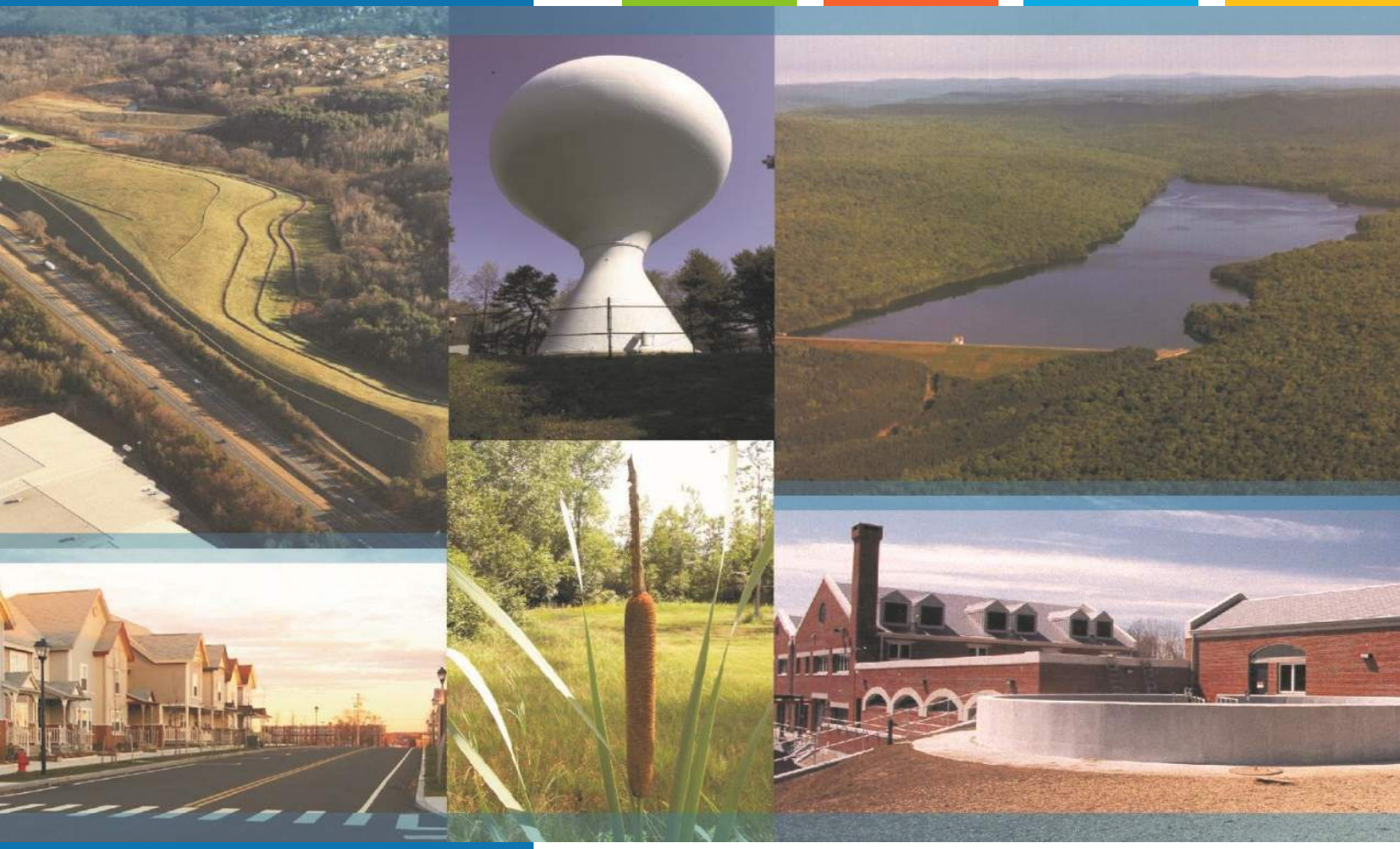

Grand Trunk Trail Continuation
Sturbridge, Massachusetts

NOTICE OF INTENT

Town of Sturbridge

April 2024

Tighe&Bond

S-5052-035
April 23, 2024

Edward Goodwin, Chairman
Sturbridge Conservation Commission
308 Main Street
Sturbridge, MA 01566

Re: **Notice of Intent (NOI)**
Grand Trunk Trail Continuation
Sturbridge, Massachusetts

Dear Chairman Goodwin and Members of the Commission:

On behalf of the Town of Sturbridge (Town; the Applicant), Tighe & Bond, Inc. (Tighe & Bond) is submitting this Notice of Intent (NOI) pursuant to the Massachusetts Wetlands Protection Act (MAWPA; M.G.L. Chapter 131, § 40) and its implementing regulations (310 CMR 10.00) as well as the Town of Sturbridge Wetlands Protection Bylaw (Chapter 286) and its implementing regulations (Chapter 365) for work associated with the Grand Trunk Trail Continuation (the Project) located in the Town of Sturbridge, Worcester County, Massachusetts.

The Town has devoted significant effort to acquire, construct, and maintain a series of trails throughout the natural open spaces within the Town. In an effort to provide safe, shared-use access for recreation and commuting, the Town recently constructed an on-road extension to the Grand Trunk Trail, terminating at the intersection of River Road and Farquhar Road. The Grand Trunk Trail is part of the larger Titanic Rail Trail system, which spans from Franklin to Palmer, Massachusetts.

The proposed Project is a continuation of the Grand Trunk Trail, extending approximately 2,100 feet northwest from Farquhar Road near its intersection with River Road, to Haynes Road. Additionally, the Project will include an approximately 11-car parking lot off of River Road to provide trail access. The proposed activities are described further in the attached NOI narrative.

The Project will require work within the 200-foot Riverfront Area and MAWPA 100-foot Buffer Zone and the Town of Sturbridge 25-Foot No Disturbance Zone, 50-Foot No Structure Zone, and 100-foot and 200-foot Buffer Zones. Additionally, the Project is located within *Estimated Habitats of Rare Wildlife* (EH 656) and *Priority Habitats of Rare Species* (PH 832).

Under Section 286-4 F (*Applications for Permits and Requests for Determination*, published September 2021) of Chapter 286 of the Town of Sturbridge Wetlands Protection Bylaw, the Town requests a waiver for any and all filing fees associated with this application.

We look forward to having the opportunity to discuss this Project with the Commission at their next scheduled public hearing. Should you have any questions or require any additional information, please contact me at (781) 995-3040 or vlocker@tighebond.com or Matt Wzorek at (413) 562-1600 or MPWzorek@tigheBond.com.

Sincerely,

TIGHE & BOND, INC.

Valerie Locker

Val Locker
Project Manager

Enclosures: Notice of Intent – Grand Trunk Trail Continuation (April 2024)

Copy: MassDEP Central Region (CERO) Division of Wetlands and Waterways (*via eDEP*)
NHESP Regulatory Review
Jamie Goodwin, Chair, Board of Selectmen
Charles Blanchard, Chair, Planning Board
Linda Cocalis, Chair, Board of Health
Nelson Burlingame, Building Inspector
Heather Blakeley, PE, Director of DPW

J:\S\S5052 Sturbridge\035 Grand Trunk Trail Continuation\Permitting\MAWPA - ConCom\NOI\GrandTrunk_NOI_1-Cover Letter.docx

Tighe&Bond

CONTENTS

Table of Contents

Section 5 Regulatory Compliance

Appendices

Town of Sturbridge
Conservation Commission
Notice of Intent Application Coversheet/Checklist

Date	4/23/2024

Fill in all white cells completely

Parcel Address Assessors Map/Plat Book & Page	See Property Cards enclosed in Appendix H	**Applicant** name Address Email Phone	Heath Blakeley, PE 301 Main Street Sturbridge, MA 01566 HBlakeley@Sturbridge.gov (508) 347-2515
Owner name Address Email Phone	Town of Sturbridge (easements) See Appendix H	**Representative** Address Email Phone	Val Locker 53 Southampton Road Westfield, MA 01085 vlocker@tighebond.com (781) 995-3040

Wetland type	RFA	**sf/cf affected**	21,758	**Relevant Perf. Standards**	**10.** 58
Wetland type		**sf/cf affected**		**Relevant Perf. Standards**	**10.**
Wetland type		**sf/cf affected**		**Relevant Perf. Standards**	**10.**

Components of a Complete NOI Application

State Form: NOI Form 3	Included? ☒ Yes ☐ No	
Engineered Plan	Included? ☒ Yes ☐ No	
Proof of Mailing to DEP	Included? ☐ Yes ☒ No	Filed via eDEP
Narrative	Included? ☒ Yes ☐ No	
Proof that all relevant perf. standards are met	Included? ☒ Yes ☐ No	
TOPO Map identifying locus with scale	Included? ☒ Yes ☐ No	
FIRM Map identifying locus with scale	Included? ☒ Yes ☐ No	
Natural Heritage Map with WH, PH, & VP data	Included? ☒ Yes ☐ No	Included? ☐
Delineation lines (backup material)	Included? ☒ Yes ☐ No	
Tax Form	Included? ☐ Yes ☒ No	N/A - Municipal project
Fees		
★ Fee Transmittal form	Included? ☒ Yes ☐ No	
★ Filing Fee Worksheet	Included? ☒ Yes ☐ No	
★ Town portion of state filing fee	Included? ☐ Yes ☐ No	N/A - Municipal project
★ Sturbridge local filing fee _$_____	Included? ☐ Yes ☐ No	
Abutter Information		
★ Certified abutters list (within 200')	Included? ☒ Yes ☐ No	
★ Abutter notification form	Included? ☒ Yes ☐ No	
★ Affidavit & proof -- bring to hearing	*Present them at the hearing*	
Other Attachments, e.g.		
Confirmation of submission to NHESP	Included? ☒ Yes ☐ No ☐ Not Applicable	
Planting Plan	Included? ☒ Yes ☐ No ☐ Not Applicable	
Floodplain analysis	Included? ☐ Yes ☒ No ☐ Not Applicable	
Stormwater analysis	Included? ☒ Yes ☐ No ☐ Not Applicable	

Components of a Complete NOI Application

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Sturbridge
City/Town

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.

Note: Before completing this form consult your local Conservation Commission regarding any municipal bylaw or ordinance.

A. General Information

1. Project Location (**Note:** electronic filers will click on button to locate project site):

River Road
a. Street Address

Sturbridge
b. City/Town

01566
c. Zip Code

Latitude and Longitude:

42.09244
d. Latitude

-72.08344
e. Longitude

545
f. Assessors Map/Plat Number

545-03432-009, 545-03432-001, 415-02925-255
g. Parcel /Lot Number

2. Applicant:

Heather
a. First Name

Blakeley
b. Last Name

Town of Sturbridge
c. Organization

308 Main St
d. Street Address

Sturbridge
e. City/Town

MA
f. State

01566
g. Zip Code

508-347-2515
h. Phone Number

i. Fax Number

HBlakeley@sturbridge.gov
j. Email Address

3. Property owner (required if different from applicant): ☐ Check if more than one owner

a. First Name

b. Last Name

c. Organization

d. Street Address

e. City/Town

f. State

g. Zip Code

h. Phone Number

i. Fax Number

j. Email address

4. Representative (if any):

Valerie
a. First Name

Locker
b. Last Name

Tighe & Bond, Inc
c. Company

300 TradeCenter Dr, Suite 5580
d. Street Address

Woburn
e. City/Town

MA
f. State

01801
g. Zip Code

781-995-3040
h. Phone Number

i. Fax Number

vlocker@tighebond.com
j. Email address

5. Total WPA Fee Paid (from NOI Wetland Fee Transmittal Form):

NA - Municipal applicant
a. Total Fee Paid

b. State Fee Paid

c. City/Town Fee Paid

A. General Information (continued)

6. General Project Description:

The proposed Project is a continuation of the Grand Trunk Trail, extending approximately 2,100 feet northwest from Farquhar Road near its intersection with River Road, to Haynes Road. Additionally, the Project will include an approximately 11-car parking lot off of River Road to provide trail access.

7a. Project Type Checklist: (Limited Project Types see Section A. 7b.)

1. ☐ Single Family Home
2. ☐ Residential Subdivision
3. ☐ Commercial/Industrial
4. ☐ Dock/Pier
5. ☐ Utilities
6. ☐ Coastal engineering Structure
7. ☐ Agriculture (e.g., cranberries, forestry)
8. ☐ Transportation
9. ☒ Other

7b. Is any portion of the proposed activity eligible to be treated as a limited project (including Ecological Restoration Limited Project) subject to 310 CMR 10.24 (coastal) or 310 CMR 10.53 (inland)?

1. ☒ Yes ☐ No

If yes, describe which limited project applies to this project. (See 310 CMR 10.24 and 10.53 for a complete list and description of limited project types)

310 CMR 10.53(6) Construction of Bikepaths/Footpaths
2. Limited Project Type

If the proposed activity is eligible to be treated as an Ecological Restoration Limited Project (310 CMR10.24(8), 310 CMR 10.53(4)), complete and attach Appendix A: Ecological Restoration Limited Project Checklist and Signed Certification.

8. Property recorded at the Registry of Deeds for:

Worcester
a. County

b. Certificate # (if registered land)

66307
c. Book

249
d. Page Number

B. Buffer Zone & Resource Area Impacts (temporary & permanent)

1. ☐ Buffer Zone Only – Check if the project is located only in the Buffer Zone of a Bordering Vegetated Wetland, Inland Bank, or Coastal Resource Area.
2. ☒ Inland Resource Areas (see 310 CMR 10.54-10.58; if not applicable, go to Section B.3, Coastal Resource Areas).

Check all that apply below. Attach narrative and any supporting documentation describing how the project will meet all performance standards for each of the resource areas altered, including standards requiring consideration of alternative project design or location.

B. Buffer Zone & Resource Area Impacts (temporary & permanent) (cont'd)

For all projects affecting other Resource Areas, please attach a narrative explaining how the resource area was delineated.

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
a. ☐ Bank	1. linear feet	2. linear feet
b. ☐ Bordering Vegetated Wetland	1. square feet	2. square feet
c. ☐ Land Under Waterbodies and Waterways	1. square feet 3. cubic yards dredged	2. square feet

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
d. ☐ Bordering Land Subject to Flooding	1. square feet 3. cubic feet of flood storage lost	2. square feet 4. cubic feet replaced
e. ☐ Isolated Land Subject to Flooding	1. square feet 2. cubic feet of flood storage lost	3. cubic feet replaced
f. ☒ Riverfront Area	Unnamed perennial tributaries (inland) 1. Name of Waterway (if available) - **specify coastal or inland**	

2. Width of Riverfront Area (check one):

☐ 25 ft. - Designated Densely Developed Areas only

☐ 100 ft. - New agricultural projects only

☒ 200 ft. - All other projects

3. Total area of Riverfront Area on the site of the proposed project: 3,786,379 square feet

4. Proposed alteration of the Riverfront Area:

a. total square feet	b. square feet within 100 ft.	c. square feet between 100 ft. and 200 ft.
21,758	10,158	11,600

5. Has an alternatives analysis been done and is it attached to this NOI? ☒ Yes ☐ No

6. Was the lot where the activity is proposed created prior to August 1, 1996? ☒ Yes ☐ No

3. ☐ Coastal Resource Areas: (See 310 CMR 10.25-10.35)

Note: for coastal riverfront areas, please complete **Section B.2.f**. above.

B. Buffer Zone & Resource Area Impacts (temporary & permanent) (cont'd)

Check all that apply below. Attach narrative and supporting documentation describing how the project will meet all performance standards for each of the resource areas altered, including standards requiring consideration of alternative project design or location.

Online Users: Include your document transaction number (provided on your receipt page) with all supplementary information you submit to the Department.

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
a. ☐ Designated Port Areas	Indicate size under Land Under the Ocean, below	
b. ☐ Land Under the Ocean	1. square feet 2. cubic yards dredged	
c. ☐ Barrier Beach	Indicate size under Coastal Beaches and/or Coastal Dunes below	
d. ☐ Coastal Beaches	1. square feet	2. cubic yards beach nourishment
e. ☐ Coastal Dunes	1. square feet	2. cubic yards dune nourishment

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
f. ☐ Coastal Banks	1. linear feet	
g. ☐ Rocky Intertidal Shores	1. square feet	
h. ☐ Salt Marshes	1. square feet	2. sq ft restoration, rehab., creation
i. ☐ Land Under Salt Ponds	1. square feet 2. cubic yards dredged	
j. ☐ Land Containing Shellfish	1. square feet	
k. ☐ Fish Runs	Indicate size under Coastal Banks, inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above 1. cubic yards dredged	
l. ☐ Land Subject to Coastal Storm Flowage	1. square feet	

4. ☐ Restoration/Enhancement
If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.2.b or B.3.h above, please enter the additional amount here.

a. square feet of BVW | b. square feet of Salt Marsh

5. ☐ Project Involves Stream Crossings

a. number of new stream crossings | b. number of replacement stream crossings

C. Other Applicable Standards and Requirements

☐ This is a proposal for an Ecological Restoration Limited Project. Skip Section C and complete Appendix A: Ecological Restoration Limited Project Checklists – Required Actions (310 CMR 10.11).

Streamlined Massachusetts Endangered Species Act/Wetlands Protection Act Review

1. Is any portion of the proposed project located in **Estimated Habitat of Rare Wildlife** as indicated on the most recent Estimated Habitat Map of State-Listed Rare Wetland Wildlife published by the Natural Heritage and Endangered Species Program (NHESP)? To view habitat maps, see the *Massachusetts Natural Heritage Atlas* or go to http://maps.massgis.state.ma.us/PRI_EST_HAB/viewer.htm.

   a. ☒ Yes ☐ No

   If yes, include proof of mailing or hand delivery of NOI to:

   Natural Heritage and Endangered Species Program
   Division of Fisheries and Wildlife
   1 Rabbit Hill Road
   Westborough, MA 01581

   August 2021
   b. Date of map

   If *yes*, the project is also subject to Massachusetts Endangered Species Act (MESA) review (321 CMR 10.18). To qualify for a streamlined, 30-day, MESA/Wetlands Protection Act review, please complete Section C.1.c, and include requested materials with this Notice of Intent (NOI); *OR* complete Section C.2.f, if applicable. *If MESA supplemental information is not included with the NOI, by completing Section 1 of this form, the NHESP will require a separate MESA filing which may take up to 90 days to review (unless noted exceptions in Section 2 apply, see below).*

   c. Submit Supplemental Information for Endangered Species Review*

      1. ☒ Percentage/acreage of property to be altered:

         (a) within wetland Resource Area — 0.003% / 0.50 ac (percentage/acreage)

         (b) outside Resource Area — 0.006% / 0.90 ac (percentage/acreage)

      2. ☒ Assessor's Map or right-of-way plan of site

2. ☒ Project plans for entire project site, including wetland resource areas and areas outside of wetlands jurisdiction, showing existing and proposed conditions, existing and proposed tree/vegetation clearing line, and clearly demarcated limits of work **

   (a) ☒ Project description (including description of impacts outside of wetland resource area & buffer zone)

   (b) ☒ Photographs representative of the site

* Some projects **not** in Estimated Habitat may be located in Priority Habitat, and require NHESP review (see https://www.mass.gov/ma-endangered-species-act-mesa-regulatory-review).
Priority Habitat includes habitat for state-listed plants and strictly upland species not protected by the Wetlands Protection Act.

** MESA projects may not be segmented (321 CMR 10.16). The applicant must disclose full development plans even if such plans are not required as part of the Notice of Intent process.

C. Other Applicable Standards and Requirements (cont'd)

(c) ☒ MESA filing fee (fee information available at https://www.mass.gov/how-to/how-to-file-for-a-mesa-project-review).
Make check payable to "Commonwealth of Massachusetts - NHESP" and ***mail to NHESP*** at above address

*Projects altering **10 or more acres** of land, also submit:*

(d) ☐ Vegetation cover type map of site

(e) ☐ Project plans showing Priority & Estimated Habitat boundaries

(f) OR Check One of the Following

1. ☐ Project is exempt from MESA review.
Attach applicant letter indicating which MESA exemption applies. (See 321 CMR 10.14, https://www.mass.gov/service-details/exemptions-from-review-for-projectsactivities-in-priority-habitat; the NOI must still be sent to NHESP if the project is within estimated habitat pursuant to 310 CMR 10.37 and 10.59.)

2. ☐ Separate MESA review ongoing. a. NHESP Tracking # b. Date submitted to NHESP

3. ☐ Separate MESA review completed.
Include copy of NHESP "no Take" determination or valid Conservation & Management Permit with approved plan.

3. For coastal projects only, is any portion of the proposed project located below the mean high water line or in a fish run?

a. ☒ Not applicable – project is in inland resource area only b. ☐ Yes ☐ No

If yes, include proof of mailing, hand delivery, or electronic delivery of NOI to either:

South Shore - Cohasset to Rhode Island border, and the Cape & Islands:

Division of Marine Fisheries -
Southeast Marine Fisheries Station
Attn: Environmental Reviewer
836 South Rodney French Blvd.
New Bedford, MA 02744
Email: dmf.envreview-south@mass.gov

North Shore - Hull to New Hampshire border:

Division of Marine Fisheries -
North Shore Office
Attn: Environmental Reviewer
30 Emerson Avenue
Gloucester, MA 01930
Email: dmf.envreview-north@mass.gov

Also if yes, the project may require a Chapter 91 license. For coastal towns in the Northeast Region, please contact MassDEP's Boston Office. For coastal towns in the Southeast Region, please contact MassDEP's Southeast Regional Office.

c. ☐ Is this an aquaculture project? d. ☐ Yes ☒ No

If yes, include a copy of the Division of Marine Fisheries Certification Letter (M.G.L. c. 130, § 57).

C. Other Applicable Standards and Requirements (cont'd)

Online Users: Include your document transaction number (provided on your receipt page) with all supplementary information you submit to the Department.

4. Is any portion of the proposed project within an Area of Critical Environmental Concern (ACEC)?

   a. ☐ Yes ☒ No If yes, provide name of ACEC (see instructions to WPA Form 3 or MassDEP Website for ACEC locations). **Note:** electronic filers click on Website.

   b. ACEC

5. Is any portion of the proposed project within an area designated as an Outstanding Resource Water (ORW) as designated in the Massachusetts Surface Water Quality Standards, 314 CMR 4.00?

   a. ☐ Yes ☒ No

6. Is any portion of the site subject to a Wetlands Restriction Order under the Inland Wetlands Restriction Act (M.G.L. c. 131, § 40A) or the Coastal Wetlands Restriction Act (M.G.L. c. 130, § 105)?

   a. ☐ Yes ☒ No

7. Is this project subject to provisions of the MassDEP Stormwater Management Standards?

   a. ☒ Yes. Attach a copy of the Stormwater Report as required by the Stormwater Management Standards per 310 CMR 10.05(6)(k)-(q) and check if:

      1. ☐ Applying for Low Impact Development (LID) site design credits (as described in Stormwater Management Handbook Vol. 2, Chapter 3)

      2. ☐ A portion of the site constitutes redevelopment

      3. ☐ Proprietary BMPs are included in the Stormwater Management System.

   b. ☐ No. Check why the project is exempt:

      1. ☐ Single-family house

      2. ☐ Emergency road repair

      3. ☐ Small Residential Subdivision (less than or equal to 4 single-family houses or less than or equal to 4 units in multi-family housing project) with no discharge to Critical Areas.

D. Additional Information

☐ This is a proposal for an Ecological Restoration Limited Project. Skip Section D and complete Appendix A: Ecological Restoration Notice of Intent – Minimum Required Documents (310 CMR 10.12).

Applicants must include the following with this Notice of Intent (NOI). See instructions for details.

Online Users: Attach the document transaction number (provided on your receipt page) for any of the following information you submit to the Department.

1. ☒ USGS or other map of the area (along with a narrative description, if necessary) containing sufficient information for the Conservation Commission and the Department to locate the site. (Electronic filers may omit this item.)

2. ☒ Plans identifying the location of proposed activities (including activities proposed to serve as a Bordering Vegetated Wetland [BVW] replication area or other mitigating measure) relative to the boundaries of each affected resource area.

D. Additional Information (cont'd)

3. ☒ Identify the method for BVW and other resource area boundary delineations (MassDEP BVW Field Data Form(s), Determination of Applicability, Order of Resource Area Delineation, etc.), and attach documentation of the methodology.

4. ☒ List the titles and dates for all plans and other materials submitted with this NOI.

Grand Trunk Trail Continuation
a. Plan Title

Tighe & Bond, Inc.
b. Prepared By

Matthew Wzorek, PE
c. Signed and Stamped by

4/22/2024
d. Final Revision Date

Various
e. Scale

Appendix A, Figures 1-4
f. Additional Plan or Document Title

Various
g. Date

5. ☐ If there is more than one property owner, please attach a list of these property owners not listed on this form.

6. ☒ Attach proof of mailing for Natural Heritage and Endangered Species Program, if needed.

7. ☐ Attach proof of mailing for Massachusetts Division of Marine Fisheries, if needed.

8. ☒ Attach NOI Wetland Fee Transmittal Form

9. ☒ Attach Stormwater Report, if needed.

E. Fees

1. ☒ Fee Exempt: No filing fee shall be assessed for projects of any city, town, county, or district of the Commonwealth, federally recognized Indian tribe housing authority, municipal housing authority, or the Massachusetts Bay Transportation Authority.

Applicants must submit the following information (in addition to pages 1 and 2 of the NOI Wetland Fee Transmittal Form) to confirm fee payment:

2. Municipal Check Number

3. Check date

4. State Check Number

5. Check date

6. Payor name on check: First Name

7. Payor name on check: Last Name

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
MassDEP File Number
Document Transaction Number
Sturbridge
City/Town

F. Signatures and Submittal Requirements

I hereby certify under the penalties of perjury that the foregoing Notice of Intent and accompanying plans, documents, and supporting data are true and complete to the best of my knowledge. I understand that the Conservation Commission will place notification of this Notice in a local newspaper at the expense of the applicant in accordance with the wetlands regulations, 310 CMR 10.05(5)(a).

I further certify under penalties of perjury that all abutters were notified of this application, pursuant to the requirements of M.G.L. c. 131, § 40. Notice must be made by Certificate of Mailing or in writing by hand delivery or certified mail (return receipt requested) to all abutters within 100 feet of the property line of the project location.

1. Signature of Applicant	2. Date: 4/22/24
3. Signature of Property Owner (if different)	4. Date
5. Signature of Representative (if any): Valerie Locker	6. Date: 4/23/2024

For Conservation Commission:
Two copies of the completed Notice of Intent (Form 3), including supporting plans and documents, two copies of the NOI Wetland Fee Transmittal Form, and the city/town fee payment, to the Conservation Commission by certified mail or hand delivery.

For MassDEP:
One copy of the completed Notice of Intent (Form 3), including supporting plans and documents, one copy of the NOI Wetland Fee Transmittal Form, and a **copy** of the state fee payment to the MassDEP Regional Office (see Instructions) by certified mail or hand delivery.

Other:
If the applicant has checked the "yes" box in any part of Section C, Item 3, above, refer to that section and the Instructions for additional submittal requirements.

The original and copies must be sent simultaneously. Failure by the applicant to send copies in a timely manner may result in dismissal of the Notice of Intent.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

NOI Wetland Fee Transmittal Form

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.

A. Applicant Information

1. Location of Project:

River Road	Sturbridge
a. Street Address	b. City/Town
NA / municipal project	$0
c. Check number	d. Fee amount

2. Applicant Mailing Address:

Heather		Blakeley	
a. First Name		b. Last Name	
Town of Sturbridge			
c. Organization			
308 Main St			
d. Mailing Address			
Sturbridge	MA	01566	
e. City/Town	f. State	g. Zip Code	
508-347-2515		HBlakeley@sturbridge.gov	
h. Phone Number	i. Fax Number	j. Email Address	

3. Property Owner (if different):

a. First Name		b. Last Name	
c. Organization			
d. Mailing Address			
e. City/Town	f. State	g. Zip Code	
h. Phone Number	i. Fax Number	j. Email Address	

B. Fees

To calculate filing fees, refer to the category fee list and examples in the instructions for filling out WPA Form 3 (Notice of Intent).

Fee should be calculated using the following process & worksheet. ***Please see Instructions before filling out worksheet.***

Step 1/Type of Activity: Describe each type of activity that will occur in wetland resource area and buffer zone.

Step 2/Number of Activities: Identify the number of each type of activity.

Step 3/Individual Activity Fee: Identify each activity fee from the six project categories listed in the instructions.

Step 4/Subtotal Activity Fee: Multiply the number of activities (identified in Step 2) times the fee per category (identified in Step 3) to reach a subtotal fee amount. Note: If any of these activities are in a Riverfront Area in addition to another Resource Area or the Buffer Zone, the fee per activity should be multiplied by 1.5 and then added to the subtotal amount.

Step 5/Total Project Fee: Determine the total project fee by adding the subtotal amounts from Step 4.

Step 6/Fee Payments: To calculate the state share of the fee, divide the total fee in half and subtract $12.50. To calculate the city/town share of the fee, divide the total fee in half and add $12.50.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

NOI Wetland Fee Transmittal Form

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

B. Fees (continued)

Step 1/Type of Activity	Step 2/Number of Activities	Step 3/Individual Activity Fee	Step 4/Subtotal Activity Fee

Step 5/Total Project Fee: _____

Step 6/Fee Payments:

Total Project Fee: _____ a. Total Fee from Step 5

State share of filing Fee: _____ b. 1/2 Total Fee **less $**12.50

City/Town share of filling Fee: _____ c. 1/2 Total Fee **plus** $12.50

C. Submittal Requirements

a.) Complete pages 1 and 2 and send with a check or money order for the state share of the fee, payable to the Commonwealth of Massachusetts.

Department of Environmental Protection
Box 4062
Boston, MA 02211

b.) **To the Conservation Commission:** Send the Notice of Intent or Abbreviated Notice of Intent; a **copy** of this form; and the city/town fee payment.

To MassDEP Regional Office (see Instructions): Send a copy of the Notice of Intent or Abbreviated Notice of Intent; a **copy** of this form; and a **copy** of the state fee payment. (E-filers of Notices of Intent may submit these electronically.)

STURBRIDGE WETLANDS PROTECTION BY-LAW AND REGULATIONS

WETLANDS FILING FEE CALCULATION WORSHEET

Application Type	Qty	Town Filing Fee	TOTAL
Notice of Intent (NOI):			
Residential – Single Family:			
Accessory (Deck, Shed, Pool Septic)	____	$150	_____
Shoreline Work	____	$150	_____
New Construction	____	$300	_____
Residential – Other:			
Subdivision/Multi-Unit	____	$750	_____
Commercial/Industrial:			
New	____	$1500	_____
Redevelopment	____	$1000	_____
Limited Project (as defined in SWB & WPA)	____	Equal to full WPA fee	_____
Alterations – located within Riverfront Area	____	Additional 50% of Fee	_____
Application filed after Enforcement Order		Double the Municipal fee	_____
Request for Amended Order of Conditions	____	50% of initial fee	_____
Request for Determination of Applicability (RDA:			
No Wetland Boundary Confirmation Residential:	____	$100	_____
No Wetland Boundary Confirmation All Other:	____	$200	_____
For Wetland Boundary Confirmation **File ANRAD or NOI**			
Abbreviated Notice of Resource Area Delineation (ANRAD):			
Residential – Single Family:	_____	$100	_____
All Other: **Base Review**	_____	$300	_____
Resource Area Boundary			

Certificate of Compliance (COC):			
Residential:			
Single Family	____	$50	_____
Subdivision or Multi-Unit	____	$150	_____
Commercial or Industrial:	____	$150	_____
If Order of Conditions has Expired	____	Add an additional $150	_____
OOC Extension Request	____	$50	_____
Emergency Certification	_____	$50	_____
(NOI may be required to be filed following issuance of Emergency Cert)			

Local Bylaw Fee (includes Town Filing Fee) **$** _____

State Filing Fee (from DEP Wetland Transmittal Form) **$** _____

Total Payable to "Town of STURBRIDGE" **$** _____

*Additional Consultant Fee may be required for reasons which may include:

- Significant amount of wetland impact;
- Extensive resource areas on a site;
- Lack of information supplied;
- Incomplete plans, reports, forms submitted;
- Supplemental information submitted.

Under Section 286-4 F (Applications for Permits and Requests for Determination, published September 2021) of Chapter 286 of the Town of Sturbridge Wetlands Protection Bylaw the Town requests a waiver for any and all filing fees associated with this application.

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SECTION 1

Section 1
Introduction

1.1 Project Background and Purpose

The Town has devoted significant effort to acquire, construct, and maintain a series of trails throughout the natural open spaces within the Town. In an effort to provide safe, shared-use access for recreation and commuting, the Town recently constructed an on-road extension to the Grand Trunk Trail, terminating at the intersection of River Road and Farquhar Road. The Grand Trunk Trail repurposes the original Grant Trunk Rail bed and is part of the larger Titanic Rail Trail system, which spans from Franklin to Palmer, Massachusetts. Clearing and grading for the segment of the Grand Trunk Rail within Sturbridge was completed in the early 1900s, but the rail was never fully constructed or operated.

The proposed Project is a continuation of the Grand Trunk Trail, a multi-use recreational path extending approximately 2,100 feet northwest from Farquhar Road near its intersection with River Road, to Haynes Road. Additionally, the Project includes the construction of an approximately 11-car parking lot off of River Road to provide trail access. Through future projects, the Town intends to continue to extend the trail north, eventually connecting to the existing Riverlands Trail at 52 Stallion Hill Road.

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SECTION 2

Section 2
Existing Environment

This section provides a description of the Project Site and surrounding area, as well as information pertaining to wetland resource areas and rare species. Land use in the general vicinity of the Project was determined based on direct observations made during site inspections and a review of information available through the Massachusetts Geographic Information System (MassGIS).

2.1 Project Locus

The Project Locus, as that term is defined at 310 CMR 10.04, includes three parcels (No. 415-02925-255, 545-03432-001, and 545-03432-009), along the northeast side of River Road between Farquhar Road to Haynes Street (Route 15). The parcels are predominantly composed of forested areas, an existing cleared and maintained utility easement with overhead electric lines, a dog boarding/daycare facility at the corner of Haynes Street and River Road, and the original Grand Trunk Rail bed. The railbed is mostly clear of woody vegetation, with shrubs and saplings colonizing the right-of-way edges and a clear central path varying in width from approximately five to ten feet throughout the Project Locus. Parcel No. 415-02925-255 is owned by the U.S. Army Corps of Engineers (USACE) and is part of the Westville Lake Recreation Area.

In addition to the Recreation Area, adjacent land uses include low-density residential properties, undeveloped/open land south of River Road, and an RV resort at the intersection of River Road and Farquhar Road.

The Project Locus is depicted on figures provided in Appendix A.

2.2 Project Site

The Project Site, or Limits of Work (LOW), includes approximately 1.4 acres within the Project Locus. For approximately 1,200 feet, the proposed trail will run within the existing maintained overhead electric utility easement. The remaining 900 feet of proposed trail will be installed along a portion of the original railbed that passes through upland forest and through an abandoned residential property and driveway at the western terminus on Haynes Street. The parking area (including infiltration basin) and connector path will be installed within upland forested areas.

The LOW are depicted on the Project Drawings in Appendix B. Representative site photographs are provided in Appendix C.

2.3 Methodology of Resource Area Investigations

On February 10, 2023, EcoTec, Inc. (EcoTec), conducted field investigations for the presence of wetland resource areas as defined by: (1) the Massachusetts Wetlands Protection Act (MAWPA, M.G.L. Ch. 131, § 40) and its implementing regulations (310 CMR 10.00 *et seq.*); (2) the Town of Sturbridge Wetlands Protection Bylaw (Chapter 286) and its implementing regulations (Chapter 365); and (3) the U.S. Clean Water Act (i.e.,

Section 404 and 401 wetlands). The EcoTec Wetland Resource Evaluation is enclosed as Appendix D.

The boundaries of Band and Bordering Vegetated Wetlands (BVW) were delineated in accordance with the definitions set forth in the regulations at 310 CMR 10.55(2)(c) and 310 CMR 10.54(2). Federal wetlands were presumed to have boundaries conterminous with the delineated BVWs and Bank. Resource area boundaries are depicted on Project Drawings in Appendix B.

2.4 Summary of Jurisdictional Wetland Resource Areas

The following wetland resource areas identified within the Project Site and immediate vicinity and are subject to jurisdiction under the MAWPA and its implementing regulations:

- Bank (Inland)
- Bordering Vegetated Wetlands (BVW)
- Land Under Waterbodies and Waterways (LUWW)
- Bordering Land Subject to Flooding (BLSF)
- Riverfront Area

A summary of delineated resource areas by flag series is presented in Table 2-1.

TABLE 2-1
Summary of Wetland Resource Areas by Flag Series

Flag Series	Flag Numbers	Resource Area Description
AA	AA1 through AA6[1] (AA1 and AA2 connect to culvert)	Boundary of BVW/Top of Bank located in the northwestern portion of the site that is associated with a mapped perennial stream.
AB	AB1 to AB8[1]	Boundary of BVW/Top of Bank located in the northwestern portion of the site that is associated with a mapped perennial stream.
AR	AR1 to AR13[1] (AR1, AR2, and AR3 connect to culverts)	Mean Annual High-water Line (MAHWL) of the mapped perennial stream located in the northern portion of the site.
BA	BA1 to BA41[1] (BA6 and BA7 connect to culvert)	Boundary of BVW/Top of Bank located in the eastern portion of the site that is associated with mapped ponds.
RA	RA1 to RA10[2] (RA1 and RA10 connect to culvert)	Mean Annual High-water Line (MAHWL) of the south side of the mapped perennial stream located in the southern portion of the site.
RB	RB1 to RB10[2] (RB1 and RB10 connect to culvert)	Mean Annual High-water Line (MAHWL) of the north side of the mapped perennial stream located in the southern portion of the site.

[1] Resource area continues beyond the flags placed in the field
[2] Flag series RA and RA depict the MAHWL on the south and north sides, respectively, of one perennial stream located at the southern terminus of the site

2.4.1 Bank (Inland)

Inland Bank is defined at 310 CMR 10.54(2) as "the portion of the land surface which normally abuts and confines a water body." Inland Bank is present within the Project Site and includes the banks of the perennial streams and bordering vegetated wetlands, describe further in sections 2.4.2 and 2.4.3 below.

2.4.2 Bordering Vegetated Wetlands (BVW)

BVW are areas which border on creeks, rivers, streams, ponds, and lakes, with soil saturation such that wetland indicator plants can be supported. The boundary of a BVW is defined by 310 CMR 10.55(2)(a) as the presence of 50% or more wetland indicator plants and where saturated or inundated conditions exist. The following BVW systems were delineated within and within the vicinity of the Project Site:

- **Wetlands AA and AB:** The flag series for Wetlands AA and AB consist of the upper boundary of Inland Bank and a wooded swamp, located in the northwestern portion of the site that is associated with a mapped perennial stream (flag series AR1 to AR13). As these vegetated wetlands border a perennial stream, they would be regulated as BVW and the perennial stream would be regulated as Inland Bank and LUWW under the MAWPA and Bylaw.
- **Wetland BA:** The flag series for Wetland BA consists of the upper boundary of Inland Bank with a fringe of wooded swamp located in the eastern portion of the site that is associated with ponds. This vegetated wetland borders a pond; accordingly, the vegetated wetland would be regulated as BVW and the pond would be regulated as Inland Bank and LUWW under the MAWPA and Bylaw.

2.4.3 Land Under Water Bodies and Waterways (LUWW)

As defined at 310 CMR 10.56(2), LUWW is the land beneath any creek, river, stream, pond, or lake. Said land may be composed of organic muck or peat, fine sediments, rocks, or bedrock. LUWW within the Project Site includes land within the delineated Mean Annual High-water Line (MAHWL) of the two perennial streams demarcated by flag series AR1-AR13 and RA1-RA10/RB1-RB10.

2.4.4 Bordering Land Subject to Flooding (BLSF)

Bordering Land Subject to Flooding (BLSF) is defined at 310 CMR 10.57(2)(a) as the estimated maximum lateral extent of flood water which will theoretically result from the statistical 100-year frequency storm. The boundary shall be determined by reference to the most recently available flood profile data prepared for the community under the National Flood Insurance Program (NFIP) and said boundary shall be presumed accurate.

The Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map (FIRM) Panel Numbers 25027C0927F and 25027C0929F, effective June 21, 2023, depict Zone A (1% annual chance of flooding) with an unspecified flood elevation associated with the ponds abutting the site. The floodplain is depicted as BLSF on Project Drawings in Appendix B.

2.4.5 Riverfront Area

Riverfront Area is defined at 310 CMR 10.58(2)(a) as the area of land between a river's mean annual high water (MAHW) line and a parallel line measured horizontally 200 feet

away. The Riverfront Area does not have a buffer zone but may overlap with other resource areas or their buffer zones.

The Mean Annual High-water (MAHW) Line of a river is defined at 310 CMR 10.58(2)(a)(2) as "the line that is apparent from visible markings or changes in the character of soils or vegetation due to the prolonged presence of water and that distinguishes between predominantly aquatic and predominantly terrestrial land."

The two delineated streams are depicted as unnamed perennial streams on the most current USGS 7.5-Minute topographic map, Southbridge Quadrangle and are therefore afforded a 200-foot Riverfront Area per 310 CMR 10.58. Riverfront Area associated with the southern stream consists mainly of maintained utility ROW within the Project Site. Riverfront Area associated with the northern stream includes BVW (Wetland series AA and AB) and consists mainly of undeveloped upland woods.

There are approximately 3,786,379 sf (143.59 acres) of Riverfront Area within the Project Locus. Portions of the Riverfront Area have been previously developed from clearing and grading of the existing railbed as well as for construction and maintenance of the overhead electric utility easement. The delineated perennial streams cross beneath the railbed via existing culverts.

2.5 Rare Species

An information request was submitted to the Massachusetts Natural Heritage and Endangered Species Program (NHESP) to determine the extent and type of state-listed protected species within the proposed Project extent. Eastern portions of the Project Site are mapped within areas identified as Priority Habitat for Rare Species (PH 832) and Estimated Habitat for Rare Wildlife (EH 656). No Certified or Potential Vernal Pools are located within or adjacent to the Project Site. A figure illustrating the extent of Priority and Estimated Habitat is provided as Figure 3 in Appendix A.

NHESP identified the wood turtle (*Glyptemys insculpta*), a state species of special concern, at or near the Project Site based on the NHESP data request response ID No. IR-82976, dated January 22, 2024 (Appendix E).

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SECTION 3

Section 3
Project Description

3.1 Proposed Activities

The Project will involve construction of: an approximately 2,100-foot-long shared-use trail, extending from Farquhar Road to Haynes Street, running roughly parallel to River Road along the original Grand Trunk Rail bed; an 11-car parking area located off of River Road, one of which is an accessible parking space; and an approximately 140-foot-long gravel connector path between the parking lot and the shared-use trail. The parking area will also include a permanent infiltration basin for stormwater management.

The shared use trail will conform to Massachusetts Shared Use Path standards, be approximately 14 feet wide within a 20-foot easement, and be composed of gravel. Construction activities associated with the Project will have a LOW of approximately 1.4 acres inclusive of access, staging/laydown, and earthwork.

3.1.1 Sequence of Construction Activities

The specific sequence of construction will be left to the discretion of the contractor but is expected to generally include the following:

1. Install erosion and sediment control and wildlife exclusion barriers as needed (see Section 3.2.1 for additional information).
2. Construction stabilized construction entrances at each of the access locations to the LOW: the existing driveway entrance on Haynes Street, the existing utility easement off of Farquhar Road, and directly from River Road for the parking area.
3. Conduct tree clearing, grubbing, and grading as necessary to accommodate the proposed shared-use trail, and parking area.
4. Strip native material from trail and parking area in preparation for placement of gravel sub-base.
5. Pour concrete pad for handicap parking.
6. Spread and compact the gravel trail and parking lot.
7. Place loam in disturbed areas adjacent to the trail and parking lot.
8. Install permanent stormwater features such as swales and infiltration basin.
9. Install site furnishings.
10. Seed and mulch all disturbed areas (see Section 3.2.5 for additional information).

3.1.2 Stormwater Management

Construction of the multi-use path is not explicitly exempt from the Massachusetts Stormwater Standards, however "Footpaths, bikepaths and other paths for pedestrian and/or nonmotorized vehicle access" are held to the Standards to the "maximum extent practicable" per Volume 1 Chapter 1 of the Massachusetts Stormwater Handbook and 310 CMR 10.05(6)(m)(6). In addition, the July 29, 2016 Recommended Final Decision in the Matter of Berkshire Community College Docket #WET-2015-023, reaffirms that 310 CMR

10.05(6)(k) through (q) do not apply to a project that does not propose a "point source" or "stormwater discharge" within resource areas or their Buffer Zones, therefore satisfying the Standard. Further discussion of the individual Stormwater Standards 1 through 10 in relation to the shared-use trail is included within the Stormwater Report in Appendix F

Under proposed conditions, stormwater runoff from the parking area flows to the east, toward two sediment forebays proposed in series. Stormwater runoff will receive pretreatment total suspended solids removal upon entering the forebays, after which it will enter the proposed infiltration basin for treatment and infiltration. The proposed path has been designed to sheet flow runoff and is pitched in the same direction as the existing topography. The stormwater design was prepared in accordance with the recommendations in the Massachusetts Stormwater Handbook and the Stormwater Report is included as Appendix F.

3.2 Construction Period BMPs

The following Best Management Practices (BMPs) will be implemented during construction to minimize the potential for erosion and sedimentation to downgradient wetland resource areas. Typical erosion control details are indicated on the Project Drawings in Appendix B and are described in detail within the Construction Period Soil Erosion and Sediment Control Plan included as Appendix E within the Stormwater Report provided as Appendix F of this NOI.

3.2.1 Erosion Control Barriers

Wetland resource areas near the proposed Project Site will be protected with erosion control barriers prior to the start of any earth disturbing activities. The erosion control barriers will consist of straw wattles or mulch-filled tubes (e.g., compost filter tubes/socks) and siltation fencing placed in a fashion that restricts the contractor(s) to the areas necessary to conduct the work and will generally define the limits of work. The applicant anticipates that erosion control barriers will function as turtle exclusion barriers (see Section 5.5.2 for additional information). In addition:

- The contractor will be required to maintain a reserve supply of erosion control barriers on-site to make repairs, as necessary.
- Perimeter control will be inspected immediately after each rainfall and at least daily during prolonged rainfall. They will be repaired if there are any signs of erosion or sedimentation below them, any repairs will be made immediately. If there are signs of undercutting at the center or the edges, or impounding of large volumes of water behind them, sediment barriers shall be replaced with a temporary check dam.

Upon conclusion of the Project, the erosion control barriers will be removed and properly disposed of off-site following the stabilization of disturbed areas.

3.2.2 Sediment Track-Out

A stone aggregate tracking pad with an underlying geotextile fabric and street sweeping measures shall be used as necessary to minimize the track-out of sediment onto adjacent streets from vehicles exiting the construction site.

3.2.3 Soil Stockpile Management

Excavated materials will be stockpiled and managed within the protected work areas. for eventual reuse on-site and/or off-site disposal. Temporary soil stockpiles will be surrounded by hay bales or silt fence and will be stabilized by covering or temporary erosion control seeding. Stockpiles will be located as far as possible from any surface water and downgradient perimeter areas will be surrounded by erosion control barriers, as necessary.

3.2.4 Excavation Dewatering

Dewatering is not anticipated for this Project. However, if needed during construction standard dewatering measures will be employed. No untreated groundwater will be discharged to wetlands or waterways. Excess water will be discharged overland in upland areas and allowed to naturally infiltrate in well-drained soils or discharged to wetlands or streams only after passing through filtration sacks or similar devices.

3.2.5 Sediment Traps

Temporary sediment basins or sediment traps may be used during construction to retain runoff and settle out particles prior to discharge from disturbed areas. Sediments will be periodically removed and disposed off in an appropriate location. If used, sediment traps will be restored post-construction.

3.2.6 Site Stabilization

Upon completion of work, disturbed areas will be loamed, seeded, and mulched. Where slopes greater than 3:1 will be created, synthetic erosion control fabric will be utilized. Erosion and sedimentation control measures will remain in place and in good working condition until final surface treatments are in place and/or until permanent vegetation is established.

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SECTION 4

Section 4
Alternatives Analysis

The Town has considered a number of alternatives related to different components of the proposed Project, including route location for the shared-use trail, parking area location, and parking area configuration. These alternatives are described below.

4.1 No Build

The No Build alternative would not construct a continuation trail segment to extend the existing Grand Trunk Trail. This alternative would not meet the Project purpose of expanding safe, shared-use access for recreation and commuting through the Town's natural open spaces. As such, the No Build alternative is not a preferred alternative.

4.2 Alternative Trail Routes

The trail proposed for this Project is part of a planned trail system that will span the Town of Sturbridge, connecting to trails in the Towns of Brimfield and Southbridge. This segment of the trail must connect to the end of an existing on-road trail segment near the intersection of River Road and Farquhar Road and terminate near the intersection of River Road and Route 15 (Haynes Street). This will allow for a future trail segment that will utilize the existing sidewalks along the Interstate 84 overpass to connect trail systems on either side of Interstate 84.

Several alternative trail routes were considered for this segment of the overall trail system as part of a 2020 feasibility study performed by Morse Engineering and Construction Industries, LLC (Morse Engineering). Four potential routes were considered before the proposed route was ultimately selected. These potential routes are depicted on the GTT Central Section 1 Locality Map enclosed in Appendix A; this figure was extracted from the 2020 feasibility study.

4.2.1 Route Along Parcel 545-0432-009 Boundary

Alternative Segment 1A, shown in red, followed the eastern boundary of parcel 545-0432-009 to the point where it reaches Haynes Street. There it would follow Haynes Street to the River Road intersection. This alternative would cause significantly more ecological disturbance as it would require clearing of the majority of the trail route rather than following the existing railbed. A larger portion of the route would also be located within BLSF, wetland buffer zones, and the US Army Corps Perpetual Flowage Easement. For these reasons this Alternative was not selected.

4.2.2 Route Along Existing Utility Easement

Alternative Segments 1B and 1D, shown in purple and brown respectively, followed the existing railbed for the extent that it coincides with the existing electrical easement. Where the railbed and electrical easement separate, Alternative Segment 1B would branch to the east, where the remainder of its route would follow Segment 1A along the eastern boundary of the parcel. At the same location, Alternative Segment 1B would branch to the West, where it would connect to River Road and run north to the Haynes Street

intersection. Similarly to Alternative Segment 1A, Alternative Segments 1B and 1D would also include more disturbances and work within wetland resource areas.

4.2.3 Route Along River Road

Alternative Segment 1C, shown in green, shows the trail running along the north side of River Road instead of along the existing railbed through the subject parcels. As noted by Morse Engineering, this route is not desirable due to the relatively narrow road ROW and steep shoulders. Development of a trail along River Road would require significant efforts to widen the ROW or secure easements from private property owners.

4.2.4 Route Along Existing Railbed – Preferred Alternative

After consideration of the alternatives included in the feasibility study, a proposed route was selected that follows the entire length of the railbed from Farquhar Road to Haynes Street. Similarly to Alternative 1B and 1D, the southern portion of the route will follow the existing electrical easement. However, where the electrical easement diverges from the railbed, the proposed route will continue along the railbed and terminate at Haynes Street. This route will minimize the amount of clearing and grading required, as the entire route will be located on the previously cleared and graded railbed.

4.3 Alternative Parking Locations

As described in Section 4.2, the preferred route for the shared-use trail redevelops the existing railbed and represents the practicable alternative with the least environmental impacts. In addition to the trail, the Project includes a parking area in order to meet the Project purpose of providing safe, shared-use access to natural open spaces within the Town. Options for siting the parking area were limited to locations in close proximity to the shared-use trail.

4.3.1 Haynes Street Spur Trail

The feasibility study identified the potential to build a spur trail along Haynes Street. This is shown in blue as Alternative Segment 1E. The purpose of this alternative was to connect to a small area at a monument on the east side of Haynes Street. This alternative was not selected as the existing seating area does not include a significant amount of parking, only a single-lane horseshoe driveway loop. It is located within a parcel owned by the US Army Corps of Engineers and is with 200 feet of wetlands.

4.3.2 Off of Haynes Street

Instead of connecting to this location, the Town evaluated areas along the shared-use trail route for potential parking locations. Parking access off of Haynes Street would be constrained by the Dog Day Care Center at 1 River Road and the USACE flowage easement. This location would require greater impacts within wetland resource areas, including Riverfront Area and BLSF. Due to the topography, land use limitations, and proximity to wetland resource areas, a parking location along Haynes Street was not considered further.

4.3.3 Off of Farquhar Road

The trail entrance at Farquhar Road is similarly unsuitable as a parking area location due to the ponds with bordering BVW and USACE flowage easement directly east of the trail route and the perennial stream that drains beneath the trail and continues west.

4.3.4 Between River Road and Existing Railbed – Preferred Alternative

Areas between River Road and the trail alignment west of the perennial stream were therefore evaluated for potential parking locations. The topography for these areas is relatively flat for approximately 400 feet northwest along River Road from the intersection with Farquhar Road. After this point, slopes increase to approximately 14% and would require substantial impacts and cost for grading.

The proposed parking location is sited away from wetland resource areas to the extent practicable while avoiding steep topography. After the preferred layout was selected, easements were secured for the length of the trail and the proposed parking area.

4.4 Alternative Parking Configurations

The proposed parking area configuration is constrained by the topography of the area along River Road, as well as the proximity to the mapped perennial stream which crosses River Road via a culvert near the Farquhar Road intersection. Several configuration options were considered for the parking lot. As the easement for the parking area has recently been secured by the Town based on the analysis in Section 4.2, the proposed parking lot layout and associated infrastructure is required to be located within this easement.

4.4.1 Parking Area and Driveway Outside of 200-Foot Riverfront Area

The parking lot's easement is approximately 130 feet wide along River Road. The southern portion of the easement, approximately 53 feet, is located within 200-foot Riverfront Area. Configuring the parking lot such that the driveway was outside of Riverfront Area was considered, however the slope on the northern portion of the easement is significantly steeper, approximately 14%, and would require extensive grading and disturbance. Locating the parking lot entirely outside of Riverfront Area was also considered, however as the parking lot is proposed to be gravel, a raised berm is proposed to prevent runoff from the sloped area north of the parking lot from causing erosion in the gravel lot.

4.4.2 Parking Area and Driveway Partially within 200-Foot Riverfront Area – Preferred Alternative

To locate the parking lot's driveway on the portion of the easement frontage that has reasonable slope and to minimize the potential for runoff from damaging the parking lot and causing sediment to erode into the 200-foot Riverfront Area, the driveway was proposed to be located on the south side of the easement and the parking lot angled such that a small corner of the lot is located within Riverfront Area. This layout allows the construction of a berm along the north side of the parking lot, preventing runoff from the uphill areas from draining through the gravel lot. The angle of the parking lot is intended to allow it to be graded to match the site topography. The parking lot's runoff will be captured in a sediment forebay before entering an infiltration basin. This layout was selected as the proposed alternative as it minimizes disturbances within Riverfront Area while fitting the parking lot, berm, and infiltration basin within the easement, and minimizing grading by working with the existing site topography.

4.4.3 Driveway Configuration within 200-Foot Riverfront Area

Alternative configurations for the parking lot driveway were evaluated. Providing a narrower driveway in order to reduce proposed impervious surface within Riverfront Area was assessed. Ultimately, because the driveway will be relatively long and will be curved in order to accommodate the parking area layout, it was determined that a narrow

driveway would present a safety hazard. The preferred configuration consisted of a 22-foot-wide driveway to prevent potential issues when vehicles are entering and exiting the parking lot at the same time. The driveway will be located on a curved section of River Road where vehicles have been observed traveling at high speeds. The expanded driveway apron will allow greater visibility for vehicles entering and exiting the driveway.

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SECTION 5

Section 5
Regulatory Compliance

The Project has been designed to avoid and minimize environmental impacts to the extent practicable. Descriptions of compliance with the regulatory requirements of the MAWPA and its implementing regulations (310 CMR 10.00) and the City of Sturbridge's Wetlands Protection Bylaw and implementing regulations (Chapters 286 and 365), as well as other pertinent state and federal regulatory programs are provided in the following sections.

5.1 Massachusetts Wetlands Protection Act

5.1.1 Limited Project Status

A portion of the proposed activities within Riverfront Area qualify for consideration as a Limited Project per 310 CMR 10.53(6):

> *"Notwithstanding the provisions of 310 CMR 10.58, the Issuing Authority may issue an Order of Conditions permitting as a limited project the construction, rehabilitation, and maintenance of footpaths, bikepaths, and other pedestrian or nonmotorized vehicle access to or along riverfront areas but outside other resource areas, provided that adverse impacts from the work are minimized and that the design specifications are commensurate with the projected use and are compatible with the character of the riverfront area. Generally, the width of the access shall not exceed ten feet of pavement, except within an area that is already altered (e.g., railroad beds within rights of way). Access shall not be located in vernal pools or fenced in a manner which would impede the movement of wildlife."*

Due to the existing railbed alignment conditions within Riverfront Area near the Project terminus with Haynes St, the Town requests that the Sturbridge Conservation Commission grant authorization for the work to proceed as a Limited Project. Limited Project status is requested for the following performance standard:

- 310 CMR 10.58(4)(d)(1)(a) – 100 Foot Wide Vegetated Buffer (Riverfront Area).

5.1.2 Summary of MAWPA Jurisdictional Alterations

The Project is designed to avoid alterations to inland Bank, LUWW, and BVW, as those areas are defined in the MAWPA regulations. However, the proposed Project will result in alterations to the 200-foot Riverfront Area.

In addition, the Project will result in alterations to the 100-foot Buffer Zone to inland Bank and BVW resource areas.

Table 5-1 below outlines the total proposed alterations by wetland resource.

TABLE 5-1
Summary of Proposed Alterations in MAWPA Jurisdictional Areas

Area	Temporary Impacts (sf)[1]	Permanent Impacts (sf)	Total Impacts (sf)
BVW	0	0	0
BLSF	0	0	0
Riverfront Total	0	21,758	21,758
Riverfront Area – Previously Developed[2]	0	15,480	15,480
Riverfront Area – Undeveloped	0	6,278	6,278

[1] No temporary impacts are proposed; all work inclusive of staging and laydown will be completed within the permanent project footprint.
[2] Includes Riverfront Area within the previously disturbed, cleared and graded railbed.

5.1.3 Performance Standards Compliance

The proposed Project includes work within Riverfront Area. The following sections summarize the Project's compliance with the General Performance Standards (provided in *italics*) established in the MAWPA regulations.

5.1.4 Riverfront Area

This section describes how the proposed project satisfies the Riverfront Area provisions at 310 CMR 10.58(4). The performance standards set forth at 310 CMR 10.58(4) are provided below in *italics*, while the details of Project design follow.

(a) Protection of Other Resource Areas.

Alterations to wetland resource areas, as defined by the MAWPA, are limited to Riverfront Area.

(b) Protection of Rare Species.

A copy of this NOI will be submitted concurrently to NHESP for streamlined review. As described in more detail in Section 5.5.2, impacts to rare species will be minimized through design by siting work in previously disturbed areas to the extent practicable and by implementing BMPs coordinated with NHESP.

(c) Practicable and Substantially Equivalent Economic Alternatives. There must be no practicable and substantially equivalent economic alternative to the proposed project with less adverse effects on the interests identified in M.G.L. c. 131 § 40.

As summarized in Section 4, the proposed design is the preferred alternative for the Project. A No Build alternative would not meet the Project purpose of expanding safe, shared-use access for recreation and commuting through the Town's natural open spaces. The selected trail route will minimize the amount of clearing and grading required, as the entire route will be located on the previously cleared and graded railbed. The parking area location was limited to close proximity to the selected trail route. The proposed parking area location and configuration is the most practicable alternative with the least adverse effects to the interests of the MAWPA.

(d) No Significant Adverse Impact. The work, including proposed mitigation measures, must have no significant adverse impact on the riverfront area to protect the interests identified in M.G.L. c. 131, § 40.

1. Within 200 foot riverfront areas, the issuing authority may allow the alteration of up to 5000 square feet or 10% of the riverfront area within the lot, whichever is greater, on a lot recorded on or before October 6, 1997 or lots recorded after October 6, 1997 subject to the restrictions of 310 CMR 10.58(4)(c)2.b.vi., or up to 10% of the riverfront area within a lot recorded after October 6, 1997, provided that:

a. At a minimum, a 100 foot wide area of undisturbed vegetation is provided. This area shall extend from mean annual high-water along the river unless another location would better protect the interests identified in M.G.L. c. 131 § 40. If there is not a 100 foot wide area of undisturbed vegetation within the riverfront area, existing vegetative cover shall be preserved or extended to the maximum extent feasible to approximate a 100 foot wide corridor of natural vegetation. Replication and compensatory storage required to meet other resource area performance standards are allowed within this area; structural stormwater management measures may be allowed only when there is no practicable alternative. Temporary impacts where necessary for installation of linear site-related utilities are allowed, provided the area is restored to its natural conditions. Proposed work which does not meet the requirement of 310 CMR 10.58(4)(d)1.a. may be allowed only if an applicant demonstrates by a preponderance of evidence from a competent source that an area of undisturbed vegetation with an overall average width of 100 feet will provide equivalent protection of the riverfront area, or that a partial rebuttal of the presumptions of significance is sufficient to justify a lesser area of undisturbed vegetation;

There are approximately 3,786,379 sf (143.59 acres) of Riverfront Area within the Project Locus. The proposed Project includes approximately 15,480 sf of alterations to previously disturbed Riverfront Area for the shared-use trail along the existing railbed and approximately 6,278 sf of alterations to Riverfront Area related to the proposed parking area. These proposed alterations represent approximately 0.5% of total Riverfront Area at the Project Locus.

A 100-foot-wide area of undisturbed vegetation is not feasible along the shared-use trail route because the existing railbed crosses perennial streams at both the southern and northern terminuses. The proposed Project is sited primarily within areas of the existing railbed lacking in woody vegetation and minimizes alteration of undisturbed vegetation to the extent practicable.

All proposed alterations within Riverfront Area related to the parking lot are further than 100 feet from the MAHW line and therefore satisfy this performance standard. Native trees and shrubs will be planted within the parking area as depicted on Sheet C-105 of the Project Drawings in Appendix B. Species were selected to support the interests of the MAWPA, including protection of wildlife habitat. The infiltration basin and other impervious areas within the Riverfront Area will be seeded with native seed mixes.

b. Stormwater is managed according to standards established by the Department in its Stormwater Policy.

The stormwater management standards are not applicable to the proposed activities along the shared-use trail route. The parking area design has been prepared in accordance with recommendations in the Massachusetts Stormwater Handbook and the Town of Sturbridge Stormwater Management Regulations. Refer to Section 5.2 and Appendix F for additional information.

c. Proposed work does not impair the capacity of the riverfront area to provide important wildlife habitat functions. Work shall not result in an impairment of the capacity to provide vernal pool habitat identified by evidence from a competent source, but not yet certified. For work within an undeveloped riverfront area which exceeds 5,000 square feet, the issuing authority may require a wildlife habitat evaluation study under 310 CMR 10.60.

The Project Site neither contains nor is in proximity to potential or certified vernal pools. Although the proposed Project will result in alterations greater than 5,000 sf of undeveloped Riverfront Area, this represents less than 0.2% of Riverfront Area within the Project Locus. In addition, seeding and planting with native species will be implemented within the parking lot area as described above to enhance ecological function. Tree and shrub species and seed mixes were selected to provide diverse flowering periods and wildlife foraging resources.

d. Proposed work shall not impair groundwater or surface water quality by incorporating erosion and sedimentation controls and other measures to attenuate nonpoint source pollution.

Erosion and sedimentation controls are incorporated into the Project design. Therefore, this standard has been met.

2. Within 25 foot riverfront areas, any proposed work shall cause no significant adverse impact by:

Not applicable. The unnamed perennial streams are not identified in 310 CMR 10.58(2)(d)(3) as having a 25-foot-wide Riverfront Area.

