µ≤Town of Ayer
CONSERVATION COMMISSION
Town Hall ♦ One Main Street ♦ Ayer, MA 01432
P: 978-772-8220 x 143

MEETING AGENDA
Thursday, January 27, 2022

Due to the ongoing COVID-19 Pandemic, in accordance with Chapter 20 of the Act of 2021, suspending certain provisions of the Open Meeting Law (OML), public bodies otherwise governed by the OML are temporarily relieved from the requirement that meetings be held in public places, open and physically accessible to the public, so long as measures are taken to ensure public access to the bodies' deliberations "through adequate, alternative means." This meeting will be live on Zoom. The public may participate remotely by joining Zoom **(Meeting ID# 840 4058 0886)** or by calling **(929-205-6099)**. For additional information about remote participation, please contact Conservation Commission at concom@ayer.ma.us or by calling 978-772-8220 ext. 143 prior to the meeting.

7:00 PM **GENERAL BUSINESS / OPEN SESSION**

- Approval of Meeting Minutes for January 6, 2022
- Accounts Payable
- Public Input

Public Hearing (cont'd): Notice of Intent (NOI) – Willow Road and Route 2A, Massachusetts Department of Transportation-Highway Division (MassDOT), Danielle Spicer, MassDEP File # 100-0477, Assessor's Map 30

Public Meeting: Request for Determination of Applicability (RDA) – 4 Shelly Lane, Seann Ives, Assessor's Map 34, Parcel 153

Discussion: Review of Contract with North County Land Trust for Conservation Restriction Services

Discussion: Review Draft Request for Proposals (RFP), 2022 Ayer Pond Treatments

Discussion: Water Chestnut removal project for Grove Pond, Laurie Nehring

Discussion: Update on Stratton Hill

CONSERVATION OFFICE AND MEMBER UPDATES

- Waterways Signs project
- ConCom Annual Report
- FY2023 Budget
- Conservation Job Vacancy
- Abutter notification requirement for utility easement projects
- Update on Fertilizer Bylaw review by Attorney General

9:00 PM **ADJOURN**

Next Scheduled Meeting: 7 PM, February 10, 2022

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

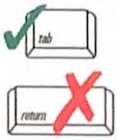
Ayer
City/Town

WPA Form 1- Request for Determination of Applicability

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

A. General Information

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



1. Applicant:

Seann Ives	seann.ives@gmail.com	
Name	E-Mail Address	
4 Shelly Lane		
Mailing Address		
Ayer	MA	01432
City/Town	State	Zip Code
617-710-8254		
Phone Number	Fax Number (if applicable)	

2. Representative (if any):

Firm		
Contact Name	E-Mail Address	
Mailing Address		
City/Town	State	Zip Code
Phone Number	Fax Number (if applicable)	

B. Determinations

1. I request the Ayer (Conservation Commission) make the following determination(s). Check any that apply:

☒ a. whether the **area** depicted on plan(s) and/or map(s) referenced below is an area subject to jurisdiction of the Wetlands Protection Act.

☐ b. whether the **boundaries** of resource area(s) depicted on plan(s) and/or map(s) referenced below are accurately delineated.

☒ c. whether the **work** depicted on plan(s) referenced below is subject to the Wetlands Protection Act.

☒ d. whether the area and/or work depicted on plan(s) referenced below is subject to the jurisdiction of any **municipal wetlands ordinance** or **bylaw** of:

Ayer
Name of Municipality

☐ e. whether the following **scope of alternatives** is adequate for work in the Riverfront Area as depicted on referenced plan(s).

C. Project Description

1. a. Project Location (use maps and plans to identify the location of the area subject to this request):

4 Shelly Lane	Ayer
Street Address	City/Town
34	153
Assessors Map/Plat Number	Parcel/Lot Number

b. Area Description (use additional paper, if necessary):

Backyard sloping down to Grove Pond

c. Plan and/or Map Reference(s):

Attached and https://docs.google.com/drawings/d/1DsNZUVufk3wwMIOHyZF0veTFZAJ4KJeqkx1j7mcwWOQ/edit?usp=sharing	1/17/22
Title	Date
Title	Date
Title	Date

2. a. Work Description (use additional paper and/or provide plan(s) of work, if necessary):

Level 16' x 12' area by fire pit 25 ft. from shore of Grove Pond. Install 20"-24" stone landscape retaining wall on uphll side; line lower edge with stone or timber; fill in between with pea gravel.

C. Project Description (cont.)

b. Identify provisions of the Wetlands Protection Act or regulations which may exempt the applicant from having to file a Notice of Intent for all or part of the described work (use additional paper, if necessary).

Minor activity in already-disturbed backyard area, no impact to pond

3. a. If this application is a Request for Determination of Scope of Alternatives for work in the Riverfront Area, indicate the one classification below that best describes the project.

- ☐ Single family house on a lot recorded on or before 8/1/96
- ☐ Single family house on a lot recorded after 8/1/96
- ☐ Expansion of an existing structure on a lot recorded after 8/1/96
- ☐ Project, other than a single-family house or public project, where the applicant owned the lot before 8/7/96
- ☐ New agriculture or aquaculture project
- ☐ Public project where funds were appropriated prior to 8/7/96
- ☐ Project on a lot shown on an approved, definitive subdivision plan where there is a recorded deed restriction limiting total alteration of the Riverfront Area for the entire subdivision
- ☐ Residential subdivision; institutional, industrial, or commercial project
- ☐ Municipal project
- ☐ District, county, state, or federal government project
- ☐ Project required to evaluate off-site alternatives in more than one municipality in an Environmental Impact Report under MEPA or in an alternatives analysis pursuant to an application for a 404 permit from the U.S. Army Corps of Engineers or 401 Water Quality Certification from the Department of Environmental Protection.

b. Provide evidence (e.g., record of date subdivision lot was recorded) supporting the classification above (use additional paper and/or attach appropriate documents, if necessary.)

D. Signatures and Submittal Requirements

I hereby certify under the penalties of perjury that the foregoing Request for Determination of Applicability and accompanying plans, documents, and supporting data are true and complete to the best of my knowledge.

I further certify that the property owner, if different from the applicant, and the appropriate DEP Regional Office were sent a complete copy of this Request (including all appropriate documentation) simultaneously with the submittal of this Request to the Conservation Commission.

Failure by the applicant to send copies in a timely manner may result in dismissal of the Request for Determination of Applicability.

Name and address of the property owner:

Seann Ives
Name

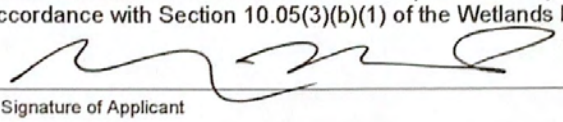
4 Shelly Lane
Mailing Address

Ayer
City/Town

MA | 01432
State | Zip Code

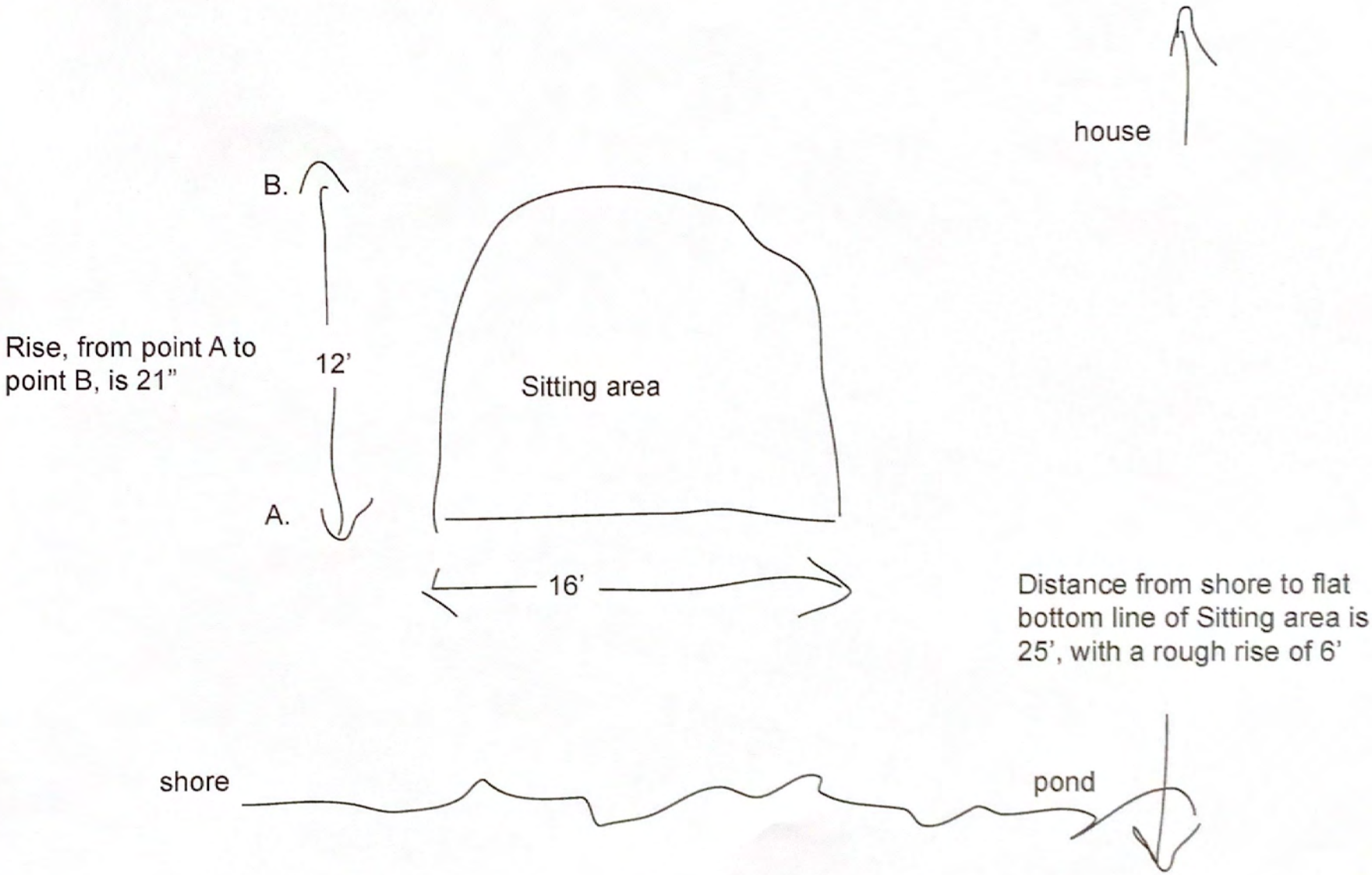
Signatures:

I also understand that notification of this Request will be placed in a local newspaper at my expense in accordance with Section 10.05(3)(b)(1) of the Wetlands Protection Act regulations.



1/17/22
Signature of Applicant | Date

Signature of Representative (if any) | Date


house
B.
Rise, from point A to point B, is 21”
12’
Sitting area
A.
16’
Distance from shore to flat bottom line of Sitting area is 25’, with a rough rise of 6’
shore
pond

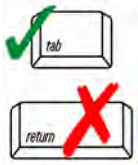
Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 2 – Determination of Applicability

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

A. General Information

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



From:

Ayer
Conservation Commission

To: Applicant

Seann Ives
Name

4 Shelly Lane
Mailing Address

Ayer | MA | 01432
City/Town | State | Zip Code

Property Owner (if different from applicant):

Name

Mailing Address

City/Town | State | Zip Code

1. Title and Date (or Revised Date if applicable) of Final Plans and Other Documents:

Title	Date
Attached	7/15/20

2. Date Request Filed:

7/24/20

B. Determination

Pursuant to the authority of M.G.L. c. 131, § 40, the Conservation Commission considered your Request for Determination of Applicability, with its supporting documentation, and made the following Determination.

Project Description (if applicable):

The project

Project Location:

Street Address | City/Town

Assessors Map/Plat Number | Parcel/Lot Number

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 2 – Determination of Applicability
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

B. Determination (cont.)

The following Determination(s) is/are applicable to the proposed site and/or project relative to the Wetlands Protection Act and regulations:

Positive Determination
Note: No work within the jurisdiction of the Wetlands Protection Act may proceed until a final Order of Conditions (issued following submittal of a Notice of Intent or Abbreviated Notice of Intent) or Order of Resource Area Delineation (issued following submittal of Simplified Review ANRAD) has been received from the issuing authority (i.e., Conservation Commission or the Department of Environmental Protection).

☐ 1. The area described on the referenced plan(s) is an area subject to protection under the Act. Removing, filling, dredging, or altering of the area requires the filing of a Notice of Intent.

☐ 2a. The boundary delineations of the following resource areas described on the referenced plan(s) are confirmed as accurate. Therefore, the resource area boundaries confirmed in this Determination are binding as to all decisions rendered pursuant to the Wetlands Protection Act and its regulations regarding such boundaries for as long as this Determination is valid.

☐ 2b. The boundaries of resource areas listed below are not confirmed by this Determination, regardless of whether such boundaries are contained on the plans attached to this Determination or to the Request for Determination.

☐ 3. The work described on referenced plan(s) and document(s) is within an area subject to protection under the Act and will remove, fill, dredge, or alter that area. Therefore, said work requires the filing of a Notice of Intent.

☐ 4. The work described on referenced plan(s) and document(s) is within the Buffer Zone and will alter an Area subject to protection under the Act. Therefore, said work requires the filing of a Notice of Intent or ANRAD Simplified Review (if work is limited to the Buffer Zone).

☐ 5. The area and/or work described on referenced plan(s) and document(s) is subject to review and approval by:

Name of Municipality

Pursuant to the following municipal wetland ordinance or bylaw:

Name | Ordinance or Bylaw Citation

B. Determination (cont.)

☐ 6. The following area and/or work, if any, is subject to a municipal ordinance or bylaw but not subject to the Massachusetts Wetlands Protection Act:

☐ 7. If a Notice of Intent is filed for the work in the Riverfront Area described on referenced plan(s) and document(s), which includes all or part of the work described in the Request, the applicant must consider the following alternatives. (Refer to the wetland regulations at 10.58(4)c. for more information about the scope of alternatives requirements):

- ☐ Alternatives limited to the lot on which the project is located.
- ☐ Alternatives limited to the lot on which the project is located, the subdivided lots, and any adjacent lots formerly or presently owned by the same owner.
- ☐ Alternatives limited to the original parcel on which the project is located, the subdivided parcels, any adjacent parcels, and any other land which can reasonably be obtained within the municipality.
- ☐ Alternatives extend to any sites which can reasonably be obtained within the appropriate region of the state.

Negative Determination

Note: No further action under the Wetlands Protection Act is required by the applicant. However, if the Department is requested to issue a Superseding Determination of Applicability, work may not proceed on this project unless the Department fails to act on such request within 35 days of the date the request is post-marked for certified mail or hand delivered to the Department. Work may then proceed at the owner's risk only upon notice to the Department and to the Conservation Commission. Requirements for requests for Superseding Determinations are listed at the end of this document.

☐ 1. The area described in the Request is not an area subject to protection under the Act or the Buffer Zone.

☐ 2. The work described in the Request is within an area subject to protection under the Act, but will not remove, fill, dredge, or alter that area. Therefore, said work does not require the filing of a Notice of Intent.

☐ 3. The work described in the Request is within the Buffer Zone, as defined in the regulations, but will not alter an Area subject to protection under the Act. Therefore, said work does not require the filing of a Notice of Intent, subject to the following conditions (if any).

☐ 4. The work described in the Request is not within an Area subject to protection under the Act (including the Buffer Zone). Therefore, said work does not require the filing of a Notice of Intent, unless and until said work alters an Area subject to protection under the Act.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 2 – Determination of Applicability

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

B. Determination (cont.)

☐ 5. The area described in the Request is subject to protection under the Act. Since the work described therein meets the requirements for the following exemption, as specified in the Act and the regulations, no Notice of Intent is required:

Exempt Activity (site applicable statuatory/regulatory provisions)

☐ 6. The area and/or work described in the Request is not subject to review and approval by:

Name of Municipality

Pursuant to a municipal wetlands ordinance or bylaw.

Name | Ordinance or Bylaw Citation

C. Authorization

This Determination is issued to the applicant and delivered as follows:

☐ by hand delivery on | ☐ by certified mail, return receipt requested on

Date | Date

This Determination is valid for **three years** from the date of issuance (except Determinations for Vegetation Management Plans which are valid for the duration of the Plan). This Determination does not relieve the applicant from complying with all other applicable federal, state, or local statutes, ordinances, bylaws, or regulations.

This Determination must be signed by a majority of the Conservation Commission. A copy must be sent to the appropriate DEP Regional Office (see https://www.mass.gov/service-details/massdep-regional-offices-by-community) and the property owner (if different from the applicant).

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 2 – Determination of Applicability
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

C. Authorization (cont.)

Signatures:

Signature	Printed Name
Signature	Printed Name
Signature	Printed Name
Signature	Printed Name
Signature	Printed Name
Signature	Printed Name
Signature	Printed Name
Signature	Printed Name
Signature	Printed Name

D. Appeals

The applicant, owner, any person aggrieved by this Determination, any owner of land abutting the land upon which the proposed work is to be done, or any ten residents of the city or town in which such land is located, are hereby notified of their right to request the appropriate Department of Environmental Protection Regional Office (see https://www.mass.gov/service-details/massdep-regional-offices-by-community) to issue a Superseding Determination of Applicability. The request must be made by certified mail or hand delivery to the Department, with the appropriate filing fee and Fee Transmittal Form (see Request for Departmental Action Fee Transmittal Form) as provided in 310 CMR 10.03(7) within ten business days from the date of issuance of this Determination. A copy of the request shall at the same time be sent by certified mail or hand delivery to the Conservation Commission and to the applicant if he/she is not the appellant. The request shall state clearly and concisely the objections to the Determination which is being appealed. To the extent that the Determination is based on a municipal ordinance or bylaw and not on the Massachusetts Wetlands Protection Act or regulations, the Department of Environmental Protection has no appellate jurisdiction.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

Request for Departmental Action Fee Transmittal Form

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

DEP File Number:

Provided by DEP

A. Request Information

1. Location of Project

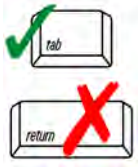
a. Street Address

b. City/Town, Zip

c. Check number

d. Fee amount

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



2. Person or party making request (if appropriate, name the citizen group's representative):

Name

Mailing Address

City/Town

State

Zip Code

Phone Number

Fax Number (if applicable)

3. Applicant (as shown on Determination of Applicability (Form 2), Order of Resource Area Delineation (Form 4B), Order of Conditions (Form 5), Restoration Order of Conditions (Form 5A), or Notice of Non-Significance (Form 6)):

Name

Mailing Address

City/Town

State

Zip Code

Phone Number

Fax Number (if applicable)

4. DEP File Number:

B. Instructions

1. When the Departmental action request is for (check one):

☐ Superseding Order of Conditions – Fee: $120.00 (single family house projects) or $245 (all other projects)

☐ Superseding Determination of Applicability – Fee: $120

☐ Superseding Order of Resource Area Delineation – Fee: $120

Send this form and check or money order, payable to the *Commonwealth of Massachusetts,* to:

Department of Environmental Protection
Box 4062
Boston, MA 02211

Request for Departmental Action Fee Transmittal Form

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

DEP File Number:

Provided by DEP

B. Instructions (cont.)

2. On a separate sheet attached to this form, state clearly and concisely the objections to the Determination or Order which is being appealed. To the extent that the Determination or Order is based on a municipal bylaw, and not on the Massachusetts Wetlands Protection Act or regulations, the Department has no appellate jurisdiction.

3. Send a **copy** of this form and a **copy** of the check or money order with the Request for a Superseding Determination or Order by certified mail or hand delivery to the appropriate DEP Regional Office (see https://www.mass.gov/service-details/massdep-regional-offices-by-community).

4. A copy of the request shall at the same time be sent by certified mail or hand delivery to the Conservation Commission and to the applicant, if he/she is not the appellant.

Re: Conservation Commission Administrative Approval Process

Seann Ives <seann.ives@gmail.com>

Sun 12/5/2021 3:33 PM

To: Ayer Conservation Commission <concom@ayer.ma.us>;

Hi Jo-Anne,

Of course shortly after you sent this over, I started a new job and all my spare time flew out the window! Ha! Regardless...

Attached is a copy of my Project Request form. To add some color, several years ago the beavers hit this area of my back yard, on Grove Pond, and cleared out a bunch of smaller trees and nearly got some of the big ones before I saw what they were up to and installed wire fence around the trees. This summer we put a couple of chairs down there to sit by the pond, then just did some simple raking, brought down a small fire pit, and picked up a few more chairs. I've included a few pictures to give you a better idea. What we'd like to do is just level it a bit and make a half circle sitting area. The uphill edge (the rounded part) we'd like to line with a simple stone hardscape wall, only about 20-24" high, and the bottom edge (a line parallel to the water's edge) we'd put in either a stone edge or perhaps treated timber, to prevent erosion, and then we'd fill with something simple like pea gravel.

As mentioned on the form, we'll hire someone to do the work (next spring ideally) but haven't started looking. I intend to call Powell's over in Lunenburg or Pinard's here in town.

Any recommendations or suggestions you have would be very welcome! Also, please feel free to stop by any time to view the property. If we're not home or in the middle of a work meeting, feel free to walk right around the house and you'll see the little path down to the pond.

As a reminder, the house mailing address (and the number you'll see on the mailbox and house) is 4 Shelly Lane. Town records will list it as 2 Shelly Lane.

Thanks!
Seann Ives
617-710-8254

REQUEST FOR ADMINISTRATIVE APPROVAL

AYER CONSERVATION COMMISSION
AYER TOWN HALL
1 MAIN STREET AYER, MA 01432
TELEPHONE: 978-772-8220 EXT. 143

Project Request – Completed by Applicant

Date: 12/5/2021

Project Address: 4 Shelly Lane, Ayer MA 01432 Applicant: Seann Ives

Phone Number: 617-710-8254 Email Address: seann.ives@gmail.com

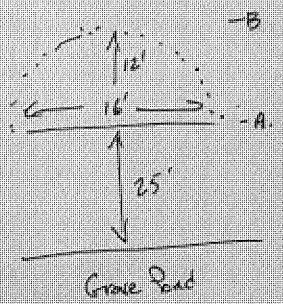
Proposed Project: Level a 16'x12' area of our back yard that's roughly 25' from Grove Pond. Install a short hardscape retaining wall on the uphill side. Line with pea gravel.

1. Do wetlands, streams, ponds, or buffer zone exist on or near your property? Yes ✓ No ___
2. Does your proposed project involve digging any holes or placing soil on the ground? Yes ✓ No ___
3. Does your proposed project include tree removal in the wetlands or in the buffer zone? Yes ___

   No ✓
4. Does your proposed project include building stone walls, decks, or patios? Yes ✓ No ___
5. Does your proposed project include building a shed? Yes ___ No ✓
6. Will you do the work yourself or hire an outside company (contractor, landscaper, etc.) Outside.

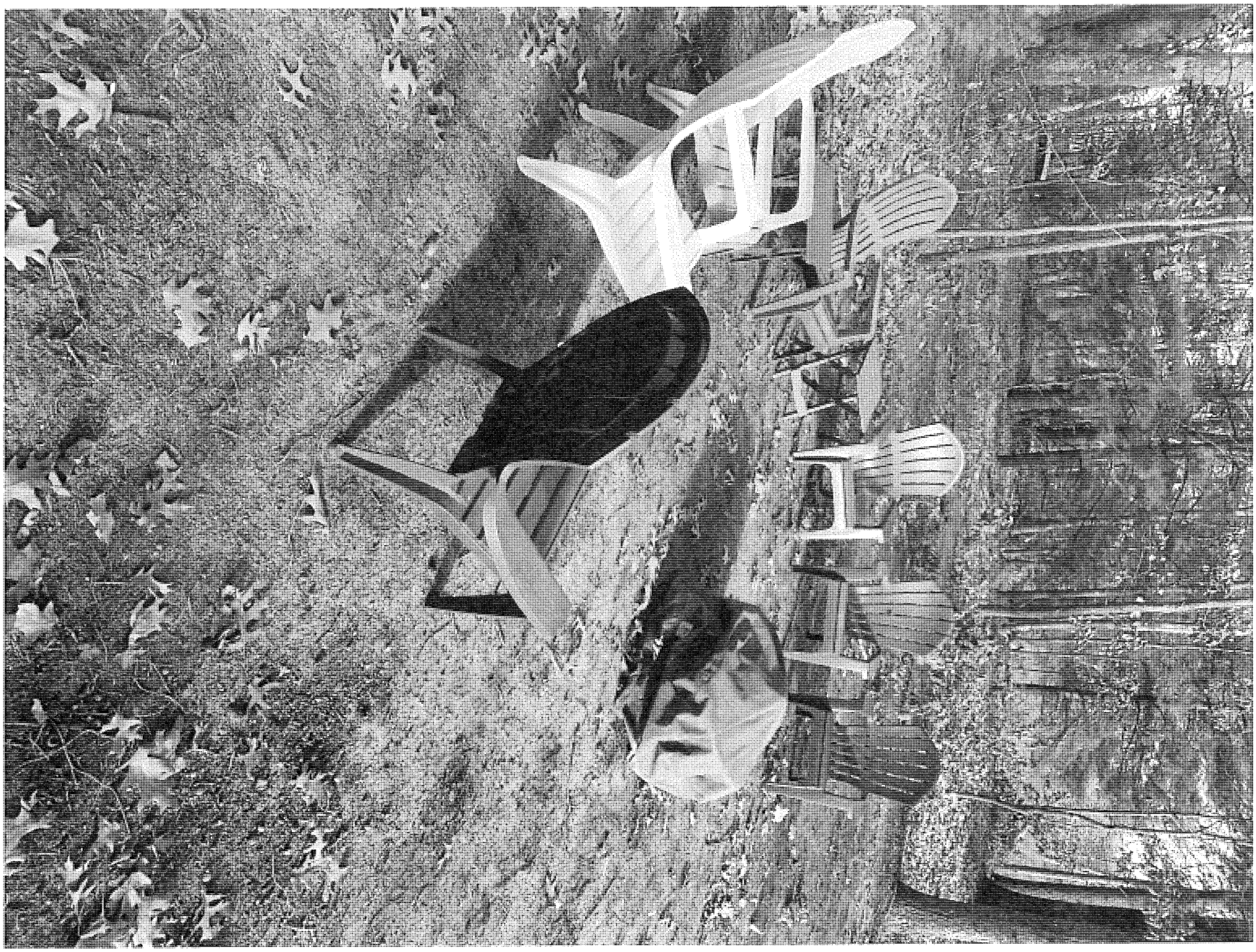
   a. If using an outside company, who are you using? Unsure - recommendations would be welcome! I intend to call Pivell's and Rinaldi's for advice.

Please draw a sketch of your proposed project:



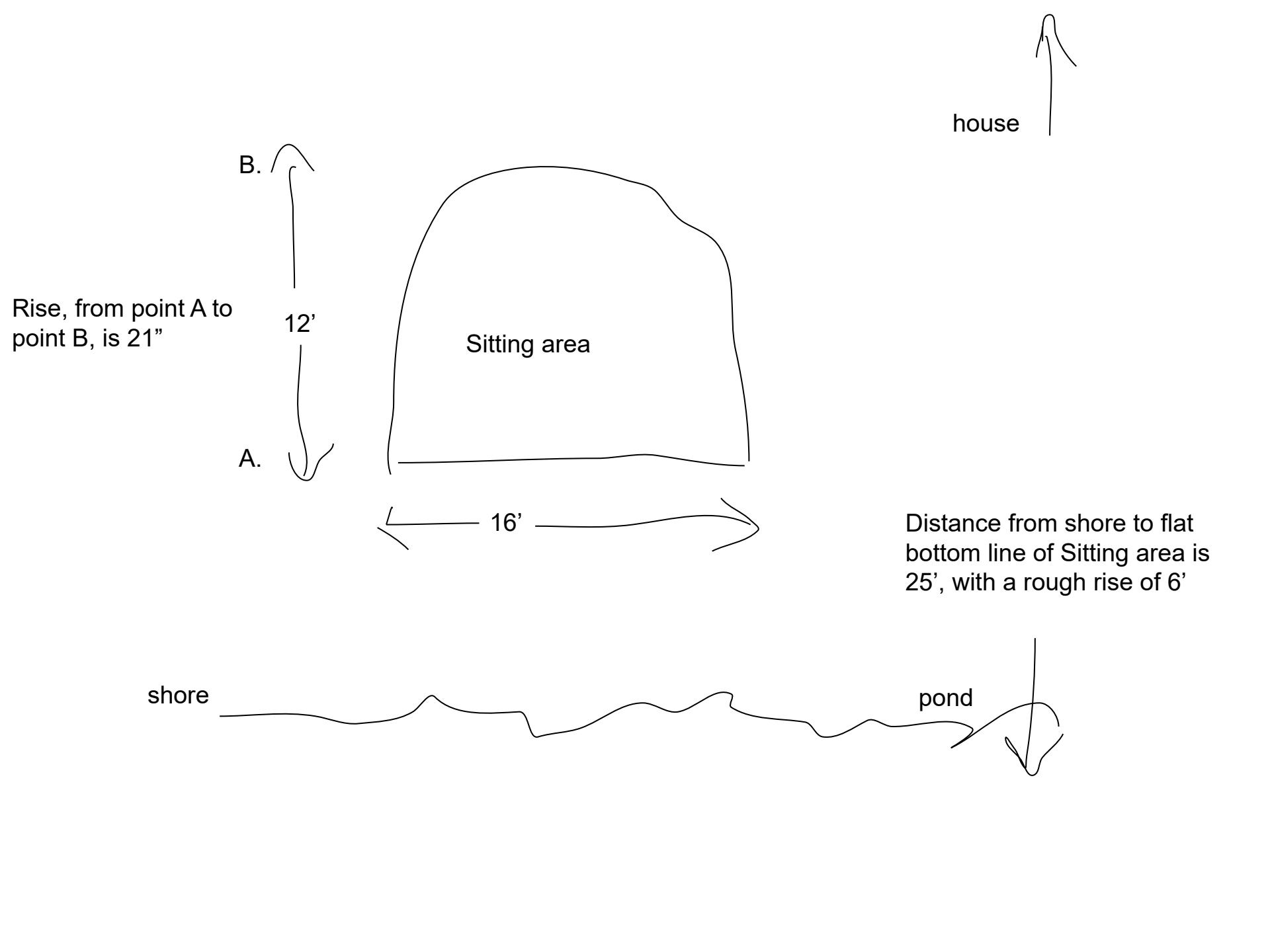
Elevation between point A and B is 21".
Elevation between Grove Pond and point A is ~6'.

It is the applicant's responsibility to ensure that proper erosion controls are installed prior to and during construction and are properly disposed of after the project is finished.



On Thu, Nov 4, 2021 at 11:33 AM Ayer Conservation Commission <concom@ayer.ma.us> wrote:

> Hi Seann-
>
> Attached is the Administrative Approval form for you to complete and return to me. Please let me know if it is alright to view your proposed project in person.
>
> Thank you,
>
> Jo-Anne
>
> Jo-Anne Crystoff
> Conservation Administrator


house
B.
Rise, from point A to point B, is 21”
12’
Sitting area
A.
16’
Distance from shore to flat bottom line of Sitting area is 25’, with a rough rise of 6’
shore
pond

TOWN OF AYER
REQUEST FOR QUOTE
2022

The Town of Ayer, acting through its Conservation Commission, is seeking services from lake management consulting/contracting firms (hereafter known as the Consultant) for Aquatic Plant Management projects at Sandy Pond, Flannagan Pond, and Pine Meadow Pond, in spring/early summer of 2022.

Six (6) copies of the technical (non-cost) quote, one copy of the price (cost) quote, and an electronic copy of both, should be submitted to the Ayer Conservation Commission c/o Office of the Town Manager, Town Hall, One Main Street, Ayer, MA 01432. Quotes must be received at the above location prior to 12 noon, Tuesday, February 22, 2022. Postmarks are not acceptable.

Objective Statement

The goal of pond treatment in Ayer is for the reduction, control, and management of the growth of aquatic invasive plants, as well as the control and maintenance of optimal reduced density levels of floating leaf plants and select stands of invasive phragmites, for the purpose of restoring and maintaining habitat, public enjoyment, and recreation. All management plans and strategies should reference and address the findings of the "Biological Survey, Assessment and Management Recommendations for Ayer's Ponds" prepared by Geosyntec Consultants (Final Report May 2016) as well as the Year End Report and recommendations from the previous treatment season (2021), both of which will found on the Commission's Town webpage.

Project Description

The Consultant shall provide all materials, labor, and equipment to perform the required herbicide treatment(s) during the spring/summer of 2022, to meet the performance objective of 90% eradication of fanwort (*Cabomba caroliniana*) and variable leaf milfoil (*M. heterophyllum*) in Sandy, Flannagan and Pine Meadow ponds. Herbicide treatment for phragmites *(Phragmites australis*) in select areas on Sandy Pond is also requested, as well as density reduction of floating leaf plants (e.g. water lilies, water shield) in Flannagan and Pine Meadow ponds. The performance objective for phragmites treatment is 50% reduction of select nuisance stands. A minimum of four (4) sampling rounds with three (3) samples per round (twelve [12] samples total per pond) shall be collected post-treatment by the Consultant and analyzed for herbicide content by a qualified laboratory. ????? The Consultant shall perform all required pre-treatment notifications and postings of printed signs prior to each herbicide application. A minimum notice of seven (7) calendar days is required for Town offices and must be confirmed by same. All work shall be performed by properly licensed personnel in accordance with all local, state, and federal requirements.

The Consultant shall perform and provide written documentation of pre-treatment and post-treatment inspections; herbicide residue sample collection/testing; and a project completion report including the calculated pre- and post—area (sf) of targeted species, and the total percentage of area (sf) where the invasive plants were targeted for eradication. Pre- and post-treatment inspections shall include a photographic survey and GPS-generated plot of the region(s) to be treated. Data points taken with GPS should be spaced at 10' or less and provide an accurate plot of the area to be treated. **Pre-treatment survey to occur after June 1, 2022 when new growth can accurately be evaluated.** A plot of pre-treatment data points is to be submitted to the Commission a minimum of seven (7) days prior to the first treatment. **Payment is contingent upon submission of the pre-treatment survey prior to initial treatment.** Post-treatment inspection shall include a photographic survey and GPS-generated plot of the final distribution of the targeted species. Pre- and post-treatment photographs shall be taken from the vantage points listed on the attached Photography Plan. The total surface area of water being treated is to be calculated and specified in the reports.

The project completion report must be submitted by the end of November and shall include the pre- and post-treatment inspection data, an overlay of the GPS-generated pre- and post-treatment plots, a calculation of the pre- and post-treatment areas, and a notarized statement by the Consultant that the eradication goal of 90% for fanwort and milfoil and 50% for phragmites was met in specified ponds throughout the project year of 2022.

The Consultant shall secure a Massachusetts Department of Environmental Protection (MassDEP) license to apply chemicals and comply with any applicable Orders of Conditions issued by the Ayer Conservation Commission.

[Please note that the use of the herbicide Clipper (flumioxazin) is prohibited in Sandy, Flannagan, and Pine Meadow ponds. Per the MDAR/MassDEP "Clipper Herbicide Product Evaluation and Recommendations (June 2013) report, the use of Clipper is "excluded from use in State-listed aquatic species habitats" without written authorization from MA Division of Fisheries and Wildlife, issued on a case-by-case basis. Because these Ayer ponds are located within the Petapawag ACEC (Area of Critical Environmental Concern), the Natural Heritage & Endangered Species Program (NHESP) has indicated verbally that a MESA filing would be required, but that they would also be unlikely to issue an approval for the use of Clipper at this location.]

Scope of Work for Sandy Pond

Sandy Pond encompasses an area of approximately 75 acres and is a deep kettle-hole pond (maximum and average depth of about 29 and 15 feet, respectively). It is also located within the Petapawag ACEC. The objective of the project at Sandy Pond is to monitor early and late season vegetation growth; and to provide spot treatments to control the growth of invasive and nuisance aquatic plants, specifically to maintain an eradication level of 90% of fanwort and

variable leaf milfoil, as well as a 50% reduction of nuisance stands of phragmites (Phragmites australis) in select areas on Sandy Pond, for the purpose of maintaining habitat and facilitating the recreational use of this Great Pond for swimming, boating, and fishing. The application of USEPA/MA registered aquatic herbicides has been identified as the most cost-effective and only feasible method of plant control at this time, given the environmental and budgetary constraints for utilizing other potential pond management techniques.

Lowering of Sandy Pond water levels is accomplished through the dam that controls Flannagan Pond, by means of the removal of two boards from the East Main Street Spillway (aka Balch Dam), subject to all restrictions of the East Main Street Spillway guidelines, dated August 22, 2001 and revised October 24, 2005.

The Town reserves the right to modify the scope due to budgetary constraints.

Scope of Work for Flannagan Pond

Flannagan Pond encompasses an area of approximately 85 acres and is a shallow impoundment type pond (maximum and average depth of 5 and 5 feet, respectively). It is also located within the Petapawag ACEC. The objective of the project at Flannagan Pond is to monitor early and late season vegetation growth; to provide spot treatments to control the growth of invasive and nuisance aquatic plants, specifically to maintain an eradication level of 90% of fanwort and variable leaf milfoil and to maintain limited levels of floating leaf plants (e.g. water lilies, water shield), for the purpose of sustaining habitat and facilitating the recreational uses of boating and fishing. The application of USEPA/MA registered aquatic herbicides has been identified as the most cost-effective and only feasible method of plant control at this time, given the environmental and budgetary constraints for utilizing other potential pond management techniques.

As with Sandy Pond, the lowering of Flannagan Pond water levels is accomplished through the board removal at the East Main Street Spillway, subject to all restrictions of the East Main Street Spillway guidelines, dated August 22, 2001 and revised October 24, 2005.

The Town reserves the right to modify the scope due to budgetary constraints.

Scope of Work for Pine Meadow Pond (aka Erskines Pond)

Pine Meadow Pond is a 23 acre pond located north of Flannagan Pond, with an average depth of 6-7 feet. It is also located within the Petapawag ACED. The objective of the project at Pine Meadow Pond is to monitor early and late season vegetation growth; to provide spot treatments to control the growth of invasive and nuisance aquatic plants, specifically to maintain an eradication level of 90% of variable leaf milfoil as well as fanwort if observed; and to continue to thin out, to a reasonable level, floating leaf plants as well as the invasive form of

Phragmites, for the purpose of maintaining habitat and facilitating the recreational uses of boating and fishing. The water level of Pine Meadow Pond is set through a fixed-height dam and cannot be lowered.

The Town reserves the right to modify the scope due to budgetary constraints.

Price Quote (to be submitted separate from the technical quote)

See attached sample cost sheet. [?????] The Consultant shall provide a clearly comprehensible price quote. The quote must provide a total sum for the cost of the project in its entirety, as well as a breakdown of costs and activities per pond.

Minimum Qualifications

The Consultant shall be licensed for Aquatic Pesticide Application by the Commonwealth of Massachusetts and shall be fully insured. The Consultant shall have a minimum of five (5) years experience in the field of Aquatic Plant Management.

All quotes submitted in accordance with the requirements of this RFQ will be reviewed for completeness and responsiveness. Quotes from firms that do not meet the minimum qualifications above may be deemed non-responsive by the Town at its sole discretion.

Quotes shall be evaluated by the Town and ranked for each of the following comparative evaluation criteria as follows:

- Highly Advantageous
- Advantageous
- Not Advantageous
- Unacceptable

Any quote receiving an unacceptable rating for any single criterion listed below will be considered unacceptable in all respects. Technical quotes will be ranked and evaluated on the following criteria:

1. Utilizing Sonar, diquat herbicides, or other appropriate herbicides to provide fanwort and variable leaf milfoil control of at least 90% through the year of treatment. [by the end of the year of treatment?] Utilizing glyphosate herbicide for thinning and/or management of optimal reduced density levels of floating leaf plants.

2. Demonstrated regional experience with Sonar, diquat herbicides, or other appropriate herbicides for fanwort control and control of variable leaf milfoil, and reported success

of those projects. Two examples of project completion reports for similar, previously completed projects shall be submitted with the Quote.

3. Experience and qualifications of key project personnel to perform chemical treatments, aquatic plant surveys/mapping, chemical residue testing and reporting tasks required for this project. Specific college or graduate degrees held, and discipline, shall be provided for all key project personnel.

4. Technical approach for the project, thoroughness of the quote, and probable success of the proposed treatment program. Provide examples of pre- and post-treatment inspection methodology, including forms and photographs. Pre- and post-treatment photographs must be taken per the Photography Plan.

5. Demonstrated knowledge and understanding of the scope of work as relates to Sandy, Flannagan, and Pine Meadow ponds.

6. Demonstrated satisfaction with previous work performed for other municipalities.

The Commission will first evaluate and rank submissions based on the technical quotes, after which it will then open and review the price proposals before making its selection. The Town of Ayer will then negotiate a contract with the selected Consultant. Should the Town and selected Consultant not be able to reach an agreement, the Town would then negotiate with the remaining firms in order of their ranking until a suitable agreement is reached.

All required information requested in the RFQ will be utilized to evaluate each Consultant. The contract will be awarded within sixty (60) calendar days from opening of quotes.

Required Information

In addition to an electronic copy, six (6) copies of the proposed quote must be submitted and the following specific information is required in each consultant's qualifications and quote package:

1. Name, address, and telephone number of the consultant and the principal contract person.
2. Name, address, telephone number, and qualifications of all personnel to be associated with this project, if applicable.
3. Type of organization (i.e. individual, corporation, partnership, joint venture, etc.). Include a list of the principals.
4. List of Municipal clients in Massachusetts over the past three years. Please include the following information:
    a. Location
    b. Scope of involvement
    c. References (name, title, and current telephone numbers)
5. Certifications that all personnel associated with this project are properly licensed to undertake and successfully complete their task.
6. Insurance certificate showing coverage for General Liability, Automobile and Workman's Compensation (statutory). It is the vendor's responsibility to purchase and maintain adequate insurance to protect the vendor and the Town for all claims.

    The following minimum insurance is required:

a. **Workman's Compensation**	Statutory
Employer's Liability	
BI Each Accident	$100,000
BI – Aggregate	$500,000
BI – Each Employee	$100,000

b. Comprehensive General Liability:	
Owner's Protective Liability	$1,000,000
Comprehensive Public Liability	$1,000,000
Bodily Injury	Any one person $1,000,000
	Aggregate $2,000,000
Property Damage:	$1,000,000

General liability of at least $1,000,000 Bodily Injury and Property Damage Liability, Combined Single Limit with a $2,000,000 Annual Aggregate Limit. The Town should be named as "Additional Insured."

c. **Professional Liability** — Per occurrence $1,000,000 Aggregate $2,000,000

Contractors Pollution Liability — Per occurrence $1,000,000 Aggregate $2,000,000

Motor Vehicle Pollution Liability — Per occurrence $1,000,000

The Liability Policy shall be Broad Form and include coverage for Premises and Operations and Product Liability.

d. Comprehensive Automobile Liability:

Bodily Injury — Any One person/Aggregate $1,000,000

Property Damage — Per Occurrence/Aggregate $500,000

The Comprehensive Automobile Liability Insurance should be written to include owned, hired and non-owned vehicles and it shall provide Extra-Territorial Coverage.

e. **Umbrella Liability** — At least $500,000/occurrence, $1,000,000 Aggregate

f. The Town of Ayer, MA shall be named as an additional insured on the vendor's policy. No insurance shall be subject to cancellation without at least thirty (30) days prior written notice forwarded by registered or certified mail to the Town of Ayer. All parties shall also be notified of the attachment of any restrictive amendments to the policies.

- Quotes must be sent to and received on or before to: Ayer Conservation Commission, c/o Office of the Town Manager, Town Hall, One Main Street, Ayer MA 01432 by **Tuesday, February 22, 2022**, no later than noon (12:00 p.m.).

- Six (6) copies of the Technical Quote must be submitted in a sealed and clearly marked envelope, along with an electronic copy submitted to concom@ayer.ma.us.

- One (1) copy of the Price Quote (outlining the project costs) must be submitted in a separate, sealed envelope, along with an electronic copy submitted to concom@ayer.ma.us

- Questions regarding this bid may be directed to: Jess Gugino (Interim Conservation Office Administrator) at the Ayer Conservation Office 978-772-8220 ext. 143 or via email at concom@ayer.ma.us.

The Town of Ayer is an EEO/AA employer and reserves the right to accept or reject any or all quotes as deemed to be in the best interest of the Town.

Jon Schmalenberger, Chair
Ayer Conservation Commission

Available on the Conservation Commission's Town webpage, www@ayer.ma.us:

"Ayer Ponds – 2021 Year End Report," prepared by Water & Wetland (November 29, 2021)

"Biological Survey, Assessment and Management Recommendations for Ayer's Ponds," prepared by Geosyntec Consultants (Final Report, May 2016)

TAX ATTESTATION AND NON-COLLUSION STATEMENT

Pursuant to MGL Chapter 62C Section 49A, I certify under the penalties of perjury that, to the best of my knowledge and belief, I have filed all state tax returns and paid all state taxes required under law.

