TOWN OF EXETER, NEW HAMPSHIRE

10 FRONT STREET • EXETER, NH • 03833-3792 • (603) 778-0591 •FAX 772-4709
www.exeternh.gov

LEGAL NOTICE
EXETER PLANNING BOARD
AGENDA

The Exeter Planning Board will meet on Thursday, November 10, 2022 at 7:00 P.M. in the Nowak Room of the Exeter Town Office building located at 10 Front Street, Exeter, New Hampshire to consider the following:

APPROVAL OF MINUTES: October 27, 2022

NEW BUSINESS: PUBLIC HEARINGS

A request by W. Scott Carlisle III for a compliance hearing on the conditional approval granted by the Planning Board on August 24, 2017 for the proposed subdivision of an existing 10+/- parcel located off of Epping Road into three parcels. The subject property is located in the I-Industrial zoning district. Tax Map Parcel # 40-12. PB Case #17-26.

The application of Jerry & Christine Sterritt for the subdivision of an existing 24.62-acre parcel located at 100 Beech Hill Road into seven (7) residential building lots. The subject property is located in the RU-Rural zoning district. Tax Map Parcel #13-1. PB Case #22-14.

OTHER BUSINESS

- Master Plan Discussion
- Field Modifications
- Bond and/or Letter of Credit Reductions and Releases

EXETER PLANNING BOARD
Langdon J. Plumer, Chairman

Posted 10/28/22: Exeter Town Office and Town of Exeter website

TOWN OF EXETER
PLANNING BOARD
NOWAK ROOM – TOWN OFFICE BUILDING
10 FRONT STREET
OCTOBER 27, 2022
7:00 PM
DRAFT MINUTES

I. PRELIMINARIES:

BOARD MEMBERS PRESENT BY ROLL CALL: Chair Langdon Plumer, Vice-Chair Aaron Brown, Pete Cameron, Clerk, Gwen English, and Nancy Belanger Select Board Representative.

STAFF PRESENT: Town Planner Dave Sharples

II. CALL TO ORDER: Chair Plumer called the meeting to order at 7:00 PM and introduced the members.

III. OLD BUSINESS

APPROVAL OF MINUTES

October 13, 2022

Mr. Cameron and Ms. Belanger recommended edits.

Mr. Cameron motioned to approve the October 13, 2022 meeting minutes as amended. Ms. Belanger seconded the motion. A vote was taken, all were in favor, the motion passed 5-0-0.

IV. NEW BUSINESS

PUBLIC HEARINGS

1. The application of Alex Ross/Ross Engineering, LLC (on behalf of Janine L. Richards) for a lot line adjustment of the common boundary between 14 Hobart Street and 16-18 Hobart Street.
   R-2 Single Family Residential zoning district
   Tax Map Parcel #74-88 and #74-89
   Planning Board Case #22-16

   Chair Plumer read out loud the Public Hearing Notice and asked Mr. Sharples if the case was ready to be heard.

Mr. Sharples noted the applicant is seeking adjustment for .27 acres of lot area to be transferred and combined with the existing .80-acre parcel at 14 Hobart Street. The applicant has submitted a lot line adjustment plan and supporting documents dated October 7, 2022, enclosed. There was no TRC review however materials were reviewed by Code Enforcement Officer Doug Eastman and found to be in compliance with zoning regulations. Monumentation is needed at the common corner between houses on Hobart Street which will be one of two conditions of approval. There are no waivers being requested.

Mr. Cameron motioned to open Planning Board Case #22-16. Ms. Belanger seconded the motion. A vote was taken, all were in favor, the motion passed 5-0-0.

Alex Ross presented the application for a lot line adjustment. He presented the plans and described an odd jog configuration with the existing lots. The line has been shifted north so the barn is contained within the setbacks, almost total conformance.

Chair Plumer opened the hearing to the public for questions and comments are 7:13 PM and being none closed the hearing to the public for deliberations.

Mr. Sharples read out loud the proposed conditions of approval:

1. A dwg file of the plan shall be provided to the Town Planner showing all property lines and monumentation prior to signing the final plans. This plan must be in NAD 1983 State Plane New Hampshire FIPS 2800 Feet coordinates; and

2. All monumentation shall be set in accordance with Section 9.25 of the Site Plan Review and Subdivision Regulations prior to the signing of the final plan.

Mrs. Belanger motioned to approve the request of Alex Ross, Planning Board Case #22-16 for a lot line adjustment with the two conditions read by the Town Planner Dave Sharples. Ms. English seconded the motion. A vote was taken, all were in favor, the motion passed 5-0-0.

V. OTHER BUSINESS

- Fire Substation/Riverwoods

Mr. Cameron recused himself as he is a resident of Riverwoods.

Mr. Sharples indicated he has been working with the Police Chief, Fire Chief, Town Manager, Town Facilities Committee and the Select Board concerning the safety complex deficiencies and the proposal to pursue a substation at Continental Drive. The Select Board met Monday night and while they did not vote are hoping to put it on the Warrant Article in March for the voters. The Town Manager brought to his attention that there was funding in 2008 from Riverwoods for a substation and land placed as a condition of approval. The Town has $150,000 and 20,000 SF of land were to be conveyed to the Town by Riverwoods.

Mr. Sharples reached out to Riverwoods to see if they would agree to allow the Town o utilize the $150,000 for the proposed substation with no transfer of land and he spoke

with the Chief Financial Officer who notified him Riverwoods was agreeable for the Town to use the funds to offset the fire station needs, even if the Warrant Article does not pass.

Vice-Chair Brown indicated that the proposal was a win-win for both parties. Chair Plumer agreed the intent would be best served. Ms. English asked when the proposal was and Mr. Sharples noted it was part of the 2008 approval for the Boulders.

Ms. Belanger motioned to accept the request outlined by the Town Planner to modify the agreement with no further need for Riverwoods to provide land for the substation and $150,000 to offset the cost. Ms. English seconded the motion. A vote was taken, all were in favor, the motion passed 5-0-0.

Mr. Cameron retuned to the meeting at 7:29 PM and questioned the wording of the motion.

Ms. Belanger withdrew her motion and amend it.

Ms. Belanger motioned to modify the Planning Board Condition and agreement so there is no further need for the commitment of Riverwoods to provide land and the $150,000 plus accrued interest tendered to the Town may be utilized by the Town to offset fire station needs. Ms. English seconded the motion. A vote was taken, all were in favor, the motion passed 5-0-0.

- Master Plan Discussion

Mr. Sharples reported the Master Plan Oversight Committee is working on part two of the flood plain ordinance as recommended by Rockingham Planning Commission, in response to SLR, to add one (1') of freeboard required in any new or existing structure with 50% or more improvement plans. Neighboring towns, Portsmouth and Hampton have already amended their ordinance.

Mr. Sharples noted in Exeter while here are some areas that would be affected, most are undeveloped/undevelopable or Conservation lands. There will be a public meeting in November and the first public hearing in January.

- Field Modifications

Mr. Sharples noted no field modifications are requested but wanted to review some issues with a project which are minor such as grading chances to accommodate the height of a retaining wall, number of trees planted (24 planned – 34 planted) and sidewalk width which includes the 6" curbing in contradiction to another plan detail. The easement for the drainage structure had a corner modified.

Mr. Sharples noted this happens on every project, the abutter is okay with them, and he has no issue but wanted to get the Board's thoughts.

Vice-Chair Brown noted that he did not remember discussing sidewalk width but agreed it didn't make sense to spend time on that. He noted abutters are welcome to attend the meeting with any concerns. Mr. Cameron agreed.

Mr. Sharples noted the sidewalk was reduced because of buffer impacts.

- Bond and/or Letter of Credit Reductions and Release

VIII. TOWN PLANNER'S ITEMS

Mr. Sharples announced that a copy of the October 19, 2022 letter to Jay Meyers from Joel Shader was provided concerning the Heritage Commission. Julie Gilman is the representative on that commission.

IX. CHAIRPERSON'S ITEMS

X. PB REPRESENTATIVE'S REPORT ON "OTHER COMMITTEE ACTIVITY"

XI. ADJOURN.

Vice-Chair Brown motioned to adjourn the meeting at 7:50 PM. Ms. Belanger seconded the motion. A vote was taken all were in favor, the motion passed 7-0-0.

Respectfully submitted,

Daniel Hoijer,
Recording Secretary
Via Exeter TV

TOWN OF EXETER

Planning and Building Department

10 FRONT STREET • EXETER, NH • 03833-3792 • (603) 778-0591 •FAX 772-4709

www.exeternh.gov

Date: **November 3, 2022**

To: **Planning Board**

From: **Dave Sharples, Town Planner**

Re: **W. Scott Carlisle III** **PB Case #17-26**

The Applicant applied for subdivision of an 18.41 acre parcel off of the easterly side of Epping Road and adjacent to NH Route 101 (behind the existing Mobil station property and the parcel being developed by Willey Creek for an active adult community). The property is identified as Tax Map Parcel #40-12 and is located in the I-Industrial zoning district.

The Board granted conditional approval of the subdivision at its August 24, 2017 meeting. Subsequently, the Applicant has received several extensions from the Planning Board, as recent as August of this year. Copies of the conditional approval letter, dated August 25, 2017 and the approvals for the extension requests are enclosed for your review.

The Applicant submitted a cover letter and supporting documents dated September 27, 2022 (enclosed) and appeared before the Board at the October 13th meeting. At the meeting, the Board took public comment on the request then closed the hearing to any further public comment and tabled the item until the November 10, 2022 meeting.

I did receive materials from Attorney Hilson, representing CKT & Associates on October 28, 2022 via email. Mr. Hilson was present at the meeting where the Board closed the public hearing. Before closing the public hearing, Mr. Brown, the Vice Chair, explained what that meant and asked those present to say anything else they needed to say before the hearing was closed. No one else from the public spoke after Mr. Brown's remarks.

Subsequent to Mr. Hilson's submittal, Mr. Hilliard, representing the applicant, provided a letter dated November 1, 2022. Mr. Hilson and Mr. Hilliard were informed that I would not be sending this material to the Planning Board as the public hearing is closed. The Board may choose to reopen the public hearing and accept the materials but I will not provide them to the Board unless directed to do so.

At the meeting, Mr. Hilson claimed that his client paid for the Cammett Plans. I said that the applicant initially paid for them but was reimbursed by the Town. Mr. Hillson disputed this fact. I have attached a copy of the TIF road agreement that specifically included the design of the portion of the road in question, and that was a reimbursable expense.

Planning Board Motion:

Compliance Hearing for Review of Condition of Approval motion: I move that condition of approval # 2 as stated in the August 25, 2017, decision letter regarding W. Scott Carlisle III (PB Case #17-26) HAS BEEN SATISFIED AND THE BOARD MAKES THE FOLLOWING FINDINGS OF FACT/HAS NOT BEEN SATISFIED FOR THE FOLLOWING REASONS.

If the Board finds the condition satisfied or denies final approval, then I would suggest the Board make findings of fact as to why the Board came to this conclusion.

Thank You.

Enclosures

TOWN OF EXETER, NEW HAMPSHIRE

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August 26, 2022

W. Scott Carlisle, III
14 Cass Street
Exeter, New Hampshire 03833

Re: PB Case #17-26 W. Scott Carlisle, III
Minor Subdivision - Property off of Epping Road, Exeter, N.H
Tax Map Parcel #40-12

Dear Mr. Carlisle:

Please be advised that at the meeting of August 25th, 2022, the Exeter Planning Board voted to **APPROVE** a one-year extension of the conditional approval granted by the Planning Board on August 24th, 2017 for the above-captioned. This conditional approval will now be valid through August 24th, 2023.

Please feel free to contact the Planning Department at 773-6114 with any questions.

Sincerely,

Dave Sharples
Town Planner
(on behalf of the Planning Board Chairman)

cc: Russell F. Hilliard, Esquire, Upton & Hatfield, LLP
Barry W. Gier, P.E., Vice President, Jones & Beach Engineers, Inc.
Douglas Eastman, Building Inspector/Code Enforcement Officer
Janet Whitten, Deputy Assessor

DS:bsm

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TOWN OF EXETER, NEW HAMPSHIRE

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www.exeternh.gov

August 27, 2021

W. Scott Carlisle, III
14 Cass Street
Exeter, New Hampshire 03833

Re: PB Case #17-26 W. Scott Carlisle, III
Minor Subdivision - Property off of Epping Road, Exeter, N.H
Tax Map Parcel #40-12

Dear Mr. Carlisle:

Please be advised that at the meeting of August 26th, 2021, the Exeter Planning Board voted to **APPROVE** a one-year extension of the conditional approval granted by the Planning Board on August 24th, 2017 for the above-captioned. This conditional approval will now be valid through August 24th, 2022.

Please feel free to contact the Planning Department at 773-6114 with any questions.

Sincerely,

Dave Sharples
Town Planner
(on behalf of the Planning Board Chairman)

cc: Barry W. Gier, P.E., Vice President, Jones & Beach Engineers, Inc.
Douglas Eastman, Building Inspector/Code Enforcement Officer
Janet Whitten, Deputy Assessor

DS:bsm

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TOWN OF EXETER, NEW HAMPSHIRE

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www.exeternh.gov

September 11, 2020

W. Scott Carlisle, III
14 Cass Street
Exeter, New Hampshire 03833

Re: PB Case #17-26 W. Scott Carlisle, III
Minor Subdivision - Property off of Epping Road, Exeter, N.H
Tax Map Parcel #40-12

Dear Mr. Carlisle:

Please be advised that at the meeting of September 10th, the Exeter Planning Board voted to **APPROVE** a one-year extension of the conditional approval granted by the Planning Board on August 24th, 2017 for the above-captioned. This conditional approval will now be valid through August 24th, 2021.

Please feel free to contact the Planning Department at 773-6114 with any questions.

Sincerely,

Dave Sharples
Town Planner
(on behalf of the Planning Board Chairman)

cc: Jonathan S. Ring, P. E., Jones & Beach Engineers, Inc.
Douglas Eastman, Building Inspector/Code Enforcement Officer
Janet Whitten, Deputy Assessor

DS:bsm

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TOWN OF EXETER, NEW HAMPSHIRE

10 FRONT STREET • EXETER, NH • 03833-3792 • (603) 778-0591 •FAX 772-4709
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August 26, 2019

W. Scott Carlisle, III
14 Cass Street
Exeter, New Hampshire 03833

Re: PB Case #17-26 W. Scott Carlisle, III
Minor Subdivision - Property off of Epping Road, Exeter, N.H
Tax Map Parcel #40-12

Dear Mr. Carlisle:

Please be advised that at the meeting of August 22nd, 2019, the Exeter Planning Board voted to **APPROVE** a one-year extension of the conditional approval granted by the Planning Board on August 24th, 2017 for the above-captioned. This conditional approval will now be valid through August 24th, 2020.

Please feel free to contact the Planning Department at 773-6114 with any questions.

Sincerely,

Langdon J. Plumer
Chairman
Exeter Planning Board

cc: Jonathan S. Ring, P. E., Jones & Beach Engineers, Inc.
Douglas Eastman, Building Inspector/Code Enforcement Officer
Janet Whitten, Deputy Assessor

LJP:bsm

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TOWN OF EXETER, NEW HAMPSHIRE

10 FRONT STREET • EXETER, NH • 03833-3792 • (603) 778-0591 •FAX 772-4709
www.exeternh.gov

August 10, 2018

W. Scott Carlisle, III
14 Cass Street
Exeter, New Hampshire 03833

Re: PB Case #17-26 W. Scott Carlisle, III
Minor Subdivision - Property off of Epping Road, Exeter, N.H
Tax Map Parcel #40-12

Dear Mr. Carlisle:

Please be advised that at the meeting of August 9th, 2018, the Exeter Planning Board voted to **APPROVE** a one-year extension of the conditional approval granted by the Planning Board on August 24th, 2017 for the above-captioned. This conditional approval will now be valid through August 24th, 2019.

Please feel free to contact the Planning Department at 773-6114 with any questions.

Sincerely,

Langdon J. Plumer
Chairman
Exeter Planning Board

cc: Jonathan S. Ring, P. E., Jones & Beach Engineers, Inc.
Douglas Eastman, Building Inspector/Code Enforcement Officer
Janet Whitten, Deputy Assessor

LJP:bsm

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TOWN OF EXETER, NEW HAMPSHIRE

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www.exeternh.gov

August 25, 2017

W. Scott Carlisle, III
14 Cass Street
Exeter, New Hampshire 03833

Re: PB Case #17-26 W. Scott Carlisle, III
Minor Subdivision - Property off of Epping Road, Exeter, N.H
Tax Map Parcel #40-12

Dear Mr. Carlisle:

Please be advised that at the meeting of August 24th, 2017, the Exeter Planning Board voted to **APPROVE** the above-captioned application for a minor subdivision, as presented, subject to the following conditions:

1. A dwg file of the subdivision plan shall be provided to the Town Planner showing all property lines and monumentation prior to signing the final plans;
2. This approval shall not be final until the applicant presents to the Board, and the Board and its engineers approve, a design for both the un-built portion of the so-called TIF road to the applicant's property, and the roadway and cul-de-sac within the property;
3. The potential discrepancy regarding the location of the common boundary line between the subject parcel and the abutting parcel (Tax Map 47 Lot 8) shall be resolved between the property owners; and,
4. These conditions shall be met prior to recording the subdivision plan.

The Board also approved the following waivers from the Site Plan Review and Subdivision Regulations in conjunction with the minor subdivision plan:

- Section 7.4.7 – Natural Features for significant trees - 16" diameter (caliper) or greater
- Section 7.5.4 – High Intensity Soil Survey (HISS) information

Both of the above waivers shall be specific to this subdivision application and shall not apply to any subsequent application submitted for the property.

Please feel free to contact the Planning Department at 773-6114 with any questions.

Sincerely,

Langdon J. Plumer
Chairman
Exeter Planning Board

cc: Jonathan S. Ring, P.E., President, Jones & Beach Engineers, Inc.
Douglas Eastman, Building Inspector/Code Enforcement Officer

LJP:bsm

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JONES&BEACH
ENGINEERS INC.
85 Portsmouth Avenue, PO Box 219, Stratham, NH 03885
603.772.4746 - JonesandBeach.com

September 26, 2022

Exeter Planning Board
Attn. Langdon Plumer, Chair
10 Front Street
Exeter, NH 03833

RE: Conditions of Approval
PB Case # 17-26, W. Scott Carlisle, III
Minor Subdivision – Property off Epping Road, Exeter, NH
Tax Map 40, Lot 12
JBE Project No. 15098

Dear Mr. Plumer,

We are in receipt of the conditions of approval dated August 25, 2017. The applicant hereby requests a Public Hearing as required in condition #2 to allow the Planning Board to review the design for the "TIF road" portion of the project. Review comments are listed below with our responses in bold.

1. *A dwg file of the subdivision plan shall be provided to the Town Planner showing all property lines and monumentation prior to signing the final plans.*
RESPONSE: A dwg file of the subdivision plan will be provided to the Town Planner showing all property lines and monumentation upon the successful conclusion of the public hearing.

2. *This approval shall not be final until the applicant presents to the Board, and the Board and its engineers approve, a design for both the un-built portion of the so-called TIF road to the applicant's property, and the roadway and cul-de-sac within the property.*
RESPONSE: The design for the unbuilt portion of the TIF Road, "Ray Farmstread Road", is included with this submittal. Additionally, e-mail correspondence from Exeter DPW indicating that the road design is acceptable has been included with this submittal.

3. *The potential discrepancy regarding the location of the common boundary line between the subject parcel and the abutting parcel (Tax Map 4 7 Lot 8) shall be resolved between the property owners.*
RESPONSE: The potential discrepancy regarding the location of the common boundary line between the subject parcel and the abutting parcel has been resolved. The applicant has elected to depict a Lot Line Adjustment granting the area in contention to the abutting parcel. The area to be transferred to Lot 8 is depicted as Parcel "1" on sheet A1, attached.

4. *These conditions shall be met prior to recording the subdivision plan.*
RESPONSE: All conditions have been met and the mylar will be submitted for recording upon the successful conclusion of the public hearing.

The Board also approved the following waivers from the Site Plan Review and Subdivision Regulations in conjunction with the minor subdivision plan:

- *Section 7.4.7 - Natural Features for significant trees - 16" diameter (caliper) or greater*
- *Section 7.5.4 - High Intensity Soil Survey (HISS) information.*

Included with this response letter are the following:

1. Seven (7) Full Size Plan Sets.
2. Fifteen (15) Half Size Plan Sets.
3. Correspondence with Exeter DPW, Jenn Mates.
4. Abutters list with three (3) sets of mailing labels.
5. Tax Map
6. Notification fee

Thank you very much for your time.

Very truly yours,
JONES & BEACH ENGINEERS, INC.

Barry W. Gier

Barry Gier, P.E.
Vice President

cc: Scott Carlisle (via email)

Jonathan Ring

Subject: FW: JBE 15098 - Carlisle TIF Road Design Documents, off Epping Road, Exeter

From: Jennifer Mates <jmates@exeternh.gov>
Sent: Thursday, July 23, 2020 11:39 AM
To: Jonathan Ring <jring@Jonesandbeach.com>
Cc: David Sharples (dsharples@exeternh.gov) <dsharples@exeternh.gov>; Darren Winham <dwinham@exeternh.gov>; wsc3@comcast.net; Russell F. Hilliard <rhilliard@uptonhatfield.com>; Barbara McEvoy <bmcevoy@exeternh.gov>; Holly Ripley <HRipley@jonesandbeach.com>; Stefanie Michaud <smichaud@jonesandbeach.com>; Barry Gier <bgier@jonesandbeach.com>; Paul Vlasich <pvlasich@exeternh.gov>
Subject: Re: JBE 15098 - Carlisle TIF Road Design Documents, off Epping Road, Exeter

Hi Jon,

I understand that the utilities (including transformers, telephone pedestals, etc.) will all be part of the final design for each lot and may need to be modified. The same goes for the grading around the cul-de-sac when the driveway locations are added to the plans. From our discussion this week, I understand that the construction notes and details used for the road on the plans prepared by Cammett Engineering will be used for the cul-de-sac. The timing of the road construction is still to be determined.

DPW has no other comments on the proposed road layout. These plans are acceptable for final approval.

Thanks,
Jen

Jennifer Mates, P.E.
Assistant Town Engineer
Public Works Department
13 Newfields Road
Exeter, NH 03833
(603) 418-6431
jmates@exeternh.gov

On Tue, Jul 14, 2020 at 2:21 PM Jonathan Ring <jring@jonesandbeach.com> wrote:

Dear Jen,

I thank you very much for speaking with me this fine day. As you requested, I attach the documents that we had submitted to the Exeter Planning Department and Public Works last June 28, 2019. Below my current email message, you will see the original electronic email submission of these documents to the Town on 6/28/19. To date, I do not believe that I have seen any review materials relating to these plans.

Please see the attached Cover Letter from me, Planning Board Approval Letter (dated 8/25/17) of our Subdivision with conditions, our Design Plan Set, and Cammett Engineers reference plans for the TIF Road up to the Carlisle property line.

ABUTTERS LIST (DIRECT)
AS OF
SEPTEMBER 23, 2022
FOR
CARLISLE SITE PLAN
OFF EPPING ROAD, EXETER, NH
JBE PROJECT No. 15098

OWNER OF RECORD/APPLICANT:

TAX MAP 40/ LOT 12 - SUBJECT PROPERTY
TAX MAP 40/ LOT 15 - ABUTTING PROPERTY
W. SCOTT CARLISLE III
14 CASS ST.
EXETER, NH 03833
BK 4244 / PG 1653

ABUTTERS:

40/8
40/14
STATE OF NEW HAMPSHIRE
PO BOX 483
CONCORD, NH 03302
2992/896 – LOT 8
2368/1332 – LOT 14

40/11
NET LEASE REALTY I INC.
ATTN. INGRID IRVIN
450 S ORANGE AVE., SUITE 900
ORLANDO, FL 32801
5731/1874 (06/24/16)

40/13
TOWN OF EXETER
CONSERVATION COMMISSION
10 FRONT ST.
EXETER, NH 03833
3667/2469 (11/02/01)

47/8
RAY FARM CONDOMINIUM ASSOCIATION
ATTN. WILLIAM BRACKET, PRESIDENT
158 SHATTUCK WAY
NEWINGTON, NH 03801
5912/0132

47/8
RAY FARM CONDOMINIUM ASSOCIATION
ATTN. JONATHAN SHAFTMASTER, VICE PRESIDENT
158 SHATTUCK WAY
NEWINGTON, NH 03801
5912/0132

47/8.1
47/9
CKT ASSOCIATES
158 SHATTUCK WAY
NEWINGTON, NH 03801
3231/2722

ENGINEERS/SURVEYORS:

JONES & BEACH ENGINEERS, INC.
ATTN: BARRY GIER, P.E.
PO BOX 219
STRATHAM, NH 03885

WETLAND CONSULTANT:

GOVE ENVIRONMENTAL SERVICES, INC.
ATTN. JAMES GOVE
8 CONTINENTAL DRIVE, UNIT H
EXETER, NH 03833-7507

W. SCOTT CARLISLE III
14 CASS ST.
EXETER, NH 03833

STATE OF NEW HAMPSHIRE
PO BOX 483
CONCORD, NH 03302

NET LEASE REALTY I INC.
ATTN. INGRID IRVIN
450 S ORANGE AVE., SUITE 900
ORLANDO, FL 32801

TOWN OF EXETER
CONSERVATION COMMISSION
10 FRONT ST.
EXETER, NH 03833

RAY FARM CONDOMINIUM ASSOCIATION
ATTN. WILLIAM BRACKET, PRESIDENT
158 SHATTUCK WAY
NEWINGTON, NH 03801

RAY FARM CONDOMINIUM ASSOCIATION
ATTN. JONATHAN SHAFTMASTER, VICE PRESIDENT
158 SHATTUCK WAY
NEWINGTON, NH 03801

CKT ASSOCIATES
158 SHATTUCK WAY
NEWINGTON, NH 03801

JONES & BEACH ENGINEERS, INC.
ATTN: BARRY GIER, PE
PO BOX 219
STRATHAM, NH 03885

GOVE ENVIRONMENTAL SERVICES, INC.
ATTN. JAMES GOVE
8 CONTINENTAL DRIVE, UNIT H
EXETER, NH 03833-7507

W. SCOTT CARLISLE III
14 CASS ST.
EXETER, NH 03833

STATE OF NEW HAMPSHIRE
PO BOX 483
CONCORD, NH 03302

NET LEASE REALTY I INC.
ATTN. INGRID IRVIN
450 S ORANGE AVE., SUITE 900
ORLANDO, FL 32801

TOWN OF EXETER
CONSERVATION COMMISSION
10 FRONT ST.
EXETER, NH 03833

RAY FARM CONDOMINIUM ASSOCIATION
ATTN. WILLIAM BRACKET, PRESIDENT
158 SHATTUCK WAY
NEWINGTON, NH 03801

RAY FARM CONDOMINIUM ASSOCIATION
ATTN. JONATHAN SHAFTMASTER, VICE PRESIDENT
158 SHATTUCK WAY
NEWINGTON, NH 03801

CKT ASSOCIATES
158 SHATTUCK WAY
NEWINGTON, NH 03801

JONES & BEACH ENGINEERS, INC.
ATTN: BARRY GIER, PE
PO BOX 219
STRATHAM, NH 03885

GOVE ENVIRONMENTAL SERVICES, INC.
ATTN. JAMES GOVE
8 CONTINENTAL DRIVE, UNIT H
EXETER, NH 03833-7507

W. SCOTT CARLISLE III
14 CASS ST.
EXETER, NH 03833

STATE OF NEW HAMPSHIRE
PO BOX 483
CONCORD, NH 03302

NET LEASE REALTY I INC.
ATTN. INGRID IRVIN
450 S ORANGE AVE., SUITE 900
ORLANDO, FL 32801

TOWN OF EXETER
CONSERVATION COMMISSION
10 FRONT ST.
EXETER, NH 03833

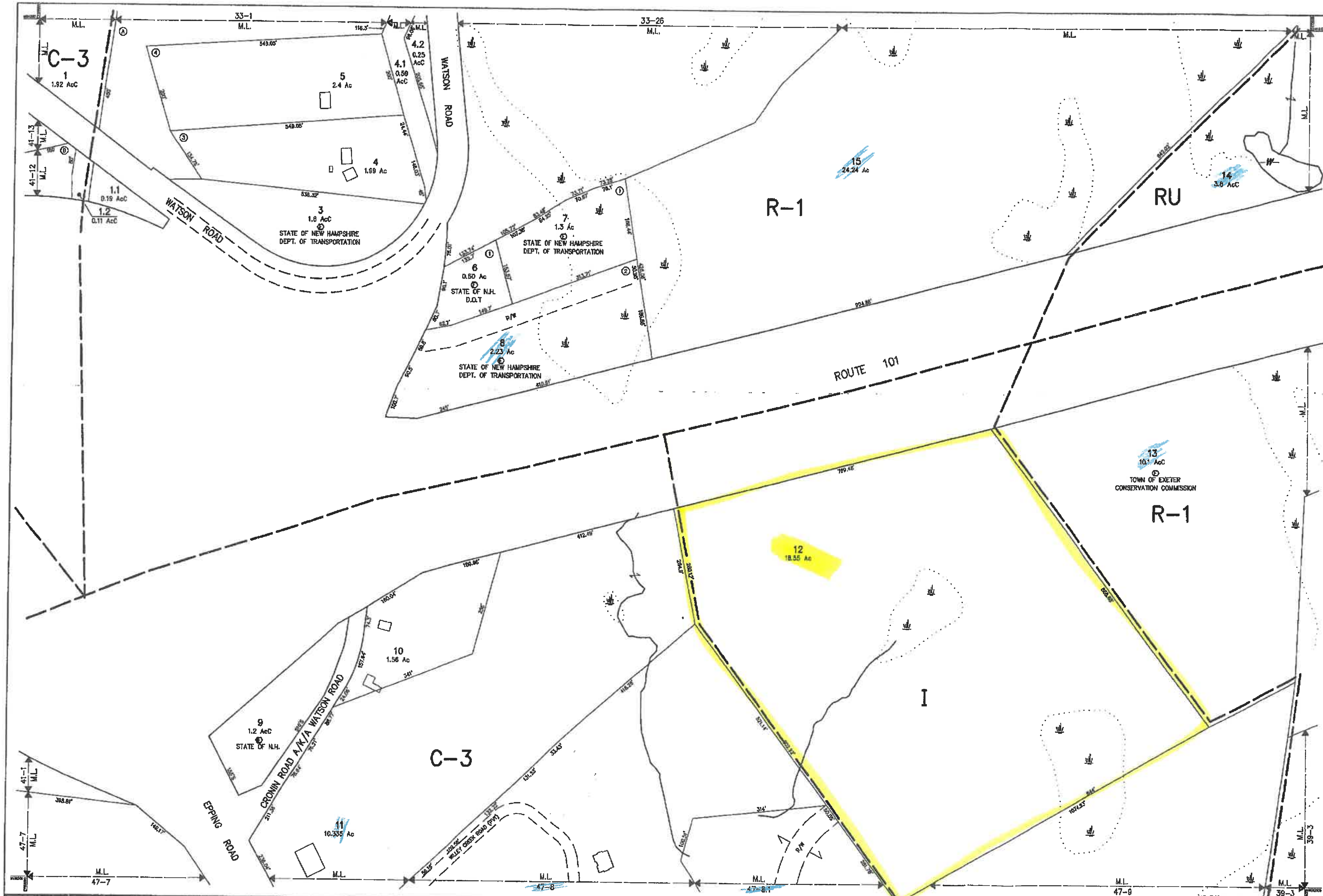
RAY FARM CONDOMINIUM ASSOCIATION
ATTN. WILLIAM BRACKET, PRESIDENT
158 SHATTUCK WAY
NEWINGTON, NH 03801

RAY FARM CONDOMINIUM ASSOCIATION
ATTN. JONATHAN SHAFTMASTER, VICE PRESIDENT
158 SHATTUCK WAY
NEWINGTON, NH 03801

CKT ASSOCIATES
158 SHATTUCK WAY
NEWINGTON, NH 03801

JONES & BEACH ENGINEERS, INC.
ATTN: BARRY GIER, PE
PO BOX 219
STRATHAM, NH 03885

GOVE ENVIRONMENTAL SERVICES, INC.
ATTN. JAMES GOVE
8 CONTINENTAL DRIVE, UNIT H
EXETER, NH 03833-7507



THIS MAP IS FOR ASSESSMENT PURPOSES. IT IS NOT VALID FOR LEGAL DESCRIPTION OR CONVEYANCE.		
THE HORIZONTAL DATUM IS THE NEW HAMPSHIRE STATE PLANE COORDINATE SYSTEM.		
PHOTOGRAPHY DATE:	APRIL 25, 1995	
COMPLETION DATE:	MARCH 29, 1996	

PRODUCED IN 1996 BY
CAI Technologies
11 PLEASANT STREET, LITTLETON, NH 03561
800.322.4540 • WWW.CAI-TECH.COM

LEGEND

AREA SURVEYED	Ac
AREA CALCULATED	AcC
RECORD DIMENSION	100'
SCALED DIMENSION	100'S
MATCH LINE	M.L.
WATER	W
EXEMPT PROPERTY	E
SUBDIVISION LOT NO.	2
ZONE LIMIT	
RIGHT OF WAY	R/W
COMMON OWNERSHIP	
BUILDING	
WETLANDS	

SCALE 1" = 100'
FEET 50 0 100 200 300
METERS 25 0 25 50 75

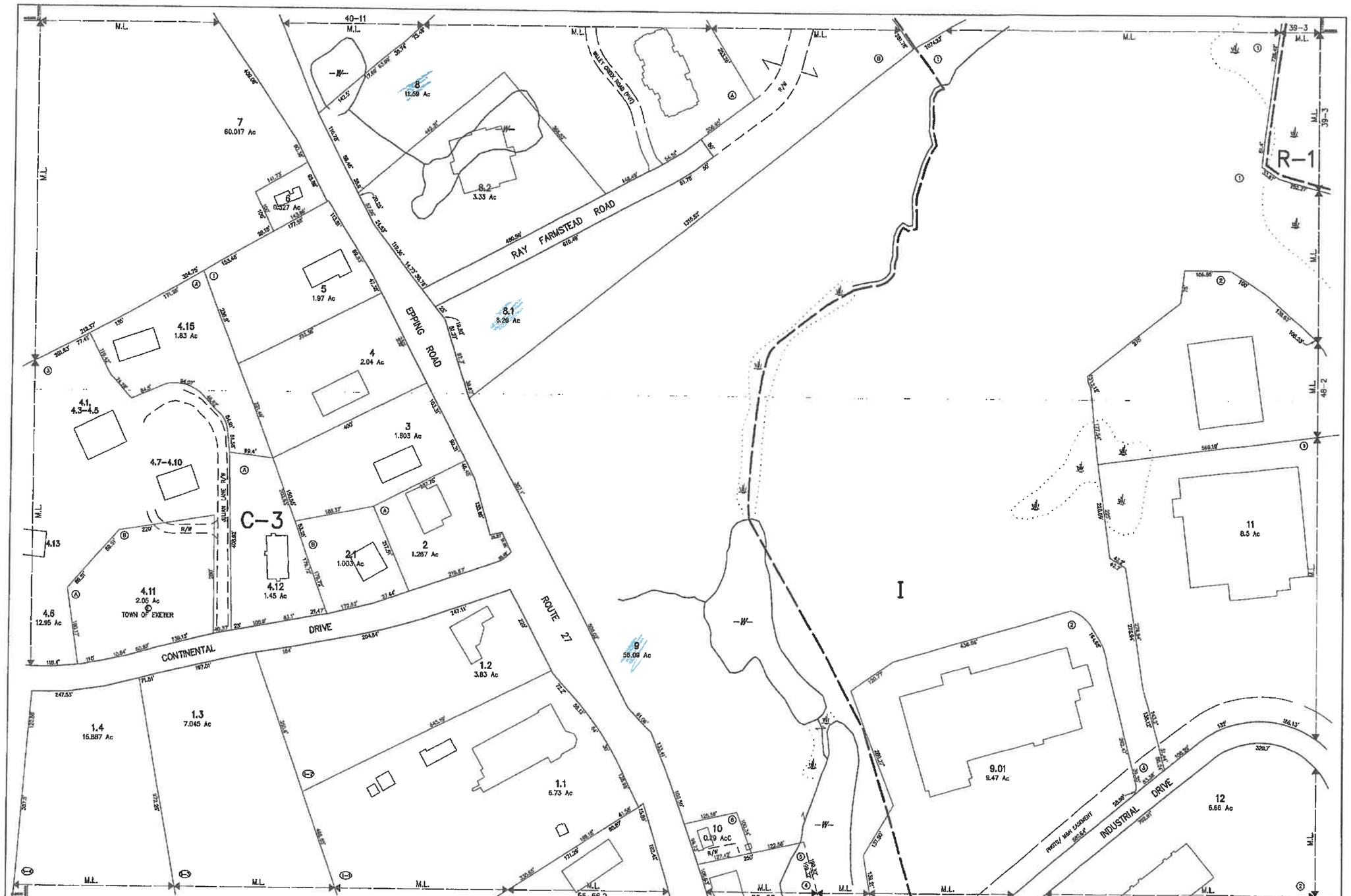
REVISED TO: APRIL 1, 2021

PROPERTY MAPS
EXETER
NEW HAMPSHIRE

INDEX DIAGRAM

32	33	34
41		39
46	47	48

MAP NO.
40



THIS MAP IS FOR ASSESSMENT PURPOSES. IT IS NOT VALID FOR LEGAL DESCRIPTION OR CONVEYANCE.

THE HORIZONTAL DATUM IS THE NEW HAMPSHIRE STATE PLANE COORDINATE SYSTEM.

PHOTOGRAPHY DATE: APRIL 25, 1995

COMPLETION DATE: MARCH 29, 1996

PRODUCED IN 1996 BY

CAI Technologies

11 PLEASANT STREET LITTLETON, NH 03561
603.323.4549 - WWW.CAI-TECH.COM

LEGEND

AREA SURVEYED . . . . . Ac
AREA CALCULATED . . . . . AcC
RECORD DIMENSION . . . . . 100'
SCALED DIMENSION . . . . . 100'±
MATCH LINE . . . . . M.L.
WATER

EXEMPT PROPERTY . . . . . E
SUBDIVISION LOT NO. 2
ZONE LINE . . . . .
RIGHT OF WAY . . . . . R/W
COMMON OWNERSHIP . . . . .
BUILDING . . . . .
WETLANDS . . . . .

FEET 50 0 100 200 300
METERS 25 0 25 50 75

SCALE 1" = 100'

REVISED TO : APRIL 1, 2021

PROPERTY MAPS

EXETER

NEW HAMPSHIRE

INDEX DIAGRAM

41	40	39
46		48
56	55	54

64

MAP NO. 47

PLAN REFERENCES

1. "PLAT OF LAND EXETER, N.H. FOR W. SCOTT CARLISLE, III," BY DURGIN-SCHOFIELD ASSOCIATES, DATED FEBRUARY 23, 1989, RECORDED AT RCRD AS PLAN D-19078.
2. "PLAT OF LAND EXETER, N.H. FOR W. SCOTT CARLISLE, III," BY DURGIN-SCHOFIELD ASSOCIATES, DATED APRIL 26, 1988, RECORDED AT RCRD AS PLAN D-17892.
3. "A SURVEY AND LAYOUT OF A RIGHT-OF-WAY SEE NOTE #7 PREPARED FOR W. SCOTT CARLISLE III AND SITUATED IN THE TOWN OF EXETER. N.H.," DATED MARCH 17, 2003, PREPARED BY RSL LAYOUT & DESIGN, INC., RECORDED AT RCRD AS PLAN D-30523.
4. "SUBDIVISION PLAN OF LAND WATSON BROOK WOOD CO. EXETER, NH", PREPARED BY HOLDEN ENGINEERING & SURVEYING, INC., DATED DECEMBER 24, 1986. RECORDED AT THE RCRD AS PLAN D-16287.
5. "PLAN OF LAND ASSESSORS MAP 40 LOT 11 PREPARED FOR ALLIANCE ENERGY", PREPARED BY MHF DESIGN CONSULTANTS, INC, DATED MAY 14, 2012, RECORDED AT THE RCRD AS PLAN D-37224.
6. "PLANS OF PROPOSED F.A.P. PROJECT NO. F018-2(8) NH PROJECT NO P-3380 SOUTH SIDE ROAD", DATED JUNE 1, 1959.
7. "MINOR SUBDIVISION PLAN FOR RAY FARM ACTIVE ADULT COMMUNITY", PREPARED BY CAMMETT ENGINEERING, DATED MAY 8, 2017, AS LAST REVISED, AND TO BE RECORDED.

LEGEND

EXISTING	PROPOSED	DESCRIPTION
		PROPERTY LINES
o		IRON PIPE/IRON ROD
		DRILL HOLE FOUND
⊡		BOUND FOUND
—o—o—		ROW FENCE POST
		TREE W/ WIRE
		STUMPS W/ WIRE
—100—		MAJOR CONTOUR
— 98 —		MINOR CONTOUR
— · · —		FRESHWATER WETLANDS LINE
	●	IRON ROD/DRILL HOLE
	■	STONE/GRANITE BOUND
x□x		FENCE POST

ABUTTERS

TAX MAP 40 LOT 13
TOWN OF EXETER CONSERVATION COMMISSION
10 FRONT STREET
EXETER, NH 03833
BK: 3667 PG: 2469

TAX MAP 40 LOT 14
STATE OF NEW HAMPSHIRE
PO BOX 483
CONCORD, NH 03302
BK: 2368 PG: 1332

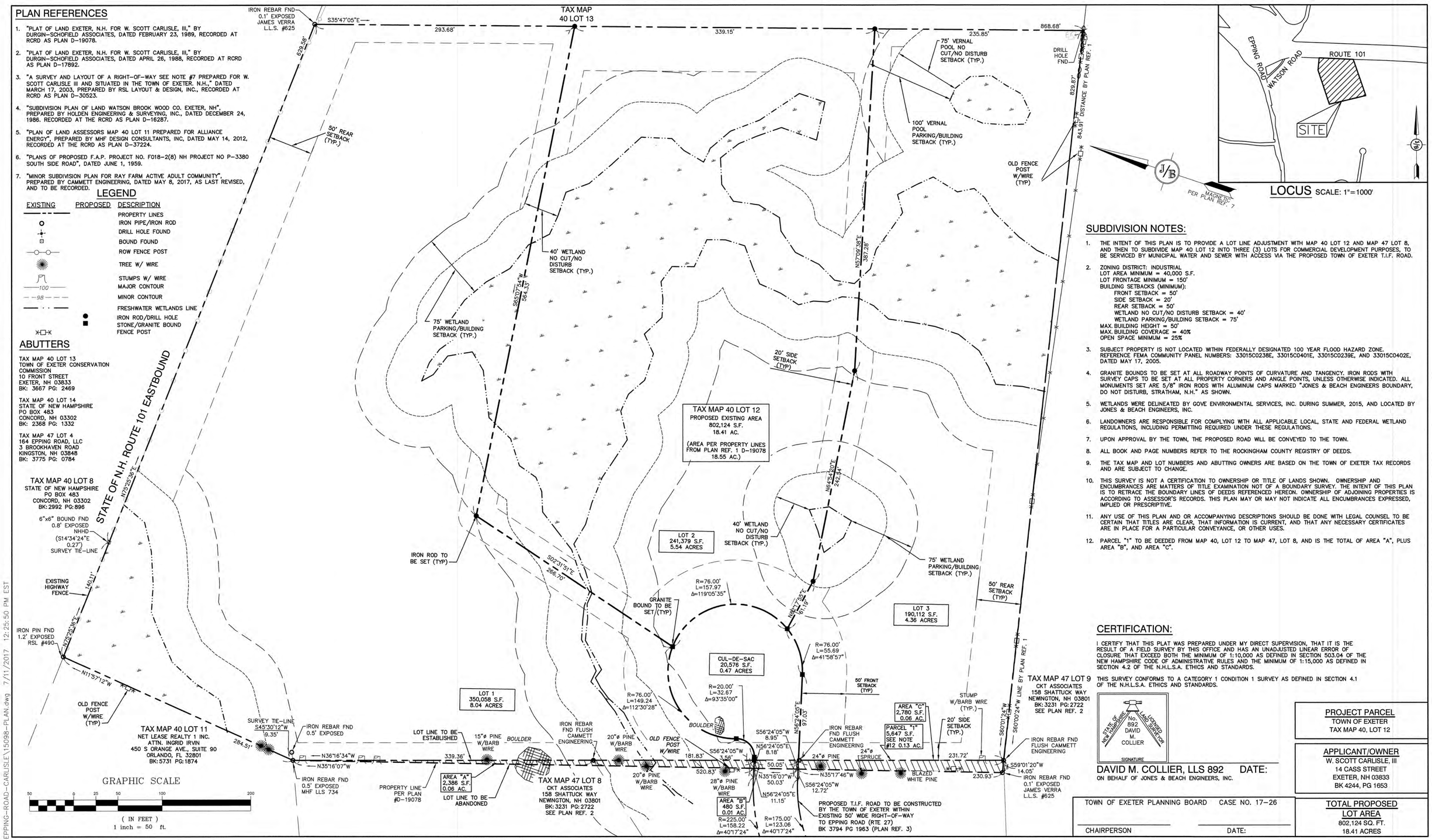
TAX MAP 47 LOT 4
164 EPPING ROAD, LLC
3 BROOKHAVEN ROAD
KINGSTON, NH 03848
BK: 3775 PG: 0784

TAX MAP 40 LOT 8
STATE OF NEW HAMPSHIRE
PO BOX 483
CONCORD, NH 03302
BK: 2992 PG: 896

TAX MAP 40 LOT 11
NET LEASE REALTY 1 INC.
ATTN. INGRID IRVIN
450 S ORANGE AVE., SUITE 90
ORLANDO, FL 32801
BK: 5731 PG: 1874

TAX MAP 47 LOT 8
CKT ASSOCIATES
158 SHATTUCK WAY
NEWINGTON, NH 03801
BK: 3231 PG: 2722
SEE PLAN REF. 2

TAX MAP 47 LOT 9
CKT ASSOCIATES
158 SHATTUCK WAY
NEWINGTON, NH 03801
BK: 3231 PG: 2722
SEE PLAN REF. 2



LOCUS SCALE: 1"=1000'

SUBDIVISION NOTES:

1. THE INTENT OF THIS PLAN IS TO PROVIDE A LOT LINE ADJUSTMENT WITH MAP 40 LOT 12 AND MAP 47 LOT 8, AND THEN TO SUBDIVIDE MAP 40 LOT 12 INTO THREE (3) LOTS FOR COMMERCIAL DEVELOPMENT PURPOSES, TO BE SERVICED BY MUNICIPAL WATER AND SEWER WITH ACCESS VIA THE PROPOSED TOWN OF EXETER T.I.F. ROAD.
2. ZONING DISTRICT: INDUSTRIAL
   LOT AREA MINIMUM = 40,000 S.F.
   LOT FRONTAGE MINIMUM = 150'
   BUILDING SETBACKS (MINIMUM):
   FRONT SETBACK = 50'
   SIDE SETBACK = 20'
   REAR SETBACK = 50'
   WETLAND NO CUT/NO DISTURB SETBACK = 40'
   WETLAND PARKING/BUILDING SETBACK = 75'
   MAX. BUILDING HEIGHT = 50'
   MAX. BUILDING COVERAGE = 40%
   OPEN SPACE MINIMUM = 25%
3. SUBJECT PROPERTY IS NOT LOCATED WITHIN FEDERALLY DESIGNATED 100 YEAR FLOOD HAZARD ZONE. REFERENCE FEMA COMMUNITY PANEL NUMBERS: 33015C0238E, 33015C0401E, 33015C0239E, AND 33015C0402E, DATED MAY 17, 2005.
4. GRANITE BOUNDS TO BE SET AT ALL ROADWAY POINTS OF CURVATURE AND TANGENCY. IRON RODS WITH SURVEY CAPS TO BE SET AT ALL PROPERTY CORNERS AND ANGLE POINTS, UNLESS OTHERWISE INDICATED. ALL MONUMENTS SET ARE 5/8" IRON RODS WITH ALUMINUM CAPS MARKED "JONES & BEACH ENGINEERS BOUNDARY, DO NOT DISTURB, STRATHAM, N.H." AS SHOWN.
5. WETLANDS WERE DELINEATED BY GOVE ENVIRONMENTAL SERVICES, INC. DURING SUMMER, 2015, AND LOCATED BY JONES & BEACH ENGINEERS, INC.
6. LANDOWNERS ARE RESPONSIBLE FOR COMPLYING WITH ALL APPLICABLE LOCAL, STATE AND FEDERAL WETLAND REGULATIONS, INCLUDING PERMITTING REQUIRED UNDER THESE REGULATIONS.
7. UPON APPROVAL BY THE TOWN, THE PROPOSED ROAD WILL BE CONVEYED TO THE TOWN.
8. ALL BOOK AND PAGE NUMBERS REFER TO THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
9. THE TAX MAP AND LOT NUMBERS AND ABUTTING OWNERS ARE BASED ON THE TOWN OF EXETER TAX RECORDS AND ARE SUBJECT TO CHANGE.
10. THIS SURVEY IS NOT A CERTIFICATION TO OWNERSHIP OR TITLE OF LANDS SHOWN. OWNERSHIP AND ENCUMBRANCES ARE MATTERS OF TITLE EXAMINATION NOT OF A BOUNDARY SURVEY. THE INTENT OF THIS PLAN IS TO RETRACE THE BOUNDARY LINES OF DEEDS REFERENCED HEREON. OWNERSHIP OF ADJOINING PROPERTIES IS ACCORDING TO ASSESSOR'S RECORDS. THIS PLAN MAY OR MAY NOT INDICATE ALL ENCUMBRANCES EXPRESSED, IMPLIED OR PRESCRIPTIVE.
11. ANY USE OF THIS PLAN AND OR ACCOMPANYING DESCRIPTIONS SHOULD BE DONE WITH LEGAL COUNSEL TO BE CERTAIN THAT TITLES ARE CLEAR, THAT INFORMATION IS CURRENT, AND THAT ANY NECESSARY CERTIFICATES ARE IN PLACE FOR A PARTICULAR CONVEYANCE, OR OTHER USES.
12. PARCEL "1" TO BE DEEDED FROM MAP 40, LOT 12 TO MAP 47, LOT 8, AND IS THE TOTAL OF AREA "A", PLUS AREA "B", AND AREA "c".

CERTIFICATION:

I CERTIFY THAT THIS PLAT WAS PREPARED UNDER MY DIRECT SUPERVISION, THAT IT IS THE RESULT OF A FIELD SURVEY BY THIS OFFICE AND HAS AN UNADJUSTED LINEAR ERROR OF CLOSURE THAT EXCEED BOTH THE MINIMUM OF 1:10,000 AS DEFINED IN SECTION 503.04 OF THE NEW HAMPSHIRE CODE OF ADMINISTRATIVE RULES AND THE MINIMUM OF 1:15,000 AS DEFINED IN SECTION 4.2 OF THE N.H.L.S.A. ETHICS AND STANDARDS.

THIS SURVEY CONFORMS TO A CATEGORY 1 CONDITION 1 SURVEY AS DEFINED IN SECTION 4.1 OF THE N.H.L.S.A. ETHICS AND STANDARDS.

STATE OF NEW HAMPSHIRE — No. 892 — DAVID M. COLLIER — LICENSED LAND SURVEYOR — SIGNATURE

DAVID M. COLLIER, LLS 892 DATE:
ON BEHALF OF JONES & BEACH ENGINEERS, INC.

TOWN OF EXETER PLANNING BOARD CASE NO. 17-26

CHAIRPERSON DATE:

PROJECT PARCEL
TOWN OF EXETER
TAX MAP 40, LOT 12

APPLICANT/OWNER
W. SCOTT CARLISLE, III
14 CASS STREET
EXETER, NH 03833
BK 4244, PG 1653

TOTAL PROPOSED LOT AREA
802,124 SQ. FT.
18.41 ACRES

Design: JSR	Draft: PLB	Date: 8/1/16
Checked: JSR	Scale: 1"=50'	Project No.: 15098
Drawing Name: 15098-CONCEPT.dwg		

REV.	DATE	REVISION	BY
5	6/28/19	ISSUED ROAD DESIGN FOR REVIEW	PLB
4	1/29/19	REVISED FOR CONCEPTUAL ROAD DESIGN	PLB
3	12/20/17	MINOR REVISIONS	PLB
2	9/20/17	REVISED PER PLANNING BOARD CONDITIONS	PLB
1	7/11/17	ISSUED FOR PLANNING BOARD	PLB

Designed and Produced in NH
J/B Jones & Beach Engineers, Inc.
85 Portsmouth Ave. PO Box 219 Stratham, NH 03885
Civil Engineering Services
603-772-4746 FAX: 603-772-0227 E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	LOT LINE ADJUSTMENT & SUBDIVISION PLAN TAX MAP 40 LOT 12 & TAX MAP 47 LOT 8
Project:	CARLISLE SUBDIVISION OFF EPPING ROAD, EXETER, NH
Owner of Record:	W. SCOTT CARLISLE, III & CKT ASSOCIATES 14 CASS STREET, EXETER, NH 03833 158 SHATTUCK WAY, NEWINGTON, NH 03801

DRAWING No. A1
SHEET 1 OF 4
JBE PROJECT NO. 15098

F:\15098-EXETER-EPPING-ROAD-CARLISLE\15098-PLAN.dwg 7/11/2017 12:25:50 PM EST

LEGEND

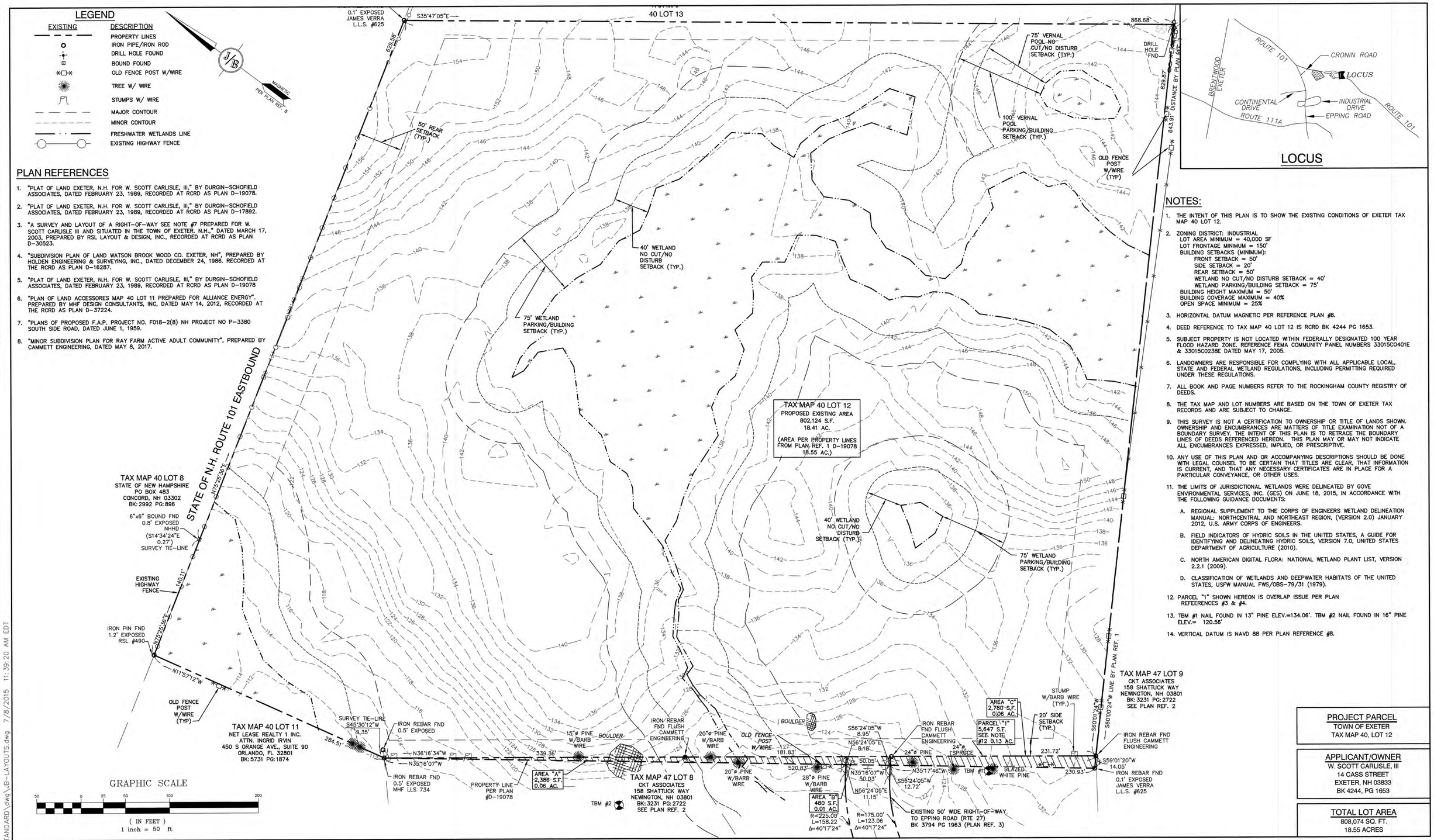
EXISTING	DESCRIPTION
	PROPERTY LINES
o	IRON PIPE/IRON ROD
+	DRILL HOLE FOUND
⊡	BOUND FOUND
	OLD FENCE POST W/WIRE
	TREE W/ WIRE
	STUMPS W/ WIRE
	MAJOR CONTOUR
	MINOR CONTOUR
	FRESHWATER WETLANDS LINE
	EXISTING HIGHWAY FENCE

J/B

MAGNETIC PER PLAN REF. 8

PLAN REFERENCES

1. "PLAT OF LAND EXETER, N.H. FOR W. SCOTT CARLISLE, III," BY DURGIN–SCHOFIELD ASSOCIATES, DATED FEBRUARY 23, 1989, RECORDED AT RCRD AS PLAN D–19078.
2. "PLAT OF LAND EXETER, N.H. FOR W. SCOTT CARLISLE, III," BY DURGIN–SCHOFIELD ASSOCIATES, DATED FEBRUARY 23, 1989, RECORDED AT RCRD AS PLAN D–17892.
3. "A SURVEY AND LAYOUT OF A RIGHT–OF–WAY SEE NOTE #7 PREPARED FOR W. SCOTT CARLISLE III AND SITUATED IN THE TOWN OF EXETER. N.H.," DATED MARCH 17, 2003, PREPARED BY RSL LAYOUT & DESIGN, INC., RECORDED AT RCRD AS PLAN D–30523.
4. "SUBDIVISION PLAN OF LAND WATSON BROOK WOOD CO. EXETER, NH", PREPARED BY HOLDEN ENGINEERING & SURVEYING, INC., DATED DECEMBER 24, 1986. RECORDED AT THE RCRD AS PLAN D–16287.
5. "PLAT OF LAND EXETER, N.H. FOR W. SCOTT CARLISLE, III," BY DURGIN–SCHOFIELD ASSOCIATES, DATED FEBRUARY 23, 1989, RECORDED AT RCRD AS PLAN D–19078
6. "PLAN OF LAND ACCESSORES MAP 40 LOT 11 PREPARED FOR ALLIANCE ENERGY". PREPARED BY MHF DESIGN CONSULTANTS, INC, DATED MAY 14, 2012, RECORDED AT THE RCRD AS PLAN D–37224.
7. "PLANS OF PROPOSED F.A.P. PROJECT NO. F018–2(8) NH PROJECT NO P–3380 SOUTH SIDE ROAD, DATED JUNE 1, 1959.
8. "MINOR SUBDIVISION PLAN FOR RAY FARM ACTIVE ADULT COMMUNITY", PREPARED BY CAMMETT ENGINEERING, DATED MAY 8, 2017.



LOCUS

NOTES:

1. THE INTENT OF THIS PLAN IS TO SHOW THE EXISTING CONDITIONS OF EXETER TAX MAP 40 LOT 12.
2. ZONING DISTRICT: INDUSTRIAL
   LOT AREA MINIMUM = 40,000 SF
   LOT FRONTAGE MINIMUM = 150'
   BUILDING SETBACKS (MINIMUM):
   FRONT SETBACK = 50'
   SIDE SETBACK = 20'
   REAR SETBACK = 50'
   WETLAND NO CUT/NO DISTURB SETBACK = 40'
   WETLAND PARKING/BUILDING SETBACK = 75'
   BUILDING HEIGHT MAXIMUM = 50'
   BUILDING COVERAGE MAXIMUM = 40%
   OPEN SPACE MINIMUM = 25%
3. HORIZONTAL DATUM MAGNETIC PER REFERENCE PLAN #8.
4. DEED REFERENCE TO TAX MAP 40 LOT 12 IS RCRD BK 4244 PG 1653.
5. SUBJECT PROPERTY IS NOT LOCATED WITHIN FEDERALLY DESIGNATED 100 YEAR FLOOD HAZARD ZONE. REFERENCE FEMA COMMUNITY PANEL NUMBERS 33015C0401E & 33015C0238E DATED MAY 17, 2005.
6. LANDOWNERS ARE RESPONSIBLE FOR COMPLYING WITH ALL APPLICABLE LOCAL, STATE AND FEDERAL WETLAND REGULATIONS, INCLUDING PERMITTING REQUIRED UNDER THESE REGULATIONS.
7. ALL BOOK AND PAGE NUMBERS REFER TO THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
8. THE TAX MAP AND LOT NUMBERS ARE BASED ON THE TOWN OF EXETER TAX RECORDS AND ARE SUBJECT TO CHANGE.
9. THIS SURVEY IS NOT A CERTIFICATION TO OWNERSHIP OR TITLE OF LANDS SHOWN. OWNERSHIP AND ENCUMBRANCES ARE MATTERS OF TITLE EXAMINATION NOT OF A BOUNDARY SURVEY. THE INTENT OF THIS PLAN IS TO RETRACE THE BOUNDARY LINES OF DEEDS REFERENCED HEREON. THIS PLAN MAY OR MAY NOT INDICATE ALL ENCUMBRANCES EXPRESSED, IMPLIED, OR PRESCRIPTIVE.
10. ANY USE OF THIS PLAN AND OR ACCOMPANYING DESCRIPTIONS SHOULD BE DONE WITH LEGAL COUNSEL TO BE CERTAIN THAT TITLES ARE CLEAR, THAT INFORMATION IS CURRENT, AND THAT ANY NECESSARY CERTIFICATES ARE IN PLACE FOR A PARTICULAR CONVEYANCE, OR OTHER USES.
11. THE LIMITS OF JURISDICTIONAL WETLANDS WERE DELINEATED BY GOVE ENVIRONMENTAL SERVICES, INC. (GES) ON JUNE 18, 2015, IN ACCORDANCE WITH THE FOLLOWING GUIDANCE DOCUMENTS:
    A. REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION, (VERSION 2.0) JANUARY 2012, U.S. ARMY CORPS OF ENGINEERS.
    B. FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES, A GUIDE FOR IDENTIFYING AND DELINEATING HYDRIC SOILS, VERSION 7.0, UNITED STATES DEPARTMENT OF AGRICULTURE (2010).
    C. NORTH AMERICAN DIGITAL FLORA: NATIONAL WETLAND PLANT LIST, VERSION 2.2.1 (2009).
    D. CLASSIFICATION OF WETLANDS AND DEEPWATER HABITATS OF THE UNITED STATES, USFW MANUAL FWS/OBS–79/31 (1979).
12. PARCEL "1" SHOWN HEREON IS OVERLAP ISSUE PER PLAN REFEERENCES #3 & #4.
13. TBM #1 NAIL FOUND IN 13" PINE ELEV.=134.06'. TBM #2 NAIL FOUND IN 16" PINE ELEV.= 120.56'
14. VERTICAL DATUM IS NAVD 88 PER PLAN REFERENCE #8.