3. Notwithstanding the provisions of 310 CMR 10.58(4)(d)1. or 2., the issuing authority shall allow the construction of a single-family house, a septic system if no sewer is available, and a driveway, on a lot recorded before August 7, 1996 where the size or shape of the lot within the riverfront area prevents the construction from meeting the requirements of 310 CMR 10.58(4)(d)1. or 2., provided that:

a. The lot can be developed for such purposes under the applicable provisions of other municipal and state law; and

b. The performance standards of 310 CMR 10.58(4)(d) are met to the maximum extent feasible. In difficult siting situations, the maximum extent of yards around houses should be limited to the area necessary for construction. Except where the lot contains vernal pool habitat or specified habitat sites of rare species, a wildlife habitat evaluation study shall not be required.

Not applicable. The Project does not include the construction activities described in this performance standard.

> *4. Notwithstanding the provisions of 310 CMR 10.58(4)(d)1. or 2., the issuing authority may allow the construction of a commercial structure of minimum feasible dimension, on a lot recorded before August 7, 1996 where the size or shape of the lot within the riverfront area prevents the construction from meeting the requirements of 310 CMR 10.58(4)(d)1. or 2., only if:*
>
> > *a. The lot can be developed for such purposes under the applicable provisions of other municipal and state law;*
> >
> > *b. The work is not eligible for 310 CMR 10.58(5); and*
> >
> > *c. The performance standards of 310 CMR 10.58(4)(d)1. Or 2. are met to the maximum extent feasible.*

Not applicable. The Project does not include the construction of a commercial structure.

5.2 Stormwater Management

As described within Section 3.1.2 and the Stormwater Report (Appendix F), 310 CMR 10.05(6)(k) through (q) do not apply to the multi-use trail and connector path components of the Project. However, construction of the new parking area will result in an increase in impervious area on-site. As such, the proposed design has been prepared in accordance with requirements in the Massachusetts Stormwater Handbook and the Town of Sturbridge Stormwater Management Regulations.

5.3 Sturbridge Wetland Regulations

The proposed activities are subject to the Town of Sturbridge Wetland Protection Bylaw and its implementing regulations. The Project is designed to avoid alterations to wetland resource areas as defined in the Town Bylaw/regulations. However, the proposed Project will result in activities within 200-foot Riverfront Area, the 25-Foot No Disturbance Zone, the 50-Foot No Structure Zone, the 100-Foot and 200-Foot Bylaw Buffer Zones as summarized in Table 5-2.

TABLE 5-2
Summary of Sturbridge Wetland Protection Bylaw Regulated Area Impacts

Resource Area[1]	Existing Railbed Corridor – Previously Developed (SF)	Parking Area – Previously Undeveloped (SF)	Total Impacts (SF)
Riverfront Area	15,480 SF	6,278 SF	21,758 SF
25-Foot No Disturb Zone	3,634 SF	3,352 SF	6,986 SF
50-Foot No Structure Zone	7,687 SF	4,025 SF	11,712 SF
100-Foot Bylaw Buffer Zone	8,667 SF	0 SF	8,667 SF
200-Foot Bylaw Buffer Zone	17,917 SF	7,437 SF	25,353 SF

[1] Quantities are for non-overlapping portions of each resource area and buffer.

5.3.1 § 365-5.5 Riverfront Area

As noted in Table 4-2 and described in Section 5.1.5, the proposed Project includes approximately 15,480 sf of alterations to previously disturbed Riverfront Area for the shared-use trail along the existing railbed and approximately 6,230 sf of alterations to Riverfront Area related to the proposed parking area. These proposed alterations represent approximately 0.5% of total Riverfront Area at the Project Locus. The performance standards set forth at § 365-5.5.D are provided below in *italics*, while the details of Project design follow.

> *(1) No project may be permitted within the riverfront area which will have any adverse effect on specified habitat sites of rare or state- or federally listed species, or which will have any adverse effect on vernal pool habitat, whether certified or identified by the Commission prior to or during the public hearing.*

The Project Site neither contains nor is in proximity to potential or certified vernal pools. Take-avoidance, minimization, and mitigation measures for rare species and their habitat will be incorporated into the Project design as needed based on coordination with NHESP. See Section 5.5.2 for additional information.

> *(2) Practicable alternative. There must be no practicable and substantially equivalent economic alternative to the proposed project with less adverse effects on the interests identified.*

The proposed activities have been designed to reduce temporary impacts to Riverfront Area to the extent practicable. See Section 4 for the detailed Alternatives Analysis. In addition, the proposed Project supports protection of recreational values consistent with interests identified in § 365-1.1.B.

> *(3) When an applicant proposes restoration on-site of degraded riverfront area, alteration may be allowed at a ratio in square feet of at least 2:1 of restored area to area of alteration not conforming to the performance standards. Restoration shall include:*
>
> *(a) Removal of all debris, but retaining any noninvasive trees or other mature noninvasive vegetation.*
>
> *(b) Grading to a topography which reduces runoff and increases infiltration;*
>
> *(c) Coverage by topsoil at a depth consistent with natural conditions at the site; and*
>
> *(d) Seeding and planting with an erosion control seed mixture, followed by plantings of herbaceous and woody species appropriate to the site.*

Restoration of on-site of degraded Riverfront Area is not proposed as part of Project activities.

> *(4) When an applicant proposes mitigation either on-site or in the riverfront area within the same general area of the river basin, alteration may be allowed at a ratio in square feet of at least 2:1 of mitigation area to area of alteration for previously disturbed sites.*

Alterations within previously undeveloped Riverfront Area have been avoided to the extent practicable. Native trees and shrubs will be planted within the parking area as depicted on

Sheet C-105 of the Project Drawings in Appendix B. Species were selected to support the interests of the MAWPA and § 365-1.1.B, including protection of wildlife habitat and protection of recreational values. The infiltration basin and other impervious areas within the Riverfront Area will be seeded with native seed mixes.

> *(5) The following may be allowed in the riverfront area and requires the filing of a notice of intent and prior review and approval of the Commission:*
>
> *(a) Fencing, stonewalls or stacks of cordwood, provided they will not constitute a barrier to wildlife movement;*
>
> *(b) Vista pruning, provided the activity is located more than 100 feet from the mean annual high water line within a riverfront area or from bordering vegetated wetland, whichever is farther;*
>
> *(c) Plantings of native species of trees, shrubs or groundcover, but excluding turf lawns;*
>
> *(d) The conversion of lawn to uses accessory to existing single-family houses in existence on August 7, 1996, such as decks, sheds, patios and pools, provided the activity is located more than 50 feet from the mean annual high-water line within the riverfront area or from bordering vegetated wetland, whichever is farther, and erosion and sedimentation controls are implemented during construction;*
>
> *(e) The conversion of impervious to vegetated surfaces, provided erosion and sedimentation controls are implemented during construction;*
>
> *(f) The repair or upgrade of existing septic systems in compliance with Sturbridge Board of Health regulations.*

The Project activities will not include any of the activities listed in (a-f).

5.3.2 § 365-5.7 Estimated habitats of rare wildlife

The Project is located within mapped habitat for the wood turtle (*Glyptemys insculpta*), a state species of special concern.

> *C. General performance standards. Work within areas identified as habitat for rare and endangered species shall not result in a measurable decrease in extant wildlife populations or biological community compositions, structure and species richness of the site or in the vicinity, exclusive of the present or future state of adjacent or nearby property, or impair, damage or reduce in value for wildlife purposes identified specific habitat features. The Commission shall take into account indirect effects, including but not limited to effects of nearby human activities, on a case-by-case basis.*

Take-avoidance, minimization, and mitigation measures for rare species and their habitat will be incorporated into the Project design as needed based on coordination with NHESP. See Section 2.5 and Section 5.5.2 for additional information.

5.3.3 § 286-6 Coordination with other boards

Electronic submission of this NOI was completed concurrently with the Conservation Commission, Board of Selectmen, Planning board, Board of Health, Building Inspector, and Town Engineer. Hard copies will be furnished upon request.

5.4 Abutter Notification

Abutters will be notified in accordance with the MAWPA and Sturbridge Wetland Protection Bylaw/Regulation requirements. The abutter notification form, a copy of the certified list of abutters prepared by the Sturbridge Assessors' office, and an Affidavit of Service declaration are provided in Appendix G.

5.5 State and Federal permits

5.5.1 Massachusetts Historical Commission

Any project that involves state or federal funding and/or approvals requires review by the Massachusetts Historical Commission (MHC) to determine potential impacts to historic and/or archaeological resources and to ensure compliance with MGL c.9 § 26-27(c).

A Project Notification Form (PNF) was submitted to the MHC on February 9, 2024. The MHC determined on March 9, 2024, that "this project is unlikely to affect significant historic or archaeological resources" (MHC record #28467).

5.5.2 Massachusetts Endangered Species Act

The Project and surrounding areas are identified as Priority Habitat for Rare Species (PH 832) and Estimated Habitat for Rare Wildlife (EH 656), according to the Massachusetts Natural Heritage Atlas, 15th edition (effective August 1, 2021). Accordingly, the Project is subject to the Massachusetts Endangered Species Act (MESA) and regulations set forth at 321 CMR 10.00, as administered by NHESP. This NOI has been submitted to NHESP for streamlined review under both the MAWPA and MESA regulations per 310 CMR 10.59.

The applicant and Tighe & Bond representatives held a pre-filing consultation with Tim Maguire, the NHESP Endangered Species Review Biologist assigned to the Project, on February 6, 2024. Mr. Maguire requested additional information regarding the entirety of the Grand Trunk Trail to cumulatively evaluate potential impacts to rare species. Construction is complete in segments of the Grand Trunk Trail within Sturbridge extending east from Farquhar Road and through the Westville Lake Recreation Area to the Westville Dam parking along Marjorie Lane. A map depicting the overall Grand Trunk Trail divided into segments based on construction status is provided in Appendix I. Note that the Grand Trunk Trail map is conceptual and the Town is still evaluating potential alignments for the remaining segments of the Grand Trunk Trail. The Town determined to develop the Grand Trunk Trail central section in phases based upon the availability of funds, the anticipated demand for the trail, and continued input from stakeholders.

The Grand Trunk Trail is sited primarily within previously disturbed areas (rail bed) to the extent practicable. Impacts to rare species will be minimized through design by siting work in previously disturbed areas and implementing BMPs coordinated with NHESP. The proposed Project has been designed for silt fence to be installed around the LOW to function as wildlife exclusion barriers during active periods for identified rare species. Wildlife exclusion gates, as depicted in the Project Drawing details, will be installed at each construction entrance.

Take-avoidance, minimization, and mitigation measures will be incorporated into the Project design as needed. This NOI has been submitted to NHESP for streamlined review.

5.5.3 Massachusetts Environmental Policy Act

Although the Project is funded through the MassTrails Grant Program, the proposed activities do not meet or exceed MEPA review thresholds. As such, MEPA coordination is not required.

5.5.4 EPA National Pollutant Discharge Elimination System (NPDES)

Construction activities will result in the cumulative disturbance of one (1) or more acres of land. As such, the Project will require coverage under the NPDES Construction General Permit (CGP) as regulated by the U.S. Environmental Protection Agency.

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Tighe&Bond

APPENDIX A

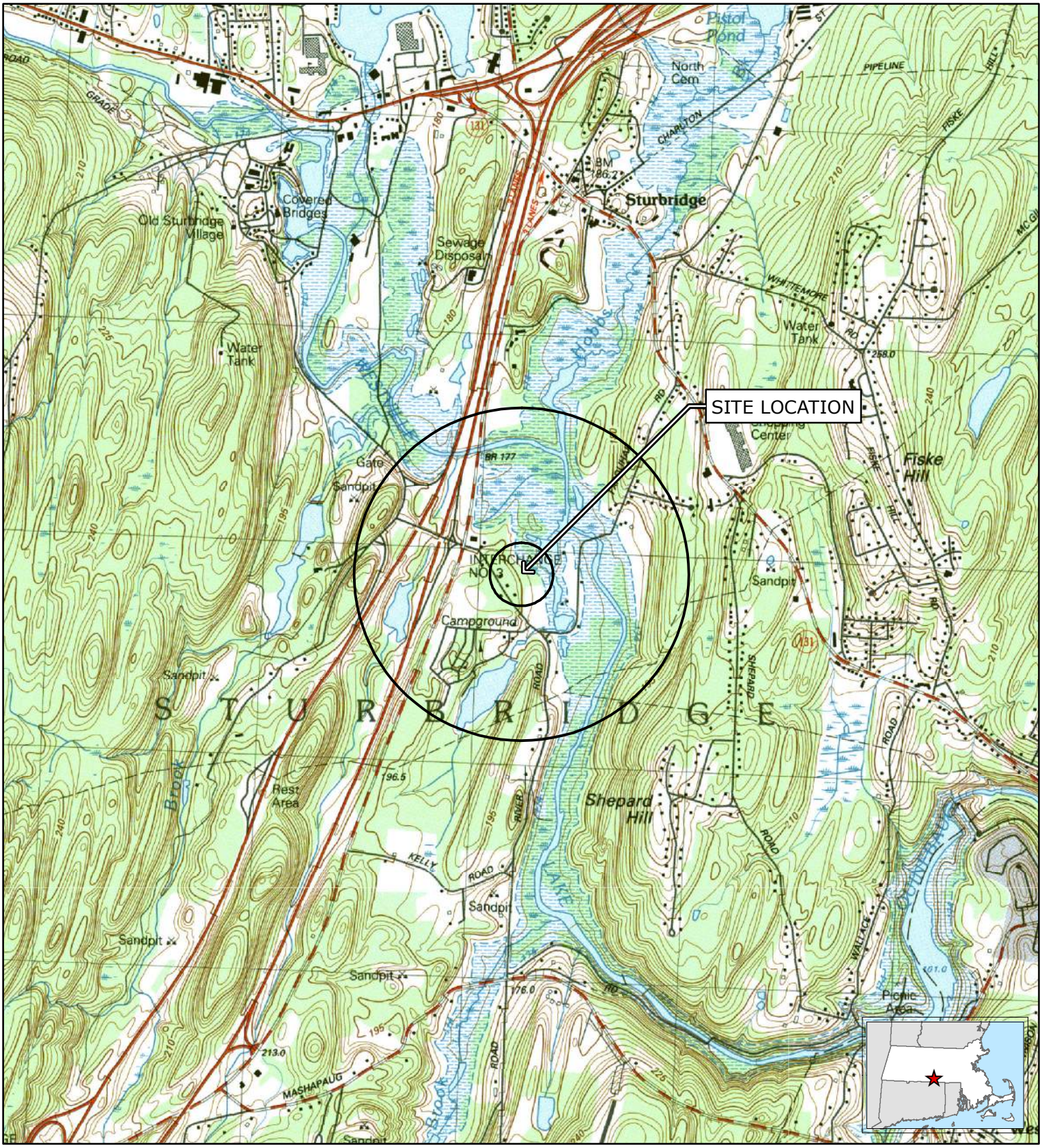

FIGURE 1
SITE LOCATION

Grand Trunk Trail Continuation
River Road
Sturbridge, Massachusetts

January 2024

Tighe&Bond

Based on USGS Topographic Map for Southbridge, MA Revised 1982.
Contour Interval Equals 3-Meters.
Circles indicate 500-foot and half-mile radii.

1:24,000
0 1,000 2,000
Feet

N

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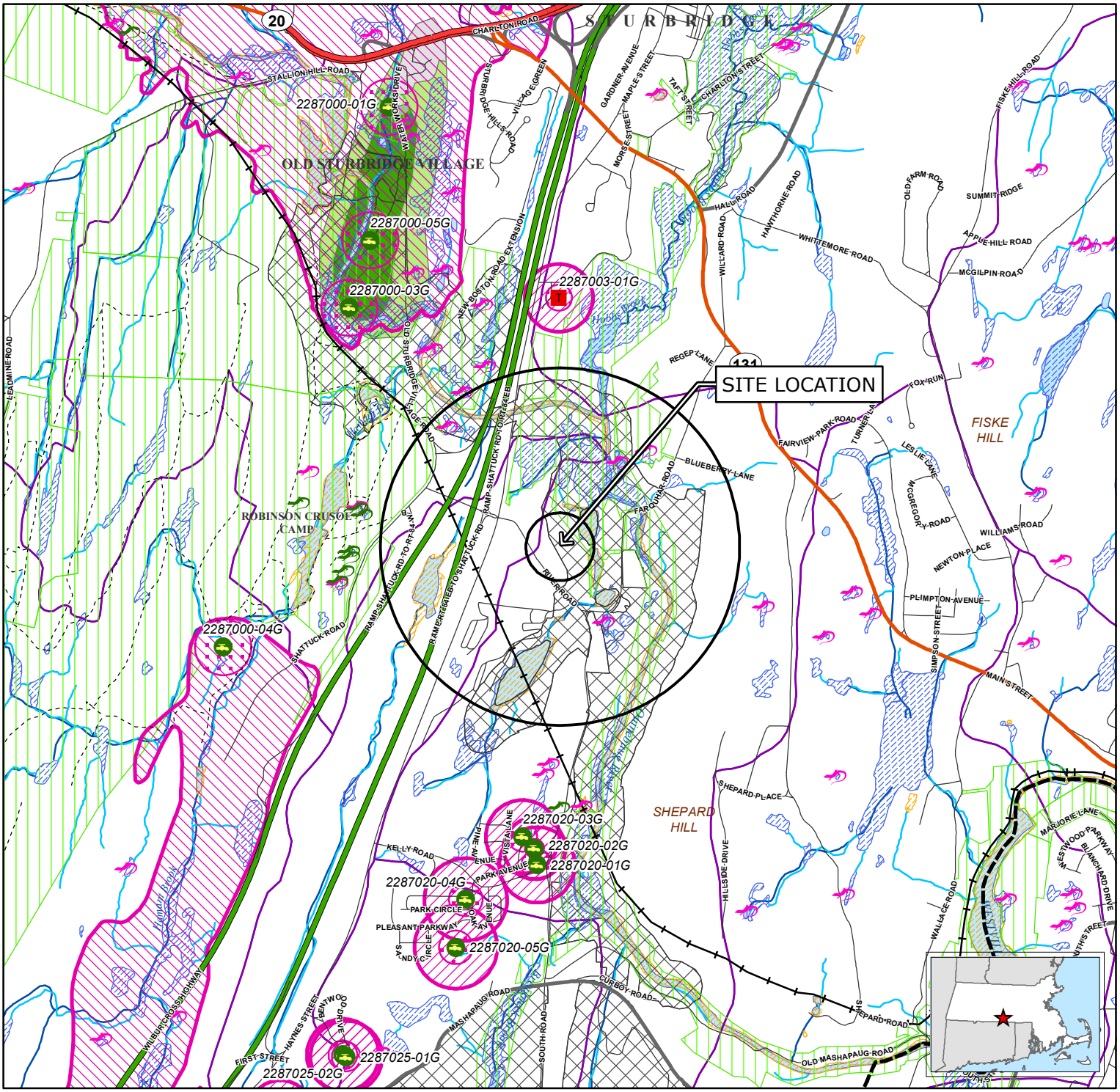

Legend

- NHESP Certified Vernal Pools
- NHESP Potential Vernal Pools
- Non-Landfill Solid Waste Sites
- Proposed Well
- Emergency Surface Water
- Community Public Water Supply - Surface Water
- Community Public Water Supply - Groundwater
- Non-Community Non-Transient Public Water Supply
- Non-Community Transient Public Water Supply
- Limited Access Highway
- Multi-Lane Highway, NOT Limited Access
- Other Numbered Route
- Major Road - Arterials and Collectors
- Minor Street or Road
- Aqueducts
- Hydrologic Connections
- Stream/Intermittent Stream
- Powerline
- Pipeline
- Track or Trail
- Trains
- Public Surface Water Supply Protection Area (Zone A)
- DEP Approved Wellhead Protection Area (Zone I)
- DEP Approved Wellhead Protection Area (Zone II)
- DEP Interim Wellhead Protection Area (IWPA)
- Protected and Recreational Open Space
- Solid Waste Landfill
- Area of Critical Environmental Concern (ACEC)
- NHESP Priority Habitats for Rare Species
- NHESP Estimated Habitats for Rare Wildlife
- EPA Designated Sole Source Aquifer
- Major Drainage Basin
- Sub Drainage Basin
- MassDEP Open Water
- MassDEP Inland Wetlands
- MassDEP Coastal Wetlands
- MassDEP Not Interpreted Wetlands
- Public Surface Water Supply (PSWS)
- Water Bodies
- Non-Potential Drinking Water Source Area - High Yield
- Non-Potential Drinking Water Source Area - Medium Yield
- Potentially Productive Medium Yield Aquifer
- Potentially Productive High Yield Aquifer
- County Boundary
- Municipal Boundary
- USGS Quadrangle Sheet Boundary

1:24,000

0 1,000 2,000

Feet

N

FIGURE 2
PRIORITY RESOURCES

Grand Trunk Trail Continuation
River Road
Sturbridge, Massachusetts

Data source: Bureau of Geographic Information (MassGIS), Commonwealth of Massachusetts, Executive Office of Technology.
Circles indicate 500-foot and half-mile radii.
Data valid as of January 2024.

January 2024

Tighe&Bond

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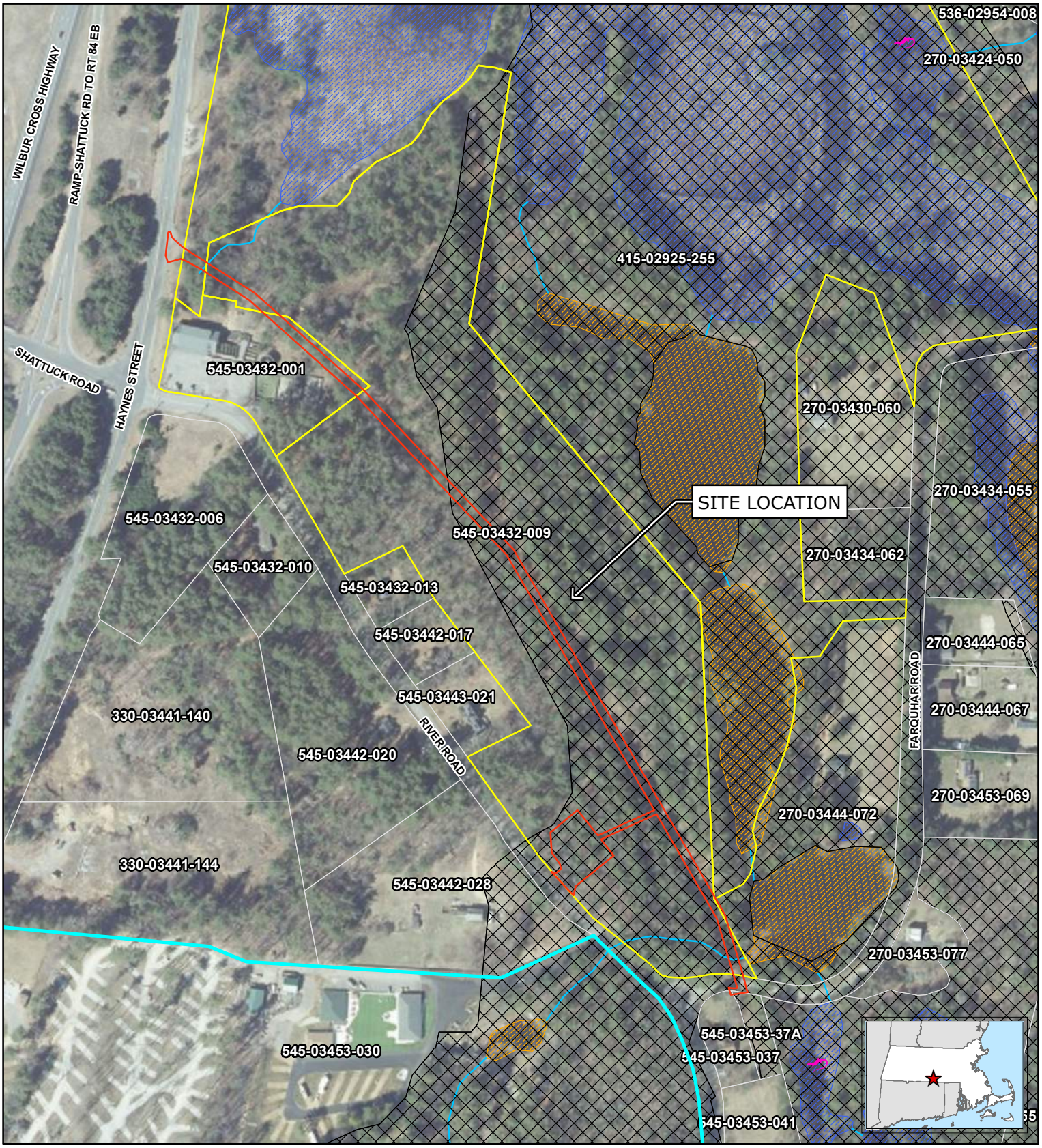

Legend

- NHESP Certified Vernal Pools
- NHESP Potential Vernal Pools
- Hydrologic Connections
- Limit of Work
- Project Locus
- Parcel Boundary
- NHESP Priority Habitats for Rare Species
- NHESP Estimated Habitats for Rare Wildlife
- MassDEP Open Water
- MassDEP Inland Wetlands

Tighe&Bond

Based on MassGIS Color Orthophotography (2021)
Parcels (FY2023) downloaded from MassGIS and are approximate.

1:3,500

0 175 350

Feet

N

FIGURE 3
WETLANDS AND RARE SPECIES

Grand Trunk Trail Continuation
River Road
Sturbridge, Massachusetts

February 2024

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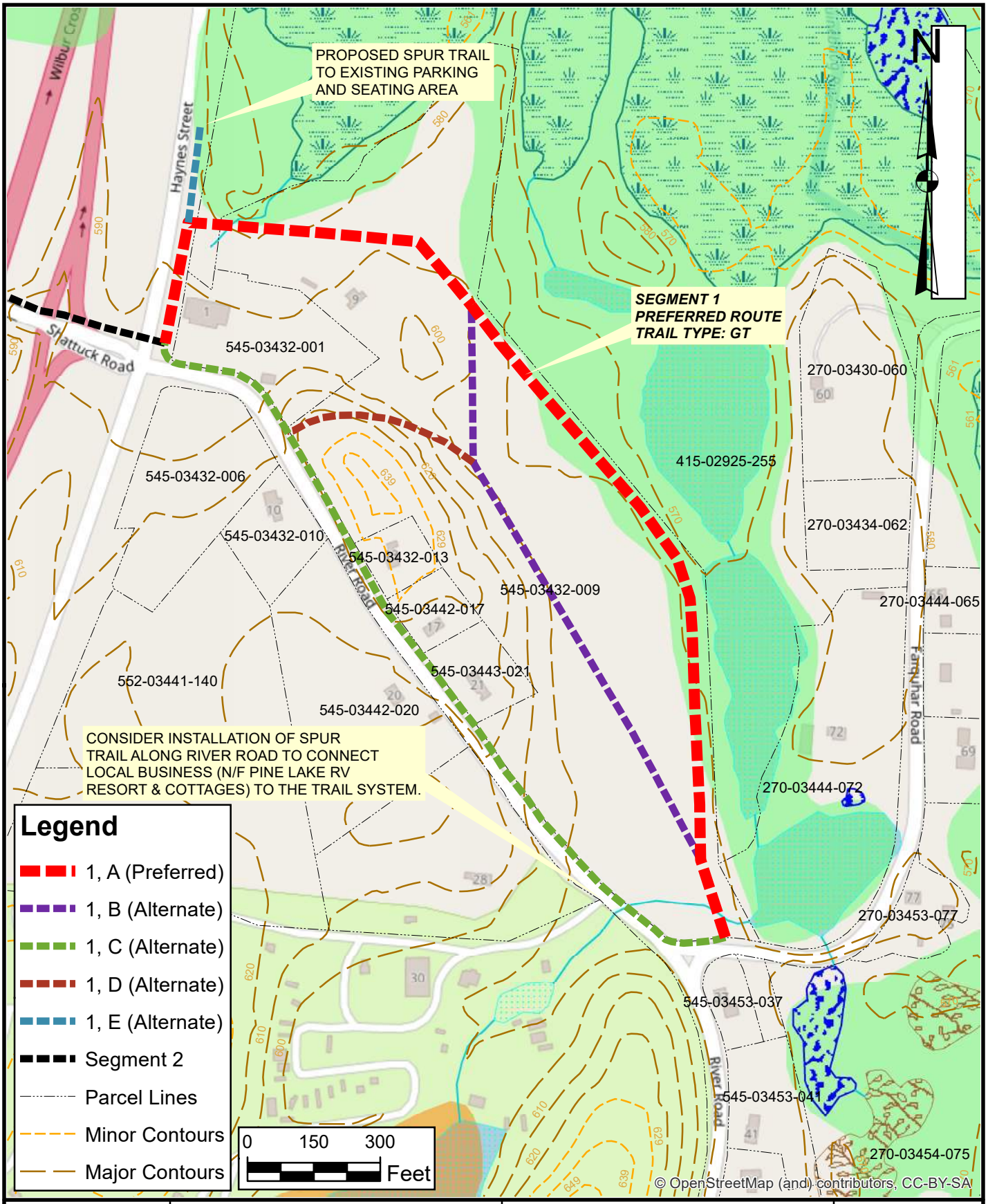


JOB NO:	MA287-H100
DATE:	06/04/2020
DRAWN BY:	EJM
CHECKED BY:	EJM
FILE NAME:	SEGMENT 1

MORSE ENGINEERING AND CONSTRUCTION INDUSTRIES, LLC

GTT CENTRAL SECTION
SEGMENT 1
LOCALITY MAP

GRAND TRUNK TRAIL - CENTRAL SECTION
FEASIBILITY STUDY
FOR
TOWN OF STURBRIDGE, MA

FIGURE: 4

Tighe&Bond

APPENDIX B

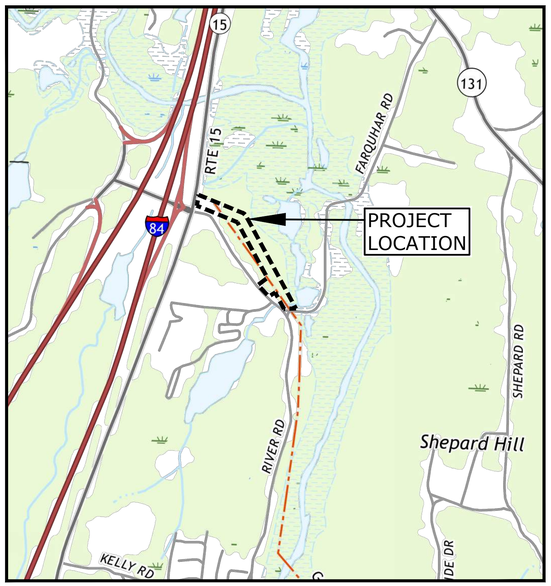
TOWN OF STURBRIDGE, MASSACHUSETTS

GRAND TRUNK TRAIL CONTINUATION

PERMIT SET

APRIL, 2024

LIST OF DRAWINGS	
DRAWING NO.	DRAWING TITLE
G-001	COVER
G-002	LEGENDS & ABBREVIATIONS
G-003	GENERAL NOTES
C-100	SHEET LAYOUT AND EXISTING CONDITIONS PLAN
C-100A	SHEET LAYOUT AND EXISTING CONDITIONS PLAN (LOCAL BYLAWS)
C-101	CONSTRUCTION PLAN & PROFILE - 1
C-101A	CONSTRUCTION PLAN & PROFILE - 1 (LOCAL BYLAWS)
C-102	CONSTRUCTION PLAN & PROFILE - 2
C-102A	CONSTRUCTION PLAN & PROFILE - 2 (LOCAL BYLAWS)
C-103	CONSTRUCTION PLAN & PROFILE - 3
C-103A	CONSTRUCTION PLAN & PROFILE - 3 (LOCAL BYLAWS)
C-104	RIVER ROAD PARKING LOT PLANS
C-104A	RIVER ROAD PARKING LOT PLANS (LOCAL BYLAWS)
C-105	SITE LANDSCAPING DETAIL
C-106	CROSS SECTION - 1
C-107	CROSS SECTION - 2
C-501	DETAILS - 1
C-502	DETAILS - 2
C-503	DETAILS - 3
C-504	DETAILS - 4
C-505	DETAILS - 5



LOCATION MAP
SCALE: 1" = 1000'

PREPARED BY:

Tighe&Bond

COMMONWEALTH OF MASSACHUSETTS
JOSEPH P VIAMARI JR.
CIVIL
No. 41776
REGISTERED PROFESSIONAL ENGINEER
04/22/2024

JOSEPH P. VIAMARI, PE

COMMONWEALTH OF MASSACHUSETTS
MATT WZOREK
CIVIL
No. 52674
REGISTERED PROFESSIONAL ENGINEER
04/22/2024

MATTHEW P. WZOREK, PE

PREPARED FOR:
TOWN OF STURBRIDGE
HEATHER BLAKELEY, DPW DIRECTOR

MassTrails
136 DAMON ROAD
NORTHAMPTON, MA

COMPLETE SET 21 SHEETS

Last Saved: 4/22/2024
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LEGEND

DESCRIPTION	EXISTING	PROPOSED
PROPERTY LINE		
PROPERTY LINE ADJACENT		
RIGHT-OF-WAY LINE		
EASEMENT LINE		
LIMIT OF WORK/ EXCLUSION BARRIER		
LIMIT OF WORK		
INTERMEDIATE CONTOURS		
INDEX CONTOURS	25	25
SPOT GRADE	X 141.2	+ 32.0
MAGNITUDE & DIRECTION OF SLOPE		0.0%
STORM DRAIN	SD	SD
STORM UNDERDRAIN		UD
GRAVITY SANITARY SEWER	SS	SS
SANITARY SEWER FORCE MAIN	SFM	SFM
SANITARY SEWER LOW PRESSURE	SSLP	SSLP
SANITARY SEWER COMBINED	COMB	COMB
WATER SERVICE	W	W
POTABLE WATER	PW	PW
FIRE SERVICE		F
HIGH PRESSURE FIRE SERVICE		F-HP
UNDERGROUND ELECTRIC	E	E
PRIMARY ELECTRIC SERVICE	PE	PE
SECONDARY ELECTRIC	SE	SE
OVERHEAD ELECTRIC	OE	OE
TELEPHONE SERVICE	T	T
TEL-DATA SERVICE	T–D	T-D
COMMUNICATIONS SERVICE	T–C	T-C
CABLE TV SERVICE	CTV	CTV
GAS SERVICE	G	G
OVERHEAD UTILITY (UNSPECIFIED)	OHW	
CURB		
EDGE OF PAVEMENT		
DIRT ROAD		
SIDEWALK		
RETAINING WALL		
STONE WALL		
FENCE - UNSPECIFIED	X	X
FENCE - CHAIN LINK		
FENCE - WOOD POST		
GUARDRAIL		
THREE RAIL WOOD FENCE		
TRAIN TRACKS		
STORM DRAIN STRUCTURES	MANHOLE D, CATCH BASIN	MANHOLE, AREA DRAIN, CATCH BASIN
SANITARY SEWER STRUCTURES	MANHOLE S, TANK	MANHOLE, TANK
WATER SERVICE STRUCTURES	HYDRANT, MANHOLE W, VALVE	HYDRANT, MANHOLE W, VALVE
GAS SERVICE STRUCTURES	MANHOLE G, VALVE, GG	MANHOLE G, VALVE
ELECTRIC SERVICE STRUCTURES	UTILITY CO. POLE #, MANHOLE E, LIGHT	UTILITY CO. POLE #, MANHOLE E, LIGHT
TELECOMMUNICATIONS MANHOLE	T	T
TREELINE		
TREE	EVERGREEN, DECIDUOUS, STUMP	EVERGREEN, DECIDUOUS

ABBREVIATIONS

ABDN('D)	ABANDON(ED)
AC	ASBESTOS CEMENT PIPE
BC	BITUMINOUS CURB
BFP	BACK FLOW PREVENTOR
BIT	BITUMINOUS
BL	BASELINE
BLDG	BUILDING
BND	BOUND
BOC	BOTTOM OF CURB
BOT	BOTTOM
BS	BOTTOM OF STEP
BW	BOTTOM OF WALL
CATV	CABLE TELEVISION
CB	CATCH BASIN
CCW	CEMENT CONCRETE WALK
CEM	CEMENT
CI	CAST IRON PIPE
CL	CENTERLINE
CLF	CHAIN LINK FENCE
CO	CLEAN OUT
CONC	CONCRETE
CPP	CORRUGATED POLYETHYLENE PIPE
CY	CUBIC YARD
DH	DRILL HOLE
DI	DUCTILE IRON PIPE
DIA	DIAMETER
DMH	DRAIN MANHOLE
E	EAST
EF	EACH FACE
EG	EXISTING GRADE
EL/ELEV	ELEVATION
ELEC	ELECTRIC
EMH	ELECTRIC MANHOLE
EOP	EDGE OF PAVEMENT
EW	EACH WAY
EXIST	EXISTING
FES	FLARED END SECTION
FF	FINISH FLOOR
FM	FORCE MAIN
G	GAS
GG	GAS GATE
GRAN	GRANITE
HC	HANDICAP
HDPE	HIGH DENSITY POLYETHYLENE
HMA	HOT MIX ASPHALT
HYD	HYDRANT
IN	INCHES
INV	INVERT
IP	IRON PIN
L	LENGTH OF CURB
LP	LIGHT POLE
LT	LEFT
MAX	MAXIMUM
MH	MANHOLE
MIN	MINIMUM
MISC	MISCELLANEOUS
MON	MONUMENT
MJ	MECHANICAL JOINT

ABBREVIATIONS CONT'D

N	NORTH
NITC	NOT IN THIS CONTRACT
NTS	NOT TO SCALE
N/A	NOT APPLICABLE
N/F	NOW OR FORMERLY
OC	ON CENTER
OCS	OUTLET CONTROL STRUCTURE
OH	OVERHEAD
PB	PLANT BED
PC	POINT OF CURVATURE
PCC	POINT OF COMPOUND CURVATURE
PCPP	PERFORATED CORRUGATED POLYETHYLENE PIPE
PERF	PERFORATED
PI	POINT OF INTERSECTION
PRC	POINT OF REVERSE CURVATURE
PROT	PROTECT
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	POINT OF TANGENCY
PVC	POLYVINYLCHLORIDE
PVMT	PAVEMENT
R	RADIUS
RCP	REINFORCED CONCRETE PIPE
RD	ROOF DRAIN
REV	REVISION
ROW	RIGHT OF WAY
RT	RIGHT
R&D	REMOVE AND DISPOSE
R&R	REMOVE AND RESET
R&S	REMOVE AND STACK
S	SOUTH
SAN	SANITARY
SCH	SCHEDULE
SF	SQUARE FOOT
SMH	SEWER MANHOLE
SS	STAINLESS STEEL
STA	STATION
STL	STEEL
STRM	STORM
T	TANGENT LENGTH
TC	TOP OF CURB
TEL	TEL-DATA
TP	TEST PIT
TS	TOP OF STEP
TW	TOP OF WALL
TYP	TYPICAL
UP	UTILITY POLE
W	WATER
WG	WATER GATE
WV	WATER VALVE
XFMR	TRANSFORMER

LEGEND

RESOURCE AREAS	
VEGETATED WETLAND LIMIT	
TOP OF BANK	
MEAN ANNUAL HIGH WATER	
LAND SUBJECT TO FLOODING	
200-FOOT RIVERFRONT AREA	
FLOWAGE EASEMENT	
25-FOOT NO DISTURBANCE ZONE	
50-FOOT NO STRUCTURE ZONE	
100-FOOT BYLAW BUFFER ZONE	
200-FOOT BYLAW BUFFER ZONE	
WETLANDS WATER COURSE	
WETLAND FLAG	WF–

LEGEND

DEMOLITION / GEOTECHNICAL	
EROSION & SEDIMENT CONTROL	
ITEM TO BE DEMOLISHED	
TEST PIT	
MONITORING WELL	
BORING	

Tighe&Bond

COMMONWEALTH OF MASSACHUSETTS
JOSEPH P VIAMARI JR.
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REGISTERED PROFESSIONAL ENGINEER
04/22/2024

COMMONWEALTH OF MASSACHUSETTS
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PERMIT SET

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Grand Trunk Trail Continuation

Town of Sturbridge

Sturbridge, Massachusetts

MARK	DATE	DESCRIPTION
A	4/21/2024	NOI PERMIT SET

PROJECT NO:	S5052-035
DATE:	4/2024
FILE:	S-5052-035 GENERAL NOTES.dwg
DRAWN BY:	AL/ND
DESIGNED/CHECKED BY:	ABS
APPROVED BY:	MPW

LEGEND & ABBREVIATIONS

SCALE: AS SHOWN

G-002

BASE PLAN NOTES

1. THE EXISTING CONDITIONS INFORMATION SHOWN ON THE DRAWINGS IS BASED ON THE FOLLOWING:
   - SURVEY DRAWINGS PROVIDED BY DC ENGINEERING & SURVEY INC. TITLED EASEMENT PLAN OF LAND AND DATED FEBRUARY 13, 2023
   - THE RESOURCE AREA BOUNDARIES DEPICTED ON THE DRAWINGS WERE DELINEATED BY ECOTEC INC ON FEBRUARY 9, 2023
   - LIMITS OF BORDERING LAND SUBJECT TO FLOODING (BLSF), THE 100-YEAR FLOOD ZONE, ARE BASED ON THE FEDERAL EMERGENCY MANAGEMENT AGENCY'S (FEMA) FLOOD INSURANCE RATE MAP (FIRM) PANEL NUMBERS 25027C0927F AND 25027CC0929F, EFFECTIVE JUNE 21, 2023.
2. LOCATION AND DEPTH OF ALL UNDERGROUND UTILITIES SHOWN ARE APPROXIMATE AND ARE BASED ON OBVIOUS ABOVE GROUND PHYSICAL UTILITY APPURTENANCES AND ACCESSIBLE MANHOLE. THE ACCURACY AND COMPLETENESS OF SUBSURFACE INFORMATION SHOWN ON THESE DRAWINGS IS NOT GUARANTEED. DETERMINE THE LOCATIONS AND ELEVATIONS OF ALL UTILITIES WHICH MAY AFFECT CONSTRUCTION OPERATIONS.
3. THE DRAWINGS ARE BASED ON THE FOLLOWING DATUMS: HORIZONTAL- NAD83; VERTICAL-NAVD88
4. THE EXISTING CONDITIONS SHOWN ARE APPROXIMATE. FIELD VERIFY EXISTING CONDITIONS.
5. BOUNDARIES SHOWN ARE THE RESULTS OF ACTUAL FIELD SURVEY PERFORMED BY DC ENGINEERING AND SURVEY INC. BASED ON AVAILABLE MAPS, DEEDS OF RECORD, AND PHYSICAL EVIDENCE, BUT ARE SUBJECT TO ALL EASEMENTS, RIGHTS OF WAY, AGREEMENTS, AND RIGHTS AND ENCUMBRANCES OF RECORD THAT AN ACCURATE AND THOROUGH TITLE SEARCH MAY DISCLOSE.

GENERAL NOTES

1. NOTIFY (DIGSAFE AT 1-888-344-7233) LIST AT LEAST 72 HOURS PRIOR TO ANY DIGGING, TRENCHING, ROCK REMOVAL, DEMOLITION, BORING, BACKFILLING, GRADING, LANDSCAPING, OR ANY OTHER EARTH MOVING OPERATIONS.
2. LOCATIONS OF EXISTING UTILITIES ARE APPROXIMATE. IN ADDITION, SOME UTILITIES MAY NOT BE SHOWN. DETERMINE THE EXACT LOCATION OF UTILITIES BY TEST PIT OR OTHER METHODS, AS NECESSARY TO PREVENT DAMAGE TO UTILITIES AND/OR INTERRUPTIONS IN UTILITY SERVICE. PERFORM TEST PIT EXCAVATIONS AND OTHER INVESTIGATIONS TO LOCATE UTILITIES, AND PROVIDE THIS INFORMATION TO THE ENGINEER, PRIOR TO CONSTRUCTING THE PROPOSED IMPROVEMENTS. LOCATE ALL EXISTING UTILITIES TO BE CROSSED BY HAND EXCAVATION.
3. BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.
4. TIGHE & BOND ASSUMES NO RESPONSIBILITY FOR ANY ISSUES, LEGAL OR OTHERWISE, RESULTING FROM CHANGES MADE TO THESE DRAWINGS WITHOUT WRITTEN AUTHORIZATION FROM TIGHE & BOND.
5. NOTIFY THE ENGINEER OF ANY UTILITIES IDENTIFIED DURING CONSTRUCTION THAT ARE NOT SHOWN ON THE DRAWINGS OR THAT DIFFER IN SIZE OR MATERIAL.
6. THE CONTRACTOR IS RESPONSIBLE FOR SITE SAFETY; COORDINATION WITH THE OWNER, ALL SUBCONTRACTORS, AND WITH OTHER CONTRACTORS WORKING WITHIN THE LIMITS OF WORK, THE MEANS AND METHODS OF CONSTRUCTING THE PROPOSED WORK.
7. OBTAIN, PAY FOR AND COMPLY WITH PERMITS, NOTICES AND FEES NECESSARY TO COMPLETE THE WORK. ARRANGE AND PAY FOR NECESSARY INSPECTIONS AND APPROVALS FROM THE JURISDICTIONAL AUTHORITIES.
8. SHORE UTILITY TRENCHES WHERE FIELD CONDITIONS DICTATE AND/OR WHERE REQUIRED BY LOCAL, STATE AND FEDERAL HEALTH AND SAFETY CODES.
9. FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO CONSTRUCTION. IF FIELD CONDITIONS ARE OBSERVED THAT VARY SIGNIFICANTLY FROM THOSE SHOWN ON THE DRAWINGS, IMMEDIATELY NOTIFY THE ENGINEER IN WRITING FOR RESOLUTION OF THE CONFLICTING INFORMATION.
10. PROTECT AND MAINTAIN ALL UTILITIES IN THE AREAS UNDER CONSTRUCTION DURING THE WORK. LEAVE ALL PIPES AND STRUCTURES WITHIN THE LIMITS OF THE CONTRACT IN A CLEAN AND OPERABLE CONDITION AT THE COMPLETION OF THE WORK. TAKE ALL NECESSARY PRECAUTIONS TO PREVENT SAND AND SILT FROM DISTURBED AREAS FROM ENTERING THE DRAINAGE SYSTEM.
11. NOTIFY THE ENGINEER IN WRITING OF ANY CONFLICT, ERROR, AMBIGUITY, OR DISCREPANCY WITH THE PLANS OR BETWEEN THE PLANS AND ANY APPLICABLE LAW, REGULATION, CODE, STANDARD SPECIFICATION, OR MANUFACTURER'S INSTRUCTIONS.
12. THE CONTRACTOR IS RESPONSIBLE FOR SUPPORT OF EXISTING UTILITIES AND REPAIR OR REPLACEMENT COSTS OF UTILITIES DAMAGED DURING CONSTRUCTION, WHETHER ABOVE OR BELOW GRADE. REPLACE DAMAGED UTILITIES IMMEDIATELY AT NO ADDITIONAL COST TO THE OWNER AND AT NO COST TO THE PROPERTY OWNER.
13. TAKE NECESSARY MEASURES AND PROVIDE CONTINUOUS BARRIERS OF SUFFICIENT TYPE, SIZE, AND STRENGTH TO PREVENT ACCESS TO ALL WORK AND STAGING AREAS AT THE COMPLETION OF EACH DAYS WORK.
14. NO OPEN TRENCHES WILL BE ALLOWED OVER NIGHT. THE USE OF ROAD PLATES TO PROTECT THE EXCAVATION WILL BE CONSIDERED UPON REQUEST, BUT BACKFILLING IS PREFERRED.
15. THE CONTRACTOR IS RESPONSIBLE FOR ALL NECESSARY TRAFFIC CONTROL/SAFETY DEVICES TO ENSURE SAFE VEHICULAR AND PEDESTRIAN ACCESS THROUGH THE WORK AREA, OR FOR SAFELY IMPLEMENTING DETOURS AROUND THE WORK AREA. PERFORM TRAFFIC CONTROL IN ACCORDANCE WITH THE CONTRACTOR'S APPROVED TRAFFIC CONTROL PLAN.
16. MAINTAIN EMERGENCY ACCESS TO ALL PROPERTIES WITHIN THE PROJECT AREA AT ALL TIMES DURING CONSTRUCTION.
17. WHEN WORKING IN THE ROAD, PROVIDE THE OWNER AND LOCAL FIRE/POLICE/SCHOOL AUTHORITIES A DETAILED PLAN OF APPROACH INDICATING METHODS OF PROPOSED TRAFFIC ROUTING ON A DAILY BASIS. PROVIDE COORDINATION TO ENSURE COMMUNICATION AND COORDINATION BETWEEN THE OWNER, CONTRACTOR AND LOCAL FIRE/POLICE/SCHOOL AUTHORITIES THROUGHOUT THE CONSTRUCTION PERIOD.
18. REMOVE AND DISPOSE OF ALL CONSTRUCTION-RELATED WASTE MATERIALS AND DEBRIS IN STRICT ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL LAWS.
19. THE TERM "DEMOLISH" USED ON THE DRAWINGS MEANS TO REMOVE AND DISPOSE OF IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REQUIREMENTS.
20. THE TERM "ABANDON" USED ON THE DRAWINGS MEANS TO LEAVE IN PLACE AND TAKE APPROPRIATE MEASURES TO DECOMMISSION AS SPECIFIED OR NOTED ON THE DRAWINGS.
21. ALL PROPOSED WORK MAY BE ADJUSTED IN THE FIELD BY THE OWNER'S PROJECT REPRESENTATIVE TO MEET EXISTING CONDITIONS.

EROSION CONTROL AND RESOURCE AREA PROTECTION NOTES

1. PROVIDE ALL EROSION CONTROL MEASURES SHOWN, SPECIFIED, REQUIRED BY PERMIT, AND/OR REQUIRED BY THE ENGINEER PRIOR TO ANY CONSTRUCTION OR IMMEDIATELY UPON REQUEST. MAINTAIN SUCH CONTROL MEASURES UNTIL FINAL SURFACE TREATMENTS ARE IN PLACE AND/OR UNTIL PERMANENT VEGETATION IS ESTABLISHED. INSPECT AFTER EACH RAINSTORM AND DURING MAJOR STORM EVENTS TO CONFIRM THAT ALL SEDIMENTATION AND EROSION CONTROL MEASURES REQUIRED ARE IN PLACE AND EFFECTIVE.
2. PRIOR TO STARTING WORK, CLEARLY STAKE WORK LIMITS. DO NOT DISTURB VEGETATION AND TOPSOIL BEYOND THE PROPOSED LIMITS. COORDINATE WITH THE ENGINEER FOR LOCATIONS OF TEMPORARY STOCKPILING OF TOPSOIL DURING CONSTRUCTION.
3. INSTALL SILT SACKS OR OTHER APPROVED SEDIMENTATION BARRIERS IN/AT ALL CATCH BASINS IN THE PROJECT AREA.
4. COMPACT, STABILIZE, AND LOAM AND SEED SIDE SLOPES, SHOULDER AREAS AND DISTURBED VEGETATED AREAS IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND AS REQUIRED BY PERMITS. GRADE SIDE SLOPES, SHOULDER AREAS AND DISTURBED VEGETATED AREAS TO A MAXIMUM SLOPE OF 3 HORIZONTAL TO 1 VERTICAL (3H:1V), WHERE POSSIBLE. PROVIDE BIODEGRADABLE EROSION CONTROL BLANKETS TO PREVENT EROSION WHERE SLOPES ARE STEEPER THAN 3H:1V.
5. SETTLE OR FILTER ALL SILT-LADEN WATER FROM DEWATERING ACTIVITIES IN A SEDIMENTATION OR FILTER BAG TO REMOVE SEDIMENTS PRIOR TO RELEASE USING A SEDIMENTATION OR FILTER BAG LOCATED DOWN-GRADIENT OF THE DEWATERED AREA.
6. REMOVE AND PROPERLY DISPOSE OF SILT TRAPPED AT BARRIERS IN UPLAND AREAS OUTSIDE BUFFER ZONES. REMOVE MATERIALS DEPOSITED IN ANY TEMPORARY SETTLING BASINS AT THE COMPLETION OF THE PROJECT. RESTORE ALL DISTURBED AREAS TO THEIR PRECONSTRUCTION CONDITION.
7. SWEEP, COLLECT, REMOVE AND DISPOSE OF ANY SEDIMENT TRACKED ONTO PUBLIC RIGHT-OF-WAYS AT THE END OF EACH DAY.
8. LOAM AND SEED ALL DISTURBED VEGETATED AREAS TO ESTABLISH COVER AND STABILIZATION AS SOON AS POSSIBLE FOLLOWING DISTURBANCE.
9. MAINTAIN AN ADDITIONAL SUPPLY OF EROSION CONTROL MEASURES ON-SITE FOR EMERGENCY REPAIRS.
10. STORE FUEL, OIL, PAINT, OR OTHER HAZARDOUS MATERIALS IN A SECONDARY CONTAINER AND REMOVE TO A SECURE LOCKED AND COVERED AREA DURING NON-WORK HOURS.
11. PROVIDE A SUPPLY OF ABSORBENT SPILL RESPONSE MATERIALS SUCH AS BOOMS, BLANKETS, AND OIL ABSORBENT MATERIALS AT THE CONSTRUCTION SITE AT ALL TIMES TO CLEAN UP POTENTIAL SPILLS OF HAZARDOUS MATERIALS. IMMEDIATELY REPORT SPILLS OF HAZARDOUS MATERIALS TO THE STATE ENVIRONMENTAL AGENCY AND THE MUNICIPALITY WHERE THE WORK IS OCCURRING.

SURFACE RESTORATION NOTES

1. ALL PAVEMENT DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPLACED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
2. PROVIDE SITE GRADING AT ACCESSIBLE SIDEWALK RAMPS, SIDEWALKS, AND BUILDING ENTRANCES THAT IS CONSISTENT WITH THE RELEVANT ACCESS REQUIREMENTS OF THE ARCHITECTURAL BARRIERS ACT (ABA), THE AMERICANS WITH DISABILITIES ACT (ADA), AND MA ARCHITECTURAL ACCESS BOARD REQUIREMENTS (AAB). SMALL CHANGES IN GRADE OVER RELATIVELY SHORT DISTANCES (E.G. AT PARKING SPACES, ACCESSIBLE ROUTES, AND RAMPS) MIGHT NOT BE CLEARLY DEPICTED WITHIN THE CONTOUR INTERVAL SHOWN. COMPLY WITH THE CRITERIA IN THESE STANDARDS. SELECT MAXIMUM SLOPE CRITERIA ARE REPRODUCED BELOW:
   - ACCESSIBLE PARKING STALL AND PASSENGER LOADING ZONE (ANY DIRECTION) SLOPE < 2.0%
   - LONGITUDINAL SLOPE ALONG ACCESSIBLE ROUTES < 5.0%
   - CROSS SLOPE ALONG ACCESSIBLE ROUTES < 2.0%
3. PROTECT PROJECT FEATURES (E.G., WALLS, FENCES, MAIL BOXES, SIGNS, SIDEWALKS, CURBING, STAIRS, WALKWAYS, TREES, ETC.) FROM DAMAGE DURING CONSTRUCTION, INCLUDING PROVIDING TEMPORARY SUPPORTS, WHEN APPROPRIATE.
4. IF REMOVAL OF PROJECT FEATURES IS REQUIRED IN ORDER TO PERFORM THE PROPOSED WORK, REMOVE THOSE SITE FEATURES ONLY UPON APPROVAL OF ENGINEER. REPLACE ALL REMOVED PROJECT FEATURES; NEW ITEMS SHALL BE EQUAL OR BETTER IN QUALITY AND CONDITION TO THE ITEMS REMOVED.
5. EXISTING SURVEY MONUMENTS DISTURBED BY THE CONTRACTOR SHALL BE REPLACED BY A LAND SURVEYOR LICENSED IN THE STATE IN WHICH THE WORK IS PERFORMED AT NO ADDITIONAL COST TO THE OWNER.
6. COORDINATE THE ADJUSTMENT OF EXISTING UTILITY STRUCTURES WITH EACH RESPONSIBLE UTILITY OWNER PRIOR TO RECONSTRUCTION AND/OR PAVING OPERATIONS. RAISE ALL STRUCTURES TO FINISHED GRADES PRIOR TO THE END OF THE CONSTRUCTION SEASON AND PRIOR TO FINISHED PAVING.
7. REPAIR DISTURBED PAVED SURFACES AT THE END OF EACH WORK WEEK, UNLESS OTHERWISE APPROVED/REQUIRED BY THE OWNER.
8. PLACE TEMPORARY BITUMINOUS CONCRETE PAVEMENT AT DISTURBED PORTLAND CEMENT CONCRETE SIDEWALKS AND DRIVEWAYS AT THE END OF EACH WORK WEEK, UNLESS OTHERWISE APPROVED/REQUIRED BY THE OWNER.
9. TRANSFER ALL TEMPORARY BENCHMARKS, AS NECESSARY.
10. RESTORE ALL AREAS DISTURBED BY THE CONTRACTOR BEYOND THE PAYLINE LIMITS TO ORIGINAL CONDITIONS AT NO ADDITIONAL COST TO THE OWNER.
11. REGRADE ALL UNPAVED AREAS DISTURBED BY THE WORK AS REQUIRED. REPAIR/REPLACE PAVED SURFACES DISTURBED BY THE WORK IN-KIND, UNLESS OTHERWISE NOTED. RESTORE SURFACES TO EXISTING OR PROPOSED CONDITIONS AS INDICATED ON THE DRAWINGS.
12. PROVIDE A SMOOTH, FLUSH TRANSITION BETWEEN ALL NEW AND EXISTING PAVEMENTS AND WALKING SURFACES.

