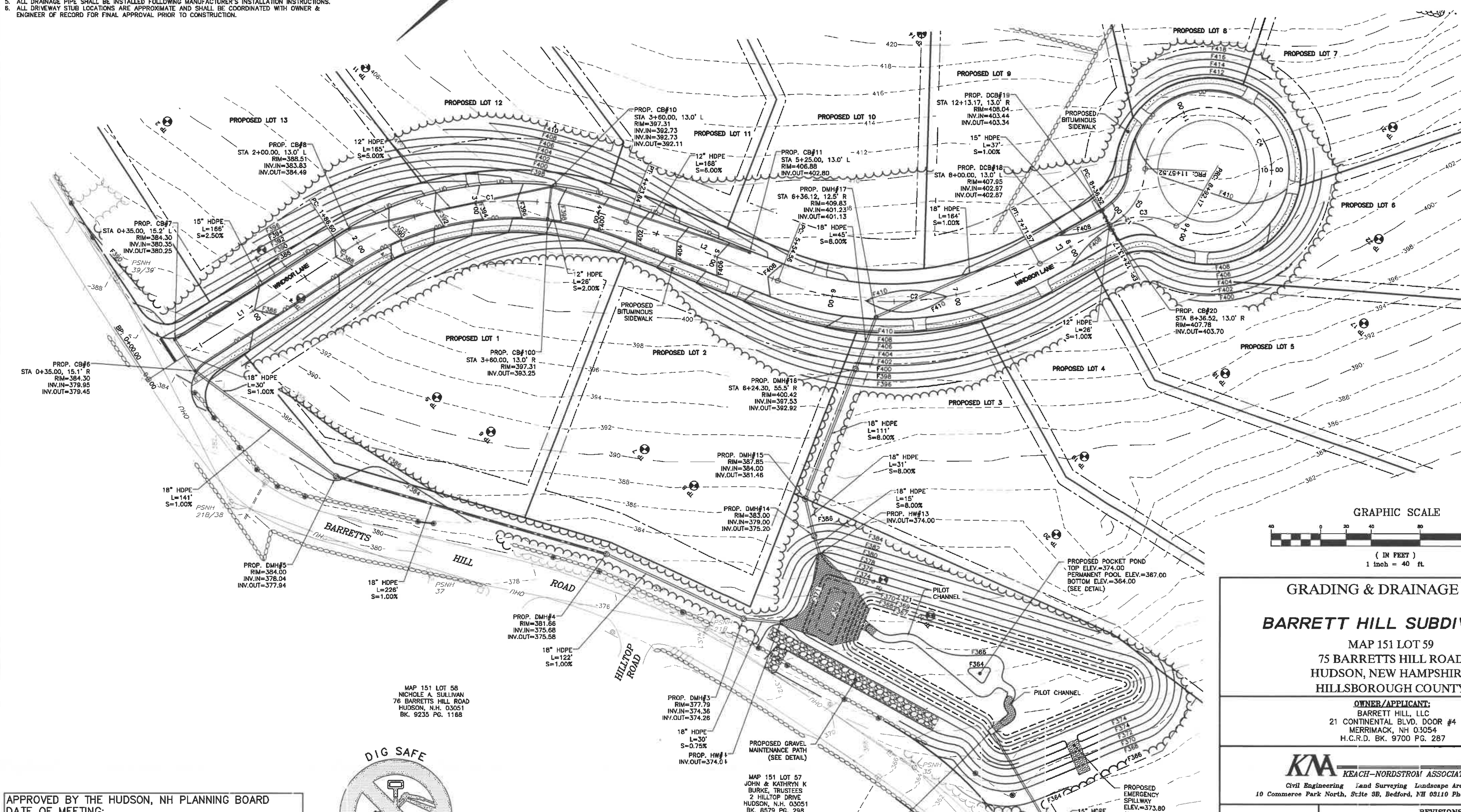
IV. Stormwater Practice Location Plan

Attachment "F"

CONSTRUCTION NOTES:

