DOCUMENT A00860

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION NOTICE OF INTENT

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LEC

WETLANDS WILDLIFE WATERWAYS

Notice of Intent Application

Pleasant Street Complete Streets Project

March 4, 2026

Subject Property

Pleasant Street (Route 122)

Paxton Town Line to South Olean Street

Worcester, Massachusetts

Applicant and Owner

Massachusetts Department of Transportation-Highway Division

10 Park Plaza

Boston, MA 02116

In Conjunction with

Toole Design

141 Tremont Street, 9th Floor

Boston, MA 02111

LEC Environmental Consultants, Inc.

100 Grove Street, Suite 310

Worcester, MA 01605

508-753-3077

www.lecenvironmental.com

LEC

WETLANDS WILDLIFE WATERWAYS

March 4, 2026

FedEx and Email (planning@worcesterma.gov)

Worcester Conservation Commission
City Hall
455 Main Street, Room 404
Worcester, MA 01608

RE: Notice of Intent Application [LEC File #: TD\24-254.04]
Pleasant Street (Route 122) Corridor Improvements
Paxton Town Line to South Olean Street
Worcester, Massachusetts

Dear Members of the Commission:

On behalf of the Applicant, the Massachusetts Department of Transportation-Highway Division (MassDOT), LEC Environmental Consultants, Inc. (LEC) respectfully submits this Notice of Intent (NOI) Application for Pleasant Street (Route 122) corridor improvements in Worcester, Massachusetts. This filing is submitted pursuant to the *Massachusetts Wetlands Protection Act* (the *Act*, M.G.L.c.131 § 40) and its implementing Regulations (the *Act Regulations*, 310 CMR 10.00). As an agency of the Commonwealth providing essential government functions, MassDOT is exempt from certain municipal requirements including, but not limited to, wetland bylaws, ordinances, and policies, and paying for peer review fees. Additionally, MassDOT is not required to notify abutters per the Act Regulations at 310 CMR 10.05(4).

Bordering Vegetated Wetland (BVW), Bordering Land Subject to Flooding (BLSF), Bank to intermittent stream, Bank-MAHW to Tatnuck Brook, and 25-foot Riverfront Area occurs on and/or proximate to the project area and are protected under the *Act* and *Act Regulations*. Components of the project that involve repaving within Buffer Zone are considered a minor activity not subject to regulation under the Act, in accordance with 310 CMR 10.02(2)(b)(2)(p). The remainder of the project that occurs within Buffer Zone and BLSF are the subject of this NOI filing. BLSF impacts of 5.24± cubic yards will be replaced with 5.72± cubic yards of new flood storage, resulting in a net gain of 0.48± cubic yards of flood storage. Activities within BLSF qualify as a limited project under 310 CMR 10.53(3)(f) for maintenance and improvement of an existing public roadway and as such, the provisions of 310 CMR 10.57 are notwithstanding.

Project details are provided on the site plans, entitled *Plan and Profile of Pleasant Street (Route 122)*, Worcester, MA, dated January 9, 2026; and *Stormwater Management Report* prepared by Jacobs, dated March 4, 2026. As part of the proposed activities, the Applicant will implement erosion controls, establish a clearly defined Limit-of-Work, and provide stormwater management measures and BLSF mitigation in accordance with the *Act Regulations*.

Enclosed please find one check made payable to the City of Worcester in the amount of Two-Hundred, Sixty-Two Dollars and Fifty Cents ($262.50) for the purpose of filing this Application under State guidelines. In addition, electronic payment to the Commonwealth of Massachusetts in the amount of Two-Hundred, Thirty-Seven Dollars and Fifty Cents ($237.50) has been made via eDEP. It is our understanding that the Conservation Commission will legally post the NOI Application and required public hearing so as to appear on the Conservation Commission's March 23, 2026 agenda. We trust that the information included herein is sufficient to facilitate your review. Should you have any questions regarding this NOI or require additional information, please contact me in our Worcester office at 508-753-3077 or at akendall@lecenvironmental.com.

Thank you for your consideration of this NOI. We look forward to meeting with the Commission on March 23, 2026.

Sincerely,

LEC Environmental Consultants, Inc.

Andrea Kendall, PWS
Senior Environmental Scientist

cc: DEP, Central Region
Adetoyin Olaoye, Massachusetts Department of Transportation
Coleen Lautrup, Toole Design

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Appendix A

Locus Maps

Figure 1: USGS Topographic Quadrangle

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MassDEP Bordering Vegetated Wetland Delineation Field Data Forms

Appendix C

USGS StreamStats Report

Attachments

Plan and Profile of Pleasant Street (Route 122), *Worcester, MA*, prepared by Toole Design, dated January 9, 2026

Stormwater Management Report, prepared by Jacobs Engineering, dated March 4, 2026

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

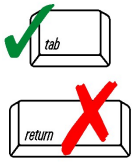
Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Worcester
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):

Pleasant Street (Route 122)
Paxton Town Line to South Olean Street
a. Street Address

Worcester
b. City/Town

01602
c. Zip Code

Latitude and Longitude:

42.28056
d. Latitude

-71.87213
e. Longitude

N/A Roadway Right of Way
f. Assessors Map/Plat Number

N/A Roadway Right of Way
g. Parcel /Lot Number

2. Applicant:

Erica
a. First Name

Larner
b. Last Name

Massachusetts Department of Transportation - Highway Division
c. Organization

10 Park Plaza, Room 7360
d. Street Address

Boston
e. City/Town

MA
f. State

02116
g. Zip Code

857-268-1729
h. Phone Number

N/A
i. Fax Number

erica.n.larner@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
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):

Andrea
a. First Name

Kendall
b. Last Name

LEC Environmental Consultants, Inc.
c. Company

100 Grove Street, Suite 310
d. Street Address

Worcester
e. City/Town

MA
f. State

01605
g. Zip Code

508-753-3077
h. Phone Number

N/A
i. Fax Number

akendall@lecenvironmental.com
j. Email address

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

$500.00
a. Total Fee Paid

$237.50
b. State Fee Paid

$262.50
c. City/Town Fee Paid

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A. General Information (continued)

6. General Project Description:

The Project consists of Pleasant Street roadway updates that enhance public safety and mobility for all modes of transportation. The project includes reconstruction and cross section modifications to Pleasant Street, improved traffic operations and new and/or improved pedestrian and bicycle accommodations from the Paxton town line east to South Olean Street. Portions of the work are located within BLSF and the 100-foot Buffer Zone.

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)

10.53 (3)(f) - Maintenance and improvement of exisiting public roadways.

2. Limited Project Type

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

8. Property recorded at the Registry of Deeds for:

Worcester
a. County

b. Certificate # (if registered land)

N/A-Roadway
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	47 (Perm); 8,257 (Temp) 1. square feet 0 3. cubic feet of flood storage lost	8,304 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	Tatnuck 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: 0 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.
0	0	N/A

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

August 2021
b. Date of map

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

c. Submit Supplemental Information for Endangered Species Review*

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

(a) within wetland Resource Area _____ 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.

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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 - Bourne 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 - Plymouth 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.

Plan & Profile of Pleasant Street (Route 122), Worcester, MA
a. Plan Title

Toole Design
b. Prepared By

Said Yahya
c. Signed and Stamped by

January 9, 2026
d. Final Revision Date

e. Scale

Stormwater Report, Jacobs Engineering
f. Additional Plan or Document Title

February 2026
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:

41608
2. Municipal Check Number

March 3, 2026
3. Check date

Electronic payment via eDEP
4. State Check Number

5. Check date

LEC Environmental Consultants, Inc.
6. Payor name on check: First Name

7. Payor name on check: Last Name

Massachusetts Department of Environmental Protection
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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.

1. Signature of Applicant Erica Larner, MassDOT-Highway Division

02/26/2026
2. Date

3. Signature of Property Owner (if different)

4. Date

Andrea Kendall

3/3/2026
5. Signature of Representative Andrea Kendall, LEC Environmental Consultants, Inc.

