

Findings of Fact | Subdivision Rules and Regulations

City of Portsmouth Planning Board

Date: 11/13/2024

Property Address: 100 Borthwick Ave, Portsmouth, NH 03801

Application #: LU-24-151

Decision: Approve Deny Approve with Conditions

Findings of Fact:

Per RSA 676:3, I: The local land use board shall issue a final written decision which either approves or disapproves an application for a local permit and make a copy of the decision available to the applicant. **The decision shall include specific written findings of fact that support the decision. Failure of the board to make specific written findings of fact supporting a disapproval shall be grounds for automatic reversal and remand by the superior court upon appeal, in accordance with the time periods set forth in RSA 677:5 or RSA 677:15, unless the court determines that there are other factors warranting the disapproval.** If the application is not approved, the board shall provide the applicant with written reasons for the disapproval. If the application is approved with conditions, the board shall include in the written decision a detailed description of the all conditions necessary to obtain final approval.

	Subdivision Review Criteria	Finding (Meets Standards/ Requirements)	Supporting Information
1	Subdivision Rules and Regulations III. D. 1 The Board shall act to deny any application which is not in compliance with Section IV or V as appropriate. SECTION IV - REQUIREMENTS FOR PRELIMINARY PLAT	Meets Does Not Meet	
2	SECTION V - REQUIREMENTS FOR FINAL PLAT	Meets Does Not Meet	
3	SECTION VI - GENERAL REQUIREMENTS	Meets Does Not Meet	The application has been reviewed by the Technical Advisory Committee (TAC) for conformance with the General Requirements. •

			The application was recommended for approval on November 21, 2024 at the Technical Advisory Committee Meeting.
4	SECTION VII - DESIGN STANDARDS	<p style="text-align: center;">Meets</p> <p style="text-align: center;">Does Not Meet</p>	<p>The application has been reviewed by the Technical Advisory Committee (TAC) for conformance with these minimum requirements.</p> <ul style="list-style-type: none"> • <p>The application was recommended for approval on November 21, 2024 at the Technical Advisory Committee Meeting.</p>
5	<u>Other Board Findings:</u>		

DATE: October 30, 2024

REFERENCE #: LU-24-151

PROJECT: 100 Borthwick Avenue / 0 Borthwick Avenue, Portsmouth, NH

This letter addresses plan review comments received on September/06/2024 from the City of Portsmouth, NH.

- **COMMENTS**

COMMENT #1

The application will only move forward if the Zoning Board of Adjustment grants approval of the current proposal.

RESPONSE #1: This has been completed as of the October 15, 2024 ZBA Meeting.

COMMENT #2

Improve sidewalk to Borthwick Ave. and crossing to an ADA complaint and concrete sidewalk.

RESPONSE #2: Per conversations with Eric Eby at TAC, this was to be looked at if utilization would still occur for access, and if not, no improvements would be required. It is not expected that this portion of the parking lot will be utilized for Staff or Patients alike, and thus we will not be utilizing the crosswalk and will not need to update as a result.

COMMENT #3

Drainage on site must be functioning as originally designed. If deficient make improvements.

RESPONSE #3: Drainage on site functions as designed (with cleanout of the system); there will be ongoing future maintenance which will be needed on the Storm Water System as defined by the Maintenance Plan provided, and that will ensure ongoing compliance with design.

COMMENT #4

The existing system should be completely cleaned (basins & pipes) and all of the outlet pipes should be found, located and dredged out as needed to confirm their adequacy and ability to continue to function for the next 20 years. I agree regarding salt pollution, change of use, etc. but the major pollutant that I think is a concern here is sediment and the heavy metals present on the sediments. The catch basins sumps are the first line of defense regarding sediments and system clogging.

RESPONSE #4: This will be resolved through the Maintenance Plan provided.

COMMENT #5

That detention pond no longer meets standards but as minimum I would like to see that it can handle a 50 year storm without overstepping so please run a drainage calculation on that and provide me with results.

RESPONSE #5: We will address with the Planning Board at the November meeting for further clarification.

COMMENT #6

A yearly drainage maintenance plan will be necessary to confirm that the basins are being cleaned annually.

RESPONSE #6: This has been included with the submitted documents.

COMMENT #7

Boundary survey showing extent of all lots is required.

RESPONSE #7: This has been included with submitted documents.

COMMENT #8

Variance from BOA is needed to expand the use of parking as a primary use.

RESPONSE #8: Variance was granted as of October 15, 2024.

COMMENT #9

Proposed dimensions for new lots must be included in lot line adjustment plan.

RESPONSE #9: This has been included with submitted documents.

COMMENT #10

Existing and proposed site plans must be provided.

RESPONSE #10: As discussed with TAC, we have included as part of the submittals, a full survey of the 100 Borthwick Ave has been included which depicts the Site Plan.

COMMENT #11

Please provide the wetland delineation from June 2024.

RESPONSE #11: This delineation is shown in the submitted documents and has been stamped by the Wetland Scientist.

Sincerely,

Apex Design Build /
Apex Design Services, P.C.

August 19, 2024

Portsmouth Technical Advisory Committee
Attn: Peter Stith
1 Junkins Avenue, Suite 3rd Floor
Portsmouth, NH 03801

RE: Lot Line Adjustment – 100 Borthwick Ave, Portsmouth, NH

Dear Mr. Peter Stith:

On behalf of the Applicant, Stonefish, LLC, Apex Design Build respectfully submits an application to the adjust of the Lot-Line between the existing neighbor (Liberty Mutual) to the north and 100 Borthwick Ave, Portsmouth, NH. The Applicant is proposing this adjustment as part of the sale of an existing parking lot which features an addition of (264) parking spots for Liberty Mutual. This parking lot was previously designed, permitted, and constructed by Liberty Mutual as part of an agreement between NECU and Liberty Mutual. Now that NECU is relocating their corporate headquarters to Dover, NH, this presents a viable opportunity to Liberty Mutual to purchase the aforementioned parking lot which has been leased back to them for 5+ years. As a result of this lot-line adjustment, there will be no change in usage, no change in surface drainage, and the existing infrastructure complies with required runoff rates employed by Portsmouth. Additionally, all current needs of the site remain in compliance for the intended mixed-use tenancy at 100 Borthwick Ave and associated parking requirements.

This Lot-Line Adjustment will ensure that Liberty Mutual continues to provide a strong presence in Portsmouth for their Corporate Headquarters, and will also be a strong advocate for continuing that presence for the foreseeable future. This, in turn, will continue to solidify thousands of local employment opportunities for the Portsmouth, NH area.

Should there be any questions or concerns about the aforementioned application, please feel free to contact me directly.

Sincerely,

Jeff Kilburg



Project Director

Encl: Application Materials

Authorization Form

This Authorization Form (this "Authorization"), effective upon the date of signature below (the "Effective Date"), is by and among Northeast Credit Union dba Lighthouse Credit Union and its successors or assigns ("Lighthouse"), Apex Design Build ("Apex") and Allen & Major Associates, Inc. (collectively with Apex, the "ATDG Borthwick Team"), to act as an agent on behalf of Lighthouse for the purposes and upon the limitations listed herein:

Effective upon the Effective Date, this Authorization, relative strictly to Lighthouse's property located at 100 Borthwick Avenue, Portsmouth, New Hampshire 03801 (the "Property") and the ATDG Borthwick Team's ongoing project on behalf of ATDG, LLC at the Property (the "Project"), is limited to: 1) permitting and land use matters relative to the Project that are before governing boards, committees or other authority bodies or individuals authorized and acting on behalf of the City of Portsmouth, New Hampshire or the State of New Hampshire (collectively, the "Project Governmental Bodies") and 2) authorizes the ATDG Borthwick Team to: a) apply for and sign permits and ancillary documents relative to the Project as needed from the Project Governmental Bodies and to b) speak with and appear before Project Governmental Bodies and individuals working on behalf of the same, as representative of Lighthouse in conjunction with the Project. This Authorization is contingent upon copy of all applications and submissions relative to the Project that are submitted to the Project Governmental Bodies being sent to Lighthouse, contemporaneously with or before their time of submission, as follows:

Lighthouse Credit Union
Attn: Lee Schafer, SVP, General Counsel & Chief Operating Officer
Via email to: lschafer@lighthousecu.org &
Neil Gordon, SVP & Chief Financial Officer
Via email to: ngordon@lighthousecu.org

With a copy to

Sheehan Phinney Bass & Green, PA
Attn: Eric T. Kilchenstein, Esq.
Via email to: ckilchenstein@sheehan.com

This Authorization is fully revocable without cause and upon written notice from Lighthouse.

[Signature Page Follows]

Northeast Credit Union dba Lighthouse Credit Union

Neil Gordon

8/19/2024

By: Neil Gordon,
Title: SVP and Chief Financial Officer
Duly Authorized

Date:

[Signature Page to Authorization Form]

Requirements for Preliminary/Final Plat				
<input checked="" type="checkbox"/>	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Required for Preliminary / Final Plat	Waiver Requested
<input checked="" type="checkbox"/>	Preliminary Plat Names and addresses of all adjoining property owners. (Section IV.2) Final Plat Names and addresses of all abutting property owners, locations of buildings within one hundred (100) feet of the parcel, and any new house numbers within the subdivision. (Section V.2)		<input checked="" type="checkbox"/> Preliminary Plat <input checked="" type="checkbox"/> Final Plat	N/A
<input checked="" type="checkbox"/>	North point, date, and bar scale. (Section IV.3/V3)	Required on all Plan Sheets	<input checked="" type="checkbox"/> Preliminary Plat <input checked="" type="checkbox"/> Final Plat	N/A
<input checked="" type="checkbox"/>	Zoning classification and minimum yard dimensions required. (Section IV.4/V.4)		<input checked="" type="checkbox"/> Preliminary Plat <input checked="" type="checkbox"/> Final Plat	N/A
<input checked="" type="checkbox"/>	Preliminary Plat Scale (not to be smaller than one hundred (100) feet = 1 inch) and location map (at a scale of 1" = 1000'). (Section IV.5) Final Plat Scale (not to be smaller than 1"=100'), Location map (at a scale of 1"=1,000') showing the property being subdivided and its relation to the surrounding area within a radius of 2,000 feet. Said location map shall delineate all streets and other major physical features that may either affect or be affected by the proposed development. (Section V.5)		<input checked="" type="checkbox"/> Preliminary Plat <input checked="" type="checkbox"/> Final Plat	N/A
<input checked="" type="checkbox"/>	Location and approximate dimensions of all existing and proposed property lines including the entire area proposed to be subdivided, the areas of proposed lots, and any adjacent parcels in the same ownership. (Section IV.6)		<input checked="" type="checkbox"/> Preliminary Plat <input checked="" type="checkbox"/> Final Plat	
<input checked="" type="checkbox"/>	Dimensions and areas of all lots and any and all property to be dedicated or reserved for schools, parks, playgrounds, or other public purpose. Dimensions shall include radii and length of all arcs and calculated bearing for all straight lines. (Section V.6/ IV.7)		<input checked="" type="checkbox"/> Preliminary Plat <input checked="" type="checkbox"/> Final Plat	N/A
<input checked="" type="checkbox"/>	Location, names, and present widths of all adjacent streets, with a designation as to whether public or private and approximate location of existing utilities to be used. Curbs and sidewalks shall be shown. (Section IV.8/V.7)		<input checked="" type="checkbox"/> Preliminary Plat <input checked="" type="checkbox"/> Final Plat	

Requirements for Preliminary/Final Plat				
<input checked="" type="checkbox"/>	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Required for Preliminary / Final Plat	Waiver Requested
<input checked="" type="checkbox"/>	Location of significant physical features, including bodies of water, watercourses, wetlands, railroads, important vegetation, stone walls and soils types that may influence the design of the subdivision. (Section IV.9/V.8)		<input checked="" type="checkbox"/> Preliminary Plat <input checked="" type="checkbox"/> Final Plat	
<input checked="" type="checkbox"/>	Preliminary Plat Proposed locations, widths and other dimensions of all new streets and utilities, including water mains, storm and sanitary sewer mains, catch basins and culverts, street lights, fire hydrants, sewerage pump stations, etc. (Section IV.10) Final Plat Proposed locations and profiles of all proposed streets and utilities, including water mains, storm and sanitary sewer mains, catchbasins and culverts, together with typical cross sections. Profiles shall be drawn to a horizontal scale of 1"=50' and a vertical scale of 1"=5', showing existing centerline grade, existing left and right sideline grades, and proposed centerline grade. (Section V.9)	No proposed new streets / utilities.	<input checked="" type="checkbox"/> Preliminary Plat <input checked="" type="checkbox"/> Final Plat	
<input checked="" type="checkbox"/>	When required by the Board, the plat shall be accompanied by profiles of proposed street grades, including extensions for a reasonable distance beyond the subject land; also grades and sizes of proposed utilities. (Section IV.10)	No proposed new streets / utilities	<input checked="" type="checkbox"/> Preliminary Plat <input checked="" type="checkbox"/> Final Plat	
<input checked="" type="checkbox"/>	Base flood elevation (BFE) for subdivisions involving greater than five (5) acres or fifty (50) lots. (Section IV.11)	No BFE within the parcel or vicinity.	<input checked="" type="checkbox"/> Preliminary Plat <input checked="" type="checkbox"/> Final Plat	
<input checked="" type="checkbox"/>	For subdivisions of five (5) lots or more, or at the discretion of the Board otherwise, the preliminary plat shall show contours at intervals no greater than two (2) feet. Contours shall be shown in dotted lines for existing natural surface and in solid lines for proposed final grade, together with the final grade elevations shown in figures at all lot corners. If existing grades are not to be changed, then the contours in these areas shall be solid lines. (Section IV.12/ V.12)	Not applicable. This is a two lot subdivision.	<input checked="" type="checkbox"/> Preliminary Plat <input checked="" type="checkbox"/> Final Plat	

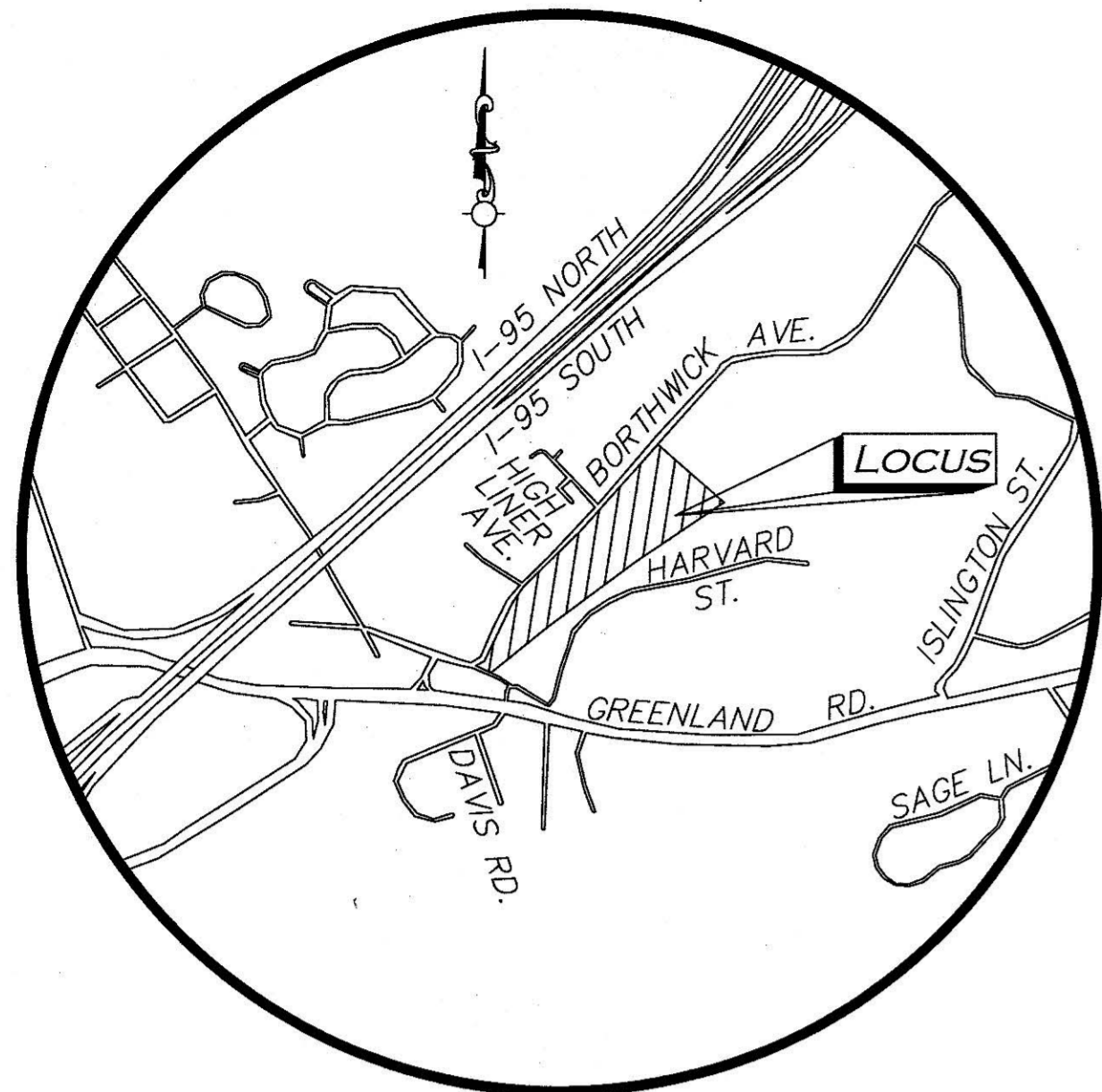
Requirements for Preliminary/Final Plat				
<input checked="" type="checkbox"/>	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Required for Preliminary / Final Plat	Waiver Requested
<input type="checkbox"/>	Dates and permit numbers of all necessary permits from governmental agencies from which approval is required by Federal or State law. (Section V.10)	N/A	<input type="checkbox"/> Preliminary Plat <input checked="" type="checkbox"/> Final Plat	
<input checked="" type="checkbox"/>	For subdivisions involving greater than five (5) acres or fifty (50) lots, the final plat shall show hazard zones and shall include elevation data for flood hazard zones. (Section V.11)	No BFE within the parcel or vicinity	<input type="checkbox"/> Preliminary Plat <input checked="" type="checkbox"/> Final Plat	
<input checked="" type="checkbox"/>	Location of all permanent monuments. (Section V.12)		<input type="checkbox"/> Preliminary Plat <input checked="" type="checkbox"/> Final Plat	

<input checked="" type="checkbox"/>	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Waiver Requested
<input checked="" type="checkbox"/>	15. Easements (VI.15) a. Utilities b. Drainage	Existing easements are shown. Proposed access easement is	
<input checked="" type="checkbox"/>	16. Monuments: (VI.16)		
<input type="checkbox"/>	17. Benchmarks: (VI.17)	No site work is proposed	
<input checked="" type="checkbox"/>	18. House Numbers (VI.18)	Existing address to remain.	

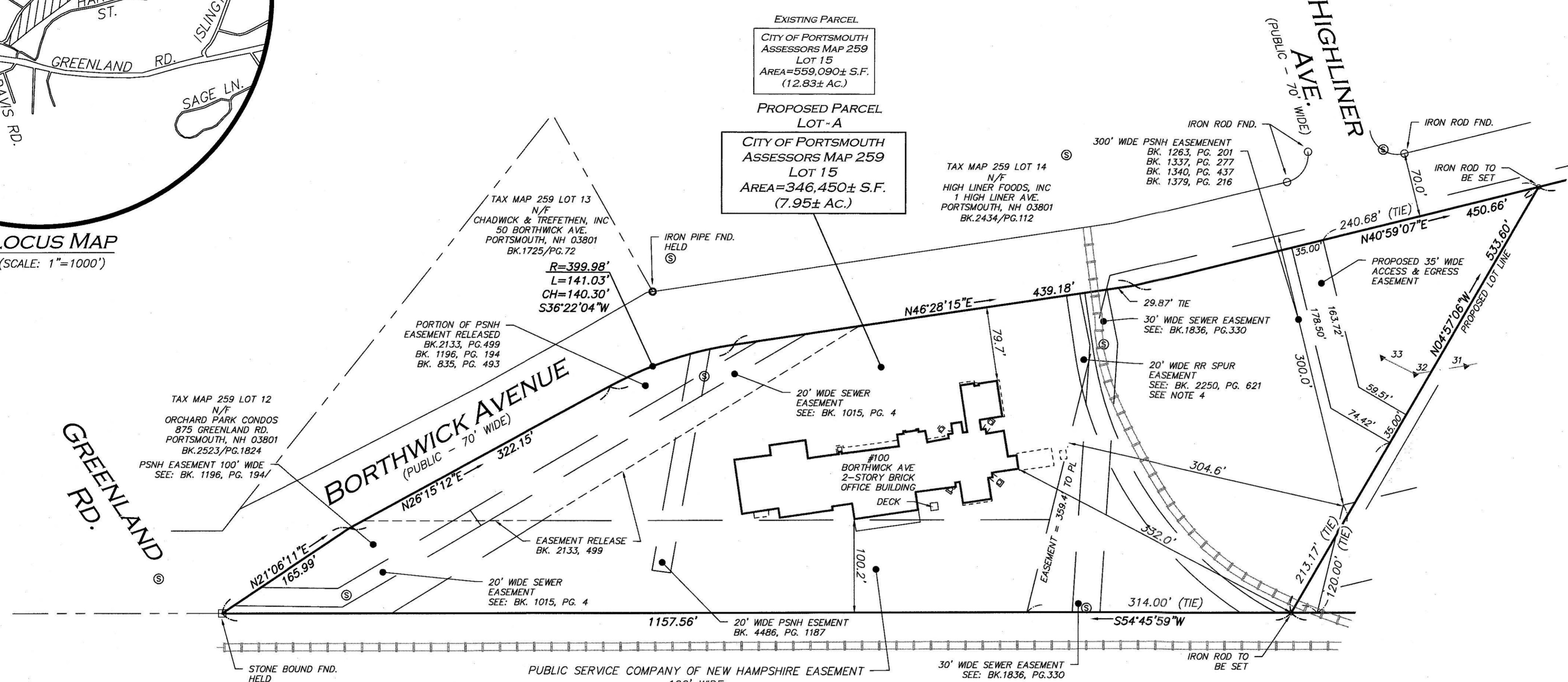
Design Standards			
	Required Items for Submittal	Indicate compliance and/or provide explanation as to alternative design	Waiver Requested
<input type="checkbox"/>	1. Streets have been designed according to the design standards required under Section (VII.1). a. Clearing b. Excavation c. Rough Grade and Preparation of Sub-Grade d. Base Course e. Street Paving f. Side Slopes g. Approval Specifications h. Curbing i. Sidewalks j. Inspection and Methods	No new streets are proposed.	
<input type="checkbox"/>	2. Storm water Sewers and Other Drainage Appurtenances have been designed according to the design standards required under Section (VII.2). a. Design b. Standards of Construction	No new storm water or drainage work is proposed. Existing drainage is to remain.	
<input type="checkbox"/>	3. Sanitary Sewers have been designed according to the design standards required under Section (VII.3). a. Design b. Lift Stations c. Materials d. Construction Standards	No new sanitary sewer work is proposed. Existing sewer is to remain.	
<input type="checkbox"/>	4. Water Mains and Fire Hydrants have been designed according to the design standards required under Section (VII.4). a. Connections to Lots b. Design and Construction c. Materials d. Notification Prior to Construction	No new water mains or hydrants are proposed. Existing water is to remain.	

Applicant's/Representative's Signature:  Date: 08/19/2024

¹ See City of Portsmouth, NH Subdivision Rules and Regulations for details.
Subdivision Application Checklist/January 2018

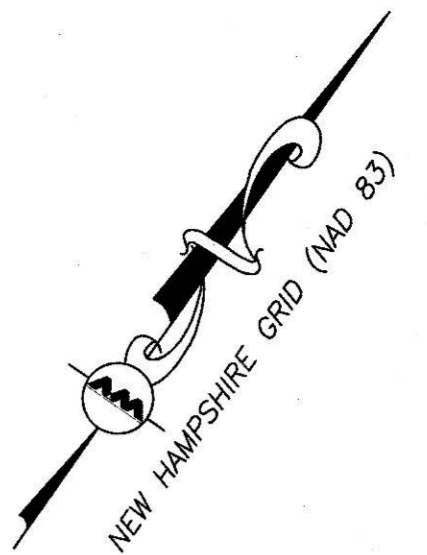


LOCUS MAP
(SCALE: 1"=1000')



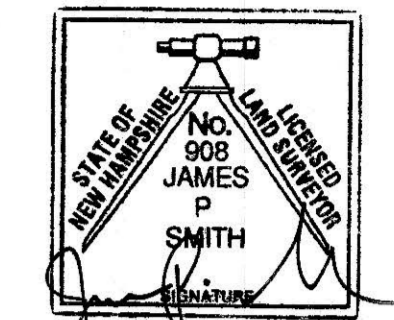
EXISTING PARCEL
CITY OF PORTSMOUTH
ASSESSORS MAP 259
LOT 15
AREA=559,090± S.F.
(12.83± AC.)