PROJECT PARCEL
TOWN OF EXETER
TAX MAP 40, LOT 12

APPLICANT/OWNER
W. SCOTT CARLISLE, III
14 CASS STREET
EXETER, NH 03833
BK 4244, PG 1653

TOTAL LOT AREA
808,074 SQ. FT.
18.55 ACRES

F:\CADD\MASTER STANDARD\dwg\JB–LAYOUTS.dwg 7/8/2015 11:39:20 AM EDT

Design: JSR	Draft: CWW
Checked: DMC	Scale: 1"=50'
Drawing Name: 15098-EXISTING-CONDITIONS.dwg	Project No.: 15098

REV.	DATE	REVISION	BY
0	9/22/15	ISSUED FOR REVIEW	CWW

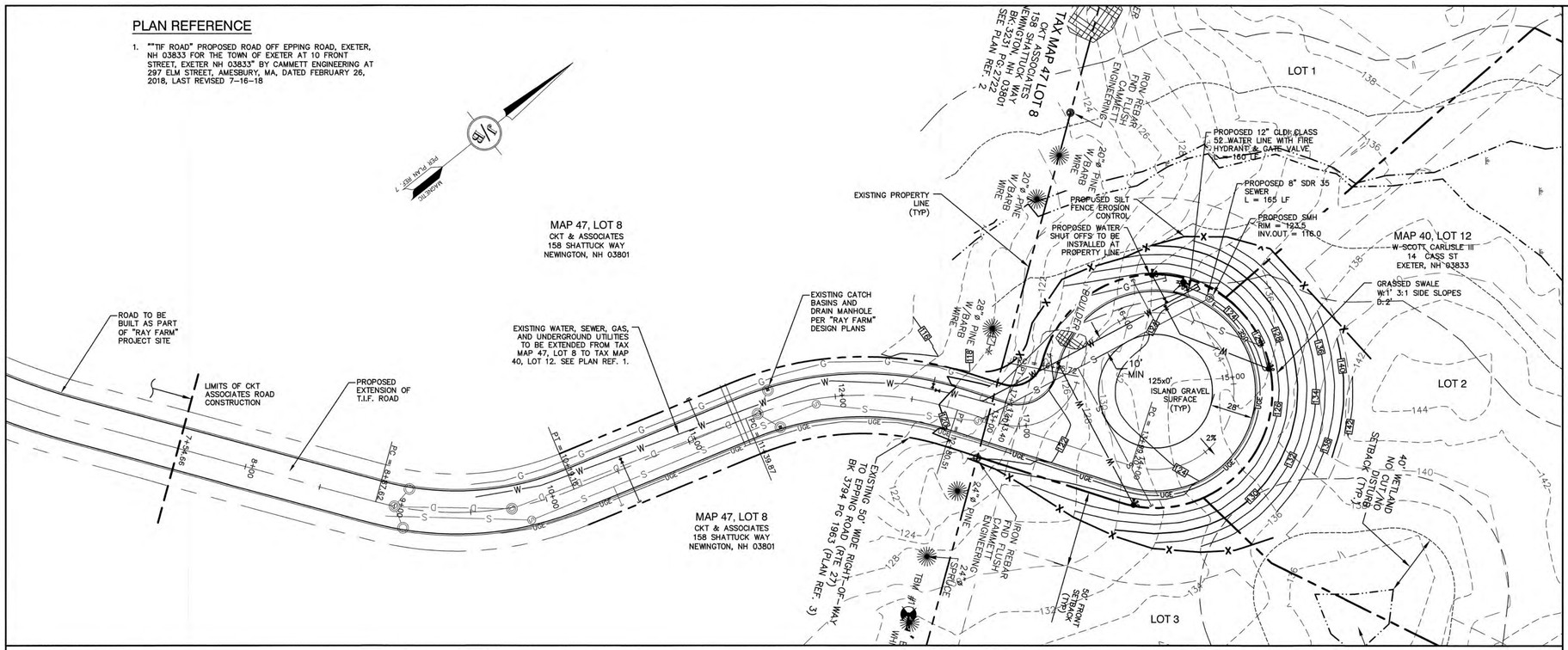
Designed and Produced in NH
J/B Jones & Beach Engineers, Inc.
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

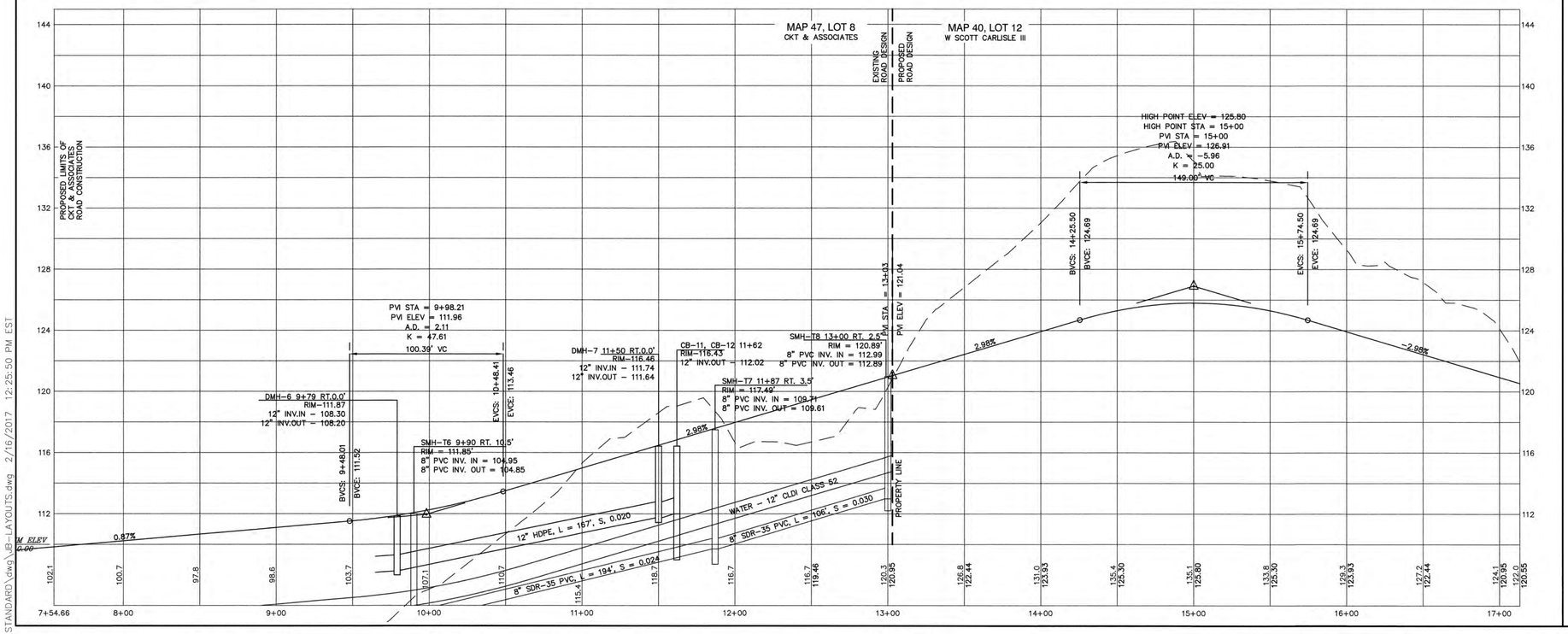
Plan Name:	EXISTING CONDITIONS PLAN MAP 40, LOT 12
Project:	W. SCOTT CARLISLE ROUTE 101, EXETER, NH
Owner of Record:	W. SCOTT CARLISLE, III 14 CASS STREET, EXETER, NH 03833

DRAWING No.
C1
SHEET 2 OF 4
JBE PROJECT NO. 15098

PLAN REFERENCE

1. ""TF ROAD" PROPOSED ROAD OFF EPPING ROAD, EXETER, NH 03833 FOR THE TOWN OF EXETER AT 10 FRONT STREET, EXETER NH 03833" BY CAMMETT ENGINEERING AT 297 ELM STREET, AMESBURY, MA, DATED FEBRUARY 26, 2018, LAST REVISED 7-16-18





NOTES:

1. THIS SITE WILL REQUIRE A USEPA NPDES PERMIT FOR STORMWATER DISCHARGE FOR THE CONSTRUCTION SITE. THE CONSTRUCTION SITE OPERATOR SHALL DEVELOP AND IMPLEMENT A CONSTRUCTION STORM WATER POLLUTION PREVENTION PLAN (SWPPP), WHICH SHALL REMAIN ON SITE AND BE MADE ACCESSIBLE TO THE PUBLIC. THE CONSTRUCTION SITE OPERATOR SHALL SUBMIT A NOTICE OF INTENT (NOI) TO THE EPA REGIONAL OFFICE SEVEN DAYS PRIOR TO COMMENCEMENT OF ANY WORK ON SITE. EPA WILL POST THE NOI AT HTTP://CFPUB1.EPA.GOV/NPDES/STORMWATER/NOI/NOISEARCH.CFM. AUTHORIZATION IS GRANTED UNDER THE PERMIT ONCE THE NOI IS SHOWN IN "ACTIVE" STATUS ON THIS WEBSITE. A COMPLETED NOTICE OF TERMINATION SHALL BE SUBMITTED TO THE NPDES PERMITTING AUTHORITY WITHIN 30 DAYS AFTER EITHER OF THE FOLLOWING CONDITIONS HAVE BEEN MET:
   A. FINAL STABILIZATION HAS BEEN ACHIEVED ON ALL PORTIONS OF THE SITE FOR WHICH THE PERMITTEE IS RESPONSIBLE; OR
   A. ANOTHER OPERATOR/PERMITTEE HAS ASSUMED CONTROL OVER ALL AREAS OF THE SITE THAT HAVE NOT BEEN FINALLY STABILIZED. PROVIDE DPW WITH A COPY OF THE NOTICE OF TERMINATION (NOT).
2. ALL ROAD AND DRAINAGE WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR THE TOWN, AND NHDOT SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, WHICHEVER IS MORE STRINGENT.
3. AS-BUILT PLANS TO BE SUBMITTED TO THE TOWN PRIOR TO ACCEPTANCE OF THE ROADWAY.
4. DEVELOPER IS RESPONSIBLE FOR COMPLYING WITH ALL APPLICABLE LOCAL, STATE AND FEDERAL WETLAND REGULATIONS, INCLUDING ANY PERMITTING AND SETBACK REQUIREMENTS REQUIRED UNDER THESE REGULATIONS.
5. CONTRACTOR TO COORDINATE AND COMPLETE ALL WORK REQUIRED FOR THE RELOCATION AND/OR INSTALLATION OF ELECTRIC, CATV, TELEPHONE, AND FIRE ALARM PER UTILITY DESIGN AND STANDARDS. LOCATIONS SHOWN ARE APPROXIMATE. LOW PROFILE STRUCTURES SHALL BE USED TO THE GREATEST EXTENT POSSIBLE.
6. THIS PLAN HAS BEEN PREPARED BY JONES & BEACH ENGINEERS, INC. FOR MUNICIPAL AND STATE APPROVALS AND FOR CONSTRUCTION BASED ON DATA OBTAINED FROM ON-SITE FIELD SURVEY AND EXISTING MUNICIPAL RECORDS. THROUGHOUT THE CONSTRUCTION PROCESS, THE CONTRACTOR SHALL INFORM THE ENGINEER IMMEDIATELY OF ANY FIELD DISCREPANCY FROM DATA SHOWN ON THE DESIGN PLANS. THIS INCLUDES ANY UNFORESEEN CONDITIONS, SUBSURFACE OR OTHERWISE, FOR EVALUATION AND RECOMMENDATIONS. ANY CONTRADICTION BETWEEN ITEMS OF THIS PLAN/PLAN SET, OR BETWEEN THE PLANS AND ON-SITE CONDITIONS MUST BE RESOLVED BEFORE RELATED CONSTRUCTION HAS BEEN INITIATED.
7. SILTATION AND EROSION CONTROLS SHALL BE INSTALLED PRIOR TO CONSTRUCTION, SHALL BE MAINTAINED DURING CONSTRUCTION, AND SHALL REMAIN UNTIL SITE HAS BEEN STABILIZED WITH PERMANENT VEGETATION. SEE DETAIL SHEET E1 FOR ADDITIONAL NOTES ON EROSION CONTROL.
8. ALL DISTURBED AREAS NOT STABILIZED BY NOVEMBER 1st SHALL BE COVERED WITH AN EROSION CONTROL BLANKET. PRODUCT TO BE SPECIFIED BY THE ENGINEER.
9. FINAL DRAINAGE, GRADING AND EROSION PROTECTION MEASURES SHALL CONFORM TO REGULATIONS OF THE PUBLIC WORKS DEPARTMENT.
10. CONTRACTOR TO VERIFY EXISTING UTILITIES AND TO NOTIFY ENGINEER OF ANY DISCREPANCY IMMEDIATELY.
11. FUTURE DRIVEWAYS TO BE REVIEWED AND APPROVED BY PUBLIC WORKS. ALL DRIVEWAYS TO HAVE CULVERTS UNLESS APPROVED BY THE TOWN ROAD AGENT.
12. RETAINING WALLS SHALL BE DESIGNED AND STAMPED BY A LICENSED PROFESSIONAL ENGINEER. CONTRACTOR SHALL COORDINATE WITH MANUFACTURER PRIOR TO INSTALLATION.
13. DRAINAGE INSPECTION AND MAINTENANCE SCHEDULE: SILT FENCING WILL BE INSPECTED DURING AND AFTER STORM EVENTS TO ENSURE THAT THE FENCE STILL HAS INTEGRITY AND IS NOT ALLOWING SEDIMENT TO PASS. SEDIMENT BUILD UP IN SWALES WILL BE REMOVED IF IT IS DEEPER THAN SIX INCHES, AND IS TO BE REMOVED FROM SUMPS BELOW THE INLET OF CULVERTS SEMIANNUALLY, AS WELL AS FROM CATCH BASINS. FOLLOWING MAJOR STORM EVENTS, THE STAGE DISCHARGE OUTLET STRUCTURES ARE TO BE INSPECTED AND ANY DEBRIS REMOVED FROM THE ORIFICE, TRASH TRACK AND EMERGENCY SPILL WAY. INFREQUENTLY, SEDIMENT MAY ALSO HAVE TO BE REMOVED FROM THE SUMP OF THE STRUCTURE.
14. CONTRACTOR MUST HAVE A VALID PIPE INSTALLER'S LICENSE FROM THE PUBLIC WORKS DEPARTMENT BEFORE WORKING ON ANY DRAINAGE AND/OR UTILITY CONSTRUCTION.
15. ALL DRAINAGE INFRASTRUCTURE SHALL BE INSTALLED AND STABILIZED PRIOR TO DIRECTING ANY RUNOFF TO IT.
16. COMPACTION TESTING SERVICES (I.E. NUCLEAR DENSITY TESTS) ARE TO BE PERFORMED BY AN INDEPENDENT GEOTECHNICAL ENGINEER RETAINED BY THE CONTRACTOR FOR ROADWAY CONSTRUCTION.
17. ROADWAY TO BE CONSTRUCTED PER DETAILS BY OTHERS. SEE PLAN REF. 1.

GRAPHIC SCALE
(IN FEET)
1 inch = 40 ft. Horiz.
1 inch = 4 ft. Vert.
0 40 80
0 4 8

Design: JSR	Draft: PLB	Date: 8/1/16
Checked: JSR	Scale: 1"=50'	Project No.: 15098
Drawing Name: 15098-CONCEPT.dwg		

REV.	DATE	REVISION	BY
5	6/28/19	ISSUED ROAD DESIGN FOR REVIEW	PLB
4	1/29/19	REVISED FOR CONCEPTUAL ROAD DESIGN	PLB
3	12/20/17	MINOR REVISIONS	PLB
2	9/20/17	REVISED PER PLANNING BOARD CONDITIONS	PLB
1	7/11/17	ISSUED FOR PLANNING BOARD	PLB

Designed and Produced in NH
J/B Jones & Beach Engineers, Inc.
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Stratham, NH 03885
Civil Engineering Services
603-772-4746
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E-Mail: JBE@JONESANDBEACH.COM

Plan Name:	PLAN AND PROFILE
Project:	CARLISLE SUBDIVISION OFF EPPING ROAD, EXETER, NH
Owner of Record:	W. SCOTT CARLISLE, III & CK T ASSOCIATES 14 CASS STREET, EXETER, NH 03833 & 158 SHATTUCK WAY, NEWINGTON, NH 03801

DRAWING No.
P1
SHEET 3 OF 4
JBE PROJECT NO. 15098

F:\CADD\MASTER STANDARD\dwg\JB-LAYOUTS.dwg 2/16/2017 12:25:50 PM EST

SEEDING SPECIFICATIONS

1. GRADING AND SHAPING
   A. SLOPES SHALL NOT BE STEEPER THAN 2:1 WITHOUT APPROPRIATE EROSION CONTROL MEASURES AS SPECIFIED ON THE PLANS (3:1 SLOPES OR FLATTER ARE PREFERRED).
   B. WHERE MOWING WILL BE DONE, 3:1 SLOPES OR FLATTER ARE RECOMMENDED.

2. SEEDBED PREPARATION
   A. SURFACE AND SEEPAGE WATER SHOULD BE DRAINED OR DIVERTED FROM THE SITE TO PREVENT DROWNING OR WINTER KILLING OF THE PLANTS.
   B. STONES LARGER THAN 4 INCHES AND TRASH SHOULD BE REMOVED BECAUSE THEY INTERFERE WITH SEEDING AND FUTURE MAINTENANCE OF THE AREA. WHERE FEASIBLE, THE SOIL SHOULD BE TILLED TO A DEPTH OF ABOUT 4 INCHES TO PREPARE A SEEDBED AND FERTILIZER AND LIME MIXED INTO THE SOIL. THE SEEDBED SHOULD BE LEFT IN A REASONABLY FIRM AND SMOOTH CONDITION. THE LAST TILLAGE OPERATION SHOULD BE PERFORMED ACROSS THE SLOPE WHEREVER PRACTICAL.

3. ESTABLISHING A STAND
   A. LIME AND FERTILIZER SHOULD BE APPLIED PRIOR TO OR AT THE TIME OF SEEDING AND INCORPORATED INTO THE SOIL. TYPES AND AMOUNTS OF LIME AND FERTILIZER SHOULD BE BASED ON AN EVALUATION OF SOIL TESTS. WHEN A SOIL TEST IS NOT AVAILABLE, THE FOLLOWING MINIMUM AMOUNTS SHOULD BE APPLIED:
      AGRICULTURAL LIMESTONE, 2 TONS PER ACRE OR 100 LBS. PER 1,000 SQ.FT.
      NITROGEN(N), 50 LBS. PER ACRE OR 1.1 LBS. PER 1,000 SQ.FT.
      PHOSPHATE(P205), 100 LBS. PER ACRE OR 2.2 LBS. PER 1,000 SQ.FT.
      POTASH(K20), 100 LBS. PER ACRE OR 2.2 LBS. PER 1,000 SQ.FT.
      (NOTE: THIS IS THE EQUIVALENT OF 500 LBS. PER ACRE OF 10-20-20 FERTILIZER OR 1,000 LBS. PER ACRE OF 5-10-10.)
   B. SEED SHOULD BE SPREAD UNIFORMLY BY THE METHOD MOST APPROPRIATE FOR THE SITE. METHODS INCLUDE BROADCASTING, DRILLING AND HYDROSEEDING. WHERE BROADCASTING IS USED, COVER SEED WITH .25 INCH OF SOIL OR LESS, BY CULTIPACKING OR RAKING.
   C. REFER TO THE 'SEEDING GUIDE' AND 'SEEDING RATES' TABLES ON THIS SHEET FOR APPROPRIATE SEED MIXTURES AND RATES OF SEEDING. ALL LEGUMES (CROWNVETCH, BIRDSFOOT, TREFOIL AND FLATPEA) MUST BE INOCULATED WITH THEIR SPECIFIC INOCULANT PRIOR TO THEIR INTRODUCTION TO THE SITE.
   D. WHEN SEEDED AREAS ARE MULCHED, PLANTINGS MAY BE MADE FROM EARLY SPRING TO EARLY OCTOBER. WHEN SEEDED AREAS ARE NOT MULCHED, PLANTINGS SHOULD BE MADE FROM EARLY SPRING TO MAY 20th OR FROM AUGUST 10th TO SEPTEMBER 1st.

4. MULCH
   A. HAY, STRAW, OR OTHER MULCH, WHEN NEEDED, SHOULD BE APPLIED IMMEDIATELY AFTER SEEDING.
   B. MULCH WILL BE HELD IN PLACE USING APPROPRIATE TECHNIQUES FROM THE BEST MANAGEMENT PRACTICE FOR MULCHING. HAY OR STRAW MULCH SHALL BE PLACED AT A RATE OF 90 LBS PER 1000 S.F.

5. MAINTENANCE TO ESTABLISH A STAND
   A. PLANTED AREAS SHOULD BE PROTECTED FROM DAMAGE BY FIRE, GRAZING, TRAFFIC, AND DENSE WEED GROWTH.
   B. FERTILIZATION NEEDS SHOULD BE DETERMINED BY ONSITE INSPECTIONS. SUPPLEMENTAL FERTILIZER IS USUALLY THE KEY TO FULLY COMPLETE THE ESTABLISHMENT OF THE STAND BECAUSE MOST PERENNIALS TAKE 2 TO 3 YEARS TO BECOME FULLY ESTABLISHED.
   C. IN WATERWAYS, CHANNELS, OR SWALES WHERE UNIFORM FLOW CONDITIONS ARE ANTICIPATED, ANNUAL MOWING MAY BE NECESSARY TO CONTROL GROWTH OF WOODY VEGETATION.

USE	SEEDING MIXTURE 1/	DROUGHTY	WELL DRAINED	MODERATELY WELL DRAINED	POORLY DRAINED
STEEP CUTS AND FILLS, BORROW AND DISPOSAL AREAS	A	FAIR	GOOD	GOOD	FAIR
	B	POOR	GOOD	FAIR	FAIR
	C	POOR	GOOD	EXCELLENT	GOOD
	D	FAIR	EXCELLENT	EXCELLENT	POOR
WATERWAYS, EMERGENCY SPILLWAYS, AND OTHER CHANNELS WITH FLOWING WATER.	A	GOOD	GOOD	GOOD	FAIR
	C	GOOD	EXCELLENT	EXCELLENT	FAIR
LIGHTLY USED PARKING LOTS, ODD AREAS, UNUSED LANDS, AND LOW INTENSITY USE RECREATION SITES.	A	GOOD	GOOD	GOOD	FAIR
	B	GOOD	GOOD	FAIR	POOR
	C	GOOD	EXCELLENT	EXCELLENT	FAIR
PLAY AREAS AND ATHLETIC FIELDS. (TOPSOIL IS ESSENTIAL FOR GOOD TURF.)	E	FAIR	EXCELLENT	EXCELLENT	2/
	F	FAIR	EXCELLENT	EXCELLENT	2/

GRAVEL PIT, SEE NH-PM-24 IN APPENDIX FOR RECOMMENDATION REGARDING RECLAMATION OF SAND AND GRAVEL PITS.

1/ REFER TO SEEDING MIXTURES AND RATES IN TABLE BELOW.
2/ POORLY DRAINED SOILS ARE NOT DESIRABLE FOR USE AS PLAYING AREA AND ATHLETIC FIELDS.

NOTE: TEMPORARY SEED MIX FOR STABILIZATION OF TURF SHALL BE WINTER RYE OR OATS AT A RATE OF 2.5 LBS. PER 1000 S.F. AND SHALL BE PLACED PRIOR TO OCTOBER 15th, IF PERMANENT SEEDING NOT YET COMPLETE.

SEEDING GUIDE

MIXTURE	POUNDS PER ACRE	POUNDS PER 1,000 Sq. Ft.
A. TALL FESCUE	20	0.45
CREEPING RED FESCUE	20	0.45
RED TOP	2	0.05
TOTAL	42	0.95
B. TALL FESCUE	15	0.35
CREEPING RED FESCUE	10	0.25
CROWN VETCH	15	0.35
OR		
FLAT PEA	30	0.75
TOTAL	40 OR 55	0.95 OR 1.35
* C. TALL FESCUE	20	0.45
CREEPING RED FESCUE	20	0.45
BIRDS FOOT TREFOIL	8	0.20
TOTAL	48	1.10
D. TALL FESCUE	20	0.45
FLAT PEA	30	0.75
TOTAL	50	1.20
E. CREEPING RED FESCUE 1/	50	1.15
KENTUCKY BLUEGRASS 1/	50	1.15
TOTAL	100	2.30
F. TALL FESCUE 1	150	3.60

1/ FOR HEAVY USE ATHLETIC FIELDS CONSULT THE UNIVERSITY OF NEW HAMPSHIRE COOPERATIVE EXTENSION TURF SPECIALIST FOR CURRENT VARIETIES AND SEEDING RATES.

SEEDING RATES

CONSTRUCTION SPECIFICATIONS:

1. WOVEN FABRIC FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES. FILTER CLOTH SHALL BE FASTENED TO WOVEN WIRE EVERY 24" AT TOP, MID AND BOTTOM AND EMBEDDED IN THE GROUND A MINIMUM OF 8" AND THEN COVERED WITH SOIL.
2. THE FENCE POSTS SHALL BE A MINIMUM OF 48" LONG, SPACED A MAXIMUM 10' APART, AND DRIVEN A MINIMUM OF 16" INTO THE GROUND.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER, THE ENDS OF THE FABRIC SHALL BE OVERLAPPED 6", FOLDED AND STAPLED TO PREVENT SEDIMENT FROM BY-PASSING.
4. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND SEDIMENT REMOVED AND PROPERLY DISPOSED OF WHEN IT IS 6" DEEP OR VISIBLE 'BULGES' DEVELOP IN THE SILT FENCE.
5. PLACE THE ENDS OF THE SILT FENCE UP CONTOUR TO PROVIDE FOR SEDIMENT STORAGE.
6. SILT FENCES SHALL BE REMOVED WHEN NO LONGER NEEDED AND THE SEDIMENT COLLECTED SHALL BE DISPOSED AS DIRECTED BY THE ENGINEER. THE AREA DISTURBED BY THE REMOVAL SHALL BE SMOOTHED AND REVEGETATED.

MAINTENANCE:

1. SILT FENCES SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REPAIRS THAT ARE REQUIRED SHALL BE DONE IMMEDIATELY.
2. IF THE FABRIC ON A SILT FENCE SHOULD DECOMPOSE OR BECOME INEFFECTIVE DURING THE EXPECTED LIFE OF THE FENCE, THE FABRIC SHALL BE REPLACED PROMPTLY.
3. SEDIMENT DEPOSITS SHOULD BE INSPECTED AFTER EVERY STORM EVENT. THE DEPOSITS SHOULD BE REMOVED WHEN THEY REACH APPROXIMATELY ONE HALF THE HEIGHT OF THE BARRIER.
4. SEDIMENT DEPOSITS THAT ARE REMOVED, OR LEFT IN PLACE AFTER THE FABRIC HAS BEEN REMOVED, SHALL BE GRADED TO CONFORM WITH THE EXISTING TOPOGRAPHY AND VEGETATED.

SILT FENCE

NOT TO SCALE

TEMPORARY EROSION CONTROL NOTES

1. THE SMALLEST PRACTICAL AREA OF LAND SHALL BE EXPOSED AT ANY ONE TIME. AT NO TIME SHALL AN AREA IN EXCESS OF 5 ACRES BE EXPOSED AT ANY ONE TIME BEFORE DISTURBED AREAS ARE STABILIZED.
2. EROSION, SEDIMENT AND DETENTION MEASURES SHALL BE INSTALLED AS SHOWN ON THE PLANS AND AT LOCATIONS AS REQUIRED, DIRECTED BY THE ENGINEER.
3. ALL DISTURBED AREAS (INCLUDING POND AREAS BELOW THE PROPOSED WATERLINE) SHALL BE RETURNED TO PROPOSED GRADES AND ELEVATIONS. DISTURBED AREAS SHALL BE LOAMED WITH A MINIMUM OF 6" OF SCREENED ORGANIC LOAM AND SEEDED WITH SEED MIXTURE 'C' AT A RATE NOT LESS THAN 1.10 POUNDS OF SEED PER 1,000 S.F. OF AREA (48 LBS. / ACRE).
4. SILT FENCES AND OTHER BARRIERS SHALL BE INSPECTED EVERY SEVEN CALENDAR DAYS AND WITHIN 24 HOURS OF A RAINFALL OF 0.25" OR GREATER. ALL DAMAGED AREAS SHALL BE REPAIRED, AND SEDIMENT DEPOSITS SHALL PERIODICALLY BE REMOVED AND DISPOSED OF.
5. AFTER ALL DISTURBED AREAS HAVE BEEN STABILIZED, THE TEMPORARY EROSION CONTROL MEASURES SHALL BE REMOVED AND THE AREA DISTURBED BY THE REMOVAL SMOOTHED AND RE-VEGETATED.
6. AREAS MUST BE SEEDED AND MULCHED OR OTHERWISE PERMANENTLY STABILIZED WITHIN 3 DAYS OF FINAL GRADING, OR TEMPORARILY STABILIZED WITHIN 14 DAYS OF THE INITIAL DISTURBANCE OF SOIL. ALL AREAS SHALL BE STABILIZED WITHIN 45 DAYS OF INITIAL DISTURBANCE.
7. ALL PROPOSED VEGETATED AREAS THAT DO NOT EXHIBIT A MINIMUM OF 85 PERCENT VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED BY SEEDING AND INSTALLING NORTH AMERICAN GREEN S75 EROSION CONTROL BLANKETS (OR AN EQUIVALENT APPROVED IN WRITING BY THE ENGINEER) ON SLOPES GREATER THAN 3:1, AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE INSTALLATION OF EROSION CONTROL BLANKETS OR MULCH AND NETTING SHALL NOT OCCUR OVER ACCUMULATED SNOW OR ON FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT EVENTS.
8. ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85 PERCENT VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED TEMPORARILY WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS.
9. AFTER NOVEMBER 15th, INCOMPLETE ROAD OR PARKING SURFACES, WHERE WORK HAS STOPPED FOR THE WINTER SEASON, SHALL BE PROTECTED WITH A MINIMUM OF 3" OF CRUSHED GRAVEL PER NHDOT ITEM 304.3.
10. AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
    a. BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED;
    b. A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED;
    c. A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH STONE OR RIPRAP HAS BEEN INSTALLED; OR
    d. EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.
11. FUGITIVE DUST CONTROL IS REQUIRED TO BE CONTROLLED IN ACCORDANCE WITH ENV-A 1000, AND THE PROJECT IS TO MEET THE REQUIREMENTS AND INTENT OF RSA 430:53 AND AGR 3800 RELATIVE TO INVASIVE SPECIES.
12. PRIOR TO BEGINNING CONSTRUCTION, THE CONTRACTOR'S NAME, ADDRESS, AND PHONE NUMBER SHALL BE SUBMITTED TO DES VIA EMAIL (SEE BELOW).
13. PRIOR TO CONSTRUCTION, A PHASING PLAN THAT DELINEATES EACH PHASE OF THE PROJECT SHALL BE SUBMITTED. ALL TEMPORARY SEDIMENT BASINS THAT WILL BE NEEDED FOR DEWATERING WORK AREAS SHALL BE LOCATED AND IDENTIFIED ON THIS PLAN.
14. IN ORDER TO ENSURE THE STABILITY OF THE SITE AND EFFECTIVE IMPLEMENTATION OF THE SEDIMENT AND EROSION CONTROL MEASURES SPECIFIED IN THE PLANS FOR THE DURATION OF CONSTRUCTION, THE CONTRACTOR SHALL BE IN STRICT COMPLIANCE WITH THE FOLLOWING INSPECTION AND MAINTENANCE REQUIREMENTS IN ADDITION TO THOSE CALLED FOR IN THE SWPPP:
    a. A CERTIFIED PROFESSIONAL IN EROSION AND SEDIMENT CONTROL OR A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF NEW HAMPSHIRE ("MONITOR") SHALL BE EMPLOYED TO INSPECT THE SITE FROM THE START OF ALTERATION OF TERRAIN ACTIVITIES UNTIL THE SITE IS IN FULL COMPLIANCE WITH THE SITE SPECIFIC PERMIT ("PERMIT").
    b. DURING THIS PERIOD, THE MONITOR SHALL INSPECT THE SUBJECT SITE AT LEAST ONCE A WEEK, AND IF POSSIBLE, DURING ANY ½ INCH OR GREATER RAIN EVENT (I.E. ½ INCH OF PRECIPITATION OR MORE WITHIN A 24 HOUR PERIOD). IF UNABLE TO BE PRESENT DURING SUCH A STORM, THE MONITOR SHALL INSPECT THE SITE WITHIN 24 HOURS OF THIS EVENT.
    c. THE MONITOR SHALL PROVIDE TECHNICAL ASSISTANCE AND RECOMMENDATIONS TO THE CONTRACTOR ON THE APPROPRIATE BEST MANAGEMENT PRACTICES FOR EROSION AND SEDIMENT CONTROLS REQUIRED TO MEET THE REQUIREMENTS OF RSA 485 A:17 AND ALL APPLICABLE DES PERMIT CONDITIONS.
    d. WITHIN 24 HOURS OF EACH INSPECTION, THE MONITOR SHALL SUBMIT A REPORT TO DES VIA EMAIL (RIDGELY MAUCK AT: RIDGELY.MAUCK@DES.NH.GOV).
    e. THE MONITOR SHALL MEET WITH DES TO DECIDE UPON A REPORT FORMAT. THE REPORT FORMAT SHALL BE REVIEWED AND APPROVED BY DES PRIOR TO THE START OF CONSTRUCTION.

CONSTRUCTION SEQUENCE

1. PRIOR TO THE START OF ANY ACTIVITY, IT IS THE RESPONSIBILITY OF THE SITE'S SITE DEVELOPER (OR OWNER) TO FILE A NOTICE OF INTENT (NOI) FORM WITH THE ENVIRONMENTAL PROTECTION AGENCY (EPA) IN ORDER TO GAIN COVERAGE UNDER THE NPDES GENERAL PERMIT FOR STORM WATER DISCHARGES FROM CONSTRUCTION ACTIVITIES. A PRE CONSTRUCTION MEETING IS TO BE HELD WITH ALL DEPARTMENT HEADS PRIOR TO THE START OF CONSTRUCTION.
2. WETLAND BOUNDARIES ARE TO BE CLEARLY MARKED PRIOR TO THE START OF CONSTRUCTION.
3. CUT AND REMOVE TREES IN CONSTRUCTION AREA AS REQUIRED OR DIRECTED.
4. INSTALL SILT FENCING, HAY BALES PRIOR TO THE START OF CONSTRUCTION. THESE ARE TO BE MAINTAINED UNTIL THE FINAL PAVEMENT SURFACING ARE ESTABLISHED.
5. CLEAR, CUT, GRUB AND DISPOSE OF DEBRIS IN APPROVED FACILITIES.
6. CONSTRUCT AND/OR INSTALL TEMPORARY OR PERMANENT SEDIMENT AND/OR DETENTION BASIN(S) AS REQUIRED. THESE FACILITIES SHALL BE INSTALLED AND STABILIZED PRIOR TO DIRECTING RUN-OFF TO THEM.
7. STRIP LOAM PER THE RECOMMENDATIONS OF THE PROJECT ENGINEER AND STOCKPILE EXCESS MATERIAL. STABILIZE STOCKPILE AS NECESSARY.
8. PERFORM PRELIMINARY SITE GRADING IN ACCORDANCE WITH THE PLANS.
9. INSTALL THE SEWER AND DRAINAGE SYSTEMS FIRST, THEN ANY OTHER UTILITIES IN ACCORDANCE WITH THE PLAN AND DETAILS. ANY CONFLICTS BETWEEN UTILITIES ARE TO BE RESOLVED WITH THE INVOLVEMENT AND APPROVAL OF THE ENGINEER.
10. INSTALL INLET PROTECTION AT ALL CATCH BASINS AS THEY ARE CONSTRUCTED IN ACCORDANCE WITH DETAILS.
11. ALL SWALES AND DRAINAGE STRUCTURES ARE TO BE CONSTRUCTED AND STABILIZED PRIOR TO HAVING RUN-OFF DIRECTED TO THEM.
12. STORMWATER FLOWS ARE NOT TO BE DIRECTED TO TREATMENT PRACTICES UNTIL ALL CONTRIBUTING AREAS HAVE BEEN FULLY STABILIZED.
13. DAILY, OR AS REQUIRED, CONSTRUCT TEMPORARY BERMS, DRAINAGE DITCHES, CHECK DAMS, SEDIMENT TRAPS, ETC., TO PREVENT EROSION ON THE SITE AND PREVENT ANY SILTATION OF ABUTTING WATERS AND/OR PROPERTY.
14. PERFORM FINAL FINE GRADING, INCLUDING PLACEMENT OF 'SELECT' SUBGRADE MATERIALS.
15. PAVE ROADWAY WITH INITIAL 'BASE COURSE'.
16. PERFORM ALL REMAINING SITE CONSTRUCTION (i.e. CURBING, UTILITY CONNECTIONS, ETC.).
17. LOAM AND SEED ALL DISTURBED AREAS AND INSTALL ANY REQUIRED SEDIMENT AND EROSION CONTROL FACILITIES (i.e. RIP RAP, EROSION CONTROL BLANKETS, ETC.).
18. FINISH PAVING ROADWAY WITH 'FINISH' COURSE.
19. ROADWAY SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
20. ALL CUT AND FILL SLOPES SHALL BE SEEDED/LOAMED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
21. COMPLETE PERMANENT SEEDING AND LANDSCAPING.
22. REMOVE TEMPORARY EROSION CONTROL MEASURES AFTER SEEDING AREAS HAVE BEEN 75%-85% ESTABLISHED AND SITE IMPROVEMENTS ARE COMPLETE. SMOOTH AND RE-VEGETATE ALL DISTURBED AREAS.
23. CLEAN SITE AND ALL DRAINAGE STRUCTURES, PIPES AND SUMPS OF ALL SILT AND DEBRIS.
24. INSTALL ALL PAINTED PAVEMENT MARKINGS AND SIGNAGE PER THE PLANS AND DETAILS.
25. ALL EROSION CONTROLS SHALL BE INSPECTED WEEKLY AND AFTER EVERY QUARTER-INCH OF RAINFALL.
26. UPON COMPLETION OF CONSTRUCTION, IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY ANY RELEVANT PERMITTING AGENCIES THAT THE CONSTRUCTION HAS BEEN FINISHED IN A SATISFACTORY MANNER.

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Design: JSR	Draft: PLB	Date: 8/1/16
Checked: JSR	Scale: AS NOTED	Project No.: 15098
Drawing Name: 15098-CONCEPT.dwg		

JONATHAN SAMUEL PING 7408 LICENSED PROFESSIONAL ENGINEER THE STATE OF NEW HAMPSHIRE 6/28/19

REV.	DATE	REVISION	BY
5	6/28/19	ISSUED ROAD DESIGN FOR REVIEW	PLB
4	1/29/19	REVISED FOR CONCEPTUAL ROAD DESIGN	PLB
3	12/20/17	MINOR REVISIONS	PLB
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Designed and Produced in NH
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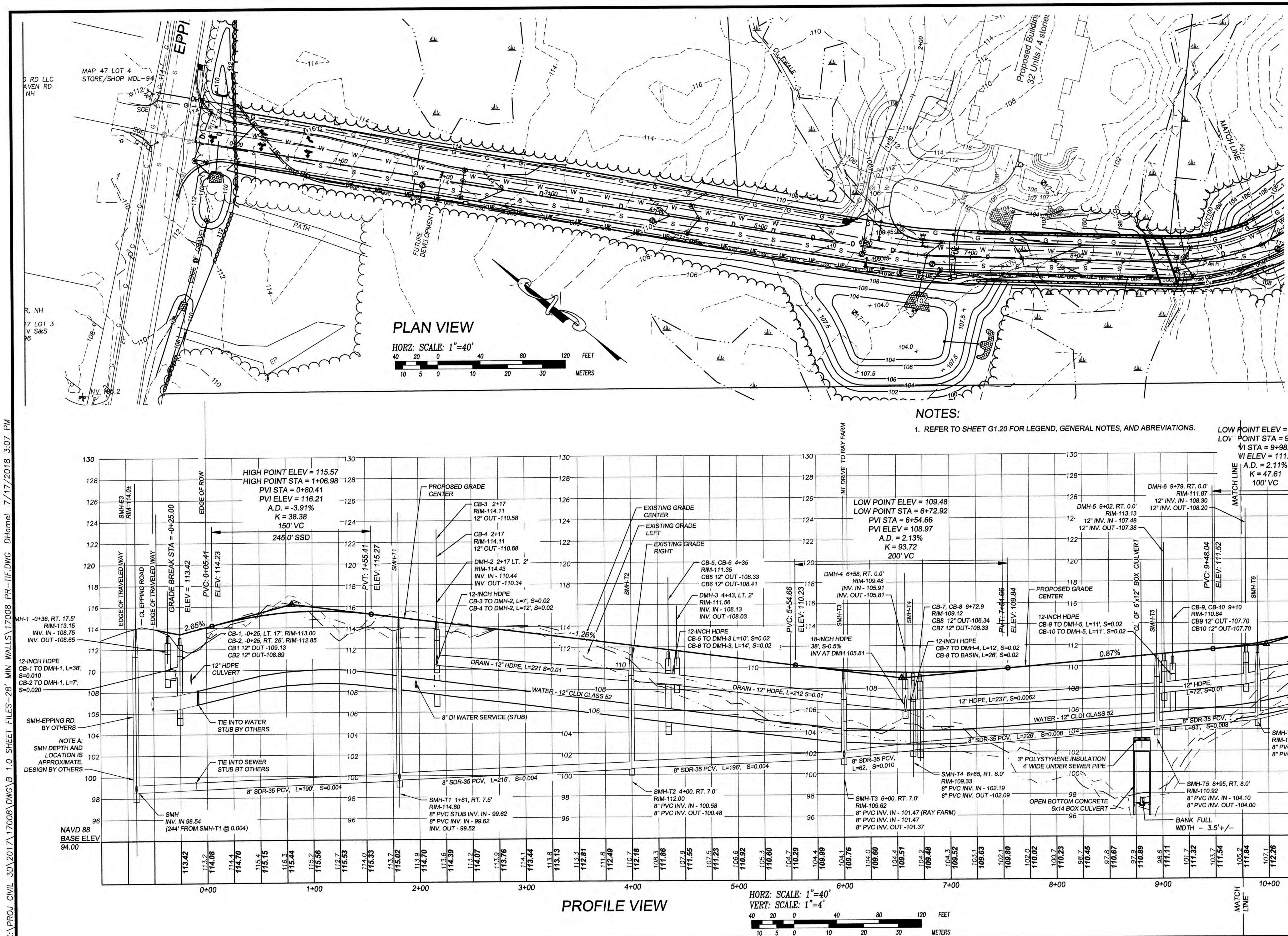
PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
FAX: 603-772-0227
E-Mail: JBE@JONESANDBEACH.COM

Plan Name: EROSION AND SEDIMENT CONTROL DETAILS
Project: CARLISLE SUBDIVISION
OFF EPPING ROAD, EXETER, NH
Owner of Record: W. SCOTT CARLISLE, III & CKT ASSOCIATES
14 CASS STREET, EXETER, NH 03833 & 158 SHATTUCK WAY, NEWINGTON, NH 03801

DRAWING No.
E1
SHEET 4 OF 4
JBE PROJECT NO. 15098



NOTES:

1. REFER TO SHEET G1.20 FOR LEGEND, GENERAL NOTES, AND ABREVIATIONS.

APPROVED BY THE TOWN OF EXETER DEPARTMENT OF PUBLIC WORKS

DATE:

CAMMETT ENGINEERING

297 ELM STREET, AMESBURY, MA.
Phone: (978) 388-2157 Fax: (978) 388-0428
CONSULTING ENGINEERS & LAND SURVEYORS SINCE 1975
Visit us on the WEB at www.cammett.com

Sheet Title:

Plan / Profile

Project Title:

"TIF Road"

Proposed Road
off Epping Road
Exeter, NH 03833
Rockingham County

Applicant:

Town of Exeter
10 Front Street
Exeter NH 03833

Owner:

CKT & Associates
158 Shattuck Way
Newington, NH 03801

REVISION			
NO. DATE	DESCRIPTION		BY
1 2-26-18	SUBMIT TO TOWN		DH
2 4-20-18	WIDEN ROAD TO 28'		DH
3 7-02-18	REVISE PHASE II		DH
4 7-16-18	FINAL SBMISSION		DH

STATE OF NEW HAMPSHIRE ROBERT B. BLANCHETTE JR. No. 15299 LICENSED PROFESSIONAL ENGINEER

Date: 16 JULY 2018

PROJ. MGR.: D. HAMEL
FIELD: M. MICHAUD / A. BICK
DESIGN: D. HAMEL
DRAWN: D. HAMEL
CHECKED: W. CAMMETT / R. BALNCHETTE
DATE: 2/20/2018
FILE: 17008 PR-TIF.DWG
FBK:
JOB #: 17008

SHEET C1.41

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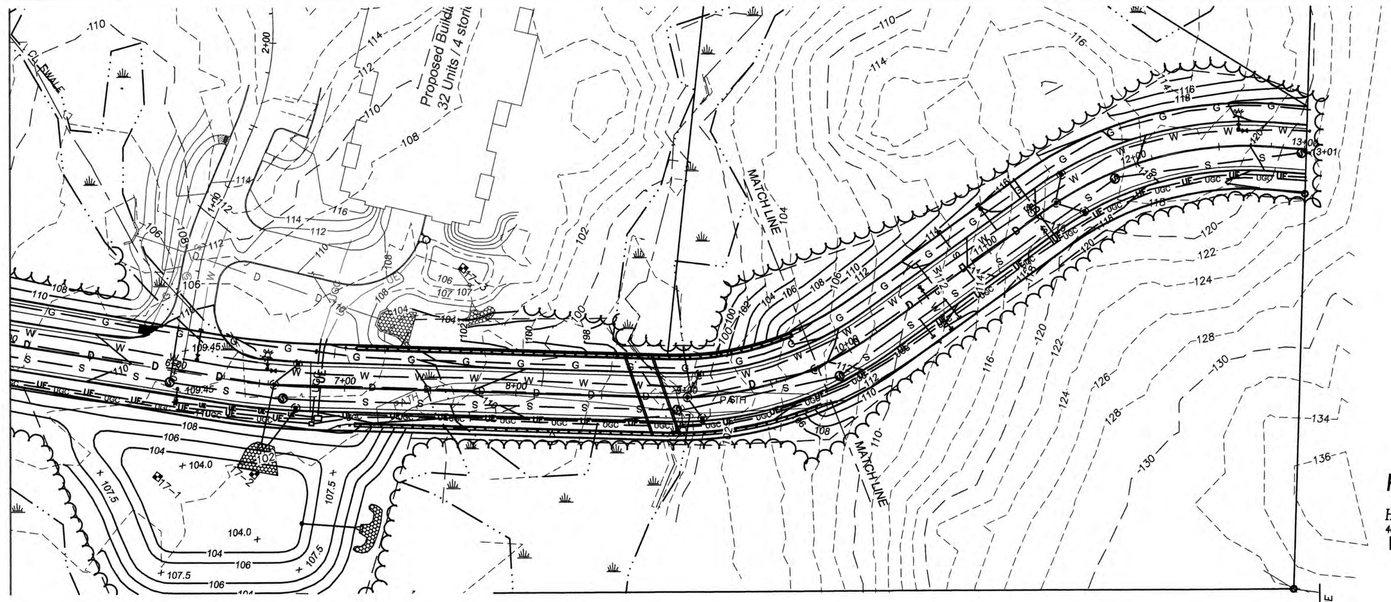


PLAN VIEW

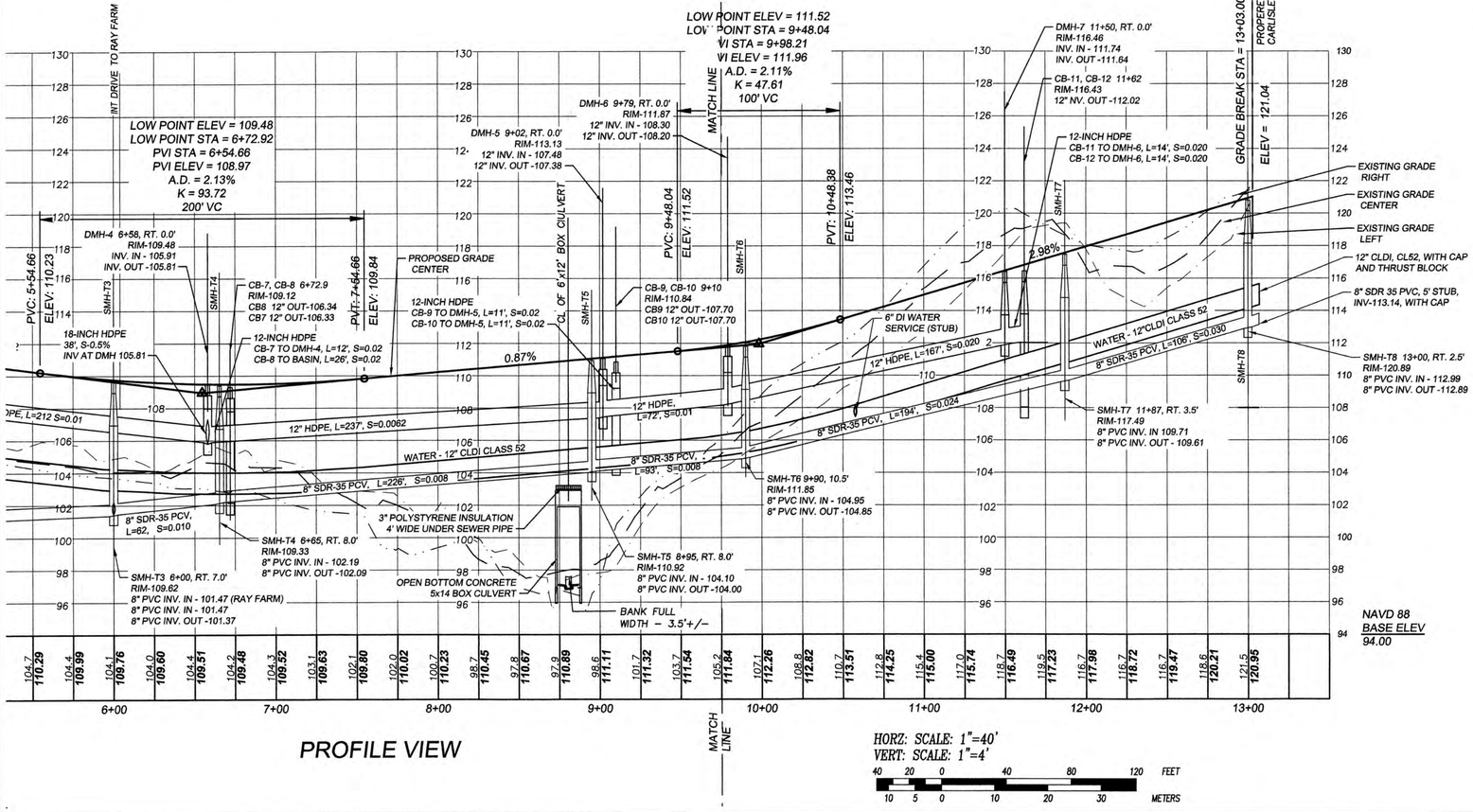
HORZ: SCALE: 1"=40'

40 20 0 40 80 120 FEET

10 5 0 10 20 30 METERS

NOTES:

1. REFER TO SHEET G1.20 FOR LEGEND, GENERAL NOTES, AND ABREVIATIONS.



PROFILE VIEW

HORZ: SCALE: 1"=40'
VERT: SCALE: 1"=4'

40 20 0 40 80 120 FEET

10 5 0 10 20 30 METERS

NAVD 88
BASE ELEV
94.00

APPROVED BY THE TOWN OF EXETER DEPARTMENT OF PUBLIC WORKS

DATE: _____

CAMMETT ENGINEERING

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Sheet Title:

Plan / Profile

Project Title:

"TIF Road"

Proposed Road
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Rockingham County

Applicant:

Town of Exeter
10 Front Street
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Owner:

CKT & Associates
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REVISION

NO.	DATE	DESCRIPTION	BY
1	2-26-18	SUBMIT TO TOWN	DH
2	4-20-18	WIDEN ROAD TO 28'	DH
3	7-02-18	REVISE PHASE II	DH
4	7-16-18	FINAL SBMISSION	DH

STATE OF NEW HAMPSHIRE – ROBERT B. BLANCHETTE JR. No. 15299 – LICENSED PROFESSIONAL ENGINEER

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SHEET C1.42

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AGREEMENT

BETWEEN

THE TOWN OF EXETER, NEW HAMPSHIRE
AND
WILLEY CREEK CO., LLC

THIS AGREEMENT, made and entered into this13th day of April, 2018, by and between the **Town of Exeter**, a New Hampshire municipal corporation (hereinafter referred to as the "Town"), with a place of business and mailing address, at 10 Front Street, Exeter, New Hampshire, 03833 and **Willey Creek Co., LLC**, a New Hampshire limited liability company, (hereinafter referred to as "WCC") with a place of business and mailing address, at 158 Shattuck Way, Newington, NH 03801 (the entities referred to in this paragraph are sometimes hereinafter collectively referred to as the "Parties"), as follows:

RECITALS:

WHEREAS, the Town of Exeter voters adopted a Tax Increment Financing District known as the Epping Road TIF District (hereinafter referred to as "TIF" or the "District") by vote at town meeting in March of 2015, all in accordance with New Hampshire RSA 162-K, including the adoption of a development plan for the District which reflected certain public improvements which are in part the subject of this Agreement;

WHEREAS, WCC received conditional site plan approval from the Town's Planning Board in July of 2017 for a 116-unit Active Adult Community (hereinafter referred to as "AAC") that would be accessed by and receive utility service through the construction of a portion of the public improvements proposed in the TIF, which as of this date have not been constructed by the Town or WCC;

WHEREAS, it is a condition of the approval of WCC's AAC that the entity constructing the so called TIF road providing access to the project premises be identified and that adequate provisions be in place to assure that the infrastructure of improvements proposed for the AAC project would be compatible with the public improvements in the TIF Road;

WHEREAS, the Town and WCC are both desirous of entering into a mutual beneficial agreement whereby a portion of the TIF District public improvements (the "TIF Road Work") can be completed on an expedited basis by WCC subject to reimbursement by the Town upon the issuance of a TIF Bond, all as provided herein;

WHEREAS, WCC, conditioned on being able to commence its site work for the AAC is prepared to undertake and initially front the cost of the Town's TIF Road work, at an all-in fixed price of $1,945,022.00, subject to the allowances and qualifications and exceptions stated herein, so that the public improvements will be available to its AAC project and projects proposed by others in the TIF District; and

WHEREAS, WCC can undertake the TIF Road Work now on the property of CKT Associates, an affiliated entity, with a qualified site contractor at an advantageous price which can be obtained because of a combination of the economy of scale and the timing of the work beginning as an off season (" early spring") project.

NOW, THEREFORE, in consideration of the mutual covenants and agreements contained herein, the receipt and sufficiency of which are hereby acknowledged, the Parties hereto agree as follows:

1. **Public Infrastructure Improvements**

1.1 The term "Public Infrastructure Improvements" as used in this agreement includes the construction of the TIF Road Work, in the location shown on **Exhibit A** in green with a

design but no construction of Public Improvements for a future extension of the TIF road to reach the Carlisle Property at Map 40, Lot 12 as shown in yellow on **Exhibit A**. The design is attached as **Exhibit B**.

1.2 The Town alone will be responsible for the design and construction of the portion of the Public Infrastructure Improvements on Epping Road, inclusive of the extension of public water and sewer, as shown in orange (Phase I) and red (Phase II) on Exhibit A and shall use its best efforts to prioritize and complete the extension of public water and sewer in the green area from the Continental Drive intersection to the TIF Road being constructed by WCC, (the "Phase I Water and Sewer extension") on or before September 30, 2018, so as to enable the timely connection of WCC's AAC project for unit sales and occupancy.

1.3 All of the TIF Road Work will be constructed upon the land of CKT Associates, Inc., (hereinafter referred to as "CKT"), an affiliated entity of WCC. CKT shall join in and execute a copy of this agreement solely for the purpose of confirming that CKT agrees to convey fee title to the 50 foot right-of-way roadway area to the Town upon the Town's acceptance of the TIF Road Work and will convey an easement to the Town associated with the roadway fee for the area of the pump station and any associated drainage improvements required for the road (the "Deeds"). CKT's obligation to do so is without compensation, provided the Town cooperates with CKT in CKT's valuing of its gift to the Town of its rights in this property and the location of any drainage easements as per Section 8.2.2.

1.4 The Deeds shall be prepared by counsel for CKT and reviewed by counsel for the Town for form and substance. They shall be executed by CKT and held in escrow by counsel for CKT to be released to the Town at the time the Town acts to accept the TIF Road as a public road.

1.5 The Parties hereto understand and agree that the total amount of TIF Bonding for the Public Infrastructure Improvements contemplated under this Agreement to be carried out by WCC shall be no less than $1,945,022.00.

2. **WCC's Obligations**.

2.1 In proceeding with the AAC Project, WCC will insure that the design of its site improvements will be fully compatible with the design WCC is completing (subject to the review of the Town and its consultants) of the TIF Road Work which WCC will be constructing under this Agreement.

2.2 To perform the TIF Road Work, WCC will engage a qualified site work contractor, S.U.R, with substantial experience in the construction of similar improvements which contractor has the approval of the Town.

2.3 WCC agrees to construct the TIF Road Work for an aggregate price of $1,900,022.00 plus $45,000.00 in approved reimbursable costs, all

as detailed on **Exhibit C,** subject to adjustment of allowances and adjustments as provided by Paragraph 3.4 of this Agreement which shall be documented by written change order(s) executed by the parties.

2.4 **Exhibit E** is an updated Development Schedule for the TIF Road Work and the Phase I Water and Sewer Extension in Epping Road which shall be completed by the Parties within 14 days of the execution of this Agreement. Notwithstanding the forgoing, the Parties recognize that the time for the Performance of the work shall be extended by a period equal to: (a) any delay caused by or resulting from a delay by the Town in implementing and approving the TIF Bond Financing herein contemplated; (b) an act of God, war, civil commotion, fire or other casualty, shortages of energy, materials or equipment, government regulations, or other

causes beyond WCC's control such that WCC's time for performance shall be extended for a reasonable time taking into account the effect and duration of the above; (c) delays which may be caused by Town mandated engineering, site or inspection requirements.

2.5 Except for the Town's TIF Financing contemplated herein, WCC shall be responsible for securing any financing, if any, required for its AAC project to go forward simultaneously with the completion of the TIF Road Work and the Phase I Water and Sewer Extension in Epping Road. The Town will reasonably cooperate with WCC to the extent documentation is requested from WCC's lender with respect to the obligations of each party under this agreement, but in no event shall the Town become a party or guarantor of the financing or WCC's performance thereunder.

2.6 The design of the TIF Improvements attached as Exhibit B which the Town received on or about February 26, 2018 has been reviewed by the Town. The Parties agree that the Hoyle Tanner six page estimate of January 5, 2015 with their letter of January 7, 2015 and the Underwood Engineering Water and Sewer Utility Build Out Evaluation dated February 26, 2018 attached hereto and incorporated herein as Exhibits F-1 and F-2 may be referenced in connection with the design.

2.7 All documents relating to the design, engineering and construction of the TIF Road Work shall be provided to the Town electronically in appropriate digital format.

2.8 WCC will cause its contractor to provide the Town with a one year warranty from the date of completion of the workmanship of its construction of the TIF Road Work.

3. Town of Exeter Obligations

3.1 As used in this Agreement the term "TIF Bond(s)" shall mean a bond(s) utilized by the Town, the proceeds of which shall be used for the purposes of paying Town costs and/or expenses associated with the Public Infrastructure Improvements and reimbursing WCC for the design and construction of the TIF Road Work. The Town shall issue Tax Increment Financing Bond(s) "TIF Bond(s)" on or before July 1, 2018 for the purposes of generating the funds to reimburse WCC for the TIF Road Work WCC shall construct under this Agreement. Nothing herein shall limit the Town's discretion in determining the amount of the TIF Bond(s) or any other aspect of the Bond(s) so long as the Bond(s) generates proceeds equal to or greater than the obligations to reimburse WCC undertaken by The Town under this Agreement. The Town shall keep WCC reasonably informed of its actions in causing the TIF Bond(s) to issue. The payments on the "TIF Bond(s)" shall be made from the funds now held by the Town in the Epping Road Tax Increment Financing District account and as they accrue going forward, all in accordance with RSA Chapter 162-K. For the purposes of this Agreement, the term "TIF Bond(s)" shall include expenses paid at any time by the Town (or such expenses which the Town becomes obligated to pay), with respect to the Public Infrastructure Improvements.

3.2 WCC with the cooperation of the Town and at its expense included in the agreed price on Schedule C is responsible for any required State or Federal approvals for the TIF Road Work. The Town shall be responsible for paying any further permits and approvals fees, if any, required for the remainder of the Public Infrastructure Improvements at its sole expense

3.3 The Town will reimburse WCC for the Public Infrastructure Improvements as they are completed and after satisfactory inspection by the Town throughout the construction process pursuant to requisitions submitted by WCC in accordance with the Schedule of Values to be approved by the Parties and attached hereto as **Exhibit D** within fourteen (14) days of the execution of this Agreement. Further, the Parties agree that they will share equally any value engineering savings, initiated by WCC and approved by the Town, in the design of the TIF Improvements or otherwise.

3.4 The Town's obligation to reimburse WCC shall not exceed the aggregate price subject only to adjustment for allowance items inclusive of ledge and the pump station; any other adjustable items requested by the Town, that, the Parties agree in written change order(s) are allowance/adjustable items; and any hidden unsuitable conditions which cannot be reasonably determined until the work is commenced. The Schedule of Values shall be appropriately adjusted for any changes in allowances/adjustable items or hidden unsuitable conditions.

3.4.1 Potentially adjustable items include, but are not limited to, the:

a. details of the pump station for which an allowance of $350,000.00 is included in the aggregate price. If the Parties do not agree on the details of the pump station, the Town with the cooperation of WCC, shall be obligated to undertake its construction, at its expense, and the aggregate price shall be reduced by $350,000.00; and

b. ledge removal in excess of the allowance of $44,000.00

The Parties agree in considering such adjustments to use best efforts to avoid any additional site costs for WCC's AAC project as currently approved and if such costs are unavoidable they shall be included in the adjustment. All adjustments shall be documented by written change order(s) executed by the Parties and the site contractor.

3.4.2 Reimbursement shall be made within twenty (20) days of the submission of a requisition with a late payment charge of 5%. Notwithstanding the forgoing until such date as the bond proceeds are available, or July 1, 2018, whichever date comes first, WCC agrees to a delay in reimbursement payments provided that any reimbursement payment submitted in proper form shall accrue interest at 0.33% monthly which shall be payable when the Bond(s) proceeds become available, but no later than July 1, 2018. The Town's obligation to make reimbursement payments shall be conditioned upon WCC not being in material default of its obligations under this Agreement.

3.5 Upon the completion of the TIF Road Work, after satisfactory inspection by the Town, the Town shall undertake the obligation to maintain and provide winter maintenance of the TIF Roadway, provided WCC has caused CKT to convey fee and easement ownership to the Town as hereinabove provided and provided the Town with an as built plan(s).

3.6 If for any reason, other than the Town's payment default hereunder, after commencement of construction, the TIF Roadway (a/k/a Ray Farm Road) is not able to be completed under this Agreement, WCC and CKT agree to convey the completed improvements and the road and drainage easements to the Town notwithstanding Section 1.2 of this Agreement.

4. Development Schedule.

4.1 The Parties acknowledge that accomplishment of the updated Development Schedule **(Exhibit E)** and the issuance of the TIF Bond(s) require the coordinated efforts of multiple parties and is dependent in many instances on the actions or approvals of third parties. The Parties agree to use diligent efforts and to cooperate with each other in undertaking their respective responsibilities under this Agreement, including, but not limited to, those events listed on the Development Schedule and TIF Bond(s) issuance. It is further understood by the Parties that the Development Schedule **(Exhibit E)** may require adjustment based upon the discovery of previously unknown site constraints, hidden unsuitable conditions, actions of third parties, and circumstances beyond the control of WCC or the Town. Any such adjustment(s) shall be reviewed and agreed upon by the Parties hereto. Consent to such Development Schedule adjustment shall not be unreasonably withheld.

4.2 For the purposes of this Agreement, Parties shall not be considered in breach or default of its/their respective obligations hereunder in the event of unavoidable delay in the performance of such obligations due to causes beyond its control and without its fault or negligence, including but not restricted to, acts of God, or of the public enemy, acts of the other party, fires, floods or other casualties, epidemics, quarantine restrictions, litigation commenced by others, freight embargoes, and unusually severe weather or delays of contractors and subcontractors due to such causes; it being the purpose and intent of this provision that in the event of the occurrence of any such enforced delay, the time or times for performance of the obligations of such party shall be extended for the period of the enforced delay, provided, that the party seeking the benefit of the provisions of this section shall, within fifteen (15) days after the beginning of any such enforced delay, have first notified the other party thereof in writing

stating the cause or causes thereof and requested an extension for the period of the enforced delay. In calculating the length of the delay, the Town and WCC shall consider not only actual work stoppages, but also any consequential delays resulting from such stoppage as well.

5. Representations and Warranties.

5.1 Representations and Warranties of Town. The Town hereby represents and warrants that:

5.1.1 The execution and delivery of this Agreement and the performance of the Town's obligations hereunder have been duly authorized by such municipal action as necessary, and this Agreement constitutes the legal, valid and binding agreement of the Town, enforceable against the Town in accordance with its terms subject only to the conditions set out in this Agreement.

5.1.2 There is no action, suit or proceeding, at law or in equity, or official investigation before or by any court or governmental authority, pending or to the best of the Town's knowledge threatened against the Town, wherein an unfavorable decision, ruling or finding would materially adversely affect the performance by the Town of the obligations hereunder or the performance by the Town of its obligations under the transactions contemplated hereby, or which, in any way, questions or may adversely affect the validity or enforceability of this Agreement, or any other agreement or instrument entered into by the Town in connection with the transactions contemplated hereby.

5.1.3 The Town has complied, and will continue to comply where and to the extent necessary, with the provisions of RSA Chapter 162-K.

5.1.4 If required by WCC or its lender(s), the Town shall provide WCC with a reasonable legal counsel's opinion, in a customary form for transactions of this nature, with respect to the matters described in this section.

5.2 **Representations and Warranties of WCC**. WCC hereby represents and warrants to the best of its knowledge and belief that:

5.2.1 WCC is a limited liability company, duly organized, validly existing and in good standing under the laws of the New Hampshire, the state of its formation, with all requisite authority to own its property and assets and to conduct its business as presently conducted or proposed to be conducted, and is duly qualified or authorized to transact business and in good standing under the laws of the State of New Hampshire.

5.2.2 WCC has the power and authority to execute, deliver and carry out the terms and provisions of this Agreement and all necessary action has been taken to authorize the execution, delivery and performance of this Agreement. This Agreement will, upon execution and delivery thereof by WCC, constitute valid, legal and binding obligations of WCC enforceable in accordance with the respective terms thereof.

5.2.3 Neither the execution or delivery by WCC of this Agreement, the performance by WCC of its obligations in connection with the transactions contemplated hereby, nor the fulfillment by WCC of the terms or conditions hereof conflicts with, violates or results in a breach of any

constitution, law or governmental regulation applicable by WCC, or conflicts with, violates or result in a breach of any term or condition of any judgment or decree, to which WCC is a party or by which WCC or any of its properties or assets are bound, or constitutes a default thereunder.

5.2.4 There is no action, suit or proceeding, at law or in equity, or official investigation before or by any court or governmental authority, pending or to the best of WCC's knowledge threatened against WCC, its principal(s), affiliate(s), or entities controlled by its principal(s), wherein an unfavorable decision, ruling or finding would materially adversely affect the performance by WCC of its obligations hereunder on the performance by WCC of its obligations under the transactions contemplated hereby, or which, in any way, questions or may adversely materially affect the validity or enforceability of this Agreement or any other agreement or instrument entered into by WCC in connection with the transactions contemplated hereby.

5.2.5 WCC will upon request provide a certificate from its corporate secretary or manager, as the case may be, indicating that the signatory to the within Agreement has obtained all necessary corporate authority to execute and perform the terms of the within Agreement.

5.2.6 If required by the Town, WCC shall provide the Town with a reasonable legal counsel's opinion, in customary form for transactions of this nature,

acceptable to the Town, with respect to the matters described in this section.

6. Defaults and Remedies.

6.1 **Events of Default by Town**. Any one or more of the following shall constitute an "Event of Default" of the Town.

6.1.1 Any representation or warranty in this Agreement made by the Town shall prove incorrect or untrue in any material respect when made and have a material adverse effect on WCC or its rights under this Agreement;

6.1.2 The Town shall fail or refuse to fulfill any of its material obligations under this Agreement, (unless such failure or refusal is caused by the acts or omissions of WCC, or its servants or agents) including, without limitation, the failure by the Town to undertake or complete the TIF Bond(s) issuance or to complete any of its obligations within the timeframes established by this Agreement, unless such timeframes have been extended and mutually agreed upon by the Town and WCC pursuant to this Agreement; Provided, however, that no such failure shall constitute an Event of Default unless and until:

6.1.3 WCC has given written notice to the Town stating that in its opinion a particular default exists that will, unless corrected, constitute a material breach of this Agreement or any related agreement on the part of the Town and that such default will, in the opinion of WCC, give WCC a right to

exercise its remedies pursuant to this Agreement, unless such default is corrected within a reasonable period of time not to exceed thirty (30) days;

6.2 Events of Default by WCC. Any one or more of the following shall constitute an "Event of Default" of WCC:

6.2.1 WCC shall fail to pay any amount required to complete the Public Infrastructure Improvements, a/k/a Ray Farm Road and associated utilities, to be constructed by it as contemplated in this Agreement and such failure is not otherwise excused or extended under this Agreement;

6.2.2 Any representation or warranty made herein by WCC shall prove to be incorrect or untrue in any material respect when made and has a material adverse effect on the Town or its rights under this Agreement; or

6.2.3 WCC fails or refuses to fulfill any of its material obligations under this Agreement (unless such failure or refusal is caused by the acts or omissions of the Town, or its servants or agents) including, without limitation, the failure by WCC to complete any of its obligations within the timeframes provided by this Agreement as such timeframes may be extended pursuant to this Agreement; or

6.2.4 WCC (through the date of the completion of the Public Infrastructure Improvements and compliance with the terms of this Agreement, shall suffer the following:

6.2.4.1 commencement by WCC (or any of such term's component entities) of a voluntary case under Title 11 of the United States Code as from time to time in effect, or by its authorizing, by

appropriate proceedings of its members, or other governing body, the commencement of such a voluntary case;

6.2.4.2 by its seeking relief as debtor under any applicable law, other than said Title 11 of any jurisdiction relating to the liquidation or reorganization of debtors or to the modification or alteration of the rights of creditors, or by its consenting to or acquiescing in such relief;

6.2.4.3 by the entry of an order by a court of competent jurisdiction (a) finding it to be bankrupt or insolvent, (b) ordering or approving its liquidation, reorganization or any modification or alteration of the rights of its creditors, or (c) assuming custody of, or appointing a receiver or other custodian for all or a substantial part of its property;

6.2.4.4 by an assignment for the benefit of its creditors, or admission in writing of its inability to pay its debts generally as they become due, or consent to the appointment of a receiver or liquidator or trustee or assignee is bankruptcy or insolvency of it or of a major part of its property.

Provided however, that the foregoing shall not be deemed to constitute an Event of Default with respect to WCC if the debtor in possession, trustee, receiver, custodian, liquidator, agent or other party exercising control over the assets of the Party, affirms this Agreement without modification and within a reasonable period of time and provides evidence satisfactory to

the Town, in the Town's sole discretion, of the capacity to continue the performance of WCC's obligations under this Agreement and to cure, in a timely manner, all breaches thereunder.

6.2.5 Once the site work has commenced, WCC has ceased active and substantial construction of the TIF Road Work for a period of sixty (60) days except as provided by the Development Schedule attached hereto as Exhibit E, unless such timeframes have been extended and mutually agreed upon by the Town and WCC pursuant to this Agreement.