1. THE PURPOSE OF THIS PLAN IS TO SHOW THE PROPOSED ROADWAY DESIGN, GRADING, AND UTILITIES FOR THIS SITE.
2. ALL WORK SHALL CONFORM TO THE APPLICABLE REGULATIONS AND STANDARDS OF THE TOWN OF HUDSON, AND SHALL BE BUILT IN A WORKMANLIKE MANNER IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS. ALL WORK PERFORMED IN THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION RIGHT-OF-WAY SHALL CONFORM TO THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, STATE OF NEW HAMPSHIRE, DEPARTMENT OF TRANSPORTATION, APPROVED AND ADOPTED 2016 ARE HEREBY INCORPORATED BY REFERENCE.
3. CONSTRUCTION SHALL CONFORM TO THE TYPICAL SECTIONS AND DETAILS SHOWN ON THE PLANS, AND SHALL MEET THE REQUIREMENTS AND SPECIFICATIONS FOR ROAD CONSTRUCTION, PUBLIC WORKS DEPARTMENT, HUDSON, NEW HAMPSHIRE. ALL DRAINAGE PIPES SHOWN SHALL BE HDPE. CATCH BASINS SHALL BE TYPE B, AND HAVE 3' SUMPS UNLESS OTHERWISE NOTED.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING AND DETERMINING THE LOCATION, SIZE AND ELEVATION OF ALL EXISTING UTILITIES, SHOWN OR NOT SHOWN ON THESE PLANS, PRIOR TO THE START OF ANY CONSTRUCTION THE ENGINEER SHALL BE NOTIFIED IN WRITING OF ANY UTILITIES FOUND INTERFERING WITH THE PROPOSED CONSTRUCTION, AND APPROPRIATE REMEDIAL ACTION TAKEN BEFORE PROCEEDING WITH THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING "DIG SAFE" AT 811 AT LEAST 72 HOURS BEFORE DIGGING.
5. ALL DRAINAGE PIPE SHALL BE INSTALLED FOLLOWING MANUFACTURER'S INSTALLATION INSTRUCTIONS.
6. ALL DRIVEWAY STUB LOCATIONS ARE APPROXIMATE AND SHALL BE COORDINATED WITH OWNER & ENGINEER OF RECORD FOR FINAL APPROVAL PRIOR TO CONSTRUCTION.

LOAM & SEED ALL DISTURBED AREAS (TYP.)



APPROVED BY THE HUDSON, NH PLANNING BOARD
DATE OF MEETING: ______________

______________ SIGNATURE DATE: ______________

______________ SIGNATURE DATE: ______________

SUBDIVISIONS ARE VALID FOR TWO YEARS FROM THE DATE OF PLANNING BOARD MEETING FINAL APPROVAL. FOR AN APPLICANT TO GAIN AN EXEMPTION FROM ALL SUBSEQUENT CHANGES IN SUBDIVISION REGULATIONS, SITE PLAN REGULATIONS AND CHANGES TO THE ZONING ORDINANCE, SEE NH RSA 674:39.

NPDES NOTE

THIS PROJECT DISTURBS IN EXCESS OF 1-ACRE OF LAND. THEREFORE IT WILL BE REQUIRED TO OBTAIN NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT COVERAGE AS ISSUED BY THE ENVIRONMENTAL PROTECTION AGENCY (EPA). THE OWNER/DEVELOPER AND "OPERATOR" (GENERAL CONTRACTOR) SHALL EACH BE REQUIRED TO PREPARE AND SUBMIT A NOTICE OF INTENT (NOI) TO THE EPA PRIOR TO THE START OF CONSTRUCTION AND SHALL BE RESPONSIBLE FOR THE PREPARATION AND IMPLEMENTATION OF A STORM WATER POLLUTION PREVENTION PLAN (SWPPP) MEETING THE REQUIREMENTS OF THE CURRENT CONSTRUCTION GENERAL PERMIT.

GRADING & DRAINAGE PLAN

BARRETT HILL SUBDIVISION

MAP 151 LOT 59
75 BARRETTS HILL ROAD
HUDSON, NEW HAMPSHIRE
HILLSBOROUGH COUNTY

OWNER/APPLICANT:
BARRETT HILL, LLC
21 CONTINENTAL BLVD. DOOR #4
MERRIMACK, NH 03054
H.C.R.D. BK. 9700 PG. 287

KNA *KEACH-NORDSTROM ASSOCIATES INC.*
Civil Engineering Land Surveying Landscape Architecture
10 Commerce Park North, Suite 3B, Bedford, NH 03110 Phone (603) 627-2881