PROPOSED PARCEL
LOT-A
CITY OF PORTSMOUTH
ASSESSORS MAP 259
LOT 15
AREA=346,450± S.F.
(7.95± AC.)



THIS PLAN IS THE RESULT OF AN ACTUAL ON THE GROUND SURVEY PERFORMED ON OR BETWEEN JUNE 14, 2024 AND OCTOBER 01, 2024 AND HAD AN ERROR OF CLOSURE OF NO GREATER THAN 1/10,000. THE SUBJECT PREMISES IS LOCATED IN FLOOD ZONE X - "AREA OF MINIMAL FLOOD HAZARD" AS SHOWN ON THE FLOOD INSURANCE RATE MAP FOR THE CITY OF PORTSMOUTH NEW HAMPSHIRE ROCKINGHAM COUNTY COMMUNITY PANEL NUMBER 33015C0270F HAVING AN EFFECTIVE DATE OF JANUARY 1, 2021.

ALLEN & MAJOR ASSOCIATES, INC.



JAMES P. SMITH NH LLS #908 DATE 10-10-24

REV	DATE	DESCRIPTION

APPLICANT:
STONEFISH, LLC
875 GREENLAND RD. UNIT C8
PORTSMOUTH, NH 03801

OWNER:
NORTH EAST CREDIT UNION
PO BOX 1240
PORTSMOUTH, NH 03802

LIBERTY MUTUAL INSURANCE CO.
C/O TYLER MUNGER
175 BERKELEY STREET
BOSTON, MA. 02117

PROJECT:
TM 259 LOT 15
100 BORTHWICK AVE.
PORTSMOUTH, NH
TM 240 LOT 3
BORTHWICK AVE.
PORTSMOUTH, NH

PROJECT NO. 3250-02 DATE: 10/09/2024

SCALE: 1" = 80' DWG. NAME: S3250-02-LLA

DRAFTED BY: CTP CHECKED BY: JPS

PREPARED BY:



ALLEN & MAJOR ASSOCIATES, INC.
civil engineering • land surveying
environmental consulting • landscape architecture
www.allenmajor.com

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DRAWING TITLE: SHEET No.

LOT LINE ADJUSTMENT PLAN 1

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ZONING TABLE - OFFICE/RESEARCH DISTRICT

ITEM	REQUIRED	EXISTING	PROPOSED 259-15
LOT AREA (MIN)	3 Ac.	12.83	7.95 AC.
LOT FRONTAGE (MIN)	300'	1848.44'	1519.01'
LOT DEPTH (MIN)	300'	337' AVG.	337' AVG.
FRONT YARD SETBACK (MIN)	50'	79.7'	79.7'
SIDE YARD SETBACK (MIN)	75'	829'	332'
REAR YARD SETBACK (MIN)	50'	100.2'	100.2'
OPEN SPACE (MIN)	30%	48%	45%
BUILDING COVERAGE (MAX)	30%	4%	6.3%
BUILDING HEIGHT (MAX)	60'	72'	72'

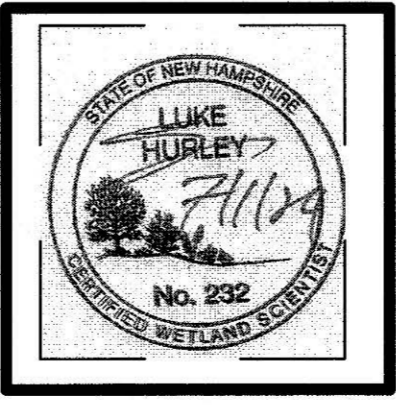
CITY OF PORTSMOUTH, NH PLANNING BOARD APPROVAL

CHAIRMAN _____ DATE _____

HURLEY ENVIRONMENTAL & LAND PLANNING, LLC
P.O. BOX 356
EPSOM, NH 03234
(603) 583-1745

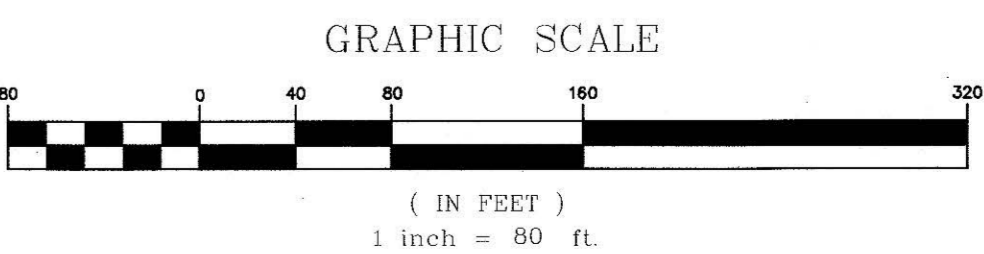
THE WETLAND DELINEATION WAS PERFORMED BY HURLEY ENVIRONMENTAL & LAND PLANNING, LLC. JUNE 2024, UTILIZING THE FOLLOWING STANDARDS:

- REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS MANUAL: NORTH CENTRAL AND NORTHEAST REGION, (VERSION 2.0) JANUARY 2012, U.S. ARMY CORPS OF ENGINEERS.
- FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES, A GUIDE FOR IDENTIFYING AND DELINEATING HYDRIC SOILS, VERSION 8.2. UNITED STATES DEPARTMENT OF AGRICULTURE(2018).
- NEW ENGLAND HYDRIC SOILS TECHNICAL COMMITTEE. 2019 VERSION 4, FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN NEW ENGLAND. NEW ENGLAND INTERSTATE WATER POLLUTION CONTROL COMMISSION, LOWELL, MA.
- NATIONAL WETLAND PLANT LIST, VERSIONS 3.5 (2020).

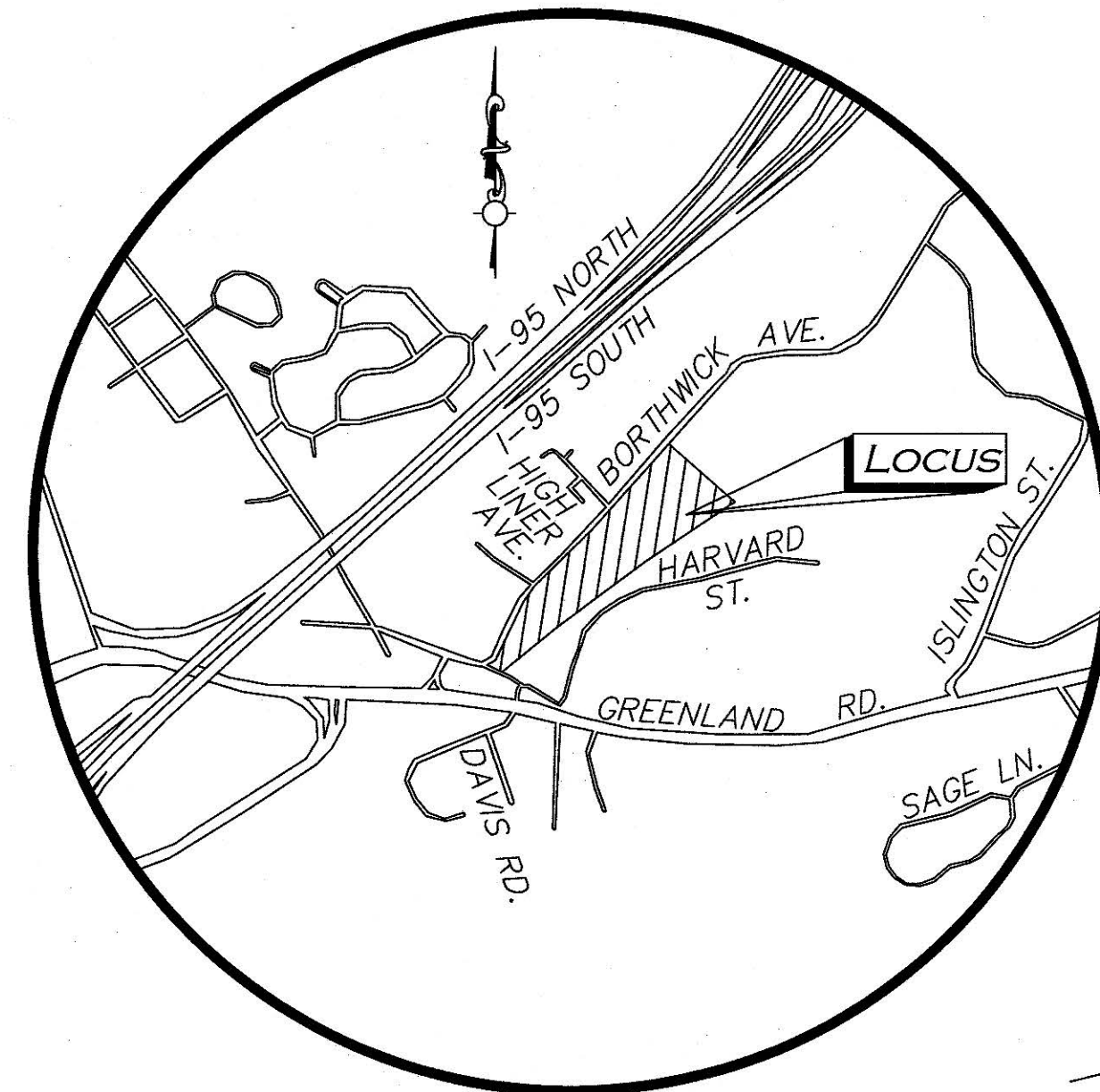


NOTES CONT. FROM PG. 2

- SEE SHEET 2 FOR LEGEND, REFERENCES, AND NOTES.
- SEE: BOOK 488, PAGE 429 AND PAGE 431, DRAINAGE RIGHTS TO PROPRIETORS OF THE PORTSMOUTH AQUEDUCT CORPORATION. NO RELINQUISHMENT WAS EVER FOUND.
 - SEE: BOOK 551, PAGE 18, RIGHT TO TRENCH OR DITCH TO FRANK JONES. NO RELINQUISHMENT WAS EVER FOUND.
 - SEE: BOOK 598, PAGE 14 POLE RIGHTS TO ROCKINGHAM COUNTY LIGHT & POWER CO.
 - SEE: BOOK 984, PAGE 378 TO THE CITY OF PORTSMOUTH 20' WIDE SEWER PIPE LINE.
 - SEE: BOOK 1015, PAGE 14 TO THE CITY OF PORTSMOUTH 20' WIDE SEWER PIPE LINE.



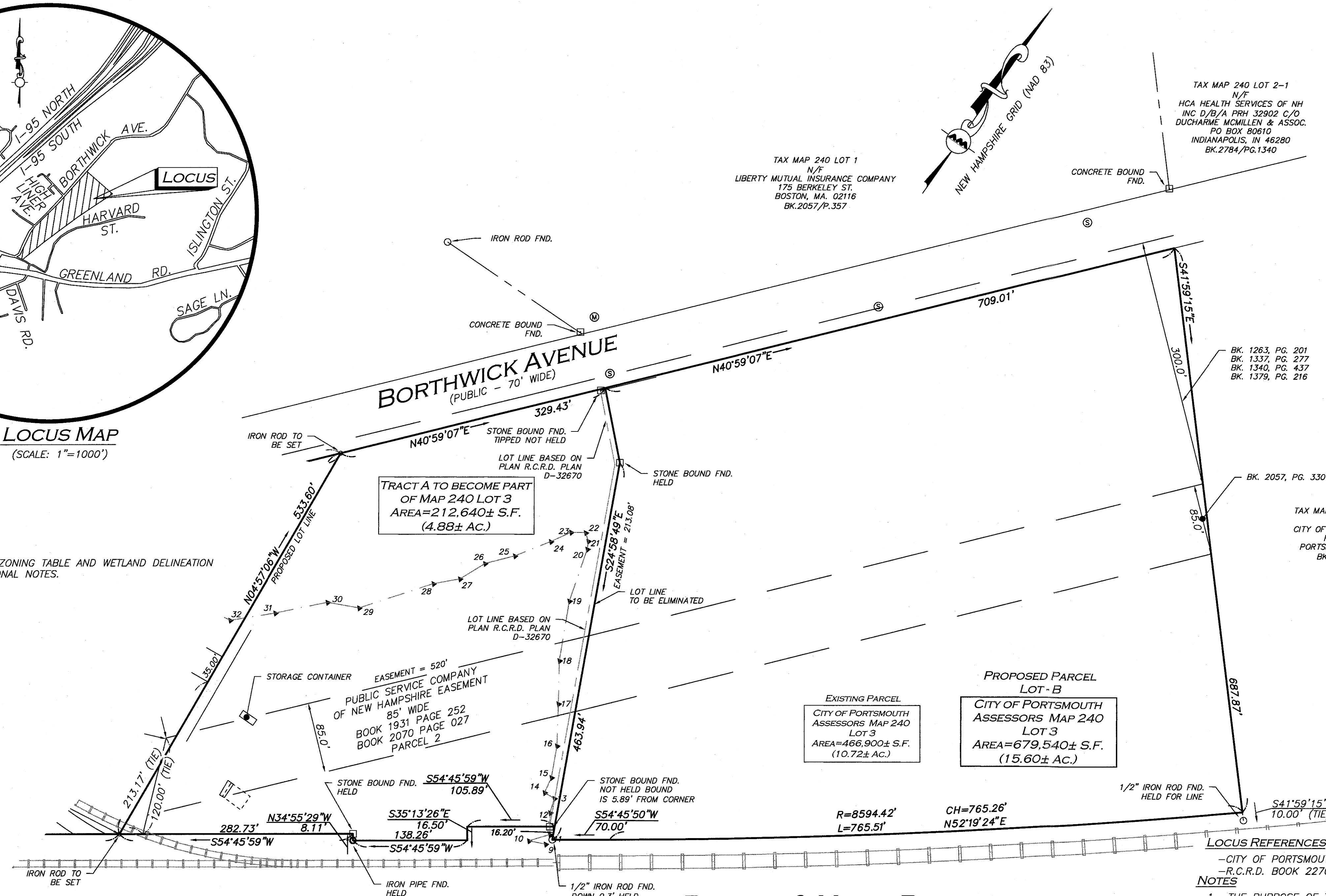
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LOCUS MAP
(SCALE: 1"=1000')

NOTES

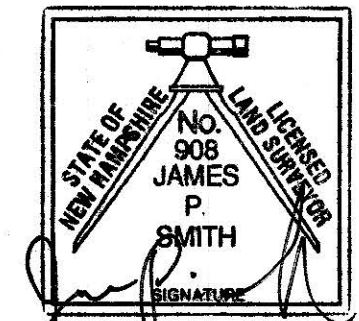
- SEE SHEET 1 FOR ZONING TABLE AND WETLAND DELINEATION NOTES, AND ADDITIONAL NOTES.



LEGEND	
STONE BOUND FND.	□
IRON PIPE (IP)	○
IRON ROD (IR)	○
WETLAND FLAG	▲A31
PROPERTY LINE	---
ABUTTERS LINE	---
STONE BOUND W/DRILL HOLE	SB/DH
CONC. BOUND W/DRILL HOLE	CB/DH
FOUND	FND
NOW OR FORMERLY	N/F
BOOK	BK.
PAGE	PG.
BUILDING HEIGHT	BH
SEWER MAN HOLE	SMH

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875 GREENLAND RD. UNIT C8
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NORTH EAST CREDIT UNION
PO BOX 1240
PORTSMOUTH, NH 03802

LIBERTY MUTUAL INSURANCE CO.

C/O TYLER MUNGER
175 BERKELEY STREET
BOSTON, MA. 02117

PROJECT:

TM 259 LOT 15
100 BORTHWICK AVE.
PORTSMOUTH, NH

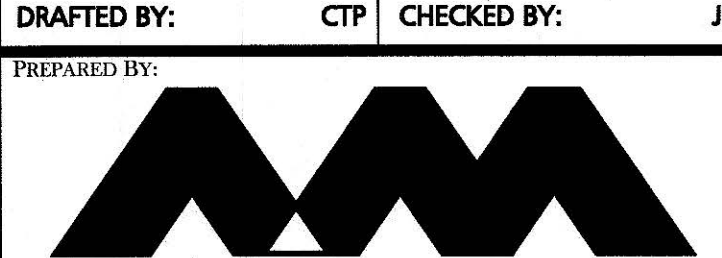
TM 240 LOT 3
BORTHWICK AVE.
PORTSMOUTH, NH

PROJECT NO. 3250-02 DATE: 10/09/2024

SCALE: 1" = 80' DWG. NAME: S-3250-02-LA

DRAFTED BY: CTP CHECKED BY: JPS

PREPARED BY:



ALLEN & MAJOR ASSOCIATES, INC.

civil engineering • land surveying
environmental consulting • landscape architecture
www.allenmajor.com
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MANCHESTER, NH 03103
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FAX: (603) 627-5501

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DRAWING TITLE: SHEET No.

LOT LINE ADJUSTMENT PLAN 2

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PLAN REFERENCES

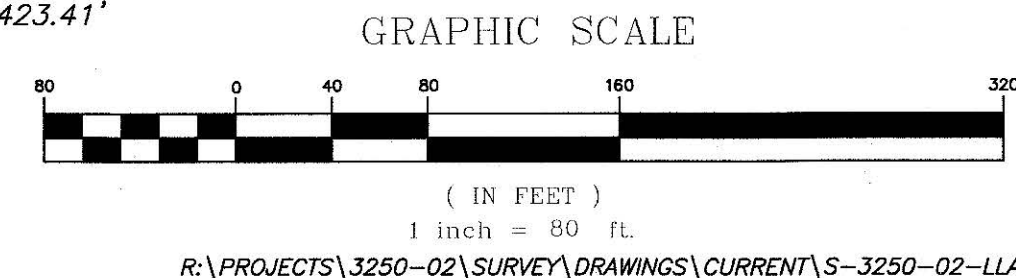
- PLAN ENTITLED, "PLAN OF A PORTION OF BORTHWICK INDUSTRIAL PARK PORTSMOUTH, N.H.", SCALE 1"=60', DATED DECEMBER 1975, PREPARED BY JOHN W. DURGIN, AND ON FILE AT THE R.C.R.D. AS PLAN NO. D-5695.
- PLAN ENTITLED, "SITE PLAN OF ORCHARD PARK CONDOMINIUMS", SCALE 1"=40', DATED OCTOBER 10, 1985, PREPARED BY KIMBALL CHASE COMPANY, INC, AND ON FILE AT THE R.C.R.D. AS PLAN NO. D-14238.
- PLAN ENTITLED, "PLAN OF LAND MAP 240, LOTS 1 & 3 PORTSMOUTH, NEW HAMPSHIRE", SCALE 1"=60', DATED JUNE 13, 2005, PREPARED BY VHB, AND ON FILE AT THE R.C.R.D. AS PLAN NO. D-33833.
- PLAN ENTITLED, "SUBDIVISION PLAN FOR NATIONAL SEA PRODUCTS INCORPORATED HIGHLINER AVENUE/ BORTHWICK AVENUE COUNTY OF ROCKINGHAM PORTSMOUTH, N.H., SCALE 1"=100', DATED OCTOBER JUNE 25, 1997, PREPARED BY RICHARD P. MILLETTE AND ASSOCIATES, AND ON FILE AT THE R.C.R.D. AS PLAN NO. D-25842.
- PLAN ENTITLED, "REVISED PLAN OF BORTHWICK INDUSTRIAL PARK PORTSMOUTH, N.H." SCALE 1"=60', DATED AUGUST 31, 1966, PREPARED BY JOHN W. DURGIN AND ON FILE AT THE R.C.R.D. AS PLAN #770.
- PLAN ENTITLED, "PLAN OF BORTHWICK INDUSTRIAL PARK PORTSMOUTH, N.H." SCALE 1"=60', DATED JANUARY, 1964, PREPARED BY JOHN W. DURGIN AND ON FILE AT THE R.C.R.D. AS PLAN NO. 262.
- PLAN ENTITLED, "STANDARD BOUNDARY SURVEY" DATED JUNE 2004, PREPARED BY AMBIT ENGINEERING, INC. CIVIL ENGINEERS & LAND SURVEYORS AND RECEIVED ON JUNE 17, 2024.
- PLAN ENTITLED, "EASEMENT PLAN MAP 259-LOT 15 NORTHEAST CREDIT UNION TO PSNH" DATED MARCH 2005, PREPARED BY AMBIT ENGINEERING, INC. CIVIL ENGINEERS & LAND SURVEYORS AND ON FILE AT R.C.R.D AS PLAN NO. D-32670.
- PLAN ENTITLED, "HIGH TENSION TRANSMISSION LINE NEW HAMPSHIRE GAS & ELEC. CO. PORTSMOUTH AND AMESBURY DATED: 1927, SCALE: 1"=200'," AND ON FILE AT R.C.R.D. AS PLAN NO. 0516.

ZONING TABLE - OFFICE/RESEARCH DISTRICT			
ITEM	REQUIRED	EXISTING	PROPOSED 240-03
LOT AREA (MIN)	3 Ac.	10.72 AC.	15.60 AC.
LOT FRONTAGE (MIN)	300'	709.01'	1038.44'
LOT DEPTH (MIN)	300'	625' AVG.	599' AVG.
FRONT YARD SETBACK (MIN)	50'	-	-
SIDE YARD SETBACK (MIN)	75'	-	-
REAR YARD SETBACK (MIN)	50'	-	-
OPEN SPACE (MIN)	30%	-	-
BUILDING COVERAGE (MAX)	30%	0%	0%
BUILDING HEIGHT (MAX)	60'	-	-

CITY OF PORTSMOUTH, NH PLANNING BOARD APPROVAL

CHAIRMAN _____ DATE _____

- LOCUS REFERENCES**
- CITY OF PORTSMOUTH TAX MAP 259, LOT 15, TAX MAP 240 LOT 03
 - R.C.R.D. BOOK 2270, PAGE 345, BOOK 2057, PAGE 357
- NOTES**
- THE PURPOSE OF THIS PLAN IS TO ADJUST THE LOT LINE BETWEEN MAP 259 LOT 15 AND MAP 240 LOT 3. PROPOSED TRACT A WILL BE ANNEXED AND COMBINED WITH MAP 240 LOT 3.
 - NORTH ARROW IS BASED ON NEW HAMPSHIRE GRID COORDINATE SYSTEM (NAD 83).
 - BOOK/PAGE AND PLAN REFERENCES ARE TAKEN FROM THE ROCKINGHAM COUNTY REGISTRY OF DEEDS IN BRENTWOOD, NH.
 - WETLANDS DELINEATED BY LUKE HURLEY, NH WETLAND SCIENTIST.
 - RAILROAD SPUR WAS CONSTRUCTED OUTSIDE OF RECORD EASEMENT.
 - SEE EXISTING CONDITIONS PLAN SET, PREPARED BY ALLEN & MAJOR ASSOCIATES, INC. WITH THE SAME DATE. ONLY THIS PLAN TO BE USED FOR SUBDIVISION RECORDING PURPOSES.
 - SEE: BK. 4486, PG. 2595 EASEMENT TO CITY OF PORTSMOUTH FOR GROUNDWATER MONITORING.
 - SEE: BK. 1372, PG. 148 AND BK. 1374, PG. 142 35' WIDE EASEMENT TO ALLIED NH GAS COMPANY. SPECIFIC LOCATION NOT IDENTIFIED, BLANKET IN NATURE.
 - SEE: BK. 835, PG. 493 FOR EASEMENT TO NH GAS & ELECTRIC COMPANY. BELIEVED TO BE AN OVERLAPPING EASEMENT THAT WAS DISCONTINUED IN BK. 2133, PG. 499.
 - RECORD SURVEYS FOR MAP 259 LOT 15 AND MAP 240 LOT 03 CREATED A 5-6' GAP BETWEEN THE SUBJECT PARCELS. THEY ALSO CREATED A JOG INTO BORTHWICK AVENUE, AT THE COMMON CORNER, AT THE ROAD. BOTH DEEDS CALL FOR EACH OTHER AS THE ABUTTER. DETERMINATION WAS MADE BY HOLDING THE SURVEY FOR MAP 240 LOT 03 AS THE COMMON LINE. I HELD BORTHWICK AVE. AS 70' WIDE AND BEST FIT USING MONUMENTS FOUND. IN DOING SO THE ANGLE POINT IN BORTHWICK ALONG MAP 259 LOT 15, IS NOW IN A NEW LOCATION OF 439.18' FROM THE CURVE. RECORD DIMENSION FROM THE CURVE TO THE ROAD ANGLE POINT IS 423.41'



R:\PROJECTS\3250-02\SURVEY\DRAWINGS\CURRENT\S-3250-02-LA.DWG



October 10, 2024

John Kilburg
Project Director
Apex Design Build
9550 W. Higgins Road, Ste. 170
Rosemont, IL 60018

A&M Project #: 3250-02
Re: 100 Borthwick Avenue
Portsmouth, NH
Existing Detention Pond
Drainage Analysis

Dear Mr. Kilburg,

Allen & Major Associates, Inc. (A&M) is pleased to provide this drainage summary for the existing detention basin located to the northeast of the existing 100 Borthwick Avenue building. The attached Watershed Plan and HydroCAD Report will outline the contributing areas flowing to the existing basin and model how the basin performs for the 2-, 10-, 25-, & 50-year design storm events.