Tighe&Bond

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REGISTERED PROFESSIONAL ENGINEER
04/22/2024

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MATT WZOREK
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04/22/2024

PERMIT SET

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Grand Trunk Trail Continuation

Town of Sturbridge

Sturbridge, Massachusetts

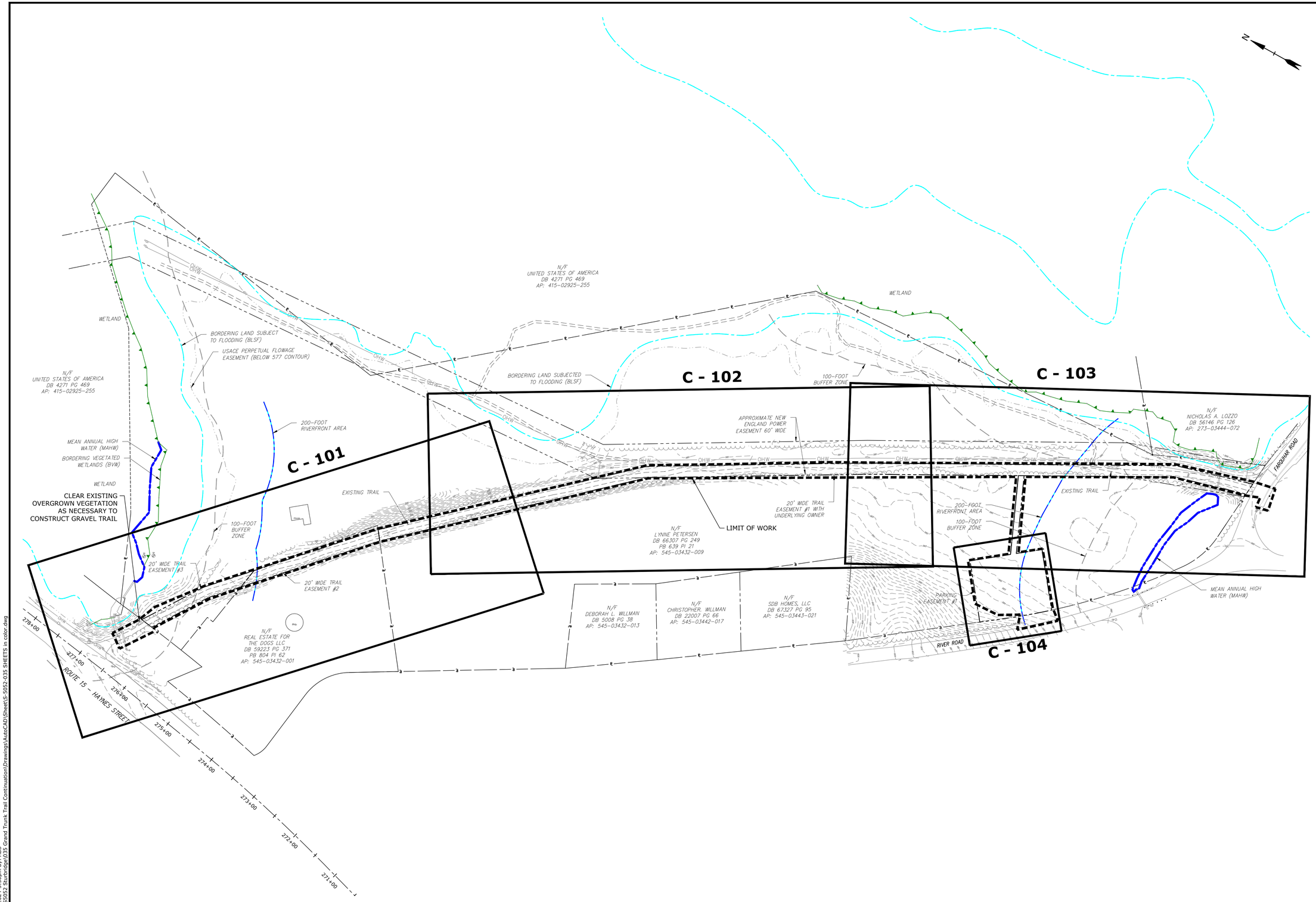
MARK	DATE	DESCRIPTION
A	4/21/2024	NOI PERMIT SET

PROJECT NO:	S5052-035
DATE:	4/2024
FILE:	S-S052-035 GENERAL NOTES.dwg
DRAWN BY:	AL/ND
DESIGNED/CHECKED BY:	ABS
APPROVED BY:	MPW

GENERAL NOTES

SCALE: AS SHOWN

G-003



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APPROVED BY:	MPW

SHEET LAYOUT AND EXISTING CONDITIONS PLAN

SCALE: AS SHOWN

C-100

Last Saved: 4/22/2024
Plotted: Oct 23, 2024 - 3:50pm By: ABS
Tighe & Bond J:\S\S5052 Sturbridge\035 Grand Trunk Trail Continuation\Drawings\AutoCAD\Sheet\S-5052-035 SHEETS in color.dwg

C - 101

C - 102

C - 103

C - 104

N/F
UNITED STATES OF AMERICA
DB 4271 PG 469
AP: 415-02925-255

WETLAND

BORDERING LAND SUBJECT TO FLOODING (BLSF)

USACE PERPETUAL FLOWAGE EASEMENT (BELOW 577 CONTOUR)

200-FOOT RIVERFRONT AREA

100-FOOT BYLAW BUFFER ZONE

MEAN ANNUAL HIGH WATER (MAHW)

BORDERING VEGETATED WETLANDS (BVW)

CLEAR EXISTING OVERGROWN VEGETATION AS NECESSARY TO CONSTRUCT GRAVEL TRAIL

EXISTING TRAIL

20' WIDE TRAIL EASEMENT #3

20' WIDE TRAIL EASEMENT #2

50-FOOT NO STRUCTURE ZONE

25-FOOT NO DISTURBANCE ZONE

N/F
REAL ESTATE FOR THE DADS LLC
DB 58223 PG 371
PB 804 PL 62
AP: 545-03432-001

N/F
DEBORAH L. WILLMAN
DB 5008 PG 38
AP: 545-03432-013

N/F
CHRISTOPHER, WILLMAN
DB 22007 PG 66
AP: 545-03442-017

N/F
SDB HOMES, LLC
DB 67327 PG 95
AP: 545-03443-021

N/F
LYNNE PETERSEN
DB 66307 PG 249
PB 639 PL 21
AP: 545-03432-009

20' WIDE TRAIL EASEMENT #1 WITH UNDERLYING OWNER

LIMIT OF WORK

APPROXIMATE NEW ENGLAND POWER EASEMENT 60' WIDE

BORDERING LAND SUBJECTED TO FLOODING (BLSF)

N/F
NICHOLAS A. LOZZO
DB 56146 PG 126
AP: 273-03444-072

PARKING EASEMENT #1

RIVER ROAD

FARGHAR ROAD

MEAN ANNUAL HIGH WATER (MAHW)

25-FOOT NO DISTURBANCE ZONE

50-FOOT NO STRUCTURE ZONE

ROUTE 15 - HAYNES STREET

278+00
277+00
276+00
275+00
274+00
273+00
272+00
271+00

0 80' 160'
SCALE: 1" = 80'

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APPROVED BY:	MPW

SHEET LAYOUT AND EXISTING CONDITIONS PLAN (LOCAL BYLAWS)

SCALE: AS SHOWN

C-100A

Last Saved: 4/22/2024
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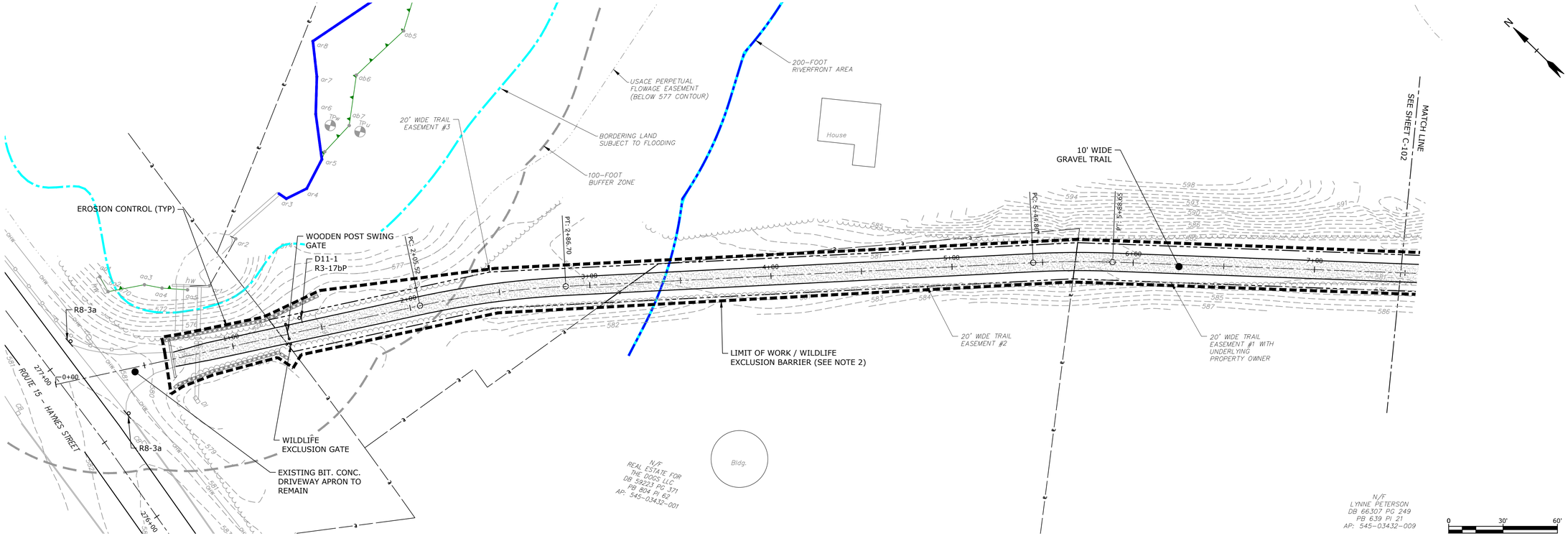
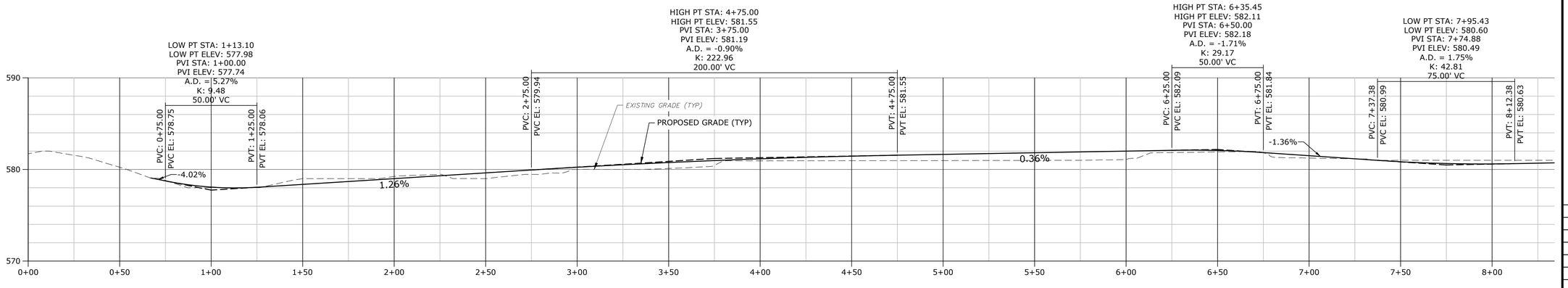
Tighe & Bond J:\S\S5052 Sturbridge\035 Grand Trunk Trail Continuation\Drawings\AutoCAD\Sheet\S-5052-035 SHEETS in color.dwg





GRAND TRUNK TRAIL PROFILE

NOTE

1. PROVIDE STABILIZED CONSTRUCTION ENTRANCE AT EACH ADJACENT STREET DURING CONSTRUCTION.
2. THE WILDLIFE EXCLUSION BARRIER SHALL CONSIST OF A SILT FENCE AROUND THE ENTIRE PERIMETER OF THE PROJECT AREA. PROVIDE WILDLIFE EXCLUSION GATES AT EACH CONSTRUCTION ENTRANCE.
3. SEED MIX FOR AREAS WITHIN 200-FOOT RIVERFRONT AREA SHALL BE NEW ENGLAND EROSION CONTROL/RESTORATION MIX FOR DRY SITES

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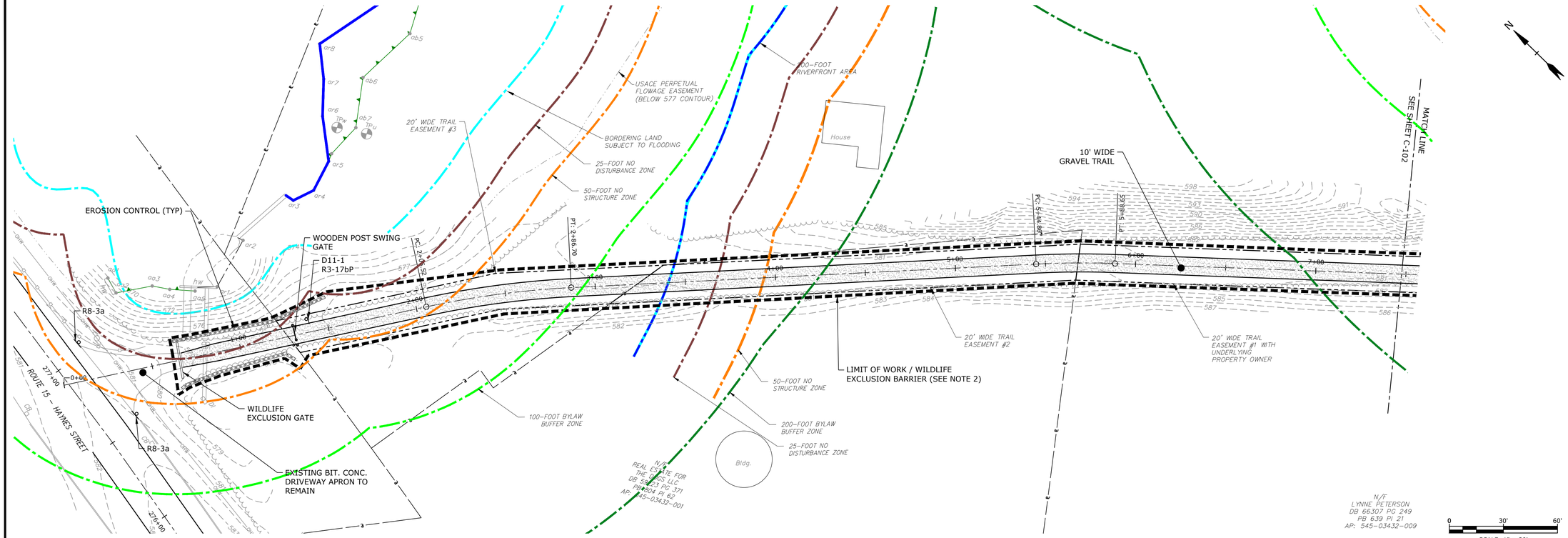
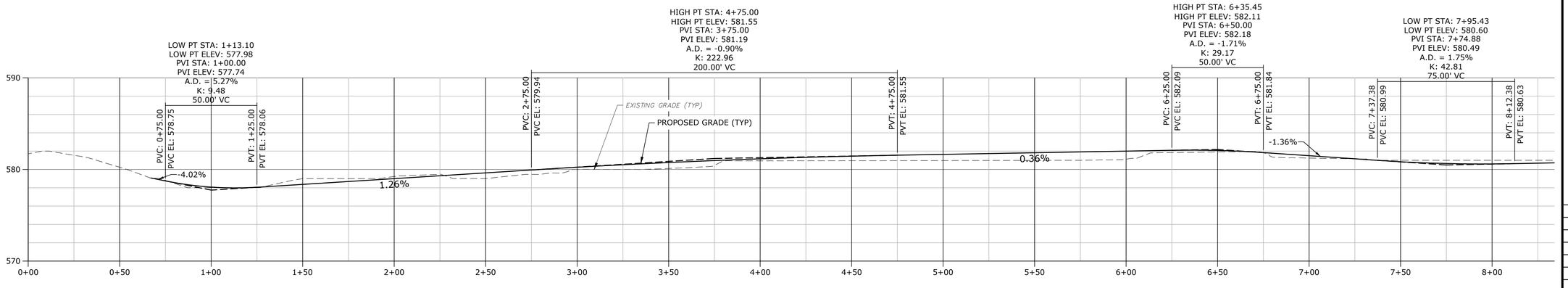
CONSTRUCTION PLAN AND PROFILE - 1

SCALE: AS SHOWN

C-101





GRAND TRUNK TRAIL PROFILE

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CONSTRUCTION PLAN AND PROFILE - 1 (LOCAL BYLAWS)

SCALE: AS SHOWN

C-101A

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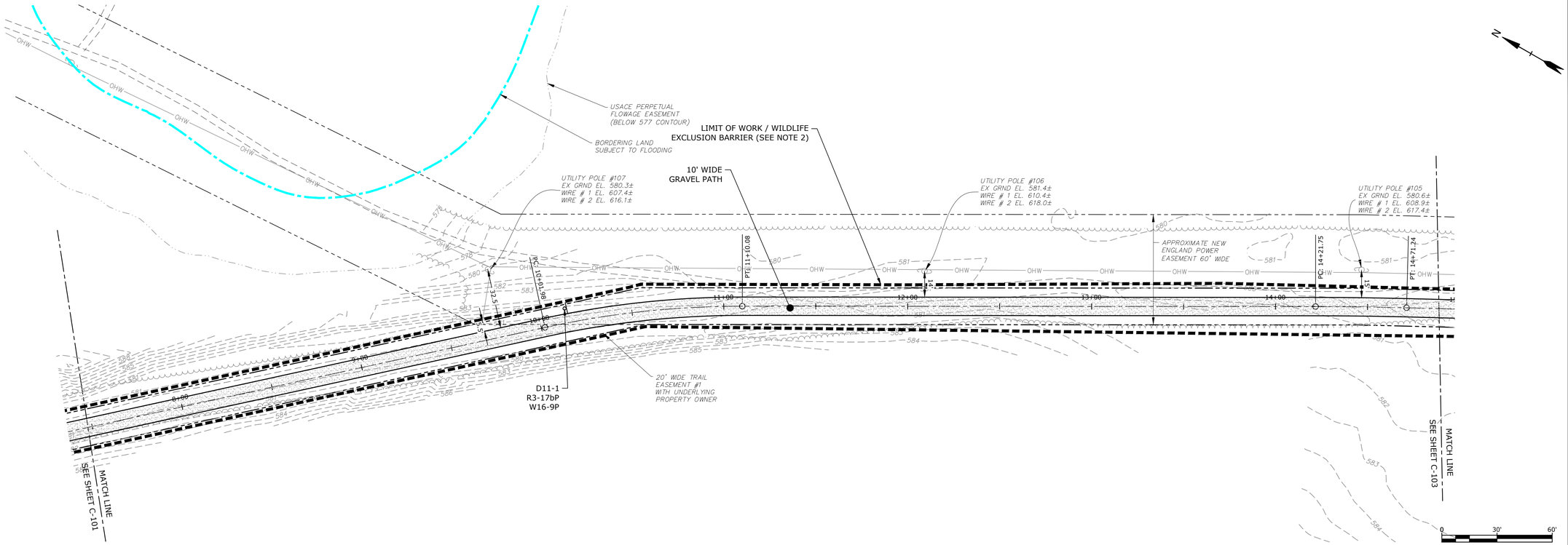
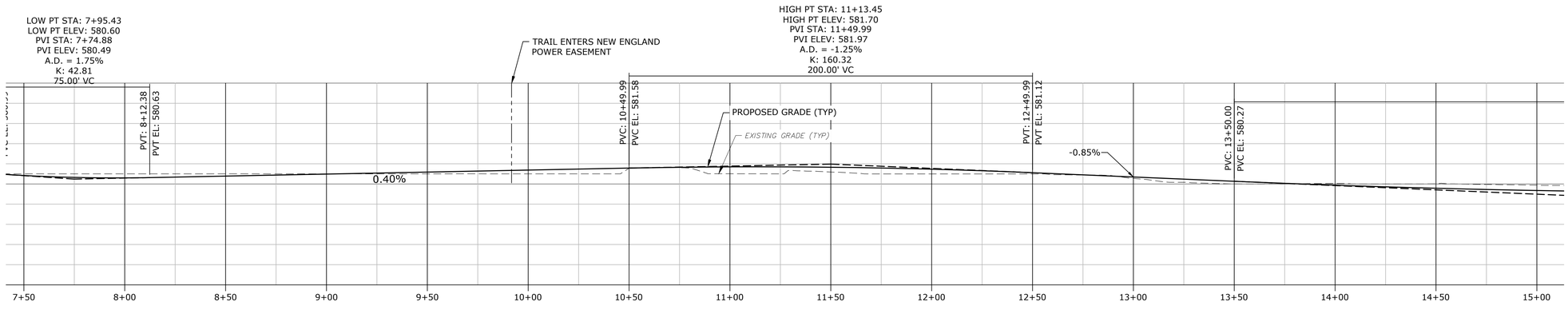
Tighe & Bond J:\S\S5052 Sturbridge\035 Grand Trunk Trail Continuation\Drawings\AutoCAD\Sheets\S-5052-035 SHEETS in color.dwg





GRAND TRUNK TRAIL PROFILE

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Tighe&Bond

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JOSEPH P VIAMARI JR.
CIVIL
No. 41776
REGISTERED PROFESSIONAL ENGINEER
04/22/2024

COMMONWEALTH OF MASSACHUSETTS
MATT WZOREK
CIVIL
No. 52674
REGISTERED PROFESSIONAL ENGINEER
04/22/2024

PERMIT SET

Grand Trunk Trail Continuation

Town of Sturbridge

Sturbridge, Massachusetts

MARK	DATE	DESCRIPTION
A	4/21/2024	NOI PERMIT SET

PROJECT NO:	S5052-035
DATE:	4/2024
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DESIGNED/CHECKED BY:	ABS
APPROVED BY:	MPW

CONSTRUCTION PLAN AND PROFILE - 2

SCALE: AS SHOWN

C-102

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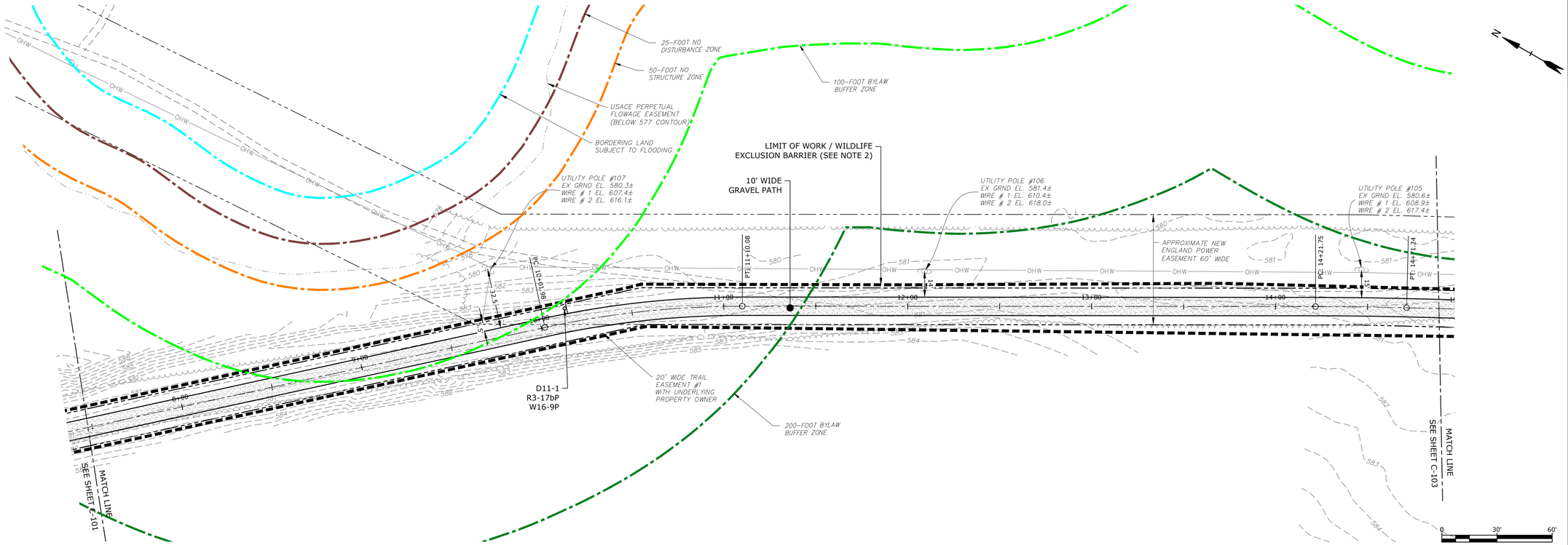

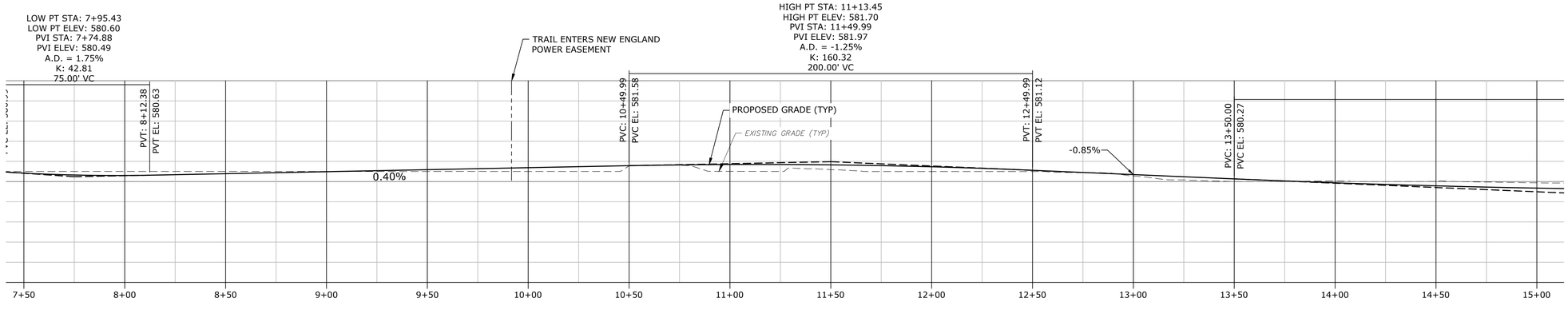

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Town of Sturbridge

Sturbridge, Massachusetts

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CONSTRUCTION PLAN AND PROFILE - 2 (LOCAL BYLAWS)

SCALE: AS SHOWN

C-102A

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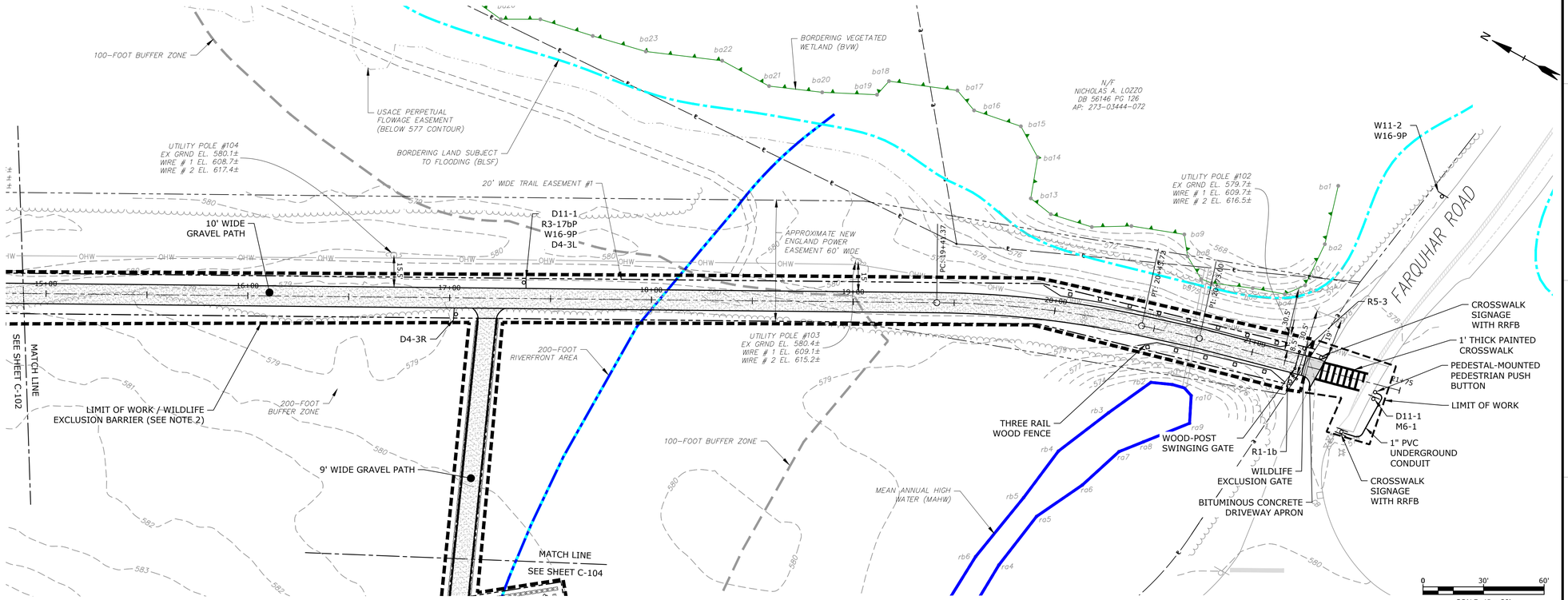

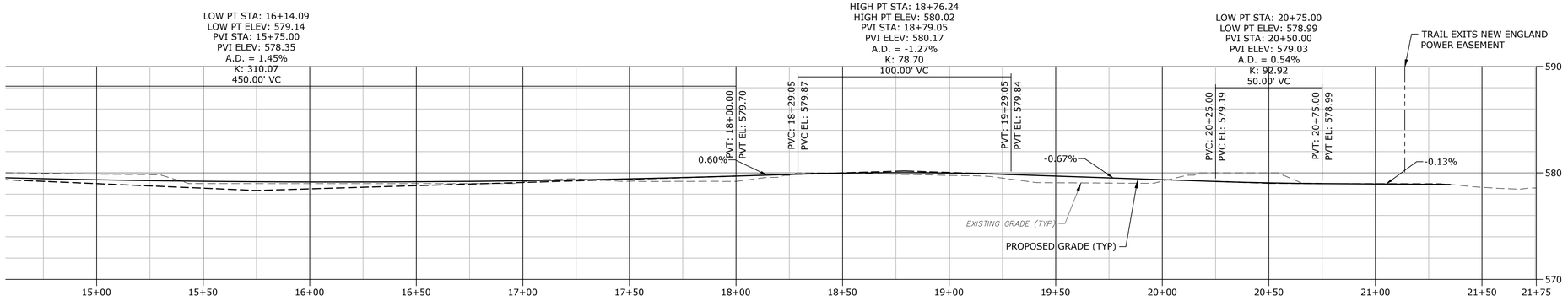

GRAND TRUNK TRAIL PROFILE

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CONSTRUCTION PLAN AND PROFILE - 3

SCALE: AS SHOWN

C-103

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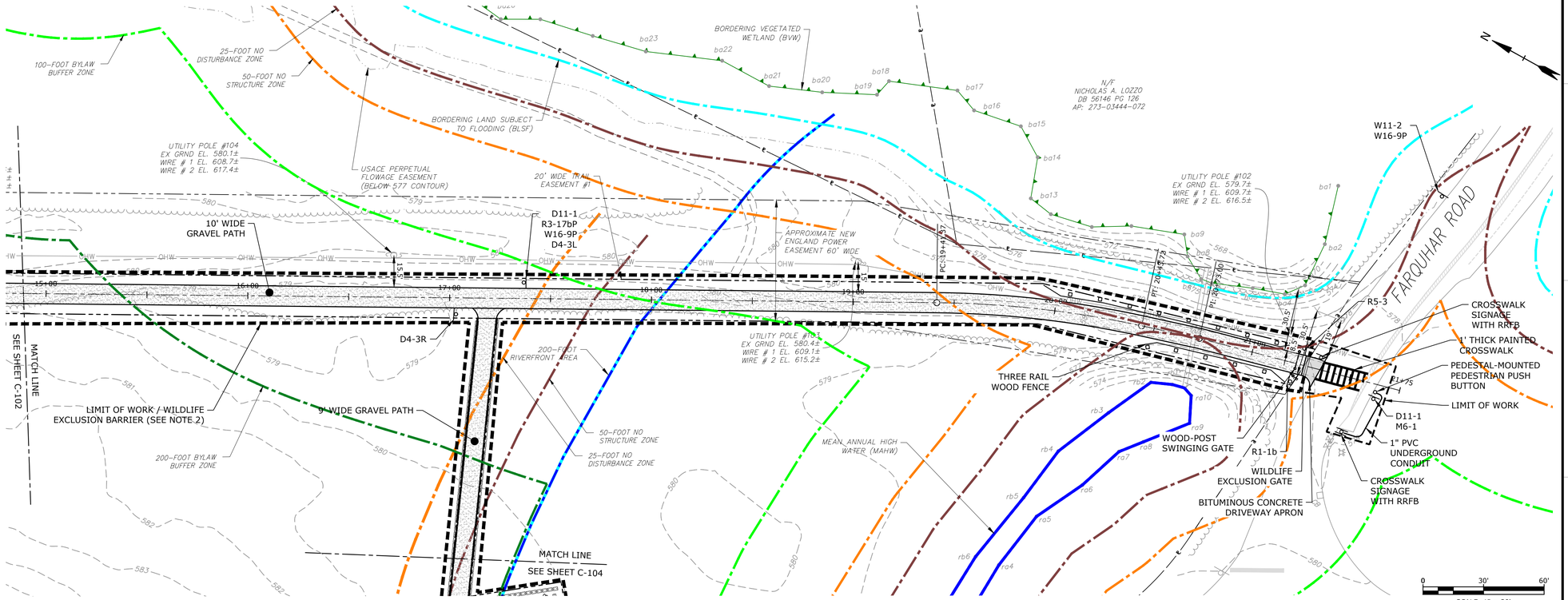

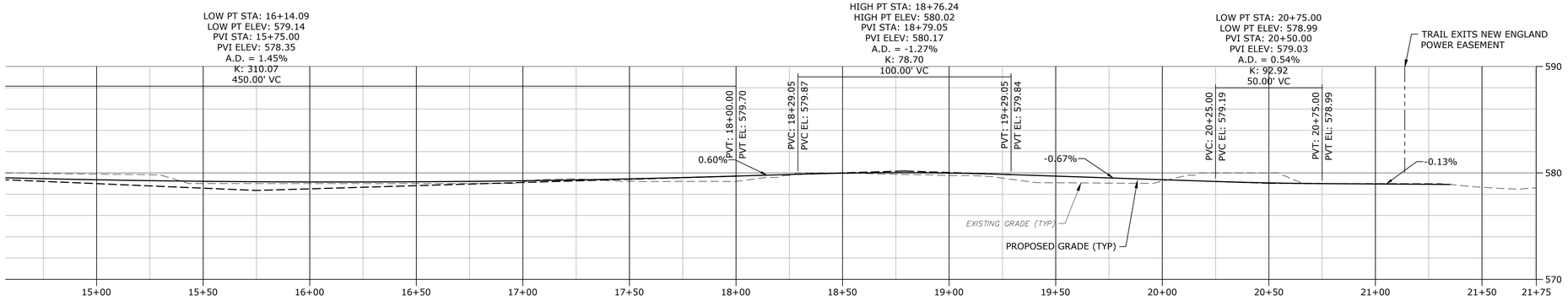

GRAND TRUNK TRAIL PROFILE

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CONSTRUCTION PLAN AND PROFILE - 3 (LOCAL BYLAWS)

SCALE: AS SHOWN

C-103A

Last Saved: 4/22/2024
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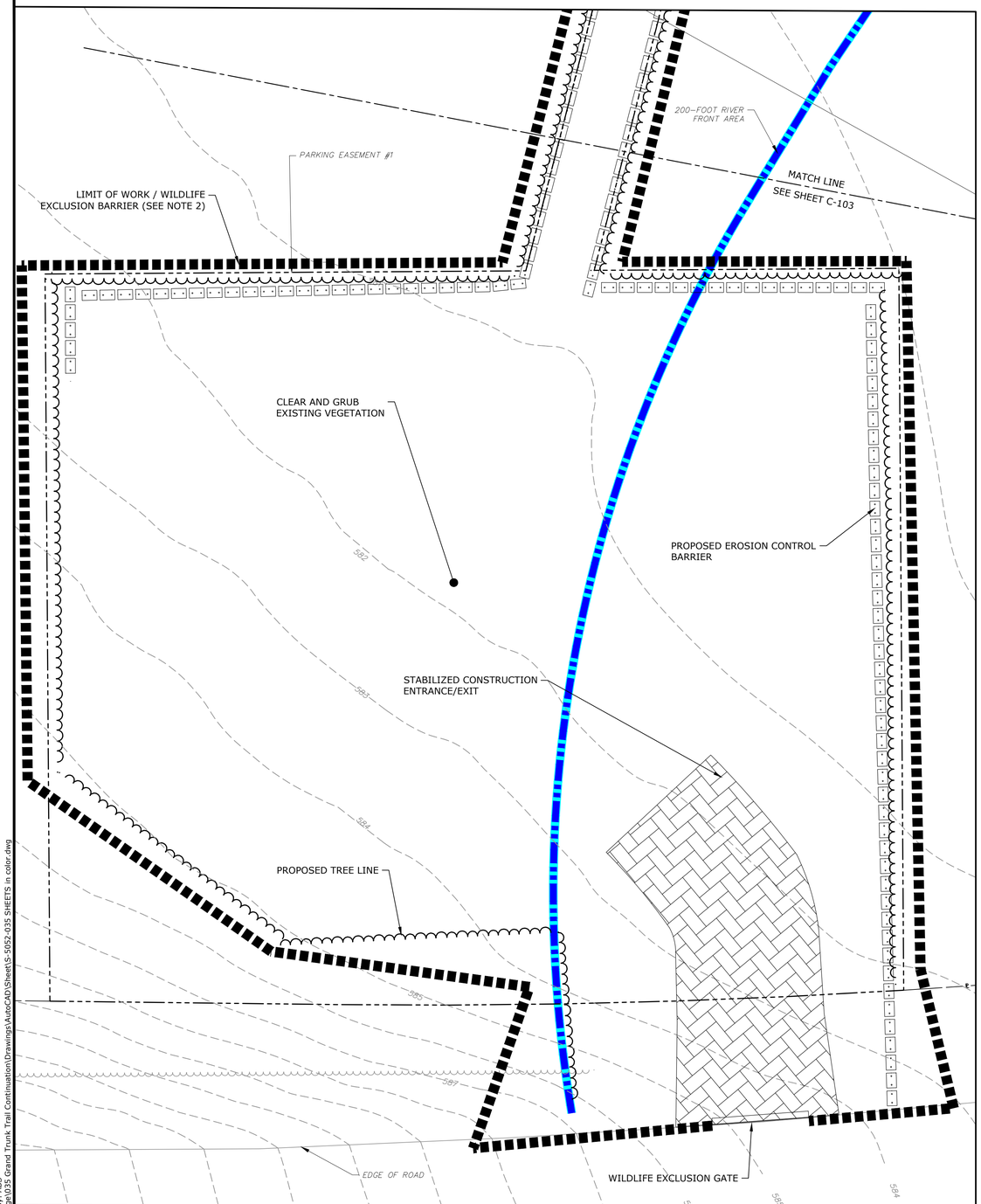
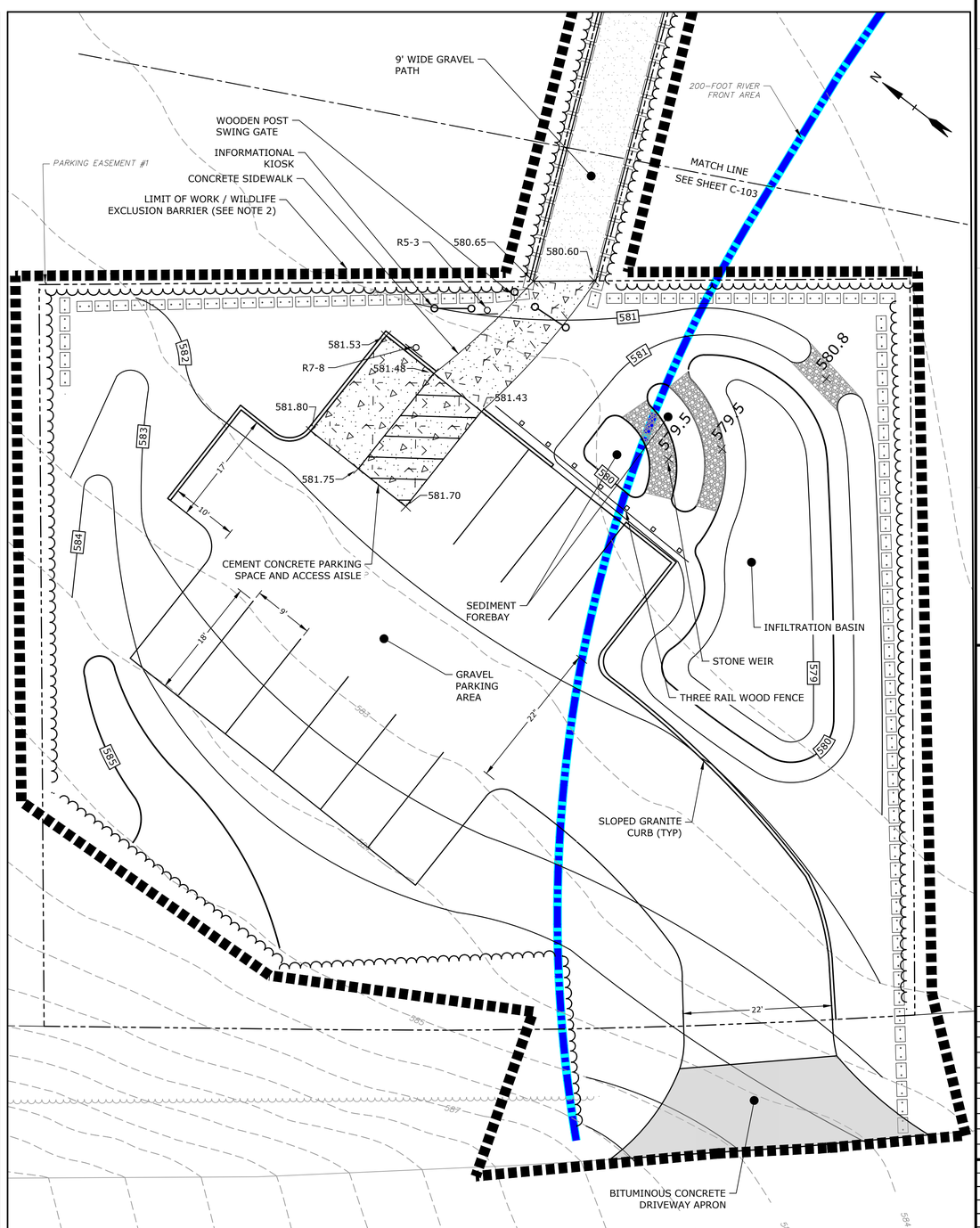


EXISTING CONDITIONS AND DEMOLITION PLAN



PROPOSED CONDITIONS PLAN

0 10' 20'

SCALE: 1" = 10'

NOTE

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RIVER ROAD PARKING LOT PLANS

SCALE: 1" = 10'

C-104

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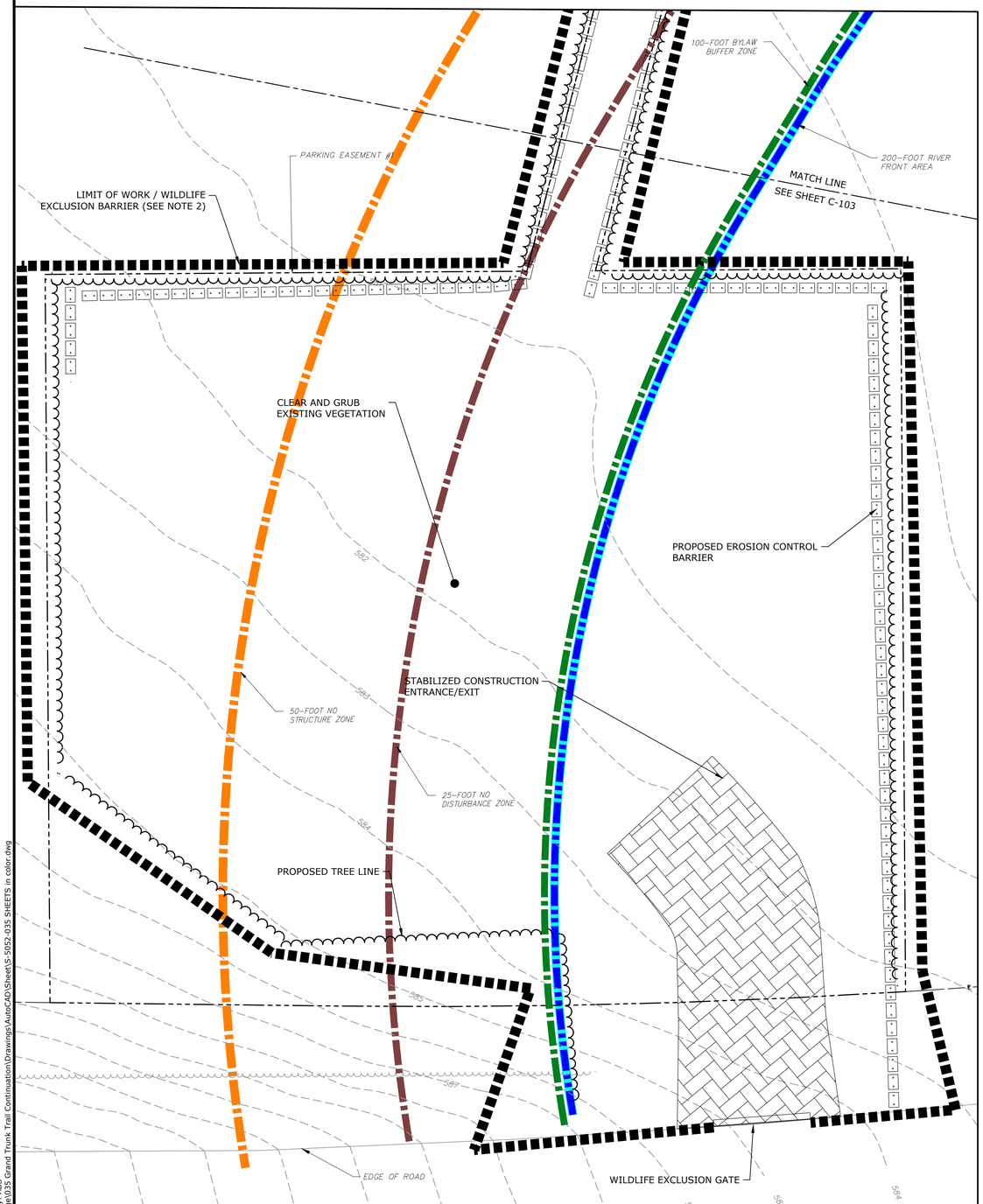
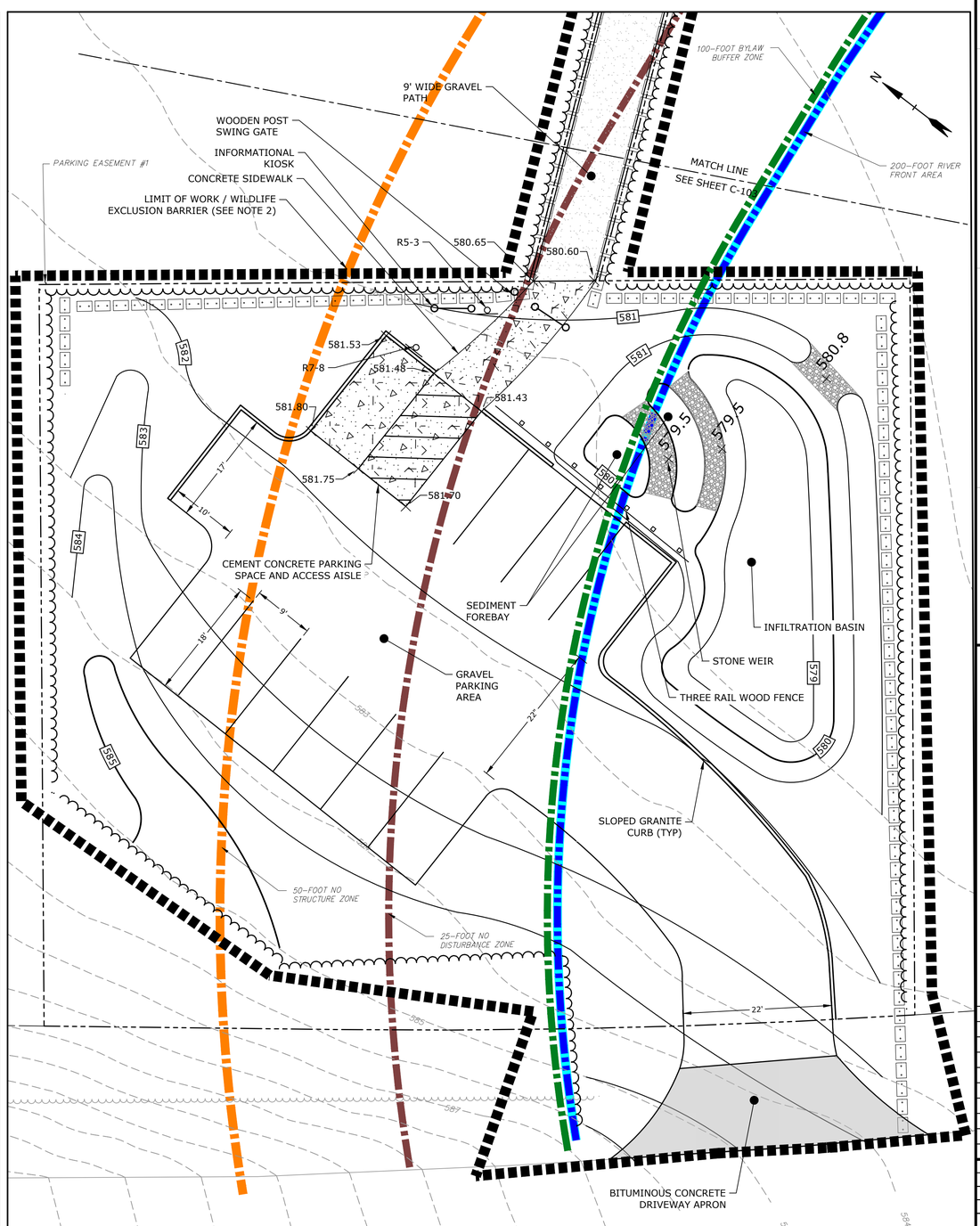


EXISTING CONDITIONS AND DEMOLITION PLAN



PROPOSED CONDITIONS PLAN

SCALE: 1" = 10'

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RIVER ROAD PARKING LOT PLANS (LOCAL BYLAWS)

SCALE: 1" = 10'

C-104A

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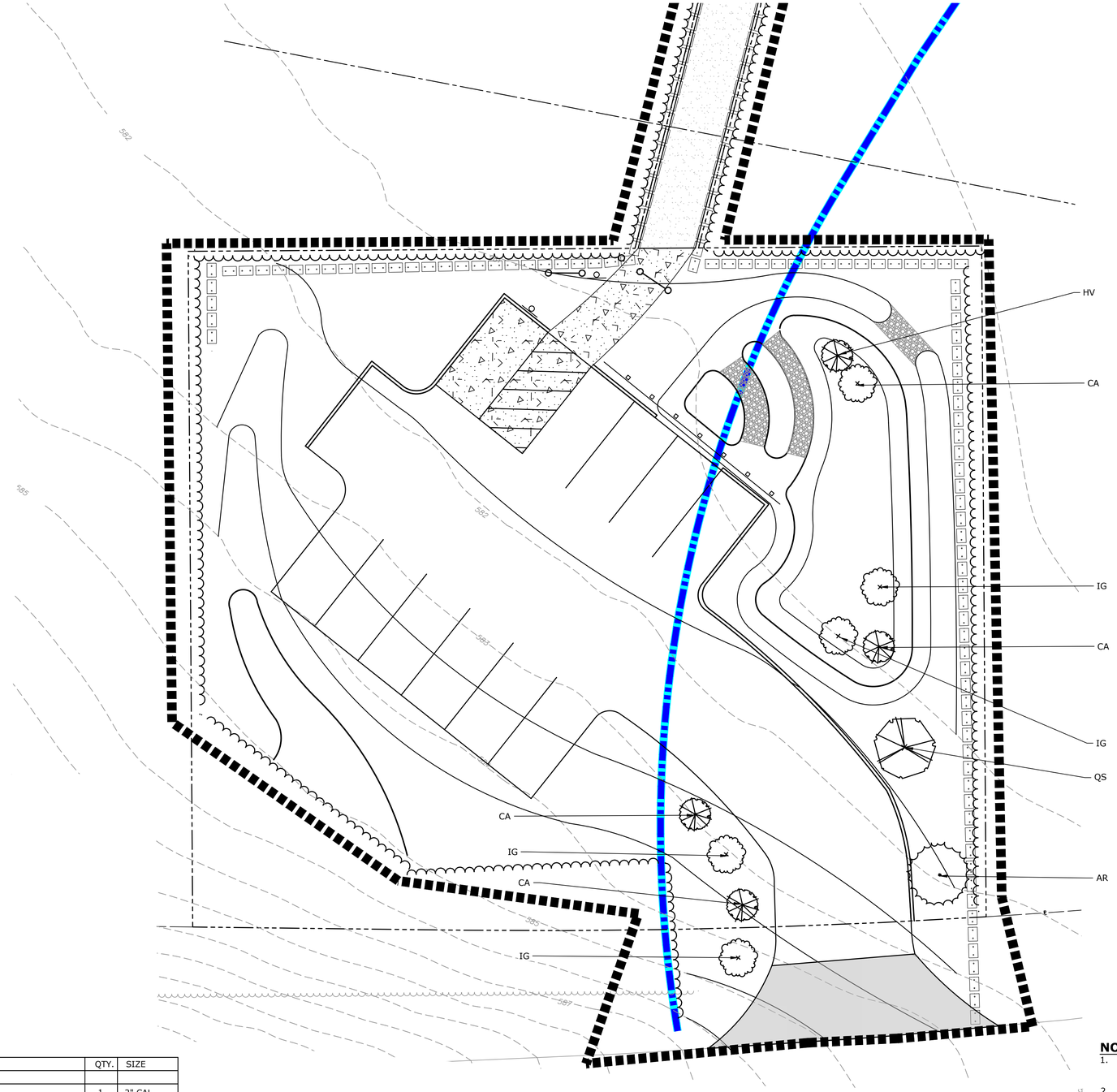

PLANT SCHEDULE

SYM.	BOTANICAL NAME	COMMON NAME	QTY.	SIZE
	TREES			
AR	ACER RUBRUM	RED MAPLE	1	2" CAL
QS	QUERCUS SPP	OAK SPP	1	3" CAL
	SHRUBS / GRASSES			
CA	CLETHRA ALNIFOLIA	SWEET PEPPERBUSH	2	#5 CONT.
IG	ILEX GLABRA	INKBERRY	2	#7 CONT.
	BIORETENTION BASIN PLANTINGS			
CA	CLETHRA ALNIFOLIA	SWEET PEPPERBUSH	2	#5 CONT.
IG	ILEX GLABRA	INKBERRY	2	#7 CONT.
HV	HAMAMELIS VIRGINIANA	COMMON WITCH HAZEL	1	#7 CONT.

CONT. = CONTAINER; CAL. = CALIPER; GAL. = GALLON, HT. = HEIGHT

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SCALE: 1" = 10'

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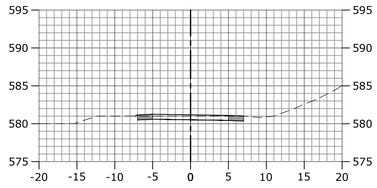
SITE LANDSCAPING PLAN

SCALE: 1" = 10'

C-105



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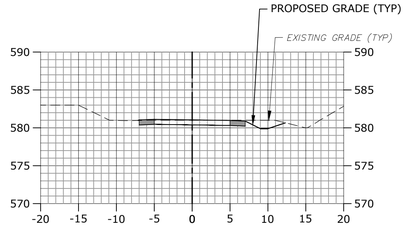

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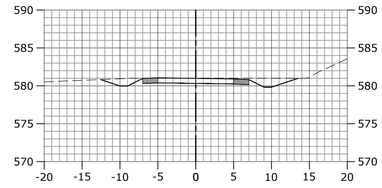

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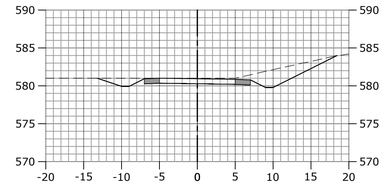

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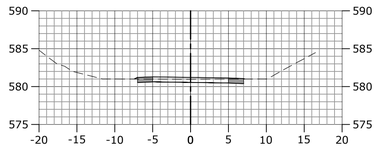

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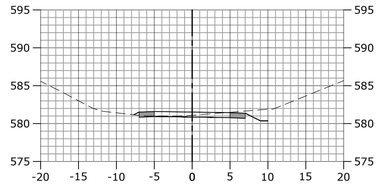

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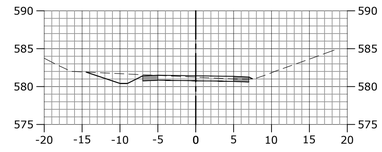

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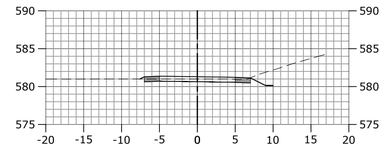

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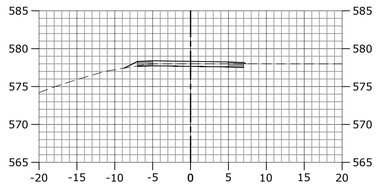

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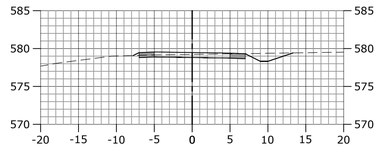

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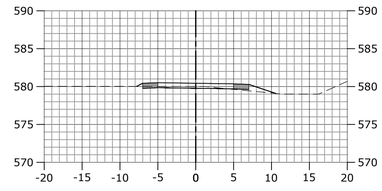

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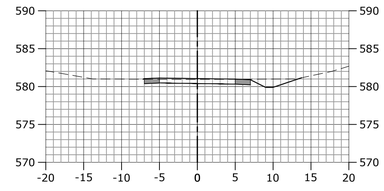

STATION: 4+00

0 10' 20'

SCALE: 1" = 10'

Tighe&Bond

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CROSS SECTIONS -1

SCALE: 1" = 10'

C-106

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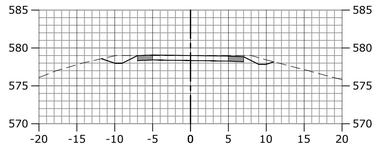

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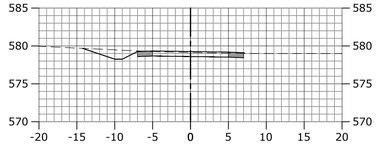
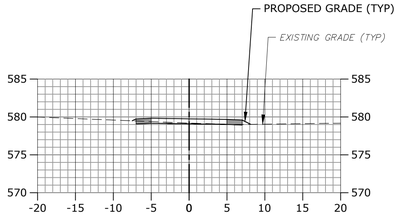


STATION: 17+00



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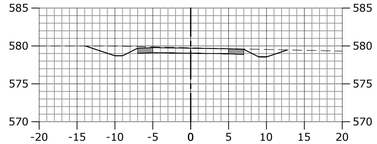

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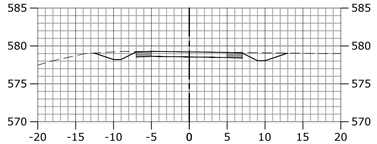

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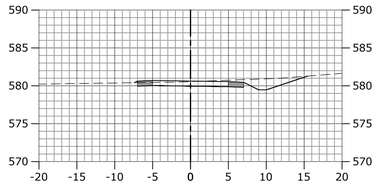

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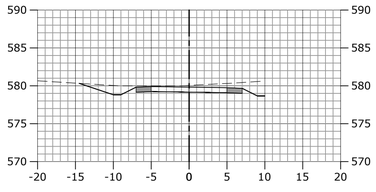

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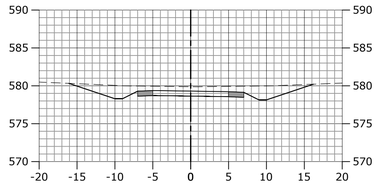

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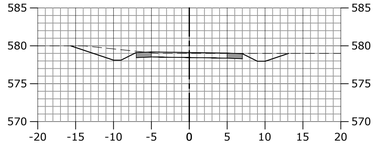

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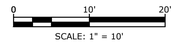

SCALE: 1" = 10'

Tighe&Bond

JOSEPH P VIAMARI JR. CIVIL No. 41776 REGISTERED PROFESSIONAL ENGINEER
COMMONWEALTH OF MASSACHUSETTS
04/22/2024

MATT WZOREK CIVIL No. 52674 REGISTERED PROFESSIONAL ENGINEER
COMMONWEALTH OF MASSACHUSETTS
04/22/2024

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Grand Trunk Trail Continuation

Town of Sturbridge

Sturbridge, Massachusetts

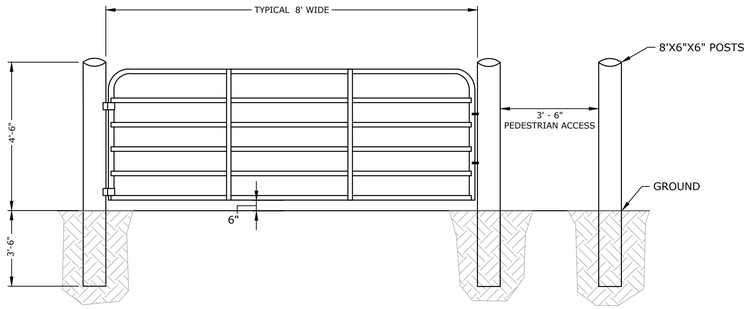
MARK	DATE	DESCRIPTION
A	4/21/2024	NOI PERMIT SET

PROJECT NO:	S5052-035
DATE:	4/2024
FILE:	S-5052-035 SHEETS in color.dwg
DRAWN BY:	AL/ND
DESIGNED/CHECKED BY:	ABS
APPROVED BY:	MPW

CROSS SECTIONS - 2

SCALE: 1" = 10'

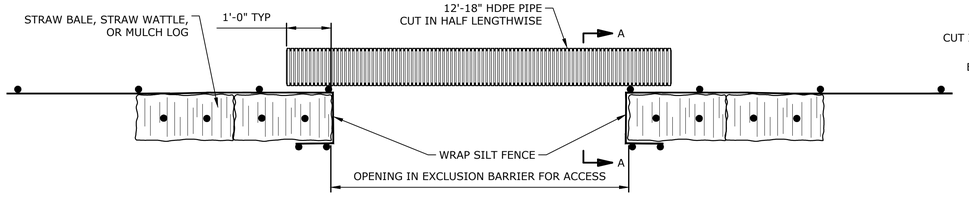
C-107



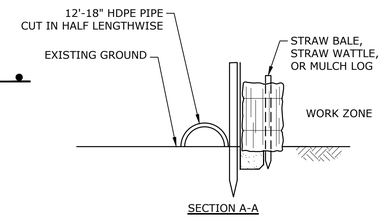
TYPICAL TRAIL ACCESS GATE
NO SCALE

NOTES:

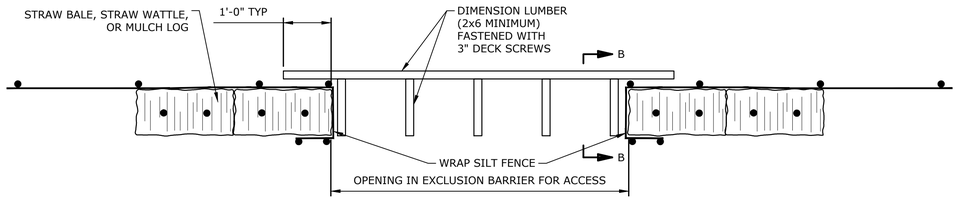
1. BOTH GATE SWING AND PEDESTRIAN ACCESS TO BE FIELD DETERMINED.



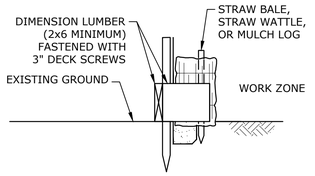
WILDLIFE EXCLUSION GATE TYPE-1



SECTION A-A



WILDLIFE EXCLUSION GATE TYPE-2

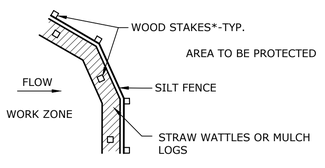


SECTION B-B

NOTES:

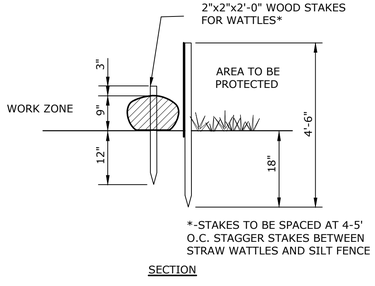
1. THE GATE SHALL BE IN PLACE AT THE END OF EACH WORK DAY, ON WEEKENDS, AND DURING ANY CESSATION OF WORK ON THE SITE.
2. GATES SHALL BE EQUIPPED WITH A LOOP ROPE HANDLE TO FACILITATE DRAGGING IN AND OUT OF POSITION.
3. STRAW BALES SHOWN, APPLICATION IS SIMILAR FOR STRAW WATTLES OR MULCH LOGS.

WILDLIFE EXCLUSION GATE
NO SCALE



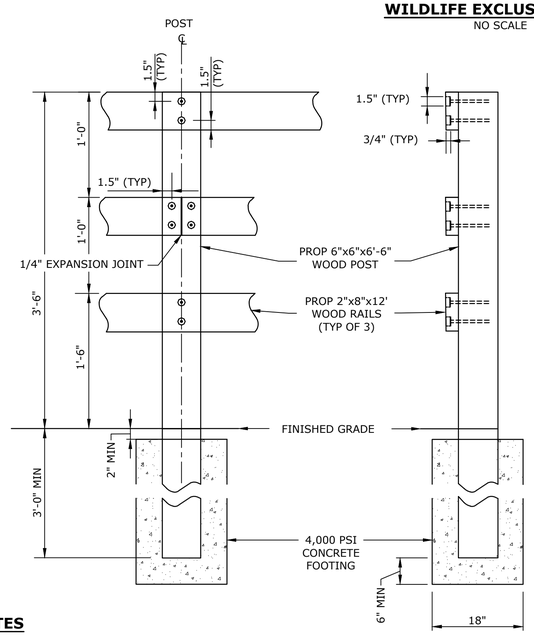
PLAN

EROSION CONTROL BARRIER
NO SCALE



*-STAKES TO BE SPACED AT 4-5' O.C. STAGGER STAKES BETWEEN STRAW WATTLES AND SILT FENCE

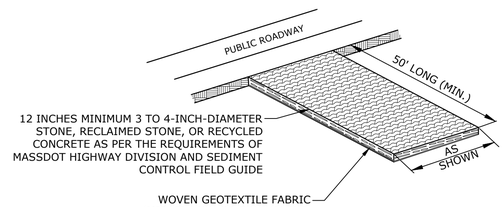
SECTION



NOTES

1. POSTS SHALL BE PLACED 6'-0" ON CENTER.
2. LAG BOLTS SHALL BE GALVANIZED AND SHALL HAVE 2" OF THREAD (MIN.).
3. WASHERS SHALL BE 1" DIA. CUT STEEL, GALVANIZED.
4. BURIED SECTIONS OF POSTS SHALL BE TREATED WITH A WOOD PRESERVATIVE AS APPROVED BY THE ENGINEER.
5. WOOD DIMENSIONS ARE NOMINAL TO MATCH COMMON INDUSTRY SIZES.