6.2.6 None of 6.2.1 through 6.2.5 shall constitute an Event of Default unless and until:

6.2.6.1 The Town has given written notice to WCC states that, in its opinion, a particular default or defaults exist that it will, unless corrected, constitute a material breach of this Agreement on the part of WCC and that such default or defaults will, in the opinion of the Town, give the Town a right to exercise its remedies pursuant to this Agreement unless such default is corrected within a reasonable period of one not to exceed thirty (30) days from the receipt of such notice.

7. Consequences of Defaults.

7.1 **Consequences of Events of Default by the Town**. Upon the occurrence of an Event of Default by the Town, WCC may proceed by appropriate proceedings, judicial, or administrative, or otherwise, in law or in equity or otherwise to protect and enforce its rights to recover damages to which it may be entitled, and to enforce performance by the Town. Said proceeding is to be brought in the Rockingham County Superior Court, and WCC may take any action and incur any expense necessary to cure or avoid any default and WCC may recover from

the Town, and the Town shall pay to reimburse WCC, for all expenses so incurred or that must be paid by WCC as ordered by that Court.

7.1.2 In the event the cure by the Town delays work by WCC, WCC's obligations under this Agreement may be extended for the period of delay taking into account weather conditions (if applicable).

7.2 **Consequences of Events of Default by WCC.** In the event of an event of default by WCC, the Town may proceed by appropriate proceedings, judicial, administrative or otherwise in law or in equity to protect and enforce its rights to recover any damages to which it may be entitled, and to enforce performance by WCC. Said proceedings to be brought in the Rockingham County Superior Court and the Town may take any action and incur any expense necessary to cure or avoid any default and the Town may recover from WCC, and WCC shall pay to reimburse the Town for all expenses so incurred or that must be paid by the Town as ordered by that Court.

7.2.2 In the event the cure by the WCC delays work by the Town, the Town's obligations under this Agreement may be extended for the period of delay.

8. Further Assurances/Cooperation.

8.1 The Parties recognize that this Agreement should be interpreted in light of the Parties overall intent which is to: (a) take advantage of an opportunity to fulfill the potential of the TIF District by constructing Public Infrastructure Improvements at a favorable price and expeditiously so as to effectuate the purpose of the TIF to encourage development which will generate additional tax revenue.

8.2 The Parties recognize that there are other related matters involving the AAC where WCC has or will request further reasonable cooperation and future consideration from the Town or its Boards and staff, including but not limited to:

1. Support by the Board of Selectmen for:

   a. Reasonable extensions to the AAC project approvals as filed;

   b. Waivers or other relief from the school and recreational impact fees given the nature of the AAC project consistent with the Towns' treatment of the comparable 55+ Sterling Hill project;

   c. Interpretation of conditions of approval and surety requirements so AAC site work can now commence at WCC's risk.

2. Consultation and consideration regarding the location of the further extension of the TIF Road on the property of CKT Associates so as to preserve the development potential of CKT's remaining land. Similarly, the Town and WCC agree to cooperate and consult should the Town wish to undertake the construction of the remainder of the TIF Road subsequent to the execution of this Agreement.

3. Consultation and cooperation in the assessment and timing of any applicable LUCT penalty associated with the AAC and TIF work, and abatement thereof for the TIF Road land area, including easements for drainage and pump station areas, to be deeded to the Town.

9. General Provisions.

9.1 This Agreement shall be governed and construed in accordance with the laws of the State of New Hampshire.

9.2 If any term or provision of this Agreement is held for invalid or unenforceable, to any extent, the remainder of this Agreement shall continue to be fully valid and enforceable.

9.3 Notices, demands, consents, approvals or other instruments required or permitted by this Agreement shall be in writing and shall be executed by the party or an officer, agent, attorney of the party, and shall be deemed to have been effective as to the date of actual delivery, if delivered personally, or as of the third day from and including the date on which it is mailed by registered or certified mail, return receipt requested with postage prepaid as follows:

To:	Willey Creek Co., LLC 158 Shattuck Way Newington, NH 03801
With a copy to:	Michael J. Donahue, Esquire DTC Lawyers 111 Maplewood Ave, Suite D Portsmouth, NH 03801-3749
To Town of Exeter:	Russell Dean, Town Manager 10 Front Street Exeter, NH 03833
With a copy to:	Walter Mitchell, Esquire Mitchell Municipal Group, PA 25 Beacon Street East Laconia, NH 03246

9.4 Time is of the essence with regard to this Agreement.

9.5 This Agreement shall be binding upon and inure to the benefit of the Parties hereto, and their respective successors and assigns. This Agreement may be assigned by WCC

to an entity that is a subsidiary or affiliate of WCC in which Jonathan Shafmaster maintains a controlling interest. Except as permitted above, neither this Agreement nor any of the rights, interests or obligations of this Agreement may be assigned or delegated by any party without the prior written consent of the other parties.

9.6 WCC shall not pledge or assign this Agreement or any documents relating thereto as security for any financing without the prior written consent of the Town, except that WCC may finance and secure the construction of the building(s) or other improvements of the AAC Project Premises and may if required by its Lender pledge or assign this Agreement and any documents relating thereto in connection with such financing, but may not otherwise pledge or assign this Agreement or any documents relating thereto as security for any financing without the prior written consent of the Town, which consent may not be unreasonably withheld or delayed; provided, however, in the event of any financing pledge and/or assignment, the obligations of WCC shall not be relieved or diminished.

9.7 The Parties anticipate that the obligations set forth herein will be further described in other agreements and/or deeds as agreed to by the Parties. The Parties agree to cooperate in good faith with regard to each and every aspect required for the completion of construction, operation and TIF financing contemplated by this Agreement. The Parties recognize, however, that the regulatory authorities of the State may perform their responsibilities in accordance with the law governing that performance and consequently are not obligated in any way by this Agreement. The Parties agree to further negotiate in good faith and to enter into such other and further agreements as may be necessary to implement any aspect of design, engineering, or construction contemplated under this Agreement.

9.8 Unless expressly stated otherwise in this Agreement, whenever a party's consent or approval is required under this Agreement, or whenever a party shall have the right to give an instruction or request another party to act or to refrain from acting under this Agreement, or whenever a party must act or perform before another party may act or perform under this Agreement, such consent, approval, or instruction, request, act or performance shall be reasonably made or done, or shall not be unreasonably withheld, delayed, or conditioned, as the case may be.

9.9 In the event that any of the terms or provisions of this Agreement are declared invalid or unenforceable by any Court of competent jurisdiction or any Federal or State Government Agency having jurisdiction over the subject matter of this Agreement, the remaining terms and provisions that are not effected thereby shall remain in full force and effect.

IN WITNESS WHEREOF, the Parties hereto have set their hands this ____ day of April, 2018.

TOWN OF EXETER
BOARD OF SELECTMEN

Witness

Julie Gilman, Chair

Witness

Kathy Corson, Vice Chair

Witness

Molly Cowan, Clerk

Witness

Don Clement

Witness

Anne Surman

WILLEY CREEK CO., LLC

Witness

By: _____
Leo F. Swift, President
Duly authorized

LIMITED JOINDER

NOW COMES CKT Associates, a New Hampshire General Partnership with a principal place of business at 158 Shattuck Way, Newington, NH 03801 and by Jonathan Shafmaster, its Partner, duly authorized, and joins in this Agreement regarding only its obligations detailed at Paragraph 1.2, which it agrees to perform.

CKT Associates

Witness

By: _____
Jonathan Shafmaster
Duly Authorized Partner

P:\Shafmaster\Town of Exeter\Development Agreement\2018 03 09 Draft Package\2018 03 12 Development Agreement final.docx

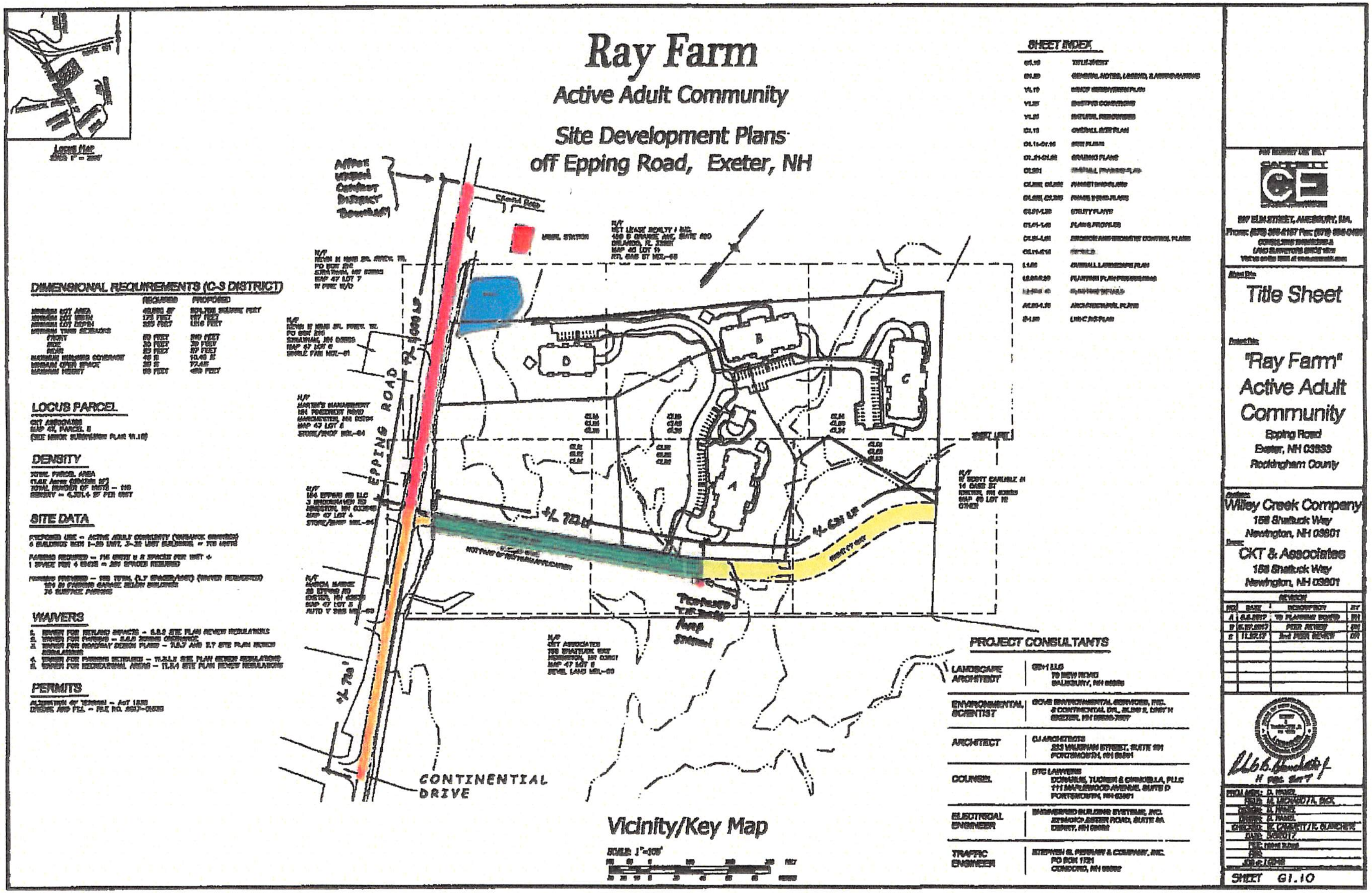
LIST OF EXHIBITS

Exhibit A	Plan Colored Up
Exhibit B	TIF RD Plans
Exhibit C	Detail of Aggregate Price
Exhibit D	Schedule of Values (to be completed by Parties within 14 days of execution)
Exhibit E	Updated Development Schedule (to be completed by Parties within 14 days of Execution)
Exhibit F-1	Hoyle Tanner Estimate of January 5, 2015 With Letter Dated January 7, 2018
Exhibit F-2	Underwood Engineers Water and Sewer District Build Out Evaluation Dated February 26, 2018

EXHIBIT A

PLAN COLORED UP

Exhibit A



Ray Farm
Active Adult Community
Site Development Plans
off Epping Road, Exeter, NH
Locus Map
SHEET INDEX
DIMENSIONAL REQUIREMENTS (C-3 DISTRICT)
LOCUS PARCEL
DENSITY
SITE DATA
WAIVERS
PERMITS
EPPING ROAD
CONTINENTAL DRIVE
A
B
C
D
PROJECT CONSULTANTS
LANDSCAPE ARCHITECT
ENVIRONMENTAL SCIENTIST
ARCHITECT
COUNSEL
ELECTRICAL ENGINEER
TRAFFIC ENGINEER
Vicinity/Key Map
Title Sheet
"Ray Farm"
Active Adult
Community
Epping Road
Exeter, NH 03833
Rockingham County
Willey Creek Company
158 Shattuck Way
Newington, NH 03801
CKT & Associates
158 Shattuck Way
Newington, NH 03801
SHEET G1.10

EXHIBIT B

CONCEPTUAL TIF RD PLANS ON FILE WITH TOWN PLANNING BOARD FOR AAC PROJECT AUGMENTED BY TIF DESIGN PLANS PROVIDED TO TOWN ON OR ABOUT FEBRUARY 26, 2018 WITH THE FOLLOWING ADJUSTMENTS:

TWENTY EIGHT FOOT ROAD WIDTH

ONE HUNDRED TWENTY FOOT TURN LANE WITH ONE HUNDRED TWENTY FOOT TRANSITION

EIGHT INCHES CRUSHED GRAVEL ON ROADWAY

TWELVE INCH WATER MAIN

EXHIBIT C

DETAIL OF AGGREGATE PRICE FOR TIF ROAD

1. TIF Road @ 28 ft. width with right turn lane

$1,900,022	4/11/18 Agreed Price	
	$893,797.00	SUR
	$350,000.00	Pump Station
	$202,000.00	Design
	$ 86,000.00	CA and RPR
	$222,715.00	Project Contingency
	$ 73,500.00	Private utilities (elec)
	$ 72,010.00	Non-SUR road widening
$ 20,000	Cammett Design Work	
$ 25,000	WCC Project/Construction Management	
$1,945,022	TOTAL AMOUNT SUBJECT TO REIMBURSEMENT	

2. Allowances Included In Above:

$350,000	Pump Station
$ 44,000	TIF Road Ledge

EXHIBIT D
SCHEDULE OF VALUES
(TO BE COMPLETED BY PARTIES WITHIN 14 DAYS OF EXECUTION)

UPDATED

EXHIBIT E

DEVELOPMENT SCHEDULE

(TO BE COMPLETED BY PARTIES WITHIN 14 DAYS OF EXECUTION)

EXHIBIT F

EXHIBIT F -1 HOYLE TANNER ESTIMATE OF JANUARY 5, 2015
WITH LETTER DATED JANUARY 7, 2018

EXHIBIT F-2 UNDERWOOD ENGINEERS WATER AND SEWER DISTRICT
BUILD OUT EVALUATION DATED FEBRUARY 26, 2018

-7

Hoyle, Tanner & Associates, Inc.

SHEET 1 OF 6

Project:	Exeter 27 - Industrial Road		
HTA Project #:	TBD	NHDOT Project #:	N/A
Location:	Exeter, NH		
Task:	Conceptual Estimate		
Calculated By:	SBH, ML, MT	Date:	1/5/2015
Checked By:	clq		

CONCEPTUAL ESTIMATE

Epping Road Utility Corridor Infrastructure Expansion

New Industrial Roadway

			COST
New Roadway Construction		$	551,000
Stream Crossing		$	300,000
Stormwater BMP		$	75,000
New Water Line		$	311,643
New Sewer Line - Incl pump station		$	709,428
Land Acquisition - pump station and stormwater BMP's		$	75,000
Contingencies (25%)		$	504,018
	Subtotal	$	2,520,088
Design Engineering & Permitting (15%)		$	378,013
Construction Engineering (10%)		$	252,009
		$	3,150,109

Epping Road Utility Extensions

Water Main Extension (incl crossing Route 101)		$	913,428
Sewer Main Extension (incl crossing Route 101)		$	1,451,245
Contingencies (25%)		$	591,168
	Subtotal	$	2,955,841
Design Engineering & Permitting (15%)		$	443,376
Construction Engineering (10%)		$	295,584
		$	3,694,801

Salem/Summer Street Sewer Repair/Replacement

Sewer Repair/Replace (incl fee for RR inspection)		$	312,173
Contingencies (25%)		$	78,043
	Subtotal	$	390,216
Design Engineering & Permitting (15%)		$	58,532
Construction Engineering (10%)		$	39,022
		$	487,770

ROUNDED PROJECT TOTAL: $ 7,332,680

Hoyle, Tanner & Associates, Inc.

Project: Exeter 27 - Industrial Road
HTA Project #: TBD
Location: Exeter, NH
Task: Conceptual Estimate
Calculated By: SBH
Checked By:
Date: 1/5/2015
MNDOT Project #: N/A

CONCEPTUAL ESTIMATE

Epping Road Utility Corridor Infrastructure Expansion

SECTION A - MAJOR ITEMS

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	UNIT COST	COST
201.1	CLEARING AND GRUBBING (F)	A	2.5	$ 10,000.00	$ 25,000.00
203.1	COMMON EXCAVATION	CY	9300	$ 10.00	$ 43,050.00
203.2	ROCK EXCAVATION	CY	430	$ 50.00	$ 21,500.00
203.6	EMBANKMENT-IN-PLACE (F)	CY	350	$ 30.00	$ 3,500.00
304.2	GRAVEL (F)	CY	3250	$ 20.00	$ 65,000.00
304.3	CRUSHED GRAVEL (F)	CY	1300	$ 25.00	$ 32,500.00
403.11	HOT BITUMINOUS PAVEMENT, MACHINE METHOD	TON	1350	$ 85.00	$ 114,750.00
585.3	STONE FILL, CLASS C	CY	155	$ 40.00	$ 6,200.00
606.18001	31" W-BEAM GR W/8" BLOCKOUTS (STEEL POSTS)	LF	200	$ 20.00	$ 4,000.00
606.1455	BEAM GUARDRAIL (TERM. UNIT EAGRT 25 FT.)	EA	4.00	$ 2,000.00	$ 8,000.00
	MISCELLANEOUS ROADWAY		10% OF ABOVE TOTAL		$ 32,345.00
			SUBTOTAL A		$ 355,795.00

SECTION B - MISCELLANEOUS ITEMS

SIGNS, MARKINGS, LOAM/HUMUS, ETC.	10%	$ 35,579.50
	SUBTOTAL B	$ 391,374.50

SECTION C - DRAINAGE ITEMS

PIPES, UNDERDRAIN, CB's, MH's, ETC.	20%	$ 78,274.90
	SUBTOTAL C	$ 469,649.40

SECTION D - TRAFFIC CONTROL

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	UNIT COST	COST
606.417	PORTABLE CONCRETE BARRIER FOR TRAFFIC CONTROL	LF			$
618.61	UNIFORMED OFFICERS WITH VEHICLE	$	1	$1,000.00	$ 1,000.00
618.7	FLAGGERS	HR	40	$25.00	$ 1,000.00
619.1	MAINTENANCE OF TRAFFIC	UNIT	1	$5,000.00	$ 5,000.00
	MISCELLANEOUS TRAFFIC CONTROL		10% OF ABOVE TOTAL		$ 700.00
			SUBTOTAL D		$ 477,349.40

SECTION E - EROSION AND SEDIMENT CONTROL

EROSION, SEDIMENT, AND POLLUTION CONTROL (HAY BALES, SILT FENCE, SWPPP, TEMP. WATER POLL. CONTROL, ETC.)	30% OF DRAINAGE	$ 23,482.47
	SUBTOTAL E	$ 500,831.87

SECTION F - MOBILIZATION AND CONTINGENCIES

ROADWAY MOBILIZATION		10%	$ 50,083.19
ROADWAY CONTINGENCIES	(Carried in Master Estimate)	0%	$
		SUBTOTAL E	$ 550,915.06

SECTION G - ADDITIONAL ITEMS

BMP's		$ 75,000.00
	SUBTOTAL F	$ 625,915.06
	ROUNDED ROADWAY TOTAL	$ 626,000.00

SEE NEXT SHEET FOR ASSUMPTIONS MADE WHILE COMPILING THIS ESTIMATE.

Hoyle, Tanner & Associates, Inc.

Project:	Exeter 27 - Industrial Road		
HTA Project #:	TBD	NHDOT Project #:	N/A
Location:	Exeter, NH		
Task:	Conceptual Estimate		
Calculated By:	SBH	Date:	42009
Checked By:	0	Date:	0

CONCEPTUAL ESTIMATE - ASSUMPTIONS

This Conceptual Engineer's Estimate of Probable Construction Costs is based on the anticipated scope of work, as well as Hoyle, Tanner's experience with similar projects and understanding of current industry trends. Teh estimate has not been based on a final design for this project, and as such, it is intended to be preliminary in nature. It should be ntoed that changes in material or labor costs in the construction industry could impact the project cost in either direction. Assumptions used for this estimate are listed below.

1.
2.
3.
4.

6.
7.
8.
9.
10.

Hoyle, Tanner & Associates, Inc.

Project:	Exeter 27 - Industrial Road			SHEET	4 OF 6
HTA Project #:	TBD			NHDOT Project #:	N/A
Location:	Exeter, NH				
Task:	Conceptual Estimate				
Calculated By:	SBH	Date:	1/5/2015		
Checked By:		Date:			

COLDPLANE & OVERLAY ESTIMATE

PROJECT TITLE

SECTION A - MAJOR ITEMS

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	UNIT COST	COST
403.11	HOT BITUMINOUS PAVEMENT, MACHINE METHOD	TON	550	$ 85.00	$ 46,750.00
417	COLD PLANING BITUMINOUS SURFACES	SY	4000	$ 5.00	$ 20,000.00
			TOTAL:		$ 66,750.00

Assumes 1.5" Coldplane and 1.5" Hot Bit. Overlay from northside of continental drive to Urban Compact Line

Hoyle, Tanner & Associates, Inc.

Project:	Exeter 27 - Industrial Road	SHEET	5 OF 6
HTA Project #:	TBD	NHDOT Project #:	N/A
Location:	Exeter, NH		
Task:	Conceptual Estimate		
Calculated By:		Date:	1/6/2015
Checked By:		Date:	

CONCEPTUAL ESTIMATE

Epping Road Utility Corridor Infrastructure Expansion

SECTION A - Epping Road Sewer Extension

DESCRIPTION	UNIT	QUANTITY	UNIT COST	COST
Mobilization/Demobilization	LS	1	$ 45,395	$ 45,395
Site Preparation and Restoration	LS	1	$ 64,850	$ 64,850
Pump Station (needed??)	LS	1	$ 350,000	$ 350,000
6" Force Main	LF	200	$ 80	$ 16,000
Air Release Manhole	EACH	1	$ 3,500	$ 3,500
6-inch Air Release Valve	EACH	1	$ 1,500	$ 1,500
15-inch Dia. PVC Sewer Pipe	LF	2500	$ 220	$ 550,000
15-inch Sewer - Route 101 Sleeve	LF	150	$ 400	$ 60,000
4' Dia. Sewer Manholes w/Inverts	EACH	10	$ 3,500	$ 35,000
6-inch Sewer Service Laterals	LF	500	$ 50	$ 25,000
Pavement Repair	LF	2600	$ 90	$ 234,000
Trench Rock Excavation	CY	200	$ 110	$ 22,000
Traffic Control	LS	1	$ 30,000	$ 30,000
Entry/Access Pits for Route 101 Sleeve	EACH	2	$ 2,000	$ 4,000
		SUBTOTAL CONSTRUCTION		$ 1,441,245
Contingencies	LS	0	$ 360,311	$
Engineering	LS	0	$ 288,249	$
NHDOT Inspection/Coordination	LS		$ 10,000	$ 10,000
		SUBTOTAL A		$ 1,451,245

SECTION B - New Industrial Park Road Sewer

Mobilization/Demobilization	LS	1	$ 2,853	$ 2,853
Site Preparation and Restoration	LS	1	$ 4,075	$ 4,075
Pump Station	LS	1	$ 350,000	$ 350,000
Force Main	LF	1000	$ 80	$ 80,000
Air Release Manhole	EACH	1	$ 3,500	$ 3,500
Air Release Valve	EACH	1	$ 1,500	$ 1,500
10-inch Dia. PVC Sewer Pipe	LF	900	$ 200	$ 180,000
4' Dia. Sewer Manholes w/Inverts	EACH	5	$ 3,500	$ 17,500
6-inch Dia. Sewer Service Laterals	LF	300	$ 50	$ 15,000
Pavement Repair (NOT APPLICABLE)	LF	0	$ -	$ -
Trench Rock Excavation	CY	400	$ 110	$ 44,000
Traffic Control	LS	1	$ 5,000	$ 5,000
		SUBTOTAL CONSTRUCTION		$ 703,428
Contingencies	LS	0	$ 175,857	$ -
Engineering	LS	0	$ 140,686	$
		SUBTOTAL B		$ 703,428

SECTION C - Salem/Summer Street Sewer Repair Replacement

Mobilization/Demobilization	LS	1	$ 9,748	$ 9,748
Site Preparation and Restoration	LS	1	$ 13,925	$ 13,925
15-inch Dia. Sewer Replacement	LF	600	$ 200	$ 120,000
15-inch R.R. Xing Sewer Replacement	LF	100	$ 500	$ 50,000
Sewer Manholes w/Inverts	EACH	6	$ 4,000	$ 24,000
6-inch Dia. Sewer Service Laterals	LF	300	$ 50	$ 15,000
Pavement Repair	LF	600	$ 90	$ 54,000
Trench Rock Excavation	CY	50	$ 110	$ 5,500
Traffic Control	LS	1	$ 10,000	$ 10,000
		SUBTOTAL CONSTRUCTION		$ 302,173
Contingencies	LS	0	$ 75,543	$
Engineering	LS	0	$ 60,435	$
Railroad Inspection Fees	LS	1	$ 10,000	$ 10,000
		SUBTOTAL A		$ 312,173

SECTION D - ROUNDED TOTALS

Total Construction (Excl. Eng. & Contng.)	ROUNDED SEWER TOTAL: $ 2,467,000.00

Hoyle, Tanner & Associates, Inc.

Project:	Exeter 27 - Industrial Road	SHEET	6 OF 6
HTA Project #:	TBD	NHDOT Project #:	N/A
Location:	Exeter, NH		
Task:	Conceptual Estimate		
Calculated By:		Date:	1/6/2015
Checked By:		Date:	

CONCEPTUAL ESTIMATE

Epping Road Utility Corridor Infrastructure Expansion

SECTION A - Epping Road Water Main Extension

DESCRIPTION	UNIT	QUANTITY	UNIT COST	COST
Mobilization/Demobilization	LS	1	$ 29,740	$ 29,739.50
Site Preparation and Restoration	LS	1	$ 33,988	$ 33,988.00
12-inch D.I. Water Pipe	LF	2500	$ 150	$ 375,000.00
12-inch Water Line Across Route 101 Bridge	LF	250	$ 320	$ 80,000.00
Hyd/ w 6" Gate Valve	LS	6	$ 7,500	$ 45,000.00
12" Gate Valves	LS	4	$ 4,000	$ 16,000.00
6" Gate Valves	LS	6	$ 2,000	$ 12,000.00
12"x8" Tee	LS	8	$ 2,000	$ 16,000.00
6" DI Pipe	LF	600	$ 52	$ 31,200.00
Testing and Chlorination	LS	1	$ 2,500	$ 2,500.00
Trench Rock Excavation	CY	200	$ 110	$ 22,000.00
Pavement Repair	LF	2500	$ 90	$ 225,000.00
Traffic Control	LS	1	$ 25,000	$ 25,000.00
		SUBTOTAL CONSTRUCTION		$ 913,428
Contingencies		0	$ 228,357	$
Engineering		0	$ 182,686	$
		SUBTOTAL A		$ 913,428

SECTION B - New Industrial Park Road Water Main Extension

Mobilization/Demobilization	LS	1	$ 10,147	$ 10,147
Site Preparation and Restoration	LS	1	$ 11,596	$ 11,596
12-inch D.I. Water Pipe	LF	1500	$ 150	$ 225,000
Hyd/ w 6" Gate Valve	LS	2	$ 7,500	$ 15,000
12" Gate Valves	LS	2	$ 4,000	$ 8,000
6" Gate Valve	LS	3	$ 2,000	$ 6,000
12"x8" Tee	LS	4	$ 2,000	$ 8,000
6" DI Pipe	LF	200	$ 52	$ 10,400
Testing and Chlorination	LS	1	$ 1,500	$ 1,500
Trench Rock Excavation	CY	100	$ 110	$ 11,000
Pavement Repair (NOT APPLICABLE)	LF	0	$	$ -
Traffic Control	LS	1	$ 5,000	$ 5,000
		SUBTOTAL CONSTRUCTION		$ 311,643
Contingencies	LS	0	$ 77,911	$
Engineering	LS	0	$ 62,329	$
		SUBTOTAL B		$ 311,643

SECTION D ROUNDED TOTALS

Total Construction (Excl. Eng. & Contng.)	ROUNDED SEWER TOTAL: $ 1,225,000

Hoyle, Tanner
Associates, Inc.

150 Dow Street
Manchester, New Hampshire 03101
603-669-5555
603-669-4168 fax
www.hoyletanner.com

January 7, 2015

Mr. Darren Winham
Economic Development Director
Town of Exeter
10 Front Street
Exeter, NH 03833

Re: Expedited Estimate for Epping Road
Development Corridor Infrastructure Improvements

Dear Darren:

Pursuant to our proposal dated January 2, 2015, Hoyle, Tanner & Associates, Inc. (Hoyle, Tanner) is pleased to submit this preliminary estimate of costs associated with planned improvements to the Epping Road Development Corridor. As you are aware, the timeframe for the development of this initial estimate was limited, therefore, we have incorporated a 25% contingency on our estimate to cover aspects of the project which cannot be identified or anticipated in detail at this time. We have separated the estimate into three basic tasks and presented rough costs for each. As previously discussed, we anticipate providing additional detail prior to the upcoming Public Hearing. We provide the following information on assumptions that have been made by Hoyle, Tanner in the preparation of this estimate:

New Industrial Road and Utilities

It is assumed that sewer will only be required on the new industrial roadway from the east end of the roadway extending to a new pump station, a distance of approximately 800 feet. An estimated 5 new manholes were assumed. It is assumed that sewer will not be required on the industrial park access road between the pump station and Epping Road. One wastewater pump station will be required along the new industrial park access roadway due to the topography and is included in the opinion of cost. The cost also includes approximately 1,000 linear feet of new force main to convey the flow from the pump station to the sewer on Epping Road.

We estimated approximately 1,500 linear feet of new 12-inch diameter water main on the new industrial park access roadway. The cost includes allowances for valves, hydrants, laterals, testing, chlorination, ledge excavation and traffic control.

The new roadway is assumed to be approximately 1,350 lf in length and a 30' paved surface with 2-12' travel lanes and 3' shoulders in accordance with the 2/7/03 plans prepared by RG Moynihan & RSL Layout & Design. The estimate assumes the structural box will consist of 5" of Hot Bituminous Pavement, 8" of crushed gravel, and 18" of gravel. Earthwork quantities are based on the proposed profile in the 2/7/03 plans and assume 10% rock excavation. Drainage is expected to be open channel flow in ditch lines with limited closed drainage as required to convey stormwater to a potential BMP. Costs have been included for a typical BMP which is likely to be required to meet Alteration of Terrain (AoT) requirements. Granite curbing and sidewalk are not anticipated to be part of this roadway. Although they may be required to meet the traffic and operational needs of the future development, intersection improvements at NH Route 27 including turn lanes (on NH Route 27 and the new roadway); shoulder widening; and traffic signals are not

included. Water and sewer line infrastructure costs for the new roadway are calculated separately. Due to the limited ROW width, private utilities will either need to be located in the roadway clear zone or underground. Private utility infrastructure costs for electrical, telephone, gas, etc. including manholes and conduit are not part of this estimate.

Epping Road Utility Extensions

The extension of sewer lines includes approximately 2,700 linear feet of new 15-inch diameter sewer on Epping Road and approximately 500 linear feet of new 10-inch diameter sewer on the new industrial park access roadway. The new sewer on Epping Road includes approximately 150 linear feet of sewer installation through an existing sleeve beneath the NH Route 101 and approximately 2500 feet of new sewer installed via open-cut trench excavation. It is assumed that a new pump station will also be required on Epping Road though this needs to be confirmed. The estimate includes 10 new manholes on Epping Road at an average depth of 10 feet. The cost of pavement repair is included for the sewer extension along Epping Road. Costs are included for service wyes, service laterals within the right-of-way, ledge removal and traffic control.

The extension of water lines includes approximately 2,700 linear feet of new 12-inch diameter water main on Epping Road. A 12 inch diameter waterline is proposed to be installed on and carried across the bridge that carries Epping Road over NH Route 101. This is a steel girder bridge supported on cantilever concrete abutments. A 24 inch diameter sleeve, according to available documentation, was installed under the bridge approach slabs and blockouts were installed in the abutment backwalls. It is assumed that the necessary utility supports between girders were also installed during the original construction, as would be NHDOT standard practice when installing a sleeve and blockouts for a future utility. The estimate assumes that a pre-insulated waterline, rollers, spacers, air release valves etc. are installed as part of this project. Trenching would be required at the end of each approach slab, however, the waterline would then be thread through the sleeves and pushed out over the bridge towards the other abutment. Traffic control coordination would be required with NHDOT to install the waterline over NH Route 101 traffic. The costs for rolling roadblocks, temporary lane closures, night work or some combination of the above are included in the estimate. The cost of pavement repair is included for the water main extension along Epping Road. The cost includes allowances for valves, hydrants, laterals, testing, chlorination, ledge excavation and traffic control.

The new roadway crosses an apparent delineated wetland area near Station 9+50 on the new roadway. The estimate assumes that the crossing will consist of twin-cell precast concrete box culvert with dimensions of 12 foot span and 6 foot rise. The bottom 2 feet of the box culvert will be buried to create a natural stream bottom which is preferred by the New Hampshire Department of Environmental Services (NHDES). Precast concrete wingwalls will be required at all four quadrants of the bridge to retain the earth fill required for the roadway construction while minimizing wetland impacts. The precast concrete box culverts will have a length equal to the width of the roadway (30 feet) plus raised brush curbs on each side for mounted bridge rails. The overall length of the box culverts is assumed to be 33 feet.

Sewer Line Replacement on Salem/Summer Street

We have included an opinion of cost for replacement of approximately 700 linear feet of existing 15-inch diameter old vitrified clay pipe (VCP) sewer along Summer Street that is known to have structural deficiencies. This includes approximately 100 feet of crossing beneath the commuter railroad to be installed using trenchless technology and 600 feet of open-cut pipe replacement along Summer Street. The opinion of cost assumes replacement of 6 existing sewer manholes. The cost opinion includes allowances for replacement/reconnection of service laterals within the right-of-way, pavement repair and traffic control. An allowance for coordination with and inspection by the railroad is also included in the opinion of cost.

We have attempted to be conservative, yet reasonable, with this estimate. We anticipate that over the next couple of weeks we could refine this estimate. A refined estimate would be expected to carry a lower contingency percentage, and possibly a lower overall cost. As mentioned above, we have not done any detailed sizing evaluations of the utilities. We have not included anything for the cost of private utility extensions into the new industrial road.

Also, as I have mentioned previously, Hoyle, Tanner does not feel that a fall 2015 construction schedule can be accomplished if the Town waits until April to begin the design and permitting effort. We anticipate a significant permitting and approval process with the regulatory agencies. We would be happy to work with you to develop a scope and fee to complete the design work that has been identified in this estimate so that an earlier start date could be achieved. We would begin with conceptual meetings with NHDES, NHDOT and applicable resource agencies which would assist in guiding our design efforts and help define a more refined understanding of the overall project.

Should you have any questions or additional input with regard to the initial estimate, please do not hesitate to contact me. We appreciate the opportunity to assist you with this very exciting initiative for the Town of Exeter.

Very Truly Yours
Hoyle, Tanner & Associates, Inc.

Michael A. Trainque, P.E.
Vice President

Carl L. Quiram, P.E.
Municipal Business Development Manager

Enclosure

Hoyle, Tanner Associates, Inc.

			SHEET	1 OF 6
Project:	Exeter 27 - Industrial Road			
HTA Project #:	TBD	NHDOT Project #:		N/A
Location:	Exeter, NH			
Task:	Conceptual Estimate			
Calculated By:	SBH, ML, MT	Date:		1/5/2015
Checked By:	clq			

CONCEPTUAL ESTIMATE

Epping Road Utility Corridor Infrastructure Expansion

New Industrial Roadway

			COST
New Roadway Construction		$	551,000
Stream Crossing		$	300,000
Stormwater BMP		$	75,000
New Water Line		$	332,000
New Sewer Line - Incl pump station		$	704,000
Land Acquisition - pump station and stormwater BMP's		$	75,000
Contingencies (25%)		$	504,250
	Subtotal	$	2,521,250
Design Engineering & Permitting (15%)		$	378,188
Construction Engineering (10%)		$	252,125
		$	3,151,563

Epping Road Utility Extensions

Water Main Extension (Incl crossing Route 101)		$	914,000
Sewer Main Extension (Incl crossing Route 101)		$	1,450,000
Contingencies (25%)		$	591,000
	Subtotal	$	2,955,000
Design Engineering & Permitting (15%)		$	443,250
Construction Engineering (10%)		$	295,500
		$	3,693,750

Salem/Summer Street Sewer Repair/Replacement

Sewer Repair/Replace (Incl fee for RR inspection)		$	313,000
Contingencies (25%)		$	78,250
	Subtotal	$	391,250
Design Engineering & Permitting (15%)		$	58,688
Construction Engineering (10%)		$	39,125
		$	489,063

ROUNDED PROJECT TOTAL: $ 7,334,375

EXHIBIT
F-2

civil &
environmental
engineering

UNDERWOOD
engineers

2266.00

February 26, 2018

Paul Vlasich, P.E., Town Engineer
Public Works Department, Town of Exeter, NH
13 Newfields Road
Exeter, NH 03833

Re: *Water and Sewer Utility Buildout Evaluation*
Exeter TIF District
Exeter, New Hampshire

Dear Mr. Vlasich:

In accordance with Engineering Services Request ESR EX-126 (dated January 9, 2018) we are pleased to provide you our findings from the Water and Sewer Buildout Evaluation within the Town's TIF District. The purpose of this evaluation is to provide the Town with suggested water and sewer main sizes based on expected future developments/connections identified by the Town along Epping Road and other buildout areas.

TIF District/Buildout Area with Estimated Water Demands and Sewer Flows

The Town's TIF District was established to promote economic expansion along the Epping Road Corridor. A portion of the tax increment is used for capital investment in infrastructure improvements including water and sewer main extensions, roadway improvements and a new commercial road off of Epping Road (aka TIF Road). With anticipated developments planned within the TIF District, the Town has requested assistance from Underwood Engineers to determine the size requirements for both a water main and sewer main extension. The extensions will serve Epping Road, the TIF Road and possible buildout areas identified in Figure 1 (attached).

The Town's Hydraulic Water Model was used to simulate the effects of future buildout on the existing water system and what the available fire flows would be for different size water mains. The model inputs are based on planning information provided by the Town, zoning regulations, and proposed site plans. The estimated future water demands and sewage flows within the TIF District/Buildout Area as calculated by UB are summarized in Table 1 below:

ph 603.436.6192
fx 603.431.4733
25 Vaughan Mall
Portsmouth, NH 03801
underwoodengineers.com

Table 1. Assumed TIF/Buildout Uses

Potential Future Connection	Anticipated Potential Uses	Average Day Water Demands (gpd)	Max Day Water Demands (gpd)	Peak Hour Sewer Flows (gpd)
High School	School	11,000	45,000	108,000
Residential Development	100 3-Bdr units	18,000	45,000	108,000
Mixed Use Commercial Development	11 lots - 1 Hotel, 3 Offices, 1 Med Office, 5 Retail Stores, 1 Kennel	32,820	82,050	196,920
Lots 32-2,3,4	1 Assisted Living, 1 Child Daycare, 1 Office	2,500	6,250	15,000
Lots 40-9 10	2 Retail Spaces	720	1,800	4,320
Gas Station	Gas Station	128	320	768
Ray Farm Residential Development	116 2-Bdr Units	14,000	35,000	84,000
Carlisle	1 Conference Center, 1 Micro Brewery, 1 Hotel	18,000	45,000	108,000
King	116 2-Bdr Units	14,000	35,000	84,000
Lot 47-9	1 Hotel, 2 Retail buildings, 1 Restaurant, 1 Sports Rec Area	28,200	70,500	169,200
Lot 47-3,5,6	1 Residential Unit, 2 Office Buildin	330	825	1,980
	TOTAL	140,698	366,745	880,188
	Rounded	142,000	370,000	900,000

NHDES ENV-WQ 1008-1 values were used to determine max day water demands for each user type. Average day sewer flows were estimated to be approximately 2.5 times less than Max Day water demands. A peaking factor of 6 was then applied to the average day sewer flows based on TR-16.

Assumed Fire Flow Requirements

Exeter DPW references Insurance Services Office (ISO) guidelines for fire flow requirements. For the purpose of this evaluation, Underwood Engineers has provided Needed Fire Flow requirements which are based on typical ISO requirements for residential and commercial evaluations performed in the past.

Table 2. Estimate of Needed Fire Flows

High School	3,000 gpm
100 Residential	750 gpm
Mixed Commercial	1,500 gpm
Lots 32-2,3,4	1,500 gpm
Lots 40-9,10	1,500 gpm
Gas Station	1,500 gpm
Ra. Farm	1,500 gpm
Carlisle	1,500 gpm
Kha	1,500 gpm
Lot 47-9	1,500 gpm
Lot 47-3,5,6	1,500 gpm

* Needed Fire Flows (NFF) are assumed based on typical needed fire flows for commercial and residential uses. Actual NFFs are based on factors not available at this time (building materials, square footages, etc) and developing each site's NFF is not included within this scope. It is the Developer's responsibility to provide NFF's to the Town during the site plan approval process. Typical NFFs range from 500gpm Min to 3,500gpm Max.

Water Model Simulation

The Exeter water system model was used to simulate the impact of the TIF Buildout on the existing water system. The hydraulic analysis was conducted using the H2OMap Water model originally set up by Underwood Engineers (2010) and later updated by Weston and Sampson (2017). For the purposes of this evaluation, the model was updated to reflect the buildout conditions in the TIF District and areas identified by the Town for this evaluation (Figure 1):

- A water main extension was added to the existing system on Epping Road from Continental Drive to Exeter High School (~12,000').
- A spur line was included on the water main extension to represent the TIF Road (~1,300').
- Nodes representing the expected water users identified in Table 1 were added.
- Pipe lengths, node locations and elevations were based on record drawings, proposed site plans, information provided by the Town, and Google Earth.

Other general conditions in the model include the following:

- Average day demands at 0.954 MGD
- Maximum day demands at 1.8 MGD.
- Cross Road Tank level at 71' (15' drawdown).
- Epping Road Tank level at 30' (10' drawdown).
- Hampton Road Tank level at 70' (15' drawdown).
- Surface Water treatment plant pumps on at 409 gpm.
- Ground Water treatment plant pumps on at 265 gpm.

The following model runs were performed:

- Evaluate the available fire flows within the TIF District and Buildout Area under max day conditions (per AWWA standards) with three different water main diameter scenarios:
  - 8" DI Pipe
  - 12" DI Pipe
  - 12" and 16" DI Pipe Combination
- Monitor change in system pressure (if any) caused by addition of demand at proposed locations during maximum and average day demand conditions.
- Predict the fire flow conditions.

Water Model Findings

A summary of the modeling results for each scenario are summarized in the tables below:

Table 3. Scenario 1: 8" DI Pipe Throughout the Entire TIF/Buildout Area

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Ray Farm	TIF Road	8	[illegible]	[illegible]
Carlisle	End of TIF Road	8	[illegible]	1,500
King	Epping Road	8	830	1,500
Lot 40-09	Epping Road South of 101	8	770	1,500
100 Residential Lots	Watson Road	8	470	750
Mixed Commercial	Epping Road and Watson Road	8	500	1,500
Lot 32-02	Epping Road and Beech Hill Road	8	585	1,500
Exeter High School	Blue Hawk Drive	8	285	3,000

The results in Table 3 show that the available flows predicted by the Town's water model would not meet the assumed needed fire flows. The next scenario increases the proposed water main size from 8" to 12" on both Epping Road and the new TIF Road. Scenario 2 results are provided in Table 4 below:

Table 4. Scenario 2: 12" DI Pipe Throughout the Entire TIF/Buildout Area

Description	Location	Pipe Size (in)	Available Fire Flow (gpm)	Needed Fire Flow (gpm)
Ray Farm	TIF Road	12	1,910	1,500
Carlisle	End of TIF Road	12	1,600	1,500
King	Epping Road	12	1,700	1,500
Lot 40-09	Epping Road (South of 101)	12	1,600	1,500
100 Residential Lots	Watson Road	12	1,150	750
Mixed Commercial	Epping Road and Watson Road	12	1,150	1,500
Lot 32-02	Epping Road and Beech Hill Road	12	1,450	1,500
Exeter High School	Blue Hawk Drive	12	800	3,000

The available fire flows predicted for Scenario 2 nearly meet all of the needed fire flows assumed for the future buildout with the exception of the high school and Lot 32-02. It should be noted that Lot 32-02's Needed Fire Flows are nearly met, and would most likely be adequate depending on future development. A third scenario was performed to try and increase the available fire flows at these areas by enlarging the proposed water main on Epping Road from 12" to 16"

Table 5. 16" Pipe on Epping Road and 12" Pipe on TIF Road

Description	Location	Pipe Size (in)	Available Fire Flow (gpm)	Needed Fire Flow (gpm)
Ray Farm	TIF Road	12	1,910	1,500
Carlisle	End of TIF Road	12	1,700	1,500
King	Epping Road	12	1,900	1,500
Lot 40-09	Epping Road (South of 101	16	1,900	1,500
100 Residential Lots	Watson Road	12	1,500	750
Mixed Commercial	Epping Road and Watson Road	16	1,500	1,500
Lot 32-02	Epping Road and Beech Hill Road	16	2,000	1,500
Exeter High School	Blue Hawk Drive	16	1,600	3,000

By increasing the proposed water main on Epping Road from 12" to 16", the increase in Lot 32-02's available fire flow was enough to meet the assumed needed fire flow. However, the available fire flow for the High School (which is at the far end of the proposed water main extension) was still significantly lower than needed. An onsite tank and/or fire pump may be needed in order to meet the school's needed fire flows. However, that would require further study beyond the scope of this evaluation.

Sewer Extension Capacity

Using Town record drawings of the existing sewer system, UE evaluated the sizing of a new gravity sewer on Epping Road from the existing sewer stub at Continental Drive to Route 101 (~2,000'). A second sewer main was also evaluated for the proposed TIF Road (~1,300'). In addition to minimum pipe slopes, the Town asked UE to determine the size of the Epping Road sewer extension using a pipe slope of 1% and 0.5%.

For the Epping Road sewer extension, the peak hour sewer flows (~900,000 gpd) identified in Table 1 were used to evaluate the following pipe sizes:

Table 6. Epping Road Sewer Extension Capacity Estimates

Slope	Peak Hour Flow (gpd)	Pipe Capacity (gpd)	Excess Capacity (gpd)
0.22% (12" Min. Slope)	900,000	1,400,000	500,000
0.5%	900,000	2,117,000	1,217,000
1.0%	900,000	994,000	2,094,000

It is understood that a pumping station will be required in the future on the north side of Route 101 to pump sewage flows from the North to the gravity sewer extension on Epping Road. The pumping station would be sized based on the Peak Hour Flow (+/-). Even if the pumping station pump rates were 20% higher than the peak hour flow, a 12" gravity sewer pipe would still be able to accommodate the estimated future flows (gravity and pumped).

The gravity sewer main for the proposed TIF Road was also evaluated. The peak hour flows for the Ray Farm and Carlisle properties (~192,000 gpd) were used for the pipe capacity calculations used in Table 7 below:

Table 7. TIF Road Sewer Capacity Estimates

Slope	Peak Hour Flow (gpd)	Pipe Capacity (gpd)	Excess Capacity (gpd)
0.4% (8" Min. Slope)	192,000	642,000	450,000
1.2%	192,000	1,088,000	896,000

It should be noted that the sewer main used for the TIF Road evaluation was based on a continuous gravity pipe from the Carlisle Property to Epping Road. However, due to the topography and elevations between Epping Road and the Carlisle property, a combination of gravity sewer and pressure sewer with a pumping station will be needed to connect into the Epping Road sewer. As noted with the Route 101 pumping station above, the TIF Road pumping station would be sized based on the estimated Peak Hour Flows. If the TIF Road pumping station

pumped at a 20% higher pumping rate than the Peak Hour Flows, the 8" gravity sewer pipe would still be able to accommodate the estimated gravity and pumped sewer flows.

This evaluation only considered the sizing needs of the TIF/Buildout area sewer extension. An evaluation on the impact of increasing sewer flows within the Town's existing system downstream of this area was not performed.

Conclusions

The following conclusions are made based on the results described above:

Water Main Extension

- The TIF/Buildout water extensions will increase demand on the Town's water system by approximately 370,000 gpd on Max Day.
- An 8" DI water main extension would not provide the assumed needed fire flows.
- A 12" DI water main extension would provide nearly all of the assumed needed fire flows throughout the TIF/Buildout Areas with the exceptions of Lot 32-02 (which is nearly met) and the High School.
- The installation of a 16" water main on Epping Road would provide the assumed needed fire flows at all locations except for the Exeter High School.
- An onsite water storage tank and/or fire pump is needed to meet fire flows at the High School. Further study will be needed for the High School.

Sewer Main Extension

- The sewer main extension would increase potential connections and flows to the Town's WWTF.
- The impact to the Town's existing sewer system was not evaluated.
- A 12" sewer main on Epping would accommodate the projected TIF/Buildout Flows.
- A combination of gravity sewer and pressure sewer is expected for the TIF Road extension.
- An 8" sewer main would accommodate the TIF Road Flows.
- Further review is necessary once the TIF Road Sewer system is designed, including the following:
    - Gravity Sewer Design Review
    - Pumping Station Capacity Review
    - Force Main Design Review

Recommendations

Underwood Engineers recommends the following:

- Design the TIF/Buildout Water main extension with a 12" DI Pipe on Epping Road and the new TIF Road.

- Design a 12" sewer main on Epping Road.
- Design the gravity portion of the TIF Road sewer extension with an 8" pipe.
- Develop a sewer model of the Town's Sewage Collection System to evaluate the impacts of sewer buildout flows to the existing system.
- Provide gravity and pressure sewer designs of the Epping Road and TIF Road sewers for review.
- Provide water main designs for the Epping Road and TIF Road extensions for review.

Please call if you have any questions.

Very truly yours,

[illegible] WOOD ENGINEERS, INC

Benjamin T. Dreyer, P.E.
Project Manager

Erik B. Nichols, E.I.T
Project Engineer

BTD/EBN

Encl.

CC: Jen Mates, Town of Exeter w/ Encl.
Dave Sharples, Town of Exeter w/ Encl.

Epping Rd TIF District – Construction Projects

April 10, 2018

Epping Rd Water and Sewer Extensions Consultant, CMA Eng. – Continental Dr. to Cronin Rd

Survey & Borings Complete	May 1
Preliminary Design Complete and Town Review	May 12
Final Design Complete and Town/NHDES Review	July 11
Contractor Notice to Proceed	Aug 1
Construction Complete	Oct 1

Intersection Traffic Signal Consultant, VHB – Epping Rd and Continental Dr.

Traffic Counts	April 6
Concept Plan on Orthophotos and Town Review	May 1
Survey from CMA Engineers	May 1
Preliminary Design Complete and Town/NHDOT Review	June 8
Order Signals	June 29
Final Design Complete	July 20
Underground Construction and Widening Complete	Dec 7
Install Delivered Poles, Mast Arms and Signals	Dec 28

Potential Contractor, SUR – Preliminary Discussion

Crew Potentially Available	July 1
Start Water & Sewer on Epping Rd per Consultant	Aug 1
Water & Sewer to new TIF Rd (8wks)	Sept 26
Water & Sewer from TIF Rd to Cronin Rd (8wks)	Nov 21
Traffic Signal Work	TBD

TOWN OF EXETER

Planning and Building Department

10 FRONT STREET • EXETER, NH • 03833-3792 • (603) 778-0591 •FAX 772-4709

www.exeternh.gov

Date: **November 3, 2022**

To: **Planning Board**

From: **Dave Sharples, Town Planner**

Re: **Jerry & Christine Sterritt** **PB Case #22-14**

The Applicant is seeking approval for the subdivision of an existing 24.62-acre parcel into seven residential lots. The subject parcel is located at 100 Beech Hill Road, in the RU-Rural zoning district and identified as Tax Map Parcel #13-1.

The Applicant has submitted an application, plans and supporting documents, dated August 30, 2022 for review and are enclosed. A Technical Review Committee (TRC) meeting was conducted on September 22nd, 2022. A copy of the TRC comment letter, dated September 22, 2022 is enclosed for your review.

Please note that as agreed upon at the TRC meeting, the Applicant was requested to provide a response letter to these comments along with revised plans as soon as practical so the application can be considered complete for review purposes, noting that a second TRC meeting would then be scheduled to review the submission.

Revised plans and supporting documents were received on October 18th, 2022 in response to TRC comments and are enclosed for your review. A second TRC meeting was conducted on October 27th, 2022. UEI comments, dated November 1, 2022, have been received subsequent to the second TRC meeting and are enclosed for your review. Staff is still in the process of reviewing this submission at this time. One important note that was made clear at the TRC is that the outcome of the waiver request will dictate the path forward, particularly the one regarding an Open Space Development. In light of this, I would request that the Board consider the waivers as there first order of business after the public hearing.

The Applicant is requesting three (3) waiver from the Board's Site Plan and Subdivision Regulations. A copy of the waiver request letter, dated November 2, 2022, is enclosed for your review.

In the event the board chooses to hold a site walk, I will ask the applicant to mark out the important features of the site. Since I will be unable to attend this meeting, I would

suggest the Board does not act on the request but table the item until the next meeting. This will give staff the time to review revised plans depending upon the outcome of the waiver requests and to prepare suggested conditions of approval.

Waiver Motions:

Significant Trees (20-inches diameter or greater) waiver motion: After reviewing the criteria for granting waivers, I move that the request of Jerry & Christine Sterritt (PB Case #22-14) for a waiver from Section 7.4.7. of the Site Plan Review and Subdivision Regulations regarding identifying significant trees 20" in diameter or greater be APPROVED / APPROVED WITH THE FOLLOWING CONDITIONS / TABLED / DENIED.

Subdivision for lots of record greater than 20 acres in area required to comply with provisions of Open Space Development motion: After reviewing the criteria for granting waivers, I move that the request of Jerry & Christine Sterritt (PB Case #22-14) for a waiver from complying with Article 7 of the Zoning Ordinance governing Open Space Development be APPROVED / APPROVED WITH THE FOLLOWING CONDITIONS / TABLED / DENIED

Perimeter Buffer Strip waiver motion: After reviewing the criteria for granting waivers, I move that the request of Jerry & Christine Sterritt (PB Case #22-14) for a waiver from Section 9.6.1.2 of the Site Plan Review and Subdivision Regulations regarding ownership of the perimeter (vegetative) buffer be APPROVED / APPROVED WITH THE FOLLOWING CONDITIONS / TABLED / DENIED.

Planning Board Motion:

Subdivision Motion: I move that the request of Jerry & Christine Sterritt (PB Case #22-14) for subdivision approval be APPROVED / APPROVED WITH THE FOLLOWING CONDITIONS / TABLED / DENIED.

Thank You.

Enclosures

ALTUS ENGINEERING, INC.

Civil
Site Planning
Environmental
Engineering

133 Court Street
Portsmouth, NH
03801-4413

August 30, 2022

Dave Sharples, Town Planner
Planning Department, Town of Exeter
10 Front Street
Exeter, NH 03833

Re: Beech Hill Subdivision
Tax Map 13, Lot 1
100 Beech Hill Road
Altus Project No. 5307

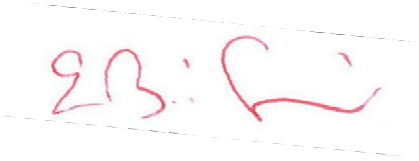
Dear Mr. Sharples,

On behalf of the Applicant, Jerry and Christine Sterritt, we are pleased to submit a Subdivision Application for seven single-family residential frontage lots off of Beech Hill and Old Town Farm Roads. No new road, municipal utility or other public improvement is proposed. We respectfully request this be placed on the next available TRC or Planning Board agenda if you feel this does not rise to the level where TRC would be required.

Please feel free to contact me directly if you have any questions or require any additional documentation. Thank you for your time and consideration.

Sincerely,

ALTUS ENGINEERING, INC.



Erik B. Saari
Vice President

ebs/5307.01-CoverLetter

SUBDIVISION APPLICATION
CHECKLIST

A COMPLETED APPLICATION FOR SUBDIVISION MUST CONTAIN THE FOLLOWING:

1. Application for Hearing (X)
2. Abutter's List Keyed to the Tax Map (X)
   (including the name and business address of every engineer, architect, land surveyor, or soil scientist whose professional seal appears on any plan submitted to the Board)
3. Checklist for Subdivision plan requirements (X)
4. Letter of Explanation (X)
5. Written Request and justification for Waiver(s) from Site Plan Review and Subdivision Regulations" (if applicable) ( )
6. Application to Connect and/or Discharge to Town of Exeter Sewer, Water or Storm Water Drainage System(s) (if applicable) ( )
7. Planning Board Fees $1,045 ($125 app, $700 lots, $50 legal, $170 abutters) (X)
8. Seven (7) full-size copies of Subdivision Plan (X)
9. Fifteen (15) 11"x 17" copies of the final plan to be submitted **TEN DAYS PRIOR** to the public hearing date. (X)
10. Three (3) pre-printed 1"x 2 5/8" labels for each abutter, the applicant and all consultants. (X)

NOTES: All required submittals must be presented to the Planning Department Office for distribution to other Town departments. Any material submitted directly to other Departments will not be considered.

TOWN OF EXETER, NH
APPLICATION FOR SUBDIVISION

OFFICE USE ONLY

THIS IS AN APPLICATION FOR:

( ) OPEN SPACE DEVELOPMENT

(X) STANDARD SUBDIVISION

( ) NUMBER OF LOTS 7

_____**APPLICATION**
_____**DATE RECEIVED**
_____**APPLICATION FEE**
_____**PLAN REVIEW FEE**
_____**ABUTTER FEE**
_____**LEGAL NOTICE FEE**
_____**INSPECTION FEE**
_____**TOTAL FEES**
_____**AMOUNT REFUNDED**

1. **NAME OF LEGAL OWNER OF RECORD:** Judith A. and Frederick J. Nichols

   ADDRESS: 100 Beech Hill Road, Exeter, NH 03833

   _____ **TELEPHONE:** ( ) N/A

2. **NAME OF APPLICANT:** Jerry and Christine Sterritt

   ADDRESS: 98 Beech Hill Road, Exeter, NH 03833

   _____ **TELEPHONE:** (603) 498-5975

3. **RELATIONSHIP OF APPLICANT TO PROPERTY IF OTHER THAN OWNER:** Daughter

   LOA Attached

   (Written permission from Owner is required, please attach.)

4. **DESCRIPTION OF PROPERTY:**

   ADDRESS: 100 Beech Hill Road

   TAX MAP: 13 **PARCEL #:** 1 **ZONING DISTRICT:** RU

   AREA OF ENTIRE TRACT: 24.62 acres **PORTION BEING DEVELOPED:** 14.75

5. **EXPLANATION OF PROPOSAL:** The project entails the subdivision of the parcel into seven single-family frontage lots served by private wells and septic systems. No new roadway or municipal infrastructure is proposed and the plan includes 9.87 acres conservation easement near or adjacent to other conservation areas.

6. **ARE MUNICIPAL SERVICES AVAILABLE?** (YES/NO) No
IF YES, WATER AND SEWER SUPERINTENDENT MUST GRANT WRITTEN APPROVAL FOR CONNECTION. IF NO, SEPTIC SYSTEM MUST COMPLY WITH W.S.P.C.C. REQUIREMENTS.

7. **LIST ALL MAPS, PLANS AND OTHER ACCOMPANYING MATERIAL SUBMITTED WITH THIS APPLICATION:**

ITEM:	NUMBER OF COPIES
A. Plan Set	
B. USGS	
C. Aerial Photo	
D. Tax Map	
E. Abutters List & Labels	
F.	

8. **ANY DEED RESTRICTIONS AND COVENANTS THAT APPLY OR ARE CONTEMPLATED** (YES/NO) No IF YES, ATTACH COPY.

9. **NAME AND PROFESSION OF PERSON DESIGNING PLAN:**

NAME: Altus Engineering
ADDRESS: 133 Court Street, Portsmouth, NH 03801
PROFESSION: Civil Engineering **TELEPHONE (** 603**)** 433-2335

10. **LIST ALL IMPROVEMENTS AND UTILITIES TO BE INSTALLED:** None. No roadway is proposed and each lot will be served by private wells and septic systems.

11. **HAVE ANY SPECIAL EXCEPTIONS OR VARIANCES BEEN GRANTED BY THE ZONING BOARD OF ADJUSTMENT TO THIS PROPERTY PREVIOUSLY?**
(Please check with the Planning Department Office to verify) (YES/NO) No
IF YES, LIST BELOW AND NOTE ON PLAN.

12. **WILL THE PROPOSED PROJECT INVOLVE DEMOLITION OF ANY EXISTING BUILDINGS OR APPURTENANCES?** IF YES, DESCRIBE BELOW.
(Please note that any proposed demolition may require review by the Exeter Heritage Commission in accordance with Article 5, Section 5.3.5 of the Exeter Zoning Ordinance).

No

13. **WILL THE PROPOSED PROJECT REQUIRE A "NOTICE OF INTENT TO EXCAVATE" (State of NH Form PA-38)? IF YES, DESCRIBE BELOW.**

No

NOTICE: I CERTIFY THAT THIS APPLICATION AND THE ACCOMPANYING PLANS AND SUPPORTING INFORMATION HAVE BEEN PREPARED IN CONFORMANCE WITH ALL APPLICABLE TOWN REGULATIONS, INCLUDING BUT NOT LIMITED TO THE "SITE PLAN REVIEW AND SUBDIVISION REGULATION" AND THE ZONING ORDINANCE. FURTHERMORE, IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION 15 OF THE "SITE PLAN REVIEW AND SUBDIVISION REGULATIONS", I AGREE TO PAY ALL COSTS ASSOCIATED WITH THE REVIEW OF THIS APPLICATION.

DATE 08/30/22 APPLICANT'S SIGNATURE

See Attached Letter of Authorization

ACCORDING TO RSA 676.4.I (c), THE PLANNING BOARD MUST DETERMINE WHETHER THE APPLICATION IS COMPLETE WITHIN 30 DAYS OF SUBMISSION. THE PLANNING BOARD MUST ACT TO EITHER APPROVE, CONDITIONALLY APPROVE, OR DENY AN APPLICATION WITHIN SIXTY FIVE (65) DAYS OF ITS ACCEPTANCE BY THE BOARD AS A COMPLETE APPLICATION. A SEPARATE FORM ALLOWING AN EXTENSION OR WAIVER TO THIS REQUIREMENT MAY BE SUBMITTED BY THE APPLICANT.

ABUTTERS: PLEASE LIST ALL PERSONS WHOSE PROPERTY IS LOCATED IN NEW HAMPSHIRE AND ADJOINS OR IS DIRECTLY ACROSS THE STREET OR STREAM FROM THE LAND UNDER CONSIDERATION BY THE BOARD. THIS LIST SHALL BE COMPILED FROM THE EXETER TAX ASSESSOR'S RECORDS.

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PLEASE ATTACH ADDITIONAL SHEETS, IF NEEDED.

SUBDIVISION PLAN REQUIREMENTS

7.4. Existing Site Conditions Plan

Submission of this plan will not be applicable in all cases. The applicability of such a plan will be considered by the TRC during its review process as outlined in Section 6.5 Technical Review Committee (TRC) of these regulations. The purpose of this plan is to provide general information on the site, its existing conditions, and to provide the base data from which the site plan or subdivision will be designed. The plan shall show the following:

APPLICANT	TRC	REQUIRED EXHIBITS
X		7.4.1. Names, addresses, and telephone numbers of the owner, applicant, and person(s) or firm(s) preparing the plan.
X		7.4.2. Location of the site under consideration, together with the current names and addresses of owners of record, of abutting properties and their existing land use.
X		7.4.3. Title, date, north arrow, scale, and Planning Board Case Number.
X		7.4.4. Tax map reference for the site under consideration, together with those of abutting properties.
X		7.4.5. Zoning (including overlay) district references.
X		7.4.6. A vicinity sketch or aerial photo showing the location of the land/site in relation to the surrounding public street system and other pertinent location features within a distance of 2,000-feet, or larger area if deemed necessary by the Town Planner.
X		7.4.7. Natural features including watercourses and water bodies, tree lines, significant trees (20-inches in diameter at breast height) and other significant vegetative cover, topographic features, and any other environmental features that are important to the site design process.
X		7.4.8. Man-made features such as, but not limited to, existing roads, structures, and stonewalls. The plan shall also indicate which features are to be retained and which are to be removed or altered.
X		7.4.9. Existing contours at intervals not to exceed 2-feet with spot elevations provided when the grade is less than 5%. All datum provided shall reference the latest applicable US Coast and Geodetic Survey datum and should be noted on the plan.

X	☐	7.4.10. A High Intensity Soil Survey (HISS) of the entire site, or appropriate portion thereof. Such soil surveys shall be prepared by a certified soil scientist in accordance with the standards established by the Rockingham County Conservation District. Any cover letters or explanatory data provided by the certified soil scientist shall also be submitted.
X	☐	7.4.11. State and Federally designated wetlands, setback information, total wetlands proposed to be filled, other pertinent information and the following wetlands note: "The landowner is responsible for complying with all applicable local, state, and federal wetlands regulations, including any permitting and setback requirements required under these regulations."
X	☐	7.4.12. Surveyed property lines including angles and bearings, distances, monument locations, and size of the entire parcel. A professional land surveyor licensed in New Hampshire must attest to said plan.
X	☐	7.4.13. The lines of existing abutting streets and driveway locations within 200-feet of the site.
X	☐	7.4.14. The location, elevation, and layout of existing catch basins and other surface drainage features.
X	☐	7.4.15. The shape, size, height, location, and use of all existing structures on the site and approximate location of structures within 200-feet of the site.
X	☐	7.4.16. The size and location of all existing public and private utilities, including off-site utilities to which connection is planned.
X	☐	7.4.17. The location of all existing easements, rights-of-way, and other encumbrances.
X	☐	7.4.18. All floodplain information, including the contours of the 100-year flood elevation, based upon the Flood Insurance Rate Map for Exeter, as prepared by the Federal Emergency Management Agency, dated May 17, 1982.
X	☐	7.4.19. All other features which would fully explain the existing conditions of the site.
X	☐	7.4.20. Name of the site plan or subdivision.