The 100 Borthwick Avenue property is currently occupied by a 2-story, brick office building and associated parking to the southwest. The northeast of the property is developed with a large parking area and associated drainage network for the impervious parking surface. An existing detention basin exists along the northeastern property line. The stormwater flows within the eastern portion of the site are captured through an existing drainage network and routed to the detention basin before discharging to the adjacent wetland. The existing topography on site slopes from the southwest to northeast, ranging from elevation 53± adjacent to Borthwick Avenue to elevation 28± at the detention basin’s floor.

HydroCAD Analysis

An existing watershed was mapped and processed to discover the associated flow being routed to the basin for the 2-, 10-, 25-, & 50-year design storm events. A&M had utilized topography information from a field survey completed in June of 2024 to model the existing detention basin volume. The basin’s outlet pipe was modeled from the “Proposed Parking Expansion” plan prepared by Kimball Chase, July 17th, 1995. See the table below showing the basin’s peak elevation in relation to the flood elevation (top of berm, referenced from survey topography) for each of the design storm events.

Peak Elevation Analysis				
As-Built – Existing Detention Basin, Top of Berm Elevation (TOB) = 32.50				
	2-Year	10-Year	25-Year	50-Year
Peak Elevation (PE)	30.72	32.34	32.90	33.02
Freeboard (PE-TOB)	-1.78	-0.16	+0.40	+0.52

In summary, the basin as it currently exists, overtops for storms greater than the 10-year storm.

Additionally, A&M had modeled the detention basin as designed by Kimball Chase on the "Proposed Parking Expansion" plan. See the table below showing the basin's peak elevation in relation to the flood elevation (top of berm, referenced from plan) for each of the design storm events.

Peak Elevation Analysis				
1995 Design – Detention Basin, Top of Berm Elevation (TOB) = 34.00				
	2-Year	10-Year	25-Year	50-Year
Peak Elevation (PE)	29.95	32.04	33.50	34.08
Freeboard (PE-TOB)	-4.05	-1.96	-0.50	+0.08

In summary, the basin does not over-top as designed in 1995 for the 2-, 10- & 25-year design storms but does over-top for the 50-year design storm.

A&M had completed a proposed analysis utilizing a 24" HDPE outlet and modeled a design condition that will handle all the flow routed to the detention basin without overtopping for all design storm events. See the table below with results.

Peak Elevation Analysis				
New 24" Outlet - Existing Detention Basin, Top of Berm Elevation (TOB) = 32.50				
	2-Year	10-Year	25-Year	50-Year
Peak Elevation (PE)	30.07	30.80	31.42	31.98
Freeboard (PE-TOB)	-2.43	-1.70	-1.08	-0.52

In conclusion of the proposed analysis, A&M is recommending to remove the existing basin's outlet pipe (it is our understanding it is currently buried) and installing a new 24" HDPE outlet pipe with headwall to handle the amount of runoff reaching this area. This upgrade will ensure the detention basin drains adequately without overtopping for all design storm events.

Very Truly Yours,

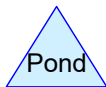
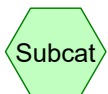
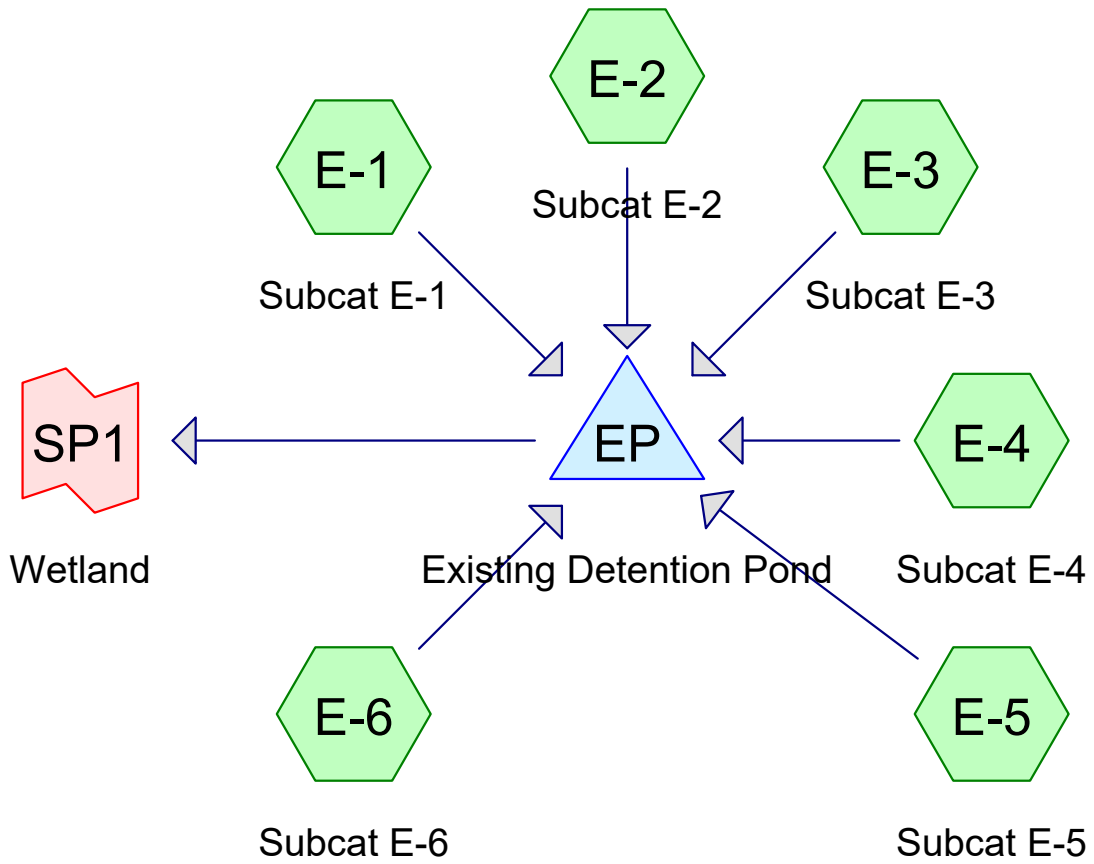
ALLEN & MAJOR ASSOCIATES, INC.



Brian D. Jones, PE
Senior Project Manager

Enclosure:

1. HydroCAD Reports (3) – As-Built, 1995 Design, Proposed Design
2. Watershed Plan, WS-1 & Proposed Grading & Drainage Plan, C-103
3. Proposed Parking Expansion Plan, prepared by Kimball Chase, July 17, 1995.
4. Operation & Maintenance Letter
5. Extreme Precipitation Tables
6. NRCS Soil Report



Routing Diagram for 3250-02_Existing HydroCAD - As-Built
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Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-year	Type III 24-hr		Default	24.00	1	4.11	2
2	10-year	Type III 24-hr		Default	24.00	1	6.37	2
3	25-year	Type III 24-hr		Default	24.00	1	8.18	2
4	50-year	Type III 24-hr		Default	24.00	1	9.89	2

3250-02_Existing HydroCAD - As-Built

Type III 24-hr 2-year Rainfall=4.11"

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Summary for Subcatchment E-1: Subcat E-1

Runoff = 2.25 cfs @ 12.09 hrs, Volume= 7,493 cf, Depth= 3.33"
 Routed to Pond EP : Existing Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-year Rainfall=4.11"

Area (sf)	CN	Description
3,912	61	>75% Grass cover, Good, HSG B
23,114	98	Paved parking, HSG B
27,026	93	Weighted Average
3,912		14.48% Pervious Area
23,114		85.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 min.

Summary for Subcatchment E-2: Subcat E-2

Runoff = 0.93 cfs @ 12.12 hrs, Volume= 3,196 cf, Depth= 1.61"
 Routed to Pond EP : Existing Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-year Rainfall=4.11"

Area (sf)	CN	Description
16,141	61	>75% Grass cover, Good, HSG B
7,726	98	Paved parking, HSG B
23,867	73	Weighted Average
16,141		67.63% Pervious Area
7,726		32.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.0450	0.23		Sheet Flow, A-B Grass: Short n= 0.150 P2= 4.11"
4.2	136	0.0060	0.54		Shallow Concentrated Flow, B-C Short Grass Pasture Kv= 7.0 fps
7.8	186	Total			

Summary for Subcatchment E-3: Subcat E-3

Runoff = 5.19 cfs @ 12.14 hrs, Volume= 18,412 cf, Depth= 2.47"
 Routed to Pond EP : Existing Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-year Rainfall=4.11"

3250-02_Existing HydroCAD - As-Built

Type III 24-hr 2-year Rainfall=4.11"

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Area (sf)	CN	Description
33,300	61	>75% Grass cover, Good, HSG B
56,212	98	Paved parking, HSG B
89,512	84	Weighted Average
33,300		37.20% Pervious Area
56,212		62.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	50	0.0180	0.16		Sheet Flow, A-B Grass: Short n= 0.150 P2= 4.11"
0.6	41	0.0260	1.13		Shallow Concentrated Flow, B-C Short Grass Pasture Kv= 7.0 fps
0.9	169	0.0230	3.08		Shallow Concentrated Flow, C-D Paved Kv= 20.3 fps
1.9	111	0.0200	0.99		Shallow Concentrated Flow, D-E Short Grass Pasture Kv= 7.0 fps
0.9	139	0.0160	2.57		Shallow Concentrated Flow, E-F Paved Kv= 20.3 fps
9.5	510	Total			

Summary for Subcatchment E-4: Subcat E-4

Runoff = 4.08 cfs @ 12.09 hrs, Volume= 13,913 cf, Depth= 3.54"
 Routed to Pond EP : Existing Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-year Rainfall=4.11"

Area (sf)	CN	Description
4,028	61	>75% Grass cover, Good, HSG B
43,139	98	Paved parking, HSG B
47,168	95	Weighted Average
4,028		8.54% Pervious Area
43,139		91.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 min.

Summary for Subcatchment E-5: Subcat E-5

Runoff = 0.79 cfs @ 12.10 hrs, Volume= 2,615 cf, Depth= 1.34"
 Routed to Pond EP : Existing Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-year Rainfall=4.11"

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Type III 24-hr 2-year Rainfall=4.11"

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Area (sf)	CN	Description
4,842	98	Paved parking, HSG B
18,600	61	>75% Grass cover, Good, HSG B
23,442	69	Weighted Average
18,600		79.35% Pervious Area
4,842		20.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 min.

Summary for Subcatchment E-6: Subcat E-6

Runoff = 5.33 cfs @ 12.09 hrs, Volume= 19,149 cf, Depth= 3.87"
 Routed to Pond EP : Existing Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-year Rainfall=4.11"

Area (sf)	CN	Description
59,301	98	Paved parking, HSG B
3	61	>75% Grass cover, Good, HSG B
59,304	98	Weighted Average
3		0.00% Pervious Area
59,301		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 min.

Summary for Pond EP: Existing Detention Pond

Per the NRCS Soil Report, the underlying soil in the detention basin area is Hoosic gravelly fine sandy loam. The Saturated Hydraulic Conductivity (Ksat) value for this soil is 116.98 micrometers/second = 16.58 in/hr. A 2x factor of safety is applied to derive the infiltration rate for the basin, 8.29 in/hr.

Inflow Area = 270,318 sf, 71.89% Impervious, Inflow Depth = 2.88" for 2-year event
 Inflow = 18.20 cfs @ 12.10 hrs, Volume= 64,778 cf
 Outflow = 8.50 cfs @ 12.31 hrs, Volume= 64,811 cf, Atten= 53%, Lag= 12.8 min
 Discarded = 1.24 cfs @ 12.31 hrs, Volume= 4,163 cf
 Primary = 7.26 cfs @ 12.31 hrs, Volume= 60,648 cf
 Routed to Link SP1 : Wetland

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 30.72' @ 12.31 hrs Surf.Area= 5,759 sf Storage= 7,931 cf
 Flood Elev= 32.50' Surf.Area= 10,369 sf Storage= 22,657 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 4.4 min (793.8 - 789.4)

3250-02_Existing HydroCAD - As-Built

Type III 24-hr 2-year Rainfall=4.11"

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Volume	Invert	Avail.Storage	Storage Description
#1	28.00'	22,657 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
28.00	449	350.0	0	0	449
29.00	2,241	607.0	1,231	1,231	20,027
30.00	4,161	635.0	3,152	4,383	22,863
31.00	6,456	735.0	5,267	9,650	33,787
32.00	9,655	711.0	8,002	17,652	36,641
32.50	10,369	718.0	5,005	22,657	37,514

Device	Routing	Invert	Outlet Devices
#1	Discarded	28.00'	9.290 in/hr Exfiltration over Surface area
#2	Primary	26.00'	12.0" Round Culvert L= 75.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 26.00' / 25.60' S= 0.0053 '/ Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf
#3	Primary	32.40'	37.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Discarded OutFlow Max=1.24 cfs @ 12.31 hrs HW=30.71' (Free Discharge)

↑1=**Exfiltration** (Exfiltration Controls 1.24 cfs)

Primary OutFlow Max=7.25 cfs @ 12.31 hrs HW=30.71' (Free Discharge)

↑2=**Culvert** (Barrel Controls 7.25 cfs @ 9.24 fps)

↑3=**Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link SP1: Wetland

Inflow Area = 270,318 sf, 71.89% Impervious, Inflow Depth = 2.69" for 2-year event

Inflow = 7.26 cfs @ 12.31 hrs, Volume= 60,648 cf

Primary = 7.26 cfs @ 12.31 hrs, Volume= 60,648 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

3250-02_Existing HydroCAD - As-Built

Type III 24-hr 10-year Rainfall=6.37"

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Summary for Subcatchment E-1: Subcat E-1

Runoff = 3.65 cfs @ 12.09 hrs, Volume= 12,495 cf, Depth= 5.55"

Routed to Pond EP : Existing Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=6.37"

Area (sf)	CN	Description
3,912	61	>75% Grass cover, Good, HSG B
23,114	98	Paved parking, HSG B
27,026	93	Weighted Average
3,912		14.48% Pervious Area
23,114		85.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 min.

Summary for Subcatchment E-2: Subcat E-2

Runoff = 2.03 cfs @ 12.11 hrs, Volume= 6,758 cf, Depth= 3.40"

Routed to Pond EP : Existing Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=6.37"

Area (sf)	CN	Description
16,141	61	>75% Grass cover, Good, HSG B
7,726	98	Paved parking, HSG B
23,867	73	Weighted Average
16,141		67.63% Pervious Area
7,726		32.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.0450	0.23		Sheet Flow, A-B Grass: Short n= 0.150 P2= 4.11"
4.2	136	0.0060	0.54		Shallow Concentrated Flow, B-C Short Grass Pasture Kv= 7.0 fps
7.8	186	Total			

Summary for Subcatchment E-3: Subcat E-3

Runoff = 9.40 cfs @ 12.13 hrs, Volume= 33,894 cf, Depth= 4.54"

Routed to Pond EP : Existing Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=6.37"

3250-02_Existing HydroCAD - As-Built

Type III 24-hr 10-year Rainfall=6.37"

Prepared by Allen & Major Associates, Inc

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Area (sf)	CN	Description
33,300	61	>75% Grass cover, Good, HSG B
56,212	98	Paved parking, HSG B
89,512	84	Weighted Average
33,300		37.20% Pervious Area
56,212		62.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	50	0.0180	0.16		Sheet Flow, A-B Grass: Short n= 0.150 P2= 4.11"
0.6	41	0.0260	1.13		Shallow Concentrated Flow, B-C Short Grass Pasture Kv= 7.0 fps
0.9	169	0.0230	3.08		Shallow Concentrated Flow, C-D Paved Kv= 20.3 fps
1.9	111	0.0200	0.99		Shallow Concentrated Flow, D-E Short Grass Pasture Kv= 7.0 fps
0.9	139	0.0160	2.57		Shallow Concentrated Flow, E-F Paved Kv= 20.3 fps
9.5	510	Total			

Summary for Subcatchment E-4: Subcat E-4

Runoff = 6.49 cfs @ 12.09 hrs, Volume= 22,716 cf, Depth= 5.78"
 Routed to Pond EP : Existing Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-year Rainfall=6.37"

Area (sf)	CN	Description
4,028	61	>75% Grass cover, Good, HSG B
43,139	98	Paved parking, HSG B
47,168	95	Weighted Average
4,028		8.54% Pervious Area
43,139		91.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 min.

Summary for Subcatchment E-5: Subcat E-5

Runoff = 1.85 cfs @ 12.09 hrs, Volume= 5,869 cf, Depth= 3.00"
 Routed to Pond EP : Existing Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-year Rainfall=6.37"

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Type III 24-hr 10-year Rainfall=6.37"

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Area (sf)	CN	Description
4,842	98	Paved parking, HSG B
18,600	61	>75% Grass cover, Good, HSG B
23,442	69	Weighted Average
18,600		79.35% Pervious Area
4,842		20.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 min.

Summary for Subcatchment E-6: Subcat E-6

Runoff = 8.30 cfs @ 12.09 hrs, Volume= 30,302 cf, Depth= 6.13"
 Routed to Pond EP : Existing Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-year Rainfall=6.37"

Area (sf)	CN	Description
59,301	98	Paved parking, HSG B
3	61	>75% Grass cover, Good, HSG B
59,304	98	Weighted Average
3		0.00% Pervious Area
59,301		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 min.

Summary for Pond EP: Existing Detention Pond

Per the NRCS Soil Report, the underlying soil in the detention basin area is Hoosic gravelly fine sandy loam. The Saturated Hydraulic Conductivity (Ksat) value for this soil is 116.98 micrometers/second = 16.58 in/hr. A 2x factor of safety is applied to derive the infiltration rate for the basin, 8.29 in/hr.

Inflow Area = 270,318 sf, 71.89% Impervious, Inflow Depth = 4.97" for 10-year event
 Inflow = 31.14 cfs @ 12.10 hrs, Volume= 112,035 cf
 Outflow = 10.75 cfs @ 12.41 hrs, Volume= 112,035 cf, Atten= 65%, Lag= 18.8 min
 Discarded = 2.18 cfs @ 12.41 hrs, Volume= 10,642 cf
 Primary = 8.57 cfs @ 12.41 hrs, Volume= 101,393 cf
 Routed to Link SP1 : Wetland

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 32.34' @ 12.41 hrs Surf.Area= 10,135 sf Storage= 20,995 cf
 Flood Elev= 32.50' Surf.Area= 10,369 sf Storage= 22,657 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 10.6 min (789.8 - 779.2)

3250-02_Existing HydroCAD - As-Built

Type III 24-hr 10-year Rainfall=6.37"

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Volume	Invert	Avail.Storage	Storage Description
#1	28.00'	22,657 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
28.00	449	350.0	0	0	449
29.00	2,241	607.0	1,231	1,231	20,027
30.00	4,161	635.0	3,152	4,383	22,863
31.00	6,456	735.0	5,267	9,650	33,787
32.00	9,655	711.0	8,002	17,652	36,641
32.50	10,369	718.0	5,005	22,657	37,514

Device	Routing	Invert	Outlet Devices
#1	Discarded	28.00'	9.290 in/hr Exfiltration over Surface area
#2	Primary	26.00'	12.0" Round Culvert L= 75.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 26.00' / 25.60' S= 0.0053 '/ Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf
#3	Primary	32.40'	37.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Discarded OutFlow Max=2.18 cfs @ 12.41 hrs HW=32.34' (Free Discharge)

↑1=Exfiltration (Exfiltration Controls 2.18 cfs)

Primary OutFlow Max=8.56 cfs @ 12.41 hrs HW=32.34' (Free Discharge)

↑2=Culvert (Barrel Controls 8.56 cfs @ 10.90 fps)

↑3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Link SP1: Wetland

Inflow Area = 270,318 sf, 71.89% Impervious, Inflow Depth = 4.50" for 10-year event
 Inflow = 8.57 cfs @ 12.41 hrs, Volume= 101,393 cf
 Primary = 8.57 cfs @ 12.41 hrs, Volume= 101,393 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

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Type III 24-hr 25-year Rainfall=8.18"

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Summary for Subcatchment E-1: Subcat E-1

Runoff = 4.75 cfs @ 12.09 hrs, Volume= 16,534 cf, Depth= 7.34"
 Routed to Pond EP : Existing Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-year Rainfall=8.18"

Area (sf)	CN	Description
3,912	61	>75% Grass cover, Good, HSG B
23,114	98	Paved parking, HSG B
27,026	93	Weighted Average
3,912		14.48% Pervious Area
23,114		85.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 min.

Summary for Subcatchment E-2: Subcat E-2

Runoff = 2.96 cfs @ 12.11 hrs, Volume= 9,884 cf, Depth= 4.97"
 Routed to Pond EP : Existing Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-year Rainfall=8.18"

Area (sf)	CN	Description
16,141	61	>75% Grass cover, Good, HSG B
7,726	98	Paved parking, HSG B
23,867	73	Weighted Average
16,141		67.63% Pervious Area
7,726		32.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.0450	0.23		Sheet Flow, A-B Grass: Short n= 0.150 P2= 4.11"
4.2	136	0.0060	0.54		Shallow Concentrated Flow, B-C Short Grass Pasture Kv= 7.0 fps
7.8	186	Total			

Summary for Subcatchment E-3: Subcat E-3

Runoff = 12.78 cfs @ 12.13 hrs, Volume= 46,756 cf, Depth= 6.27"
 Routed to Pond EP : Existing Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-year Rainfall=8.18"

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Type III 24-hr 25-year Rainfall=8.18"

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Area (sf)	CN	Description
33,300	61	>75% Grass cover, Good, HSG B
56,212	98	Paved parking, HSG B
89,512	84	Weighted Average
33,300		37.20% Pervious Area
56,212		62.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	50	0.0180	0.16		Sheet Flow, A-B Grass: Short n= 0.150 P2= 4.11"
0.6	41	0.0260	1.13		Shallow Concentrated Flow, B-C Short Grass Pasture Kv= 7.0 fps
0.9	169	0.0230	3.08		Shallow Concentrated Flow, C-D Paved Kv= 20.3 fps
1.9	111	0.0200	0.99		Shallow Concentrated Flow, D-E Short Grass Pasture Kv= 7.0 fps
0.9	139	0.0160	2.57		Shallow Concentrated Flow, E-F Paved Kv= 20.3 fps
9.5	510	Total			

Summary for Subcatchment E-4: Subcat E-4

Runoff = 8.39 cfs @ 12.09 hrs, Volume= 29,797 cf, Depth= 7.58"
Routed to Pond EP : Existing Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=8.18"

Area (sf)	CN	Description
4,028	61	>75% Grass cover, Good, HSG B
43,139	98	Paved parking, HSG B
47,168	95	Weighted Average
4,028		8.54% Pervious Area
43,139		91.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 min.

Summary for Subcatchment E-5: Subcat E-5

Runoff = 2.79 cfs @ 12.09 hrs, Volume= 8,797 cf, Depth= 4.50"
Routed to Pond EP : Existing Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=8.18"

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Type III 24-hr 25-year Rainfall=8.18"

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Area (sf)	CN	Description
4,842	98	Paved parking, HSG B
18,600	61	>75% Grass cover, Good, HSG B
23,442	69	Weighted Average
18,600		79.35% Pervious Area
4,842		20.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 min.

Summary for Subcatchment E-6: Subcat E-6

Runoff = 10.68 cfs @ 12.09 hrs, Volume= 39,240 cf, Depth= 7.94"
 Routed to Pond EP : Existing Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-year Rainfall=8.18"

Area (sf)	CN	Description
59,301	98	Paved parking, HSG B
3	61	>75% Grass cover, Good, HSG B
59,304	98	Weighted Average
3		0.00% Pervious Area
59,301		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 min.

Summary for Pond EP: Existing Detention Pond

Per the NRCS Soil Report, the underlying soil in the detention basin area is Hoosic gravelly fine sandy loam. The Saturated Hydraulic Conductivity (Ksat) value for this soil is 116.98 micrometers/second = 16.58 in/hr. A 2x factor of safety is applied to derive the infiltration rate for the basin, 8.29 in/hr.