The undersigned certifies under penalties of perjury that this quote is in all respects bona fide, fair, and made without collusion or fraud with any other person. As used in this section, the word "person" shall mean any natural person, joint venture, partnership, corporation, or other business or legal entity.

The undersigned declares that the only parties interested in this quote as principals are named herein; that this quote is made without collusion with any other person, firm, or corporation; that he/she has carefully examined the specifications therein referred to; and he/she proposes and agrees that, if this quote is accepted, he/she will contract the Owner, in accordance with the specifications, to provide all necessary work to be done and also furnish all the materials specified in the manner and time prescribed and according to the requirements as set forth; and that he/she will take in full payment the following sum(s) to wit:

_____ By: _____

Social Security Number or
Federal Identification Number

Print Name:_____

Date: _____

SŌLITUDE
LAKE MANAGEMENT

Report on Arsenic Testing
of Water Chestnut Plant Material

Grove Pond – Ayer, MA

Prepared for: Ayer Conservation Commission
c/o Kait Rimol
Town Hall,1 Main Street
Ayer, MA 01432

October 27, 2017

Dear Kait Rimol,

Due to reported arsenic contamination, the Town of Ayer approached SŌLitude questioning the bioaccumulation of metals, specifically arsenic, in the Water Chestnut (*Trapa natans*) plants located in the eastern end of the pond.

On September 14, SŌLitude visited Grove Pond with the objective of locating and collecting invasive water chestnut specimens for arsenic concentration analysis within the plant material. Six (6) plants were obtained, including roots, stems, rosettes, and any new seed growth present on the rosettes.

Analysis of a composite of all plant tissue measured Total arsenic levels of 3.06 mg/kg – please see attached Lab report. According to MA DEP Environmental Risk Characterization (also attached), arsenic concentrations in sediment below 33 mg/kg are of no significant risk of harm to the environment. However, the contaminants contained in aquatic plants are likely released upon seasonal die-back and decomposition. This suggests that the arsenic concentration uptake by Water Chestnut in Grove Pond may become mobile within the water column, slowly releasing the sediment-bound arsenic into the water column over multiple seasons.

Depending on the goals of the Commission, we would be happy to discuss further studies regarding arsenic or other metal contamination in other plant species or potential release into the water column.

If you have any questions regarding the sampling or report, please contact our office.

Sincerely,

Brea Arvidson
Aquatic Biologist

ANALYTICAL REPORT

Lab Number:	L1732764
Client:	Solitude Lake Management LLC 590 Lake Street Shrewsbury, MA 01545
ATTN:	Bregieta Arvidson
Phone:	(508) 865-1000
Project Name:	GROVE POND
Project Number:	Not Specified
Report Date:	09/28/17

Certifications & Approvals: MA (M-MA030), NH NELAP (2062), NJ NELAP (MA015), CT (PH-0141), FL (E87814), IL (200081), LA (85084), ME (MA00030), MD (350), NY (11627), NC (685), OH (CL106), PA (68-02089), RI (LAO00299), TX (T104704419), VT (VT-0015), VA (460194), WA (C954), US Army Corps of Engineers, USDA (Permit #P330-13-00067), USFWS (Permit #LE2069641).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: GROVE POND
Project Number: Not Specified

Lab Number: L1732764
Report Date: 09/28/17

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1732764-01	SITE 1	PLANT TISSUE	AYER, MA	09/14/17 10:00	09/14/17

Project Name: GROVE POND
Project Number: Not Specified

Lab Number: L1732764
Report Date: 09/28/17

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. All specific QC information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications. Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances the specific failure is not narrated but noted in the associated QC table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

HOLD POLICY
For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Client Service Representative and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

Project Name: GROVE POND
Project Number: Not Specified

Lab Number: L1732764
Report Date: 09/28/17

Case Narrative (continued)

Sample Receipt

The samples were received at the laboratory above the required temperature range. The samples were delivered directly from the sampling site but were not preserved with ice.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Elizabeth Porta

Title: Technical Director/Representative

Date: 09/28/17

METALS

Project Name:	GROVE POND	**Lab Number:**	L1732764
Project Number:	Not Specified	**Report Date:**	09/28/17

SAMPLE RESULTS

Lab ID:	L1732764-01	Date Collected:	09/14/17 10:00
Client ID:	SITE 1	Date Received:	09/14/17
Sample Location:	AYER, MA	Field Prep:	Not Specified
Matrix:	Plant Tissue		
Percent Solids:	Results are reported on an 'AS RECEIVED' basis.		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	3.06		mg/kg	0.096	--	2	09/26/17 14:45	09/27/17 15:14	EPA 3051A	1,6020A	AM

Project Name: GROVE POND
Project Number: Not Specified

Lab Number: L1732764
Report Date: 09/28/17

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1045278-1										
Arsenic, Total	ND		mg/kg	0.100	--	2	09/26/17 14:45	09/27/17 13:55	1,6020A	AM

Prep Information

Digestion Method: EPA 3051A

Lab Control Sample Analysis
Batch Quality Control

Project Name: GROVE POND
Project Number: Not Specified

Lab Number: L1732764
Report Date: 09/28/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1045278-2								
Arsenic, Total	94		-		75-125	-		20

Matrix Spike Analysis
Batch Quality Control

Project Name: GROVE POND
Project Number: Not Specified

Lab Number: L1732764
Report Date: 09/28/17

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01	QC Batch ID: WG1045278-3					WG1045278-4	QC Sample: L1730693-05		Client ID: MS Sample			
Arsenic, Total	ND	11.2	10.2	91		10.1	92		75-125	1		20

Project Name: GROVE POND
Project Number: Not Specified

Lab Number: L1732764
Report Date: 09/28/17

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1732764-01A	Bag	A	NA		24.0	Y	Absent		A2-TISSUE_PREP(),A2-AS-6020T(180),A2-PREP-3051(180)

*Values in parentheses indicate holding time in days

Project Name: GROVE POND
Project Number: Not Specified
Lab Number: L1732764
Report Date: 09/28/17

GLOSSARY

Acronyms

EDL - Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).

EPA - Environmental Protection Agency.

LCS - Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LCSD - Laboratory Control Sample Duplicate: Refer to LCS.

LFB - Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

MDL - Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

MS - Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.

MSD - Matrix Spike Sample Duplicate: Refer to MS.

NA - Not Applicable.

NC - Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.

NDPA/DPA - N-Nitrosodiphenylamine/Diphenylamine.

NI - Not Ignitable.

NP - Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.

RL - Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

RPD - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

SRM - Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.

STLP - Semi-dynamic Tank Leaching Procedure per EPA Method 1315.

TIC - Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Footnotes

1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

A - Spectra identified as "Aldol Condensation Product".

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related

Report Format: Data Usability Report

Project Name: GROVE POND **Lab Number:** L1732764

Project Number: Not Specified **Report Date:** 09/28/17

Data Qualifiers

projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

ND - Not detected at the reporting limit (RL) for the sample.

Report Formal: Data Usability Report

Project Name: GROVE POND
Project Number: Not Specified

Lab Number: L1732764
Report Date: 09/28/17

REFERENCES

1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IV, 2007.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624: m/p-xylene, o-xylene
EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), Methyl methacrylate, 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270D: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
EPA 300: DW: Bromide
EPA 6860: NPW and SCM: Perchlorate
EPA 9010: NPW and SCM: Amenable Cyanide Distillation
EPA 9012B: NPW: Total Cyanide
EPA 9050A: NPW: Specific Conductance
SM3500: NPW: Ferrous Iron
SM4500: NPW: Amenable Cyanide, Dissolved Oxygen; SCM: Total Phosphorus, TKN, NO2, NO3.
SM5310C: DW: Dissolved Organic Carbon

Mansfield Facility
SM 2540D: TSS
EPA 3005A NPW
EPA 8082A: NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B**
EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH, EPA 350.1: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **SM4500NO3-F, EPA 353.2**: Nitrate-N, **EPA 351.1, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D.**
EPA 624: Volatile Halocarbons & Aromatics,
EPA 608: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045**: PCB-Oil.
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E.**

Mansfield Facility:

Drinking Water
EPA 200.7: Ba, Be, Cd, Cr, Cu, Ni, Na, Ca. **EPA 200.8:** Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Ni, Se, TL. **EPA 245.1** Hg.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

CHAIN OF CUSTODY

PAGE OF

ALPHA ANALYTICAL — World Class Chemistry

Westborough, MA TEL: 508-898-9220 FAX: 508-898-9193
Mansfield, MA TEL: 508-822-9300 FAX: 508-822-3288

Date Rec'd in Lab: 9/14/17

ALPHA Job #: L1732764

Client Information

Client: SŌLitude Lake Management, North

Address: 590 Lake Street

Shrewsbury, MA 01545

Phone: 508-865-1000

Fax: 508-865-1220

Email: BArvidson@solitudelake.com

☐ These samples have been Previously analyzed by Alpha

Project Information

Project Name: GROVE POND

Project Location: AYER, MA

Project #:

Project Manager: DOMINIC MERINGOLO

ALPHA Quote #:

Turn-Around Time

Report Information Data Deliverables

☐ FAX ☐ EMAIL

☐ ADEx ☐ Add'l Deliverables

Billing Information

☐ Same as Client info PO #:

Regulatory Requirements/Report Limits

State/Fed Program *Criteria*

Other Project Specific Requirements/Comments/Detection Limits:

Please run out of hold-time

ANALYSIS

		Collection Date	Collection Time			ARSENIC	Sample Specific Comments
32764-01 ~~SAMPLE~~	SITE 1	9/14	10:00A	PLANT	MRH	☒	

Container Type	-	-	-	-	-	-	-	-	-	-	-	-
Preservative	-	-	-	-	-	-	-	-	-	-	-	-

Relinquished By:	Date/Time	Received By:	Date/Time
Matt Haupt	9/14/17 4:53	[signature]	9/14/17 1653
[signature]	08/15/17 0555	Kim Basile	9/15/17 05:55

Massachusetts Department of ENVIRONMENTAL PROTECTION

technical update

Revised Sediment Screening Values

Update to: Section 9 of *Guidance for Disposal Site Risk Characterization – In Support of the Massachusetts Contingency Plan* (1996)

The sediment screening values presented in this Technical Update are intended for use in Stage I Screening at sites where oil or hazardous material has been released or migrated to sediment. Stage I is used to evaluate the need for a quantitative Stage II Environmental Risk Characterization, and to eliminate from further evaluation those situations in which either (1) the exposures are clearly unlikely to result in environmental harm or (2) harm is readily apparent. Exposure pathways that are not eliminated in Stage I are carried through the quantitative Stage II Risk Characterization.

Sediment screening values are used to evaluate the potential risk of harm to the environment from sediment contamination. If each detected sediment contaminant concentration is equal to or less than the sediment screening criterion for the contaminant, no further evaluation of the risk of harm from the sediment is required. In other words, a Stage II Risk Characterization is not required if no contaminant concentration exceeds the applicable screening value. If the concentration of even one contaminant exceeds the screening criterion, then a Stage II Risk Characterization must be done.

This Technical Update revises the Stage I sediment screening criteria for metals (except mercury). The current screening criteria for metals are based on the Threshold Effects Concentrations (TECs) that have been developed as consensus-based sediment quality guidelines by MacDonald et al. (2000). The revised criteria presented in this Technical Update are based on the Probable Effects Concentrations (PECs) developed by the same researchers, which are typically several times higher than the TECs. Based on ten years of experience with lower screening levels, it has become apparent that Stage II site-specific risk assessments generally find a condition of "no significant risk of harm" to the environment for sediment contaminated with metals at levels below the PECs.

Tables 1, 2 and 3 summarize the screening criteria for metals (revised), polynuclear aromatic hydrocarbons, and PCBs and pesticides respectively.

Table 1
Stage I Freshwater Sediment Screening Criteria for Metals
(Revised July 2005)

Metals	Screening Criterion mg/kg dry wt.	Basis
		PEC (1)
Arsenic	33	PEC (1)
Cadmium	5.0	PEC (1)
Chromium	110	PEC (1)
Copper	150	PEC (1)
Lead	130	PEC (1)
Mercury	0.18	TEC (1)
Nickel	49	PEC (1)
Zinc	460	PEC (1)

Table 2
Stage I Freshwater Sediment Screening Criteria for Polycyclic Aromatic Hydrocarbons

Chemical	Screening Criterion µg/kg dry wt.	Basis
Anthracene	57	TEC (1)
Fluorene	77	TEC (1)
Naphthalene	180	TEC (1)
Phenanthrene	200	TEC (1)
Benzo(a)anthracene	110	TEC (1)
Benzo(a)pyrene	150	TEC (1)
Chrysene	170	TEC (1)
Dibenz(a,h)anthracene	33	TEC (1)
Fluoranthene	420	TEC (1)
Pyrene	200	TEC (1)

Massachusetts Department of Environmental Protection
One Winter Street
Boston, MA 02108-4746

Commonwealth of Massachusetts
Mitt Romney, Governor

Executive Office of Environmental Affairs
Stephen R. Pritchard, Secretary

Department of Environmental Protection
Robert W. Golledge, Commissioner

Produced by the Office of Research & Standards, January 2006.

This information is available in alternate format by calling our ADA Coordinator at (617) 574-6872.

Table 3
Stage I Freshwater Sediment Screening Criteria for PCBs and Pesticides

Chemical	Screening Criterion µg/kg dry wt.	Basis
Total PCBs	60	TEC (1)
Chlordane	3.2	TEC (1)
Dieldrin	1.9	TEC (1)
Sum DDD	4.9	TEC (1)
Sum DDE	3.2	TEC (1)
Sum DDT	4.2	TEC (1)
Total DDT	5.3	TEC (1)
Endrin	2.2	TEC (1)
Heptachlor epoxide	2.5	TEC (1)
Lindane (gamma-BHC)	2.4	TEC (1)

Massachusetts Department of
Environmental Protection
One Winter Street
Boston, MA 02108-4746

Commonwealth of
Massachusetts
Mitt Romney,
Governor

Executive Office of
Environmental Affairs
Stephen R. Pritchard,
Secretary

Department of
Environmental Protection
Robert W. Golledge,
Commissioner

Produced by the
Office of Research & Standards,
January 2006.

Reference:

1. MacDonald, D. D., C. G. Ingersoll, T. A. Berger. 2000. Development and evaluation of consensus-based sediment quality guidelines for freshwater systems. *Archives of Environmental Contamination and Toxicology* 39, 20-31. January 13, 2000.

Questions about this document should be directed to:

Thomas Angus at (617)292-5513 or thomas.angus@state.ma.us
Nancy Bettinger at (617)556-1159 or nancy.bettinger@state.ma.us

GREEN INTERNATIONAL AFFILIATES, INC.
100 AMES POND DRIVE, SUITE 200 TEWKSBURY, MA 01876
T: (978) 923-0400 | F: (978) 399-0033 | WWW.GREENINTL.COM

MEMORANDUM

January 5, 2022

To:	Ms. Jo-Anne Crystoff (concom@ayer.ma.us)
Cc:	Melissa Lenker, MassDOT (melissa.lenker@state.ma.us) Henry Barbaro, (MassDOT) (henry.barbaro@state.ma.us) Kimberley Sloan, (MassDOT) (Kimberley.Sloan@dot.state.ma.us) Hung Pham, (MassDOT) (hung.pham@state.ma.us)
From:	Danielle Spicer, P.E., Green International Affiliates, Inc.
Date:	January 5, 2022
Project Name:	608443 Intersection Improvements on Route 2A at Willow Road and Bruce Street, Ayer and Littleton, MA
Project Number:	Green No. 13033.11X
Subject:	**Route 2A - Ayer NOI Review – Con Com Comment Responses (DEP No. 100-0477)**

This memorandum provides the responses to the Conservation Commissions comments during the Con Com hearing on 12/16/2021 and during the Site Walk on 12/18/2021 for the roadway improvements along Route 2A in Littleton, MA (DEP File No. 100-0477). The Con Com's comments are copied below in *italics*. Responses to each comment are noted below in **Bold**.

1. *Since all catch basins are located in Littleton, please provide O&M for how often MassDOT will inspect/clean these structures.*

Attached is MassDOT's O&M table for stormwater control structures.

2. *There was concern with the close proximity of the gas station and the number of trucks that park in the area and potential for oil spills.*

All CB's within the public right-of-way will have plastic hoods installed for the project since the entire project is located with a Zone II. These hoods extend below the outlet invert thereby retaining floatable oil, grease and petroleum hydrocarbons at the water surface within the sump of the catch basin. In addition, the gas station has its own closed drainage system that is not connected to the MassDOT drainage system within Route 2A.

In addition, MassDOT follows established Best Management Practices (BMPs) and operational procedures and has implemented a range of strategies statewide to reduce the amount of road salt used and minimize its environmental impact. Such strategies include the increased use of liquid deicers to pre-wet dry material in order to reduce bounce and scatter and for pre-treating roadways prior to storms when conditions allow. Both of these techniques have been shown to reduce the overall application of sodium chloride. In addition, the use of closed loop controllers, pavement sensors and other equipment allow for more efficient operations.

3. *Can additional treatment be done at the outfall? If not, can additional treatment be done along Willow Road.*

The outlet along the downstream Brook is immediately adjacent to the Riverfront bank, wetlands and Floodway and located within the 100-year Floodplain (see photo 1 below). Stormwater Mitigation cannot be done within the Floodway, wetlands or below the Riverfront Bank per 310 CMR 10.58 (4)(d). The majority of the upload area is located within the 100-year Floodplain and has an established vegetated slope, which is not ideal to disturb for stormwater mitigation. The outlet elevation of the drain line is at approx. elev. 240, while the adjacent road and parking area is around elevation 244', which would require a 4' cut adjacent to the parking lot, removal of trees and installation of a retaining wall to install a stormwater BMP. Due to the close proximity to the Brook, groundwater will be high, so infiltration will not be feasible. Given these site constraints, and that removal of an established vegetated Riverfront Area contradicts the performance standards within the Wetlands Protection Act, we do not recommend a Stormwater BMP in this location.

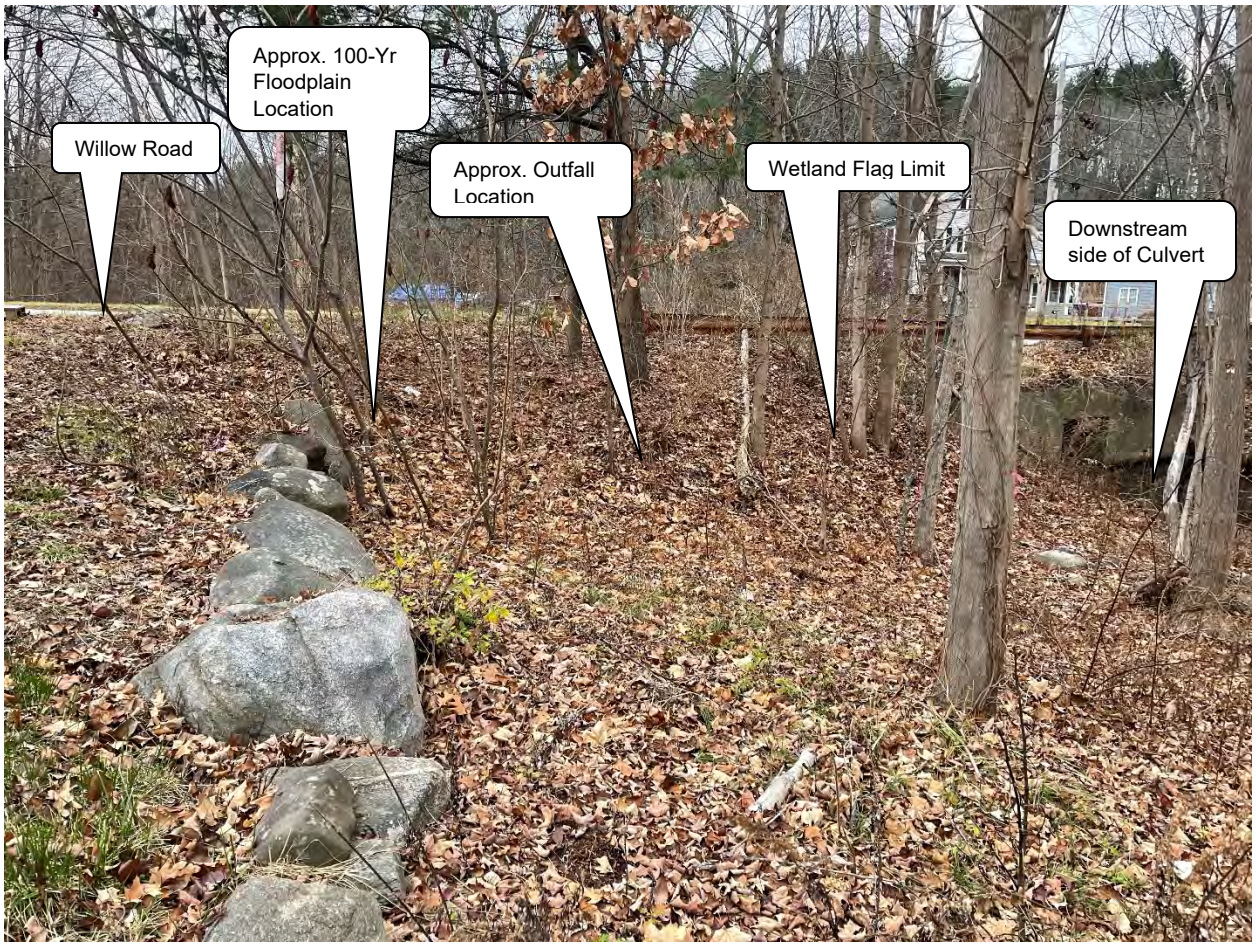


Photo 1 – Downstream Side of Culvert at Bennetts Brook

We considered other locations for potential stormwater mitigation.

- **The upstream side of the Bennett's Brook culvert under Willow Road. There are two grassy areas adjacent to the Brook along the upstream side of the culvert (see photo 2 below). The closest grass area to the Brook is located within the Floodway; therefore, stormwater mitigation is not feasible. The second grass area is located between a chain link fence and**

established tree line. This area currently provides a paper access to the rest of the parcel that does not have access to a roadway. Installation of a stormwater BMP within this area would not only block access to this parcel, but the area is located entirely within the 100-year Floodplain and would require a 4' cut to install a Stormwater BMP, which would result in the loss of several large trees along the Riverfront. As noted above, the removal of these large trees within an established Riverfront Area contradicts the performance standards within the Wetlands Protection Act; therefore, we do not feel it is practicable to install a Stormwater BMP in this location. In addition, the project in increasing flows to Bennett Brook. If stormwater is discharged to the upstream side of the existing culvert, this would need to be analyzed and potentially require upsizing. Upsizing of the culvert would result in significant impact to the Riverfront Area and Land Under Water.

Photo 2 – Upstream Side of Culvert at Bennetts Brook

- **We considered installing stormwater BMP's along Willow Road closer to the Route 2A intersection; however, the drainage trunkline invert at the intersection when it turns down Willow Road is approximately 8' deep; therefore, any offline stormwater BMP would result in an excavation of 8' – 12' deep to provide treatment volume. Due to the close proximity of the buildings to Willow Road, site features and utilities an 8'-12' cut would have significant negative impacts to the surrounding area.**

With the alternatives considered above do not result in feasible additional stormwater mitigation, it is important to note the overall project benefits of the project to the Interests of the WPA.

- **The majority of the existing runoff from Route 2A discharges with little to no treatment to Bennett's Brook. While there is a peak rate increase to DP-4, the overall project provides a significant improvement in water quality runoff and recharge to Bennett's Brook. The overall project proposes the construction of subsurface drainage improvements that are necessary with a shared use path, which will extend pavement life spans and will result in improved safety by reducing stormwater ponding on reconstructed roadway pavements. As proposed under the scope of this project, the infiltration basin in the Town of Littleton will fully treat and mitigate stormwater runoff from DP-5 watershed. While this watershed doesn't directly discharge to Bennet's Brook, it promotes recharge as well as provides significant water quality treatment within its larger watershed.**

- **In addition, the proposed closed drainage system will have catch basins with deep sumps and plastic hoods to provide additional treatment at curb inlets and in close proximity to commercial land-use properties. The proposed closed drainage system capturing and conveying runoff from the western portion of the project to the proposed outfall near Bennett's Brook will be designed with a flared end section and rip rap protection to prevent erosion to Bennett's Brook. The above improvements proposed under this project will result in improved water quality and drainage characteristics in the area; therefore, contributing to the interests of the WPA (public or private water supply, to groundwater supply, to flood control, to storm damage prevention, to the prevention of pollution and to the protection of fisheries and wildlife habitat).**

Enclosed with this letter response are the following documents:

- MassDOT's O&M Maintenance Schedule

Stormwater Control Measures (SCMs)	Activity Schedule				
	Mow	Sweep	Inspect	Clean	Maintain/ Repair
Pretreatment SCMs					
Deep-Sump Catch Basins	--	--	Annually	ANI	ANI
Sediment Forebays	--	--	Annually	ANI	ANI
Open-Graded Friction Course	--	Annually	Annually	ANI	ANI
Infiltration SCMs					
Pavement Disconnection (Qualifying Pervious Area or Vegetated Filter Strip)	Annually	--	Annually	ANI	ANI
Infiltration Basin and Infiltration Linear Practice	Annually	--	Annually	ANI	ANI
Leaching Basin	--		Annually	ANI	ANI
Subsurface Infiltration System	--	--	Annually	ANI	ANI
Porous Pavement	--	Annually	Annually	ANI	ANI
Stormwater Wetland SCMs					
Constructed Stormwater Wetland	--	--	Annually	ANI	ANI
Gravel Wetland	--	--	Annually	ANI	ANI
Bioretention SCMs					
Bioretention Area and Bioretention Linear Practice	--	--	Annually	ANI	ANI
Other SCMs					
Extended Dry Detention Basins	Annually	--	Annually	ANI	ANI
Wet Basin and Wet Linear Practice	--	--	Annually	ANI	ANI
Vegetated Riprap	--	--	Annually	ANI	ANI
Other	--	--	Annually	ANI	ANI

ANI - As Needed per Inspection

MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION

PLAN AND PROFILE OF

ROUTE 2A (AYER ROAD)

IN THE TOWNS OF

LITTLETON/AYER

MIDDLESEX COUNTY

FEDERAL AID PROJECT NO.

LITTLETON/AYER
ROUTE 2A (AYER ROAD)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	1	78
PROJECT FILE NO.	608443		

TITLE AND INDEX SHEET

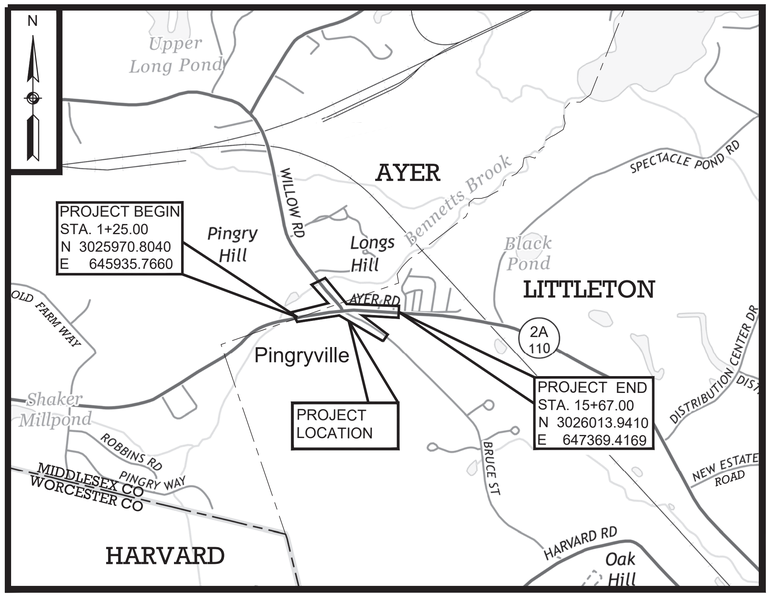
THESE PLANS ARE SUPPLEMENTED BY THE OCTOBER 2017 CONSTRUCTION STANDARD DETAILS, THE 2015 OVERHEAD SIGNAL STRUCTURE AND FOUNDATION STANDARD DRAWINGS, MASSDOT TRAFFIC MANAGEMENT PLANS AND DETAIL DRAWINGS, THE 1990 STANDARD DRAWINGS FOR SIGNS AND SUPPORTS, THE 1968 STANDARD DRAWINGS FOR TRAFFIC SIGNALS AND HIGHWAY LIGHTING, AND THE LATEST EDITION OF THE AMERICAN STANDARD FOR NURSERY STOCK.

INDEX

SHEETS TO BE INCLUDED IN THE 100% DESIGN SUBMISSION

BORING LOGS

100% SUBMITTAL



0 2000 4000 6000 8000

SCALE: 1" = 2000'

LENGTH OF PROJECT = 1442.00 FEET = 0.273 MILES

NOTICE OF INTENT SUBMISSION DATE

10/13/2021

DESIGN DESIGNATION (ROUTE 2A (AYER ROAD))

DESIGN SPEED	50 MPH
ADT (2017)	14,460
ADT (2037)	15,980
K	7.7%
D	65.7%
T (PEAK HOUR)	7.2%
T (AVERAGE DAY)	10.7%
DHV	1,230
DDHV	810
FUNCTIONAL CLASSIFICATION	URBAN PRINCIPAL ARTERIAL

COMMONWEALTH OF MASSACHUSETTS
DANIELLE H. SPICER
CIVIL
No. 46067
REGISTERED PROFESSIONAL ENGINEER
10/14/2021

7/8/2021	75% SUBMISSION	REV 0

MassDOT Massachusetts Department of Transportation Highway Division

PREPARED BY

GREEN INTERNATIONAL AFFILIATES, INC.
Civil and Structural Engineers Westford, Massachusetts

APPROVED

CHIEF ENGINEER **DATE**

GENERAL SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
JB	JB	JERSEY BARRIER
CB	CB	CATCH BASIN
		CATCH BASIN CURB INLET
FP	FP	FLAG POLE
GP	GP	GAS PUMP
MB	MB	MAIL BOX
		POST SQUARE
		POST CIRCULAR
WELL	WELL	WELL
EHH	EHH	ELECTRIC HANDHOLE
		FENCE GATE POST
GG	GG	GAS GATE
BHL #	BHL #	BORING HOLE
MW #	MW #	MONITORING WELL
TP #	TP #	TEST PIT
		HYDRANT
		LIGHT POLE
CO.BD.		COUNTY BOUND
		GPS POINT
		CABLE MANHOLE
		DRAINAGE MANHOLE
		ELECTRIC MANHOLE
		GAS MANHOLE
		MISC MANHOLE
		SEWER MANHOLE
		TELEPHONE MANHOLE
		WATER MANHOLE
MHB	MHB	MASSACHUSETTS HIGHWAY BOUND
MON		MONUMENT
SB		STONE BOUND
TB		TOWN OR CITY BOUND
		TRAVERSE OR TRIANGULATION STATION
TPL or GUY	TPL or GUY	TROLLEY POLE OR GUY POLE
HTP		TRANSMISSION POLE
UFB	UFB	UTILITY POLE W/ FIREBOX
UPDL	UPDL	UTILITY POLE WITH DOUBLE LIGHT
ULT	ULT	UTILITY POLE W / 1 LIGHT
UPL	UPL	UTILITY POLE
		BUSH
SIZE & TYPE		TREE
		STUMP
		SWAMP / MARSH
WG	WG	WATER GATE
PM	PM	PARKING METER
		OVERHEAD CABLE/WIRE
		CURBING
100 99		CONTOURS (ON-THE-GROUND SURVEY DATA)
100 99		CONTOURS (PHOTOGRAMMETRIC DATA)
		UNDERGROUND DRAIN PIPE (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND ELECTRIC DUCT (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND GAS MAIN (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND SEWER MAIN (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND TELEPHONE DUCT (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND WATER MAIN (DOUBLE LINE 24 INCH AND OVER)
		BALANCED STONE WALL
		GUARD RAIL - STEEL POSTS
		GUARD RAIL - WOOD POSTS
x	x	CHAIN LINK OR METAL FENCE
		WOOD FENCE
		HAY BALES/SILT FENCE
		TREE LINE
		SAWCUT LINE
		TOP OR BOTTOM OF SLOPE
		EDGE OF PAVEMENT
		LIMIT OF MICROMILLING AND OVERLAY
		BANK OF RIVER OR STREAM
		BORDER OF WETLAND
		100 FT WETLAND BUFFER
		200 FT RIVERFRONT BUFFER
		STATE HIGHWAY LAYOUT
		TOWN OR CITY LAYOUT
		COUNTY LAYOUT
		RAILROAD SIDELINE
		TOWN OR CITY BOUNDARY LINE
		PROPERTY LINE OR APPROXIMATE PROPERTY LINE
		EASEMENT

TRAFFIC SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
1	1	CONTROLLER PHASE ACTUATED
		TRAFFIC SIGNAL HEAD (SIZE AS NOTED)
		WIRE LOOP DETECTOR (6' x 6' TYP UNLESS OTHERWISE SPECIFIED)
		VIDEO DETECTION CAMERA
		MICROWAVE DETECTOR
		PEDESTRIAN PUSH BUTTON, SIGN (DIRECTIONAL ARROW AS SHOWN) AND SADDLE
	*	EMERGENCY PREEMPTION CONFIRMATION STROBE LIGHT
		VEHICULAR SIGNAL HEAD
		VEHICULAR SIGNAL HEAD, OPTICALLY PROGRAMMED
		FLASHING BEACON
		PEDESTRIAN SIGNAL HEAD, (TYPE AS NOTED OR AS SPECIFIED)
RRSG	RRSG	RAILROAD SIGNAL
OR		SIGNAL POST AND BASE (ALPHA-NUMERIC DESIGNATION NOTED)
	20'	MAST ARM, SHAFT AND BASE (ARM LENGTH AS NOTED)
		HIGH MAST POLE OR TOWER
		SIGN AND POST
		SIGN AND POST (2 POSTS)
	20'	MAST ARM WITH LUMINAIRE
		OPTICAL PRE-EMPTION DETECTOR
		CONTROL CABINET, GROUND MOUNTED
		CONTROL CABINET, POLE MOUNTED
		FLASHING BEACON CONTROL AND METER PEDESTAL
		LOAD CENTER ASSEMBLY
		PULL BOX 12"x12" (OR AS NOTED)
		ELECTRIC HANDHOLE 12"x24" (OR AS NOTED)
		TRAFFIC SIGNAL CONDUIT

PAVEMENT MARKINGS SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
		PAVEMENT ARROW - WHITE
ONLY	ONLY	LEGEND "ONLY" - WHITE
	SL	STOP LINE - 12"
	CW	CROSSWALK
	SWL	SOLID WHITE LINE - 6"
	SYL	SOLID YELLOW LINE - 6"
	BWL	BROKEN WHITE LINE - 6" (10' LINE SEGMENT AND 30' GAP)
	BYL	BROKEN YELLOW LINE - 6" (10' LINE SEGMENT AND 30' GAP)
	DWL	DOTTED WHITE LINE - 6" (3' LINE SEGMENT AND 9' GAP)
	DYL	DOTTED YELLOW LINE - 6" (3' LINE SEGMENT AND 9' GAP)
	DWLEx	DOTTED WHITE LINE EXTENSION - 6" (2' LINE SEGMENT AND 6' GAP)
	DYLEx	DOTTED YELLOW LINE EXTENSION - 6" (2' LINE SEGMENT AND 6' GAP)
	DBWL	DOUBLE WHITE LINE - 6"
	DBYL	DOUBLE YELLOW LINE - 6"
		12" SOLID YELLOW GORE LINES @ 10' O.C. @ 45°

ABBREVIATIONS

GENERAL

AADT	ANNUAL AVERAGE DAILY TRAFFIC
ABAN	ABANDON
ADJ	ADJUST
APPROX.	APPROXIMATE
A.C.	ASPHALT CONCRETE
ACCM PIPE	ASPHALT COATED CORRUGATED METAL PIPE
BIT.	BITUMINOUS
BC	BOTTOM OF CURB
BD.	BOUND
BL	BASELINE
BLDG	BUILDING
BM	BENCHMARK
BO	BY OTHERS
BOS	BOTTOM OF SLOPE
BR.	BRIDGE
CB	CATCH BASIN
CBCI	CATCH BASIN WITH CURB INLET
CC	CEMENT CONCRETE
CCM	CEMENT CONCRETE MASONRY
CEM	CEMENT
CI	CURB INLET
CIP	CAST IRON PIPE
CLF	CHAIN LINK FENCE
CL	CENTERLINE
CMP	CORRUGATED METAL PIPE
CSP	CORRUGATED STEEL PIPE
CO.	COUNTY
CONC	CONCRETE
CONT	CONTINUOUS
CONST	CONSTRUCTION
CR GR	CROWN GRADE
DHV	DESIGN HOURLY VOLUME
DI	DROP INLET
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
DW	STEADY DON'T WALK - PORTLAND ORANGE
DWY	DRIVEWAY
ELEV (or EL.)	ELEVATION
EMB	EMBANKMENT
EOP	EDGE OF PAVEMENT
EXIST (or EX)	EXISTING
EXC	EXCAVATION
F&C	FRAME AND COVER
F&G	FRAME AND GRATE
FDN.	FOUNDATION
FLDSTN	FIELDSTONE
GAR	GARAGE
GD	GROUND
GG	GAS GATE
GI	GUTTER INLET
GIP	GALVANIZED IRON PIPE
GRAN	GRANITE
GRAV	GRAVEL
GRD	GUARD
HDW	HEADWALL
HMA	HOT MIX ASPHALT
HOR	HORIZONTAL
HYD	HYDRANT
INV	INVERT
JCT	JUNCTION
L	LENGTH OF CURVE
LB	LEACH BASIN
LP	LIGHT POLE
LT	LEFT
MAX	MAXIMUM
MB	MAILBOX
MH	MANHOLE
MHB	MASSACHUSETTS HIGHWAY BOUND
MIN	MINIMUM
NIC	NOT IN CONTRACT
NO.	NUMBER
PC	POINT OF CURVATURE
PCC	POINT OF COMPOUND CURVATURE
P.G.L.	PROFILE GRADE LINE
PI	POINT OF INTERSECTION
POC	POINT ON CURVE
POT	POINT ON TANGENT
PRC	POINT OF REVERSE CURVATURE
PROJ	PROJECT
PROP	PROPOSED
PSB	PLANTABLE SOIL BORROW
PT	POINT OF TANGENCY
PVC	POINT OF VERTICAL CURVATURE
PVI	POINT OF VERTICAL INTERSECTION
PVT	POINT OF VERTICAL TANGENCY
PVMT	PAVEMENT
PWW	PAVED WATER WAY

ABBREVIATIONS (cont.)

GENERAL

R	RADIUS OF CURVATURE
R&D	REMOVE AND DISPOSE
RCP	REINFORCED CONCRETE PIPE
RD	ROAD
RDWY	ROADWAY
REM	REMOVE
RET	RETAIN
RET WALL	RETAINING WALL
ROW	RIGHT OF WAY
RR	RAILROAD
R&R	REMOVE AND RESET
R&S	REMOVE AND STACK
RT	RIGHT
SB	STONE BOUND
SHLD	SHOULDER
SMH	SEWER MANHOLE
ST	STREET
STA	STATION
SSD	STOPPING SIGHT DISTANCE
SHLO	STATE HIGHWAY LAYOUT LINE
SW	SIDEWALK
T	TANGENT DISTANCE OF CURVE/TRUCK %
TAN	TANGENT
TEMP	TEMPORARY
TC	TOP OF CURB
TOS	TOP OF SLOPE
TYP	TYPICAL
UP	UTILITY POLE
VAR	VARIES
VERT	VERTICAL
VC	VERTICAL CURVE
WCR	WHEEL CHAIR RAMP
WG	WATER GATE
WIP	WROUGHT IRON PIPE
WM	WATER METER/WATER MAIN
X-SECT	CROSS SECTION

TRAFFIC SIGNAL ABBREVIATIONS

CAB	CABINET
CCVE	CLOSED CIRCUIT VIDEO EQUIPMENT
DW	STEADY UPRAISED HAND
FDW	FLASHING UPRAISED HAND
FR	FLASHING CIRCULAR RED
FRL	FLASHING RED LEFT ARROW
FRR	FLASHING RED RIGHT ARROW
FY	FLASHING CIRCULAR YELLOW
FYL	FLASHING YELLOW LEFT ARROW
FYR	FLASHING YELLOW RIGHT ARROW
G	STEADY CIRCULAR GREEN
GL	STEADY GREEN LEFT ARROW
GR	STEADY GREEN RIGHT ARROW
GSL	STEADY GREEN SLASH LEFT ARROW
GSR	STEADY GREEN SLASH RIGHT ARROW
GV	STEADY GREEN VERTICAL ARROW
OL	OVERLAP
PED	PEDESTRIAN
PTZ	PAN, TILT, ZOOM
R	STEADY CIRCULAR RED
RL	STEADY RED LEFT ARROW
RR	STEADY RED RIGHT ARROW
TR SIG	TRAFFIC SIGNAL
TSC	TRAFFIC SIGNAL CONDUIT
W	STEADY WALKING PERSON
Y	STEADY CIRCULAR YELLOW
YL	STEADY YELLOW LEFT ARROW

LITTLETON/AYER
ROUTE 2A (AYER ROAD)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	2	78
PROJECT FILE NO.	608443		

LEGEND & ABBREVIATIONS

GENERAL NOTES

1. THE LOCATIONS OF THE EXISTING UTILITIES SHOWN ARE APPROXIMATE AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES AND SUBSURFACE STRUCTURES. THE CONTRACTOR IS RESPONSIBLE FOR MAKING FIELD INVESTIGATIONS AND OBTAINING INFORMATION FROM UTILITY COMPANIES AND INDIVIDUALS TO PINPOINT THE LOCATION AND ELEVATION OF ALL SUBSURFACE UTILITIES AND STRUCTURES. DIG-SAFE SHALL BE CONTACTED 72 HOURS PRIOR TO THE START OF CONSTRUCTION. DIG-SAFE TELEPHONE: 1-888-344-7233.
2. ALL DRAINAGE STRUCTURES, WATER GATES, AND CURB STOPS ARE TO BE ADJUSTED TO FINISHED GRADE UNLESS OTHERWISE NOTED.
3. ALL GAS GATES, TELEPHONE MANHOLES, ELECTRIC MANHOLES AND ELECTRIC HANDHOLES ARE TO BE ADJUSTED TO FINISHED GRADE BY OTHERS UNLESS OTHERWISE NOTED.
4. ALL UTILITY POLES REQUIRING RELOCATION ARE TO BE RELOCATED BY OTHERS.
5. MINIMUM CLEAR PATH ON THE SHARED USE PATHS SHALL BE 8'-0" EXCLUDING THE SURFACE OF THE CURB.
6. WHEELCHAIR RAMPS AND DRIVEWAYS SHALL CONFORM TO THE CURRENT MASSDOT STANDARDS, ADA REQUIREMENTS AND MASSACHUSETTS ARCHITECTURAL ACCESS BOARD REQUIREMENTS.
7. THE CONTRACTOR SHALL RETAIN ALL CURBS, FENCES, WALLS, TREES, SHRUBS, POSTS, LANDSCAPE FEATURES, AND OTHER MISCELLANEOUS ITEMS WITHIN ABUTTING PROPERTIES, UNLESS OTHERWISE NOTED. WHEN RETAINING THOSE ITEMS IS NOT PRACTICAL IN THE OPINION OF THE ENGINEER, THE CONTRACTOR SHALL REMOVE, STOCKPILE, PROTECT AND RESET THE ITEMS. THE CONTRACTOR SHALL REPLACE ITEMS DAMAGED DURING REMOVAL, STOCKPILING, OR RESETTING DUE TO NEGLIGENCE, CARELESSNESS, OR MISHANDLING WITH EQUIVALENT NEW ITEMS AT NO COST TO THE OWNER.
8. ALL TREES WITHIN THE SLOPE LIMIT SHALL BE RETAINED AND PROTECTED UNLESS OTHERWISE NOTED.
9. CONTRACTOR SHALL PROTECT ALL PROPERTY MARKERS UNLESS OTHERWISE NOTED IN THE PLANS. THE CONTRACTOR IS HEREBY RESPONSIBLE FOR REPLACING ANY EXISTING MASSACHUSETTS HIGHWAY BOUND OR PRIVATE PROPERTY PIN DAMAGED OR DESTROYED DURING CONSTRUCTION TO ITS PRE-CONSTRUCTION LOCATION.
10. TREATMENT OF SLOPE AREAS SHALL BE REPLACEMENT IN KIND UNLESS OTHERWISE NOTED.
11. THE RIGHT OF WAY LINES SHOWN ON THIS PLAN ARE THE DIRECT RESULT OF AN INSTRUMENT SURVEY PERFORMED ON THE GROUND IN MAY OF 2016 BY GREEN INTERNATIONAL AFFILIATES, INC. (GREEN) WITH AN ERROR OF CLOSURE LESS THAN 1:15,000, AND FROM PLANS AND DEEDS OF RECORD. PROPERTY LINES SHOWN HEREON ARE APPROXIMATE ONLY AND ARE BASED UPON RECORD DEEDS, PLANS AND ASSESSORS INFORMATION.
12. HORIZONTAL AND VERTICAL CONTROL WAS ESTABLISHED BY MASSDOT SURVEY, IN BOOK 41023, PAGE 109, ON MAY 31, 2016. HORIZONTAL DATUM IS BASED ON THE MASSACHUSETTS STATE PLANE COORDINATE SYSTEM (MAINLAND) NAD83 (2011), 2010.00 EPOCH. VERTICAL DATUM IS NAVD88. THE UNIT OF MEASUREMENTS IS US SURVEY FEET.
13. OWNERSHIP AND DEED INFORMATION WAS OBTAINED FROM THE TOWNS OF LITTLETON AND AYER ASSESSORS OFFICES AND THE MIDDLESEX(SOUTH) COUNTY REGISTRY OF DEEDS. ALL INFORMATION WAS CURRENT AS OF THE DATE OF THE JUNE 2021 GREEN SURVEY.
14. THE SAID PARCELS SHOWN HEREIN ARE SUBJECT TO RIGHTS AND EASEMENTS AS CONTAINED WITHIN THE VARIOUS DEEDS OF RECORD DESCRIBING SAID PREMISES. THE LOCATIONS AND EXTENT OF SAID RIGHTS AND EASEMENTS ARE NOT THE SUBJECT OF THIS SURVEY.
15. EXTRA CARE SHALL BE TAKEN BY THE CONTRACTOR WHEN PERFORMING WORK IN CLOSE PROXIMITY (I.E. EXCAVATION WITH HAND TOOLS) TO THE EXISTING SEPTIC SYSTEM AT 254 AYER ROAD TO PREVENT ANY DAMAGE TO THE SEPTIC SYSTEM. ANY DAMAGE TO THE EXISTING SEPTIC SYSTEM DUE TO THE NEGLIGENCE OR CARELESSNESS OF THE CONTRACTOR SHALL BE REPAIRED AT NO ADDITIONAL COST TO THE OWNER.
16. THE REMOVAL OF THE STONE WALL FROM STATION 13+31 RT TO STATION 13+79 RT SHALL BE PAID FOR UNDER ITEM 120, EARTH EXCAVATION.