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.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

NOI Wetland Fee Transmittal Form

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

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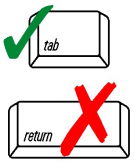

A. Applicant Information

1. Location of Project:

Pleasant Street (Route 122)	Worcester
a. Street Address	b. City/Town
Electronic payment through eDEP	$237.50
c. Check number	d. Fee amount

2. Applicant Mailing Address:

Erica	Larner
a. First Name	b. Last Name

Massachusetts Department of Transportation-Highway Division
c. Organization

10 Park Plaza, Room 7360
d. Mailing Address

Boston	MA	02116
e. City/Town	f. State	g. Zip Code

857-268-1729		Erica.n.larner@dot.state.ma.us
h. Phone Number	i. Fax Number	j. Email Address

3. Property Owner (if different):

a. First Name	b. Last Name

Massachusetts Department of Transportation-Highway Division
c. Organization

10 Park Plaza
d. Mailing Address

Boston	MA	02116
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

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

B. Fees (continued)

Step 1/Type of Activity	Step 2/Number of Activities	Step 3/Individual Activity Fee	Step 4/Subtotal Activity Fee
Category 2e (inland limited project)	1	$500.00	$500.00

Step 5/Total Project Fee: $500.00

Step 6/Fee Payments:

Total Project Fee:	$500.00 (a. Total Fee from Step 5)
State share of filing Fee:	$237.50 (b. 1/2 Total Fee **less $**12.50)
City/Town share of filling Fee:	$262.50 (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. Introduction

On behalf of the Applicant, Massachusetts Department of Transportation (MassDOT), LEC Environmental Consultants, Inc. (LEC) is submitting this Notice of Intent (NOI) Application for Pleasant Street (Route 122) corridor improvements in Worcester, Massachusetts. The NOI Application is filed under the *Massachusetts Wetlands Protection Act* (*Act*, M.G.L., c. 131, s. 40) and its implementing *Regulations* (*Act Regulations*, 310 CMR 10.00. As an agency of the Commonwealth providing essential government functions, MassDOT is exempt from certain municipal requirements including, but not limited to, wetland bylaws, ordinances, and policies, and paying for peer review fees. Additionally, MassDOT is not required to notify abutters per the *Act Regulations* at 310 CMR 10.05(4).

The purpose of the proposed project is to enhance safety and mobility for all modes of transportation. Designed as a *Complete Street*, the project includes reconstruction and cross section modifications to Pleasant Street, improved traffic operations, and new pedestrian and bicycle accommodations. These improvements are aligned with MassDOT's sustainability initiative known as GreenDOT, which promotes the healthy transportation modes of walking, bicycling, and public transit, and supportive smart growth development. Construction activities will be conducted, in part, within Bordering Land Subject to Flooding (BLSF) and the 100-foot Buffer Zone. Wetland resource areas will be protected from impacts during construction through the implementation of erosion and sedimentation controls. The erosion and sedimentation controls will function as the limit of work and will minimize areas of disturbance, as will phasing and sequencing of the work.

The proposed work activities are depicted on the site plans entitled, *Plan and Profile of Pleasant Street (Route 122)*, *Worcester, MA*, prepared by Toole Design, dated November 21, 2025 (*Site Plans*, Attachment).

The following report provides a description of the site, the associated Wetland Resource Areas, proposed activities, and a description of the measures used to mitigate potential impacts to Wetland Resource Areas and their associated Buffer Zones. The project qualifies as a limited project under 310 CMR 10.53(3)(f) for maintenance and improvement of an existing public roadway. No other state or municipal permits are required for this project.

2. General Site Description

The proposed project limits (herein referred to as "the Site") includes a 1.4± mile segment of the Pleasant Street right-of-way (ROW) and directly adjacent areas from the Town of Paxton municipal boundary east to South Olean Street/Tatnuck Brook (Appendix A, Figure 1) within the west-central portion of Worcester. Pleasant Street (Route 122) is a two-way, east-west roadway. Westbound travel consists of two lanes that transition to a single-lane proximate to the Paxton town line to the west. The southbound travel consists of a single lane. Classified as an urban principal arterial route, Pleasant Street traverses through business and residential zone districts. In 2024, Pleasant Street supported almost 9,500 average daily trips (ADT). Residential and commercial uses, including Tatnuck Country Club, occur along the Site and forested uplands and wetlands occur in select areas. Currently, the project corridor poses several operational and safety issues due to substandard bicycle and pedestrian facilities. A sidewalk occurs on the south side of the roadway along the entire corridor and on the north side of the roadway in discrete locations within the eastern and western project limits. No bicycle accommodations are present along the corridor.

Photo 1. Representative view of Pleasant Street and sidewalk.

Guardrails extend along select sections of Pleasant Street generally where slopes adjacent to the roadway are steep as well as adjacent to a stormwater basin on the south side of the roadway. Overhead electric and telecommunication lines attached to wooden utility poles are located within the ROW on both sides of Pleasant Street. Sewer, gas, water, and electric utilities occur

belowground within the ROW. Vegetation immediately along the roadside consists of lawn, grasses and forbs, shrubs, and small caliper trees. Bordering Vegetated Wetlands and/or Bank to intermittent streams or perennial stream (Tatnuck Brook) generally occur within 100 feet of Pleasant Street, between STA 18+00 and 21+50; 25+25 and 28+50; 35+75 and 45+00; 64+25 and 70+00; and 80+25 and 80+50). These wetlands occur at the bottom of the moderate to steep hillside slopes/embankments and typically between 10 to 20 feet lower than the roadway surface.

Stormwater runoff sheet flows from the roadway surface to a closed drainage system comprised of catch basins and underground pipes that direct flow to a stormwater basin and/or downgradient BVWs/streams.

According to the regional Natural Resources Conservation Service (NRCS) soil survey, soils mapped along the project corridor primarily include Paxton fine sandy loam, 8 to 15 percent slopes, Woodbridge fine sandy loam, 3 to 8 percent slopes, Hinckley-Urban land complex, 0 to 15 percent slopes, and Urban land.

Vegetation within the forested uplands includes a canopy dominated by Norway maple (*Acer platanoides*) with individuals of black cherry (*Prunus serotina*). The understory is comprised of saplings from the canopy with individuals of tatarian honeysuckle (*Lonicera tatarica*), and burning bush (*Euonymus alatus*). The groundcover is dominated by Japanese knotweed (*Polygonum cuspidatum*), with patches of tatarian honeysuckle, and individuals of ash (*Fraxinus* sp.), burning bush, Canada mayflower (*Maianthemum canadense*), poison ivy (*Toxicodendron radicans*), and seedlings from the canopy.

Utilizing a hand-held, Dutch-style auger, LEC inspected soil conditions within the upland along the BVW boundary and observed a 9-inch thick, very fine sandy loam topsoil (A Horizon) with a soil matrix color of 10YR 2/2. The topsoil is underlain by a 7-inch thick, very fine sandy loam subsoil (B_1 Horizon) with a soil matrix color of 10YR 4/6 and a 7+ inch thick subsoil (B_2 Horizon) with a soil matrix color of 2.5Y 5/6. This soil profile is not considered hydric according to *Field Indicators for Identifying Hydric Soils in New England* (Version 4, June 2020, the *Field Indicators Guide*).

The Site is not located within an Area of Critical Environmental Concern (ACEC), and according to DEP, the Site is not located in an area designated as an Outstanding Resource Water or a contributor to a public water supply.

2.1 MA Natural Heritage & Endangered Species Program Designation

According to the 15th Edition of the Massachusetts Natural Heritage Atlas (valid from August 1, 2021) published by the Natural Heritage & Endangered Species Program (NHESP) and the MassGIS database, the Site is not located within *Priority Habitats of Rare Species or Estimated Habitats for Rare Wildlife.* No Certified Vernal Pools (CVP) or Potential Vernal Pools (PVP) are located on or near the Site (Appendix A, Figure 2).