THREE RAIL WOOD FENCE
NO SCALE



STABILIZED CONSTRUCTION ENTRANCE/EXIT
NO SCALE

Tighe&Bond

COMMONWEALTH OF MASSACHUSETTS
JOSEPH P VIAMARI JR.
CIVIL
No. 41776
REGISTERED PROFESSIONAL ENGINEER
04/22/2024

COMMONWEALTH OF MASSACHUSETTS
MATT WZOREK
CIVIL
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04/22/2024

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Grand Trunk Trail Continuation

Town of Sturbridge

Sturbridge, Massachusetts

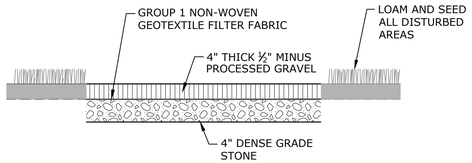
MARK	DATE	DESCRIPTION
A	4/21/2024	NOI PERMIT SET

PROJECT NO:	S5052-035
DATE:	4/2024
FILE:	S-5052-035 DETAILS.dwg
DRAWN BY:	AL/ND
DESIGNED/CHECKED BY:	ABS
APPROVED BY:	MPW

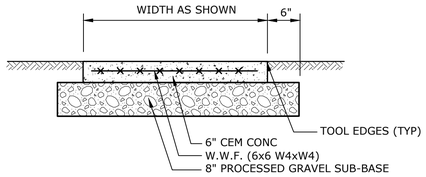
DETAILS - 1

SCALE: AS SHOWN

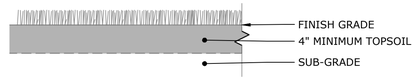
C-501



GRAVEL TRAIL
NO SCALE



CONCRETE WALK
NO SCALE



LAWN AREAS
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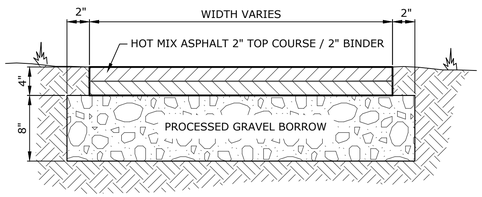
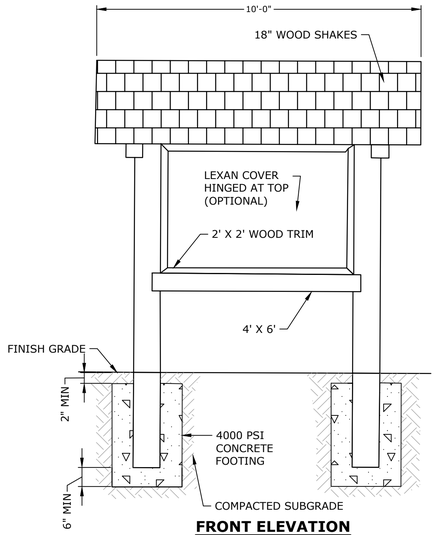


BITUMINOUS CONCRETE DRIVEWAY PAVEMENT
NO SCALE



FRONT ELEVATION
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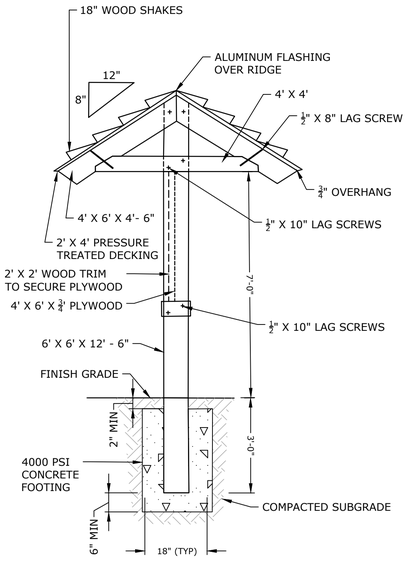
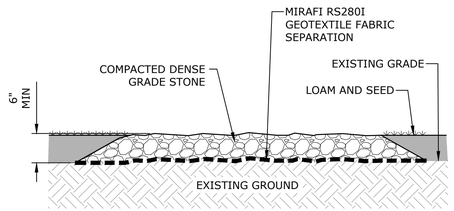


END ELEVATION
NO SCALE



GRAVEL PARKING AREA
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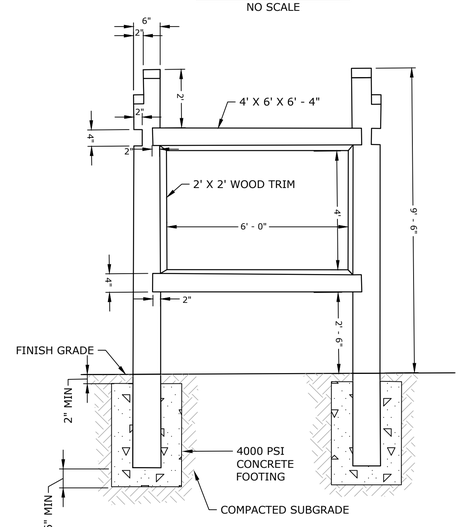

FRAMING DETAIL
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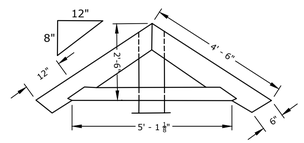
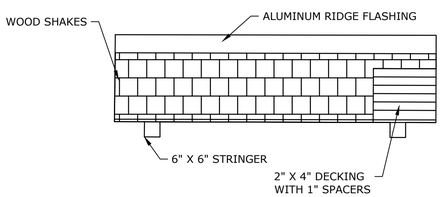


SIDE FRAMING DETAIL
NO SCALE



ROOF ASSEMBLY
NO SCALE

BULLETIN BOARD
NO SCALE

Tighe&Bond

COMMONWEALTH OF MASSACHUSETTS
JOSEPH P VIAMARI JR.
CIVIL
No. 41776
REGISTERED PROFESSIONAL ENGINEER
04/22/2024

COMMONWEALTH OF MASSACHUSETTS
MATT WZOREK
CIVIL
No. 52674
REGISTERED PROFESSIONAL ENGINEER
04/22/2024

PERMIT SET

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Grand Trunk Trail Continuation

Town of Sturbridge

Sturbridge, Massachusetts

MARK	DATE	DESCRIPTION
A	4/21/2024	NOI PERMIT SET

PROJECT NO:	S5052-035
DATE:	4/2024
FILE:	S-5052-035 DETAILS.dwg
DRAWN BY:	AL/ND
DESIGNED/CHECKED BY:	ABS
APPROVED BY:	MPW

DETAILS - 2

SCALE: AS SHOWN

C-502

Last Saved: 4/16/2024
Plotted: 04/22/2024 4:12pm By: ABS
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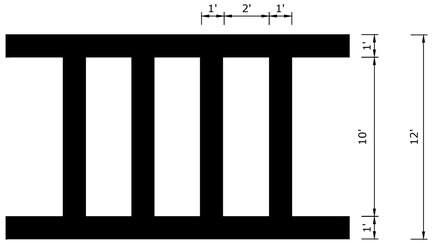
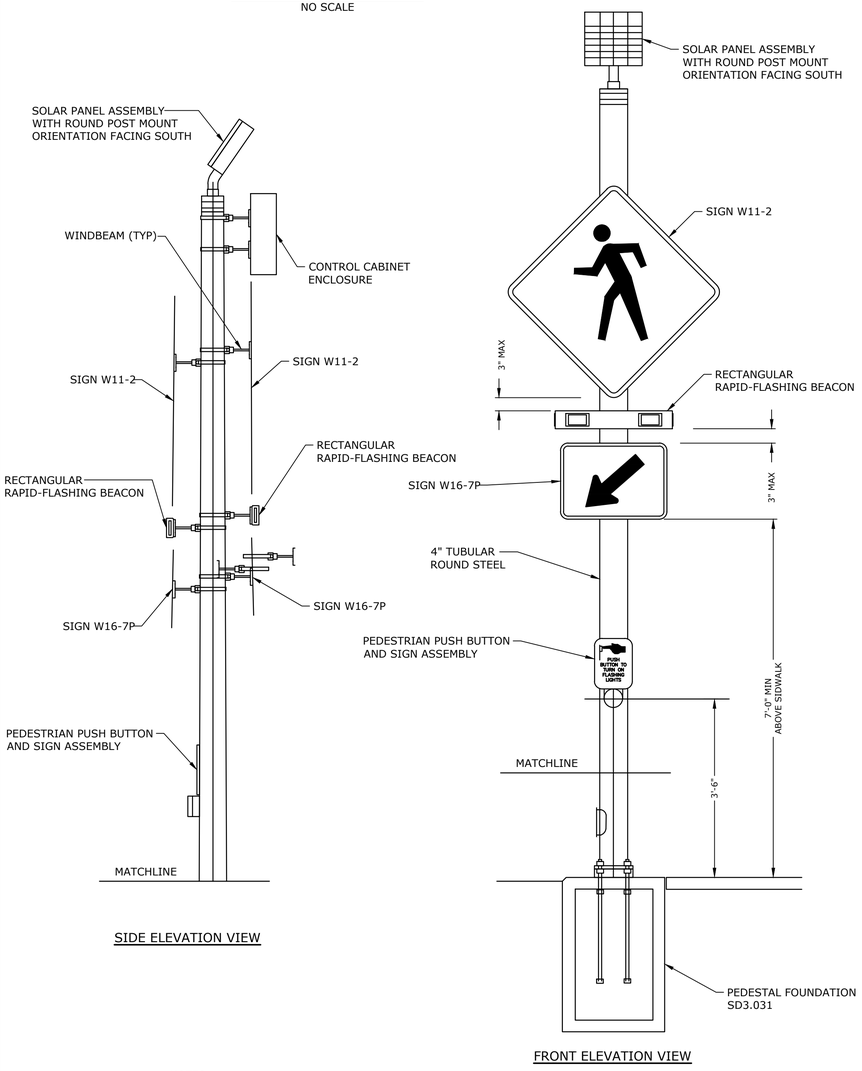


NOTES

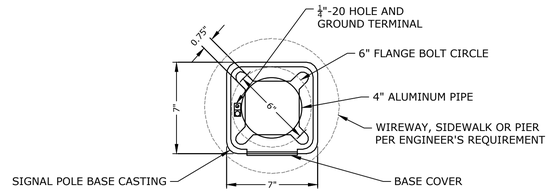
1. CONTRACTOR TO USE STURBRIDGE DPW STANDARD CROSSWALK STENCIL.

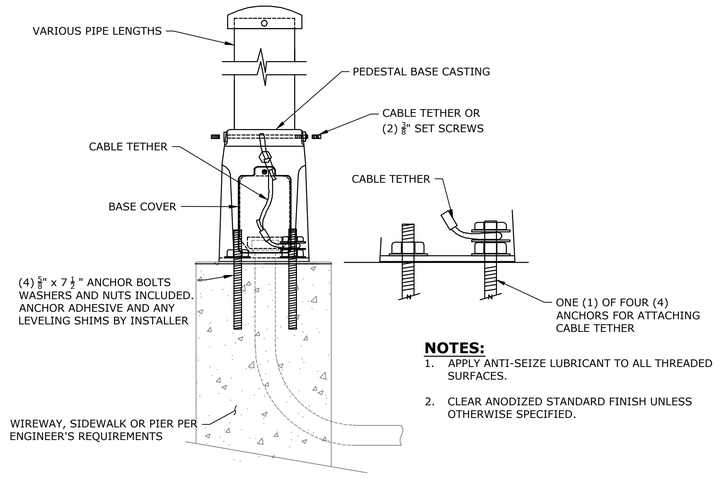
CROSSWALK STRIPING
NO SCALE



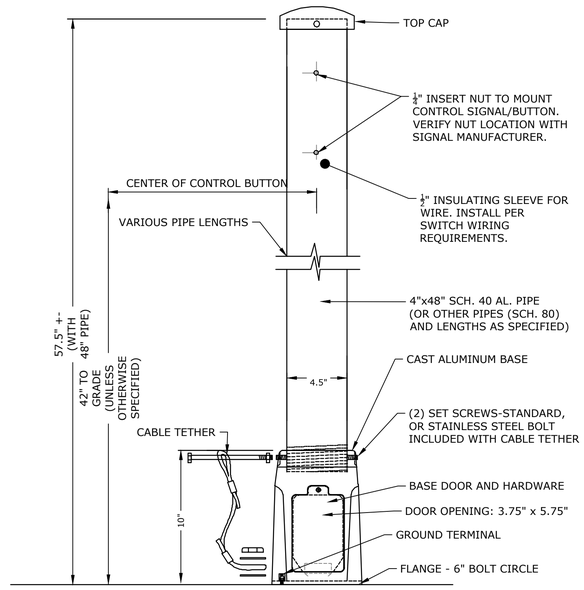
NOTES:
1. CONTROL CABINET ENCLOSURE SHALL BE SIZED PER THE RRFB MANUFACTURER.

RECTANGULAR RAPID FLASHING BEACON
NO SCALE

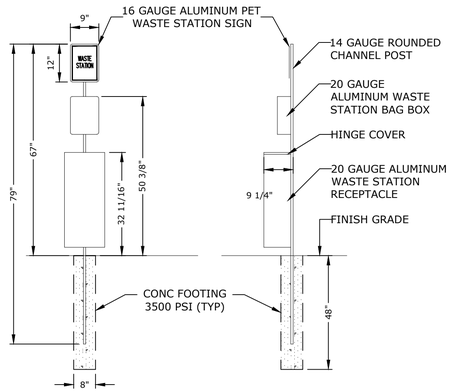




NOTES:
1. APPLY ANTI-SEIZE LUBRICANT TO ALL THREADED SURFACES.
2. CLEAR ANODIZED STANDARD FINISH UNLESS OTHERWISE SPECIFIED.



PEDESTAL-MOUNTED PEDESTRIAL PUSH BUTTON
NO SCALE



NOTES

1. PET WASTE STATION TO BE MODEL PBARK-467 PET BY BELSON OUTDOORS.
2. ALL HARDWARE SHALL BE STAINLESS STEEL.
3. WASTE STATION BAG BOX SHALL HOLD 2 BOXES OF 200 COUNT BAGS.
4. ALL COMPONENTS TO BE ELECTROSTATIC POWDER COATED, COLOR GREEN.

SIGN LEGEND

PET WASTE STATION
NO SCALE

Tighe&Bond

COMMONWEALTH OF MASSACHUSETTS
JOSEPH P VIAMARI JR.
CIVIL
No. 41776
REGISTERED PROFESSIONAL ENGINEER
04/22/2024

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Grand Trunk Trail Continuation

Town of Sturbridge

Sturbridge, Massachusetts

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DATE:	4/2024
FILE:	S-5052-035 DETAILS.dwg
DRAWN BY:	AL/ND
DESIGNED/CHECKED BY:	ABS
APPROVED BY:	MPW

DETAILS - 3

SCALE: AS SHOWN

C-503

Last Saved: 4/16/2024
Plotted On: 4/22/2024 4:12pm By: ABS
File Name: \\tighebond.com\data\data\projects\S\S5052 Sturbridge\035 Grand Trunk Trail Continuation\Drawings\AutoCAD\Sheet\S-5052-035 DETAILS.dwg

TABLE 1
New England Erosion Control/Restoration Mix for Dry Sites

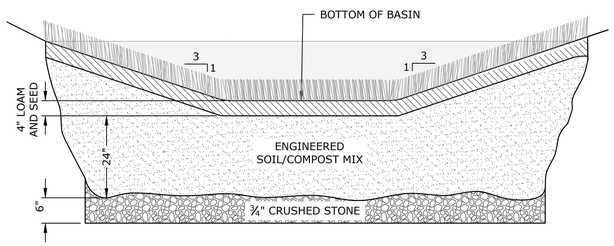
Common Name	Botanical Name1	Indicator Status1
Canada Wild Rye	Elymus canadensis	FACU
Red Fescue	Festuca rubra	FACU
Annual Ryegrass	Lolium multiflorum	
Perennial Ryegrass	Lolium perenne	
Little Bluestem	Schizachyrium scoparium	FACU
Switch Grass	Panicum virgatum	FAC
Indian Grass	Sorghastrum nutans	FACU

1Source: USDA, NRCS. 2019. The PLANTS Database (http://plants.usda.gov, 11 February 2020).
National Plant Data Team, Greensboro, NC 27401-4901 USA.

TABLE 2
New England Erosion Control/Restoration Mix for Detention Basins and Moist Sites

Common Name	Botanical Name1	Indicator Status1
Riverbank Wild Rye	Elymus riparius	FACW
Little Bluestem	Schizachyrium scoparium	FACU
Red Fescue	Festuca rubra	FACU
Big Bluestem	Andropogon gerardii	FACU
Switch Grass	Panicum virgatum	FAC
New York Ironweed	Vernonia noveboracensis	FACW
Upland Bentgrass	Agrostis perennans	FACU
Beggar Ticks	Bidens frondosa	FACW
Spotted Joe Pye Weed	Eupatorium maculatum	OBL
Boneset	Eupatorium perfoliatum	OBL
New England Aster	Symphyotricum novae-angliae	FACW
Wool Grass	Scirpus cyperinus	OBL
Soft Rush	Juncus effusus	OBL

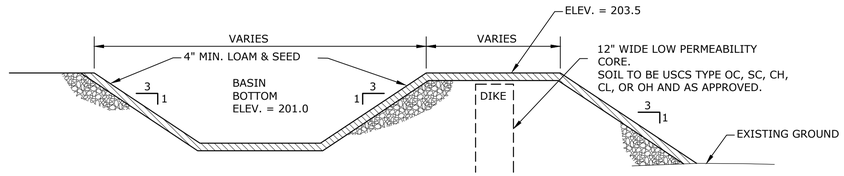
1Source: USDA, NRCS. 2019. The PLANTS Database (http://plants.usda.gov, 11 February 2020).
National Plant Data Team, Greensboro, NC 27401-4901 USA.



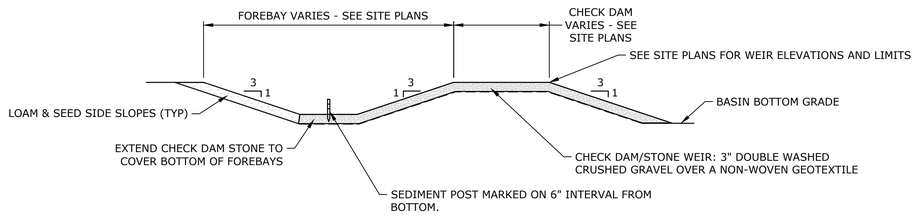
NOTES

1. INSTALL BASIN AFTER LAWN IS STABILIZED. PREVENT SEDIMENT FROM CLOGGING BASIN.
2. ENGINEERED SOIL/COMPOST MIX TO BE 90% MASON'S SAND/5% SAND/5% COMPOST. SANDY TOPSOIL TO BE 50% SAND/45% TOPSOIL/5% COMPOST. SUBMIT SAMPLES AND GRADATION TESTS FOR REVIEW & APPROVAL PRIOR TO DELIVERY.
3. SEED MIX TO BE ERNST SEEDS RAIN GARDEN MIX (ERNMX-180) OR APPROVED EQUAL SUITABLE FOR RAIN GARDENS OR BIORETENTION AREAS.

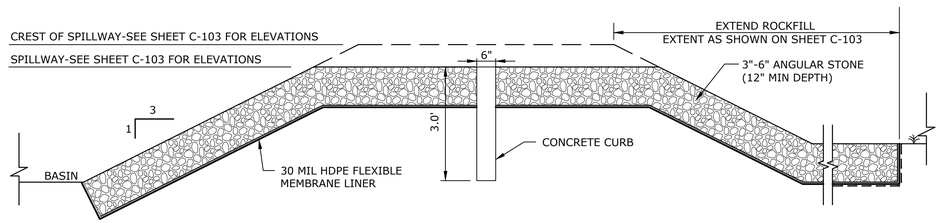
INFILTRATION BASIN DETAIL
NO SCALE



INFILTRATION BASIN - BERM DETAIL
NO SCALE



SEDIMENT FOREBAY - SECTION
NO SCALE



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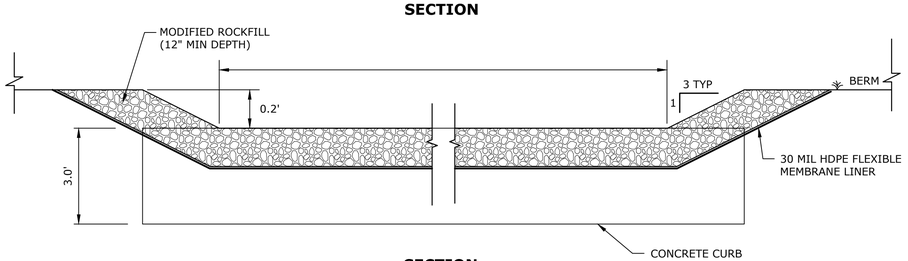

SECTION

EMERGENCY SPILLWAY
NO SCALE

Tighe&Bond

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JOSEPH P VIAMARI JR.
CIVIL
No. 41776
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COMMONWEALTH OF MASSACHUSETTS
MATT WZOREK
CIVIL
No. 52674
REGISTERED PROFESSIONAL ENGINEER
04/22/2024

PERMIT SET

THIS DOCUMENT IS RELEASED TEMPORARILY FOR PROGRESS REVIEW ONLY. IT IS NOT INTENDED FOR BIDDING OR CONSTRUCTION PURPOSES.

Grand Trunk Trail Continuation

Town of Sturbridge

Sturbridge, Massachusetts

MARK	DATE	DESCRIPTION
A	4/21/2024	NOI PERMIT SET

PROJECT NO:	S5052-035
DATE:	4/2024
FILE:	S-5052-035 DETAILS.dwg
DRAWN BY:	AL/ND
DESIGNED/CHECKED BY:	ABS
APPROVED BY:	MPW

DETAILS - 4

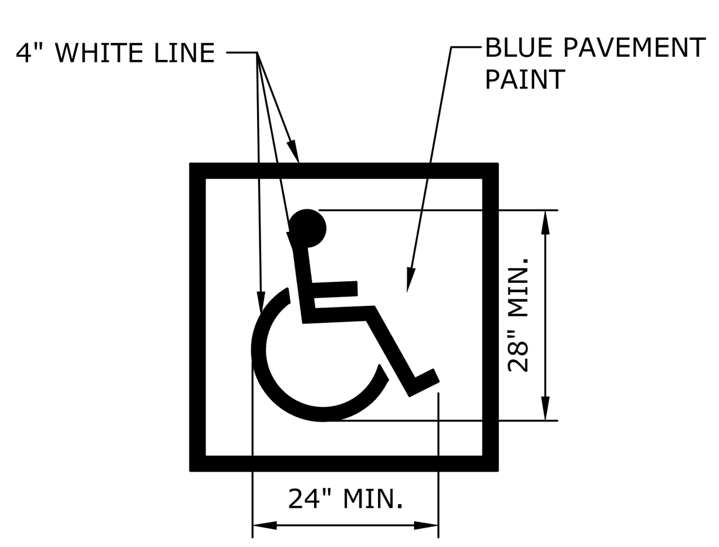
SCALE: AS SHOWN

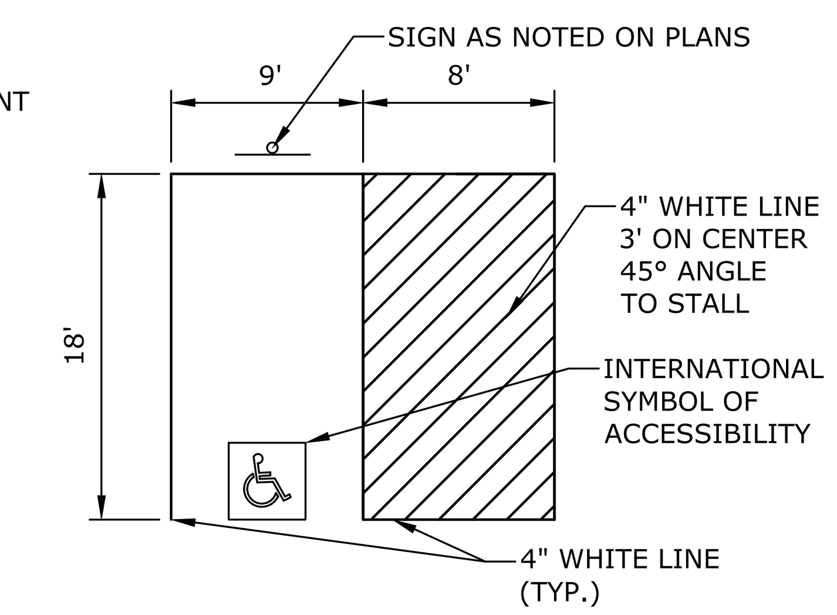
C-504

QTY	ITEM	NOTES	BASIS OF DESIGN
1	PARK BENCH		BELSON OUTDOORS 6' RECYCLED PLASTIC CEDAR TONE BENCH WITH BLACK POWDER COATED FRAME MODEL RB6WB-P OR EQUAL
1	RECYCLING RECEPTACLE		BELSON OUTDOORS BLACK POWDER COATED FRAME STEEL FLARE TOP TRASH RECEPTACLE WITH RAIN BONNET AND LINER MODEL CBTR-FTRB-BK OR EQUAL
1	TRASH RECEPTACLE		BELSON OUTDOORS BLACK POWDER COATED STEEL FRAME RECYCLING RECEPTACLE MODEL 18RT-1H OR EQUAL
2	PET WASTE STATION	SEE DETAIL SHEET C-502	BELSON OUTDOORS PET WASTE STATION PBARK-467 MODEL 18RT-1H OR EQUAL
6	BIKE RACK		BELSON OUTDOORS MODEL CBBR-2UR-SS OR EQUAL

SITE FURNISHING NOTES:

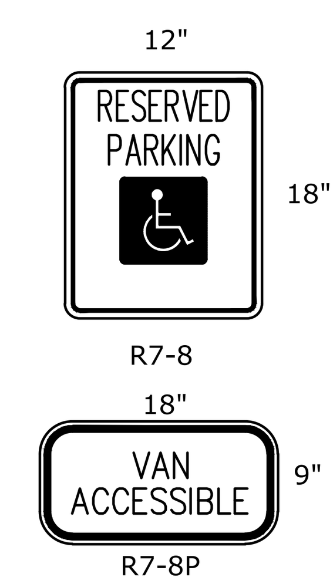
1. ALL SITE FURNISHINGS TO BE INSTALLED ACCORDING TO MANUFACTURER'S SPECIFICATIONS.



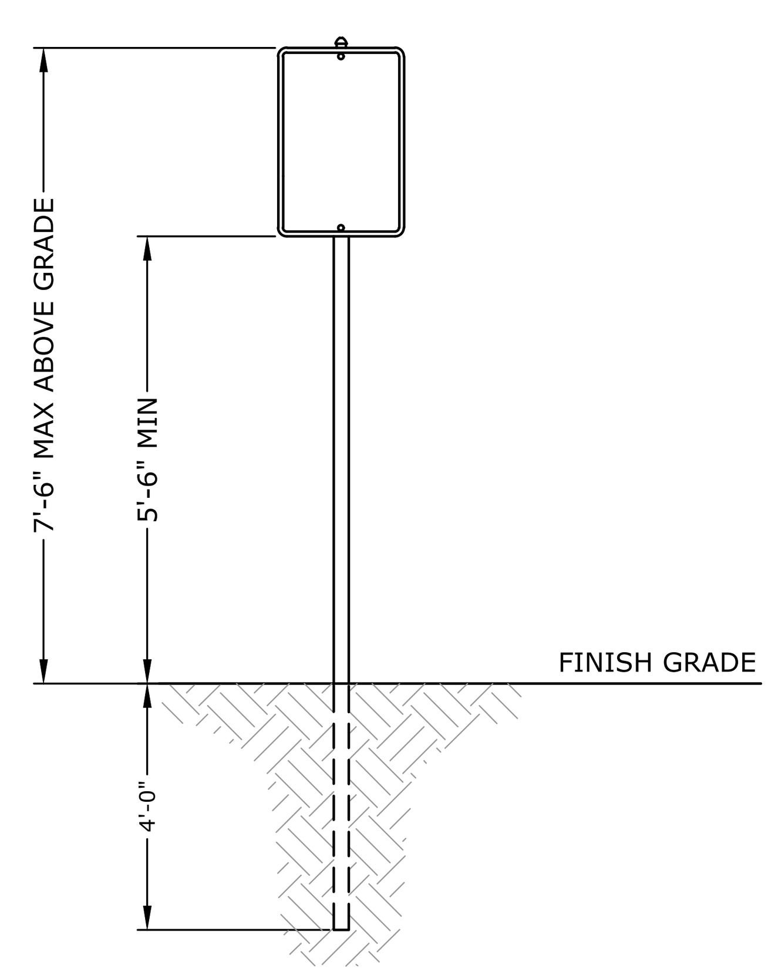


NOTES:
1. SIGN BACKGROUND - BLUE REFLECTIVE
2. LETTERS, GRAPHICS & BORDER - WHITE REFLECTIVE

HANDICAPPED SPACES STRIPING DETAIL
NO SCALE



SIGN DETAIL
NO SCALE



TYPICAL SIGN
NO SCALE

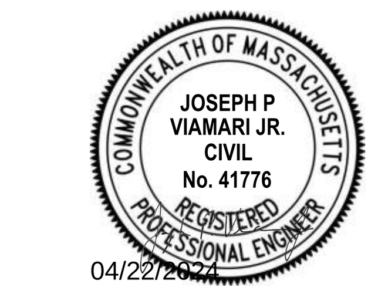
NOTES

1. BREAKAWAY SIGN SUPPORTS SHALL BE FABRICATED FROM STEEL AND SHALL CONFORM TO MASSACHUSETTS "STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES".
2. STEEL POSTS SHALL CONFORM TO ASTM-A366. THE CROSS SECTION OF THE POST SHALL BE SQUARE TUBE FORMED OF 12 GAUGE COLD-ROLLED CARBON STEEL SHEETS WHICH HAVE BEEN ZINC COATED CONFORMING TO ASTM-A525.
3. ALL BOLTS SHALL CONFORM TO ASTM-A307.
4. ALL BOLTS, NUTS, WASHERS, AND POST CAPS SHALL BE GALVANIZED AS PER ASTM-A153.
5. THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD)" WILL GOVERN (LATEST EDITION).
6. QUANTITY OF SIGNS AND POSTS INCLUDES BASE BID WORK AND ALTERNATE WORK. SEE PLANS FOR SIGN LOCATIONS.

TRAFFIC SIGN SUMMARY

IDENTIFICATION NUMBER	SIZE OF SIGN		TEXT	NUMBER OF SIGNS REQ'D	TEXT DIMENSIONS (inches)			COLOR			POST SIZE AND NUMBER REQUIRED	AREA IN SQUARE FEET	NOTES
	WIDTH (inches)	HEIGHT (inches)			LETTER HEIGHT	VERTICAL SPACING	ARROW RTE MKR	BACK-GROUND	LEGEND	BORDER			
W11-2	36	36		4	SEE MUTCD STANDARDS			SEE MUTCD STANDARDS			4 - 4" TUBULAR ROUND STEEL 2	45	PART OF RRFB BID ITEM
				1							P5 1		
W16-7P	30	18		4							MOUNTED WITH W11-2	15	PART OF RRFB BID ITEM
RRFB-XL	N/A	N/A		4							MOUNTED WITH W11-2	N/A	PART OF RRFB BID ITEM
R1-1b	18	18	STOP	1							P5 1	2.25	-
R5-3	24	24	NO MOTOR VEHICLES	2							P5 2	8	-
R7-8	12	18	RESERVED PARKING	1							P5 1	1.5	-
D4-3L	12	18	PARKING	1							MOUNTED WITH D11-1	1.5	-
D4-3R	12	18	PARKING	1							P5 1	1.5	-
R8-3	12	18	NO PARKING	3							P5 3	4.5	-
D11-1	24	18	BIKE ROUTE	4							P5 4	12	-
R5-11	30	24	AUTHORIZED VEHICLES ONLY	1							MOUNTED ON EMERGENCY CRASH GATE	5	-
R3-17bP	24	8	ENDS	2							MOUNTED WITH D11-1	1.4	-
M6-1	21	15		1							MOUNTED WITH D11-1	2.2	-
W16-9P	12	6	AHEAD	1							MOUNTED WITH W11-2	1.5	-
				2							MOUNTED WITH D11-1		
										TOTALS	15	88.85	-

Tighe&Bond



PERMIT SET

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DRAWN BY:	AL/ND
DESIGNED/CHECKED BY:	ABS
APPROVED BY:	MPW

DETAILS - 5

SCALE: AS SHOWN

C-505

Last Saved: 4/16/2024
Plotted On:Apr 22, 2024-4:13pm By: ABS
Tighe & Bond:\\tighebond.com\data\data\projects\S\S5052 Sturbridge\035 Grand Trunk Trail Continuation\Drawings\AutoCAD\Sheet\S-5052-035 DETAILS.dwg

Tighe&Bond

APPENDIX C

Appendix C – Photographic Log

Client: Town of Sturbridge **Job Number:** S-5052-035

Site: Grand Trunk Trail Continuation
River Road (Haynes St to Farquar Rd), Sturbridge, MA

Photograph No.: 1	**Date:** 12/1/2023	**Direction Taken:** North
Description: Existing driveway and disturbed area at western terminus of Project Site along Haynes Street.		

Photograph No.: 2	**Date:** 12/1/2023	**Direction Taken:** East
Description: View of existing old Grand Trunk Rail bed that was cleared and graded in the early 1900's.		

Appendix C – Photographic Log

Client: Town of Sturbridge **Job Number:** S-5052-035

Grand Trunk Trail Continuation

Site: River Road (Haynes St to Farquar Rd), Sturbridge, MA

Photograph No.: 3	**Date:** 12/1/2023	**Direction Taken:** Southeast

Description: View of the maintained overhead electric utility easement.

Photograph No.: 4	**Date:** 12/1/2023	**Direction Taken:** East

Description: View of the southern terminus at Farquhar Road. Previously constructed segment of the Grand Trunk Trail runs along the southern side of the road (right side of photo).

Client: Town of Sturbridge **Job Number:** S-5052-035

Grand Trunk Trail Continuation

Site: River Road (Haynes St to Farquar Rd), Sturbridge, MA

Photograph No.: 5	**Date:** 12/1/2023	**Direction Taken:** Northwest

Description: View of upland woods in approximate location for proposed parking area.

Photograph No.: 6	**Date:** 12/1/2023	**Direction Taken:** North

Description: View of ponds and bordering vegetated wetland northeast of the existing utility corridor.

Appendix C – Photographic Log

Client: Town of Sturbridge **Job Number:** S-5052-035

Site: Grand Trunk Trail Continuation
River Road (Haynes St to Farquar Rd), Sturbridge, MA

Photograph No.: 7	**Date:** 12/1/2023	**Direction Taken:** South

Description: The pond and perennial stream cross through a culvert near the southern terminus of the Project Site.

Photograph No.: 8	**Date:** 12/1/2023	**Direction Taken:** Northwest

Description: View of existing culvert crossing within the utility easement near the southern terminus of the Project Site.

Tighe&Bond

APPENDIX D

EcoTec, Inc.

ENVIRONMENTAL CONSULTING SERVICES
102 Grove Street
Worcester, MA 01605-2629
508-752-9666 – Fax: 508-752-9494

February 17, 2023

Jeremy Croteau, PLS
DC Engineering & Survey, Inc.
32 Cranberry Meadow Road,
Charlton, MA 01507

RE: Wetland Resource Evaluation, River Road Trail, Sturbridge, MA.

Dear Mr. Croteau.:

On February 10, 2023, EcoTec, Inc. inspected the area within the vicinity of the proposed trail and parking lot (see attached locus) located at River Road in Sturbridge for the presence of wetland resources as defined by: (1) the Massachusetts Wetlands Protection Act (M.G.L. Ch. 131, § 40; the "Act") and its implementing regulations (310 CMR 10.00 *et seq.*; the "Regulations"); (2) the Town of Sturbridge Wetlands Protection Bylaw and its implementing regulations; and (3) the U.S. Clean Water Act (i.e., Section 404 and 401 wetlands). Art Allen and Kate O'Donnell, WPIT conducted the inspection.

The subject site consists of an approximately 10-acre portion of a parcel totaling approximately 20-acres (see attached locus) at River Road in Sturbridge. The upland portions of the site consist of undeveloped forested land and a cleared utility easement. Plant species observed include northern red oak (*Quercus rubra*) and eastern white pine (*Pinus strobus*) trees and/or saplings; oriental bitter-sweet (*Celastrus orbiculata*) climbing woody vines; winged euonymus (*Euonymus alata*), honeysuckle (*Lonicera sp.*), multiflora rose (*Rosa multiflora*), and Japanese barberry (*Berberis thunbergia*) shrubs; and bracken fern (*Pteridium aquilinum*) and Christmas fern (*Polystichum acrostichoides*) ground cover. The wetland resources observed on the site are described below.

Methodology

The site was inspected, and areas suspected to qualify as wetland resources were identified. The boundaries of Bordering Vegetated Wetlands and Bank were delineated in the field in accordance with the definitions set forth in the regulations at 310 CMR 10.55(2)(c) and 310 CMR 10.54(2). Section 10.55(2)(c) states that "The boundary of Bordering Vegetated Wetlands is the line within which 50% or more of the vegetational community consists of wetland indicator plants and saturated or inundated conditions exist." Section 10.54(2)(c) states that "The upper boundary of Bank is the first observable break in the slope or the mean annual flood level, whichever is lower." The methodology used to delineate Bordering Vegetated Wetlands is further described in: (1) the BVW Policy "*BVW: Bordering Vegetated Wetlands Delineation Criteria and Methodology*," issued March 1, 1995; and (2) "*Delineating Bordering Vegetated Wetlands Under the Massachusetts Wetlands Protection Act: A Handbook*," produced by the

Massachusetts Department of Environmental Protection, dated March 1995. The plant taxonomy used in this report is based on the *National List of Plant Species that Occur in Wetlands: Massachusetts* (Fish and Wildlife Service, U.S. Department of the Interior, 1988). Federal wetlands were presumed to have boundaries conterminous with the delineated Bordering Vegetated Wetlands and Bank. One set of DEP Bordering Vegetated Wetland Delineation Field Data Forms completed for observation plots located in the wetlands and uplands near flag AB7 is attached. The table below provides the Flag Numbers, Flag Type, and Wetland Types and Locations for the delineated wetland resources.

Flag Numbers	Flag Type	Wetland Types and Locations
Start AA1 to AA6 Stop (AA1 and AA2 connect to culvert)	Blue Flags	Boundary of Bordering Vegetated Wetlands/ Top of Bank located in the northwestern portion of the site that is associated with a mapped perennial stream.
Start AB1 to AB8 Stop (AA1 and AA2 connect to culvert)	Blue Flags	Boundary of Bordering Vegetated Wetlands/ Top of Bank located in the northwestern portion of the site that is associated with a mapped perennial stream.
Start BA1 to BA41 Stop (BA6 and BA7 connect to culvert)	Blue Flags	Boundary of Bordering Vegetated Wetlands/ Top of Bank located in the eastern portion of the site that is associated with mapped ponds.
Start RA1 to RA10 Stop (RA1 and RA10 Connect to culvert)	Red Flags	Mean Annual High-water Line (MAHWL) of the mapped perennial stream located in the southern portion of the site.
Start RB1 to RB10 Stop (RB1 and RB10 Connect to culvert)	Red Flags	Mean Annual High-water Line (MAHWL) of the mapped perennial stream located in the southern portion of the site.
Start AR1 to AR13 Stop (AR1, AR2, and AR3 connect to culverts)	Red Flags	Mean Annual High-water Line (MAHWL) of the mapped perennial stream located in the northern portion of the site.
TP-Wet, TP-Up	Red Flags	BVW Delineation test plot flags located near AB7

Findings

Wetlands AA and AB (i.e., flags AA1 – AA6 and flags AB1 – AB8) consist of the upper boundary of Bank and a wooded swamp, located in the northwestern portion of the site that is associated with a mapped perennial stream. Plant species observed include red maple (*Acer rubrum*) and American elm (*Ulmus americana*) trees and/or saplings; highbush blueberry (*Vaccinium corymbosum*) and common winterberry (*Ilex verticillata*) shrubs. Evidence of wetland hydrology, including hydric soils, saturated soils, evidence of flooding, and drainage patterns, was observed within the delineated wetlands. These vegetated wetlands border a perennial stream; accordingly, the vegetated wetlands would be regulated as Bordering Vegetated Wetlands and the perennial stream would be regulated as Bank and Land Under Water Bodies and Waterways under the Act and Bylaw. A 100-foot Buffer Zone extends horizontally outward from the edge of Bordering Vegetated Wetlands and Bank under the Act and a 200-foot Buffer Zone extends horizontally outward from the edge of Bordering Vegetated Wetlands and Bank under the Bylaw.

Wetland BA (i.e., flags BA1 – BA41) consists of the upper boundary of Bank with a fringe of wooded swamp located in the eastern portion of the site that is associated with mapped ponds.

Plant species observed include red maple (*Acer rubrum*) and American elm (*Ulmus americana*) trees and/or saplings; highbush blueberry (*Vaccinium corymbosum*), common winterberry (*Ilex verticillata*), silky dogwood (*Cornus amomum*), and sweet pepper-bush (*Clethra alnifolia*) shrubs; and sedges and broad-leaf cattail (*Typha latifolia*) ground cover. Evidence of wetland hydrology, including hydric soils, saturated soils, evidence of flooding, and drainage patterns, was observed within the delineated wetland. This vegetated wetland borders a pond; accordingly, the vegetated wetland would be regulated as Bordering Vegetated Wetlands and the pond would be regulated as Bank and Land Under Water Bodies and Waterways under the Act and Bylaw. A 100-foot Buffer Zone extends horizontally outward from the edge of Bordering Vegetated Wetlands and Bank under the Act and a 200-foot Buffer Zone extends horizontally outward from the edge of Bordering Vegetated Wetlands and Bank under the Bylaw.

Bordering Land Subject to Flooding is an area that floods due to a rise in floodwaters from a bordering waterway or water body. Where flood studies have been completed, the boundary of Bordering Land Subject to Flooding is based upon flood profile data prepared by the National Flood Insurance Program. Section 10.57(2)(a)3. states that "The boundary of Bordering Land Subject to Flooding is the estimated maximum lateral extent of flood water which will theoretically result from the statistical 100-year frequency storm." Based upon a review of the Flood Insurance Rate Map, Worcester County, Massachusetts, Map Number 25027C0929E, Effective Date 7/4/2011, there is a mapped Zone A (i.e., 100-year floodplain with an unspecified flood elevation) that is associated with the ponds on the site. The project engineer should evaluate the most recent National Flood Insurance Program flood profile data to establish the extent of Bordering Land Subject to Flooding on the site. Bordering Land Subject to Flooding would occur in areas where the 100-year flood elevation is located outside of or upgradient of the delineated Bordering Vegetated Wetlands or Bank boundary. Bordering Land Subject to Flooding does not have a Buffer Zone under the Act.

The Massachusetts Rivers Protection Act amended the Act to establish an additional wetland resource area: Riverfront Area. Based upon a review of the current USGS Map (i.e., Southbridge Quadrangle, dated 1982, attached), two unnamed streams that are shown as perennial are located in the northern and southern portions of the site. Streams that are shown as perennial on the current USGS map are designated perennial under the Massachusetts Wetlands Protection Act regulations. Unless this perennial designation is overcome, Riverfront Area is presumed to extend 200 feet horizontally upgradient from the mean annual high-water line of the stream. Section 10.58(2)(a)2. states that the "Mean annual high-water line of a river is the line that is apparent from visible markings or changes in the character of soils or vegetation due to prolonged presence of water and that distinguishes between predominantly aquatic and predominantly terrestrial land. Field indicators of bankfull conditions shall be used to determine the mean annual high-water line. Bankfull field indicators include but are not limited to: changes in slope, changes in vegetation, stain lines, top of pointbars, changes in bank materials, or bank undercuts." Section 10.58(2)(a)2.a. states that "In most rivers, the first observable break in slope is coincident with bankfull conditions and the mean annual high-water line." The mean annual high-water line of the stream in the northern portion of the site was delineated in the field with flags AR1 to AR13 based upon the above-referenced regulation. The mean annual high-water line of the stream in the southern portion of the site was delineated in the field with flags RA1 to

RA10 and flags RB1 to RB10 based upon the above-referenced regulation. Furthermore, based upon a review of the current USGS Map and observations made during the site inspection, there are no other mapped or unmapped streams located within 200 feet of the site Accordingly, Riverfront Area on the site is associated only with the two perennially designated streams. Riverfront Area does not have a Buffer Zone under the Act but may overlap other wetland resources and their Buffer Zones.

The Regulations require that no project may be permitted that will have any adverse effect on specified habitat sites of rare vertebrate or invertebrate species, as identified by procedures set forth at 310 CMR 10.59. Based upon a review of the *Massachusetts Natural Heritage Atlas*, 15th edition, Priority Habitats and Estimated Habitats from the NHESP Interactive Viewer, valid from August 1, 2021, and viewed on February 8, 2023, and Certified Vernal Pools from MassGIS, there are no Certified Vernal Pools on or in the immediate vicinity of the site. However, the site is located within an Estimated Habitat and a Priority Habitat. A copy of this map is attached. The Regulations at 310 CMR 10.59 state that projects proposed within an Estimated Habitat as indicated on the most recent map published by the Natural Heritage and Endangered Species Program require a fully completed copy of any required Notice of Intent filed under the Act and Regulations (including all plans, reports, and other required materials) to be submitted to the Natural Heritage and Endangered Species Program no later than the date of filing with the issuing authority. In addition, in July 2005, the Massachusetts Endangered Species Act (M.G.L. Ch. 131A; "MESA") regulations (321 CMR 10.00 *et seq.*; the "MESA Regulations") were revised to provide formal review procedures for projects and activities proposed within a Priority Habitat. For nonexempt projects or activities proposed within a Priority Habitat, an additional filing beyond that required under 310 CMR 10.59 for a project proposed within an Estimated Habitat, or a consolidated filing that meets the requirements under 321 CMR 10.20 and 310 CMR 10.59, must be made with the Natural Heritage and Endangered Species Program to allow the project or activity to be reviewed under MESA or under MESA and the Act, respectively.

The reader should be aware that the regulatory authority for determining wetland jurisdiction rests with local, state, and federal authorities. Brief descriptions of our experience and qualifications are attached. If you have any questions, please feel free to contact us at any time.

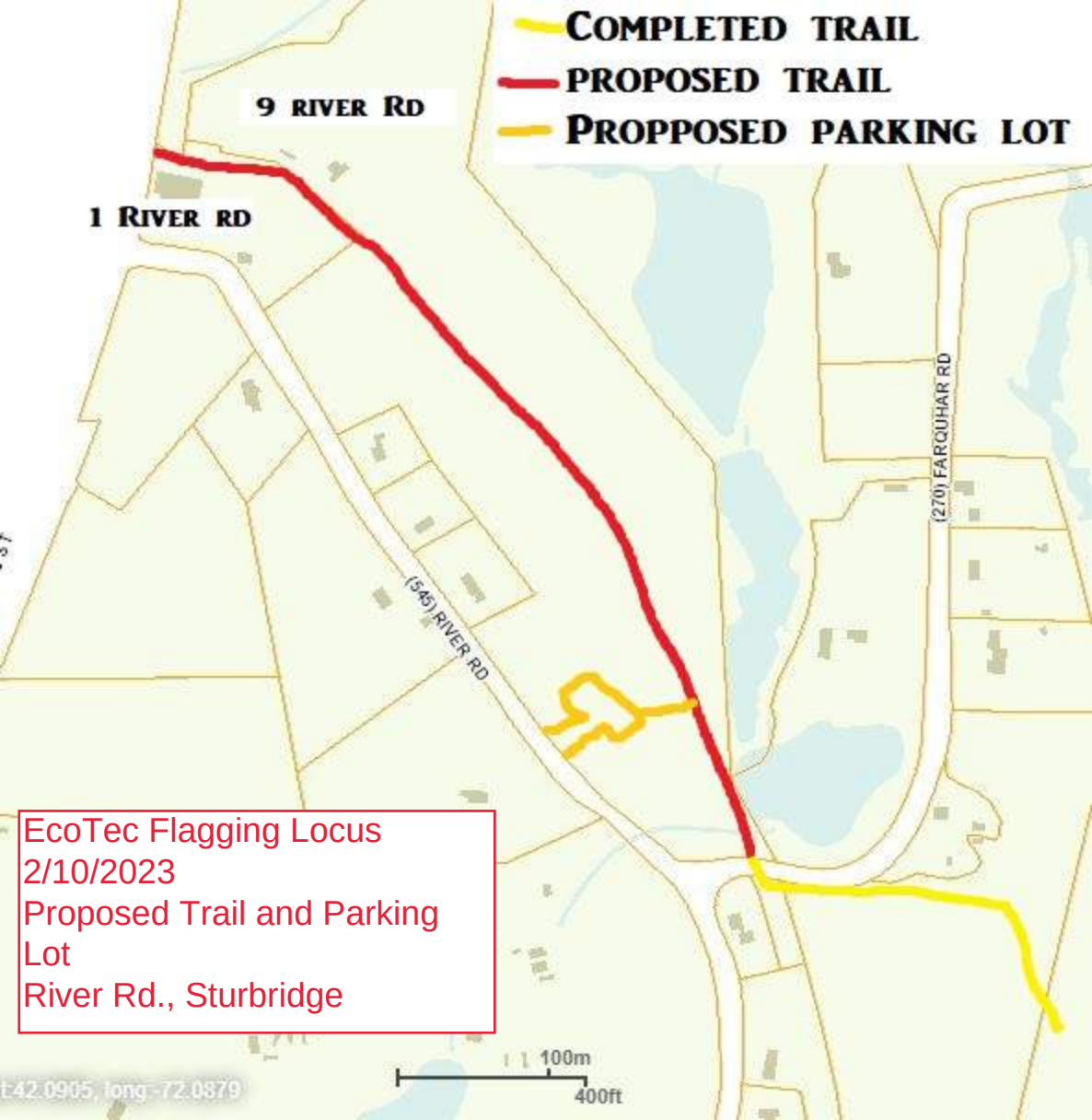
Cordially,
ECOTEC, INC.

Art Allen
Vice President

Kate O'Donnell, WPIT
Environmental Scientist

Attachments (10 pages)

KO/E/P/SturbridgeRiverRdTrailWetlandReport


COMPLETED TRAIL
PROPOSED TRAIL
PROPPOSED PARKING LOT
9 RIVER RD
1 RIVER RD
(545) RIVER RD
(270) FARQUHAR RD
EcoTec Flagging Locus
2/10/2023
Proposed Trail and Parking Lot
River Rd., Sturbridge
100m
400ft
t:42.0905, long -72.0879

DEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Form

Applicant | Prepared by: EcoTec, Inc | Project Location: River Road Trail, Sturbridge | DEP File #

Section I. Vegetation | Number: TP-Upland | Transect # AB7 | Date of Delin: 2/10/2023

A. Sample layer and plant species (Enter largest to smallest % cover by layer)			Percent Cover (or basal area)	Percent Dominance	Dominant Plant?	Wetland Indicator Category	
Tree	eastern cottonwood	Populus deltoides	30	50.0	YES	FAC	*
	red maple	Acer rubrum	10	16.7	NO	FAC	*
	white pine	Pinus strobus	10	16.7	NO	FACU	
	white birch	Betula papyrifera	10	16.7	NO	FACU	
Sapling	american elm	Ulmus americana	30	100.0	YES	FACW-	*
Shrub	eastern burning-bush	Euonymus atropurpureus	30	60.0	YES	FACU	
	tartarian honeysuckle	Lonicera tatarica	20	40.0	YES	FACU	
Ground							
Vine	asiatic bittersweet	Celastrus orbiculata	20	100.0	YES	NL	

Vegetation Conclusions

Number of dominant wetland indicator plants **2** | Number of dominant non-wetland indicator plants **3**

Is the number of dominant wetland plants equal or greater than the number of dominant non-wetland plants? NO

DEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Form

Applicant		Prepared by: EcoTec, Inc	Project Location: River Road Trail, Sturbridge	DEP File #
Section II. Indicators of Hydrology		Number: TP-Upland	Transect # AB7	Date of Delin: 2/10/2023

1. Soil Survey

Is there a published soil survey for this site?

- title/date
- map number
- soil type mapped
- hydric soil inclusions

Are field observarions consistent with soil survey?

Remarks:

2. Soil Description

Horizon	Depth (inches)	Matrix Color	Mottle Color
Leaf Litter	2 inches		
A	0-6	10YR 3/3	
Bw	6-13	10YR 5/4	5% 7.5YR 5/8
Bg	13-20	2.5Y 5/2	

Remarks sand

3. Other

Conclusion: Is the soil hydric?

No

Other Indicators of hydrology (check all that apply):

- ☐ Site Inundated
- ☐ Depth to free water in observation hole
- ☐ Depth to soil saturation in observation hole
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment Deposits
- ☐ Drainage patterns in BVWs
- ☐ Oxidized rhizospheres
- ☐ Water stained leaves
- ☐ Recorded data (stream, lake, or tidal gauge; aerial photo; other):
- ☐ Other:

Vegetation and Hydrology Conclusion

	Yes	No
Number of wetland indicator plants ≥ number of non-wetland indicator plants	☐	☑
Wetland hydrology present:		
Hydric soil present	☐	☑
Other indicators of hydrology present	☐	☑
Sample Location is in a BVW	☐	☑

DEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Form

Applicant | Prepared by: EcoTec, Inc | Project Location: River Road Trail, Sturbridge | DEP File #

Section I. Vegetation | Number: TP-Wetland | Transect # AB7 | Date of Delin: 2/10/2023

A. Sample layer and plant species (Enter largest to smallest % cover by layer)			Percent Cover (or basal area)	Percent Dominance	Dominant Plant?	Wetland Indicator Category	
Tree	red maple	Acer rubrum	20	66.7	YES	FAC	*
	american elm	Ulmus americana	10	33.3	YES	FACW-	*
Sapling							
Shrub	winterberry	Ilex verticillata	30	46.2	YES	FACW+	*
	highbush blueberry	Vaccinium corymbosum	10	15.4	YES	FACW-	*
	eastern burning-bush	Euonymus atropurpureus	10	15.4	NO	FACU	
	multi-flora rose	Rosa multiflora	10	15.4	NO	FACU	
	black birch	Betula lenta	5	7.7	NO	FACU	
Ground	sensitive fern	Onoclea sensibilis	30	100.0	YES	FACW	*
Vine	asiatic bittersweet	Celastrus orbiculata	10	100.0	YES	NL	

Vegetation Conclusions

Number of dominant wetland indicator plants **5** | Number of dominant non-wetland indicator plants **1**

Is the number of dominant wetland plants equal or greater than the number of dominant non-wetland plants? YES

DEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Form

Applicant	Prepared by: EcoTec, Inc	Project Location: River Road Trail, Sturbridge	DEP File #
Section II. Indicators of Hydrology	Number: TP-Wetland	Transect # AB7	Date of Delin: 2/10/2023

1. Soil Survey

Is there a published soil survey for this site?

title/date

map number

soil type mapped

hydric soil inclusions

Are field observarions consistent with soil survey?

Remarks:

2. Soil Description

Horizon	Depth (inches)	Matrix Color	Mottle Color
A	0-8	10YR 2/2	
Bg	8-14+	10YR 4/2	10% 10YR 5/8

Remarks sand

3. Other

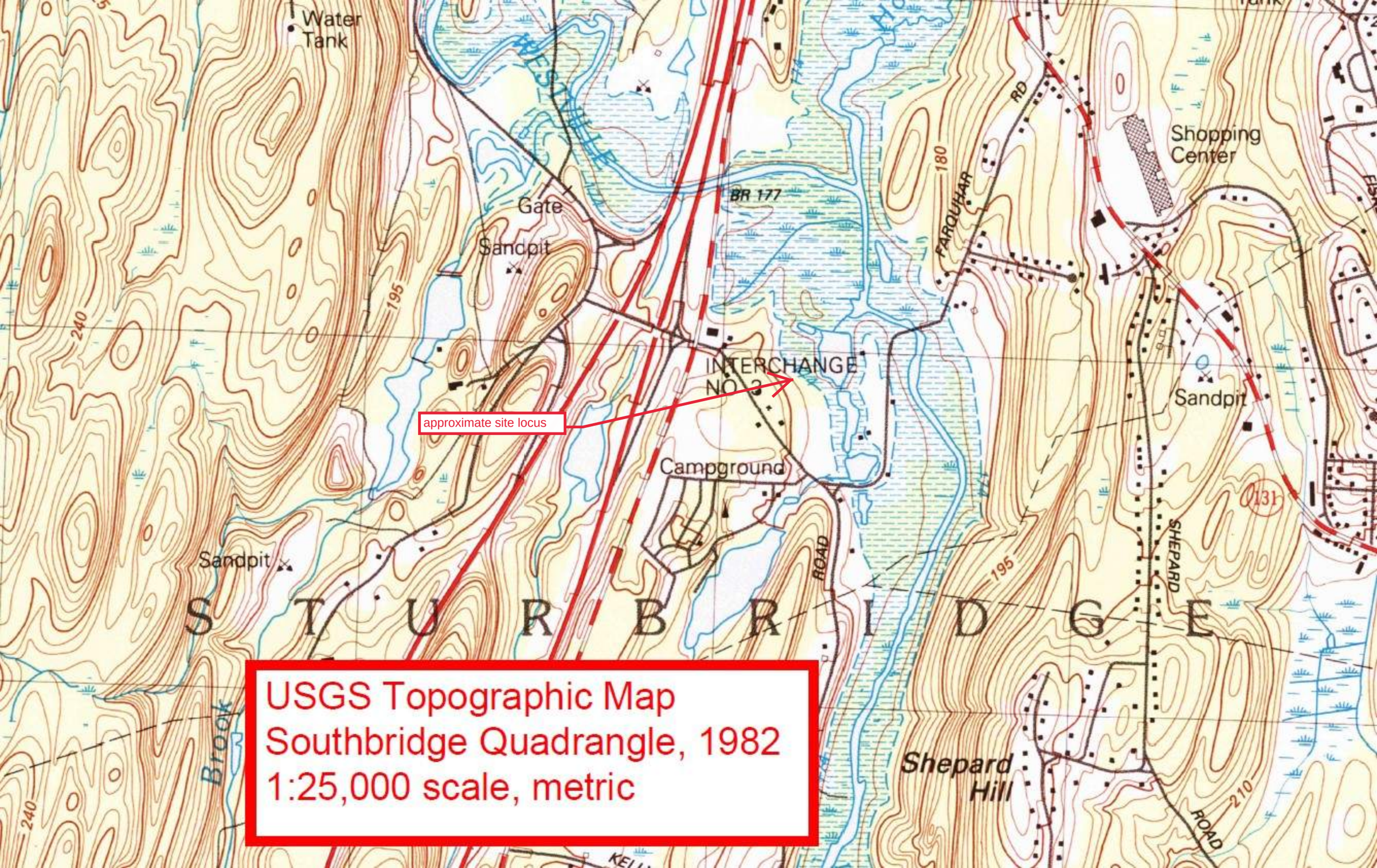
Conclusion: Is the soil hydric? Yes

Other Indicators of hydrology (check all that apply):

- ☐ Site Inundated
- ☐ Depth to free water in observation hole
- ☐ Depth to soil saturation in observation hole
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment Deposits
- ☐ Drainage patterns in BVWs
- ☐ Oxidized rhizospheres
- ☐ Water stained leaves
- ☐ Recorded data (stream, lake, or tidal gauge; aerial photo; other):
- ☐ Other:

Vegetation and Hydrology Conclusion

	Yes	No
Number of wetland indicator plants ≥ number of non-wetland indicator plants	☑	☐
Wetland hydrology present:		
Hydric soil present	☑	☐
Other indicators of hydrology present	☐	☑
Sample Location is in a BVW	☑	☐



USGS Topographic Map
Southbridge Quadrangle, 1982
1:25,000 scale, metric

National Flood Hazard Layer FIRMette

FEMA

72°5'18"W 42°5'42"N

72°4'40"W 42°5'16"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 Cross Sections with 1% Annual Chance / Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

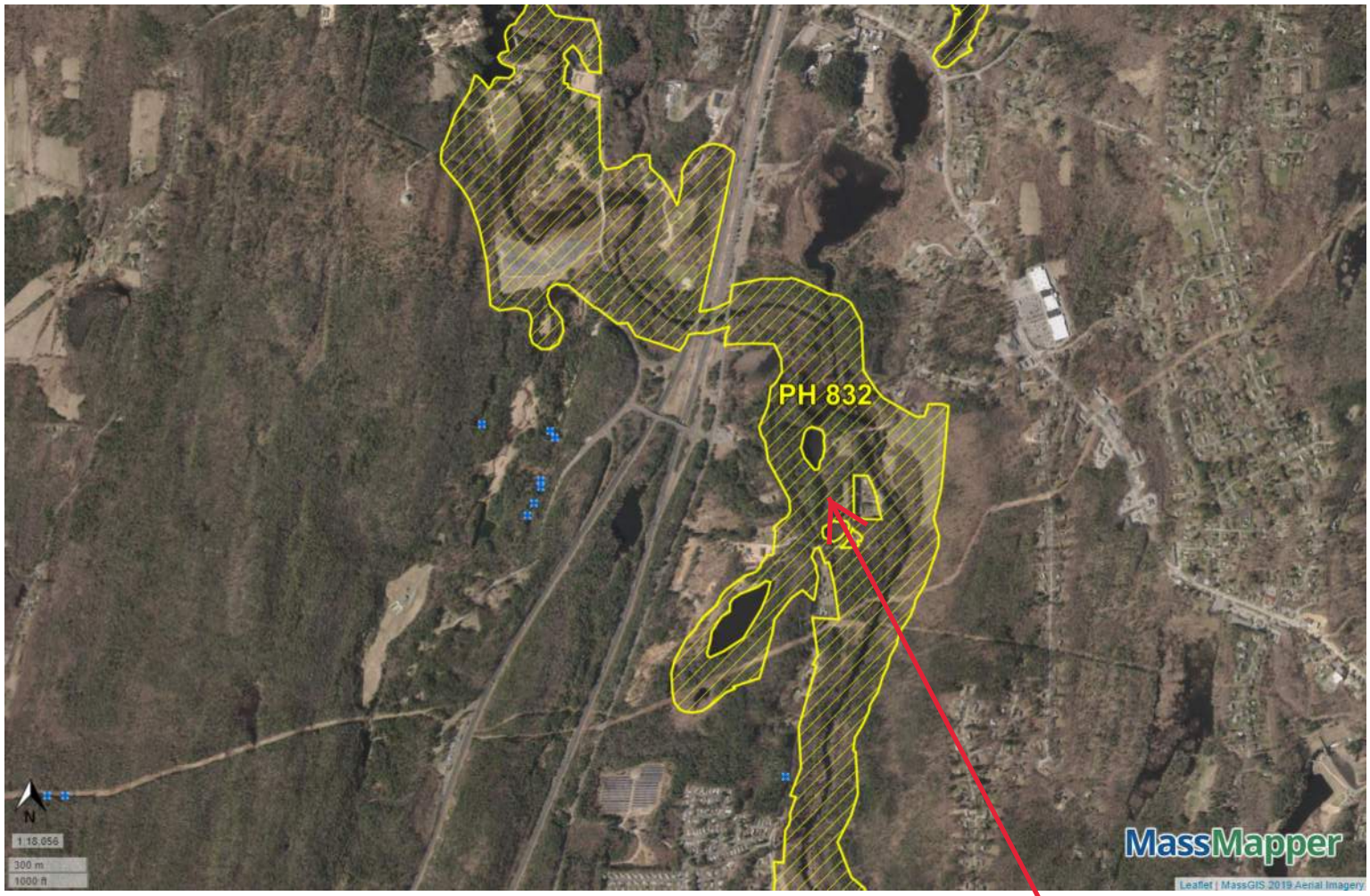
The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 2/8/2023 at 10:53 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

River Road Trail, Sturbridge, NHESP



NHESP Priority Habitats of Rare Species

NHESP Estimated Habitats of Rare Wildlife

NHESP Certified Vernal Pools

Natural Heritage Atlas
Online Data Viewer, 15th edition, valid August 1, 2021
created: 2/8/2023
River Road Trail, Sturbridge

approximate site locus

EcoTec, Inc.

ENVIRONMENTAL CONSULTING SERVICES
102 Grove Street
Worcester, MA 01605-2629
508-752-9666 / Fax: 508-752-9494

Arthur Allen, CPSS, CWS, CESSWI
Vice President
Soil & Wetland Scientist

Arthur Allen is the Vice President of EcoTec, Inc. and has been a senior environmental scientist there since 1995. His work with EcoTec has involved wetland delineation, wildlife habitat evaluation, environmental permitting (federal, state and local), environmental monitoring, expert testimony, peer reviews, contaminated site assessment and the description, mapping and interpretation of soils. His clients have included private landowners, developers, major corporations and regulatory agencies. Prior to joining EcoTec, Mr. Allen mapped and interpreted soils in Franklin County, MA for the U.S.D.A. Natural Resources Conservation Service (formerly Soil Conservation Service) and was a research soil scientist at Harvard University's Harvard Forest. Since 1994, Mr. Allen has assisted the Massachusetts Department of Environmental Protection and the Massachusetts Association of Conservation Commissions as an instructor in the interpretation of soils for wetland delineation and for the Title V Soil Evaluator program.

Mr. Allen has a civil service rating as a soil scientist, an undergraduate degree in Natural Resource Studies and a graduate certificate in Soil Studies. His work on the Franklin County soil survey involved interpretation of landscape-soil-water relationships, classifying soils and drainage, and determining use and limitation of the soil units that he delineated. As a soil scientist at the Harvard Forest, Mr. Allen was involved in identifying the legacies of historical land-use in modern soil and vegetation at a number of study sites across southern New England. He has a working knowledge of the chemical and physical properties of soil and water and how these properties interact with the plants that grow on a given site. While at Harvard Forest he authored and presented several papers describing his research results which were later published. In addition to his aforementioned experience, Mr. Allen was previously employed by the Trustees of Reservations as a land manager and by the Town of North Andover, MA as a conservation commission intern.