DRAINAGE NOTES

1. ALL REINFORCED CONCRETE (RCP) PIPE SHALL BE CLASS III UNLESS OTHERWISE NOTED.
2. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ALL CONFLICTS BETWEEN THE EXISTING UTILITIES AND THE PROPOSED WORK. THE ENGINEER RESERVES THE RIGHT TO MODIFY THE DESIGN TO REALIGN THE PIPE AND STRUCTURE LOCATIONS AND INVERTS TO SUIT ACTUAL FIELD CONDITIONS ENCOUNTERED AT NO ADDITIONAL COST.
3. ALL OFFSETS TO THE CATCH BASINS ARE TO THE CENTER OF THE GRATE. THE LOCATION AND ORIENTATION OF THE BELOW GRADE STRUCTURE SHALL BE FIELD COORDINATED BY THE CONTRACTOR TO AVOID CONFLICTS WITH EXISTING UTILITIES.
4. ALL EXISTING AND PROPOSED CATCH BASINS SHALL BE PROTECTED FROM SEDIMENT INUNDATION DURING ALL CONSTRUCTION ACTIVITIES.
5. ALL EXISTING DRAIN PIPES UNDER THE PROPOSED ROAD OR SIDEWALK SHALL BE RETAINED UNLESS OTHERWISE NOTED. IF THE EXISTING PIPE IS TO BE REMOVED TO ACCOMMODATE THE WORK OR ABANDONED AND IT EXTENDS OUTSIDE THE PROPOSED ROADWAY OR SIDEWALK LIMIT IT SHALL BE CUT AND CAPPED AT THE RESPECTIVE LIMIT AT NO ADDITIONAL COST. REMOVAL AND DISPOSAL OF THESE PIPES ARE INCIDENTAL TO THE DRAINAGE ITEMS.
6. ALL PROPOSED CATCH BASINS SHALL BE DEEP SUMP CATCH BASINS WITH HOOD.
7. DRAINAGE ELEVATIONS ARE PROVIDED FOR DESIGN PURPOSES ONLY. THE CONTRACTOR SHALL VERIFY BY TEST PIT, THE LOCATIONS OF EXISTING UTILITIES WHICH MAY CONFLICT WITH THE PROPOSED DRAINAGE DESIGN. FIELD ADJUSTMENTS WILL BE MADE AS APPROVED OR AS REQUIRED BY THE ENGINEER. ONLY AFTER THE CONTRACTOR VERIFIES ELEVATIONS FOR CONSTRUCTABILITY OF THE DRAINAGE SYSTEM SHALL STRUCTURES BE ORDERED. ANY FIELD ADJUSTMENTS TO DRAIN LINE UP TO A DEPTH OF 5 FEET SHALL BE INCLUDED IN THE COST OF THE PIPE.
8. ALL SINGLE GRATE CATCH BASINS AND DRAIN MANHOLE STRUCTURES ARE ECCENTRIC, UNLESS OTHERWISE NOTED.
9. USE FLAT TOP SLAB MANHOLE AND CATCH BASIN WHERE NEEDED AND APPROVED BY THE ENGINEER.
10. IN INSTANCES WHERE AN EXISTING MANHOLE, HANDHOLE OR "SURFACE" TYPE STRUCTURE THAT CANNOT BE REMOVED OR RESET IS WITHIN THE PROPOSED OR EXISTING ACCESSIBLE SURFACE, THE STRUCTURE SHALL BE CAREFULLY ADJUSTED SUCH THAT THE TOPMOST SURFACES OF THE STRUCTURE COVER SHALL BE FLUSH WITH THE CURB RAMP SURFACE.
11. A MINIMUM OF 12" OF SEPARATION BETWEEN THE EXISTING 8" HP GAS MAIN AND ALL IMPROVEMENTS MUST BE MAINTAINED. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IF EXISTING FIELD CONDITIONS DO NOT ALLOW FOR THIS SEPARATION REQUIREMENT TO BE MAINTAINED.
12. ALL EXISTING CATCH BASINS TO BE RETAINED WITHIN THE LIMIT OF WORK SHALL BE CLEANED AS DIRECTED BY THE ENGINEER.
13. BICYCLE SAFE CASCADE GRATE SHALL BE USED FOR ALL THE INLETS ON CONTINUOUS GRADES. AT LOW POINTS RECTANGULAR BAR GRATES SHALL BE USED.
14. A TEST PIT SHOULD BE PREFORMED AT PROPOSED DRAIN MANHOLE (1-26) TO VERIFY INVERTS OF THE EXISTING 12" CMP BEFORE THE STRUCTURE IS ORDERED.

UTILITY NOTES:

1. THE CONTRACTOR IS HEREBY MADE AWARE THAT EXISTING UTILITIES, INCLUDING BUT NOT LIMITED TO EXISTING WATER AND DRAIN PIPES; DRAINAGE AND SEWER STRUCTURES; GAS LINES, COMMUNICATION LINES AND UTILITY POLES, MAY NEED TO BE PROTECTED AND/OR SHORED UP DURING THE CONSTRUCTION OF THE PROPOSED IMPROVEMENTS UNDER THIS PROJECT. THE COST OF THE WORK REQUIRED FOR THE PROTECTION, MAINTENANCE AND SUPPORT OF THESE OR OTHER EXISTING ABOVEGROUND OR UNDERGROUND UTILITIES IN THE VICINITY OF THE PROPOSED WORK SHALL NOT BE PAID FOR SEPARATELY BUT SHALL BE CONSIDERED INCIDENTAL TO THE WORK UNDER THIS CONTRACT.
2. THIS PLAN WAS PREPARED IN CONFORMANCE WITH AMERICAN SOCIETY OF CIVIL ENGINEERS STANDARD CI/ASCE 38-02 "STANDARD GUIDELINE FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA", QL"C". REFER TO UTILITY QUALITY LEVEL INFORMATION INDEX. ACCURACY OF UTILITY LOCATIONS IS NOT GUARANTEED.
3. BELOW GROUND STRUCTURES, UNLESS DIMENSIONED, ARE SYMBOLIC ONLY.
4. ALL UTILITY COMPANIES, PUBLIC AND PRIVATE, MUST BE NOTIFIED INCLUDING THOSE IN CONTROL OF UTILITIES NOT SHOWN ON THIS PLAN (SEE CHAPTER 370, ACTS OF 1963, MASSACHUSETTS) PRIOR TO DESIGNING, EXCAVATING, BLASTING, INSTALLING, BACKFILLING, GRADING, PAVEMENT RESTORING, OR REPAVING.
5. THE EXISTING CONDITIONS PLAN IS TO BE USED FOR THE SPECIFIED PROJECT ONLY AND IS NOT WARRANTED TO BE COMPLETE FOR ANY OTHER FUTURE PROJECTS.

SUMMARY OF UTILITY MAPPING QUALITY LEVELS:

THE FOLLOWING IS A SUMMARY OF THE SURVEY MAPPING LEVELS FOR UTILITIES AS DESCRIBED IN ASCE STANDARD 38-02, "STANDARD GUIDELINE FOR THE DEPICTION OF EXISTING SUBSURFACE UTILITY DATA". THESE GUIDELINES ARE MORE FULLY DESCRIBED IN THE ASCE STANDARD.

UTILITY QUALITY LEVEL A:
PRECISE HORIZONTAL AND VERTICAL LOCATION OF UTILITIES OBTAINED BY THE ACTUAL EXPOSURE (OR VERIFICATION OF PREVIOUSLY EXPOSED AND SURVEYED UTILITIES) AND SUBSEQUENT MEASUREMENT OF SUBSURFACE UTILITIES, USUALLY AT A SPECIFIC POINT. MINIMALLY INTRUSIVE EXCAVATION EQUIPMENT IS TYPICALLY USED TO MINIMIZE THE POTENTIAL FOR UTILITY DAMAGE. A PRECISE HORIZONTAL AND VERTICAL LOCATION, AS WELL AS OTHER UTILITY ATTRIBUTES, IS SHOWN ON PLAN DOCUMENTS. ACCURACY IS TYPICALLY SET TO 15-MM VERTICAL AND TO APPLICABLE HORIZONTAL SURVEY AND MAPPING ACCURACY AS DEFINED OR EXPECTED BY THE PROJECT OWNER.

UTILITY QUALITY LEVEL B:
INFORMATION OBTAINED THROUGH THE APPLICATION OF APPROPRIATE SURFACE GEOPHYSICAL METHODS TO DETERMINE THE EXISTENCE AND APPROXIMATE HORIZONTAL POSITION OF SUBSURFACE UTILITIES. QUALITY LEVEL B DATA SHOULD BE REPRODUCIBLE BY SURFACE GEOPHYSICS AT ANY POINT OF THEIR DEPICTION. THIS INFORMATION IS SURVEYED TO APPLICABLE TOLERANCES DEFINED BY THE PROJECT AND REDUCED ONTO PLAN DOCUMENTS.

UTILITY QUALITY LEVEL C:
INFORMATION OBTAINED BY SURVEYING AND PLOTTING VISIBLE ABOVE-GROUND UTILITY FEATURES AND BY USING PROFESSIONAL JUDGMENT IN CORRELATING THIS INFORMATION TO QUALITY LEVEL D INFORMATION.

UTILITY QUALITY LEVEL D:
INFORMATION DERIVED FROM EXISTING RECORDS OR ORAL RECOLLECTIONS.

EROSION AND SEDIMENT CONTROL NOTES:

1. ALL EROSION CONTROL MEASURES MUST BE INSTALLED PRIOR TO THE START OF ANY LAND DISTURBANCE / EARTHWORK ACTIVITIES.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPAIR, REPLACEMENT AND MAINTENANCE OF ALL SEDIMENTATION / EROSION CONTROL MEASURES UNTIL ALL DISTURBED AREAS ARE STABILIZED.

LITTLETON/AYER
ROUTE 2A (AYER ROAD)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	4	78
PROJECT FILE NO.	608443		

KEY PLAN

608443_HD04(KEY).DWG Plotted on 13-Oct-2021 1:35 PM

N

BEGIN PROJECT
BEGIN FINE MILLING AND RESURFACING
STATION 1+25.00
COORD. N 3025970.8040
E 645935.7660

ROUTE 2A/110
(AYER ROAD)

APPROX.
TOWN LINE

AYER
LITTLETON

WILLOW ROAD

LIMIT OF WORK
END FINE MILLING AND RESURFACING
STA. 14+90.00

LIMIT OF WORK
END FINE MILLING AND RESURFACING
STA. 23+16.00

BRUCE STREET

END PROJECT
END FINE MILLING AND RESURFACING
STATION 15+67.00
COORD. N 3026013.9410
E 647369.4169

ROUTE 2A/110
(AYER ROAD)

LEGEND

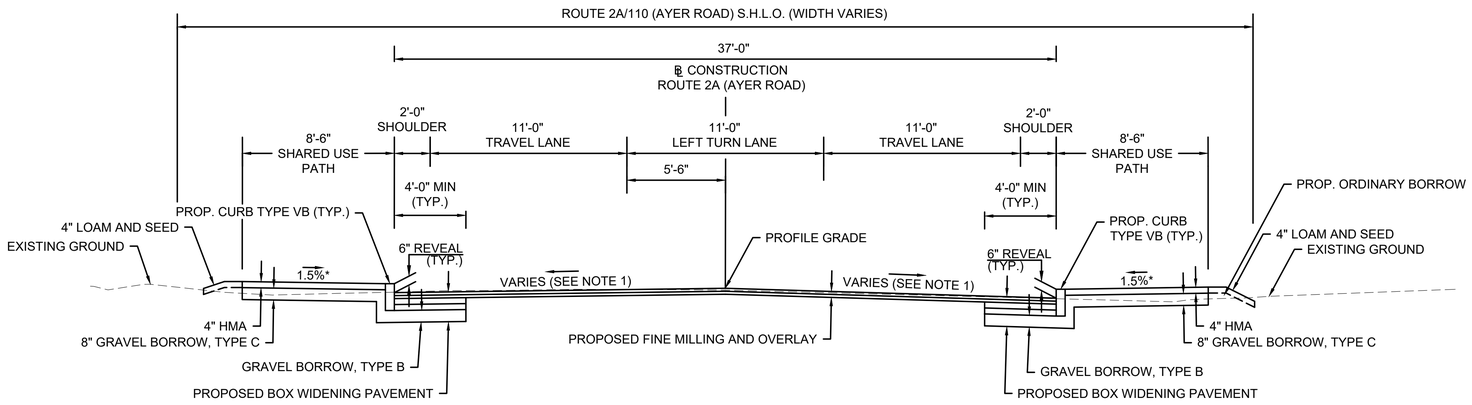
(7) CONSTRUCTION PLANS
(11) PROFILES
(20) DRAINAGE AND UTILITY PLANS
[30] TRAFFIC SIGNS & PAVEMENT MARKINGS PLANS

0 60 120 240
SCALE: 1"=60'

LITTLETON/AYER
ROUTE 2A (AYER ROAD)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	5	78
PROJECT FILE NO.	608443		

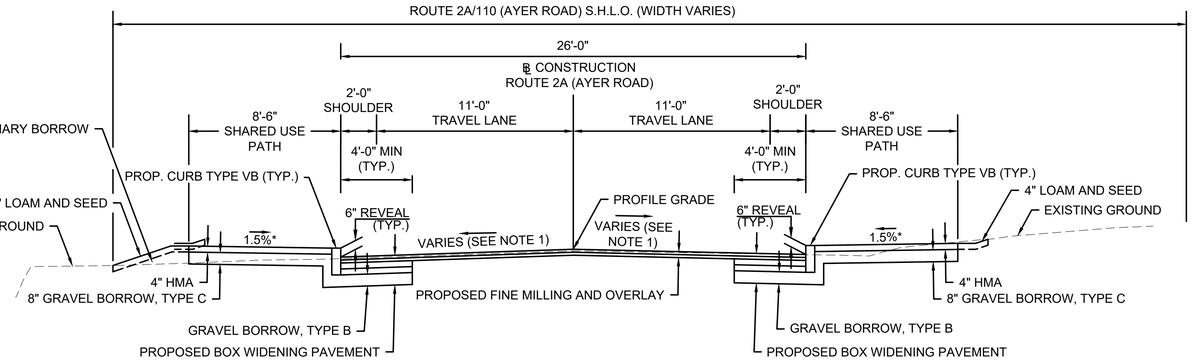
TYPICAL SECTIONS (1 OF 2)



* TOLERANCE FOR CONSTRUCTION = ±0.5%

TYPICAL ROUTE 2A/110 (AYER ROAD) SECTION

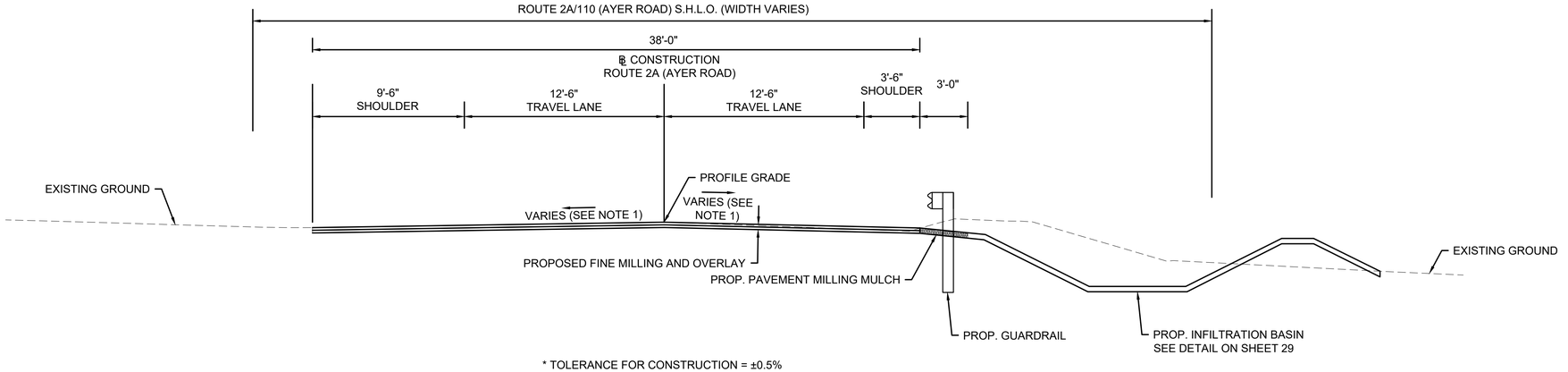
STA. 3+50.00 - STA. 9+90.00
SCALE 1"=4'



* TOLERANCE FOR CONSTRUCTION = ±0.5%

TYPICAL ROUTE 2A/110 (AYER ROAD) SECTION

STA. 1+25.00 - STA. 3+50.00
STA. 9+90.00 - STA. 13+25.00
SCALE 1"=4'



* TOLERANCE FOR CONSTRUCTION = ±0.5%

TYPICAL ROUTE 2A/110 (AYER ROAD) SECTION

STA. 13+25.00 - STA. 15+67.00
SCALE 1"=4'

PAVEMENT NOTES:

PROPOSED BOX WIDENING PAVEMENT

PAVEMENT: 2" SUPERPAVE SURFACE COURSE 12.5 (SSC-12.5-P) OVER ASPHALT EMULSION FOR TACK COAT RS-1H AT 0.08 GAL/SY OVER 2.25" SUPERPAVE INTERMEDIATE COURSE 19.0 (SIC-19.0) OVER ASPHALT EMULSION FOR TACK COAT RS-1H AT 0.08 GAL/SY OVER

BASE: 4" SUPERPAVE BASE COURSE 37.5 (SBC-37.5)

SUBBASE: 4" DENSE GRADED CRUSHED STONE OVER EXISTING SUBBASE MEETING MATERIAL SPECIFICATION M1.03.0 GRAVEL BORROW, TYPE B OR 8" GRAVEL BORROW, TYPE B

PROPOSED FINE MILLING AND OVERLAY

PAVEMENT FINE MILLING: 3" VARIABLE PAVEMENT FINE MILLING (SEE NOTE 1)

SURFACE: 2" SUPERPAVE SURFACE COURSE 12.5 (SSC-12.5-P) OVER ASPHALT EMULSION FOR TACK COAT RS-1H AT 0.08 GAL/SY OVER 2.25" SUPERPAVE INTERMEDIATE COURSE 19.0 (SIC-19.0) OVER ASPHALT EMULSION FOR TACK COAT RS-1H AT 0.09 GAL/SY

HMA SHARED USE PATH

SURFACE 1.5" SUPERPAVE SURFACE COURSE 12.5(SSC-12.5) OVER ASPHALT EMULSION FOR TACK COAT (RS-1) AT 0.08 GAL/SY OVER 2.5" SUPERPAVE INTERMEDIATE COURSE 19.0 (SIC-19.0)

SUBBASE: 8" GRAVEL BORROW, TYPE C

CEM. CONC. DRIVEWAY

TOP COURSE: 6" CEMENT CONCRETE

SUBBASE: 8" GRAVEL BORROW, TYPE C

NOTES:

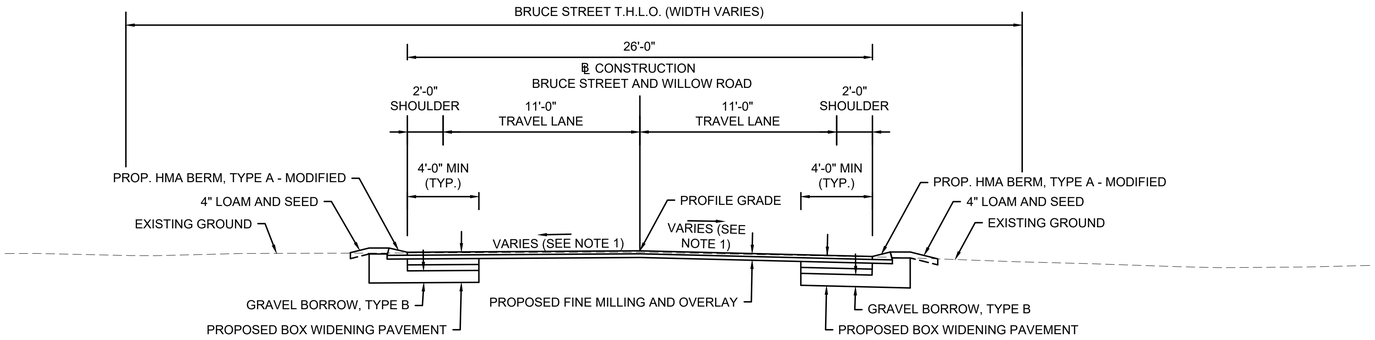
1. PAVEMENT MILLING TO MATCH EXISTING CROSS SLOPE OR ESTABLISH 2% CROSS SLOPE WHERE POSSIBLE AS SHOWN ON THE CROSS SECTIONS.

2. ALL HMA SHALL BE PER SECTION 450 HOT MIX ASPHALT AND SECTION M3 ASPHALTIC MATERIALS.

LITTLETON/AYER
ROUTE 2A (AYER ROAD)

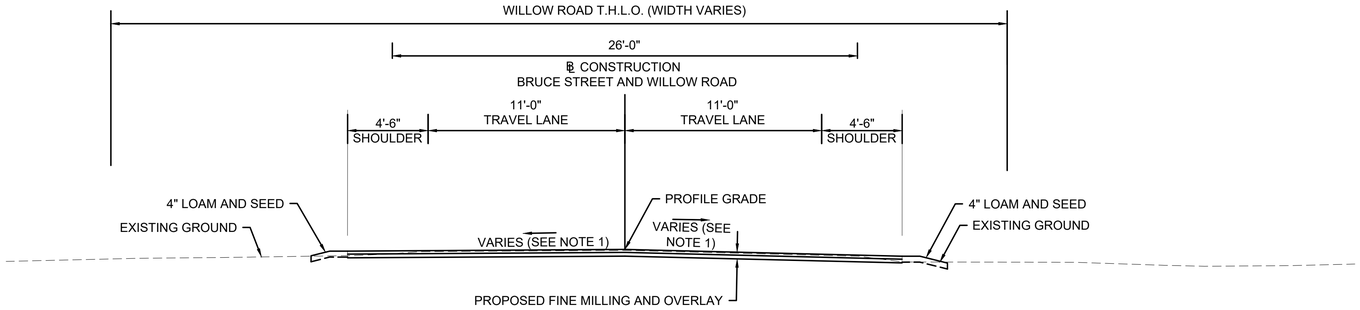
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	6	78
PROJECT FILE NO.	608443		

TYPICAL SECTIONS (2 OF 2)



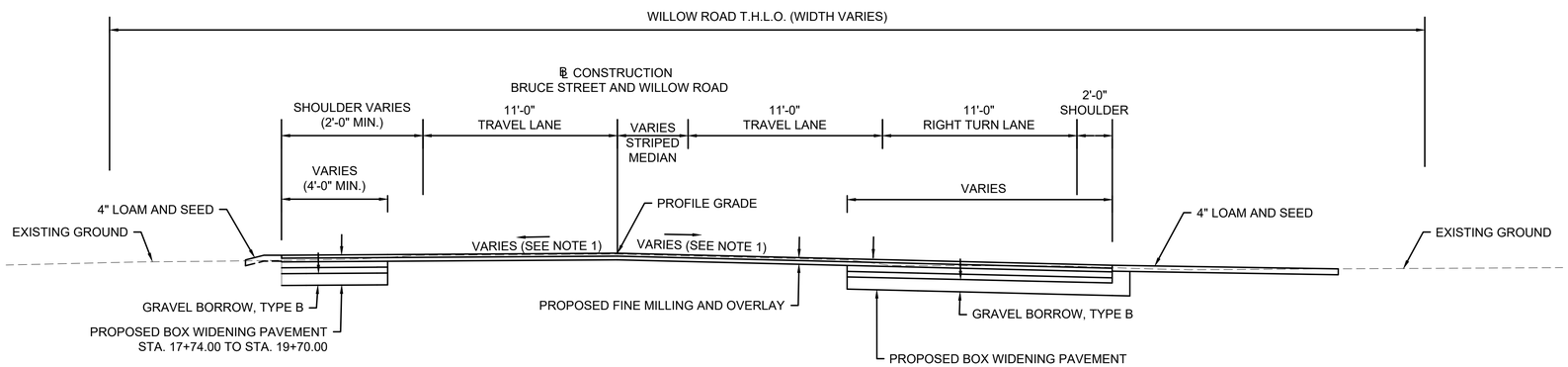
TYPICAL BRUCE STREET SECTION

STA. 20+30.00 - STA. 23+16.00
SCALE 1"=4'



TYPICAL WILLOW ROAD SECTION

STA. 14+90.00 - STA. 18+00.00
SCALE 1"=4'



TYPICAL WILLOW ROAD SECTION (RIGHT TURN)

STA. 18+00.00 - STA. 19+70.00
SCALE 1"=4'

LITTLETON/AYER
ROUTE 2A (AYER ROAD)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	7	78
PROJECT FILE NO.	608443		

CONSTRUCTION PLANS (1 OF 4)

HIGHWAY GUARD DETAILS
NONE

TRAFFIC SIGNAL CONDUIT
SEE BELOW

WATER SUPPLY ALTERATIONS
NONE

DRAINAGE DETAILS
SEE SHEET NO. 20

BEGIN PROJECT
BEGIN FINE MILLING AND RESURFACING
STATION 1+25.00
COORD. N 3025970.8040
E 645935.7660

ROUTE 2A (AYER ROAD)
(PUBLIC - VARIABLE WIDTH)
N 79° 29' 37" E 445.41'

AYER
LITTLETON

1926 SHLO NO. 2331

N/F
JOSEPH P.A. ROUTHIER
PARCEL ID 30-9
BOOK 59354 PAGE 438
0 LITTLETON RD

N/F
PINGRYVILLE REALTY TRUST
BRENT C. ROUTHIER, TRUSTEE
PARCEL ID 30-12
BOOK 70372 PAGE 268
186 LITTLETON RD

N/F
PINGRYVILLE REALTY TRUST
PARCEL ID 30-13
BOOK 70655 PAGE 130
190 LITTLETON RD
TOWN OF AYER

N/F
PINGRYVILLE REALTY TRUST
PARCEL ID 30-14
BOOK 70655 PAGE 133
192 LITTLETON RD
TOWN OF AYER

N/F
PINGRYVILLE REALTY TRUST
PARCEL ID U45 9 0
BOOK 70655 PAGE 130
AYER RD
TOWN OF LITTLETON

N/F
PINGRYVILLE REALTY TRUST
PARCEL ID U45 10 0
BOOK 70655 PAGE 133
192 AYER RD
TOWN OF LITTLETON

N/F
THE THEODORE W. NUSSDORFER
2007 REVOCABLE TRUST,
THEODORE W. NUSSDORFER AND
MAUREEN M. NUSSDORFER TRUSTEES
PARCEL ID U45 8 0
BOOK 50576 PAGE 223
264 AYER RD

N/F
260 AYER RD TRUST,
RONALD J RAFFI TRUSTEE
PARCEL ID U45 8 A
BOOK 21527 PAGE 232
260 AYER RD

PROP. TEMP. EASEMENT (TYP.)
PROP. PERM. EASEMENT
RET. LP
RET. BENCH
RET. AND PROTECT 4" DIA. TREES
RET. BLDR
PROP. SLOPE LIMIT (TYP.)
PROP. CLEARING AND GRUBBING
LIMIT OF BOX WIDENING STA. 3+33.00
RET. FENCE
R&S MEMORIAL
PROP. SAWCUT AND MATCH EXISTING
PROP. HMA DRIVEWAY
PROP. GRANITE CURB TYPE VB
PROP. LOAM AND SEED
PROP. HMA DRIVEWAY
PROP. CEM. CONC. DRIVEWAY
R&R MB
RET. FENCE
RET. TIMBER WALL
SAWCUT AND MATCH EXISTING
PROP. HMA SHARED USE PATH
PROP. GRANITE CURB TYPE VB
RET. BLDR
PROP. FINE MILLING AND RESURFACING
PC +45.41
PROP. GRANITE CURB TYPE VB
PROP. HMA SHARED USE PATH
PROP. SLOPE LIMIT
R&S. BLDR.
PROP. TREE PROTECTION - ARMORING & PRUNING
RET. BRICK WALL
RET. BRICK WALL
PROP. HMA DRIVEWAY
SAWCUT AND MATCH EXISTING
NEAT CUTLINE (TYP.)
LIMIT OF BOX WIDENING STA. 2+47.00
PROP. MATTING FOR EROSION CONTROL
R&S ROCKS
PROP. LOAM AND SEED
PROP. CLEARING AND GRUBBING
R&S BLDRS
R&S BLDRS
RET. PLANTER AND SIGN
PROP. PERM. EASEMENT
PROP. HMA SHARED USE PATH
PROP. GRANITE CURB TYPE VB

200 FT RIVERFRONT AREA

CONTINUED ON SHEET NO. 8

0 20 50 100
SCALE: 1" = 20'

FOR PROFILE: SEE SHEET NO. 11

608443_HD06(CONSTRUCTION PLAN).DWG Plotted on 13-Oct-2021 1:35 PM

CONTINUED ON SHEET NO. 10

CONTINUED ON SHEET NO. 7

CONTINUED ON SHEET NO. 9

HIGHWAY GUARD DETAILS

NONE

TRAFFIC SIGNAL CONDUIT

SEE BELOW

WATER SUPPLY ALTERATIONS

NONE

DRAINAGE DETAILS

SEE SHEET NO. 26

LITTLETON/AYER
ROUTE 2A (AYER ROAD)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	8	78
PROJECT FILE NO.	608443		

CONSTRUCTION PLANS (2 OF 4)

608443_HD06(CONSTRUCTION PLAN).DWG Plotted on 13-Oct-2021 1:36 PM

N

AYER
LITTLETON

WILLOW ROAD
(PUBLIC - VARIABLE WIDTH)

ROUTE 2A (AYER ROAD)
(PUBLIC - VARIABLE WIDTH)

BRUCE STREET
(PUBLIC - VARIABLE WIDTH)

LIMIT OF BOX WIDENING
STA. 17+74.00

LIMIT OF BOX WIDENING
STA. 17+80.00

RET. STONE WALL

S 42° 11' 45" E 207.08'

N/F
WATTS FAMILY TRUST,
ELIZABETH M. WATTS TRUSTEE
PARCEL ID 30-15
BOOK 25290 PAGE 543
59 WILLOW RD

1967 MIDDLESEX COUNTY LAYOUT

RET. BLDR.

N/F
256 AYER ROAD TRUST
PARCEL ID 30-16
BOOK 70655 PAGE 127
0 LITTLETON ROAD
TOWN OF AYER

PROP. BOUND
R&S BLDRS
PROP. BOUND

PROP. LOAM AND SEED
PROP. PERM. EASEMENT
PROP. TEMP. EASEMENT (TYP.)
PROP. SAWCUT AND MATCH EXISTING
PROP. HMA DRIVEWAY

PROP. CLEARING AND GRUBBING

N/F
256 AYER ROAD TRUST
PARCEL ID U45 11 0
BOOK 70655 PAGE 127
AYER RD
TOWN OF LITTLETON

R&S. BLDR.
PROP. BOUND
R&S POST
R&S. BLDR.
PROP. LOAM AND SEED

PC +45.37

L=215.28'
R=550.00'
Δ=22° 25' 36"

PROP. HMA SHARED USE PATH
PROP. GRANITE CURB TYPE VB

PROP. CLEARING AND GRUBBING

PROP. BOUND
Δ=13° 48' 19"
L=409.61' R=1700.00'

NEAT CUT LINE (TYP.)

PC +45.41 PC-1

HMA BERM TYPE A, MODIFIED
REM. CURB
PROP. GRANITE CURB TYPE VB
PROP. HMA SHARED USE PATH

PROP. GRANITE TRANSITION CURB TYPE VB

PROP. BOUND

REM. BERM

R&S. BLDR
HMA BERM TYPE A, MODIFIED
REM. CURB
SAWCUT AND MATCH EXISTING
PROP. HMA DRIVEWAY
PROP. AGED PINE BARK MULCH

REM. BERM
HMA BERM TYPE A, MODIFIED
SAWCUT AND MATCH EXISTING
PROP. HMA DRIVEWAY
PROP. TEMP. EASEMENT (TYP.)
HMA BERM TYPE A, MODIFIED

PROP. SLOPE LIMIT
PROP. LOAM AND SEED
LIMIT OF BOX WIDENING
STA. 7+11.00
PROP. PERM. EASEMENT
PROP. CLEARING AND GRUBBING
PROP. BOUND
R&D BUSHES
SAWCUT AND MATCH EXISTING
REM. BIT. CONC. DRIVEWAY
REM. BIT. BERM
PROP. TEMP. EASEMENT (TYP.)
HMA BERM TYPE A, MODIFIED
R&R MB
PROP. BOUND
SAWCUT AND MATCH EXISTING
PROP. HMA DRIVEWAY

R&R MB

RET. LANDSCAPING
RET. SIGN
RET. POST
R&S FENCE
R&S BOLLARD
REM. BLDR
R&S. BLDR
PROP. GRASS SWALE
R&S TIMBER

PROP. BOUND
1912 SHLO NO. 1433

PROP. HMA SHARED USE PATH
PROP. GRANITE CURB TYPE VB

PT +55.02

PROP. BOUND
PROP. FINE MILLING AND RESURFACING

TOWN OF LITTLETON EASEMENT LINE

PC-2

R&S. ROCKS
PROP. GRANITE CURB TYPE VB
PROP. HMA SHARED USE PATH
PROP. GRANITE CURB TYPE VB

R&S POST

1926 SHLO NO. 2330

R&S POSTS
LIMIT OF BOX WIDENING
STA. 7+97.00
RET. POSTS
RET. STUMP
R&S POST
PROP. GRANITE TRANSITION CURB TYPE VB
LIMIT OF BOX WIDENING
STA. 21+48.00
PROP. CLEARING AND GRUBBING
RET. ROCK
R&S POSTS
RET
HMA BERM TYPE A, MODIFIED

PT +60.65

S 64° 37' 20" E 198.35'

LIMIT OF BOX WIDENING
STA. 22+60.00
PROP. HMA DRIVEWAY
MATCH EXISTING

LIMIT OF WORK
END FINE MILLING AND RESURFACING
STA. 23+16.00

23+60

RET. 20" TREE
HMA BERM TYPE A, MODIFIED
RET. 28" TREE
RET. STONE WALL
PROP. CLEARING AND GRUBBING
R&S POST
LIMIT OF BOX WIDENING
STA. 22+60.00
RET. 28" TREE

RET. BOLLARD
HMA BERM TYPE A, MODIFIED
SAWCUT AND MATCH EXISTING
PROP. HMA DRIVEWAY
PROP. LOAM AND SEED
PROP. SLOPE LIMIT
R&S BOLLARD
RET. BERM
R&S FENCE
RET. FENCE
R&S POST
R&R MB
MB

R&S FENCE

R&S STONE WALL
R&S GRANITE BLOCK
RET. SHRUBS
PROP. AGED PINE BARK MULCH
R&R MB
PROP. HMA DRIVEWAY
SAWCUT AND MATCH EXISTING
R&S. BLDR.
RET. 5" TREE
RET. 24" TREE
PROP. GRANITE CURB TYPE VB
PROP. LOAM AND SEED
R&S. FLAG POLE
PROP. TEMP. EASEMENT (TYP.)
R&S FENCE
STA. 6+84.87 ROUTE 2A/110 (AYER ROAD) ℄ =
STA. 20+00.00 WILLOW ROAD/BRUCE STREET ℄

N/F
CLARISSA A. EATON
PARCEL ID 31-2
BOOK 30815 PAGE 287
64 WILLOW RD
TOWN OF AYER

N/F
CLARISSA A. EATON
PARCEL ID U45 12 0
BOOK 30815 PAGE 287
64 WILLOW RD
TOWN OF LITTLETON

N/F
CHIP SHOTS REALTY LLC
PARCEL ID U45 14 0
BOOK 46676 PAGE 280
245 AYER RD

N/F
FRANK W. MATHESON JR
PARCEL ID U45 2 0
BOOK 64522 PAGE 122
2 BRUCE ST

RET. PLANTER AND SIGN
RET. BERM
PROP. PERM. EASEMENT
PROP. AGED PINE BARK MULCH
MATTING EROSION CONTROL

N/F
AYER HOUSE TRUST,
JOSEPH PAUL ROUTHIER TRUSTEE
PARCEL ID U45 7 0
BOOK 14463 PAGE 422
256 AYER RD

DRIVEWAY EASEMENT TO PASS AND REPASS
BOOK 14407 PG 382

N/F
256 AYER ROAD TRUST,
JOSEPH PAUL ROUTHIER TRUSTEE
PARCEL ID U45 7 B
BOOK 14407 PAGE 382
254 AYER RD

N/F
AYER HOUSE TRUST,
JOSEPH PAUL ROUTHIER TRUSTEE
PARCEL ID U45 7 0
BOOK 14463 PAGE 422
256 AYER RD

N/F
CHRISTOPHER SNAY
PARCEL ID U45 7 A
BOOK 70787 PAGE 593
5 BRUCE ST

ACCESS EASEMENT
BOOK 16348 PG 141

N/F
GEORGE MATHEW ROBINSON
PARCEL ID U45 7 C
BOOK 63285 PAGE 19
7 BRUCE ST

PUMP STATION
SEPTIC TANK
GREASE TRAP
DRAINFIELD
POLYETHELENE BARRIER

0 20 50 100
SCALE: 1" = 20'

FOR PROFILE: SEE SHEETS NO. 12, 15

LITTLETON/AYER
ROUTE 2A (AYER ROAD)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	9	78
PROJECT FILE NO.	608443		

CONSTRUCTION PLANS (3 OF 4)

608443_HD06(CONSTRUCTION PLAN).DWG Plotted on 13-Oct-2021 1:36 PM

HIGHWAY GUARD DETAILS

STA 13+03 - 13+40 RT (GUARDRAIL FLARED END TREATMENT, TL-3)
STA 13+40 - 15+56 RT (GUARDRAIL, TL-3(SINGLE FACED))
STA 15+56 - 15+65 RT (TRAILING ANCHORAGE)

TRAFFIC SIGNAL CONDUIT

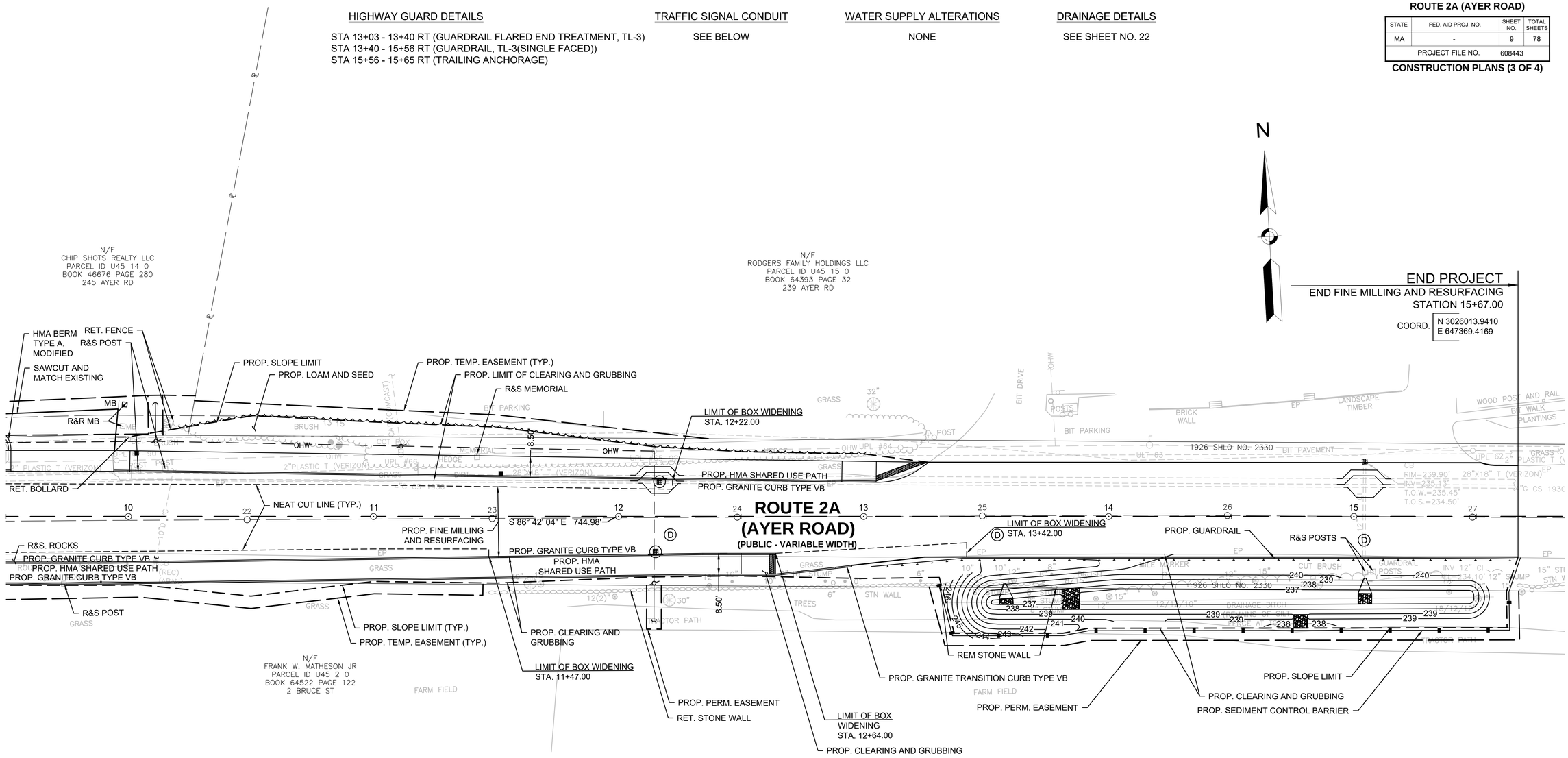
SEE BELOW

WATER SUPPLY ALTERATIONS

NONE

DRAINAGE DETAILS

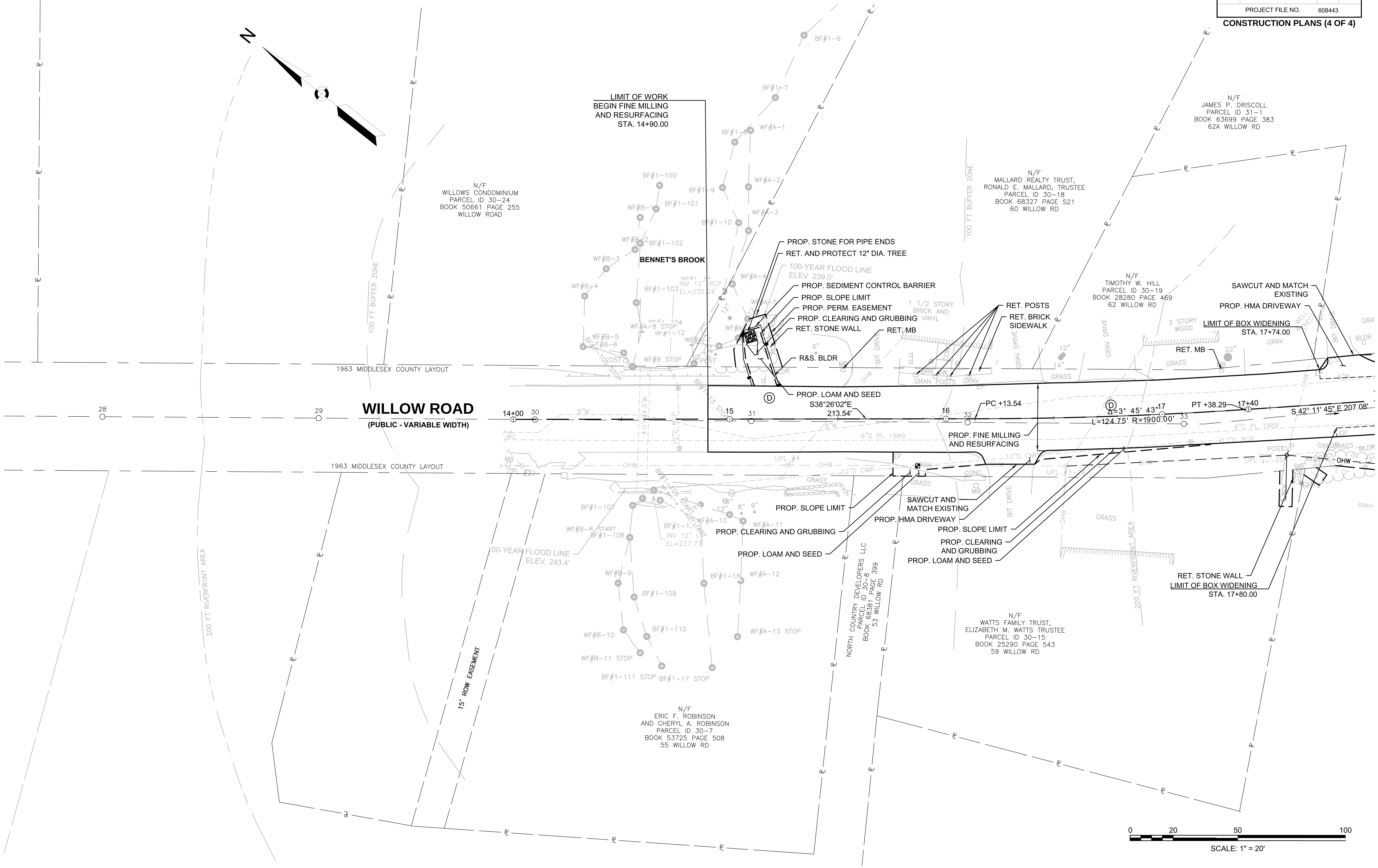
SEE SHEET NO. 22



NOTE:
1. SEE SHEET 29 FOR ADDITIONAL GRADING INFORMATION.