7.6. Subdivision Layout Plan (Pertains to Subdivisions Only)

The purpose of this plan is to illustrate the layout of the subdivision lots, rights-of-way, easements, and other uses of land within the subdivision. It shall be prepared on reproducible mylar and be suitable for filing with the Rockingham County Registry of Deeds. The plan shall depict the following:

APPLICANT	TRC	REQUIRED EXHIBITS	
X		7.6.1	Names, addresses, and telephone numbers of: the owner, applicant, and person(s) or firm(s) preparing the plan (including engineer, architect, or land surveyor).
X		7.6.2	Name of the subdivision.
X		7.6.3	Location of the land/site together with the names and address of all owners of record of abutting properties.
X		7.6.4	Title, date, north arrow, scale, and Planning Board Case Number.
X		7.6.5	Tax map reference for land/site under consideration with those of abutting properties.
X		7.6.6	Zoning (including overlay) district references.
X		7.6.7	The location and dimensions of all boundary lines of the property to be expressed in feet and decimals of a foot.
X		7.6.8	The location and width of all existing and proposed streets, street rights-of-way, sidewalks, easements, alleys, and other public ways.
X		7.6.9	The locations, dimensions, and areas of all proposed lots.
X		7.6.10	The location of all test pits and the 4,000-square-foot septic reserve areas for each newly created lot, if applicable.
X		7.6.11	High Intensity Soil Survey (HISS) information for the site, including the total area of wetlands proposed to be filled.
X		7.6.12	State and Federally designated wetlands, setback information, total wetlands proposed to be filled, other pertinent information and the following wetlands note: “The landowner is responsible for complying with all applicable local, state, and federal wetlands regulations, including any permitting and setback requirements required under these regulations.”
X		7.6.13	All floodplain information, including contours of the 100-year flood elevation, based upon the Flood Insurance Rate Map for Exeter, as prepared by the Federal Emergency Management Agency, dated May 17, 1982.
X		7.6.14	Sufficient data acceptable to the Board to determine the location, bearing, and length of all lines; sufficient data to be

			able to reproduce such lines upon the ground; and the location of all proposed monuments.
X	☐	7.6.15	The location and dimensions of all property proposed to be set aside for green space, parks, playgrounds, or other public or private reservations. The plan shall describe the purpose of the dedications or reservations, and the accompanying conditions thereof (if any).
X	☐	7.6.16	A notation shall be included which explains the intended purpose of the subdivision. Indication and location of all parcels of land proposed to be dedicated to public use and the conditions of such dedications, and a copy of such private deed restriction as are intended to cover part or all of the tract.
X	☐	7.6.17	Newly created lots shall be consecutively numbered or lettered in alphabetical order. Street address numbers shall be assigned in accordance with Section 9.17 Streets of these regulations.
X	☐	7.6.18	The following notations shall also be shown: • Explanation of proposed drainage easements, • Explanation of proposed utility easement, • Explanation of proposed site easement, • Explanation of proposed reservations • Signature block for Board approval
X	☐	7.6.19	A note indicating that: “All water, sewer, road (including parking lot), and drainage work shall be constructed in accordance with Section 9.5 Grading, Drainage, and Erosion & Sediment Control and the Standard Specifications for Construction of Public Utilities in Exeter, New Hampshire”. See Section 9.14 Roadways, Access Points and Fire Lanes and Section 9.13 Parking Areas for exceptions.

OTHER REQUIRED PLANS (See Section indicated)

- ☐ 7.7 Construction plan
- ☐ 7.8 Utilities plan
- ☐ 7.9 Grading, drainage and erosion & sediment control plan
- ☐ 7.10 Landscape plan
- ☐ 7.11 Drainage Improvements and Storm Water Management Plan
- ☐ 7.12 Natural Resources Plan
- ☐ 7.13 Yield Plan

Letter of Authorization

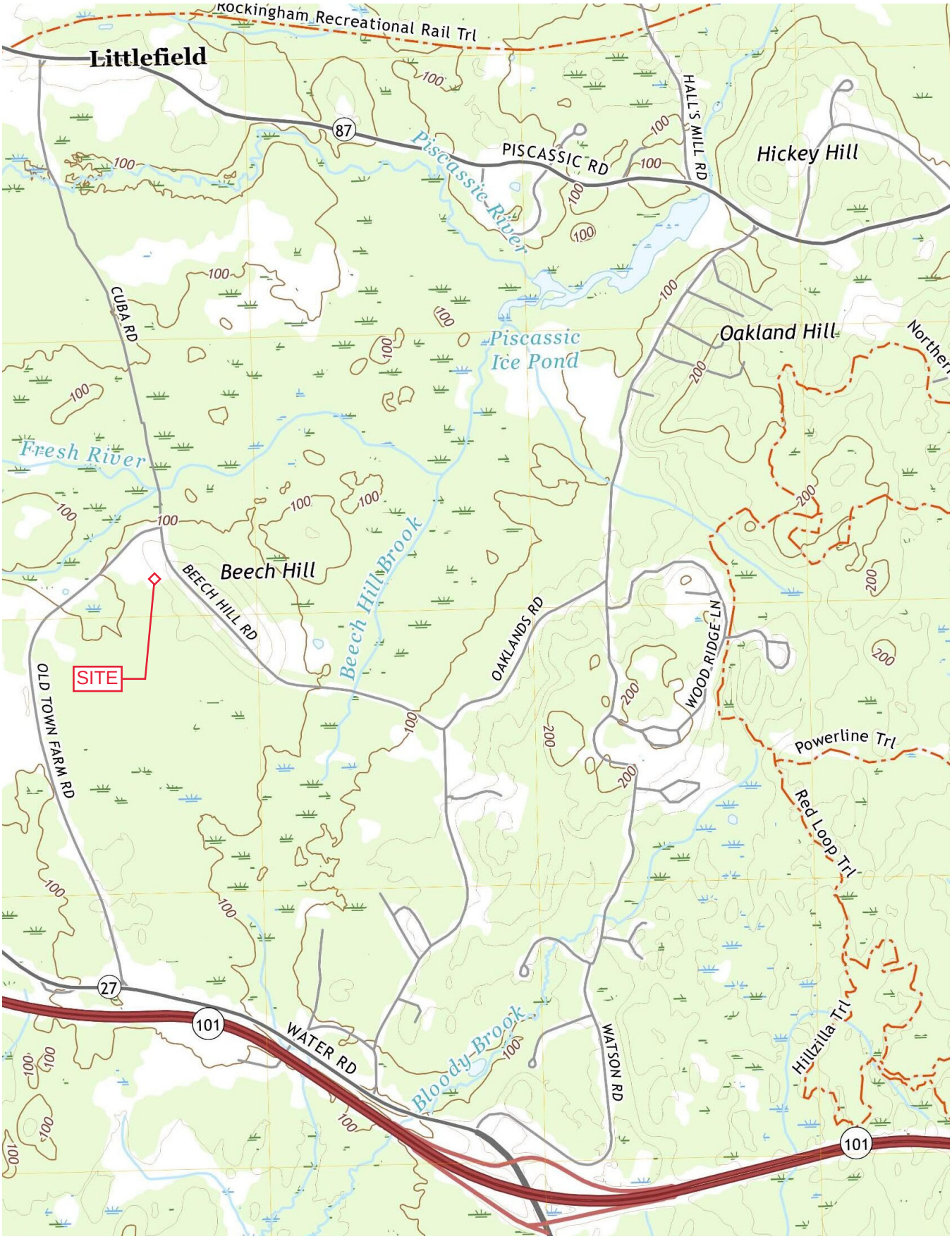
We, Jerry and Christine Sterritt, hereby authorize Altus Engineering, Inc. of Portsmouth, NH to represent us as the Applicant in all matters concerning the engineering and related permitting of a subdivision on Exeter Tax Map 13, Lot 1 located at 100 Beech Hill Road in Exeter, New Hampshire. This authorization shall include representation at public hearings and other project-related meetings in addition to any signatures required for Federal, State and Municipal permit applications.

Signature	Christine Sterrit	6/27/22
	Christine Sterrit	Date
Signature	Gerald D. Sterritt	6/27/22
	Jerry Sterritt	Date
Witness	JUDITH A. NICHOLS	6-22-22
	Print Name	Date

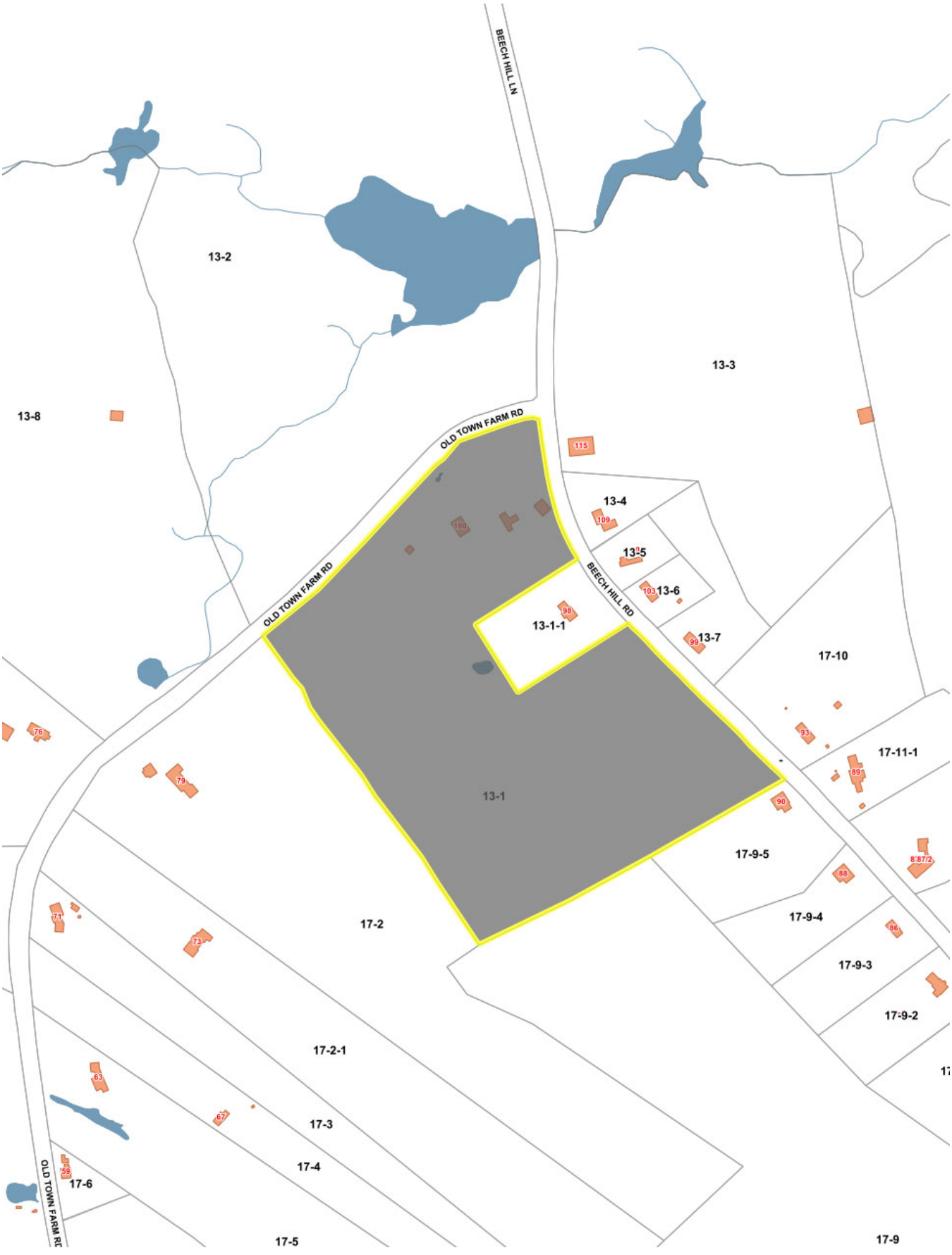
Letter of Authorization

I, Judith Nichols, hereby authorize Altus Engineering, Inc. of Portsmouth, NH to represent me as the Owner in all matters concerning the engineering and related permitting of a subdivision on Exeter Tax Map 13, Lot 1 located at 100 Beech Hill Road in Exeter, New Hampshire. This authorization shall include representation at public hearings and other project-related meetings in addition to any signatures required for Federal, State and Municipal permit applications.

Judith A. Nichols	JUDITH NICHOLS	6-22-22
Signature	Judith Nichols	Date
Christine Hebert	Christine Hebert	6/22/22
Witness	Print Name	Date


Rockingham Recreational Rail Trl
Littlefield
87
PISCASSIC RD
HALL'S MILL RD
Hickey Hill
Piscassic River
Piscassic Ice Pond
Oakland Hill
CUBA RD
Fresh River
Beech Hill Brook
Beech Hill
BEECH HILL RD
OAKLANDS RD
WOOD RIDGE LN
SITE
OLD TOWN FARM RD
Powerline Trl
Red Loop Trl
27
101
WATER RD
Bloody Brook
WATSON RD
Hillzilla Trl
100
200


Cubie Rd
Cubie Rd
Fresh River
Old Town Farm Rd
Beech Hill Rd
Curtis Tree Care
Old Town Farm Rd
Beech Hill Rd
SITE
Beech Hill Rd
Blue Hawk Dr
DQ'ed Motorsports
Temporarily closed
Gautreau's Auto
Restoration


BEECH HILL LN
OLD TOWN FARM RD
OLD TOWN FARM RD
BEECH HILL RD
13-1
13-1-1
13-2
13-3
13-4
13-5
13-6
13-7
13-8
17-2
17-2-1
17-3
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17-9-3
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109
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58

ALTUS ENGINEERING, INC.

Civil
Site Planning
Environmental
Engineering

133 Court Street
Portsmouth, NH
03801-4413

ABUTTER'S LIST

Beech Hill Subdivision
Tax Map 13, Lot 1
100 Beech Hill Road
Exeter, NH 03833

	Tax Map / Parcel	Abutter Name & Address
Owner:	13 / 1	Judith A. Nichols and Frederick J. Nichols 100 Beech Hill Road Exeter, NH 03833
Applicant:	13 / 1-1	Jerry and Christine Sterritt 98 Beech Hill Road Exeter, NH 03833
Abutters:	13 / 8	Michael S. Davis 78 Old Town Farm Road Exeter, NH 03833
	13 / 2	Town of Exeter 10 Front Street Exeter, NH 03833
	13 / 3	Robert Webb 37 Middle Road Brentwood, NH 03833
	13 / 4	Emily Skarda Marci J. Roche 109 Beech Hill Road Exeter, NH 03833
	13 / 5	John P. Heisey 105 Beech Hill Road Exeter, NH 03833
	13 / 6	John R. Wentworth, Jr. Phyllis W. Wentworth 103 Beech Hill Road Exeter, NH 03833

13 / 7	William E. Curtis Mariah J. Blain 99 Beech Hill Road Exeter, NH 03833
17 / 10	Lois E. Burns 93 Beech Hill Road Exeter, NH 03833
17 / 11-1	Robert C. Burns, Jr. Michelle E. Burns 89 Beech Hill Road Exeter, NH 03833
17 / 9-5	Nicholas G. Nordin Brita M. Nordin 90 Beech Hill Road Exeter, NH 03833
17 / 9	State of New Hampshire Fish and Game Department 11 Hazen Drive Concord, NH 03301
17 / 2	William R. Stiner Rev. Trust Marcy L. Stiner Rev. Trust 79 Old Town Farm Road Exeter, NH 03833

Engineer:	Altus Engineering, Inc. c/o Erik Saari 133 Court Street Portsmouth, NH 03801
Surveyor:	T.F. Bernier, Inc. P.O. Box 3464 Concord, NH 03302-3464
Wetland and Soils Scientist:	Gove Environmental Services, Inc. 8 Continental Drive, Unit H Exeter, NH 03833

TOWN OF EXETER

Planning and Building Department

10 FRONT STREET • EXETER, NH • 03833-3792 • (603) 778-0591 •FAX 772-4709
www.exeternh.gov

Date: September 22, 2022

To: Erik Saari, Vice President, Altus Engineering, Inc.
Jerry & Christine Sterritt, Applicant

From: Dave Sharples, Town Planner

Re: Site Plan Review TRC Comments
PB Case # 22-14 7-Lot Subdivision – 100 Beech Hill Road
Tax Map Parcel #13-1

The following comments are provided as a follow-up for technical review of the site plans and supporting documents submitted on August 30th, 2022 for the above-captioned project. The TRC meeting was held on September 22nd, 2022 and materials were reviewed by Town departments.

TOWN PLANNER COMMENTS

1. Are there any known environmental hazards on site? Has any type(s) of environmental assessments been conducted on the site? If so, please provide copies.
2. Identify significant trees per Section 7.4.7;
3. Indicate to the extent, it any, that the stone walls shall be altered or removed per Section 7.4.8;
4. Submit High Intensity Soil Survey per Section .7.4.10;
5. In lieu of a Utilities Plan referenced in Section 7.8, provide information/note on how lots will be serviced by utilities. Indicate that they will all be underground per Section 9.23;
6. Provide signature block per Section 7.6.18;
7. Show driveways and grades as discussed at the TRC (per Section 9.14), extent of disturbance and the total cumulative disturbance to determine if a Grading, Drainage, and Erosion & Sediment Control Plan is required per Section 7.9. Without this information, the TRC assumes that the total disturbance is greater than 10,000 square feet and this plan is required.
8. Note # 12 mentions a waiver from the open space requirement but no written justification is required per Section 13.7.

PUBLIC WORKS COMMENTS

1. The driveways off Beech Hill Rd for Lots #4, 5, 6 & 7 will be really steep. I'd like to see some sort of grading information on how these will be constructed. Especially noting: the grading at the roadway connections and the specifics of the driveway easement for Lot #7.

FIRE DEPARTMENT COMMENTS

E-mail received from Deputy Fire Chief Jason Fritz, dated 9/22/22, indicating the Fire Department has no comments.

CONSERVATION & SUSTAINABILITY PLANNER COMMENTS

General Comments

1. Missing location of significant trees remaining or to be removed (SS Regs 7.4.7).
2. Our local shoreland regulations requires a 300' buffer for the Fresh River and 150' for perennial brooks and streams within the watershed. Please check to see if a perennial brook or stream as defined (ZO 9.3.2.F) is present on this side of the road and if so, whether a shoreland buffer would be present within this lot (ZO 9.3.3.B).
3. A 100' perimeter buffer strip is required in the RU (SS 9.6.1.2).
4. Please confirm in writing that the wetland survey included the determination of whether vernal pools were present. I note specifically the small wetland behind proposed lot 5.

As agreed upon at the TRC meeting, please provide a response letter to these comments along with revised plans as soon as practical so the application can be considered complete for review purposes. Once the submittal is received, a second TRC meeting will be scheduled shortly thereafter to review the resubmission.

ALTUS ENGINEERING, INC.

Civil
Site Planning
Environmental
Engineering

133 Court Street
Portsmouth, NH
03801-4413

October 11, 2022

Dave Sharples, Town Planner
Town of Exeter
10 Front Street
Exeter, NH 03833

Re: TRC Comments
Exeter PB Case #22-14
100 Beech Hill Road
Exeter, NH
Altus Project No. 5307

Transmitted via email to: dsharples@exeternh.gov

Dear Mr. Sharples,

Altus Engineering, Inc. (Altus) is in receipt of the TRC's review comments dated September 22, 2022. We offer the following in response to your comments:

Town Planner Comments

1. There are no know environmental hazards on the project site.

2. We respectfully request a waiver of Subdivision Regulation Section 7.4.7 which requires trees over 20" in diameter be shown on the plan. While there may exist some trees that meet this criterion on the site, over fifty-five percent of the wooded area is proposed for conservation or located in wetlands and wetland buffers. The remaining area will be cleared only to accommodate four building envelopes, not roadways or other major infrastructure that would require a more substantial impact. We therefore feel that the requirement to locate every large tree on the property to be overly burdensome and that a waiver is justified in this case.

3. Note #17 has been added to Sheet C-1 indicating the extent to which stonewalls can be removed.

4. A HISS map is included in the plan set on Sheet C-2.

5. Note #3 on Sheet C-3 references utilities provided to the individual lots, in this case overhead electric and communications and private wells and septic systems. In regard to the overhead services, we respectfully request a waiver from Subdivision Regulation Section 9.23 which requires underground utilities. Given that the project entails frontage lots and no road, the extension of existing overhead services to each house site is reasonable and commensurate with the surrounding neighborhood.

6. A signature block has been provided on the Cover Sheet for the Town's records and Sheet C-1 for recording purposes.

7. Conceptual house and driveway locations for all lots and driveway grading for Lots 4 through 7 is shown on Sheet C-3. Combined with the notes and details on subsequent sheets, this plan is intended to meet the requirements of Subdivision Regulation Section 7.9, Grading, Drainage and Erosion & Sediment Control Plan. We have also included a Drainage Analysis that meets Section 9.3, Stormwater Management Standards for Post Construction and Construction.

8. As referenced in Zoning Section 4.3, Schedule II, Footnote #19, the Planning Board may waive the requirement that any subdivision on a lot over twenty acres comply with the provisions of Article 7 and Subdivision Regulation Section 11 governing Open Space Development. Given the characteristics of the land, it is our professional opinion that an Open Space subdivision layout is not suitable for this parcel and we respectfully request the waiver noted above.

   Although the lot is over twenty-four acres, there are a number of unique qualities that inhibit an Open Space design and instead lend themselves to the conventional frontage lot configuration shown on the plans. The first is the location of abutting Lot 13/1-1 at 98 Beech Hill Road which interrupts the project site's continuity. Second is the wetland area along the site's southern western boundary. This wetland features numerous fingers extending east into the site. Where these intersect with the abutting lot, the parcel is effectively cut in half, the two resulting segments each having their own restrictive features. On the northeast corner, there is the existing residence at 100 Beech Hill Road. Given that this structure is in fine shape, the Applicant understandably has no intention of tearing it down. This limits the available remaining land to the point where the two frontage lots shown on the plan is the only real option for development. On the southeast, the upland area is confined to two narrow strips and one larger area along Beech Hill Road. While it might be possible to cluster a few units there, the slope from Beech Hill makes construction of a cul-de-sac impractical without a significant amount of fill and related expense. In this case, the Applicant would be forced into the unnecessary position of having to build a road for the sake of building a road. Furthermore, the resulting grades would require even more fill for lot development as the new road would be many feet above the surrounding ground. The open field behind Lot 13/1-1 would also most likely be developed in this scenario rather than be preserved as intended. For these reasons, it is obvious that an open space design is not appropriate for this site.

   Despite the waiver request, the project does meet the purpose of the Open Space Ordinance, specifically where conservation of open space, the efficient use of land and the preservation of natural features are concerned. Although not required by the standard subdivision regulations, 42% of the lot is intended to be preserved as open space where only 30% is required in an Open Space layout. This allows the best of both worlds where conservation and resource protection goals are met, infrastructure and its long-term maintenance responsibilities are minimized and the Applicant is able to make viable economic use of their land.

<u>Public Works Comments</u>

1. As shown on Sheet C-3, we have included conceptual grading designs for the driveways to Lots 4 through 7. These grades are similar to the abutting lots on both side of the site. The driveway to Lot 7 will be contained within a 50'-wide easement over Lots 5 and 6. Maintenance of the easement and the driveway within it will be the responsibility of the owner of Lot 7 unless the owners of Lots 5 and/or 6 choose to utilize the easement at which point the shared maintenance provisions specified in the easement language would come into effect.

<u>Conservation and Sustainability Planner Comments</u>

1. Please reference Town Planner Comment #2 above regarding trees over 20" in diameter.

2. We have verified that the wetland adjacent to the southwest property line does not contain a brook. This is supported by the attached USGS map as well as visual observation conducted during the rain event on September 22, 2022.

3. We respectfully request a waiver of Subdivision Regulation Section 9.6.1.2 which requires a 100' buffer strip between the proposed lots and the perimeter of the site. It is obvious that this regulation is designed with a standard, road-based conventional or cluster subdivision in mind. Given that this site has been demonstrated to be better suited to frontage lots than a layout which features a road, application of this rule is impossible as lots separated from the existing roads would have no legal frontage. Strict compliance would essentially create a mandate that a road be constructed to create frontage which is unreasonable and runs counter to the arguments presented in response to Town Planner Comment #8 above. Furthermore, the need for a 100' buffer is not present given the characteristics of the site. Lots 1 and 2 are located across the street from existing conservation land and their building envelopes are pushed back from Old Town Farm Road due to wetland setbacks. Lot 3 is around an existing house that is intended to remain. Lots 1, 2, 3, 4 and 7 abut the Applicants property at Lot 13/1-11 where buffering is not a concern. The three lots along Beech Hill Road, Lots 4, 5 and 6, will be similar to the surrounding neighborhood which is characterized by single-family homes. Finally, the building area on Lot 7 will abut conservation land to the southeast. Taken together, these unique factors make the buffer strip unnecessary for this project.

4. We stand corrected in our initial statement that what we believe to be an old farm pond is not a vernal pool. As indicated in the attached correspondence from Gove Environmental Services, this pond is in fact a vernal pool and is the only one on the property. The wetland pocket on Lot 5 in question was included in the survey and was found to not be a vernal pool.

Altus hopes that the above information satisfies your concerns. Please call me if you have any questions or need any additional information. Thank you for your time and consideration.

Sincerely,

ALTUS ENGINEERING, INC.

Erik Saari
Vice President

ebs/5307-LTR-Town-101122

Enclosures

2022 VERNAL POOL ASSESSMENT
Beach Hill Road
Exeter, NH

1.0 INTRODUCTION

Gove Environmental Services, Inc. (GES) presents this Vernal Pool Report for the subject property located on 98 Beach Hill Road, Exeter, NH, Tax Map 13, Lot 1. The attached locus map shows the location of the subject property, with an additional survey plan attached to outline the location of the vernal pool identified during the investigation. The analysis contained in this report is based on the field assessment conducted during the 2022 breeding season.

It addresses:

Amphibian and other obligate species activity; and
Existing conditions in the upland envelope surrounding the pool.

All field data collection and analysis for this report was conducted by GES.

Location and Site Description

The 24-acre subject property located at the corner of Beach Hill Road and Old Town Farm Road in Exeter was reviewed in its entirety for areas that may meet the criteria to have potential vernal pool activity during the spring of 2022 wetland delineation. The frontage of the property is largely maintained field area with areas along the road consisting primarily of uplands and areas moving down slope to the west transitioning to wet meadow, adjacent to mature forested wetland with a dominant overstory of red maple. A few areas of isolated wetland were identified both in the field along Old Town Farm Road and another to the south within the forested wetland area where old trails appeared to have developed hydric soils suitable to support hydrophytes. These isolated areas did not have the characteristics to support viable vernal pool activity, with deficiencies in areas of cover, depth, and hydroperiod needed to support vernal pool species life cycles. A single area was identified on site to meet the characteristics to have potential vernal pool activity. This area is within a small portion of scrubshrub wetland directly adjacent to the wet meadow transition area. This area was reviewed and will be addressed below.

Regulations

NH Department of Environmental Services defines vernal pools under Env-Wt 104.44 “Vernal pool” means a surface water or wetland, including an area intentionally created for purposes of compensatory mitigation, that provides breeding habitat for amphibians and invertebrates that have adapted to the unique environments provided by such pools and that:

(a) Is not the result of on-going anthropogenic activities that are not intended to provide compensatory mitigation, including but not limited to:

8 Continental Dr Bldg 2 Unit H, Exeter, NH 03833-7526
Ph (603) 778 0644 / *Fax* (603) 778 0654
www.gesinc.biz
info@gesinc.biz

(1) Gravel pit operations in a pit that has been mined at least every other year; and
(2) Logging and agricultural operations conducted in accordance with all applicable New Hampshire statutes and rules; and
(b) Typically has the following characteristics:
(1) Cycles annually from flooded to dry conditions, although the hydroperiod, size, and shape of the pool might vary from year to year;
(2) Forms in a shallow depression or basin;
(3) Has no permanently flowing outlet;
(4) Holds water for at least 2 continuous months following spring ice-out;
(5) Lacks a viable fish population; and
(6) Supports one or more primary vernal pool indicators, or 3 or more secondary vernal pool indicators.

2.0 METHODOLOGY

During the wetland delineation in March of 2022, one area was identified on the subject property as having characteristics that would meet the criteria for potential vernal pool activity. A vernal pool assessment was conducted on the subject property on April 4th, with a follow up on April 11th of 2022. Vernal pool activity was observed during the second visit to the subject property. The active vernal pool area is shown on the attached sketch.

Egg mass counts were conducted in these areas by slowly wading through the pools while wearing polarized glasses for a better view through the water. Egg mass species identification was made using the professional experience of the biologist in conjunction with the publication "Identification and Documentation of Vernal Pools in New Hampshire".[1] During surveys, adult amphibians and other vernal pool indicator species were noted if present. Other factors which contribute to the significance of the pool were also recorded including ponding depth, canopy cover, the character of the surrounding upland, and the presence of predator species. The following section provides a brief description of the pools.

3.0 VERNAL POOL DESCRIPTIONS & DISCUSSION

The ponded area of interest identified on the subject property was reviewed during the vernal pool season and is described below. This area at the time of observation, met the criteria for having potential vernal pool activity. This identified ponded area was the only one observed during the assessment to meet the criteria for potential vernal pool activity. The documented activity assessed in the pools will be discussed below. This vernal pool appears to be part of an old man-made farm pond however the exact origin of the land form is unknown.

Pool #1
This identified vernal pool is a depression within a larger wetland complex with vegetation beginning primarily on the exterior portions of the pond. This vegetation consisted of iron wood and some smaller red maple saplings. There was no vegetation identified within the ponded area.

[1] Michael Marchand, Identifying and Documenting Vernal Pools in New Hampshire Third Edition: Published by New Hampshire Fish and Game Department – Nongame and Endangered Wildlife Program.

Substrate within the pond consisted of deep organics overtop a mineral layer. Several large branches and sticks were noted within the ponded area from the surrounding saplings adjacent to the ponded area that can be and were used for attachment locations for indicator species egg masses. An intermittent outlet was noted however the outlet maintained a water depth of at least 4 ft though an exact depth was not recorded due to lack of access to the deeper areas of the pond. No predator species were identified during the assessment. A total of 50 spotted salamander egg masses and 16 wood frog egg masses were observed during the second site visit. No adults or other indicator species were observed during the assessment.

Appendix A
Vernal Pool Photos

Vernal Pool Photo Log
Beach Hill Road, Exeter
Taken: 4/11/22

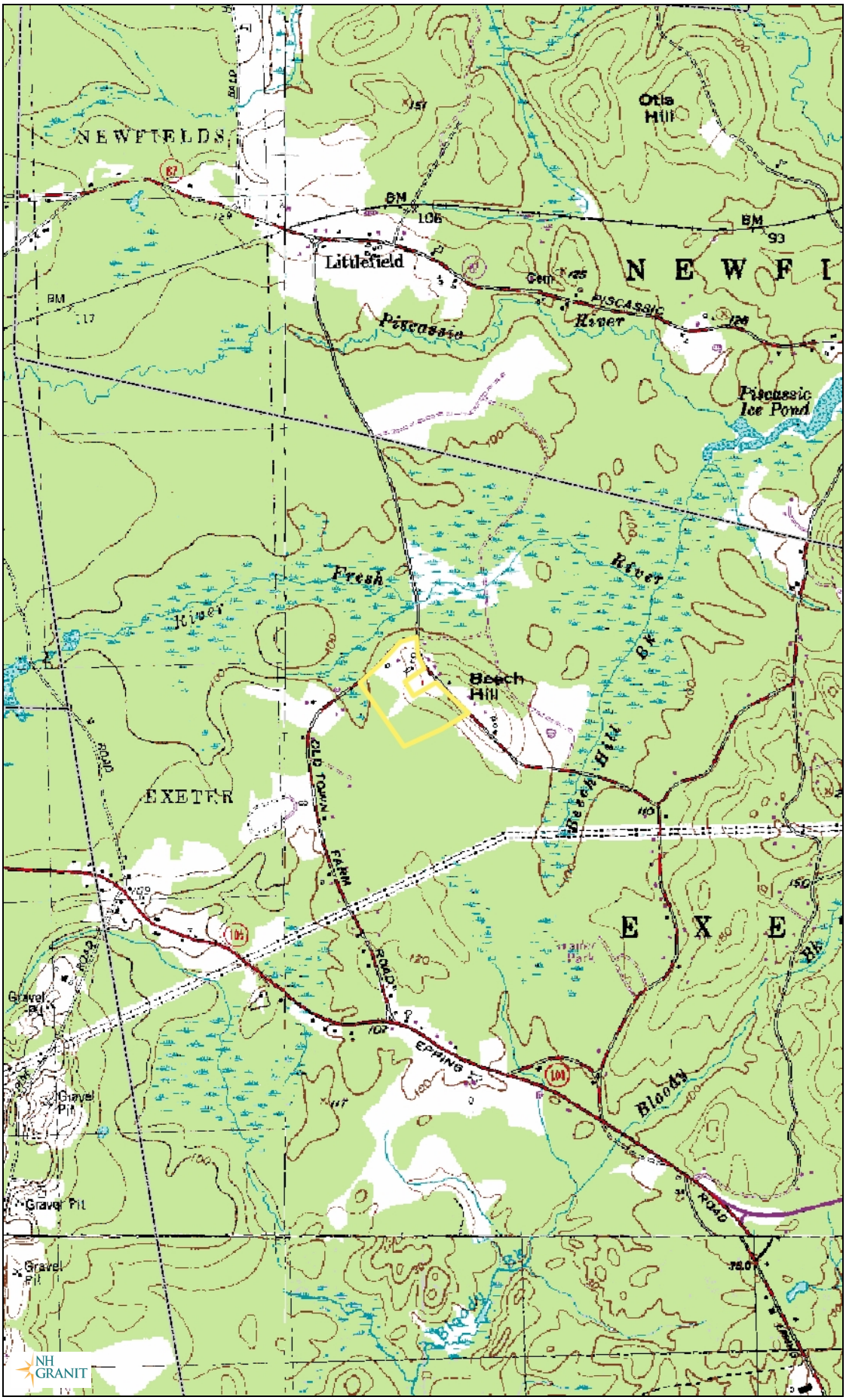
Photo # 1: Looking to the east at vernal pool #1.

Photo #2: Another view of vernal pool #1 looking to the east.

Photo #3: Looking to the south at vernal pool #1.

Photo #4: Looking at the intermittent outlet that flows to the west into the larger wetland complex.

USGS



Legend

- State
- County
- City/Town

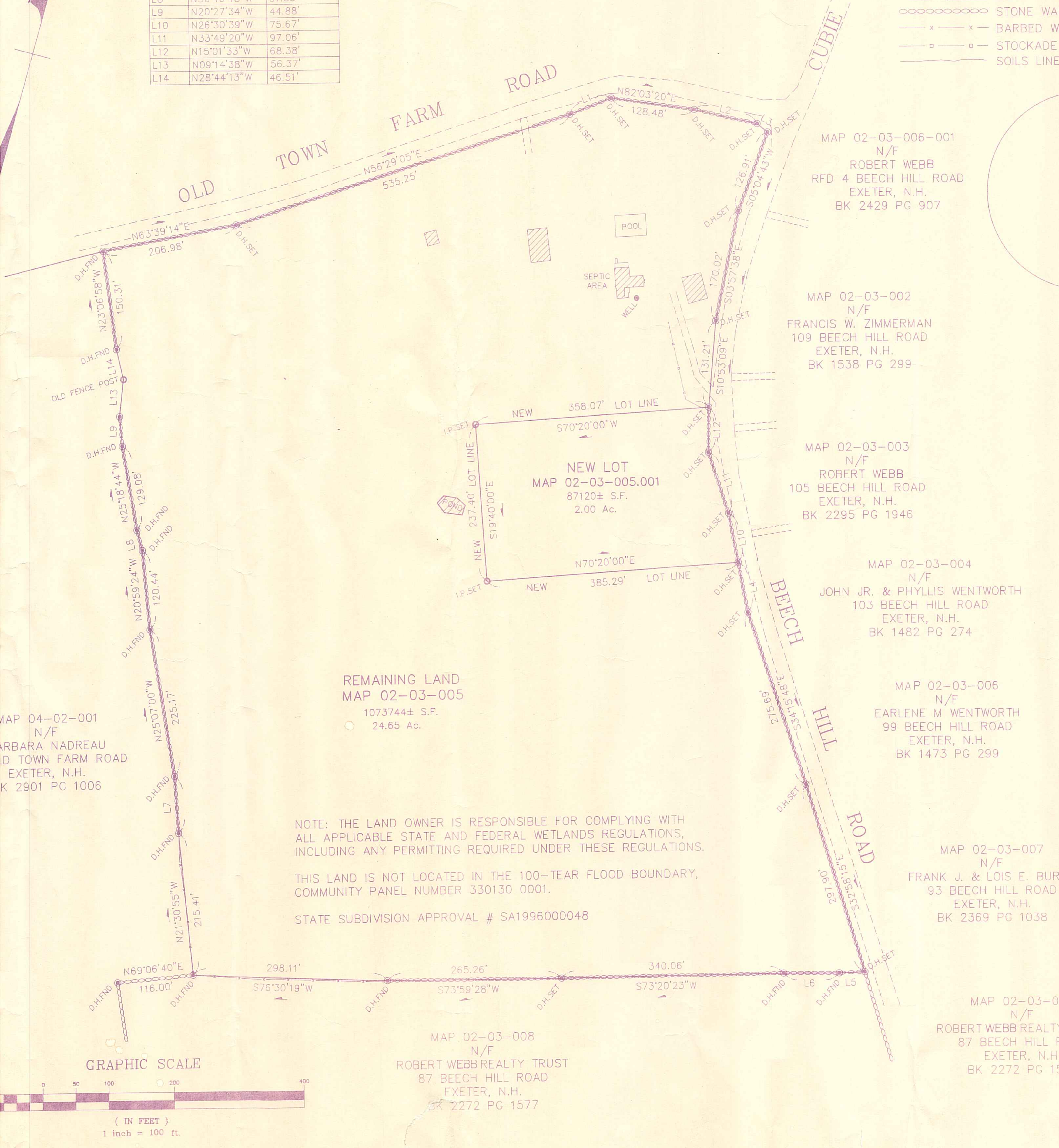
Map Scale

1: 24,000

Map Generated: 10/12/2022

Notes

No.	Bearing	Distance
L1	N53°36'24"E	68.27'
L2	N87°12'53"E	98.17'
L3	S66°46'59"E	20.44'
L4	S26°30'39"E	77.00'
L5	S71°57'29"W	39.14'
L6	S74°31'40"W	84.70'
L7	N19°27'58"W	86.15'
L8	N30°40'43"W	31.55'
L9	N20°27'34"W	44.88'
L10	N26°30'39"W	75.67'
L11	N33°49'20"W	97.06'
L12	N15°01'33"W	68.38'
L13	N09°14'38"W	56.37'
L14	N28°44'13"W	46.51'



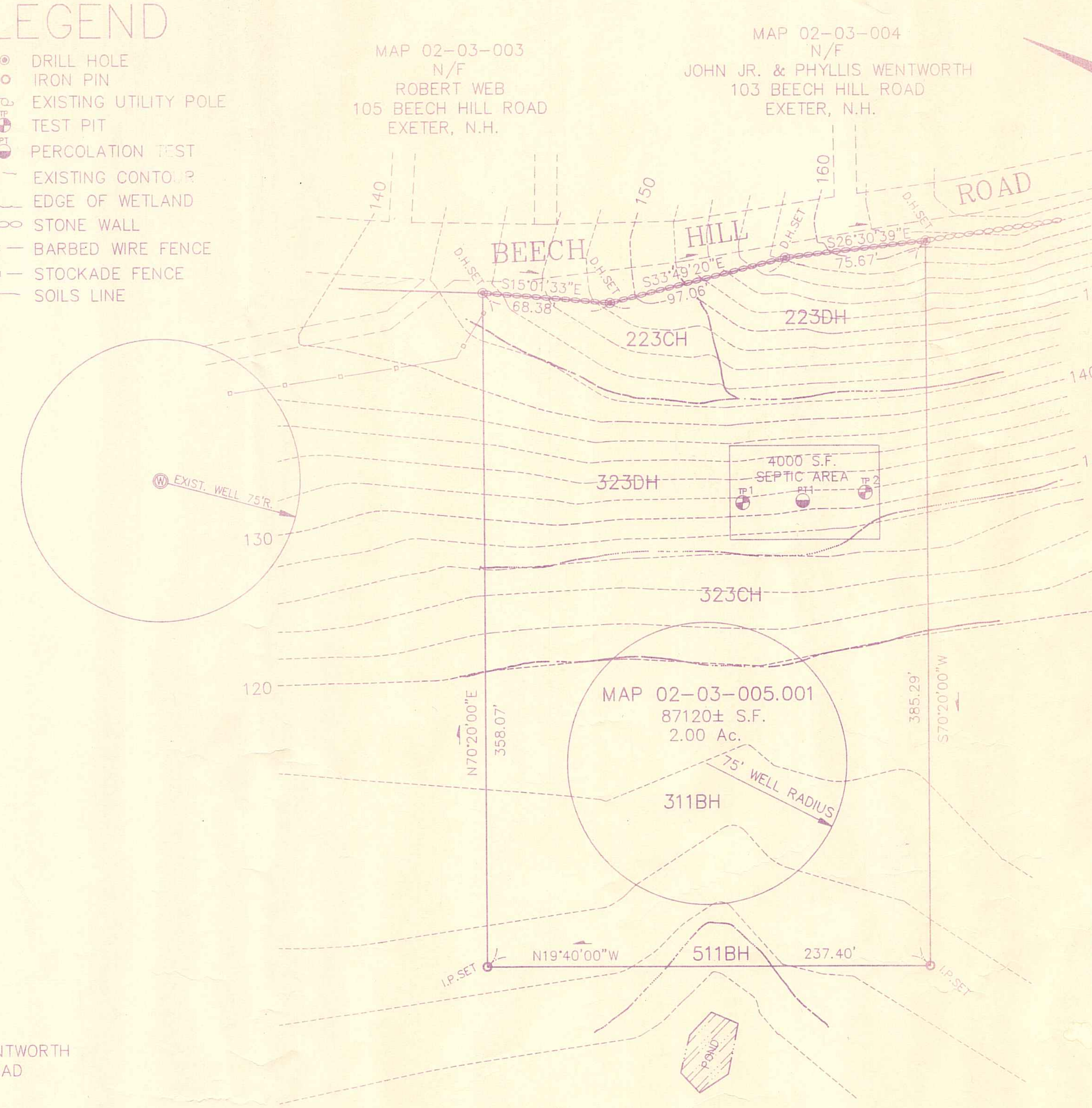
NOTE: THE LAND OWNER IS RESPONSIBLE FOR COMPLYING WITH ALL APPLICABLE STATE AND FEDERAL WETLANDS REGULATIONS, INCLUDING ANY PERMITTING REQUIRED UNDER THESE REGULATIONS.

THIS LAND IS NOT LOCATED IN THE 100-TEAR FLOOD BOUNDARY, COMMUNITY PANEL NUMBER 330130 0001.

STATE SUBDIVISION APPROVAL # SA1996000048

LEGEND

- DRILL HOLE
- IRON PIN
- EXISTING UTILITY POLE
- TEST PIT
- PERCOLATION TEST
- EXISTING CONTOUR
- EDGE OF WETLAND
- STONE WALL
- BARBED WIRE FENCE
- STOCKADE FENCE
- SOILS LINE



NEW LOT
SCALE 1" = 50'

TEST PIT #1, DEC. 28, 1995

0-12" FINE SANDY LOAM DARK BROWN, 10YR, 3/ FRIABLE, GRANULAR

12-30" FINE SNADY LOAM YELLOWISH BROWN, 10YR 5/4, FRIABLE, GRANULA

30-84" FINE SANDY LOAM OLIVE BROWN, 2.5Y, 4/ FIRM, BLOCKY

ESHWT @ 30" LT GREY MOTTLES
NO LEDGE OR HARD PAN
RESTRICTIVE LAYER @ 30"
ROOTS TO 30"
NO OBSERVED WATER
PERC. RATE, 8 MIN/IN @ 24"
WITNESSED BY MIKE COMEAU

TEST PIT #2, DEC. 28, 1995

0-8" FINE SANDY LOAM DARK BROWN, 10YR, 3/ FRIABLE, GRANULAR

8-25" FINE SANDY LOAM YELLOWISH BROWN, 10YR 5/4, FRIABLE, GRANULA

25-96" FINE SANDY LOAM OLIVE BROWN, 2.5Y, 4/ FIRM, BLOCKY

ESHWT @ 25" LT GREY MOTTLES
NO LEDGE OR HARD PAN
RESTRICTIVE LAYER @ 25"
ROOTS TO 25"
NO OBSERVED WATER
WITNESSED BY MIKE COMEAU

APPROVED BY THE TOWN OF EXETER, N.H. PLANNING BOARD. DATE:____________

____
CHAIRMAN

NOTES:

OWNER OF RECORD: JUDITH A. NICHOLS, 100 BEECH HILL ROAD, EXETER, N.H., 03833. TAX MAP 02-03-005. BK 2558 PG 1377. TOTAL LOT AREA = 1160864±S.F., 26.65 ACRES, ZONE: RURAL.

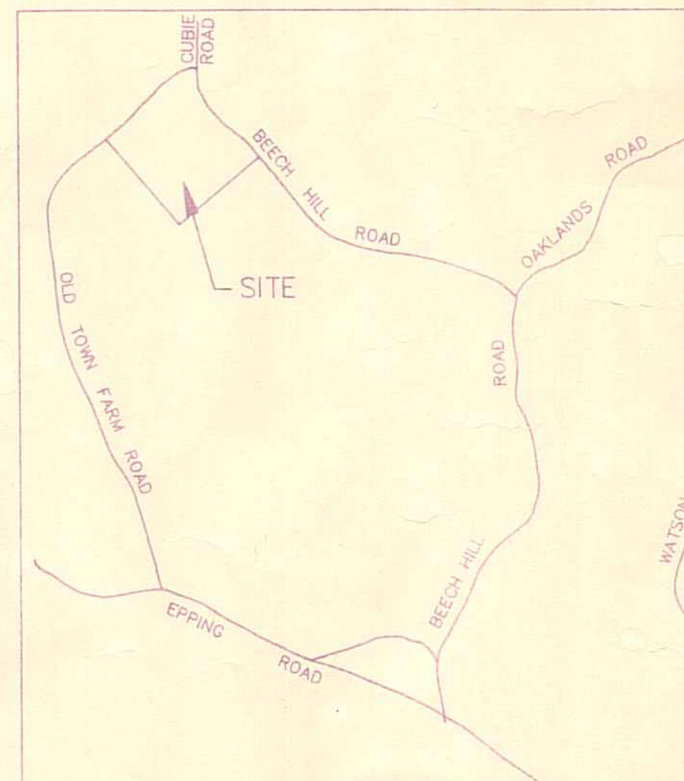
PLAN REFERENCES: SEE SUBDIVISION OF LAND FOR GLEN BOSWORTH IN EXETER, N.H., SCALE 1"=100', APRIL 1976, BY PARKER SURVEY ASSOC., INC. R.C.R.D. PLAN D-6245.

BENCH MARK: STATION, STANDARD NHDOT DISK STAMPED 153 0320, SET INTO TOP OF GRANITE MONUMENT FLUSH WITH THE GROUND AND 1 FT. LOWER THAN THE ROAD, 25.6 FT. NORTH OF THE CENTER LINE OF RT. 101, 55.1 FT. WEST-NORTHWEST OF THE CENTER LINE OF OLD TOWN FARM ROAD, 26.9 FT. SOUTHWEST FROM POLE 1/6/2/3/80, 21.7 FT. SOUTH FROM THE CENTER OF A 2 FT. WIDE STONE WALL, AND 3.9 FT. FROM A METAL DELINEATOR POST. ELEV. = 106.11' U.S.G.S..

THIS PLAN CONFORMS TO THE RULES AND REGULATIONS OF THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.

ERROR OF CLOSURE OF SURVEY IS 1' IN 54544'.

SOILS ANALYSIS BY JAMES H. LONG, CERTIFIED SOIL SCIENTIST, N. H. SOIL CONSULTANTS, ONE SIMONS LANE, NEWMARKET, N.H. 03857.



LOCUS
1" = 2000'

SUBDIVISION PLAN OF
IN
EXETER, N.
TAX MAP 02-03-005
AS DRAWN FOR

JUDITH A. NICHOL
100 BEECH HILL ROAD
EXETER, N.H. 03833

PAUL F. NICHOLS
9 ACORN DRIVE
KINGSTON, N.H. 03848
603-642-4750

DATE: FEB 1, 1995
SCALE 1" = 100' &
DRAWN BY: HAL
CHECKED BY: PFN
REVISED 2-23-96, PF
REVISED 3-21-96, PF
JOB NO. 383-95

GRAPHIC SCALE

80 0 40 80 160 320

(IN FEET)

NOTES

1. TEST PITS WERE PERFORMED BY GOVE ENVIRONMENTAL SERVICES, INC., ON AUGUST 10, 2022 AND WITNESSED BY THE ROCKINGHAM COUNTY CONSERVATION DISTRICT.
2. HISS MAPPING PREPARED BY GOVE ENVIRONMENTAL SERVICES, INC.
3. WETLANDS WERE DELINEATED BY GOVE ENVIRONMENTAL SERVICES INC. IN MARCH OF 2022 UTILIZING THE FOLLOWING STANDARDS:
   - REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL 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.
   - U.S. ARMY CORPS OF ENGINEERS NATIONAL WETLAND PLANT LIST, VERSION 3.5. (2020)
   - CLASSIFICATION OF WETLANDS AND DEEPWATER HABITATS OF THE UNITED STATES. USFW MANUAL FWS/OBS-79/31 (1979).
4. THE EXACT LOCATION AND CONDITION OF THE EXISTING SEPTIC SYSTEM ON LOT 3 (CURRENTLY 100 BEECH HILL ROAD) IS UNKNOWN. THE SUSPECTED LOCATION CALLED OUT ON THIS PLAN IS SOLELY BASED ON VISUAL OBSERVATION OF GROUND SURFACE CONDITIONS. ALTUS ENGINEERING DOES NOT WARRANT THE SYSTEM'S LOCATION, CONDITION, FUNCTIONALITY OR IT'S COMPLIANCE WITH CURRENT NH SUBSURFACE DISPOSAL SYSTEM RULES.

CASE #22-XX

TOWN OF EXETER PROJECT REFERENCE

ALTUS ENGINEERING, INC.

133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

NOT FOR CONSTRUCTION

ISSUED FOR: PLANNING BOARD

ISSUE DATE: AUGUST 30, 2022

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	PLANNING BOARD	EBS	08/30/22

DRAWN BY: EBS
APPROVED BY: EBS
DRAWING FILE: 5307-SUB.dwg

SCALE:
(22"x34") 1"= 80'
(11"x17") 1"=160'

OWNER:
JUDITH A. NICHOLS
FREDERICK J. NICHOLS
100 BEECH HILL ROAD
EXETER, NH 03833

APPLICANT:
JERRY AND CHRISTINE STERRITT
98 BEECH HILL ROAD
EXETER, NH 03833

PROJECT:
BEECH HILL SUBDIVISION
TAX MAP 13, LOT 1
BEECH HILL ROAD
EXETER, NH 03833

TITLE:
TOPOGRAPHY AND SOILS PLAN

SHEET NUMBER:
C - 2

P5307

DRAINAGE ANALYSIS

FOR

Beech Hill Subdivision

Beech Hill and Old Town Farm Roads
Exeter, New Hampshire

Tax Map 13, Lot 3

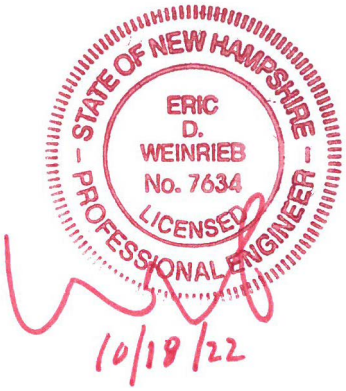
October 11, 2022

Prepared For:

Jerry and Christine Sterritt
98 Beech Hill Road
Exeter, New Hampshire 03833

Prepared By:

ALTUS ENGINEERING, INC.
133 Court Street
Portsmouth, NH 03801
Phone: (603) 433-2335



ALTUS ENGINEERING

Altus Project 5307

Table of Contents

ALTUS ENGINEERING

Section 1

Narrative

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PROJECT DESCRIPTION

Jerry and Christine Sterritt are proposing to develop a residential lot located at the corner of Beech Hill and Old Town Farm Roads in Exeter, New Hampshire. The 24.62-acre property is identified as Assessor's Map 13, Lot 1 and is located in the Rural (RU) district. The site is a mixture of open pasture and woodland. Several wetland areas are located on the site, including a large contiguous complex adjacent to the southwest lot line. No wetland impacts are proposed as part of this project.

The proposed project will consist of seven single-family frontage lots serviced by private individual wells and septic systems to include an existing house at 100 Beech Hill Road. Private driveways will access the lots from Beech Hill and Old Town Farm Roads. No new roadway is proposed for this project.

The stormwater management system proposed for the site will reduce peak flows and treat runoff from 100% of the site's impervious areas prior to leaving the site. Treatment will be achieved with stone drip strips and vegetated buffers in addition to various temporary sediment and erosion controls measures that are to be utilized during construction.

Site Soils

A High Intensity Soils Survey (HISS) was conducted on the site which indicated that site's soils fall into Hydrologic Soils Groups (HSG) B and C.

Pre-Development (Existing Conditions)

The Pre-Development Watershed Plan (Sheet WS-1) reflects the current conditions of the site which include the existing house, field and wooded areas. The current site can be divided into one subcatchment which discharges to the southwest a wetland at Point of Analysis (POA) #1 (HydroCAD Link 100L).

Post-Development (Proposed Conditions)

The proposed project will construct six new houses and driveways and associated site improvements. Each house is intended to be equipped with a stone drip strip in order to infiltrate all new roof-generated runoff. A cross culvert fitted with a control structure and riprap plunge pool is also proposed. Treatment will be provided to paved driveways by vegetated buffers protected by the Town's wetland setbacks.

As shown on the attached Post-Development Watershed Plan (Sheet WS-2), the site was divided into eight subcatchment areas in the post-development conditions. The same point of analysis that was used in the Pre-Development model (POA # 1) was used for comparison of the Pre- and Post-development conditions.

CALCULATION METHODS

The drainage study was completed using the USDA SCS TR-20 Method within the HydroCAD Stormwater Modeling System. Reservoir routing was performed with the Dynamic Storage Indication method with automated calculation of tailwater conditions. A Type III 24-hour rainfall distribution was utilized in analyzing the data for the 2, 10 25 and 50 year - 24-hour storm events using rainfall data provided by the Northeast Regional Climate Center (NRCC). A time span of 0 to 36 hours was analyzed at 0.01-hour increments. The design infiltration rate used in the drip strips was calculated from the SSSNNE publication *Ksat for New Hampshire Soils* using the lowest rate in the most restrictive horizon of the in-situ material divided by two.

Disclaimer

Altus Engineering, Inc. notes that stormwater modeling is limited in its capacity to precisely predict peak rates of runoff and flood elevations. Results should not be considered to represent actual storm events due to the number of variables and assumptions involved in the modeling effort. Surface roughness coefficients (n), entrance loss coefficients (ke), velocity factors (kv) and times of concentration (Tc) are based on subjective field observations and engineering judgment using available data. For design purposes, curve numbers (Cn) describe the average conditions. However, curve numbers will vary from storm to storm depending on the antecedent runoff conditions (ARC) including saturation and frozen ground. Also, higher water elevations than predicted by modeling could occur if drainage channels, closed drain systems or culverts are not maintained and/or become blocked by debris before and/or during a storm event as this will impact flow capacity of the structures. Structures should be re-evaluated if future changes occur within relevant drainage areas in order to assess any required design modifications.

Drainage Analysis

A complete summary of the drainage model is included in the appendix of this report. The following table compares pre- and post-development peak rates at the Point of Analysis identified on the plans for the 2, 10 25 and 50-year storm events:

Stormwater Modeling Summary
Peak Q (cfs) for Type III 24-Hour Storm Events

	2-Yr Storm (3.30 inch)	10-Yr Storm (4.90 inch)	25-Yr Storm (6.20 inch)	50-Yr Storm (6.20 inch)
POA #1 (SW Wetland)				
Pre	15.09	38.73	60.14	81.27
Post	14.76	38.05	59.39	80.76
Change	**-0.33**	**-0.68**	**-0.75**	**-0.51**

As the above table demonstrates, the proposed peak rates of runoff will be decreased from the existing conditions for all analyzed storm events.

CONCLUSION

This proposed frontage subdivision off Beech Hill and Old Town Farm Roads in Exeter, New Hampshire will have minimal adverse effect on abutting properties and infrastructure as a result of stormwater runoff or siltation. Post-construction peak rates of runoff from the site will be lower than the existing conditions for all analyzed storm events. Appropriate steps will be taken to properly mitigate erosion and sedimentation through the use of temporary and permanent Best Management Practices for sediment and erosion control, including stone drip strips, vegetated buffers and a riprap plunge pool.

Section 2

Aerial Photo and USGS Map

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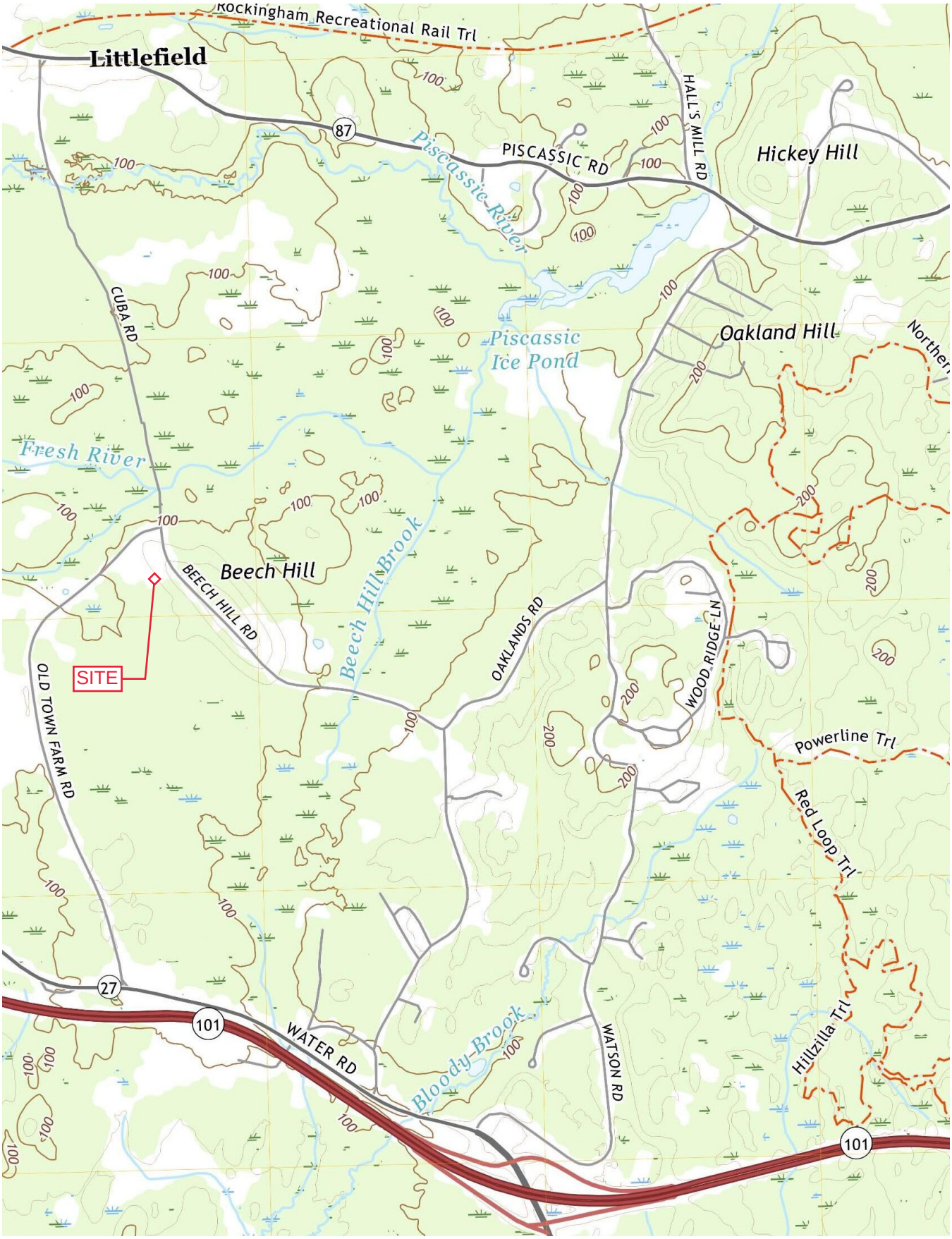
Rockingham Recreational Rail Trl
Littlefield
87
PISCASSIC RD
HALL'S MILL RD
Hickey Hill
Piscassic River
Piscassic Ice Pond
Oakland Hill
CUBA RD
Fresh River
Beech Hill Brook
Beech Hill
BEECH HILL RD
OAKLANDS RD
WOOD RIDGE LN
SITE
OLD TOWN FARM RD
Powerline Trl
Red Loop Trl
27
101
WATER RD
Bloody Brook
WATSON RD
Hillzilla Trl
100
200


Cubie Rd
Cubie Rd
Fresh River
Old Town Farm Rd
Beech Hill Rd
Curtis Tree Care
Old Town Farm Rd
Beech Hill Rd
SITE
Beech Hill Rd
Blue Hawk Dr
DQ'ed Motorsports
Temporarily closed
Gautreau's Auto
Restoration

Section 3

Drainage Calculations

Pre-Development
2-Year, 24-Hour Summary
10-Year, 24-Hour Complete
25-Year, 24-Hour Summary
50-Year, 24-Hour Complete

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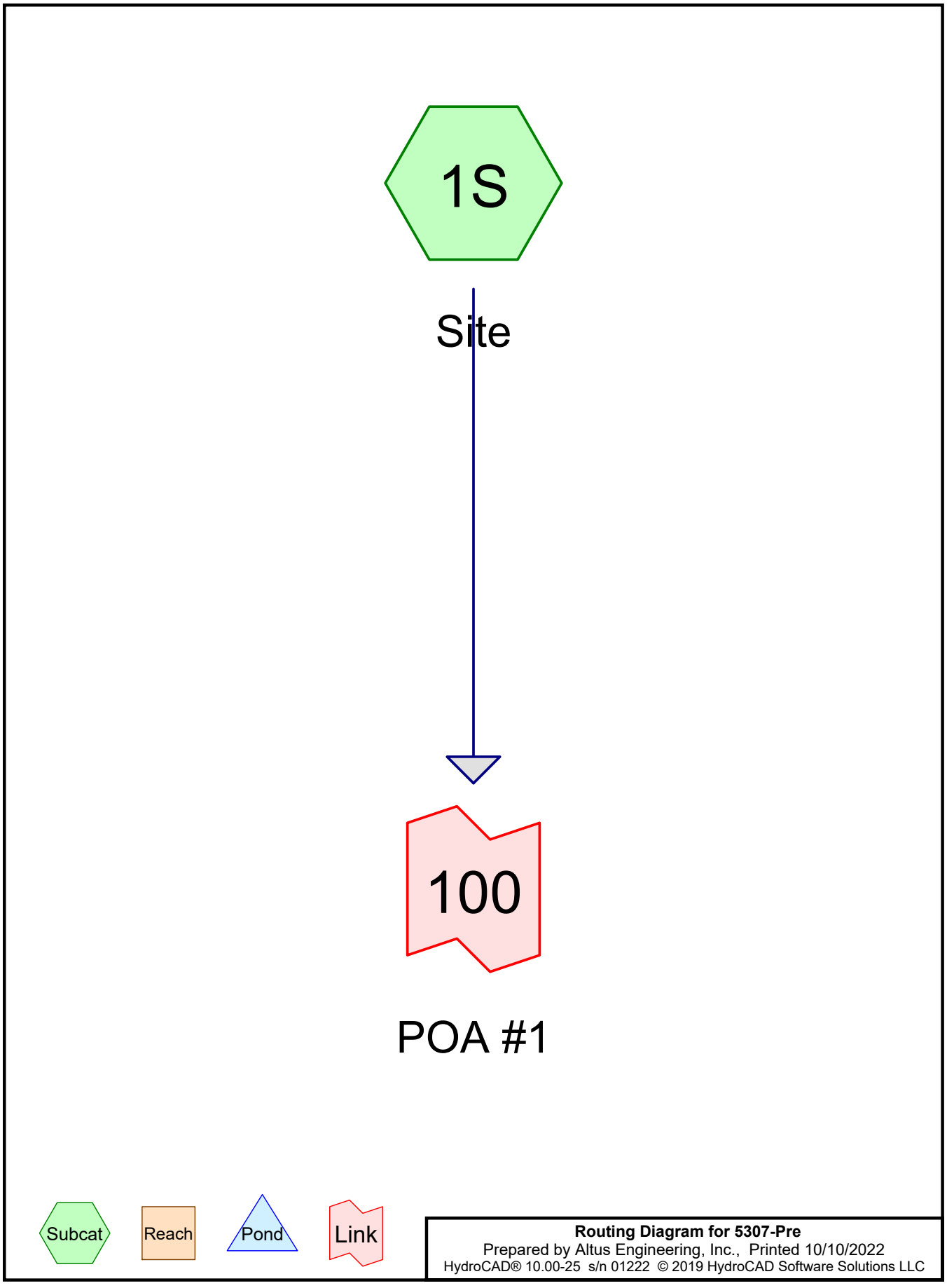


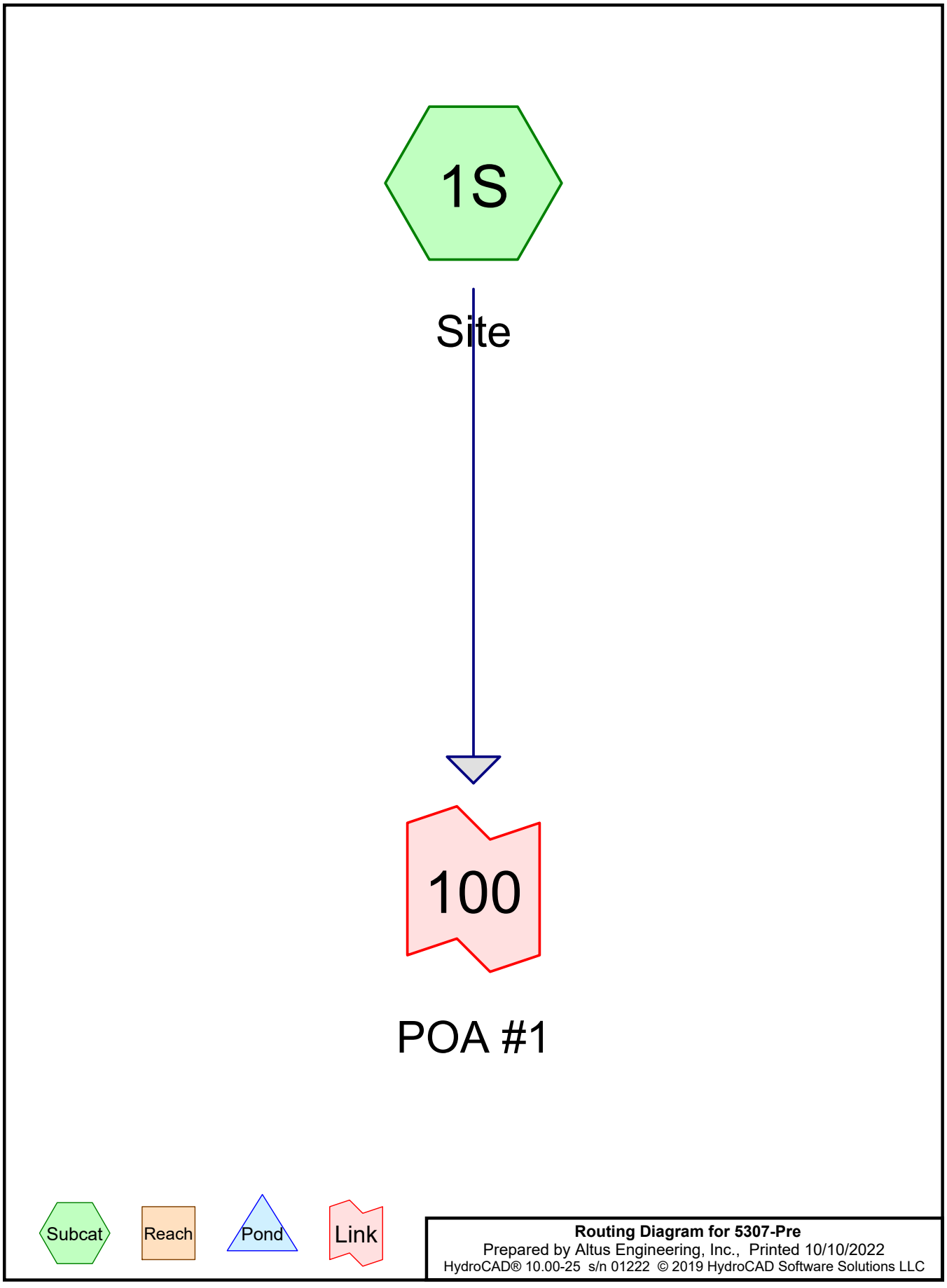
Routing Diagram for 5307-Pre
Prepared by Altus Engineering, Inc., Printed 10/10/2022