Education:
1993-Graduate Certificate in Soil Studies, University of New Hampshire
1982-Bachelor of Science in Natural Resource Studies, University of Massachusetts

Professional Affiliations:
Certified Professional Soil Scientist (ARCPACS CPSS #22529)
New Hampshire Certified Wetland Scientist (#19)
Registered Professional Soil Scientist – Society of Soil Scientists of SNE [Board Member (2000-2006)]
Certified Erosion, Sediment & Stormwater Inspector (#965)
Massachusetts Approved Soil Evaluator (#13764)
Massachusetts Arborists Association-Certified Arborist (1982 – 1998)
New England Hydric Soils Technical Committee member
Massachusetts Association of Conservation Commissions member
Society of Wetland Scientists member

Refereed Publications:
Soil Science and Survey at Harvard Forest. A.Allen. *In*: Soil Survey Horizons. Vol. 36, No. 4, 1995, pp. 133-142.
Controlling Site to Evaluate History: Vegetation Patterns of a New England Sand Plain. G.Motzkin, D.Foster, A.Allen, J.Harrod, & R.Boone. *In*: Ecological Monographs 66(3), 1996, pp. 345-365.
Vegetation Patterns in Heterogeneous Landscapes: The Importance of History and Environment. G.Motzkin, P.Wilson, D.R.Foster & A.Allen. In: Journal of Vegetation Science 10, 1999, pp. 903-920.

EcoTec, Inc.

ENVIRONMENTAL CONSULTING SERVICES
102 Grove Street
Worcester, MA 01605-2629
508-752-9666 – Fax: 508-752-9494

Kate O'Donnell, WPIT
Environmental Scientist

Kate O'Donnell is an Environmental Scientist at EcoTec, Inc. Since joining EcoTec in June of 2021, her project experience includes wetland resource evaluation and delineation, as well as environmental permitting at the local, state, and federal level. She received certification as a Wetland Professional In Training (WPIT) from the International Society of Wetland Scientists (SWS) in September of 2021. Additionally, Ms. O'Donnell has experience in turbidity and erosion control monitoring, salinity sampling, wildlife habitat evaluation, stream evaluation, vernal pool evaluation and certification, preconstruction sweeps for rare species including the eastern box turtle, Stormwater Pollution Prevention Plan (SWPPP) preparation, Turtle Protection Plan preparation, Massachusetts Endangered Species Act (MESA) Project Review Checklists, and Massachusetts Environmental Policy Act (MEPA) documentation. Prior to starting at EcoTec, Ms. O'Donnell was a student at the College of the Holy Cross, where she received degrees in Biology and Environmental Studies. Her educational background includes with extensive coursework in ecology and environmental science, as well as courses in geoscience, biology, chemistry, and environmental law. During her time at Holy Cross, she conducted hydrologic and water quality research to investigate the impacts of road salt on the salinity of the Middle River in Worcester, MA.

Education:

Bachelor of Arts in Biology (Ecology emphasis) and Bachelor of Arts in Environmental Studies, College of the Holy Cross, 2021

Professional Affiliations:

Society of Wetland Scientists
Massachusetts Association of Conservation Commissioners

Certifications:

Society of Wetland Scientists Wetland Professional In Training
EPA Construction General Permit Site Inspector Certification

Tighe&Bond

APPENDIX E

MASSWILDLIFE

DIVISION OF
FISHERIES & WILDLIFE

1 Rabbit Hill Road, Westborough, MA 01581
p: (508) 389-6300 | f: (508) 389-7890
MASS.GOV/MASSWILDLIFE

January 22, 2024

Val Locker
Tighe & Bond, Inc.

RE: Project Location: 9 River Road
Town: Sturbridge
Heritage Hub Form ID: IR-82976
NHESP Tracking No.: -

To Whom It May Concern:

Thank you for contacting the Natural Heritage and Endangered Species Program (NHESP) of the MA Division of Fisheries & Wildlife (the "Division") for information regarding state-listed species in the vicinity of the above referenced site. Based on the information provided, this project site or a portion thereof is located **within** the current *Massachusetts Natural Heritage Atlas*. The following state-listed species are mapped for either *Priority Habitat (PH)* alone, or for both *Priority Habitat (PH)* and *Estimated Habitat (EH)*, as indicated in the following table:

Scientific Name	Common Name	Taxonomic Group	State Status	EH	PH
Glyptemys insculpta	Wood Turtle	Reptile	Special Concern	656	832

The species listed above is protected under the Massachusetts Endangered Species Act (MESA) (M.G.L. c. 131A) and its implementing regulations (321 CMR 10.00). State-listed wildlife are also protected under the Massachusetts Wetlands Protection Act (WPA) (M.G.L. c. 131, s. 40) and its implementing regulations (310 CMR 10.00). Fact sheets for most state-listed species can be found on our website (www.mass.gov/nhesp).

Please note that projects and activities located within Priority and/or Estimated Habitat **must** be reviewed by the Division for compliance with the state-listed species protection provisions of MESA (321 CMR 10.00) and/or the WPA (310 CMR 10.00).

Wetlands Protection Act (WPA)
If the project site is within Estimated Habitat and a Notice of Intent (NOI) is required, then a copy of the NOI must be submitted to the Division so that it is received at the same time as the local conservation commission. If the Division determines that the proposed project will adversely affect the actual Resource Area habitat of state-protected wildlife, then the proposed project may not be permitted (310 CMR 10.37, 10.58(4)(b) & 10.59). In such a case, the project proponent may request a consultation with the Division to discuss potential project design modifications that would avoid adverse effects to state-listed wildlife habitat.

A streamlined joint MESA/WPA review process is available. When filing an NOI, the applicant may file concurrently under the MESA and qualify for a 30-day streamlined joint review. Please visit our website for filing instructions: www.mass.gov/regulatory-review.

MA Endangered Species Act (MESA)

If the proposed project is located within Priority Habitat and is not exempt from review (see 321 CMR 10.14), then project plans, a fee, and other required materials must be submitted to the Division to determine whether a Take under the MA Endangered Species Act would occur (321 CMR 10.18). Please note that all proposed and anticipated development must be disclosed, as MESA does not allow project segmentation (321 CMR 10.16). Please visit our website for filing instructions: www.mass.gov/regulatory-review.

We recommend that state-listed species habitat concerns be addressed during the project design phase prior to submission of a formal MESA filing, as avoidance and minimization of impacts to state-listed species and their habitats is likely to expedite regulatory review. Please visit our website for more information on how to request a pre-filing consultation with the Division: www.mass.gov/how-to/request-a-pre-filing-consultation

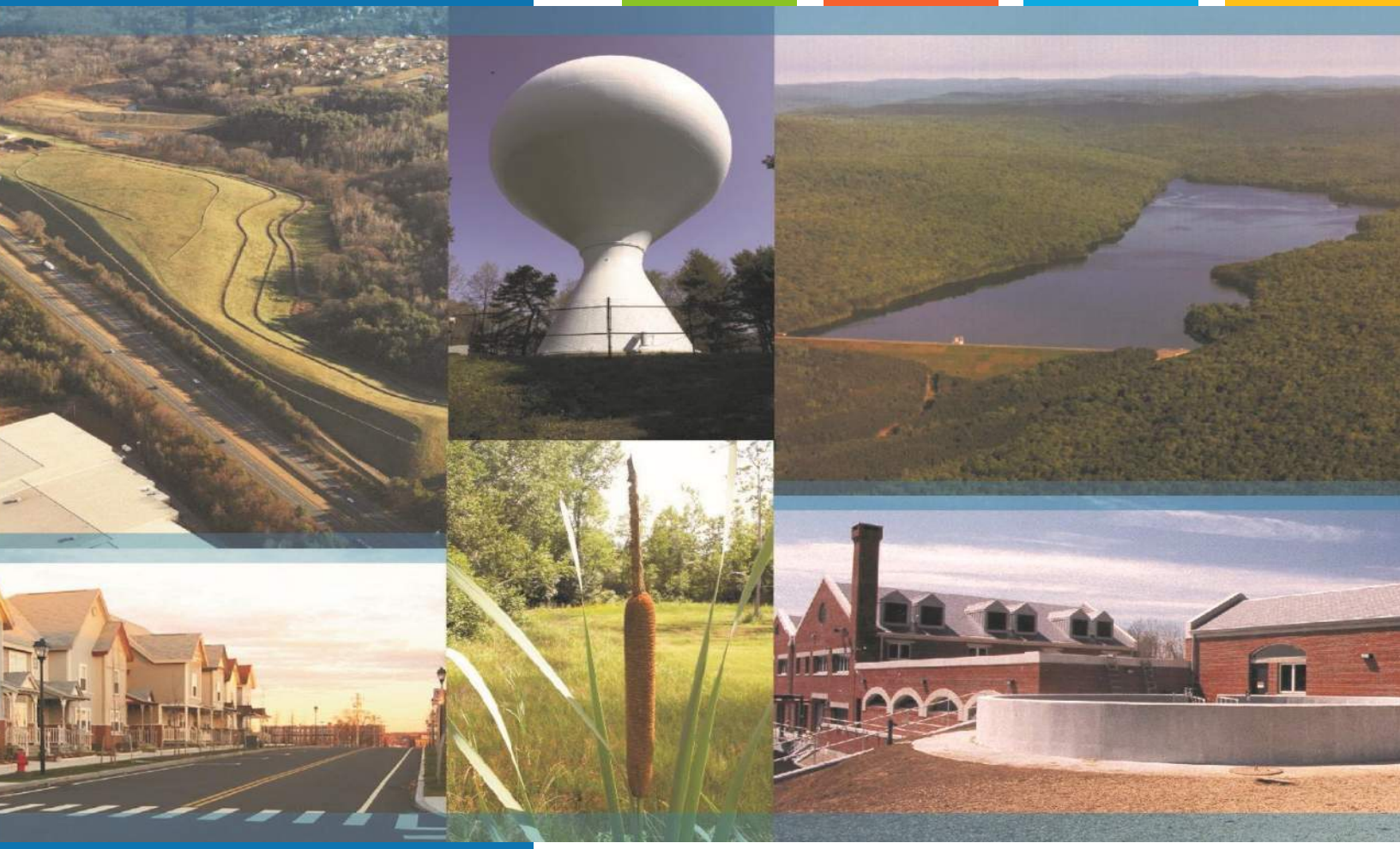
This evaluation is based on the most recent information available in the NHESP database, which is constantly being expanded and updated through ongoing research and inventory. If the purpose of your inquiry is to generate a species list to fulfill the federal Endangered Species Act (16 U.S.C. 1531 et seq.) information requirements for a permit, proposal, or authorization of any kind from a federal agency, we recommend that you use the NOAA Fisheries Greater Atlantic Region ESA Section 7 Mapper (https://noaa.maps.arcgis.com/apps/webappviewer/index.html?id=1bc332edc5204e03b250ac11f9914a27) and the U.S. Fish and Wildlife Service's Information for Planning and Conservation website (https://ecos.fws.gov/ipac). If you have any questions regarding this letter please contact Melany Cheeseman, Endangered Species Review Assistant, at Melany.Cheeseman@mass.gov.

Sincerely,

Everose Schlüter, Ph.D.
Assistant Director

Tighe&Bond

APPENDIX F



Grand Trunk Trail Continuation Project
Sturbridge, MA

STORMWATER MANAGEMENT REPORT

Town of Sturbridge

April 2024

Tighe&Bond

100% Recyclable

Tighe&Bond

Stormwater Management Report

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PLACEHOLDER FOR APPLICATION FORM

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Stormwater Management Report

SECTION 1

Section 1
Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the computations, published and site-specific soil information, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan, the Long-term Post-Construction Operation and Maintenance Plan and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Massachusetts Department of Environmental Protection (MassDEP) Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist, provided in Appendix A, is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature Ashleigh Gilchrist 4/22/2024

Signature, Date

Tighe&Bond

Stormwater Management Report

SECTION 2

Section 2
Project Description

2.1 Project Introduction

On behalf of The Town of Sturbridge (the "Applicant"), Tighe & Bond has prepared the following Stormwater Management Report to support permitting efforts for the Grand Trunk Trail Continuation Project located on River Road in Sturbridge, Massachusetts.

The Town of Sturbridge (Town) has devoted significant effort to acquire, construct, and maintain a series of trails throughout the natural open spaces within the Town. In an effort to provide safe, multi-use access for recreation and commuting, the Town recently constructed an on-road extension to the Grand Trunk Trail, terminating at the intersection of River Road and Farquhar Road. The Grand Trunk Trail is part of the larger Titanic Rail Trail system, which spans from Franklin to Palmer, Massachusetts.

The proposed Project is a continuation of the Grand Trunk Trail, extending approximately 2,100 feet northwest from Farquhar Road near its intersection with River Road, to Haynes Road. The project also involves the construction of an approximately 5,000 square foot parking lot located near the intersection of Farquhar Road and River Road in Sturbridge. The parking lot will feature 11 parking spaces, 1 of which is an accessible parking space. Work associated with the construction of the proposed parking lot includes vegetation removal and grading.

A United States Geological Survey (USGS) Site Location figure, Priority Resource figure, and Orthophotograph of the Project site are provided in Appendix B as Figures 1-3 (respectively). Project plans are provided separately.

2.2 Existing Conditions

The Site is located within the Special Use Zoning District. Currently, the Site consists of undeveloped, forested land. The property slopes gradually downward toward the east, where runoff flows toward an unnamed waterbody to the north of the project area and ultimately to the Quinebaug River. Land surrounding the Site is occupied primarily by residential properties, with a campground to the south. There are wetlands located to the east of the site.

The Natural Resources Conservation Service (NRCS) soil data was obtained through the Web Soil Survey portal on the United States Department of Agriculture (USDA) NRCS website. The areas surrounding the property were queried for soil types according to the record soil survey maps maintained by NRCS. Soils within the project area, as published in the USDA Soil Survey for Worcester County, Version 16, dated September 10, 2023, include the Hinckley, Merrimac, and Windsor associations. The NRCS Soils Mapping is provided in Appendix C. The hydrologic soil group (HSG) and further description for each soil association is presented in Table 2.1 below.

Table 2.1
Soil Descriptions

Soil Map Designation	Soil Name	Hydrologic Soil Group (HSG)
245B	Hinckley loamy sand, 3 to 8 percent slopes	A
254A	Merrimac fine sandy loam, 0 to 3 percent slopes	A
255C	Windsor loamy sand, 8 to 15 percent slopes	A

The hydrologic soil group designation (HSG) for these soil types is listed as A. The HSG rating for soil types is based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long duration storms. Soils designated as HSG A are generally well drained and have a high capacity for water infiltration.

A subsurface exploration program was conducted on March 1, 2024. The explorations included test pits to determine soil textures and seasonal high groundwater within the project site. The results of the explorations within the limits of the proposed infiltration systems indicate soils are predominantly loamy sand and that an infiltration rate of 2.41 inches per hour would be appropriate for the site and hydrologic analysis. Seasonal high groundwater was observed ranging from 2.7-4.0 feet below existing grade. The results of the subsurface explorations are generally consistent with the mapping available from Web Soil Survey. The Stormwater Infiltration Data Report is provided in Appendix C.

The individual runoff curve numbers (CN) used in the calculation of the composite RCN for each drainage area are based on the values provided in TR-55, Urban Hydrology for Small Watersheds. RCN values vary depending on the type of ground cover and soil HSG. Existing Conditions Drainage Areas were delineated based on topography and stormwater discharge location. A summary of each existing drainage area, including area, RCN, and time of concentration calculations are provided in the HydroCAD reports in Appendix D. An Existing Conditions Drainage Area Map is provided as Figure 4 in Appendix B.

2.3 Floodplain Management

The Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map (FIRM) for the subject parcel, designated as Community Panel Number 25027C0929F and effective June 21, 2023 shows the project site outside of any floodways or floodplains, as attached in Appendix B. Therefore, no floodplain is identified on this site.

2.4 Proposed Improvements

The proposed project involves the construction of a continuation of the Grand Trunk trail, from the River Road and Farquhar Road intersection to Haynes Road, approximately 1,800 feet through the 9 River Road parcel. The shared use, gravel trail will conform to Massachusetts Shared Use Path standards and be approximately 14-feet-wide (10-foot-

wide path and 2-foot-wide shoulders). This project includes design and permitting for the construction of the proposed shared use path as well as an approximately 11-car parking lot to be located off of River Road. A portion of the proposed work occurs within the 200-foot Riverfront Area associated with the unnamed stream to the east of the project site.

The proposed parking lot design has been prepared in accordance with recommendations in the Massachusetts Department of Environmental Protection (MassDEP) Stormwater Handbook.

Under proposed conditions, stormwater runoff from the parking area flows to the east, toward two sediment forebays proposed in series. Stormwater runoff will receive pretreatment TSS removal upon entering the forebays, after which it will enter the proposed infiltration basin for treatment and infiltration. The proposed path has been designed to sheet flow runoff, and is pitched in the same direction as existing site topography.

Proposed conditions drainage areas for the proposed parking lot location were delineated based on topography and stormwater discharge location. A summary of each proposed conditions drainage area, including area, RCN, and time of concentration calculations are provided in the HydroCAD reports in Appendix D. A Proposed Conditions Drainage Area Map is provided as Figure 5 in Appendix B.

The proposed stormwater management system treats both the quality and the quantity of stormwater discharge from the parking lot site. The system includes Best Management Practices (BMPs) such as sediment forebays and an infiltration basin.

A brief description of the proposed BMPs incorporated into the stormwater management system are as follows:

> Sediment Forebays: The sediment forebays located to the southeast of the proposed parking lot will serve as pretreatment devices for the site's infiltration basin. The sediment forebay is designed to slow incoming stormwater runoff and facilitate the gravity separation of suspended solids.
>
> Infiltration Basin: The proposed surface infiltration basin is the collection point for the runoff from the proposed parking lot and is located in the easternmost area of the lot. The infiltration basin has been designed in accordance with the Massachusetts Stormwater Handbook to provide the required groundwater recharge and water quality volume for the project. The basin is equipped with an emergency overflow spillway to minimize the potential for flooding during extreme storm events.

2.5 Method of Hydrologic and Hydraulic Analysis

The following storm drainage design criteria were used for all hydrologic and hydraulic analyses:

1. Minimum time of concentration = 6 minutes.
2. For SCS peak flow calculations, Curve Numbers were as follows:
    a. Woods, Good, HSG A = 30

   b. >75% Grass Cover, Good, HSG A = 39
   c. Gravel Parking = 96
   d. Paved Road = 98
   e. Water Surface = 98
3. The stormwater management plan for the site is designed to treat the water quality volume, remove total suspended solids and infiltrate the required recharge volume while reducing peak flow.
4. Watershed areas delineated using polylines in AutoCAD Civil 3D 2021.
5. Comparative hydrology analyzed using HydroCAD Stormwater Modeling software Version 10.00-20-4b.

Runoff computations, storm drainage calculations, and suspended solids removal rates are included in Appendix D.

A hydrologic analysis of the pre-development and post-development site was performed to determine the impacts of the proposed project on peak discharge rates and stormwater runoff volumes. HydroCAD Release 10.00-20-4b is a hydrology and hydraulics software using Technical Release (TR) 20 and TR-55 methodologies for the determination of stormwater runoff quantities. The HydroCAD Report for both pre- and post-development conditions for the 2-, 10-, and 100-year storm events is provided in Appendix D.

Table 2.2 below presents the design rainfall depths for the 2-, 10,- and 100-year storms, as provided by the National Oceanic and Atmospheric Administration's (NOAA) National Weather Service.

Table 2.2
Design Rainfall Depths

Storm Event	Rainfall Depth (inches)
2-Year	3.21
10-Year	5.03
100-Year	7.90

Tighe&Bond

Stormwater Management Report

SECTION 3

Section 3
Regulatory Compliance

The proposed parking lot portion of the project is required to comply with the ten MassDEP Massachusetts Stormwater Standards (Standards) under the Massachusetts Wetlands Protection Act and the Town of Sturbridge Stormwater Management Regulations. The shared-use path portion of the project is only required to comply with the Standards to the maximum extent practicable due to its status as a shared-use path and the provisions of CMR 10.05(6)(m)(6). The Massachusetts Stormwater Checklist is provided in Appendix A.

3.1 LID Measures

MassDEP allows for reductions in structural stormwater Best Management Practice (BMP) requirements for water quantity and quality when certain criteria are met. The proposed project includes environmentally sensitive site design and low impact development techniques; however, the applicant is not requesting credit for LID measures.

3.2 Standard 1: No New Untreated Discharges

The project will not result in any new stormwater conveyance discharging untreated stormwater directly to the Waters of the Commonwealth. No new outfalls are proposed as part of the project and runoff from all proposed impervious surfaces will be treated and infiltrated to groundwater. Further documentation pertaining to stormwater treatment is provided in Section 3.5.

3.3 Standard 2: Peak Discharge Rate Attenuation

Since the proposed project alters existing drainage patterns, stormwater management features are required to attenuate peak discharge rates through the use of infiltration and detention. Runoff from the proposed parking area sheet flows to the proposed sediment forebays, where it receives pretreatment TSS removal. Runoff is then conveyed to the proposed infiltration basin, where it is treated and infiltrated to groundwater. Table 3.1 presents the results of the pre-development stormwater runoff analysis versus the post-development stormwater runoff analysis, previously described in Section 2.4, for the project.

Table 3.1
Peak Discharge Rate Comparison

		2-Year Storm Event (cfs)	10-Year Storm Event (cfs)	100-Year Storm Event (cfs)
Design Point 1	Existing	0.000	0.000	0.170
	Proposed	0.000	0.000	0.120

Table 3.1 indicates that existing peak discharge rates for the project are reduced or maintained under all storm events. In addition to a summary of peak discharge rates, total runoff volumes are also presented in Table 3.2.

Table 3.2
Total Runoff Volume Comparison

		2-Year Storm Event (acre-ft)	10-Year Storm Event (acre-ft)	100-Year Storm Event (acre-ft)
Design Point 1	Existing	0.000	0.003	0.033
	Proposed	0.000	0.003	0.022

Table 3.2 indicates that the total runoff volumes from the project location are reduced under proposed conditions as compared to existing conditions.

The proposed path has been designed to sheet flow runoff, and is pitched in the same direction as existing site topography. While the proposed gravel increases the impervious cover of the corridor, the overall impact on the site is negligible. Full peak rate attenuation is not achievable along the path, however based on site characteristics existing hydrology, we do not anticipate a significant change.

3.4 Standard 3: Groundwater Recharge

The proposed project will allow treated stormwater runoff from the proposed parking lot area to infiltrate to groundwater. The infiltration system has been designed in accordance with the MassDEP Stormwater Handbook and provides the required recharge volume. Recharge calculations are provided in Appendix D.

The collection of stormwater runoff from the proposed pathway is not proposed, instead, existing flow regimes have been preserved to the extent practicable. Accordingly, runoff will infiltrate naturally into the ground adjacent to the path and the overall impact to existing recharge is negligible.

3.5 Standard 4: Water Quality

Standard 4 of the Massachusetts Stormwater Standards addresses stormwater quality requirements. This standard requires that new stormwater management systems be designed to achieve an 80% Total Suspended Solids (TSS) removal rate prior to discharge. MassDEP has published presumed removal rates for each of the BMP's featured in their design guidelines. Additionally, this standard addresses the required volume of stormwater runoff that is to be treated by the BMPs, as well as components of a long-term source control and pollution prevention plan.

The following treatment train has been incorporated into the design of the stormwater management system for stormwater runoff from the proposed parking area:

Treatment Train: This treatment train consists of two sediment forebays in series and an infiltration basin. The pretreatment requirement of 44% TSS removal prior to infiltration, triggered by the rapid infiltration rate of the soils on-site, is met through the pretreatment features of this train. With each sediment forebay providing 25% TSS removal, both forebays in sequence provide a combined pretreatment TSS removal of 44%. The overall TSS removal for this train is 80%.

The project has been designed such that stormwater runoff from all proposed gravel surfaces which will be exposed to vehicular access will pass through the previously described treatment train, which results in the required TSS removal for the project.

Runoff originating on the gravel surface will generally flow in the same direction as it did prior to path development and will flow over stabilized shoulders prior to reaching the leaf litter and other natural/organic material adjacent to the site on the undisturbed forest floor. As the path is to be used for non-motorized means of transportation and recreation, no new sources of sediment or pollutants are anticipated along the path (e.g., no sand or salt; no potential for petroleum product spills).

3.6 Standard 5: Land Uses with Higher Potential Pollutant Loads (LUHPPLs)

The proposed use is not considered a LUHPPL. Therefore, compliance with the additional requirements of Standard 5 is not required.

3.7 Standard 6: Critical Areas

The site discharges stormwater runoff to two waterbodies, one to the southeast and one to the east. Both waterbodies ultimately drain to a tributary of the Quinebaug River. The Quinebaug River, specifically segment MA41-02, is listed as a Category 5 Water, which requires a Total Maximum Daily Load (TMDL) as listed in the Massachusetts Year 2022 Integrated List of Waters. The impairments listed for this segment of the Quinebaug River include Algae, Lack of a Coldwater Assemblage, Trash, and Turbidity. Impairments that do not require a TMDL include Debris.

The project has been designed to improve water quality and quantity under proposed conditions. The stormwater BMPs selected for the project remove 80% of annual average TSS loading, as well as 81% of total phosphorus and 92% of total nitrogen when constructed and maintained properly. The project is located outside of any MassDEP Wellhead Protection Areas, including Zones I, II, and any Interim Wellhead Protection Areas.

Other Critical Areas, as defined in the Massachusetts Stormwater Handbook, are shown on Figure 2 in Appendix B.

3.8 Standard 7: Redevelopment Projects

The project parking area is not considered a redevelopment; therefore, the project has been designed to fully comply with all of the Standards.

The shared-use path portion of the project is considered a new development, but is only required to comply with the Standards to the maximum extent practicable due to its status as a shared-use path and the provisions of CMR 10.05(6)(m)(6).

3.9 Standard 8: Construction Period Pollution Prevention, Erosion and Sedimentation Control

A construction period Soil Erosion and Sediment Control Plan (SESCP) is provided in Appendix E. The SESCP presents the minimum soil erosion a sediment control practices to be used during construction. General soil erosion and sedimentation control BMPs are indicated on the Site Plans.

Additionally, there will be more than one acre of land disturbed as a result of this project, therefore the construction will be required to comply with the Environmental Policy Act (EPA) National Pollutant Discharge Elimination System (NPDES) Construction General Permit (CGP). Coverage under the CGP will be obtained before construction commenced by the Contractor. The Contractor will be required file a Notice of Intent with the EPA and to implement a Stormwater Pollution Prevention Plan (SWPPP) prior to construction. A SWPPP was not prepared as part of this report.

3.10 Standard 9: Long-Term Operation and Maintenance Plan

A Long-Term Stormwater Operations and Maintenance Plan is included in Appendix F of this report. The O&M plan indicates the responsible parties for the project, routine and non-routine maintenance tasks and inspection criteria. The O&M Plan also provides guidance on long-term pollution prevention practices for the project.

3.11 Standard 10: Prohibition of Illicit Discharges

Illicit discharges to the stormwater management system are discharges that are not entirely comprised of stormwater. Illicit discharge does not include discharges from the following activities or facilities: firefighting, water line flushing, landscape irrigation, uncontaminated groundwater, potable water sources, foundation drains, air conditioning condensation, footing drains, individual resident car washing, flows from riparian habitats and wetlands, dechlorinated water from swimming pools, water used for street washing, and water used to clean residential buildings without detergents. A signed Illicit Discharge Statement is provided in Appendix G.

3.12 Local Stormwater Management Regulations

The proposed project is required to obtain a stormwater management permit through the Department of Public Works per the Town of Sturbridge Stormwater Management Bylaw. Per section 8.06(B) of the Bylaw, the Stormwater Management Application Package must include the following:

1) A completed stormwater management permit application form with original signatures of all owners

   PLACEHOLDER

2) Stormwater management plan and project description

A stormwater management plan and project description is included as part of this Stormwater Management Report, as described herein and documented within the attached appendices.

3) Operation and maintenance plan

   An operation and maintenance plan is included as part of this Stormwater Management Report as Appendix F.

4) Payment of the application and review fees

   Payment and review fees have been waived as this is a Town project.

5) Inspection and maintenance agreement

   An inspection and maintenance agreement is included as part of the Operation and Maintenance Plan in Appendix F, however, because the Town owns the property upon which the project is proposed, operation and maintenance responsibilities belong to the Town beyond the completion of construction activities.

6) Erosion and sediment control plan

   An erosion and sediment control plan is included as part of the Construction Period Soil Erosion and Sediment Control Plan in Appendix E.

7) Surety bond

   A surety bond will be provided prior to construction commencement once a contractor has been selected for the project.

Additionally, the proposed project is required to comply with section 8.14(D) of the Town of Sturbridge Stormwater Management Bylaw, which states:

1) Stormwater management systems on new development sites shall be designed to:

   a. Retain the volume of runoff equivalent to, or greater than, one inch multiplied by the total post-construction impervious surface area on the site, and/or;

      While the water quality calculations provided in Appendix D use a water quality depth = 0.5”, the proposed basin provides adequate storage capacity for a water quality depth = 1.0" as well with a cumulative storage of 1,795 cubic feet within the basin.

   b. Remove 80% of the average annual load of total suspended solids (TSS) generated from the total post-construction impervious area on the site and 60% of the average annual load of total phosphorus (TP) generated from the total post-construction impervious surface area on the site. Pollutant removal shall be calculated consistent with EPA Region 1's BMP Performance Extrapolation Tool or other BMP performance evaluation tool provided by

EPA Region 1, where available. If EPA Region 1 tools do not address the planned or installed BMP performance, any federally or state-approved BMP design guidance or performance standards (e.g., state stormwater handbooks and design guidance manuals) may be used to calculate BMP performance.

As demonstrated in the TSS and nutrient removal calculations provided in Appendix D, the proposed stormwater management design removes 80% of the average annual load of TSS generated from the total post-construction impervious area on the site, as well as 81% of the average annual load of total phosphorus (TP) generated from the total post-construction impervious surface area on the site. Pollutant removal estimates are calculated using the BMP Performance Curves developed by the EPA Region 1, as presented in the New England Stormwater Retrofit Manual. These performance curves provide an estimation of pollutant removal efficiency for different stormwater control measures as a function of volumetric performance.

J:\S\S5052 Sturbridge\035 Grand Trunk Trail Continuation\Permitting\Stormwater\Narrative\Stormwater Management Report.docx

Stormwater Management Report

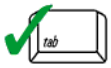
APPENDIX A

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

A. Introduction

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the Massachusetts Stormwater Handbook. The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.[1] This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8[2]
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

[1] The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

[2] For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature

4/22/2024
Signature and Date

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

☒ New development

☐ Redevelopment

☐ Mix of New Development and Redevelopment

Checklist for Stormwater Report

Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

☒ No disturbance to any Wetland Resource Areas

☐ Site Design Practices (e.g. clustered development, reduced frontage setbacks)

☐ Reduced Impervious Area (Redevelopment Only)

☒ Minimizing disturbance to existing trees and shrubs

☐ LID Site Design Credit Requested:

- ☐ Credit 1
- ☐ Credit 2
- ☐ Credit 3

☐ Use of "country drainage" versus curb and gutter conveyance and pipe

☐ Bioretention Cells (includes Rain Gardens)

☐ Constructed Stormwater Wetlands (includes Gravel Wetlands designs)

☐ Treebox Filter

☐ Water Quality Swale

☐ Grass Channel

☐ Green Roof

☒ Other (describe): Infiltration Basin

Standard 1: No New Untreated Discharges

☒ No new untreated discharges

☒ Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth

☒ Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.

Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

☐ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.

☐ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.

☒ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

☒ Soil Analysis provided.

☒ Required Recharge Volume calculation provided.

☐ Required Recharge volume reduced through use of the LID site Design Credits.

☒ Sizing the infiltration, BMPs is based on the following method: Check the method used.

☐ Static ☒ Simple Dynamic ☐ Dynamic Field[1]

☒ Runoff from all impervious areas at the site discharging to the infiltration BMP.

☐ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.

☒ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.

☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:

- ☐ Site is comprised solely of C and D soils and/or bedrock at the land surface
- ☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
- ☐ Solid Waste Landfill pursuant to 310 CMR 19.000
- ☐ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.

☒ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.

☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

[1] 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.

Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

☒ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.

☐ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
- Provisions for storing materials and waste products inside or under cover;
- Vehicle washing controls;
- Requirements for routine inspections and maintenance of stormwater BMPs;
- Spill prevention and response plans;
- Provisions for maintenance of lawns, gardens, and other landscaped areas;
- Requirements for storage and use of fertilizers, herbicides, and pesticides;
- Pet waste management provisions;
- Provisions for operation and management of septic systems;
- Provisions for solid waste management;
- Snow disposal and plowing plans relative to Wetland Resource Areas;
- Winter Road Salt and/or Sand Use and Storage restrictions;
- Street sweeping schedules;
- Provisions for prevention of illicit discharges to the stormwater management system;
- Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
- Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
- List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.

☐ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.

☒ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:

- ☐ is within the Zone II or Interim Wellhead Protection Area
- ☐ is near or to other critical areas
- ☒ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
- ☐ involves runoff from land uses with higher potential pollutant loads.

☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.

☒ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.

Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

☒ The BMP is sized (and calculations provided) based on:

- ☒ The ½" or 1" Water Quality Volume or
- ☐ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.

☐ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.

☐ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.

☐ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted ***prior to*** the discharge of stormwater to the post-construction stormwater BMPs.

☒ The NPDES Multi-Sector General Permit does ***not*** cover the land use.

☐ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.

☐ All exposure has been eliminated.

☐ All exposure has ***not*** been eliminated and all BMPs selected are on MassDEP LUHPPL list.

☐ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

☐ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.

☒ Critical areas and BMPs are identified in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

☒ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:

- ☐ Limited Project
- ☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
- ☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
- ☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
- ☒ Bike Path and/or Foot Path
- ☐ Redevelopment Project
- ☐ Redevelopment portion of mix of new and redevelopment.

☐ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.

☐ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
- Construction Period Operation and Maintenance Plan;
- Names of Persons or Entity Responsible for Plan Compliance;
- Construction Period Pollution Prevention Measures;
- Erosion and Sedimentation Control Plan Drawings;
- Detail drawings and specifications for erosion control BMPs, including sizing calculations;
- Vegetation Planning;
- Site Development Plan;
- Construction Sequencing Plan;
- Sequencing of Erosion and Sedimentation Controls;
- Operation and Maintenance of Erosion and Sedimentation Controls;
- Inspection Schedule;
- Maintenance Schedule;
- Inspection and Maintenance Log Form.

☒ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has ***not*** been included in the Stormwater Report but will be submitted ***before*** land disturbance begins.

☐ The project is ***not*** covered by a NPDES Construction General Permit.

☐ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.

☒ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

☒ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:

- ☒ Name of the stormwater management system owners;
- ☒ Party responsible for operation and maintenance;
- ☒ Schedule for implementation of routine and non-routine maintenance tasks;
- ☒ Plan showing the location of all stormwater BMPs maintenance access areas;
- ☒ Description and delineation of public safety features;
- ☒ Estimated operation and maintenance budget; and
- ☒ Operation and Maintenance Log Form.

☐ The responsible party is ***not*** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:

- ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
- ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

☐ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;

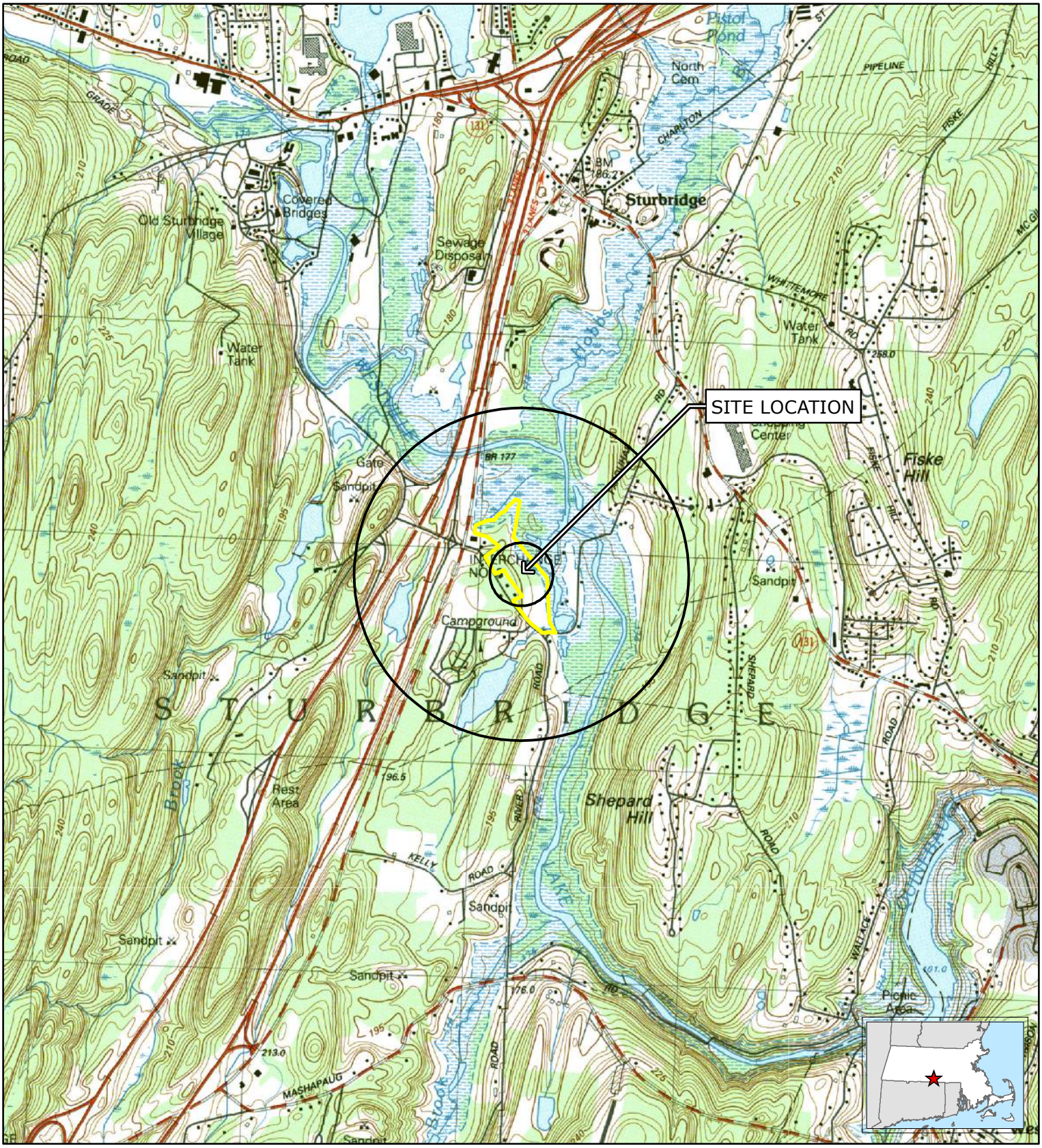
☒ An Illicit Discharge Compliance Statement is attached;

☐ NO Illicit Discharge Compliance Statement is attached but will be submitted ***prior to*** the discharge of any stormwater to post-construction BMPs.

Tighe&Bond

Stormwater Management Report

APPENDIX B



Legend

Project Site

FIGURE 1
SITE LOCATION

Grand Trunk Trail Continuation
9 River Road
Sturbridge, Massachusetts

March 2024

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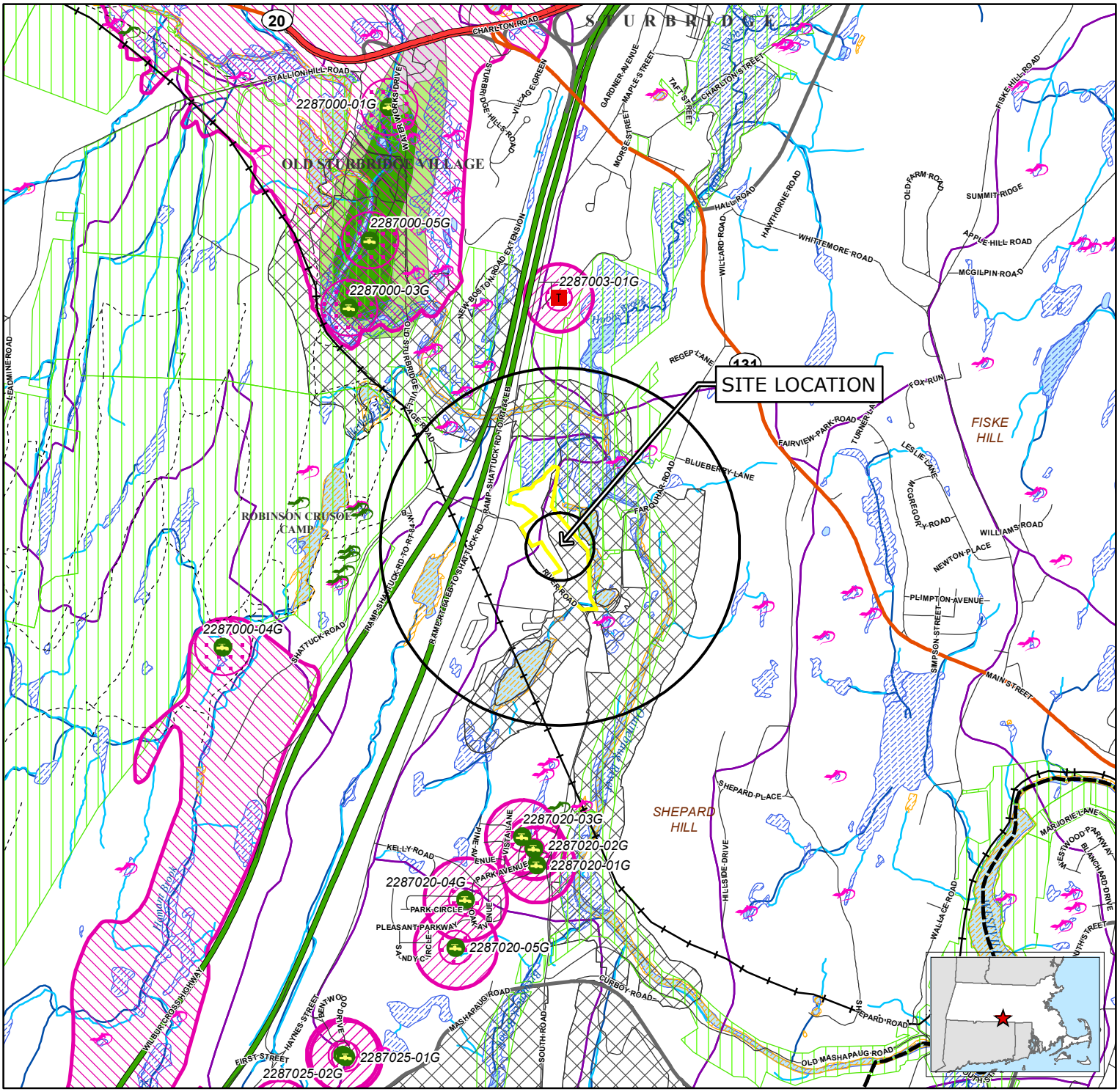

Legend

- NHESP Certified Vernal Pools
- NHESP Potential Vernal Pools
- Non-Landfill Solid Waste Sites
- Project Site
- Proposed Well
- Emergency Surface Water
- Community Public Water Supply - Surface Water
- Community Public Water Supply - Groundwater
- Non-Community Non-Transient Public Water Supply
- Non-Community Transient Public Water Supply
- Limited Access Highway
- Multi-Lane Highway, NOT Limited Access
- Other Numbered Route
- Major Road - Arterials and Collectors
- Minor Street or Road
- Aqueducts
- Hydrologic Connections
- Stream/Intermittent Stream
- Powerline
- Pipeline
- Track or Trail
- Trains
- Project Site
- Public Surface Water Supply Protection Area (Zone A)
- DEP Approved Wellhead Protection Area (Zone I)
- DEP Approved Wellhead Protection Area (Zone II)
- DEP Interim Wellhead Protection Area (IWPA)
- Protected and Recreational Open Space
- Solid Waste Landfill
- Area of Critical Environmental Concern (ACEC)
- NHESP Priority Habitats for Rare Species
- NHESP Estimated Habitats for Rare Wildlife
- EPA Designated Sole Source Aquifer
- Major Drainage Basin
- Sub Drainage Basin
- MassDEP Open Water
- MassDEP Inland Wetlands
- MassDEP Coastal Wetlands
- MassDEP Not Interpreted Wetlands
- Public Surface Water Supply (PSWS)
- Water Bodies
- Non-Potential Drinking Water Source Area - High Yield
- Non-Potential Drinking Water Source Area - Medium Yield
- Potentially Productive Medium Yield Aquifer
- Potentially Productive High Yield Aquifer
- County Boundary
- Municipal Boundary
- USGS Quadrangle Sheet Boundary

FIGURE 2
PRIORITY RESOURCES

Grand Trunk Trail Continuation
9 River Road
Sturbridge, Massachusetts

Data source: Bureau of Geographic Information (MassGIS), Commonwealth of Massachusetts, Executive Office of Technology.
Circles indicate 500-foot and half-mile radii.
Data valid as of December 2023.

March 2024

Tighe&Bond

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Legend

- NHESP Priority Habitats for Rare Species
- MassDEP Open Water
- MassDEP Inland Wetlands

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Based on MassGIS Color Orthophotography (2021)

1:3,600

0 180 360

Feet

N

FIGURE 3
ORTHOPHOTOGRAPH

Grand Trunk Trail Continuation
9 River Road
Sturbridge, Massachusetts

March 2024

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DP-1

PRE
1.0

LEGEND

SUBCATCHMENT BOUNDARY

STORMWATER FLOW PATH

GRAND TRUNK TRAIL CONTINUATION
STURBRIDGE, MASSACHUSETTS

EXISTING CONDITIONS
DRAINAGE AREA MAP

DATE:	APRIL 2024
SCALE:	1" = 30'
FIGURE:	4

Tighe&Bond

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POST 1.0

POST 2.0

POST 3.0

DP-1

3S

2S

SEDIMENT FOREBAYS

INFILTRATION BASIN

579.5

579.5

580.8

580

LEGEND

SUBCATCHMENT BOUNDARY

STORMWATER FLOW PATH

GRAND TRUNK TRAIL CONTINUATION
STURBRIDGE, MASSACHUSETTS

PROPOSED CONDITIONS
DRAINAGE AREA MAP

DATE: APRIL 2024
SCALE: 1" = 30'
FIGURE: 5

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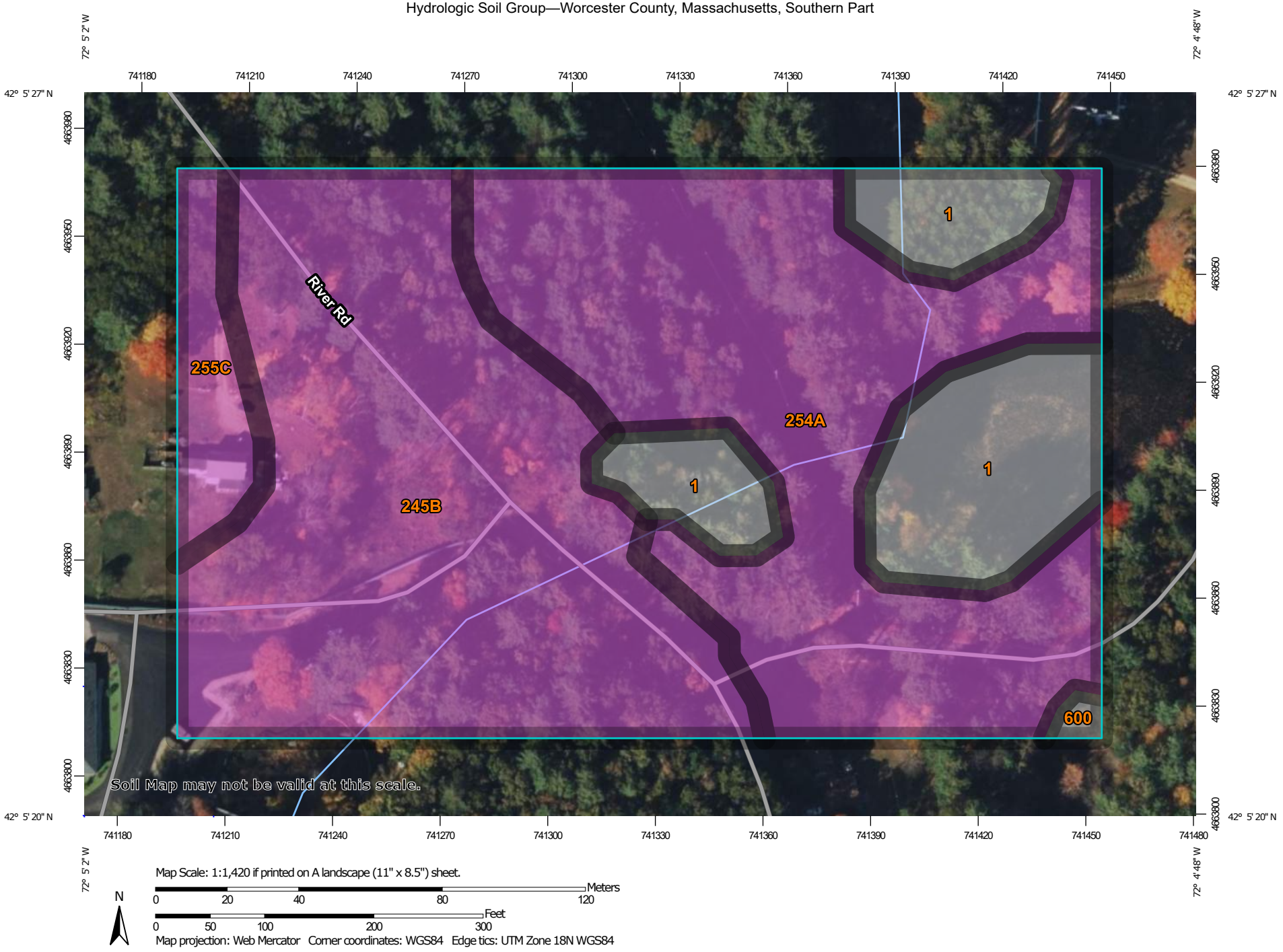
FEMA

FIGURE 6

Tighe&Bond

Stormwater Management Report

APPENDIX C


72° 5' 2" W
72° 4' 48" W
42° 5' 27" N
42° 5' 20" N
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741480
4663980
4663950
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4663890
4663860
4663830
4663800
River Rd
255C
245B
254A
1
1
1
600
Soil Map may not be valid at this scale.
Map Scale: 1:1,420 if printed on A landscape (11" x 8.5") sheet.
N
Meters
0 20 40 80 120
Feet
0 50 100 200 300
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

- Streams and Canals

Transportation

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

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:25,000.

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: Worcester County, Massachusetts, Southern Part
Survey Area Data: Version 16, Sep 10, 2023

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

Date(s) aerial images were photographed: Oct 15, 2020—Oct 31, 2020

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
1	Water		1.6	15.4%
245B	Hinckley loamy sand, 3 to 8 percent slopes	A	4.2	41.0%
254A	Merrimac fine sandy loam, 0 to 3 percent slopes	A	3.9	38.6%
255C	Windsor loamy sand, 8 to 15 percent slopes	A	0.5	4.6%
600	Pits, gravel		0.0	0.4%
Totals for Area of Interest			**10.1**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

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

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

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

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

N

TP-1

TP-2

GRAND TRUNK TRAIL CONTINUATION
STURBRIDGE, MASSACHUSETTS

TEST PIT LOCATION MAP

DATE:	APRIL 2024
SCALE:	1" = 30'
FIGURE:	1

Tighe&Bond

Performed by:
Nick Day
License #:
SE14758

Commonwealth of Massachusetts
City/Town of

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (*minimum of two holes required at every proposed primary and reserve disposal area*)

Deep Observation Hole Number: 1 (Hole #) 3/1/24 (Date) 805AM (Time) Sunny (Weather) ____ (Latitude) ____ (Longitude)

1. Land Use: Woodland (e.g., woodland, agricultural field, vacant lot, etc.) | Vegetation: Pine trees Under Brush | Surface Stones (e.g., cobbles, stones, boulders, etc.): NONE | Slope (%): 3-5%

Description of Location: 120' from River Road

2. Soil Parent Material: glaciofluvial deposits | Landform: outwash Plains | Position on Landscape (SU, SH, BS, FS, TS, Plain): SH

3. Distances from: Open Water Body 750 feet | Drainage Way 7100 feet | Wetlands 750 feet | Property Line 710 feet | Drinking Water Well 7100 feet | Other N/A feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: _____ Depth to Weeping in Hole _____ Depth to Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-9"	A_p	Loamy Sand	10YR 2/2	—	Cnc: — Dpl: —	—	0	—	Massive	very friable	
9"-34"	B_w	Loamy Sand	10YR 6/8	—	Cnc: — Dpl: —	—	0	—	Massive	very friable	
34"-48	B	Loamy Sand	10YR 4/3	—	Cnc: — Dpl: —	—	0	—	Massive	friable	
48-120	C	Sand	10YR 6/4	46"	Cnc: 2.5YR 4/6 Dpl: —	15%	20%	—	single grain	Loose	
					Cnc: Dpl:						
					Cnc: Dpl:						

Additional Notes:

Performed by:
Nick Day
License #:
SE14758

Commonwealth of Massachusetts
City/Town of

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (*minimum of two holes required at every proposed primary and reserve disposal area*)

Deep Observation Hole Number: 7 (Hole #) ~~10~~ 3/1/24 (Date) 900AM (Time) Sunny (Weather) _____ (Latitude) _____ (Longitude)

1. Land Use: Woodland (e.g., woodland, agricultural field, vacant lot, etc.) Pinetrees (Vegetation) NONE (Surface Stones (e.g., cobbles, stones, boulders, etc.) 3-5% (Slope (%)

Description of Location: 140 feet from River Road

2. Soil Parent Material: glaciofluvial deposits outwash Plains (Landform) SH (Position on Landscape (SU, SH, BS, FS, TS, Plain)

3. Distances from: Open Water Body 250 feet; Drainage Way >100 feet; Wetlands >50 feet; Property Line >10 feet; Drinking Water Well >100 feet; Other N/A feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: _____ Depth to Weeping in Hole _____ Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-10	Ap	Loamy Sand	10YR 3/3	—	Cnc: — Dpl: —	—	0	0	Massive	Friable	
10-32	Bw	Loamy Sand	10YR 5/4	—	Cnc: — Dpl: —	—	0	0	Massive	Friable	
32-48	C	Loamy Sand	10YR 6/3	32"	Cnc: 2.5YR 4/6 Dpl: —	10%	0	0	Massive	Friable	
48-120	C	Sand	10YR 6/4	↓	Cnc: ~~2.5YR 4/6~~ Dpl:	20%	15%	—	Single grain	Loose	
					Cnc: Dpl:						
					Cnc: Dpl:						

Additional Notes:

Tighe&Bond

Stormwater Management Report

APPENDIX D

Standard 3 Compliance Calculations

Tighe&Bond

Project Name: **Grand Trunk Trail Continuation Project**
Project Location: **Sturbridge, MA**
Description: **Standard 3 - Groundwater Recharge Calculations**
Prepared By: **TAL** Date: **March 2024**

Standard 3: Required Recharge Volume

For Class A Soils: F = Target Depth Factor = 0.60 inch
Impervious Area = 5,276 square feet
Req'd Recharge Volume (R_{vo}) = F x Impervious Area

$$Rvo = \frac{(0.60 \text{ inch}) \times (5{,}276 \text{ square feet})}{(12 \text{ inch/foot})}$$

Rvo = 264 cubic feet required

Basin 1 = 1,795 cubic feet provided

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
579.00	608	125.0	0	0	608
580.00	1,043	151.0	816	816	1,195
580.80	1,414	165.0	979	1,795	1,570
581.00	1,526	169.0	294	2,089	1,681

Drawdown Time = Vs / (K * Area)

Vs = Storage Volume = 1795 cubic ft
K= 0.689 ft/hr (8.27 in/hour Rawls Rate)
Area= Bottom Area of Basin= 608.0 square feet at elevation XX

Drawdown Time 4.28 hr

Project Name: **Grand Trunk Trail Continuation Project**
Project Location: **Sturbridge, MA**
Description: **Standard 3 - Groundwater Recharge Calculations**
Prepared By: **TAL** Date: **March 2024**

Standard 3: Groundwater Mounding Calculations

The groundwater mounding analysis below has been prepared for the parking lot expansion project in Springfield, Massachusetts. The Hantush Method was used with the following inputs:

Recharge: 0.80 ft/day

Specific Yield: S_y = 0.28 (28%)

The average specific yield was estimated to be 0.28 for medium sand, which was observed on site. (Johnson, A.I. 1967. Specific yield — compilation of specific yields for various materials. U.S. Geological Survey Water Supply Paper 1662-D. 74 p.)

Horizontal Hydraulic Conductivity:

The hydraulic conductivity was assumed to be the relevant Rawls Rate as given in the Massachusetts Stormwater Handbook:

Vertical Hydraulic Conductivity
Rawls Rate = 4.82 ft/day

According to the USGS report the vertical hydraulic conductivity is assumed to be $1/10^{th}$ of the horizontal hydraulic conductivity. K = 10 x 4.82 ft/day = 48.2 ft/day (USGS SIR 2010-5102, pp 6).

***Basin Geometry*:** The basin is approximately 53' long by 20' wide.

Duration of Infiltration Period:

t= 1 day. A period of 24 hours was reviewed to estimate the groundwater mound below the basin.

Initial Saturated Thickness:

h_i = 7.67 ft. Initial saturated thickness is the difference between the seasonal high ground water level (assumed to be 2.33 ft below grade) and the low permeability layer. In test pits at the site, a low permeability layer was not encountered. The deepest test pit was 120". The bottom of the aquifer is conservatively assumed to be at a depth of 120 inches (10.0 ft) below ground surface. The initial thickness of the aquifer was therefore calculated to be: 10.0 ft – 2.33 ft = 7.67 ft.

Maximum Groundwater Mounding (Beneath Center of Basin at End of Infiltration Period) = 0.64 ft

The height of the groundwater mound is less than the difference between the seasonal high groundwater elevation (578.3) and the proposed basin's bottom elevation (579.0).

Standard 4 Compliance Calculations

Project Name: **Grand Trunk Trail Continuation Project**
Project Location: **Sturbridge, MA**
Description: **Standard 4 - Water Quality Calculations**
Prepared By: **TAL** Date: **March 2024**

Required Water Quality Volume (Vwq)

Impervious Area **(A)** = **5,276 square feet**

WQ Depth = 0.5 in

$$\textbf{Vwq} = \frac{\textbf{(0.5")(5,276)}}{\textbf{12}} = \textbf{220 cf}$$

Provided Vwq = **1795 cf**

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
579.00	608	125.0	0	0	608
580.00	1,043	151.0	816	816	1,195
580.80	1,414	165.0	979	1,795	1,570
581.00	1,526	169.0	294	2,089	1,681

Calculated in accordence with the Hydrology Handbook For Conservation Comissioners - 2002, and MassDEP Q Rate - 2013

Project Name: **Grand Trunk Trail Continuation Project**
Project Location: **Sturbridge, MA**
Description: **Nutrient Removal Calculations**
Prepared By: **TAL** Date: **March 2024**

Pollutant Removal Calculations:

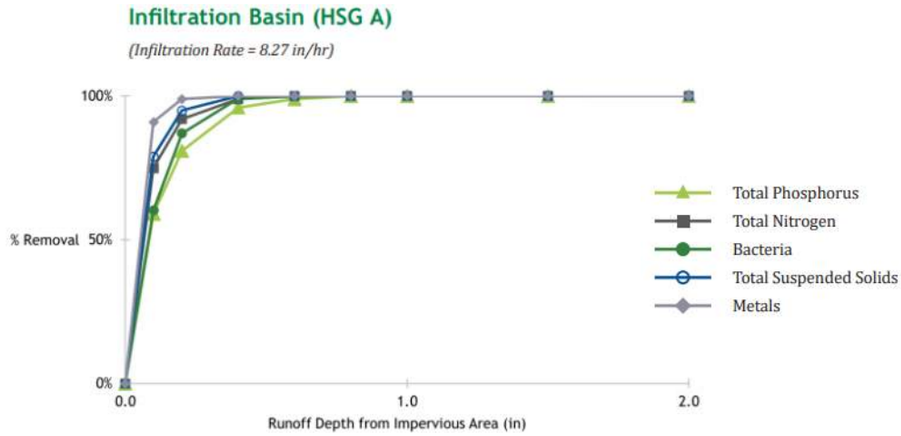
Per page 65 of the New England Stormwater Retrofit Manual,

"If Infiltration is incorporated into the design, then the Infiltration Trench or Infiltration Basin Performance Curves may be used to represent the infiltration unit operation and process (UOP), if it is the primary UOP."

Basin 1 Capacity:	1795	cubic ft
Contributing Impervious Area (IA):	5276	square ft
Infiltration Rate:	2.41	in/hr

Equation 3-1 : $BMP\text{-}Volume_{IA\text{-}ft}{}^{3} = IA\ (acre) * BMP\text{-}Volume_{IA\text{-}in} * 3{,}630\ ft^{3}/acre\text{-}in$

$BMP\text{-}Volume_{IA\text{-}in}$ = 0.340



Pollutant	Design Storage Volume: Runoff Depth from Impervious Area (in)								
	0	0.10	0.20	0.40	0.60	0.80	1.00	1.50	2.00
TP	0%	59%	81%	96%	99%	100%	100%	100%	100%
TN	0%	75%	92%	99%	100%	100%	100%	100%	100%
Bacteria	0%	60%	87%	99%	100%	100%	100%	100%	100%
TSS	0%	79%	95%	100%	100%	100%	100%	100%	100%
Metals	0%	91%	99%	100%	100%	100%	100%	100%	100%

TP Removal = 81%
TN Removal = 92%

TSS Removal Calculations

INSTRUCTIONS:

Version 1, Automated: Mar. 4, 2008

1. In BMP Column, click on Blue Cell to Activate Drop Down Menu
2. Select BMP from Drop Down Menu
3. After BMP is selected, TSS Removal and other Columns are automatically completed.

Location: Pretreament Train

TSS Removal Calculation Worksheet

B BMP[1]	C TSS Removal Rate[1]	D Starting TSS Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Sediment Forebay	0.25	1.00	0.25	0.75
Sediment Forebay	0.25	0.75	0.19	0.56
	0.00	0.56	0.00	0.56
	0.00	0.56	0.00	0.56
	0.00	0.56	0.00	0.56

Total TSS Removal = 44%

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: Grand Trunk Trail Continuation

Prepared By: TAL

Date:

*Equals remaining load from previous BMP (E) which enters the BMP

Non-automated TSS Calculation Sheet must be used if Proprietary BMP Proposed

1. From MassDEP Stormwater Handbook Vol. 1

INSTRUCTIONS:

Version 1, Automated: Mar. 4, 2008

1. In BMP Column, click on Blue Cell to Activate Drop Down Menu
2. Select BMP from Drop Down Menu
3. After BMP is selected, TSS Removal and other Columns are automatically completed.