FOR PROFILE: SEE SHEET NO. 13

HIGHWAY GUARD DETAILS	TRAFFIC SIGNAL CONDUIT	WATER SUPPLY ALTERATIONS	DRAINAGE DETAILS
NONE	NONE	NONE	SEE SHEET NO. 23



FOR PROFILE: SEE SHEET NO. 14

LITTLETON/AYER
ROUTE 2A (AYER ROAD)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	20	78
PROJECT FILE NO.	608443		

DRAINAGE AND UTILITY PLANS (1 OF 4)

608443_HDXX(D&U PLAN).DWG Plotted on 13-Oct-2021 1:36 PM

N

BEGIN PROJECT
BEGIN FINE MILLING AND RESURFACING
STATION 1+25.00
COORD. N 3025970.8040
E 645935.7660

AYER
LITTLETON

ROUTE 2A (AYER ROAD)
(PUBLIC - VARIABLE WIDTH)

1926 SHLO NO. 2331

0+00
+18.68 PI

N/F
JOSEPH P.A. ROUTHIER
PARCEL ID 30-9
BOOK 59354 PAGE 438
0 LITTLETON RD

N/F
PINGRYVILLE REALTY TRUST
BRENT C. ROUTHIER, TRUSTEE
PARCEL ID 30-12
BOOK 70372 PAGE 268
186 LITTLETON RD

N/F
PINGRYVILLE REALTY TRUST
PARCEL ID 30-13
BOOK 70655 PAGE 130
190 LITTLETON RD
TOWN OF AYER

N/F
PINGRYVILLE REALTY TRUST
PARCEL ID 30-14
BOOK 70655 PAGE 133
192 LITTLETON RD
TOWN OF AYER

N/F
PINGRYVILLE REALTY TRUST
PARCEL ID U45 9 0
BOOK 70655 PAGE 130
AYER RD
TOWN OF LITTLETON

N/F
PINGRYVILLE REALTY TRUST
PARCEL ID U45 10 0
BOOK 70655 PAGE 133
192 AYER RD
TOWN OF LITTLETON

N/F
THE THEODORE W. NUSSDORFER
2007 REVOCABLE TRUST,
THEODORE W. NUSSDORFER AND
MAUREEN M. NUSSDORFER TRUSTEES
PARCEL ID U45 8 0
BOOK 50576 PAGE 223
264 AYER RD

N/F
260 AYER RD TRUST,
RONALD J RAFFI TRUSTEE
PARCEL ID U45 8 A
BOOK 21527 PAGE 232
260 AYER RD

R&R UP(50') (BO)
R&R UP(50') & GUYS (2) (BO)
PROP. PERM. EASEMENT
PROP. TEMP. EASEMENT (TYP.)
PROP. CBCI (1-2)
15 LF - 12" RCP
PROP. DMH (1-3)
REM 12" D RCP
245 LF - 12" RCP
29 LF - 12" RCP
PROP CUT AND PLUG (TYP.)
PROP. GI (1-1)
8 LF - 12" DIP
PROP. CB W FRAME AND COVER (1-24)
DRIVEWAY EASEMENT TO PASS AND REPASS BOOK 14407 PG 382

CB
RIM=253.47
INV.(A)=250.12
INV.(B)=250.16
T.O.W.=250.22
T.O.S.=248.37
SUMP=248.07

CONTINUED ON SHEET NO. 21

0 20 50 100
SCALE: 1" = 20'

LITTLETON/AYER
ROUTE 2A (AYER ROAD)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	21	78
PROJECT FILE NO.	608443		

DRAINAGE AND UTILITY PLANS (2 OF 4)

608443_HDXX(D&U PLAN).DWG Plotted on 13-Oct-2021 1:52 PM

CONTINUED ON SHEET NO. 23

CONTINUED ON SHEET NO. 20

CONTINUED ON SHEET NO. 22

N

AYER
LITTLETON

ROUTE 2A (AYER ROAD)
(PUBLIC - VARIABLE WIDTH)

WILLOW ROAD
(PUBLIC - VARIABLE WIDTH)

BRUCE STREET
(PUBLIC - VARIABLE WIDTH)

UPGRADE UP(45') (BO)
PROP. PUSH BRACE (BO)
284 LF - 18" RCP
PROP. PERM. EASEMENT
PROP. WATER SERVICE RELOCATION
ADJ. WATER GATE
REM. UP (BO)
PROP GUY (3) (BO)
PROP. PERM. EASEMENT
R&R UP(50') & GUY (BO)
PROP. DMH (1-4)
R&R UP(50') (BO)
R&R FLOODLIGHTS
69 LF - 12" RCP
ADJ. TMH (BO)
245 LF - 12" RCP
ADJ. GAS GATE (BO)
PROP CUT AND PLUG (TYP.)
55 LF - 18" RCP
ADJ. WATER GATE
PROP. TEMP. EASEMENT (TYP.)
ADJ. WATER GATE
PROP. 5' DIA. DMH (1-20)
R&R UP(50') & GUY (BO)
R&R COBRA HEAD LIGHT (BO)
ADJ. WATER GATE
ADJ. GAS GATE (BO)
ADJ. WATER GATE
PROP. ELECTRIC SERVICE RISER RELOCATION
REMOVE AND RELOCATE SIGN - BY OTHERS
PROP. CBCI (1-8)
29 LF - 12" RCP
PROP. DMH (1-10)
10 LF - 12" RCP
PROP. PERM. EASEMENT
PROP. 6" DIP
PROP. HYDRANT
ADJ. WATER GATE
PROP. 28" X 18" DUCT BANK RELOCATION (BO)
R&R UP(50') (BO)
PROP. CBCI (1-5)
PROP. 2" PL TELE. LINE RELOCATION (BO)
PROP. GUY (BO)
R&R UP(50') (BO)
R&R UP(50') (BO)
R&R FLOOD LIGHTS
1912 SHLO NO. 1433
R&S. EXISTING HYDRANT
PROP. 6" SOLID SLEEVE
27 LF - 12" RCP
121 LF - 12" RCP
PROP. DMH (1-16)
50 LF - 18" RCP
62 LF - 12" RCP
TOWN OF LITTLETON EASEMENT LINE
23 LF - 12" RCP
ADJ. MONITORING WELL
PROP. CBCI (1-18)
ADJ. MONITORING WELL
20 LF - 12" RCP
PROP. 5' DIA DMH (1-19)
10 LF - 12" RCP
PROP. CBCI (1-17)
PROP. PERM. EASEMENT
ADJ. WATER GATE
R&R UP(50') & GUY (BO)
PROP. CB (1-14)
R&R COBRA HEAD LIGHT (BO)
24 LF - 12" RCP
PROP. CB (1-13)
PROP. TEMP. EASEMENT (TYP.)
39 LF - 12" RCP
PROP. 5' DIA DMH (1-15)
23 LF - 12" RCP
15 LF - 12" RCP
PROP. CB (1-9)
PROP. CBCI (1-11)
14 LF - 12" RCP
PROP. DMH (1-12)
6 LF - 12" RCP
CONNECT TO EXISTING 12"D RCP
PROP. LEACHING BASIN (1-25)
PROP. DMH (1-7)
8 LF - 12" RCP
PROP. TEMP. EASEMENT (TYP)
PROP. CBCI (1-6)
PROP CUT AND PLUG (TYP.)
ADJ. WATER GATE
ADJ. GAS GATE (BO)
UPGRADE UP(45') (BO)
ADJ. GAS GATE (BO)
ADJ. WATER GATE
LIMIT OF WORK
END FINE MILLING AND RESURFACING
STA. 23+16.00

N/F
WATTS FAMILY TRUST,
ELIZABETH M. WATTS TRUSTEE
PARCEL ID 30-15
BOOK 25290 PAGE 543
59 WILLOW RD

N/F
256 AYER ROAD TRUST
PARCEL ID 30-16
BOOK 70655 PAGE 127
0 LITTLETON ROAD
TOWN OF AYER

N/F
256 AYER ROAD TRUST
PARCEL ID U45 11 0
BOOK 70655 PAGE 127
AYER RD
TOWN OF LITTLETON

N/F
CLARISSA A. EATON
PARCEL ID 31-2
BOOK 30815 PAGE 287
64 WILLOW RD
TOWN OF AYER

N/F
CLARISSA A. EATON
PARCEL ID U45 12 0
BOOK 30815 PAGE 287
64 WILLOW RD
TOWN OF LITTLETON

N/F
CHIP SHOTS REALTY LLC
PARCEL ID U45 14 0
BOOK 46676 PAGE 280
245 AYER RD

N/F
AYER HOUSE TRUST,
JOSEPH PAUL ROUTHIER TRUSTEE
PARCEL ID U45 7 0
BOOK 14463 PAGE 422
256 AYER RD

N/F
256 AYER ROAD TRUST,
JOSEPH PAUL ROUTHIER TRUSTEE
PARCEL ID U45 7 B
BOOK 14407 PAGE 382
254 AYER RD

N/F
AYER HOUSE TRUST,
JOSEPH PAUL ROUTHIER TRUSTEE
PARCEL ID U45 7 0
BOOK 14463 PAGE 422
256 AYER RD

N/F
CHRISTOPHER SNAY
PARCEL ID U45 7 A
BOOK 70787 PAGE 593
5 BRUCE ST

N/F
GEORGE MATHEW ROBINSON
PARCEL ID U45 7 C
BOOK 63285 PAGE 19
7 BRUCE ST

N/F
FRANK W. MATHESON JR
PARCEL ID U45 2 0
BOOK 64522 PAGE 122
2 BRUCE ST

DRIVEWAY EASEMENT TO PASS AND REPASS
BOOK 14407 PG 382

ACCESS EASEMENT
BOOK 16348 PG 141

1967 MIDDLESEX COUNTY LAYOUT

TOWN LOCATION LINE

CB RIM=253.47 INV.(A)=250.12 INV.(B)=250.16 T.O.W.=250.22 T.O.S.=248.37 SUMP=248.07

CB RIM=254.67 INV.=251.87 T.O.W.=251.32 T.O.S.=248.67

CB RIM=253.07 INV.(A)=249.77 INV.(B)=249.87 T.O.W.=249.57 T.O.S.=248.57 SUMP=248.07

DMH RIM=251.90 INV.=247.91 T.O.W.=247.71 T.O.S.=246.21

DMH RIM=255.14'

CP RIM=246.62 INV.(A)=241.39 INV.(B)=241.40 T.O.S.=242.02

WMH RIM=249.88

0 20 50 100
SCALE: 1" = 20'

LITTLETON/AYER
ROUTE 2A (AYER ROAD)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	22	78
PROJECT FILE NO.	608443		

DRAINAGE AND UTILITY PLANS (3 OF 4)

608443_HDXX(D&U PLAN).DWG Plotted on 13-Oct-2021 2:50 PM

N

ROUTE 2A (AYER ROAD)

(PUBLIC - VARIABLE WIDTH)

END PROJECT
END FINE MILLING AND RESURFACING
STATION 15+67.00
COORD. N 3026013.9410
E 647369.4169

N/F
CHIP SHOTS REALTY LLC
PARCEL ID U45 14 0
BOOK 46676 PAGE 280
245 AYER RD

N/F
RODGERS FAMILY HOLDINGS LLC
PARCEL ID U45 15 0
BOOK 64393 PAGE 32
239 AYER RD

N/F
FRANK W. MATHESON JR
PARCEL ID U45 2 0
BOOK 64522 PAGE 122
2 BRUCE ST

PROP. PERM. EASEMENT
PROP. GUY (BO)
RET. BOLLARD
R&R UP(50') (BO)
PROP. TEMP. EASEMENT (TYP.)
R&R UP(50') (BO)
R&R PRIMARY RISER (BO)
RET. UP
PROP. CBCI (2-1)
PROP. 28" X 18" DUCT BANK RELOCATION (BO)
PROP. 4" GAS LINE RELOCATION (BO)
RET. UP
PROP. 28" X 18" DUCT BANK RELOCATION (BO)
R&R COBRA HEAD LIGHT (BO)
PROP. GI (2-7)
30 LF - 12" DIP
PROP. 4" GAS LINE RELOCATION (BO)
22 LF - 12" RCP
133 LF - 12" RCP
22 LF - 12" RCP
PROP CUT AND PLUG (TYP.)
REM
PROP. TEMP. EASEMENT (TYP.)
PROP. UP & GUY (BO)
PROP. DMH (2-4)
9 LF - 12" RCP
PROP. CBCI (2-3)
PROP. PERM. EASEMENT
PROP. DMH (2-5)
PROP. FES (2-9)
PROP. INFILTRATION BASIN
PROP. PERM. EASEMENT
PROP. CB W FRAME AND COVER (2-6)
16 LF - 12" RCP CLASS V
PROP. FES (2-8)

CONTINUED ON SHEET NO. 21

NOTE:
1. SEE SHEET 29 FOR ADDITIONAL GRADING INFORMATION.

0 20 50 100
SCALE: 1" = 20'

LITTLETON/AYER
ROUTE 2A (AYER ROAD)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	23	78
PROJECT FILE NO.	608443		

DRAINAGE AND UTILITY PLANS (4 OF 4)

608443_HDXX(D&U PLAN).DWG Plotted on 13-Oct-2021 2:50 PM

N

LIMIT OF WORK
BEGIN FINE MILLING
AND RESURFACING
STA. 14+90.00

N/F
WILLOWS CONDOMINIUM
PARCEL ID 30-24
BOOK 50661 PAGE 255
WILLOW ROAD

100 FT BUFFER ZONE

1963 MIDDLESEX COUNTY LAYOUT

WILLOW ROAD
(PUBLIC - VARIABLE WIDTH)

14+00

200 FT RIVERFRONT AREA

15' ROW EASEMENT

100-YEAR FLOOD LINE
ELEV. 239.0'

INV 12" RCP
EL=235.24'

WF#B STOP

WF#A-8 STOP

WF#B-5
WF#B-6

BF#1-100
BF#1-101
BF#1-102
BF#1-103
BF#1-104
BF#1-12

WF#B-1
WF#B-2
WF#B-3
WF#B-4

WF#A-1
WF#A-2
WF#A-3
WF#A-4
WF#A-5=238.98

BF#1-4
BF#1-5
BF#1-6
BF#1-7
BF#1-8
BF#1-9
BF#1-10

RIM=243.57
INV.(A)=236.17

PROP. STONE FOR PIPE ENDS
PROP. PERM. EASEMENT
PROP. FLARED END
INV=240.30
PROP. FES (1-23)
21 LF - 18" RCP
158 LF - 18" RCP
PROP. DMH (1-22)
PROP. DMH (1-21)
284 LF - 18" RCP
PROP. TEST PIT
126 LF - 12" RCP
RET.
ADJ.
EXIST. CB (1-27)
R&R COBRA HEAD
LIGHT (BO)
UPGRADE UP(45') (BO)
PROP. PUSH BRACE (BO)
UPGRADE UP(40') (BO)
PROP. PERM. EASEMENT
PROP. DMH(1-26)
4 LF - 12" RCP
RET UP

15
16
17
17+40

N/F
MALLARD REALTY TRUST,
RONALD E. MALLARD, TRUSTEE
PARCEL ID 30-18
BOOK 68327 PAGE 521
60 WILLOW RD

100 FT BUFFER ZONE

N/F
JAMES P. DRISCOLL
PARCEL ID 31-1
BOOK 63699 PAGE 383
62A WILLOW RD

N/F
TIMOTHY W. HILL
PARCEL ID 30-19
BOOK 28280 PAGE 469
62 WILLOW RD

2 STORY
BRICK AND
VINYL

2 STORY
WOOD

GRAV DRIVE
BIT DRIVE

CB
RIM=243.82
INV=239.32

CB
RIM=246.52
INV.(A)=241.39
INV.(B)241.40
T.O.S.=242.02

BF#1-107
BF#1-108
BF#1-111
BF#1-16
BF#1-17
BF#1-109
BF#1-110

WF#A-10
WF#A-11
WF#A-12
WF#A-13 STOP

WF#B-8 START
WF#B-9
WF#B-10
WF#B-11 STOP

100-YEAR FLOOD LINE
ELEV. 243.4'

N/F
ERIC F. ROBINSON
AND CHERYL A. ROBINSON
PARCEL ID 30-7
BOOK 53725 PAGE 508
55 WILLOW RD

NORTH COUNTRY DEVELOPERS LLC
PARCEL ID 30-8
BOOK 6838 PAGE 399
53 WILLOW RD

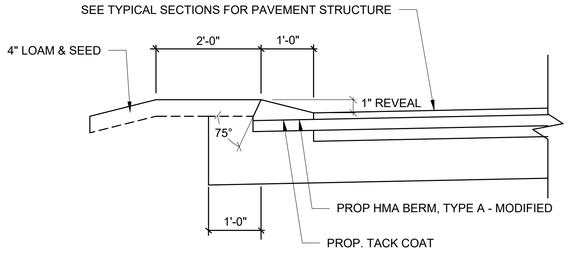
N/F
WATTS FAMILY TRUST,
ELIZABETH M. WATTS TRUSTEE
PARCEL ID 30-15
BOOK 25290 PAGE 543
59 WILLOW RD

1967 MIDDLESEX
COUNTY LAYOUT

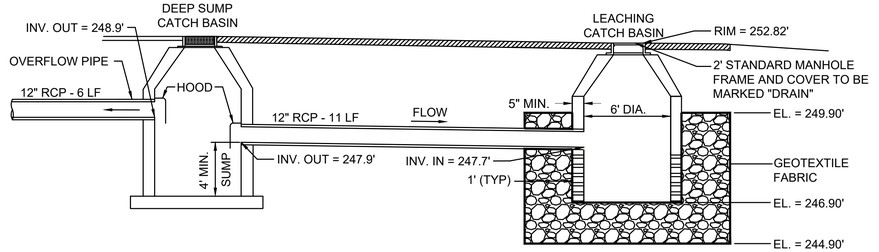
N/F
256 AYER ROAD TRUS
PARCEL ID 30-16
BOOK 70655 PAGE 12
0 LITTLETON ROAD
TOWN OF AYER

CONTINUED ON SHEET NO. 21

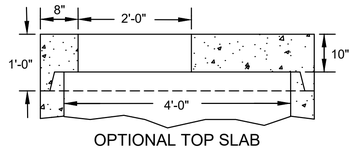
0 20 50 100
SCALE: 1" = 20'



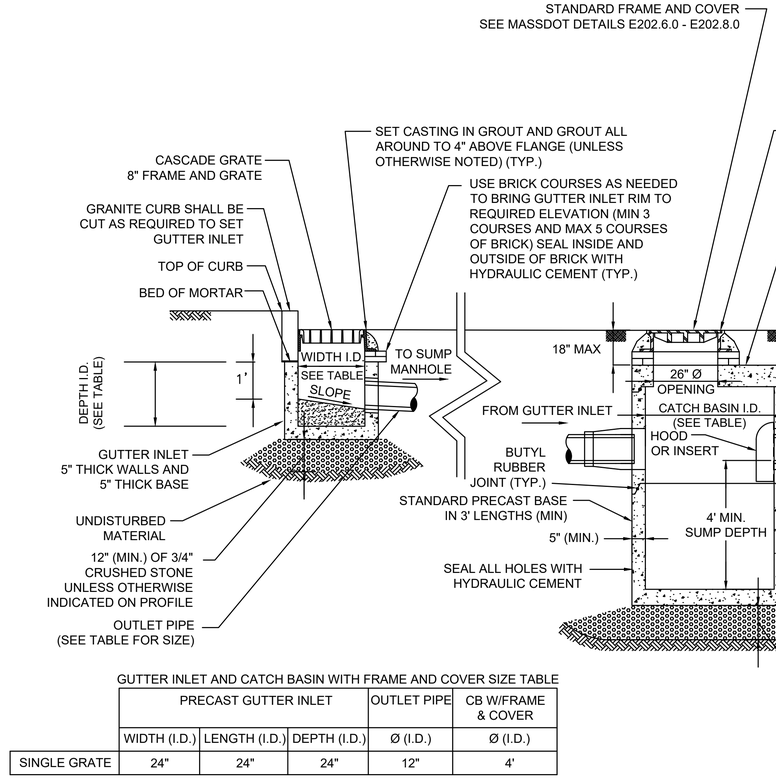
HMA BERM, TYPE A - MODIFIED
NOT TO SCALE



TYPICAL CATCH BASIN/LEACHING CATCH BASIN CONNECTION DETAIL
NOT TO SCALE



OPTIONAL TOP SLAB

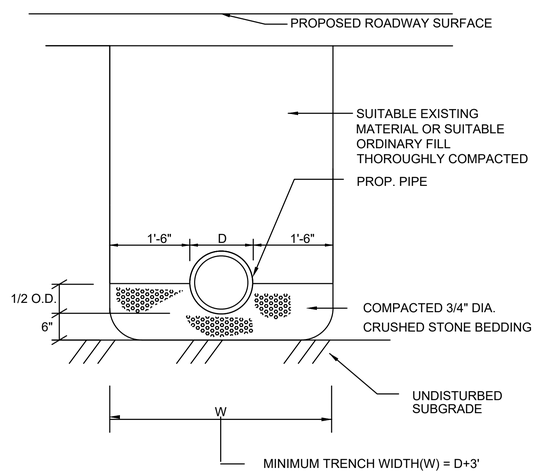


GUTTER INLET AND CATCH BASIN WITH FRAME AND COVER SIZE TABLE

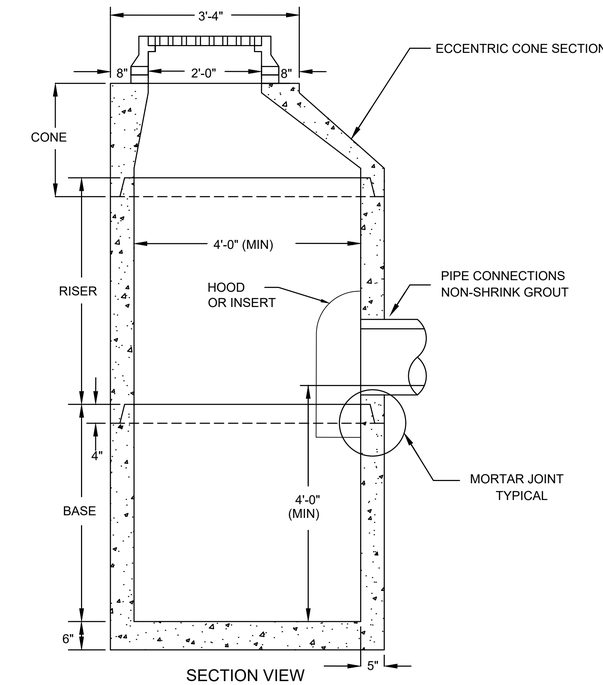
	PRECAST GUTTER INLET			OUTLET PIPE	CB W/FRAME & COVER
	WIDTH (I.D.)	LENGTH (I.D.)	DEPTH (I.D.)	Ø (I.D.)	Ø (I.D.)
SINGLE GRATE	24"	24"	24"	12"	4'

I.D. = INSIDE DIMENSION

GUTTER INLET AND CATCH BASIN WITH FRAME AND COVER
NOT TO SCALE



TYPICAL PIPE TRENCH
NOT TO SCALE

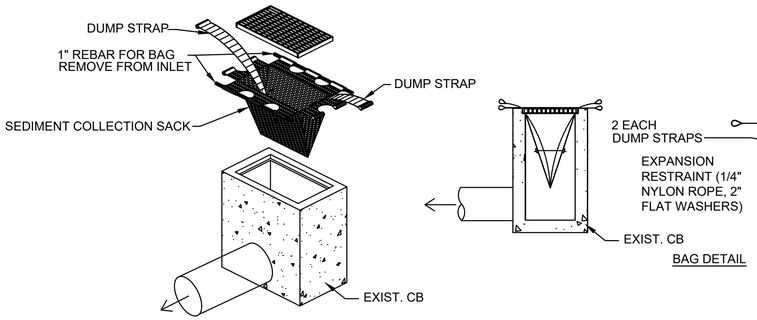


SECTION VIEW

NOTES:

1. CONCRETE: 4,000PSI MINIMUM AFTER 28 DAYS.
2. REINFORCED STEEL CONFORMS TO LATEST ASTM A185 SPEC. 0.12 SQ. IN/LINEAL FT. AND 0.12 SQ. IN. (BOTH WAYS) BASE BOTTOM.
3. H-20 DESIGN LOADING PER AASHTO HS-20-44; ASTM C478 SPEC FOR "PRECAST REINFORCED CONCRETE MANHOLE SECTIONS."
4. BASED ON ACTUAL FIELD CONDITIONS; THE CONTRACTOR SHALL DETERMINE WHICH TYPE OF TOP SECTION SHOULD BE USED. FLAT TOP SECTIONS SHALL ONLY BE INSTALLED WHEN APPROVED BY THE ENGINEER.

ECCENTRIC CATCH BASIN DETAIL
NOT TO SCALE

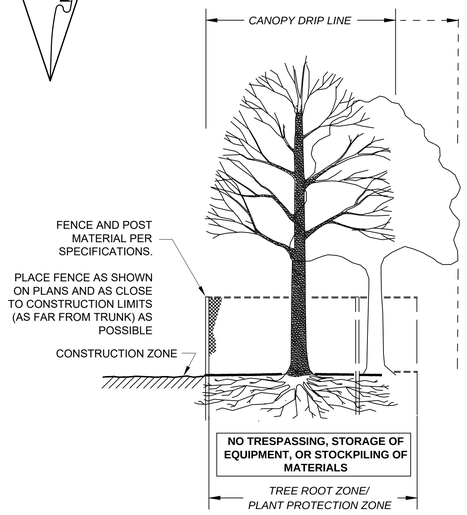


TEMPORARY INLET FILTER BAG DETAIL

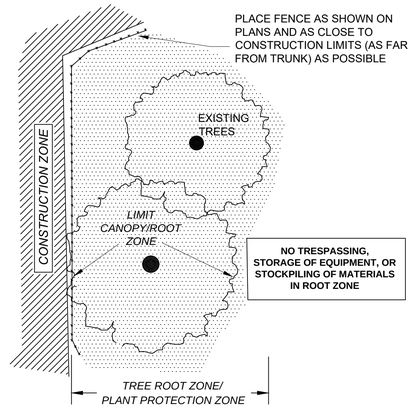
SCALE: NOT TO SCALE

EROSION AND SEDIMENT CONTROLS

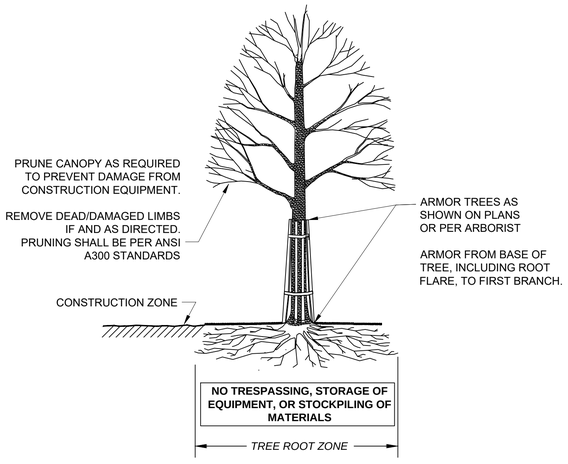
1. THE CONTRACTOR IS RESPONSIBLE FOR CONTROLLING THE EROSION AND SEDIMENT DURING THE CONSTRUCTION PROCESS. SITE SPECIFIC CONDITIONS MAY REQUIRE MODIFICATIONS IN THE FIELD, BUT THE CONTRACTOR MUST ENSURE THAT THE CHANGES MEET THE MINIMUM REQUIREMENTS OF THIS PLAN AND ARE APPROVED BY THE ENGINEER.
2. IN ORDER TO MINIMIZE EROSION AND SEDIMENT RUNOFF FROM THE SITE, THE CONTRACTOR SHALL MAINTAIN EXISTING VEGETATION WHERE POSSIBLE AND STABILIZE THE DISTURBED PORTIONS OF THE SITE AS QUICKLY AS POSSIBLE. THIS MAY INCLUDE PHASING THE PROJECT AS NEEDED TO MINIMIZE THE SIZE OF THE DISTURBED AREAS ON THE SITE. THE COST OF PHASING THE PROJECT IS INCIDENTAL TO THE CONTRACT.
3. THE CONTRACTOR MUST ALSO ANTICIPATE INCREASED RUNOFF FROM STEEPER SLOPES AND DURING HIGH GROUNDWATER CONDITIONS. THIS MAY OCCUR DURING THE WET SEASON (TYPICALLY MARCH THROUGH APRIL) OR AFTER SIGNIFICANT PRECIPITATION EVENTS.
4. ALL DISTURBED SURFACES SHALL BE STABILIZED WITHIN 14 DAYS AFTER CONSTRUCTION IN ANY PORTION OF THE SITE THAT HAS BEEN COMPLETED OR WHERE CONSTRUCTION HAS TEMPORARILY CEASED.
5. THE CONTRACTOR SHALL, AT ALL TIMES, HAVE A STOCKPILE OF COMPOST FILTER TUBES ADEQUATE TO REINFORCE/REPLACE EROSION AND SEDIMENT CONTROL AS NEEDED.



SECTION - FENCE PROTECTION OF ROOT ZONE



PLAN VIEW - FENCE PROTECTION OF ROOT ZONE

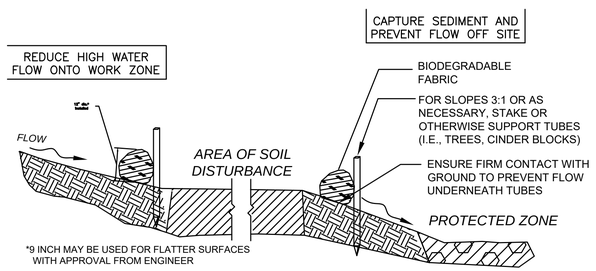


SECTION - TRUNK ARMORING & PRUNING

TREE PROTECTION DETAILS

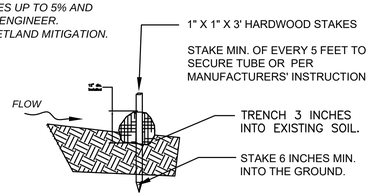
NOT TO SCALE

SEDIMENT BARRIER - COMPOST FILTER TUBE

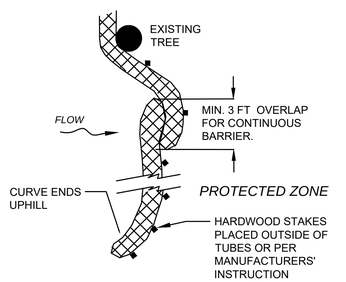


12 INCH STRAW WATTLE

FOR USE ONLY ON SLOPES UP TO 5% AND WITH APPROVAL OF THE ENGINEER. NOT TO BE USED FOR WETLAND MITIGATION.



SECTION



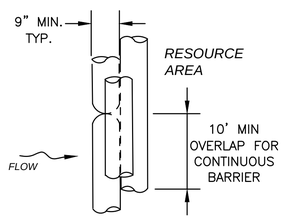
PLACE TUBE AS CLOSE TO LIMIT OF SOIL DISTURBANCE AS POSSIBLE, ALONG CONTOURS, AND PERPENDICULAR TO FLOW.

ADJUST LOCATION AS REQUIRED FOR OPTIMUM EFFECTIVENESS. DO NOT INSTALL IN WATERWAYS.

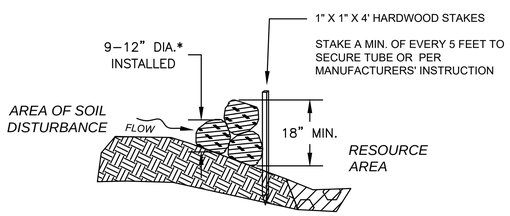
PLAN VIEW

SEDIMENT BARRIERS - COMPOST FILTER TUBES & STRAW WATTLES

SCALE: NOT TO SCALE



PLAN VIEW



SECTION

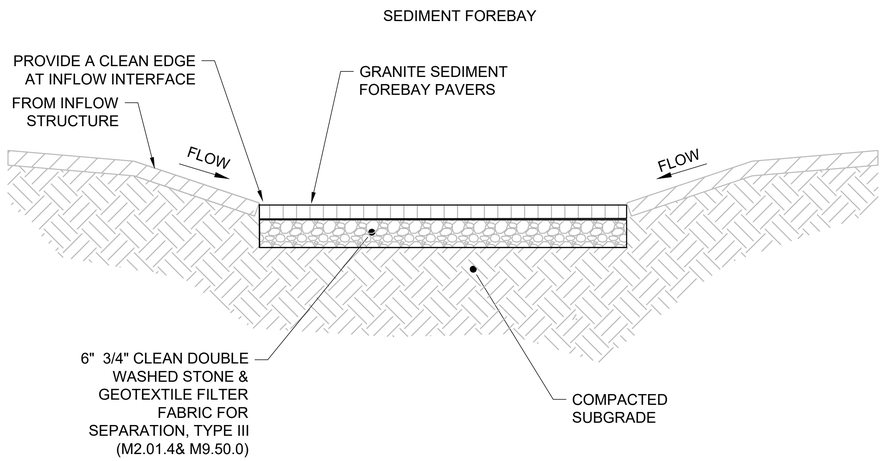
COMPOST FILTER TUBE BERM (SLOPES 2:1 OR STEEPER)

SCALE: NOT TO SCALE

LITTLETON/AYER
ROUTE 2A (AYER ROAD)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	27	78
PROJECT FILE NO.	608443		

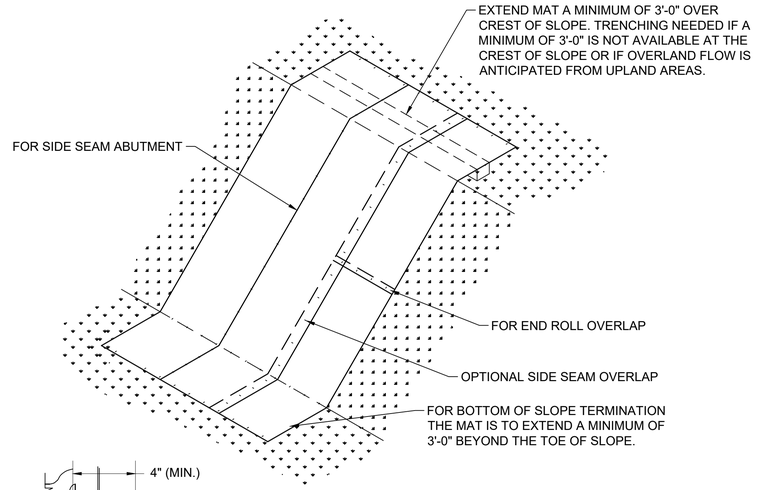
CONSTRUCTION DETAILS (3 OF 5)

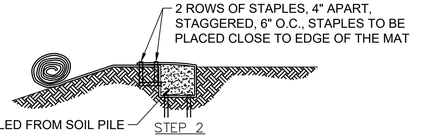


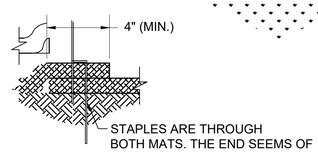
NOTES:
1. SEE SPECIFICATIONS FOR SEDIMENT FOREBAY PAVER REQUIREMENTS.
2. SEE PLANS FOR DIMENSIONS GRADING AND ELEVATIONS FOR SEDIMENT FOREBAY

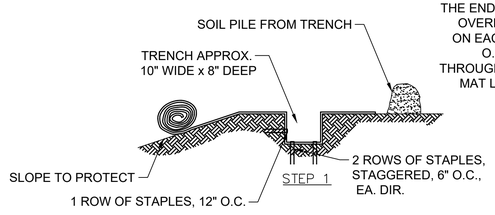
SEDIMENT FOREBAY PAVERS

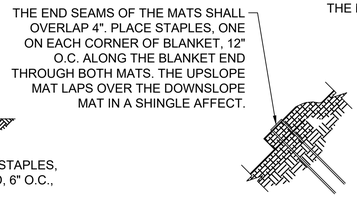
NOT TO SCALE

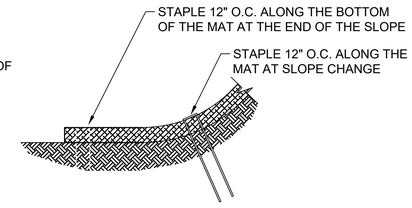








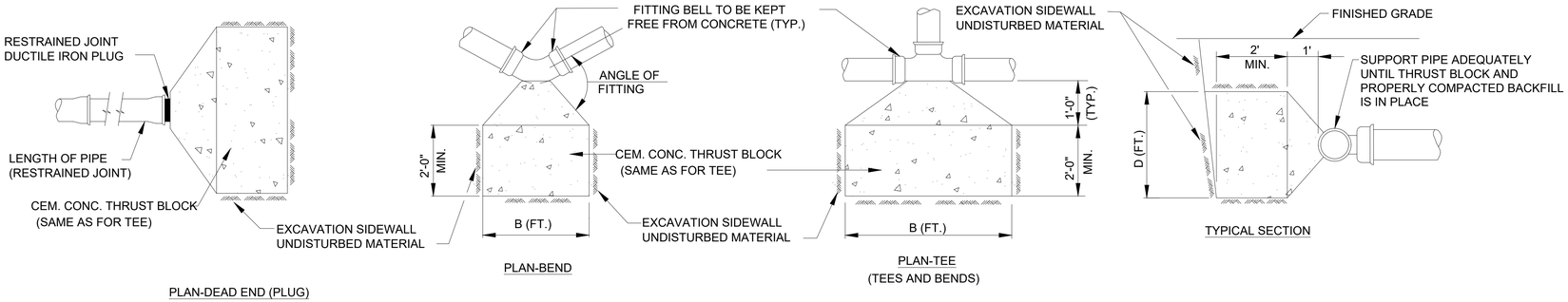




NOTES:
1. SEE MANUFACTURER'S STAPLE PATTERN GUIDE FOR DETAILS.
2. INSTALL EROSION CONTROL MATTING IN LOCATIONS SHOWN ON THE PLANS.
3. AREAS WITH EROSION CONTROL MATS SHALL BE SEEDED.
4. STAPLES SHALL BE BIODEGRADABLE
5. EROSION CONTROL MATS SHALL BE BIODEGRADABLE.

EROSION CONTROL MATTING

NOT TO SCALE

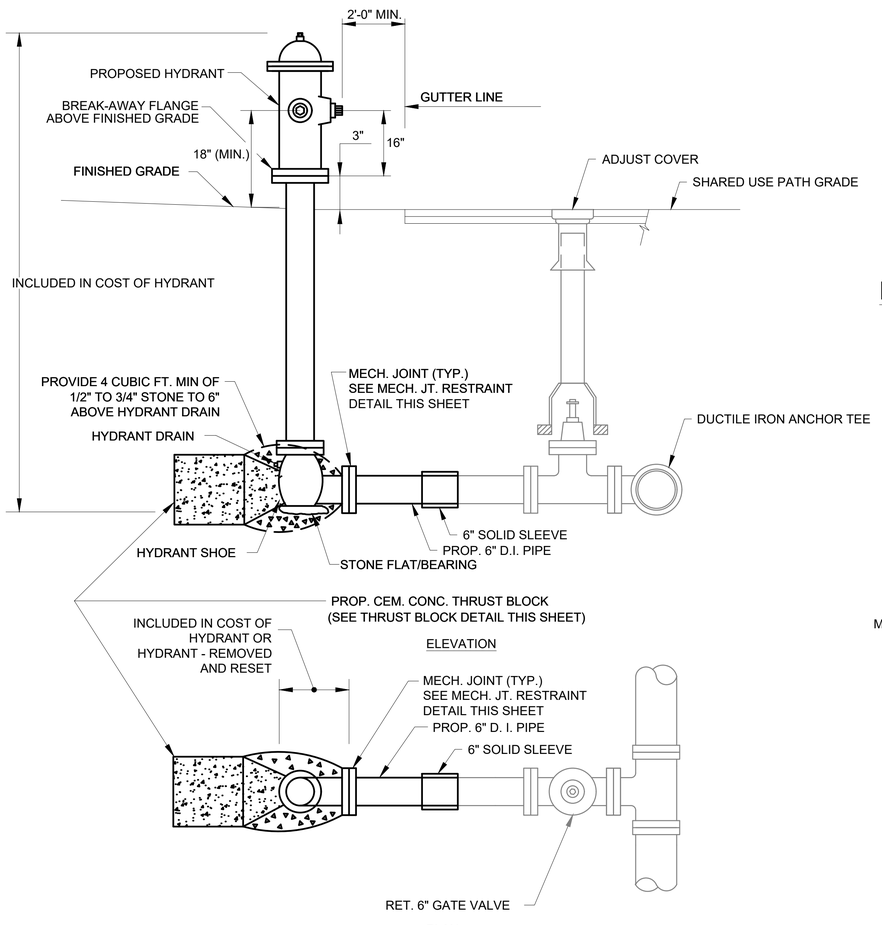


THRUST BLOCK DETAILS

NOT TO SCALE

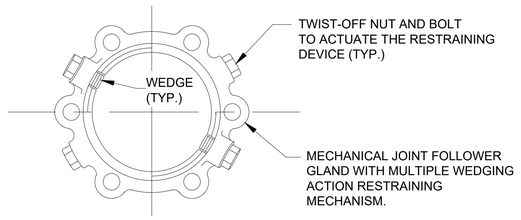
PIPE SIZE	6"		8"		12"	
DIMENSION	B	D	B	D	B	D
TEE/PLUG	2	2	3	3	4	4
90°	2	2	3	3	4	4
45°	2	2	2	2	4	4
22 1/2°	2	2	2	2	3	3
11 1/4°	N/A	N/A	N/A	N/A	N/A	N/A

THRUST BLOCK SCHEDULE



TYPICAL FIRE HYDRANT CONNECTION DETAIL

NOT TO SCALE

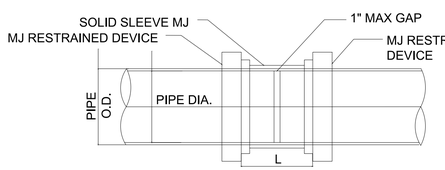


NOTES:

1. GLANDS SHALL BE DUCTILE IRON CONFORMING TO A.S.T.M A536-80 STEEL.
2. DIMENSIONS OF THE GLAND SHALL BE SUCH THAT IT CAN BE USED WITH THE STANDARDIZED MECHANICAL JOINT BELL AND TEE-HEAD BOLTS CONFORMING TO A.N.S.I/A.W.W.A. C111/A21.11 AND A.N.S.A/A.W.W.A C153/A21.53 OF THE LATEST REVISION.