2.2 Area of Critical Environmental Concern and Outstanding Resource Water

According to MassGIS database, the Site is not located within an Area of Critical Environmental Concern (ACEC) and is not located in an area designated as an Outstanding Resource Water or a contributor to a public water supply.

3. Wetland Boundary Determination Methodology

LEC conducted a site evaluation on March 10, 2025 to identify, characterize, and delineate existing protectable Wetland Resource Areas located within and adjacent to the Site. The wetland boundaries were determined through observations of the existing plant communities, using the "fifty percent criteria" to determine dominance of wetland/upland vegetation, the interpretation of soil characteristics, and other indicators of wetland hydrology in accordance with the MassDEP handbook, *Delineating Bordering Vegetated Wetlands under the Massachusetts Wetlands Protection Act* (September, 2022), the *Field Indicators for Identifying Hydric Soils in New England* (December, 2019), and the criteria set forth in 310 CMR 10.55.

LEC demarcated the BVW boundaries with sequentially-numbered, blaze orange surveyor's flagging tape/pin flags embossed with the words "LEC Resource Area Boundary" in bold, black print. LEC flagging stations 1-1 through 1-8, 2-1 through 2-6, 3-1 through 3-3, and 4-4 through 4-26 demarcate the boundary of BVW boundary. LEC demarcated Bank boundaries and/or Mean Annual High Water (MAHW) line with sequentially-numbered, blaze blue surveyor's tape. LEC flagging stations A1 to A4; B1 to B5; C1 to C5; D1 to D35; E1 to E3; and F1 to F9 demarcate the boundary of Bank to intermittent. LEC flagging stations G1 to G11 demarcate the boundary of Bank/MAHW line to Tatnuck Brook, a perennial stream. All flags were survey located by Green International Affiliates, Inc.

4. Wetland Resource Area Descriptions

Wetland Resource Areas located adjacent to and/or within the Site include BVW, Bank to intermittent stream, Bank/MAHW to Tatnuck Brook, and associated 25-foot Riverfront Area, and Bordering Land Subject to Flooding. A brief description of the Wetland Resource Areas and 100-foot Buffer Zone are provided below.

4.1 Bordering Vegetated Wetland (BVW)

Bordering Vegetated Wetland (BVW) is defined at 310 CMR 10.55 (2) as *freshwater wetlands that 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 Wetland is the line within which 50% or more of the vegetational community consists of wetland indicator plants and saturated or inundated conditions exist.*

Four vegetated wetlands are located adjacent to the Site and are regulated as BVW under the *Act*. Primarily characterized as forested/scrub-shrub wetlands, vegetation includes a canopy of red maple (*Acer rubrum*), Norway maple, ash, black birch (*Betula lenta*), and American elm (*Ulmus americana*). The understory is comprised of patches of red osier dogwood (*Cornus sericea*), with individuals of multiflora rose (*Rosa multiflora*), tatarian honeysuckle, locust (*Gleditsia* sp.), privet (*Ligustrum* sp.), silky dogwood (*Conus amomum*), and saplings from the canopy. Ground cover vegetation is dominated by Japanese knotweed and jewelweed (*Impatiens capensis*), with patches of sensitive fern (*Onoclea sensibilis*) and poison ivy, scattered patches of goldenrod (*Solidago* sp.), individuals of burnweed (*Erechtites heiraciifolius*), cinnamon fern (*Osmunda cinnamomea*), and aster (*Aster* sp.), and scattered individuals of New York fern (*Thelypteris noveboracensis*) and seedlings from the canopy. Entanglements of grape (*Vitis* sp.) and Asian bittersweet (*Celastrus orbiculatus*) are found throughout.

Photo 2. Northerly view of A-Series Bank to intermittent stream and 1-Series BVW.

The 3-Series BVW is a fringing scrub-shrub wetland south of Pleasant Street adjacent to the D-series Bank. The BVW lacks any canopy vegetation. The understory is dominated by tatarian honeysuckle, with patches of multiflora rose.

Photo 3. Southerly view of F-Series Bank to intermittent stream.

Utilizing a hand-held, Dutch-style auger, LEC inspected soils within the BVWs along the BVW boundary. Within the 4-series BVW, LEC observed an 8-inch thick, gravelly sandy loam topsoil (A Horizon) with a soil matrix color of 10YR 2/1. The A Horizon is underlain by an 11-inch thick, sandy loam subsoil (B_1 Horizon) with a soil matrix color of 10YR 3/2 and redoximorphic concentrations (10%) with a soil color of 7.5YR 3/4. The subsoil is underlain by a 6+ inch thick, sandy loam subsoil (B_2 Horizon) with a soil matrix color of 10YR 3/1 and redoximorphic depletions (10%) with a soil color of 10YR 5/2 and concentrations (10%) with a soil matrix color of 10YR 3/6. This soil profile meets the A11 (Depleted Below Dark Surface) indicator for hydric soil according to the *Field Indicators Guide.*

MassDEP Bordering Vegetated Wetland Delineation Field Data Forms for a representative wetland transect proximate to LEC flagging station 4-7 are included in Appendix B. Field data forms for the 1-Series, 2-Series, and 3-Series BVWs are not required since the boundaries occur along a distinct break in slope.

4.2 **Bank and Mean Annual High-Water (MAHW) Line**

Bank is the first observable break in slope or the mean annual flood level, whichever is lower. The lower boundary of a Bank is the mean annual low flow level [310 CMR 10.54 (2) (c)].

Mean Annual High-water Line of a river is the line that is apparent from visible markings or changes in the character of soils or vegetation due to the prolonged presence of water and that distinguishes between predominantly aquatic and predominantly terrestrial land. Field indicators of bankfull conditions shall be used to determine the mean annual high-water line [310 CMR 10.58 (2)(a)(2)].

According to 310 CMR 10.04, a stream means a body of running water, including brooks and creeks, which moves in a definite channel in the ground due to a hydraulic gradient, and which flows within, into or out of an Area Subject to Protection under M.G.L. c. 131, § 40. A portion of a stream may flow through a culvert or beneath a bridge. Such a body of running water which does not flow throughout the year (i.e., which is intermittent) is a stream <u>except for that portion upgradient of all bogs, swamps, wet meadows and marshes</u>

Bank to Intermittent Streams

An intermittent stream originates within the 1-Series BVW located south of Tarrytown Lane and flows easterly proximate to the Site. The stream flows through a series of roadway culverts, below Pleasant Street, Bailey Street/Airport Drive, Prouty Lane, and is

piped for discrete sections. At Joppa Road, the stream flows through a culvert and continues as a piped conveyance below Pleasant Street and, based on topography, is presumed to daylight within the 4-series BVW.

Photo 4. Upstream (westerly) view of D-Series stream flowing out of piped conveyance.

Photo 5. Downstream (easterly) view of D-Series stream flowing parallel to Pleasant Street.

Intermittent Stream Status

According to the *Act Regulations* [310 CMR 10.58(2)(a)(1)(b and c)], b. *A river or stream shown as intermittent or not shown on the current USGS map or more recent map provided by the Department, that has a watershed size greater than or equal to one square mile, is perennial. c. A stream shown as intermittent or not shown on the current USGS map or more recent map provided by the Department, that has a watershed size less than one square mile, is intermittent unless: i. The stream has a watershed size of at least ½ (0.50) square mile and has a predicted flow rate greater than or equal to 0.01 cubic feet per second at the 99% flow duration using the USGS Stream Stats method. The issuing authority shall find such streams to be perennial…*

The stream interior of the forested BVW is mapped as intermittent on the latest USGS Topographic Map. In accordance with 310 CMR 10.58(2)(a)(1)(c), in order to confirm the intermittent status of this stream, LEC utilized the USGS Water Resources Web Application, StreamStats, to calculate the contributing watershed area and 99% flow duration. The report (Attachment B, StreamStats) determined a 0.71 square mile watershed where the stream flows into Tatnuck Brook and a 99% flow duration of 0.00939 cubic feet per second. The 99% flow duration is below the minimum threshold for perennial stream status (Appendix C). Thus, the stream is confirmed as intermittent.