Location: Treatment Train

TSS Removal Calculation Worksheet

B BMP[1]	C TSS Removal Rate[1]	D Starting TSS Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Infiltration Basin	**0.80**	**1.00**	**0.80**	**0.20**
	0.00	**0.20**	**0.00**	**0.20**
	0.00	**0.20**	**0.00**	**0.20**
	0.00	**0.20**	**0.00**	**0.20**
	0.00	**0.20**	**0.00**	**0.20**

Total TSS Removal = **80%**

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: **Grand Trunk Trail Continuation**

Prepared By: **TAL**

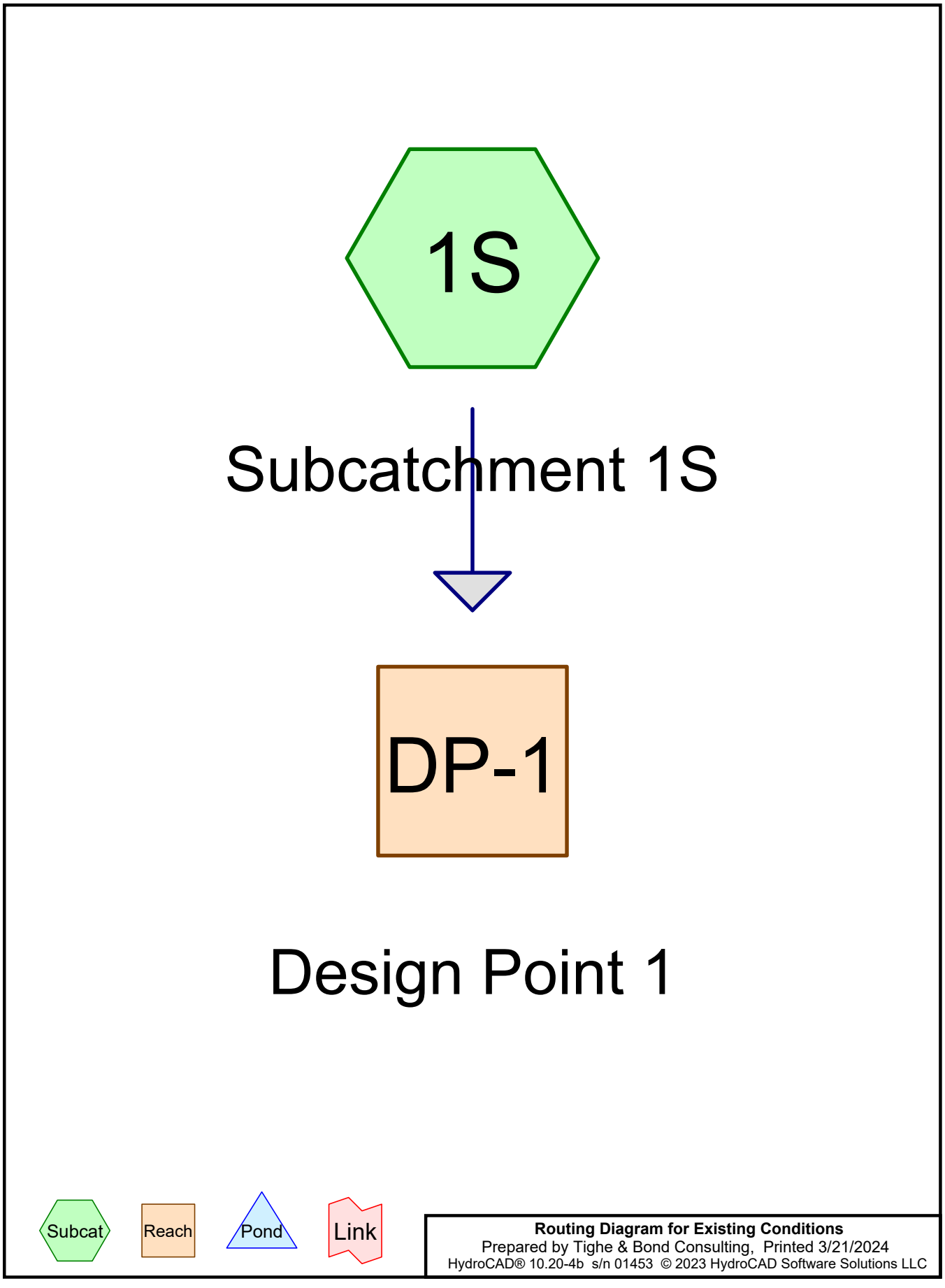
Date: **March 2024**

*Equals remaining load from previous BMP (E) which enters the BMP

Non-automated TSS Calculation Sheet must be used if Proprietary BMP Proposed

1. From MassDEP Stormwater Handbook Vol. 1

Existing Hydrology


1S
Subcatchment 1S
DP-1
Design Point 1
Subcat
Reach
Pond
Link
Routing Diagram for Existing Conditions
Prepared by Tighe & Bond Consulting, Printed 3/21/2024
HydroCAD® 10.20-4b s/n 01453 © 2023 HydroCAD Software Solutions LLC

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.035	98	Paved road, HSG A (1S)
0.547	30	Woods, Good, HSG A (1S)
0.582	**34**	**TOTAL AREA**

Summary for Subcatchment 1S: Subcatchment 1S

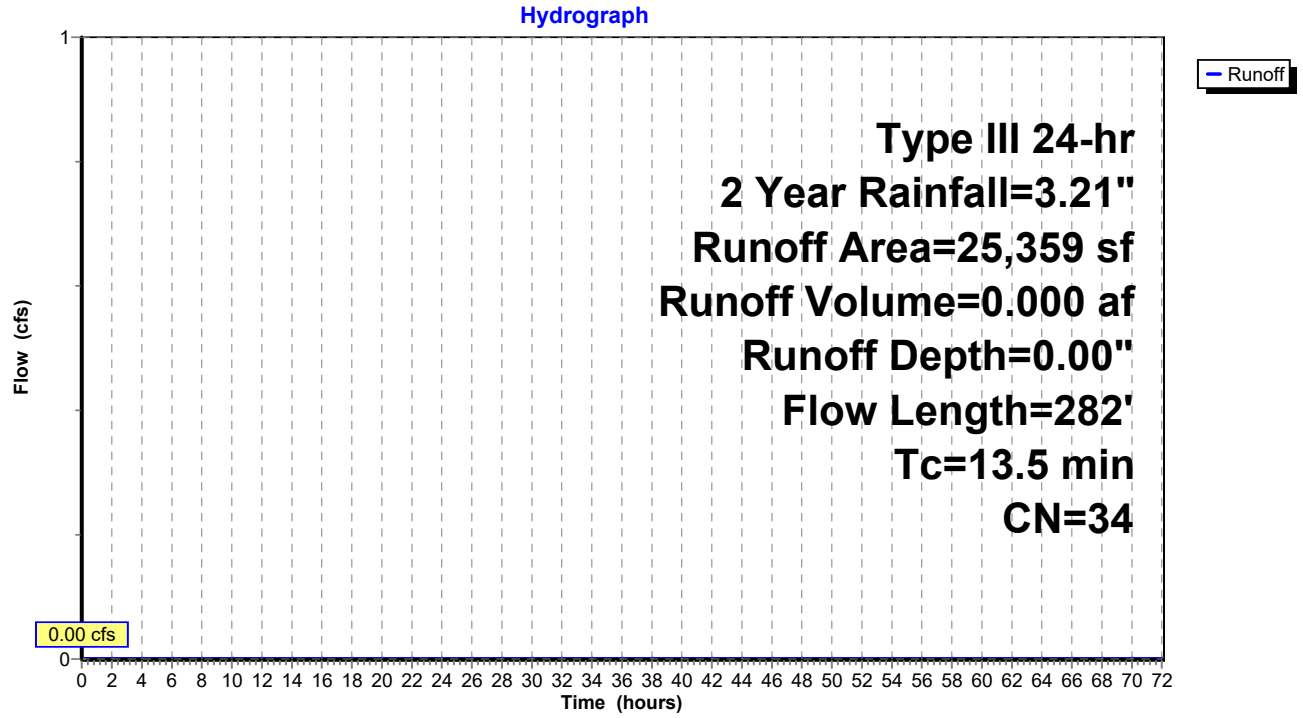
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"
Routed to Reach DP-1 : Design Point 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Rainfall=3.21"

	Area (sf)	CN	Description
*	1,532	98	Paved road, HSG A
	23,827	30	Woods, Good, HSG A
	25,359	34	Weighted Average
	23,827		93.96% Pervious Area
	1,532		6.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	50	0.1290	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.21"
0.7	76	0.1290	1.80		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.0	69	0.0580	1.20		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.6	87	0.0345	0.93		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.5	282	Total			

Subcatchment 1S: Subcatchment 1S

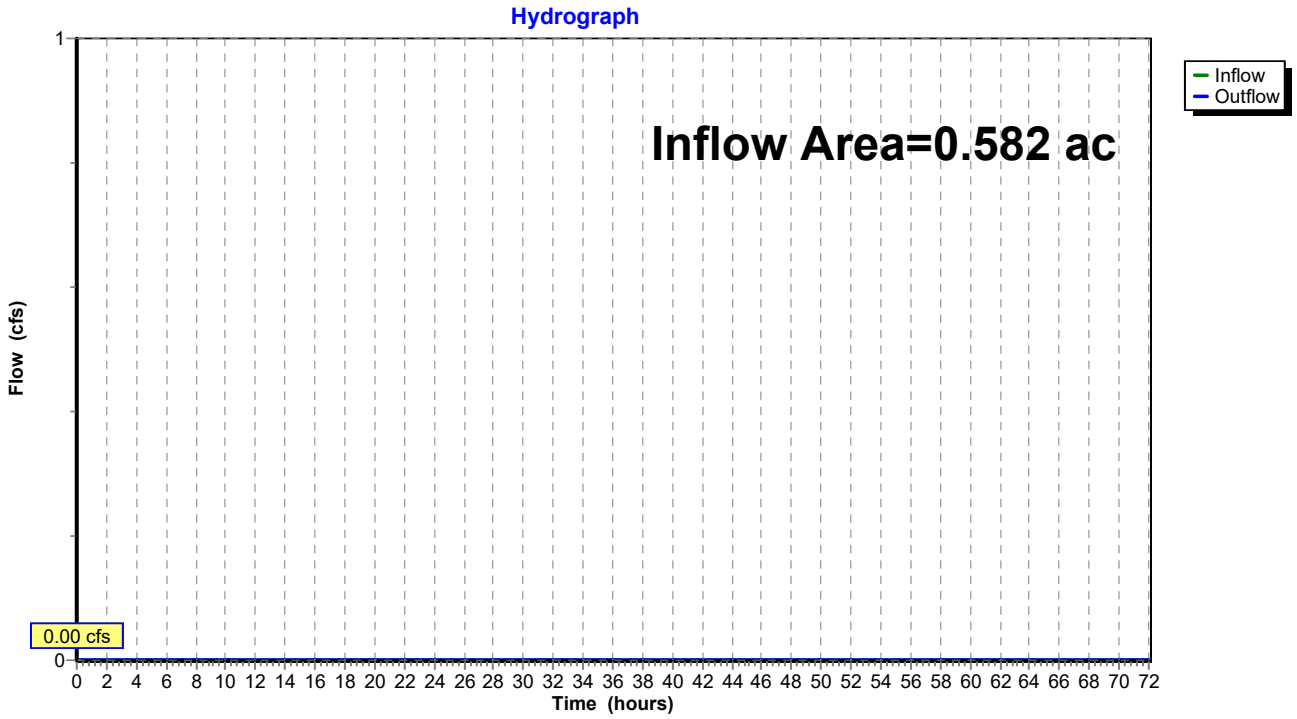


Summary for Reach DP-1: Design Point 1

Inflow Area = 0.582 ac, 6.04% Impervious, Inflow Depth = 0.00" for 2 Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Reach DP-1: Design Point 1



Summary for Subcatchment 1S: Subcatchment 1S

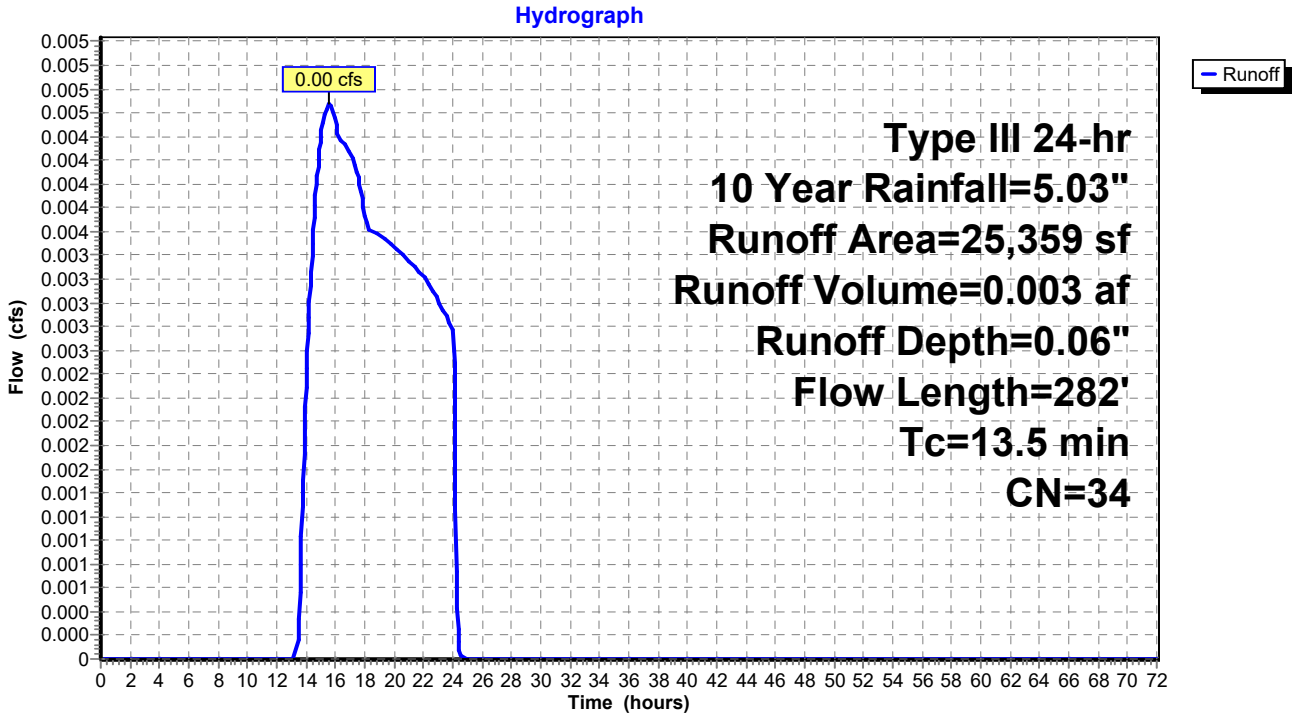
Runoff = 0.00 cfs @ 15.56 hrs, Volume= 0.003 af, Depth= 0.06"
Routed to Reach DP-1 : Design Point 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=5.03"

	Area (sf)	CN	Description
*	1,532	98	Paved road, HSG A
	23,827	30	Woods, Good, HSG A
	25,359	34	Weighted Average
	23,827		93.96% Pervious Area
	1,532		6.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	50	0.1290	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.21"
0.7	76	0.1290	1.80		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.0	69	0.0580	1.20		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.6	87	0.0345	0.93		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.5	282	Total			

Subcatchment 1S: Subcatchment 1S

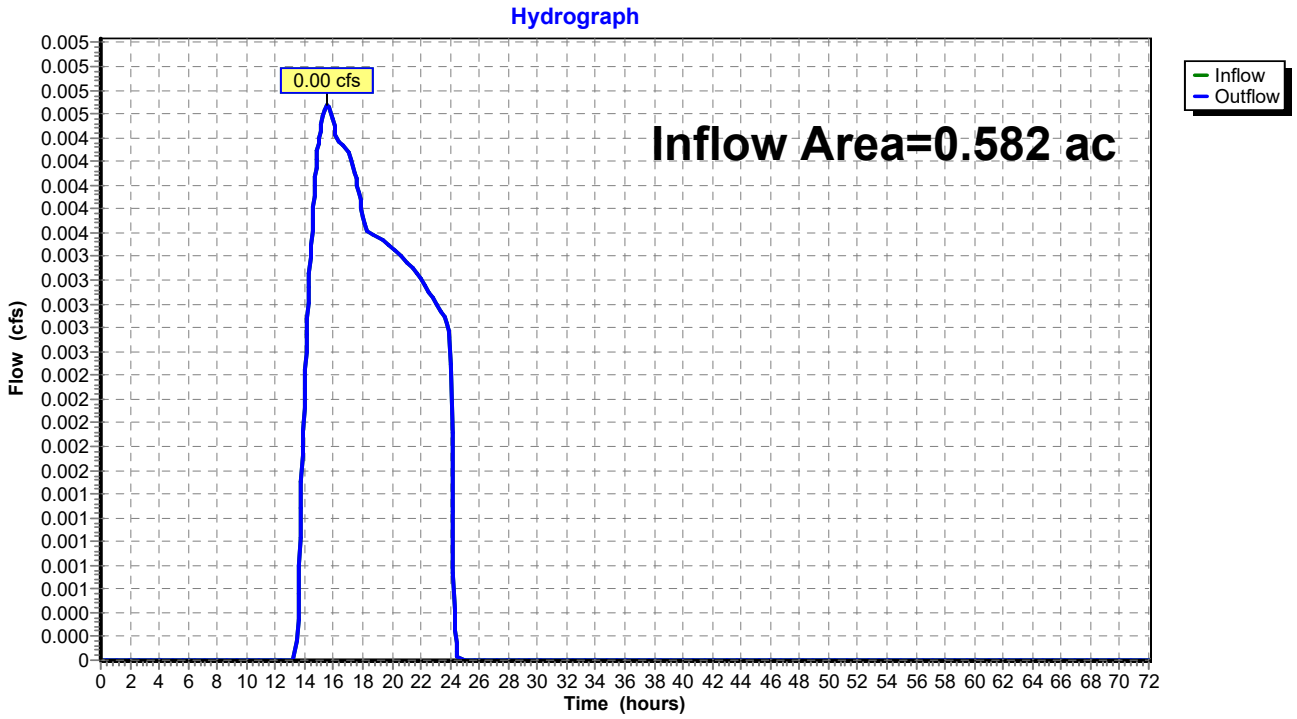


Summary for Reach DP-1: Design Point 1

Inflow Area = 0.582 ac, 6.04% Impervious, Inflow Depth = 0.06" for 10 Year event
Inflow = 0.00 cfs @ 15.56 hrs, Volume= 0.003 af
Outflow = 0.00 cfs @ 15.56 hrs, Volume= 0.003 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Reach DP-1: Design Point 1



Summary for Subcatchment 1S: Subcatchment 1S

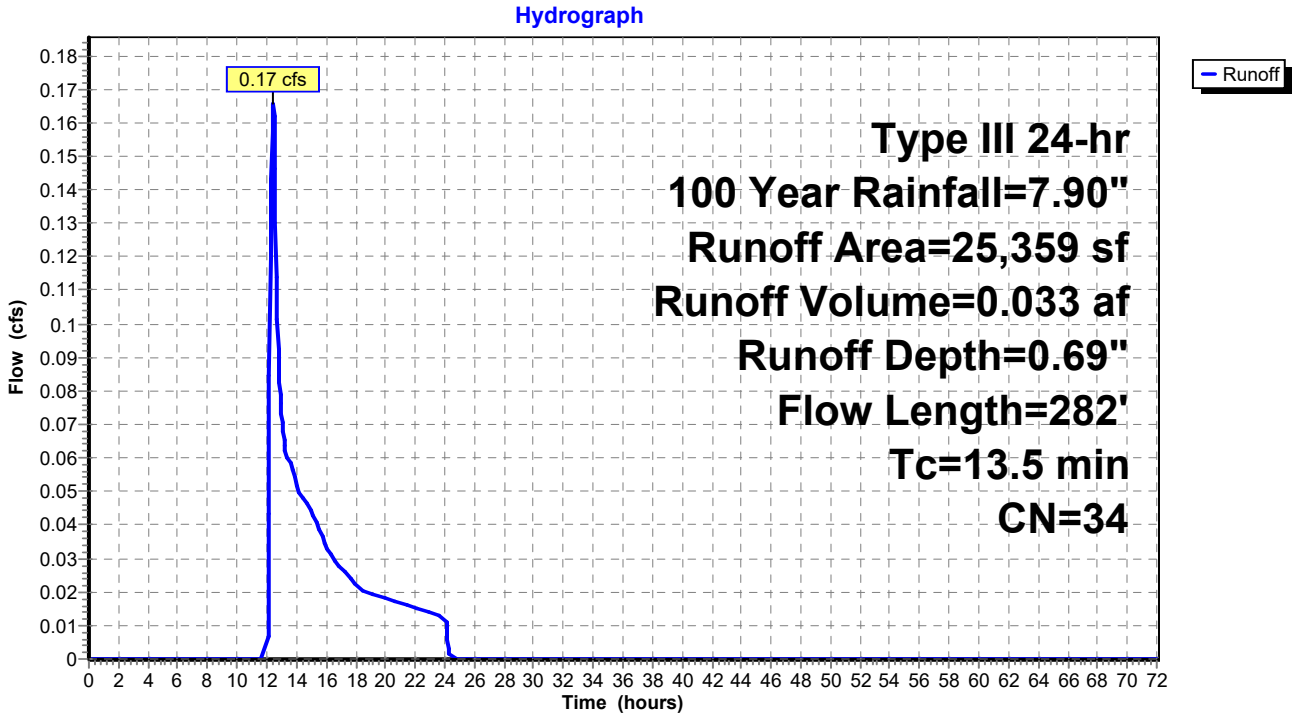
Runoff = 0.17 cfs @ 12.43 hrs, Volume= 0.033 af, Depth= 0.69"
Routed to Reach DP-1 : Design Point 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Rainfall=7.90"

	Area (sf)	CN	Description
*	1,532	98	Paved road, HSG A
	23,827	30	Woods, Good, HSG A
	25,359	34	Weighted Average
	23,827		93.96% Pervious Area
	1,532		6.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	50	0.1290	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.21"
0.7	76	0.1290	1.80		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.0	69	0.0580	1.20		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.6	87	0.0345	0.93		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.5	282	Total			

Subcatchment 1S: Subcatchment 1S

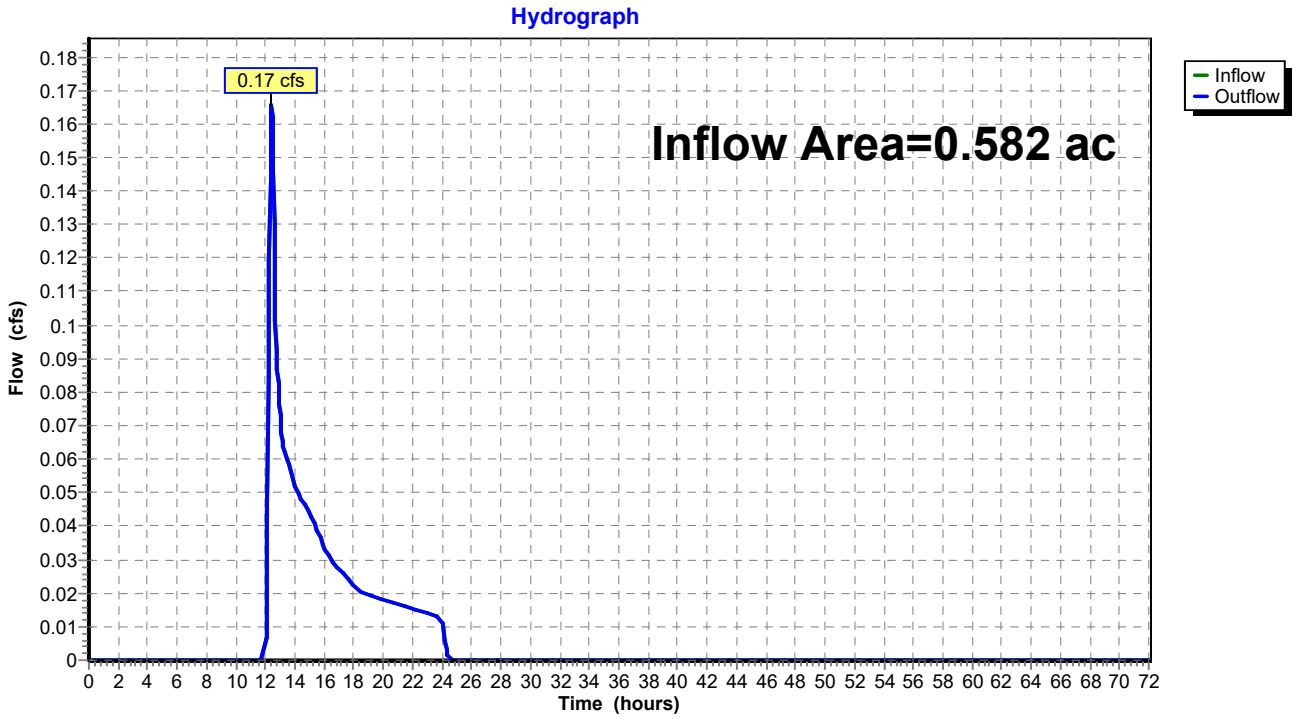


Summary for Reach DP-1: Design Point 1

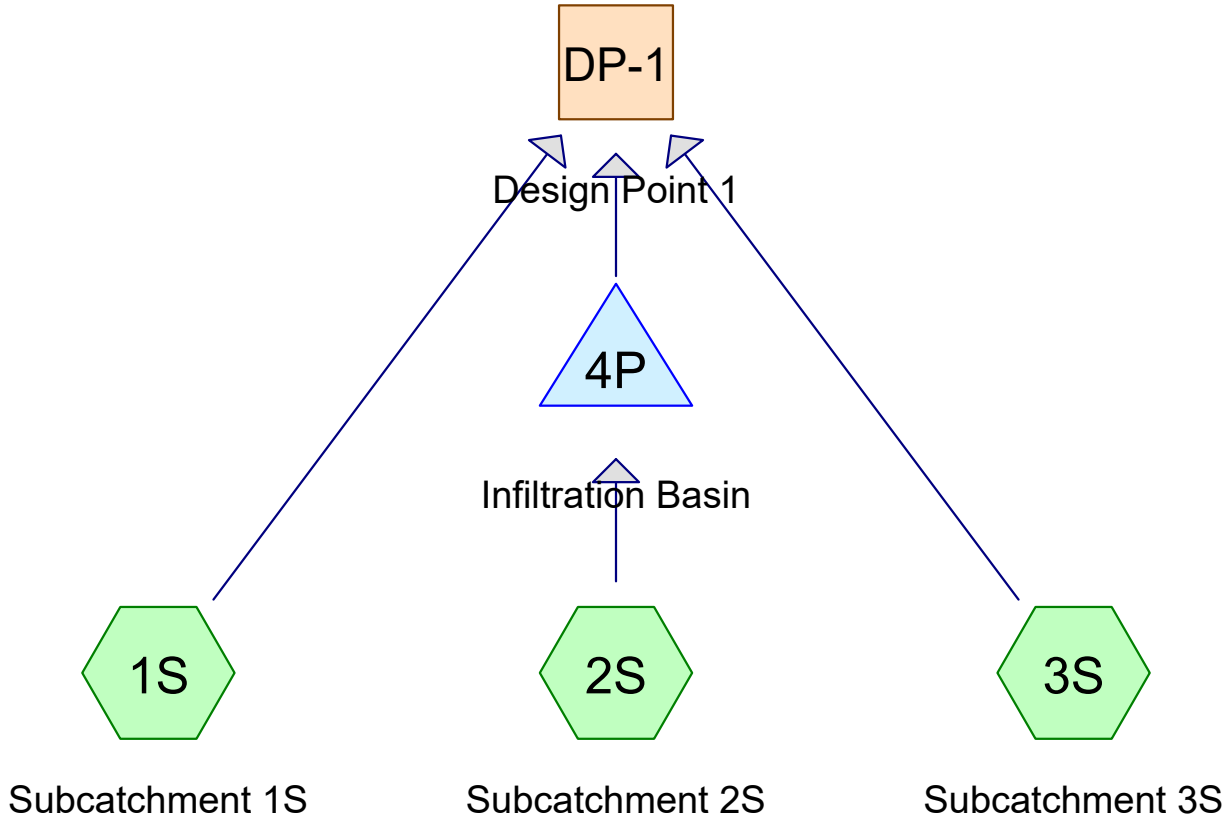
Inflow Area = 0.582 ac, 6.04% Impervious, Inflow Depth = 0.69" for 100 Year event
Inflow = 0.17 cfs @ 12.43 hrs, Volume= 0.033 af
Outflow = 0.17 cfs @ 12.43 hrs, Volume= 0.033 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Reach DP-1: Design Point 1



Proposed Hydrology



Subcat Reach Pond Link

Routing Diagram for Proposed Conditions
Prepared by Tighe & Bond Consulting, Printed 3/21/2024

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.171	39	>75% Grass cover, Good, HSG A (1S, 2S, 3S)
0.121	96	Gravel Parking (2S)
0.030	98	Paved Road, HSG A (1S, 2S)
0.024	98	Water Surface, HSG A (2S)
0.236	30	Woods, Good, HSG A (1S, 2S)
0.582	**53**	**TOTAL AREA**

Summary for Subcatchment 1S: Subcatchment 1S

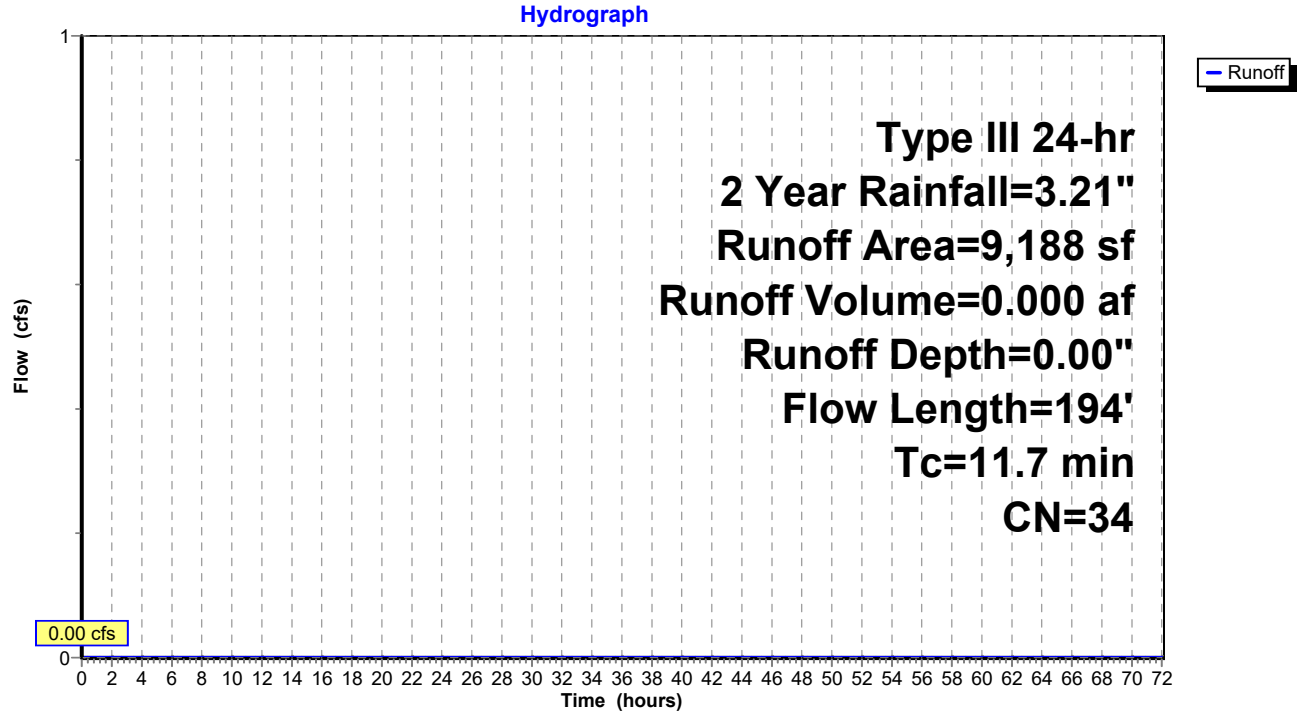
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"
Routed to Reach DP-1 : Design Point 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Rainfall=3.21"

	Area (sf)	CN	Description
	809	39	>75% Grass cover, Good, HSG A
	7,905	30	Woods, Good, HSG A
*	474	98	Paved Road, HSG A
	9,188	34	Weighted Average
	8,714		94.84% Pervious Area
	474		5.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	50	0.1290	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.21"
0.7	80	0.1290	1.80		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.8	64	0.0781	1.40		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
11.7	194	Total			

Subcatchment 1S: Subcatchment 1S



Summary for Subcatchment 2S: Subcatchment 2S

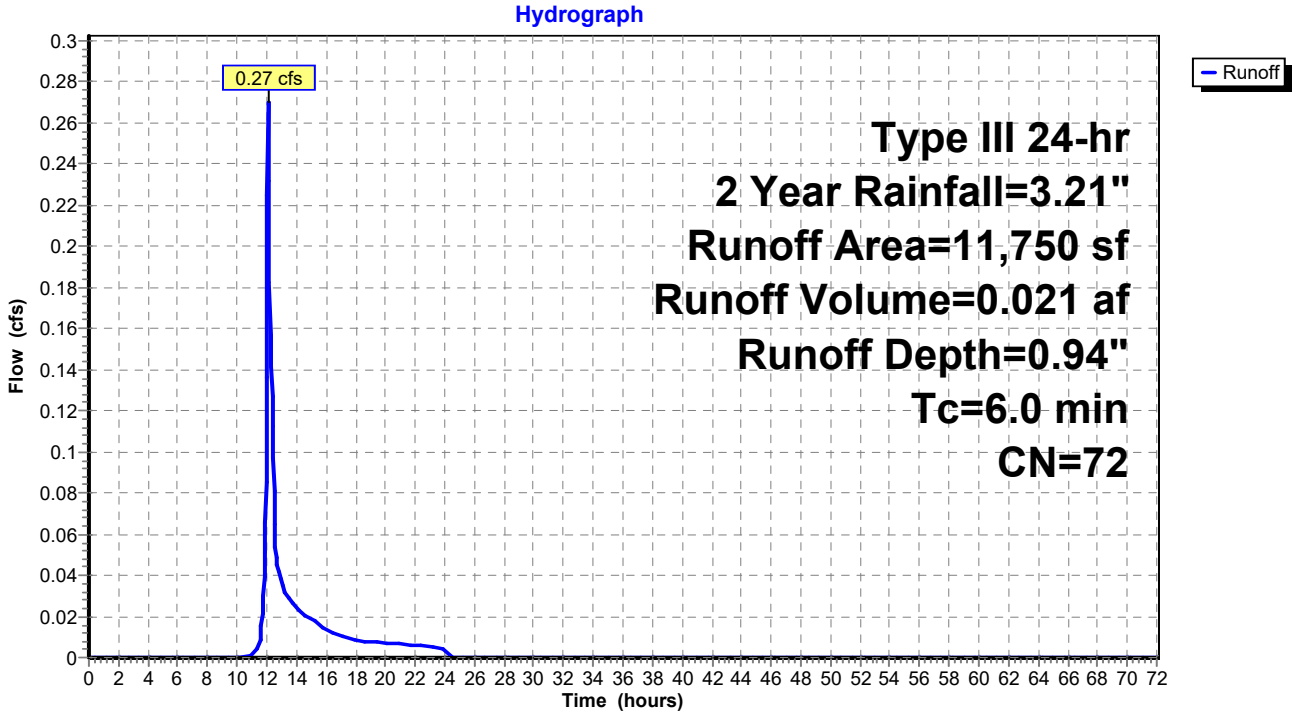
Runoff = 0.27 cfs @ 12.10 hrs, Volume= 0.021 af, Depth= 0.94"
Routed to Pond 4P : Infiltration Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Rainfall=3.21"

	Area (sf)	CN	Description
*	5,276	96	Gravel Parking
	2,368	30	Woods, Good, HSG A
*	816	98	Paved Road, HSG A
	1,065	98	Water Surface, HSG A
	2,225	39	>75% Grass cover, Good, HSG A
	11,750	72	Weighted Average
	9,869		83.99% Pervious Area
	1,881		16.01% Impervious Area

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

Subcatchment 2S: Subcatchment 2S



Summary for Subcatchment 3S: Subcatchment 3S

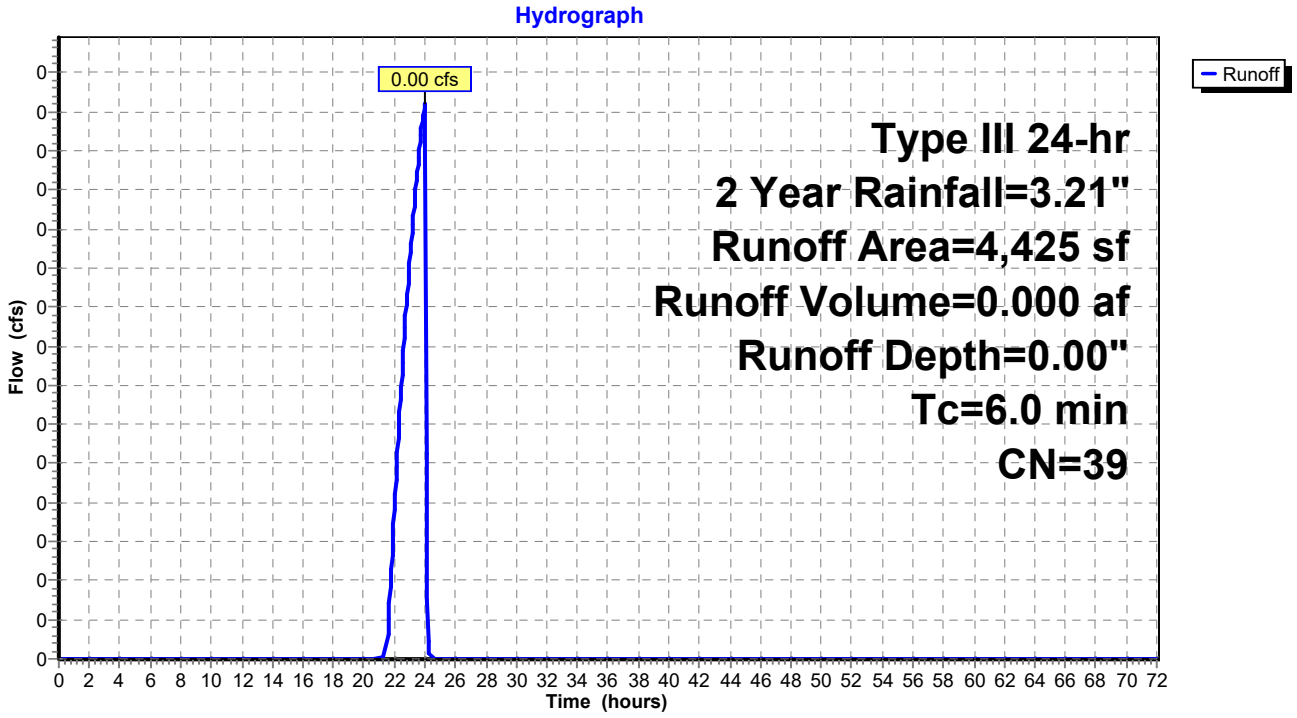
Runoff = 0.00 cfs @ 24.00 hrs, Volume= 0.000 af, Depth= 0.00"
Routed to Reach DP-1 : Design Point 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Rainfall=3.21"

Area (sf)	CN	Description
4,425	39	>75% Grass cover, Good, HSG A
4,425		100.00% Pervious Area

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

Subcatchment 3S: Subcatchment 3S



Summary for Pond 4P: Infiltration Basin

Inflow Area = 0.270 ac, 16.01% Impervious, Inflow Depth = 0.94" for 2 Year event
Inflow = 0.27 cfs @ 12.10 hrs, Volume= 0.021 af
Outflow = 0.06 cfs @ 12.57 hrs, Volume= 0.021 af, Atten= 77%, Lag= 27.9 min
Discarded = 0.06 cfs @ 12.57 hrs, Volume= 0.021 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach DP-1 : Design Point 1

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 579.35' @ 12.57 hrs Surf.Area= 749 sf Storage= 240 cf

Plug-Flow detention time= 32.5 min calculated for 0.021 af (100% of inflow)
Center-of-Mass det. time= 32.5 min (901.0 - 868.5)

Volume	Invert	Avail.Storage	Storage Description
#1	579.00'	2,089 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

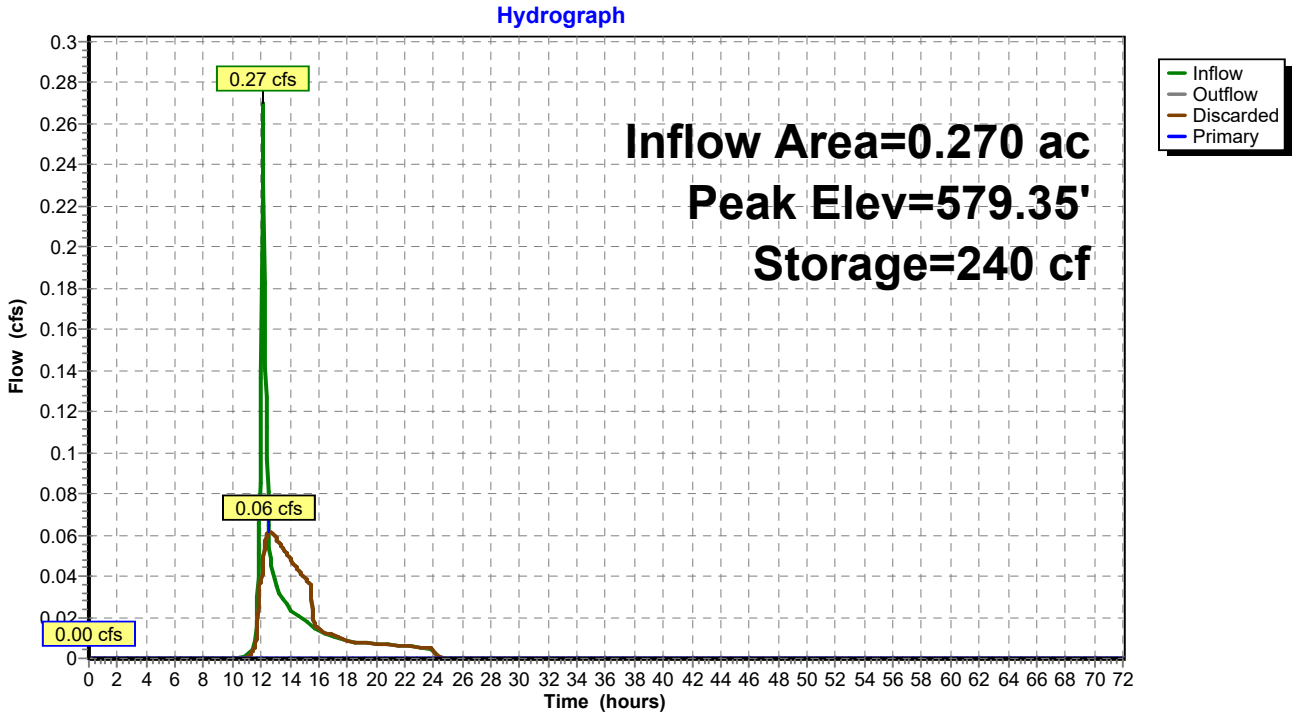
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
579.00	608	125.0	0	0	608
580.00	1,043	151.0	816	816	1,195
580.80	1,414	165.0	979	1,795	1,570
581.00	1,526	169.0	294	2,089	1,681

Device	Routing	Invert	Outlet Devices
#1	Discarded	579.00'	**2.410 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 578.33'
#2	Primary	580.80'	**15.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.06 cfs @ 12.57 hrs HW=579.35' (Free Discharge)
↑**1=Exfiltration** (Controls 0.06 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=579.00' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 4P: Infiltration Basin

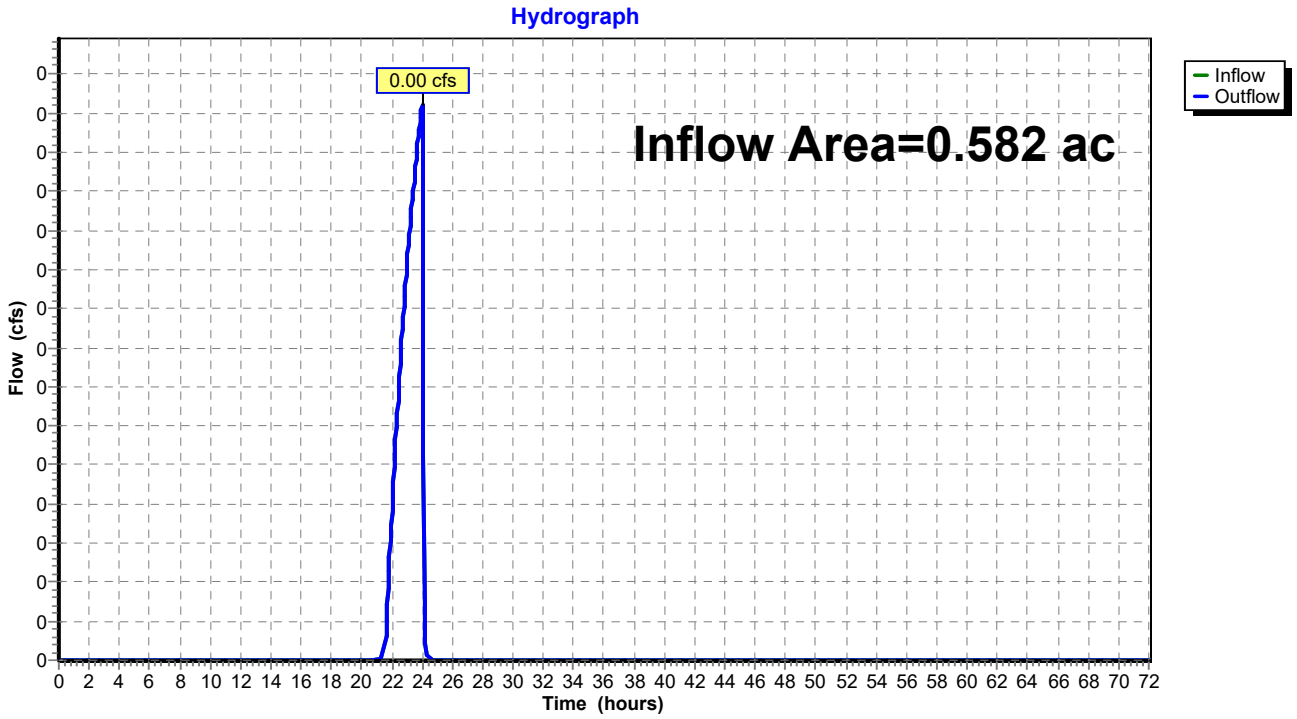


Summary for Reach DP-1: Design Point 1

Inflow Area = 0.582 ac, 9.29% Impervious, Inflow Depth = 0.00" for 2 Year event
Inflow = 0.00 cfs @ 24.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 24.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Reach DP-1: Design Point 1



Summary for Subcatchment 1S: Subcatchment 1S

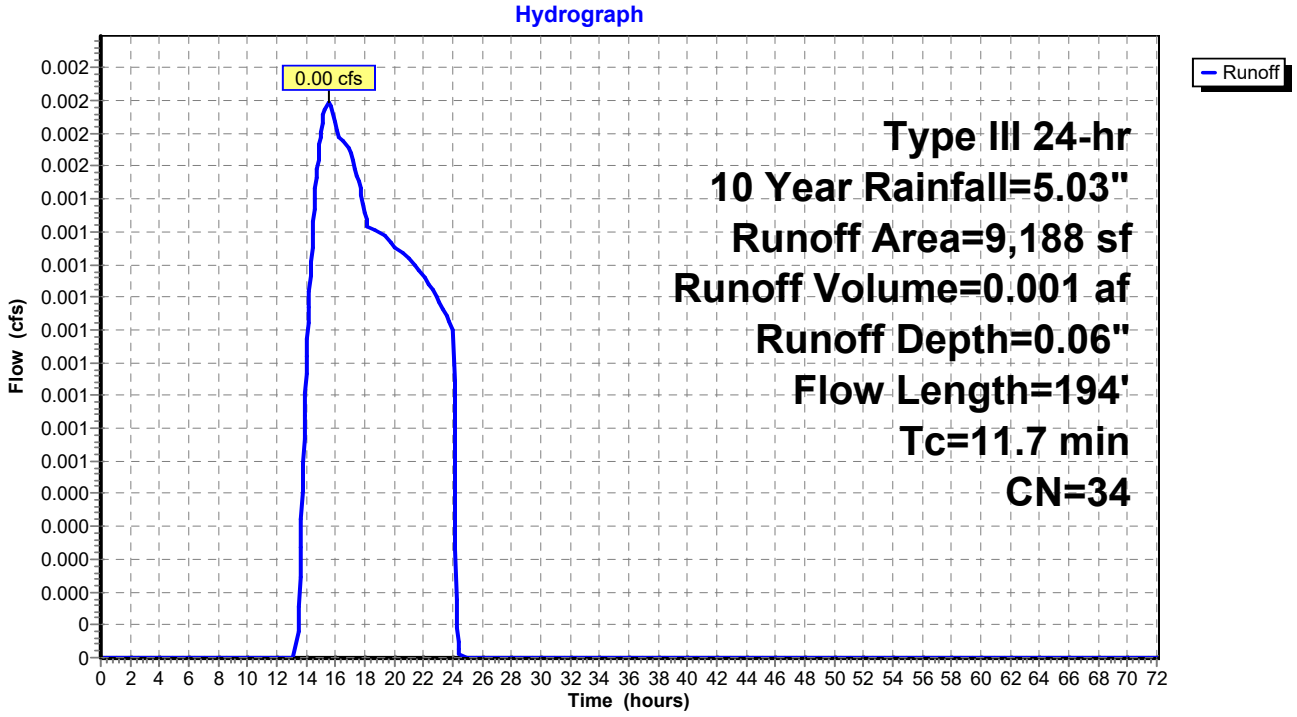
Runoff = 0.00 cfs @ 15.52 hrs, Volume= 0.001 af, Depth= 0.06"
Routed to Reach DP-1 : Design Point 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=5.03"

	Area (sf)	CN	Description
	809	39	>75% Grass cover, Good, HSG A
	7,905	30	Woods, Good, HSG A
*	474	98	Paved Road, HSG A
	9,188	34	Weighted Average
	8,714		94.84% Pervious Area
	474		5.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	50	0.1290	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.21"
0.7	80	0.1290	1.80		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.8	64	0.0781	1.40		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
11.7	194	Total			

Subcatchment 1S: Subcatchment 1S



Summary for Subcatchment 2S: Subcatchment 2S

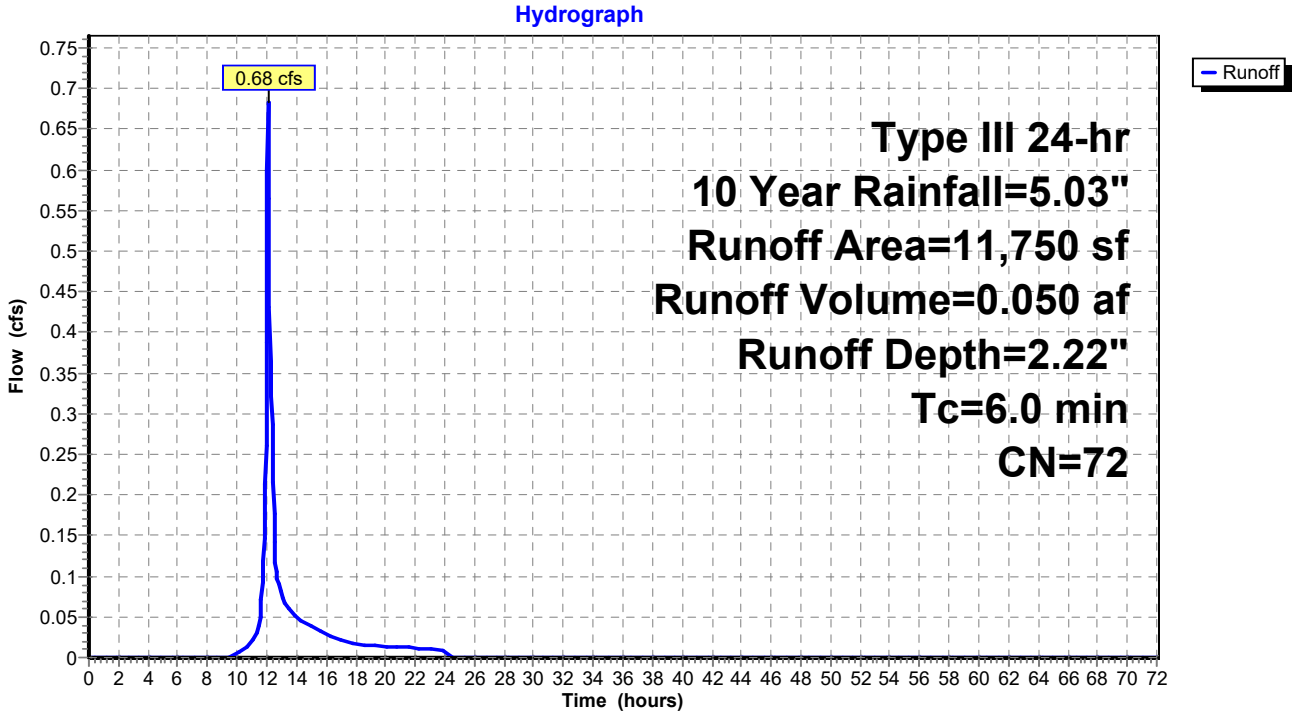
Runoff = 0.68 cfs @ 12.10 hrs, Volume= 0.050 af, Depth= 2.22"
Routed to Pond 4P : Infiltration Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=5.03"

	Area (sf)	CN	Description
*	5,276	96	Gravel Parking
	2,368	30	Woods, Good, HSG A
*	816	98	Paved Road, HSG A
	1,065	98	Water Surface, HSG A
	2,225	39	>75% Grass cover, Good, HSG A
	11,750	72	Weighted Average
	9,869		83.99% Pervious Area
	1,881		16.01% Impervious Area

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

Subcatchment 2S: Subcatchment 2S



Summary for Subcatchment 3S: Subcatchment 3S

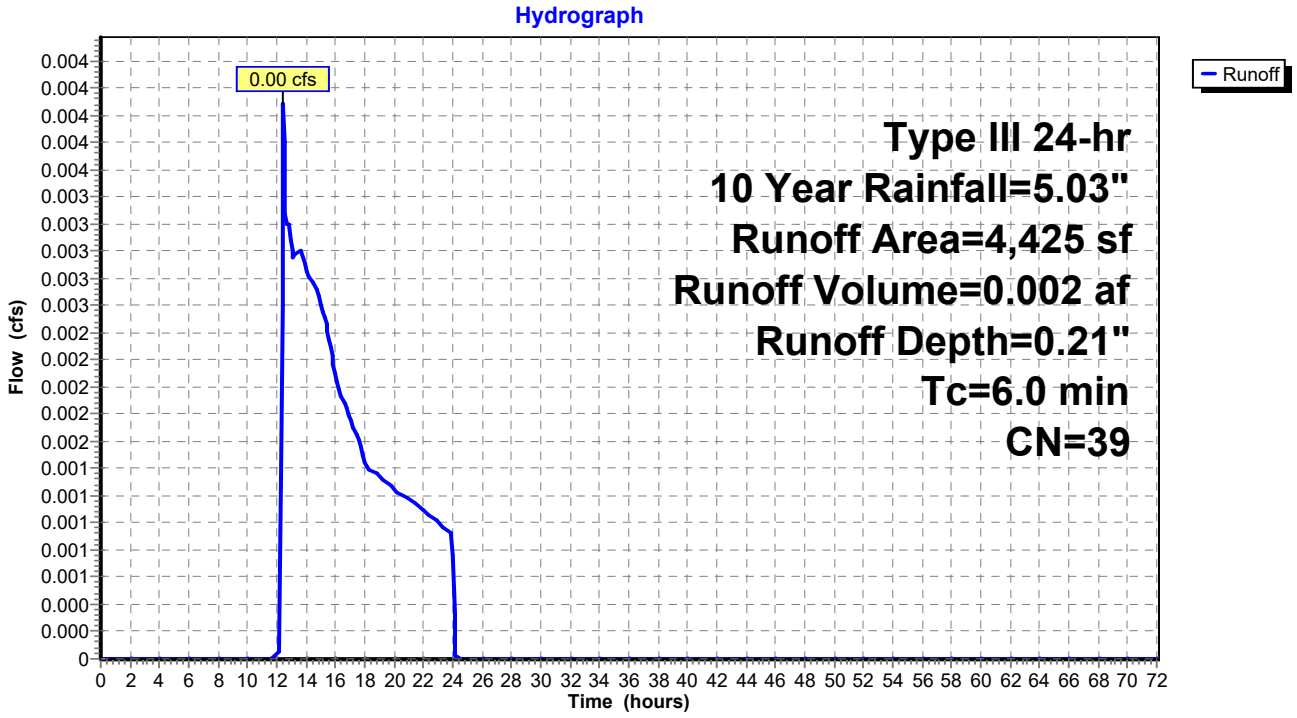
Runoff = 0.00 cfs @ 12.47 hrs, Volume= 0.002 af, Depth= 0.21"
Routed to Reach DP-1 : Design Point 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=5.03"

Area (sf)	CN	Description
4,425	39	>75% Grass cover, Good, HSG A
4,425		100.00% Pervious Area

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

Subcatchment 3S: Subcatchment 3S



Summary for Pond 4P: Infiltration Basin

Inflow Area = 0.270 ac, 16.01% Impervious, Inflow Depth = 2.22" for 10 Year event
Inflow = 0.68 cfs @ 12.10 hrs, Volume= 0.050 af
Outflow = 0.11 cfs @ 12.62 hrs, Volume= 0.050 af, Atten= 83%, Lag= 31.3 min
Discarded = 0.11 cfs @ 12.62 hrs, Volume= 0.050 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach DP-1 : Design Point 1

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 579.94' @ 12.62 hrs Surf.Area= 1,013 sf Storage= 752 cf

Plug-Flow detention time= 68.7 min calculated for 0.050 af (100% of inflow)
Center-of-Mass det. time= 68.7 min (910.9 - 842.2)

Volume	Invert	Avail.Storage	Storage Description
#1	579.00'	2,089 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

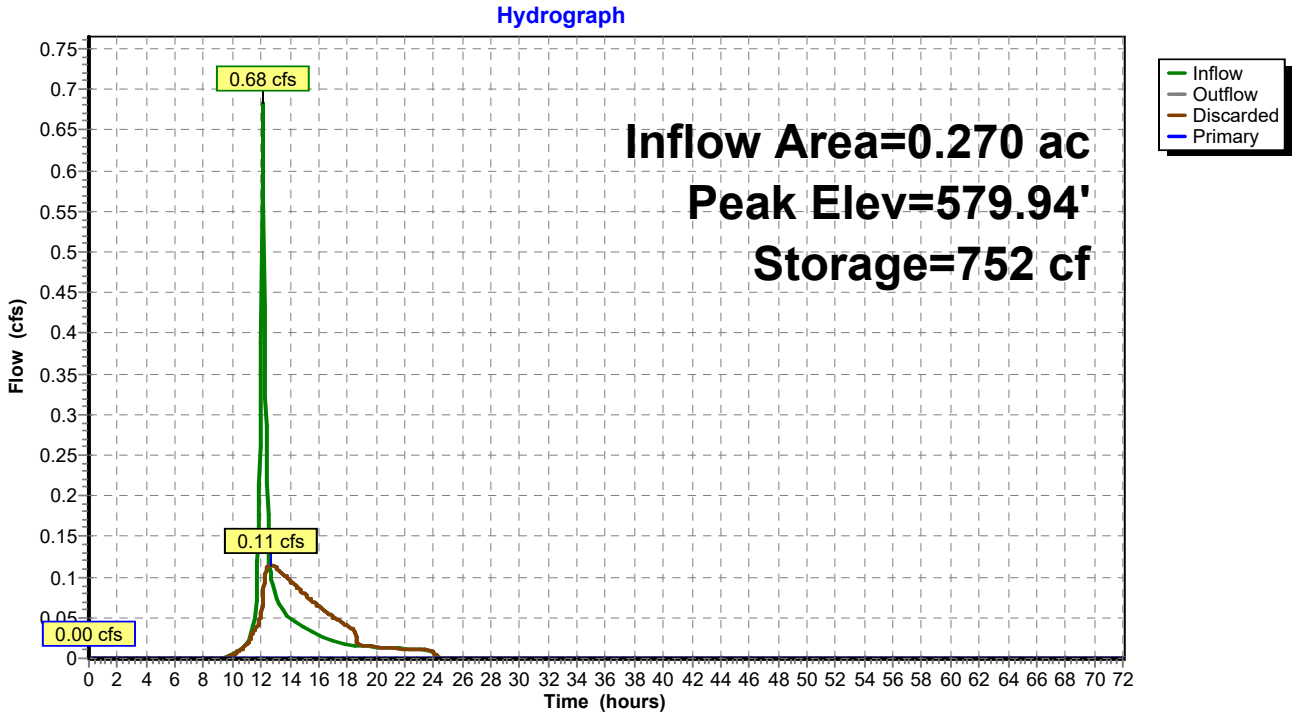
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
579.00	608	125.0	0	0	608
580.00	1,043	151.0	816	816	1,195
580.80	1,414	165.0	979	1,795	1,570
581.00	1,526	169.0	294	2,089	1,681

Device	Routing	Invert	Outlet Devices
#1	Discarded	579.00'	**2.410 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 578.33'
#2	Primary	580.80'	**15.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.11 cfs @ 12.62 hrs HW=579.94' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.11 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=579.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 4P: Infiltration Basin

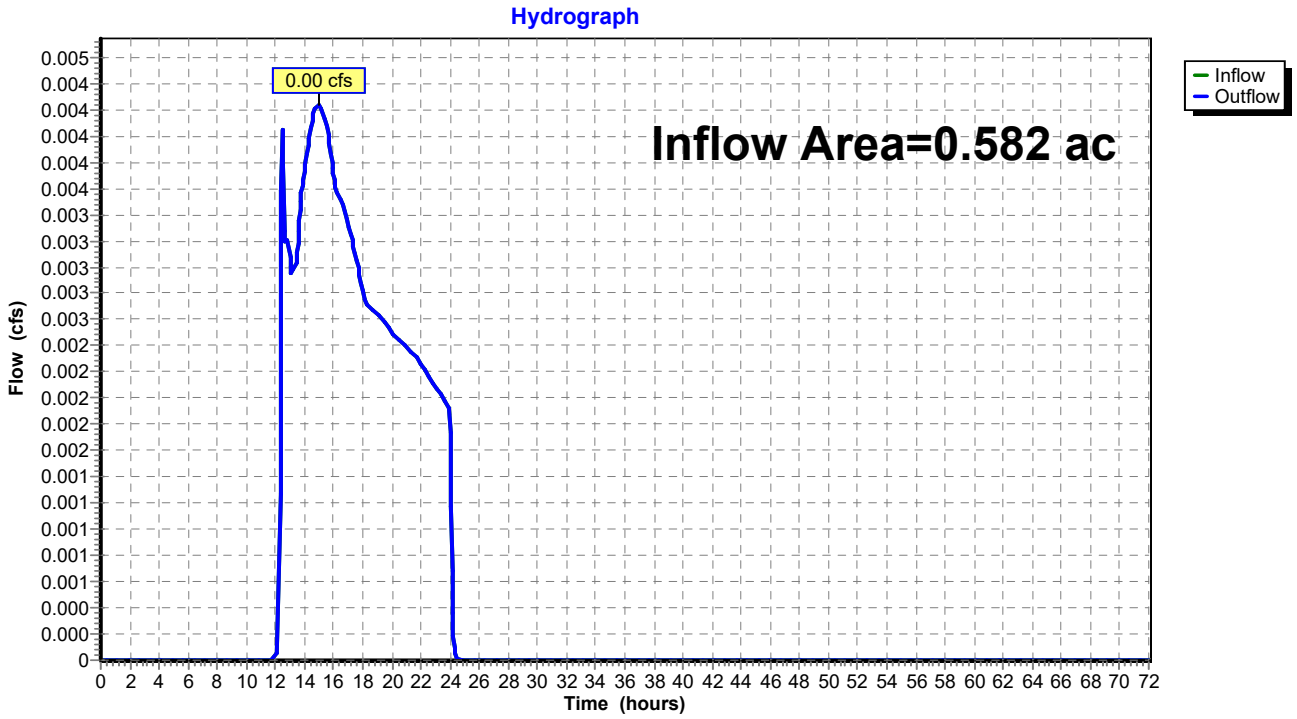


Summary for Reach DP-1: Design Point 1

Inflow Area = 0.582 ac, 9.29% Impervious, Inflow Depth = 0.06" for 10 Year event
Inflow = 0.00 cfs @ 14.97 hrs, Volume= 0.003 af
Outflow = 0.00 cfs @ 14.97 hrs, Volume= 0.003 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Reach DP-1: Design Point 1