MECHANICAL JOINT RESTRAINT DETAIL

NOT TO SCALE

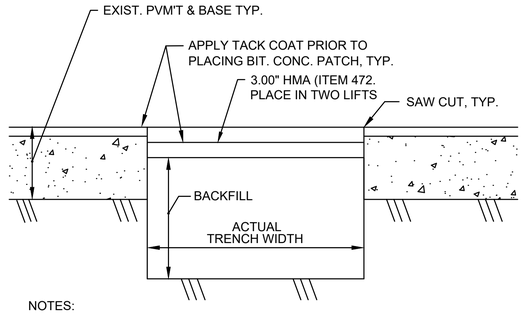


SOLID SLEEVE CONNECTION WITH MJ RESTRAINT DEVICE FOR NEW DI PIPE TO EXISTING DI PIPE

SOLID SLEEVE		
PIPE DIA.	PIPE O.D.	L
6"	6.9"	12"

SOLID SLEEVE CONNECTION DETAIL

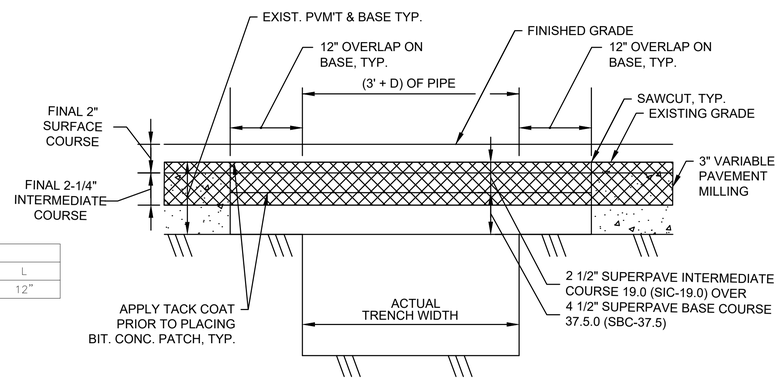
NOT TO SCALE



NOTES:
1. PERMANENT HMA PATCH SHALL BE USED IN ALL AREAS THAT WILL BE MILLED & OVERLAID. PERMANENT HMA PATCH IS NOT REQUIRED WITHIN THE LIMITS OF BOX WIDENING, TEMPORARY HMA PATCH SHALL BE MAINTAINED UNTIL PERMANENT PATCH IS PERFORMED IN THESE AREAS.
2. PAVEMENT FOR TEMPORARY HMA PATCH SHALL BE PAID FOR UNDER ITEM 472. HOT MIX ASPHALT FOR MISCELLANEOUS WORK.

TEMPORARY HMA PATCH DETAIL

SCALE: NOT TO SCALE



NOTES:
1. PERMANENT HMA PATCH SHALL BE USED IN ALL AREAS THAT WILL BE MILLED & OVERLAID. PERMANENT HMA PATCH IS NOT REQUIRED WITHIN THE LIMITS OF BOX WIDENING. TEMPORARY HMA PATCH SHALL BE MAINTAINED UNTIL PERMANENT PATCH IS INSTALLED IN THESE AREAS.

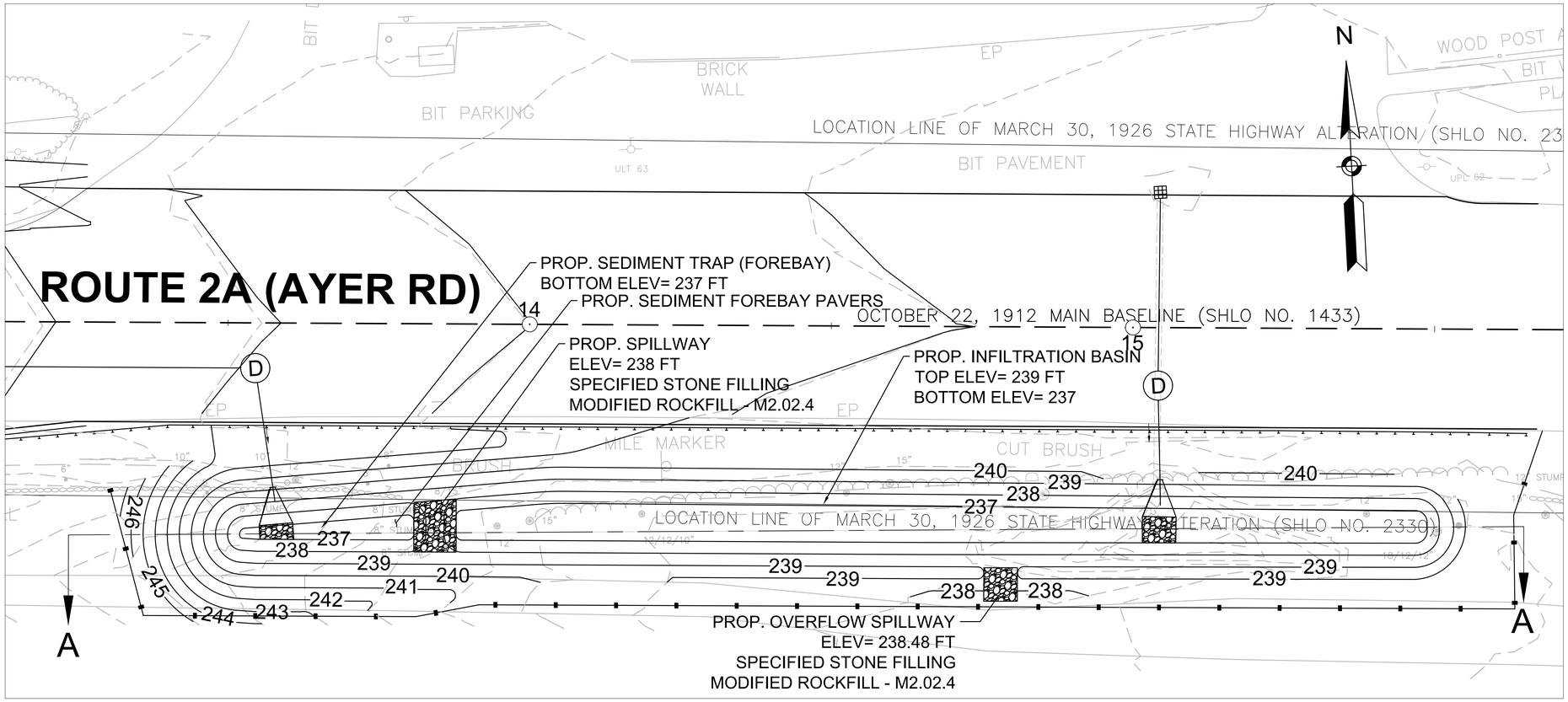
PERMANENT HMA PATCH DETAIL

SCALE: NOT TO SCALE

LITTLETON/AYER
ROUTE 2A (AYER ROAD)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	29	78
PROJECT FILE NO.	608443		

CONSTRUCTION DETAILS (5 OF 5)



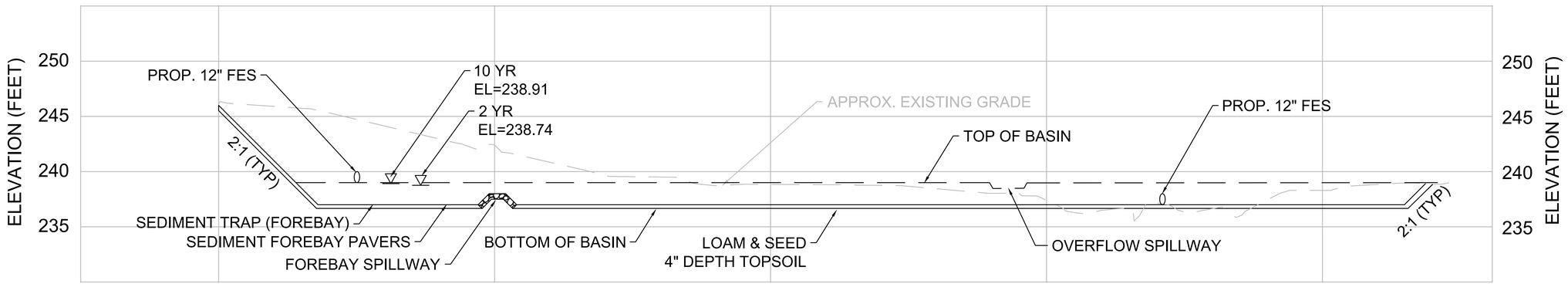
PLAN

SCALE: 1" = 10'

0 10 20 30 40

SCALE: 1" = 10'

INFILTRATION BASIN



SECTION A - A

SCALE: HOR: 1" = 10'
VERT: 1" = 5'

NOTE: FOR PROPOSED SEDIMENT FOREBAY PAVERS SEE DETAIL ON SHEET 27.

NOTICE OF INTENT

Intersection Improvements on Route 2A At Willow Road and Bruce Street Ayer and Littleton, Massachusetts

MassDOT Contract No. 608443

Prepared for

Massachusetts Department of Transportation

October 13, 2021

Prepared by

GREEN INTERNATIONAL AFFILIATES, INC.

Building Strong Client Relationships Through Engineering Excellence

GREEN INTERNATIONAL AFFILIATES, INC.
239 LITTLETON ROAD, SUITE 3 WESTFORD, MA 01886
T: (978) 923-0400 | F: (978) 399-0033 | WWW.GREENINTL.COM

October 13, 2021

Ms. Jo-Anne Crystoff, Ayer Conservation Administrator
Ayer Conservation Commission
Town Hall
1 Main Street
Ayer, MA 01432

Subject: **Intersection Improvements on**
Route 2A at Willow Road and Bruce Street
Littleton/Ayer, Massachusetts
Notice of Intent Submittal

Dear Ms. Crystoff:

On behalf of the Massachusetts Department of Transportation – Highway Division (MassDOT), Green International Affiliates, Inc. is pleased to submit the enclosed Notice of Intent (NOI) application pursuant to the Massachusetts Wetlands Protection Act (WPA) and 310 CMR 10.00, which is administered by the Ayer Conservation Commission. This NOI Application has been prepared for the roadway and intersection improvements on Route 2A, Willow Road and Bruce Street.

This Notice of Intent (NOI) is being submitted to the Ayer Conservation Commission pursuant to the Massachusetts Wetlands Protection Act (WPA) Regulations and its implementing regulations 310 CMR 10.00 for work within the Bordering Land Subject to Flooding (BLSF), the 100-foot Buffer Zones and the 200-foot Riverfront Area.

This NOI is being submitted for the purpose of receiving an Order of Conditions under the Massachusetts WPA for the proposed work within these resource areas. As this is a MassDOT project, the project is not subject to local wetlands bylaw and abutters notification is not required per 310 CMR 10.05(4)(b). The project is categorized as a "Redevelopment" project under the Massachusetts Stormwater Management Standards and thus needs to meet the Stormwater Standards to the maximum extent practicable. Though the project is located both in Littleton and in Ayer, no OOC will be sought from the Littleton Conservation Commission as there are no resource areas under the jurisdiction of the WPA within or adjacent to the limit of work in the Town of Littleton. However, a copy of this NOI will be sent to the Littleton Conservation Commission as a courtesy.

This project meets the criteria of the Limited Project provisions of the WPA listed in the 310 CMR 10.53(3)(f): *Maintenance and improvement of existing public roadways, but limited to widening less than a single lane, adding shoulders, correcting substandard intersections, and improving inadequate drainage systems.*

The following items are included with this submission:

- Six (6) hard copies of the NOI Application Report with Forms, Locus Map, Narrative, Stormwater Checklist, Stormwater Management Report, Figures
- Six (6) half-size (12"x18") plan sets
- Two (2) full-size (24"x36") plan sets

We are also emailing a PDF file of the submittal materials to email concom@ayer.ma.us (and a copy to agreen@littletonma.org).

As required by regulations, one (1) copy of the above submittal is being provided concurrently to the Massachusetts DEP Central Regional Office (CERO_NOI@mass.gov)

We respectfully request that this project be placed on the Conservation Commission agenda for the hearing scheduled on November 18, 2021. Should you have any questions regarding this submittal, please do not hesitate to contact me.

Sincerely,

Green International Affiliates, Inc.

Danielle Spicer, P.E., LEED AP, ENV SP
Stormwater & Permitting Group Leader

cc: DEP – Central Region
Kim Sloane, MassDOT Project Manager
Tom Bigelow, P.E., Green International Affiliates, Inc., Project Manager

F:\Projects\2013\13033\13033.11X - Littleton Route 2A\Documents\Environmental\NOI\NOI_Letter_Ayer.Docx

TABLE OF CONTENTS

APPENDICES

NOTICE OF INTENT FORMS

(This page is left blank for double sided printing)

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

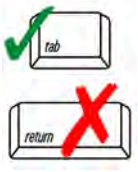
Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Ayer
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):

Willow Road north of Rt 2A/Willow St/Bruce Rd — a. Street Address
Ayer — b. City/Town
01432 — c. Zip Code

Latitude and Longitude:
42°33'09"N (in Ayer) — d. Latitude
71°32'13"W (in Ayer) — e. Longitude

N/A — f. Assessors Map/Plat Number
g. Parcel /Lot Number

2. Applicant:

Melissa — a. First Name
Lenker — b. Last Name
Massachusetts Department of Transportation Highway Division — c. Organization
10 Park Plaza, Room 4260 — d. Street Address
Boston — e. City/Town
MA — f. State
02116 — g. Zip Code
978-429-1772 — h. Phone Number
i. Fax Number
Melissa.Lenker@dot.state.ma.us — j. Email Address

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

a. First Name
b. Last Name
Massachusetts Department of Transportation Highway Division — c. Organization
10 Park Plaza, Room 4260 — d. Street Address
Boston — e. City/Town
MA — f. State
02116 — g. Zip Code
h. Phone Number
i. Fax Number
j. Email address

4. Representative (if any):

Danielle — a. First Name
Spicer — b. Last Name
Green International Affiliates, Inc. — c. Company
239 Littleton Road, Suite 3 — d. Street Address
Westford — e. City/Town
MA — f. State
01886 — g. Zip Code
(978) 923-0400 — h. Phone Number
(978) 923-0033 — i. Fax Number
dspicer@greenintl.com — j. Email address

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

$750.00 — a. Total Fee Paid
$362.50 — b. State Fee Paid
$376.50 — c. City/Town Fee Paid

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

Ayer
City/Town

A. General Information (continued)

6. General Project Description:

The project proposes to perform roadway and intersection improvements on Route 2A/110, Willow Road and Bruce Street in Littleton and Ayer, MA. The project will replace the existing interim traffic signal with a permanent traffic signal, will provide improvements to geometry, pedestrian and bicycle accommodations as well as drainage improvements. (See Project Narrative for details).

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(3)(f). See narrative for full description.

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:

Middlesex	
a. County	b. Certificate # (if registered land)
N/A	N/A
c. Book	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.

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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	58 (temp.) 1. square feet 0 3. cubic feet of flood storage lost	0 2. square feet 0 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	Bennetts Brook - 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: 21,748 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.
6,990	3,127	3,863

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.

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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

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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

   2017
   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 _____ percentage/acreage

         (b) outside Resource Area _____ 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).

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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.

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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.

See Attached List
a. Plan Title

Green International Affiliates, Inc
b. Prepared By

Tom Bigelow, P.E.
c. Signed and Stamped by

As shown on each plan
d. Final Revision Date

As shown on each plan
e. Scale

f. Additional Plan or Document Title

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:

TBD
2. Municipal Check Number

TBD
3. Check date

TBD
4. State Check Number

TBD
5. Check date

6. Payor name on check: First Name

7. Payor name on check: Last Name

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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.

Melissa Lenker

1. Signature of Applicant

October 14, 2021
2. Date

3. Signature of Property Owner (if different)

4. Date

10/14/2021

5. Signature of Representative (if any) Danielle Spicer, P.E.

6. Date

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.

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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:

Willow Road north of Rt 2A/Willow St/Bruce Rd	Ayer
a. Street Address	b. City/Town
TBD	$750.00
c. Check number	d. Fee amount

2. Applicant Mailing Address:

Melissa		Lenker	
a. First Name		b. Last Name	
Massachusetts Department of Transportation Highway Division			
c. Organization			
10 Park Plaza, Room 4260			
d. Mailing Address			
Boston	MA	02116	
e. City/Town	f. State	g. Zip Code	
978-429-1772		Melissa.Lenker@dot.state.ma.us	
h. Phone Number	i. Fax Number	j. Email Address	

3. Property Owner (if different):

a. First Name		b. Last Name	
same			
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.

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NOI Wetland Fee Transmittal Form

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B. Fees (continued)

Step 1/Type of Activity	Step 2/Number of Activities	Step 3/Individual Activity Fee	Step 4/Subtotal Activity Fee
(e) Inland Limited Projects (with Riverfront Area)	1.5	$500.00	$750.00

Step 5/Total Project Fee: $750.00

Step 6/Fee Payments:

Total Project Fee:	$750.00 a. Total Fee from Step 5
State share of filing Fee:	$362.50 b. 1/2 Total Fee **less $**12.50
City/Town share of filling Fee:	$376.50 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.)

1.0 PROJECT DESCRIPTION

This Notice of Intent Application has been prepared on behalf of the Massachusetts Department of Transportation, Highway Division (MassDOT) for proposed roadway and intersection improvements on Route 2A/110 (Ayer Road) at the intersection of Willow Road and Bruce Street in the Town of Littleton with a portion of the project extending into the Town of Ayer. The project starts on Route 2A/110 (Ayer Road) near the Littleton/Ayer town line and extends approximately 1,450 feet in the easterly direction. The project proposes to replace the existing temporary traffic signal equipment with a permanent traffic signal at the intersection of Route 2A/110(Ayer Road) with Willow Road and Bruce Street. The design also includes the addition of pedestrian activated crosswalks, roadway widening for dedicated left turn lanes with Advanced Vehicle Detection system and new Mast Arms, and an 8' wide shared-use path on both sides of Route 2A/110 (Ayer Road). The shared-use path will provide pedestrian and bicycle accommodations within the project limits in accordance with current MassDOT design standards and guidelines, as well as provide connections for the local residential properties, businesses and truck layover area at the northwest quadrant of the intersection. The proposed improvements include fine milling and overlay, improved intersection geometry, and adequate turning movements. Drainage improvements will also be constructed throughout the project, including replacement of the portion of the existing CMP drain line in Ayer. New signage and pavement markings are proposed to improve driver safety along the project corridor and to enhance safety for bicyclists and pedestrians near the intersection. The project limits extend approximately 500 feet along Willow Road and 300 feet along Bruce Street.

The purpose of the project is to provide roadway and intersection improvements on Route 2A/110, Bruce Street, and Willow Road by reducing congestion, improving pedestrian and bicycle safety, improving the roadway infrastructure, and upgrading the existing drainage system. The existing traffic signal was installed on an interim basis in the Summer of 2016 after a safety issue was identified by MassDOT and the Towns of Littleton and Ayer. It has been recommended that the interim signal be replaced with permanent signal equipment and a new lane configuration. The proposed improvements intend to provide increased safety for all roadway users, including drivers, bicyclists, and pedestrians, and thereby, promote future commercial and residential development along the project intersection.

This project consists of maintenance and improvement of an existing roadway (including widening of less than a single lane, improvements to existing drainage systems and repaving). As the proposed project is a roadway project, which is increasing in impervious area by less than one lane, it is therefore categorized as a "Redevelopment Project" under the Massachusetts Stormwater Management Standards. The project is therefore designed to meet the Standards to the maximum extent practicable. A stormwater report is attached demonstrating the compliance of the project with the ten state stormwater standards.

This Notice of Intent (NOI) is being submitted to the Ayer Conservation Commission pursuant to the Massachusetts Wetlands Protection Act (WPA) Regulations and its implementing regulations 310 CMR 10.00 for work within the Bordering Land Subject to Flooding (BLSF), 200-foot Riverfront Area and the 100-foot Buffer Zones. As stated in 310 CMR 10.05(4)(b), projects proposed by the MassDOT Highway Division are not subject to local wetlands bylaws or regulations and do not require individual abutter notification. Though the project is located both in Littleton and in Ayer, no OOC will be sought from the Littleton Conservation Commission as there are no resource areas under the jurisdiction of the WPA within or adjacent to the limit of work in the Town of Littleton. However, a copy of this NOI will be sent to the Littleton Conservation Commission as a courtesy.

Limited Project Provisions

This Project meets the criteria of the Limited Project provisions of the WPA listed in the 310 CMR 10.53(3)(f): *Maintenance and improvement of existing public roadways, but limited to widening less than a single lane, adding shoulders, correcting substandard intersections, and improving inadequate drainage systems.*

1.1 Existing Conditions

The signalized intersection of Route 2A/110 (Ayer Road) at Willow Road/Bruce Street is located in the northwest corner of the Town of Littleton in the close vicinity of the Ayer town line, providing east-west movements at the intersection and surrounded primarily by commercial, low-,medium-, and high-density residential properties with a few undeveloped forested areas. The Boston Minuteman campground is located to the southwest of the intersection.

Route 2A/110 (Ayer Road) is classified as an Urban Principal Arterial and is owned and maintained by the Massachusetts Department of Transportation (MassDOT). This roadway connects downtown Ayer to downtown Littleton, and eventually I-495. Route 2A/110 (Ayer Road) is a two-lane, two-way roadway and is typically 25 – 30 feet wide with 11 – 12 foot travel lanes. Shoulders vary from 2 to 4.5 feet in width. There are neither bicycle nor pedestrian accommodations along the project corridor; no sidewalk exists along either side of the roadway. The posted speed limit in the vicinity of the intersection is 45 mph in both directions.

Both Willow Road and Bruce Street are classified as Urban Collectors, and both are under municipal jurisdictions. In the vicinity of the intersection, Willow Road is approximately 28 feet wide striped with double yellow center lines and single white edge lines. The lane widths range from 10.5-12 feet, with shoulders on both sides less than 2 feet wide. The posted speed limit on Willow Road in the vicinity of the study intersection is 35 mph. Willow Road continues the path of Bruce Street north from the intersection into Ayer, providing access to residences and businesses (commercial and industrial) before curving toward downtown Ayer. Bruce Street is approximately 20 feet wide, and consists of two 10-foot travel lanes, one in each direction, with no shoulders and no pavement markings. There are berms on both sides of the road in the vicinity of the intersection. The posted speed limit near the subject intersection is 30 mph. Bruce Street generally runs southeast-northwest, and mostly provides residential access.

There are neither bicycle nor pedestrian accommodations along the project corridor. Prior to the installation of the temporary traffic signal at the intersection during summer 2016, both Willow Road and Bruce Street provided the northwest and southwest “STOP” controlled approaches to the unsignalized intersection, respectively.

The protected wetland resources areas exist adjacent to Bennetts Brook, flowing in the west-to-east direction, and crossing Route 2A/110 approximately 900 feet east and crossing Willow Road approximately 450 feet north of the project intersection (see section 2.1 of this report for detailed description of each protected resource area). Riverfront Area associated with Bennetts Brook, Buffer Zones as well as 100-year floodplain extend into the Willow Road northern project limits, where the new stormwater outfall into Bennetts Brook is proposed. There is also a 12-inch CMP drain line on Willow Road that leaves the catch basin a little over 200 feet south of the Willow Road crossing over Bennetts Brook and it appears to discharge on the east side of the upstream headwall.

Surface runoff on Route 2A/110 is distributed via a combination of the existing closed drainage system and "country drainage" off the pavement edges. There are currently no private treatment systems, seven (7) watershed areas contributing runoff to six (6) discharge points, and two (2) natural low points within the limit of work where stormwater leaves the project site. The protected wetland recourse areas adjacent to the project limits can be seen on Figure 3 in Appendix C - Figures.

1.2 Proposed Conditions

The proposed project provides roadway and intersection improvements along Route 2A/110, Willow Road and Bruce Street in the Town of Littleton and Willow Road portion in the Town of Ayer, which include minor roadway widening, new permanent traffic signal and turn lanes with Advanced Vehicle Detection system and new Mast Arms, improved intersection geometry and adequate turning movements. The project will provide new bicycle and pedestrian accommodations by constructing 8-foot shared use paths on both sides of Route 2A/110 and ADA complaint and signalized pedestrian crossings throughout the intersection. The project also proposes improvements to the existing roadway signage and pavement markings. The existing closed drainage system is proposed to be upgraded to meet current design standards, while new infiltration basin is proposed to control stormwater discharges from the added impervious surface within the project limit. Utility pole relocations will be required as part of the project scope.

The proposed Route 2A/110 roadway within the intersection will include two 11-foot travel lanes, one 11-foot left turn lanes on the east- and west-bound sides, 2-foot shoulders on both sides of the roadway as well as two 8-foot shared-use paths on both sides of Route 2A/110. ADA-compliant pedestrian ramps and crosswalks will also be added at the intersection as part of the proposed improvements. A new permanent traffic signal with optimized timing to reduce congestion will be installed at the intersection in place of the existing temporary traffic signal. The improvements on Willow Road will include 11-foot travel lanes and 2-foot shoulders while Bruce Street will include 11-foot travel lanes and 2-foot shoulders. The project will also incorporate improvements to the existing closed drainage system, including the construction of one new outfall on the east side of Willow Road in the vicinity of Bennetts Brook in the Town of Ayer, and an infiltration basin on the south side of Route 2A/110 on the east end of the project.

This project will include fine milling and resurfacing within the project limits; no full depth reconstruction is proposed at any of the project segments. Box widening along both sides of Route 2A/110 is proposed in order to accommodate the new turn lanes and to construct the 8-foot wide shared-use paths along the project corridor. Minor box widening is also proposed on Willow Road and Bruce Street as part of this project. Overhead and underground utility relocations are required to construct the project improvements.

The proposed drainage improvements include new catch basins, leaching basins, drain manholes, two (2) new drainage outfalls, and one (1) infiltration basin; in addition, a portion of the existing 12-inch CMP drain line on Willow Road in Ayer from the existing catch basin on Willow Road to the proposed drain manhole within the existing Right-of-Way is proposed to be replaced. Under proposed conditions, there will be nine (9) watershed areas contributing runoff to six (6) discharge points. Therefore, the proposed improvements will not result in new untreated point source discharges created as a result of this project. All work will be done in a manner that will limit the impacts to adjacent resource areas.

The proposed roadway and intersection improvements will benefit safety for all roadway users including vehicles, pedestrians, and bicyclists.

1.3 Construction Phasing

Construction phasing will ultimately be determined by the project contractor. Construction is anticipated to be completed in a period of 20 months. The construction phasing is assumed to generally include the following items:

1. Installation of sediment and erosion control measures.
2. Tree removal and the clearing and grubbing of trees in sections along Route 2A/110, Willow Road and Bruce Street.
3. Overhead and underground utility relocations.
4. Clearing and rough grading of the area for installation of the infiltration basin.
5. Construction of the infiltration basin.
6. Construction of new catch basins and drainage improvements including a new outfall to Bennetts Brook form Willow Road.
7. Installation of the new traffic signal system.
8. Box widening along Route 2A/110, Willow Road and Bruce Street within and adjacent to the project intersections.
9. Construction of shared use-paths on both sides of Route 2A/110
10. Milling of pavement in sections along Route 2A/110, Willow Road and Bruce Street within the project limits.
11. Installation of the ADA compliant pedestrian ramps and crosswalks at the intersection.
12. Installation of the HMA surface course.
13. Completing roadway construction, upgrading signage and pavement markings.
14. Installation of loam and seed to restore disturbed areas.
15. Removal and disposal of sediment and erosion control measures.

Equipment that is likely to be utilized for this project includes dump trucks, flatbed trucks, front-end loader(s), backhoe(s), skid steer(s), excavator, hoe rams, drilling rigs, concrete pumpers, boom trucks, air hammers, air compressor(s), and a crane. Equipment can be parked on roadway pavements off-limits for construction staging purposes. Staging equipment in BVWs, intermittent streams and/or Waterways shall be prohibited.

1.4 Project Plan List

The following plan sheets are included with this Notice of Intent in Appendix E:

Sheet	Title	Prepared by	Date
1	Title Sheet & Index	Green International Affiliates, Inc	10/13/2021
2	Legend & Abbreviations	Green International Affiliates, Inc	10/13/2021
3	General Notes	Green International Affiliates, Inc	10/13/2021
4	Key Plan	Green International Affiliates, Inc	10/13/2021
5-6	Typical Sections	Green International Affiliates, Inc	10/13/2021
7-10	Construction Plans	Green International Affiliates, Inc	10/13/2021
20-23	Drainage & Utility Plans	Green International Affiliates, Inc	10/13/2021
25-27	Construction Details	Green International Affiliates, Inc	10/13/2021

2.0 PROJECT IMPACTS

2.1 WETLAND RESOURCE AREAS

The wetland resource areas on the project site are regulated under Federal, State and Local regulatory programs including:

- Section 404 of the Clean Water Act (CWA) which is administered by the U.S. Army Corps of Engineers (ACOE)
- Section 401 of the CWA which is overseen by the Massachusetts Department of Environmental Protection (DEP)
- Massachusetts Wetlands Protection Act (WPA) and 310 CMR 10.00 which is administered by the local Conservation Commission or (upon appeal) by DEP
- The Town of Littleton and the Town of Ayer have their own local Wetlands Bylaws (hereinafter referred to as the local bylaws), however, as stated above MassDOT projects are not subject to local wetlands bylaws or regulations

There are protected wetland resource areas that exist adjacent to Willow Road on north of the project intersection. These areas are identified on Figure 3, Protected Resource Area Map, attached to this application in Appendix C.

The following sections describe jurisdictional areas adjacent to the project:

2.1.1 Bordering Vegetated Wetlands (BVW)

Per 310 CMR 10.55(1), Bordering Vegetated Wetlands (BVWs) are likely to be significant to public or private water supply, to ground water supply, to flood control, to storm damage prevention, to prevention of pollution, to the protection of fisheries and to wildlife habitat.

A delineation of the wetland boundaries in the vicinity of the project site was completed by Green International Affiliates, Inc. on December 15, 2020, in accordance with the methodology outlined in the Regulations at 310 CMR 10.55 and the DEP handbook *Delineating Bordering Vegetated Wetlands Under Massachusetts Wetlands Protection Act*. Hydrophytic vegetation was based upon the *US Fish and Wildlife Service National List of Plant Species That Occur in Wetlands*, as well as all plant species listed in the Act. Wetland hydrology includes hydric soils, which were determined based upon the interagency document *Field Indicators for Identifying Hydric Soils in New England*. This methodology is consistent with the three-parameter approach required for the delineation of federal wetlands as outlined in the Corps of Engineers *Wetland Delineation Manual*. These wetlands are identified as Bank Flags ”1” series on both sides of Route 2A and Willow Road and Wetland Flags “A” and “B” series on both sides of Willow Road near the northern project limit, and are described in further detail in Appendix A.

No work is proposed within Bordering Vegetated Wetlands as a result of this project.

2.1.2 Inland Bank

Per 310 CMR 10.54(1), Banks are likely to be significant to public or private water supply, to ground water supply, to flood control, to storm damage prevention, to the prevention of pollution and to the protection of fisheries and wildlife habitat.

Bennetts Brook, crossing Willow Road approximately 450 feet northwest of the Route 2A/Willow Road intersection, has an associated Bank. The brook is flowing in the west-to-east direction and is identified on Figure 3, Protected Resource Area Map, and described in further detail in Appendix A.

]No impacts to the Bank of Bennetts Brook are proposed as a result of this project.

2.1.3 Land Under Water Bodies and Waterways (LUW)

Land under Water Bodies and Waterways (under any Creek, River, Stream, Pond or Lake), established through 310 CMR 10.56, is likely to be significant to public and private water supply, to ground water supply, to flood control, to storm damage prevention, to prevention of pollution and to protection of fisheries and wildlife habitat.

There is one perennial stream, Bennetts Brook, crossing Willow Road approximately 450 feet northwest of the Route 2A/Willow Road intersection. No work is proposed within LUW will occur as part of this project.

2.1.4 Buffer Zone

The 100-foot Buffer Zone (established through 310 CMR 10.02) is a 100-foot offset from any area subject to protection under M.G.L. c. 131, § 40 specified in 310 CMR 10.02(1)(a), including BVWs and Bank of the stream present in the vicinity of the subject project.

The Buffer Zones within the project area consist of existing paved roadway as well as adjacent landscaped areas and some wooded areas. Portion of Willow Road within the project limit is located within the Buffer Zones associated with the Bank of Bennets Brook, and adjacent BVW A and BVW B. 4. No trees are being proposed to be removed in the wetland buffer zone.

2.1.5 Bordering Land Subject to Flooding (BLSF)

Per the Flood Insurance Rate Maps (FIRM) for the Town of Ayer, Massachusetts, Middlesex County, Panels 25017C0216E, dated 06/04/2010, the northern limit of the project on Willow Road is located adjacent to the 100-year flood plain associated with Bennetts Brook. The flood plain areas are shown on Figure 4 – FEMA Map. The Flood Insurance Study, by the Federal Management Agency and last revised on July 6, 2016, includes a detailed study of the project area, showing the 100-year floodplain elevations in the project vicinity. Bennetts Brook is crossing Route 2A outside of the project limit and crossing Willow Road within the northern end of the project approximately 450 feet northwest of the Route 2A/Willow Road intersection. Bennetts Brook has a determined 100-year flood elevation of 243.4 feet (NAVD 88) on the west side, and 239 feet (NAVD 88) on the east side of Willow Road. The majority of the project components will not encroach into these floodplain areas, while the proposed work associated with the installation of the outfall into Bennetts Brook on the east side of Willow Road will occur within 58 square feet of the floodplain area (Zone AE) on the east side of Willow Road, which is defined as Bordering Land Subject to Flooding (BLSF), an area subject to protection under 310 CMR 10.57.

2.1.6 Riverfront Area

Per 310 CMR 10.58(1), Riverfront areas are likely to be significant to protect the private or public water supply, to protect groundwater, to provide flood control, to prevent storm damage, to prevent pollution, to protect land containing shellfish, to protect wildlife habitat and fisheries.

Bennetts Brook is a perennial stream crossing the project limits in the Town of Ayer; it has a 200-foot Riverfront Area associated with it. Portion of the project is located within its 200-foot Riverfront Area.

2.2 REGULATORY COMPLIANCE

Pursuant to 310 CMR 10.53(3), the project has been designed to avoid wetland resource area impacts to the maximum extent practicable and will mitigate unavoidable resource area impacts in accordance with state regulations. Since the proposed project qualifies as a limited project, it will meet the performance standards for each resource area to the maximum extent practicable. No replication is required for the proposed project, since there are no direct impacts to BVWs. Restoration of the impacted resource areas is provided to contribute to the protection of the interests identified in M.G.L. c. 131, § 40.

2.2.1 Resource Areas Impacts

The proposed roadway and intersection improvements will result in direct impacts to the Bordering Land Subject to Flooding (BLSF), the 100-foot Buffer Zones and the 200-foot Riverfront Area associated with Bennetts Brook crossing Willow Road north of the northern project limit; there are no other direct impacts to wetland resource areas. To minimize the impacts to the wetland area buffer zones, proper erosion and sediment controls will be installed during construction.

In addition to the minimum control measures included in the plan set, a Stormwater Pollution Prevention Plan (SWPPP) for construction activities will be prepared by the Contractor for the site in compliance with the EPA's Construction General Permit. It will include measures to minimize exposed soil areas through sequencing and temporary stabilization and establish a permanent vegetative cover or other forms of stabilization as soon as practicable.

BLSF

Portions of the project on Willow Road at the northern limit of work are located within the 100-year floodplain with an established elevation of 243.4 feet (NAVD 88) on the west side, and 239 feet (NAVD 88) on the east side of Willow Road. The installation of the proposed new outfall to Bennetts Brook will impact the BLSF resource area.

The proposed project activities will occur within approximately 58 square feet of BLSF area, due to the construction of the new outfall and placement of riprap at pipe end on the east side of Willow Road in the vicinity of Bennetts Brook; the existing grades will be reestablished following the installation of these new features. Since the project will not result in the placement of fill within a floodplain, there will be no flood storage loss in complying with the BLSF performance standards (see Figure 8 for details). The proposed outfall will be installed at elevation

100-foot Buffer Zone

Portions of the project on Willow Road at the northern limits of work are located within the 100-foot Buffer Zone to the BVWs under WPA jurisdiction. Erosion and sediment control Best Management

Practices (BMPs) will be installed during construction to protect adjacent resource areas, which will temporarily impact the buffer zones. These BMPs ensure the land disturbance within the Buffer Zone does not negatively impact resource areas and will secure the protection of those interests.

200-foot Riverfront Area

Riverfront Area associated with Bennetts Brook extends over 6,990 square feet of the project area on Willow Road at the northern limit of work in Ayer. The work proposed in the Riverfront Area includes minor box widening, fine milling and resurfacing on Willow Road, replacement of a portion of the existing 12-inch CMP drain line on Willow Road and construction of the new drainage outfall into Bennetts Brook. Majority of work within the Riverfront Area will take place in existing developed areas and is considered as redevelopment. Small portion of work associated with construction of the new outfall will occur within the undeveloped Riverfront Area.

General Performance Standards for Riverfront Area, as set forth in 310 CMR 10.58(4), are addressed as described below:

a) *Protection of other Resource Areas*: The affected Riverfront Area does not include any other resource areas under WPA jurisdiction.

b) *Protection of Rare Species:* As indicated previously in this Narrative, there are no threatened or endangered species, or species of concern, in the project area.

c) *Practicable and Substantially Equivalent Economic Alternative:* Since this project will occur within the previously developed Riverfront Area created prior to August 7, 1996, it does not need to document equivalent economic alternatives.

d) *No Significant Adverse Impact:* The work within Riverfront Area will occur within previously developed paved and landscaped areas. Small portion of work associated with construction of the new outfall will occur within the undeveloped Riverfront Area. No significant adverse impacts are anticipated, since all impacts have been minimized to the maximum extent practicable and the area will be stabilized upon completion of construction.

When work that redevelops previously developed Riverfront Areas is proposed, the following criteria from 310 CMR 10.58(5) need to be complied with:

a) At a minimum, proposed work shall result in an improvement over existing conditions of the capacity of the Riverfront Area to protect the interests identified in M.G.L. c.131,§40. When a lot is previously developed but no portion of the Riverfront Area is degraded, the requirements of 310 CMR 10.58(4) shall be met.

This roadway and intersection improvement project is intended to improve existing substandard conditions to promote safety for various roadway users and provide drainage improvements. The project mostly alters previously disturbed and degraded Riverfront Area (RA), and within the limits of the project area, minimal space is present where improvements to the Riverfront Area could be realized. Where possible, disturbed areas will be loamed and seeded. Some degraded areas will be improved near the culvert crossings. Most of the Riverfront Area within parcels containing the project is degraded with pavement and unpaved shoulders. The work within small undeveloped portions of the Riverfront Area is

unavoidable due to the need to construct new drainage outfall, associated regrading and placement of the erosion and sediments controls to protect nearby resource areas.

b) Stormwater management is provided according to Massachusetts Stormwater Management Standards, as can be seen in the Appendix D to this Application.

The project will provide improvements to the existing drainage system and improve the quality of stormwater runoff discharged to adjacent wetlands. The proposed new outfall will have stone at the pipe end to provide splash pads for stormwater discharges and to reduce erosion and movement of sediment into the resource areas. Construction of subsurface drainage improvements will extend pavement life spans, and will result in improved safety by reducing stormwater ponding on reconstructed roadway pavements. An infiltration basin is proposed to treat and mitigate stormwater runoff as the result of increased impervious area. In addition, catch basins will be added throughout the project. These improvements will result in improved water quality and drainage characteristics; therefore, contributing to the interests of the WPA (public or private water supply, to ground water supply, to flood control, to storm damage prevention, to the prevention of pollution and to the protection of fisheries and wildlife habitat).

c) Within 200-foot Riverfront Areas, proposed work shall not be located closer to the river than existing conditions or 100 feet, whichever is less, or not closer than existing conditions within 25 foot Riverfront Areas, except in accordance with 310 CMR 10.58(5)(f) or (g).

Majority of proposed work will occur as close to the river as the present limits of areas degraded by pavement, shoulders and landscaped areas. However, due to the proposed drainage improvements, small portions of this work associated with the proposed new outfall will be located closer to the river than existing conditions. The limit of work has been minimized to the maximum extent practicable, and the area will be stabilized and restored to the maximum extent feasible upon completion of work.

d) Proposed work, including expansion of existing structures, shall be located outside the riverfront area or toward the riverfront area boundary and away from the river, except in accordance with 310 CMR 10.58(5)(f) or (g).

Most of the permanent work will be located within the area previously disturbed, due to existing roadway shoulder or embankment. Areas disturbed by construction of the new drainage outfall within the Riverfront Area will be stabilized upon completion of construction to the maximum extent practicable.

e) The area of proposed work shall not exceed the amount of degraded area, provided that the proposed work may alter up to 10% if the degraded area is less than 10% of the riverfront area, except in accordance with 310 CMR 10.58(5)(f) or (g).

The amount of work in the Riverfront Area is 6,990 square feet of the 21,748 square feet of the total Riverfront Area on site. Approximately 32% percent of the Riverfront Area will be affected by the proposed work. Of the 6,990 square feet of Riverfront Area within the project area, most of the resource area is already degraded with pavement, shoulders, landscape areas or embankments. The 97.6% of the riverfront area within the limit of work is degraded; only 2.4% where the new outfall will be constructed is undeveloped. Disturbances within the Riverfront Area associated with the proposed new drainage outfall have been minimized to the maximum extent practicable and the area will be stabilized upon completion of construction.

f) When an applicant proposes restoration on-site of degraded riverfront area alteration may be allowed notwithstanding the criteria of 310 CMR 10.58(5)(c), (d), and (e) at a ratio in square feet of at least 1:1 of restored area to area of alteration not conforming to the criteria. Areas immediately along the river shall be selected for restoration. Alteration not conforming to the criteria shall begin at the riverfront area boundary. Restoration shall include:

1. removal of all debris, but retaining any trees or other mature vegetation;
2. grading to a topography which reduces runoff and increases infiltration;
3. coverage by topsoil at a depth consistent with natural conditions at the site; and
4. seeding and planting with an erosion control seed mixture followed by plantings of herbaceous and woody species appropriate to the site;

No mitigation is needed since the project is comprised of the reconstruction of a road and structure owned by the Town prior to August 7, 1996, and as such activities to maintain these facilities are grandfathered from Requirements for the Riverfront Area.

g) 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 notwithstanding the criteria of 310 CMR 10.58(5)(c), (d), or (e) at a ratio in square feet of at least 2:1 of mitigation area to area of alteration not conforming to the criteria or an equivalent level of environmental protection where square footage is not a relevant measure. Alteration not conforming to the criteria shall begin at the riverfront area boundary. Mitigation may include off-site restoration of riverfront areas, conservation restrictions under M.G.L. c. 184, §§ 31 to 33 to preserve undisturbed riverfront areas that could be otherwise altered under 310 CMR 10.00, the purchase of development rights within the riverfront area, the restoration of bordering vegetated wetland, projects to remedy an existing adverse impact on the interests identified in M.G.L. c. 131, § 40 for which the applicant is not legally responsible, or similar activities undertaken voluntarily by the applicant which will support a determination by the issuing authority of no significant adverse impact. Preference shall be given to potential mitigation projects, if any, identified in a River Basin Plan approved by the Secretary of the Executive Office of Environmental Affairs.

No mitigation is needed since the project is comprised of the reconstruction of a road and structure owned by the Town prior to August 7, 1996, and as such activities to maintain these facilities are grandfathered from Requirements for the Riverfront Area.

h) The issuing authority shall include a continuing condition in the Certificate of Compliance for projects under 310 CMR 10.58(5)(f) or (g) prohibiting further alteration within the restoration or mitigation area, except as may be required to maintain the area in its restored or mitigated condition. Prior to requesting the issuance of the Certificate of Compliance, the applicant shall demonstrate the restoration or mitigation has been successfully completed for at least two growing seasons.

No mitigation is needed since the project is comprised of the reconstruction of a road and structure owned by the Town prior to August 7, 1996, and as such activities to maintain these facilities are grandfathered from Requirements for the Riverfront Area.

2.2.2 Stormwater Management

Stormwater management for this project has been designed in compliance with the Stormwater Management Standards as outlined in 310 CMR 10.05(6)(k) through (q) and defined in detail in the DEP's

Stormwater Management Handbook. The project has been designed to improve upon existing stormwater conditions while minimizing impacts to nearby resource areas from both the construction and operation of the proposed project. A full Stormwater Management Report documenting compliance with the DEP's Stormwater Management Standards, including required calculations and description of methodology, is attached as Appendix D to this report.