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Site Runoff Area=1,151,880 sf 1.69% Impervious Runoff Depth=0.84"
Flow Length=1,308' Tc=21.8 min CN=70 Runoff=15.09 cfs 1.850 af

Link 100: POA #1 Inflow=15.09 cfs 1.850 af
Primary=15.09 cfs 1.850 af

Total Runoff Area = 26.444 ac Runoff Volume = 1.850 af Average Runoff Depth = 0.84"
98.31% Pervious = 25.996 ac 1.69% Impervious = 0.448 ac



Routing Diagram for 5307-Pre
Prepared by Altus Engineering, Inc., Printed 10/10/2022

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
3.684	61	>75% Grass cover, Good, HSG B (1S)
6.055	74	>75% Grass cover, Good, HSG C (1S)
0.006	98	Gravel, HSG C (1S)
0.333	98	Unconnected pavement, HSG C (1S)
0.109	98	Unconnected roofs, HSG C (1S)
0.295	55	Woods, Good, HSG B (1S)
15.851	70	Woods, Good, HSG C (1S)
0.111	77	Woods, Good, HSG D (1S)
26.444	**70**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
3.979	HSG B	1S
22.354	HSG C	1S
0.111	HSG D	1S
0.000	Other	
26.444		**TOTAL AREA**

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Site Runoff Area=1,151,880 sf 1.69% Impervious Runoff Depth=1.97"
Flow Length=1,308' Tc=21.8 min CN=70 Runoff=38.73 cfs 4.341 af

Link 100: POA #1 Inflow=38.73 cfs 4.341 af
Primary=38.73 cfs 4.341 af

Total Runoff Area = 26.444 ac Runoff Volume = 4.341 af Average Runoff Depth = 1.97"
98.31% Pervious = 25.996 ac 1.69% Impervious = 0.448 ac

Summary for Subcatchment 1S: Site

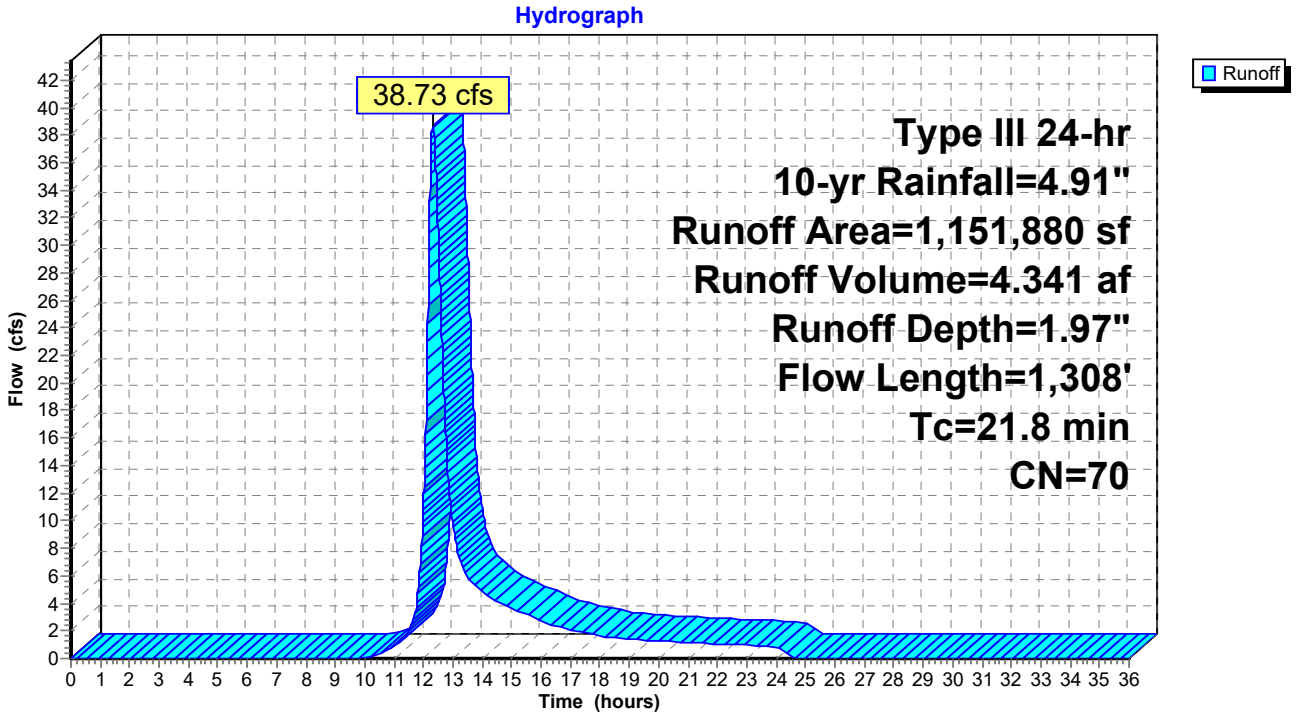
Runoff = 38.73 cfs @ 12.32 hrs, Volume= 4.341 af, Depth= 1.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.91"

	Area (sf)	CN	Description
	14,493	98	Unconnected pavement, HSG C
	4,764	98	Unconnected roofs, HSG C
*	254	98	Gravel, HSG C
	4,830	77	Woods, Good, HSG D
	263,769	74	>75% Grass cover, Good, HSG C
	690,466	70	Woods, Good, HSG C
	160,466	61	>75% Grass cover, Good, HSG B
	12,838	55	Woods, Good, HSG B
	1,151,880	70	Weighted Average
	1,132,369		98.31% Pervious Area
	19,511		1.69% Impervious Area
	19,257		98.70% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	14	0.0200	1.05		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.10"
1.0	149	0.2449	2.47		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.6	309	0.0493	1.11		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
3.4	224	0.0241	1.09		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.0	438	0.0329	0.91		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.6	174	0.0160	0.63		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
21.8	1,308	Total			

Subcatchment 1S: Site

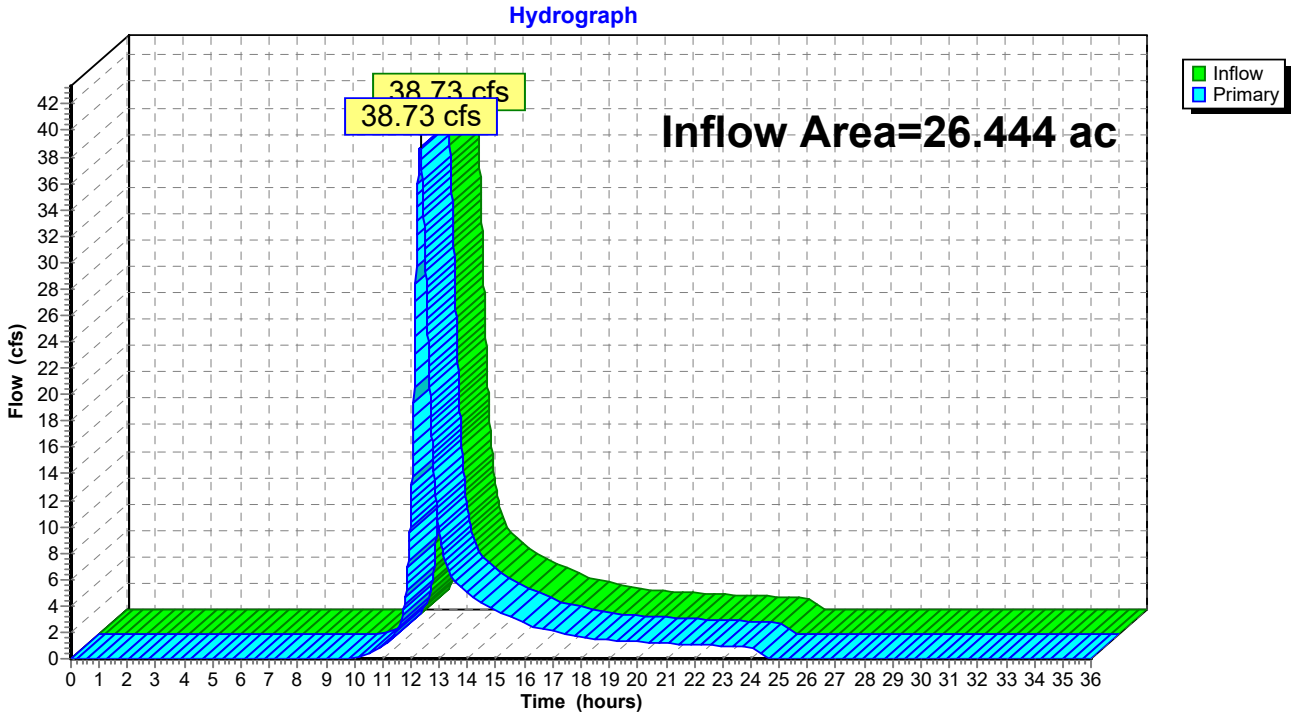


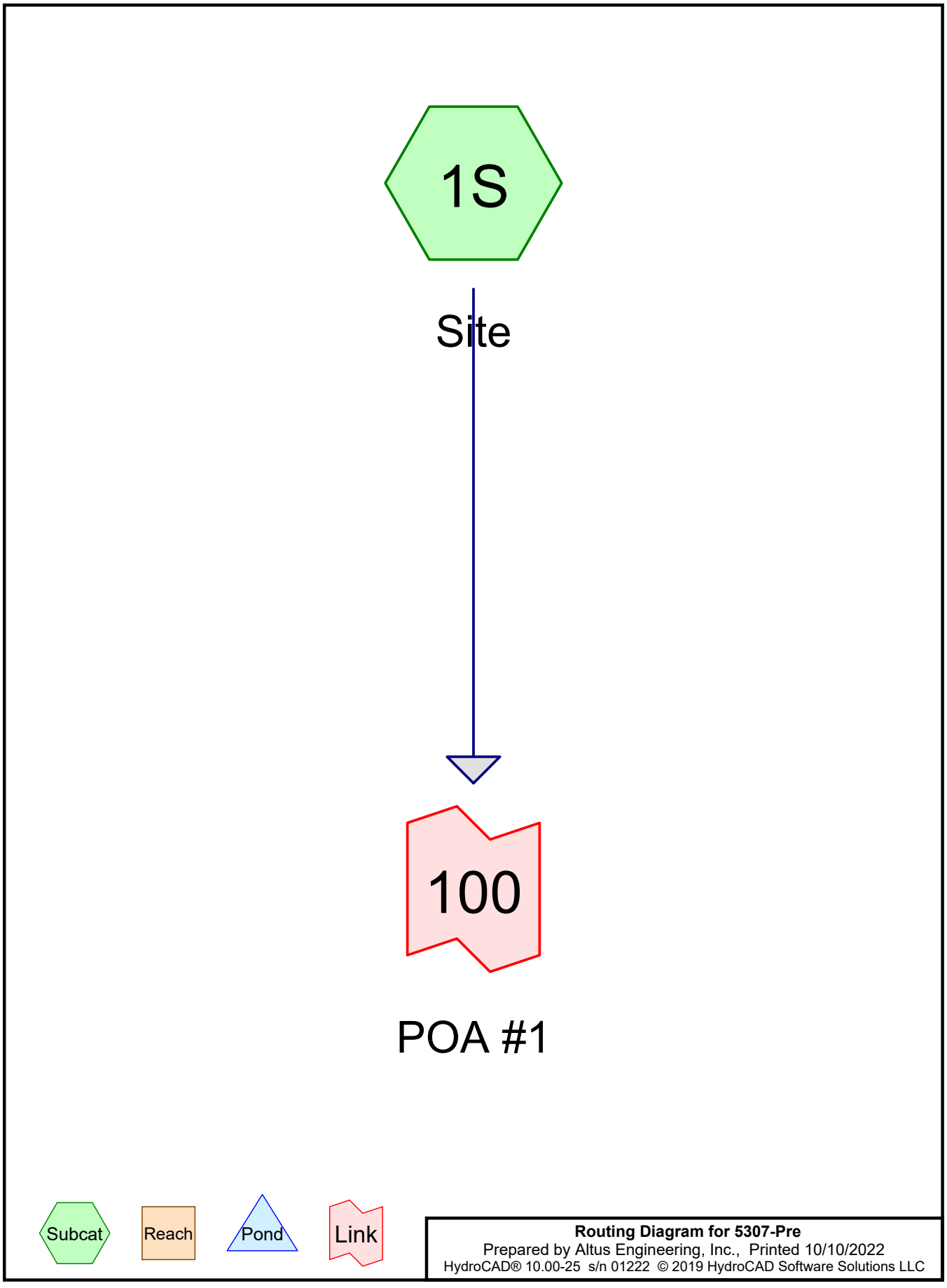
Summary for Link 100: POA #1

Inflow Area = 26.444 ac, 1.69% Impervious, Inflow Depth = 1.97" for 10-yr event
Inflow = 38.73 cfs @ 12.32 hrs, Volume= 4.341 af
Primary = 38.73 cfs @ 12.32 hrs, Volume= 4.341 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link 100: POA #1





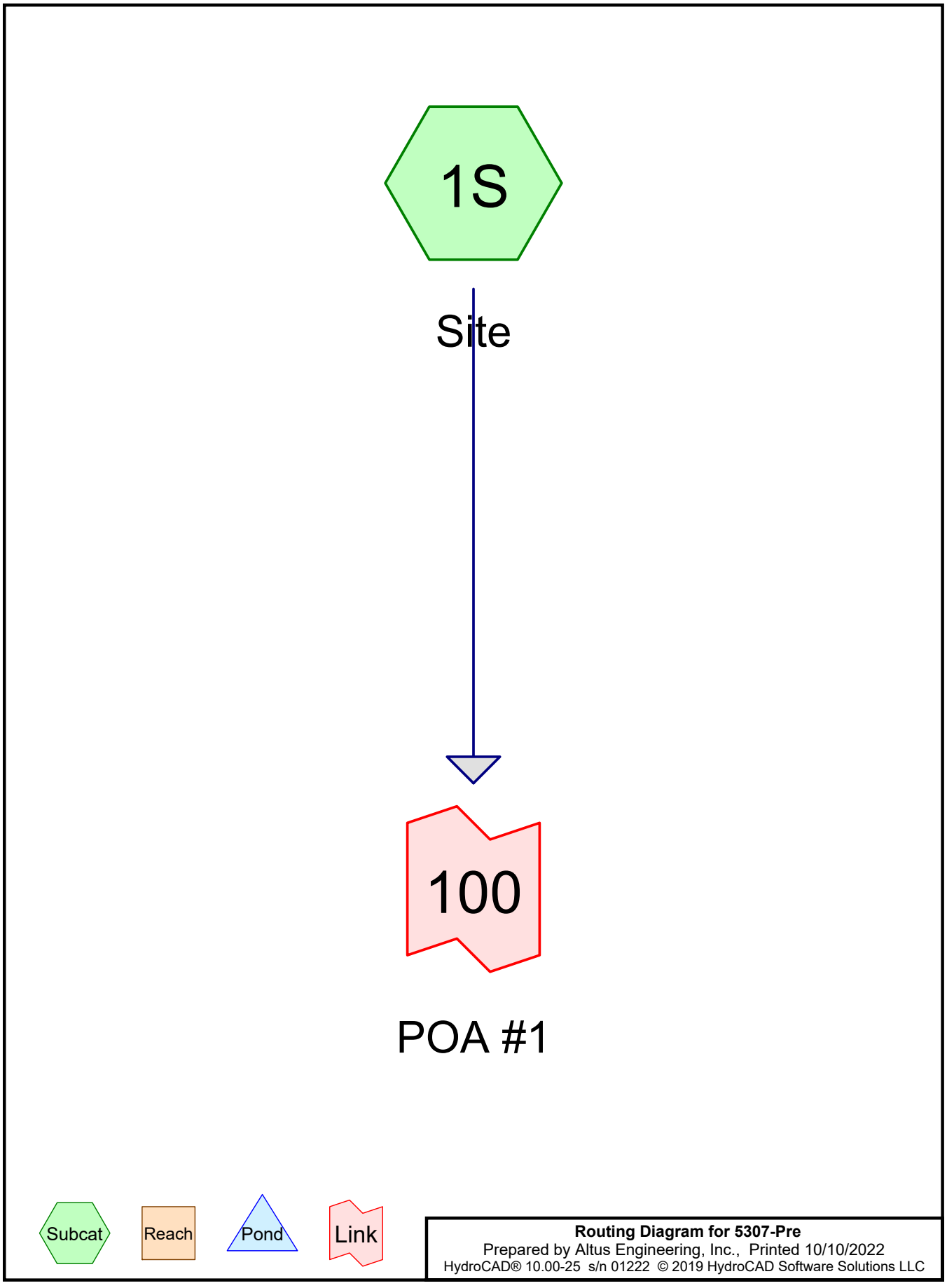
Routing Diagram for 5307-Pre
Prepared by Altus Engineering, Inc., Printed 10/10/2022

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Site Runoff Area=1,151,880 sf 1.69% Impervious Runoff Depth=3.00"
Flow Length=1,308' Tc=21.8 min CN=70 Runoff=60.14 cfs 6.622 af

Link 100: POA #1 Inflow=60.14 cfs 6.622 af
Primary=60.14 cfs 6.622 af

Total Runoff Area = 26.444 ac Runoff Volume = 6.622 af Average Runoff Depth = 3.00"
98.31% Pervious = 25.996 ac 1.69% Impervious = 0.448 ac



Routing Diagram for 5307-Pre
Prepared by Altus Engineering, Inc., Printed 10/10/2022

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Site Runoff Area=1,151,880 sf 1.69% Impervious Runoff Depth=4.04"
Flow Length=1,308' Tc=21.8 min CN=70 Runoff=81.27 cfs 8.898 af

Link 100: POA #1 Inflow=81.27 cfs 8.898 af
Primary=81.27 cfs 8.898 af

Total Runoff Area = 26.444 ac Runoff Volume = 8.898 af Average Runoff Depth = 4.04"
98.31% Pervious = 25.996 ac 1.69% Impervious = 0.448 ac

Section 4

Drainage Calculations

Post-Development
2-Year, 24-Hour Summary
10-Year, 24-Hour Complete
25-Year, 24-Hour Summary
50-Year, 24-Hour Complete

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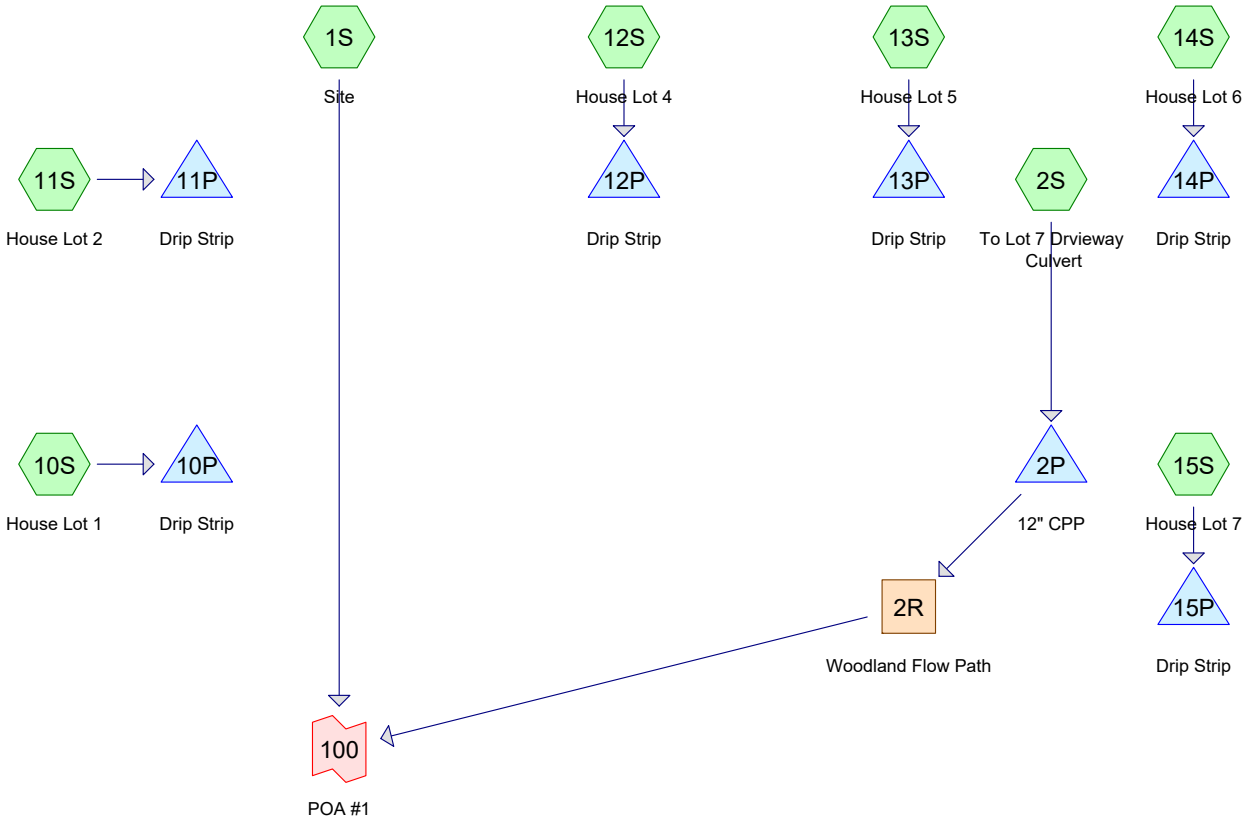


Subcat Reach Pond Link

Routing Diagram for 5307-Post
Prepared by Altus Engineering, Inc., Printed 10/10/2022

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Site Runoff Area=1,038,165 sf 2.75% Impervious Runoff Depth=0.84"
Flow Length=1,231' Tc=20.6 min CN=70 Runoff=13.90 cfs 1.668 af

Subcatchment 2S: To Lot 7 Drvieway Runoff Area=102,930 sf 4.36% Impervious Runoff Depth=1.00"
Flow Length=455' Tc=5.0 min UI Adjusted CN=73 Runoff=2.68 cfs 0.196 af

Subcatchment 10S: House Lot 1 Runoff Area=1,800 sf 100.00% Impervious Runoff Depth=2.99"
Tc=6.0 min CN=98 Runoff=0.13 cfs 0.010 af

Subcatchment 11S: House Lot 2 Runoff Area=1,800 sf 100.00% Impervious Runoff Depth=2.99"
Tc=6.0 min CN=98 Runoff=0.13 cfs 0.010 af

Subcatchment 12S: House Lot 4 Runoff Area=1,800 sf 100.00% Impervious Runoff Depth=2.99"
Tc=6.0 min CN=98 Runoff=0.13 cfs 0.010 af

Subcatchment 13S: House Lot 5 Runoff Area=1,800 sf 100.00% Impervious Runoff Depth=2.99"
Tc=6.0 min CN=98 Runoff=0.13 cfs 0.010 af

Subcatchment 14S: House Lot 6 Runoff Area=1,800 sf 100.00% Impervious Runoff Depth=2.99"
Tc=6.0 min CN=98 Runoff=0.13 cfs 0.010 af

Subcatchment 15S: House Lot 7 Runoff Area=1,800 sf 100.00% Impervious Runoff Depth=2.99"
Tc=6.0 min CN=98 Runoff=0.13 cfs 0.010 af

Reach 2R: Woodland Flow Path Avg. Flow Depth=0.15' Max Vel=0.59 fps Inflow=1.04 cfs 0.196 af
n=0.100 L=561.0' S=0.0241 '/' Capacity=35.11 cfs Outflow=0.99 cfs 0.196 af

Pond 2P: 12" CPP Peak Elev=120.71' Storage=1,325 cf Inflow=2.68 cfs 0.196 af
Outflow=1.04 cfs 0.196 af

Pond 10P: Drip Strip Peak Elev=0.15' Storage=77 cf Inflow=0.13 cfs 0.010 af
Outflow=0.03 cfs 0.010 af

Pond 11P: Drip Strip Peak Elev=0.15' Storage=77 cf Inflow=0.13 cfs 0.010 af
Outflow=0.03 cfs 0.010 af

Pond 12P: Drip Strip Peak Elev=0.26' Storage=129 cf Inflow=0.13 cfs 0.010 af
Outflow=0.02 cfs 0.010 af

Pond 13P: Drip Strip Peak Elev=0.26' Storage=129 cf Inflow=0.13 cfs 0.010 af
Outflow=0.02 cfs 0.010 af

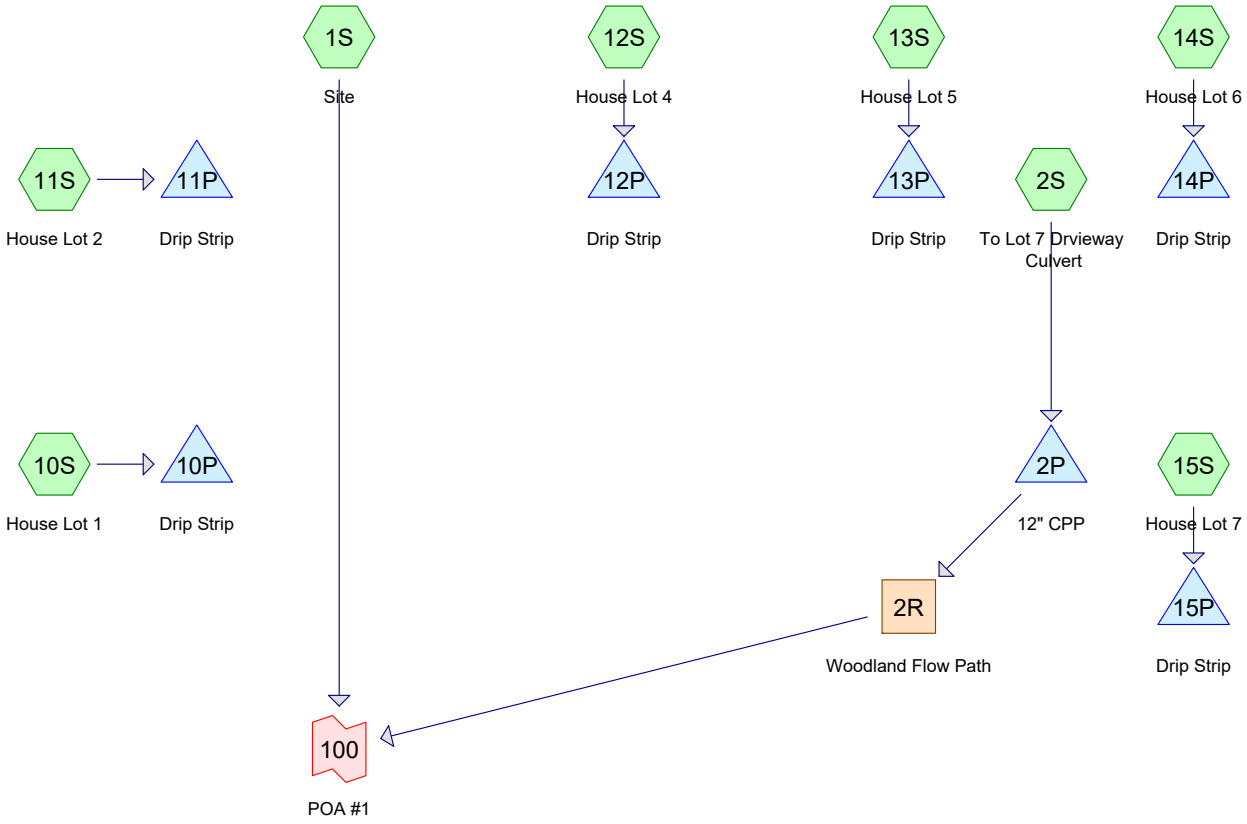
Pond 14P: Drip Strip Peak Elev=0.26' Storage=129 cf Inflow=0.13 cfs 0.010 af
Outflow=0.02 cfs 0.010 af

Pond 15P: Drip Strip Peak Elev=0.26' Storage=129 cf Inflow=0.13 cfs 0.010 af
Outflow=0.02 cfs 0.010 af

Link 100: POA #1

Inflow=14.76 cfs 1.864 af
Primary=14.76 cfs 1.864 af

Total Runoff Area = 26.444 ac Runoff Volume = 1.926 af Average Runoff Depth = 0.87"
96.20% Pervious = 25.438 ac 3.80% Impervious = 1.006 ac



Subcat Reach Pond Link

Routing Diagram for 5307-Post
Prepared by Altus Engineering, Inc., Printed 10/10/2022

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
3.525	61	>75% Grass cover, Good, HSG B (1S)
8.252	74	>75% Grass cover, Good, HSG C (1S, 2S)
0.006	98	Gravel, HSG C (1S)
0.081	98	Unconnected pavement, HSG B (1S)
0.562	98	Unconnected pavement, HSG C (1S, 2S)
0.083	98	Unconnected roofs, HSG B (10S, 11S)
0.275	98	Unconnected roofs, HSG C (1S, 12S, 13S, 14S, 15S)
0.290	55	Woods, Good, HSG B (1S)
13.260	70	Woods, Good, HSG C (1S, 2S)
0.111	77	Woods, Good, HSG D (1S)
26.444	**71**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
3.979	HSG B	1S, 10S, 11S
22.354	HSG C	1S, 2S, 12S, 13S, 14S, 15S
0.111	HSG D	1S
0.000	Other	
26.444		**TOTAL AREA**

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Site Runoff Area=1,038,165 sf 2.75% Impervious Runoff Depth=1.97"
Flow Length=1,231' Tc=20.6 min CN=70 Runoff=35.81 cfs 3.912 af

Subcatchment 2S: To Lot 7 Drvieway Runoff Area=102,930 sf 4.36% Impervious Runoff Depth=2.21"
Flow Length=455' Tc=5.0 min UI Adjusted CN=73 Runoff=6.30 cfs 0.435 af

Subcatchment 10S: House Lot 1 Runoff Area=1,800 sf 100.00% Impervious Runoff Depth=4.67"
Tc=6.0 min CN=98 Runoff=0.20 cfs 0.016 af

Subcatchment 11S: House Lot 2 Runoff Area=1,800 sf 100.00% Impervious Runoff Depth=4.67"
Tc=6.0 min CN=98 Runoff=0.20 cfs 0.016 af

Subcatchment 12S: House Lot 4 Runoff Area=1,800 sf 100.00% Impervious Runoff Depth=4.67"
Tc=6.0 min CN=98 Runoff=0.20 cfs 0.016 af

Subcatchment 13S: House Lot 5 Runoff Area=1,800 sf 100.00% Impervious Runoff Depth=4.67"
Tc=6.0 min CN=98 Runoff=0.20 cfs 0.016 af

Subcatchment 14S: House Lot 6 Runoff Area=1,800 sf 100.00% Impervious Runoff Depth=4.67"
Tc=6.0 min CN=98 Runoff=0.20 cfs 0.016 af

Subcatchment 15S: House Lot 7 Runoff Area=1,800 sf 100.00% Impervious Runoff Depth=4.67"
Tc=6.0 min CN=98 Runoff=0.20 cfs 0.016 af

Reach 2R: Woodland Flow Path Avg. Flow Depth=0.25' Max Vel=0.81 fps Inflow=2.91 cfs 0.435 af
n=0.100 L=561.0' S=0.0241 '/' Capacity=35.11 cfs Outflow=2.56 cfs 0.435 af

Pond 2P: 12" CPP Peak Elev=121.29' Storage=3,628 cf Inflow=6.30 cfs 0.435 af
Outflow=2.91 cfs 0.435 af

Pond 10P: Drip Strip Peak Elev=0.34' Storage=171 cf Inflow=0.20 cfs 0.016 af
Outflow=0.03 cfs 0.016 af

Pond 11P: Drip Strip Peak Elev=0.34' Storage=171 cf Inflow=0.20 cfs 0.016 af
Outflow=0.03 cfs 0.016 af

Pond 12P: Drip Strip Peak Elev=0.48' Storage=241 cf Inflow=0.20 cfs 0.016 af
Outflow=0.02 cfs 0.016 af

Pond 13P: Drip Strip Peak Elev=0.48' Storage=241 cf Inflow=0.20 cfs 0.016 af
Outflow=0.02 cfs 0.016 af

Pond 14P: Drip Strip Peak Elev=0.48' Storage=241 cf Inflow=0.20 cfs 0.016 af
Outflow=0.02 cfs 0.016 af

Pond 15P: Drip Strip Peak Elev=0.48' Storage=241 cf Inflow=0.20 cfs 0.016 af
Outflow=0.02 cfs 0.016 af

Link 100: POA #1

Inflow=38.05 cfs 4.347 af
Primary=38.05 cfs 4.347 af

Total Runoff Area = 26.444 ac Runoff Volume = 4.444 af Average Runoff Depth = 2.02"
96.20% Pervious = 25.438 ac 3.80% Impervious = 1.006 ac

Summary for Subcatchment 1S: Site

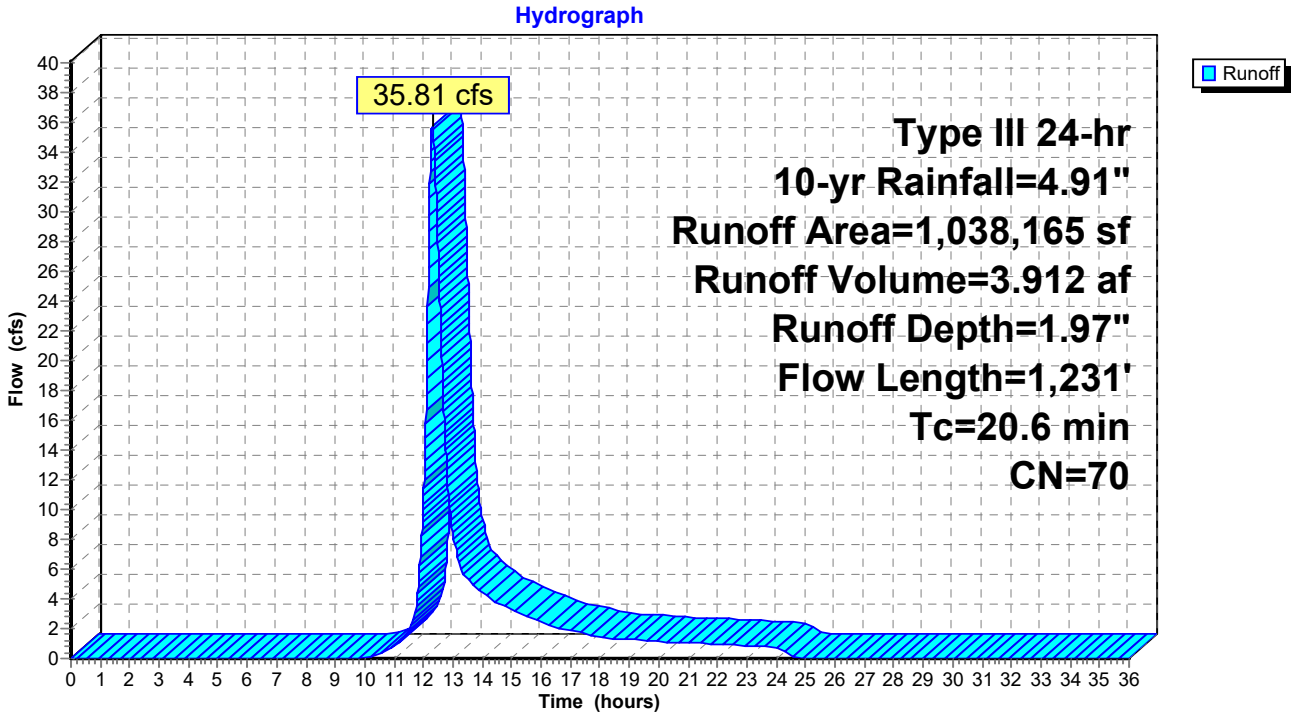
Runoff = 35.81 cfs @ 12.29 hrs, Volume= 3.912 af, Depth= 1.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.91"

	Area (sf)	CN	Description
	12,400	98	Unconnected pavement, HSG C
	4,764	98	Unconnected roofs, HSG C
	7,599	98	Unconnected pavement, HSG C
	3,521	98	Unconnected pavement, HSG B
*	254	98	Gravel, HSG C
	4,830	77	Woods, Good, HSG D
	293,688	74	>75% Grass cover, Good, HSG C
	544,926	70	Woods, Good, HSG C
	153,560	61	>75% Grass cover, Good, HSG B
	12,623	55	Woods, Good, HSG B
	1,038,165	70	Weighted Average
	1,009,627		97.25% Pervious Area
	28,538		2.75% Impervious Area
	28,284		99.11% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	12	0.0200	1.02		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.10"
1.2	171	0.2326	2.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
3.2	212	0.0493	1.11		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
3.4	224	0.0241	1.09		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.0	438	0.0329	0.91		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.6	174	0.0160	0.63		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
20.6	1,231	Total			

Subcatchment 1S: Site



Summary for Subcatchment 2S: To Lot 7 Drvieway Culvert

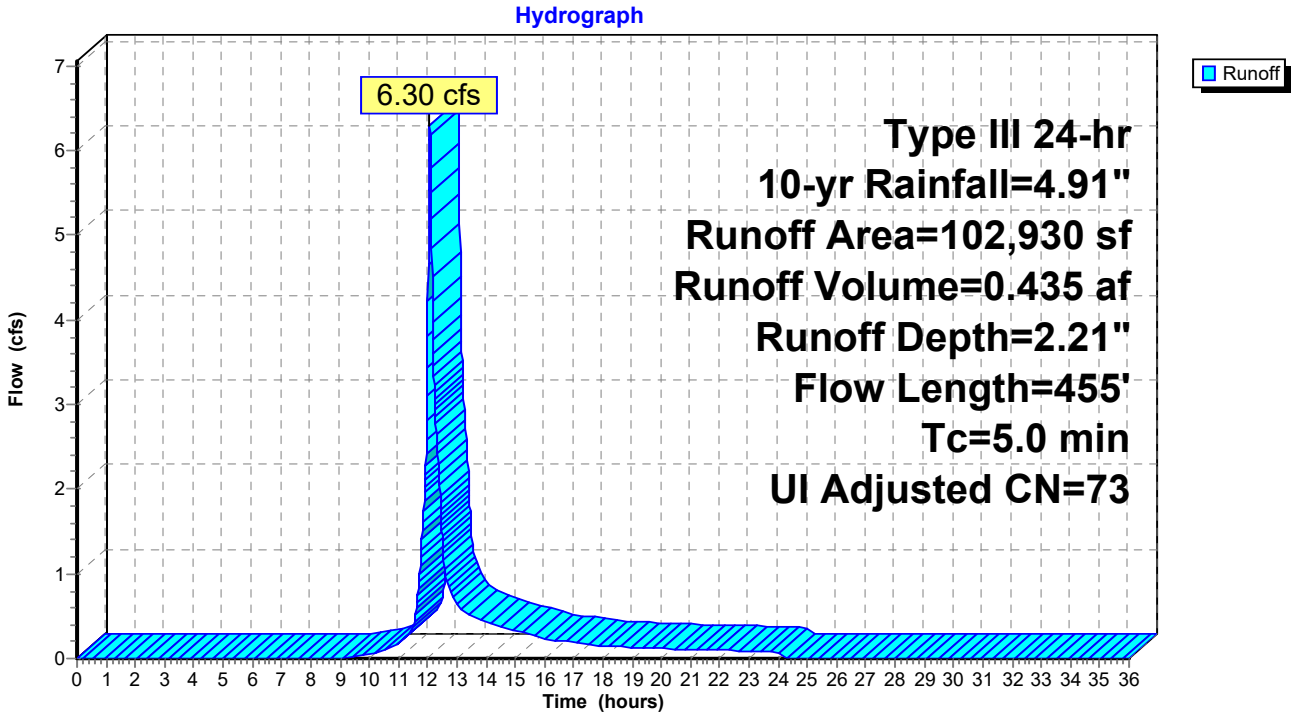
Runoff = 6.30 cfs @ 12.08 hrs, Volume= 0.435 af, Depth= 2.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.91"

Area (sf)	CN	Adj	Description
2,093	98		Unconnected pavement, HSG C
2,395	98		Unconnected pavement, HSG C
65,780	74		>75% Grass cover, Good, HSG C
32,662	70		Woods, Good, HSG C
102,930	74	73	Weighted Average, UI Adjusted
98,442			95.64% Pervious Area
4,488			4.36% Impervious Area
4,488			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	14	0.0200	1.05		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.10"
0.6	117	0.2222	3.30		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.5	71	0.1972	2.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
3.3	183	0.0345	0.93		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.4	70	0.0100	3.02	15.11	**Trap/Vee/Rect Channel Flow,** Bot.W=2.00' D=1.00' Z= 3.0 '/' Top.W=8.00' n= 0.035 Earth, dense weeds
5.0	455	Total			

Subcatchment 2S: To Lot 7 Drvieway Culvert



Summary for Subcatchment 10S: House Lot 1

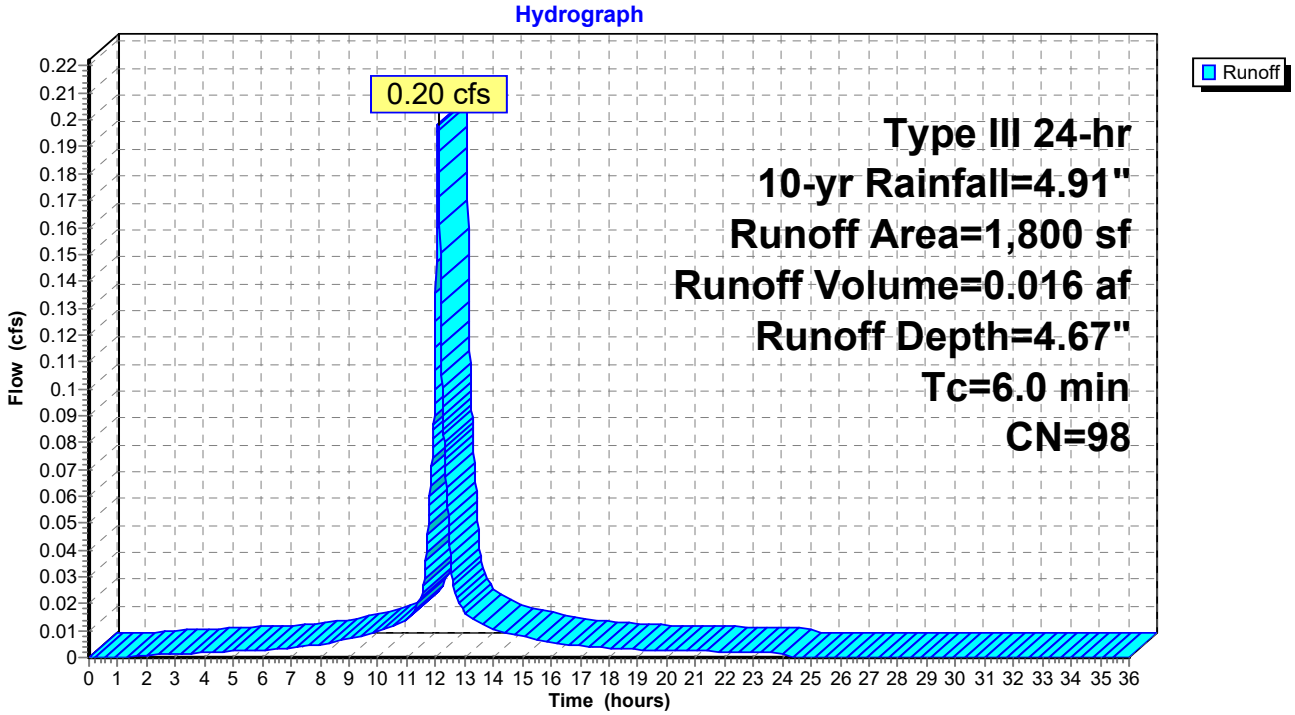
Runoff = 0.20 cfs @ 12.08 hrs, Volume= 0.016 af, Depth= 4.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.91"

Area (sf)	CN	Description
1,800	98	Unconnected roofs, HSG B
1,800		100.00% Impervious Area
1,800		100.00% Unconnected

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

Subcatchment 10S: House Lot 1



Summary for Subcatchment 11S: House Lot 2

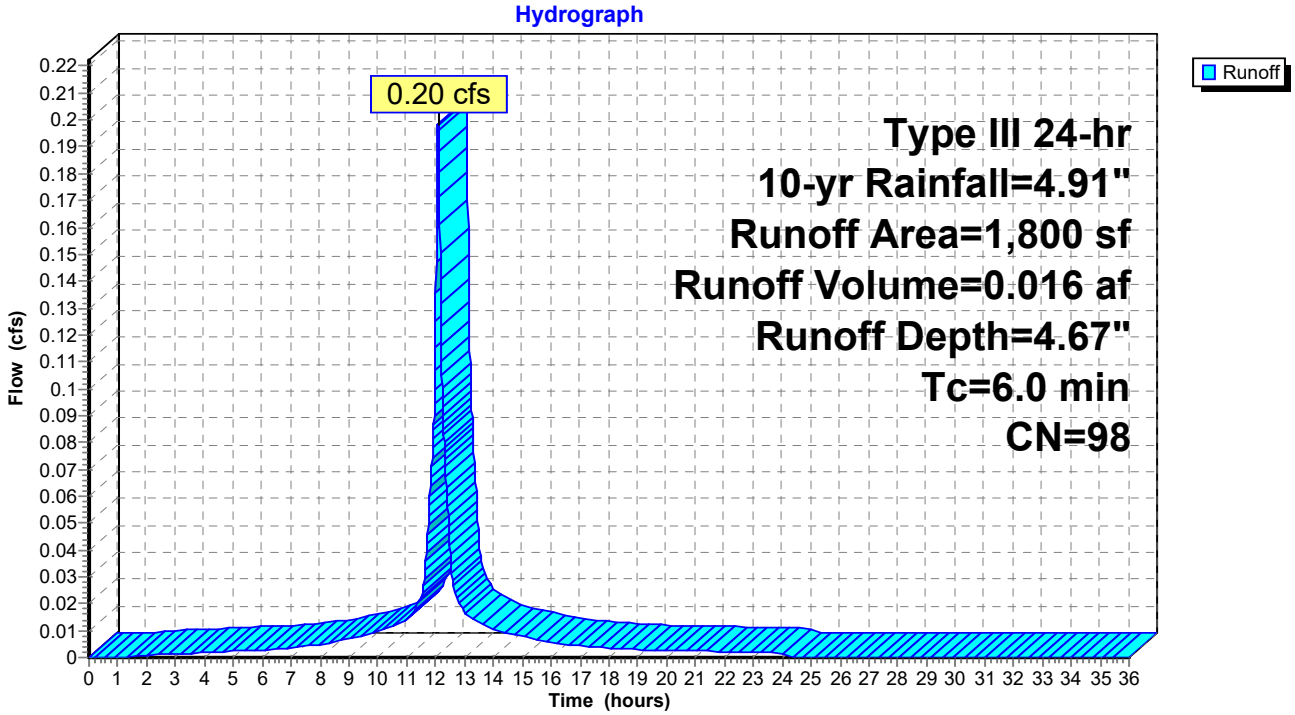
Runoff = 0.20 cfs @ 12.08 hrs, Volume= 0.016 af, Depth= 4.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.91"

Area (sf)	CN	Description
1,800	98	Unconnected roofs, HSG B
1,800		100.00% Impervious Area
1,800		100.00% Unconnected

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

Subcatchment 11S: House Lot 2



Summary for Subcatchment 12S: House Lot 4

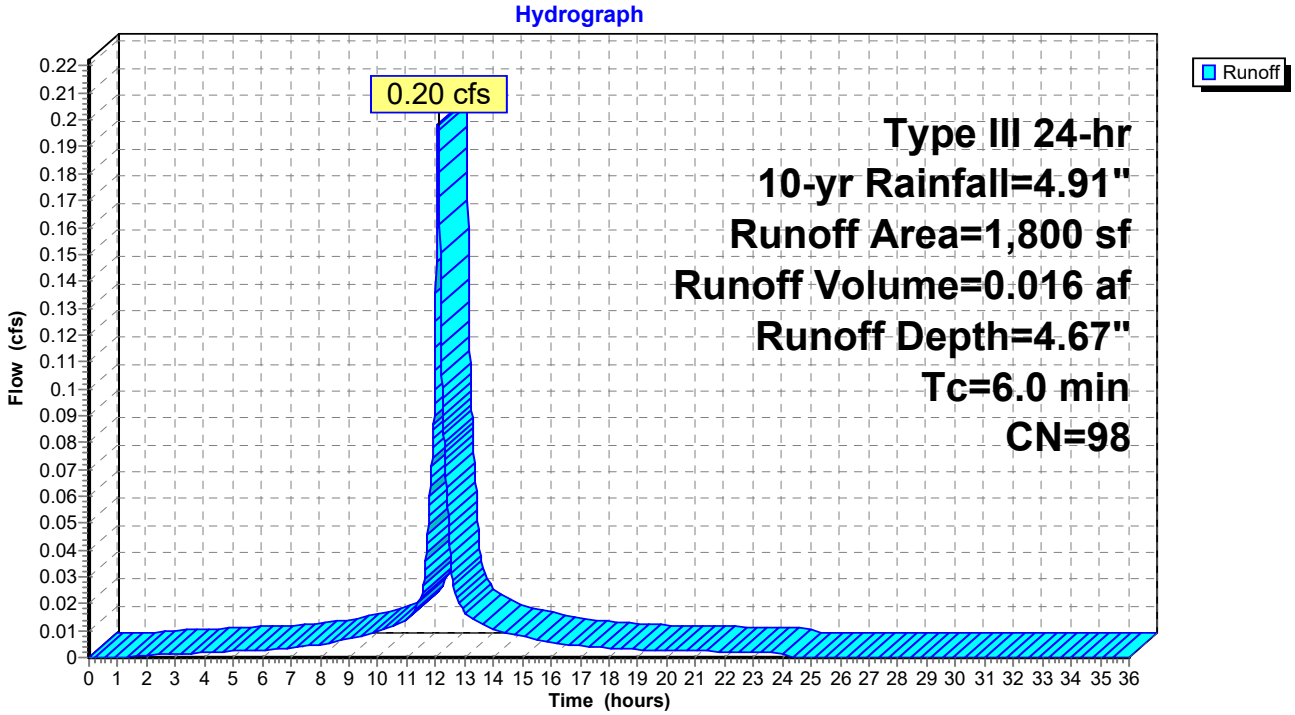
Runoff = 0.20 cfs @ 12.08 hrs, Volume= 0.016 af, Depth= 4.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.91"

Area (sf)	CN	Description
1,800	98	Unconnected roofs, HSG C
1,800		100.00% Impervious Area
1,800		100.00% Unconnected

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

Subcatchment 12S: House Lot 4



Summary for Subcatchment 13S: House Lot 5

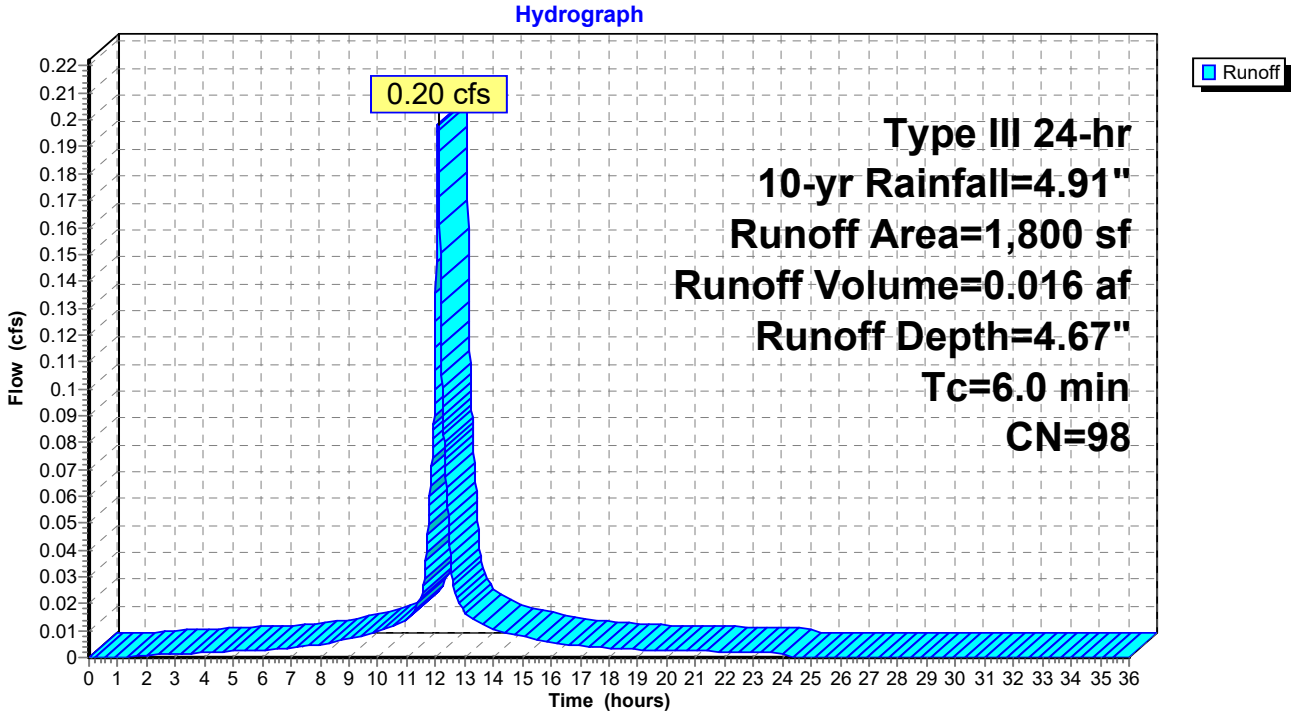
Runoff = 0.20 cfs @ 12.08 hrs, Volume= 0.016 af, Depth= 4.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.91"

Area (sf)	CN	Description
1,800	98	Unconnected roofs, HSG C
1,800		100.00% Impervious Area
1,800		100.00% Unconnected

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

Subcatchment 13S: House Lot 5



Summary for Subcatchment 14S: House Lot 6

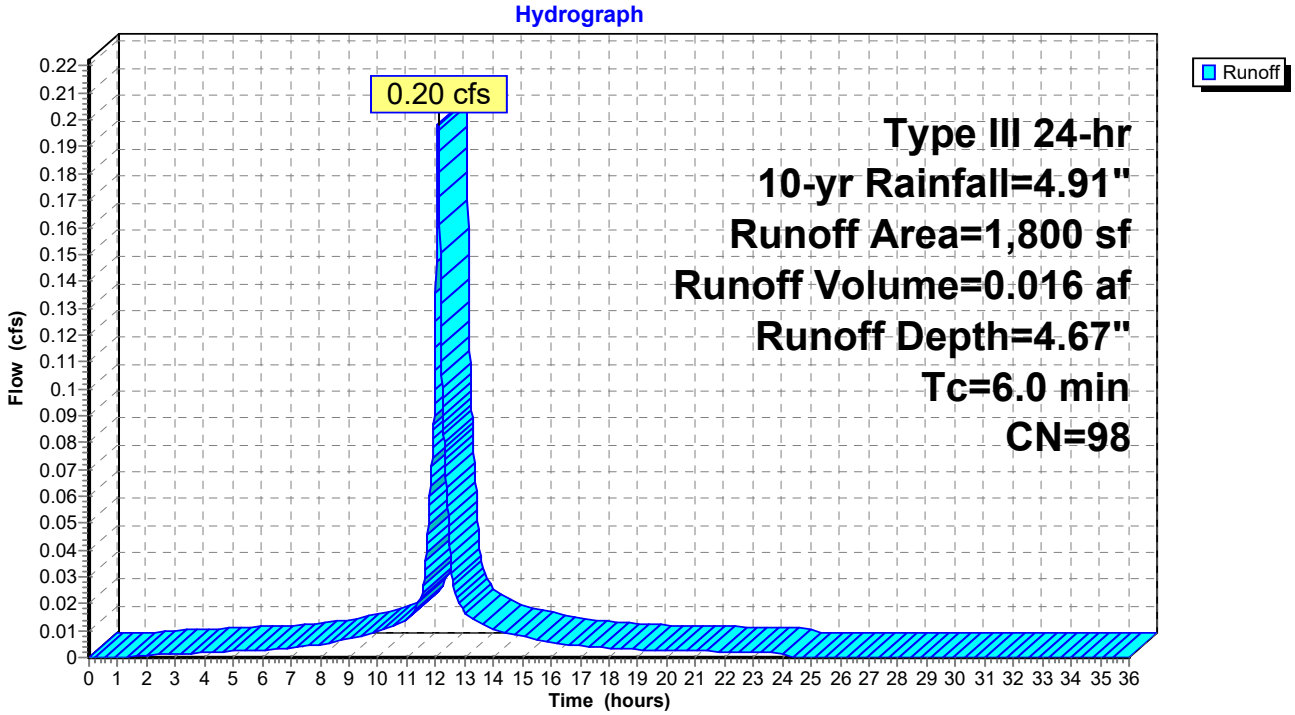
Runoff = 0.20 cfs @ 12.08 hrs, Volume= 0.016 af, Depth= 4.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.91"

Area (sf)	CN	Description
1,800	98	Unconnected roofs, HSG C
1,800		100.00% Impervious Area
1,800		100.00% Unconnected

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

Subcatchment 14S: House Lot 6



Summary for Subcatchment 15S: House Lot 7

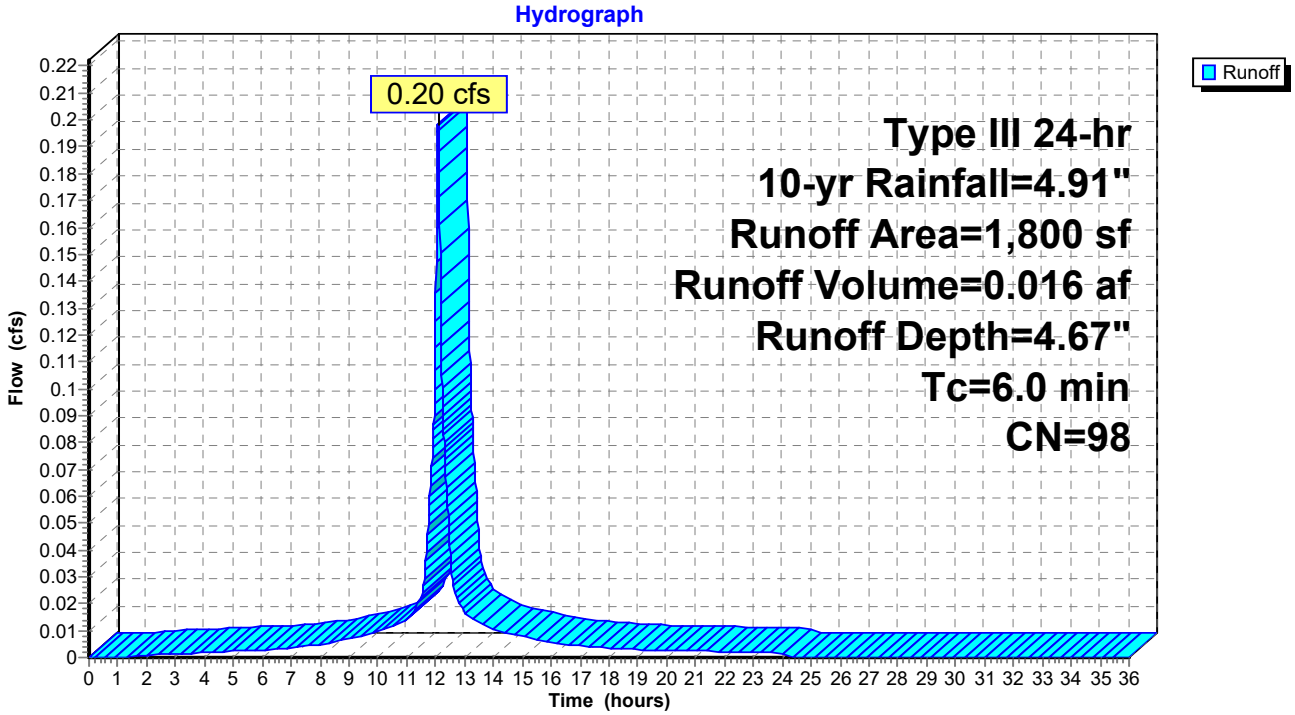
Runoff = 0.20 cfs @ 12.08 hrs, Volume= 0.016 af, Depth= 4.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.91"

Area (sf)	CN	Description
1,800	98	Unconnected roofs, HSG C
1,800		100.00% Impervious Area
1,800		100.00% Unconnected

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

Subcatchment 15S: House Lot 7



Summary for Reach 2R: Woodland Flow Path

Inflow Area = 2.363 ac, 4.36% Impervious, Inflow Depth = 2.21" for 10-yr event
Inflow = 2.91 cfs @ 12.26 hrs, Volume= 0.435 af
Outflow = 2.56 cfs @ 12.43 hrs, Volume= 0.435 af, Atten= 12%, Lag= 10.0 min

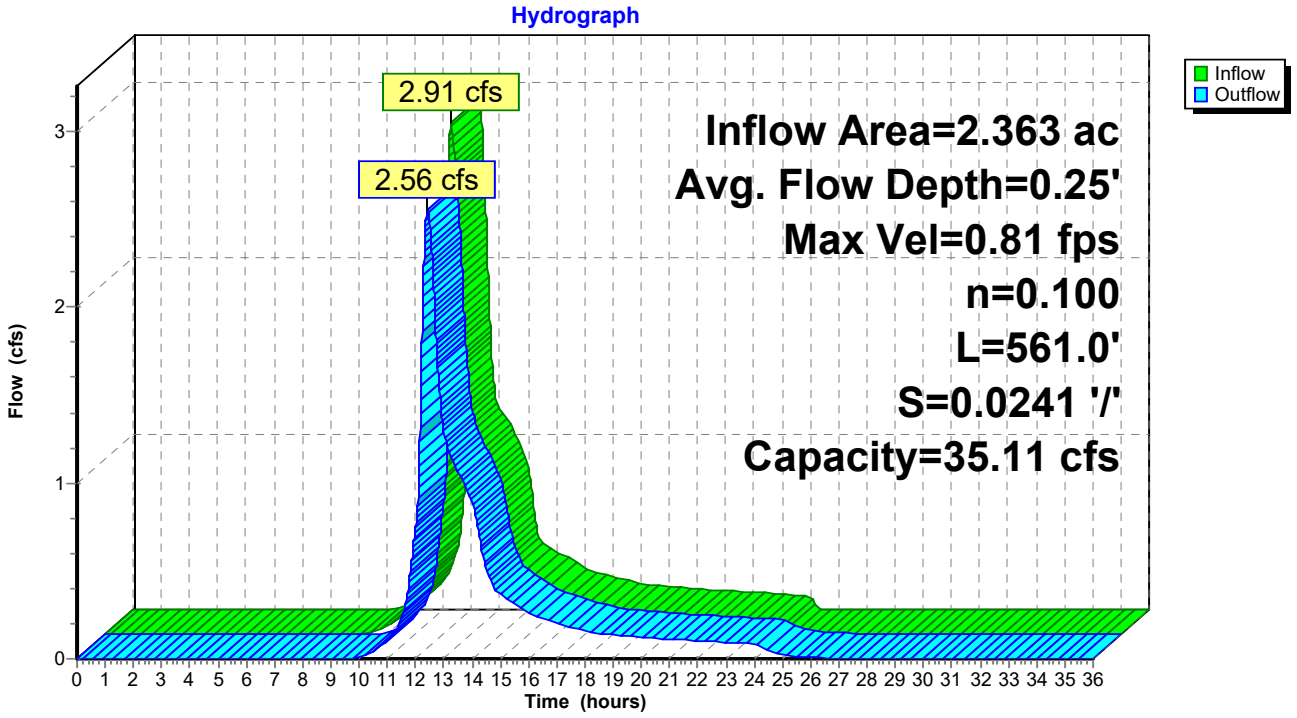
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.81 fps, Min. Travel Time= 11.5 min
Avg. Velocity = 0.24 fps, Avg. Travel Time= 38.7 min

Peak Storage= 1,766 cf @ 12.43 hrs
Average Depth at Peak Storage= 0.25'
Bank-Full Depth= 1.00' Flow Area= 20.0 sf, Capacity= 35.11 cfs

10.00' x 1.00' deep channel, n= 0.100 Very weedy reaches w/pools
Side Slope Z-value= 10.0 '/' Top Width= 30.00'
Length= 561.0' Slope= 0.0241 '/'
Inlet Invert= 119.00', Outlet Invert= 105.50'

‡

Reach 2R: Woodland Flow Path



Summary for Pond 2P: 12" CPP

Inflow Area = 2.363 ac, 4.36% Impervious, Inflow Depth = 2.21" for 10-yr event
Inflow = 6.30 cfs @ 12.08 hrs, Volume= 0.435 af
Outflow = 2.91 cfs @ 12.26 hrs, Volume= 0.435 af, Atten= 54%, Lag= 11.1 min
Primary = 2.91 cfs @ 12.26 hrs, Volume= 0.435 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 121.29' @ 12.26 hrs Surf.Area= 5,447 sf Storage= 3,628 cf
Flood Elev= 121.70' Surf.Area= 7,792 sf Storage= 6,309 cf

Plug-Flow detention time= 14.9 min calculated for 0.435 af (100% of inflow)
Center-of-Mass det. time= 14.9 min (854.9 - 840.0)

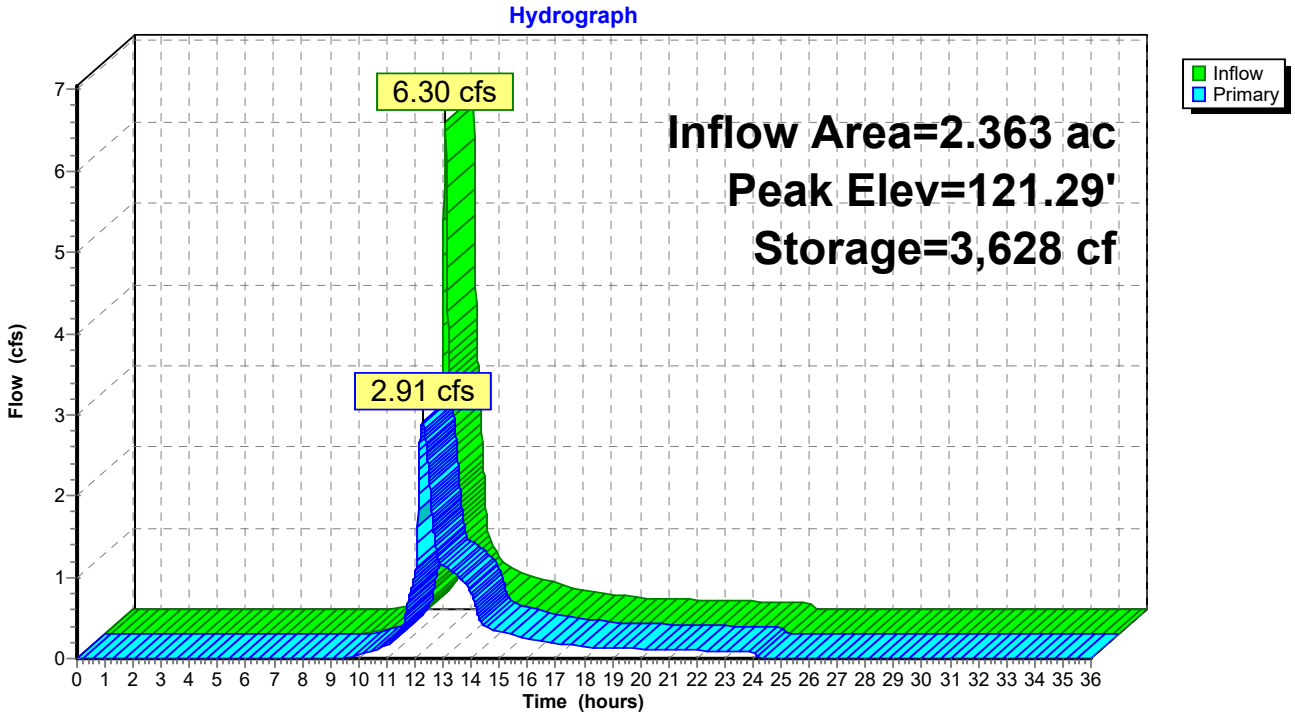
Volume	Invert	Avail.Storage	Storage Description
#1	119.25'	8,907 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
119.25	100	0	0
120.00	418	194	194
121.00	3,740	2,079	2,273
122.00	9,528	6,634	8,907