REVISIONS

No.	DATE	DESCRIPTION	BY

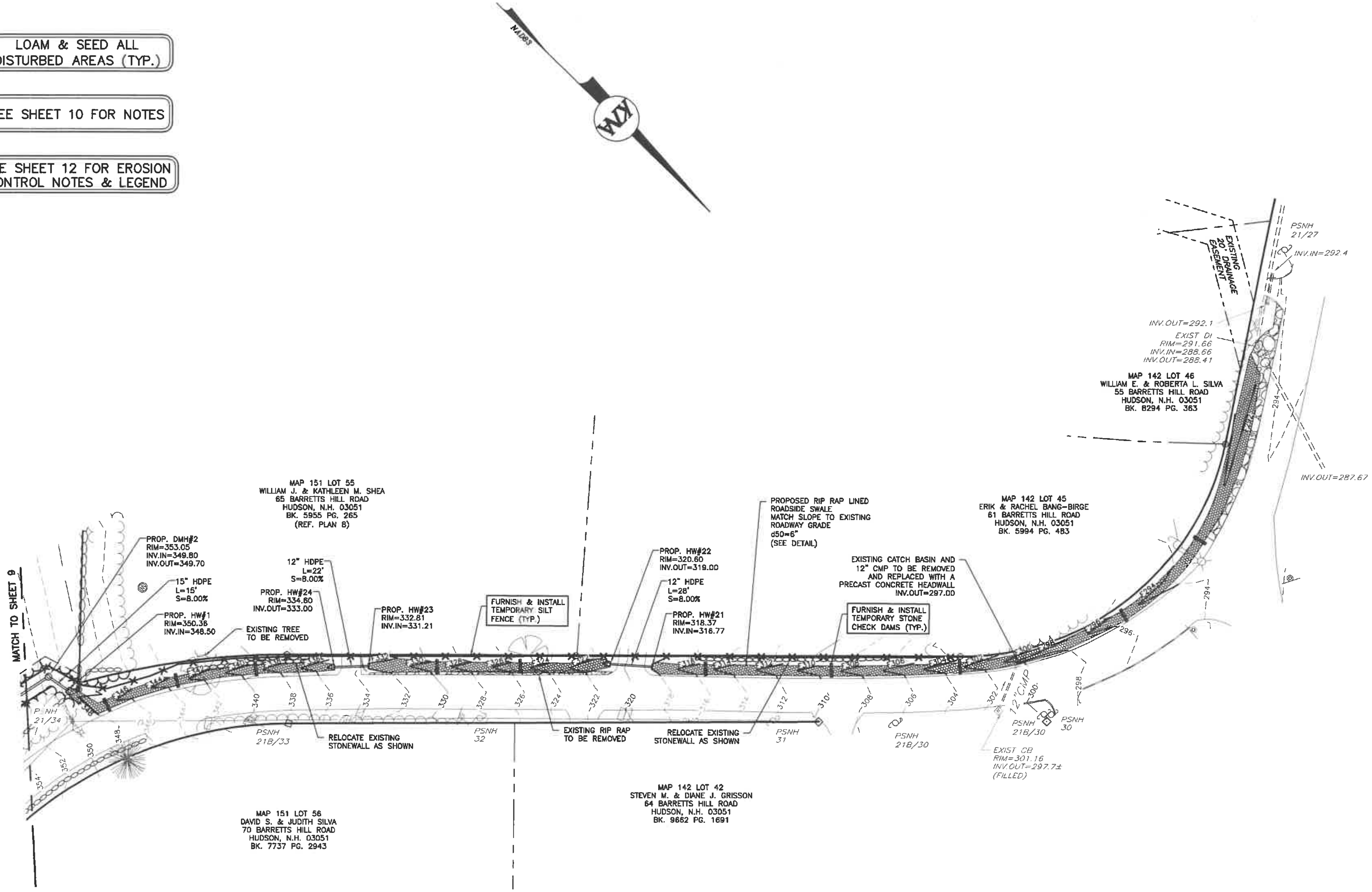
DATE: DECEMBER 6, 2023	SCALE: 1" = 40'
PROJECT NO: 23-0414-1	SHEET: 10 OF 21

Attachment "F"

LOAM & SEED ALL DISTURBED AREAS (TYP.)