2.2.3 Rare Species

The project site is not located within an area designated as a Priority Habitat of Rare Species or Estimated Habitat of Rare Wildlife by the Natural Heritage & Endangered Species Program (NHESP) 2017 Maps. There are no Certified or Potential Vernal Pools in the vicinity of the project area.

2.2.4 Water Quality

Per MassGIS online data mapping, there are no Outstanding Resource Waters (ORW) or cold water fisheries either crossing or located adjacent to the project area. The project is located within Zone II Wellhead Protection Area (See Figure 3 in Appendix C).

2.2.5 Area of Critical Environmental Concern

Per MassGIS online data mapping, the project site is not located within an Area of Critical Environmental Concern (ACEC). (See Figure 3 in Appendix C).

2.3 AVOIDANCE, MINIMIZATION AND MITIGATION MEASURES

In addition to the above described avoidance, minimization and mitigation measures, some project activities will contribute to the interests of the WPA:

- Construction of subsurface drainage improvements will extend pavement life spans, and will contribute to the enhanced flood control and storm damage prevention.
- This project provides an opportunity to improve the existing drainage system and improve the quality of stormwater runoff discharged to adjacent resource areas.
- The proposed design aims to improve the water quality by installing a new infiltration BMP.

As a result of the projects activities, there will be new catch basins, leaching basins, drain manholes, two (2) new drainage outfalls, and one (1) infiltration basin; in addition, a portion of the existing 12-inch CMP drain line on Willow Road in Ayer from the existing catch basin on Willow Road to the proposed drain manhole within the existing Right-of-Way is proposed to be replaced. The proposed improvements will not result in new untreated point source discharges created as a result of this project. All work will be done in a manner that will limit the impacts to adjacent resource areas.

The proposed improvements to the existing drainage system will result in enhanced quality of the runoff that will, in turn, result in the improved water quality (surface and ground),and drainage characteristics; therefore, contributing to the interests of the WPA (public or private water supply, to ground water supply, to flood control, to storm damage prevention, to the prevention of pollution and to the protection of fisheries and wildlife habitat).

There are no fisheries, land containing shellfish or significant wildlife habitat located within or in close proximity to the project area, therefore the project will not negatively impact these interests of the WPA.

2.3.1 Construction Mitigation Measures

Erosion and Sediment Control

To protect the resource areas and interests of the WPA during construction, a combination of erosion and sediment control BMPs will be installed as shown on the attached plan set. Erosion control techniques may include compost filter tubes, sedimentation fence barriers and floating silt fence. The Contractor will have a stockpile of materials required to control erosion on-site to be used to supplement or repair erosion control devices. Means and methods of erosion and sediment controls are left to the contractor. The erosion controls will be maintained in good condition until on-site soils are stabilized. All areas will be permanently stabilized following the completion of construction work. For additional information on erosion and sediment controls, please see the attached Stormwater Management Report in Appendix D of this report.

Trench Dewatering

It is anticipated that a NPDES Construction General Permit (CGP) will be required for the project; therefore, if trench dewatering is needed, all pumped effluent will be done in compliance with the dewatering requirements within the CGP. There will be no direct discharge of pumped water into any wetland, resource area, or closed drainage system.

2.3.2 Wetland Mitigation

Wetland mitigation is not required since the project will not result in work within BVWs as discussed in detail above under item 2.2.1 Resource Areas Impacts/Bordering Vegetated Wetland.

2.3.3 Flood Storage Compensation

Flood storage compensation is not required since the project will not result in a loss of flood storage, as discussed in detail above under item 2.2.1 Resource Areas Impacts/Bordering Land Subject to Flooding.

APPENDICES

Appendix A – Wetland Resource Area Identification/Delineations Memo
Appendix B – Photo Log
Appendix C – Figures
Appendix D – Stormwater Management Report (bound separately)
Appendix E – Drawing for NOI Submission (bound separately)

APPENDIX A

Wetland Resource Area Identification/Delineations Memo

WETLAND SUMMARY REPORT

Route 2A & Willow Road Project
Route 2A, Littleton, Massachusetts
Willow Road, Ayer, Massachusetts

PREPARED FOR:
Green International Affiliates, Inc.
239 Littleton Road, Suite 3
Westford, Massachusetts 01886

PREPARED BY:
Lucas Environmental, LLC
500A Washington Street
Quincy, Massachusetts 02169

REPORT DATE: July 13, 2021

LUCAS ENVIRONMENTAL, LLC

LUCAS ENVIRONMENTAL, LLC

500A Washington Street, Quincy, MA 02169

July 13, 2021

Green International Affiliates, Inc.
Attn: Danielle Spicer, P.E.
239 Littleton Road, Suite 3
Westford, MA 01886

Re: Wetland Summary Report
Route 2A &Willow Road Project
Route 2A, Littleton, MA
Willow Road, Ayer, MA

Dear Ms. Spicer,

A Professional Wetland Scientist (PWS) from Lucas Environmental, LLC (LE) conducted site investigations along Route 2A and Willow Road in Littleton and Ayer, Massachusetts on December 14 and 15, 2020. The purpose of the site investigation was to investigate and delineate wetland resources along the portion of Route 2A (Ayer Road) between the intersection with 3rd Street to the east and the municipal boundary with Ayer to the west. This does not include the portion of Route 2A located west of Bennetts Brook. It also includes Willow Road in Ayer from Route 2A to approximately 200 feet north of Bennetts Brook. The site investigation was limited to wetland areas within 100 feet of and perennial streams within 200 feet of Route 2A and Willow Road. This investigation included both a field and office-based component. Please note that this due diligence effort is specific to environmental resources; it does not evaluate constraints related to local planning or zoning requirements.

MassDEP Bordering Vegetated Wetland Delineation Field Data Forms were completed as described herein and are included with this report.

If you have any questions, please do not hesitate to contact me at 617.405.4140 or cml@lucasenvironmetnal.net. Thank you for your consideration in this matter.

Sincerely,
LUCAS ENVIRONMENTAL, LLC

Christopher M. Lucas, PWS, CWS, RPSS
Environmental Consultant/Soil Scientist

Joseph H. Orzel, PWS
Project Manager/Wetland Scientist

Enclosures: Photographic Documentation
Wetland Delineation Field Data Forms

LUCAS ENVIRONMENTAL, LLC

TABLE OF CONTENTS

SECTION I – NARRATIVE

1.0 INTRODUCTION

A Professional Wetland Scientist (PWS) from Lucas Environmental, LLC (LE) conducted site investigations along Route 2A and Willow Road in Littleton and Ayer, Massachusetts on December 14 and 15, 2020. The wetland investigation was performed in accordance with the Massachusetts Wetlands Protection Act (M.G.L. Ch. 131, § 40) and regulations (310 CMR 10.00 *et seq.*); Section 404 of the Clean Water Act (33 U.S.C. 1344); Massachusetts Department of Environmental Protection (MassDEP) publication "Delineating Bordering Vegetated Wetlands" under the Massachusetts Wetlands Protection Act (1995); and the U.S. Army Corp of Engineers (USACE) Wetland Delineation Manual (1987); the Northcentral and Northeast Regional Supplement (2012); the Ayer Wetlands Protection Bylaw (Article XXVI) and Regulations; and the Littleton Wetlands Protection Bylaw (Chapter 171) and Regulations.

The following data sources were examined in addition to the site investigation:

- Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map;
- United States Geological Survey Topographic Quadrangle (Wilmington, 2018);
- MassGIS MassDEP Wetland and Hydrography Datalayers;
- National Wetland Inventory (NWI) Maps;
- MassGIS Natural Heritage Atlas Datalayers; and
- United States Department of Agriculture, Natural Resources Conservation Service (USDA-NRCS) Soil Survey.

2.0 EXISTING CONDITIONS

The area under investigation includes wetland areas within 100 feet and perennial streams within 200 feet of the portion of Route 2A (Ayer Road) in Littleton, Massachusetts between the intersection with 3rd Street to the east and the municipal boundary with Ayer to the west, as well as Willow Road in Ayer, Massachusetts from Route 2A to approximately 200 feet north of Bennetts Brook (the Study Area). Within the Study Area, Route2A and Willow road are generally bounded by a mix of commercial, residential, and agricultural properties, as well as forested land. Bennetts Brook is a perennial stream in the Merrimack River Basin that flows from west to east through the Study Area and is crossed by both Route 2A and Willow Road.

A review of the current MassGIS data layer for the Massachusetts Natural Heritage Atlas (effective August 1, 2017) under the Natural Heritage and Endangered Species Program (NHESP) indicates that no portion of the site is located within Estimated Habitat of Rare Wildlife or Priority Habitat of Rare Species under the Massachusetts Endangered Species Act (321 CMR 10.00 et seq.). No Certified Vernal Pools under the jurisdiction of the Wetlands Protection Act Regulations (310 CMR 10.00 et seq.) are present near the Study Area, nor are any mapped Potential Vernal Pools. The Mass CAPS Important Wildlife Habitat Maps for Littleton and Ayer indicate a potential area of important habitat wildlife within approximately 800 feet to the south of Route 2A, south of the Bennetts Brook crossing.

The Study Area is not located within an Area of Critical Environmental Concern (ACEC), Outstanding Resource Water (ORW), or Watershed Protection Area. The Study Area is located within a MassDEP Zone II Wellhead Protection Area (Zone II #429, Ayer DPW Water Division) as well as within the Town of Ayer Aquifer Protection Zone and Town of Littleton Water Resource Zoning Overlay District.

Bennetts Brook within the Study Area (Segment ID MA84B-06) is identified as a Category 5 water requiring a Total Maximum Daily Load (TMDL) per the Final MassDEP 2016 Integrated List of Waters (305(b)/303(d)). Waters are listed in Category 5 if they were identified as impaired (i.e., not supporting one or more intended uses), the impairment was related to the presence of one or more "pollutants", and the source of those pollutants was not considered to be natural. The cause of impairment in Bennetts Brook has been identified as *E. Coli*.

3.0 ENVIRONMENTAL RESOURCE AREAS

Wetland resource areas identified within the Study Area include Inland Bank, Bordering Vegetated Wetland (BVW), Land Under Water Bodies and Waterways (LUWW), Bordering Land Subject to Flooding (BLSF), and Riverfront Area. Under the Massachusetts Wetlands Protection Act (WPA), the Ayer Wetlands Protection Bylaw (Article XXVI) and Regulations, and the Littleton Wetlands Protection Bylaw (Chapter 171) and Regulations, the wetlands in the Study Area are defined as follows.

3.1 Inland Bank – 310 CMR 10.54

Section 310 CMR 10.54 of the WPA defines a Bank *as the portion of the land surface which normally abuts and confines a water body. It occurs between a water body and a vegetated bordering wetland and adjacent flood plain, or, in the absence of these, it occurs between a water body and an upland. The upper boundary of a Bank is the first observable break in the slope or the mean annual flood level, whichever is lower. The lower boundary of a Bank is the mean annual low flow level*. Under the Ayer Wetlands Protection Bylaw, the upper boundary is the first observable break in the slope or the mean annual flood level, whichever is *higher*. The delineated Banks are described below.

3.2 Bordering Vegetated Wetlands – 310 CMR 10.55

Section 310 CMR 10.55 of the WPA defines BVW *as freshwater wetlands which border on creeks, rivers, streams, ponds and lakes. The types of freshwater wetlands are wet meadows, marshes, swamps and bogs. Bordering Vegetated Wetlands are areas where the soils are saturated and/or inundated such that they support a predominance of wetland indicator plants. 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. Wetland indicator plants are also those classified in the indicator categories of Facultative, Facultative+, Facultative Wetland-, Facultative Wetland, Facultative Wetland+, or Obligate Wetland in the National List of Plant Species That Occur in Wetlands: Massachusetts (Fish & Wildlife Service, U.S. Department of the Interior, 1988) or plants exhibiting physiological or morphological adaptations to life in saturated or inundated conditions.* Under the Ayer Wetlands Protection Bylaw, all *Freshwater Wetlands* are protected whether or not they border on a waterbody. The delineated BVWs are described below.

3.3 Land Under Water Bodies and Waterways – 310 CMR 10.56

Section 310 CMR 10.56(2) of the WPA defines LUWW *as 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. The boundary of Land under Water Bodies and Waterways is the mean annual low water level.* LUWW is present within Bennetts Brook within the Study Area. This resource area is located below the edge of Bank or the Mean Annual High Water (MAHW) mark of perennial streams, therefore it is not field delineated.

3.4 Bordering Land Subject to Flooding – 310 CMR 10.57

Section 310 CMR 10.57(2)(a) of the WPA defines BLSF as *an area with low, flat topography adjacent to and inundated by flood waters rising from creeks, rivers, streams, ponds or lakes. It extends from the banks of these waterways and water bodies; where a bordering vegetated wetland occurs, it extends from said wetland. 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.*

Flood zones are present within the Study Area. According to the FEMA Flood Insurance Rate Maps (FIRM) for Middlesex County, Massachusetts, Map Number 25017C0216E effective June 4, 2010, areas designated as Zone AE are present within and along Bennetts Brook. Zone AE is classified as an area subject to the 1% annual chance flood (100-year flood), where base flood elevations have been determined. The flood elevations at Bennetts Brook vary from 249 feet (NAVD 88) immediately upstream (south) of Route 2A to 239 feet immediately downstream (east) of Willow Road.

Bennetts Brook is also a mapped Regulatory Floodway, which is classified as the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights. The section of Bennetts Brook south of Route 2A and within Littleton lies outside the Limit of the FEMA Detailed Study. The remainder of the Study Area is designated as a Zone X which is classified as an Area of Minimal Flood Hazard. The boundary of BLSF was not delineated in the field and should be identified on the plans.

3.5 Riverfront Area – 310 CMR 10.58

Section 310 CMR 10.58(2)(a)(3) of the WPA defines Riverfront Area *as the area of land between a river's mean annual high water line measured horizontally outward from the river and a parallel line located 200 feet away.* Bennetts Brook is mapped as perennial on the current USGS topographic map (Ayer, Massachusetts Quadrangle, 2021) and is therefore presumed to be perennial. No other perennial or intermittent streams are mapped or were observed within the Study Area. The MAHW line along Bennetts Brook was delineated in the field as described for Stream 1 in the following below.

3.6 Local Wetlands Protection Bylaws

Both Littleton and Ayer have local Wetlands Protection Bylaws and Regulations. Under the Littleton Wetlands Protection Bylaw (Chapter 171) and Regulations, any area within a BVW or Bank and the first 50 feet of the Buffer Zone from BVW or Bank is protected as a No-Disturbance Area.

Under the Ayer Wetlands Protection Bylaw (Article XXVI) and Regulations, the 100-Foot Buffer Zone is considered a jurisdictional resource area referred to as the Adjacent Upland Resource Area. The 200-Foot Riverfront Area is also considered Adjacent Upland Resource Area. Within Undisturbed Lands, the inner 50 feet of the 100-Foot Adjacent Resource Area is a protected No-Disturbance Zone (Undisturbed Land is land determined by the Commission to be of a predominantly natural character or to have been altered after May 1996 without a permit from the Commission).

3.7 Wetland Descriptions

The following describes each of the wetlands identified in the Study Area. This description includes BVW only as no isolated wetlands were identified within the Study Area. A jurisdictional 100-Foot Buffer Zone extends from the delineated wetland boundary.

Wetland A & B

Wetland A is a BVW bordering on the south Bank of Bennetts Brook at Willow Road. The BVW boundary was delineated with pink survey tape numbered sequentially with flag series WFA-1 to WFA-13. Flags WFA-1 to WFA-8 are on the east side of the road and WFA-9 to WFA-13 are on the west side. Common vegetation observed within this wetland includes red maple (*Acer rubrum*), American elm (*Ulmus americana*), speckled alder (*Alnus incana*), silky dogwood (*Cornus amomum*), bristly dewberry *(Rubus hispidus*), and goldenrods (*Solidago* spp.). Upland vegetation includes Norway maple (*Acer platanoides*), sugar maple (*Acer saccharum*), white pine (*Pinus strobus*), white oak (*Quercus alba*), black cherry (*Prunus serotina*), staghorn sumac (*Rhus typhina*), multiflora rose (*Rosa multiflora*), honeysuckle (*Lonicera sp.*), privet (*Ligustrum vulgare*), Oriental bittersweet (*Celastrus orbiculatus*), and Virginia creeper (*Parthenocissus quinquefolia*). Soil within the wetland is a deep, dark silt loam with shallow high chroma mottles and oxidized rhizospheres. Upland soils are fine sandy loam with a four chroma B-horizon. Indicators of wetland hydrology included saturation at the soil surface and buttressed tree roots. State and federal boundaries are coincident.

Wetland B is a BVW bordering on the north Bank of Bennetts Brook at Willow Road. The BVW boundary was delineated with pink survey tape numbered sequentially with flag series WFB-1 to WFB-11. Flags WFB-1 to WFB-7 are on the east side of the road and WFB-8 to WFB-11 are on the west side. Common vegetation observed within this wetland includes red maple, American elm, silky dogwood, sensitive fern (*Onoclea sensibilis*), jewelweed (*Impatiens capensis*), and bristly dewberry. Upland vegetation includes Norway maple, multiflora rose, and privet. Soil and indicators of hydrology are similar to those within Wetland A. State and federal boundaries are coincident.

Wetland C

Wetland C is located along Bennetts Brook on the south side of Route 2A, just west of the road crossing. The BVW boundary was delineated with pink survey tape numbered sequentially with flag series WFC-1 to WFC-7. Common vegetation in this forested wetlands includes red maple, green ash (*Fraxinus pennsylvanica*), black elderberry (*Sambucus nigra*), cinnamon fern (*Osmundastrum cinnamomeum*), and sensitive fern. Common vegetation within the upland includes red oak (*Quercus rubra*), shagbark hickory (*Carya ovata*), and poison ivy (*Toxicodendron radicans*).

Soils within the wetlands consist of a deep, dark silty loam over dark coarse sand to refusal at approximately 17 inches. Saturation occurred at ten inches and free water was at a depth of fourteen inches. Upland soils were fine sandy loam to loamy fine sand with a three chroma B-horizon without redoximorphic features and no saturation to refusal at thirteen inches. State and federal boundaries are coincident.

3.8 Watercourse Descriptions

The following describes the watercourses identified in the Study Area. The only watercourse identified was Bennetts Brook, a perennial stream.

Stream 1 – Bennetts Brook

The MAHW of Bennetts Brook upstream and downstream of the crossings at Route 2A and Willow Road was delineated with blue survey flagging numbered sequentially from BF1-1 to BF1-17, BF1-100 to BF1-111, BF1-200 to BF1-217, and BF1-300 to BF1-315, as described below. In many locations MAHW is coincident with the Bank; however, in some locations the delineated MAHW line is upgradient of the first break in slope and the delineation was based on apparent evidence of high water, such as water or sediment staining of rocks, soil, leaves, or vegetation.

Flags BF1-1 through BF1-17 and BF1-100 to BF1-111 are located on the south and north Banks of Bennetts Brook, respectively, at the Willow Road crossing. East of Willow Road the southern Bank is comprised primarily of rocks and boulders and is well defined. The northern Bank is a mix of rocks, boulders, and vegetated areas. Common vegetation includes multiflora rose, silky dogwood, speckled alder, and sensitive fern. West of Willow Road the northern Bank is rock lined and well defined whereas the southern Bank is less well defined and vegetated primarily with silky dogwood.

Flags BF1-200 through BF1-217 and BF1-300 to BF1-315 are located on the east and west Banks of Bennetts Brook, respectively, at the Route 2A crossing. North of Route 2A the Bank is fairly well defined and thickly vegetated with species such as grape (*Vitis* sp.), black elderberry, and silky dogwood. South of Route 2A the Bank is well defined and vegetated, with rock armoring in the vicinity of the road culvert.

The Riverfront Area extends 200 feet horizontally from the delineated Inland Bank/MAHW line along Bennetts Brook and includes all of Wetlands A, B, and C described above, as well as adjacent uplands.

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SECTION II – APPENDICES

LUCAS ENVIRONMENTAL, LLC

APPENDIX A

PHOTOGRAPHIC DOCUMENTATION

PHOTOGRAPHIC DOCUMENTATION

DATE: December 14, 2020

Photograph 1: Bennetts Brook near flag BF1-2.

Photograph 2: Bennetts Brook near flag BF1-112.

Photograph 3: Bennetts Brook near flag BF1-209.

Photograph 4: Bennetts Brook near flag BF1-310.

Photograph 5: Wetland A near flag WFA-5.

Photograph 6: Wetland A near flag WFA-13.

Photograph 7: Wetland B near flag WFB-4.

Photograph 8: Wetland C near flag WFC-4.

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APPENDIX B

WETLAND DELINEATION FIELD DATA FORMS

LUCAS ENVIRONMENTAL, LLC

WETLAND DELINEATION FIELD DATA FORM

Observation Plot Number: WFA-5 Transect Number: WET-1

Applicant: **MassDOT** Prepared by: **Lucas Environmental, LLC** Project Location: **Route 2A & Willow Road, Littleton/Ayer, MA**

☐ Vegetation alone presumed adequate to delineate BVW boundary: fill out Section I only

☑ Vegetation and other indicators of hydrology used to delineate BVW boundary: fill out Sections I and II

☐ Method other than dominance test used (attach additional information)

SECTION I. VEGETATION

Date of Delineation: **December 14, 2020**

A. Sample Layer and Plant Species (by common/scientific name)	B. Percent Cover (or basal area)	C. Percent Dominance	D. Dominant Plant (yes or no)	E. Wetland Indicator Category*
Tree				
American elm (*Ulmus americana*)	38.0	65.0%	YES	FACW*
Red maple (*Acer rubrum*)	20.5	35.0%	YES	FAC*
Saplings				
None				
Shrubs				
Multiflora rose (*Rosa multiflora*)	3.0	100%	YES	FACU
Privet (*Ligustrum vulgare*)	T	NA	NO	FACU
Herbaceous				
Sensitive fern (*Onoclea sensibilis*)	20.5	77.4%	YES	FACW*
Tussock sedge (*Carex stricta*)	3.0	11.3%	NO	OBL*
Wrinkleleaf goldenrod (*Solidago rugosa*)	3.0	11.3%	NO	FAC*
Vines				
Oriental bittersweet (*Celastrus orbiculatus*)	T			

* Use an asterisk to mark indicator plants: plant species listed in the wetlands Protection Act (MGL c.131, s.40); plants in the genus *Sphagnum*; plants listed as FAC, FAC+, FACW-, FACW, FACW+, or OBL; or plants with physiological or morphological adaptations. If any plants are identified as wetland indicator plants due to physiological or morphological adaptations, describe the adaptation next to the asterisk.

Vegetation conclusion:

Number of dominant wetland indicator plants: 3 **Number of dominant non-wetland indicator plants: 1**

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants: YES ☑ NO ☐

LUCAS ENVIRONMENTAL, LLC

WETLAND DELINEATION FIELD DATA FORM

Observation Plot Number: WFA-5 Transect Number: WET-1

SECTION II. INDICATORS OF HYDROLOGY

Hydric Soil Interpretation

1. Soil Survey

Is there a published soil survey for this site? YES ☑ NO ☐

Title/Date: **Custom Soil Resource Report for Middlesex County, Massachusetts. (GIS Data from the Soil Survey Geographic - SSURGO data base produced by the USDA, NRCS) Accessed online June 29, 2021.**

Map Number/Soil Type Mapped**:**

53A – Freetown muck, ponded, 0 to 1%slopes
307E - Paxton fine sandy loam, 25 to 35% slopes, extremely stony
311B – Woodbridge fine sandy loam, 0 to 8 % slopes, very stony
629C - Canton-Charlton-Urban land complex, 3 to 15% slopes

Hydric Soil Inclusions: **Whitman, Swansea, Scarboro, Ridgebury,**

Are field observations consistent with soil survey? YES ☐ NO ☑

Remarks: **The soils are silty loam.**

2. Soil Description

Horizon	Depth	Matrix Color	Mottles Color
O (leaf litter)			
A (silt loam)	**0-4”**	**10YR 2/1**	
	4-12”	**10YR 2/1**	**7.5YR 4/4 (5%)**
Refusal at 12”			

Remarks:

3. Other:

Conclusion: Is soil hydric? YES ☑ NO ☐

Other Indicators of Hydrology:

☐ Site inundated: _____

☑ Depth to free water in observation hole: **12 inches**

☑ Depth to soil saturation in observation hole: **At surface**

☐ Water marks: _____

☐ Drift lines: _____

☐ Sediment deposits: _____

☐ Drainage patterns in BVW: _____

☐ Oxidized rhizospheres: _____

☐ Water-stained leaves: _____

☐ Recorded data (stream, lake, or tidal gauge; aerial photo; other):

_____

☑ Other: **Buttressed tree roots**

Vegetation and Hydrology Conclusion

	YES	NO
Number of wetland indicator plants greater than or equal to number of non-wetland indicator plants	☑	☐
Hydric soils present	☑	☐
Other indicators of hydrology present	☑	☐
Sample location is in BVW	☑	☐

LUCAS ENVIRONMENTAL, LLC

WETLAND DELINEATION FIELD DATA FORM

Observation Plot Number: WFA-5 Transect Number: UPL-1

Applicant: **MassDOT** Prepared by: **Lucas Environmental, LLC** Project Location: **Route 2A & Willow Road, Littleton/Ayer, MA**

☐ Vegetation alone presumed adequate to delineate BVW boundary: fill out Section I only

☑ Vegetation and other indicators of hydrology used to delineate BVW boundary: fill out Sections I and II

☐ Method other than dominance test used (attach additional information)

SECTION I. VEGETATION

Date of Delineation: **December 14, 2020**

A. Sample Layer and Plant Species (by common/scientific name)	B. Percent Cover (or basal area)	C. Percent Dominance	D. Dominant Plant (yes or no)	E. Wetland Indicator Category*
Tree				
Sugar maple (*Acer saccharum*)	38.0	73.1%	YES	FACU
White pine (*Pinus strobus*)	10.5	20.2%	YES	FACU
Red oak (*Quercus rubra*)	3.5	6.7%	NO	FACU
Saplings				
None				
Shrubs				
Multiflora rose (*Rosa multiflora*)	10.5	43.8%	YES	FACU
Staghorn sumac (*Rhus typhina*)	10.5	43.8%	YES	UPL
White oak (*Quercus alba*)	3.0	12.5%	NO	FACU
Herbaceous				
Grass sp.	63.0	100%	YES	NA (*)
Wrinkleleaf goldenrod (*Solidago rugosa*)	T	NA	NO	FAC*
Vines				
Virginia creeper (*Parthenocissus quinquefolia*)	T	NA	NO	FACU

* Use an asterisk to mark indicator plants: plant species listed in the wetlands Protection Act (MGL c.131, s.40); plants in the genus *Sphagnum*; plants listed as FAC, FAC+, FACW-, FACW, FACW+, or OBL; or plants with physiological or morphological adaptations. If any plants are identified as wetland indicator plants due to physiological or morphological adaptations, describe the adaptation next to the asterisk.

Vegetation conclusion:

Number of dominant wetland indicator plants: 0 or 1 **Number of dominant non-wetland indicator plants: 5 or 4**

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants: YES ☑ NO ☐

SECTION II. INDICATORS OF HYDROLOGY

Hydric Soil Interpretation

1. Soil Survey

Is there a published soil survey for this site? YES ☑ NO ☐

Title/Date: **Custom Soil Resource Report for Middlesex County, Massachusetts. (GIS Data from the Soil Survey Geographic - SSURGO data base produced by the USDA, NRCS) Accessed online June 29, 2021.**

Map Number/Soil Type Mapped**:**

53A – Freetown muck, ponded, 0 to 1%slopes
307E - Paxton fine sandy loam, 25 to 35% slopes, extremely stony
311B – Woodbridge fine sandy loam, 0 to 8 % slopes, very stony
629C - Canton-Charlton-Urban land complex, 3 to 15% slopes

Hydric Soil Inclusions: **Whitman, Swansea, Scarboro, Ridgebury,**

Are field observations consistent with soil survey? YES ☐ NO ☑

Remarks:

2. Soil Description

Horizon	Depth	Matrix Color	Mottles Color
O (leaf litter)			
A	**0-10”**	**10YR 3/1**	
B	**10-12”**	**7.5YR 4/4**	
Refusal at 12”			

Remarks: **Fine sandy loam**

3. Other:

Conclusion: Is soil hydric? YES ☐ NO ☑

Other Indicators of Hydrology:

☐ Site inundated: _____

☐ Depth to free water in observation hole: _____

☐ Depth to soil saturation in observation hole: **None to refusal at 12”**

☐ Water marks: _____

☐ Drift lines: _____

☐ Sediment deposits: _____

☐ Drainage patterns in BVW: _____

☐ 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 greater than or equal to number of non-wetland indicator plants	☑	☐
Hydric soils present	☐	☑
Other indicators of hydrology present	☐	☑
Sample location is in BVW	☐	☑

LUCAS ENVIRONMENTAL, LLC

WETLAND DELINEATION FIELD DATA FORM

Observation Plot Number: WFC-3/4 Transect Number: WET-2

Applicant: **MassDOT** Prepared by: **Lucas Environmental, LLC** Project Location: **Route 2A & Willow Road, Littleton/Ayer, MA**

☐ Vegetation alone presumed adequate to delineate BVW boundary: fill out Section I only

☑ Vegetation and other indicators of hydrology used to delineate BVW boundary: fill out Sections I and II

☐ Method other than dominance test used (attach additional information)

SECTION I. VEGETATION

Date of Delineation: **December 15, 2020**

A. Sample Layer and Plant Species (by common/scientific name)	B. Percent Cover (or basal area)	C. Percent Dominance	D. Dominant Plant (yes or no)	E. Wetland Indicator Category*
Tree				
Red maple (*Acer rubrum*)	20.5	66.1%	YES	FAC*
Green ash (*Fraxinus pennsylvanica*)	10.5	33.9%	YES	FACW*
Saplings				
Red maple (*Acer rubrum*)	T	NA	NO	FAC*
Shrubs				
Black elderberry (*Sambucus nigra*)	20.5	77.4%	YES	FACW*
Multiflora rose (*Rosa multiflora*)	3.0	11.3%	NO	FACU
Tatarian honeysuckle (*Lonicera tatarica*)	3.0	11.3%	NO	FACU
Red oak (*Quercus rubra*)	T	NA	NO	FACU
Herbaceous				
Cinnamon fern (*Osmunda cinnamomea*)	20.5	30.4%	YES	FACW*
New York fern (*Thelypteris noveboracensis*)	20.5	30.4%	YES	FAC*
Grass sp.	20.5	30.4%	YES	NA (*)
Poison ivy (*Toxicodendron radicans*)	3.0	4.4%	NO	FAC*
Sensitive fern (*Onoclea sensibilis*)	3.0	4.4%	NO	FACW*
Vines				
None				

* Use an asterisk to mark indicator plants: plant species listed in the wetlands Protection Act (MGL c.131, s.40); plants in the genus *Sphagnum*; plants listed as FAC, FAC+, FACW-, FACW, FACW+, or OBL; or plants with physiological or morphological adaptations. If any plants are identified as wetland indicator plants due to physiological or morphological adaptations, describe the adaptation next to the asterisk.

Vegetation conclusion:

Number of dominant wetland indicator plants: 5 or 6 **Number of dominant non-wetland indicator plants: 1 or 0**

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants: YES ☑ NO ☐

LUCAS ENVIRONMENTAL, LLC

WETLAND DELINEATION FIELD DATA FORM

Observation Plot Number: WFC-3/4 Transect Number: WET-2

SECTION II. INDICATORS OF HYDROLOGY

Hydric Soil Interpretation

1. Soil Survey

Is there a published soil survey for this site? YES ☑ NO ☐

Title/Date: **Custom Soil Resource Report for Middlesex County, Massachusetts. (GIS Data from the Soil Survey Geographic - SSURGO data base produced by the USDA, NRCS) Accessed online June 29, 2021.**

Map Number/Soil Type Mapped**:**

53A – Freetown muck, ponded, 0 to 1%slopes
104C - Hollis-Rock outcrop-Charlton complex, 0 to 15% slopes
307E - Paxton fine sandy loam, 25 to 35% slopes, extremely stony

Hydric Soil Inclusions: **Whitman, Swansea, Scarboro**

Are field observations consistent with soil survey? YES ☑ NO ☐

Remarks:

2. Soil Description

Horizon	Depth	Matrix Color	Mottles Color
O (leaf litter)			
A (mucky fs loam)	**0-15”**	**10YR 2/1**	
B (coarse sand)	**15-17”**	**10YR 3/2**	
Refusal at 17”			

Remarks:

3. Other:

Conclusion: Is soil hydric? YES ☑ NO ☐

Other Indicators of Hydrology:

☐ Site inundated: _____

☑ Depth to free water in observation hole: **14 inches**

☑ Depth to soil saturation in observation hole: **10 inches**

☐ Water marks: _____

☐ Drift lines: _____

☐ Sediment deposits: _____

☐ Drainage patterns in BVW: _____

☐ 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 greater than or equal to number of non-wetland indicator plants	☑	☐
Hydric soils present	☑	☐
Other indicators of hydrology present	☑	☐
Sample location is in BVW	☑	☐

LUCAS ENVIRONMENTAL, LLC

WETLAND DELINEATION FIELD DATA FORM

Observation Plot Number: WFC-3/4 Transect Number: UPL-2

Applicant: **MassDOT** Prepared by: **Lucas Environmental, LLC** Project Location: **Route 2A & Willow Road, Littleton/Ayer, MA**

☐ Vegetation alone presumed adequate to delineate BVW boundary: fill out Section I only

☑ Vegetation and other indicators of hydrology used to delineate BVW boundary: fill out Sections I and II

☐ Method other than dominance test used (attach additional information)

SECTION I. VEGETATION

Date of Delineation: **December 15, 2020**

A. Sample Layer and Plant Species (by common/scientific name)	B. Percent Cover (or basal area)	C. Percent Dominance	D. Dominant Plant (yes or no)	E. Wetland Indicator Category*
Tree				
Red oak (*Quercus rubra*)	20.5	49.4%	YES	FACU
Green ash (*Fraxinus pennsylvanica*)	10.5	25.3%	YES	FAC*
Shagbark hickory (*Carya ovata*)	10.5	25.3%	YES	FACU
Saplings				
Red oak (*Quercus rubra*)	10.5	100%	YES	FACU
Shrubs				
Poison ivy (*Toxicodendron radicans*)	20.5	100%	YES	FAC*
Herbaceous				
Poison ivy (*Toxicodendron radicans*)	20.5	100%	YES	FAC*
Vines				
None				

* Use an asterisk to mark indicator plants: plant species listed in the wetlands Protection Act (MGL c.131, s.40); plants in the genus *Sphagnum*; plants listed as FAC, FAC+, FACW-, FACW, FACW+, or OBL; or plants with physiological or morphological adaptations. If any plants are identified as wetland indicator plants due to physiological or morphological adaptations, describe the adaptation next to the asterisk.

Vegetation conclusion:

Number of dominant wetland indicator plants: 3 **Number of dominant non-wetland indicator plants: 3**

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants: YES ☑ NO ☐

Observation Plot Number: WFC-3/4 Transect Number: UPL-2

SECTION II. INDICATORS OF HYDROLOGY

Hydric Soil Interpretation

1. Soil Survey

Is there a published soil survey for this site? YES ☑ NO ☐

Title/Date: **Custom Soil Resource Report for Middlesex County, Massachusetts. (GIS Data from the Soil Survey Geographic - SSURGO data base produced by the USDA, NRCS) Accessed online June 29, 2021.**

Map Number/Soil Type Mapped**:**

53A – Freetown muck, ponded, 0 to 1%slopes
104C - Hollis-Rock outcrop-Charlton complex, 0 to 15% slopes
307E - Paxton fine sandy loam, 25 to 35% slopes, extremely stony

Hydric Soil Inclusions: **Whitman, Swansea, Scarboro**

Are field observations consistent with soil survey? YES ☑ NO ☐

Remarks:

2. Soil Description

Horizon	Depth	Matrix Color	Mottles Color
Oe	**2-0”**	**7.5YR 2.5/2**	
A (loamy fine sand)	**0-4”**	**10YR 3/2**	
B (fine sandy loam)	**4-13”**	**2.5Y 5/3**	
Refusal at 13”			

Remarks: No redoximorphic features to refusal.

3. Other:

Conclusion: Is soil hydric? YES ☐ NO ☑

Other Indicators of Hydrology:

☐ Site inundated: _____

☐ Depth to free water in observation hole: _____

☐ Depth to soil saturation in observation hole: **None to refusal at 13”**

☐ Water marks: _____

☐ Drift lines: _____

☐ Sediment deposits: _____

☐ Drainage patterns in BVW: _____

☐ 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 greater than or equal to number of non-wetland indicator plants	☑	☐
Hydric soils present	☐	☑
Other indicators of hydrology present	☐	☑
Sample location is in BVW	☐	☑

APPENDIX B

Photo Log

Photo Log – September 2019, August - September 2020, July 2021

Photo 01 – Approx. Sta. 8+00, View West on Route 2A from westbound stop line at the intersection

Photo 02 – Approx. Sta. 3+50, View East on Route 2A towards the intersection

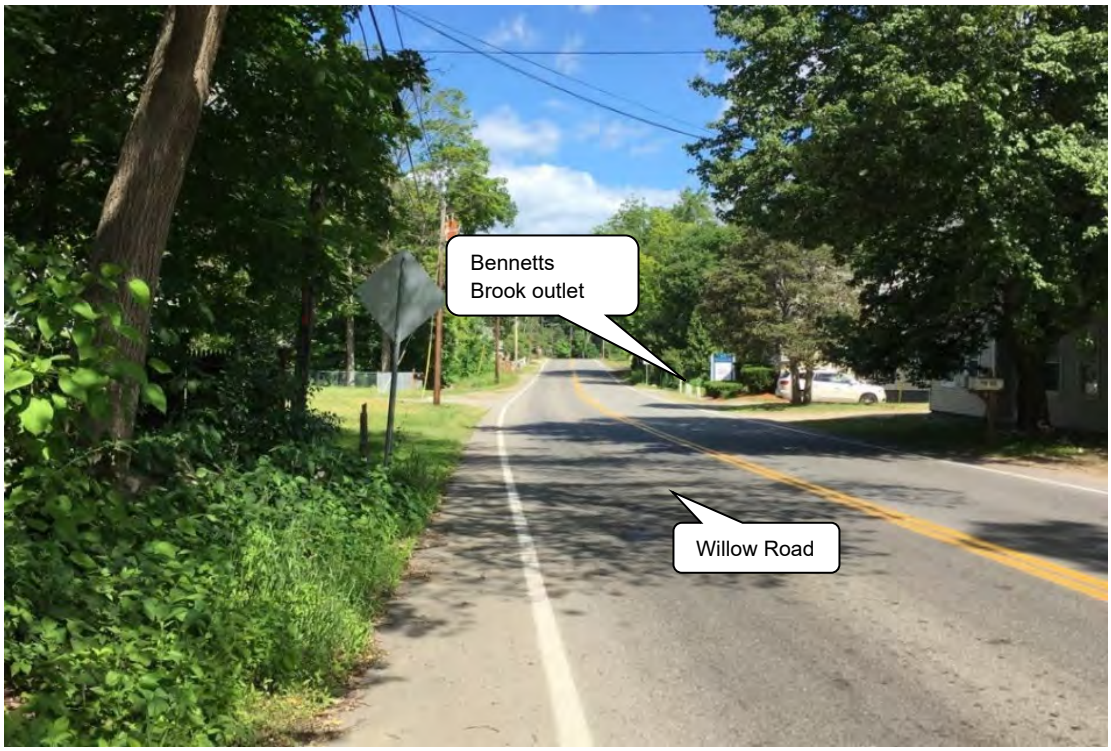


Photo 03 – Approx. Sta. 18+00, View northwest down Willow Road towards Bennetts Brook crossing

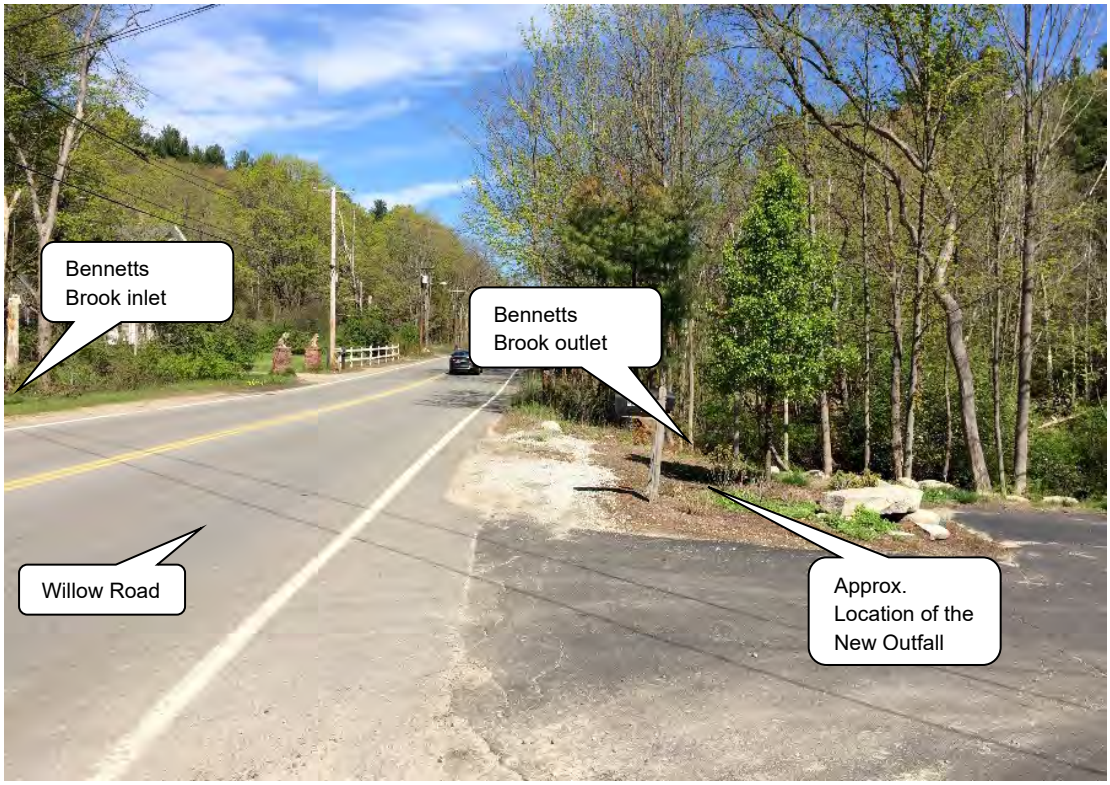


Photo 04 – Approx. Sta. 16+00, Willow Road crossing over Bennetts Brook, view from northbound shoulder