Summary for Subcatchment 1S: Subcatchment 1S

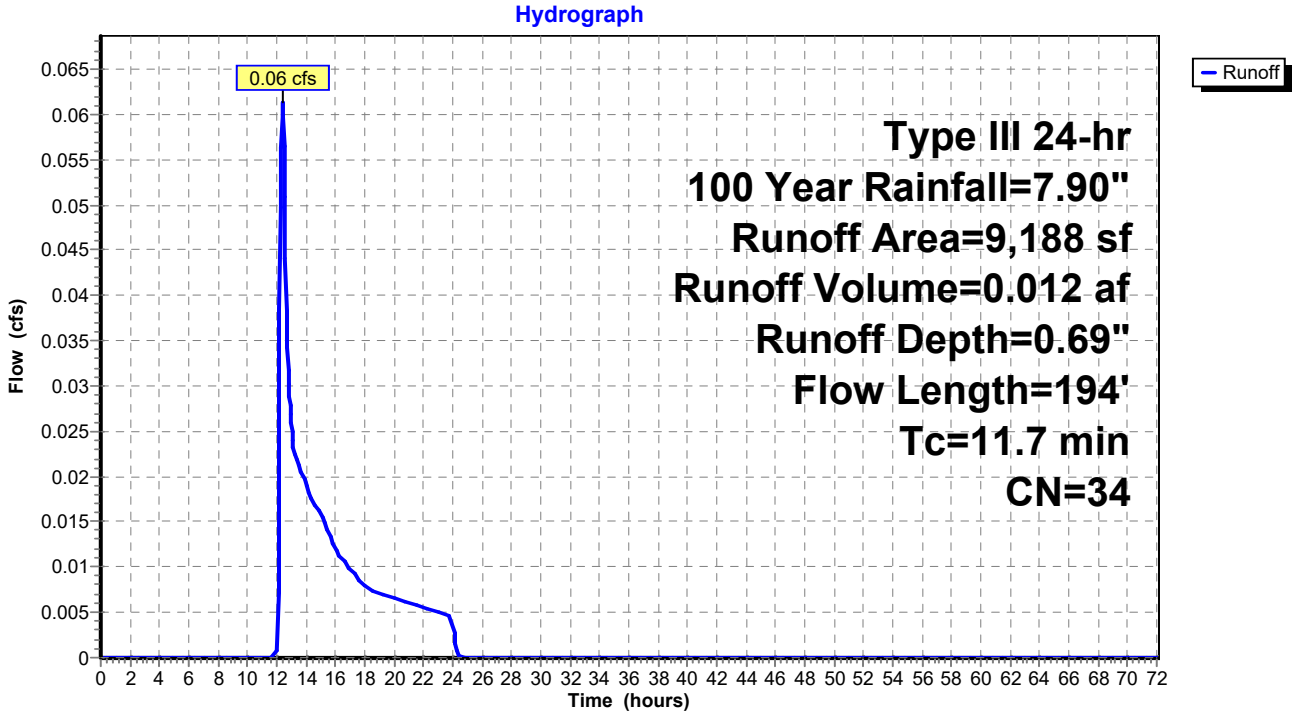
Runoff = 0.06 cfs @ 12.40 hrs, Volume= 0.012 af, Depth= 0.69"
Routed to Reach DP-1 : Design Point 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Rainfall=7.90"

	Area (sf)	CN	Description
	809	39	>75% Grass cover, Good, HSG A
	7,905	30	Woods, Good, HSG A
*	474	98	Paved Road, HSG A
	9,188	34	Weighted Average
	8,714		94.84% Pervious Area
	474		5.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	50	0.1290	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.21"
0.7	80	0.1290	1.80		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.8	64	0.0781	1.40		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
11.7	194	Total			

Subcatchment 1S: Subcatchment 1S



Summary for Subcatchment 2S: Subcatchment 2S

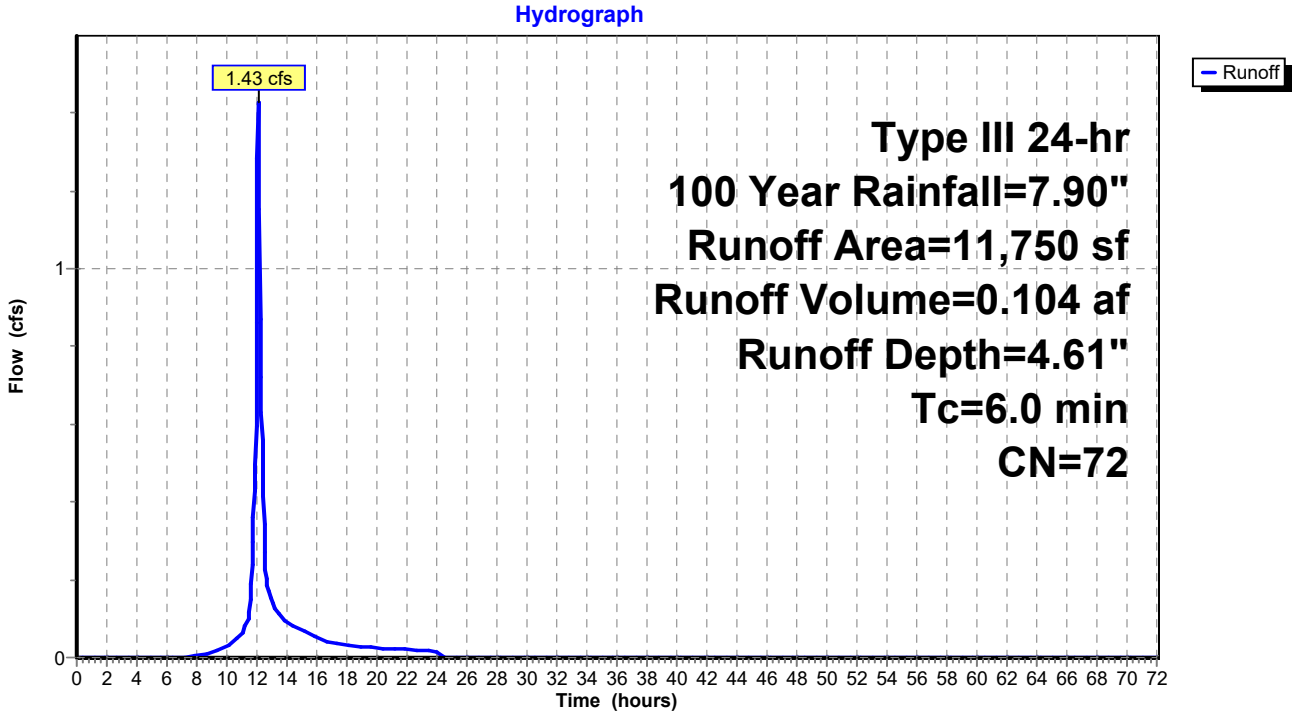
Runoff = 1.43 cfs @ 12.09 hrs, Volume= 0.104 af, Depth= 4.61"
Routed to Pond 4P : Infiltration Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Rainfall=7.90"

	Area (sf)	CN	Description
*	5,276	96	Gravel Parking
	2,368	30	Woods, Good, HSG A
*	816	98	Paved Road, HSG A
	1,065	98	Water Surface, HSG A
	2,225	39	>75% Grass cover, Good, HSG A
	11,750	72	Weighted Average
	9,869		83.99% Pervious Area
	1,881		16.01% Impervious Area

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

Subcatchment 2S: Subcatchment 2S



Summary for Subcatchment 3S: Subcatchment 3S

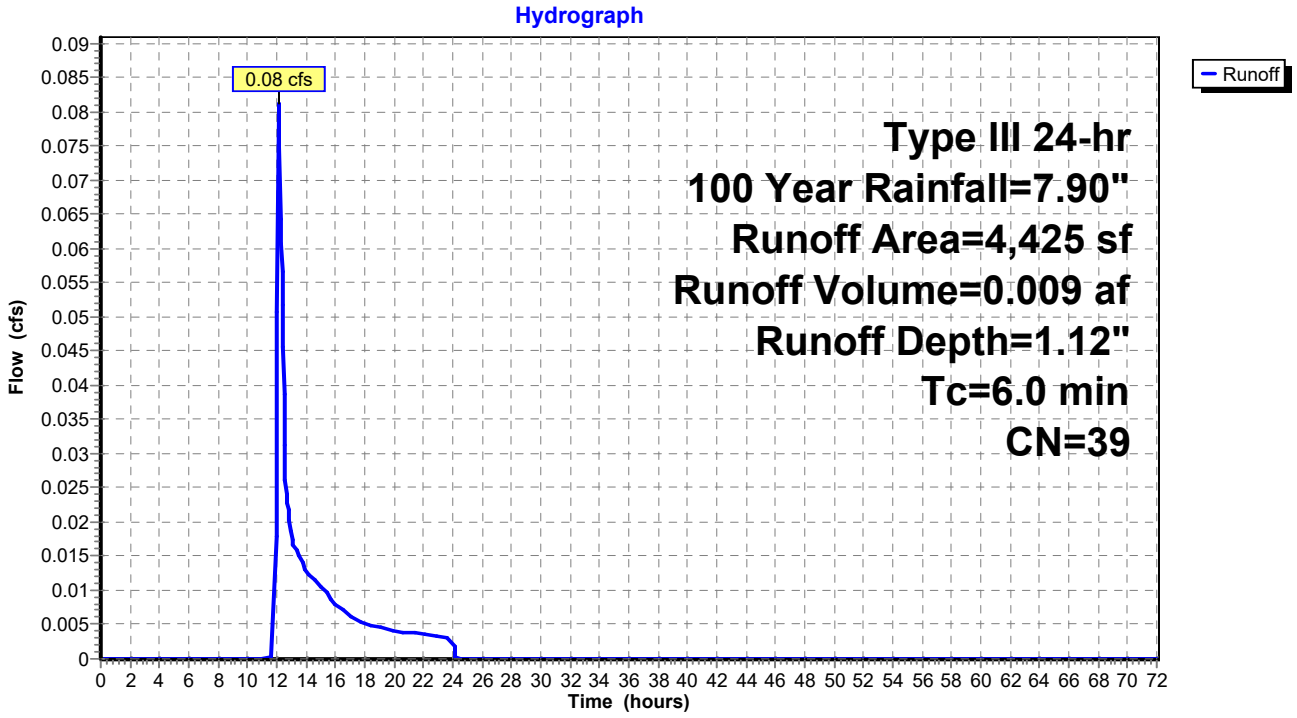
Runoff = 0.08 cfs @ 12.13 hrs, Volume= 0.009 af, Depth= 1.12"
Routed to Reach DP-1 : Design Point 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Rainfall=7.90"

Area (sf)	CN	Description
4,425	39	>75% Grass cover, Good, HSG A
4,425		100.00% Pervious Area

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

Subcatchment 3S: Subcatchment 3S



Summary for Pond 4P: Infiltration Basin

Inflow Area = 0.270 ac, 16.01% Impervious, Inflow Depth = 4.61" for 100 Year event
Inflow = 1.43 cfs @ 12.09 hrs, Volume= 0.104 af
Outflow = 0.20 cfs @ 12.65 hrs, Volume= 0.104 af, Atten= 86%, Lag= 33.6 min
Discarded = 0.20 cfs @ 12.65 hrs, Volume= 0.104 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach DP-1 : Design Point 1

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 580.80' @ 12.65 hrs Surf.Area= 1,414 sf Storage= 1,795 cf

Plug-Flow detention time= 103.0 min calculated for 0.103 af (100% of inflow)
Center-of-Mass det. time= 102.9 min (924.0 - 821.1)

Volume	Invert	Avail.Storage	Storage Description
#1	579.00'	2,089 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

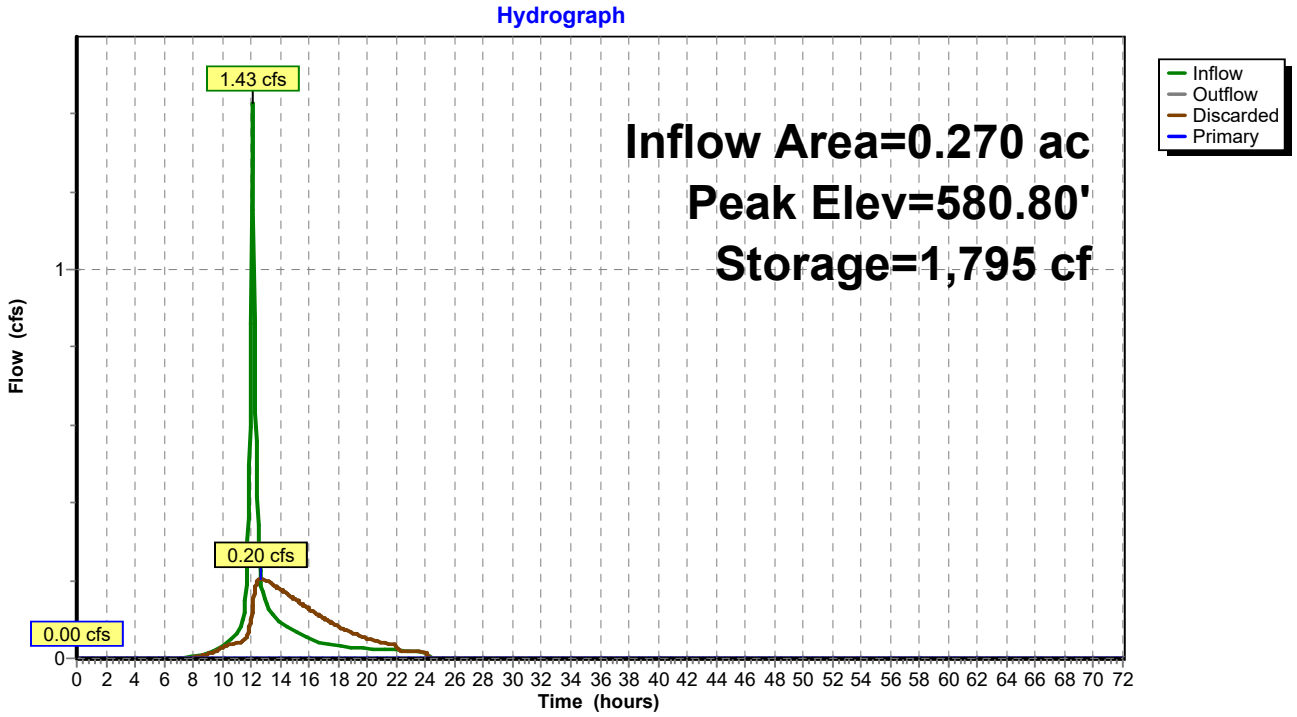
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
579.00	608	125.0	0	0	608
580.00	1,043	151.0	816	816	1,195
580.80	1,414	165.0	979	1,795	1,570
581.00	1,526	169.0	294	2,089	1,681

Device	Routing	Invert	Outlet Devices
#1	Discarded	579.00'	**2.410 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 578.33'
#2	Primary	580.80'	**15.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.20 cfs @ 12.65 hrs HW=580.80' (Free Discharge)
↑**1=Exfiltration** (Controls 0.20 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=579.00' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 4P: Infiltration Basin

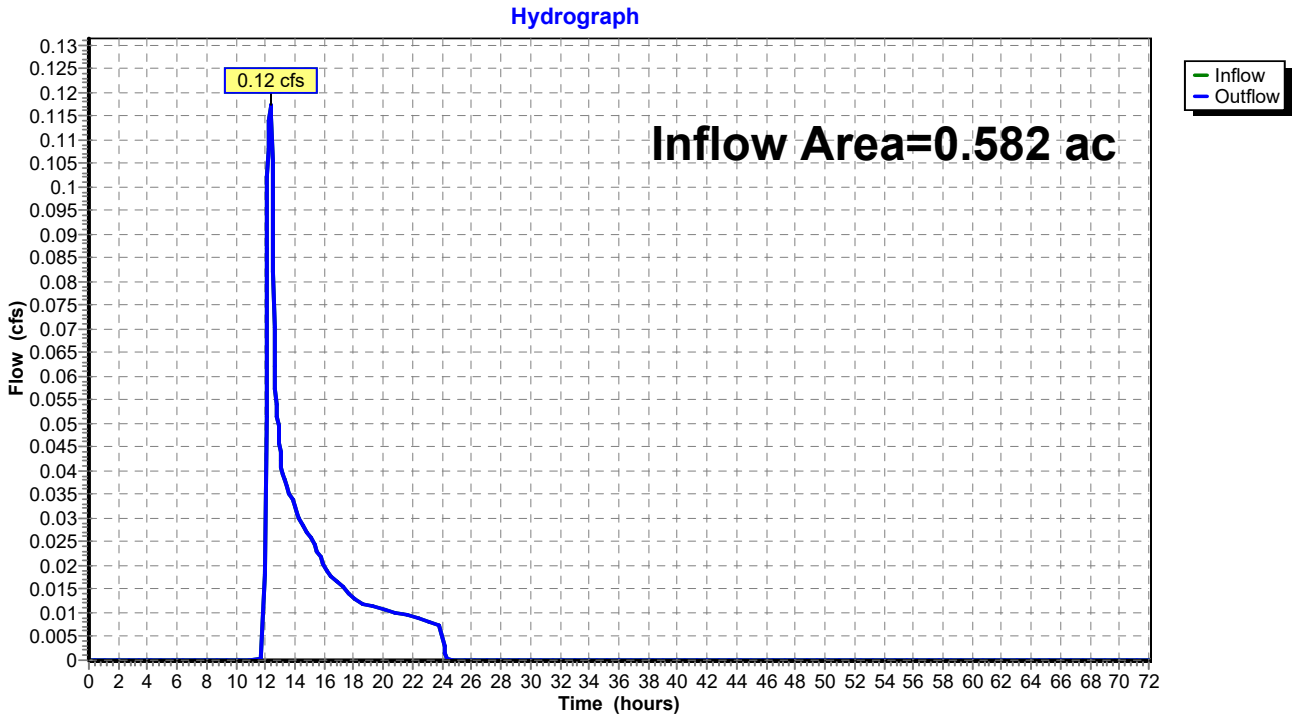


Summary for Reach DP-1: Design Point 1

Inflow Area = 0.582 ac, 9.29% Impervious, Inflow Depth = 0.44" for 100 Year event
Inflow = 0.12 cfs @ 12.32 hrs, Volume= 0.022 af
Outflow = 0.12 cfs @ 12.32 hrs, Volume= 0.022 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Reach DP-1: Design Point 1



Atlas 14 Precipitation Data

NOAA Atlas 14, Volume 10, Version 3
Location name: Sturbridge, Massachusetts, USA*
Latitude: 42.0902°, Longitude: -72.0829°
Elevation: 586 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.338** (0.262-0.430)	**0.399** (0.309-0.509)	**0.499** (0.384-0.638)	**0.582** (0.446-0.749)	**0.696** (0.516-0.935)	**0.782** (0.569-1.08)	**0.871** (0.614-1.24)	**0.967** (0.650-1.42)	**1.10** (0.712-1.68)	**1.20** (0.762-1.88)
10-min	**0.479** (0.371-0.610)	**0.565** (0.437-0.721)	**0.706** (0.544-0.903)	**0.823** (0.632-1.06)	**0.985** (0.731-1.32)	**1.11** (0.805-1.52)	**1.23** (0.870-1.76)	**1.37** (0.922-2.01)	**1.56** (1.01-2.38)	**1.71** (1.08-2.66)
15-min	**0.563** (0.436-0.717)	**0.665** (0.514-0.848)	**0.831** (0.641-1.06)	**0.969** (0.743-1.25)	**1.16** (0.860-1.56)	**1.30** (0.947-1.79)	**1.45** (1.02-2.07)	**1.61** (1.08-2.37)	**1.83** (1.19-2.79)	**2.01** (1.27-3.13)
30-min	**0.763** (0.591-0.972)	**0.901** (0.697-1.15)	**1.13** (0.868-1.44)	**1.31** (1.01-1.69)	**1.57** (1.17-2.11)	**1.77** (1.28-2.43)	**1.97** (1.39-2.80)	**2.18** (1.47-3.21)	**2.48** (1.61-3.78)	**2.72** (1.72-4.24)
60-min	**0.963** (0.746-1.23)	**1.14** (0.879-1.45)	**1.42** (1.10-1.82)	**1.66** (1.27-2.13)	**1.98** (1.47-2.67)	**2.23** (1.62-3.06)	**2.48** (1.75-3.54)	**2.76** (1.86-4.05)	**3.13** (2.03-4.78)	**3.43** (2.17-5.35)
2-hr	**1.24** (0.963-1.56)	**1.45** (1.13-1.84)	**1.80** (1.40-2.29)	**2.09** (1.61-2.68)	**2.49** (1.86-3.34)	**2.79** (2.05-3.83)	**3.11** (2.22-4.45)	**3.48** (2.35-5.09)	**4.02** (2.61-6.10)	**4.47** (2.84-6.93)
3-hr	**1.42** (1.11-1.79)	**1.67** (1.30-2.10)	**2.08** (1.62-2.63)	**2.41** (1.87-3.08)	**2.88** (2.16-3.85)	**3.22** (2.38-4.42)	**3.59** (2.58-5.15)	**4.04** (2.73-5.89)	**4.71** (3.07-7.14)	**5.29** (3.36-8.18)
6-hr	**1.78** (1.40-2.22)	**2.11** (1.66-2.65)	**2.66** (2.09-3.35)	**3.12** (2.43-3.95)	**3.75** (2.84-5.01)	**4.22** (3.14-5.78)	**4.72** (3.43-6.78)	**5.35** (3.63-7.78)	**6.34** (4.13-9.55)	**7.19** (4.58-11.1)
12-hr	**2.18** (1.73-2.71)	**2.65** (2.10-3.30)	**3.41** (2.69-4.27)	**4.05** (3.18-5.09)	**4.92** (3.75-6.54)	**5.56** (4.16-7.59)	**6.27** (4.58-8.97)	**7.15** (4.87-10.3)	**8.53** (5.59-12.8)	**9.73** (6.23-14.9)
24-hr	**2.61** (2.08-3.22)	**3.21** (2.56-3.97)	**4.20** (3.34-5.22)	**5.03** (3.97-6.28)	**6.16** (4.72-8.14)	**6.99** (5.26-9.49)	**7.90** (5.81-11.3)	**9.04** (6.18-13.0)	**10.8** (7.11-16.2)	**12.4** (7.95-18.9)
2-day	**3.04** (2.44-3.72)	**3.76** (3.01-4.61)	**4.93** (3.94-6.08)	**5.91** (4.70-7.33)	**7.26** (5.60-9.53)	**8.24** (6.24-11.1)	**9.33** (6.90-13.2)	**10.7** (7.34-15.3)	**12.8** (8.45-19.0)	**14.7** (9.45-22.3)
3-day	**3.31** (2.67-4.05)	**4.10** (3.30-5.01)	**5.38** (4.32-6.61)	**6.45** (5.14-7.97)	**7.91** (6.13-10.4)	**8.99** (6.83-12.1)	**10.2** (7.54-14.4)	**11.7** (8.02-16.6)	**14.0** (9.25-20.7)	**16.1** (10.4-24.3)
4-day	**3.55** (2.87-4.33)	**4.39** (3.54-5.35)	**5.75** (4.63-7.04)	**6.88** (5.51-8.49)	**8.44** (6.56-11.0)	**9.59** (7.30-12.9)	**10.8** (8.06-15.3)	**12.4** (8.57-17.7)	**14.9** (9.88-22.1)	**17.1** (11.1-25.9)
7-day	**4.21** (3.43-5.10)	**5.15** (4.19-6.25)	**6.69** (5.42-8.15)	**7.97** (6.41-9.77)	**9.72** (7.59-12.6)	**11.0** (8.43-14.7)	**12.4** (9.28-17.4)	**14.2** (9.84-20.1)	**17.1** (11.3-25.1)	**19.5** (12.6-29.3)
10-day	**4.89** (4.00-5.91)	**5.89** (4.80-7.12)	**7.52** (6.11-9.13)	**8.87** (7.16-10.8)	**10.7** (8.40-13.9)	**12.1** (9.28-16.1)	**13.6** (10.2-19.0)	**15.5** (10.7-21.8)	**18.4** (12.2-27.0)	**20.9** (13.6-31.4)
20-day	**7.06** (5.80-8.46)	**8.12** (6.66-9.74)	**9.84** (8.05-11.9)	**11.3** (9.16-13.7)	**13.2** (10.4-16.9)	**14.7** (11.3-19.2)	**16.3** (12.1-22.2)	**18.1** (12.6-25.3)	**20.7** (13.9-30.2)	**23.0** (14.9-34.2)
30-day	**8.88** (7.33-10.6)	**9.96** (8.21-11.9)	**11.7** (9.63-14.1)	**13.2** (10.8-15.9)	**15.2** (11.9-19.2)	**16.7** (12.8-21.6)	**18.3** (13.5-24.6)	**20.0** (14.0-27.9)	**22.3** (15.0-32.4)	**24.2** (15.7-35.9)
45-day	**11.1** (9.22-13.2)	**12.2** (10.1-14.6)	**14.1** (11.6-16.8)	**15.6** (12.8-18.7)	**17.6** (13.9-22.1)	**19.3** (14.8-24.7)	**20.8** (15.3-27.7)	**22.4** (15.8-31.0)	**24.4** (16.4-35.2)	**25.8** (16.8-38.2)
60-day	**13.0** (10.8-15.4)	**14.1** (11.7-16.8)	**16.0** (13.2-19.1)	**17.6** (14.4-21.1)	**19.7** (15.6-24.6)	**21.4** (16.4-27.3)	**23.1** (16.9-30.3)	**24.5** (17.3-33.9)	**26.2** (17.7-37.8)	**27.4** (17.9-40.5)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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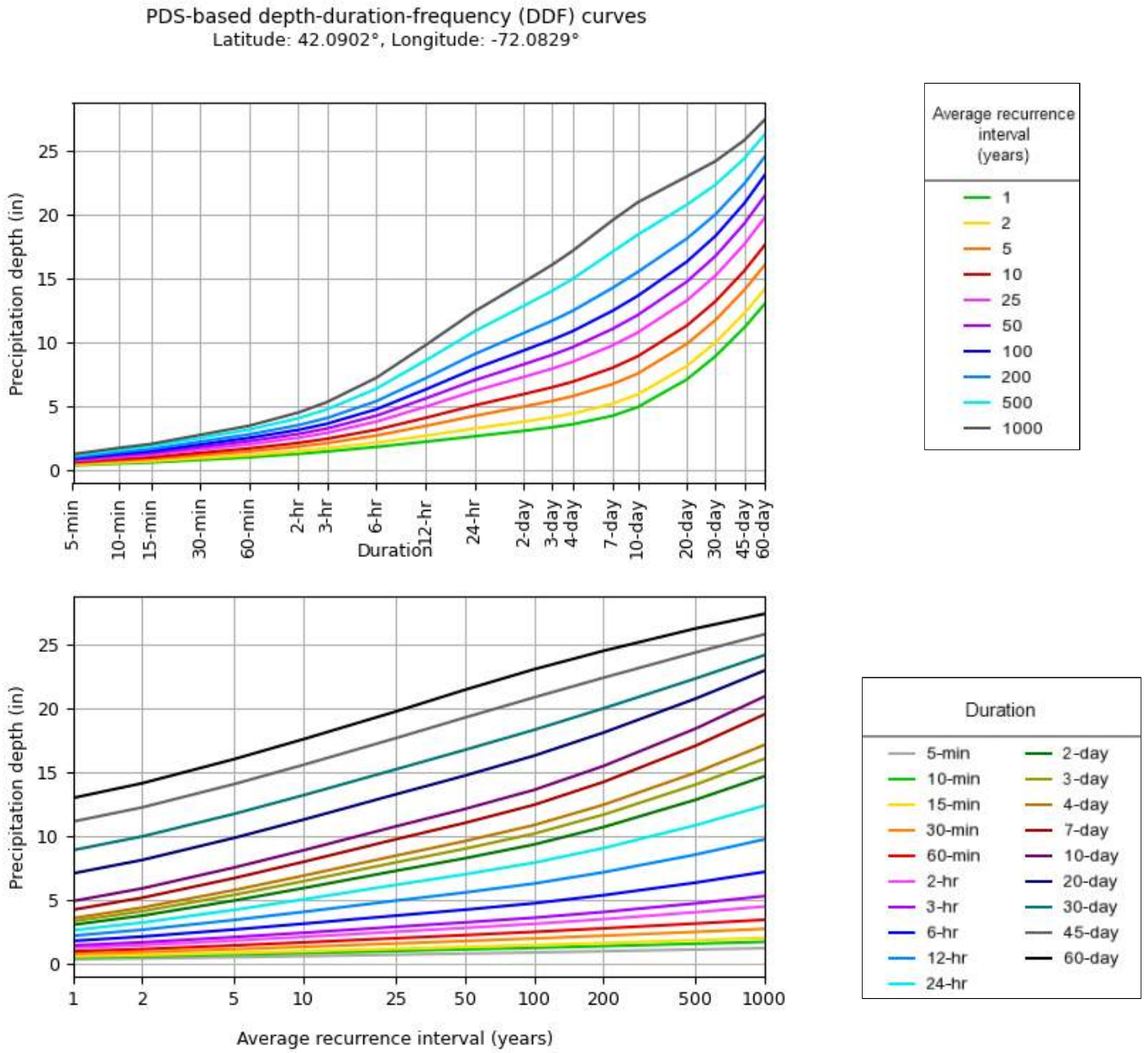
PF graphical



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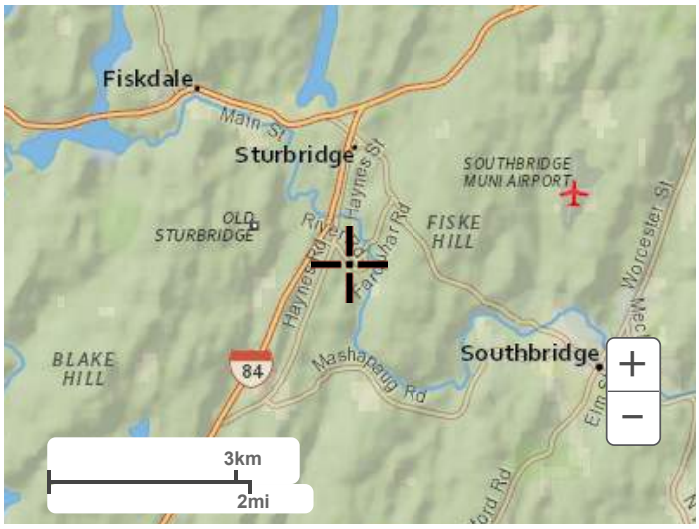
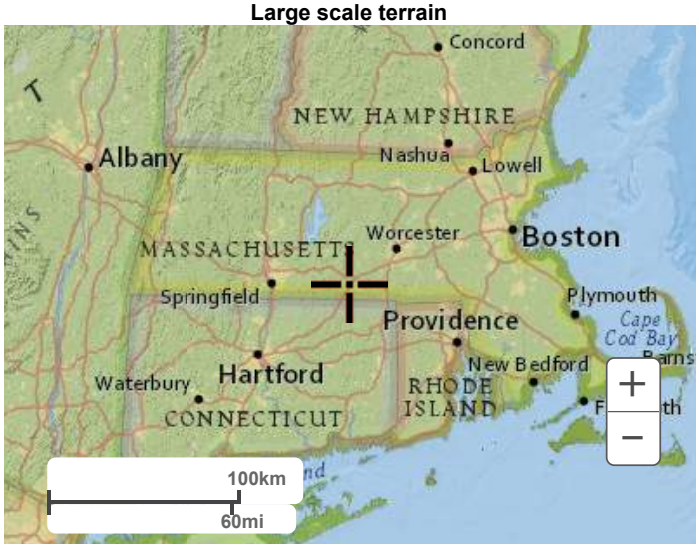
Maps & aerials

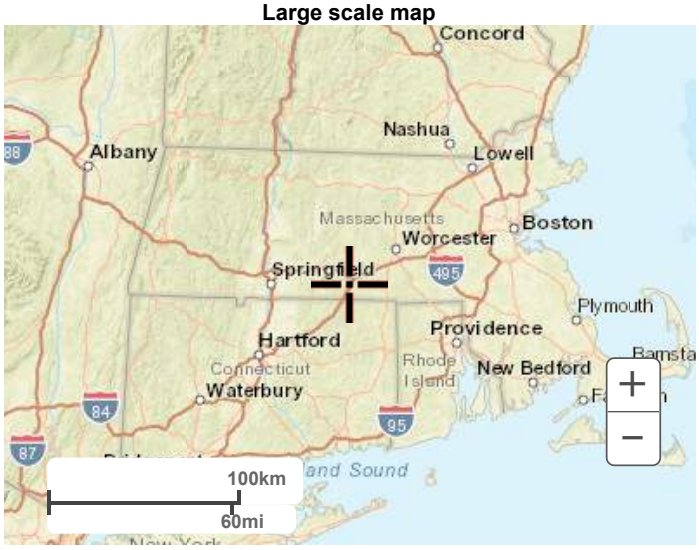
Small scale terrain



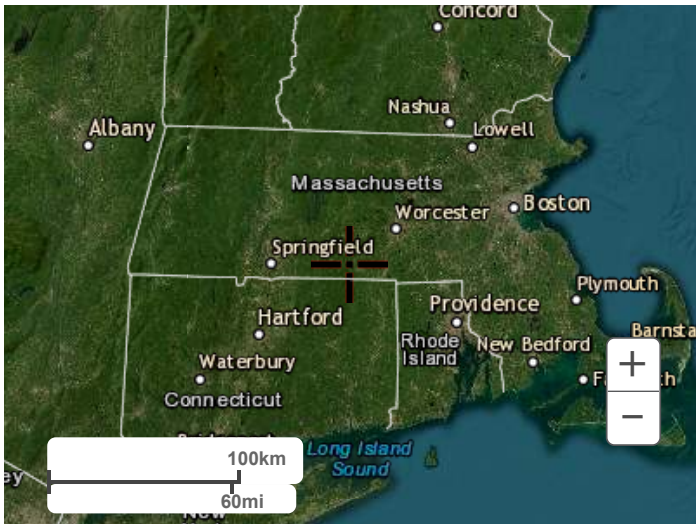
Large scale terrain



Large scale map



Large scale aerial



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US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

Tighe&Bond

Stormwater Management Report

APPENDIX E

CONSTRUCTION PERIOD SOIL EROSION AND SEDIMENT CONTROL PLAN

Grand Trunk Trail Continuation Project
Sturbridge, Massachusetts

April 2024

Prepared for:

Town of Sturbridge, Massachusetts

APPENDIX A

Figure 1 – Erosion and Sediment Control Plan

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Appendices

Section 1
Introduction

Stormwater runoff from construction activities can have a significant impact on water quality. As stormwater flows over a construction site, it can pick up pollutants like sediment, debris, and chemicals and transport these to a nearby storm sewer system or directly to a river, lake, or coastal water. Polluted stormwater runoff can harm or kill fish and other wildlife. Sedimentation can destroy aquatic habitat, and high volumes of runoff can cause stream bank erosion. Debris can clog waterways and potentially reach the ocean where it can kill marine wildlife and impact habitat.

Standard 8 of the Massachusetts Stormwater Standards requires:

> "a plan to control construction-related impacts including erosion, sedimentation and other pollutant sources during construction and land disturbance activities (construction period erosion, sedimentation, and pollution prevention plan) shall be developed and implemented".

The following Construction Period Soil Erosion and Sediment Control Plan (SESCP) identifies the requirements to comply with Standard 8.

Section 2
Project Information

2.1 Plan Contents

This PPP was developed for the Grand Trunk Trail Continuation Project in Sturbridge, Massachusetts. This PPP provides permit-related information to satisfy the requirements of Standard 8 of the Massachusetts Stormwater Handbook.

2.2 Project/ Site Information

Project Name and Address

Project/Site Name:	Grand Trunk Continuation Project
Project Street/Location:	River Road
City:	Sturbridge
State:	MA
ZIP Code:	01566
County or Similar Subdivision:	Worcester County

2.3 Nature of the Construction Activity

General Description of Project

The property is owned by the Town of Sturbridge and is within the Special Use Zoning District. The site is part of the Grand Trunk Trail, and the majority of the property consists of woodlands. There are wetlands to the east of the site, and a river is located to the west of the proposed trail and south of the proposed parking lot.

Size of Construction Project

Total size of the property: 20.8 acres

Total area expected to be disturbed by the construction activities: 1.6 acres

The maximum area expected to be disturbed at any one time (in acres): 1.6 acres

TABLE 2-1

Pollutant-Generating Activities

Pollutant-Generating Activity	Pollutants or Pollutant Constituents (that could be discharged if exposed to stormwater)
Site work	Soil particles and fines
Paving and construction areas	Petroleum, concrete, vehicle fluids, paints, solvents
Disinfection of water mains	Chlorine, dechlorination chemicals
Concrete construction	Concrete

Pollutant-Generating Activity	Pollutants or Pollutant Constituents (that could be discharged if exposed to stormwater)
Pavement marking	Paint
Solid waste storage	Construction debris, trash
Fertilizing	Fertilizers
Equipment use	Hydraulic Oils/fluids
Equipment use	Antifreeze/coolant
Portable toilets	Sewage
Staging areas	Sediment, gasoline, fuel oil, concrete, vehicle fluids, paints, solvents, fertilizers, adhesives, antifreeze/coolant, hydraulic oil/fluid, etc.

2.4 Sequence and Estimated Dates of Construction Activities

The following is an anticipated construction sequence identifying the major components of construction for the project.

2.4.1 Project Timeline

Estimated Start Date of Construction Activities for this Phase	Summer 2024
Estimated End Date of Construction Activities for this Phase	Fall 2024
Estimated Date(s) of Application of Stabilization Measures for Areas of the Site Required to be Stabilized	Fall 2024
Estimated Date(s) when Stormwater Controls will be Removed	Fall 2024

2.5 Allowable Non-Stormwater Discharges

Water from non-stormwater sources are allowed when properly managed. The following identifies discharge sources anticipated with the project.

TABLE 2-2

List of Allowable Non-Stormwater Discharges Present at the Site

Type of Allowable Non-Stormwater Discharge	Likely to be Present at Your Site?	Location on Site
Discharges from emergency fire-fighting activities	☐ YES ☒ NO	
Fire hydrant flushings	☐ YES ☒ NO	
Landscape irrigation	☒ YES ☐ NO	Throughout Site

Waters used to wash vehicles and equipment[1]	☐ YES ☒ NO	
Water used to control dust	☒ YES ☐ NO	Throughout site
Potable water including uncontaminated water line flushings	☐ YES ☒ NO	
External building wash down, provided soaps, solvents, and detergents are not used, and external surfaces do not contain hazardous substances (e.g. see Appendix A) (e.g. paint or caulk containing PCBs)	☐ YES ☒ NO	
Pavement wash waters[2]	☐ YES ☒ NO	
Uncontaminated air conditioning or compressor condensate	☐ YES ☒ NO	
Uncontaminated, non-turbid discharges of ground water or spring water	☐ YES ☒ NO	
Foundation or footing drains[3]	☐ YES ☒ NO	
Construction dewatering water[4]	☒ YES ☐ NO	Throughout site

[1]provided that there is no discharge of soaps, solvents, or detergents used for such purposes

[2]provided spills or leaks of toxic or hazardous substances have not occurred (unless all spill material has been removed) and where soaps, solvents, and detergents are not used. You are prohibited from directing pavement wash waters directly into any water of the U.S., storm drain inlet, or stormwater conveyance, unless the conveyance is connected to a sediment basin, sediment trap, or similarly effective control;

[3]where flows are not contaminated with process materials sucks as solvents or contaminated ground water

[4]discharged in accordance with applicable regulations

* All treated (chlorinated) water flushed from water lines shall be disposed of by discharging to the nearest sanitary sewer or by other approved means provided in AWWA. It shall **not** be discharged to wetlands or waterways.

** **No** untreated or contaminated groundwater will be discharged to wetlands or waterways. Excess water will be discharged overland in upland areas and allowed to naturally infiltrate in well-drained soils, or discharged to wetlands or streams only after passing through filtration sacks or similar devices.

2.6 Site Maps

An Erosion and Sediment Control Plan (ESCP) has been prepared to provide the Contractor will the minimum requirements for the prevention of erosion and sedimentation due to consruction impacts. The ESCP is provided in Appendix A. The ESCP provides locations of perimeter erosion controls, inlet controls, and construction-period stormwter management features such as sediment traps.

Section 3
Erosion and Sediment Controls

The Contractor must implement erosion and sediment controls in accordance with the following requirements to minimize the discharge of pollutants in stormwater from construction activities. This project also includes site specific controls and permit conditions which may take precedent and are not included in the following descriptions. The Contractor shall also comply with the requirements in the project's permits.

3.1 Perimeter Controls

Provide perimeter controls to prevent sediment from entering and compromising the adjacent storm drain system.

General

Roadways and storm drainage components adjacent to the proposed project area will be protected by a row of erosion control barriers. The erosion control barriers will consist of straw wattles or mulch-filled tubes (e.g. compost filter tubes/socks) and siltation fencing placed in a fashion that restricts the contractor(s) to the areas necessary to conduct the work and will generally define the limits of work. The locations of these barriers are shown on the project drawings.

Specific Perimeter Controls

Perimeter Control Description

- Perimeter controls include the installation of a straw wattle or mulch log barrier and siltation fence system around the perimeter of the site. Perform work in accordance with the ESCP.

Installation

- Temporary erosion control measures shall be installed prior to the start of any earth disturbing activities.
- Erosion control barriers shall not be removed until their removal is approved by the Engineer.

Maintenance Requirements

- The contractor(s) will be required to maintain a reserve supply of erosion control barriers on-site to make repairs, as necessary.
- Perimeter control shall be inspected immediately after each rainfall and at least daily during prolonged rainfall. They shall be repaired if there are any signs of erosion or sedimentation below them, any repairs shall be made immediately. If there are signs of undercutting at the center or the edges, or impounding of large volumes of water behind them, sediment barriers shall be replaced with a temporary check dam.
- Should the fabric on a barrier decompose or become ineffective prior to the end of the expected usable life and the barrier still is necessary, the fabric shall be replaced promptly.
- Sediment deposits should be removed after each storm event. They must be removed when deposits reach approximated 1/3 the height of the barrier.

At the conclusion of the project, the erosion control barriers will be removed and properly disposed off-site following the stabilization of disturbed areas.

3.2 Sediment Track-Out

General

It is the Contractor's responsibility to take measures to prevent tracking of sediment from the project site. It is also the Contractor's responsibility to take measures to prevent tracking of sediment from any staging and material storage area. A stone tracking pad and street sweeping apparatus shall be used as necessary to minimize the track-out of sediment onto adjacent streets, other paved areas, and sidewalks from vehicles exiting the construction site.

Specific Track-Out Controls

Track-Out Controls Description

- Stone aggregate tracking pad
- Street sweeping

Installation

- Sediment track out controls to be installed by the Contractor include a stone aggregate tracking pad with an underlying geotextile fabric. The pad shall be constructed in accordance with the ESCP.

Maintenance Requirements

- The site exit shall be maintained in a condition which will prevent tracking of sediment onto public right-of-way. When washing is required, it shall be done in an area stabilized with aggregate which drains into a sediment trapping controls.
- If sediment is tracked out from the site to the surface of off-site streets, other paved areas, and sidewalks, the Contractor shall remove the deposited sediment by the end of the same work day in which the track-out occurs.

3.3 Stockpiled Sediment or Soil

General

Temporary soil stockpiles shall be surrounded by hay bales or silt fence and shall be stabilized by covering or temporary erosion control seeding. Stockpiles are to be located as far as possible from any surface water.

Specific Stockpile Controls

Description

- Temporary stockpiles of excavated soil may be present at the site as construction progresses.

Installation

- Install a sediment barrier consisting of silt fencing or straw bales along downgradient perimeter areas of stockpiles.

- For piles that will be unused for 14 or more days, temporary stabilization with erosion control seeding shall be used if perimeter controls and/or temporary covering are not sufficient to prevent sediment migration.

Maintenance Requirements

- Do not hose down or sweep soil or sediment accumulated on pavement or other impervious surfaces into any stormwater conveyance (unless connected to a sediment basin, sediment trap, or similarly effective control), storm drain inlet, or surface water.

3.4 Minimize Dust

General

The Contactor shall be responsible for the control of dust throughout the construction period. Dust control methods shall include, but be not limited to, sprinkling water or calcium chloride on exposed areas, covering loaded dump trucks leaving the site, and temporary mulching exposed soil areas. Dust control measures shall be utilized to prevent the migration of dust from the site to abutting areas.

Specific Dust Controls

Description

- Prevent dust from becoming a nuisance or hazard. During construction, excavated material and open or stripped areas are to be policed and controlled to prevent spreading of the material.
- Dust control measures shall be utilized to prevent the migration of dust from the site to abutting areas.
- Ensure that the existing equipment, facilities, and occupied space adjacent to or nearby areas of the work do not come in contact with dust or debris as a result of concrete demolition, excavation or surface preparation.

Installation

- Dust control methods shall include, but be not limited to, sprinkling water on exposed areas, using calcium chloride, covering loaded dump trucks leaving the site, and temporary mulching.
- Use a mechanical street sweeper daily.

Maintenance Requirements

- During the work on-site, daily all paved road and driveway surfaces shall be scraped and broomed free of excavated materials on a daily basis. Prior to sweeping, or as needed during the work day, the surfaces shall be hosed down or otherwise treated to eliminate active or potential dust conditions and the natural road or wearing surface shall be exposed.

3.5 Minimize the Disturbance of Steep Slopes

General

All slopes greater than 15% during the regular construction season are to have slope stabilization measures. This applies to all slopes greater than 8% after October 1st.

Specific Steep Slope Controls

- Where slopes greater than 3:1 will be created, synthetic erosion control fabric is to be utilized in these areas to prevent erosion until permanent vegetation is established.

3.6 Topsoil/Loam Areas

General

All areas not to be paved or otherwise treated shall receive 4-inch loam and seed. The salvaging of existing loam and topsoil is not anticipated due to the urban nature of the site.

Specific Topsoil/Loam Area Controls

Description

- Erosion of topsoil/ loam areas will be controlled by providing temporary and perminant grass cover.
- Where slopes greater than 3:1 will be created, synthetic erosion control fabric will be utilized to prevent erosion until permanent vegetation is established.

Installation

- Temporary vegetative cover shall be provided to stabilize the site in areas where additional construction activity will not occur for more than 14 calendar days.

Maintenance Requirements

- Seeding shall be inspected periodically and at a minimum 95% of the soil surface should be covered by vegetation. If any evidence of erosion is apparent, repairs shall be made and additional measures shall be used to prevent further erosion.
- Straw mulch, wood fiber mulch, or erosion control blankets shall be applied immediately after seeding.

3.7 Soil Compaction

General

In areas where final vegetative stabilization is proposed, the Contractor shall prevent excessive compaction by:

- Restricting vehicle and equipment use in these locations to avoid excessive soil compaction; or
- Prior to seeding or planting areas of exposed soil that have been compacted, use techniques that aerates the soils resulting in conditions that will support vegetative growith.

3.8 Storm Drain Inlets

General

Provide catch basin inlet protection as per construction drawings and specifications in all catch basins within the vicinity of the earth disturbing activities to protect the

stormwater management system from high sediment loads and high velocities, while disturbance due to construction is occurring in the drainage area.

Specific Storm Drain Inlet Controls

Description

- Storm Drain Inlet Controls include the installation of Silt Sacks
- Refer to the ESCP for inlet control locations.

Installation

- Refer to manufacturer recommended specifications and instillation instructions.

Maintenance Requirements

- Silt sacks shall be inspected immediately after each rainfall and at least daily during prolonged rainfall. They shall be repaired or replaced as needed immediately.
- Sediment deposits should be removed after each storm event. They must be cleaned when deposits reach approximated 1/3 the height of the barrier.
- The Contractor shall remove the deposited sediment and make any repairs by the end of the same work day in which the sediment is observed or by the end of the next work day if observation occurs on a non-work day.

3.9 Sediment Traps

General

Permanent sediment basins are not proposed as part of the final stormwater management system, however, temporary sediment basins or sediment traps may be used during construction to retain runoff and settle out particles prior to discharge from the site.

Specific Sediment Basin/Sediment Trap Controls

Description

- Temporary sediment basins or sediment traps may be excavations or bermed detention areas on site with stabilized discharges.

Installation

- As required due to site conditions and activities.

Maintenance Requirements

- Contractor shall periodically remove sediments and dispose of them in an appropriate location. Discharge locations shall be inspected regularly and stabilized as necessary.

3.10 Dewatering Practices

General

Dewatering is not anticipated for this project. Standard dewatering measures will be employed. No untreated groundwater will be discharged to wetlands or waterways. Excess water will be discharged overland in upgradient areas and allowed to naturally infiltrate, or discharged to the drainage system only after passing through filtration sacks or similar devices.

Specific Dewatering Practices

Dewatering Practice Description

- Provide, operate and maintain adequate pumping, diversion and drainage facilities in accordance with the approved dewatering plan to maintain the excavated area sufficiently dry from groundwater and/or surface runoff so as not to adversely affect construction procedures nor cause excessive disturbance of underlying natural ground. Locate dewatering system components so that they do not interfere with construction under this or other contracts.
- Install erosion/sedimentation controls for velocity dissipation at point discharges onto non-paved surfaces.

Installation

- Install sand and gravel, or crushed stone, filters in conjunction with sumps, well points, and/or deep wells to prevent the migration of fines from the existing soil during the dewatering operation.
- Transport pumped or drained water without interference to other work, damage to pavement, other surfaces, or property. Pump water through a silt filter bag prior to discharge to grade or drainage system.
- Do not discharge water into any separated sanitary sewer system.

Maintenance Requirements

- Repair any damage resulting from the failure of the dewatering operations and any damage resulting from the failure to maintain all the areas of work in a suitable dry condition.
- Take actions necessary to ensure that dewatering discharges comply with permits applicable to the Project. Dispose of water from the trenches and excavations in such a manner as to avoid public nuisance, injury to public health or the environment, damage to public or private property, or damage to the work completed or in progress.

3.11 Site Stabilization

General

Initiate site stabilization measures immediately whenever earth-disturbing activities have permanently ceased or will be temporarily suspended on any portion of the site for more than 14 days.

Complete the stabilization activities within 14 days after the permanent or temporary cessation of earth-disturbing activities. Temporary paving of disturbed areas of existing roads should be completed at a minimum at the end of each week.

Use the following stabilization practices to protect exposed soil from erosion and prevent sediment movement.

3.11.1 Seeding

Installation

- When construction has temporarily or permanently ceased, seeding shall occur immediately in accordance with the project specifications.

Maintenance Requirements

- Periodic inspections shall occur once a week and after every rainstorm of 0.25 inches or greater until a minimum of 70% of the soil surface is covered by vegetation.

3.11.2 Mulching

Installation

- When construction has temprorarily or permanently ceased, mulching shall occur immediately, as required, for erosion control while vegetation is being established.

Maintenance Requirements

- Periodic inspections shall occur once a week and after every rainstorm 0.25 inches or greater.

3.11.3 Erosion Control Mats or Blankets

Installation

- When construction has temprorarily or permanently ceased, erosion control blanket installation shall occur immediately on slopes greater than 3:1, or as required, for erosion control while vegetation is being established.

Maintenance Requirements

- Periodic inspections shall occur once a week and after every rainstorm 0.25 inches or greater.

Section 4
Pollution Prevention Standards

A clean and orderly construction site will reduce the opportunity for pollutants to enter the stormwater runoff stream. The following identifies sources of pollution anticipated on a typical construction site and preventative measures to avoid pollution.

4.1 Potential Sources of Pollution

TABLE 4-1

Construction Site Pollutants

Pollutant-Generating Activity	Pollutants or Pollutant Constituents	Location on Site
Site work	Soil particals and fines	Where disturbance is proposed
Paving and construction areas	Petroleum, concrete, vehicle fluids, paints, solvents	Where paving and construction is proposed
Disinfection of water mains	Chlorine, dechlorination chemicals	Where water mains are proposed
Concrete construction	Concrete	Where concrete is proposed
Pavement marking	Paint	Where pavement markings are proposed
Solid waste storage	Construction debris, trash	In dumpster locations
Fertilizing	Fertilizers	In areas of proposed seeding
Equipment use	Hydraulic Oils/fluids	Leaks/broken hoses from equipment
Equipment use	Antifreeze/coolant	Leaks/broken hoses from equipment
Portable toilets	Sewage	Where portable toilets are located
Staging areas	Sediment, gasoline, fuel oil, concrete, vehicle fluids, paints, solvents, fertilizers, adhesives, antifreeze/coolant, hydraulic oil/fluid, etc.	

4.2 Spill Prevention and Response

- Manufacturer's recommended methods for cleanup will be clearly posted and site personnel will be made aware of the procedures and the location of the information and clean up supplies.
- Materials and equipment necessary for spill cleanup will be kept in the material storage areas on site. Equipment and materials will include but not be limited to brooms, dustpans, mops, rags, gloves, goggles, kitty litter, sand, sawdust and plastic or metal trash containers specifically for this purpose.

- All spills will be cleaned up immediately after discovery.
- The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contact with hazardous substances.
- Spills of toxic or hazardous material will be reported to the appropriate state or local government agency regardless of size.
- The Spill Prevention Plan will be adjusted to include measures to prevent this type of spill from recurring and how to cleanup the spill if it recurs. A description of the spill, its cause and the cleanup measures will be included.
- The site superintendent responsible for day to day operations will be the Spill Response Coordinator (SRC). The SRC is responsible for decisive actions in the event of a spill at the facility. The SRC will supervise efforts to provide immediate containment of the spill to prevent a more difficult cleanup situation. Cleanup crews will utilize proper spill cleanup materials and employ safe work practices.

4.2.1 Federal and State Spill Notification

In accordance with 310 CMR 40.0333, the SRC shall notify the Massachusetts Department of Environmental Protection (Central Region) - 508-792-7650, the Local Emergency Planning Committee (LEPC) and any other authorities or agencies within two hours if an accident or other type of incident results in a release to:

- Land
  - 10 Gallons for more Oils (PCB<500 ppm)
  - 1 Gallon or more Oils (PCB ≥500 ppm)
- Waterways
  - Any quantity of Oils
- Or, triggers the exposure to toxic chemical levels as listed in 301 CMR 40.1600, Revised Massachusetts Contingency Plan

The SRC shall notify the National Response Center (NRC) at **(800) 424-8802** where a leak, spill, or other release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity consistent with Part 2.3.3.4c and established under either 40 CFR Part 110, 40 CFR Part 117, or 40 CFR Part 302, occurs during a 24-hour period.

In either event, the SRC will work with state and federal agencies to ensure that all appropriate forms and reports are submitted in a timely manner.

- Note: Trigger volumes for other chemical spills vary. Contact the DEP or a Licensed Site Professional (LSP) for specific guidance on reporting thresholds and requirements for other chemicals.

4.2.2 Local Notification

The following local agencies will be called to provide emergency assistance at the facility on the judgment of the SRC:

TABLE 4-2

Emergency Assistance Notification

Fire Department 911 or (508) 347-2525	Police Department 911 or (508) 347-2525
Hospital: UMass Memorial Health – Harrington Hospital (508) 765-9771	Department of Public Works: (508) 347-2516

4.3 Fueling and Maintenance of Equipment or Vehicles

General

Efforts shall be made to perform equipment/vehicle fueling and maintenance off-site. If fueling and/or maintenance of equipment of vehicles is performed on site, the following pollution prevention practices must be provided.

Specific Pollution Prevention Practices

- Site contractor/project manager shall provide an onsite vehicle fueling and maintenance area that is clean and dry.
- If possible keep area covered.
- Keep a spill kit at the fueling and maintenance area.
- Vehicles shall be inspected regularly for leaks and damage.
- Use drip pans, drip cloths or absorbent pads when replacing spent fluid.

4.4 Washing of Equipment and Vehicles

General

Efforts shall be made to perform equipment/vehicle washing and maintenance off-site. If washing of equipment and vehicles is performed on site, the following pollution prevention practices must be provided to minimize the discharge of pollutants.

Specific Pollution Prevention Practices

- Site contractor/project manager shall provide a proper washing area.
- Discharges from washing areas shall be infiltrated or diverted into sanitary sewer system unless no soaps or detergents are used.
- If soaps, detergents or solvents are stored onsite over must be provided to prevent these detergents from coming into contact with rainwater.

4.5 Storage, Handling, and Disposal of Construction Products, Materials, and Wastes

4.5.1 Building Products

- Site contractor/project manager shall designate a waste collection area on the site that does not receive a substantial amount of runoff from upland areas and does not drain directly to a water body.
- Ensure that containers have lids so they can be covered before periods of rain, and keep containers in a covered area whenever possible.
- Schedule waste collection to prevent the containers from overfilling.
- Clean up spills immediately. For hazardous materials, follow cleanup instructions on the package. Use an absorbent material such as sawdust or kitty litter to contain the spill.
- During the demolition phase of construction, provide extra containers and schedule more frequent pickups.
- Collect, remove, and dispose of all construction site wastes at authorized disposal areas.

4.5.2 Pesticides, Herbicides, Insecticides, Fertilizers, and Landscaping Materials

- Store new and used materials in a neat, orderly manner in their appropriate containers in a covered area. If storage in a covered area is not possible, the materials shall be covered with polyethylene or polypropylene sheeting to protect them from the elements.
- Storage area should include precautions to contain any potential spills.
- Immediately contain and clean up any spills with absorbent materials.

4.5.3 Diesel Fuel, Oil, Hydraulic Fluids, Other Petroleum Products, and Other Chemicals

- Store new and used petroleum products for vehicles in a neat, orderly manner in their appropriate containers in a covered area. If storage in a covered area is not possible, the materials shall be covered with polyethylene or polypropylene sheeting to protect them from the elements.
- Storage area should include precautions to contain any potential spills.
- Immediately contain and clean up any spills with absorbent material.
- Have equipment available in fuel storage areas and in vehicles to contain and clean up any spills that occur.

4.5.4 Hazardous or Toxic Waste

- Store new and used materials in a neat, orderly manner in their appropriate containers in a covered area. If storage in a covered area is not possible, the materials shall be covered with polyethylene or polypropylene sheeting to protect them from the elements.
- Storage areas should include precautions to contain any potential spills.

- Immediately contain and clean up any spills with absorbent materials.
- Have equipment available in fuel storage areas and in vehicles to contain and clean up any spills that occur.
- To prevent leaks, empty and clean hazerdous waste containers before disposing of them.
- Never remove the original product label from the container because it contains important safety information. Follow the manufacturer's recommended method of disposal, which should be printed on the label.
- Never mix excess products when disposing of them, unless specifically recommended by the manufacturer.

4.5.5 Construction and Domestic Waste

- All materials shall be collected and stored in securely lidded receptacles, no construction waste materials will be buried. Clean up immediately if containers overflow.

4.5.6 Sanitary Waste

- Portable sanitary units will be provided throughout the course of the project for use by the site contractor/project manager's employees. A licensed sanitary waste management contractor will regularly collect all sanitary waste from the portable units. Position portable toilets so that they are secure and will not be tipped or knocked over.

4.6 Washing of Applicators and Containers used for Paint, Concrete or Other Materials

- The contractors should be encouraged where possible, to use washout facilities at their own plant or dispatch facility from stucco, paint, concrete, form release oils, curing compounds, and other construction materials.
- If washout of these materials in done on site:
    - Direct all washwater into a leak-proof container or leak-proof pit. The container or pit must be designed so that no overflows can occur due to inadequate sizing or precipitation.
    - Handle washout or cleanout wastes as follows:
        - Do not dump liquid wastes in the storm sewers
        - Dispose of liquid wastes in accordance with applicable regulations
        - Remove and dispose of hardened concrete waste consistent with your handling of other construction wastes in Section 5.5.
    - Attempts should be made to locate washout area as far away as possible from surface waters and storwmater inlets or conveyances, and to the extend practicable, designate areas to buse for these activities and conduct such activities only in these areas.
- Inspect washout facilities daily to detect leaks or tears and to identify when materials need to be removed.

4.7 Fertilizers

If fertilizers are to be used on site, the following requirements shall be followed:

- Store new and used materials in a neat, orderly manner in their appropriate containers in a covered area. If storage in a covered area is not possible, the materials shall be covered with polyethylene or polypropylene sheeting to protect them from the elements.
- Storage area should include precautions to contain any potential spills.
- Immediately contain and clean up any spills with absorbent materials.
- Apply at a rate and in amounts consistent with manufacturer's specifications, or document departures from the manufacturer's specifications.
- Apply at the appropriate time of year for the site, and preferably timed to coincide as closely as possible to the period of maximum vegetation uptake and growth
- Avoid applying before heavy rains that could cause excessive nutrients to be discharged
- Never apply to frozen ground
- Never apply to stormwater conveyance channels with flowing water
- Follow all federal, state, tribal, and local requirements regarding fertilizer application.

N

EROSION AND SEDIMENT
CONTROL BARRIER (TYP.)

STABILIZED CONSTRUCTION
ENTRANCE

GRAND TRUNK TRAIL CONTINUATION
STURBRIDGE, MASSACHUSETTS

EROSION AND SEDIMENT
CONTROL PLAN

DATE:	APRIL 2024
SCALE:	1" = 30'
FIGURE:	1

Tighe&Bond

Tighe&Bond

Stormwater Management Report

APPENDIX F

LONG-TERM POLLUTION PREVENTION AND STORMWATER MANAGEMENT SYSTEM OPERATION AND MAINTENANCE PLAN

Grand Trunk Trail Continuation Project
Sturbridge, Massachusetts

April 2024

Prepared for:

Town of Sturbridge, Massachusetts

Table of Contents

Section 1
Introduction and Purpose

The following Long-Term Pollution Prevention and Stormwater Operations and Maintenance (O&M) Plan has been prepared for the stormwater management system at the proposed Grand Trunk Continuation project in Sturbridge, Massachusetts. The purpose of the plan is to provide guidance and procedures for proper pollution prevention and stormwater management system maintenance following construction completion.

The proposed project has been designed in compliance with the Massachusetts Department of Environmental Protection (MassDEP) Stormwater Handbook and the Town of Sturbridge Stormwater Bylaw to maintain or improve stormwater runoff quality and quantity. The stormwater management system components shall be maintained as recommended in the Massachusetts Stormwater Handbook.

A Stormwater Maintenance Agreement is required per Section 8.13 of the Town of Sturbridge Stormwater Management Bylaw. This agreement, between the property owner and the Town of Sturbridge Board of Health, allows the Town to assume responsibility for the inspection and maintenance of the stormwater management system, should the responsible party described in Section 2 of this O&M Plan be unresponsive. This O&M Plan is referenced as part of the Stormwater Maintenance Agreement provided as part of the Stormwater Management Permit Application for the project. Because the Town of Sturbridge owns the property upon which the project is proposed, operation and maintenance responsibilities belong to the Town in perpetuity from the completion of construction activities and onward. Changes in property ownership, or changes to this O&M Plan, must be provided to the Town of Sturbridge Board of Health within 30 days of said changes.

Access and maintenance easements by the property Owner to the Town are indicated on the Site Plans referenced in this O&M Plan. All easements shall be recorded in the Worcester County Registry of Deeds.

Section 2
Responsible Parties

The Town of Sturbridge is responsible for maintaining and servicing the proposed stormwater management facilities post construction. The property is owned by The Town of Sturbridge. During construction, the contractor will be responsible for stormwater management system maintenance.

Property Owner:

Town of Sturbridge
9 River Road
Sturbridge, MA 01566

Owner Signature, date: Heather Blady 4/22/24

Maintenance Contact:

Sturbridge Department of Public Works
1 New Boston Road Extension P.O. Box 182
Sturbridge, MA 01566
(508) 347-2515

Maintenance Contact
Signature, date: [signature] 4/22/24

Section 3
Long Term Pollution Prevention Plan

3.1 Good Housekeeping

The goal of the good housekeeping policy is to keep the site in a clean and orderly condition. A disorderly site can lead to improper materials management and can reduce the efficiency of any response to potential pollution problems.