SEE SHEET 10 FOR NOTES

SEE SHEET 12 FOR EROSION CONTROL NOTES & LEGEND



LEGEND

- GB-F — GRANITE BOUND FOUND
- IPIN-F — IRON PIN FOUND
- DH-F — DRILL HOLE FOUND
- IPP-F — IRON PIPE FOUND
- RRS-F — RAILROAD SPIKE FOUND
- UTILITY POLE
- SIGN
- LIGHT
- WELL
- SEWER MANHOLE
- DRAINAGE MANHOLE
- CATCH BASIN
- ABUTTER LINE
- PROPERTY LINE
- STREAM
- WETLAND
- OHU — OVERHEAD UTILITIES
- DRAINAGE LINE
- TREELINE
- 10' CONTOUR
- 2' CONTOUR
- STONEWALL
- BUILDING SETBACK
- EASEMENT
- PROPOSED WATER VALVE
- PROPOSED HYDRANT
- PROPOSED WELL
- PROPOSED DRAINAGE MANHOLE
- PROPOSED CATCH BASIN
- PROPOSED PROPERTY LINE
- PROPOSED GUARDRAIL
- UGU — PROPOSED UNDERGROUND UTILITIES
- G — PROPOSED GAS LINE
- W — PROPOSED WATER LINE
- PROPOSED DRAINAGE LINE
- PROPOSED TREELINE
- PROPOSED EDGE OF PAVEMENT
- PROPOSED SLOPED GRANITE CURB
- PROPOSED 2' CONTOUR

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

OFFSITE GRADING, DRAINAGE & EROSION CONTROL PLAN
BARRETT HILL SUBDIVISION

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75 BARRETTS HILL ROAD
HUDSON, NEW HAMPSHIRE
HILLSBOROUGH COUNTY

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REVISIONS

No.	DATE	DESCRIPTION	BY

DATE: DECEMBER 6, 2023 SCALE: 1" = 40'
PROJECT NO: 23-0414-1 SHEET: 11 OF 21

APPROVED BY THE HUDSON, NH PLANNING BOARD
DATE OF MEETING: ____________

____________ SIGNATURE DATE: ____________

____________ SIGNATURE DATE: ____________

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DIG SAFE
UTILITIES UNDERGROUND PLANT DAMAGE PREVENTION SYSTEM — 811 CALL TOLL-FREE