Device	Routing	Invert	Outlet Devices
#1	Primary	119.25'	**12.0" Round Culvert** L= 25.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 119.25' / 119.00' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	119.25'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	121.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	121.70'	**Asymmetrical Weir, C= 3.27** Offset (feet) -47.00 0.00 30.00 Height (feet) 0.30 0.00 0.30

Primary OutFlow Max=2.91 cfs @ 12.26 hrs HW=121.29' TW=119.22' (Dynamic Tailwater)
- **1=Culvert** (Passes 2.91 cfs of 4.70 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 1.27 cfs @ 6.45 fps)
  - **3=Orifice/Grate** (Weir Controls 1.64 cfs @ 1.78 fps)
- **4=Asymmetrical Weir** (Controls 0.00 cfs)

Pond 2P: 12" CPP



Summary for Pond 10P: Drip Strip

Inflow Area = 0.041 ac,100.00% Impervious, Inflow Depth = 4.67" for 10-yr event
Inflow = 0.20 cfs @ 12.08 hrs, Volume= 0.016 af
Outflow = 0.03 cfs @ 11.84 hrs, Volume= 0.016 af, Atten= 82%, Lag= 0.0 min
Discarded = 0.03 cfs @ 11.84 hrs, Volume= 0.016 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 0.34' @ 12.53 hrs Surf.Area= 504 sf Storage= 171 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 24.7 min (773.0 - 748.3)

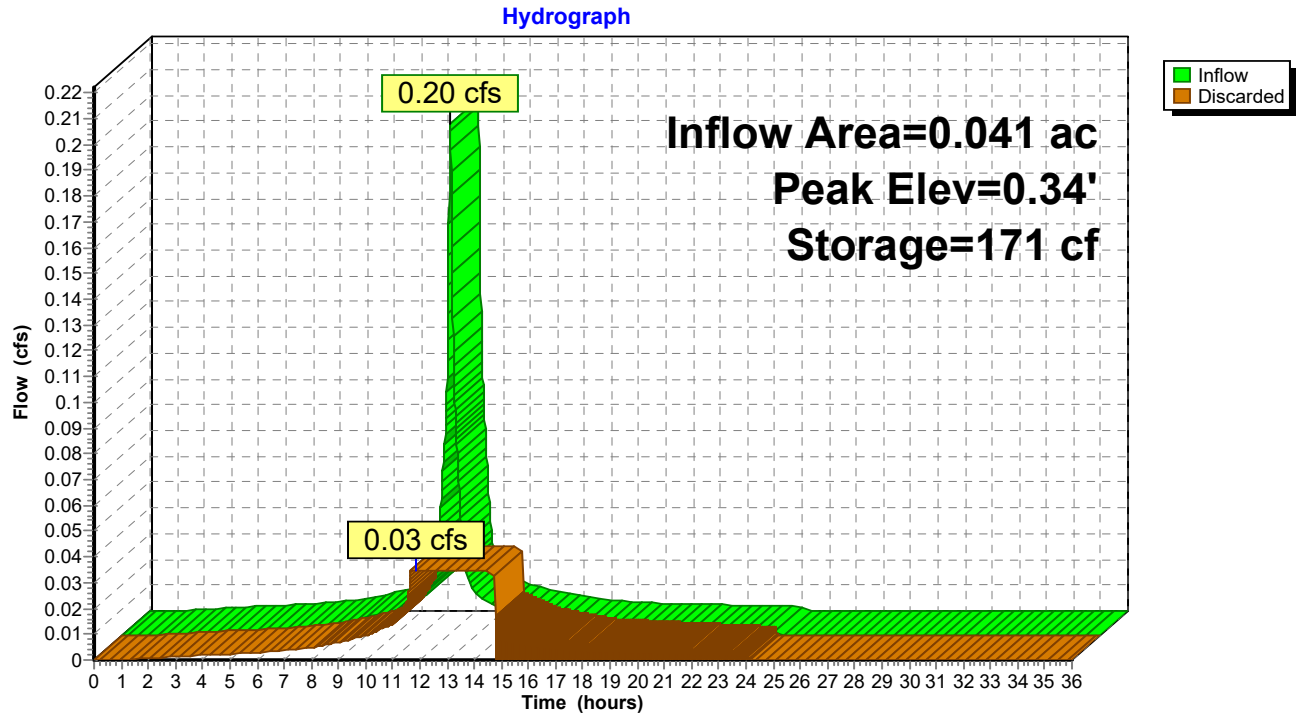
Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	1,008 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
0.00	504	0	0
2.00	504	1,008	1,008

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**3.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 11.84 hrs HW=0.02' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Pond 10P: Drip Strip



Summary for Pond 11P: Drip Strip

Inflow Area = 0.041 ac,100.00% Impervious, Inflow Depth = 4.67" for 10-yr event
Inflow = 0.20 cfs @ 12.08 hrs, Volume= 0.016 af
Outflow = 0.03 cfs @ 11.84 hrs, Volume= 0.016 af, Atten= 82%, Lag= 0.0 min
Discarded = 0.03 cfs @ 11.84 hrs, Volume= 0.016 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 0.34' @ 12.53 hrs Surf.Area= 504 sf Storage= 171 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 24.7 min (773.0 - 748.3)

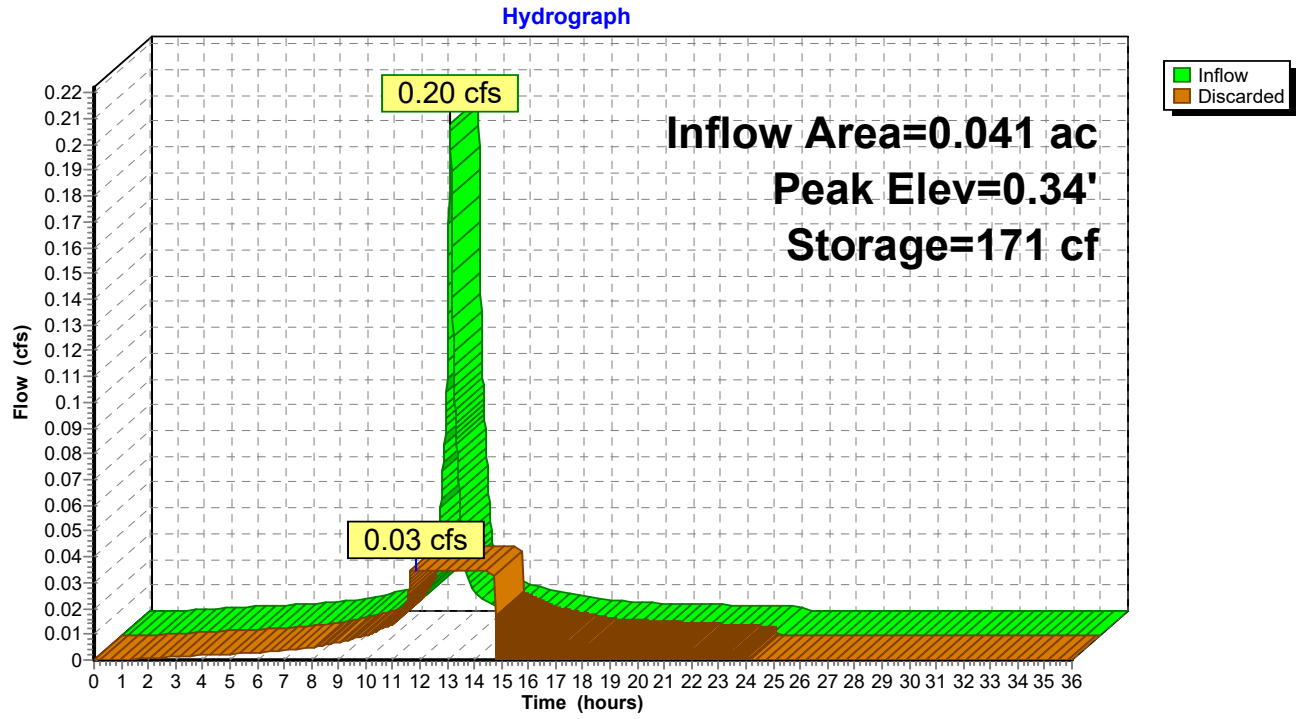
Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	1,008 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
0.00	504	0	0
2.00	504	1,008	1,008

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**3.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 11.84 hrs HW=0.02' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Pond 11P: Drip Strip



Summary for Pond 12P: Drip Strip

Inflow Area = 0.041 ac,100.00% Impervious, Inflow Depth = 4.67" for 10-yr event
Inflow = 0.20 cfs @ 12.08 hrs, Volume= 0.016 af
Outflow = 0.02 cfs @ 11.70 hrs, Volume= 0.016 af, Atten= 91%, Lag= 0.0 min
Discarded = 0.02 cfs @ 11.70 hrs, Volume= 0.016 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 0.48' @ 12.95 hrs Surf.Area= 504 sf Storage= 241 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 93.5 min (841.8 - 748.3)

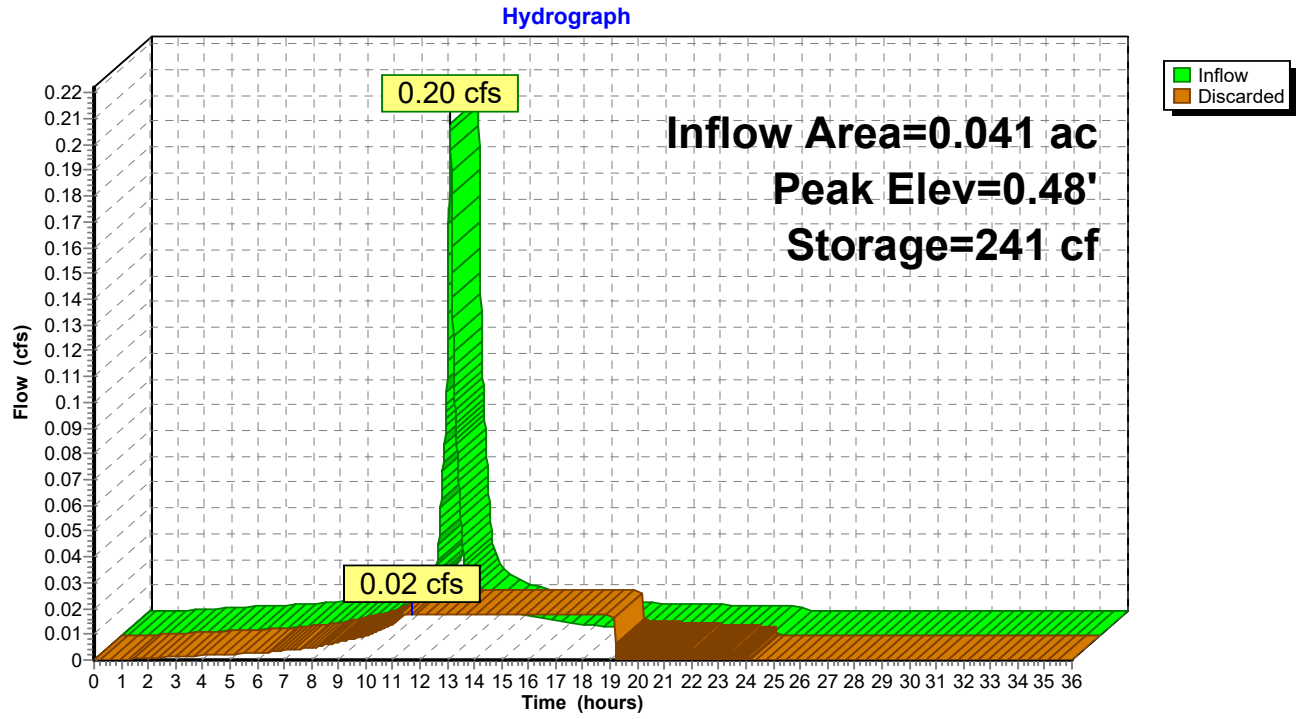
Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	1,008 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
0.00	504	0	0
2.00	504	1,008	1,008

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**1.500 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.02 cfs @ 11.70 hrs HW=0.02' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.02 cfs)

Pond 12P: Drip Strip



Summary for Pond 13P: Drip Strip

Inflow Area = 0.041 ac,100.00% Impervious, Inflow Depth = 4.67" for 10-yr event
Inflow = 0.20 cfs @ 12.08 hrs, Volume= 0.016 af
Outflow = 0.02 cfs @ 11.70 hrs, Volume= 0.016 af, Atten= 91%, Lag= 0.0 min
Discarded = 0.02 cfs @ 11.70 hrs, Volume= 0.016 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 0.48' @ 12.95 hrs Surf.Area= 504 sf Storage= 241 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 93.5 min (841.8 - 748.3)

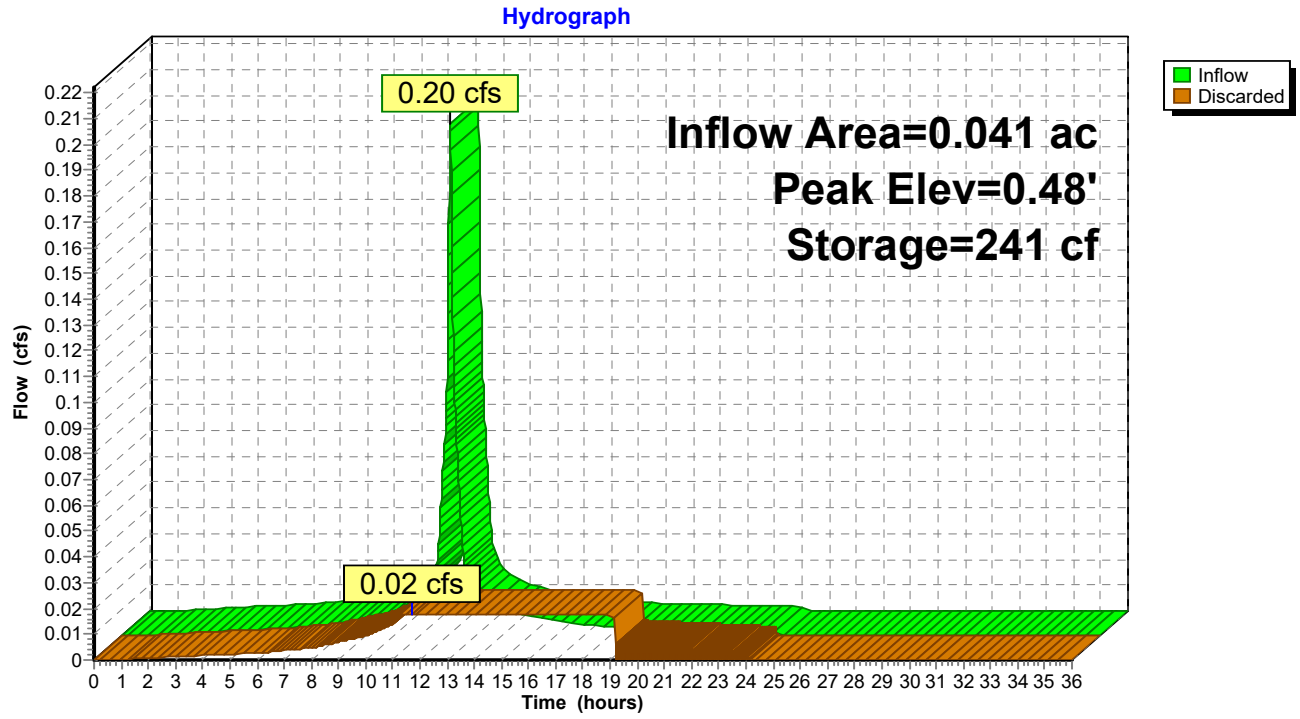
Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	1,008 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
0.00	504	0	0
2.00	504	1,008	1,008

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**1.500 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.02 cfs @ 11.70 hrs HW=0.02' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.02 cfs)

Pond 13P: Drip Strip



Summary for Pond 14P: Drip Strip

Inflow Area = 0.041 ac,100.00% Impervious, Inflow Depth = 4.67" for 10-yr event
Inflow = 0.20 cfs @ 12.08 hrs, Volume= 0.016 af
Outflow = 0.02 cfs @ 11.70 hrs, Volume= 0.016 af, Atten= 91%, Lag= 0.0 min
Discarded = 0.02 cfs @ 11.70 hrs, Volume= 0.016 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 0.48' @ 12.95 hrs Surf.Area= 504 sf Storage= 241 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 93.5 min (841.8 - 748.3)

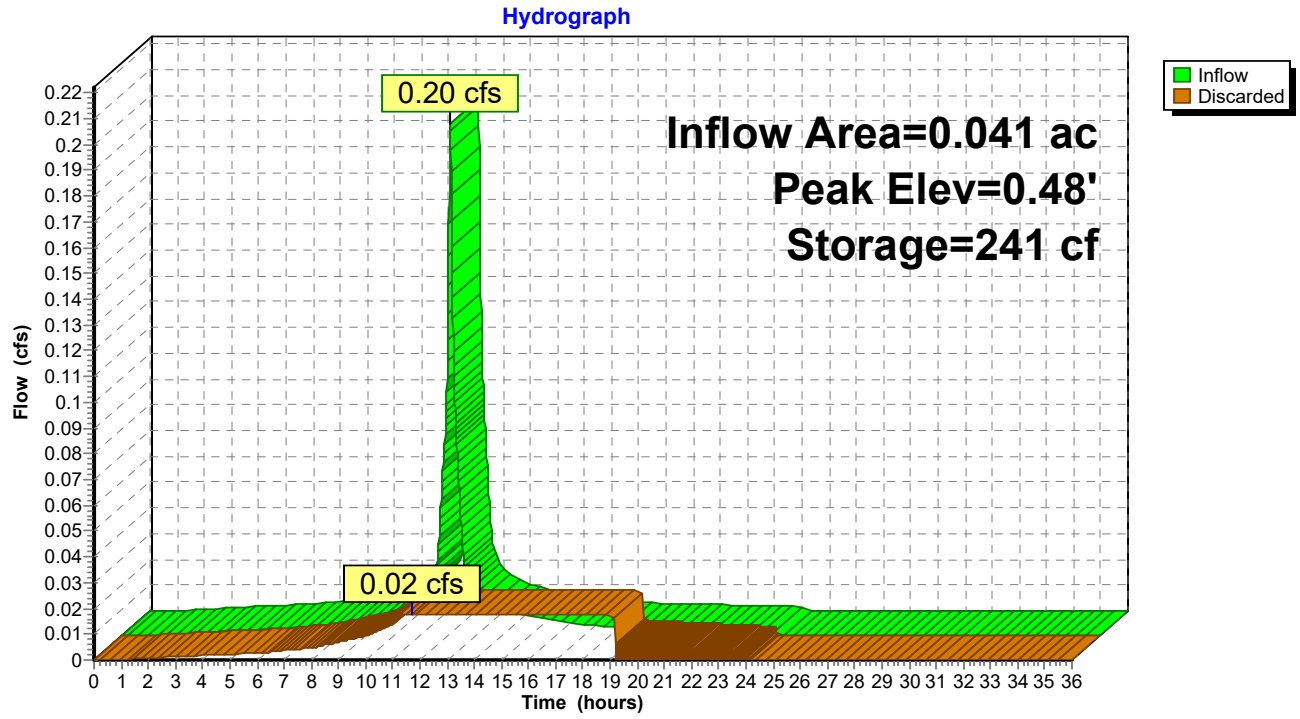
Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	1,008 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
0.00	504	0	0
2.00	504	1,008	1,008

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**1.500 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.02 cfs @ 11.70 hrs HW=0.02' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.02 cfs)

Pond 14P: Drip Strip



Summary for Pond 15P: Drip Strip

Inflow Area = 0.041 ac,100.00% Impervious, Inflow Depth = 4.67" for 10-yr event
Inflow = 0.20 cfs @ 12.08 hrs, Volume= 0.016 af
Outflow = 0.02 cfs @ 11.70 hrs, Volume= 0.016 af, Atten= 91%, Lag= 0.0 min
Discarded = 0.02 cfs @ 11.70 hrs, Volume= 0.016 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 0.48' @ 12.95 hrs Surf.Area= 504 sf Storage= 241 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 93.5 min (841.8 - 748.3)

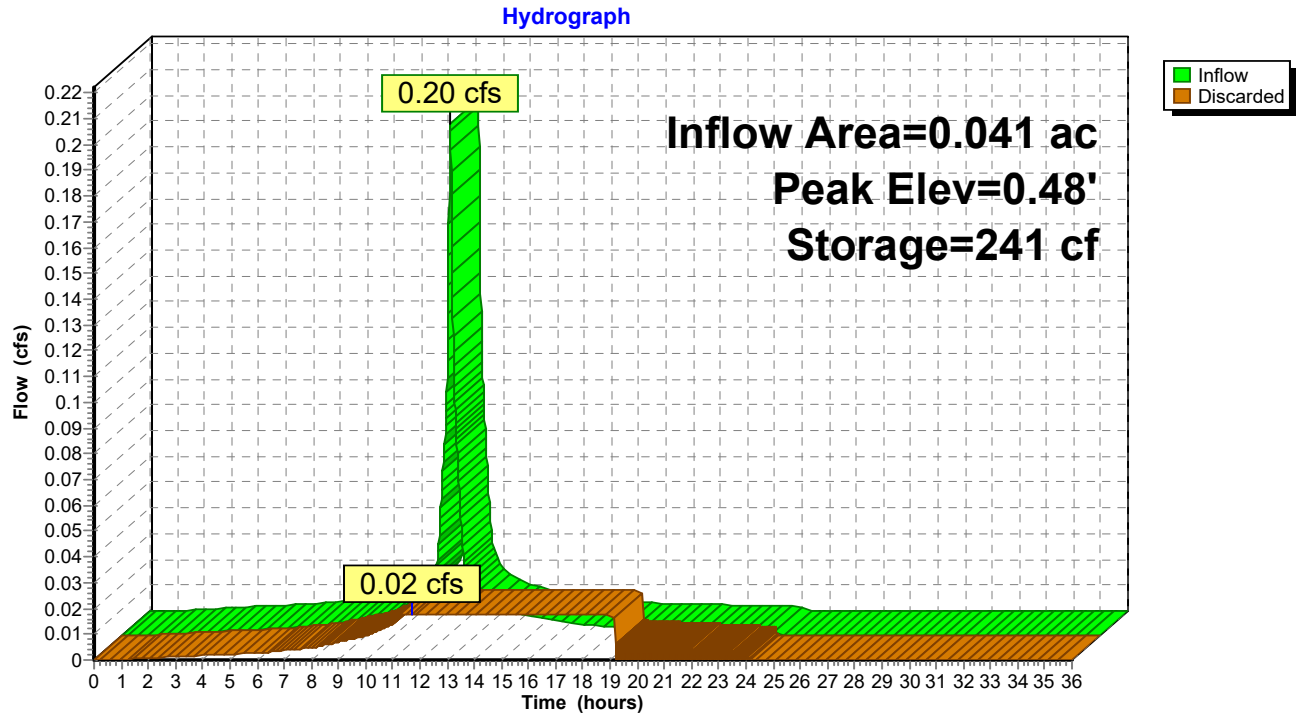
Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	1,008 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
0.00	504	0	0
2.00	504	1,008	1,008

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**1.500 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.02 cfs @ 11.70 hrs HW=0.02' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.02 cfs)

Pond 15P: Drip Strip

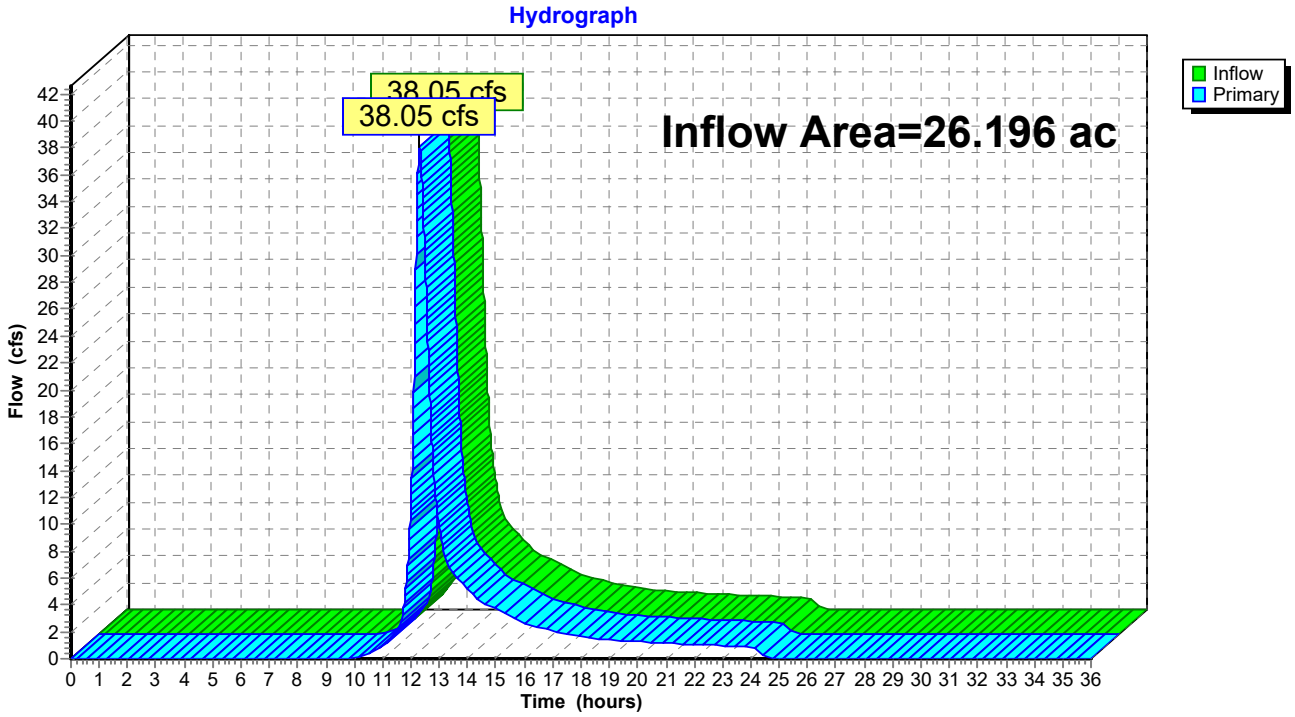


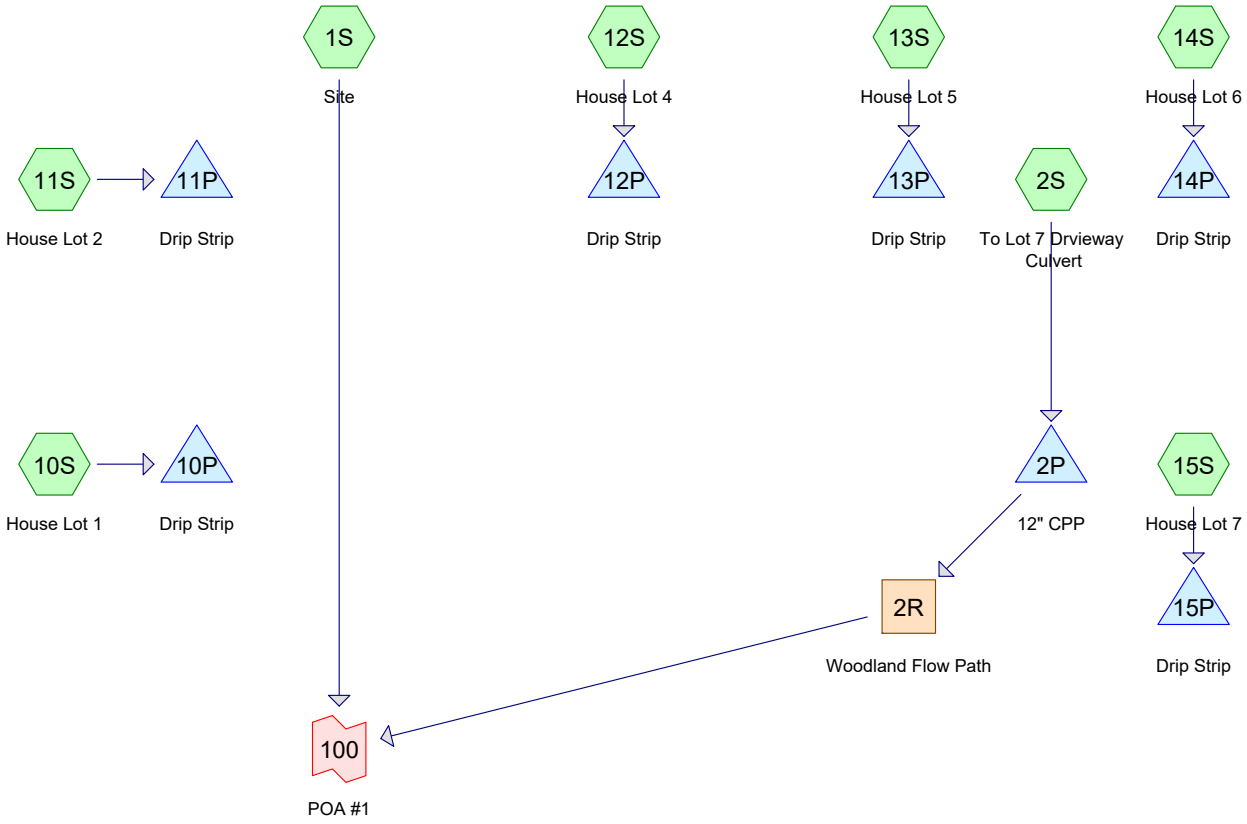
Summary for Link 100: POA #1

Inflow Area = 26.196 ac, 2.89% Impervious, Inflow Depth = 1.99" for 10-yr event
Inflow = 38.05 cfs @ 12.30 hrs, Volume= 4.347 af
Primary = 38.05 cfs @ 12.30 hrs, Volume= 4.347 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link 100: POA #1





Subcat Reach Pond Link

Routing Diagram for 5307-Post
Prepared by Altus Engineering, Inc., Printed 10/10/2022

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Site Runoff Area=1,038,165 sf 2.75% Impervious Runoff Depth=3.00"
Flow Length=1,231' Tc=20.6 min CN=70 Runoff=55.66 cfs 5.968 af

Subcatchment 2S: To Lot 7 Drvieway Runoff Area=102,930 sf 4.36% Impervious Runoff Depth=3.30"
Flow Length=455' Tc=5.0 min UI Adjusted CN=73 Runoff=9.47 cfs 0.649 af

Subcatchment 10S: House Lot 1 Runoff Area=1,800 sf 100.00% Impervious Runoff Depth=6.01"
Tc=6.0 min CN=98 Runoff=0.25 cfs 0.021 af

Subcatchment 11S: House Lot 2 Runoff Area=1,800 sf 100.00% Impervious Runoff Depth=6.01"
Tc=6.0 min CN=98 Runoff=0.25 cfs 0.021 af

Subcatchment 12S: House Lot 4 Runoff Area=1,800 sf 100.00% Impervious Runoff Depth=6.01"
Tc=6.0 min CN=98 Runoff=0.25 cfs 0.021 af

Subcatchment 13S: House Lot 5 Runoff Area=1,800 sf 100.00% Impervious Runoff Depth=6.01"
Tc=6.0 min CN=98 Runoff=0.25 cfs 0.021 af

Subcatchment 14S: House Lot 6 Runoff Area=1,800 sf 100.00% Impervious Runoff Depth=6.01"
Tc=6.0 min CN=98 Runoff=0.25 cfs 0.021 af

Subcatchment 15S: House Lot 7 Runoff Area=1,800 sf 100.00% Impervious Runoff Depth=6.01"
Tc=6.0 min CN=98 Runoff=0.25 cfs 0.021 af

Reach 2R: Woodland Flow Path Avg. Flow Depth=0.33' Max Vel=0.94 fps Inflow=4.29 cfs 0.649 af
n=0.100 L=561.0' S=0.0241 '/' Capacity=35.11 cfs Outflow=4.05 cfs 0.649 af

Pond 2P: 12" CPP Peak Elev=121.60' Storage=5,526 cf Inflow=9.47 cfs 0.649 af
Outflow=4.29 cfs 0.649 af

Pond 10P: Drip Strip Peak Elev=0.50' Storage=250 cf Inflow=0.25 cfs 0.021 af
Outflow=0.03 cfs 0.021 af

Pond 11P: Drip Strip Peak Elev=0.50' Storage=250 cf Inflow=0.25 cfs 0.021 af
Outflow=0.03 cfs 0.021 af

Pond 12P: Drip Strip Peak Elev=0.68' Storage=341 cf Inflow=0.25 cfs 0.021 af
Outflow=0.02 cfs 0.021 af

Pond 13P: Drip Strip Peak Elev=0.68' Storage=341 cf Inflow=0.25 cfs 0.021 af
Outflow=0.02 cfs 0.021 af

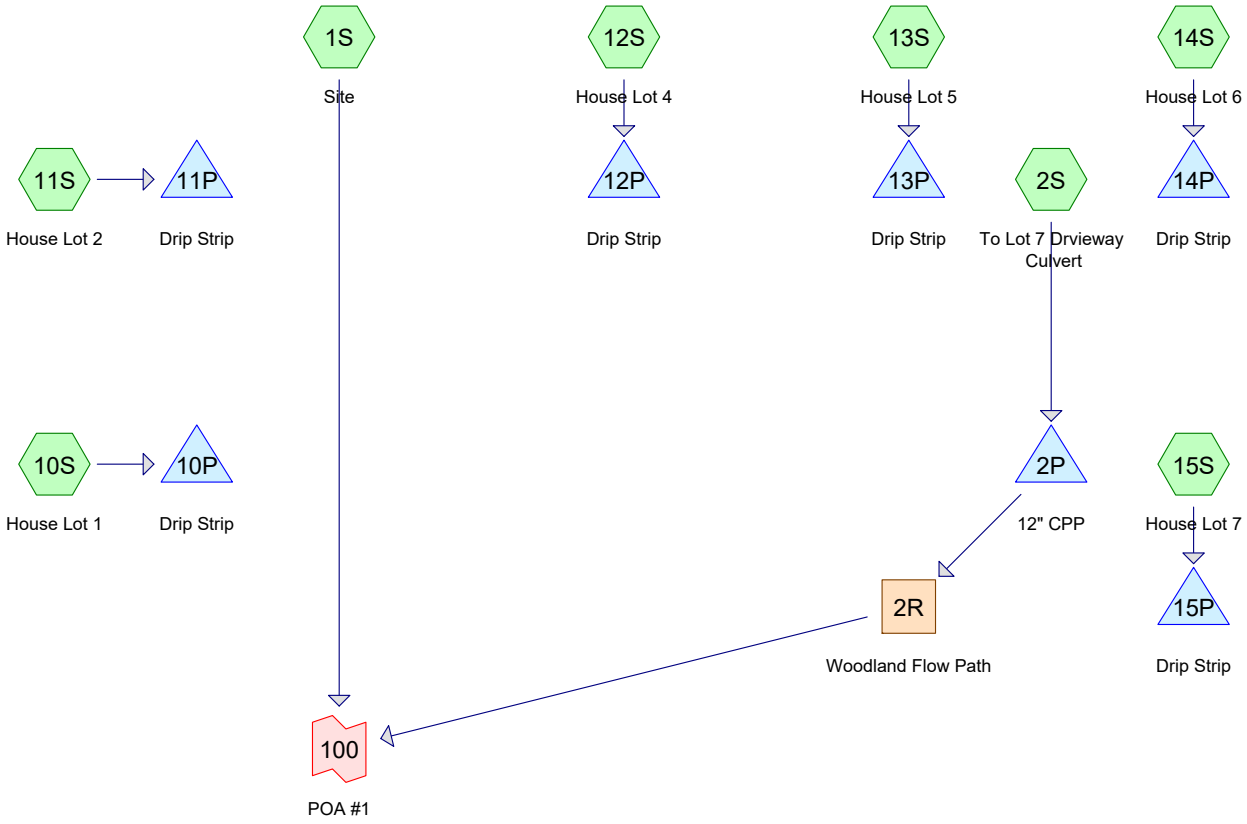
Pond 14P: Drip Strip Peak Elev=0.68' Storage=341 cf Inflow=0.25 cfs 0.021 af
Outflow=0.02 cfs 0.021 af

Pond 15P: Drip Strip Peak Elev=0.68' Storage=341 cf Inflow=0.25 cfs 0.021 af
Outflow=0.02 cfs 0.021 af

Link 100: POA #1

Inflow=59.36 cfs 6.617 af
Primary=59.36 cfs 6.617 af

Total Runoff Area = 26.444 ac Runoff Volume = 6.741 af Average Runoff Depth = 3.06"
96.20% Pervious = 25.438 ac 3.80% Impervious = 1.006 ac



Subcat Reach Pond Link

Routing Diagram for 5307-Post
Prepared by Altus Engineering, Inc., Printed 10/10/2022

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Site Runoff Area=1,038,165 sf 2.75% Impervious Runoff Depth=4.04"
Flow Length=1,231' Tc=20.6 min CN=70 Runoff=75.20 cfs 8.019 af

Subcatchment 2S: To Lot 7 Drvieway Runoff Area=102,930 sf 4.36% Impervious Runoff Depth=4.37"
Flow Length=455' Tc=5.0 min UI Adjusted CN=73 Runoff=12.55 cfs 0.860 af

Subcatchment 10S: House Lot 1 Runoff Area=1,800 sf 100.00% Impervious Runoff Depth=7.26"
Tc=6.0 min CN=98 Runoff=0.30 cfs 0.025 af

Subcatchment 11S: House Lot 2 Runoff Area=1,800 sf 100.00% Impervious Runoff Depth=7.26"
Tc=6.0 min CN=98 Runoff=0.30 cfs 0.025 af

Subcatchment 12S: House Lot 4 Runoff Area=1,800 sf 100.00% Impervious Runoff Depth=7.26"
Tc=6.0 min CN=98 Runoff=0.30 cfs 0.025 af

Subcatchment 13S: House Lot 5 Runoff Area=1,800 sf 100.00% Impervious Runoff Depth=7.26"
Tc=6.0 min CN=98 Runoff=0.30 cfs 0.025 af

Subcatchment 14S: House Lot 6 Runoff Area=1,800 sf 100.00% Impervious Runoff Depth=7.26"
Tc=6.0 min CN=98 Runoff=0.30 cfs 0.025 af

Subcatchment 15S: House Lot 7 Runoff Area=1,800 sf 100.00% Impervious Runoff Depth=7.26"
Tc=6.0 min CN=98 Runoff=0.30 cfs 0.025 af

Reach 2R: Woodland Flow Path Avg. Flow Depth=0.39' Max Vel=1.04 fps Inflow=6.70 cfs 0.860 af
n=0.100 L=561.0' S=0.0241 '/' Capacity=35.11 cfs Outflow=5.61 cfs 0.860 af

Pond 2P: 12" CPP Peak Elev=121.82' Storage=7,321 cf Inflow=12.55 cfs 0.860 af
Outflow=6.70 cfs 0.860 af

Pond 10P: Drip Strip Peak Elev=0.65' Storage=327 cf Inflow=0.30 cfs 0.025 af
Outflow=0.03 cfs 0.025 af

Pond 11P: Drip Strip Peak Elev=0.65' Storage=327 cf Inflow=0.30 cfs 0.025 af
Outflow=0.03 cfs 0.025 af

Pond 12P: Drip Strip Peak Elev=0.89' Storage=447 cf Inflow=0.30 cfs 0.025 af
Outflow=0.02 cfs 0.025 af

Pond 13P: Drip Strip Peak Elev=0.89' Storage=447 cf Inflow=0.30 cfs 0.025 af
Outflow=0.02 cfs 0.025 af

Pond 14P: Drip Strip Peak Elev=0.89' Storage=447 cf Inflow=0.30 cfs 0.025 af
Outflow=0.02 cfs 0.025 af

Pond 15P: Drip Strip Peak Elev=0.89' Storage=447 cf Inflow=0.30 cfs 0.025 af
Outflow=0.02 cfs 0.025 af

Link 100: POA #1

Inflow=80.76 cfs 8.880 af
Primary=80.76 cfs 8.880 af

Total Runoff Area = 26.444 ac Runoff Volume = 9.030 af Average Runoff Depth = 4.10"
96.20% Pervious = 25.438 ac 3.80% Impervious = 1.006 ac

Section 5

Precipitation Table

ALTUS ENGINEERING

Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Smoothing	Yes
State	New Hampshire
Location	
Longitude	70.948 degrees West
Latitude	42.981 degrees North
Elevation	0 feet
Date/Time	Tue, 26 Apr 2022 17:11:17 -0400

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	0.66	0.82	1.04	**1yr**	0.71	0.99	1.22	1.57	2.05	2.68	2.90	**1yr**	2.37	2.79	3.21	3.91	4.54	**1yr**
2yr	0.32	0.50	0.62	0.82	1.03	1.30	**2yr**	0.89	1.18	1.52	1.94	2.49	3.22	3.57	**2yr**	2.85	3.43	3.94	4.68	5.33	**2yr**
5yr	0.38	0.58	0.73	0.98	1.26	1.62	**5yr**	1.08	1.47	1.90	2.45	3.16	4.09	4.59	**5yr**	3.62	4.41	5.05	5.97	6.75	**5yr**
10yr	0.42	0.66	0.83	1.13	1.46	1.91	**10yr**	1.26	1.73	2.25	2.92	3.78	4.91	5.56	**10yr**	4.34	5.34	6.09	7.19	8.07	**10yr**
25yr	0.49	0.77	0.98	1.35	1.80	2.37	**25yr**	1.55	2.16	2.81	3.68	4.80	6.25	7.15	**25yr**	5.53	6.88	7.80	9.19	10.22	**25yr**
50yr	0.55	0.87	1.12	1.56	2.11	2.80	**50yr**	1.82	2.55	3.34	4.39	5.75	7.50	8.67	**50yr**	6.64	8.33	9.42	11.08	12.24	**50yr**
100yr	0.61	0.99	1.27	1.81	2.47	3.32	**100yr**	2.13	3.01	3.98	5.25	6.89	9.00	10.50	**100yr**	7.97	10.10	11.37	13.36	14.66	**100yr**
200yr	0.69	1.13	1.46	2.09	2.89	3.92	**200yr**	2.49	3.56	4.72	6.26	8.25	10.82	12.72	**200yr**	9.57	12.23	13.72	16.11	17.57	**200yr**
500yr	0.82	1.35	1.76	2.55	3.57	4.89	**500yr**	3.08	4.44	5.91	7.90	10.4	13.79	16.41	**500yr**	12.21	15.78	17.61	20.66	22.33	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.24	0.37	0.45	0.61	0.75	0.89	**1yr**	0.64	0.87	0.95	1.25	1.54	2.29	2.54	**1yr**	2.03	2.44	2.89	3.43	4.02	**1yr**
2yr	0.32	0.49	0.60	0.82	1.01	1.19	**2yr**	0.87	1.17	1.37	1.82	2.33	3.11	3.49	**2yr**	2.75	3.36	3.85	4.56	5.14	**2yr**
5yr	0.36	0.55	0.68	0.94	1.19	1.42	**5yr**	1.03	1.39	1.62	2.12	2.73	3.81	4.26	**5yr**	3.38	4.10	4.70	5.62	6.31	**5yr**
10yr	0.40	0.61	0.75	1.05	1.36	1.63	**10yr**	1.17	1.59	1.82	2.40	3.07	4.39	4.95	**10yr**	3.89	4.76	5.46	6.53	7.26	**10yr**
25yr	0.46	0.69	0.86	1.23	1.62	1.95	**25yr**	1.40	1.91	2.12	2.78	3.58	4.94	6.02	**25yr**	4.37	5.78	6.64	7.96	8.89	**25yr**
50yr	0.51	0.77	0.96	1.38	1.85	2.25	**50yr**	1.60	2.20	2.37	3.12	4.01	5.59	6.96	**50yr**	4.95	6.69	7.69	9.26	10.28	**50yr**
100yr	0.57	0.86	1.08	1.55	2.13	2.58	**100yr**	1.84	2.52	2.65	3.48	4.48	6.30	8.04	**100yr**	5.58	7.73	8.90	10.75	11.84	**100yr**
200yr	0.64	0.96	1.21	1.76	2.45	2.96	**200yr**	2.11	2.89	2.95	3.88	5.00	7.08	9.69	**200yr**	6.27	9.32	10.31	12.47	13.68	**200yr**
500yr	0.75	1.11	1.43	2.08	2.96	3.58	**500yr**	2.55	3.50	3.42	4.48	5.81	8.22	11.85	**500yr**	7.27	11.39	12.52	15.14	16.51	**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**	0.76	1.06	1.26	1.71	2.17	2.96	3.12	**1yr**	2.62	3.00	3.56	4.28	4.98	**1yr**
2yr	0.33	0.51	0.63	0.86	1.06	1.26	**2yr**	0.91	1.23	1.48	1.94	2.48	3.39	3.67	**2yr**	3.00	3.53	4.06	4.85	5.62	**2yr**
5yr	0.40	0.62	0.77	1.06	1.34	1.62	**5yr**	1.16	1.58	1.87	2.48	3.17	4.38	4.93	**5yr**	3.88	4.74	5.42	6.35	7.20	**5yr**
10yr	0.48	0.73	0.91	1.27	1.64	1.97	**10yr**	1.41	1.93	2.26	3.02	3.81	5.45	6.19	**10yr**	4.83	5.95	6.79	7.88	8.89	**10yr**
25yr	0.59	0.90	1.11	1.59	2.09	2.56	**25yr**	1.81	2.50	2.93	3.92	4.88	7.62	8.38	**25yr**	6.75	8.06	9.12	10.50	11.53	**25yr**
50yr	0.69	1.05	1.31	1.88	2.53	3.11	**50yr**	2.18	3.04	3.56	4.78	5.91	9.56	10.56	**50yr**	8.46	10.15	11.45	13.06	14.18	**50yr**
100yr	0.81	1.23	1.54	2.22	3.05	3.78	**100yr**	2.63	3.70	4.34	5.84	7.17	11.99	13.30	**100yr**	10.61	12.79	14.34	16.29	17.46	**100yr**
200yr	0.95	1.44	1.82	2.64	3.68	4.62	**200yr**	3.17	4.51	5.29	7.13	8.68	15.09	16.13	**200yr**	13.35	15.51	18.00	20.31	21.51	**200yr**
500yr	1.19	1.77	2.27	3.30	4.70	5.98	**500yr**	4.05	5.84	6.87	9.32	11.20	20.47	21.74	**500yr**	18.12	20.90	24.26	27.21	28.40	**500yr**

Powered by ACIS Northeast Regional Climate Center

Section 6

GRV / WQV Calculations

ALTUS
ENGINEERING

Groundwater Recharge Volume (GRV) / Water Quality Volume (WQV) Infiltration Calculations

Project: Beech Hill Subdivision
Town: Exeter, NH
Proj. No.: 5307
Date: 11-Oct-22

Area (AI) = existing vegetated area covered by new impervious surfaces

HSG	Area (ac)	Ratio	WQV		
A	0	0.4	0.000	in	Area*Ratio
B	0.16	0.25	0.040	in	Area*Ratio
C	0.39	0.1	0.039	in	Area*Ratio
D	0	0	0.000	in	Area*Ratio
Area (AI):	0.55		0.079	in	Weighted GRV Depth = Sum of WQV's
			0.043	ac-in	GRV = AI*Rd
			157.72	cf	GRV Conversion (ac-in * 43560sf/ac * 1'/12")

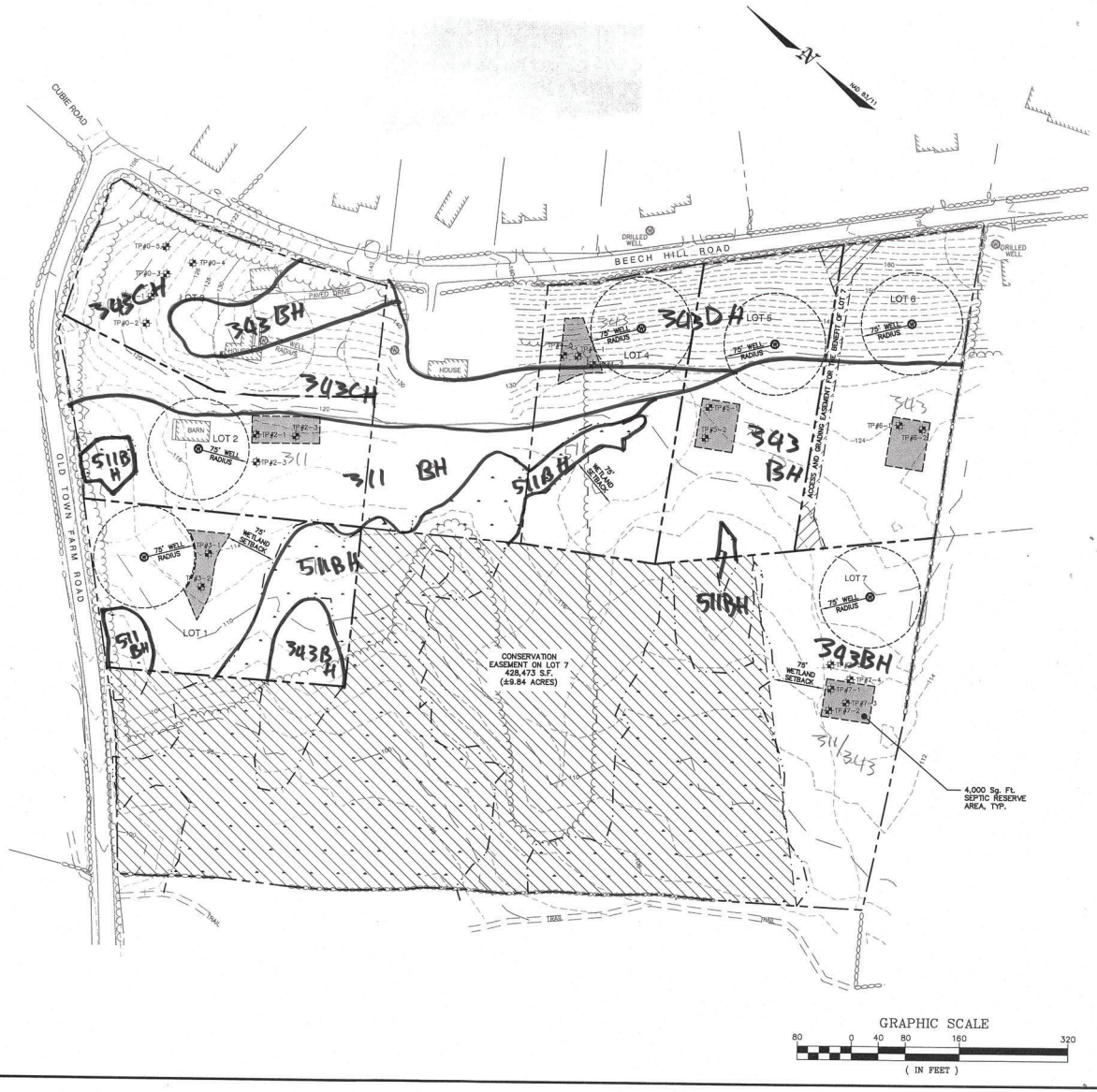
Volume Infiltrated:	4182	cf
	4024.28	cf Surplus/Deficit

ALTUS ENGINEERING

Section 7

HISS Map
Test Pit Logs
NRCS Soil Survey

ALTUS
ENGINEERING



NOTES

1. WETLANDS WERE DELINEATED BY GOVE ENVIRONMENTAL SERVICES, INC., SPRING 2022.
2. TEST PITS WERE PERFORMED BY GOVE ENVIRONMENTAL SERVICES, INC., ON AUGUST 10, 2022 AND WITNESSED BY THE ROCKINGHAM COUNTY CONSERVATION DISTRICT.
3. HISS MAPPING PREPARED BY GOVE ENVIRONMENTAL SERVICES, INC.

CASE #22-XX
TOWN OF EXETER PROJECT REFERENCE

ALTUS ENGINEERING, INC.
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

NOT FOR CONSTRUCTION

ISSUED FOR: PLANNING BOARD

ISSUE DATE: AUGUST 30, 2022

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	PLANNING BOARD	EBS	08/30/22

DRAWN BY: EBS
APPROVED BY: EBS
DRAWING FILE: 5307-SUB.dwg

SCALE: (22"x34") 1"= 80'
(11"x17") 1"=160'

OWNER:
JUDITH A. NICHOLS
FREDERICK J. NICHOLS
100 BEECH HILL ROAD
EXETER, NH 03833

APPLICANT:
JERRY AND CHRISTINE STERRITT
98 BEECH HILL ROAD
EXETER, NH 03833

PROJECT:
BEECH HILL SUBDIVISION
TAX MAP 13, LOT 1
BEECH HILL ROAD
EXETER, NH 03833

TITLE:
SOILS PLAN

SHEET NUMBER:
C - 2

P5307

GOVE ENVIRONMENTAL SERVICES, INC.

TEST PIT DATA

Project	Beech Hill Road
Client	Altus Engineering, Inc.
LDH 8/10/22	Luke Hurley, Certified Soil Scientist # 095
Test Pit No.	**0-1**
ESHWT:	20"
Termination @	60"
Refusal:	No
Obs. Water:	No

Depth	Color	Texture	Structure	Consistence	REDOX
0-7"	10YR3/3	FSL	GR	FR	N
7-20"	10YR5/4	FSL	GR	FR	N
20-60"	2.5Y4/3	FSL	BLK	Fi	P

Test Pit No.	**0-2**
ESHWT:	20"
Termination @	48"
Refusal:	No
Obs. Water:	No

Depth	Color	Texture	Structure	Consistence	REDOX
0-8"	10YR3/3	FSL	GR	FR	N
8-20"	10YR5/4	FSL	GR	FR	N
20-48"	2.5Y4/3	FSL	BLK	Fi	P

Test Pit No.	**0-3**
ESHWT:	20"
Termination @	48"
Refusal:	No
Obs. Water:	No

Depth	Color	Texture	Structure	Consistence	REDOX
0-8"	10YR3/2	FSL	GR	FR	N
8-20"	10YR4/4	FSL	GR	FR	N
20-48"	2.5Y5/4	FSL	GR	FR	P

Test Pit No.	**0-4**
ESHWT:	28"
Termination @	60"
Refusal:	No

8 Continental Dr Bldg 2 Unit H, Exeter, NH 03833-7526
Ph (603) 778 0644 / *Fax* (603) 778 0654
info@gesinc.biz
www.gesinc.biz

Obs. Water: No

Depth	Color	Texture	Structure	Consistence	REDOX
0-8"	10YR3/3	FSL	GR	FR	N
8-28"	10YR4/4	FSL	GR	FR	N
28-60"	2.5Y5/3	FSL	BLK	Fi	P

Test Pit No. **0-5**
ESHWT: 30"
Termination @ 50"
Refusal: No
Obs. Water: No

Depth	Color	Texture	Structure	Consistence	REDOX
0-8"	10YR3/3	FSL	GR	FR	N
8-20"	10YR4/4	FSL	GR	FR	N
20-30"	2.5Y5/3	FSL	GR	FR	N
30-50"	2.5Y5/4	FSL	BLK	Fi	P

Test Pit No. **1-1**
ESHWT: 24"
Termination @ 54"
Refusal: No
Obs. Water: No

Depth	Color	Texture	Structure	Consistence	REDOX
0-10"	10YR3/2	FSL	GR	FR	N
10-16"	10YR4/4	FSL	GR	FR	N
16-24"	2.5Y5/4	FSL	GR	FR	N
24-54"	10YR4/4	S	GR	FR	P

Test Pit No. **1-2**
ESHWT: 26"
Termination @ 60"
Refusal: No
Obs. Water: No

Depth	Color	Texture	Structure	Consistence	REDOX
0-10"	10YR3/3	FSL	GR	FR	N
10-18"	10YR4/4	FSL	GR	FR	N
18-26"	2.5Y5/4	FSL	GR	FR	N
26-60"	2.5Y4/4	S	GR	FR	P

Test Pit No. **1-3**
ESHWT: 32"
Termination @ 50"
Refusal: No
Obs. Water: No

Depth	Color	Texture	Structure	Consistence	REDOX
0-10"	10YR3/3	FSL	GR	FR	N
10-24"	10YR4/4	FSL	GR	FR	N
24-50"	2.5Y5/4	S	SG	L	P

Test Pit No. **2-1**
ESHWT: 30"
Termination @ 52"
Refusal: No
Obs. Water: No

Depth	Color	Texture	Structure	Consistence	REDOX
0-8"	10YR3/3	FSL	GR	FR	N
8-14"	10YR4/4	FSL	GR	FR	N
14-30"	2.5Y5/6	S	GR	L	N
30-52"	10YR5/8	S	GR	FR	P

Test Pit No. **2-2**
ESHWT: 17"
Termination @ 60"
Refusal: No
Obs. Water: No

Depth	Color	Texture	Structure	Consistence	REDOX
0-8"	10YR3/3	FSL	GR	FR	N
8-17"	10YR4/4	FSL	GR	FR	N
17-60"	2.5Y5/6	S	GR	FR	P

Test Pit No. **4-1**
ESHWT: 24"
Termination @ 64"
Refusal: No
Obs. Water: No

Depth	Color	Texture	Structure	Consistence	REDOX
0-8"	10YR3/3	FSL	GR	FR	N
8-16"	10YR5/4	FSL	GR	FR	N
16-24"	10YR4/4	FSL	GR	FR	N
24-64"	2.5Y4/3	FSL	BLK	Fi	P

Test Pit No. **4-2**
ESHWT: 20"
Termination @ 60"
Refusal: No
Obs. Water: No

Depth	Color	Texture	Structure	Consistence	REDOX
0-10"	10YR3/3	FSL	GR	FR	N
10-20"	10YR4/4	FSL	GR	FR	N
20-60"	2.5Y5/3	FSL	BLK	Fi	P

Test Pit No. **4-3**
ESHWT: 30"
Termination @ 60"
Refusal: No
Obs. Water: No

Depth	Color	Texture	Structure	Consistence	REDOX
0-6"	10YR3/2	FSL	GR	FR	N
6-18"	10YR4/4	FSL	GR	FR	N
18-30"	2.5Y4/4	FSL	GR	FR	N
30-60"	2.5Y5/3	FSL	BLK	Fi	P

Test Pit No. **5-1**
ESHWT: 30"
Termination @ 56"
Refusal: No
Obs. Water: No

Depth	Color	Texture	Structure	Consistence	REDOX
0-12"	10YR3/3	FSL	GR	FR	N
12-20"	10YR4/4	FSL	GR	FR	N
20-30"	2.5Y5/6	FSL	GR	FR	N
30-56"	2.5Y5/4	FSL	BLK	Fi	P

Test Pit No. **5-2**
ESHWT: 38"
Termination @ 64"
Refusal: No
Obs. Water: No

Depth	Color	Texture	Structure	Consistence	REDOX
0-8"	10YR3/3	FSL	GR	FR	N
8-16"	10YR4/4	FSL	GR	FR	N
16-38"	10YR4/6	FSL	GR	FR	N
38-64"	2.5Y5/4	Gr	OM	Fi	P

Test Pit No. **6-1**
ESHWT: 30"
Termination @ 66"
Refusal: No
Obs. Water: No

Depth	Color	Texture	Structure	Consistence	REDOX
0-8"	10YR3/3	FSL	GR	FR	N
8-18"	10YR4/4	FSL	GR	FR	N
18-30"	2.5Y4/6	FSL	GR	FR	N
30-66"	2.5Y5/3	FSL	BLK	Fi	P

Test Pit No. **6-2**
ESHWT: 38"
Termination @ 60"
Refusal: No
Obs. Water: No

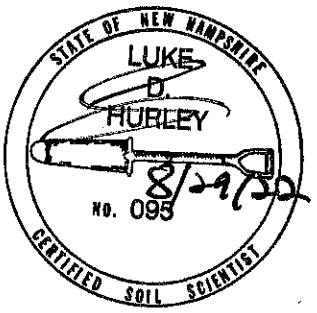
Depth	Color	Texture	Structure	Consistence	REDOX
0-6"	10YR3/3	FSL	GR	FR	N
6-18"	10YR4/4	FSL	GR	FR	N
18-38"	10YR4/6	FSL	GR	FR	N
38-60"	2.5Y5/3	FSL	BLK	Fi	P

Test Pit No. **7-1**
ESHWT: 24"
Termination @ 36"
Refusal: 36"
Obs. Water: No

Depth	Color	Texture	Structure	Consistence	REDOX
0-6"	10YR3/2	FSL	GR	FR	N
6-18"	10YR4/4	FSL	GR	FR	N
18-24"	2.5Y4/6	S	GR	L	N
24-36"	2.5Y5/4	S	BLK	Fi	P

Test Pit No. **7-2**
ESHWT: 24"
Termination @ 42"
Refusal: 42
Obs. Water: No

Depth	Color	Texture	Structure	Consistence	REDOX
0-6"	10YR3/2	FSL	GR	FR	N
6-12"	10YR4/4	FSL	GR	FR	N
12-24"	10YR4/6	S	GR	FR	N
24-42"	2.5Y5/3	FSL	BLK	Fi	P



Test Pit No. **7-3**
ESHWT: 20"
Termination @ 54"
Refusal: No
Obs. Water: No

Depth	Color	Texture	Structure	Consistence	REDOX
0-10"	10YR3/3	FSL	GR	FR	N
10-20"	10YR4/4	FSL	GR	FR	N
20-54"	2.5Y5/4	S	GR	FR	P

Test Pit No. **7-4**
ESHWT: 18"
Termination @ 52"
Refusal: No
Obs. Water: No

Depth	Color	Texture	Structure	Consistence	REDOX
0-8"	10YR3/2	FSL	GR	FR	N
8-14"	10YR4/4	FSL	GR	FR	N
14-18"	10YR4/6	FSL	GR	FR	N
18-24"	2.5Y5/6	FS	GR	FR	P
24-36"	2.5Y5/4	FS	GR	FR	P
36-52"	2.5Y5/3	SiL	BLK	Fi	P

Test Pit No. **7-5**
ESHWT: 24"
Termination @ 60"
Refusal: No
Obs. Water: No

Depth	Color	Texture	Structure	Consistence	REDOX
0-6"	10YR3/2	FSL	GR	FR	N
6-12"	10YR4/4	FSL	GR	FR	N
12-24"	2.5Y4/6	S	GR	FR	N
24-60"	2.5Y5/4	Sd	GR	FR	P

GR (TEXTURE) = GRAVELLY
LS = LOAMY SAND
S = SAND
FSL = FINE SANDY LOAM
SL = SANDY LOAM
SIL = SILT LOAM
SICL = SILTY CLAY
CB (TEXTURE) = COBBLY
CN (TEXTURE) = CHANNERY

GR = GRANULAR
OM = MASSIVE
PL = PLATY
BLK = BLOCKY

FR = FRIABLE
FI = FIRM
C = COMMON
P = PROMINENT
D = DISTINCT
N = NONE

VF (TEXTURE) = VERY FINE
F (TEXTURE) = FINE
V (ROCK FRAGMENT)(TEXTURE) = VERY

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

October 10, 2022

Preface

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

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

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

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

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

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

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Contents

Soil Map

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

Custom Soil Resource Report
Soil Map

Map Scale: 1:5,000 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

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

MAP LEGEND

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

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

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

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

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

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 25, Sep 12, 2022

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—Jun 5, 2022

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
12B	Hinckley loamy sand, 3 to 8 percent slopes	6.9	15.4%
32B	Boxford silt loam, 3 to 8 percent slopes	0.6	1.4%
33A	Scitico silt loam, 0 to 5 percent slopes	6.5	14.5%
38B	Eldridge fine sandy loam, 3 to 8 percent slopes	1.5	3.4%
66D	Paxton fine sandy loam, 15 to 25 percent slopes	4.9	11.0%
67C	Paxton fine sandy loam, 8 to 15 percent slopes, very stony	2.3	5.1%
313A	Deerfield loamy fine sand, 0 to 3 percent slopes	12.4	27.9%
495	Natchaug mucky peat, 0 to 2 percent slopes	2.8	6.4%
538A	Squamscott fine sandy loam, 0 to 5 percent slopes	6.6	14.8%
Totals for Area of Interest		**44.6**	**100.0%**

Map Unit Descriptions

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

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

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They

generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

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

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

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

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

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

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

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

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

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

Rockingham County, New Hampshire

12B—Hinckley loamy sand, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2svm8
Elevation: 0 to 1,430 feet
Mean annual precipitation: 36 to 53 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 250 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Hinckley

Setting

Landform: Outwash deltas, outwash terraces, moraines, kames, outwash plains, kame terraces, eskers
Landform position (two-dimensional): Summit, shoulder, backslope, footslope
Landform position (three-dimensional): Nose slope, side slope, base slope, crest, riser, tread
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Parent material: Sandy and gravelly glaciofluvial deposits derived from gneiss and/or granite and/or schist

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 8 inches: loamy sand
Bw1 - 8 to 11 inches: gravelly loamy sand
Bw2 - 11 to 16 inches: gravelly loamy sand
BC - 16 to 19 inches: very gravelly loamy sand
C - 19 to 65 inches: very gravelly sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Very low (about 3.0 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

Windsor
Percent of map unit: 8 percent
Landform: Outwash deltas, outwash terraces, moraines, kames, outwash plains, kame terraces, eskers
Landform position (two-dimensional): Summit, shoulder, backslope, footslope
Landform position (three-dimensional): Nose slope, side slope, base slope, crest, riser, tread
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Hydric soil rating: No

Sudbury
Percent of map unit: 5 percent
Landform: Outwash deltas, outwash terraces, moraines, outwash plains, kame terraces
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Head slope, side slope, base slope, tread
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Hydric soil rating: No

Agawam
Percent of map unit: 2 percent
Landform: Outwash deltas, outwash terraces, moraines, kames, outwash plains, kame terraces, eskers
Landform position (two-dimensional): Summit, shoulder, backslope, footslope
Landform position (three-dimensional): Nose slope, side slope, base slope, crest, riser, tread
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Hydric soil rating: No

32B—Boxford silt loam, 3 to 8 percent slopes

Map Unit Setting
National map unit symbol: 9cn4
Elevation: 0 to 1,000 feet
Mean annual precipitation: 30 to 55 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 120 to 180 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Boxford and similar soils: 80 percent
Minor components: 20 percent

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

Description of Boxford

Setting

Parent material: Glaciomarine

Typical profile

H1 - 0 to 2 inches: silt loam
H2 - 2 to 13 inches: silt loam
H3 - 13 to 23 inches: silty clay loam
H4 - 23 to 60 inches: silty clay

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D
Ecological site: F144AY018NY - Moist Lake Plain
Hydric soil rating: No

Minor Components

Eldridge

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

Scitico

Percent of map unit: 10 percent
Landform: Marine terraces
Hydric soil rating: Yes

33A—Scitico silt loam, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 9cn6
Elevation: 0 to 180 feet
Mean annual precipitation: 47 to 49 inches
Mean annual air temperature: 48 degrees F
Frost-free period: 155 to 165 days
Farmland classification: Farmland of local importance

Map Unit Composition

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

Description of Scitico

Setting

Landform: Marine terraces

Typical profile

H1 - 0 to 6 inches: silt loam
H2 - 6 to 12 inches: silty clay loam
H3 - 12 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C/D
Ecological site: F144AY019NH - Wet Lake Plain
Hydric soil rating: Yes

Minor Components

Squamscott

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

Boxford

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

Maybid

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

38B—Eldridge fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9cnb
Elevation: 90 to 1,000 feet
Mean annual precipitation: 30 to 55 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 120 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Eldridge

Setting

Parent material: Outwash over glaciolacustrine

Typical profile

H1 - 0 to 8 inches: fine sandy loam
H2 - 8 to 23 inches: loamy fine sand
H3 - 23 to 62 inches: loamy very fine sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.60 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 9.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F144AY027MA - Moist Sandy Outwash
Hydric soil rating: No

Minor Components

Well drained inclusion

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

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

Scitico
Percent of map unit: 5 percent
Landform: Marine terraces
Hydric soil rating: Yes

Squamscott
Percent of map unit: 5 percent
Landform: Marine terraces
Hydric soil rating: Yes

66D—Paxton fine sandy loam, 15 to 25 percent slopes

Map Unit Setting
National map unit symbol: 2w67j
Elevation: 0 to 1,450 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

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

Description of Paxton

Setting
Landform: Hills, ground moraines, drumlins
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile
Ap - 0 to 8 inches: fine sandy loam
Bw1 - 8 to 15 inches: fine sandy loam
Bw2 - 15 to 26 inches: fine sandy loam
Cd - 26 to 65 inches: gravelly fine sandy loam

Properties and qualities
Slope: 15 to 25 percent
Depth to restrictive feature: 20 to 39 inches to densic material
Drainage class: Well drained
Runoff class: High

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 18 to 37 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: F144AY007CT - Well Drained Dense Till Uplands
Hydric soil rating: No

Minor Components

Charlton

Percent of map unit: 8 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Woodbridge

Percent of map unit: 6 percent
Landform: Hills, ground moraines, drumlins
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Ridgebury

Percent of map unit: 1 percent
Landform: Drainageways, depressions, hills, ground moraines, drumlins
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Head slope, base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Hydric soil rating: Yes

67C—Paxton fine sandy loam, 8 to 15 percent slopes, very stony

Map Unit Setting

National map unit symbol: 2w677
Elevation: 0 to 1,330 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F

Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Paxton, Very Stony

Setting

Landform: Hills, ground moraines, drumlins
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Oe - 0 to 2 inches: moderately decomposed plant material
A - 2 to 10 inches: fine sandy loam
Bw1 - 10 to 17 inches: fine sandy loam
Bw2 - 17 to 28 inches: fine sandy loam
Cd - 28 to 67 inches: gravelly fine sandy loam

Properties and qualities

Slope: 8 to 15 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 20 to 43 inches to densic material
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 18 to 37 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C
Ecological site: F144AY007CT - Well Drained Dense Till Uplands
Hydric soil rating: No

Minor Components

Woodbridge, very stony

Percent of map unit: 8 percent
Landform: Hills, ground moraines, drumlins
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Charlton, very stony

Percent of map unit: 5 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Ridgebury, very stony

Percent of map unit: 2 percent
Landform: Hills, ground moraines, drumlins, drainageways, depressions
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Head slope, base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

313A—Deerfield loamy fine sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2xfg8
Elevation: 0 to 1,100 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Farmland of local importance

Map Unit Composition

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

Description of Deerfield

Setting

Landform: Outwash deltas, outwash terraces, outwash plains, kame terraces
Landform position (three-dimensional): Tread
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Parent material: Sandy outwash derived from granite, gneiss, and/or quartzite

Typical profile

Ap - 0 to 9 inches: loamy fine sand
Bw - 9 to 25 inches: loamy fine sand
BC - 25 to 33 inches: fine sand
Cg - 33 to 60 inches: sand

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: About 15 to 37 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Sodium adsorption ratio, maximum: 11.0
Available water supply, 0 to 60 inches: Moderate (about 6.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: A
Ecological site: F144AY027MA - Moist Sandy Outwash
Hydric soil rating: No

Minor Components

Windsor

Percent of map unit: 7 percent
Landform: Outwash deltas, outwash terraces, outwash plains, kame terraces
Landform position (three-dimensional): Tread
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Hydric soil rating: No

Wareham

Percent of map unit: 5 percent
Landform: Drainageways, depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Sudbury

Percent of map unit: 2 percent
Landform: Outwash deltas, outwash terraces, outwash plains, kame terraces
Landform position (three-dimensional): Tread
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Hydric soil rating: No

Ninigret

Percent of map unit: 1 percent
Landform: Outwash terraces, outwash plains, kame terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear, convex
Across-slope shape: Concave, convex
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
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

Scarboro

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

Walpole

Percent of map unit: 4 percent
Landform: Outwash terraces, outwash plains, depressions, depressions, deltas
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

538A—Squamscott fine sandy loam, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 9cp9
Elevation: 0 to 1,000 feet
Mean annual precipitation: 30 to 55 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 120 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

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

Description of Squamscott

Setting

Landform: Marine terraces

Typical profile

H1 - 0 to 4 inches: fine sandy loam
H2 - 4 to 12 inches: loamy sand
H3 - 12 to 19 inches: fine sand
H4 - 19 to 65 inches: silt loam

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.60 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C/D
Ecological site: F144AY019NH - Wet Lake Plain
Hydric soil rating: Yes

Minor Components

Scitico

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

Maybid

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

Eldridge

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

Section 8

Stormwater Operations & Maintenance Plan

ALTUS
ENGINEERING

STORMWATER INSPECTION AND MAINTENANCE MANUAL

Branch View Estates
Alfred Assessor's Map 2, Lot 30

OWNER AT TIME OF APPROVAL:
Judith and Frederick Nichols
100 Beech Hill Road
Exeter, NH 03833

Proper inspection, maintenance, and repair are key elements in maintaining a successful stormwater management program on a developed property. Routine inspections ensure permit compliance and reduce the potential for deterioration of infrastructure or reduced water quality. Inspections should also be carried out after any rainfall of 1" or more. Qualified inspectors shall be Professional Engineers licensed in the State of Maine or Certified Professionals in Erosion and Sediment Control. The following responsible parties shall be in charge of managing the stormwater facilities:

RESPONSIBLE PARTIES:

Owner: *Judith and Frederick Nichols or Assigns*
Name *Company* *Phone*

Inspection: *Judith and Frederick Nichols or Assigns*
Name *Company* *Phone*

Maintenance: *Judith and Frederick Nichols or Assigns*
Name *Company* *Phone*

NOTES:

Inspection and maintenance responsibilities shall transfer to any future property owner(s).