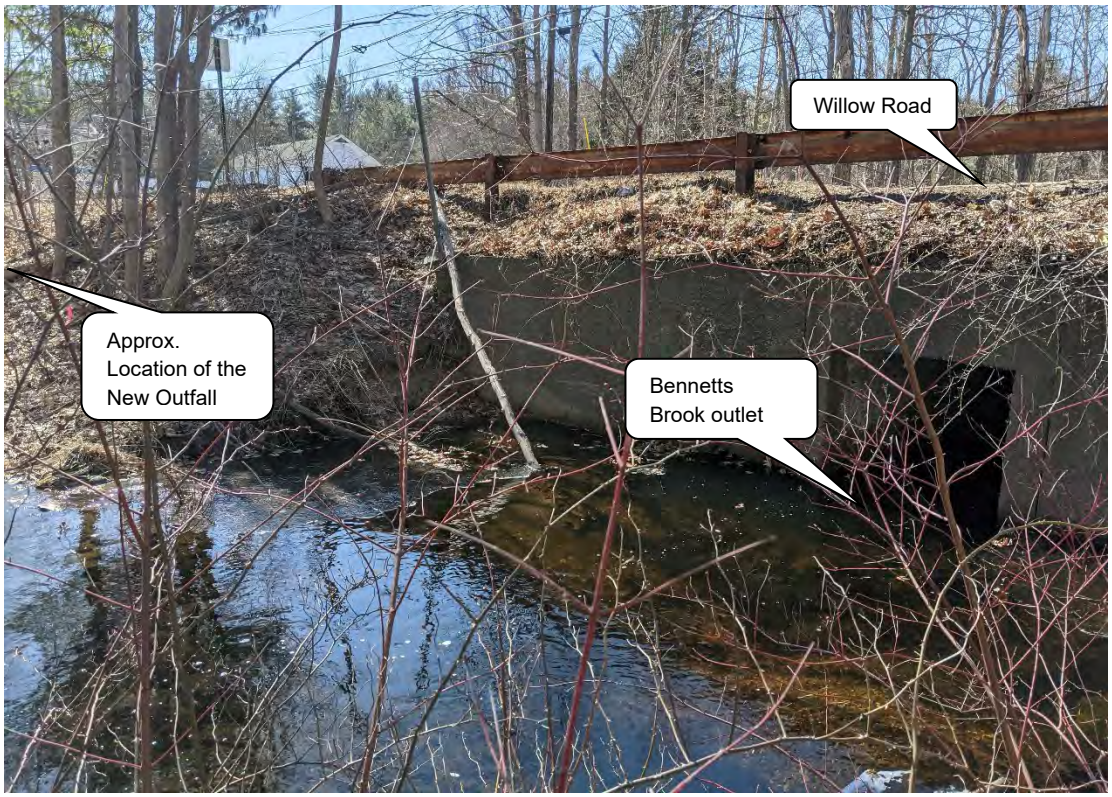


Photo 05 – View South at the Bennetts Brook Outlet

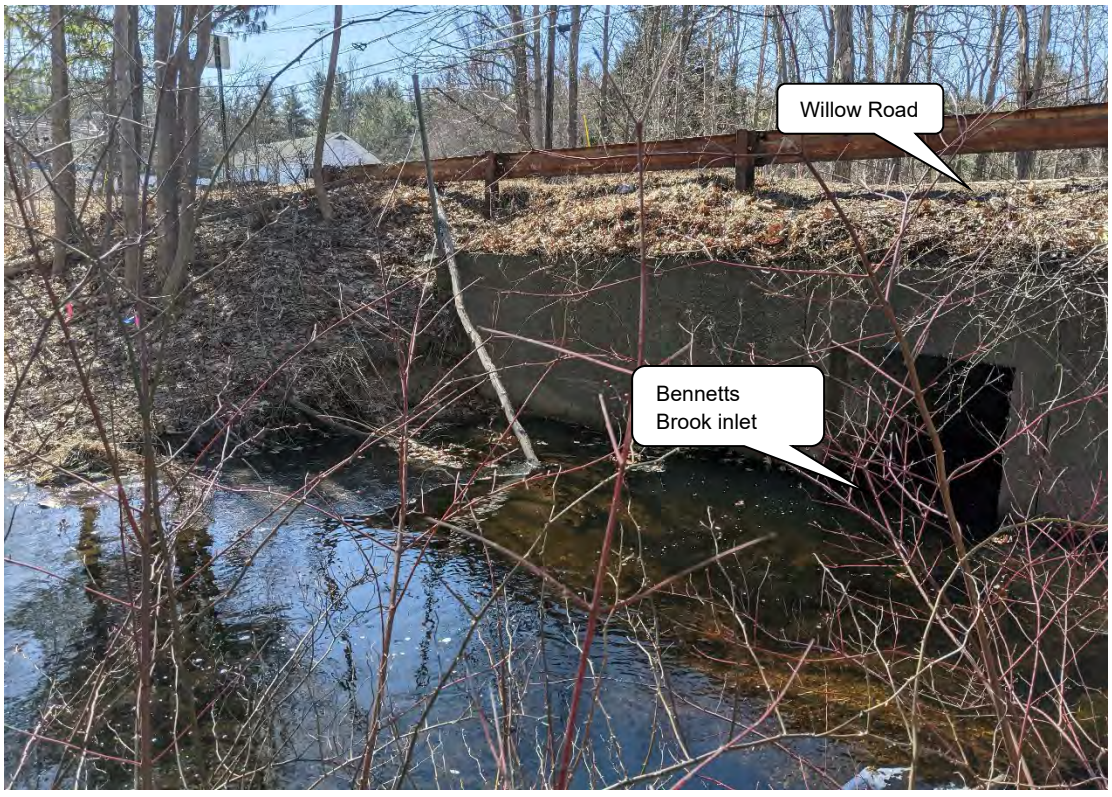
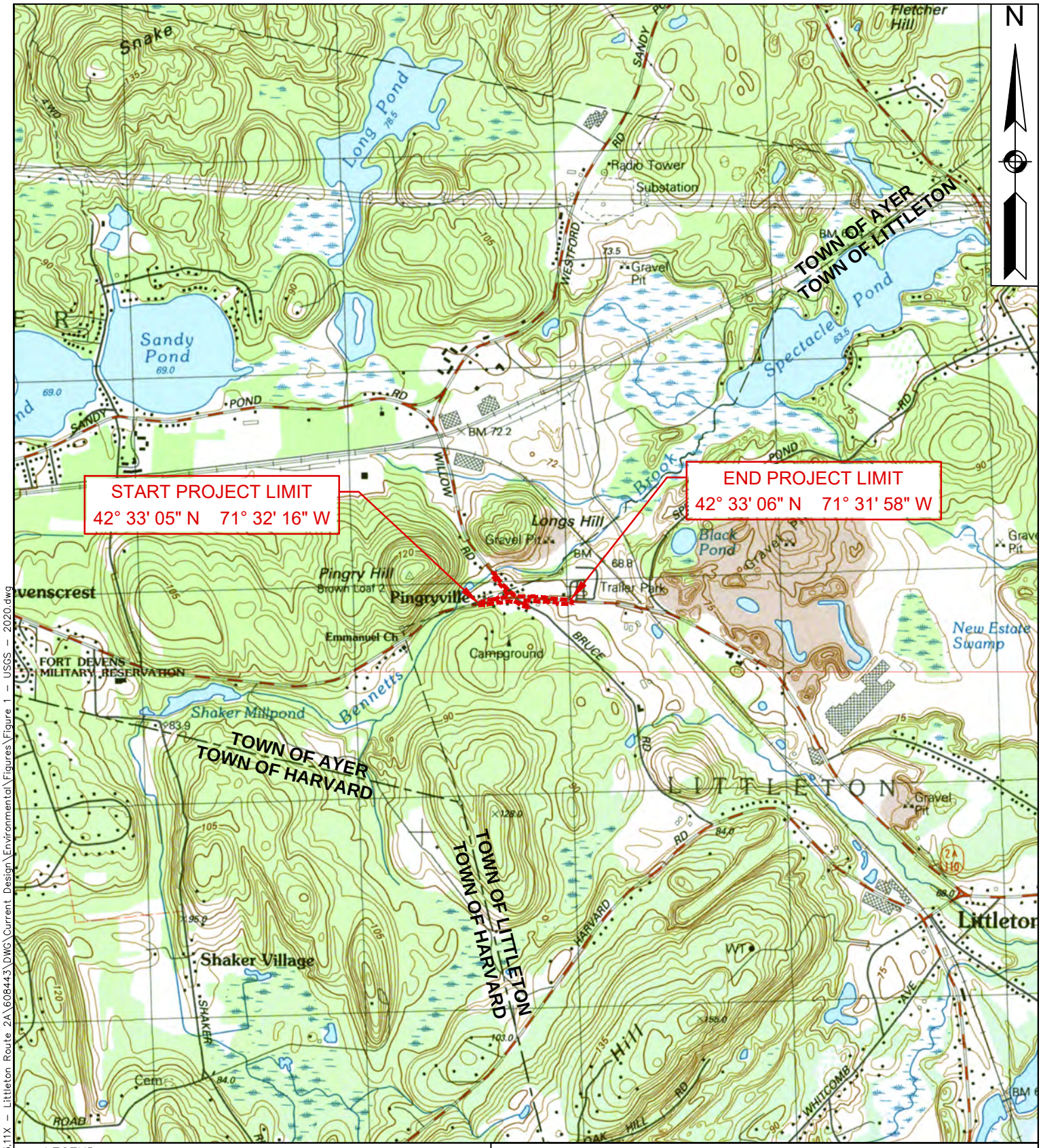


Photo 06 –View east at the Bennetts Brook Inlet

APPENDIX C

Figures



LEGEND

APPROXIMATE PROJECT LOCATION

SCALE IN FEET

1000 0 1000 2000

1" = 2000'

ELEVATIONS IN METERS

NOTE: DATA TAKEN FROM MASSGIS

USGS LOCUS MAP

LITTLETON – AYER – INTERSECTION IMPROVEMENTS ON ROUTE 2A AT WILLOW ROAD AND BRUCE STREET, MASSDOT FILE 608443

PREPARED BY:

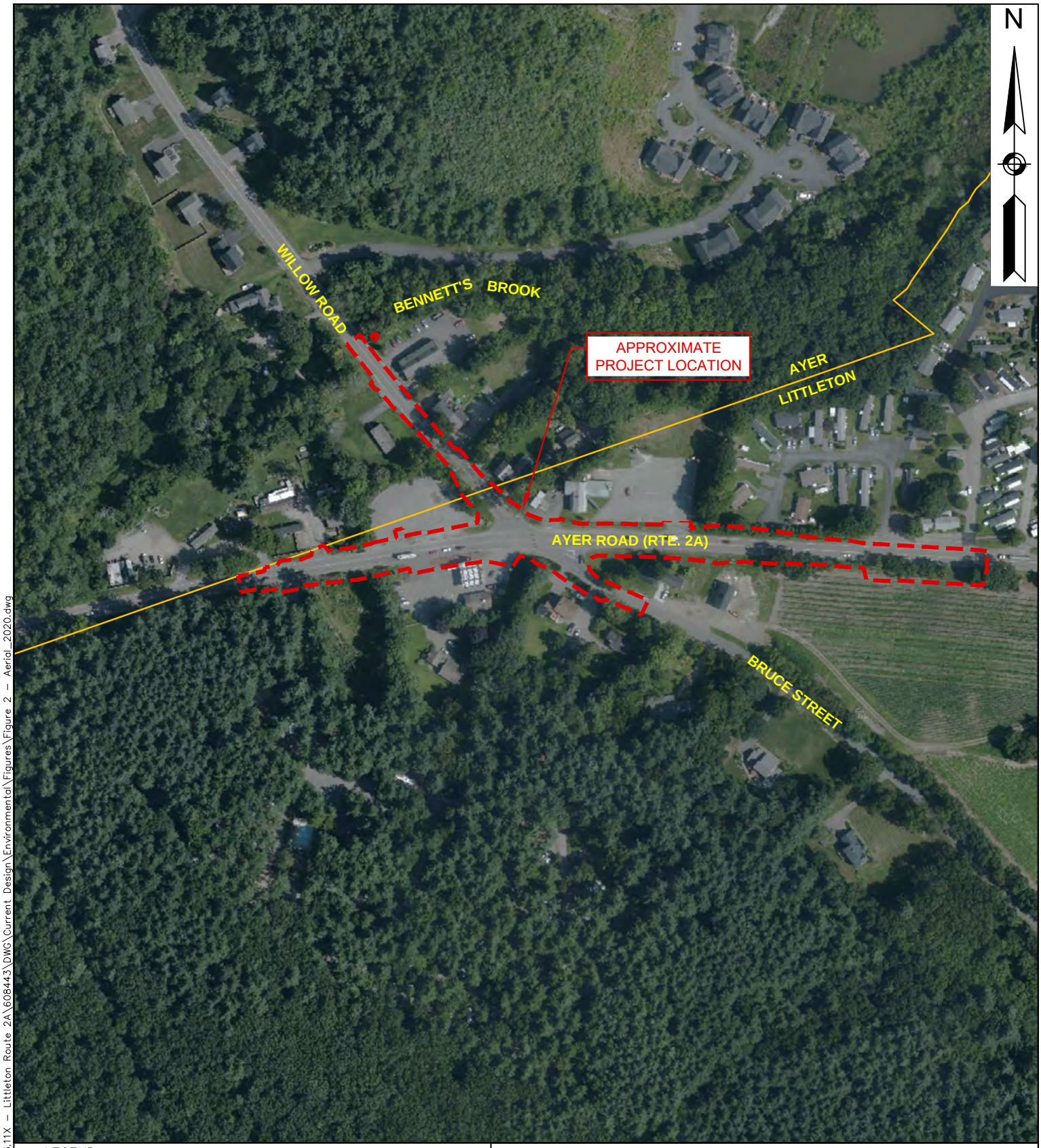
GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS
239 LITTLETON RD, WESTFORD, MA (978) 923-0400
24 ALBION RD, LINCOLN, RI (401) 305-7895

PREPARED FOR:

massDOT
Massachusetts Department of Transportation
Highway Division

SCALE: AS NOTED	PROJECT NO. 13033.114	FIGURE 1
DATE: 10/08/2020 REVISED:	DRAWN BY: AE/OF CHECKED BY: MC	

\\fs1\engineering\Projects\2013\13033\13033.11X – Littleton Route 2A\608443\DWG\Current Design\Environmental\Figures\Figure 1 – USGS – 2020.dwg



LEGEND

LIMIT OF WORK

MUNICIPAL BOUNDARY

SCALE IN FEET

125 0 125 250

1" = 250'

NOTE: DATA TAKEN FROM MASSGIS

AERIAL MAP

LITTLETON – AYER – INTERSECTION IMPROVEMENTS ON ROUTE 2A AT WILLOW ROAD AND BRUCE STREET, MASSDOT FILE 608443

PREPARED BY:
GREEN INTERNATIONAL AFFILIATES, INC.
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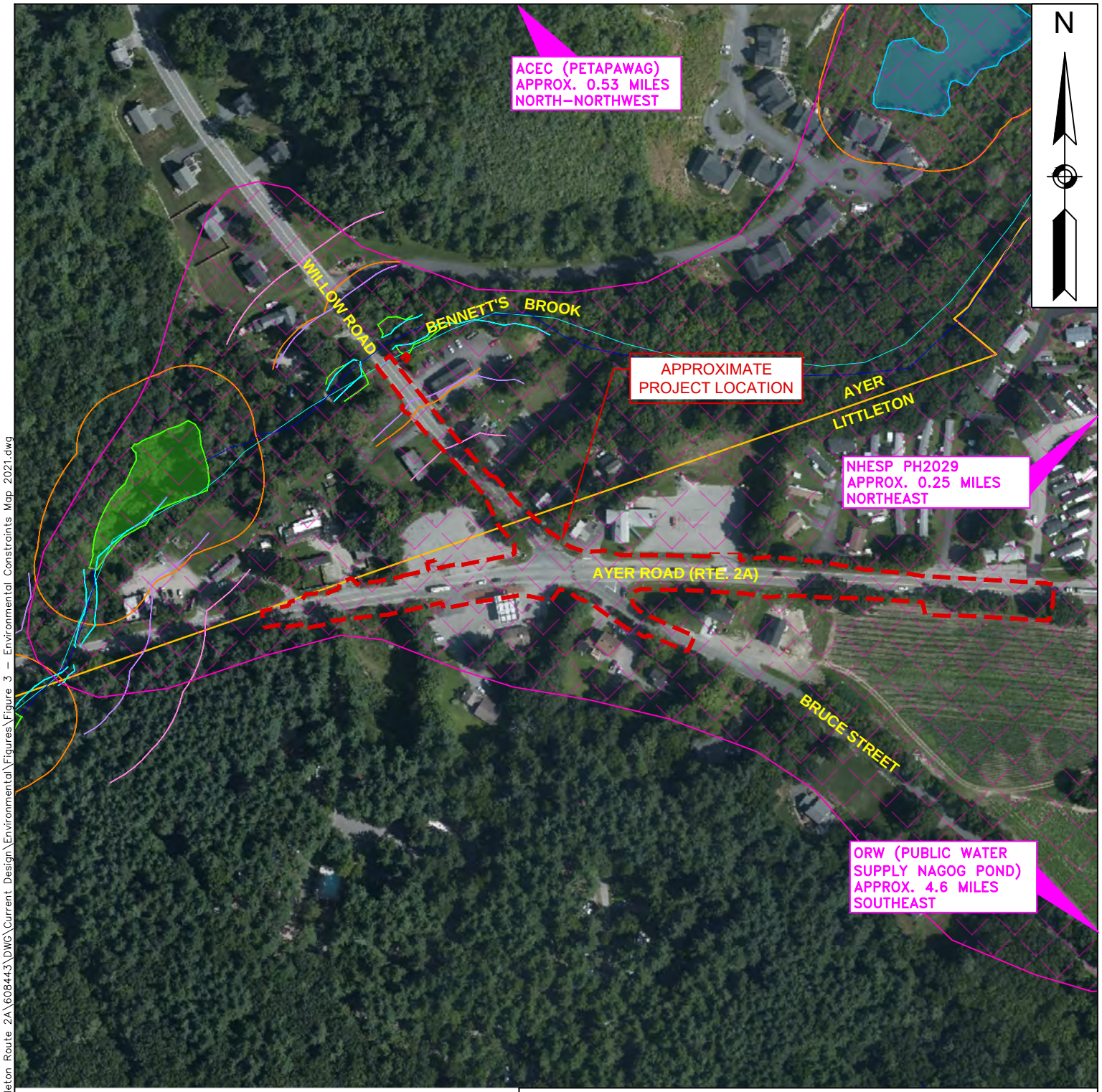
24 ALBION RD, LINCOLN, RI (401) 305-7895

PREPARED FOR: massDOT Massachusetts Department of Transportation Highway Division

SCALE: AS NOTED	PROJECT NO. 13033.114
DATE: 10/08/2021	DRAWN BY: AE/OF
REVISED:	CHECKED BY: MC

FIGURE 2

\\fs1\engineering\Projects\2013\13033\13033.11X - Littleton Route 2A\608443\DWG\Current Design\Environmental\Figures\Figure 2 - Aerial_2020.dwg



LEGEND

- LIMIT OF WORK
- DEP & SURVEYED WETLANDS
- DEP HYDROLOGIC CONNECTIONS
- PERENNIAL STREAM/MAHW
- 100' BUFFER ZONE
- 100' RIVERFRONT AREA
- 200' RIVERFRONT AREA
- WELLHEAD PROTECTION AREA ZONE II
- POTENTIAL VERNAL POOLS
- CERTIFIED VERNAL POOLS

SCALE IN FEET

125 0 125 250

1" = 250'

NOTE: DATA TAKEN FROM MASSGIS

RESOURCE AREA MAP

LITTLETON – AYER – INTERSECTION IMPROVEMENTS ON ROUTE 2A AT WILLOW ROAD AND BRUCE STREET, MASSDOT FILE 608443

PREPARED BY:
GREEN INTERNATIONAL AFFILIATES, INC.
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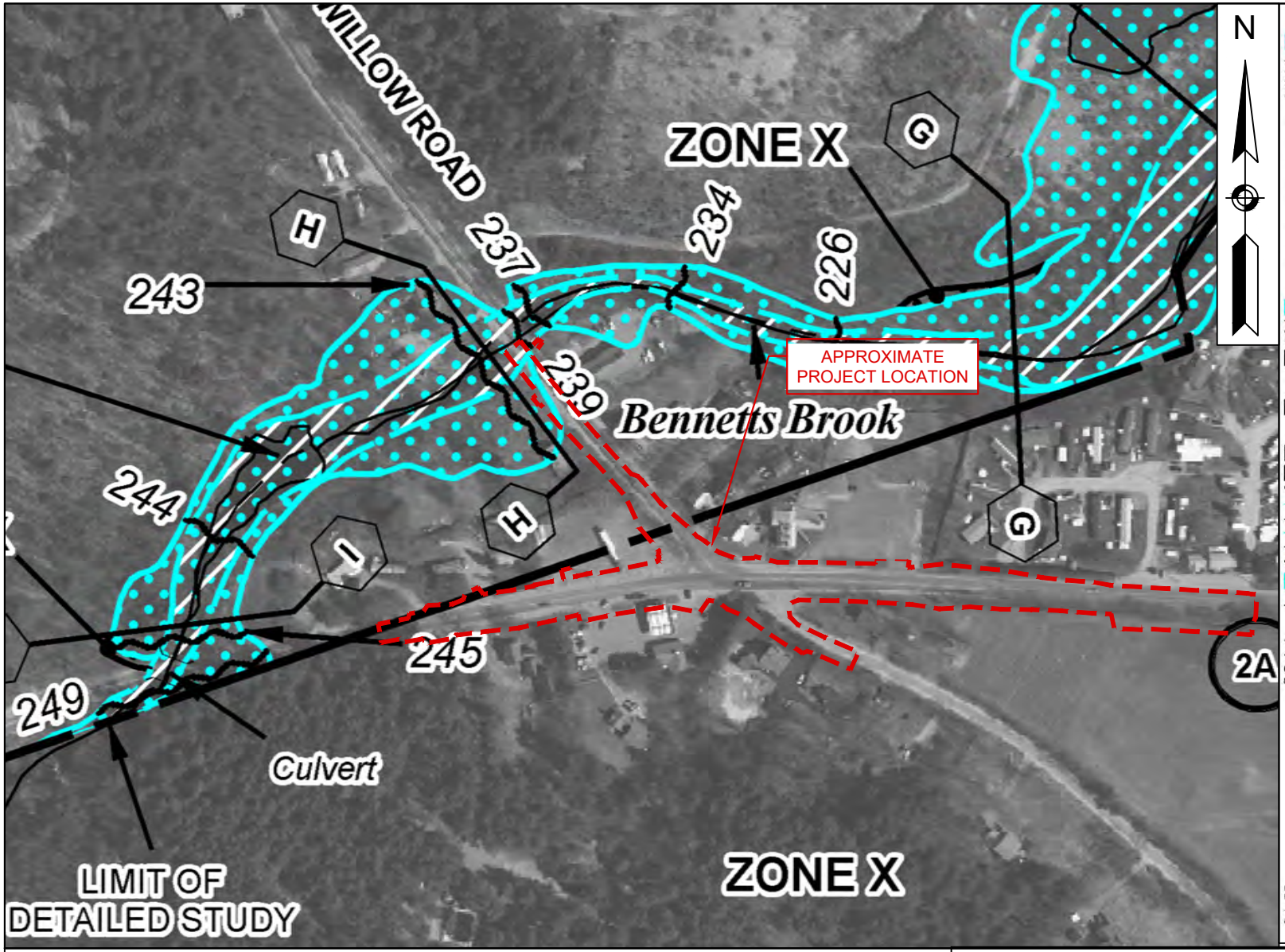
24 ALBION RD, LINCOLN, RI (401) 305-7895

PREPARED FOR:
massDOT
Massachusetts Department of Transportation
Highway Division

SCALE: AS NOTED	PROJECT NO. 13033.114
DATE: 10/08/2021	DRAWN BY: OF
REVISED:	CHECKED BY: DS

FIGURE 3

\\fs1\engineering\Projects\2013\13033\13033.11X - Littleton Route 2A\608443\DWG\Current Design\Environmental\Figures\Figure 3 - Environmental Constraints Map 2021.dwg



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provice protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X — Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% annual chance floodplain boundary

0.2% annual chance floodplain boundary

Floodway boundary

Zone D boundary

CBRS and OPA boundary

Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.

513 — Base Flood Elevation line and value; elevation in feet*

(EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

Cross section line

Transect line

87°07'45", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere

4276000mN — 1000-meter Universal Transverse Mercator grid values, zone 19

600000 FT — 5000-foot grid values: Massachusetts State Plane coordinate system, Mainland zone (FIPSZONE 2001), Lambert Conformal Conic projection

DX5510 × — Bench mark (see explanation in Notes to Users section of this FIRM panel)

M1.5 — River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
June 4, 2010

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

LEGEND:

APPROXIMATE LIMIT OF WORK

SCALE IN FEET

125 0 125 250

1" = 250'

NOTE:
THE FLOOD ZONE DATA SHOWN IS TAKEN FROM THE (FEDERAL EMERGENCY MANAGEMENT AGENCY) FEMA FOR THE TOWN OF LITTLETON, MA (FIRM COMMUNITY PANEL 25017C0216E, DATED 06/04/2010)

FEMA MAP

LITTLETON – AYER – INTERSECTION IMPROVEMENTS ON ROUTE 2A AT WILLOW ROAD AND BRUCE STREET, MASSDOT FILE 608443

PREPARED BY:
GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS
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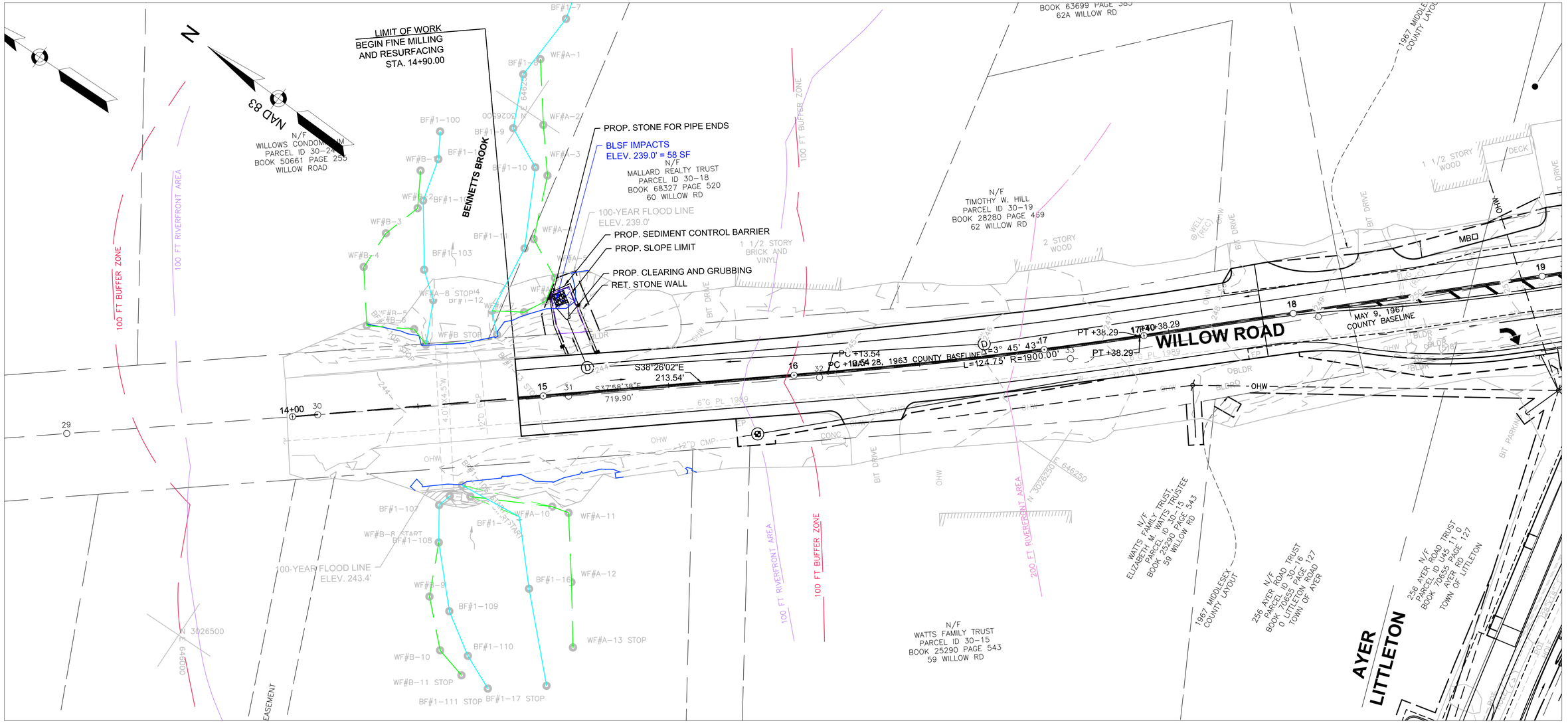
24 ALBION RD, LINCOLN, RI (401) 305-7895

PREPARED FOR:
massDOT
Massachusetts Department of Transportation
Highway Division

SCALE: AS NOTED	PROJECT NO. 13033.114	FIGURE 4
DATE: 10/08/2021	DRAWN BY: EY/OF	
REVISED:	CHECKED BY: MC	

\\fs1\engineering\Projects\2013\13033\13033.11X – Littleton Route 2A\608443\DWG\Current Design\Environmental\Figures\Figure 4 – FEMA – 2020.dwg



LEGEND

- BORDERING VEGETATED WETLAND (BVW)
- 100-FOOT BUFFER ZONE
- 200-FOOT RIVERFRONT AREA
- 100-FOOT RIVERFRONT AREA
- PERENNIAL STREAM/BANK (MAHW)
- 100-YEAR FLOODPLAIN LINE

RESOURCE AREA IMPACTS	TOTAL IMPACTS
BORDERING LAND SUBJECT TO FLOODING (SF)	58
BLSF STORAGE (NET CUT/FILL) (CY)	0
RIVERFRONT AREA (SF)	6,350
0-100 (SF)	3,127
100-200 (SF)	3,863
100-FT BUFFER ZONES (SF)	3,841

SCALE IN FEET

10 0 10 20 30 40

RESOURCE AREA IMPACTS

INTERSECTION IMPROVEMENTS ON ROUTE 2A
AT WILLOW ROAD AND BRUCE
LITTLETON/AYER, MA

PREPARED BY:
GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS
239 LITTLETON RD, WESTFORD, MA (978) 923-0400
24 ALBION RD, LINCOLN, RI (401) 305-7895

PREPARED FOR:
massDOT
Massachusetts Department of Transportation
Highway Division

SCALE: AS NOTED	PROJECT NO. 13033.11X	FIGURE 8A
DATE: 07/02/2021	DRAWN BY: OF	
REVISED: 10/08/2021	CHECKED BY: DS	

APPENDIX D

Stormwater Management Report (bound separately)

APPENDIX E

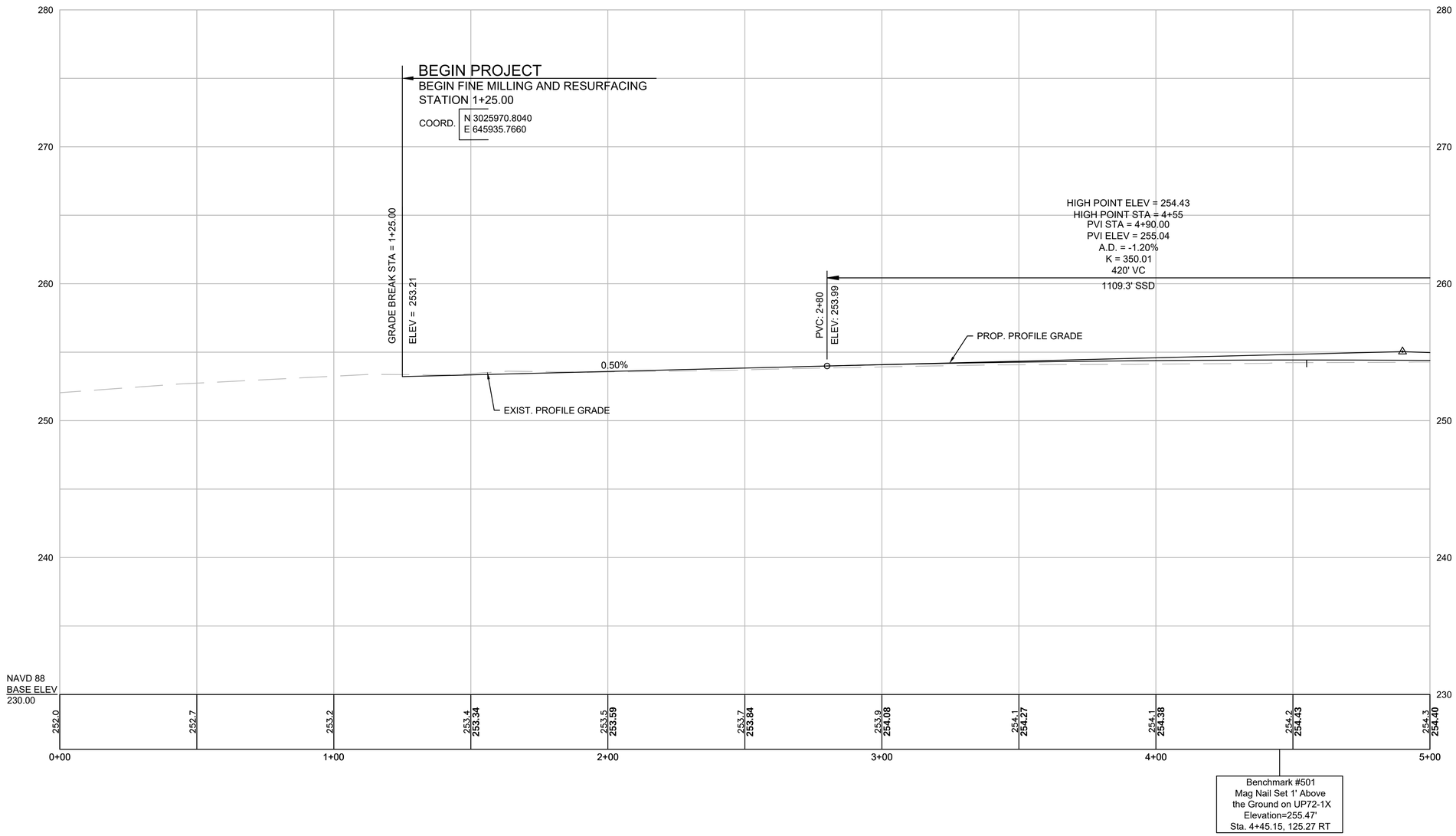
Drawing for NOI Submission (bound separately)

LITTLETON/AYER
ROUTE 2A (AYER ROAD)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	11	78
PROJECT FILE NO.	608443		

PROFILES (1 OF 5)

ROUTE 2A/110 (AYER ROAD)



HOR. SCALE IN FEET
20 0 20 40
4 0 4 8
VER. SCALE IN FEET

FOR CONSTRUCTION PLAN:
SEE SHEET NO. 7

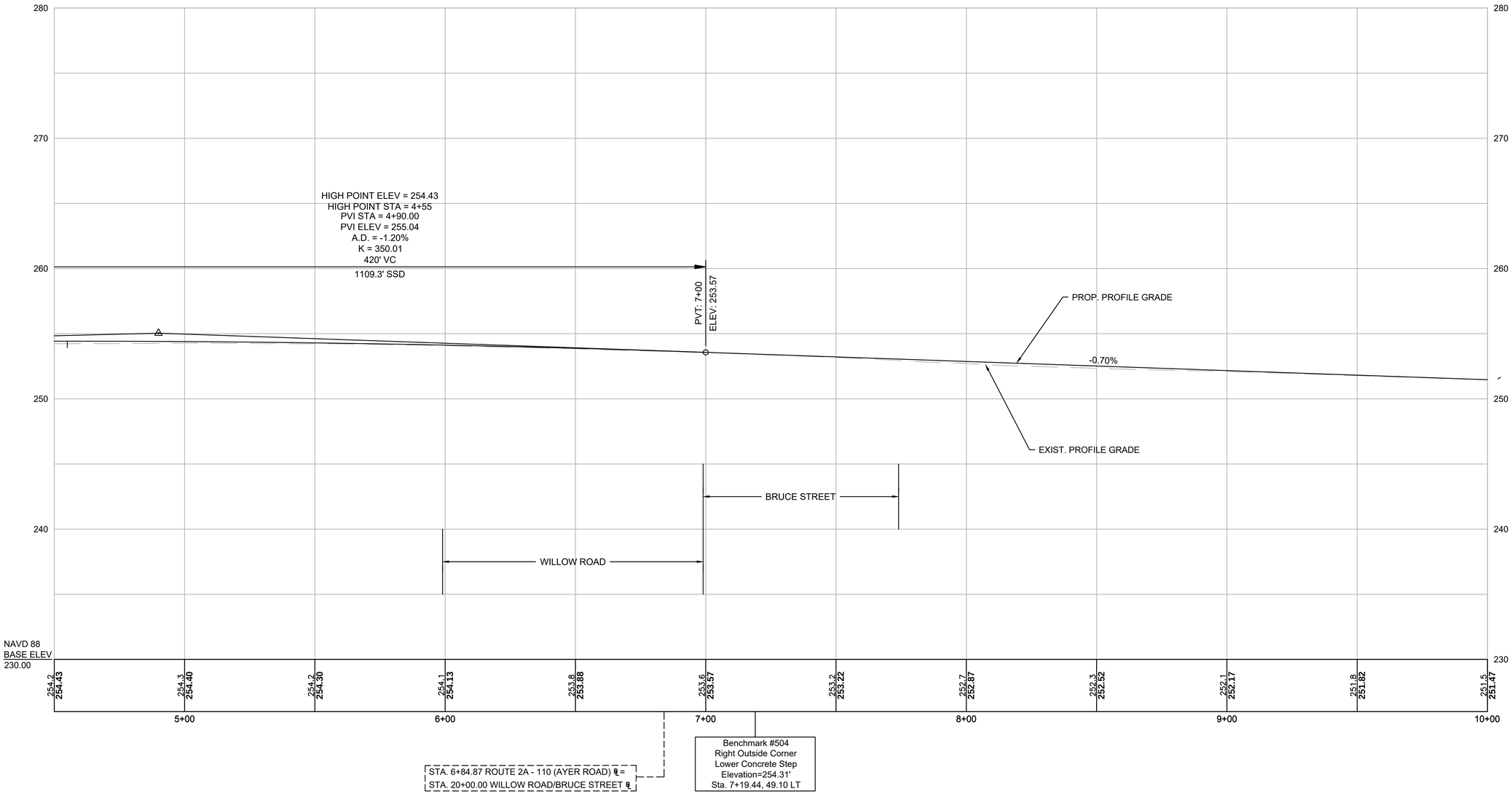
LITTLETON/AYER
ROUTE 2A (AYER ROAD)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	12	78
PROJECT FILE NO.	608443		

PROFILES (2 OF 5)

608443_HD07(PROFILES).DWG Plotted on 30-Nov-2021 10:52 AM

ROUTE 2A/110 (AYER ROAD)



CONTINUED ON SHEET NO. 11

CONTINUED ON SHEET NO. 13

HOR. SCALE IN FEET
20 0 20 40
4 0 4 8
VER. SCALE IN FEET

FOR CONSTRUCTION PLAN:
SEE SHEET NO. 8

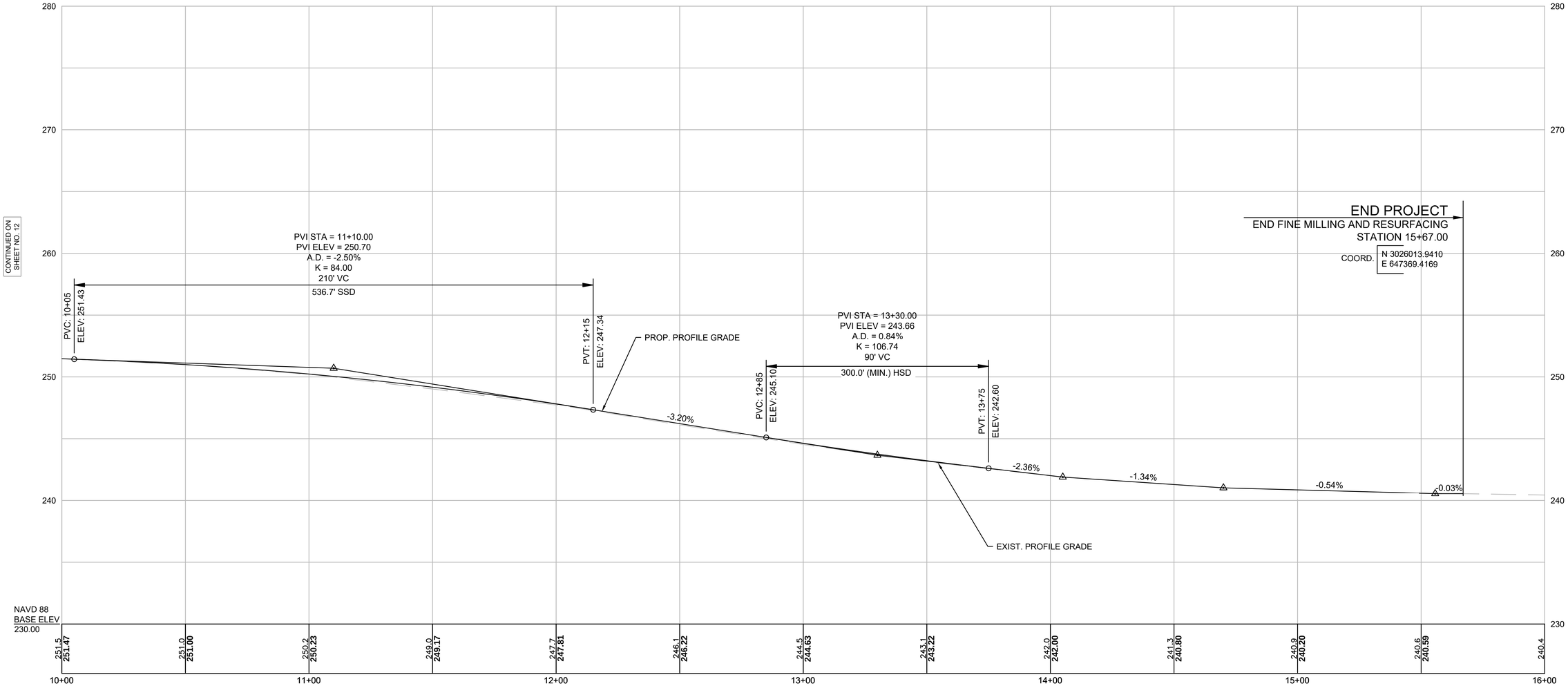
LITTLETON/AYER
ROUTE 2A (AYER ROAD)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	13	78
PROJECT FILE NO.	608443		

PROFILES (3 OF 5)

ROUTE 2A/110 (AYER ROAD)

CONTINUED ON SHEET NO. 12



HOR. SCALE IN FEET
20 0 20 40
4 0 4 8
VER. SCALE IN FEET

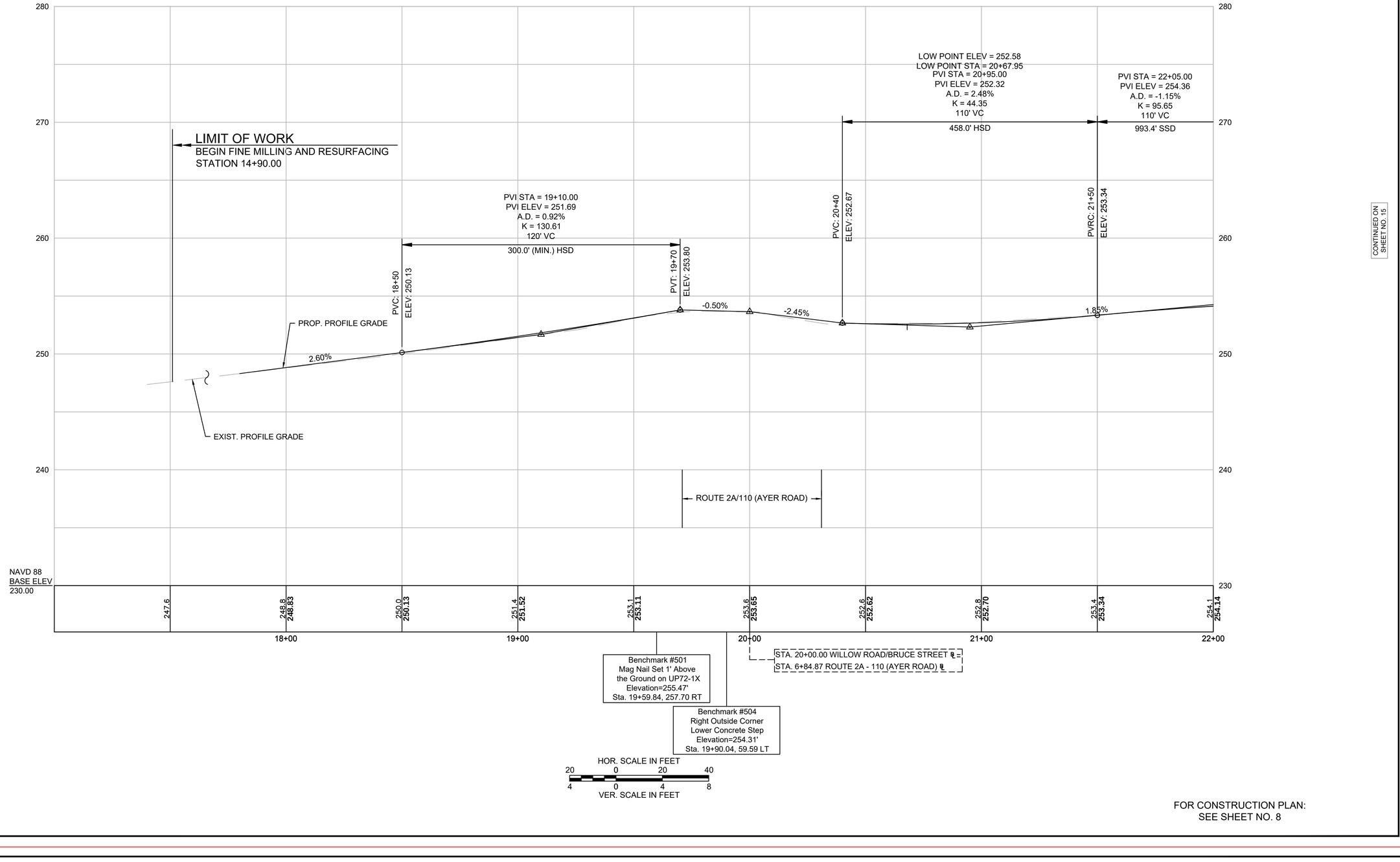
FOR CONSTRUCTION PLAN:
SEE SHEET NO. 9

LITTLETON/AYER
ROUTE 2A (AYER ROAD)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	14	78
PROJECT FILE NO.	608443		

PROFILES (4 OF 5)