NPDES NOTE

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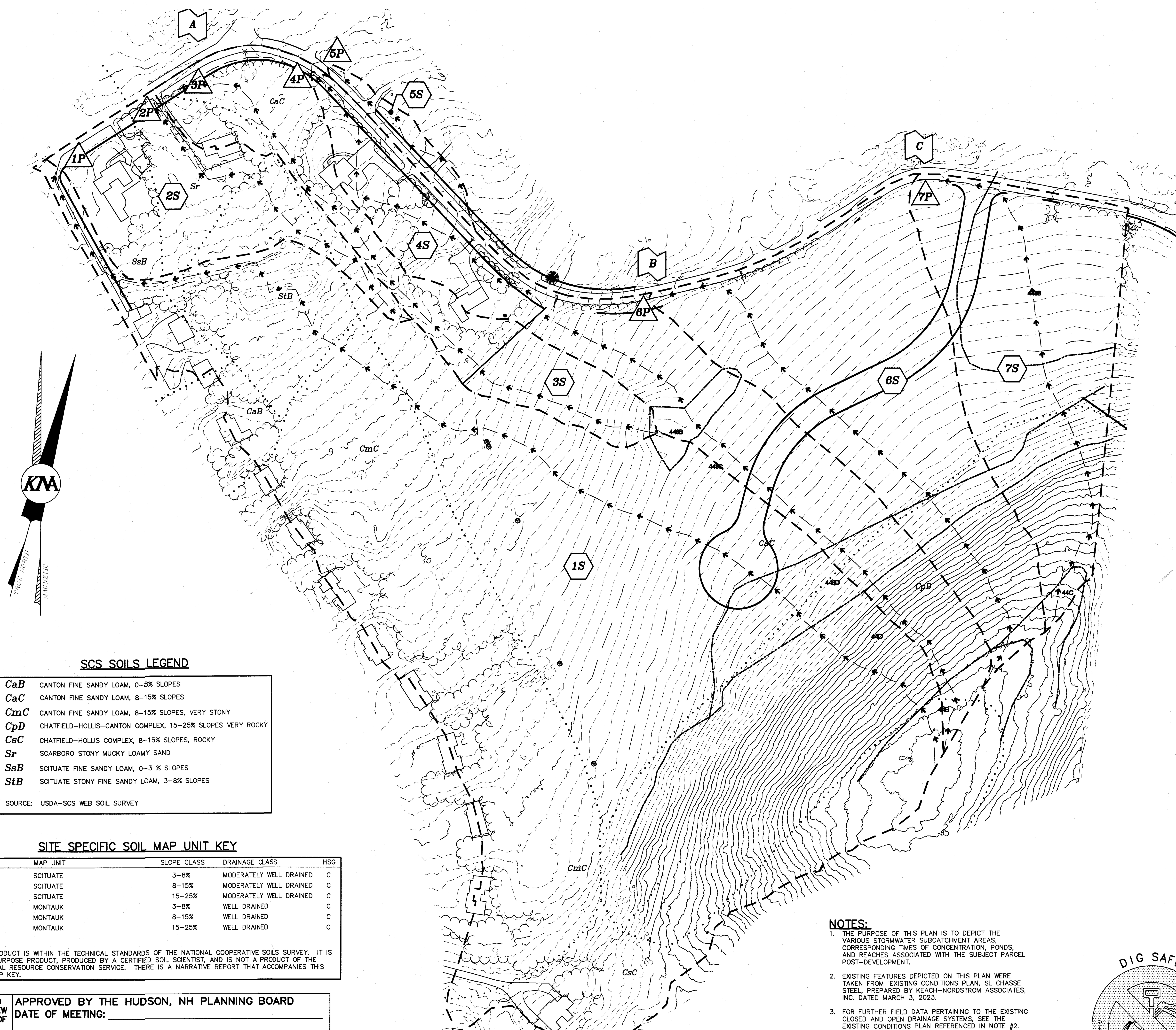
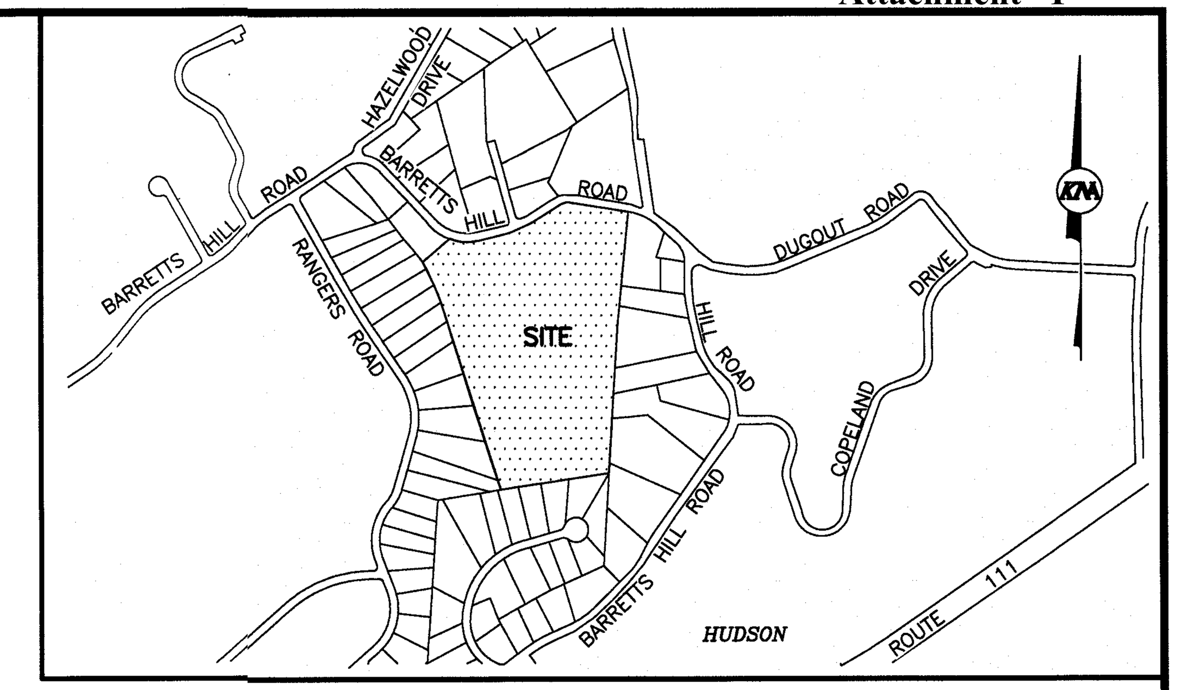
Attachment "F"





LOCATION PLAN

SCALE: 1" = 1000'±

DRAINAGE LEGEND:

THE LEGEND BELOW REFLECTS THE HYDROCAD MODEL USED FOR DRAINAGE CALCULATIONS.