Tatnuck Brook

Tatnuck Brook is mapped by the latest USGS Topographic Map as a perennial stream. Proximate to the Site, the stream flows southerly through a culvert below Pleasant Street. The approximately 20-foot-wide stream channel is contained by 1-2 foot vertical Banks located at the bottom of moderate to gentle slopes. The Bank is vegetated, contains undercuts, and interspersed with exposed soil and small boulders/rocks.

Photo 6. Downstream (southerly) view of Tatnuck Brook from Pleasant Street bridge.

4.3 Riverfront Area

According to 310 CMR 10.58 2 (a) Riverfront Area is defined 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, except that the parallel line is located: (a) 25 feet away in Boston, Brockton, Cambridge, Chelsea, Everett, Fall River, Lawrence, Lowell, Malden, New Bedford, Somerville, Springfield, Winthrop, and Worcester* [Underline added].

Tatnuck Brook is mapped by the latest USGS Topographic Map as a perennial stream. Under the *Act*, a 25-foot Riverfront Area extends parallel to the Bank/MAHW line. No portion of the Site is located within Riverfront Area.

4.4 Bordering Land Subject to Flooding (BLSF)

Bordering Land Subject to Flooding is an area which floods from a rise in a bordering waterway or water body. Such areas are likely to be significant to flood control and storm damage prevention [310 CMR 10.57 (1)(a)].

According to the November 26, 2024 Revised Preliminary *Federal Emergency Management Agency Flood Insurance Rate Map* for Worcester County, Massachusetts (Community Panel: 25027C0613F), Tatnuck Brook is mapped as a Regulatory Floodway: *Special Flood Hazard Area* that includes the channel of the river and adjacent

land areas that must remain free from obstruction to allow the discharge of the 1% annual chance flood. The eastern-most section of the Site (i.e., proximate to the Pleasant Street bridge over Tatnuck Brook) is located within Zone AE: *Area subject to flooding by the 1% annual chance flood – Base Flood Elevations determined* (elevation 581.9 (south of the crossing) to 587.1 (north of the crossing)); and Zone X [shaded]: *areas of 0.2% annual chance flood*. The remainder of the project occurs within Zone X [unshaded]: *Areas determined to be outside the 0.2% annual chance floodplain* (Appendix A, Figure 2). BLSF extends from the Bank to the limit of the Zone AE. BLSF within the Site is comprised of roadway and sidewalk surfaces. No portion of the Site is located within the Regulatory Floodway.

5. Proposed Project

The Project consists of roadway updates that enhance safety and mobility for all modes of transportation. Designed as a *Complete Street*, the project includes reconstruction and cross section modifications to Pleasant Street, improved traffic operations, and new pedestrian and bicycle accommodations. New and/or improved sidewalks and new bicycle lanes are proposed along the corridor, providing new multi-modal connections. To accommodate the new bicycle lanes, westbound travel will be reduced to a single lane and include dedicated turning lanes. Specifically, the project will:

- Resurface roadways with new pavement by milling and overlay and reset curb;
- Relocate and upgrade drainage infrastructure in select locations within the Project limits;
- Provide bicycle accommodations in each direction of vehicular travel via buffered bicycle lanes;
- Construct Americans with Disabilities Act (ADA)/Architectural Access Board (AAB) compliant accessible sidewalks and pedestrian ramps to improve pedestrian accommodations along the entire project corridor;
- Restore vegetated areas with loam and seed mix; and
- Install new traffic signage & striping, including bicycle and pedestrian crossings, and turning lanes.

The existing closed drainage system, where present, is being retained, modified, and/or relocated to accommodate the proposed improvements. A new catch basin (CB-15) is proposed at STA 30+00.

The project will occur, in part, within BLSF and Buffer Zone, as described below in Section 6.1. As discussed below in Section 7, the work has been designed to comply with applicable performance standards to the maximum extent practicable.

6. Assessment of Impacts and Mitigation Measures

The following provides an Assessment of Impacts and proposed Mitigation associated with construction of the Proposed Project.

6.1 Wetland Resource Area and Buffer Zone Impacts

The project will result in temporary and permanent impacts to BLSF and 100-foot Buffer Zone. The project has been designed with mitigation measures to ensure compliance with the applicable performance standards and protection of the interests of the *Act* during and after construction. Erosion and sediment controls will be implemented during construction and stormwater management improvements will further protect downgradient resource areas.

6.1.1 Bordering Land Subject to Flooding

Activities within BLSF include roadway repaving and sidewalk reconstruction. The proposed roadway and sidewalk grades within BLSF will match existing conditions, except for the reconstruction of the sidewalk at South Olean Street which will require grade readjustments. Approximately 8,304 square feet of the corridor improvements will occur within BLSF and are largely associated with roadway repaving. Portions of the sidewalk reconstruction will result in the loss of 5.24± cubic yards of flood storage at elevation 587. Compensatory flood storage of 5.72± cubic yards has been provided and results in an overall increase in flood storage capacity (0.48± cubic yards). Compensatory flood storage will be located at the sidewalk reconstruction area. New flood storage will be created at the same incremental 1-foot elevation as the impact area, as noted on the Floodplain Impact Summary table prepared by Toole Design (Sheet 13, Site Plans).

6.1.2 **100-Foot Buffer Zone**

Activities in Buffer Zone include roadway and sidewalk repaving, sidewalk improvements (i.e., widening and/or reconfiguration), and/or new sidewalk construction along Pleasant Street. Overall, sidewalk improvements result in a net increase of 3,202 square feet of impervious surface. The following describes the scope of work within Buffer Zone that occur beyond the existing roadway/sidewalk footprint within pervious (e.g., vegetated or gravel) surfaces.

Tarrytown Lane and Assabet Lane (STA 18+00 to 22+00, Sheet 2)

- New 5-foot wide sidewalk on the north side of Pleasant Street, extending into vegetated shoulder.
- Reconfiguration of Tarrytown Lane and Assabet Lane intersections. Results in removal of pavement and addition of vegetated surface.
- All trees and shrubs to be retained.

Edwidge Street (STA 35+75) to Prouty Lane (STA 45+00)

- New 5-foot wide sidewalk on the north side of Pleasant Street, extending into vegetated or pervious shoulder.
- All trees and shrubs to be retained.

East of South Olean Street (STA 80+25 to 80+75).

- Minor sidewalk widening on north side of Pleasant Street.

The remainder of the activities within Buffer Zone involve only activities within the existing roadway footprint (i.e., repaving or sidewalk construction) and are considered a minor activity not subject to regulation under the Act, in accordance with 310 CMR 10.02(2)(b)(2)(p).

The following table summarizes the net change in impervious surface within each Buffer Zone and which portions of the project area are designated as a Minor Activity exempt from Regulation.

Table 1. Summary of Buffer Zone Activities.

Buffer Zone No.	Wetland Resource Area	Location (STA)	Net Change to Impervious Surface[2] (SF)	Minor Activity
1	1-Series BVW	18+00 to 22+00	551	No
2	2-Series BVW/ B-Series Bank	25+50 to 28+50	0	Yes
3	3-Series BVW/ D-Series Bank	35+75 to 45+00	2,624	No
4	4-Series BVW/ F-Series Bank	64+25 to 70+00	0	Yes
5	G-Series Bank	80+25 to 80+75	27	No
		Totals:	3,202	

1. represents the conversion of vegetated/pervious areas (lawn or gravel) to pavement.

6.2 Mitigation Measures

The Applicant proposes to implement a sedimentation and erosion control program, comprised of structural and non-structural practices, during construction. Additionally, the work area will be restored to preexisting conditions.