The following good housekeeping measures will be followed at the site to aid in pollution prevention:

- Promptly clean and remove any spills or contamination from vehicles or other services.
- Perform preventative maintenance on the structural components of the stormwater system.
- Properly dispose of refuse.

3.2 Potential Sources of Pollution

The following sources of pollution are anticipated as part of the long-term use of the project.

Pollutant-Generating Activity	**Pollutants or Pollutant Constituents** (that could be discharged if exposed to stormwater)
Vehicular Access	Petroleum, concrete, vehicle fluids, paints, solvents
Solid waste storage	Construction debris, trash
Landscaping Activites	Fertilizers, pesticides, herbcides
Equipment use	Hydraulic oils, fluids, antifreeze, coolant

3.3 General Spill Prevention and Response

In the event of a spill, the following procedures shall be followed by the Maintenance Contact or their authorized representative:

- Manufacturer's recommended methods for cleanup will be clearly posted and facility personnel will be made aware of the procedures and the location of the information and clean up supplies.
- Materials and equipment necessary for spill cleanup will be kept in the material storage areas at the facility. Equipment and materials will include but not be limited to brooms, dustpans, mops, rags, gloves, goggles, kitty litter, sand, sawdust and plastic or metal trash containers specifically for this purpose.
- All spills will be cleaned up immediately after discovery.

- The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contact with hazardous substances.
- Spills of toxic or hazardous material will be reported to the appropriate state or local government agency regardless of size.
- The Spill Prevention Plan will be adjusted to include measures to prevent this type of spill from recurring and how to cleanup the spill if it recurs. A description of the spill, its cause and the cleanup measures will be included.
- The Maintenance Contact is responsible for day to day operations will be the spill prevention and cleanup coordinator.

3.3.1 Federal and State Spill Notification

In accordance with 310 CMR 40.0333, the Maintenance Contact shall notify the Massachusetts Department of Environmental Protection (Central Region) – (508) 982-7650 the Local Emergency Planning Committee (LEPC) (if applicable) and any other authorities or agencies within two hours if an accident or other type of incident results in a release to:

- land
  - 10 Gallons for more Oils (PCB<500 ppm)
  - 1 Gallon or more Oils (PCB ≥500 ppm)
- waterways
  - Any quantity of Oils
- Or, triggers the exposure to toxic chemical levels as listed in 301 CMR 40.1600, Revised Massachusetts Contingency Plan (MPC)

The Maintenance Contact shall notify the National Response Center (NRC) at **(800) 424-8802** where a leak, spill, or other release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity consistent with Part 2.3.3.4c and established under either 40 CFR Part 110, 40 CFR Part 117, or 40 CFR Part 302, occurs during a 24-hour period.

In either event, the Maintenance Contact will work with state and federal agencies to ensure that all appropriate forms and reports are submitted in a timely manner.

- Note: Trigger volumes for other chemical spills vary. Contact the MassDEP or a Licensed Site Professional (LSP) for specific guidance on reporting thresholds and requirements for other chemicals.

3.3.2 Local Notification

The following local agencies will be called to provide emergency assistance at the facility on the judgment of the Maintenance Contact:

Fire Department 911 or (508) 347-2525	Police Department 911 or (508) 347-2525
Hospital: UMass Memorial Health – Harrington Hospital (508) 765-9771	Department of Public Works: (508) 347-2516

3.4 Storage, Handling, and Disposal of Materials and Wastes

The following procedures shall be followed throughout the facility when storing, handling and disposing of various materials.

3.4.1 Pesticides, Herbicides, Insecticides, Fertilizers, and Landscaping Materials

- Store new and used materials in a neat, orderly manner in their appropriate containers in a covered area. If storage in a covered area is not possible, the materials shall be covered with polyethylene or polypropylene sheeting to protect them from the elements.
- Storage area should include precautions to contain any potential spills.
- Immediately contain and clean up any spills with absorbent materials.
- Apply at a rate and in amounts consistent with manufacturer's specifications, or document departures from the manufacturer's specifications.
- Apply at the appropriate time of year for the site, and preferably timed to coincide as closely as possible to the period of maximum vegetation uptake and growth
- Avoid applying before heavy rains that could cause excessive nutrients to be discharged
- Never apply to frozen ground
- Never apply to stormwater conveyance channels with flowing water
- Follow all federal, state, tribal, and local requirements regarding fertilizer application.

3.4.2 Hazardous or Toxic Waste

- Store new and used materials in a neat, orderly manner in their appropriate containers in a covered area. If storage in a covered area is not possible, the materials shall be covered with polyethylene or polypropylene sheeting to protect them from the elements.
- Storage areas should include precautions to contain any potential spills.
- Immediately contain and clean up any spills with absorbent materials.
- Have equipment available in fuel storage areas and in vehicles to contain and clean up any spills that occur.
- To prevent leaks, empty and clean hazardous waste containers before disposing of them.
- Never remove the original product label from the container because it contains important safety information. Follow the manufacturer's recommended method of disposal, which should be printed on the label.
- Never mix excess products when disposing of them, unless specifically recommended by the manufacturer.

3.4.3 Domestic Waste

- Site property manager shall designate a waste collection area on the site that does not receive a substantial amount of runoff from upland areas and does not drain directly to a water body.
- Ensure that containers have lids so they can be covered before periods of rain and keep containers in a covered area whenever possible.
- Schedule waste collection to prevent the containers from overfilling.
- Clean up spills immediately. For hazardous materials, follow cleanup instructions on the package. Use an absorbent material such as sawdust or kitty litter to contain the spill.

Section 4
Stormwater Management System

The on-site stormwater management system is comprised of vegetated surfaces, driveway and walkway sweeping, two sediment forebays and an infiltration basin. In general, runoff from the proposed parking area is directed to the sediment forebays. After pretreatment, stormwater runoff enters the proposed infiltration basin for infiltration to groundwater.

See the attached Figure 1 in Appendix A for the location of the various described components of the Stormwater Management System.

4.1 Inspections

Inspections will be performed in accordance with the Massachusetts Department of Environmental Protection (MassDEP) Stormwater Handbook. Figure 1, provided in Appendix A, identifies the location of each BMP to be inspected and maintained as described in this Section. All inspections should be logged using the Inspection Forms provided in Section 5.

The following stormwater management system features will be evaluated during each inspection:

4.1.1 Vegetated Surfaces

Inspection Frequency: Bi-annually in Summer and Winter

Special Inspection Event(s): Spring Snow Melt

All vegetative surfaces will be observed to identify locations of settlement, erosion and other impacts from the proposed parking lot development. Areas of settlement and erosion that may result in a discharge of sediment into Waters of the Commonwealth shall be repaired and restored to a vegetated condition.

4.1.2 Driveway and Walkway Sweeping

Inspection Frequency: Quarterly

Special Inspection Event(s): Spring Snow Melt

All pavement surfaces should be inspected annually for deterioration or spalling. Additionally, the pavement surface should be regularly monitored to make sure it drains properly after storms. Cleanings should be conducted on a quarterly basis to prevent clogging. For best management practices, high-efficiency vacuum sweeping machines should be used to clean and maintain the surface.

4.1.3 Surface Infiltration Basin

Inspection Frequency: Bi-annually

Special Inspection Event(s): Rainfall greater than 0.5 inches

Surface infiltration basins should be inspected bi-annually for standing water. If standing water is observed for longer than 72 hours, a pump should be placed in the basin and discharged through the outlet pipe. After the system is dewatered, it should be observed by a Professional Engineer. A Professional Engineer should provide an opinion as to why the infiltrations basin is not draining and provide recommendations to restore infiltration capacity to the system. Additionally, infiltration basins shall be observed to identify depths of sediment and occurrence of debris which would impact functionality. The outlet control structure, if applicable, shall be observed for signs of clogging during storm events and erosion. Any trash or debris encountered shall be removed.

4.1.4 Sediment Forebays

Inspection Frequency: Monthly

Special Inspection Event(s): Rainfall greater than 0.5 inches

At a minimum, sediment forebays should be inspected monthly and cleaned out four times per year. When maintaining grasses, grass height should be kept at no greater than 6 inches. The sediment forebay should be checked for signs of rilling and gullying regularly and repaired as needed. When sediment is removed from the basin, any vegetation damaged during the clean-out should be replaced through reseeding or resodding.

Section 5 Operation and Maintenance Log Form

Date: _____

Person conducting Inspection: _____

Reason for Inspection (Routine / Significant Rainfall): _____

Stormwater Management System Components:

Vegetated Surface

Component inspected during this inspection_____

Any Repair Necessary_____

Other Comments_____

Driveway and Walkway Sweeping

Component inspected during this inspection_____

Any Repair Necessary_____

Other Comments_____

Infiltration Basin

Component inspected during this inspection_____

Any Repair Necessary_____

Other Comments_____

Sediment Forebays

Component inspected during this inspection_____

Any Repair Necessary_____

Other Comments_____

Section 6
Snow Management & De-Icing

Snow removal will occur along the proposed access road drive and parking area. Snow storage should not be in or adjacent to wetland areas nor block drainage to surface inlets (e.g. catch basins).

Applications of chemical de-icing may be applied along with sand for the roads, main entrances, stop sign areas, and sidewalks. Apply only as needed using minimum quantities. Small quantities of deicers may be mixed with sand or sprayed on hard to maintain areas.

Sweep or clean up accumulated sand, sidewalks, steps, and roads as soon as possible after the road surface clears.

Section 7
Estimated O&M Budget

The following estimated O&M Budget includes the inspections and maintenance activities previously described on an annual basis.

Maintenance Component	Frequency	Unit Cost	Annual Cost
Vegetated Surfaces	4	$100	$400
Street Sweeping	4	$250	$1,000
Infiltration Basin	6	$200	$1,200
Sediment Forebay	12	$250	$3,000
Total Annual Estimated Budget			**$5,600**

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APPENDIX A

Figure 1 - BMP Location Map

N

SEDIMENT FOREBAYS

INFILTRATION BASIN

GRAND TRUNK TRAIL CONTINUATION
STURBRIDGE, MASSACHUSETTS

STORMWATER BMP LOCATION MAP

DATE:	APRIL 2024
SCALE:	1" = 30'
FIGURE:	1

Tighe&Bond

Tighe&Bond

Stormwater Management Report

APPENDIX G

Illicit Discharge Compliance Statement

Project Location: Grand Trunk Trail Continuation Project

Sturbridge, Massachusetts

Illicit discharges to the stormwater management system are discharges that are not entirely comprised of stormwater. Illicit discharge does not include discharges from the following activities or facilities: firefighting, water line flushing, landscape irrigation, uncontaminated groundwater, potable water sources, foundation drains, air conditioning condensation, footing drains, individual resident car washing, flows from riparian habitats and wetlands, dechlorinated water from swimming pools, water used for street washing, and water used to clean residential buildings without detergents.

To the best of my knowledge, I am not aware of any existing illicit discharges located at the Project Location and will abandon or remove such illicit discharges/connections in the future, if found.

Signature: _____

Printed Name & Title: Heather Blakeley, DPW Director

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Tighe&Bond

APPENDIX G

Town of Sturbridge

Conservation Commission

Notification to Abutters

under the MA Wetlands Protection Act
and the Town of Sturbridge Wetland Bylaw Regulations

(certificates of mailing, certified mail, or hand-delivery with abutter signature required as proof of notification)

In accordance with the second paragraph of Massachusetts General Laws, Chapter 131, § 40, as well as the Town of Sturbridge Wetland Bylaws, you are hereby notified of the following permit application for work within a wetland resource area and/or within the 200-foot buffer zone to a resource area:

A. The name of the applicant is: Town of Sturbridge, DPW

B. The address of the lot(s) where the activity is proposed is: 1 River Road, 9 River Road, 255 Main Street

C. The nature of the activity proposed includes: Construction of the Grand Trunk Trail (bike trail) continuation

D. The applicant has filed the following in accordance with the Wetlands Protection Act (MGL c. 131, § 40), and/or the Town of Sturbridge Wetland Bylaws.

- ☒ Notice of Intent seeking permission to conduct work within a wetland, water body or resource area
- ☐ Request for Determination seeking permission to conduct work within a buffer zone to a wetland, waterbody or resource area
- ☐ Abbreviated Notice of Resource Area Delineation seeking to confirm the wetland resource area boundaries.
- ☐ Request to amend an existing Order of Conditions for DEP File #300-_____

E. Copies of the application may be examined at the Sturbridge Conservation Department, 301 Main Street, Center Office Building, Sturbridge, MA between the hours of **9:00 a.m. – 3:30 p.m. Monday through Friday.** Additional times may available by appointment. Please call ahead to check for availability. (508) 347-2506

F. Copies of the application may be obtained from either ☒ the applicant: Town of Sturbridge, DPW
or ☐ the applicant's representative: Valerie Locker, Tighe & Bond Inc., by calling telephone # (781) 995-3040
on the following days of the week: M-F between the hours of 8:30 am and 5:00 pm.

The Public Hearing for this application will be held in the Center Office Building, 301 Main Street, 2nd Floor on May 9, 2024 **at** 6:00 **pm.**

PLEASE NOTE: Notice of this Public Hearing will be published as follows:

- In The Southbridge Evening News at least five days in advance of the hearing
- In the Town Hall at the Town Clerks office, not less than 48 hours in advance of the hearing
- On the Town's Meeting Calendar not less than 48 hours in advance of the hearing (www.town.sturbridge.ma.us)
- On the Conservation Commission webpage not less than 48 hours in advance of the hearing

You may contact the Sturbridge Conservation Commission Office (508) 347-2506 or the Department of Environmental Protection Central Regional Office at 508-792-7650 with questions in regards to the Notice of Intent application process or the Wetlands Protection Act.

Parcel ID	Owner	Owner Address	Owner City	State	Zip	Property Address
545-03432-010	KANAKE DYNANSEH P	10 RIVER ROAD	STURBRIDGE	MA	01566	10 RIVER ROAD
545-03432-001	REAL ESTATE FOR THE DOGS LLC	18 OAK RIDGE DRIVE	CHARLTON	MA	01507	1 RIVER ROAD
545-03432-006	SALTUS SCOTT	8227 CYPRESS TRACE BLVD	LAKELAND	FL	33809	6 RIVER ROAD
415-02925-255	U S ARMY CORPS OF ENGINEERS	696 VIRGINIA ROAD	CONCORD	MA	01742	255 MAIN STREET
	BOARD OF ASSESSORS					
Above persons listed are record owners as they appear on the most recent applicable tax list.						
Assessors are not responsible for errors or omissions. RE: M.G.L. - Chapter 40A, Section 11						
Abutters List -	Conservation Commission - 200'					
RE: 1 RIVER ROAD						
Certified Copy						
Assessor:						
Date:	4-17-24					

Parcel ID	Owner	Owner Address	Owner City	State	Zip	Property Address
545-03453-030	BOSTON RV RESORT & COTTAGES - STURBRIDGE LLC	104 E FAIRVIEW AVENUE	MERIDIAN	ID	83642	30 RIVER ROAD
270-03444-072	IOZZO NICHOLAS A	72 FARQUHAR ROAD	STURBRIDGE	MA	01566	72 FARQUHAR ROAD
545-03432-010	KANAKE DYNANSEH P	10 RIVER ROAD	STURBRIDGE	MA	01566	10 RIVER ROAD
545-03453-037	MODIG JEFFREY C	37 RIVER ROAD	STURBRIDGE	MA	01566	37 RIVER ROAD
545-03453-37A	MODIG JEFFREY C	37 RIVER ROAD	STURBRIDGE	MA	01566	37A RIVER ROAD
545-03442-028	MORSE CHARLES M JR	28 RIVER ROAD	STURBRIDGE	MA	01566	28 RIVER ROAD
545-03442-020	MORSE ELIZABETH M	20 RIVER ROAD	STURBRIDGE	MA	01566	20 RIVER ROAD
545-03432-001	REAL ESTATE FOR THE DOGS LLC	18 OAK RIDGE DRIVE	CHARLTON	MA	01507	1 RIVER ROAD
545-03432-006	SALTUS SCOTT	8227 CYPRESS TRACE BLVD	LAKELAND	FL	33809	6 RIVER ROAD
545-03443-021	STEFANSSON MAGNUS & BROWNE CATHERINE A	21 RIVER ROAD	STURBRIDGE	MA	01566	21 RIVER ROAD
270-03454-075	TOWN OF STURBRIDGE	308 MAIN STREET	STURBRIDGE	MA	01566	75 FARQUHAR ROAD
415-02925-255	U S ARMY CORPS OF ENGINEERS	696 VIRGINIA ROAD	CONCORD	MA	01742	255 MAIN STREET
545-03442-017	WILLMAN CHRISTOPHER	17 RIVER ROAD	STURBRIDGE	MA	01566	17 RIVER ROAD
545-03432-013	WILLMAN DEBORAH L	PO BOX 305	STURBRIDGE	MA	01566	13 RIVER ROAD
	BOARD OF ASSESSORS					
Above persons listed are record owners as they appear on the most recent applicable tax list.						
Assessors are not responsible for errors or omissions. RE: M.G.L. - Chapter 40A, Section 11						
Abutters List -	Conservation Commission - 200'					
RE: 9 RIVER ROAD						
Certified Copy						
Assessor:						
Date:	4-17-24					

Parcel ID	Owner	Owner Address	Owner City	State	Zip	Property Address
415-02925-266	BALIAN A & RESTREPO OLGA L	266 MAIN STREET	STURBRIDGE	MA	01566	266 MAIN STREET
415-02924-267	BARDSLEY TIMOTHY R	P O BOX 174	STURBRIDGE	MA	01566	267 MAIN STREET
270-03430-060	BERNIER CRAIG S	60 FARQUHAR ROAD	STURBRIDGE	MA	01566	60 FARQUHAR ROAD
270-03444-067	BOOTH JOHN E II	67 FARQUHAR ROAD	STURBRIDGE	MA	01566	67 FARQUHAR ROAD
270-03444-065	FARRA FABIO	65 FARQUHAR ROAD	STURBRIDGE	MA	01566	65 FARQUHAR ROAD
415-02915-269	FOULIS DAVID B	P.O. BOX 395	STURBRIDGE	MA	01566	269 MAIN STREET
415-02925-262	GOODWIN JAMIE	262 MAIN STREET	STURBRIDGE	MA	01566	262 MAIN STREET
315-02917-023	HOBBES LAURENCE P	15325 QUAIL RUN DRIVE	GAITHERSBURG	MD	20878	23 HALL ROAD
270-03444-072	IOZZO NICHOLAS A	72 FARQUHAR ROAD	STURBRIDGE	MA	01566	72 FARQUHAR ROAD
415-02935-235	KAITBENSKI STANLEY INC	P.O. BOX 725	FISKDALE	MA	01518	235 MAIN STREET
415-02945-225	KAITBENSKI STANLEY INC	P.O. BOX 725	FISKDALE	MA	01518	225 MAIN STREET
415-02925-260	KENDERIAN JUANITA	260 MAIN STREET	STURBRIDGE	MA	01566	260 MAIN STREET
270-03434-062	KOPACZ KENNETH B	9510 SPRING CIRCLE	PORT CHARLOTTE	FL	33981	62 FARQUHAR ROAD
330-02942-072	SAVAGE CLARA	4418 AVENIDA MANANA NE	ALBUQUERQUE	NM	87110	72 HAYNES STREET
415-02935-227	MANTHORNE MARK W TR OF DND RT TRUST	P.O. BOX 108	STURBRIDGE	MA	01566	227 MAIN STREET
270-03424-050	MARTEL BARBARA J	50 FARQUHAR ROAD	STURBRIDGE	MA	01566	50 FARQUHAR ROAD
415-02925-265	NGUYEN DAM	265 MAIN STREET	STURBRIDGE	MA	01566	265 MAIN STREET
545-03432-009	PETERSEN LYNNE	47 FARQUHAR ROAD	STURBRIDGE	MA	01566	9 RIVER ROAD
415-02925-258	PLAVA LLC	258 MAIN STREET	STURBRIDGE	MA	01566	258 MAIN STREET
545-03432-001	REAL ESTATE FOR THE DOGS LLC	18 OAK RIDGE DRIVE	CHARLTON	MA	01507	1 RIVER ROAD
415-02934-277	RESURRECTION REAL ESTATE LLC	P. O. BOX 187	STURBRIDGE	MA	01566	277 MAIN STREET
415-02924-271	RESURRECTION REAL ESTATE LLC	P. O. BOX 187	STURBRIDGE	MA	01566	271 MAIN STREET
415-02924-275	RESURRECTION REAL ESTATE LLC	P. O. BOX 187	STURBRIDGE	MA	01566	275 MAIN STREET
415-02945-223	RESURRECTION REAL ESTATE LLC	P.O. BOX 187	STURBRIDGE	MA	01566	223 MAIN STREET
270-03435-047	SARTY LYNNE	47 FARQUHAR ROAD	STURBRIDGE	MA	01566	47 FARQUHAR ROAD
330-02943-066	SHRI GAYATRI LLC	21 NEW BOSTON ROAD	STURBRIDGE	MA	01566	66 HAYNES STREET
330-02943-068	SHRI GAYATRI LLC	3 TURTLE CREEK CIRCLE	SHREWSBURY	MA	01545	68 HAYNES STREET
686-02935-047	SOLARI JEFFREY B	47 WILLARD ROAD	STURBRIDGE	MA	01566	47 WILLARD ROAD
686-02935-037	SOUTH CENTRAL REHAB RESOURCES	1 PICKER ROAD	STURBRIDGE	MA	01566	37 WILLARD ROAD
415-02935-245	STURBRIDGE REALTY CO INC	P.O. BOX 1104	STURBRIDGE	MA	01566	245 MAIN STREET
415-02935-241	STURBRIDGE REALTY CO INC	P.O. BOX 1104	STURBRIDGE	MA	01566	241 MAIN STREET
686-02935-035	SULLIVAN WILLIAM S	35 WILLARD ROAD	STURBRIDGE	MA	01566	35 WILLARD ROAD
330-02952-080	TOWN OF STURBRIDGE	308 MAIN STREET	STURBRIDGE	MA	01566	80 HAYNES STREET
536-02954-008	TOWN OF STURBRIDGE	308 MAIN STREET	STURBRIDGE	MA	01566	8 REGEP LANE
415-02924-278	TOWN OF STURBRIDGE	308 MAIN STREET	STURBRIDGE	MA	01566	278 MAIN STREET
415-02925-254	U S ARMY CORPS OF ENGINEERS	696 VIRGINIA ROAD	CONCORD	MA	01742	254 MAIN STREET
270-03434-055	U S ARMY CORPS OF ENGINEERS	696 VIRGINIA ROAD	CONCORD	MA	01742	55 FARQUHAR ROAD

BOARD OF ASSESSORS

Above persons listed are record owners as they appear on the most recent applicable tax list.

Assessors are not responsible for errors or omissions. RE: M.G.L. - Chapter 40A, Section 11

Abutters List - Conservation Commission - 200'

RE: 255 MAIN STREET

Certified Copy

Assessor:

Date: 4-17-24

Town of Sturbridge

Conservation Commission

STURBRIDGE CONSERVATION COMMISSION AFFIDAVIT OF SERVICE

Under the Massachusetts Wetlands Protection Act and the Town of Sturbridge Wetland Bylaws I, **Valerie Locker**, hereby certify under the pains and penalties of perjury that on **May 1, 2024**, I gave notification to abutters in compliance with the second paragraph of the Massachusetts General Laws Chapter 131, § 40, and the DEP Guide to Abutter Notification as well as the Town of Sturbridge Wetland Bylaws, in connection with the following matter:

X A **Notice of Intent** OR

____ A Request for Determination OR

____ An Abbreviated Notice of Resource Area Delineation

that was filed under the Massachusetts Wetlands Protection Act and the Town of Sturbridge Bylaws, by **Sturbridge DPW** with the Sturbridge Conservation Commission on **April 23, 2024,** for the property located at **1 River Road, 9 River Road, and 255 Main Street.**

The form of the Notification and a list of abutters to whom it was given and their addresses are included in the application file.

Valerie Locker 4/23/2024

(signature of applicant) (date)

Valerie Locker

(name of applicant-printed or typed)

Tighe&Bond

APPENDIX H

Property Location 1 RIVER ROAD | Map ID 545-/0 3432/- 001/ / | Bldg Name | State Use 3220
Vision ID 3195 | Account # 545-03432-001 | Bldg # 1 | Sec # 1 of 1 | Card # 1 of 3 | Print Date 7/31/2023 12:58:56 P

CURRENT OWNER

REAL ESTATE FOR THE DOGS LLC

18 OAK RIDGE DRIVE

CHARLTON MA 01507

GIS ID F_497319_2859565

TOPO TYPE	UTILITY	STREET	LOCATION
4 Rolling			
TOPO WET	**EASEMENT**	**TRAFFIC**	**CORNER**
	4 Bus. District		
DRAINAGE		**VIEW**	**COMMUNITY**
6 Septic			1 Paved

SUPPLEMENTAL DATA

Alt Prcl ID	545-03432-001	SEPTIC	
Parcel User_		FEATURES	
Parcel User_		TOPO	
Parcel User_		WF CHAR	
Parcel User_		USE	
POND		Assoc Pid#	

CURRENT ASSESSMENT

Description	Code	Appraisec	Assessed
COMMERC.	3220	469300	469,300
COM LAND	3220	132500	132,500
COMMERC.	3220	32900	32,900
COMMERC.	3400	10300	10,300
Total		645,000	645,000

348

STURBRIDGE, MA

RECORD OF OWNERSHIP

RECORD OF OWNERSHIP	BK-VOL/PAGE		SALE DATE	Q/U	V/I	SALE PRICE	VC
REAL ESTATE FOR THE DOGS LLC	59223	371	08-07-2018	Q	I	600,000	00
SMS REALTY LLC	45713	0149	04-26-2010	U	I	862,230	1
HOME OF THE HEBERT CANDIES INC	32772	0006	02-03-2004	U	I	100	1B
HOME OF THE HEBERT CANDIES INC	3916	0485				0	

PREVIOUS ASSESSMENTS (HISTORY)

Year	Code	Assessed	Year	Code	Assessed	Year	Code	Assessed
2024	3220	469,300	2023	3220	400,900	2022	3220	366,700
	3220	132,500		3220	115,100		3220	102,600
	3220	32,900		3220	32,900		3220	32,900
	3400	10,300		3400	8,800		3400	8,000
	Total	645,000		Total	557,700		Total	510,200

EXEMPTIONS

Year	Code	Description	Amount
		Total	0.00

OTHER ASSESSMENTS

Code	Description	Number	Amount	Comm Int

This signature acknowledges a visit by a Data Collector or Assessor

ASSESSING NEIGHBORHOOD

Nbhd	Nbhd Name	B	Tracing	Batch
C8				

NOTES

PAWS PLAZA

173-03432-001

APPRAISED VALUE SUMMARY

Appraised Bldg. Value (Card)	476,800
Appraised Xf (B) Value (Bldg)	2,800
Appraised Ob (B) Value (Bldg)	32,900
Appraised Land Value (Bldg)	132,500
Special Land Value	0
Total Appraised Parcel Value	645,000
Valuation Method	C
Exemption	0
Adjustment	
	645,000

BUILDING PERMIT RECORD

Permit Id	Issue Date	Type	Description	Amount	Insp Date	% Comp	Date Comp	Comments
MP0042	12-05-2018	CM				0		PAWZ PLAZA - PER
BP0187	07-09-2018	CM				0		SPRINKLER SYSTE
BP0186	07-09-2018	CM		341,000		0		INTERIOR RENO: P
BP0086	05-04-2017	CM	Commercial	19,000		100	06-22-2017	STRIP & REROOF

VISIT / CHANGE HISTORY

Date	Type	Is	Id	Cd	Purpost/Result
05-06-2021	02		AB	50	VISITED FOR CYC RE
06-04-2019	01		AB	50	VISITED FOR CYC RE
04-26-2007			RM	14	Field Review
06-09-2004			RD	14	Field Review
08-09-2000			BP		
02-27-1998			RM	00	Measur+Listed
02-27-1998			RM	00	Measur+Listed

LAND LINE VALUATION SECTION

B	Use Co	Description	Zone	D	Fronta	Depth	Land Units		Unit Price	I. Fact	S.A.	Ac Di	C. Fact	St. Idx	Adj	Notes	Special Pricing		Size A	Adj Unit Pric	Land Value
1	3220	Retail > 10,00	SUD				43,560	SF	1.85	1.000	A	1.000	1.00	CM4	1.60			0	1.000	2.96	128,900
1	3220	Retail > 10,00	SUD				1.020	AC	3,500.00	1.000	0	1.000	1.00		1.00			0	1.000	3,500	3,600
						Total Card Land Units	2.02	AC	Parcel Total Land Area:	2.02										Total Land Value	132,500

Property Location	1 RIVER ROAD		Map ID	545-/0 3432/- 001/ /		Bldg Name	State Use 3220
Vision ID 3195		Account # 545-03432-001		Bldg # 1	Sec # 1 of 1	Card # 1 of 3	Print Date 7/31/2023 12:58:56 P

CONSTRUCTION DETAIL

Element	Cd	Description
Style	17	Store
Model	94	Commercial
Grade	03	Average
Stories:	2	
Occupancy	1.00	
Exterior Wall 1	21	Stone/Masonry
Exterior Wall 2	14	Wood Shingle
Roof Structure	03	Gable/Hip
Roof Cover	03	Asph/F Gls/Cmp
Interior Wall 1	03	Plastered
Interior Wall 2	05	Drywall/Sheet
Interior Floor 1	14	Carpet
Interior Floor 2	05	Vinyl/Asphalt
Heating Fuel	02	Oil
Heating Type	05	Hot Water
AC Pct	50	None
Total Rooms		
Total Bedrms	00	
Total Baths	0	
Heat/AC	02	HEAT/AC SPLIT
Frame Type	02	WOOD FRAME
Baths/Plumbing	02	AVERAGE
Ceiling/Wall	06	CEIL & WALLS
Rooms/Prtns	02	AVERAGE
Wall Height	12.00	
% Comn Wall	0.00	
0cc	3220	Retail > 10,000 SF

CONSTRUCTION DETAIL (CONTINUED)

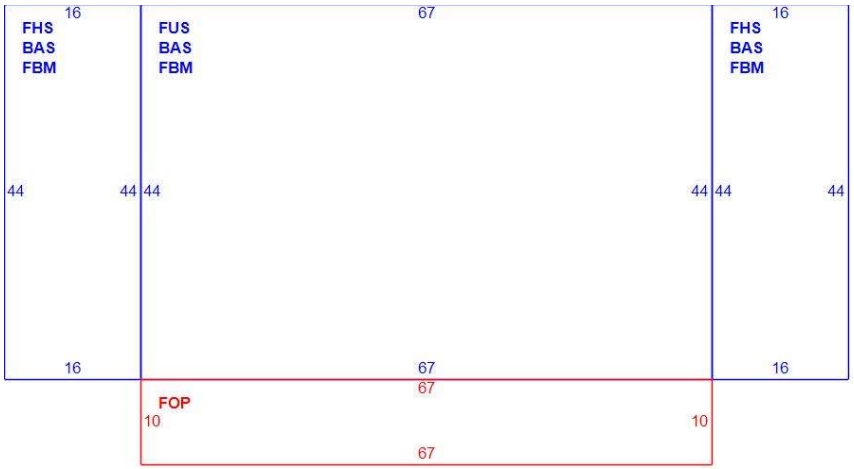
Element	Cd	Description

MIXED USE

Code	Description	Percentage
3220	Retail > 10,000 SF	100
		0
		0

COST / MARKET VALUATION

Adj Base Rate	87.62
	999,551
Net Other Adj	
Replace Cost	999,551
Year Built	1961
Effective Year Built	
Depreciation Code	A
Remodel Rating	
Year Remodeled	
Depreciation %	44
Functional Obsol	10
Economic Obsol	0
Cost Trend Factor	1
Condition	
% Complete	
Overall % Condition	46
Deprec Value	459,800
Dep % Ovr	
Dep Ovr Comment	
Misc Imp Ovr	
Misc Imp Ovr Comment	
Cost to Cure Ovr	
Cost to Cure Ovr Comment	



OB - OUTBUILDING & YARD ITEMS(L) / XF - BUILDING EXTRA FEATURES(B)

Code	Description	Su	Sub Type	Lan	Units	Unit Price	Yr Blt	%	Dep.	Cond	Gra	Qual	Apprais Va
PAV1	PAVING-ASP			L	16,3	3.70	1986	50	0.00			0.00	30,200
FPL3	2 STORY CH			B	2	3000.00	1970	46	2.00			0.00	2,800
LT5	MERC VAP/F			L	5	1000.00	2004	50	0.00			0.00	2,500
SGN2	DOUBLE SID			L	6	35.00		100	0.00			0.00	200

BUILDING SUB-AREA SUMMARY SECTION

Subarea	Description	Living	Gross	Eff Area	Unit Cost	Undeprec Value
BAS	First Floor	4,356	4,356		89.05	387,888
FBM	Basement, Finished	0	4,356		62.33	271,504
FHS	Half Story, Finished	704	1,408		44.52	62,689
FOP	Frame Porch	0	670		22.33	14,960
FUS	Upper Story, Finished	2,948	2,948		89.05	262,510
	Ttl Gross Liv / Lease Area	8,008	13,738			

Property Location 1 RIVER ROAD | Map ID 545-/0 3432/- 001/ / | Bldg Name | State Use 3220
Vision ID 3195 | Account # 545-03432-001 | Bldg # 2 | Sec # 1 of 1 | Card # 2 of 3 | Print Date 7/31/2023 12:58:57 P

CURRENT OWNER

REAL ESTATE FOR THE DOGS LLC

18 OAK RIDGE DRIVE

CHARLTON MA 01507

GIS ID F_497319_2859565

TOPO TYPE	UTILITY	STREET	LOCATION
4 Rolling			

TOPO WET	EASEMENT	TRAFFIC	CORNER
	4 Bus. District		

DRAINAGE	VIEW	COMMUNITY
6 Septic		1 Paved

SUPPLEMENTAL DATA

Alt Prcl ID	545-03432-001	SEPTIC	
Parcel User_		FEATURES	
Parcel User_		TOPO	
Parcel User_		WF CHAR	
Parcel User_		USE	
POND		Assoc Pid#	

CURRENT ASSESSMENT

Description	Code	Appraisec	Assessed
COMMERC.	3220	469300	469,300
COM LAND	3220	132500	132,500
COMMERC.	3220	32900	32,900
COMMERC.	3400	10300	10,300
Total		645,000	645,000

348

STURBRIDGE, MA

RECORD OF OWNERSHIP

RECORD OF OWNERSHIP	BK-VOL/PAGE		SALE DATE	Q/U	V/I	SALE PRICE	VC
REAL ESTATE FOR THE DOGS LLC	59223	371	08-07-2018	Q	I	600,000	00
SMS REALTY LLC	45713	0149	04-26-2010	U	I	862,230	1
HOME OF THE HEBERT CANDIES INC	32772	0006	02-03-2004	U	I	100	1B
HOME OF THE HEBERT CANDIES INC	3916	0485				0	

PREVIOUS ASSESSMENTS (HISTORY)

Year	Code	Assessed	Year	Code	Assessed	Year	Code	Assessed
2024	3220	469,300	2023	3220	400,900	2022	3220	366,700
	3220	132,500		3220	115,100		3220	102,600
	3220	32,900		3220	32,900		3220	32,900
	3400	10,300		3400	8,800		3400	8,000
	Total	645,000		Total	557,700		Total	510,200

EXEMPTIONS

Year	Code	Description	Amount
		Total	0.00

OTHER ASSESSMENTS

Code	Description	Number	Amount	Comm Int

This signature acknowledges a visit by a Data Collector or Assessor

ASSESSING NEIGHBORHOOD

Nbhd	Nbhd Name	B	Tracing	Batch
C8				

NOTES

28 FT DIA

ROUND BLD

VACANT (4-2010)

APPRAISED VALUE SUMMARY

Appraised Bldg. Value (Card)	476,800
Appraised Xf (B) Value (Bldg)	2,800
Appraised Ob (B) Value (Bldg)	32,900
Appraised Land Value (Bldg)	132,500
Special Land Value	0
Total Appraised Parcel Value	645,000
Valuation Method	C
Exemption	0
Adjustment	
	645,000

BUILDING PERMIT RECORD

Permit Id	Issue Date	Type	Description	Amount	Insp Date	% Comp	Date Comp	Comments

VISIT / CHANGE HISTORY

Date	Type	Is	Id	Cd	Purpost/Result

LAND LINE VALUATION SECTION

B	Use Co	Description	Zone	D	Fronta	Depth	Land Units		Unit Price	I. Fact	S.A.	Ac Di	C. Fact	St. Idx	Adj	Notes	Special Pricing		Size A	Adj Unit Pric	Land Value
2	3220	Retail > 10,00	SUD				0	SF	0.01	1.000	0	1.000	1.00		1.00			0	1.000	0.01	0
						Total Card Land Units	0.00	AC	Parcel Total Land Area:	2.02										Total Land Value	0

Property Location 1 RIVER ROAD | Map ID 545-/0 3432/- 001/ / | Bldg Name | State Use 3220
Vision ID 3195 | Account # 545-03432-001 | Bldg # 2 | Sec # 1 of 1 | Card # 2 of 3 | Print Date 7/31/2023 12:58:57 P

CONSTRUCTION DETAIL

Element	Cd	Description
Style	17	Store
Model	94	Commercial
Grade	02	Below Average
Stories:	2	
Occupancy	1.00	
Exterior Wall 1	15	Concr/Cinder
Exterior Wall 2		
Roof Structure	01	Flat
Roof Cover	04	Tar & Gravel
Interior Wall 1	01	Minim/Masonry
Interior Wall 2		
Interior Floor 1	03	Concr-Finished
Interior Floor 2	04	Concr Abv Grad
Heating Fuel	03	Gas
Heating Type	03	Hot Air-no Duc
AC Pct	0	None
Total Rooms		
Total Bedrms	00	
Total Baths	0	
Heat/AC	00	NONE
Frame Type	03	MASONRY
Baths/Plumbing	02	AVERAGE
Ceiling/Wall	01	SUSP-CEIL ONLY
Rooms/Prtns	02	AVERAGE
Wall Height	16.00	
% Comn Wall	0.00	
0cc	3220	Retail > 10,000 SF

CONSTRUCTION DETAIL (CONTINUED)

Element	Cd	Description

MIXED USE

Code	Description	Percentage
3220	Retail > 10,000 SF	100
		0
		0

COST / MARKET VALUATION

Adj Base Rate	145.26
	134,002
Net Other Adj	
Replace Cost	134,002
Year Built	1959
Effective Year Built	
Depreciation Code	P
Remodel Rating	
Year Remodeled	
Depreciation %	57
Functional Obsol	0
Economic Obsol	50
Cost Trend Factor	1
Condition	
% Complete	
Overall % Condition	5
Deprec Value	6,700
Dep % Ovr	
Dep Ovr Comment	
Misc Imp Ovr	
Misc Imp Ovr Comment	
Cost to Cure Ovr	
Cost to Cure Ovr Comment	

BAS (615 sf)

FUS (615 sf)

OB - OUTBUILDING & YARD ITEMS(L) / XF - BUILDING EXTRA FEATURES(B)

Code	Description	Su	Sub Type	Lan	Units	Unit Price	Yr Blt	%	Dep.	Cond	Gra	Qual	Apprais Va

BUILDING SUB-AREA SUMMARY SECTION

Subarea	Description	Living	Gross	Eff Area	Unit Cost	Undeprec Value
BAS	First Floor	615	615		108.94	67,001
FUS	Upper Story, Finished	615	615		108.94	67,001
	Ttl Gross Liv / Lease Area	1,230	1,230			

Property Location 1 RIVER ROAD | Map ID 545-/0 3432/- 001/ / | Bldg Name | State Use 3220
Vision ID 3195 | Account # 545-03432-001 | Bldg # 3 | Sec # 1 of 1 | Card # 3 of 3 | Print Date 7/31/2023 12:58:57 P

CURRENT OWNER

REAL ESTATE FOR THE DOGS LLC

18 OAK RIDGE DRIVE

CHARLTON MA 01507

GIS ID F_497319_2859565

TOPO TYPE	UTILITY	STREET	LOCATION
4 Rolling			

TOPO WET	EASEMENT	TRAFFIC	CORNER
	4 Bus. District		

DRAINAGE	VIEW	COMMUNITY
6 Septic		1 Paved

SUPPLEMENTAL DATA

Alt Prcl ID	545-03432-001	SEPTIC	
Parcel User_		FEATURES	
Parcel User_		TOPO	
Parcel User_		WF CHAR	
Parcel User_		USE	
POND		Assoc Pid#	

CURRENT ASSESSMENT

Description	Code	Appraisec	Assessed
COMMERC.	3220	469300	469,300
COM LAND	3220	132500	132,500
COMMERC.	3220	32900	32,900
COMMERC.	3400	10300	10,300
Total		645,000	645,000

348

STURBRIDGE, MA

RECORD OF OWNERSHIP

RECORD OF OWNERSHIP	BK-VOL/PAGE		SALE DATE	Q/U	V/I	SALE PRICE	VC
REAL ESTATE FOR THE DOGS LLC	59223	371	08-07-2018	Q	I	600,000	00
SMS REALTY LLC	45713	0149	04-26-2010	U	I	862,230	1
HOME OF THE HEBERT CANDIES INC	32772	0006	02-03-2004	U	I	100	1B
HOME OF THE HEBERT CANDIES INC	3916	0485				0	

PREVIOUS ASSESSMENTS (HISTORY)

Year	Code	Assessed	Year	Code	Assessed	Year	Code	Assessed
2024	3220	469,300	2023	3220	400,900	2022	3220	366,700
	3220	132,500		3220	115,100		3220	102,600
	3220	32,900		3220	32,900		3220	32,900
	3400	10,300		3400	8,800		3400	8,000
	Total	645,000		Total	557,700		Total	510,200

EXEMPTIONS

Year	Code	Description	Amount
		Total	0.00

OTHER ASSESSMENTS

Code	Description	Number	Amount	Comm Int

This signature acknowledges a visit by a Data Collector or Assessor

ASSESSING NEIGHBORHOOD

Nbhd	Nbhd Name	B	Tracing	Batch
C8				

NOTES

RED

CURRENTLY USE AS OFFICE

FOR MASS HIGHWAY

VACANT (4-2010)

APPRAISED VALUE SUMMARY

Appraised Bldg. Value (Card)	476,800
Appraised Xf (B) Value (Bldg)	2,800
Appraised Ob (B) Value (Bldg)	32,900
Appraised Land Value (Bldg)	132,500
Special Land Value	0
Total Appraised Parcel Value	645,000
Valuation Method	C
Exemption	0
Adjustment	
	645,000

BUILDING PERMIT RECORD

Permit Id	Issue Date	Type	Description	Amount	Insp Date	% Comp	Date Comp	Comments

VISIT / CHANGE HISTORY

Date	Type	Is	Id	Cd	Purpost/Result

LAND LINE VALUATION SECTION

B	Use Co	Description	Zone	D	Fronta	Depth	Land Units		Unit Price	I. Fact	S.A.	Ac Di	C. Fact	St. Idx	Adj	Notes	Special Pricing		Size A	Adj Unit Pric	Land Value
3	3400	Office	SUD				0	SF	0.01	1.000	0	1.000	1.00		1.00			0	1.000	0.01	0
						Total Card Land Units	0.00	AC	Parcel Total Land Area:	2.02										Total Land Value	0

Property Location	1 RIVER ROAD		Map ID	545-/0 3432/- 001/ /		Bldg Name	State Use 3220
Vision ID 3195		Account # 545-03432-001		Bldg # 3	Sec # 1 of 1	Card # 3 of 3	Print Date 7/31/2023 12:58:58 P

CONSTRUCTION DETAIL

Element	Cd	Description
Style	18	Office Bldg
Model	94	Commercial
Grade	01	Low Cost
Stories:	1	
Occupancy	1.00	
Exterior Wall 1	06	Board & Batten
Exterior Wall 2		
Roof Structure	03	Gable/Hip
Roof Cover	03	Asph/F Gls/Cmp
Interior Wall 1	05	Drywall/Sheet
Interior Wall 2	01	Minim/Masonry
Interior Floor 1	09	Pine/Soft Wood
Interior Floor 2	05	Vinyl/Asphalt
Heating Fuel	01	Coal or Wood
Heating Type	01	None
AC Pct	0	None
Total Rooms		
Total Bedrms	00	
Total Baths	0	
Heat/AC	00	NONE
Frame Type	02	WOOD FRAME
Baths/Plumbing	00	NONE
Ceiling/Wall	04	CEIL & MIN WL
Rooms/Prtns	02	AVERAGE
Wall Height	9.00	
% Comn Wall	0.00	
0cc	3400	Office

CONSTRUCTION DETAIL (CONTINUED)

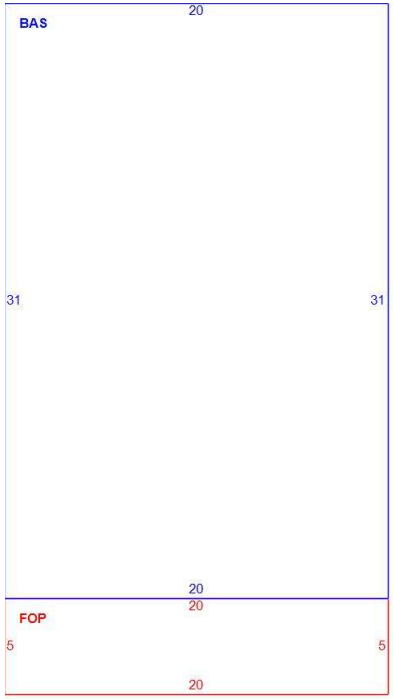
Element	Cd	Description

MIXED USE

Code	Description	Percentage
3400	Office	100
		0
		0

COST / MARKET VALUATION

Adj Base Rate	152.73
	49,255
Net Other Adj	
Replace Cost	49,255
Year Built	1950
Effective Year Built	
Depreciation Code	F
Remodel Rating	
Year Remodeled	
Depreciation %	54
Functional Obsol	0
Economic Obsol	25
Cost Trend Factor	1
Condition	
% Complete	
Overall % Condition	21
Deprec Value	10,300
Dep % Ovr	
Dep Ovr Comment	
Misc Imp Ovr	
Misc Imp Ovr Comment	
Cost to Cure Ovr	
Cost to Cure Ovr Comment	



OB - OUTBUILDING & YARD ITEMS(L) / XF - BUILDING EXTRA FEATURES(B)

Code	Description	Su	Sub Type	Lan	Units	Unit Price	Yr Blt	%	Dep.	Cond	Gra	Qual	Apprais Va

BUILDING SUB-AREA SUMMARY SECTION

Subarea	Description	Living	Gross	Eff Area	Unit Cost	Undeprec Value
BAS	First Floor	620	620		76.36	47,346
FOP	Frame Porch	0	100		19.09	1,909
	Ttl Gross Liv / Lease Area	620	720			

Property Location 9 RIVER ROAD | Map ID 545-/0 3432/- 009/ / | Bldg Name | State Use 1010
Vision ID 101900 | Account # 545-03432-009 | Bldg # 1 | Sec # 1 of 1 | Card # 1 of 1 | Print Date 7/31/2023 3:32:33 PM

CURRENT OWNER

PETERSEN LYNNE

47 FARQUHAR ROAD

STURBRIDGE MA 01566

GIS ID F_497943_2859035

TOPO TYPE	UTILITY	STREET	LOCATION
1 Level	5 Well		
TOPO WET	**EASEMENT**	**TRAFFIC**	**CORNER**
4 Rolling	2 Suburban		
DRAINAGE		**VIEW**	**COMMUNITY**
6 Septic			1 Paved

SUPPLEMENTAL DATA

Alt Prcl ID	545-03432-009	SEPTIC	
Parcel User_		FEATURES	
Parcel User_		TOPO	
Parcel User_		WF CHAR	
Parcel User_		USE	
POND		Assoc Pid#	

CURRENT ASSESSMENT

Description	Code	Appraisec	Assessed
RESIDNTL	1010	78600	78,600
RES LAND	1010	152000	152,000
	Total	230,600	230,600

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STURBRIDGE, MA

RECORD OF OWNERSHIP

RECORD OF OWNERSHIP	BK-VOL/PAGE		SALE DATE	Q/U	V/I	SALE PRICE	VC
PETERSEN LYNNE	66307	249	10-15-2021	U	I	175,000	1K
OLD STURBRIDGE VILLAGE, INC	58075	0302	11-21-2017	U	I	100	1K
EC REALTY CORPORATION	53204	0096	12-24-2014	U	I	250,000	1
BOSTON CHOCOLATE LLC	41559	0109	07-27-2007	U	I	187,500	1A
HOME OF THE HEBERT CANDIES INC	3916	0454	01-01-1930	U	I	0	

PREVIOUS ASSESSMENTS (HISTORY)

Year	Code	Assessed	Year	Code	Assessed	Year	Code	Assessed
2024	1010	78,600	2023	1010	67,200	2022	1010	61,000
	1010	152,000		1010	141,100		1010	134,100
	Total	230,600		Total	208,300		Total	195,100

EXEMPTIONS

Year	Code	Description	Amount
		Total	0.00

OTHER ASSESSMENTS

Code	Description	Number	Amount	Comm Int

This signature acknowledges a visit by a Data Collector or Assessor

APPRAISED VALUE SUMMARY

Appraised Bldg. Value (Card)	77,500
Appraised Xf (B) Value (Bldg)	1,100
Appraised Ob (B) Value (Bldg)	0
Appraised Land Value (Bldg)	152,000
Special Land Value	0
Total Appraised Parcel Value	230,600
Valuation Method	C
Exemption	0
Adjustment	
	230,600

ASSESSING NEIGHBORHOOD

Nbhd	Nbhd Name	B	Tracing	Batch
0001				

NOTES

SET BACK FROM STREET (ACCESS FROM RT 15)
FY18 ACREAGE UPDATED PER PLAN REVIEW
VACANT
SEMI TRAILER PARKED ON SITE
FRONTAGE ON RT 15, RIVER AND FARQUHAR
DIRT FLR IN BSMT
OVERHEAD POWER LINES RUN THRU PARCEL

BUILDING PERMIT RECORD

Permit Id	Issue Date	Type	Description	Amount	Insp Date	% Comp	Date Comp	Comments

VISIT / CHANGE HISTORY

Date	Type	Is	Id	Cd	Purpost/Result
04-02-2015	01		AJ	53	VALUE REVIEW

LAND LINE VALUATION SECTION

B	Use Co	Description	Zone	D	Fronta	Depth	Land Units		Unit Price	I. Fact	S.A.	Ac Di	C. Fact	St. Idx	Adj	Notes	Special Pricing		Size A	Adj Unit Pric	Land Value
1	1010	Single Fam	SU				43,560	SF	1.90	1.000	5	1.000	1.00		1.00			0	1.000	1.9	82,800
1	1010	Single Fam	SU				19.780	AC	3,500.00	1.000	0	1.000	1.00		1.00			0	1.000	3,500	69,200
1	1010	Single Fam	SU		900		900.000	FF	0.00	1.000	0	1.000	1.00		1.00			0	1.000	0	0
						Total Card Land Units	20.78	AC	Parcel Total Land Area:	20.78										Total Land Value	152,000

Property Location 9 RIVER ROAD | Map ID 545-/0 3432/- 009/ / | Bldg Name | State Use 1010
Vision ID 101900 | Account # 545-03432-009 | Bldg # 1 | Sec # 1 of 1 | Card # 1 of 1 | Print Date 7/31/2023 3:32:33 PM

CONSTRUCTION DETAIL

Element	Cd	Description
Style	05	Bungalow
Model	01	Residential
Grade:	03	Average
Stories:	1	
Occupancy	1	
Exterior Wall 1	11	Clapboard
Exterior Wall 2		
Roof Structure:	03	Gable/Hip
Roof Cover	03	Asph/F Gls/Cmp
Interior Wall 1	03	Plastered
Interior Wall 2		
Interior Flr 1	12	Hardwood
Interior Flr 2		
Heat Fuel	02	Oil
Heat Type:	06	Steam
AC Type:	01	None
Total Bedrooms	02	2 Bedrooms
Total Bthrms:	1	
Total Half Baths	0	0
Total Xtra Fixtrs		
Total Rooms:	4	
Bath Style:	02	Average
Kitchen Style:	02	Average
Num Kitchens		

CONSTRUCTION DETAIL (CONTINUED)

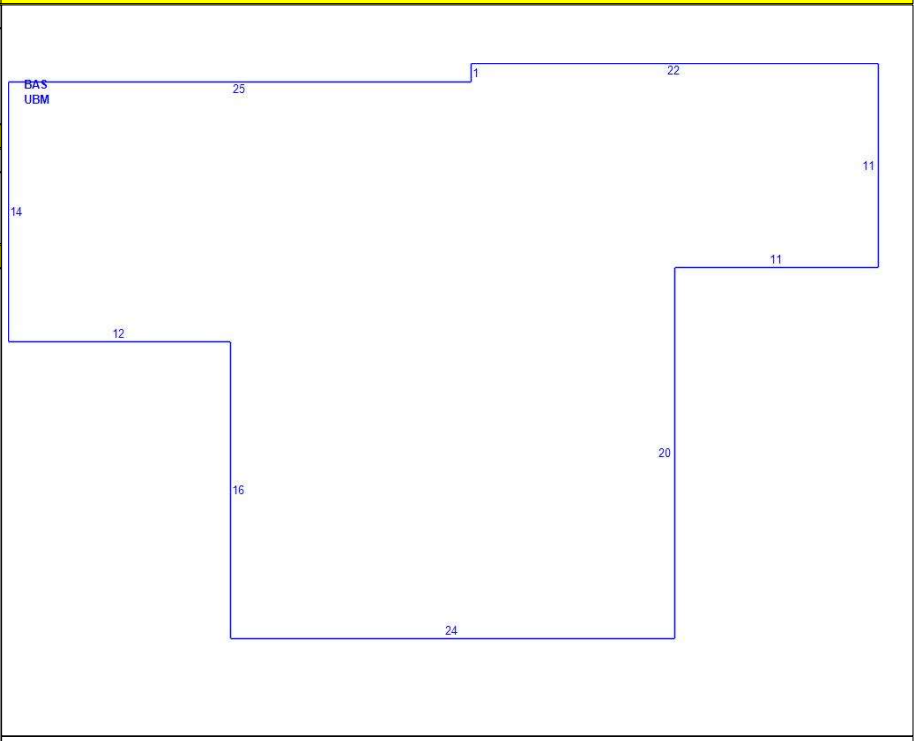
Element	Cd	Description

MIXED USE

Code	Description	Percentage
1010	Single Fam	100
		0
		0

COST / MARKET VALUATION

Adj Base Rate	150.74
Replace Cost	184,506
Net Other Adj	
Year Built	1956
Effective Year Built	
Depreciation Code	VP
Remodel Rating	
Year Remodeled	
Depreciation %	58
Functional Obsol	
Economic Obsol	
Cost Trend Factor	1
Condition	
% Complete	
Overall % Condition	42
Deprec Value	77,500
Dep % Ovr	
Dep Ovr Comment	
Misc Imp Ovr	
Misc Imp Ovr Comment	
Cost to Cure Ovr	
Cost to Cure Ovr Comment	



OB - OUTBUILDING & YARD ITEMS(L) / XF - BUILDING EXTRA FEATURES(B)

Code	Description	Su	Sub Type	Lan	Units	Unit Price	Yr Blt	%	Dep.	Cond	Gra	Qual	Apprais Va
FPL1	FIREPLACE			B	1	2500.00	1961	45	1.00			0.00	1,100

BUILDING SUB-AREA SUMMARY SECTION

Subarea	Description	Living	Gross	Eff Area	Unit Cost	Undeprec Value
BAS	First Floor	1,020	1,020		150.74	153,755
UBM	Basement, Unfinished	0	1,020		30.15	30,751
	Ttl Gross Liv / Lease Area	1,020	2,040			

Property Location 255 MAIN STREET | Map ID 415-/0 2925/- 255/ / | Bldg Name | State Use 9000
Vision ID 2296 | Account # 415-02925-255 | Bldg # 1 | Sec # 1 of 1 | Card # 1 of 1 | Print Date 7/31/2023 11:14:11 A

CURRENT OWNER

U S ARMY CORPS OF ENGINEERS
RE DIVISION N E DISTRICT
696 VIRGINIA ROAD

CONCORD MA 01742-275

GIS ID F_498228_2860208

TOPO TYPE	UTILITY	STREET	LOCATION
5 Wetland			

TOPO WET	EASEMENT	TRAFFIC	CORNER
3 Low	2 Suburban		

DRAINAGE	VIEW	COMMUNITY
		1 Paved

SUPPLEMENTAL DATA

Alt Prcl ID	415-02925-255	SEPTIC	
Parcel User_		FEATURES	
Parcel User_		TOPO	
Parcel User_		WF CHAR	
Parcel User_		USE	
POND		Assoc Pid#	

CURRENT ASSESSMENT

Description	Code	Appraisec	Assessed
EXM LAND	9000	470600	470,600
		Total	470,600	470,600

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STURBRIDGE, MA

RECORD OF OWNERSHIP

RECORD OF OWNERSHIP	BK-VOL/PAGE		SALE DATE	Q/U	V/I	SALE PRICE	VC
U S ARMY CORPS OF ENGINEERS	00	0	01-01-1900	U	V	0	

PREVIOUS ASSESSMENTS (HISTORY)

Year	Code	Assessed	Year	Code	Assessed	Year	Code	Assessed
2024	9000	470,600	2023	9000	449,900	2022	9000	435,000
	Total	470,600		Total	449,900		Total	435,000

EXEMPTIONS

Year	Code	Description	Amount
		Total	0.00

OTHER ASSESSMENTS

Code	Description	Number	Amount	Comm Int

This signature acknowledges a visit by a Data Collector or Assessor

ASSESSING NEIGHBORHOOD

Nbhd	Nbhd Name	B	Tracing	Batch
5				

APPRAISED VALUE SUMMARY

Appraised Bldg. Value (Card)	0
Appraised Xf (B) Value (Bldg)	0
Appraised Ob (B) Value (Bldg)	0
Appraised Land Value (Bldg)	470,600
Special Land Value	0
Total Appraised Parcel Value	470,600
Valuation Method	C
Exemption	0
Adjustment	
	470,600

NOTES

FY2013 ACREAGE CHANGE FROM 122.07 TO
121.96
QUINNEBAUG RIVER
FRONTAGE ON OLD RTE 15, MAIN OPP HALL
FARQUHAR @ RIVER BRIDGE

BUILDING PERMIT RECORD

Permit Id	Issue Date	Type	Description	Amount	Insp Date	% Comp	Date Comp	Comments

VISIT / CHANGE HISTORY

Date	Type	Is	Id	Cd	Purpost/Result
03-04-2015	01		AJ	53	VALUE REVIEW

LAND LINE VALUATION SECTION

B	Use Co	Description	Zone	D	Fronta	Depth	Land Units		Unit Price	I. Fact	S.A.	Ac Di	C. Fact	St. Idx	Adj	Notes	Special Pricing		Size A	Adj Unit Pric	Land Value
1	9000	US Governme	SR				43,560	SF	1.85	1.000	A	1.000	1.00	CM2	1.90			0	1.000	3.52	153,100
1	9000	US Governme	SR				120.960	AC	3,500.00	1.000	0	1.000	0.75		1.00			0	1.000	2,625	317,500
						Total Card Land Units	121.96	AC	Parcel Total Land Area:	121.96										Total Land Value	470,600

Property Location 255 MAIN STREET | Map ID 415-/0 2925/- 255/ / | Bldg Name | State Use 9000
Vision ID 2296 | Account # 415-02925-255 | Bldg # 1 | Sec # 1 of 1 | Card # 1 of 1 | Print Date 7/31/2023 11:14:11 A

CONSTRUCTION DETAIL

Element	Cd	Description
Style	99	Vacant Land
Model	00	Vacant
Grade:		
Stories:		
Occupancy		
Exterior Wall 1		
Exterior Wall 2		
Roof Structure:		
Roof Cover		
Interior Wall 1		
Interior Wall 2		
Interior Flr 1		
Interior Flr 2		
Heat Fuel		
Heat Type:		
AC Type:		
Total Bedrooms		
Total Bthrms:		
Total Half Baths		
Total Xtra Fixtrs		
Total Rooms:		
Bath Style:		
Kitchen Style:		
Num Kitchens		

CONSTRUCTION DETAIL (CONTINUED)

Element	Cd	Description

MIXED USE

Code	Description	Percentage
9000	US Government V	100
		0
		0

COST / MARKET VALUATION

Adj Base Rate	
Replace Cost	0
Net Other Adj	
Year Built	0
Effective Year Built	
Depreciation Code	
Remodel Rating	
Year Remodeled	
Depreciation %	
Functional Obsol	0
Economic Obsol	0
Cost Trend Factor	1
Condition	
% Complete	0
Overall % Condition	
Deprec Value	0
Dep % Ovr	
Dep Ovr Comment	
Misc Imp Ovr	
Misc Imp Ovr Comment	
Cost to Cure Ovr	
Cost to Cure Ovr Comment	

No Sketch

OB - OUTBUILDING & YARD ITEMS(L) / XF - BUILDING EXTRA FEATURES(B)

Code	Description	Su	Sub Type	Lan	Units	Unit Price	Yr Blt	%	Dep.	Cond	Gra	Qual	Apprais Va

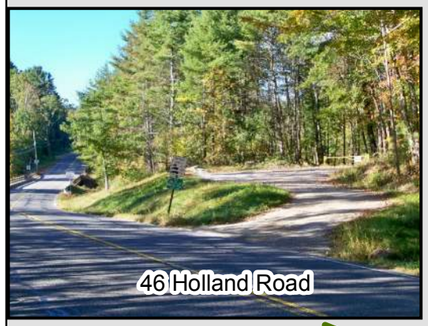
BUILDING SUB-AREA SUMMARY SECTION

Subarea	Description	Living	Gross	Eff Area	Unit Cost	Undeprec Value
	Ttl Gross Liv / Lease Area	0	0			

Tighe&Bond

APPENDIX I

Grand Trunk Trail (GTT) - A Portion of the Titanic Rail Trail



Information Center/Public Restrooms
380 Main Street

Sturbridge

Brimfield

Streeter Road State Beach

Heins Farm

Leadmine Mountain Conservation Lands

Southbridge

Westville Lake Recreation Area

MASSACHUSETTS TURNPIKE

LONG POND

CEDAR POND

BROOKFIELD ROAD

BRIMFIELD ROAD

MAIN STREET

STREETER

RIVERVIEW

EAST BRIMFIELD

STALLION HILL

ROUTE 20

ROUTE 84

HALL ROAD

PODUNK PIKE

STURBRIDGE

QUINEBAUG RIVER

FARQUHAR

SOUTHBRIDGE ROAD

WALLACE

HAMILTON STREET

MAIN STREET

49

20

131

84

Notes of Interest:
The Sturbridge Trails Committee (STC) is a volunteer town board charged with overseeing the development, construction and maintenance of the Grand Trunk Trail (GTT).
The GTT is part of the larger 66 mile Titanic Rail Trail system.
The STC is assisted in partnership with the US Army Corp of Engineers (USACE), the Friends of the Titanic Rail Trail, and the Friends of Sturbridge Trails.
The GTT is a multiple, non-motorized use, universally accessible recreation path.
It connects to several town open space lands as well as two USACE recreational areas as indicated on the map. The trail illustrated on this map when complete will be 6 miles long, traveling in an east-west direction.
Completed sections have a fine dense grade hard packed surface.

Trail Segments

Grand Trunk Trail Segments

Mileage is Approximate

- Fiskdale Section Complete 1.867 Miles
- Fiskdale/Sturbridge Section Proposed 2.91 Miles
- Sturbridge Section On-Road .64 Miles
- Under Construction .37 Miles
- Westville Section Complete 3.05 Miles
- Open Space

N W E S

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