. . . .	SCS SOIL LINES
—·—·—·—	SITE SPECIFIC SOIL LINES
44B	DENOTES SOIL TYPE
P	DENOTES POND
S	DENOTES SUBCATCHMENT AREA
L	DENOTES POINT OF INTEREST
R	DENOTES REACH
▬ ▬ ▬ ▬	LIMIT OF SUBCATCHMENT AREA
— → — → — → —	TIME OF CONCENTRATION
—— —— ——	REACH

SCS SOILS LEGEND

CaB	CANTON FINE SANDY LOAM, 0–8% SLOPES
CaC	CANTON FINE SANDY LOAM, 8–15% SLOPES
CmC	CANTON FINE SANDY LOAM, 8–15% SLOPES, VERY STONY
CpD	CHATFIELD–HOLLIS–CANTON COMPLEX, 15–25% SLOPES VERY ROCKY
CsC	CHATFIELD–HOLLIS COMPLEX, 8–15% SLOPES, ROCKY
Sr	SCARBORO STONY MUCKY LOAMY SAND
SsB	SCITUATE FINE SANDY LOAM, 0–3 % SLOPES
StB	SCITUATE STONY FINE SANDY LOAM, 3–8% SLOPES

SOURCE: USDA–SCS WEB SOIL SURVEY

SITE SPECIFIC SOIL MAP UNIT KEY

SYMBOL	MAP UNIT	SLOPE CLASS	DRAINAGE CLASS	HSG
448B	SCITUATE	3–8%	MODERATELY WELL DRAINED	C
448C	SCITUATE	8–15%	MODERATELY WELL DRAINED	C
448D	SCITUATE	15–25%	MODERATELY WELL DRAINED	C
44B	MONTAUK	3–8%	WELL DRAINED	C
44C	MONTAUK	8–15%	WELL DRAINED	C
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THIS MAP PRODUCT IS WITHIN THE TECHNICAL STANDARDS OF THE NATIONAL COOPERATIVE SOILS SURVEY. IT IS A SPECIAL PURPOSE PRODUCT, PRODUCED BY A CERTIFIED SOIL SCIENTIST, AND IS NOT A PRODUCT OF THE USDA NATURAL RESOURCE CONSERVATION SERVICE. THERE IS A NARRATIVE REPORT THAT ACCOMPANIES THIS MAP AND MAP KEY.

PURSUANT TO THE SITE REVIEW REGULATIONS OF THE HUDSON PLANNING BOARD, THE SITE PLAN APPROVAL GRANTED HEREIN EXPIRES ONE YEAR FROM DATE OF APPROVAL	**APPROVED BY THE HUDSON, NH PLANNING BOARD** **DATE OF MEETING:** ____________ SIGNATURE ____________ SIGNATURE DATE ________ SIGNATURE ____________ SIGNATURE DATE ________ **SITE PLANS ARE VALID FOR TWO YEARS FROM THE DATE OF PLANNING BOARD MEETING FINAL APPROVAL. FINAL APPROVAL COMMENCES AT THE PLANNING BOARD MEETING DATE AT WHICH THE PLAN RECEIVES FINAL APPROVAL.**

NOTES:

1. THE PURPOSE OF THIS PLAN IS TO DEPICT THE VARIOUS STORMWATER SUBCATCHMENT AREAS, CORRESPONDING TIMES OF CONCENTRATION, PONDS, AND REACHES ASSOCIATED WITH THE SUBJECT PARCEL POST–DEVELOPMENT.
2. EXISTING FEATURES DEPICTED ON THIS PLAN WERE TAKEN FROM "EXISTING CONDITIONS PLAN, SL CHASSE STEEL, PREPARED BY KEACH–NORDSTROM ASSOCIATES, INC. DATED MARCH 3, 2023."
3. FOR FURTHER FIELD DATA PERTAINING TO THE EXISTING CLOSED AND OPEN DRAINAGE SYSTEMS, SEE THE EXISTING CONDITIONS PLAN REFERENCED IN NOTE #2.
4. FOR FURTHER DATA PERTAINING TO THE CLOSED & OPEN DRAINAGE SYSTEMS PROPOSED WITH THIS DEVELOPMENT SEE "GRADING AND DRAINAGE PLAN OR DRAINAGE PROFILES, SL CHASSE STEEL PREPARED BY KEACH–NORDSTROM ASSOCIATES, INC., DATED MARCH 3, 2023."

DIG SAFE

UTILITIES UNDERGROUND PLANT DAMAGE PREVENTION SYSTEM

1-888-344-7233 CALL TOLL FREE

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)

1 inch = 100 ft.