Inflow Area = 270,318 sf, 71.89% Impervious, Inflow Depth = 6.70" for 25-year event
 Inflow = 41.62 cfs @ 12.10 hrs, Volume= 151,008 cf
 Outflow = 45.58 cfs @ 12.20 hrs, Volume= 151,008 cf, Atten= 0%, Lag= 5.9 min
 Discarded = 2.23 cfs @ 12.15 hrs, Volume= 13,181 cf
 Primary = 43.35 cfs @ 12.20 hrs, Volume= 137,827 cf
 Routed to Link SP1 : Wetland

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 32.90' @ 12.20 hrs Surf.Area= 10,369 sf Storage= 22,657 cf
 Flood Elev= 32.50' Surf.Area= 10,369 sf Storage= 22,657 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 10.3 min (783.9 - 773.6)

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Type III 24-hr 25-year Rainfall=8.18"

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Volume	Invert	Avail.Storage	Storage Description
#1	28.00'	22,657 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
28.00	449	350.0	0	0	449
29.00	2,241	607.0	1,231	1,231	20,027
30.00	4,161	635.0	3,152	4,383	22,863
31.00	6,456	735.0	5,267	9,650	33,787
32.00	9,655	711.0	8,002	17,652	36,641
32.50	10,369	718.0	5,005	22,657	37,514

Device	Routing	Invert	Outlet Devices
#1	Discarded	28.00'	9.290 in/hr Exfiltration over Surface area
#2	Primary	26.00'	12.0" Round Culvert L= 75.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 26.00' / 25.60' S= 0.0053 '/ Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf
#3	Primary	32.40'	37.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Discarded OutFlow Max=2.23 cfs @ 12.15 hrs HW=32.59' (Free Discharge)

↑1=**Exfiltration** (Exfiltration Controls 2.23 cfs)

Primary OutFlow Max=41.38 cfs @ 12.20 hrs HW=32.88' (Free Discharge)

↑2=**Culvert** (Barrel Controls 8.96 cfs @ 11.41 fps)

↑3=**Broad-Crested Rectangular Weir** (Weir Controls 32.41 cfs @ 1.81 fps)

Summary for Link SP1: Wetland

Inflow Area = 270,318 sf, 71.89% Impervious, Inflow Depth = 6.12" for 25-year event
 Inflow = 43.35 cfs @ 12.20 hrs, Volume= 137,827 cf
 Primary = 43.35 cfs @ 12.20 hrs, Volume= 137,827 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

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Type III 24-hr 50-year Rainfall=9.89"

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Summary for Subcatchment E-1: Subcat E-1

Runoff = 5.79 cfs @ 12.09 hrs, Volume= 20,361 cf, Depth= 9.04"

Routed to Pond EP : Existing Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=9.89"

Area (sf)	CN	Description
3,912	61	>75% Grass cover, Good, HSG B
23,114	98	Paved parking, HSG B
27,026	93	Weighted Average
3,912		14.48% Pervious Area
23,114		85.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 min.

Summary for Subcatchment E-2: Subcat E-2

Runoff = 3.86 cfs @ 12.11 hrs, Volume= 12,960 cf, Depth= 6.52"

Routed to Pond EP : Existing Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=9.89"

Area (sf)	CN	Description
16,141	61	>75% Grass cover, Good, HSG B
7,726	98	Paved parking, HSG B
23,867	73	Weighted Average
16,141		67.63% Pervious Area
7,726		32.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.0450	0.23		Sheet Flow, A-B Grass: Short n= 0.150 P2= 4.11"
4.2	136	0.0060	0.54		Shallow Concentrated Flow, B-C Short Grass Pasture Kv= 7.0 fps
7.8	186	Total			

Summary for Subcatchment E-3: Subcat E-3

Runoff = 15.96 cfs @ 12.13 hrs, Volume= 59,094 cf, Depth= 7.92"

Routed to Pond EP : Existing Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=9.89"

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Type III 24-hr 50-year Rainfall=9.89"

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Area (sf)	CN	Description
33,300	61	>75% Grass cover, Good, HSG B
56,212	98	Paved parking, HSG B
89,512	84	Weighted Average
33,300		37.20% Pervious Area
56,212		62.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	50	0.0180	0.16		Sheet Flow, A-B Grass: Short n= 0.150 P2= 4.11"
0.6	41	0.0260	1.13		Shallow Concentrated Flow, B-C Short Grass Pasture Kv= 7.0 fps
0.9	169	0.0230	3.08		Shallow Concentrated Flow, C-D Paved Kv= 20.3 fps
1.9	111	0.0200	0.99		Shallow Concentrated Flow, D-E Short Grass Pasture Kv= 7.0 fps
0.9	139	0.0160	2.57		Shallow Concentrated Flow, E-F Paved Kv= 20.3 fps
9.5	510	Total			

Summary for Subcatchment E-4: Subcat E-4

Runoff = 10.19 cfs @ 12.09 hrs, Volume= 36,497 cf, Depth= 9.29"
 Routed to Pond EP : Existing Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 50-year Rainfall=9.89"

Area (sf)	CN	Description
4,028	61	>75% Grass cover, Good, HSG B
43,139	98	Paved parking, HSG B
47,168	95	Weighted Average
4,028		8.54% Pervious Area
43,139		91.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 min.

Summary for Subcatchment E-5: Subcat E-5

Runoff = 3.70 cfs @ 12.09 hrs, Volume= 11,712 cf, Depth= 6.00"
 Routed to Pond EP : Existing Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 50-year Rainfall=9.89"

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Type III 24-hr 50-year Rainfall=9.89"

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Area (sf)	CN	Description
4,842	98	Paved parking, HSG B
18,600	61	>75% Grass cover, Good, HSG B
23,442	69	Weighted Average
18,600		79.35% Pervious Area
4,842		20.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 min.

Summary for Subcatchment E-6: Subcat E-6

Runoff = 12.92 cfs @ 12.09 hrs, Volume= 47,686 cf, Depth= 9.65"
 Routed to Pond EP : Existing Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 50-year Rainfall=9.89"

Area (sf)	CN	Description
59,301	98	Paved parking, HSG B
3	61	>75% Grass cover, Good, HSG B
59,304	98	Weighted Average
3		0.00% Pervious Area
59,301		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 min.

Summary for Pond EP: Existing Detention Pond

Per the NRCS Soil Report, the underlying soil in the detention basin area is Hoosic gravelly fine sandy loam. The Saturated Hydraulic Conductivity (Ksat) value for this soil is 116.98 micrometers/second = 16.58 in/hr. A 2x factor of safety is applied to derive the infiltration rate for the basin, 8.29 in/hr.

Inflow Area = 270,318 sf, 71.89% Impervious, Inflow Depth = 8.36" for 50-year event
 Inflow = 51.54 cfs @ 12.10 hrs, Volume= 188,312 cf
 Outflow = 58.15 cfs @ 12.14 hrs, Volume= 188,312 cf, Atten= 0%, Lag= 2.6 min
 Discarded = 2.23 cfs @ 12.10 hrs, Volume= 15,240 cf
 Primary = 55.92 cfs @ 12.14 hrs, Volume= 173,071 cf
 Routed to Link SP1 : Wetland

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 33.02' @ 12.14 hrs Surf.Area= 10,369 sf Storage= 22,657 cf
 Flood Elev= 32.50' Surf.Area= 10,369 sf Storage= 22,657 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 9.5 min (779.1 - 769.5)

3250-02_Existing HydroCAD - As-Built

Type III 24-hr 50-year Rainfall=9.89"

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Volume	Invert	Avail.Storage	Storage Description
#1	28.00'	22,657 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
28.00	449	350.0	0	0	449
29.00	2,241	607.0	1,231	1,231	20,027
30.00	4,161	635.0	3,152	4,383	22,863
31.00	6,456	735.0	5,267	9,650	33,787
32.00	9,655	711.0	8,002	17,652	36,641
32.50	10,369	718.0	5,005	22,657	37,514

Device	Routing	Invert	Outlet Devices
#1	Discarded	28.00'	9.290 in/hr Exfiltration over Surface area
#2	Primary	26.00'	12.0" Round Culvert L= 75.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 26.00' / 25.60' S= 0.0053 '/ Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf
#3	Primary	32.40'	37.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Discarded OutFlow Max=2.23 cfs @ 12.10 hrs HW=32.83' (Free Discharge)

↑1=**Exfiltration** (Exfiltration Controls 2.23 cfs)

Primary OutFlow Max=52.20 cfs @ 12.14 hrs HW=32.98' (Free Discharge)

↑2=**Culvert** (Barrel Controls 9.04 cfs @ 11.50 fps)

↑3=**Broad-Crested Rectangular Weir** (Weir Controls 43.16 cfs @ 2.00 fps)

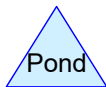
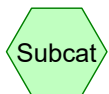
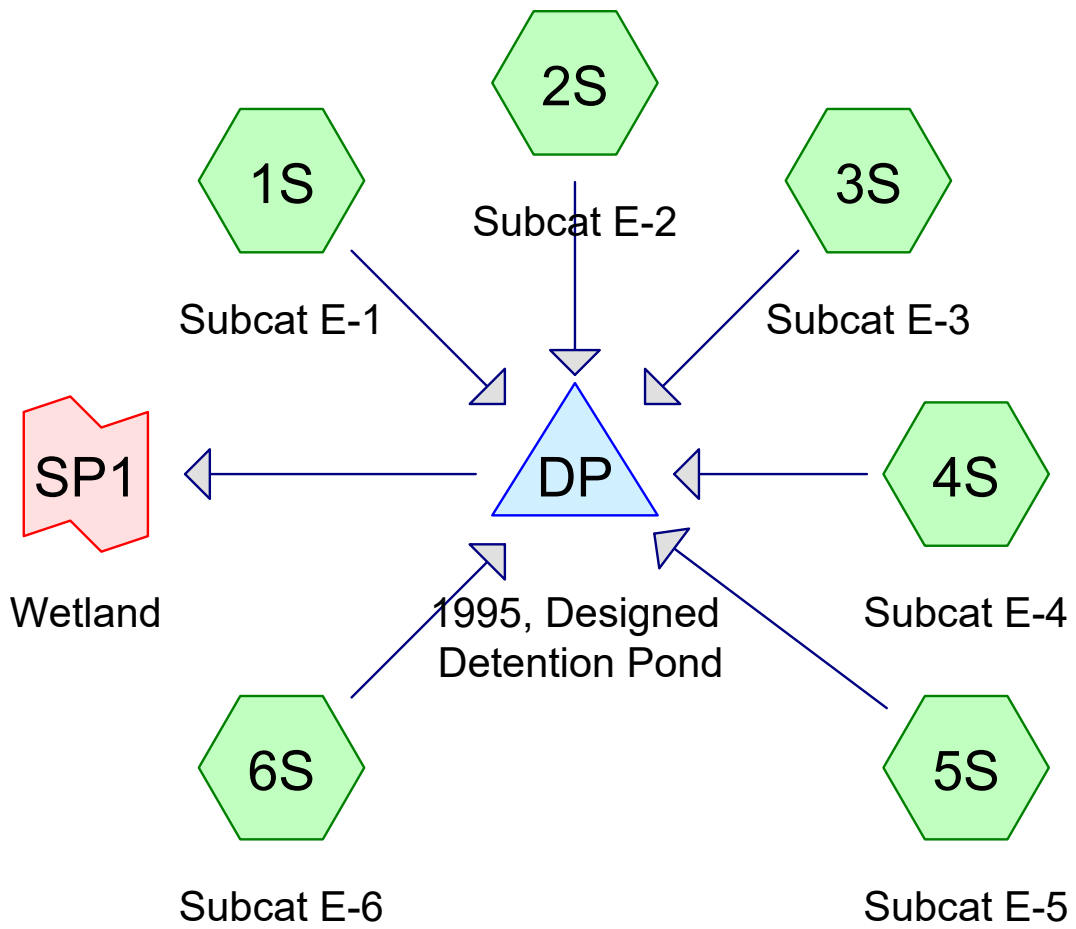
Summary for Link SP1: Wetland

Inflow Area = 270,318 sf, 71.89% Impervious, Inflow Depth = 7.68" for 50-year event

Inflow = 55.92 cfs @ 12.14 hrs, Volume= 173,071 cf

Primary = 55.92 cfs @ 12.14 hrs, Volume= 173,071 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs



Routing Diagram for 3250-02_1995 Design HydroCAD
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Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-year	Type III 24-hr		Default	24.00	1	4.11	2
2	10-year	Type III 24-hr		Default	24.00	1	6.37	2
3	25-year	Type III 24-hr		Default	24.00	1	8.18	2
4	50-year	Type III 24-hr		Default	24.00	1	9.89	2

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Type III 24-hr 2-year Rainfall=4.11"

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Summary for Subcatchment 1S: Subcat E-1

Runoff = 2.25 cfs @ 12.09 hrs, Volume= 7,493 cf, Depth= 3.33"

Routed to Pond DP : 1995, Designed Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=4.11"

Area (sf)	CN	Description
3,912	61	>75% Grass cover, Good, HSG B
23,114	98	Paved parking, HSG B
27,026	93	Weighted Average
3,912		14.48% Pervious Area
23,114		85.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 min.

Summary for Subcatchment 2S: Subcat E-2

Runoff = 0.93 cfs @ 12.12 hrs, Volume= 3,196 cf, Depth= 1.61"

Routed to Pond DP : 1995, Designed Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=4.11"

Area (sf)	CN	Description
16,141	61	>75% Grass cover, Good, HSG B
7,726	98	Paved parking, HSG B
23,867	73	Weighted Average
16,141		67.63% Pervious Area
7,726		32.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.0450	0.23		Sheet Flow, A-B Grass: Short n= 0.150 P2= 4.11"
4.2	136	0.0060	0.54		Shallow Concentrated Flow, B-C Short Grass Pasture Kv= 7.0 fps
7.8	186	Total			

Summary for Subcatchment 3S: Subcat E-3

Runoff = 5.19 cfs @ 12.14 hrs, Volume= 18,412 cf, Depth= 2.47"

Routed to Pond DP : 1995, Designed Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=4.11"

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Type III 24-hr 2-year Rainfall=4.11"

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Area (sf)	CN	Description
33,300	61	>75% Grass cover, Good, HSG B
56,212	98	Paved parking, HSG B
89,512	84	Weighted Average
33,300		37.20% Pervious Area
56,212		62.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	50	0.0180	0.16		Sheet Flow, A-B Grass: Short n= 0.150 P2= 4.11"
0.6	41	0.0260	1.13		Shallow Concentrated Flow, B-C Short Grass Pasture Kv= 7.0 fps
0.9	169	0.0230	3.08		Shallow Concentrated Flow, C-D Paved Kv= 20.3 fps
1.9	111	0.0200	0.99		Shallow Concentrated Flow, D-E Short Grass Pasture Kv= 7.0 fps
0.9	139	0.0160	2.57		Shallow Concentrated Flow, E-F Paved Kv= 20.3 fps
9.5	510	Total			

Summary for Subcatchment 4S: Subcat E-4

Runoff = 4.08 cfs @ 12.09 hrs, Volume= 13,913 cf, Depth= 3.54"
 Routed to Pond DP : 1995, Designed Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-year Rainfall=4.11"

Area (sf)	CN	Description
4,028	61	>75% Grass cover, Good, HSG B
43,139	98	Paved parking, HSG B
47,168	95	Weighted Average
4,028		8.54% Pervious Area
43,139		91.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 min.

Summary for Subcatchment 5S: Subcat E-5

Runoff = 0.79 cfs @ 12.10 hrs, Volume= 2,615 cf, Depth= 1.34"
 Routed to Pond DP : 1995, Designed Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-year Rainfall=4.11"

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Type III 24-hr 2-year Rainfall=4.11"

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Area (sf)	CN	Description
4,842	98	Paved parking, HSG B
18,600	61	>75% Grass cover, Good, HSG B
23,442	69	Weighted Average
18,600		79.35% Pervious Area
4,842		20.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 min.

Summary for Subcatchment 6S: Subcat E-6

Runoff = 5.33 cfs @ 12.09 hrs, Volume= 19,149 cf, Depth= 3.87"
 Routed to Pond DP : 1995, Designed Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-year Rainfall=4.11"

Area (sf)	CN	Description
59,301	98	Paved parking, HSG B
3	61	>75% Grass cover, Good, HSG B
59,304	98	Weighted Average
3		0.00% Pervious Area
59,301		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 min.

Summary for Pond DP: 1995, Designed Detention Pond

Per the NRCS Soil Report, the underlying soil in the detention basin area is Hoosic gravelly fine sandy loam. The Saturated Hydraulic Conductivity (Ksat) value for this soil is 116.98 micrometers/second = 16.58 in/hr. A 2x factor of safety is applied to derive the infiltration rate for the basin, 8.29 in/hr.

Inflow Area = 270,318 sf, 71.89% Impervious, Inflow Depth = 2.88" for 2-year event
 Inflow = 18.20 cfs @ 12.10 hrs, Volume= 64,778 cf
 Outflow = 7.62 cfs @ 12.35 hrs, Volume= 64,778 cf, Atten= 58%, Lag= 15.1 min
 Discarded = 1.08 cfs @ 12.35 hrs, Volume= 9,377 cf
 Primary = 6.54 cfs @ 12.35 hrs, Volume= 55,401 cf
 Routed to Link SP1 : Wetland

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 29.95' @ 12.35 hrs Surf.Area= 5,613 sf Storage= 9,160 cf
 Flood Elev= 34.00' Surf.Area= 10,363 sf Storage= 41,030 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 6.2 min (795.6 - 789.4)

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Type III 24-hr 2-year Rainfall=4.11"

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Volume	Invert	Avail.Storage	Storage Description
#1	28.00'	41,030 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
28.00	3,842	413.0	0	0	3,842
34.00	10,363	666.0	41,030	41,030	25,805

Device	Routing	Invert	Outlet Devices
#1	Discarded	28.00'	8.290 in/hr Exfiltration over Surface area
#2	Primary	26.00'	12.0" Round Culvert L= 75.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 26.00' / 25.60' S= 0.0053 ' / ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf
#3	Primary	33.90'	90.0' long x 8.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Discarded OutFlow Max=1.08 cfs @ 12.35 hrs HW=29.95' (Free Discharge)

↑1=**Exfiltration** (Exfiltration Controls 1.08 cfs)

Primary OutFlow Max=6.54 cfs @ 12.35 hrs HW=29.95' (Free Discharge)

↑2=**Culvert** (Barrel Controls 6.54 cfs @ 8.33 fps)

↑3=**Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link SP1: Wetland

Inflow Area = 270,318 sf, 71.89% Impervious, Inflow Depth = 2.46" for 2-year event
 Inflow = 6.54 cfs @ 12.35 hrs, Volume= 55,401 cf
 Primary = 6.54 cfs @ 12.35 hrs, Volume= 55,401 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

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Type III 24-hr 10-year Rainfall=6.37"

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Summary for Subcatchment 1S: Subcat E-1

Runoff = 3.65 cfs @ 12.09 hrs, Volume= 12,495 cf, Depth= 5.55"

Routed to Pond DP : 1995, Designed Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=6.37"

Area (sf)	CN	Description
3,912	61	>75% Grass cover, Good, HSG B
23,114	98	Paved parking, HSG B
27,026	93	Weighted Average
3,912		14.48% Pervious Area
23,114		85.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 min.

Summary for Subcatchment 2S: Subcat E-2

Runoff = 2.03 cfs @ 12.11 hrs, Volume= 6,758 cf, Depth= 3.40"

Routed to Pond DP : 1995, Designed Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=6.37"

Area (sf)	CN	Description
16,141	61	>75% Grass cover, Good, HSG B
7,726	98	Paved parking, HSG B
23,867	73	Weighted Average
16,141		67.63% Pervious Area
7,726		32.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.0450	0.23		Sheet Flow, A-B Grass: Short n= 0.150 P2= 4.11"
4.2	136	0.0060	0.54		Shallow Concentrated Flow, B-C Short Grass Pasture Kv= 7.0 fps
7.8	186	Total			

Summary for Subcatchment 3S: Subcat E-3

Runoff = 9.40 cfs @ 12.13 hrs, Volume= 33,894 cf, Depth= 4.54"

Routed to Pond DP : 1995, Designed Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=6.37"

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Type III 24-hr 10-year Rainfall=6.37"

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Area (sf)	CN	Description
33,300	61	>75% Grass cover, Good, HSG B
56,212	98	Paved parking, HSG B
89,512	84	Weighted Average
33,300		37.20% Pervious Area
56,212		62.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	50	0.0180	0.16		Sheet Flow, A-B Grass: Short n= 0.150 P2= 4.11"
0.6	41	0.0260	1.13		Shallow Concentrated Flow, B-C Short Grass Pasture Kv= 7.0 fps
0.9	169	0.0230	3.08		Shallow Concentrated Flow, C-D Paved Kv= 20.3 fps
1.9	111	0.0200	0.99		Shallow Concentrated Flow, D-E Short Grass Pasture Kv= 7.0 fps
0.9	139	0.0160	2.57		Shallow Concentrated Flow, E-F Paved Kv= 20.3 fps
9.5	510	Total			

Summary for Subcatchment 4S: Subcat E-4

Runoff = 6.49 cfs @ 12.09 hrs, Volume= 22,716 cf, Depth= 5.78"
 Routed to Pond DP : 1995, Designed Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-year Rainfall=6.37"

Area (sf)	CN	Description
4,028	61	>75% Grass cover, Good, HSG B
43,139	98	Paved parking, HSG B
47,168	95	Weighted Average
4,028		8.54% Pervious Area
43,139		91.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 min.

Summary for Subcatchment 5S: Subcat E-5

Runoff = 1.85 cfs @ 12.09 hrs, Volume= 5,869 cf, Depth= 3.00"
 Routed to Pond DP : 1995, Designed Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-year Rainfall=6.37"

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Type III 24-hr 10-year Rainfall=6.37"

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Area (sf)	CN	Description
4,842	98	Paved parking, HSG B
18,600	61	>75% Grass cover, Good, HSG B
23,442	69	Weighted Average
18,600		79.35% Pervious Area
4,842		20.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 min.

Summary for Subcatchment 6S: Subcat E-6

Runoff = 8.30 cfs @ 12.09 hrs, Volume= 30,302 cf, Depth= 6.13"
 Routed to Pond DP : 1995, Designed Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-year Rainfall=6.37"

Area (sf)	CN	Description
59,301	98	Paved parking, HSG B
3	61	>75% Grass cover, Good, HSG B
59,304	98	Weighted Average
3		0.00% Pervious Area
59,301		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 min.

Summary for Pond DP: 1995, Designed Detention Pond

Per the NRCS Soil Report, the underlying soil in the detention basin area is Hoosic gravelly fine sandy loam. The Saturated Hydraulic Conductivity (Ksat) value for this soil is 116.98 micrometers/second = 16.58 in/hr. A 2x factor of safety is applied to derive the infiltration rate for the basin, 8.29 in/hr.

Inflow Area = 270,318 sf, 71.89% Impervious, Inflow Depth = 4.97" for 10-year event
 Inflow = 31.14 cfs @ 12.10 hrs, Volume= 112,035 cf
 Outflow = 9.85 cfs @ 12.44 hrs, Volume= 112,035 cf, Atten= 68%, Lag= 20.4 min
 Discarded = 1.51 cfs @ 12.44 hrs, Volume= 16,441 cf
 Primary = 8.34 cfs @ 12.44 hrs, Volume= 95,594 cf
 Routed to Link SP1 : Wetland

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 32.04' @ 12.44 hrs Surf.Area= 7,880 sf Storage= 23,172 cf
 Flood Elev= 34.00' Surf.Area= 10,363 sf Storage= 41,030 cf

Plug-Flow detention time= 13.7 min calculated for 111,957 cf (100% of inflow)
 Center-of-Mass det. time= 13.7 min (792.9 - 779.2)

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Type III 24-hr 10-year Rainfall=6.37"

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Volume	Invert	Avail.Storage	Storage Description
#1	28.00'	41,030 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
28.00	3,842	413.0	0	0	3,842
34.00	10,363	666.0	41,030	41,030	25,805

Device	Routing	Invert	Outlet Devices
#1	Discarded	28.00'	8.290 in/hr Exfiltration over Surface area
#2	Primary	26.00'	12.0" Round Culvert L= 75.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 26.00' / 25.60' S= 0.0053 ' / Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf
#3	Primary	33.90'	90.0' long x 8.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Discarded OutFlow Max=1.51 cfs @ 12.44 hrs HW=32.03' (Free Discharge)

↑1=Exfiltration (Exfiltration Controls 1.51 cfs)

Primary OutFlow Max=8.34 cfs @ 12.44 hrs HW=32.03' (Free Discharge)

↑2=Culvert (Barrel Controls 8.34 cfs @ 10.61 fps)

↑3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Link SP1: Wetland

Inflow Area = 270,318 sf, 71.89% Impervious, Inflow Depth = 4.24" for 10-year event
 Inflow = 8.34 cfs @ 12.44 hrs, Volume= 95,594 cf
 Primary = 8.34 cfs @ 12.44 hrs, Volume= 95,594 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

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Type III 24-hr 25-year Rainfall=8.18"

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Summary for Subcatchment 1S: Subcat E-1

Runoff = 4.75 cfs @ 12.09 hrs, Volume= 16,534 cf, Depth= 7.34"

Routed to Pond DP : 1995, Designed Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=8.18"

Area (sf)	CN	Description
3,912	61	>75% Grass cover, Good, HSG B
23,114	98	Paved parking, HSG B
27,026	93	Weighted Average
3,912		14.48% Pervious Area
23,114		85.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 min.