This manual shall be updated as needed to reflect any changes related to any transfer of ownership and/or any delegation of inspection and maintenance responsibilities to any entity other than those listed above.

ALTUS ENGINEERING

CULVERTS AND DRAINAGE PIPES

Function – Culverts and drainage pipes convey stormwater away from buildings, walkways, and parking areas and to surface waters or closed drainage systems.

Maintenance

- Culverts and drainage pipes shall be inspected semi-annually, or more often as needed, for accumulation of debris and structural integrity. Leaves and other debris shall be removed from the inlet and outlet to insure the functionality of drainage structures. Debris shall be disposed of on site where it will not concentrate back at the drainage structures or at a solid waste disposal facility.
- Riprap Areas - Culvert outlets and inlets shall be inspected during annual maintenance and operations for erosion and scour. If scour or erosion is identified, the owner shall take appropriate means to prevent further erosion.

LANDSCAPED AREAS - FERTILIZER MANAGEMENT

Function – Fertilizer management involves controlling the rate, timing and method of fertilizer application so that the nutrients are taken up by the plants thereby reducing the chance of polluting the surface and ground waters. Fertilizer management can be effective in reducing the amounts of phosphorus and nitrogen in runoff from landscaped areas, particularly lawns.

Maintenance

- Have the soil tested by your landscaper or local Soil Conservation Service for nutrient requirements and follow the recommendations.
- Do not apply fertilizer to frozen ground.
- Clean up any fertilizer spills.
- Do not allow fertilizer to be broadcast into water bodies.
- When fertilizing a lawn, water thoroughly, but do not create a situation where water runs off the surface of the lawn.

LANDSCAPED AREAS - LITTER CONTROL

Function – Landscaped areas tend to filter debris and contaminates that may block drainage systems and pollute the surface and ground waters.

Maintenance

- Litter Control and lawn maintenance involves removing litter such as trash, leaves, lawn clippings, pet wastes, oil and chemicals from streets, parking lots, and lawns before materials are transported into surface waters.
- Litter control shall be implemented as part of the grounds maintenance program.

VEGETATIVE SWALES

Function – Vegetative swales filter sediment from stormwater, promote infiltration, and the uptake of contaminates. They are designed to treat runoff and dispose of it safely into the natural drainage system.

Maintenance

- Timely maintenance is important to keep a swale in good working condition. Mowing of grassed swales shall be monthly to keep the vegetation in vigorous condition. The cut vegetation shall be removed to prevent the decaying organic litter from adding pollutants to the discharge from the swale.
- Fertilizing shall be bi-annual or as recommended from soil testing.
- Inspect swales following significant rainfall events.
- Woody vegetation shall not be allowed to become established in the swales or rock riprap outlet protection and if present shall be removed.
- Accumulated debris disrupts flow and leads to clogging and erosion. Remove debris and litter as necessary.
- Inspect for eroded areas. Determine cause of erosion and correct deficiency as required. Monitor repaired areas.

RIP RAP OUTLETS, SWALES, LEVEL SPREADERS AND BUFFERS

Function – Rip rap outlets slow the velocity of runoff, minimizing erosion and maximizing the treatment capabilities of associated buffers. Level spreaders distribute concentrated stormwater flow over a continuous level lip constructed above a buffer. Vegetated buffers, either forested or meadow, slow runoff which promotes and reduces peak rates of runoff. The reduced velocities and the presence of vegetation encourage the filtration of sediment and the limited bio-uptake of nutrients.

Maintenance

- Inspect riprap, level spreaders and buffers at least annually for signs of erosion, sediment buildup, or vegetation loss.
- Inspect level for signs of condensed flows. Level spreader and rip rap shall be maintained to disperse flows evenly over level spreader.
- If a meadow buffer, provide periodic mowing as needed to maintain a healthy stand of herbaceous vegetation.
- If a forested buffer, then the buffer should be maintained in an undisturbed condition, unless erosion occurs.
- If erosion of the buffer (forested or meadow) occurs, eroded areas should be repaired and replanted with vegetation similar to the remaining buffer. Corrective action should include eliminating the source of the erosion problem and may require retrofit or reconstruction of the level spreader.
- Remove debris and accumulated sediment and dispose of properly.

DRIP STRIPS

Function – Drip strips are to provide erosion control of surface where impervious surfaces meet non-impervious surfaces, such as building or roadway edges. The also can provide for the infiltration and treatment of runoff and are particularly effective for roof-generated stormwater.

Maintenance
Drip strips should be inspected annually for erosion, rutting, and migration of stone. Any areas experiencing erosion shall be properly maintained by replacing or adding additional stone to the area of concern.

GENERAL CLEAN UP

- Upon completion of the project, the contractor shall remove all temporary stormwater structures (i.e., temporary stone check dams, silt fence, temporary diversion swales, catch basin inlet filter, etc.). Any sediment deposits remaining in place after the silt fence or filter barrier is no longer required shall be dressed to conform to the existing grade, prepared, and seeded. Remove any sediment in catch basins and clean drain pipes that may have accumulated during construction.
- Once in operation, all paved areas of the site should be swept at least once annually at the end of winter/early spring prior to significant spring rains.

APPPENDIX

A. Stormwater System Operations and Maintenance Report
B. Site Grading and Drainage Plan

STORM WATER SYSTEM OPERATION AND MAINTENANCE REPORT

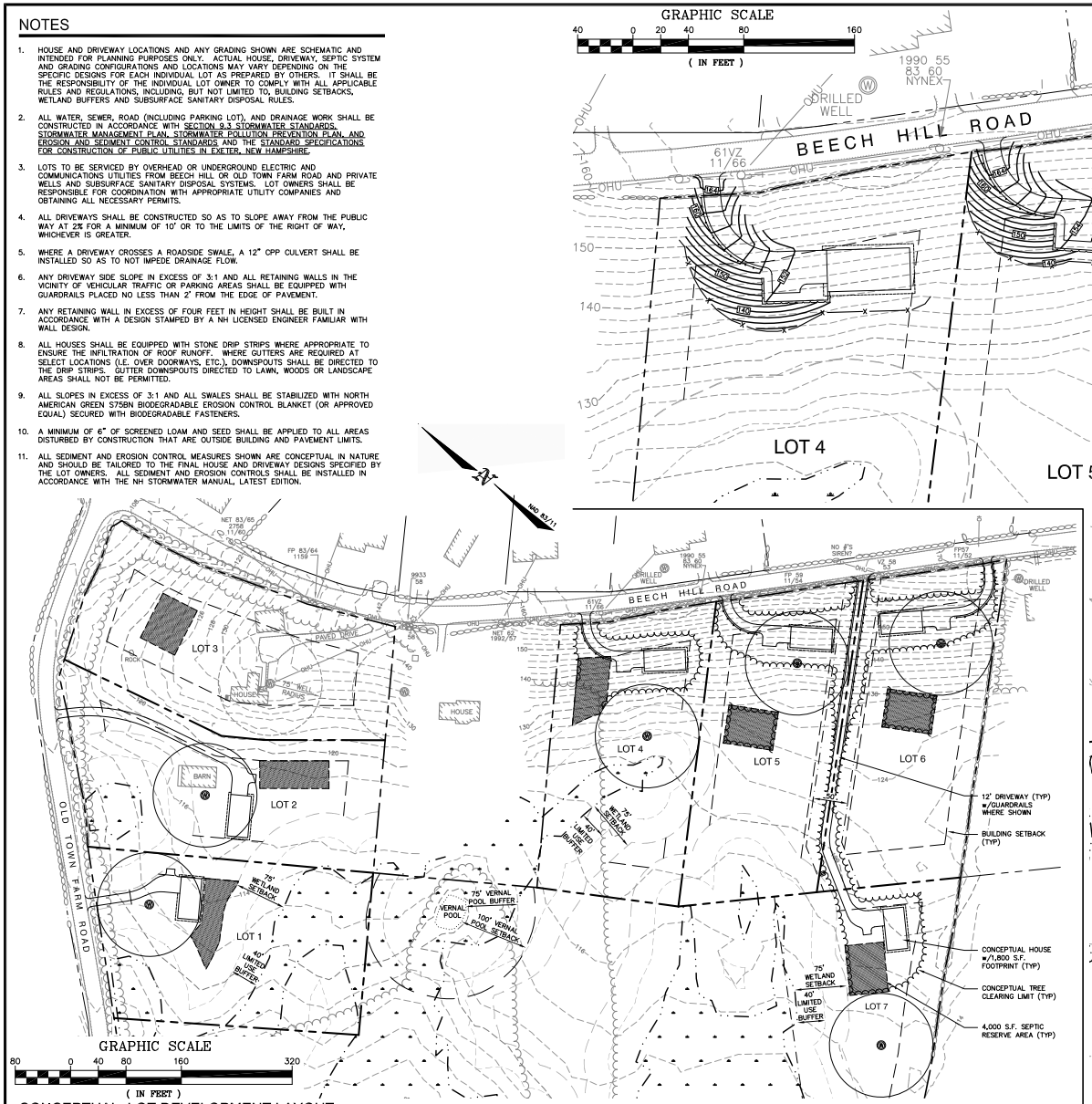
General Information			
Project Name			
Owner			
Inspector's Name(s)			
Inspector's Contact Information			
Date of Inspection		**Start Time:**	**End Time:**
Type of Inspection: ☐ Annual Report ☐ Post-storm event ☐ Due to a discharge of significant amounts of sediment			
Notes:			

General Site Questions and Discharges of Significant Amounts of Sediment			
Subject		**Status**	**Notes**
A discharge of significant amounts of sediment may be indicated by (but is not limited to) observations of the following. Note whether any are observed during this inspection:			*Notes/ Action taken:*
1	Do the current site conditions reflect the attached site plan?	❑Yes ❑No	
2	Is the site permanently stabilized, temporary erosion and sediment controls are removed, and stormwater discharges from construction activity are eliminated?	❑Yes ❑No	
3	Is there evidence of the discharge of significant amounts of sediment to surface waters, or conveyance systems leading to surface waters?	❑Yes ❑No	

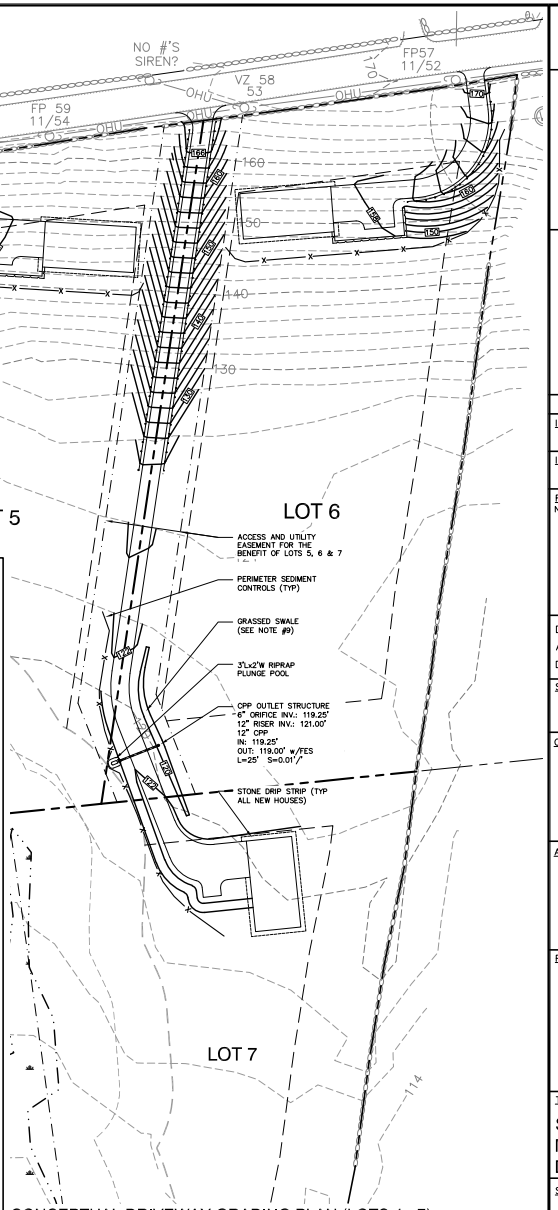
Permit Coverage and Plans				
#	**BMP/Facility**	**Inspected**	**Corrective Action Needed and Notes**	**Date Corrected**
	Drip Strips	❑Yes ❑No		
	Vegetated Buffers	❑Yes ❑No		
	Drainage Pipes	❑Yes ❑No		
	Riprap Aprons/Plunge Pools	❑Yes ❑No		
	Vegetated Swales	❑Yes ❑No		
		❑Yes ❑No		
		❑Yes ❑No		

NOTES

1. HOUSE AND DRIVEWAY LOCATIONS AND ANY GRADING SHOWN ARE SCHEMATIC AND INTENDED FOR PLANNING PURPOSES ONLY. ACTUAL HOUSE, DRIVEWAY, SEPTIC SYSTEM AND GRADING CONFIGURATIONS AND LOCATIONS MAY VARY DEPENDING ON THE SPECIFIC DESIGNS FOR EACH INDIVIDUAL LOT AS PREPARED BY OTHERS. IT SHALL BE THE RESPONSIBILITY OF THE INDIVIDUAL LOT OWNER TO COMPLY WITH ALL APPLICABLE RULES AND REGULATIONS, INCLUDING, BUT NOT LIMITED TO, BUILDING SETBACKS, WETLAND BUFFERS AND SUBSURFACE SANITARY DISPOSAL RULES.
2. ALL WATER, SEWER, ROAD (INCLUDING PARKING LOT), AND DRAINAGE WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH SECTION 9.3 STORMWATER STANDARDS, STORMWATER MANAGEMENT PLAN, STORMWATER POLLUTION PREVENTION PLAN, AND EROSION AND SEDIMENT CONTROL STANDARDS AND THE STANDARD SPECIFICATIONS FOR CONSTRUCTION OF PUBLIC UTILITIES IN EXETER, NEW HAMPSHIRE.
3. LOTS TO BE SERVICED BY OVERHEAD OR UNDERGROUND ELECTRIC AND COMMUNICATIONS UTILITIES FROM BEECH HILL OR OLD TOWN FARM ROAD AND PRIVATE WELLS AND SUBSURFACE SANITARY DISPOSAL SYSTEMS. LOT OWNERS SHALL BE RESPONSIBLE FOR COORDINATION WITH APPROPRIATE UTILITY COMPANIES AND OBTAINING ALL NECESSARY PERMITS.
4. ALL DRIVEWAYS SHALL BE CONSTRUCTED SO AS TO SLOPE AWAY FROM THE PUBLIC WAY AT 2% FOR A MINIMUM OF 10' OR TO THE LIMITS OF THE RIGHT OF WAY, WHICHEVER IS GREATER.
5. WHERE A DRIVEWAY CROSSES A ROADSIDE SWALE, A 12" CPP CULVERT SHALL BE INSTALLED SO AS TO NOT IMPEDE DRAINAGE FLOW.
6. ANY DRIVEWAY SIDE SLOPE IN EXCESS OF 3:1 AND ALL RETAINING WALLS IN THE VICINITY OF VEHICULAR TRAFFIC OR PARKING AREAS SHALL BE EQUIPPED WITH GUARDRAILS PLACED NO LESS THAN 2' FROM THE EDGE OF PAVEMENT.
7. ANY RETAINING WALL IN EXCESS OF FOUR FEET IN HEIGHT SHALL BE BUILT IN ACCORDANCE WITH A DESIGN STAMPED BY A NH LICENSED ENGINEER FAMILIAR WITH WALL DESIGN.
8. ALL HOUSES SHALL BE EQUIPPED WITH STONE DRIP STRIPS WHERE APPROPRIATE TO ENSURE THE INFILTRATION OF ROOF RUNOFF. WHERE GUTTERS ARE REQUIRED AT SELECT LOCATIONS (I.E. OVER DOORWAYS, ETC.), DOWNSPOUTS SHALL BE DIRECTED TO THE DRIP STRIPS. GUTTER DOWNSPOUTS DIRECTED TO LAWN, WOODS OR LANDSCAPE AREAS SHALL NOT BE PERMITTED.
9. ALL SLOPES IN EXCESS OF 3:1 AND ALL SWALES SHALL BE STABILIZED WITH NORTH AMERICAN GREEN S75BN BIODEGRADABLE EROSION CONTROL BLANKET (OR APPROVED EQUAL) SECURED WITH BIODEGRADABLE FASTENERS.
10. A MINIMUM OF 6" OF SCREENED LOAM AND SEED SHALL BE APPLIED TO ALL AREAS DISTURBED BY CONSTRUCTION THAT ARE OUTSIDE BUILDING AND PAVEMENT LIMITS.
11. ALL SEDIMENT AND EROSION CONTROL MEASURES SHOWN ARE CONCEPTUAL IN NATURE AND SHOULD BE TAILORED TO THE FINAL HOUSE AND DRIVEWAY DESIGNS SPECIFIED BY THE LOT OWNERS. ALL SEDIMENT AND EROSION CONTROLS SHALL BE INSTALLED IN ACCORDANCE WITH THE NH STORMWATER MANUAL, LATEST EDITION.



CONCEPTUAL LOT DEVELOPMENT LAYOUT 1" = 80'



CONCEPTUAL DRIVEWAY GRADING PLAN (LOTS 4 - 7) 1" = 40'

CASE #22-14
TOWN OF EXETER PROJECT REFERENCE

ALTUS ENGINEERING, INC.
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

NOT FOR CONSTRUCTION

ISSUED FOR: PLANNING BOARD

ISSUE DATE: OCTOBER 11, 2022

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	PLANNING BOARD	EBS	10/11/22

DRAWN BY: EBS
APPROVED BY: EBS
DRAWING FILE: 5307-SUB.dwg

SCALE: AS NOTED

OWNER:
JUDITH A. NICHOLS
FREDERICK J. NICHOLS
100 BEECH HILL ROAD
EXETER, NH 03833

APPLICANT:
JERRY AND CHRISTINE STERRITT
98 BEECH HILL ROAD
EXETER, NH 03833

PROJECT:
BEECH HILL SUBDIVISION
TAX MAP 13, LOT 1
BEECH HILL ROAD
EXETER, NH 03833

TITLE:
STORMWATER MANAGEMENT AND DEVELOPMENT PLAN

SHEET NUMBER:
C - 3

P5307

Section 9

Watershed Plans

Pre-Development Drainage Area Plan
Post-Development Drainage Area Plan

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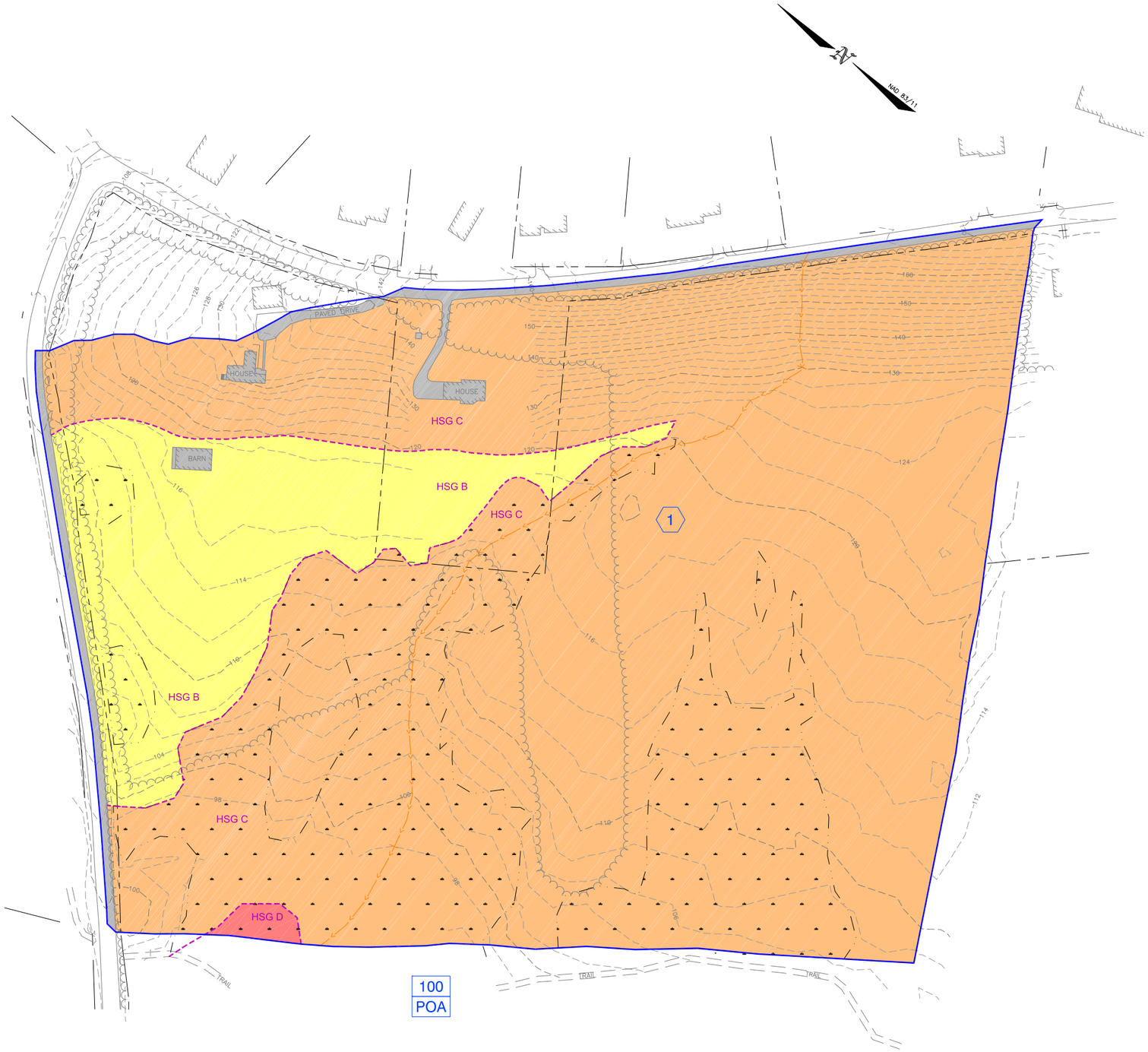


GRAPHIC SCALE

80 0 40 80 160 320

(IN FEET)

LEGEND

- PROPERTY LINE
- WETLAND BOUNDARY
- 60 EXISTING CONTOUR
- WATERSHED BOUNDARY
- Tc PATH / REACH PATH
- PROPOSED GROUND SLOPE DIRECTION
- HISS SOIL BOUNDARY
- 311BH HISS SOIL DESIGNATION
- SOILS – HSG A
- SOILS – HSG B
- SOILS – HSG C
- SOILS – HSG D
- SOILS – IMPERVIOUS
- SOILS – WATER
- 1 1 1 SUBCATCHMENT/POND/REACH
- POA POINT OF ANALYSIS

CASE #22-14

TOWN OF EXETER PROJECT REFERENCE

ALTUS ENGINEERING, INC.

133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

STATE OF NEW HAMPSHIRE
ERIC D. WEINRIEB
No. 7634
LICENSED PROFESSIONAL ENGINEER
10/18/22

NOT FOR CONSTRUCTION

ISSUED FOR: PLANNING BOARD

ISSUE DATE: OCTOBER 11, 2022

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	PLANNING BOARD	EBS	10/11/22

DRAWN BY: EBS
APPROVED BY: EBS
DRAWING FILE: 5307-SUB.dwg

SCALE:
(22"x34") 1"= 80'
(11"x17") 1"=160'

OWNER:
JUDITH A. NICHOLS
FREDERICK J. NICHOLS
100 BEECH HILL ROAD
EXETER, NH 03833

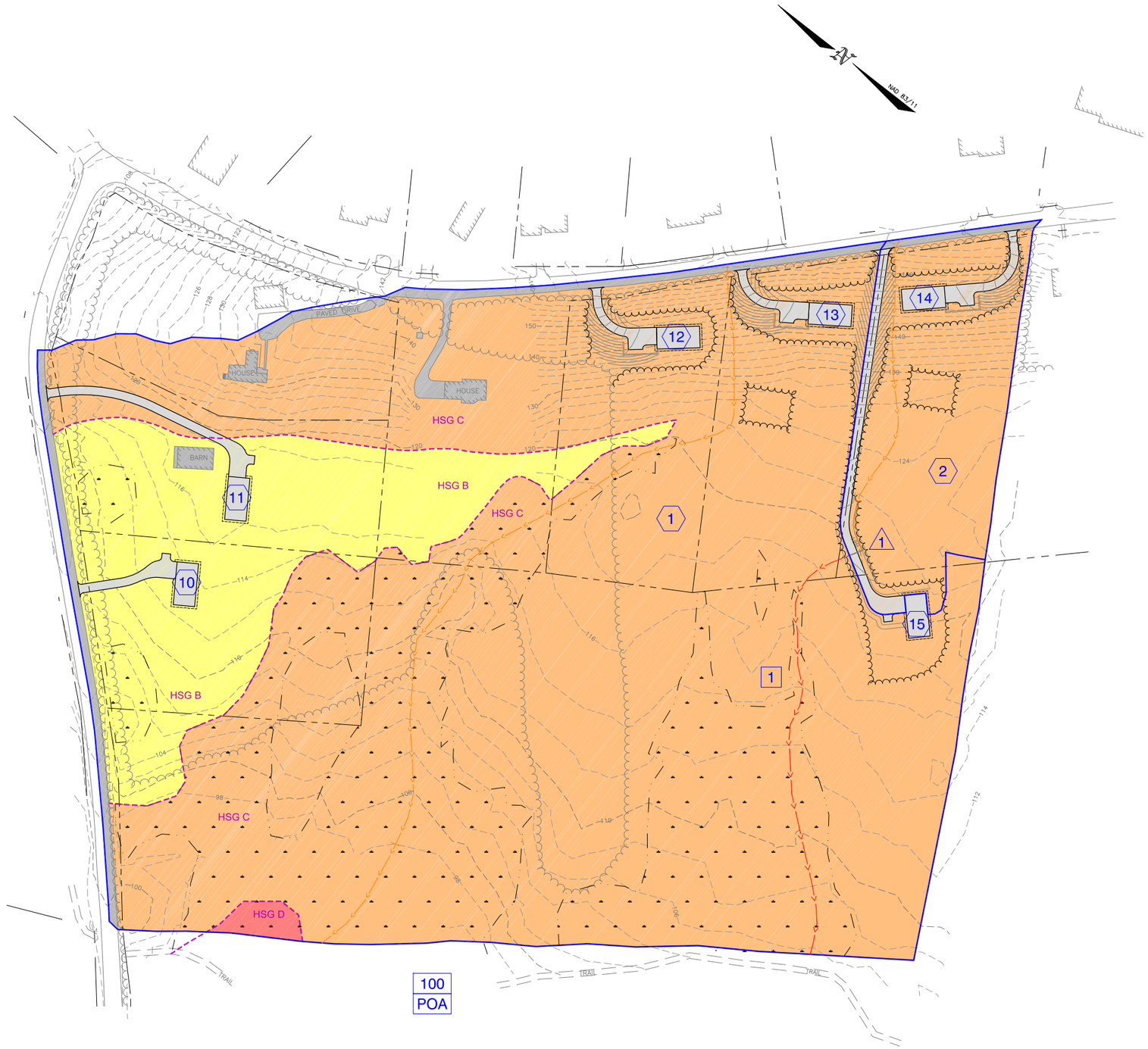
APPLICANT:
JERRY AND CHRISTINE STERRITT
98 BEECH HILL ROAD
EXETER, NH 03833

PROJECT:
BEECH HILL SUBDIVISION
TAX MAP 13, LOT 1
BEECH HILL ROAD
EXETER, NH 03833

TITLE:
PRE-DEVELOPMENT WATERSHED PLAN

SHEET NUMBER:
WS - 1

P5307



GRAPHIC SCALE

80 0 40 80 160 320

(IN FEET)

LEGEND

- PROPERTY LINE
- WETLAND BOUNDARY
- 60 EXISTING CONTOUR
- WATERSHED BOUNDARY
- Tc PATH / REACH PATH
- PROPOSED GROUND SLOPE DIRECTION
- HISS SOIL BOUNDARY
- 311BH HISS SOIL DESIGNATION
- SOILS – HSG A
- SOILS – HSG B
- SOILS – HSG C
- SOILS – HSG D
- SOILS – IMPERVIOUS
- SOILS – WATER
- 1 1 1 SUBCATCHMENT/POND/REACH
- POA POINT OF ANALYSIS

CASE #22-14

TOWN OF EXETER PROJECT REFERENCE

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STATE OF NEW HAMPSHIRE
ERIC D. WEINRIEB
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LICENSED PROFESSIONAL ENGINEER
10/18/22

NOT FOR CONSTRUCTION

ISSUED FOR:
PLANNING BOARD

ISSUE DATE:
OCTOBER 11, 2022

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	PLANNING BOARD	EBS	10/11/22

DRAWN BY: EBS
APPROVED BY: EBS
DRAWING FILE: 5307-SUB.dwg

SCALE:
(22"x34") 1"= 80'
(11"x17") 1"=160'

OWNER:
JUDITH A. NICHOLS
FREDERICK J. NICHOLS
100 BEECH HILL ROAD
EXETER, NH 03833

APPLICANT:
JERRY AND CHRISTINE STERRITT
98 BEECH HILL ROAD
EXETER, NH 03833

PROJECT:
BEECH HILL SUBDIVISION
TAX MAP 13, LOT 1
BEECH HILL ROAD
EXETER, NH 03833

TITLE:
POST-DEVELOPMENT WATERSHED PLAN

SHEET NUMBER:
WS - 2

P5307

CASE #22-14

TOWN OF EXETER, PLANNING BOARD

CHAIRPERSON _____ DATE _____

THIS DRAWING SET HAS NOT BEEN RELEASED FOR CONSTRUCTION

BEECH HILL SUBDIVISION

Beech Hill Road
Exeter, New Hampshire

Assessor's Parcel 13, Lot 1

ISSUED FOR PLANNING BOARD

Plan Issue Date:

October 11, 2022

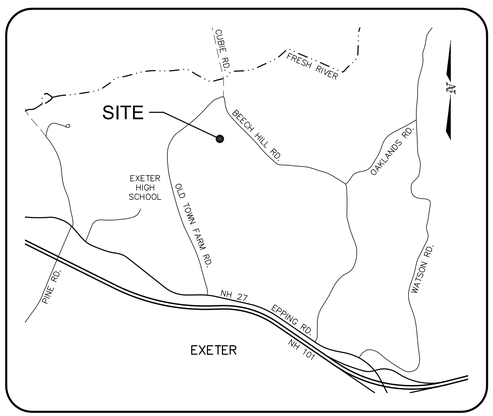
Owner:
Judith A. Nichols and
Frederick J. Nichols
100 Beech Hill Road
Exeter, NH 03833

Applicant:
Jerry and
Christine Sterritt
98 Beech Hill Road
Exeter, NH 03833
(603) 498-5975

Civil Engineer:
ALTUS ENGINEERING, INC.
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

Surveyor:
T. F. BERNIER, INC.
Land Surveyors - Designers - Consultants
50 PLEASANT STREET – P.O. BOX 3464
CONCORD, NEW HAMPSHIRE 03302-3464
Tel:(603)224-4148 – Fax:(603)224-0507

Wetland Scientist:
GOVE ENVIRONMENTAL SERVICES, INC.
Wetlands and Soil Mapping
8 Continental Dr Bldg 2 Unit H, Exeter, NH 03833-7526
Ph (603) 778 0644 / Fax (603) 778 0654

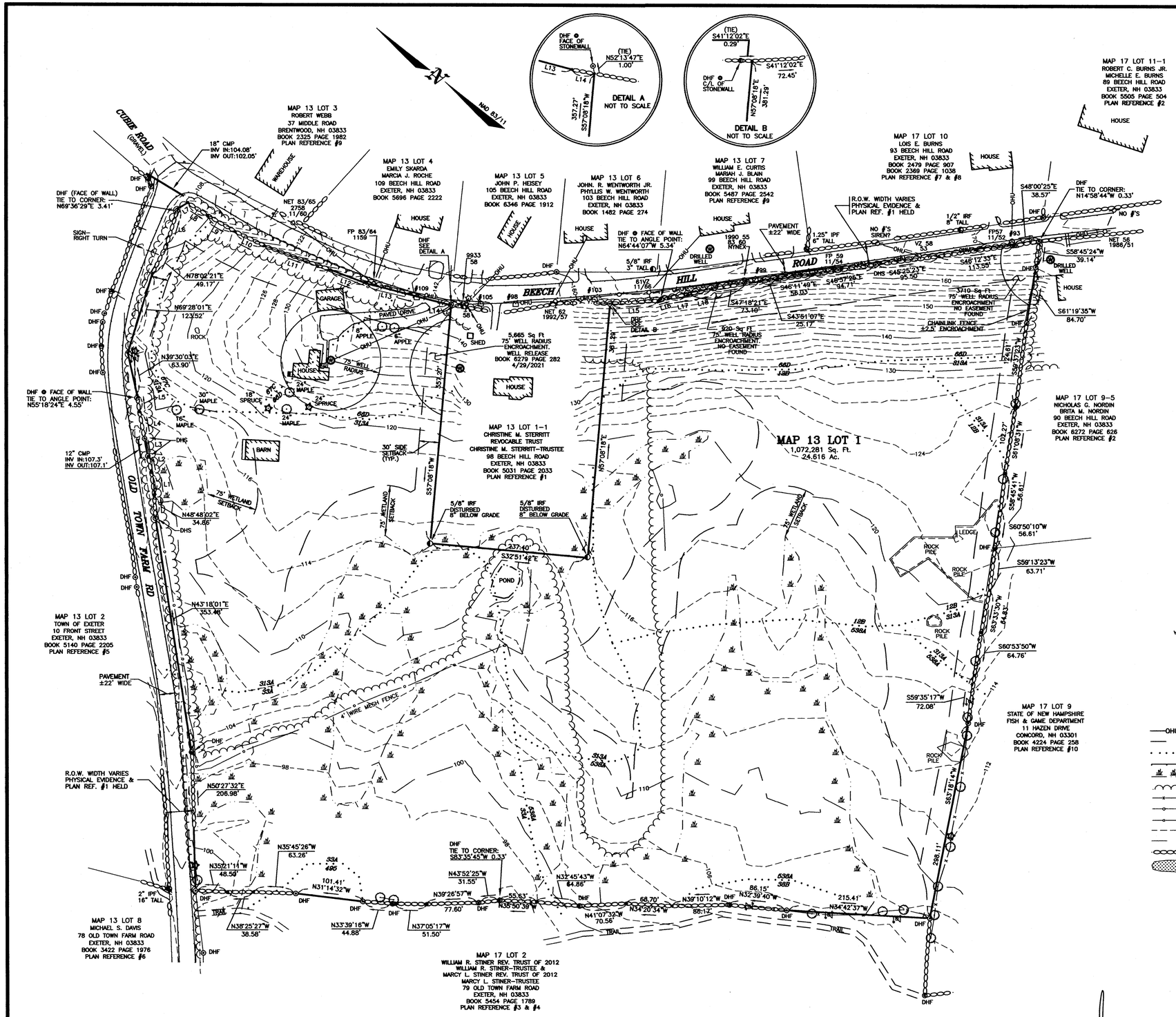


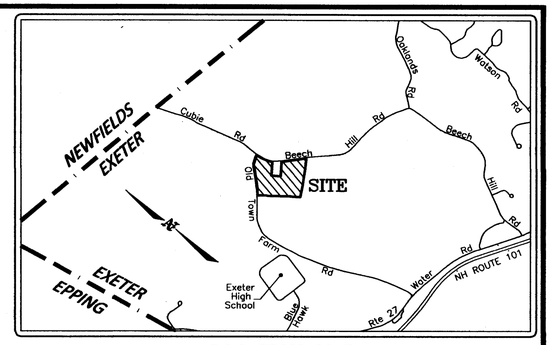
LOCUS NOT TO SCALE

Sheet Index Title	*Sheet No.:*	*Rev.*	*Date*
Existing Conditions Plan	None	0	May 2022
Subdivision Plan	C-1	1	10/11/22
Topography and Soils Plan	C-2	2	10/11/22
Stormwater Management and Development Plan	C-3	0	10/11/22
Details	C-4	0	10/11/22
Details	C-5	0	10/11/22

Permit Summary:	*Submitted*	*Received*
Exeter Subdivision Review	08/30/22	–
NH State Subdivision	08/30/22	–

P5307





LOCATION MAP
SCALE:1"=2,000'

LINE TABLE

LINE	BEARING	LENGTH
L1	N44°45'39"E	33.64'
L2	N39°55'53"E	25.15'
L3	N41°20'42"E	26.57'
L4	N40°51'10"E	40.45'
L5	N44°39'08"E	25.80'
L6	N69°36'29"E	55.94'
L7	S68°48'39"E	17.34'
L8	S5°16'07"E	35.18'
L9	S7°52'10"E	47.75'
L10	S12°00'11"E	48.93'
L11	S18°17'54"E	104.91'
L12	S17°14'44"E	57.82'
L13	S23°35'49"E	127.99'
L14	S29°05'47"E	3.36'
L15	S41°12'02"E	72.45'
L16	S53°39'55"E	15.45'
L17	S48°22'49"E	30.10'
L18	S50°22'53"E	36.82'

LEGEND
- ANGLE POINT
- DRILL HOLD FOUND/SET
- IRON PIPE FOUND
- IRON ROD FOUND
- #105 MAILBOX & STREET #
- UTILITY POLE W/ANCHOR
- LIGHT
- DECIDUOUS TREE WITH BARBED WIRE
- CONIFEROUS TREE WITH BARBED WIRE
- W WELL
- ELECTRIC METER
- FENCE POST WITH WIRE
- SIGN
- OHU OVERHEAD UTILITIES
- SETBACK LINE
- SOILS LINE
- EDGE OF PAVEMENT
- EDGE OF WETLANDS
- TREELINE
- BARBED WIRE FENCE
- WIRE/CHAINLINK FENCE
- WOODEN FENCE
- 2' TOPOGRAPHIC LINE
- 10' TOPOGRAPHIC LINE
- STONEWALL
- RIPRAP STONE
- DHF DRILL HOLE FOUND
- DHS DRILL HOLE SET
- IRF IRON ROD FOUND
- IRS IRON ROD SET
- IPF IRON PIPE FOUND

NOTES:
1. THE PURPOSE OF THIS PLAN IS TO SHOW THE EXISTING CONDITIONS ON LOT 1 OF THE TOWN OF EXETER ASSESSORS MAP 13.
2. THE PARCELS SHOWN HEREON ARE LOCATED IN THE "RU"– RURAL ZONING DISTRICT AND ARE SUBJECT TO FOLLOWING DIMENSIONAL REGULATIONS;

(NO MUNICIPAL WATER OR SEWER)	
MINIMUM FRONTAGE:	200 FEET
MINIMUM LOT SIZE:	2 ACRES
MINIMUM LOT WIDTH:	200 FEET
MINIMUM LOT DEPTH:	200 FEET
MAXIMUM BUILDING HEIGHT:	35 FEET
MAXIMUM BUILDING COVERAGE:	10%
MINIMUM OPEN SPACE %:	85/75
BUILDING SETBACKS:	FRONT: 50 FEET (ALSO SEE ZONING 5.5.1)
	SIDE: (ONE)30 FEET (BOTH)60 FEET
	REAR: 50 FEET
WETLAND BUFFER:	75 FEET(PARKING AND STRUCTURES)
	75 FEET(WASTEWATER SYSTEMS)

3. THE INFORMATION SHOWN HEREON IS FROM A FIELD SURVEY PERFORMED BY THIS OFFICE IN APRIL 2022 USING A TOTAL STATION INSTRUMENT. THE BEARINGS ARE REFERENCED TO NH STATE PLANE NAD 83/11 AND THE VERTICAL DATUM IS NAVD88 BASED ON GPS OBSERVATIONS MADE BY THIS OFFICE IN APRIL 2022.
4. THE WETLANDS SHOWN HEREON WERE DELINEATED IN THE FIELD BY GOVE ENVIRONMENTAL SERVICES, INC. OF EXETER NEW HAMPSHIRE IN APRIL 2022 AND FIELD LOCATED BY THIS OFFICE.
5. NO PORTION OF THE PARCEL AS SHOWN HEREON FALLS IN A SPECIAL FLOOD HAZARD AREA AS SHOWN ON THE FLOOD INSURANCE RATE MAP FOR ROCKINGHAM COUNTY NEW HAMPSHIRE MAP NUMBER 33015C0238F WITH EFFECTIVE DATE JANUARY 29, 2021.

PLAN REFERENCES
1. SUBDIVISION PLAN OF LAND IN EXETER, N.H. TAX MAP 02-03-005 AS DRAWN FOR JUDITH A. NICHOL 100 BEECH HILL ROAD EXETER, NH 03833. DATE: FEB 1, 1995 SCALE:1"=100'. PREPARED BY PAUL F. NICHOLS C.E. KINGSTON, NH 03848 AND RECORDED AT THE ROCKINGHAM COUNTY REGISTRY OF DEEDS AS PLAN #D-24554
2. SUBDIVISION PLAN FOR PARK AVENUE DEVELOPMENT CORP. 87 BEECH HILL ROAD, COUNTY OF ROCKINGHAM EXETER, N.H. DATE: AUGUST 2, 2000. SCALE: 1"=100'. SHEET 2 OF 5. PREPARED BY MILLETTE, SPRAUGE & COLWELL, INC OF PORTSMOUTH, NH AND RECORDED AT THE ROCKINGHAM COUNTY REGISTRY OF DEEDS AS PLAN #D-28635.
3. SUBDIVISION PLAN TAX MAP 17 LOT 2 PROPERTY OF BARBARA NADREAU. 73 & 79 OLD TOWN FARM ROAD. COUNTY OF ROCKINGHAM EXETER NEW HAMPSHIRE. DATE: FEBRUARY 21, 2006. SCALE: 1"=60'. SHEET 1 & 2. PREPARED BY AMES MSC ARCHITECTS & ENGINEERS OF PORTSMOUTH, NH AND RECORDED AT THE ROCKINGHAM COUNTY REGISTRY OF DEEDS AS PLAN #D-33757.
4. SUBDIVISION OF LAND OF GLEN BOSWORTH IN EXETER, N.H. SCALE: 1"=100' DATE: APRIL 1978. PREPARED BY PARKER SURVEY ASSOC, INC OF SEABROOK, NH AND RECORDED AT THE ROCKINGHAM COUNTY REGISTRY OF DEEDS AS PLAN #D-6245.
5. TITLE INSURANCE PLOT PLAN MAP 13 LOT 2 PREPARED FOR THE NATURE CONSERVANCY OF N.H. SCALE: 1"=100' DATE: NOVEMBER 6, 2000. SHEET 2 OF 2. PREPARED BY JOHN J. O'NEIL, INC. OF NASHUA, NH AND RECORDED AT THE ROCKINGHAM COUNTY REGISTRY OF DEEDS AS PLAN #D-28606.
6. SUBDIVISION PLAN OF LAND IN EXETER, N.H. TAX MAP 17 LOT 1 AS DRAWN FOR DORIS W. CARLISLE 76 OLD TOWN FARM ROAD, EXETER, NH 03833. DATE: JAN 26, 1999 SCALE: 1"=100' SHEET 1 OF 2. PREPARED BY PAUL F. NICHOLS C.E. KINGSTON, NH 03848 AND RECORDED AT THE ROCKINGHAM COUNTRY REGISTRY OF DEEDS AS PLAN #D-27619.
7. BOUNDARY LINE CHANGE OF LAND FOR ROBERT WEBB IN EXETER, N.H. SCALE: 1"=50' DATE: NOV 5, 1982. SHOWN AS PARCEL "C". PREPARED BY BRUCE L. POHOPEK OF DOVER, N.H. AND RECORDED AT THE ROCKINGHAM COUNTY REGISTRY OF DEEDS AS PLAN #C-11219
8. PROPERTY BELONGING TO FRANK BURNS & LOIS PETERSON. BEECH HILL ROAD EXETER NEW HAMPSHIRE. DATE: JUNE 1979 SCALE: 1"=50' PREPARED BY WARD B. WILLIAMS ASSOC. 590 SOUTH ROAD IN RYE, NH AND RECORDED AT THE ROCKINGHAM COUNTY REGISTRY OF DEEDS AS PLAN #C-8752.
9. SUBDIVISION OF LAND FOR JOHN R. SR & EARLENE M. WENTWORTH IN EXETER, N.H. SCALE: 1"=100'. DATE: SEPTEMBER 1976. PREPARED BY PARKER SURVEY ASSOC, INC OF EXETER AND SEABROOK, NH AND RECORDED AT THE ROCKINGHAM COUNTY REGISTRY OF DEEDS AS PLAN #D-6500.
10. PLAN OF LAND FOR ROBERT WEBB REALTY, INC. 87 BEECH HILL ROAD EXETER & NEWFIELDS, NEW HAMPSHIRE. SCALE: 1"=200'. DATE: NOVEMBER 2000. PREPARED BY KEM LAND SURVEY, INC. OF DOVER, NH AND RECORDED AT THE ROCKINGHAM COUNTY REGISTRY OF DEEDS AS PLAN #D-28636.

EXISTING CONDITIONS PLAN
PREPARED FOR
ALTUS ENGINEERING, INC
ASSESSORS MAP 13 LOT 1
100 BEECH HILL ROAD
EXETER, NEW HAMPSHIRE
SCALE: 1"=80' * DATE: MAY 2022

SOILS DATA
FROM NRCS WEB SOIL SURVEY
12B – HINCKLEY LOAMY SAND, 3 TO 8 PERCENT SLOPES
33A – SCITICO SILT LOAM, 0 TO 5 PERCENT SLOPES
38B – ELDRIDGE FINE SANDY LOAM, 3 TO 8 PERCENT SLOPES
66D – PAXTON FINE SANDY LOAM, 15 TO 25 PERCENT SLOPES
67C – PAXTON FINE SANDY LOAM, 8 TO 15 PERCENT SLOPES, VERY STONY
313A – DEERFIELD LOAMY FINE SAND, 0 TO 3 PERCENT SLOPES
495 – NATCHAUG MUCKY PEAT, 0 TO 2 PERCENT SLOPES
538A – SQUAMSCOTT FINE SANDY LOAM, 0 TO 5 PERCENT SLOPES

OWNER OF RECORD
MAP 13 LOT 1
JUDITH A. NICHOLS
FREDERICK J. NICHOLS
100 BEECH HILL ROAD
EXETER, NH 03833
BOOK 2558 PAGE 1377

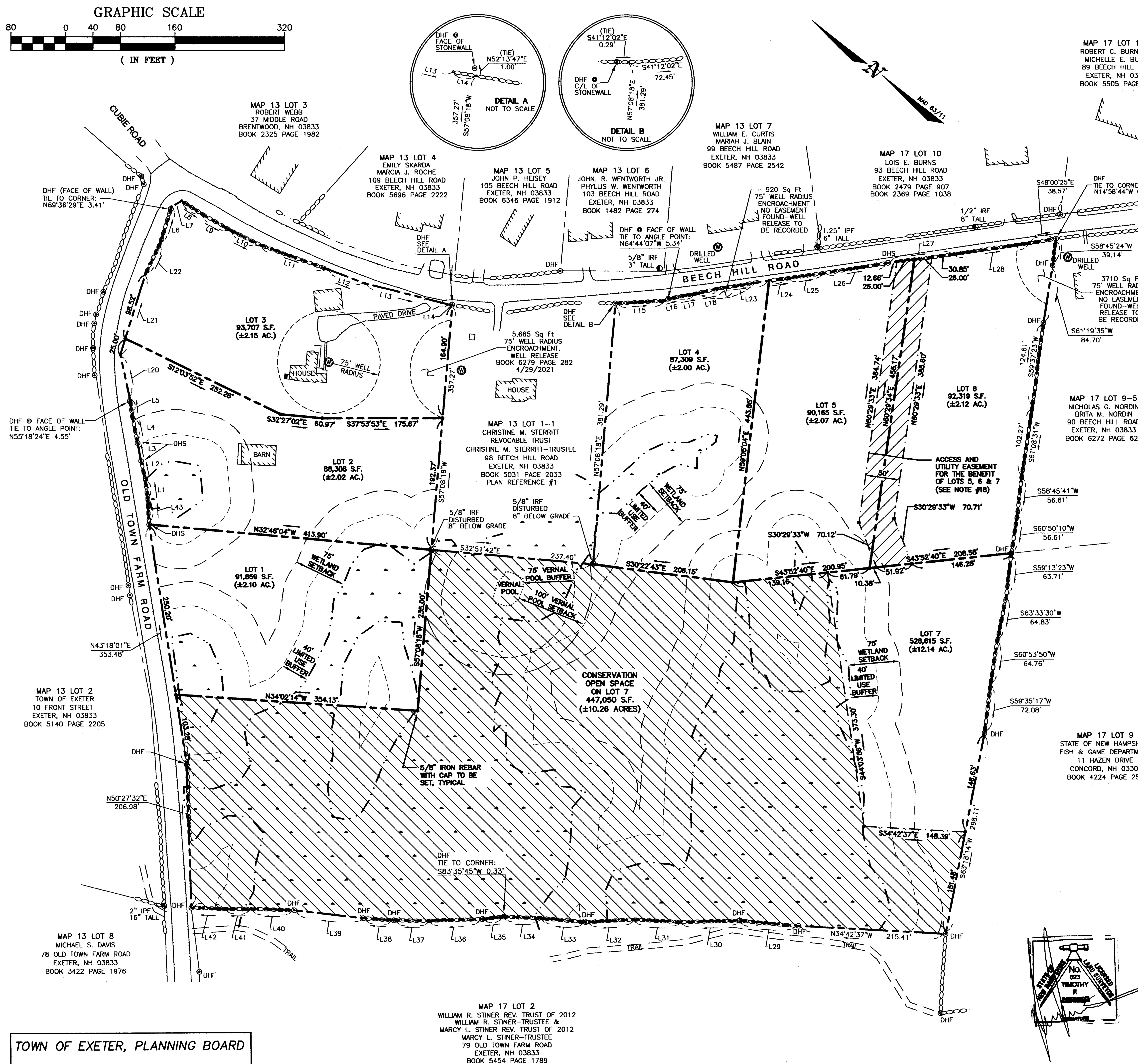
STATE OF NEW HAMPSHIRE No. 823 TIMOTHY F. BERNIER LAND SURVEYOR

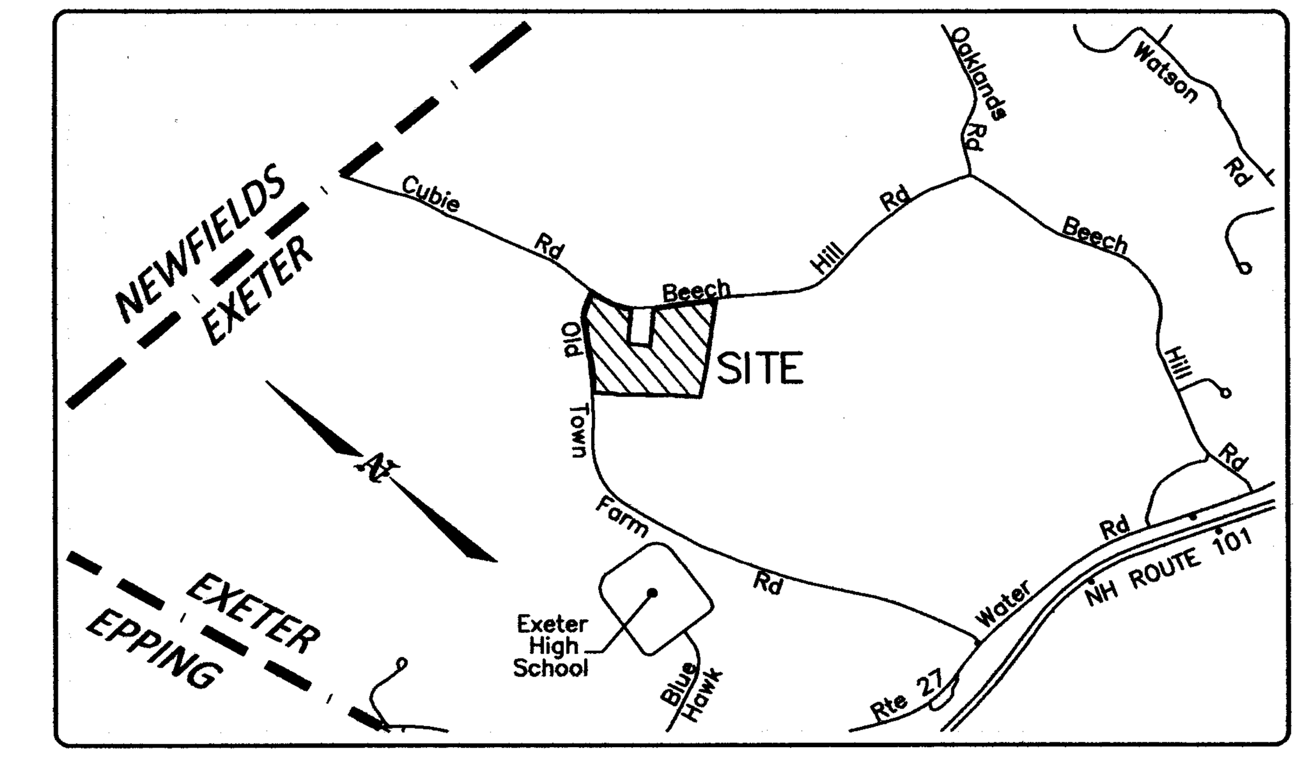
NO.	REVISION	DATE

T. F. BERNIER, INC.
Land Surveyors - Designers - Consultants
50 PLEASANT STREET – P.O. BOX 3464
CONCORD, NEW HAMPSHIRE 03302-3464
Tel:(603)224-4148 – Fax:(603)224-0507

DESIGNED BY	DRAWN BY	CHECKED BY	F.B.	PG.	JOB #
———	BRK	BRK, JRC	232	48	155-08

DRAWING NAME: Existing Conditions 2022.dwg





LOCATION MAP
SCALE:1"=2,000'

SUBDIVISION NOTES

1. DESIGN INTENT – THIS PLAN SET IS INTENDED TO DEPICT A PROPOSED SEVEN-LOT RESIDENTIAL SUBDIVISION.
2. THE BASE PLAN USED HERE WAS DEVELOPED FROM "EXISTING CONDITIONS PLAN, ASSESSOR'S MAP 13 LOT 1, 100 BEECH HILL ROAD, EXETER, NEW HAMPSHIRE", DATED MAY 2022, PREPARED BY T.F. BERNIER, INC.
3. APPROXIMATE LOT AREA: 1,072,281 (±24.62 AC.)
4. DEED REFERENCE: RCRD BOOK 2558, PAGE 1377
5. ZONE: RURAL (RU)
6. DIMENSIONAL REQUIREMENTS:

MIN. LOT AREA:	2 ACRES (w/75% UPLAND)
MIN. LOT FRONTAGE:	200'
MIN. FRONT SETBACK:	50'
MIN. SIDE SETBACK:	30'
MIN. REAR SETBACK:	50'
MIN. LOT WIDTH:	200'
MIN. LOT DEPTH:	200'
MAX. BUILDING HEIGHT:	35'
WETLAND SETBACK:	75'
LIMITED USE WETLAND BUFFER:	40'
MAX. BUILDING COVERAGE:	10%
MIN. OPEN SPACE:	85%

7. WETLANDS WERE DELINEATED BY GOVE ENVIRONMENTAL SERVICES, INC., SPRING 2022.
8. SINGLE FAMILY HOUSE LOTS WILL BE SERVED BY PRIVATE ON-SITE WATER & SEWER.
9. NO IMPACTS TO WETLANDS OR WETLAND BUFFERS ARE PROPOSED, WETLAND CONDITIONAL USE PERMIT NOT REQUIRED. DEVELOPMENT OF ALL PROPOSED LOTS BY THEIR RESPECTIVE OWNERS SHALL BE SUBJECT TO ALL APPLICABLE ZONING REGULATIONS, INCLUDING THOSE REGARDING WETLANDS AND ANY ASSOCIATED BUFFERS.
10. OVERALL AREA OF DISTURBANCE UNDER 100,000 S.F., NHDES ALTERATION OF TERRAIN PERMIT NOT REQUIRED.
11. AREA OF DISTURBANCE UNDER 43,560 SF, COVERAGE UNDER EPA NPDES PHASE II CONSTRUCTION GENERAL PERMIT NOT REQUIRED.
12. WAIVER OF ZONING ARTICLE 7 AND SUBDIVISION REGULATION SECTION 11 AS PERMITTED UNDER ZONING SECTION 4.3, SCHEDULE II, FOOTNOTE #19 REQUIRED TO ALLOW A CONVENTIONAL SUBDIVISION IN LIEU OF AN OPEN SPACE DEVELOPMENT ON A LOT OVER TWENTY ACRES IN SIZE.
13. WAIVER OF SUBDIVISION REGULATION SECTION 7.4.7 REQUIRED TO NOT SHOW TREES OVER 20" IN DIAMETER ON THE EXISTING CONDITIONS PLAN.
14. WAIVER OF SUBDIVISION REGULATION SECTION 9.23 REQUIRED TO ALLOW OVERHEAD ELECTRIC AND COMMUNICATIONS UTILITIES FROM BEECH HILL AND OLD TOWN FARM ROADS IN LIEU OF UNDERGROUND SERVICES.
15. WAIVER OF SUBDIVISION REGULATION SECTION 9.6.1.2 REQUIRED TO ALLOW THE ELIMINATION OF THE PERIMETER BUFFER STRIP.
16. THE BOUNDARY OF THE ORIGINAL MAP 13 LOT 1 SHOWN HEREON IS FROM A FIELD SURVEY MADE ON THE GROUND BY T.F. BERNIER, INC. IN APRIL 2022 USING AN ELECTRONIC TOTAL STATION SURVEYING INSTRUMENT. THE TRAVERSE HAS AN ERROR OF CLOSURE OF BETTER THAN ONE PART IN 15,000. THE SURVEY WAS COMPLETED IN ACCORDANCE WITH THE REQUIREMENTS OF A STANDARD PROPERTY SURVEY AS DEFINED IN THE NH CODE OF ADMINISTRATIVE RULES Lan 500. THE BEARINGS ARE REFERENCED TO NH STATE PLANE NAD 83/11 GRID BASED ON GPS OBSERVATIONS PERFORMED BY T.F. BERNIER, INC. IN APRIL 2022.
17. EXISTING STONE WALLS ARE TO BE REMOVED ONLY TO THE MINIMUM AMOUNT PRACTICABLE TO INSTALL NEW DRIVEWAYS. NO OTHER WALL DISTURBANCE SHALL BE PERMITTED.
18. ACCESS AND UTILITY EASEMENT MAY BE UTILIZED BY LOTS 5 AND 6 PROVIDED JOINT MAINTENANCE RESPONSIBILITIES ARE CARRIED OUT IN ACCORDANCE WITH THE OBLIGATIONS SPECIFIED IN THE RELEVANT PROPERTY DEEDS.
19. CONSERVATION OPEN SPACE ANALYSIS –
    WETLAND: ±5.97 ACRES (58%)
    UPLAND: ±4.29 ACRES (42%)
    TOTAL: ±10.26 ACRES (42% OF TOTAL LOT)

PERIMETER LINE TABLE

LINE	BEARING	LENGTH
L1	N44°45'39"E	33.64'
L2	N39°55'53"E	25.15'
L3	N41°20'42"E	26.57'
L4	N40°51'10"E	40.45'
L5	N44°39'06"E	25.80'
L6	N69°36'29"E	55.94'
L7	S68°48'39"E	17.34'
L8	S5°16'07"E	35.18'
L9	S7°52'10"E	47.75'
L10	S12°00'11"E	48.93'
L11	S18°17'54"E	104.91'
L12	S17°14'44"E	57.82'
L13	S23°35'49"E	127.99'
L14	S29°05'47"E	3.36'

LINE	BEARING	LENGTH
L15	S41°12'02"E	72.45'
L16	S53°39'55"E	15.45'
L17	S48°22'49"E	30.10'
L18	S50°22'53"E	36.82'
L19	NOT USED	
L20	N39°30'03"E	63.90'
L21	N69°28'01"E	123.52'
L22	N78°02'21"E	49.17'
L23	S47°18'21"E	73.10'
L24	S43°51'07"E	25.17'
L25	S46°11'49"E	56.03'
L26	S46°57'25"E	94.71'
L27	S45°25'23"E	95.50'
L28	S46°12'33"E	113.55'

LINE	BEARING	LENGTH
L29	N32°39'40"W	86.15'
L30	N39°10'12"W	86.17'
L31	N34°20'34"W	68.70'
L32	N41°07'32"W	70.56'
L33	N32°45'43"W	64.86'
L34	N35°50'39"W	55.63'
L35	N43°52'25"W	31.55'
L36	N39°26'57"W	77.60'
L37	N37°05'17"W	51.50'
L38	N33°39'16"W	44.88'
L39	N31°14'32"W	101.41'
L40	N35°45'26"W	63.26'
L41	N38°25'27"W	38.58'
L42	N35°21'11"W	48.50'
L43	N48°48'02"E	34.86'

TOWN OF EXETER, PLANNING BOARD

CHAIRPERSON DATE

CASE #22-14
TOWN OF EXETER PROJECT REFERENCE

ALTUS ENGINEERING, INC.
133 Court Street, Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

T. F. BERNIER, INC.
Land Surveyors – Designers – Consultants
50 PLEASANT STREET – P.O. BOX 3464
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NOT FOR CONSTRUCTION

ISSUED FOR: PLANNING BOARD

ISSUE DATE: OCTOBER 11, 2022

REVISIONS

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0	PLANNING BOARD	EBS	08/30/22
1	PLANNING BOARD	EBS	10/11/22