PRE DEVELOPMENT DRAINAGE PLAN

BARRETT HILL, LLC

MAP 151 LOT 59
75 BARRETTS HILL ROAD
HUDSON, NEW HAMPSHIRE
HILLSBOROUGH COUNTY

OWNER/APPLICANT:

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21 CONTINENTAL BLVD. DOOR #4
MERRIMACK, N.H. 03054
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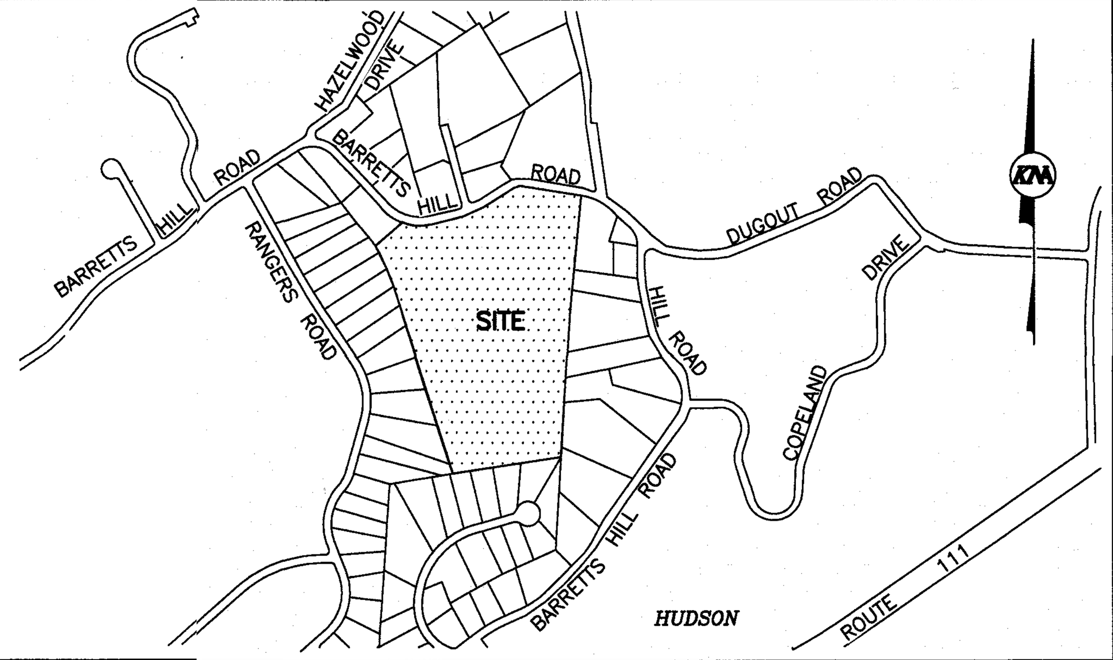
10 Commerce Park North, Suite 3B, Bedford, NH 03110 Phone (603) 627-2881

REVISIONS

No.	DATE	DESCRIPTION	BY

DATE: JULY 26, 2023	**SCALE:** 1"=100'
PROJECT NO: 23–0414–1	**SHEET** 1 OF 4

Attachment "F"