Summary for Subcatchment 2S: Subcat E-2

Runoff = 2.96 cfs @ 12.11 hrs, Volume= 9,884 cf, Depth= 4.97"

Routed to Pond DP : 1995, Designed Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=8.18"

Area (sf)	CN	Description
16,141	61	>75% Grass cover, Good, HSG B
7,726	98	Paved parking, HSG B
23,867	73	Weighted Average
16,141		67.63% Pervious Area
7,726		32.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.0450	0.23		Sheet Flow, A-B Grass: Short n= 0.150 P2= 4.11"
4.2	136	0.0060	0.54		Shallow Concentrated Flow, B-C Short Grass Pasture Kv= 7.0 fps
7.8	186	Total			

Summary for Subcatchment 3S: Subcat E-3

Runoff = 12.78 cfs @ 12.13 hrs, Volume= 46,756 cf, Depth= 6.27"

Routed to Pond DP : 1995, Designed Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=8.18"

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Type III 24-hr 25-year Rainfall=8.18"

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Area (sf)	CN	Description
33,300	61	>75% Grass cover, Good, HSG B
56,212	98	Paved parking, HSG B
89,512	84	Weighted Average
33,300		37.20% Pervious Area
56,212		62.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	50	0.0180	0.16		Sheet Flow, A-B Grass: Short n= 0.150 P2= 4.11"
0.6	41	0.0260	1.13		Shallow Concentrated Flow, B-C Short Grass Pasture Kv= 7.0 fps
0.9	169	0.0230	3.08		Shallow Concentrated Flow, C-D Paved Kv= 20.3 fps
1.9	111	0.0200	0.99		Shallow Concentrated Flow, D-E Short Grass Pasture Kv= 7.0 fps
0.9	139	0.0160	2.57		Shallow Concentrated Flow, E-F Paved Kv= 20.3 fps
9.5	510	Total			

Summary for Subcatchment 4S: Subcat E-4

Runoff = 8.39 cfs @ 12.09 hrs, Volume= 29,797 cf, Depth= 7.58"
 Routed to Pond DP : 1995, Designed Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-year Rainfall=8.18"

Area (sf)	CN	Description
4,028	61	>75% Grass cover, Good, HSG B
43,139	98	Paved parking, HSG B
47,168	95	Weighted Average
4,028		8.54% Pervious Area
43,139		91.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 min.

Summary for Subcatchment 5S: Subcat E-5

Runoff = 2.79 cfs @ 12.09 hrs, Volume= 8,797 cf, Depth= 4.50"
 Routed to Pond DP : 1995, Designed Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-year Rainfall=8.18"

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Type III 24-hr 25-year Rainfall=8.18"

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Area (sf)	CN	Description
4,842	98	Paved parking, HSG B
18,600	61	>75% Grass cover, Good, HSG B
23,442	69	Weighted Average
18,600		79.35% Pervious Area
4,842		20.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 min.

Summary for Subcatchment 6S: Subcat E-6

Runoff = 10.68 cfs @ 12.09 hrs, Volume= 39,240 cf, Depth= 7.94"
 Routed to Pond DP : 1995, Designed Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-year Rainfall=8.18"

Area (sf)	CN	Description
59,301	98	Paved parking, HSG B
3	61	>75% Grass cover, Good, HSG B
59,304	98	Weighted Average
3		0.00% Pervious Area
59,301		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 min.

Summary for Pond DP: 1995, Designed Detention Pond

Per the NRCS Soil Report, the underlying soil in the detention basin area is Hoosic gravelly fine sandy loam. The Saturated Hydraulic Conductivity (Ksat) value for this soil is 116.98 micrometers/second = 16.58 in/hr. A 2x factor of safety is applied to derive the infiltration rate for the basin, 8.29 in/hr.

Inflow Area = 270,318 sf, 71.89% Impervious, Inflow Depth = 6.70" for 25-year event
 Inflow = 41.62 cfs @ 12.10 hrs, Volume= 151,008 cf
 Outflow = 11.26 cfs @ 12.48 hrs, Volume= 151,008 cf, Atten= 73%, Lag= 22.9 min
 Discarded = 1.86 cfs @ 12.48 hrs, Volume= 22,662 cf
 Primary = 9.39 cfs @ 12.48 hrs, Volume= 128,346 cf
 Routed to Link SP1 : Wetland

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 33.50' @ 12.48 hrs Surf.Area= 9,700 sf Storage= 36,024 cf
 Flood Elev= 34.00' Surf.Area= 10,363 sf Storage= 41,030 cf

Plug-Flow detention time= 19.8 min calculated for 150,903 cf (100% of inflow)
 Center-of-Mass det. time= 19.8 min (793.4 - 773.6)

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Type III 24-hr 25-year Rainfall=8.18"

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Volume	Invert	Avail.Storage	Storage Description
#1	28.00'	41,030 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
28.00	3,842	413.0	0	0	3,842
34.00	10,363	666.0	41,030	41,030	25,805

Device	Routing	Invert	Outlet Devices
#1	Discarded	28.00'	8.290 in/hr Exfiltration over Surface area
#2	Primary	26.00'	12.0" Round Culvert L= 75.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 26.00' / 25.60' S= 0.0053 ' S= 0.0053 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf
#3	Primary	33.90'	90.0' long x 8.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Discarded OutFlow Max=1.86 cfs @ 12.48 hrs HW=33.50' (Free Discharge)

↑1=Exfiltration (Exfiltration Controls 1.86 cfs)

Primary OutFlow Max=9.39 cfs @ 12.48 hrs HW=33.50' (Free Discharge)

↑2=Culvert (Barrel Controls 9.39 cfs @ 11.96 fps)

↑3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Link SP1: Wetland

Inflow Area = 270,318 sf, 71.89% Impervious, Inflow Depth = 5.70" for 25-year event
 Inflow = 9.39 cfs @ 12.48 hrs, Volume= 128,346 cf
 Primary = 9.39 cfs @ 12.48 hrs, Volume= 128,346 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

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Type III 24-hr 50-year Rainfall=9.89"

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Summary for Subcatchment 1S: Subcat E-1

Runoff = 5.79 cfs @ 12.09 hrs, Volume= 20,361 cf, Depth= 9.04"

Routed to Pond DP : 1995, Designed Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=9.89"

Area (sf)	CN	Description
3,912	61	>75% Grass cover, Good, HSG B
23,114	98	Paved parking, HSG B
27,026	93	Weighted Average
3,912		14.48% Pervious Area
23,114		85.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 min.

Summary for Subcatchment 2S: Subcat E-2

Runoff = 3.86 cfs @ 12.11 hrs, Volume= 12,960 cf, Depth= 6.52"

Routed to Pond DP : 1995, Designed Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=9.89"

Area (sf)	CN	Description
16,141	61	>75% Grass cover, Good, HSG B
7,726	98	Paved parking, HSG B
23,867	73	Weighted Average
16,141		67.63% Pervious Area
7,726		32.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.0450	0.23		Sheet Flow, A-B Grass: Short n= 0.150 P2= 4.11"
4.2	136	0.0060	0.54		Shallow Concentrated Flow, B-C Short Grass Pasture Kv= 7.0 fps
7.8	186	Total			

Summary for Subcatchment 3S: Subcat E-3

Runoff = 15.96 cfs @ 12.13 hrs, Volume= 59,094 cf, Depth= 7.92"

Routed to Pond DP : 1995, Designed Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=9.89"

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Type III 24-hr 50-year Rainfall=9.89"

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Area (sf)	CN	Description
33,300	61	>75% Grass cover, Good, HSG B
56,212	98	Paved parking, HSG B
89,512	84	Weighted Average
33,300		37.20% Pervious Area
56,212		62.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	50	0.0180	0.16		Sheet Flow, A-B Grass: Short n= 0.150 P2= 4.11"
0.6	41	0.0260	1.13		Shallow Concentrated Flow, B-C Short Grass Pasture Kv= 7.0 fps
0.9	169	0.0230	3.08		Shallow Concentrated Flow, C-D Paved Kv= 20.3 fps
1.9	111	0.0200	0.99		Shallow Concentrated Flow, D-E Short Grass Pasture Kv= 7.0 fps
0.9	139	0.0160	2.57		Shallow Concentrated Flow, E-F Paved Kv= 20.3 fps
9.5	510	Total			

Summary for Subcatchment 4S: Subcat E-4

Runoff = 10.19 cfs @ 12.09 hrs, Volume= 36,497 cf, Depth= 9.29"
 Routed to Pond DP : 1995, Designed Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 50-year Rainfall=9.89"

Area (sf)	CN	Description
4,028	61	>75% Grass cover, Good, HSG B
43,139	98	Paved parking, HSG B
47,168	95	Weighted Average
4,028		8.54% Pervious Area
43,139		91.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 min.

Summary for Subcatchment 5S: Subcat E-5

Runoff = 3.70 cfs @ 12.09 hrs, Volume= 11,712 cf, Depth= 6.00"
 Routed to Pond DP : 1995, Designed Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 50-year Rainfall=9.89"

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Type III 24-hr 50-year Rainfall=9.89"

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Area (sf)	CN	Description
4,842	98	Paved parking, HSG B
18,600	61	>75% Grass cover, Good, HSG B
23,442	69	Weighted Average
18,600		79.35% Pervious Area
4,842		20.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 min.

Summary for Subcatchment 6S: Subcat E-6

Runoff = 12.92 cfs @ 12.09 hrs, Volume= 47,686 cf, Depth= 9.65"
 Routed to Pond DP : 1995, Designed Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 50-year Rainfall=9.89"

Area (sf)	CN	Description
59,301	98	Paved parking, HSG B
3	61	>75% Grass cover, Good, HSG B
59,304	98	Weighted Average
3		0.00% Pervious Area
59,301		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 min.

Summary for Pond DP: 1995, Designed Detention Pond

Per the NRCS Soil Report, the underlying soil in the detention basin area is Hoosic gravelly fine sandy loam. The Saturated Hydraulic Conductivity (Ksat) value for this soil is 116.98 micrometers/second = 16.58 in/hr. A 2x factor of safety is applied to derive the infiltration rate for the basin, 8.29 in/hr.

Inflow Area = 270,318 sf, 71.89% Impervious, Inflow Depth = 8.36" for 50-year event
 Inflow = 51.54 cfs @ 12.10 hrs, Volume= 188,312 cf
 Outflow = 28.34 cfs @ 12.29 hrs, Volume= 188,312 cf, Atten= 45%, Lag= 11.3 min
 Discarded = 1.99 cfs @ 12.25 hrs, Volume= 27,120 cf
 Primary = 26.35 cfs @ 12.29 hrs, Volume= 161,191 cf
 Routed to Link SP1 : Wetland

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 34.08' @ 12.29 hrs Surf.Area= 10,363 sf Storage= 41,030 cf
 Flood Elev= 34.00' Surf.Area= 10,363 sf Storage= 41,030 cf

Plug-Flow detention time= 20.8 min calculated for 188,181 cf (100% of inflow)
 Center-of-Mass det. time= 20.8 min (790.3 - 769.5)

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Type III 24-hr 50-year Rainfall=9.89"

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Volume	Invert	Avail.Storage	Storage Description
#1	28.00'	41,030 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
28.00	3,842	413.0	0	0	3,842
34.00	10,363	666.0	41,030	41,030	25,805

Device	Routing	Invert	Outlet Devices
#1	Discarded	28.00'	8.290 in/hr Exfiltration over Surface area
#2	Primary	26.00'	12.0" Round Culvert L= 75.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 26.00' / 25.60' S= 0.0053 ' S= 0.0053 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf
#3	Primary	33.90'	90.0' long x 8.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Discarded OutFlow Max=1.99 cfs @ 12.25 hrs HW=34.05' (Free Discharge)

↑1=Exfiltration (Exfiltration Controls 1.99 cfs)

Primary OutFlow Max=24.95 cfs @ 12.29 hrs HW=34.07' (Free Discharge)

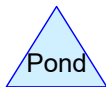
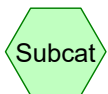
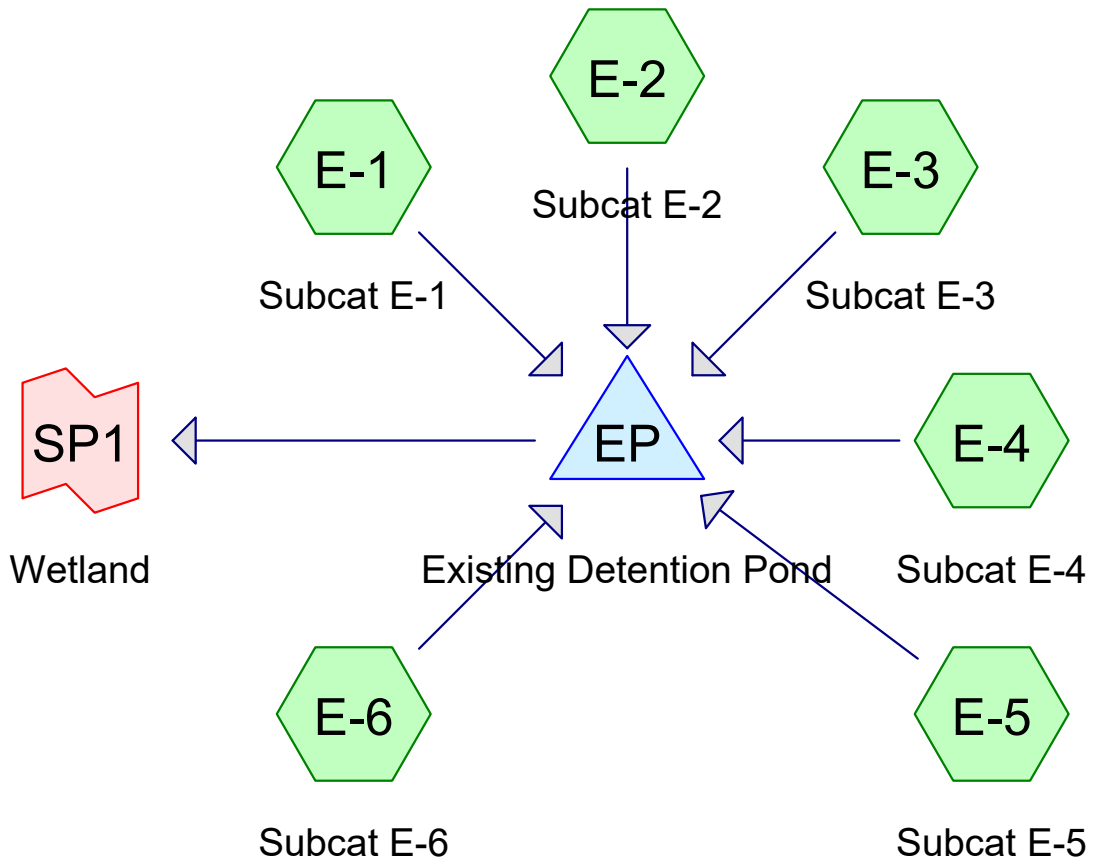
↑2=Culvert (Barrel Controls 9.77 cfs @ 12.44 fps)

↑3=Broad-Crested Rectangular Weir (Weir Controls 15.18 cfs @ 1.00 fps)

Summary for Link SP1: Wetland

Inflow Area = 270,318 sf, 71.89% Impervious, Inflow Depth = 7.16" for 50-year event
 Inflow = 26.35 cfs @ 12.29 hrs, Volume= 161,191 cf
 Primary = 26.35 cfs @ 12.29 hrs, Volume= 161,191 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs



Routing Diagram for 3250-02 Proposed HydroCAD
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Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-year	Type III 24-hr		Default	24.00	1	4.11	2
2	10-year	Type III 24-hr		Default	24.00	1	6.37	2
3	25-year	Type III 24-hr		Default	24.00	1	8.18	2
4	50-year	Type III 24-hr		Default	24.00	1	9.89	2

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Type III 24-hr 2-year Rainfall=4.11"

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Summary for Subcatchment E-1: Subcat E-1

Runoff = 2.25 cfs @ 12.09 hrs, Volume= 7,493 cf, Depth= 3.33"
Routed to Pond EP : Existing Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=4.11"

Area (sf)	CN	Description
3,912	61	>75% Grass cover, Good, HSG B
23,114	98	Paved parking, HSG B
27,026	93	Weighted Average
3,912		14.48% Pervious Area
23,114		85.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 min.

Summary for Subcatchment E-2: Subcat E-2

Runoff = 0.93 cfs @ 12.12 hrs, Volume= 3,196 cf, Depth= 1.61"
Routed to Pond EP : Existing Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=4.11"

Area (sf)	CN	Description
16,141	61	>75% Grass cover, Good, HSG B
7,726	98	Paved parking, HSG B
23,867	73	Weighted Average
16,141		67.63% Pervious Area
7,726		32.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.0450	0.23		Sheet Flow, A-B Grass: Short n= 0.150 P2= 4.11"
4.2	136	0.0060	0.54		Shallow Concentrated Flow, B-C Short Grass Pasture Kv= 7.0 fps
7.8	186	Total			

Summary for Subcatchment E-3: Subcat E-3

Runoff = 5.19 cfs @ 12.14 hrs, Volume= 18,412 cf, Depth= 2.47"
Routed to Pond EP : Existing Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=4.11"

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Type III 24-hr 2-year Rainfall=4.11"

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Area (sf)	CN	Description
33,300	61	>75% Grass cover, Good, HSG B
56,212	98	Paved parking, HSG B
89,512	84	Weighted Average
33,300		37.20% Pervious Area
56,212		62.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	50	0.0180	0.16		Sheet Flow, A-B Grass: Short n= 0.150 P2= 4.11"
0.6	41	0.0260	1.13		Shallow Concentrated Flow, B-C Short Grass Pasture Kv= 7.0 fps
0.9	169	0.0230	3.08		Shallow Concentrated Flow, C-D Paved Kv= 20.3 fps
1.9	111	0.0200	0.99		Shallow Concentrated Flow, D-E Short Grass Pasture Kv= 7.0 fps
0.9	139	0.0160	2.57		Shallow Concentrated Flow, E-F Paved Kv= 20.3 fps
9.5	510	Total			

Summary for Subcatchment E-4: Subcat E-4

Runoff = 4.08 cfs @ 12.09 hrs, Volume= 13,913 cf, Depth= 3.54"
 Routed to Pond EP : Existing Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-year Rainfall=4.11"

Area (sf)	CN	Description
4,028	61	>75% Grass cover, Good, HSG B
43,139	98	Paved parking, HSG B
47,168	95	Weighted Average
4,028		8.54% Pervious Area
43,139		91.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 min.

Summary for Subcatchment E-5: Subcat E-5

Runoff = 0.79 cfs @ 12.10 hrs, Volume= 2,615 cf, Depth= 1.34"
 Routed to Pond EP : Existing Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-year Rainfall=4.11"

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Type III 24-hr 2-year Rainfall=4.11"

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Area (sf)	CN	Description
4,842	98	Paved parking, HSG B
18,600	61	>75% Grass cover, Good, HSG B
23,442	69	Weighted Average
18,600		79.35% Pervious Area
4,842		20.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 min.

Summary for Subcatchment E-6: Subcat E-6

Runoff = 5.33 cfs @ 12.09 hrs, Volume= 19,149 cf, Depth= 3.87"
 Routed to Pond EP : Existing Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-year Rainfall=4.11"

Area (sf)	CN	Description
59,301	98	Paved parking, HSG B
3	61	>75% Grass cover, Good, HSG B
59,304	98	Weighted Average
3		0.00% Pervious Area
59,301		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 min.

Summary for Pond EP: Existing Detention Pond

Per the NRCS Soil Report, the underlying soil in the detention basin area is Hoosic gravelly fine sandy loam. The Saturated Hydraulic Conductivity (Ksat) value for this soil is 116.98 micrometers/second = 16.58 in/hr. A 2x factor of safety is applied to derive the infiltration rate for the basin, 8.29 in/hr.

Inflow Area = 270,318 sf, 71.89% Impervious, Inflow Depth = 2.88" for 2-year event
 Inflow = 18.20 cfs @ 12.10 hrs, Volume= 64,778 cf
 Outflow = 15.28 cfs @ 12.16 hrs, Volume= 64,778 cf, Atten= 16%, Lag= 3.8 min
 Discarded = 0.93 cfs @ 12.16 hrs, Volume= 21,571 cf
 Primary = 14.35 cfs @ 12.16 hrs, Volume= 43,207 cf
 Routed to Link SP1 : Wetland

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 30.07' @ 12.16 hrs Surf.Area= 4,315 sf Storage= 4,700 cf
 Flood Elev= 32.50' Surf.Area= 10,369 sf Storage= 22,657 cf

Plug-Flow detention time= 11.0 min calculated for 64,733 cf (100% of inflow)
 Center-of-Mass det. time= 11.0 min (800.4 - 789.4)

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Type III 24-hr 2-year Rainfall=4.11"

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Volume	Invert	Avail.Storage	Storage Description			
#1	28.00'	22,657 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
28.00	449	350.0	0	0	449	
29.00	2,241	607.0	1,231	1,231	20,027	
30.00	4,161	635.0	3,152	4,383	22,863	
31.00	6,456	735.0	5,267	9,650	33,787	
32.00	9,655	711.0	8,002	17,652	36,641	
32.50	10,369	718.0	5,005	22,657	37,514	

Device	Routing	Invert	Outlet Devices
#1	Discarded	28.00'	9.290 in/hr Exfiltration over Surface area
#2	Primary	28.50'	24.0" Round Culvert L= 25.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 28.50' / 27.75' S= 0.0300 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf
#3	Primary	32.40'	37.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Discarded OutFlow Max=0.92 cfs @ 12.16 hrs HW=30.06' (Free Discharge)
 ↳ **1=Exfiltration** (Exfiltration Controls 0.92 cfs)

Primary OutFlow Max=14.18 cfs @ 12.16 hrs HW=30.06' (Free Discharge)
 ↳ **2=Culvert** (Barrel Controls 14.18 cfs @ 7.42 fps)
 ↳ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link SP1: Wetland

Inflow Area = 270,318 sf, 71.89% Impervious, Inflow Depth = 1.92" for 2-year event
 Inflow = 14.35 cfs @ 12.16 hrs, Volume= 43,207 cf
 Primary = 14.35 cfs @ 12.16 hrs, Volume= 43,207 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

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Type III 24-hr 10-year Rainfall=6.37"

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Summary for Subcatchment E-1: Subcat E-1

Runoff = 3.65 cfs @ 12.09 hrs, Volume= 12,495 cf, Depth= 5.55"
Routed to Pond EP : Existing Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=6.37"

Area (sf)	CN	Description
3,912	61	>75% Grass cover, Good, HSG B
23,114	98	Paved parking, HSG B
27,026	93	Weighted Average
3,912		14.48% Pervious Area
23,114		85.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 min.

Summary for Subcatchment E-2: Subcat E-2

Runoff = 2.03 cfs @ 12.11 hrs, Volume= 6,758 cf, Depth= 3.40"
Routed to Pond EP : Existing Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=6.37"

Area (sf)	CN	Description
16,141	61	>75% Grass cover, Good, HSG B
7,726	98	Paved parking, HSG B
23,867	73	Weighted Average
16,141		67.63% Pervious Area
7,726		32.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.0450	0.23		Sheet Flow, A-B Grass: Short n= 0.150 P2= 4.11"
4.2	136	0.0060	0.54		Shallow Concentrated Flow, B-C Short Grass Pasture Kv= 7.0 fps
7.8	186	Total			

Summary for Subcatchment E-3: Subcat E-3

Runoff = 9.40 cfs @ 12.13 hrs, Volume= 33,894 cf, Depth= 4.54"
Routed to Pond EP : Existing Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=6.37"

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Type III 24-hr 10-year Rainfall=6.37"

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Area (sf)	CN	Description
33,300	61	>75% Grass cover, Good, HSG B
56,212	98	Paved parking, HSG B
89,512	84	Weighted Average
33,300		37.20% Pervious Area
56,212		62.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	50	0.0180	0.16		Sheet Flow, A-B Grass: Short n= 0.150 P2= 4.11"
0.6	41	0.0260	1.13		Shallow Concentrated Flow, B-C Short Grass Pasture Kv= 7.0 fps
0.9	169	0.0230	3.08		Shallow Concentrated Flow, C-D Paved Kv= 20.3 fps
1.9	111	0.0200	0.99		Shallow Concentrated Flow, D-E Short Grass Pasture Kv= 7.0 fps
0.9	139	0.0160	2.57		Shallow Concentrated Flow, E-F Paved Kv= 20.3 fps
9.5	510	Total			

Summary for Subcatchment E-4: Subcat E-4

Runoff = 6.49 cfs @ 12.09 hrs, Volume= 22,716 cf, Depth= 5.78"
 Routed to Pond EP : Existing Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-year Rainfall=6.37"

Area (sf)	CN	Description
4,028	61	>75% Grass cover, Good, HSG B
43,139	98	Paved parking, HSG B
47,168	95	Weighted Average
4,028		8.54% Pervious Area
43,139		91.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 min.