6.2.1 Erosion and Sedimentation Standards and Controls

A sedimentation and erosion control program will be implemented to protect the adjacent wetland resource areas from sedimentation during the proposed construction activities. The program incorporates BMPs specified in the guidelines developed by the DEP and the U.S. Environmental Protection Agency (EPA).

Proper implementation of the erosion and sedimentation control program will:

- Minimize exposed soil areas through sequencing and temporary stabilization;
- Place structures to manage stormwater runoff; and
- Establish a permanent vegetative cover or other forms of stabilization as soon as practicable.

The following sections describe the controls that will be used and practices that will be followed during construction. These practices comply with the criteria contained in

NPDES General Permit for Discharges from Large and Small Construction Activities issued by the EPA.

Non-Structural Practices

Non-structural practices to be used during construction include temporary stabilization, temporary seeding, and permanent seeding. These practices will be initiated as soon as practicable in appropriate areas of the Site.

Structural Practices

Structural erosion and sedimentation controls to be used on the Site include erosion control barriers, catch basin inlet protection, and dewatering filters.

Erosion Control Barriers

Prior to any ground disturbance, sediment and erosion controls such as compost filter tubes or equivalent will be installed at the downgradient side of the limit of work. As construction progresses, additional barriers will be installed at the base of stockpiles and other erosion prone areas. All barriers will remain in place until disturbed areas are stabilized. Details are included on the Plan Set (Attachment).

6.2.2 Stormwater Management Measures

Toole Design has designed a comprehensive stormwater management system to manage stormwater runoff associated with the redevelopment project. In addition, Jacobs Engineering has prepared a Stormwater Management Report that documents the redevelopment project's compliance with DEP's Stormwater Management Standards (Standards). The project proposes minor improvements to the existing stormwater infrastructure within the project limits, including installation of deep sump catch basins at several side street intersections where the curbline is modified. Details regarding the design and supporting calculations are contained on the *Site Plans* and in the *Drainage Report* (Attachment). The following provides a brief summary of the project's compliance with the Standards.

Standard 1: No New Untreated Discharge

No new stormwater conveyances or outfalls are proposed. All stormwater runoff will be conveyed through existing or proposed catch basins. As such, the Project meets fully complies with this Standard.

Standard 2: Peak Rate Attenuation

As proposed, the post-development peak discharge rates are slightly higher than the pre-development peak discharge rates due to the construction of new sidewalks. However, as a redevelopment project, the project complies with Standard 2 to the maximum extent practicable. Due to site constraints of the roadway right-of-way, site topography, existing adjacent development and above and below-ground utilities, additional opportunities to mitigate peak rate attenuation are not available.

Standard 3: Recharge

As proposed, the post-development recharge is less than the pre-development conditions. Due to the limited scope of the project and site constraints of the roadway right-of-way, site topography, existing adjacent development and above and below-ground utilities, opportunities to provide recharge to offset the additional impervious surface are not available. As a redevelopment project, the project complies with Standard 3 to the maximum extent practicable.

Standard 4: Water Quality Treatment

Several new catch basins are proposed that are equipped with deep sumps and hoods. Therefore, water quality treatment is improved in comparison to existing conditions. Due to the limited scope of the project and site constraints of the roadway right-of-way, site topography, existing adjacent development and above and below-ground utilities, additional opportunities to treat stormwater are not available. However, the project complies with Standard 4 to the maximum extent practicable.

Standard 5: Land Uses with Higher Potential Pollutant Loads

There are no land uses with higher potential pollutant loads within the project limits. Therefore, the Standard does not apply.

Standard 6: Critical Areas

The proposed project is not located within a Zone II or Interim Wellhead Protection Area. Therefore, this Standard does not apply.

Standard 7: Redevelopment

The project qualifies as redevelopment. As required, the project meets Standards 1, 2 and 3 to the maximum extent practicable and the structural pretreatment requirements for Standards 4, 5, and 6. As required, the project complies with Standard 8 and 9 and improves existing conditions. As such, the project complies with Standard 7.

Standard 8. Erosion and Sediment Control

The project incorporates construction level erosion and sediment controls and housekeeping measures that protect resource areas. As such, the project complies with Standard 8.

Standard 9. Operation and Maintenance Plan

MassDOT will incorporate an Operation and Maintenance Plan. Therefore, the project complies with Standard 8.

Standard 10. Prohibition of Illicit Discharges

The project includes measures to prevent illicit discharges. Therefore, the project complies with Standard 10.

7. Regulatory Compliance

Proposed construction activities will occur within the 100-foot Buffer Zone to BVW and/or Bank and BLSF. Portions of the project within the 100-foot Buffer Zone qualify as a minor activity

7.1 100-Foot Buffer Zone

Except between STA 18+00 to STA 22+00, 35+75 to 45+00, and 80+25 to 80+75, where intersection reconfiguration and/or sidewalk addition are proposed, activities within the 100-foot Buffer Zone are considered a minor activity not subject to regulation under the *Act*, in accordance with 310 CMR 10.02(2)(b)(2)(p) for "*pavement repair, resurfacing, and reclamation of existing roadways within the right-of-way configuration provided that the roadway and shoulders are not widened, no staging or stockpiling of materials, all disturbed shoulders are stabilized within 72 hours of completion of the resurfacing or reclamation, and no work on the drainage system is performed, other than adjustments and/or repairs to respective structures within the roadway*."

The 3,202 square feet of new impervious surface results from new sidewalks. The net increase of impervious surface has been kept to a minimum along the 1.34 mile project corridor. The overall character and function of the previously developed/disturbed buffer zone will remain unchanged following corridor improvements. As required, the limit of work will be clearly demarcated and a construction level stormwater management program is planned to protect adjacent resource areas. Where proposed, new catch basins will meet current stormwater standards and provide improved stormwater runoff treatment.

7.2 **Bordering Land Subject to Flooding**

The planned roadway improvements comply with the provisions of a limited project in accordance with 310 CMR 10.53(3)(f) for "*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*" and as such, the provisions of 310 CMR 10.57 is notwithstanding. However, it is important to note that the project fully complies with the performance standards for BLSF.

Resource area alteration has been avoided and minimized to the extent practicable and will be restricted to 8,257±sf of temporary BLSF impacts between STA 79+00 and 80+75 (associated with the mill and overlay of Pleasant Street and reconstruction of the adjacent sidewalk) and 47 square feet of permanent BLSF impacts at STA 79+50 (associated with expansion of the sidewalk). These activities will maintain existing grades, resulting in no change to flood storage capacity. All disturbed areas will be restored to the current existing conditions, resulting in no permanent impacts to BLSF.

The following addresses the applicable Performance Standards for BLSF under the State Regulations.

According to 310 CMR 10.57(4)(a):

1. Compensatory storage shall be provided for all flood storage volume that will be lost as the result of a proposed project within Bordering Land Subject to Flooding, when in the judgment of the issuing authority said loss will cause an increase or will contribute incrementally to an increase in the horizontal extent and level of flood waters during peak flows. Compensatory storage shall mean a volume not previously used for flood storage and shall be incrementally equal to the theoretical volume of flood water at each elevation, up to and including the 100-year flood elevation, which would be displaced by the proposed project. Such compensatory volume shall have an unrestricted hydraulic connection to the same waterway or water body. Further, with respect to waterways, such compensatory volume shall be provided within the same reach of the river, stream or creek.

Activities within BLSF are associated with mill and overlay of the roadway surface and reconstruction/expansion of the adjacent sidewalk between STA 79+00 and STA 80+75. Overall, these activities will maintain existing grades and not result in a change to flood storage.

2. Work within Bordering Land Subject to Flooding, including that work required to provide the above-specified compensatory storage, shall not restrict flows so as to cause an increase in flood stage or velocity.

Existing grades will be maintained and as such will not restrict flows to cause an increase in flood stage or velocity.