WILLOW ROAD AND BRUCE STREET



CONTINUED ON SHEET NO. 15

FOR CONSTRUCTION PLAN:
SEE SHEET NO. 8

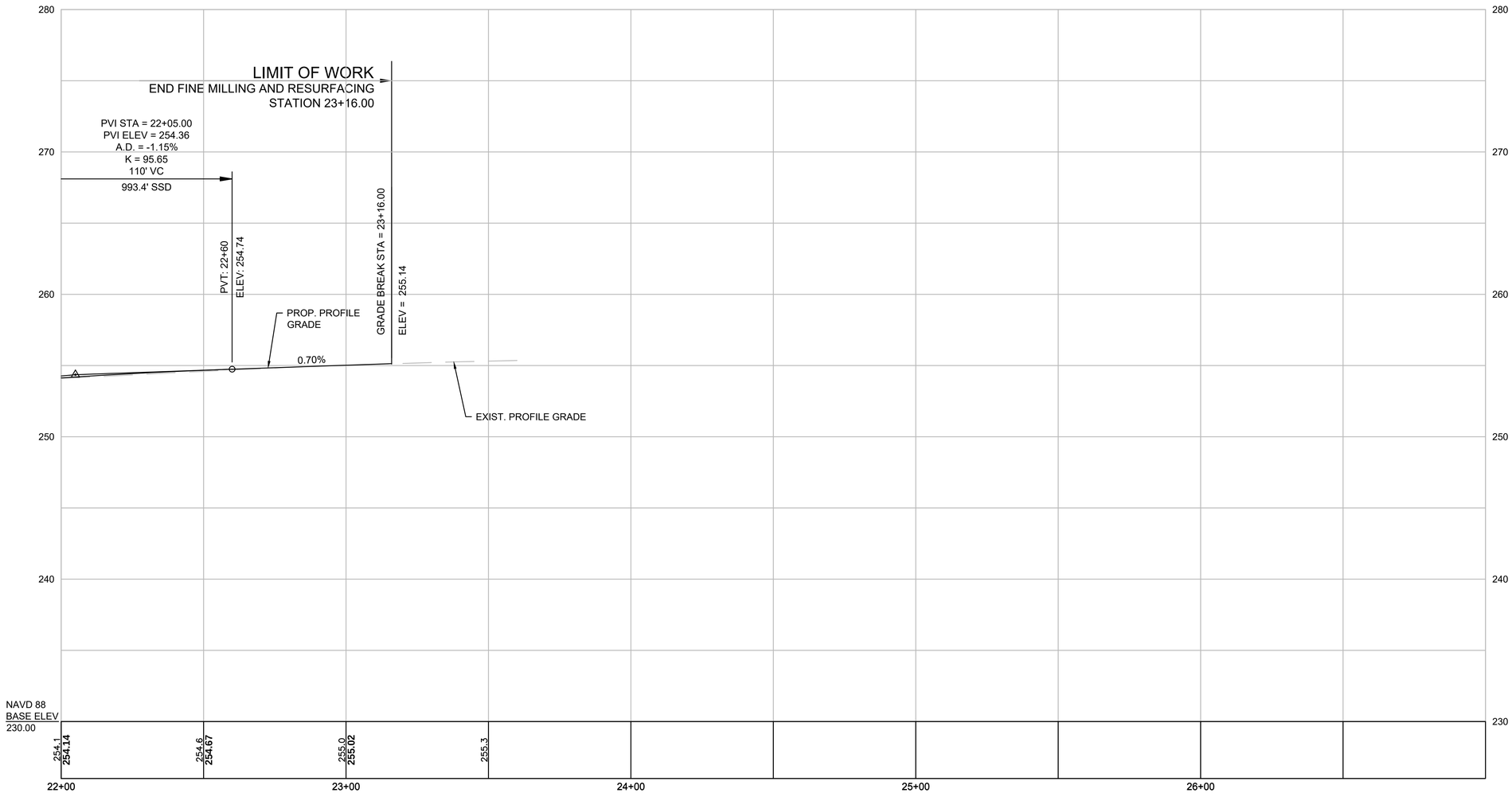
LITTLETON/AYER
ROUTE 2A (AYER ROAD)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	15	78
PROJECT FILE NO.	608443		

PROFILES (5 OF 5)

608443_HD07(PROFILES).DWG Plotted on 30-Nov-2021 10:53 AM

WILLOW ROAD AND BRUCE STREET



CONTINUED ON SHEET NO. 14

HOR. SCALE IN FEET
20 0 20 40
4 0 4 8
VER. SCALE IN FEET

FOR CONSTRUCTION PLAN:
SEE SHEET NO. 8

LITTLETON/AYER
ROUTE 2A (AYER ROAD)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	22	78
PROJECT FILE NO.	608443		

DRAINAGE AND UTILITY PLANS (3 OF 4)

608443_HDXX(D&U PLAN).DWG Plotted on 30-Nov-2021 10:53 AM

N

ROUTE 2A (AYER ROAD)

(PUBLIC - VARIABLE WIDTH)

END PROJECT
END FINE MILLING AND RESURFACING
STATION 15+67.00
COORD. N 3026013.9410
E 647369.4169

N/F
CHIP SHOTS REALTY LLC
PARCEL ID U45 14 0
BOOK 46676 PAGE 280
245 AYER RD

N/F
RODGERS FAMILY HOLDINGS LLC
PARCEL ID U45 15 0
BOOK 64393 PAGE 32
239 AYER RD

N/F
FRANK W. MATHESON JR
PARCEL ID U45 2 0
BOOK 64522 PAGE 122
2 BRUCE ST

PROP. PERM. EASEMENT
PROP. GUY (BO)
RET. BOLLARD
R&R UP(50') (BO)
PROP. TEMP. EASEMENT (TYP.)
R&R UP(50') (BO)
R&R PRIMARY RISER (BO)
RET. UP
PROP. CBCI (2-1)
PROP. 28" X 18" DUCT BANK RELOCATION (BO)
PROP. 4" GAS LINE RELOCATION (BO)
RET. UP
PROP. 28" X 18" DUCT BANK RELOCATION (BO)
R&R COBRA HEAD LIGHT (BO)
PROP. GI (2-7)
30 LF - 12" DIP
22 LF - 12" RCP
133 LF - 12" RCP
22 LF - 12" RCP
BORING B-4
BORING B-5
PROP. 4" GAS LINE RELOCATION (BO)
PROP CUT AND PLUG (TYP.)
REM
PROP. TEMP. EASEMENT (TYP.)
PROP. UP & GUY (BO)
PROP. DMH (2-4)
9 LF - 12" RCP
PROP. CBCI (2-3)
PROP. PERM. EASEMENT
PROP. DMH (2-5)
PROP. FES (2-9)
PROP. INFILTRATION BASIN
PROP. PERM. EASEMENT
PROP. CB W FRAME AND COVER (2-6)
16 LF - 12" RCP CLASS V
PROP. FES (2-8)

CONTINUED ON SHEET NO. 21

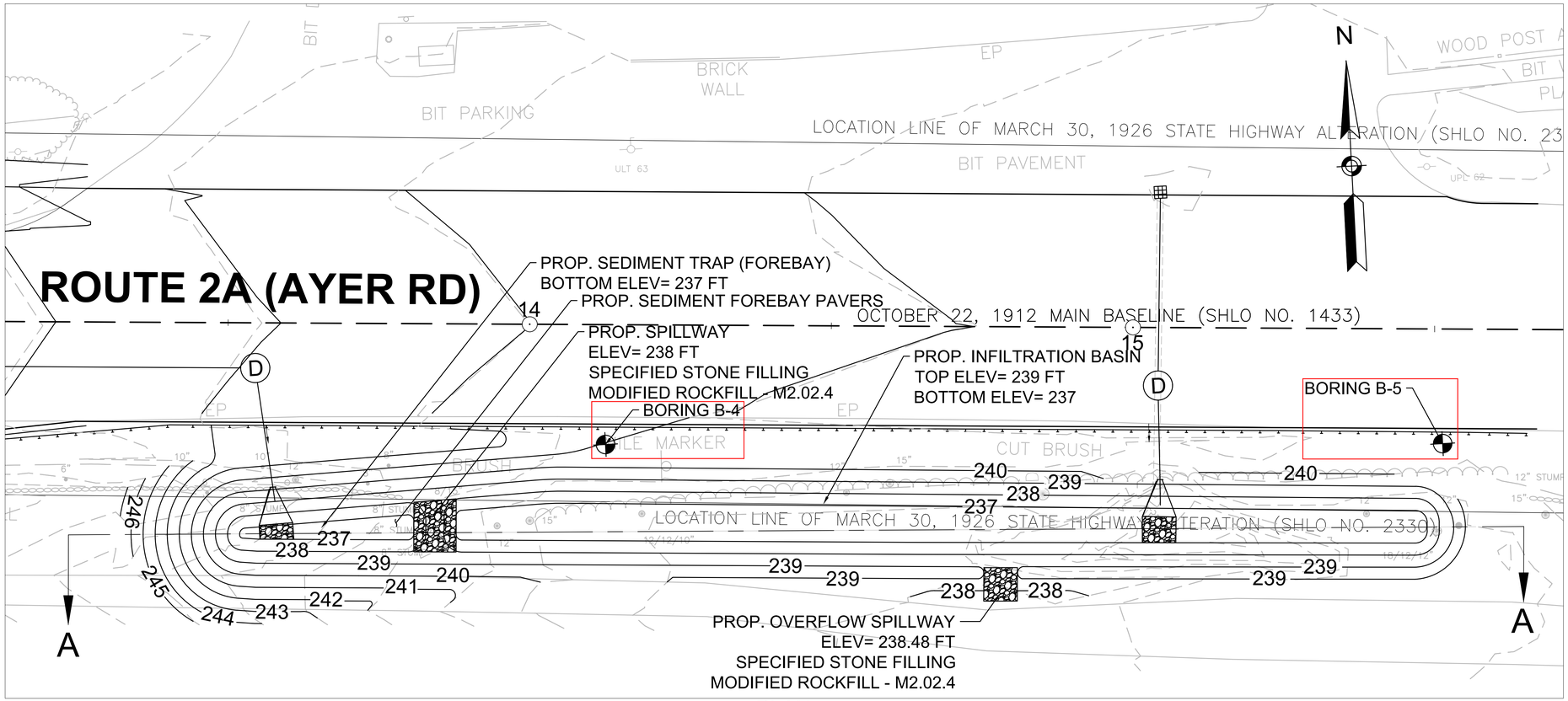
0 20 50 100
SCALE: 1" = 20'

NOTE:
1. SEE SHEET 29 FOR ADDITIONAL GRADING INFORMATION.

LITTLETON/AYER
ROUTE 2A (AYER ROAD)

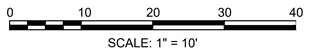
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	29	78
PROJECT FILE NO.	608443		

CONSTRUCTION DETAILS (5 OF 5)

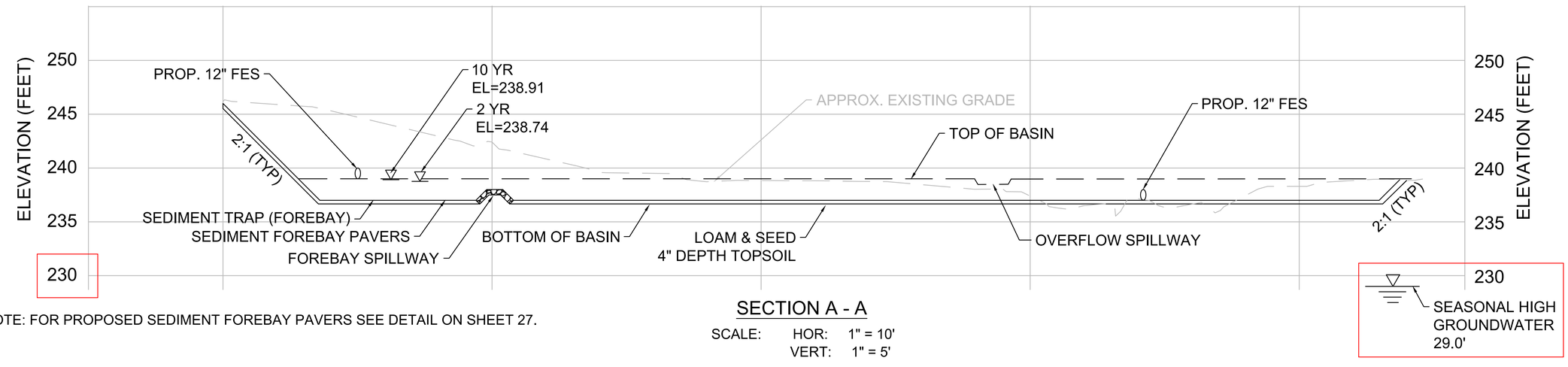


PLAN

SCALE: 1" = 10'



INFILTRATION BASIN



NOTE: FOR PROPOSED SEDIMENT FOREBAY PAVERS SEE DETAIL ON SHEET 27.

SECTION A - A

SCALE: HOR: 1" = 10'
VERT: 1" = 5'

GREEN INTERNATIONAL AFFILIATES, INC.
100 AMES POND DRIVE, SUITE 200 TEWKSBURY, MA 01876
T: (978) 923-0400 | F: (978) 399-0033 | WWW.GREENINTL.COM

MEMORANDUM

December 10, 2021

To:	Heidi Davis, DEP (cero_noi@state.ma.us; heidi.davis@state.ma.us)
Cc:	Melissa Lenker, MassDOT (melissa.lenker@state.ma.us) Timothy Dexter, MassDOT (timothy.dexter@state.ma.us) Ryan Hale, DEP (ryan.hale@state.ma.us) Ayer Conservation Commission (concom@ayer.ma.us)
From:	Danielle Spicer, P.E., Green International Affiliates, Inc.
Date:	December 10, 2021
Project Name:	Intersection Improvements on Route 2A at Willow Road and Bruce Street, Ayer and Littleton, MA
Project Number:	Green No. 13033.11X
Subject:	**Route 2A - Ayer NOI Review - DEP Comment Responses (DEP No. 100-0477)**

This memorandum provides the responses to DEP comments on the Notice of Intent that was submitted on 10/18/2021 for the roadway improvements along Route 2A in Littleton, MA (DEP File No. 100-0477). DEP's comments were received on 11/18/2021 and are copied below in *italics*. Responses to each comment are noted below in **Bold**.

1. *Project plans should depict existing and proposed topography with elevations.*

Typical roadway plans do not include existing and proposed topography; however, we have attached the profile sheets to show change in elevations for the project.

2. *The project would result in a significant increase in peak rate discharge to Bennett's Brook and a decrease in groundwater recharge. Locations and types of stormwater Best Management Practices (BMPs) rejected as part of the complete evaluation must be thoroughly discussed and depicted. Opportunities to subdivide the proposed watersheds that would drain to Design Points (DPs) 3 and 4 at Bennett's Brook and direct flow to stormwater BMPs needs to be fully evaluated. This includes routing portions of the watersheds to the proposed infiltration basin and/or exploring Low Impact Development (LID) techniques.*

As noted in the Stormwater Report on page 15, *there is an increase in peak flow rates for DP-3 and DP-4 for all storm events due to the proposed increase in impervious area. The increase of peak rates for DP-3, which is the upstream side of the culvert for Bennetts Brook along Ayer Street, is approximately a quarter cfs for all storm events, which is considered negligible. In addition, when DP-1, which is the discharge point further upstream of DP-3, is combined with DP-3 using the Macro Approach, there is a net reduction in peak rates for the 10- and 100-year storm events. The 2-year storm results in a 0.04 cfs increase, which is negligible.*

There is an increase in peak rates to DP-4, downstream side of Bennetts Brook Culvert, due to the revised drainage system now discharging more runoff to the downstream side of the culvert. While this increase in peak rates varies from 1.31cfs to 4.24cfs, no change to the effective FEMA base flood

elevation is anticipated since the roadway stormwater runoff will discharge at DP-4 prior to Bennetts Brook reaching its peak. To emphasize, the effective FEMA FIS lists the 100-year peak discharge at 330 cfs and the watershed area of Bennetts Brook at DP-4 is 3.46 sq. miles (2214 acres). The roadway drainage area is 2.399 acres, with a discharge rate of 16.23 cfs for the 100-year storm event. Because the project site is located on the lower end of the watershed, the stormwater runoff from the roadway will reach its peak, which is negligible, prior to Bennetts Brook (the combination of DP-1, 3, and 4) reaching its peak at DP-4, resulting in no change in flood elevations for any storm event.

In addition, using Stream Stats, an analysis was performed along the downstream side of the culvert analyzing the surface elevation change of Bennett's Brook between existing and proposed that notes there will be a 0.03' increase in the surface elevation for the 10- and 100-year elevations, which is negligible. Therefore, no adverse impacts are anticipated by the increase in peak rates as a result of the roadway improvements. Calculations are included in the Stormwater Report that was submitted as part of the NOI.

Overall Project Benefit to the Interests of the WPA

The majority of the existing runoff from Route 2A discharges with little to no treatment to Bennett's Brook. While there is a peak rate increase to DP-4, the overall project provides a significant improvement in water quality runoff and recharge to Bennett's Brook. The overall project proposes the construction of subsurface drainage improvements that are necessary with a Shared use path, which will extend pavement life spans and will result in improved safety by reducing stormwater ponding on reconstructed roadway pavements. As proposed under the scope of this project, the infiltration basin in the Town of Littleton will fully treat and mitigate stormwater runoff from DP-5 watershed. While this watershed doesn't directly discharge to Bennet's Brook, it promotes recharge as well as provides significant water quality treatment within its larger watershed.

In addition, the proposed closed drainage system will have catch basins with deep sumps and plastic hoods to provide additional treatment at curb inlets and in close proximity to commercial land-use properties. The proposed closed drainage system capturing and conveying runoff from the western portion of the project to the proposed outfall near Bennett's Brook will be designed with a flared end section and rip rap protection to prevent erosion to Bennett's Brook. The above improvements proposed under this project will result in improved water quality and drainage characteristics in the area; therefore, contributing to the interests of the WPA (public or private water supply, to groundwater supply, to flood control, to storm damage prevention, to the prevention of pollution and to the protection of fisheries and wildlife habitat).

3. *Please clarify if there will be two (2) leaching basins as noted, as the plans only depict one (1). Opportunities to increase the size of the watershed that flows to the leaching basin if capacity allows, and/or increase the number of leaching basins throughout the project should be evaluated. Although online leaching basins are not credited under the Stormwater Management Standards, they would provide some groundwater recharge.*

There is only 1 leaching basin. The SW report incorrectly noted there were two. The SW report has been revised to reflect this. We reviewed the entire project for areas where additional leaching basins could be added; however, given the tight ROW and the existing utilities, it was not feasible to add more than one.

4. *The proposed outlet at Bennett's Brook is not considered Redevelopment, and therefore alternatives must be evaluated for the outfall per 310 CMR 10.58(4).*

There is a 200-foot Riverfront Area (RA) associated with Bennett's Brook, measured horizontally from the brook's Mean Annual High Water Line (MAHW). The temporary work within the Riverfront Area is required for minor box widening, fine milling and resurfacing on Willow Road and drainage improvements, which include construction of the new drainage outfall into Bennett's Brook and replacement of a portion of the existing 12-inch CMP drain line on Willow Road in Ayer within the existing Right-of-Way. The table below summarizes temporary impacts noted in the NOI to the RA:

Table 2.2.2 – Riverfront Area Impacts

Resource Area	Total area on Site of the Proposed Project (sf)	Temporary Impact Area (sf)	Percentage Disturbed
Riverfront Area		3,127 sf (0 – 100')	14%
		3,863 sf (100 – 200')	18%
	21,748 sf (Total)	6,990 sf (Total)	32%

While the majority of the work within the riverfront area is within degraded RA (97.6%), there is a small portion (2.6%) of it that is considered new development and is regulated by 310 CMR 10.58(4), which provides that there are no practicable and substantially equivalent economic alternatives with less adverse effects and there will be no significant adverse impact on the riverfront area. The following section describes how the proposed work within the Riverfront Area meets general performance standards for 10.58(4)(c) Alternatives Analysis:

<u>No-Build Alternative</u>

The project cannot achieve its purpose and need of increasing safety at the project intersection, improving operations, and providing multimodal accommodations along the Route 2A corridor in the vicinity of the project intersection without installation of the proposed closed drainage system on Willow Road and a new outfall to Bennett's Brook. The proposed closed drainage system and a new outfall are required in order to collect and capture additional runoff from the increased impervious area on Route 2A caused by the proposed new share-use path (SUP); therefore, this is not a viable alternative.

<u>Alternative 1 (Preferred) - New Outfall on the downstream side of Bennett's Brook</u>

As mentioned in the NOI, out of 6,990 sf of the riverfront area on site, 97.6% of this work will be a temporary disturbance to the land within existing developed areas and is considered as redevelopment. Only 2.6% of the RA where the new outfall is proposed to be installed is located within an undeveloped RA.

The Preferred Alternative subject to this NOI proposes a new outfall to be located just outside of the BVW A-series and MAHW line of Bennett's Brook (downstream); therefore, avoiding direct permanent and temporary impacts to these resource areas. The proposed layout was selected in order to daylight the closed drainage system while avoiding work within BVW and LUW and minimize the disturbances to all resource areas within the Riverfront Area and Buffer Zones to the maximum extent feasible. The affected Riverfront Area includes Buffer Zones only with a negligible part (58 SF) within BLSF on the downstream side of the Bennett Brook crossing. Therefore, the preferred alternative design minimizes the disturbances within the Riverfront Area associated with the

installation of the new outfall and regrading to the maximum extent practicable and the area will be stabilized upon completion of construction.

<u>Alternative 2 – New connection to 12" Existing pipe</u>

This alternative would connect the proposed new closed drainage system to the existing 12" pipe that discharges directly into Bennett's Brook north of the Preferred Alternative's proposed outfall. This alternative would require the existing 12-inch Reinforced Concrete Pipe (RCP) to be replaced with a an 18-inch pipe which would result in direct impacts to Land Under Water and Waterways (LUW) and work within the FEMA Floodway. In addition, since the existing outfall is located immediately adjacent to the edge of the brook, there isn't room to install energy dissipation methods without increasing impacts to the project. A direct discharge of runoff with no energy dissipation installed into the Brook could negatively affect the water quality.

<u>Alternative 3 – New connection to the Existing Cross Box Culvert</u>

This alternative would connect the proposed new closed drainage system to the existing box culvert, which most likely would also require box culvert replacement with the additional flows resulting in significant direct impacts to LUW, BLSF and work directly within the Floodway, which are avoided under the Preferred Alternative. This alternative would also have the same issues as Alternative 2, in that no energy dissipation would be installed, which could negatively affect the water quality.

5. *Measures to improve existing conditions per 310 CMR 10.58(5)(a) and the Stormwater Management Standards beyond meeting Standards 2 and 3, and the pretreatment and structural stormwater best management practice requirements of Standards 4, 5 and 6 to the maximum extent practicable, must be demonstrated.*

As noted in response No. 2 and No. 3 above, the project provides a significant improvement in water quality runoff and recharge to Bennett's Brook through the implementation of BMPs, However, there was only one feasible location within the project limits at DP-5 that can meet the full Stormwater Standards. The project includes installing an infiltration basin with a forebay that is part of the MassDEP's Volume 2 Chapter 2 Handbook which will provide groundwater recharge to the area, treat 80% of Total Suspended Solids even though this is not a typical option within a redevelopment area due to ROW constraints for DP-5. Since this is a redevelopment project and given the limited space within the ROW, existing utilities, and proximity to waterbodies, it was not feasible to propose structural stormwater control measures to within all the drainage areas of the project.

6. *Test pit location(s) at the proposed infiltration basin and leaching basin must be depicted. The estimated seasonal high groundwater elevation should be identified on the plans.*

Test Pit locations and seasonal high groundwater are now shown on Drainage & Utility Plan (sheet 3 of 4) and Construction Detail (sheet 5 of 5), attached to this memorandum.

7. *Specific source control and pollution prevention measures to be implemented in the Zone II Wellhead Protection Area need to be identified.*

Catch Basins with plastic hoods and 4' sumps are proposed throughout the project. The hoods will provide some volume to capture floatable oil, grease, and petroleum hydrocarbons if a spill occurs. In addition, it is assumed the local Fire Department has spill kits and/or booms on hand to respond as necessary.

In addition, MassDOT follows established Best Management Practices (BMPs) and operational procedures and has implemented a range of strategies statewide to reduce the amount of road salt used and minimize its environmental impact. Such strategies include the increased use of liquid deicers to pre-wet dry material in order to reduce bounce and scatter and for pre-treating roadways prior to storms when conditions allow. Both of these techniques have been shown to reduce the overall application of sodium chloride. In addition, the use of closed loop controllers, pavement sensors and other equipment allow for more efficient operations.

Enclosed with this letter response are the following documents:

- Profile Sheets (1 – 6)
- Revised Drainage & Utility Plan (sheet 3 of 4)
- Revised Construction Detail (sheet 5 of 5)

DEPARTMENT OF PUBLIC WORKS

Water, Wastewater, Highway & Solid Waste Divisions

Dan Van Schalkwyk, Director
Pamela J. Martin, Business Manager

25 BROOK STREET
AYER, MASSACHUSETTS 01432
T: (978) 772-8240
F: (978) 772-8244

January 4, 2022

Ayer Planning Board
Town of Ayer
Town Hall
Ayer, MA 01432

RE: Intersection Improvements on Route 2A at Willow Road and Bruce Street

Dear Commissioners:

The DPW Office has received the submittals for the above referenced project. Documents that were received included:

- Notice of Intent prepared by Green International Affiliates, Inc., dated October 13, 2021
- Memorandum titled "Route 2A – Ayer NOI Review – DEP Comment Responses (DEP No. 100-0477" prepared by Green International Affiliates, Inc., dated December 10, 2021
- Plans: Notice of Intent Submission 10/13/2021 and Revised Plans prepared by Green International Affiliates, Inc.
- Stormwater Management Report prepared by Green International Affiliates, Inc., dated September 16, 2021

I reviewed the proposed stormwater associated with the project. I did not conduct constructability or engineering review of the project. I conducted a site visit on January 3, 2022.

Comments:

1. In general, the proposed stormwater system discharging to Bennetts Brook has a very traditional design as a closed drainage system (i.e. catch basins, drain manholes, outfall). It's understood this is a redevelopment project which makes it difficult to provide stormwater treatment. However, additional BMPs should be evaluated to improve the design.
2. My main concerns with the proposed design are the lack of water quality treatment prior to discharge to Bennetts Brook, the increase in peak discharge rates to Bennetts Brook, and maximizing infiltration in the Zone II aquifer of Ayer's Spectacle Pond Wells.
    a. The proposed TSS removal prior to discharge to Bennetts Brook is 25%. On page 20 and 21 of the Stormwater Management Report, the Applicant has indicated it is unable to provide a proprietary device (e.g. hydrodynamic separator) to reduce TSS at each discharge point due to cost and other factors. I recommend a separator be located prior to discharge point DP-4; the remaining discharge points are not as critical because DP-4 has the highest flow volume discharging directly to the Brook.
    b. The Memorandum provided by the Applicant speaks to the peak discharge in response to DEP comment 2. The Applicant should respond directly about DEPs

comment regarding evaluation of subdividing the watershed and directing less water toward the Bennetts Brook.

c. Alternatives to maximize infiltration should be evaluated. The project is located in a Zone II critical area for Ayer's Spectacle Pond Wellfield. Diverting more drainage to the proposed infiltration basin should be evaluated, as mentioned in my above comment, and any opportunities for infiltration along Willow Road.

3. The applicant should provide a detail of the flared end outlet and riprap apron sizing. It was unclear from the stormwater calculations what velocities were anticipated at the outfalls.

Should you have any questions or comments, please do not hesitate to contact this office.
Regards,

AYER PUBLIC WORKS DEPARTMENT

Daniel Van Schalkwyk, P.E.
Director

RE: MassDOT project at Willow Road/Rte. 2A intersection

Dan Van Schalkwyk <dVanSchalkwyk@ayer.ma.us>

Tue 1/4/2022 3:26 PM

To:jgugino@ayer.ma.us <jgugino@ayer.ma.us>; Robert Pontbriand <rpontbriand@ayer.ma.us>; Carly Antonellis <cantonellis@ayer.ma.us>; Ayer Conservation Commission <concom@ayer.ma.us>;

Cc:Jon Schmalenberger <jschmalenberger@ayer.ma.us>; Mark Phillips <mphillips@ayer.ma.us>;

1 attachments (125 KB)

01-2022 Comments to Concom.pdf;

Hi Jess,

I've responded to your questions below and have attached my comments for the project to this email.

Thanks,
Dan

Dan Van Schalkwyk, P.E.
Director
Town of Ayer - Public Works Department
25 Brook Street
Ayer, Massachusetts 01432
office: (978) 772-8240
cell: (978) 833-2252
email: dvanschalkwyk@ayer.ma.us

From: jgugino@ayer.ma.us <jgugino@ayer.ma.us>
Sent: Monday, December 20, 2021 3:03 PM
To: Dan Van Schalkwyk <dVanSchalkwyk@ayer.ma.us>; Robert Pontbriand <rpontbriand@ayer.ma.us>; Carly Antonellis <cantonellis@ayer.ma.us>; Ayer Conservation Commission <concom@ayer.ma.us>
Cc: Jon Schmalenberger <jschmalenberger@ayer.ma.us>; Mark Phillips <mphillips@ayer.ma.us>
Subject: MassDOT project at Willow Road/Rte. 2A intersection

Hi Dan,

A MassDOT project finally came before the Commission last Thursday (12/16) -- after two previous continuances while they were responding to MassDEP comments. Revised plans were also submitted thereafter. We did a site walk on Saturday morning (12/18). And now the Commission has a number of concerns, including especially good ones raised by Mark Phillips, for which we would like DPW to make an assessment and/or recommendations on the Town's behalf. Our next meeting with the DOT representatives is on Thursday, January 6. Note -- we probably should have forwarded the NOI and plans to you/DPW for review when we first got them, but as you know, we are in a bit of disarray with Jo-Anne having gone on leave and now, as of Friday, having resigned from her position. However, as the plans were revised after the initial submission, and our concerns were only made clearer after the site walk,we would have followed up with these questions/concerns anyway.

Danielle Spicer (Stormwater & Permitting Group Leader) and Tom Bigelow (Project Manager), of Green International affiliates, Inc., presented on behalf of DOT, and Ms. Spicer met us for the site walk. The project will replace the temporary traffic signal with a permanent one, and improvements are to be made to the road (widening to add turn

lanes on 2A , Bruce, and Willow Road), adding an 8' wide shared-use path on both sides of 2A, pedestian-activated crosswalks, granite curbing, and upgrades to drainage and stormwater treatment.

The project starts in Ayer, near the intersection, and extends about 1450 feet east into Littleton. It also extends about 300 feet along Bruce Street (Littleton), but more importantly for our concerns, about 500 feet up Willow Road in Ayer, where there is a Town culvert under the road for Bennett's Brook as it flows toward Spectacle Pond. In addition to Bennett's Brook and associated wetlands, this area is also floodplain.

As Ms. Spicer said, while most of the work is in Littleton, the bulk of the environmental impact will be around Bennett's Brook, in Ayer. There are no resource areas to be affected in Littleton, so the only Conservation review is before Ayer's Commission. Most of the drainage improvements (i.e. new catch basins, leaching basins, infiltration basin, manhole covers) are in Littleton, which would also make any continuing environmental impact in Ayer dependent on Littleton and/or MassDOT maintenance along 2A. MassDOT has not always well maintained catchbasins further up 2A, near Pingry Hill.

1. The project proposes discharging drainage on the downstream side of the box culvert, with daylighting very close to the brook (less than 15 ft. I think). Mark Phillips asked about possibly having this daylight further from the brook, which would involve cutting into an existing slope by a substantial margin in order to establish the same pipe discharge elevation -- but it would move this further from the brook, albeit an easement would be required.

I don't see a significant benefit to doing this. I believe providing treatment upstream in the system will be more valuable. The propsed flared end riprap discharge will reduce the energy at the discharge but moving the discharge upstream will not have much impact to improve water quality and may necessitate retaining walls.

2. No treatment or discharge was proposed for the upstream side of the culvert. The reason we were given is that the existing culvert might not be able to handle additional flow, as the project will increase total discharge. Is this a viable reason? Or is there any plan for the Town to replace this culvet in the near future anyway, with, say, a larger cuilvert?

The Town does not have any plans to improve this culvert in the near future. I agree that it makes more sense for the final discharge point to be on the downstream side. The applicant could evaluate if a localized BMP could be located on the upstream side that overflows to the downstream side.

3. Is 25% TSS removal (in Littleton) sufficient for treating increased discharge that flows into Ayer -- Bennett's Brook/Spectacle Pond and Ayer's primary drinking water supply?

The Town boundary is not a major concern as the stormwater infrastructure is owned by MassDOT and regulated under their TS4 Permit for post construction maintenance. The maintenance of these items are included in the Long Term O&M and added to their TS4 permit. However, the applicant should evaluate options to increase TSS removal and overall water quality treatment, I mention this in my attached memo.

4. On the western side of the Willow/2A intersection, there's a large parking area where multiple semis are parked. Off the back of this parking lot, the grade drops steeply to reach the level of the yard at the first residence down Willow. No treatment or filtration is planned for this area, and our concern is with untreated gas/oil leakages still leaving that parking lot, but now funneled more directly toward the brook. It looks like previous sheet flow over nearby lawn would have provided some natural infiltration. Are there viable options to be considered to address this? (Not to mention the gas station on the other side of 2A from this parking area).

I agree this area is of concern especially with the trucks parking there. I also agree that the applicant needs to explore BMPs and this appears to be a potential area to include one – there's some Right-of-Way and a permanent easement is being proposed.

5. Can you see any viable options for any filtration on Ayer land that could be added to this project?

I believe the applicant should explore this. Some options I see are the area mentioned in #4 above. Potential near the upstream side of the culvert on private property. There's really not a lot of room in Ayer...

6. Is there any viability to pushing for the treated discharge to be on the upstream side of the culvert -- where there exists more possibility for easement creation/use of flatter land next to the culvert. This to avoid the close proximity of the daylighted pipe on the downstream side, or the need to cut into land further away to move the pipe out.

You could ask the applicant to explore this. They could provide a hydraulic analysis showing if the impacts of moving the discharge upstream. Alternatively, the treatment could potentially be located upstream with a final discharge across the road on the downstream side.

7. DOT has created easement use in Littleton for some of their treatment structures, but has not seemed interested in doing this on Ayer land -- of concern because, again, ALL of the environmental impacts to wetland resources are in the Ayer portion of the project.

It could be hard for them to work with private property owners. I'm not sure if they have communicated with any in Ayer.

If I'm successful, I will have attached to this email the NOI, revised plans, and DOT response to DEP comments. If not, I'll get them to you another way.

Also, I've copied Jon Schmalenberger, our Chair, and Mark Phillips, our Vice Chair, in case they want to add any more comments or clarify the ones made here.

Thank you!

Jess Gugino

Ayer Conservation Commission, Member and Clerk

Short Form Professional Services Agreement
(For Amounts under $10,000)

This services agreement (this "Agreement") is made and entered as of the 15th day of December, 2021 by and between the **Town of Ayer, Massachusetts** (the "Town"), on behalf of its Conservation Department located at 1 Main Street, Ayer, MA and **North County Land Trust** ("Consultant") located at 325 Lindell Ave, Leominster, MA 01453.

RECITAL:

Town and Consultant desire to enter into this Agreement to provide for each party's responsibilities with respect to the services described on **Exhibit A,** attached hereto and incorporated herein by this reference (the "Services").

AGREEMENTS

In consideration of the recital and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledge, the parties agree as follows:

1. Consultant Responsibilities; Fees. Consultant will perform the Services to the reasonable satisfaction of Town. Assuming such satisfactory performance, the Town shall pay Consultant the amount set forth on **Exhibit A** within 30 days following the completion of the Services by check or in such other form as the Town may require. Consultant is an independent Consultant and shall be solely and personally responsible for all federal, state and local taxes, contributions and other liabilities with regard to such payments.

2. Term. The term of this Agreement shall be annual, from the date of this Agreement until the same date in the next year, or until the Services are no longer needed and payment therefor by the Town. Except for material breach of the Agreement by the other party, this Agreement may not be terminated by either party except that the Town may immediately terminate this Agreement upon the death or incapacity of Consultant. The contract may be revised and/or renewed annually.

3. Ownership of Work Product. Consultant hereby sells, assigns, grants and transfers to the Town all right, title and interest in any reports, documents, performances or other copyrighted materials authored or created by Consultant for the Town pursuant to this Agreement, including all copyrights, renewals and extensions thereof.

4. Relationship. The parties hereto are independent Consultants. Nothing in this Agreement shall be understood or construed to create or imply any relationship between the parties in the nature of any joint venture, employer/employee, principal/agent or partnership. Consultant shall in no way become an employee of the Town pursuant to this Agreement. Neither party shall have the authority to nor shall either party attempt to create or assume any obligation by or on behalf of the other party.

5. Expenses. Except as expressly provided to the contrary in this Agreement, all expenses incurred by the parties shall be the sole responsibility of the party who ordered the service or incurred the particular expense.

6. Indemnity. To the fullest extent permitted by law, Consultant shall indemnify and hold harmless the Town, and their respective agents, officers and employees from and against any and all liability, loss, claims, damages, fines, penalties, costs and expenses (including reasonable attorney's fees), judgments and awards (collectively, "Damages") sustained, incurred or suffered by or imposed upon any Covered Person resulting from any breach of this Agreement or false representation of Consultant under this Agreement, or any negligent acts or omissions or reckless or intentional misconduct of Consultant or any of Consultant's agents, officers, directors, employees or subconsultants. Without limiting the foregoing, Consultant shall indemnify and hold harmless each Covered Person against any and all Damages that may directly or indirectly arise out of or may be imposed because of the failure to comply with the provisions of applicable law by Consultant or any of its agents, officers, employees or subconsultants.

7. Insurance. Consultant shall obtain and maintain in effect through the term of this Agreement appropriate insurance coverage for its activities under this Agreement, including, but not limited to, comprehensive general liability insurance (bodily injury and property damage) and professional liability insurance. At Town's request, Consultant will provide Town with copies of the certificates of insurance evidencing such coverage.

8. Miscellaneous. This Agreement may not be assigned without the written consent of the other party. Consultant's services are personal in nature and may not be assigned or delegated to any other person. This Agreement represents the entire Agreement between the parties and supersedes any prior oral or written understandings with respect to the Services. This Agreement may only be amended by an agreement signed in writing by all of the parties hereto. Upon execution, this Agreement will be a valid and binding obligation of each party and enforceable in accordance with its terms. Consultant shall maintain insurance in such amounts and of such types as are customarily held by persons engaged in the same or a similar kind of business similarly situated.

_____	**TOWN OF AYER**
By:_____	By:_____
Title:_____	Title:_____
Name:_____	Name:_____

EXHIBIT A

Description of Services:

	CR in place	Baseline doc	Monitoring &Enforcement plan	M&E plan implemented
Kohler Place	yes	Yes		
Pine Meadow Conservation Area	no			
Tooker Property	no			
Minnie French	?			
Mountain Laurel/Sandy Pond II	?			
Pond View Estates	yes			
Autumn Ridge	yes	yes	yes	yes
John Carroll Reserve	no			
Shaker Mill Pond	no			
Groton School Road	no			
Stratton Hill	no			

Assist Town Conservation Department staff with managing the Town's conservation portfolio which includes compiling the required documents for proper record keeping, performing annual monitoring of existing conservation lands, drafting and following through on implementing Conservation Restrictions on new OSRD developments, and other duties aimed at keeping the Town in compliance with its conservation obligations.

Required Deliverables, if Any:

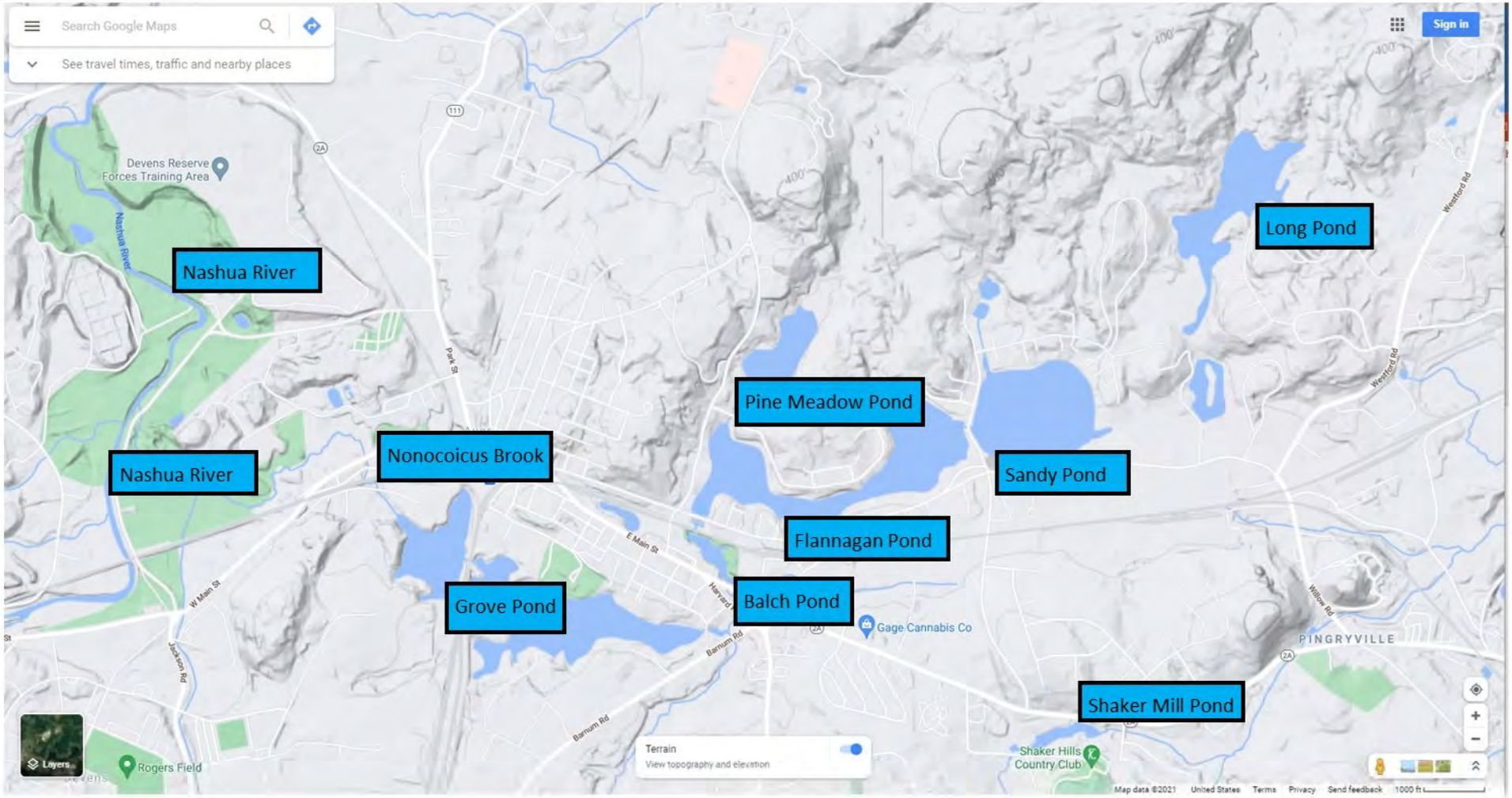
Payment for Services: $10,000 agreement)(not to exceed $10,000 if using this short form)

Billing schedule for services per/quarter will include Staff Time @ $70/hr, sub-contracted resources at cost (pass through), and any related out-of-pocket expenses (if any).

Service Period	Billing Date	Due By
Q1- Jan-March	April 7	April 30
Q2- Apr-June	July 7	July 31
Q3- July-Sept	October 7	October 31
Q4- Oct-Dec	January 7	January 31

Date(s) for Services: _____

Date Contract Expires: **January 1, 2023** _____



Waterways' Signs Project

Sign Locations Draft 7/8/21

Appendix One: Sign Locator Map

Upper Long Pond (3):

A. Put-In/Dock on Badger Road
B. Trail Parking Area end of Loon Hill Road
C. Dam/Trail (access from north side of Sandy Pond)

Sandy Pond (2):

D. Sandy Pond Beach was created with support from the Land Water Conservation Fund (LWCF)
E. Sandy Pond/Flannagan Pond Causeway/Fishing Area

Upper Flannagan Pond/Pine Meadow Trails (1):

F. Pond View Trail

Balch Pond (3):

G. Oak Ridge Drive Trail Parking Area
H. Central Ave Culvert/Fishing Area
I. East Main Street Overlook (Guardrail)

Grove Pond (3):

J. Pirone Park
K. Community Garden
L. Overlook between 2A East Rotary Entrance and Barnum Road

Nonacoicus Brook (1):

M. West Main Street on the bridge on the sidewalk side of the street

Nashua River (1):

N. Route 2A/Shirley Line

James Brook (1):

O. James Brook on Groton School Road