Summary for Subcatchment E-5: Subcat E-5

Runoff = 1.85 cfs @ 12.09 hrs, Volume= 5,869 cf, Depth= 3.00"
 Routed to Pond EP : Existing Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-year Rainfall=6.37"

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Type III 24-hr 10-year Rainfall=6.37"

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Area (sf)	CN	Description
4,842	98	Paved parking, HSG B
18,600	61	>75% Grass cover, Good, HSG B
23,442	69	Weighted Average
18,600		79.35% Pervious Area
4,842		20.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 min.

Summary for Subcatchment E-6: Subcat E-6

Runoff = 8.30 cfs @ 12.09 hrs, Volume= 30,302 cf, Depth= 6.13"
 Routed to Pond EP : Existing Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-year Rainfall=6.37"

Area (sf)	CN	Description
59,301	98	Paved parking, HSG B
3	61	>75% Grass cover, Good, HSG B
59,304	98	Weighted Average
3		0.00% Pervious Area
59,301		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 min.

Summary for Pond EP: Existing Detention Pond

Per the NRCS Soil Report, the underlying soil in the detention basin area is Hoosic gravelly fine sandy loam. The Saturated Hydraulic Conductivity (Ksat) value for this soil is 116.98 micrometers/second = 16.58 in/hr. A 2x factor of safety is applied to derive the infiltration rate for the basin, 8.29 in/hr.

Inflow Area = 270,318 sf, 71.89% Impervious, Inflow Depth = 4.97" for 10-year event
 Inflow = 31.14 cfs @ 12.10 hrs, Volume= 112,035 cf
 Outflow = 24.59 cfs @ 12.17 hrs, Volume= 112,035 cf, Atten= 21%, Lag= 4.5 min
 Discarded = 1.28 cfs @ 12.17 hrs, Volume= 27,105 cf
 Primary = 23.31 cfs @ 12.17 hrs, Volume= 84,930 cf
 Routed to Link SP1 : Wetland

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 30.80' @ 12.17 hrs Surf.Area= 5,957 sf Storage= 8,408 cf
 Flood Elev= 32.50' Surf.Area= 10,369 sf Storage= 22,657 cf

Plug-Flow detention time= 9.3 min calculated for 111,957 cf (100% of inflow)
 Center-of-Mass det. time= 9.4 min (788.6 - 779.2)

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Type III 24-hr 10-year Rainfall=6.37"

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Volume	Invert	Avail.Storage	Storage Description
#1	28.00'	22,657 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
28.00	449	350.0	0	0	449
29.00	2,241	607.0	1,231	1,231	20,027
30.00	4,161	635.0	3,152	4,383	22,863
31.00	6,456	735.0	5,267	9,650	33,787
32.00	9,655	711.0	8,002	17,652	36,641
32.50	10,369	718.0	5,005	22,657	37,514

Device	Routing	Invert	Outlet Devices
#1	Discarded	28.00'	9.290 in/hr Exfiltration over Surface area
#2	Primary	28.50'	24.0" Round Culvert L= 25.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 28.50' / 27.75' S= 0.0300 ' S= 0.0300 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf
#3	Primary	32.40'	37.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Discarded OutFlow Max=1.27 cfs @ 12.17 hrs HW=30.78' (Free Discharge)
 ↳ **1=Exfiltration** (Exfiltration Controls 1.27 cfs)

Primary OutFlow Max=23.04 cfs @ 12.17 hrs HW=30.78' (Free Discharge)
 ↳ **2=Culvert** (Barrel Controls 23.04 cfs @ 8.07 fps)
 ↳ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link SP1: Wetland

Inflow Area = 270,318 sf, 71.89% Impervious, Inflow Depth = 3.77" for 10-year event
 Inflow = 23.31 cfs @ 12.17 hrs, Volume= 84,930 cf
 Primary = 23.31 cfs @ 12.17 hrs, Volume= 84,930 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

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Type III 24-hr 25-year Rainfall=8.18"

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Summary for Subcatchment E-1: Subcat E-1

Runoff = 4.75 cfs @ 12.09 hrs, Volume= 16,534 cf, Depth= 7.34"

Routed to Pond EP : Existing Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=8.18"

Area (sf)	CN	Description
3,912	61	>75% Grass cover, Good, HSG B
23,114	98	Paved parking, HSG B
27,026	93	Weighted Average
3,912		14.48% Pervious Area
23,114		85.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 min.

Summary for Subcatchment E-2: Subcat E-2

Runoff = 2.96 cfs @ 12.11 hrs, Volume= 9,884 cf, Depth= 4.97"

Routed to Pond EP : Existing Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=8.18"

Area (sf)	CN	Description
16,141	61	>75% Grass cover, Good, HSG B
7,726	98	Paved parking, HSG B
23,867	73	Weighted Average
16,141		67.63% Pervious Area
7,726		32.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.0450	0.23		Sheet Flow, A-B Grass: Short n= 0.150 P2= 4.11"
4.2	136	0.0060	0.54		Shallow Concentrated Flow, B-C Short Grass Pasture Kv= 7.0 fps
7.8	186	Total			

Summary for Subcatchment E-3: Subcat E-3

Runoff = 12.78 cfs @ 12.13 hrs, Volume= 46,756 cf, Depth= 6.27"

Routed to Pond EP : Existing Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=8.18"

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Type III 24-hr 25-year Rainfall=8.18"

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Area (sf)	CN	Description
33,300	61	>75% Grass cover, Good, HSG B
56,212	98	Paved parking, HSG B
89,512	84	Weighted Average
33,300		37.20% Pervious Area
56,212		62.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	50	0.0180	0.16		Sheet Flow, A-B Grass: Short n= 0.150 P2= 4.11"
0.6	41	0.0260	1.13		Shallow Concentrated Flow, B-C Short Grass Pasture Kv= 7.0 fps
0.9	169	0.0230	3.08		Shallow Concentrated Flow, C-D Paved Kv= 20.3 fps
1.9	111	0.0200	0.99		Shallow Concentrated Flow, D-E Short Grass Pasture Kv= 7.0 fps
0.9	139	0.0160	2.57		Shallow Concentrated Flow, E-F Paved Kv= 20.3 fps
9.5	510	Total			

Summary for Subcatchment E-4: Subcat E-4

Runoff = 8.39 cfs @ 12.09 hrs, Volume= 29,797 cf, Depth= 7.58"
Routed to Pond EP : Existing Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=8.18"

Area (sf)	CN	Description
4,028	61	>75% Grass cover, Good, HSG B
43,139	98	Paved parking, HSG B
47,168	95	Weighted Average
4,028		8.54% Pervious Area
43,139		91.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 min.

Summary for Subcatchment E-5: Subcat E-5

Runoff = 2.79 cfs @ 12.09 hrs, Volume= 8,797 cf, Depth= 4.50"
Routed to Pond EP : Existing Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=8.18"

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Type III 24-hr 25-year Rainfall=8.18"

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Area (sf)	CN	Description
4,842	98	Paved parking, HSG B
18,600	61	>75% Grass cover, Good, HSG B
23,442	69	Weighted Average
18,600		79.35% Pervious Area
4,842		20.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 min.

Summary for Subcatchment E-6: Subcat E-6

Runoff = 10.68 cfs @ 12.09 hrs, Volume= 39,240 cf, Depth= 7.94"
 Routed to Pond EP : Existing Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-year Rainfall=8.18"

Area (sf)	CN	Description
59,301	98	Paved parking, HSG B
3	61	>75% Grass cover, Good, HSG B
59,304	98	Weighted Average
3		0.00% Pervious Area
59,301		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 min.

Summary for Pond EP: Existing Detention Pond

Per the NRCS Soil Report, the underlying soil in the detention basin area is Hoosic gravelly fine sandy loam. The Saturated Hydraulic Conductivity (Ksat) value for this soil is 116.98 micrometers/second = 16.58 in/hr. A 2x factor of safety is applied to derive the infiltration rate for the basin, 8.29 in/hr.

Inflow Area = 270,318 sf, 71.89% Impervious, Inflow Depth = 6.70" for 25-year event
 Inflow = 41.62 cfs @ 12.10 hrs, Volume= 151,008 cf
 Outflow = 29.55 cfs @ 12.20 hrs, Volume= 151,008 cf, Atten= 29%, Lag= 5.9 min
 Discarded = 1.66 cfs @ 12.20 hrs, Volume= 30,698 cf
 Primary = 27.89 cfs @ 12.20 hrs, Volume= 120,310 cf
 Routed to Link SP1 : Wetland

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 31.42' @ 12.20 hrs Surf.Area= 7,725 sf Storage= 12,632 cf
 Flood Elev= 32.50' Surf.Area= 10,369 sf Storage= 22,657 cf

Plug-Flow detention time= 8.8 min calculated for 150,903 cf (100% of inflow)
 Center-of-Mass det. time= 8.8 min (782.4 - 773.6)

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Type III 24-hr 25-year Rainfall=8.18"

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Volume	Invert	Avail.Storage	Storage Description			
#1	28.00'	22,657 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
28.00	449	350.0	0	0	449	
29.00	2,241	607.0	1,231	1,231	20,027	
30.00	4,161	635.0	3,152	4,383	22,863	
31.00	6,456	735.0	5,267	9,650	33,787	
32.00	9,655	711.0	8,002	17,652	36,641	
32.50	10,369	718.0	5,005	22,657	37,514	

Device	Routing	Invert	Outlet Devices											
#1	Discarded	28.00'	9.290 in/hr Exfiltration over Surface area											
#2	Primary	28.50'	24.0" Round Culvert L= 25.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 28.50' / 27.75' S= 0.0300 ' S= 0.0300 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf											
#3	Primary	32.40'	37.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32											

Discarded OutFlow Max=1.66 cfs @ 12.20 hrs HW=31.42' (Free Discharge)
 ↳ **1=Exfiltration** (Exfiltration Controls 1.66 cfs)

Primary OutFlow Max=27.86 cfs @ 12.20 hrs HW=31.42' (Free Discharge)
 ↳ **2=Culvert** (Barrel Controls 27.86 cfs @ 8.87 fps)
 ↳ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link SP1: Wetland

Inflow Area = 270,318 sf, 71.89% Impervious, Inflow Depth = 5.34" for 25-year event
 Inflow = 27.89 cfs @ 12.20 hrs, Volume= 120,310 cf
 Primary = 27.89 cfs @ 12.20 hrs, Volume= 120,310 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

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Type III 24-hr 50-year Rainfall=9.89"

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Summary for Subcatchment E-1: Subcat E-1

Runoff = 5.79 cfs @ 12.09 hrs, Volume= 20,361 cf, Depth= 9.04"

Routed to Pond EP : Existing Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=9.89"

Area (sf)	CN	Description
3,912	61	>75% Grass cover, Good, HSG B
23,114	98	Paved parking, HSG B
27,026	93	Weighted Average
3,912		14.48% Pervious Area
23,114		85.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 min.

Summary for Subcatchment E-2: Subcat E-2

Runoff = 3.86 cfs @ 12.11 hrs, Volume= 12,960 cf, Depth= 6.52"

Routed to Pond EP : Existing Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=9.89"

Area (sf)	CN	Description
16,141	61	>75% Grass cover, Good, HSG B
7,726	98	Paved parking, HSG B
23,867	73	Weighted Average
16,141		67.63% Pervious Area
7,726		32.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.0450	0.23		Sheet Flow, A-B Grass: Short n= 0.150 P2= 4.11"
4.2	136	0.0060	0.54		Shallow Concentrated Flow, B-C Short Grass Pasture Kv= 7.0 fps
7.8	186	Total			

Summary for Subcatchment E-3: Subcat E-3

Runoff = 15.96 cfs @ 12.13 hrs, Volume= 59,094 cf, Depth= 7.92"

Routed to Pond EP : Existing Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=9.89"

3250-02_Proposed HydroCAD

Type III 24-hr 50-year Rainfall=9.89"

Prepared by Allen & Major Associates, Inc

Printed 10/10/2024

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Page 16

Area (sf)	CN	Description
33,300	61	>75% Grass cover, Good, HSG B
56,212	98	Paved parking, HSG B
89,512	84	Weighted Average
33,300		37.20% Pervious Area
56,212		62.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	50	0.0180	0.16		Sheet Flow, A-B Grass: Short n= 0.150 P2= 4.11"
0.6	41	0.0260	1.13		Shallow Concentrated Flow, B-C Short Grass Pasture Kv= 7.0 fps
0.9	169	0.0230	3.08		Shallow Concentrated Flow, C-D Paved Kv= 20.3 fps
1.9	111	0.0200	0.99		Shallow Concentrated Flow, D-E Short Grass Pasture Kv= 7.0 fps
0.9	139	0.0160	2.57		Shallow Concentrated Flow, E-F Paved Kv= 20.3 fps
9.5	510	Total			

Summary for Subcatchment E-4: Subcat E-4

Runoff = 10.19 cfs @ 12.09 hrs, Volume= 36,497 cf, Depth= 9.29"
Routed to Pond EP : Existing Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=9.89"

Area (sf)	CN	Description
4,028	61	>75% Grass cover, Good, HSG B
43,139	98	Paved parking, HSG B
47,168	95	Weighted Average
4,028		8.54% Pervious Area
43,139		91.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 min.

Summary for Subcatchment E-5: Subcat E-5

Runoff = 3.70 cfs @ 12.09 hrs, Volume= 11,712 cf, Depth= 6.00"
Routed to Pond EP : Existing Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=9.89"

3250-02_Proposed HydroCAD

Type III 24-hr 50-year Rainfall=9.89"

Prepared by Allen & Major Associates, Inc

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Area (sf)	CN	Description
4,842	98	Paved parking, HSG B
18,600	61	>75% Grass cover, Good, HSG B
23,442	69	Weighted Average
18,600		79.35% Pervious Area
4,842		20.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 min.

Summary for Subcatchment E-6: Subcat E-6

Runoff = 12.92 cfs @ 12.09 hrs, Volume= 47,686 cf, Depth= 9.65"
 Routed to Pond EP : Existing Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 50-year Rainfall=9.89"

Area (sf)	CN	Description
59,301	98	Paved parking, HSG B
3	61	>75% Grass cover, Good, HSG B
59,304	98	Weighted Average
3		0.00% Pervious Area
59,301		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 min.

Summary for Pond EP: Existing Detention Pond

Per the NRCS Soil Report, the underlying soil in the detention basin area is Hoosic gravelly fine sandy loam. The Saturated Hydraulic Conductivity (Ksat) value for this soil is 116.98 micrometers/second = 16.58 in/hr. A 2x factor of safety is applied to derive the infiltration rate for the basin, 8.29 in/hr.

Inflow Area = 270,318 sf, 71.89% Impervious, Inflow Depth = 8.36" for 50-year event
 Inflow = 51.54 cfs @ 12.10 hrs, Volume= 188,312 cf
 Outflow = 34.24 cfs @ 12.21 hrs, Volume= 188,312 cf, Atten= 34%, Lag= 6.7 min
 Discarded = 2.06 cfs @ 12.21 hrs, Volume= 33,775 cf
 Primary = 32.19 cfs @ 12.21 hrs, Volume= 154,537 cf
 Routed to Link SP1 : Wetland

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 31.98' @ 12.21 hrs Surf.Area= 9,569 sf Storage= 17,416 cf
 Flood Elev= 32.50' Surf.Area= 10,369 sf Storage= 22,657 cf

Plug-Flow detention time= 8.6 min calculated for 188,312 cf (100% of inflow)
 Center-of-Mass det. time= 8.6 min (778.1 - 769.5)

3250-02_Proposed HydroCAD

Type III 24-hr 50-year Rainfall=9.89"

Prepared by Allen & Major Associates, Inc

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Volume	Invert	Avail.Storage	Storage Description			
#1	28.00'	22,657 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
28.00	449	350.0	0	0	449	
29.00	2,241	607.0	1,231	1,231	20,027	
30.00	4,161	635.0	3,152	4,383	22,863	
31.00	6,456	735.0	5,267	9,650	33,787	
32.00	9,655	711.0	8,002	17,652	36,641	
32.50	10,369	718.0	5,005	22,657	37,514	

Device	Routing	Invert	Outlet Devices
#1	Discarded	28.00'	9.290 in/hr Exfiltration over Surface area
#2	Primary	28.50'	24.0" Round Culvert L= 25.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 28.50' / 27.75' S= 0.0300 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf
#3	Primary	32.40'	37.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

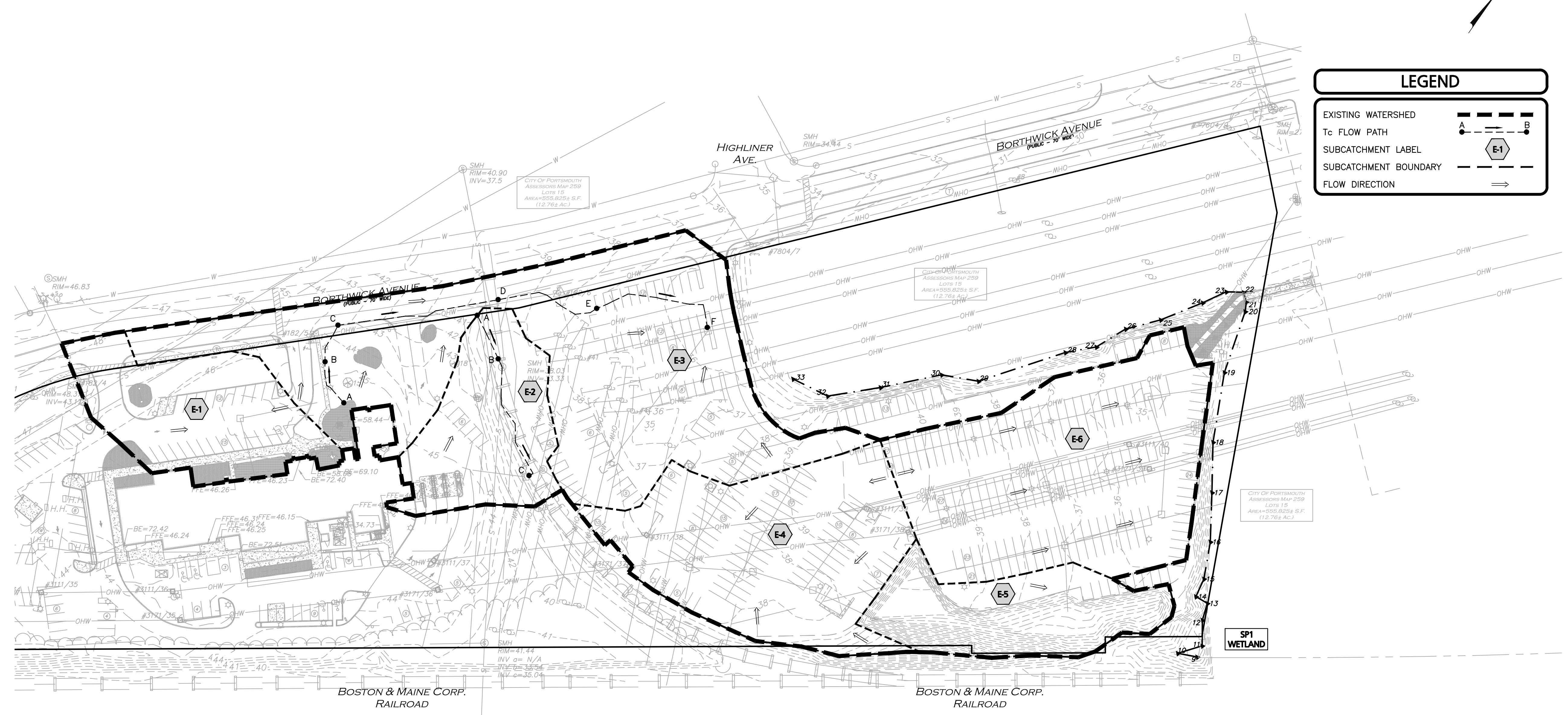
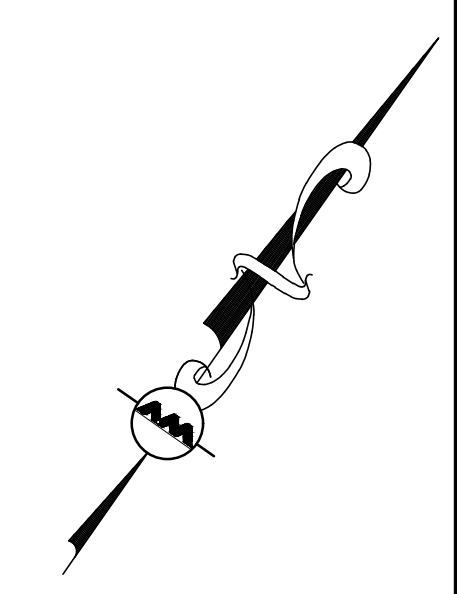
Discarded OutFlow Max=2.05 cfs @ 12.21 hrs HW=31.96' (Free Discharge)
 ↳ **1=Exfiltration** (Exfiltration Controls 2.05 cfs)

Primary OutFlow Max=32.08 cfs @ 12.21 hrs HW=31.96' (Free Discharge)
 ↳ **2=Culvert** (Barrel Controls 32.08 cfs @ 10.21 fps)
 ↳ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link SP1: Wetland

Inflow Area = 270,318 sf, 71.89% Impervious, Inflow Depth = 6.86" for 50-year event
 Inflow = 32.19 cfs @ 12.21 hrs, Volume= 154,537 cf
 Primary = 32.19 cfs @ 12.21 hrs, Volume= 154,537 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs



LEGEND

EXISTING WATERSHED

Tc FLOW PATH

SUBCATCHMENT LABEL

SUBCATCHMENT BOUNDARY

FLOW DIRECTION

ISSUED FOR REVIEW
OCTOBER 10, 2024

PROFESSIONAL ENGINEER FOR ALLEN & MAJOR ASSOCIATES, INC.