3. Work in those portions of bordering land subject to flooding found to be significant to the protection of wildlife habitat shall not impair its capacity to provide important wildlife habitat functions. Except for work which would adversely affect vernal pool habitat, a project or projects on a single lot, for which Notice(s) of Intent is filed on or after November 1, 1987, that (cumulatively) alter(s) up to 10% or 5,000 square feet (whichever is less) of land in this resource area found to be significant to the protection of wildlife habitat, shall not be deemed to impair its capacity to provide important wildlife habitat functions. Additional alterations beyond the above threshold, or altering vernal pool habitat, may be permitted if they will have no adverse effects on wildlife habitat, as determined by procedures contained in 310 CMR 10.60.

While the project proposes to alter greater than 5,000 sf of BLSF (8,257 sf), the proposed alterations are limited to existing impervious surfaces. For this reason, the applicant posits the BLSF subject to the work is not significant to wildlife habitat, and therefore a wildlife habitat evaluation is not required under 310 CMR 10.57(4)(a)4.

8. Summary

On behalf of the Applicant, MassDOT, LEC is submitting this NOI Application with the Worcester Conservation Commission for the Pleasant Street (Route 122) corridor improvements, a roadway update project that enhances safety and mobility for all modes of transportation.

The project will occur within BLSF and 100-foot Buffer Zone to BVW and/or Bank and fully complies with the *Regulations* under the *Act*. Erosion and sedimentation controls will be employed throughout the construction period to mitigate temporary impacts. As a result, LEC respectfully requests the Worcester Conservation Commission find these measures adequately protective of the interests identified in the *Act* and issue an Order of Conditions approving the work described in this NOI and shown on the accompanying Site Plans.

Federal Emergency Management Agency Flood Insurance Rate Map (Revised Preliminary) for Worcester County (*Community Panel* 25027C0613F), dated November 26, 2024

Massachusetts Natural Heritage Atlas, 15th Edition. Natural Heritage & Endangered Species Program, Massachusetts Division of Fisheries and Wildlife, Route 135, Westborough, MA 01581, http://maps.massgis.state.ma.us/PRI_EST_HAB/viewer.htm

Massachusetts Wetlands Protection Act (M.G.L. c. 131, §. 40), www.state.ma.us/dep

Massachusetts Wetlands Protection Act Regulations (310 CMR 10.00), www.state.ma.us/dep

Massachusetts Department of Environmental Protection, 1997, Massachusetts Erosion and Sediment Control Guidelines for Urban and Suburban Areas; A Guide for Planners, Designers and Municipal Officials

Massachusetts Department of Environmental Protection, Division of Wetlands and Waterways *Massachusetts Handbook for Delineation of Bordering Vegetated Wetlands* (Second Edition, September 2022)

New England Hydric Soils Technical Committee. 2020, 4th ed., *Field Indicators for Identifying Hydric Soils in New England,* New England Interstate Water Pollution Control Commission, Lowell, MA.

Reed, P.B. 1988. *National List of Plant Species that Occur in Wetlands: 1988 Massachusetts*. U.S. Department of the Interior, Fish and Wildlife Service. NERC-88/18.21

U.S. Environmental Protection Agency, 2007, Interim Developing Your Stormwater Pollution Prevention Plan: A Guide for Construction Sites. Office of Water. Report EPA 833-R060-04

City of Worcester Wetlands Protection Ordinance and Regulations (§ C Ch. 6), www.worcesterma.gov/city-clerk/ordinances-regulations.

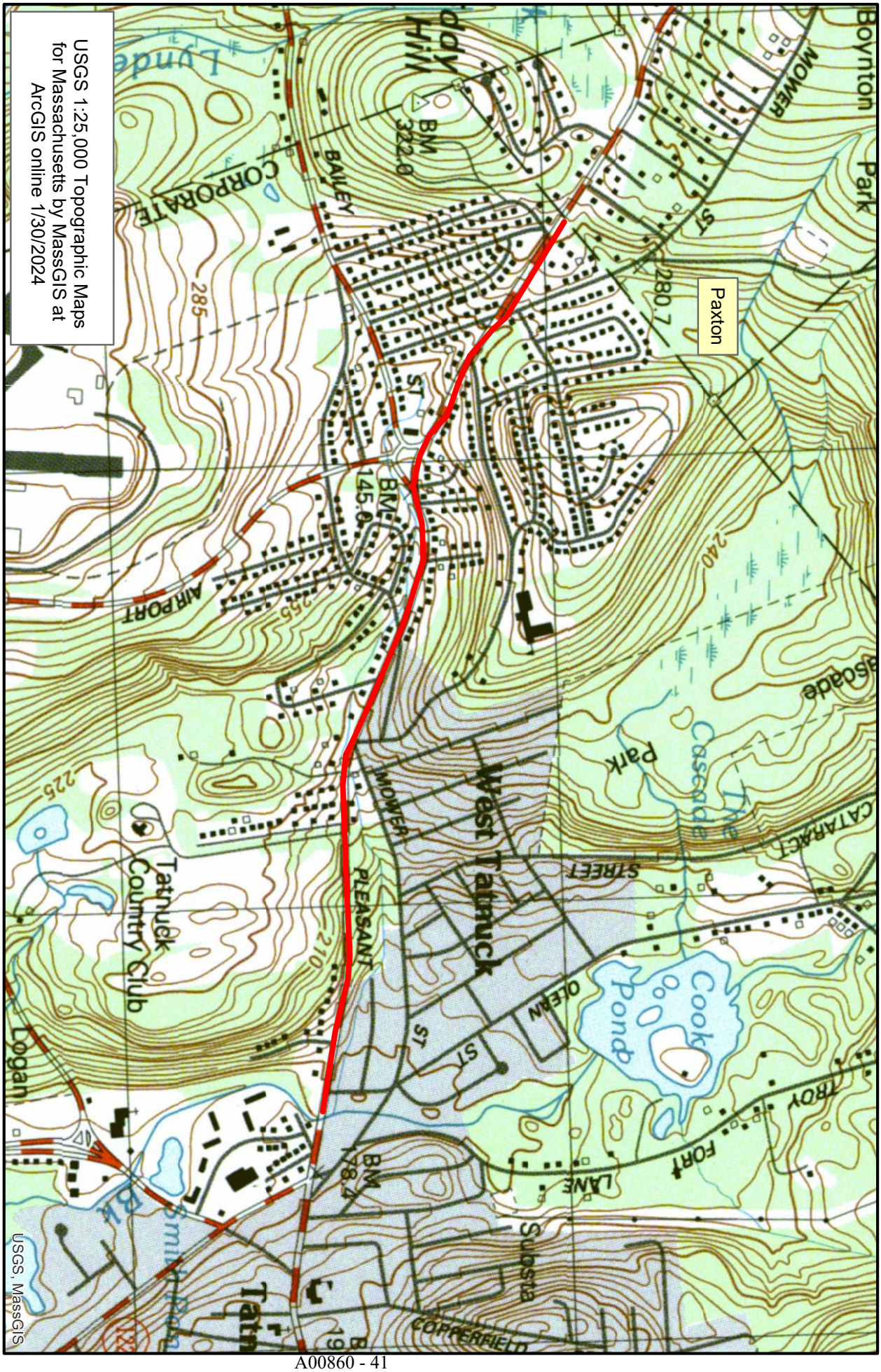
Appendix A

Locus Maps

Figure 1: USGS Topographic Quadrangle

Figure 2: MassGIS Orthophoto

Figure 3: FEMA Flood Insurance Rate Map



LEC
Environmental Consultants, Inc.
Wakefield, MA
781.245.2500
www.lecenvironmental.com

Figure 1: USGS Topographic Map
Pleasant Street (Route 122) Roadway Improvements
Worcester, Massachusetts