LOCATION PLAN

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- R — DENOTES REACH
- LIMIT OF SUBCATCHMENT AREA
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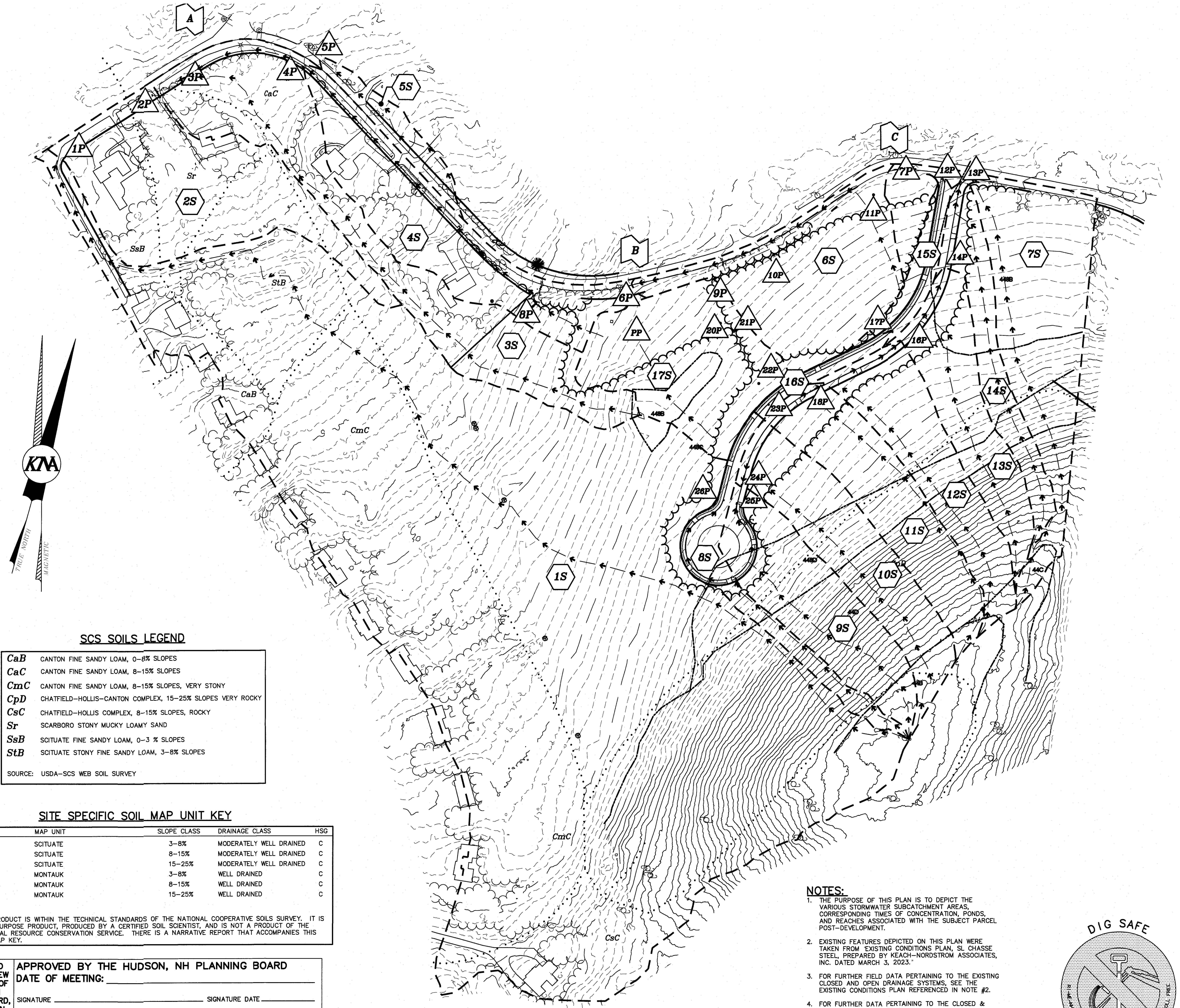
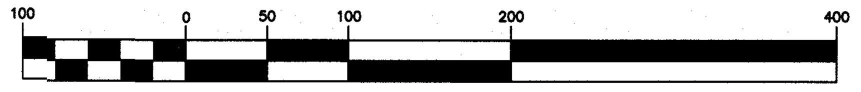


GRAPHIC SCALE



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DIG SAFE
1-888-344-7233 CALL TOLL FREE
UTILITIES UNDERGROUND PLANT DAMAGE PREVENTION SYSTEM

POST DEVELOPMENT DRAINAGE PLAN

BARRETT HILL, LLC

MAP 151 LOT 59
75 BARRETTS HILL ROAD
HUDSON, NEW HAMPSHIRE
HILLSBOROUGH COUNTY

OWNER/APPLICANT:
BARRETT HILL, LLC
21 CONTINENTAL BLVD. DOOR #4
MERRIMACK, N.H. 03054
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KEACH-NORDSTROM ASSOCIATES, INC.
Civil Engineering Land Surveying Landscape Architecture
10 Commerce Park North, Suite 3B, Bedford, NH 03110 Phone (603) 627-2881

REVISIONS

No.	DATE	DESCRIPTION	BY

DATE: JULY 26, 2023	**SCALE:** 1"=100'
PROJECT NO: 23-0414-1	**SHEET** 2 OF 4

Attachment "G"

TOWN OF HUDSON

Planning Board

Timothy Malley, Chairman

12 School Street · Hudson, New Hampshire 03051 · Tel: 603-886-6008 · Fax: 603-594-1142

CAP FEE WORKSHEET - 2024

Date: 03-21-24 Zone # 1 Map/Lot: 151/059-000
475 Barretts Hill Rd.

Project Name: SB# 08-23 Barrett Hill LLC OSD Subdivision

Proposed ITE Use #1: Single Family

Proposed Building Area (square footage): N/A S.F.

CAP FEES: (ONE CHECK NEEDED)

1.	**(Bank 09)** **2070-701**	**Traffic Improvements**	**$ 2,216.00**
2.	**(Bank 09)** **2050-182**	**Recreation**	**$ 400.00**
3.	**(Bank 09)** **2080-051**	**School**	**$ 3,578.00**
		Total CAP Fee	**$ 6,194.00**

Check should be made payable to the Town of Hudson.

Thank you,

Brooke Dubowik

Planning Administrative Aid II