REV	DATE	DESCRIPTION

APPLICANT/OWNER:
APEX DESIGN BUILD
9550 W. HIGGINS ROAD, STE 170
ROSEMONT, IL 60018

PROJECT:
100 BORTHWICK AVENUE
PORTSMOUTH, NH

PROJECT NO. 3250-02 DATE: 10-10-24

SCALE: 1" = 60' DWG. NAME: C3250-02

DESIGNED BY: JRG CHECKED BY: BDJ

PREPARED BY:

ALLEN & MAJOR ASSOCIATES, INC.
civil engineering • land surveying
environmental consulting • landscape architecture
www.allenmajor.com
400 HARVEY ROAD
MANCHESTER, NH 03103
TEL: (603) 627-5500
FAX: (603) 627-5501

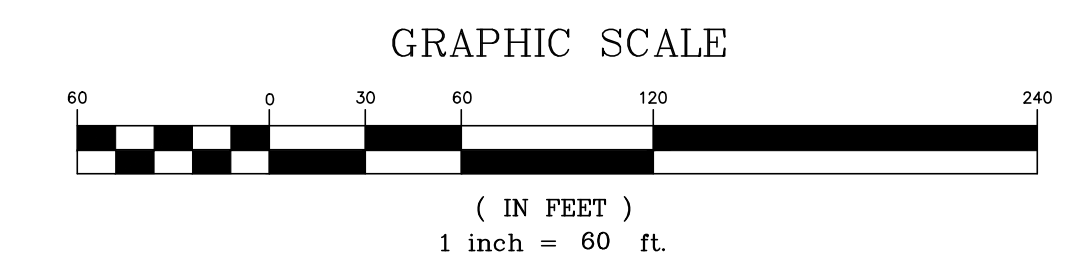
WOBURN, MA • LAKEVILLE, MA • MANCHESTER, NH

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DRAWING TITLE: **EXISTING WATERSHED PLAN** SHEET No. **WS-1**

PLAN NOTES:

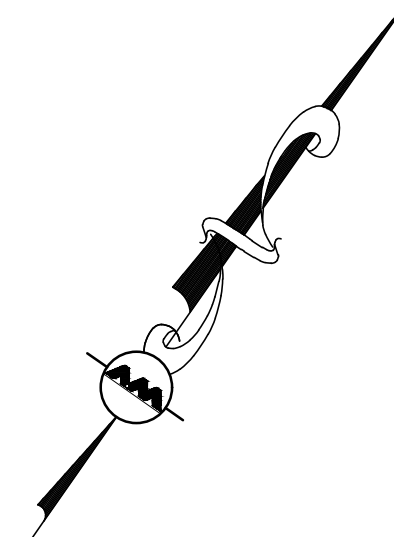
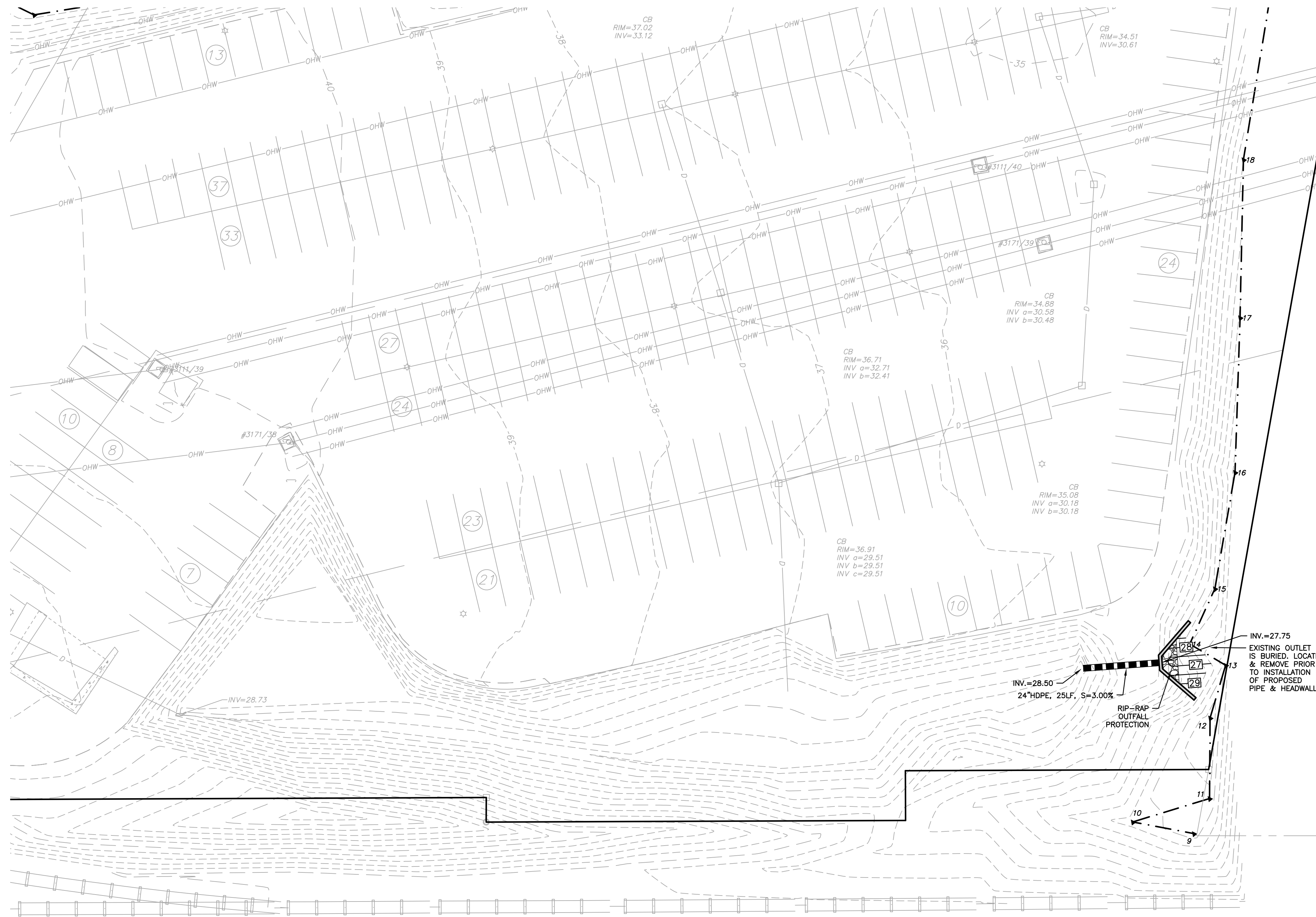
- EXISTING CONDITIONS WERE COMPILED FROM AN ON THE GROUND SURVEY PERFORMED BY ALLEN & MAJOR ASSOCIATES, INC. IN JUNE OF 2024, AS WELL AS AVAILABLE RECORD PLANS OBTAINED FROM THE CITY OF PORTSMOUTH AND OTHER SOURCES.
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R:\PROJECTS\3250-02\CIVIL\DRAWINGS\CURRENT\C-3250-02-WATERSHED-EXISTING.DWG

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1-888-DIG-SAFE
1-888-344-7233



LEGEND	
RIPRAP OUTFALL	
5' CONTOUR	
1' CONTOUR	
HEADWALL	
DRAIN LINE	

ISSUED FOR REVIEW
OCTOBER 10, 2024

PROFESSIONAL ENGINEER FOR ALLEN & MAJOR ASSOCIATES, INC.

REV	DATE	DESCRIPTION

APPLICANT/OWNER:
APEX DESIGN BUILD
9550 W. HIGGINS ROAD, STE 170
ROSEMONT, IL 60018

PROJECT:
100 BORTHWICK AVENUE
PORTSMOUTH, NH

PROJECT NO.	3250-02	DATE:	10-10-24
SCALE:	1" = 20'	DWG. NAME:	C3250-02
DESIGNED BY:	JRG	CHECKED BY:	BDJ

ALLEN & MAJOR ASSOCIATES, INC.
civil engineering • land surveying
environmental consulting • landscape architecture
www.allenmajor.com

400 HARVEY ROAD
MANCHESTER, NH 03103
TEL: (603) 627-5500
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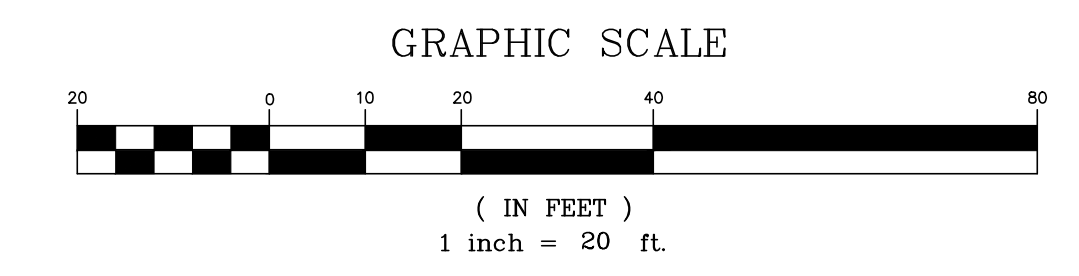
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DRAWING TITLE:	SHEET No.
GRADING & DRAINAGE PLAN	C-103

BOSTON & MAINE CORP. RAILROAD

PLAN NOTES:

- EXISTING CONDITIONS WERE COMPILED FROM AN ON THE GROUND SURVEY PERFORMED BY ALLEN & MAJOR ASSOCIATES, INC. IN JUNE OF 2024, AS WELL AS AVAILABLE RECORD PLANS OBTAINED FROM THE CITY OF PORTSMOUTH AND OTHER SOURCES.
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1-888-344-7233

PROPERTY LINE DIMENSIONS	
A	5.00' N 35°44'00" W
B	16.50' N 35°44'00" W
C	6.77' S 25°27'00" E
D	58.05' S 41°40'00" E

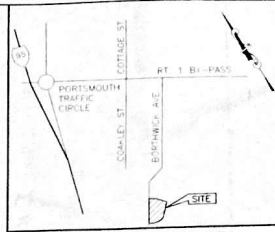
ABUTTERS

LOCATION	TAX MAP #	LOT #	ABUTTER'S NAME & ADDRESS
1	R 59	14	NATIONAL SEA PRODUCTS, INC. P.O. BOX 832 PORTSMOUTH, NH 03802
2	R 40	1	LIBERTY MUTUAL 9 RIVERSIDE ROAD WESTON, MASS. 02193
3	R 59	27	CITY OF PORTSMOUTH C/O WATER DEPARTMENT P.O. BOX 8 PORTSMOUTH, NH 03802

NOTE: REFER TO ABUTTER'S LIST FOR REMAINING ABUTTERS NOT SHOWN ON PLAN

TBM
TOP OF CONCRETE BOUND
ELEV = 28.72

EXISTING POND
ELEV = 22.04



LOCATION MAP

REFERENCE PLANS

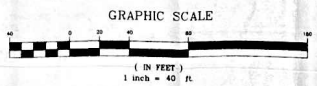
1. PLAN OF A PORTION OF BORTHWICK INDUSTRIAL PARK BY JOHN W. DURGIN, P.A. DATED DECEMBER 1975.
2. SITE PLAN - NORTHEAST FEDERAL CREDIT UNION BY JARA DALY ASSOCIATES DRAWING NO. 1-11-SEPT 1985.

GENERAL NOTES

1. PROPERTY LOCATED IN CITY OF PORTSMOUTH TAX MAP #59, LOT 15 (APPLICANT).
2. ZONING FOR THIS PARCEL IS OF - OFFICE RESEARCH.
3. AREA OF PARCEL IS 12.767 ACRES.
4. BOUNDARY SHOWN APPROXIMATELY PER REFERENCE PLAN #1.
5. TOPOGRAPHIC SURVEY BY KIMBALL CHASE CO. JULY 1995.
6. WETLAND DELINEATION PER "FEDERAL MANUAL FOR IDENTIFYING AND DelineATING JURISDICTIONAL WETLANDS, 1985" BY JOSEPH W. NOEL - CPCS/INC ON 6/19/95.
7. THIS SITE IS LOCATED WITHIN A WETLAND PROTECTION AREA FOR THE COLLINS AND PORTSMOUTH WETLANDS.
8. ALL CONSTRUCTION TO CONFORM WITH STATE OF N.H. D.O.E. STANDARD SPECIFICATIONS FOR BRIDGE AND BRIDGE CONSTRUCTION - LATEST EDITION AND CITY OF PORTSMOUTH STANDARDS.
9. ALL DISTURBED AREAS NOT OTHERWISE SPECIFIED SHALL RECEIVE 4" LOAM, GRASS SEED AND MULCH.
10. EROSION CONTROL AND SITE STABILIZATION SHALL CONFORM TO EROSION AND SEDIMENT HANDBOOK - USRA, 5/83, AUGUST 1992.

LEGEND

- PROPOSED UNDERGROUND ELECTRIC
- EXISTING CULVERT
- EXISTING DRAIN
- EXISTING SEWER
- EXISTING SEWER MANHOLE
- EXISTING DRAIN MANHOLE
- PROPOSED SILT FENCE
- EXISTING EDGE OF WETLAND
- EXISTING WIRE FENCE
- EXISTING CATCH BASIN
- EXISTING CONCRETE BOUND FOUND
- EXISTING PROPERTY LINE
- EXISTING DIRT ROAD
- EXISTING RAILROAD TRACKS
- EXISTING OVERHEAD ELECTRIC



CONSERVATION ZONE

DRAINAGE SUMMARY

Catch Basin	Rim In	Inn In	Inn Out
1	35.50	-	32.50
2	35.50	32.10	32.10
3	35.50	31.65	31.65
4	35.50	-	31.77
5	37.50	31.15	31.15
6	37.50	30.57	30.57
7	39.00	-	34.00
8	39.00	33.66	33.41
9	39.00	33.12	32.87
10	35.50	-	31.50
11	35.50	31.06	31.06
12	35.50	30.78	30.78

Storm Drain	Size	Length	Slope
P1	12" RCP	20	.005
P2	12" RCP	90	.005
P3	15" RCP	216	.005
P4	24" RCP	62	.010
P5	24" RCP	58	.010
P6	30" RCP	118	.005
P7	12" RCP	68	.005
P8	12" RCP	58	.005
P9	12" RCP	84	.005
P10	12" RCP	66	.005
P11	12" RCP	60	.005
P12	15" RCP	116	.005
P13	12" RCP	75	.005

REV	DATE	STATUS	BY	CHK	APP



DESIGNED BY: ST
 DRAWN BY: AW
 CHECKED BY: CTD
 APPROVED BY: ST
 DATE: 7/17/95

Kimball Chase
 Engineering & Surveying • Land Planning and Design
 One Cole Street, Portsmouth, NH 03801 • (603)431-2520
 Bath, ME • Andover, MA

CLIENT: LIBERTY MUTUAL
 9 RIVERSIDE ROAD
 WESTON, MASS. 02193

APPLICANT TO CITY: NORTHEAST FEDERAL CREDIT UNION
 P.O. BOX 1304
 PORTSMOUTH, NH 03802

PROJECT: PROPOSED PARKING EXPANSION

TITLE: SITE PLAN

SCALE: 1"=40'

PROJECT NO: 95-5400

DRAWING NO: OVERALL

SHT: 1 of 2 REV

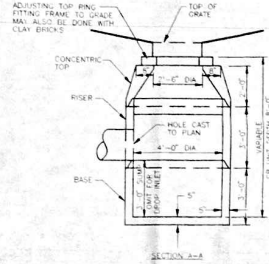
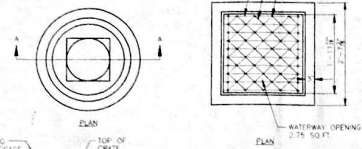
Parking Street Available
 834 - Caswell
 100 - Stuart

Parking Street Available
 1050 - Caswell
 100 - Stuart
 50 - Seckman
 50 - Walters, Trammis
 1360 - 80% = 1098
 834

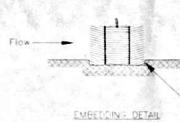
25 33
 40 52
 51 36
 28 36
 35 30
 27 35
 25 35

NOTES

- All sections to be concrete Class AA (4000 PSI) (4000 PSI)
- Circumferential reinforcement shall be 0.12 sq in. per linear foot in all sections and shall be in the center of the wall.
- The tongue or the groove of the joint shall contain one line of circumferential reinforcement equal to 0.12 sq in. per linear foot.
- Risers of 12", 3' and 4' can be used to reach desired depth.
- Frame and grate shall be NHDOT Type B.

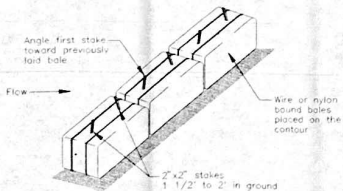


CATCH BASIN

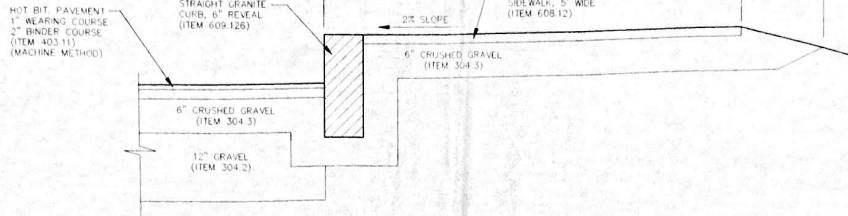


CONSTRUCTION DETAILS

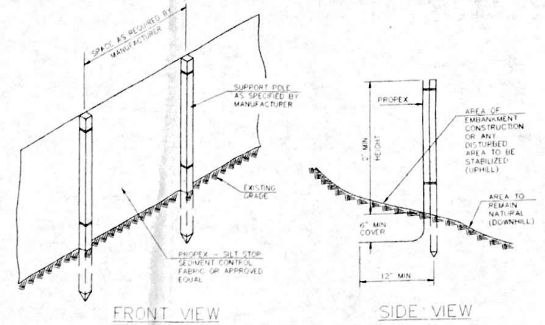
- Bales shall be placed in a row with ends tightly abutting the adjacent bales.
- Each bale shall be embedded in the soil a minimum of 4\"/>



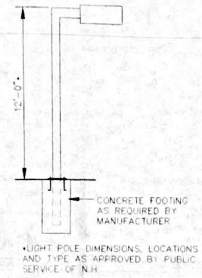
HAYBALE DETAIL



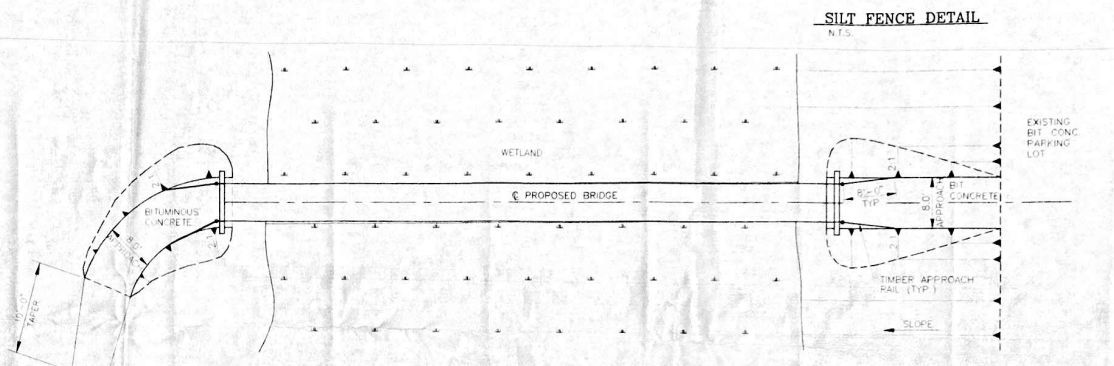
PAVEMENT/CURBING/SIDEWALK DETAIL



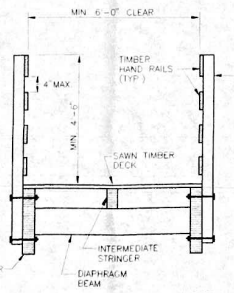
SILT FENCE DETAIL



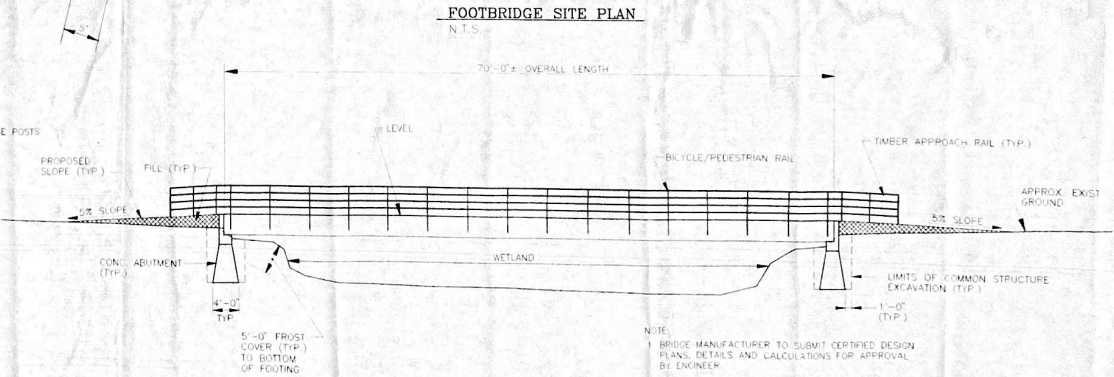
LIGHT POLE



FOOTBRIDGE SITE PLAN



FOOBRIDGE TYPICAL CROSS SECTION



FOOTBRIDGE ELEVATION

REV.	DATE	STATUS	BY	CHKD.	APPD.



DESIGNED BY	ST
DRAWN BY	AW
CHECKED BY	CTO
APPROVED BY	ST
DATE	7/17/95

Kimball Chase
 Engineering • Surveying • Land Planning and Design
 One Gate Street, Portsmouth, NH 03801 • (603)431-2520
 Bath, ME • Andover, MA

CLIENT	LIBERTY MUTUAL 9 RIVERGATE ROAD WESTON, MASS. 02193
APPLICANT TO CITY	NORTHEAST FEDERAL CREDIT UNION P.O. BOX 1304 PORTSMOUTH, N.H. 03802

PROJECT	PROPOSED PARKING EXPANSION
TITLE	SITE DETAILS
SCALE	N.T.S.
PROJECT NO.	95-5400
DRAWING NO.	DETAILS
SHT.	2 of 2

October 10, 2024

John Kilburg
Project Director
Apex Design Build
9550 W. Higgins Road, Ste. 170
Rosemont, IL 60018

A&M Project #: 3250-02
Re: 100 Borthwick Avenue
Portsmouth, NH
Existing Detention Pond
Operation & Maintenance

Dear Mr. Kilburg,

Allen & Major Associates, Inc. (A&M) is pleased to prepare the below operation and maintenance summary for the existing detention basin and drainage infrastructure located at 100 Borthwick Avenue in Portsmouth, NH.

Detention Basin:

It is our understanding that the existing detention basin on site is overgrown with various trees, brush, and vegetation. For immediate action, A&M recommends clearing out the entire basin by removing all trees, brush, and vegetation within it and along its embankments. Once fully grubbed, the basin shall be maintained at least semi-annually (twice per year) to be mowed, remove any accumulated sediments, and ensure inlet & outlet structures are unobstructed.

Maintenance Requirements:

- Periodic mowing of embankments.
- Removal of woody vegetation from embankments.
- Removal of debris from outlet structures.
- Removal of accumulated sediment.
- Inspection and repair of embankments, inlet and outlet structures, and appurtenances.

Deep Sump Catch Basin:

The existing catch basins and drain manholes on site should also be inspected to ensure proper performance. Each inspection shall include the removal of accumulated sediment in the sump as well as ensuring the structure's inlet and outlet pipes are not obstructed. Catch basins and drain manholes on site shall be checked and maintained at least semi-annually (twice per year).

Maintenance Requirements:

- It is recommended that catch basins be inspected at least twice annually, once following snow-melt and once following leafdrop, and cleaned as indicated by inspection.
- Sediment should be removed when it approaches half the sump depth.

- If floating hydrocarbons are observed during an inspection, the material should be removed immediately by skimming, absorbent materials, or other method and disposed in conformance with applicable state and federal regulations.
- Cleaning may require Vacuum-truck instead of "clam-shell" to avoid damage to hood.

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 State	Yes
Location	
Latitude	43.060 degrees North
Longitude	70.795 degrees West
Elevation	10 feet
Date/Time	Tue Sep 10 2024 10:43:53 GMT-0400 (Eastern Daylight Time)

Add 15% multiplier for areas within the Great Bay region.