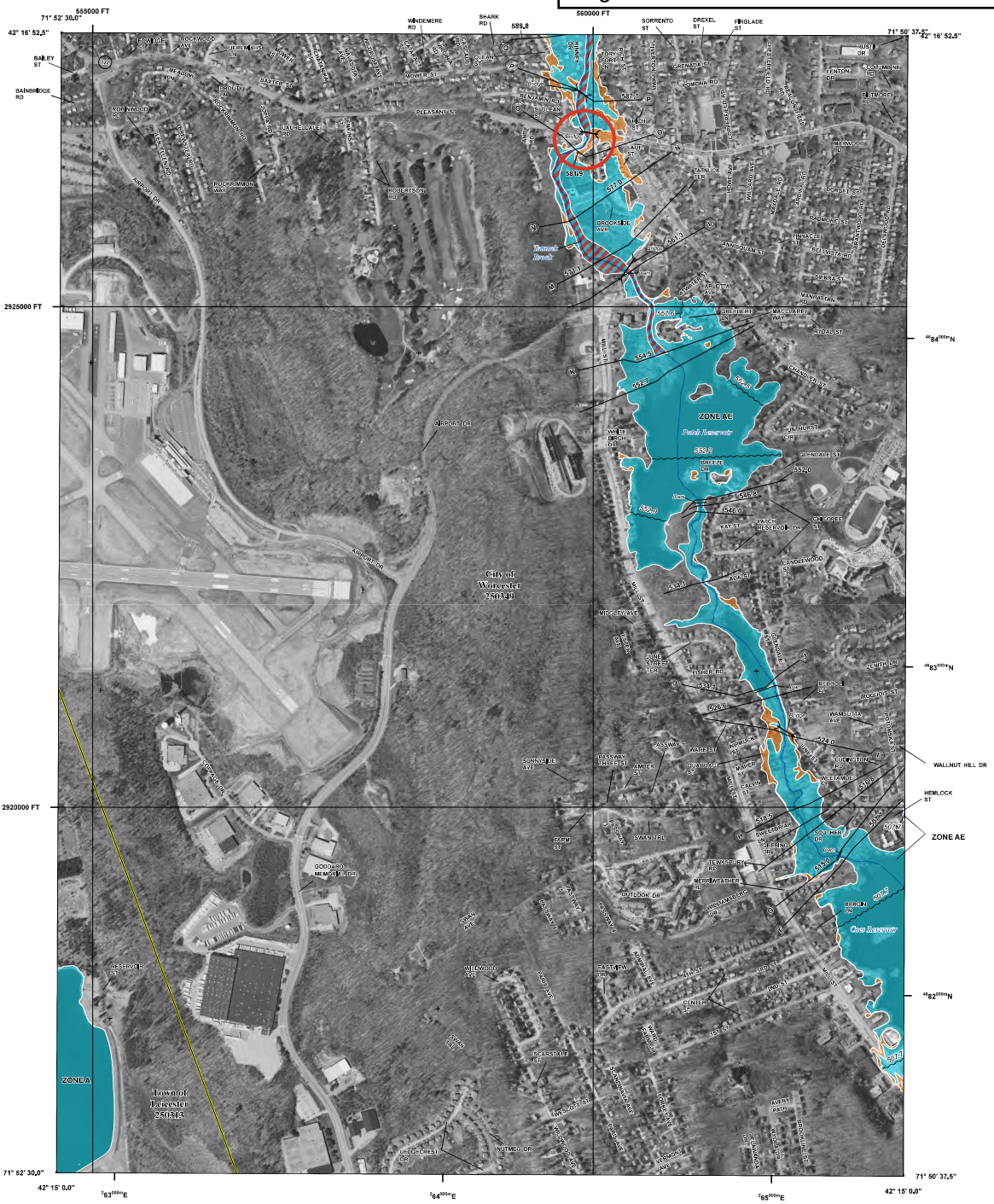
March 3, 2026

Figure 2: MassGIS Orthophoto & NHESP Map
Pleasant Street (Route 122) Roadway Improvements
Worcester, Massachusetts

March 3, 2026

LEC Environmental Consultants, Inc.
Wakefield, MA
781.245.2500
www.lecenvironmental.com

Figure 3: FEMA Flood Insurance Rate Map



FLOOD HAZARD INFORMATION

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

THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT HTTPS://MSC.FEMA.GOV

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

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

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

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

OTHER FEATURES
- 18.2 / 17.2 Cross Sections with 1% Annual Chance Water Surface Elevation
- Coastal Transect
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary

NOTES TO USERS

For information and questions about this Flood Insurance Rate Map (FIRM) available products associated with this FIRM including historic versions, the current map date for each FIRM panel, how to order products, or the National Flood Insurance Program (NFIP) in general, please call the FEMA Mapping and Insurance eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Flood Map Service Center website at https://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Flood Map Service Center at the number listed above.

For community and countywide map dates refer to 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.

Base map information shown on the FIRM was imagery from 2019 provided by the U.S. Geological Survey at a resolution of 0.15 meter and 2016 transportation data provided by the U.S. Census Bureau with an undefined scale, and political boundaries from 2017 provided by MassGIS at a scale of 1:5,000.

SCALE

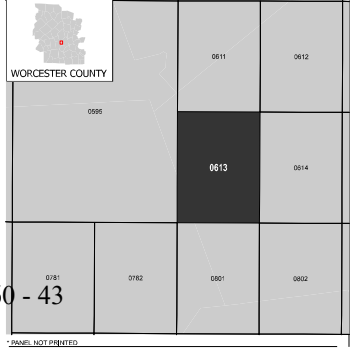
Map Projection:
NAD 1983 State Plane, Massachusetts Mainland, FIPS 2001, Feet;
Western Hemisphere; Vertical Datum: NAVD 88

1 inch = 500 feet 1:6,000

0 500 1,000 2,000 feet

0 125 250 500 meters

PANEL LOCATOR



* PANEL NOT PRINTED

National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP

WORCESTER COUNTY, MASSACHUSETTS
(All Jurisdictions)

PANEL 0613 OF 1075

Panel Contains:

COMMUNITY	NUMBER	PANEL	SUFFIX
LEICESTER, TOWN OF	250313	0613	F
WORCESTER, CITY OF	250349	0613	F

REVISED PRELIMINARY 11/26/2024

VERSION NUMBER 2.6.3.6

MAP NUMBER 25027C0613F

MAP REVISED

Appendix B

MassDEP Bordering Vegetated Wetland Delineation Field Data Forms

BORDERING VEGETATED WETLAND DETERMINATION FORM

Project/Site: Pleasant Street (Route 122) City/Town: Worcester Sampling Date: 9/5/2025

Applicant/Owner: MassDOT Sampling Point or Zone: WET (4-Series)

Investigator(s): Trevor Nassar, LEC Environmental Consultants, Inc. Latitude / Longitude: -71.86114, 42.279344

Soil Map Unit Name: Paxton, fine sandy loam, 8 to 15 percent slopes NWI or DEP Classification: Not Mapped

Are climatic/hydrologic conditions on the site typical for this time of year? Yes [✓] No [ ] (If no, explain in Remarks)

Are Vegetation [ ], Soil [ ], or Hydrology [ ] significantly disturbed? (If yes, explain in Remarks)

Are Vegetation [ ], Soil [ ], or Hydrology [ ] naturally problematic? (If yes, explain in Remarks)

SUMMARY OF FINDINGS – Attach site map and photograph log showing sampling locations, transects, etc.