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EXETER, NH 03833

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JERRY AND CHRISTINE STERRITT
98 BEECH HILL ROAD
EXETER, NH 03833

PROJECT:
BEECH HILL SUBDIVISION
TAX MAP 13, LOT 1
BEECH HILL ROAD
EXETER, NH 03833

TITLE:
SUBDIVISION PLAN

SHEET NUMBER:
C - 1

P5307

TEST PIT LOGS

Test Pit No.1–1
ESHWT: 24"
Termination @ 54"
Refusal: No
Obs. Water: No

Depth	Color	Texture	Structure	Consistence	REDOX
0–10"	10YR3/2	FSL	GR	FR	N
10–16"	10YR4/4	FSL	GR	FR	N
16–24"	2.5Y5/4	FSL	GR	FR	N
24–54"	10YR4/4	S	GR	FR	P

Test Pit No.1–2
ESHWT: 26"
Termination @ 60"
Refusal: No
Obs. Water: No

Depth	Color	Texture	Structure	Consistence	REDOX
0–10"	10YR3/3	FSL	GR	FR	N
10–18"	10YR4/4	FSL	GR	FR	N
18–26"	2.5Y5/4	FSL	GR	FR	N
26–60"	2.5Y4/4	S	GR	FR	P

Test Pit No.1–3
ESHWT: 32"
Termination @ 50"
Refusal: No
Obs. Water: No

Depth	Color	Texture	Structure	Consistence	REDOX
0–10"	10YR3/3	FSL	GR	FR	N
10–24"	10YR4/4	FSL	GR	FR	N
24–50"	2.5Y5/4	S	SG	L	P

Test Pit No.2–1
ESHWT: 30"
Termination @ 52"
Refusal: No
Obs. Water: No

Depth	Color	Texture	Structure	Consistence	REDOX
0–8"	10YR3/3	FSL	GR	FR	N
8–14"	10YR4/4	FSL	GR	FR	N
14–30"	2.5Y5/6	S	GR	L	N
30–52"	10YR5/8	S	GR	FR	P

Test Pit No.2–2
ESHWT: 17"
Termination @ 60"
Refusal: No
Obs. Water: No

Depth	Color	Texture	Structure	Consistence	REDOX
0–8"	10YR3/3	FSL	GR	FR	N
8–17"	10YR4/4	FSL	GR	FR	N
17–60"	2.5Y5/6	S	GR	FR	P

Test Pit No.3–1
ESHWT: 20"
Termination @ 60"
Refusal: No
Obs. Water: No

Depth	Color	Texture	Structure	Consistence	REDOX
0–7"	10YR3/3	FSL	GR	FR	N
7–20"	10YR5/4	FSL	GR	FR	N
20–60"	2.5Y4/3	FSL	BLK	FI	P

Test Pit No.3–2
ESHWT: 20"
Termination @ 48"
Refusal: No
Obs. Water: No

Depth	Color	Texture	Structure	Consistence	REDOX
0–8"	10YR3/3	FSL	GR	FR	N
8–20"	10YR5/4	FSL	GR	FR	N
20–48"	2.5Y4/3	FSL	BLK	FI	P

Test Pit No.3–3
ESHWT: 20"
Termination @ 48"
Refusal: No
Obs. Water: No

Depth	Color	Texture	Structure	Consistence	REDOX
0–8"	10YR3/2	FSL	GR	FR	N
8–20"	10YR4/4	FSL	GR	FR	N
20–48"	2.5Y5/4	FSL	GR	FR	N

Test Pit No.3–4
ESHWT: 28"
Termination @ 60"
Refusal: No
Obs. Water: No

Depth	Color	Texture	Structure	Consistence	REDOX
0–8"	10YR3/3	FSL	GR	FR	N
8–28"	10YR4/4	FSL	GR	FR	N
28–60"	2.5Y5/3	FSL	BLK	FI	P

Test Pit No.3–5
ESHWT: 30"
Termination @ 50"
Refusal: No
Obs. Water: No

Depth	Color	Texture	Structure	Consistence	REDOX
0–8"	10YR3/3	FSL	GR	FR	N
8–20"	10YR4/4	FSL	GR	FR	N
20–30"	2.5Y5/3	FSL	GR	FR	N
30–50"	2.5Y5/4	FSL	BLK	FI	P

Test Pit No.4–1
ESHWT: 24"
Termination @ 64"
Refusal: No
Obs. Water: No

Depth	Color	Texture	Structure	Consistence	REDOX
0–8"	10YR3/3	FSL	GR	FR	N
8–16"	10YR5/4	FSL	GR	FR	N
16–24"	10YR4/4	FSL	GR	FR	N
24–64"	2.5Y4/3	FSL	BLK	FI	P

Percolation Rate: 8 min/in

Test Pit No.4–2
ESHWT: 20"
Termination @ 60"
Refusal: No
Obs. Water: No

Depth	Color	Texture	Structure	Consistence	REDOX
0–10"	10YR3/3	FSL	GR	FR	N
10–20"	10YR4/4	FSL	GR	FR	N
20–60"	2.5Y5/3	FSL	BLK	FI	P

Test Pit No.4–3
ESHWT: 30"
Termination @ 60"
Refusal: No
Obs. Water: No

Depth	Color	Texture	Structure	Consistence	REDOX
0–6"	10YR3/2	FSL	GR	FR	N
6–18"	10YR4/4	FSL	GR	FR	N
18–30"	2.5Y4/4	FSL	GR	FR	N
30–60"	2.5Y5/3	FSL	BLK	FI	P

Test Pit No.5–1
ESHWT: 30"
Termination @ 56"
Refusal: No
Obs. Water: No

Depth	Color	Texture	Structure	Consistence	REDOX
0–12"	10YR3/3	FSL	GR	FR	N
12–20"	10YR4/4	FSL	GR	FR	N
20–30"	2.5Y5/6	FSL	GR	FR	N
30–56"	2.5Y5/4	FSL	BLK	FI	P

Test Pit No.5–2
ESHWT: 38"
Termination @ 64"
Refusal: No
Obs. Water: No

Depth	Color	Texture	Structure	Consistence	REDOX
0–8"	10YR3/3	FSL	GR	FR	N
8–16"	10YR4/4	FSL	GR	FR	N
16–38"	10YR4/6	FSL	GR	FR	N
38–64"	2.5Y5/4	Gr	OM	FI	P

Test Pit No.6–1
ESHWT: 30"
Termination @ 66"
Refusal: No
Obs. Water: No

Depth	Color	Texture	Structure	Consistence	REDOX
0–8"	10YR3/3	FSL	GR	FR	N
8–18"	10YR4/4	FSL	GR	FR	N
18–30"	2.5Y4/6	FSL	GR	FR	N
30–66"	2.5Y5/3	FSL	BLK	FI	P

Test Pit No.6–2
ESHWT: 38"
Termination @6 0"
Refusal: No
Obs. Water: No

Depth	Color	Texture	Structure	Consistence	REDOX
0–6"	10YR3/3	FSL	GR	FR	N
6–18"	10YR4/4	FSL	GR	FR	N
18–38"	10YR4/6	FSL	GR	FR	N
38–60"	2.5Y5/3	FSL	BLK	FI	P

Test Pit No.7–1
ESHWT: 24"
Termination @ 36"
Refusal: 36"
Obs. Water: No

Depth	Color	Texture	Structure	Consistence	REDOX
0–6"	10YR3/2	FSL	GR	FR	N
6–18"	10YR4/4	FSL	GR	FR	N
18–24"	2.5Y4/6	S	GR	L	N
24–36"	2.5Y5/4	S	BLK	FI	P

Test Pit No.7–2
ESHWT: 24"
Termination @ 42"
Refusal: 42"
Obs. Water: No

Depth	Color	Texture	Structure	Consistence	REDOX
0–6"	10YR3/2	FSL	GR	FR	N
6–12"	10YR4/4	FSL	GR	FR	N
12–24"	10YR4/6	S	GR	FR	N
24–42"	2.5Y5/3S	FSL	BLK	FI	P

Test Pit No.7–3
ESHWT: 20"
Termination @ 54"
Refusal: No
Obs. Water: No

Depth	Color	Texture	Structure	Consistence	REDOX
0–10"	10YR3/3	FSL	GR	FR	N
10–20"	10YR4/4	FSL	GR	FR	N
20–54"	2.5Y5/4	S	GR	FR	P

Test Pit No.7–4
ESHWT: 18"
Termination @ 52"
Refusal: No
Obs. Water: No

Depth	Color	Texture	Structure	Consistence	REDOX
0–8"	10YR3/2	FSL	GR	FR	N
8–14"	10YR4/4	FSL	GR	FR	N
14–18"	10YR4/6	FSL	GR	FR	N
18–24"	2.5Y5/6	FS	GR	FR	P
24–36"	2.5Y5/4	FS	GR	FR	P
36–52"	2.5Y5/3	SIL	BLK	FI	P

Test Pit No.7–5
ESHWT: 24"
Termination @ 60"
Refusal: No
Obs. Water: No

Depth	Color	Texture	Structure	Consistence	REDOX
0–6"	10YR3/2	FSL	GR	FR	N
6–12"	10YR4/4	FSL	GR	FR	N
12–24"	2.5Y4/6	Sil	GR	FR	N
24–60"	2.5Y5/4	SL	GR	FR	P

KEY:

GR (TEXTURE)= GRAVELLY	GR= GRANULAR
LS = LOAMY SAND	OM = MASSIVE
S = SAND	PL = PLATY
FSL = FINE SANDY LOAM	BLK = BLOCKY
SL = SANDY LOAM	L=LOOSE
SIL = SILTY LOAM	
SICL = SILTY CLAY	
F (TEXTURE) = FINE	CB (TEXTURE) = COBBLY
CN (TEXTURE) = CHANNERY	F (TEXTURE) = VERY FINE
V (ROCK FRAGMENT)(TEXTURE) = VERY	

FR = FRIABLE	
FI = FIRM	
C = COMMON	
P = PROMINENT	
D = DISTINCT	
N = NONE	

LEGEND

- PROPERTY LINE
- WETLAND BOUNDARY
- 60 EXISTING CONTOUR
- 75' WETLAND SETBACK
- HISS SOIL BOUNDARY
- 543BH HISS SOIL DESIGNATION
- EXISTING TREE/DRIP LINE
- PROPOSED EASEMENT

HIGH INTENSITY MAP SYMBOL: 523BH

DRAINAGE CLASS
1. EXCESSIVELY DRAINED
2. WELL DRAINED
3. MODERATELY WELL DRAINED
4. SOMEWHAT POORLY DRAINED
5. POORLY DRAINED
6. VERY POORLY DRAINED
7. NOT DETERMINABLE

PARENT MATERIAL
1. GLACIOFLUVIAL
2. GLACIAL TILL
3. MARINE OR GLACIOLACUSTRINE VERY FINE SAND AND SILT
4. MARINE OR GLACIOLACUSTRINE LOAMY/SANDY OVER SILT/CLAY
5. MARINE OR GLACIOLACUSTRINE SILT AND CLAY
6. EXCAVATED, REGRADED, OR FILLED
7. ALLUVIAL DEPOSITS
8. ORGANIC MATERIALS FRESH WATER
9. ORGANIC MATERIALS TIDAL MARSH

IDENTIFIER
H. INDICATES HIGH INTENSITY SOIL MAP
P. INDICATES PRELIMINARY MAP

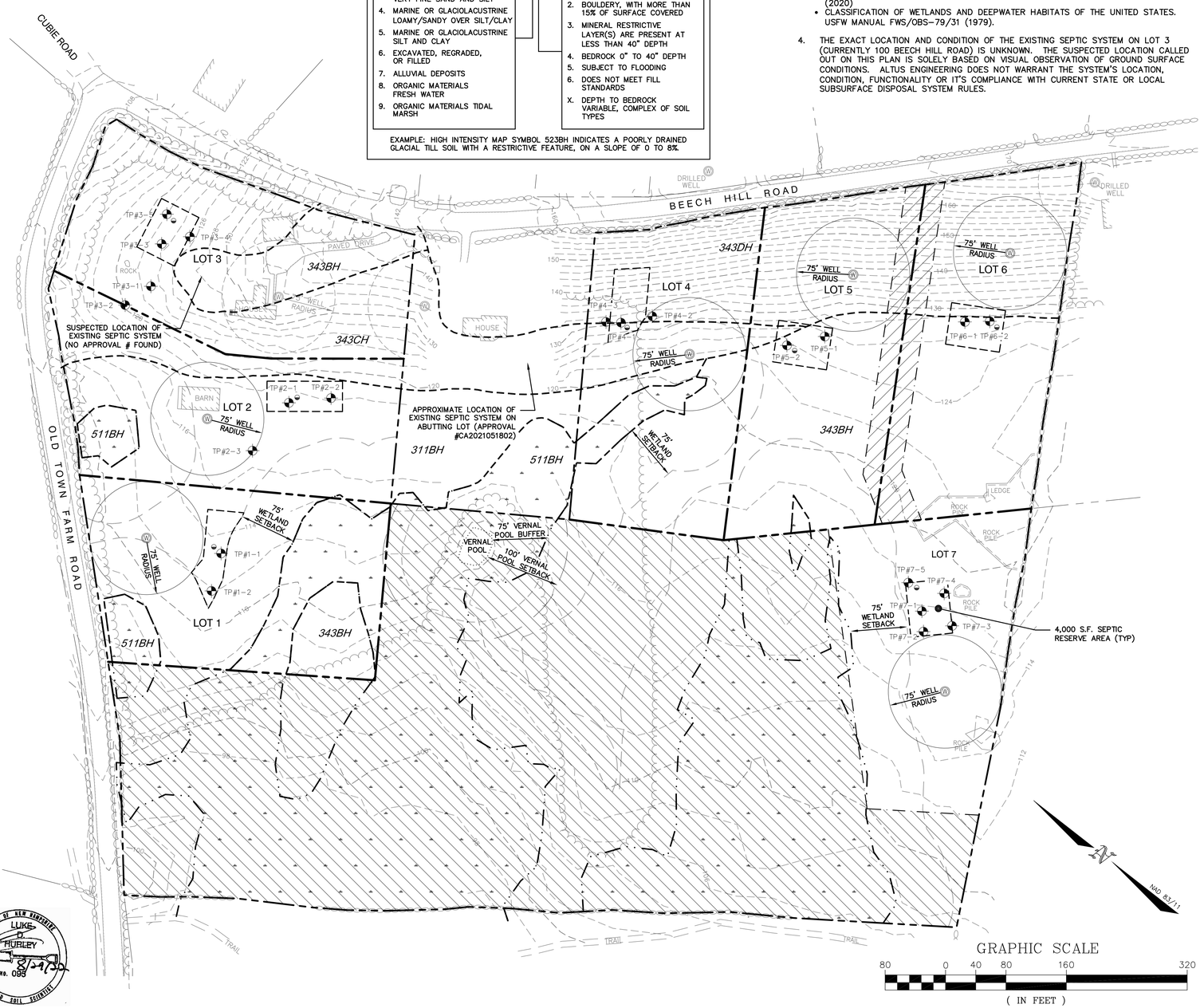
SLOPE CLASS
B. 0 TO 8%
C. 8 TO 15%
D. 15 TO 25%
E. 15 TO 25%

RESTRICTIVE FEATURE
1. NONE
2. BOULDERY, WITH MORE THAN 15% OF SURFACE COVERED
3. MINERAL RESTRICTIVE LAYER(S) ARE PRESENT AT LESS THAN 40" DEPTH
4. BEDROCK 0" TO 40" DEPTH
5. SUBJECT TO FLOODING
6. DOES NOT MEET FILL STANDARDS
X. DEPTH TO BEDROCK VARIABLE, COMPLEX OF SOIL TYPES

EXAMPLE: HIGH INTENSITY MAP SYMBOL 523BH INDICATES A POORLY DRAINED GLACIAL TILL SOIL WITH A RESTRICTIVE FEATURE, ON A SLOPE OF 0 TO 8%

NOTES

1. TEST PITS WERE PERFORMED BY GOVE ENVIRONMENTAL SERVICES, INC., ON AUGUST 10, 2022 AND WITNESSED BY THE ROCKINGHAM COUNTY CONSERVATION DISTRICT.
2. HISS MAPPING PREPARED BY GOVE ENVIRONMENTAL SERVICES, INC.
3. WETLANDS WERE DELINEATED BY GOVE ENVIRONMENTAL SERVICES INC. IN MARCH OF 2022 UTILIZING THE FOLLOWING STANDARDS:
   - REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL 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.
   - U.S. ARMY CORPS OF ENGINEERS NATIONAL WETLAND PLANT LIST, VERSION 3.5. (2020)
   - CLASSIFICATION OF WETLANDS AND DEEPWATER HABITATS OF THE UNITED STATES. USFW MANUAL FWS/OBS–79/31 (1979).
4. THE EXACT LOCATION AND CONDITION OF THE EXISTING SEPTIC SYSTEM ON LOT 3 (CURRENTLY 100 BEECH HILL ROAD) IS UNKNOWN. THE SUSPECTED LOCATION CALLED OUT ON THIS PLAN IS SOLELY BASED ON VISUAL OBSERVATION OF GROUND SURFACE CONDITIONS. ALTUS ENGINEERING DOES NOT WARRANT THE SYSTEM'S LOCATION, CONDITION, FUNCTIONALITY OR IT'S COMPLIANCE WITH CURRENT STATE OR LOCAL SUBSURFACE DISPOSAL SYSTEM RULES.



GRAPHIC SCALE
80 0 40 80 160 320
(IN FEET)

STATE OF NEW HAMPSHIRE
LUKE D. HURLEY
No. 099
CERTIFIED SOIL SCIENTIST
8/24/22

CASE #22-14
TOWN OF EXETER PROJECT REFERENCE

ALTUS ENGINEERING, INC.
133 Court Street
(603) 433-2335
Portsmouth, NH 03801
www.altus-eng.com

NEW HAMPSHIRE Designer of Subsurface Disposal Systems ERIC D. WEINRIEB No. 809 Water Supply & Pollution Control
10/11/22

NOT FOR CONSTRUCTION

ISSUED FOR: PLANNING BOARD

ISSUE DATE: OCTOBER 11, 2022

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	PLANNING BOARD	EBS	08/30/22
1	ADDED TEST PIT LOGS	EBS	09/09/22
2	REV. PER NHDES	EBS	10/11/22

DRAWN BY: EBS
APPROVED BY: EBS
DRAWING FILE: 5307–SUB.dwg

SCALE:
(22"x34") 1"= 80'
(11"x17") 1"=160'

OWNER:
JUDITH A. NICHOLS
FREDERICK J. NICHOLS
100 BEECH HILL ROAD
EXETER, NH 03833

APPLICANT:
JERRY AND CHRISTINE STERRITT
98 BEECH HILL ROAD
EXETER, NH 03833

PROJECT:
BEECH HILL SUBDIVISION
TAX MAP 13, LOT 1
BEECH HILL ROAD
EXETER, NH 03833

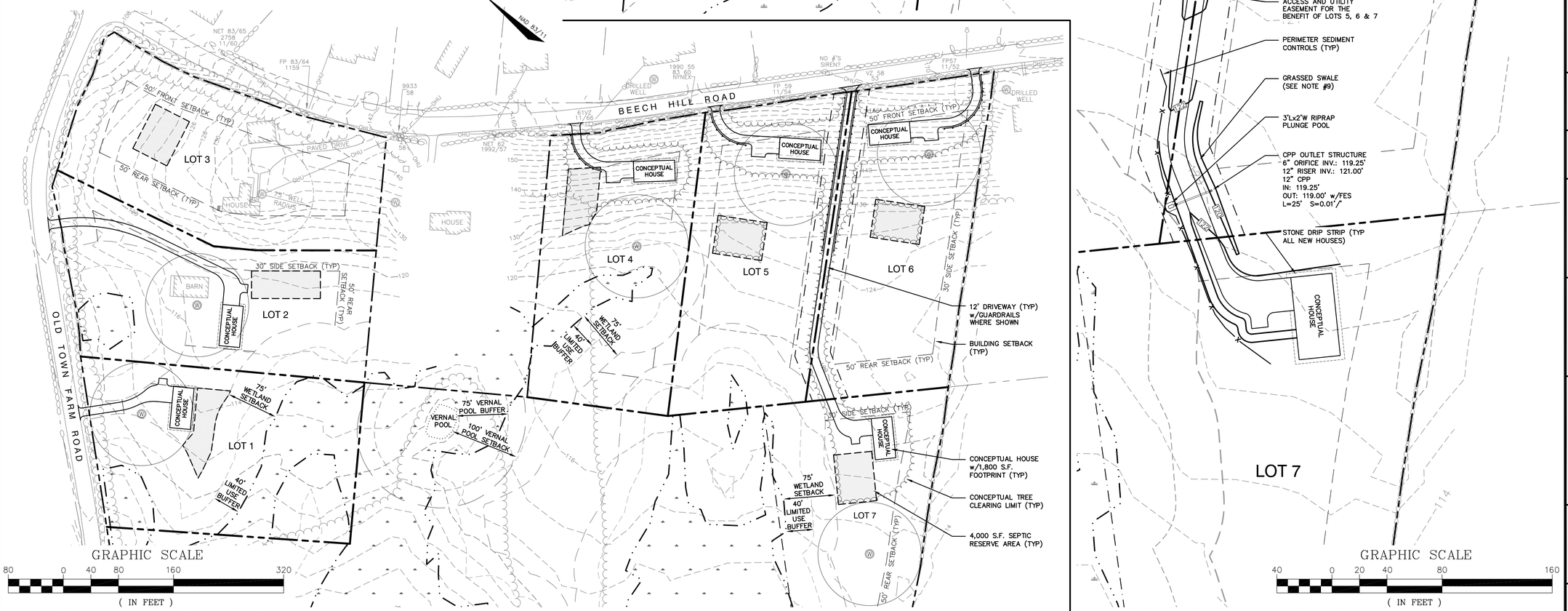
TITLE:
TOPOGRAPHY AND SOILS PLAN

SHEET NUMBER:
C - 2

P5307

NOTES

1. HOUSE AND DRIVEWAY LOCATIONS AND ANY GRADING SHOWN ARE SCHEMATIC AND INTENDED FOR PLANNING PURPOSES ONLY. ACTUAL HOUSE, DRIVEWAY, SEPTIC SYSTEM AND GRADING CONFIGURATIONS AND LOCATIONS MAY VARY DEPENDING ON THE SPECIFIC DESIGNS FOR EACH INDIVIDUAL LOT AS PREPARED BY OTHERS. IT SHALL BE THE RESPONSIBILITY OF THE INDIVIDUAL LOT OWNER TO COMPLY WITH ALL APPLICABLE RULES AND REGULATIONS, INCLUDING, BUT NOT LIMITED TO, BUILDING SETBACKS, WETLAND BUFFERS AND SUBSURFACE SANITARY DISPOSAL RULES.
2. ALL WATER, SEWER, ROAD (INCLUDING PARKING LOT), AND DRAINAGE WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH SECTION 9.3 STORMWATER STANDARDS, STORMWATER MANAGEMENT PLAN, STORMWATER POLLUTION PREVENTION PLAN, AND EROSION AND SEDIMENT CONTROL STANDARDS AND THE STANDARD SPECIFICATIONS FOR CONSTRUCTION OF PUBLIC UTILITIES IN EXETER, NEW HAMPSHIRE.
3. LOTS TO BE SERVICED BY OVERHEAD OR UNDERGROUND ELECTRIC AND COMMUNICATIONS UTILITIES FROM BEECH HILL OR OLD TOWN FARM ROAD AND PRIVATE WELLS AND SUBSURFACE SANITARY DISPOSAL SYSTEMS. LOT OWNERS SHALL BE RESPONSIBLE FOR COORDINATION WITH APPROPRIATE UTILITY COMPANIES AND OBTAINING ALL NECESSARY PERMITS.
4. ALL DRIVEWAYS SHALL BE CONSTRUCTED SO AS TO SLOPE AWAY FROM THE PUBLIC WAY AT 2% FOR A MINIMUM OF 10' OR TO THE LIMITS OF THE RIGHT OF WAY, WHICHEVER IS GREATER.
5. WHERE A DRIVEWAY CROSSES A ROADSIDE SWALE, A 12" CPP CULVERT SHALL BE INSTALLED SO AS TO NOT IMPEDE DRAINAGE FLOW.
6. ANY DRIVEWAY SIDE SLOPE IN EXCESS OF 3:1 AND ALL RETAINING WALLS IN THE VICINITY OF VEHICULAR TRAFFIC OR PARKING AREAS SHALL BE EQUIPPED WITH GUARDRAILS PLACED NO LESS THAN 2' FROM THE EDGE OF PAVEMENT.
7. ANY RETAINING WALL IN EXCESS OF FOUR FEET IN HEIGHT SHALL BE BUILT IN ACCORDANCE WITH A DESIGN STAMPED BY A NH LICENSED ENGINEER FAMILIAR WITH WALL DESIGN.
8. ALL HOUSES SHALL BE EQUIPPED WITH STONE DRIP STRIPS WHERE APPROPRIATE TO ENSURE THE INFILTRATION OF ROOF RUNOFF. WHERE GUTTERS ARE REQUIRED AT SELECT LOCATIONS (I.E. OVER DOORWAYS, ETC.), DOWNSPOUTS SHALL BE DIRECTED TO THE DRIP STRIPS. GUTTER DOWNSPOUTS DIRECTED TO LAWN, WOODS OR LANDSCAPE AREAS SHALL NOT BE PERMITTED.
9. ALL SLOPES IN EXCESS OF 3:1 AND ALL SWALES SHALL BE STABILIZED WITH NORTH AMERICAN GREEN S75BN BIODEGRADABLE EROSION CONTROL BLANKET (OR APPROVED EQUAL) SECURED WITH BIODEGRADABLE FASTENERS.
10. A MINIMUM OF 6" OF SCREENED LOAM AND SEED SHALL BE APPLIED TO ALL AREAS DISTURBED BY CONSTRUCTION THAT ARE OUTSIDE BUILDING AND PAVEMENT LIMITS.
11. ALL SEDIMENT AND EROSION CONTROL MEASURES SHOWN ARE CONCEPTUAL IN NATURE AND SHOULD BE TAILORED TO THE FINAL HOUSE AND DRIVEWAY DESIGNS SPECIFIED BY THE LOT OWNERS. ALL SEDIMENT AND EROSION CONTROLS SHALL BE INSTALLED IN ACCORDANCE WITH THE NH STORMWATER MANUAL, LATEST EDITION.



CONCEPTUAL LOT DEVELOPMENT LAYOUT 1" = 80'

CONCEPTUAL DRIVEWAY GRADING PLAN (LOTS 4 - 7) 1" = 40'

CASE #22-14

TOWN OF EXETER PROJECT REFERENCE

ALTUS ENGINEERING, INC.

133 Court Street
(603) 433-2335
Portsmouth, NH 03801
www.altus-eng.com

STATE OF NEW HAMPSHIRE
ERIC D. WEINRIEB
No. 7634
LICENSED PROFESSIONAL ENGINEER
10/18/22

NOT FOR CONSTRUCTION

ISSUED FOR: PLANNING BOARD

ISSUE DATE: OCTOBER 11, 2022

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	PLANNING BOARD	EBS	10/11/22

DRAWN BY: EBS
APPROVED BY: EBS
DRAWING FILE: 5307-SUB.dwg

SCALE: AS NOTED

OWNER:
JUDITH A. NICHOLS
FREDERICK J. NICHOLS
100 BEECH HILL ROAD
EXETER, NH 03833

APPLICANT:
JERRY AND CHRISTINE STERRITT
98 BEECH HILL ROAD
EXETER, NH 03833

PROJECT:
BEECH HILL SUBDIVISION
TAX MAP 13, LOT 1
BEECH HILL ROAD
EXETER, NH 03833

TITLE:
STORMWATER MANAGEMENT AND DEVELOPMENT PLAN

SHEET NUMBER:
C - 3

P5307

SEDIMENT AND EROSION CONTROL NOTES

PROJECT NAME AND LOCATION

100 BEECH HILL ROAD
EXETER, NEW HAMPSHIRE
TAX MAP 13 LOT 1

LATITUDE: 43°00'54" N
LONGITUDE: 71°01'45" W

OWNER/APPLICANT:
JUDITH AND FREDERICK NICHOLS
100 BEECH HILL ROAD
EXETER, NH 03833

DESCRIPTION

The project consists of a seven–lot single family residential subdivision with no new roadway or associated infrastructure.

DISTURBED AREA

Given that each house lot will be developed independently to the specific plans prepared by each owner, the total area to be disturbed for the development is unknown.

PROJECT PHASING

The project will be completed on a per lot basis by individual contractors retained by the lot owners.

NAME OF RECEIVING WATER

The site drains to an unnamed wetland tributary to the Fresh River.

SEQUENCE OF MAJOR ACTIVITIES (TO BE REPEATED FOR EACH LOT)

1. Install temporary erosion control measures including perimeter controls, stabilized construction entrance and inlet sediment filters as noted on the plan. All temporary erosion control measures shall be maintained in good working condition for the duration of the project.
2. Delineate limits of disturbance.
3. Remove trees, stumps and brush strip loam and stockpile.
4. Construct building foundations.
5. Rough grade site including placement of borrow materials.
6. Construct new buildings and associated improvements.
7. Construct drainage structures, culverts, utilities & pavement base course materials.
8. Install base course paving.
9. Install top course paving.
10. Loam (6" min) and seed on all disturbed areas not paved or otherwise stabilized.
11. Install landscaping.
12. When all construction activity is complete and site is stabilized, remove all temporary erosion control measures and any sediment that has been trapped by these devices.

TEMPORARY EROSION & SEDIMENT CONTROL AND STABILIZATION PRACTICES

All work shall be in accordance with state and local permits. Work shall conform to the practices described in the "New Hampshire Stormwater Manual, Volumes 1 – 3", issued December 2008, as amended. As indicated in the sequence of Major Activities, perimeter controls shall be installed prior to commencing any clearing or grading of the site. Structural controls shall be installed concurrently with the applicable activity. Once construction activity ceases permanently in an area and permanent measures are established, perimeter controls shall be removed.

During construction, runoff will be diverted around the site with stabilized channels where possible. Sheet runoff from the site shall be filtered through appropriate perimeter controls. All storm drain inlets shall be provided with inlet protection measures.

Temporary and permanent vegetation and mulching is an integral component of the erosion and sedimentation control plan. All areas shall be inspected and maintained until vegetative cover is established. These control measures are essential to erosion prevention and also reduce costly rework of graded and shaped areas.

Temporary vegetation shall be maintained in these areas until permanent seeding is applied. Additionally, erosion and sediment control measures shall be maintained until permanent vegetation is established.

INSTALLATION, MAINTENANCE AND INSPECTION PROCEDURES FOR TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES

A. GENERAL

These are general inspection and maintenance practices that shall be used to implement the plan:

1. The smallest practical portion of the site shall be denuded at one time.
2. All control measures shall be inspected at least once each week and following any storm event of 0.25 inches or greater.
3. All measures shall be maintained in good working order; if a repair is necessary, it will be initiated within 24 hours.
4. Built–up sediment shall be removed from perimeter barriers when it has reached one–third the height of the barrier or when "bulges" occur.
5. All diversion dikes shall be inspected and any breaches promptly repaired.
6. Temporary seeding and planting shall be inspected for bare spots, washouts, and unhealthy growth.
7. The owner's authorized engineer shall inspect the site on a periodic basis to review compliance with the Plans.
8. An area shall be considered stable if one of the following has occurred:
   a. Base coarse gravels have been installed in areas to be paved;
   b. A minimum of 85% vegetated growth as been established;
   c. A minimum of 3 inches of non–erosive material such as stone of riprap has been installed; – or –
   d. Erosion control blankets have been properly installed.
9. The length of time of exposure of area disturbed during construction shall not exceed 45 days.

B. MULCHING

Mulch shall be used on highly erodible soils, on critically eroding areas, on areas where conservation of moisture will facilitate plant establishment, and where shown on the plans.

1. Timing – In order for mulch to be effective, it must be in place prior to major storm events. There are two (2) types of standards which shall be used to assure this:
   a. Apply mulch prior to any storm event. This is applicable when working within 100 feet of wetlands. It will be necessary to closely monitor weather predictions, usually by contacting the National Weather Service in Concord, to have adequate warning of significant storms.
   b. Required Mulching within a specified time period. The time period can range from 21 to 28 days of inactivity on a area, the length of time varying with site conditions. Professional judgment shall be used to evaluate the interaction of site conditions (soil erodibility, season of year, extent of disturbance, proximity to sensitive resources, etc.) and the potential impact of erosion on adjacent areas to choose an appropriate time restriction.
2. Guidelines for Winter Mulch Application –

Type	Rate per 1,000 s.f.	Use and Comments
Hay or Straw	70 to 90 lbs.	Must be dry and free from mold. May be used with plantings.
Wood Chips or Bark Mulch	460 to 920 lbs.	Used mostly with trees and shrubs.
Jute and Fibrous Matting (Erosion Blanket	As per manufacturer Specifications	Used in slope areas, water courses and other Control areas.
Crushed Stone 1/4" to 1–1/2" dia.	Spread more than 1/2" thick	Effective in controlling wind and water erosion.
Erosion Control Mix	2" thick (min)	

* The organic matter content is between 80 and 100%, dry weight basis.
* Particle size by weight is 100% passing a 6"screen and a minimum of 70 %, maximum of 85%, passing a 0.75" screen.
*The organic portion needs to be fibrous and elongated.
*Large portions of silts, clays or fine sands are not acceptable in the mix.
* Soluble salts content is less than 4.0 mmhos/cm.
*The pH should fall between 5.0 and 8.0.

3. Maintenance – All mulches must be inspected periodically, in particular after rainstorms, to check for rill erosion. If less than 90% of the soil surface is covered by mulch, additional mulch shall be immediately applied.

C. PERMANENT SEEDING –

1. Bedding – stones larger than 1½", trash, roots, and other debris that will interfere with seeding and future maintenance of the area should be removed. Where feasible, the soil should be tilled to a depth of 5" to prepare a seedbed and mix fertilizer into the soil.
2. Fertilizer – lime and fertilizer should be applied evenly over the area prior to or at the time of seeding and incorporated into the soil. Kinds and amounts of lime and organic fertilizer should be based on an evaluation of soil tests. When a soil test is not available, the following minimum amounts should be applied:

   Agricultural Limestone @ 100 lbs. per 1,000 s.f.
   10–20–20 organic fertilizer @ 12 lbs. per 1,000 s.f.

3. Seed Mixture (for lawns**):

Type	Lbs. / Acre	Lbs. / 1,000 sf
Tall Fescue	24	0.55
Creeping Red Fescue	24	0.55
Total	48	1.10

Seed Mixture (For slope embankments**):
Grass Seed: Provide fresh, clean, new–crop seed complying with tolerance for purity and germination established by Official Seed Analysts of North America. Provide seed mixture composed of grass species, proportions and minimum percentages of purity, germination, and maximum percentage of weed seed, as specified:

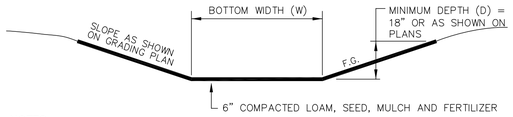
Type	Min. Purity (%)	Min. Germination (%)	Kg./Hectare (Lbs/Acre)
Creeping Red Fescue (c)	96	85	45 (40)
Perennial Rye Grass (a)	98	90	35 (30)
Redtop	95	80	5 (5)
Alsike Clover	97	90(e)	5 (5)
		Total	90 (80)

   a. Ryegrass shall be a certified fine–textured variety such as Pennfine, Fiesta, Yorktown, Diplomat, or equal.
   b. Fescue varieties shall include – Creeping Red and/or Hard Reliant, Scaldis, Koket, or Jamestown.
   ** In the event that the seed mixes shown here conflict with the project landscape plans, the landscape plans shall govern.

4. Sodding – sodding is done where it is desirable to rapidly establish cover on a disturbed area. Sodding an area may be substituted for permanent seeding procedures anywhere on site. Bed preparation, fertilizing, and placement of sod shall be performed according to the S.C.S. Handbook. Sodding is recommended for steep sloped areas, areas immediately adjacent to sensitive water courses, easily erodible soils (fine sand/silt), etc.

WINTER CONSTRUCTION NOTES

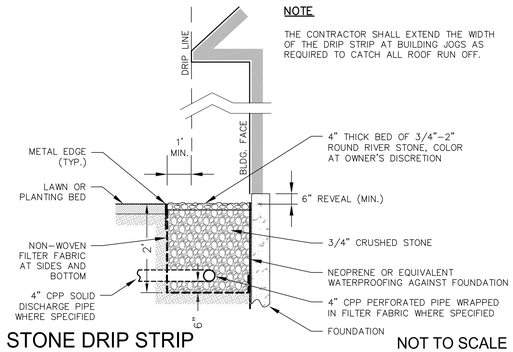
1. All proposed vegetated areas which do not exhibit a minimum of 85% vegetative growth by October 15th, or which are disturbed after October 15th, shall be stabilized by seeding and installing erosion control blankets on slopes greater than 3:1, and elsewhere seeding and placing 3 to 4 tons of mulch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



NOTES

1. THE FOUNDATION AREA OF THE SWALE SHALL BE CLEARED AND GRUBBED OF ALL TREES, BRUSH, STUMPS, AND OTHER OBJECTIONABLE MATERIAL.
2. THE SWALE SHALL BE EXCAVATED OR SHAPED TO LINE, GRADE AND CROSS SECTION AS REQUIRED TO MEET THE DESIGN CRITERIA AND BE FREE OF IRREGULARITIES.
3. EARTH FILLS REQUIRED TO MEET SUBGRADE REQUIREMENTS BECAUSE OF OVER EXCAVATION OR TOPOGRAPHY SHALL BE COMPACTED TO THE SAME DENSITY AS THE SURROUNDING SOIL TO PREVENT UNEQUAL SETTLEMENT THAT COULD CAUSE DAMAGE TO THE COMPLETED SWALE.
4. VEGETATION SHALL BE ESTABLISHED IN THE SWALE OR AN EROSION CONTROL MATTING INSTALLED PRIOR TO DIRECTING STORMWATER TO IT.
5. MAINTENANCE OF THE VEGETATION IS EXTREMELY IMPORTANT IN ORDER TO PREVENT RILLING, EROSION, AND FAILURE OF THE SWALE. MOWING SHALL BE DONE FREQUENTLY ENOUGH TO CONTROL ENCROACHMENT OF WEEDS AND WOODY VEGETATION AND TO KEEP GRASSES IN A VIGOROUS CONDITION. THE VEGETATION SHALL NOT BE MOWED TOO CLOSELY SO AS TO REDUCE THE EROSION RESISTANCE IN THE SWALE.
6. THE SWALE SHOULD BE INSPECTED PERIODICALLY AND AFTER ANY STORM GREATER THAN 0.5" OF RAINFALL IN 24 HOURS TO DETERMINE ITS CONDITION. RILLS AND DAMAGED AREAS SHOULD BE PROMPTLY REPAIRED AND REVEGETATED AS NECESSARY TO PREVENT FURTHER DETERIORATION.

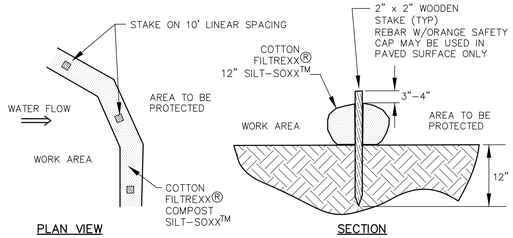
VEGETATED SWALE — NOT TO SCALE



NOTE

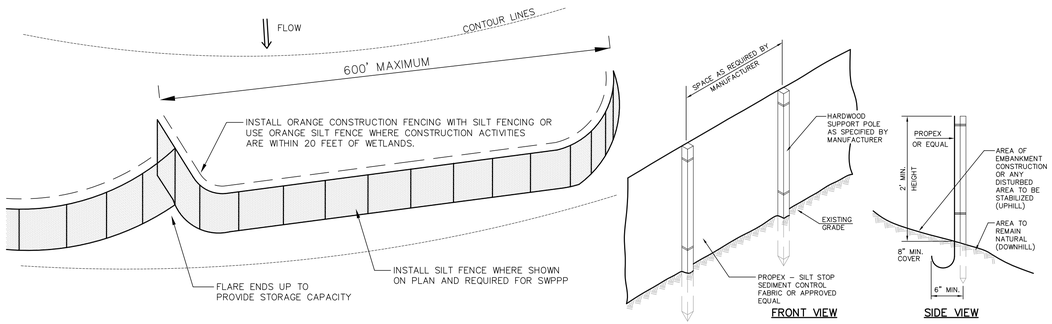
THE CONTRACTOR SHALL EXTEND THE WIDTH OF THE DRIP STRIP AT BUILDING JOGS AS REQUIRED TO CATCH ALL ROOF RUN OFF.

STONE DRIP STRIP — NOT TO SCALE

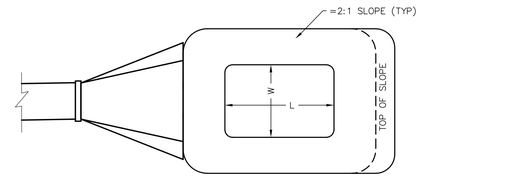


NOTES:
1. SILTSOXX MAY BY USED IN PLACE OF SILT FENCE OR OTHER SEDIMENT BARRIERS.
2. ALL MATERIAL TO MEET FILTREXX SPECIFICATIONS.
3. SILTSOXX COMPOST/SOIL/ROCK/SEED FILL MATERIAL SHALL BE ADJUSTED AS NECESSARY TO MEET THE REQUIREMENTS OF THE SPECIFIC APPLICATION.
4. ALL SEDIMENT TRAPPED BY SILTSOXX SHALL BE DISPOSED OF PROPERLY.

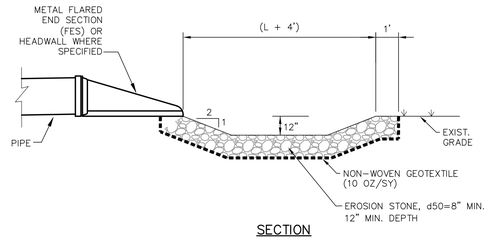
TUBULAR SEDIMENT BARRIER — NOT TO SCALE



SILT AND ORANGE CONSTRUCTION FENCE LAYOUT DETAIL — NOT TO SCALE



PLAN VIEW

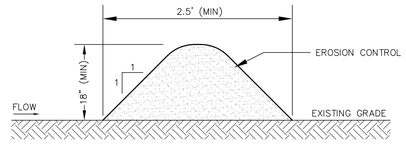


SECTION

NOTES

1. CONSTRUCT PLUNGE POOL TO THE WIDTHS AND LENGTHS SHOWN ON THE PLAN.
2. THE SUBGRADE FOR THE GEOTEXTILE FABRIC AND RIPRAP SHALL BE PREPARED TO LINES AND GRADES SHOWN ON THE PLANS.
3. EROSION STONE USED FOR THE PLUNGE POOL SHALL MEET THE FOLLOWING GRADATION.
4. GEOTEXTILE FABRICS SHALL BE PROTECTED FROM PUNCTURE OR TEARING DURING THE PLACEMENT OF THE EROSION STONE. DAMAGED AREAS IN THE FABRIC SHALL BE REPAIRED BY PLACING A PIECE OF FABRIC OVER THE DAMAGED AREA OR BY COMPLETE REPLACEMENT OF THE FABRIC. ALL OVERLAPS REQUIRED FOR REPAIRS OR JOINING TWO PIECES OF FABRIC SHALL BE A MINIMUM OF 18 INCHES.
5. THE EROSION STONE MAY BE PLACED BY EQUIPMENT AND SHALL BE CONSTRUCTED TO THE FULL LAYER THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO PREVENT SEGREGATION OF THE STONE SIZES.

PLUNGE POOL — NOT TO SCALE



NOTES

1. ORGANIC FILTER BERMS MAY BE UTILIZED IN LIEU OF SILT FENCE OR OTHER SEDIMENT BARRIERS.
2. THE EROSION CONTROL MIXTURE USED IN FILTER BERMS SHALL BE A WELL–GRADED MIX OF PARTICLE SIZES THAT MAY CONTAIN ROCKS LESS THAN 4" IN DIAMETER, STUMP GRINDINGS, SHREDDED OR COMPOSTED BARK, AND/OR ACCEPTABLE MANUFACTURED PRODUCTS AND SHALL BE FREE OF REFUSE, PHYSICAL CONTAMINANTS AND MATERIAL TOXIC TO PLANT GROWTH. EROSION CONTROL MIXTURE SHALL MEET THE FOLLOWING STANDARDS:
   a) THE ORGANIC CONTENT SHALL BE 80–100% OF DRY WEIGHT.
   b) PARTICLE SIZE BY WEIGHT SHALL BE 100% PASSING A 6" SCREEN, AND 70–85% PASSING A 0.75" SCREEN.
   c) THE ORGANIC PORTION SHALL BE FIBROUS AND ELONGATED.
   d) LARGE PORTIONS OF SILTS, CLAYS, OR FINE SANDS SHALL NOT BE INCLUDED IN THE MIXTURE.
   e) SOLUBLE SALTS CONTENT SHALL BE >4.0mmhos/cm.
   f) THE pH SHALL BE BETWEEN 5.0 AND 8.0.
3. ORGANIC FILTER BERMS SHALL BE INSTALLED ALONG A RELATIVELY LEVEL CONTOUR. IT MAY BE NECESSARY TO CUT TALL GRASSES OR WOODY VEGETATION TO AVOID CREATING VOIDS AND BRIDGES THAT WOULD ENABLE FINES TO WASH UNDER THE BERM.
4. ON SLOPES LESS THAN 5%, OR AT THE BOTTOM OF SLOPES NO STEEPER THAN 3:1 AND UP TO 20' LONG, THE BERM SHALL BE A MINIMUM OF 12" HIGH (AS MEASURED ON THE UPHILL SIDE) AND A MINIMUM OF 36" WIDE. ON LONGER AND/OR STEEPER SLOPES, THE BERM SHALL BE TALLER AND WIDER TO ACCOMMODATE THE POTENTIAL FOR ADDITIONAL RUNOFF (MAXIMUM HEIGHT SHALL NOT EXCEED 2').
5. FROZEN GROUND, OUTCROPS OF BEDROCK, AND VERY ROOTED FORESTED AREAS PRESENT THE MOST PRACTICAL AND EFFECTIVE LOCATIONS FOR ORGANIC FILTER BERMS. OTHER BMP'S SHOULD BE USED AT LOW POINTS OF CONCENTRATED RUNOFF, BELOW CULVERT OUTLET APRONS, AROUND CATCH BASINS, AND AT THE BOTTOM OF STEEP PERIMETER SLOPES THAT HAVE A LARGE CONTRIBUTING AREA.
6. SEDIMENT SHALL BE REMOVED FROM BEHIND THE FILTER BERMS WHEN IT HAS ACCUMULATED TO ONE HALF THE ORIGINAL HEIGHT OF THE BERM.
7. ORGANIC FILTER BERMS MAY BE LEFT IN PLACE ONCE THE SITE IS STABILIZED PROVIDED ANY SEDIMENT DEPOSITS TRAPPED BY THEM ARE REMOVED AND DISPOSED OF PROPERLY.
8. FILTER BERMS ARE PROHIBITED AT THE BASE OF SLOPES STEEPER THAN 8% OR WHERE THERE IS FLOWING WATER WITHOUT THE SUPPORT OF ADDITIONAL MEASURES SUCH AS SILTFENCE.

ORGANIC FILTER BERM — NOT TO SCALE

CASE #22-14
TOWN OF EXETER PROJECT REFERENCE

ALTUS ENGINEERING, INC.
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

STATE OF NEW HAMPSHIRE
ERIC D. WEINRIEB
No. 7634
LICENSED PROFESSIONAL ENGINEER
10/18/22

NOT FOR CONSTRUCTION

ISSUED FOR:
PLANNING BOARD

ISSUE DATE:
OCTOBER 11, 2022

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	PLANNING BOARD	EBS	10/11/22

DRAWN BY: EBS
APPROVED BY: EBS
DRAWING FILE: 5307–SUB.dwg

SCALE:
AS NOTED

OWNER:
JUDITH A. NICHOLS
FREDERICK J. NICHOLS
100 BEECH HILL ROAD
EXETER, NH 03833

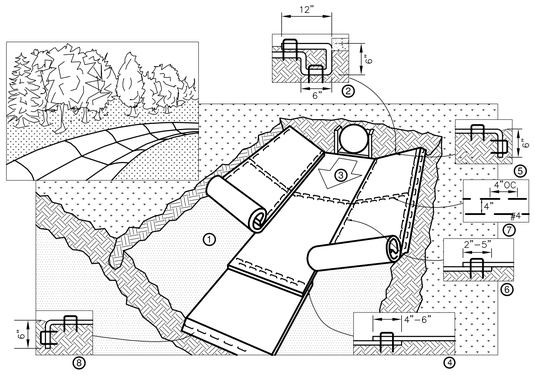
APPLICANT:
JERRY AND CHRISTINE STERRITT
98 BEECH HILL ROAD
EXETER, NH 03833

PROJECT:
BEECH HILL SUBDIVISION
TAX MAP 13, LOT 1
BEECH HILL ROAD
EXETER, NH 03833

TITLE:
DETAILS

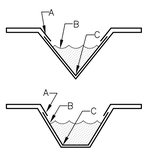
SHEET NUMBER:
C - 4

P5307



NOTES

1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED.
2. BEGIN AT THE TOP OF THE CHANNEL BY ANCHORING THE BLANKET IN A 6" DEEP BY 6" WIDE TRENCH WITH APPROXIMATELY 12" OF BLANKET EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE BLANKET.
3. ROLL CENTER BLANKET IN DIRECTION OF WATER FLOW IN BOTTOM OF CHANNEL. BLANKETS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL BLANKETS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE.
4. PLACE CONSECUTIVE BLANKETS END OVER END (SHINGLE STYLE) WITH A 4"–6" OVERLAP. USE A DOUBLE ROW OF STAPLES STAGGERED 4" APART AND 4" ON CENTER TO SECURE BLANKETS.
5. FULL LENGTH EDGE OF BLANKETS AT TOP OF SIDE SLOPES MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN A 6" DEEP BY 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
6. ADJACENT BLANKETS MUST BE OVERLAPPED APPROXIMATELY 2"–5" (DEPENDING ON BLANKET TYPE) AND STAPLED. TO INSURE PROPER SEAM ALIGNMENT, PLACE THE EDGE OF THE OVERLAPPING BLANKET (BLANKET BEING INSTALLED ON TOP) EVEN WITH THE COLORED SEAM STITCH ON THE BLANKET BEING OVERLAPPED.
7. IN HIGH FLOW CHANNEL APPLICATIONS, A STAPLE CHECK SLOT IS RECOMMENDED AT 30 TO 40 FOOT INTERVALS. USE A DOUBLE ROW OF STAPLES STAGGERED 4" APART AND 4" ON CENTER OVER ENTIRE WIDTH OF THE CHANNEL.
8. THE TERMINAL END OF THE BLANKETS MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN A 6" DEEP BY 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.



CRITICAL POINTS:

A. OVERLAPS AND SEAMS
B. PROJECTED WATER LINE
C. CHANNEL BOTTOM/SIDE SLOPE VERTICES

NOTES:

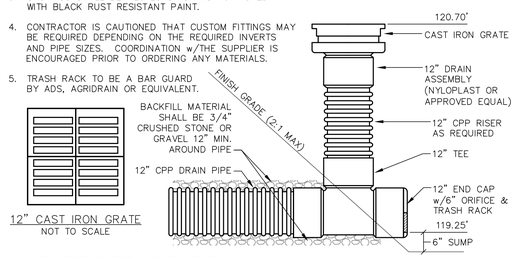
* HORIZONTAL STAPLE SPACING SHOULD BE ALTERED IF NECESSARY TO ALLOW STAPLES TO SECURE THE CRITICAL POINTS ALONG THE CHANNEL SURFACE.

** IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" MAY BE NECESSARY TO PROPERLY ANCHOR THE BLANKETS.

EROSION CONTROL BLANKET - SWALE NOT TO SCALE

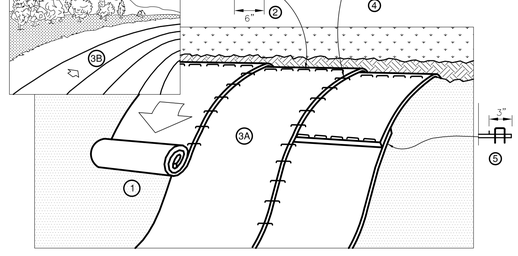
NOTES:

1. MATERIALS TO BE NYLOPLAST USA, INC., AND SUPPLIED BY ADS, INC., OR APPROVED EQUAL.
2. QUALITY: MATERIAL SHALL CONFORM TO ASTM A48–CLASS 30B.
3. CASTINGS SHALL BE H20 LOADING AND FURNISHED WITH BLACK RUST RESISTANT PAINT.
4. CONTRACTOR IS CAUTIONED THAT CUSTOM FITTINGS MAY BE REQUIRED DEPENDING ON THE REQUIRED INVERTS AND PIPE SIZES. COORDINATION w/THE SUPPLIER IS ENCOURAGED PRIOR TO ORDERING ANY MATERIALS.
5. TRASH RACK TO BE A BAR GUARD BY ADS, AGRIDRAIN OR EQUIVALENT.



12" CAST IRON GRATE
NOT TO SCALE

OUTLET STRUCTURE NOT TO SCALE



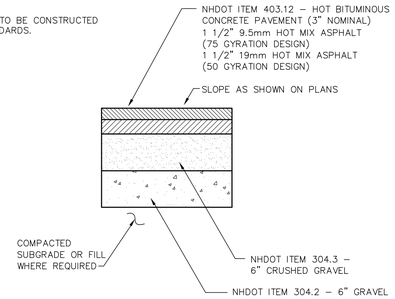
NOTES

1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN A 6" DEEP BY 6" WIDE TRENCH WITH APPROXIMATELY 12" OF BLANKET EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE BLANKET.
3. ROLL THE BLANKETS (A) DOWN OR (B) HORIZONTALLY ACROSS THE SLOPE. BLANKETS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL BLANKETS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE.
4. THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH APPROXIMATELY 2"–5" OVERLAP DEPENDING ON BLANKET TYPE. TO ENSURE PROPER SEAM ALIGNMENT, PLACE THE EDGE OF THE OVERLAPPING BLANKET (BLANKET BEING INSTALLED ON TOP) EVEN WITH THE COLORED SEAM STITCH ON THE PREVIOUSLY INSTALLED BLANKET.
5. CONSECUTIVE BLANKETS SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART ACROSS ENTIRE BLANKET WIDTH. NOTE: IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" MAY BE NECESSARY TO PROPERLY SECURE THE BLANKETS.

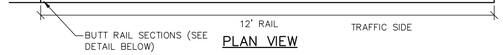
EROSION CONTROL BLANKET - SLOPE NOT TO SCALE

NOTES:

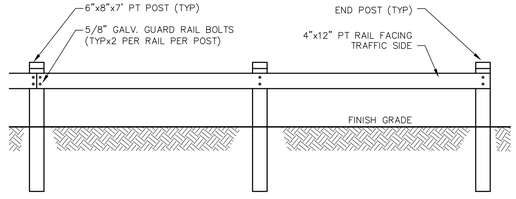
1. ALL DRIVEWAYS TO BE CONSTRUCTED PER TOWN STANDARDS.



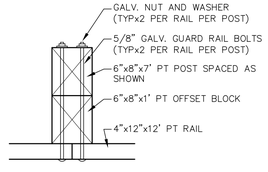
DRIVEWAY CROSS SECTION NOT TO SCALE



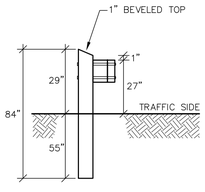
PLAN VIEW



FRONT VIEW



POST DETAIL



SIDE VIEW

NOTES

1. ALL POST AND RAIL MATERIAL SHALL BE PRESSURE TREATED (PT). PT POSTS SHALL BE RATED FOR GROUND CONTACT.
2. BOLT LENGTH IS DETERMINED BY 8" POST AND RAIL THICKNESS PLUS 1 INCH FOR NUT AND WASHER.
3. ALL MATERIAL TO MEET OR EXCEED NHDOT SECTION 606 – GUARDRAIL.

WOOD BEAM GUARDRAIL NOT TO SCALE

CASE #22-14

TOWN OF EXETER PROJECT REFERENCE

ALTUS ENGINEERING, INC.

133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

STATE OF NEW HAMPSHIRE – ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER – 10/18/22

NOT FOR CONSTRUCTION

ISSUED FOR: PLANNING BOARD

ISSUE DATE: OCTOBER 11, 2022

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	PLANNING BOARD	EBS	10/11/22

DRAWN BY: EBS
APPROVED BY: EBS
DRAWING FILE: 5307–SUB.dwg

SCALE: AS NOTED

OWNER:

JUDITH A. NICHOLS
FREDERICK J. NICHOLS

100 BEECH HILL ROAD
EXETER, NH 03833

APPLICANT:

JERRY AND CHRISTINE STERRITT

98 BEECH HILL ROAD
EXETER, NH 03833

PROJECT:

BEECH HILL SUBDIVISION

TAX MAP 13, LOT 1

BEECH HILL ROAD
EXETER, NH 03833

TITLE:

DETAILS

SHEET NUMBER:

C - 5

P5307

civil &
environmental
engineering

UNDERWOOD
engineers

2853.00

November 1, 2022

David Sharples, Town Planner
Town Planning Office, Town of Exeter
10 Front Street
Exeter, NH 03833

Re: ***Beech Hill Subdivision***
Design Review Engineering Services
Exeter, New Hampshire

Site Information:

Review No. 1

Tax Map/Lot#:	13 / 1
Address:	Beech Hill Road
Lot Area:	24.62 ac (+/- 14.75 ac developed for this project)
Proposed Use:	Residential
Water:	Well
Sewer:	Septic Systems
Zoning District:	RU
Applicant:	Jerry and Christine Sterritt
Design Engineer:	Altus Engineering

Application Materials Received:

- Site plan set entitled "Beech Hill Subdivision" dated October 11, 2022, prepared by Altus Engineering.
- Site plan application materials prepared by Altus Engineering.
- Vernal pool assessment prepared by Gove Environmental Services.
- Drainage analysis dated October 11, 2022, prepared by Altus Engineering.

Dear Mr. Sharples:

Based on our review of the above information, in addition to comments provided by the Town, we offer the following comments in accordance with the Town of Exeter Regulations and standard engineering practice.

General

1. We note the proposed houses and driveways shown on sheet C-3 are conceptual in nature and will likely not be constructed as shown by individual landowners:

ph 603.230.9898
fx 603.230.9899
99 North State Street
Concord, NH 03301
underwoodengineers.com

- The driveways are shown as being graded between 12.5% and 20%.
- The grading upon Lots 5 and 6 relative to that necessary to construct the drive to Lot 7 may be in conflict, both as presented, as the owners of Lots 5 and 6 would need to grade their lots in the future. If this project were to move forward, there may need to be a sequence of sales that must be followed, in other words Lot 7 might need to be sold prior to Lots 5 and 6 to ensure that the driveway is constructed before the development of Lots 5 and 6 progresses forward.
- The minimal grading portrayed may not be sufficient to determine if these three lots can be developed as proposed with the property sharing that is being preserved by the notes on the plans.

Subdivision Plan

2. Total frontage for each lot should be clearly listed on the plan. The area of the upland for the lots should also be a call-out on the plan, particularly where Lots 1 and 4 are impacted by wetlands.
3. It appears that reducing the frontage for lots 4 through 6 to 200 LF each could allow the easement shown to be an extension of Lot 7 such that it has its own frontage.

Stormwater Analysis

4. The parcel number on the cover page should be changed to 1.
5. Since each lot will be developed by individual landowners, how will they be directed to ensure a drip edge and plunge pool is constructed for each lot?
6. Runoff amounts should be increased by 15%.
7. **PTAP Database: This project requires registration with the PTAP Database,** the Applicant is requested to enter project related stormwater tracking information contained in the site plan application documents using the Great Bay Pollution Tracking and Accounting Program (PTAP) database (www.unh.edu/unhsc/ptapp) and submit the information with the resubmitted response to comments.

A written response is required to facilitate future reviews. Please contact us if you have any questions.

Very truly yours,
UNDERWOOD ENGINEERS, INC.

Allison M. Rees, P.E.
Project Manager

Robert J. Saunders, P.E.
Senior Project Engineer

ALTUS ENGINEERING

Civil
Site Planning
Environmental
Engineering

133 Court Street
Portsmouth, NH
03801-4413

November 2, 2022

Dave Sharples, Town Planner
Town of Exeter
10 Front Street
Exeter, NH 03833

Re: Waiver Requests
Exeter PB Case #22-14
100 Beech Hill Road
Exeter, NH
Altus Project No. 5307

Transmitted via email to: dsharples@exeternh.gov

Dear Mr. Sharples,

On behalf of the Applicant, Jerry and Christine Sterritt, and pursuant to comments received at TRC on October 27, 2022, Altus Engineering has prepared the following formal waiver requests from the Exeter Site and Subdivision Regulations:

1. We respectfully request a waiver of Subdivision Regulation Section 7.4.7 which requires trees over 20" in diameter be shown on the plan.

   The granting of the waiver will not be detrimental to the public safety, health or welfare or injurious to other property.

   The lack of said trees on a plan will not have a detrimental impact to the public. As this is not a site plan, the final location of houses and driveways will ultimately be chosen by the individual homeowners. Whether or not they choose to cut down or preserve their own trees will have no effect on the public.

   The conditions upon which the request for a waiver is based are unique to the property for which the waiver is sought and are not applicable generally to other property.

   The property is over twenty-four acres in size and the current proposal intends to preserve over 40% of it, including over half the site's wooded area. A portion of the residual woodland is contained within wetland and limited use buffer areas where clearing is not permitted without a Conditional Use Permit. The remaining area will be cleared only to accommodate four single-family building envelopes and driveways, not roadways or other major infrastructure that would require a more substantial impact. These unique considerations make the depiction of large trees unnecessary.

Because of the physical surroundings, shape or topographical conditions of the specific property involved, a particular hardship to the owner would result, as distinguished from a mere inconvenience, if the strict letter of these regulations are carried out.

The expense required to locate said trees, if any exist, would be of questionable utility and is overly burdensome to the applicant. These are not deep-pocketed developers. The applicant is a local family forced to subdivide the property to pay for spiraling medical costs. Any additional cost only exacerbates an already expensive process where every penny spent increases their hardship.

The granting of the waiver will not be contrary to the spirit and intent of the ordinance.

The waiver will not be contrary to the spirit and intent of the ordinance as the proposal meets the zoning regardless of whether or not the trees are shown.

The waiver will not, in any manner, vary the provisions of the Zoning Ordinance or Master Plan.

The granting of this waiver would not in any way vary the provisions of the Ordinance or Master Plan. Lot sizing, density and other applicable zoning elements remain unchanged with or without the trees being shown on the plan.

2. Our original October 11, 2022 request for a waiver from Subdivision Regulation Section 9.23 which requires underground utilities is hereby withdrawn.

3. As referenced in Zoning Section 4.3, Schedule II, Footnote #19, the Planning Board may waive the requirement that any subdivision on a lot of record over twenty acres in size comply with the provisions of Article 7 governing Open Space Development. We therefore respectfully request said waiver in order to allow a conventional subdivision with no new roadway.

The granting of the waiver will not be detrimental to the public safety, health or welfare or injurious to other property.

The waiver will not be detrimental to the public as it does not alter the number of units in the subdivision. In addition, the lack of public infrastructure such as roads and stormwater facilities minimizes the long-term maintenance burden on the town and its taxpayers.

The conditions upon which the request for a waiver is based are unique to the property for which the waiver is sought and are not applicable generally to other property.

Although the lot is over twenty-four acres, there are a number of unique qualities that inhibit an Open Space design and instead lend themselves to the conventional frontage lot configuration shown on the plans. The first is the location of abutting Lot 13/1-1 at 98 Beech Hill Road which interrupts the site's continuity. Second is the wetland area along the site's southern western boundary. This wetland features numerous fingers extending east into the site. Where these intersect with the abutting lot, the parcel is effectively cut in half, the two resulting segments each having their own restrictive features. On the northeast corner, there is the existing residence at 100 Beech Hill Road. Given that this structure is in fine shape, the Applicant understandably has no intention of tearing it down. This limits the available remaining land to the point where the two frontage lots shown on

the plan is the only real option for development. On the southeast, the upland area is confined to two narrow strips and one larger area along Beech Hill Road. While it might be possible to cluster a few units there, the slope from Beech Hill makes construction of a code-compliant cul-de-sac impractical without a significant amount of fill and related expense. Furthermore, the resulting grades would require even more fill for lot development as the new road would be many feet above the surrounding ground. The open field behind Lot 13/1-1 would also most likely be developed in this scenario rather than be preserved as intended. For these reasons, it is clear that an open space design is not appropriate for this site.

Because of the physical surroundings, shape or topographical conditions of the specific property involved, a particular hardship to the owner would result, as distinguished from a mere inconvenience, if the strict letter of these regulations are carried out.

Given the above referenced characteristics unique to the property, a conventional subdivision with no road is preferable to an open space layout that would essentially force the Applicant to build a road for the sake of building a road. As the Applicant is not a developer, the requirement to construct infrastructure of this scale would be well beyond their means and would subject them to significant hardship.

The granting of the waiver will not be contrary to the spirit and intent of the ordinance.

Despite the waiver request, the project does meet the purpose of the Open Space Ordinance, specifically where conservation of open space, the efficient use of land and the preservation of natural features are concerned. Although not required by the standard subdivision regulations, 42% of the lot is intended to be preserved as open space where only 30% is required in an Open Space layout. Over 40% of this area is upland, including a section of pasture that allows for a diversity of habitat and viewscape. This combines the best of both worlds where conservation and resource protection goals are met, infrastructure and its long-term maintenance responsibilities are minimized and the Applicant is able to make viable economic use of their land.

The waiver will not, in any manner, vary the provisions of the Zoning Ordinance or Master Plan.

The unit count would remain the same in either a conventional or open space subdivision layout, leaving the provisions of the Ordinance unvaried.

4. We respectfully request a waiver of Subdivision Regulation Section 9.6.1.2 which requires a 100' buffer strip between any proposed lots and the perimeter lot line.

The granting of the waiver will not be detrimental to the public safety, health or welfare or injurious to other property.

This waiver will in no way be detrimental to public health, safety or welfare. The project as designed conforms with the surrounding neighborhood and will comply with all applicable NHDES regulations regarding private septic systems and wells.

The conditions upon which the request for a waiver is based are unique to the property for which the waiver is sought and are not applicable generally to other property.

The need for a 100' buffer is not present given the characteristics of the site. Lots 1 and 2 are located across the street from existing conservation land and their building envelopes are pushed back from Old Town Farm Road due to wetland setbacks. Lot 3 is around an existing house that is intended to remain. Lots 1, 2, 3, 4 and 7 abut the Applicants property at Lot 13/1-11 where extensive buffering is not a concern. The three lots along Beech Hill Road, Lots 4, 5 and 6, will be similar to the surrounding neighborhood which is characterized by similar single-family homes. Finally, the building area on Lot 7 will abut conservation land to the southeast. Taken together, these unique factors make the buffer strip unnecessary for this project.

Because of the physical surroundings, shape or topographical conditions of the specific property involved, a particular hardship to the owner would result, as distinguished from a mere inconvenience, if the strict letter of these regulations are carried out.

Strict enforcement of the buffer rule in this instance would result in the building envelope on Lot 4 to be pushed into the existing field at the center of the property. The result would be a significant reduction in the area of preserved open space currently shown on the plan. This would be a hardship to the applicant in that their intent is to strike a balance between developing their land and preserving as much of it as possible.

The granting of the waiver will not be contrary to the spirit and intent of the ordinance.

The placement of single-family homes in an area surrounded by similar development will not be contrary to the ordinance. This project fits with the neighborhood and will allow for the preservation of open space that will link with other conservations areas.

The waiver will not, in any manner, vary the provisions of the Zoning Ordinance or Master Plan.

The waiver will not vary the provisions of the Ordinance or Master plan in that the required minimum lot sizes and building setbacks remain unchanged and the density is not altered.

Altus hopes that the above information satisfies your concerns. Please call me if you have any questions or need any additional information. Thank you for your time and consideration.

Sincerely,

ALTUS ENGINEERING, INC.

Erik Saari
Vice President

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