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.26	0.40	0.50	0.65	0.82	1.04	1yr	0.70	0.98	1.21	1.56	2.03	2.67	2.93	1yr	2.36	2.81	3.22	3.94	4.56	1yr
2yr	0.32	0.50	0.62	0.81	1.02	1.30	2yr	0.88	1.18	1.52	1.94	2.49	3.22	3.57	2yr	2.85	3.44	3.94	4.69	5.33	2yr
5yr	0.37	0.58	0.73	0.97	1.24	1.60	5yr	1.07	1.46	1.88	2.43	3.14	4.08	4.59	5yr	3.61	4.41	5.05	5.94	6.71	5yr
10yr	0.41	0.65	0.82	1.11	1.45	1.89	10yr	1.25	1.72	2.23	2.89	3.75	4.88	5.54	10yr	4.32	5.33	6.09	7.12	8.00	10yr
25yr	0.48	0.76	0.96	1.33	1.77	2.33	25yr	1.52	2.14	2.77	3.62	4.74	6.19	7.11	25yr	5.48	6.84	7.81	9.04	10.08	25yr
50yr	0.53	0.85	1.09	1.53	2.06	2.75	50yr	1.78	2.52	3.28	4.32	5.67	7.41	8.60	50yr	6.56	8.27	9.44	10.84	12.01	50yr
100yr	0.59	0.96	1.24	1.76	2.40	3.24	100yr	2.07	2.97	3.89	5.15	6.77	8.88	10.40	100yr	7.86	10.00	11.40	13.00	14.33	100yr
200yr	0.67	1.09	1.42	2.03	2.81	3.82	200yr	2.42	3.50	4.60	6.12	8.09	10.65	12.58	200yr	9.42	12.10	13.77	15.59	17.09	200yr
500yr	0.79	1.30	1.70	2.47	3.45	4.74	500yr	2.98	4.36	5.74	7.69	10.23	13.53	16.19	500yr	11.98	15.57	17.70	19.84	21.59	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	0.36	0.44	0.59	0.73	0.89	1yr	0.63	0.87	0.92	1.32	1.66	2.22	2.53	1yr	1.97	2.44	2.86	3.15	3.88	1yr
2yr	0.32	0.49	0.60	0.81	1.00	1.19	2yr	0.86	1.16	1.37	1.82	2.34	3.06	3.47	2yr	2.71	3.33	3.83	4.56	5.08	2yr
5yr	0.35	0.54	0.67	0.92	1.17	1.40	5yr	1.01	1.37	1.61	2.12	2.74	3.80	4.22	5yr	3.37	4.06	4.73	5.56	6.27	5yr
10yr	0.39	0.59	0.74	1.03	1.33	1.60	10yr	1.15	1.57	1.81	2.40	3.07	4.39	4.90	10yr	3.89	4.71	5.48	6.45	7.24	10yr
25yr	0.44	0.67	0.83	1.19	1.56	1.90	25yr	1.35	1.86	2.10	2.77	3.55	4.70	5.96	25yr	4.16	5.73	6.72	7.86	8.75	25yr
50yr	0.48	0.74	0.92	1.32	1.77	2.17	50yr	1.53	2.12	2.35	3.09	3.95	5.30	6.90	50yr	4.69	6.63	7.83	9.14	10.11	50yr
100yr	0.54	0.81	1.02	1.47	2.02	2.48	100yr	1.74	2.42	2.63	3.44	4.38	5.95	7.98	100yr	5.27	7.67	9.13	10.64	11.67	100yr
200yr	0.60	0.90	1.14	1.65	2.29	2.82	200yr	1.98	2.76	2.94	3.81	4.84	6.66	9.23	200yr	5.90	8.88	10.65	12.39	13.50	200yr
500yr	0.69	1.03	1.33	1.93	2.74	3.38	500yr	2.36	3.30	3.41	4.36	5.53	7.74	11.19	500yr	6.85	10.76	13.05	15.19	16.35	500yr

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.28	0.44	0.54	0.72	0.89	1.08	1yr	0.77	1.06	1.26	1.74	2.21	3.00	3.15	1yr	2.66	3.03	3.59	4.38	5.06	1yr
2yr	0.34	0.52	0.64	0.86	1.06	1.27	2yr	0.92	1.24	1.48	1.96	2.51	3.44	3.70	2yr	3.04	3.55	4.08	4.84	5.65	2yr
5yr	0.40	0.61	0.76	1.05	1.33	1.62	5yr	1.15	1.58	1.88	2.53	3.24	4.34	4.95	5yr	3.84	4.76	5.38	6.36	7.14	5yr
10yr	0.47	0.72	0.89	1.24	1.60	1.97	10yr	1.38	1.93	2.27	3.10	3.93	5.35	6.17	10yr	4.73	5.94	6.77	7.82	8.73	10yr
25yr	0.57	0.87	1.08	1.55	2.04	2.56	25yr	1.76	2.50	2.94	4.05	5.11	7.84	8.28	25yr	6.94	7.97	9.05	10.30	11.37	25yr
50yr	0.67	1.01	1.26	1.82	2.44	3.11	50yr	2.11	3.04	3.58	4.97	6.26	9.83	10.37	50yr	8.70	9.97	11.29	12.67	13.91	50yr
100yr	0.78	1.18	1.48	2.14	2.94	3.78	100yr	2.53	3.70	4.35	6.12	7.67	12.31	12.97	100yr	10.90	12.47	14.08	15.61	17.02	100yr
200yr	0.91	1.38	1.74	2.52	3.52	4.61	200yr	3.04	4.51	5.30	7.53	9.41	15.47	16.25	200yr	13.69	15.63	17.57	19.22	20.83	200yr
500yr	1.13	1.68	2.17	3.15	4.48	5.98	500yr	3.86	5.85	6.88	9.94	12.35	20.92	21.89	500yr	18.51	21.05	23.56	25.32	27.23	500yr



United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

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

Custom Soil Resource Report for Rockingham County, New Hampshire



Preface

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

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

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

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

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

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

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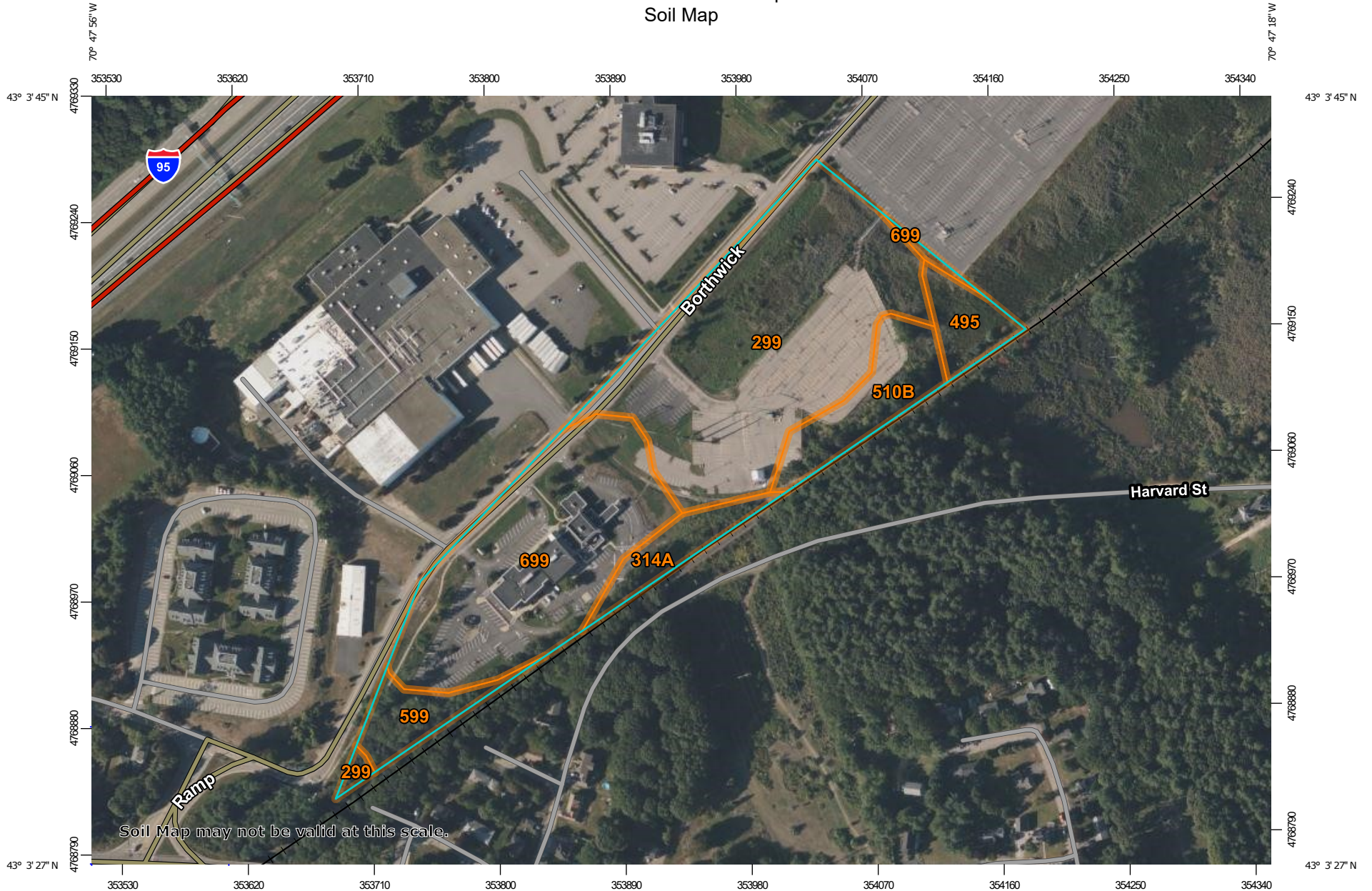
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Soil Map

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

Custom Soil Resource Report Soil Map



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines


 Soil Map Unit Points

Special Point Features

-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot

-  Spoil Area
-  Stony Spot
-  Very Stony Spot
-  Wet Spot
-  Other
-  Special Line Features


Water Features

 Streams and Canals

Transportation

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

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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: Rockingham County, New Hampshire
 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: Jun 19, 2020—Sep 20, 2020

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
299	Udorthents, smoothed	7.6	45.1%
314A	Pipestone sand, 0 to 5 percent slopes	0.8	4.8%
495	Natchaug mucky peat, 0 to 2 percent slopes	0.7	4.5%
510B	Hoosic gravelly fine sandy loam, 3 to 8 percent slopes	1.4	8.5%
599	Urban land-Hoosic complex, 3 to 15 percent slopes	0.8	4.7%
699	Urban land	5.4	32.4%
Totals for Area of Interest		16.7	100.0%

Map Unit Descriptions

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

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

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

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

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

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

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

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

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

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

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

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

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

Rockingham County, New Hampshire

299—Udorthents, smoothed

Map Unit Setting

National map unit symbol: 9cmt
Elevation: 0 to 840 feet
Mean annual precipitation: 44 to 49 inches
Mean annual air temperature: 48 degrees F
Frost-free period: 155 to 165 days
Farmland classification: Not prime farmland

Map Unit Composition

Udorthents and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents

Properties and qualities

Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

314A—Pipestone sand, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 9cn2
Elevation: 0 to 2,100 feet
Mean annual precipitation: 28 to 55 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 100 to 200 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Pipestone

Setting

Landform: Outwash terraces

Typical profile

H1 - 0 to 6 inches: sand
H2 - 6 to 33 inches: sand
H3 - 33 to 60 inches: sand

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Properties and qualities

Slope: 0 to 5 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Poorly drained

Runoff class: Negligible

Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)

Depth to water table: About 6 to 18 inches

Frequency of flooding: None

Frequency of ponding: None

Available water supply, 0 to 60 inches: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4w

Hydrologic Soil Group: A/D

Ecological site: F144AY027MA - Moist Sandy Outwash

Hydric soil rating: Yes

Minor Components

Chocorua

Percent of map unit: 5 percent

Landform: Bogs

Hydric soil rating: Yes

Not named wet

Percent of map unit: 5 percent

Landform: Outwash terraces

Hydric soil rating: Yes

Squamscott

Percent of map unit: 5 percent

Landform: Marine terraces

Hydric soil rating: Yes

Scarboro

Percent of map unit: 5 percent

Landform: Depressions

Hydric soil rating: Yes

Deerfield

Percent of map unit: 5 percent

Hydric soil rating: No

495—Natchaug mucky peat, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2w691

Elevation: 0 to 910 feet

Mean annual precipitation: 36 to 71 inches

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Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Natchaug and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Natchaug

Setting

Landform: Depressions, depressions, depressions
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Moderately decomposed organic material over loamy glaciofluvial deposits and/or loamy glaciolacustrine deposits and/or loamy till

Typical profile

Oe1 - 0 to 12 inches: mucky peat
Oe2 - 12 to 31 inches: mucky peat
2Cg1 - 31 to 39 inches: silt loam
2Cg2 - 39 to 79 inches: fine sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.01 to 14.17 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 25 percent
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Very high (about 14.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8w
Hydrologic Soil Group: B/D
Ecological site: F144AY042NY - Semi-Rich Organic Wetlands
Hydric soil rating: Yes

Minor Components

Walpole

Percent of map unit: 4 percent
Landform: Outwash terraces, depressions, outwash plains, depressions, deltas
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Scarboro

Percent of map unit: 4 percent

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Landform: Outwash deltas, drainageways, outwash terraces, depressions

Landform position (three-dimensional): Tread

Down-slope shape: Concave

Across-slope shape: Concave

Hydric soil rating: Yes

Maybid

Percent of map unit: 2 percent

Landform: Depressions, depressions

Down-slope shape: Concave

Across-slope shape: Concave

Hydric soil rating: Yes

510B—Hoosic gravelly fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9cp4

Elevation: 100 to 1,100 feet

Mean annual precipitation: 30 to 50 inches

Mean annual air temperature: 45 to 50 degrees F

Frost-free period: 135 to 190 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Hoosic and similar soils: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hoosic

Setting

Parent material: Outwash

Typical profile

H1 - 0 to 8 inches: gravelly fine sandy loam

H2 - 8 to 15 inches: very gravelly fine sandy loam

H3 - 15 to 60 inches: very gravelly coarse sand

Properties and qualities

Slope: 3 to 8 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Somewhat excessively drained

Runoff class: Very low

Capacity of the most limiting layer to transmit water (Ksat): High to very high (2.00 to 20.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water supply, 0 to 60 inches: Very low (about 2.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F144AY022MA - Dry Outwash
Hydric soil rating: No

Minor Components

Not named

Percent of map unit: 10 percent
Hydric soil rating: No

599—Urban land-Hoosic complex, 3 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9cpg
Elevation: 90 to 1,100 feet
Mean annual precipitation: 30 to 55 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 120 to 190 days
Farmland classification: Not prime farmland

Map Unit Composition

Urban land: 55 percent
Hoosic and similar soils: 25 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hoosic

Setting

Parent material: Outwash

Typical profile

H1 - 0 to 8 inches: gravelly fine sandy loam
H2 - 8 to 15 inches: very gravelly fine sandy loam
H3 - 15 to 60 inches: very gravelly coarse sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (2.00 to 20.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.6 inches)

Custom Soil Resource Report

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3s

Hydrologic Soil Group: A

Ecological site: F144AY022MA - Dry Outwash

Hydric soil rating: No

Minor Components

Udorthents

Percent of map unit: 4 percent

Hydric soil rating: No

Scitico

Percent of map unit: 4 percent

Landform: Marine terraces

Hydric soil rating: Yes

Eldridge

Percent of map unit: 4 percent

Hydric soil rating: No

Squamscott

Percent of map unit: 4 percent

Landform: Marine terraces

Hydric soil rating: Yes

Newfields

Percent of map unit: 4 percent

Hydric soil rating: No

699—Urban land

Map Unit Composition

Urban land: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Minor Components

Not named

Percent of map unit: 15 percent

Hydric soil rating: No

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Physical Properties

Soil Physical Properties are measured or inferred from direct observations in the field or laboratory. Examples of soil physical properties include percent clay, organic matter, saturated hydraulic conductivity, available water capacity, and bulk density.

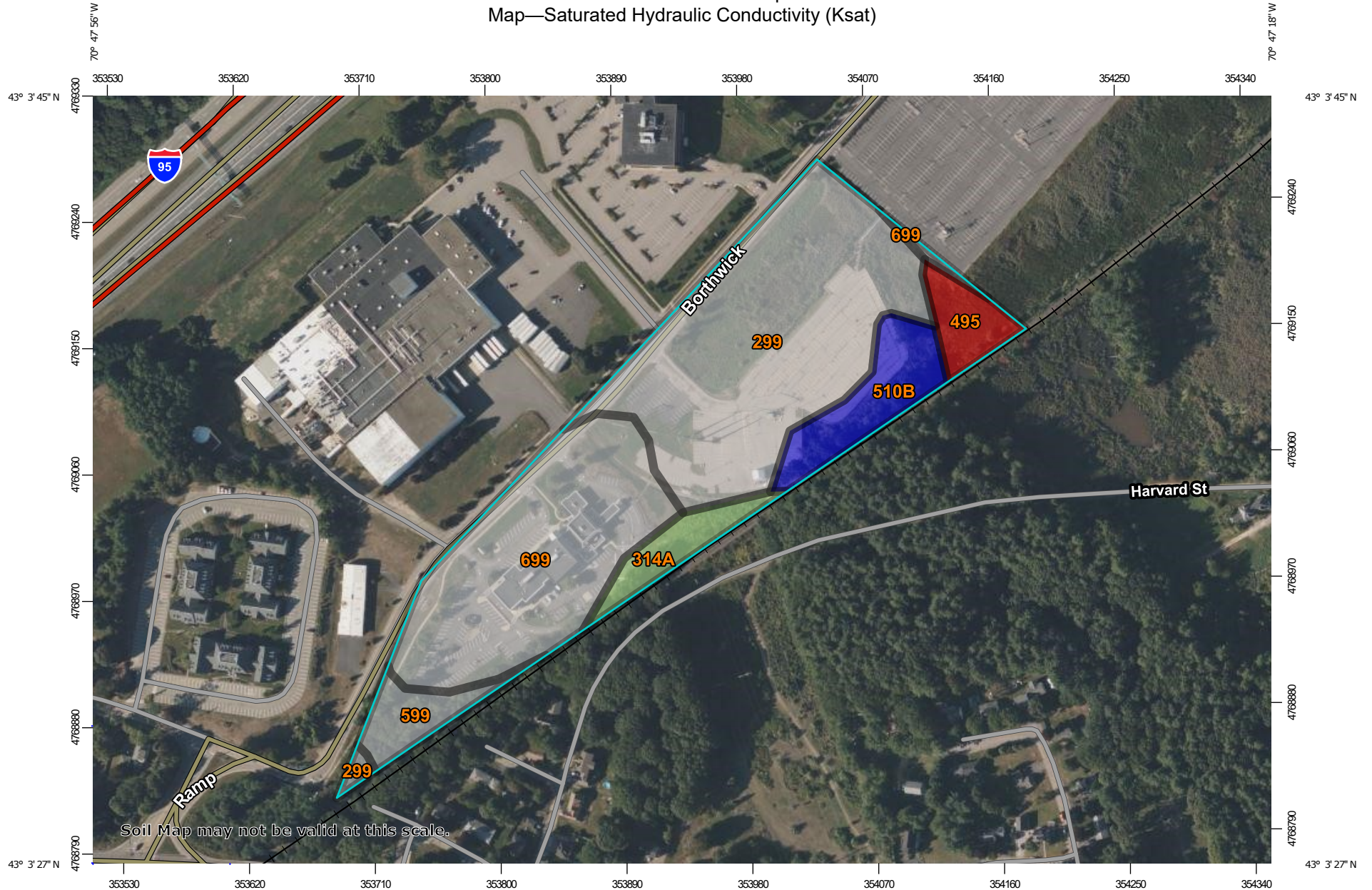
Saturated Hydraulic Conductivity (Ksat)

Saturated hydraulic conductivity (Ksat) refers to the ease with which pores in a saturated soil transmit water. The estimates are expressed in terms of micrometers per second. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Saturated hydraulic conductivity is considered in the design of soil drainage systems and septic tank absorption fields.

For each soil layer, this attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

The numeric Ksat values have been grouped according to standard Ksat class limits.

Custom Soil Resource Report Map—Saturated Hydraulic Conductivity (Ksat)























Map Scale: 1:3,850 if printed on A landscape (11" x 8.5") sheet.

0 50 100 200 300 Meters
0 150 300 600 900 Feet

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

- Area of Interest (AOI)**
 -  Area of Interest (AOI)
- Background**
 -  Aerial Photography
- Soils**
 - Soil Rating Polygons**
 -  <= 9.1000
 -  > 9.1000 and <= 91.7222
 -  > 91.7222 and <= 116.9811
 -  Not rated or not available
 - Soil Rating Lines**
 -  <= 9.1000
 -  > 9.1000 and <= 91.7222
 -  > 91.7222 and <= 116.9811
 -  Not rated or not available
 - Soil Rating Points**
 -  <= 9.1000
 -  > 9.1000 and <= 91.7222
 -  > 91.7222 and <= 116.9811
 -  Not rated or not available
- Water Features**
 -  Streams and Canals
- Transportation**
 -  Rails
 -  Interstate Highways
 -  US Routes
 -  Major Roads
 -  Local Roads

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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: Rockingham County, New Hampshire
 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: Jun 19, 2020—Sep 20, 2020

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.

Table—Saturated Hydraulic Conductivity (Ksat)

Map unit symbol	Map unit name	Rating (micrometers per second)	Acres in AOI	Percent of AOI
299	Udorthents, smoothed		7.6	45.1%
314A	Pipestone sand, 0 to 5 percent slopes	91.7222	0.8	4.8%
495	Natchaug mucky peat, 0 to 2 percent slopes	9.1000	0.7	4.5%
510B	Hoosic gravelly fine sandy loam, 3 to 8 percent slopes	116.9811	1.4	8.5%
599	Urban land-Hoosic complex, 3 to 15 percent slopes		0.8	4.7%
699	Urban land		5.4	32.4%
Totals for Area of Interest			16.7	100.0%

Rating Options—Saturated Hydraulic Conductivity (Ksat)

Units of Measure: micrometers per second

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Fastest

Interpret Nulls as Zero: No

Layer Options (Horizon Aggregation Method): Depth Range (Weighted Average)

Top Depth: 0

Bottom Depth: 100

Units of Measure: Centimeters

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group

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.

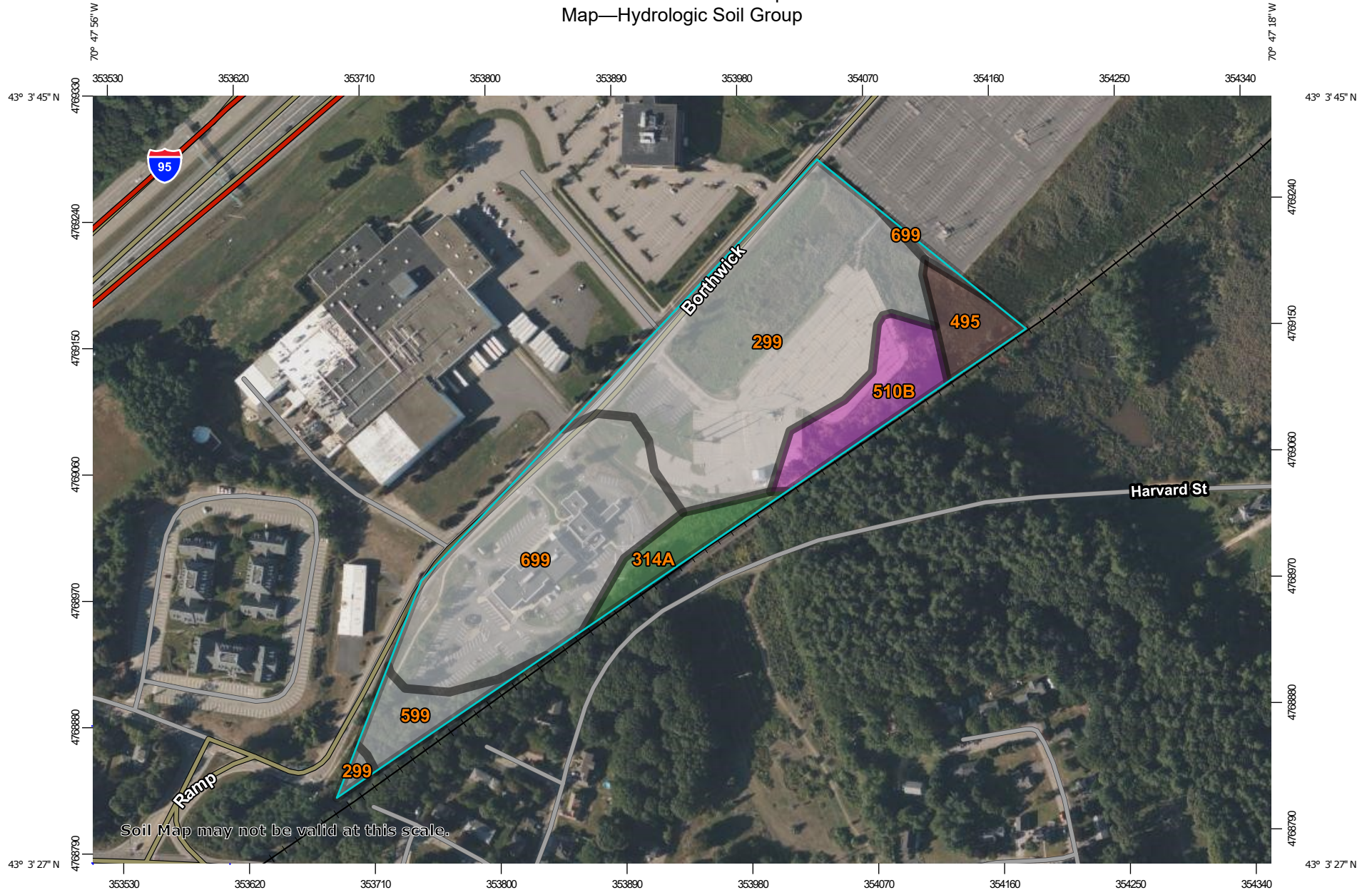
Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

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.

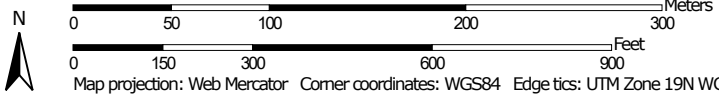
Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over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

Custom Soil Resource Report Map—Hydrologic Soil Group




Map Scale: 1:3,850 if printed on A landscape (11" x 8.5") sheet.



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 1:24,000.

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Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

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Table—Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
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599	Urban land-Hoosic complex, 3 to 15 percent slopes		0.8	4.7%
699	Urban land		5.4	32.4%
Totals for Area of Interest			16.7	100.0%

Rating Options—Hydrologic Soil Group

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

References

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Custom Soil Resource Report

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