Wetland vegetation criterion met?	Yes [✓] No [ ]	**Is the Sampled Area within a Wetland?** Yes [✓] No [ ]
Hydric Soils criterion met?	Yes [✓] No [ ]	
Wetlands hydrology present?	Yes [✓] No [ ]	

Remarks, Photo Details, Flagging, etc.:

- test pit dug downgradient of flag 4-10
- hand-held Dutch-style auger

HYDROLOGY

Field Observations:			
Surface Water Present?	Yes [ ]	No [✓]	Depth (inches)
Water Table Present?	Yes [ ]	No [✓]	Depth (inches)
Saturation Present (including capillary fringe)?	Yes [✓]	No [ ]	Depth (inches) 0.00

Wetland Hydrology Indicators

Reliable Indicators of Wetlands Hydrology	Indicators that can be Reliable with Proper Interpretation	Indicators of the Influence of Water
[ ] Water-stained leaves	[ ] Hydrological records	[ ] Direct observation of inundation
[ ] Evidence of aquatic fauna	[ ] Free water in a soil test hole	[ ] Drainage patterns
[✓] Iron deposits	[✓] Saturated soil	[ ] Drift lines
[ ] Algal mats or crusts	[ ] Water marks	[ ] Scoured areas
[ ] Oxidized rhizospheres/pore linings	[ ] Moss trim lines	[ ] Sediment deposits
[ ] Thin muck surfaces	[ ] Presence of reduced iron	[ ] Surface soil cracks
[ ] Plants with air-filled tissue (aerenchyma)	[ ] Woody plants with adventitious roots	[ ] Sparsely vegetated concave surface
[ ] Plants with polymorphic leaves	[ ] Trees with shallow root systems	[ ] Microtopographic relief
[ ] Plants with floating leaves	[ ] Woody plants with enlarged lenticels	[ ] Geographic position (depression, toe of slope, fringing lowland
[ ] Hydrogen sulfide odor		

Remarks (describe recorded data from stream gauge, monitoring well, aerial photos, previous inspections, if available):

This form is only for BVW delineations. Other wetland resource areas may be present and should be delineated according to the applicable regulatory provisions.

Sampling Point WET (4-Series)

VEGETATION – Use both common and scientific names of plants.

Tree Stratum Plot size 30ft

Common name	Scientific name	Indicator Status	Absolute % Cover	Dominant? (yes/no)	Wetland Indictor? (yes/no)
1. Norway maple	Acer platanoides	FACU	20.5	Yes	No
2. Green ash	Fraxinus pennsylvanica	FACW	10.5	Yes	Yes
3. Sweet Birch	Betula lenta	FACU	5.0	No	No
4.					
5.					
6.					
7.					
8.					
9.					

36.0 = Total Cover

Shrub/Sapling Stratum Plot size 15ft

Common name	Scientific name	Indicator Status	Absolute % Cover	Dominant? (yes/no)	Wetland Indictor? (yes/no)
1. Norway maple	Acer platanoides	FACU	10.5	Yes	No
2. Green ash	Fraxinus pennsylvanica	FACW	10.5	Yes	Yes
3.					
4.					
5.					
6.					
7.					
8.					
9.					

21.0 = Total Cover

Herb Stratum Plot size 5ft

Common name	Scientific name	Indicator Status	Absolute % Cover	Dominant? (yes/no)	Wetland Indictor? (yes/no)
1. Poison ivy	Toxicodendron radicans	FAC	38.0	Yes	Yes
2. Virginia creeper	Parthenocissus quinquefolia	FACU	3.0	No	No
3. Cinnamon fern	Osmunda cinnamomea	FACW	3.0	No	Yes
4. Aster	Aster sp.	FAC	3.0	No	Yes
5. Asian bittersweet	Celastrus orbiculatus	FACU	3.0	No	No
6.					
7.					
8.					
9.					
10.					
11.					
12.					

50.0 = Total Cover

Sampling Point WET (4-Series)

VEGETATION – continued.

Woody Vine Stratum	Plot size _____				
Common name	Scientific name	Indicator Status	Absolute % Cover	Dominant? (yes/no)	Wetland Indictor? (yes/no)
1.					
2.					
3.					
4.					
		0.0 = Total Cover			

Rapid Test: Do all dominant species have an indicator status of OBL or FACW?				Yes ☐ No ☑
Dominance Test:	Number of dominant species	Number of dominant species that are wetland indicator plants		Do wetland indicator plants make up ≥ 50% of dominant plant species?
	5	3		Yes ☑ No ☐
Prevalence Index:		Total % Cover (all strata)	Multiply by:	Result
	OBL species		X 1	= 0.00
	FACW species		X 2	= 0.00
	FAC species		X 3	= 0.00
	FACU species		X 4	= 0.00
	UPL species		X 5	= 0.00
	Column Totals	(A) 0		(B) 0
Prevalence Index		B/A = 0.00		Is the Prevalence Index ≤ 3.0? Yes ☐ No ☐
Wetland vegetation criterion met?		**Yes** ☑	**No** ☐	

Definitions of Vegetation Strata

Tree - Woody plants 3 in. (7.62 cm) or more in diameter at breast height (DBH), regardless of height

Shrub / Sapling - Woody plants less than 3 in. (7.62 cm) DBH and greater than or equal to 3.3 ft. (1 m) tall

Herb - All herbaceous (non-woody plants, regardless of size, and woody plants less than 3.3 ft. (1 m) tall

Woody vines - All woody vines greater than 3.3 ft. (1 m) in height

Cover Ranges	
Range	Midpoint
1-5 %	3.0 %
6-15 %	10.5 %
15-25 %	20.5 %
26-50 %	38.0 %
51-75 %	63.0 %
76-95 %	85.5 %
96-100 %	98.0 %

Sampling Point WET (4-Series)

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type[1]	Location[2]		
0-8	10YR 2/1	100.00					gravelly sandy loam	trace redox
8-19	10YR 3/2	90.00	7.5YR 3/4	10.00	C	M	gravelly sandy loam	
19-25+	10YR 3/1	80.00	10YR 3/6	10.00	C	M	gravelly sandy loam	
			10YR 5/2	10.00	D	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators (Check all that apply)		**Indicators for Problematic Hydric Soils**
☐ Histosol (A1)	☐ Polyvalue Below Surface (S8)	☐ 2 cm Muck (A10)
☐ Histic Epipedon (A2)	☐ Thin Dark Surface (S9)	☐ 5 cm Mucky Peat or Peat (S3)
☐ Black Histic (A3)	☐ Loamy Gleyed Matrix (F2)	☐ Iron-Manganese Masses (F12)
☐ Hydrogen Sulfide (A4)	☐ Depleted Matrix (F3)	☐ Mesic Spodic (A17)
☐ Stratified Layers (A5)	☐ Redox Dark Surface (F6)	☐ Red Parent Material (F21)
☑ Depleted Below Dark Surface (A11)	☐ Depleted Dark Surface (F7)	☐ Very Shallow Dark Surface (F22)
☐ Thick Dark Surface (A12)	☐ Redox Depressions (F8)	
☐ Sandy Mucky Mineral (S1)		
☐ Sandy Gleyed Matrix (S4)		
☐ Sandy Redox (S5)		☐ Other (Include Explanation in Remarks)
☐ Stripped Matrix (S6)		
☐ Dark Surface (S7)		

Restrictive Layer (if observed) Type: _____ Depth (inches): _____

Remarks: Saturated to surface

Hydric Soils criterion met? **Yes** ☑ **No** ☐

BORDERING VEGETATED WETLAND DETERMINATION FORM

Project/Site: Pleasant Street (Route 122) City/Town: Worcester Sampling Date: 9/5/2025

Applicant/Owner: MassDOT Sampling Point or Zone: UPL (4-Series)

Investigator(s): Trevor Nassar, LEC Environmental Consultants, Inc. Latitude / Longitude: -71.86114, 42.279344

Soil Map Unit Name: Paxton fine sandy loam, 8 to 15 percent slopes NWI or DEP Classification: _____

Are climatic/hydrologic conditions on the site typical for this time of year? Yes [✓] No [ ] (If no, explain in Remarks)

Are Vegetation [ ], Soil [ ], or Hydrology [ ] significantly disturbed? (If yes, explain in Remarks)

Are Vegetation [ ], Soil [ ], or Hydrology [ ] naturally problematic? (If yes, explain in Remarks)

SUMMARY OF FINDINGS – Attach site map and photograph log showing sampling locations, transects, etc.

Wetland vegetation criterion met?	Yes [ ]	No [✓]	**Is the Sampled Area within a Wetland?** Yes [ ] No [✓]
Hydric Soils criterion met?	Yes [ ]	No [✓]	
Wetlands hydrology present?	Yes [ ]	No [✓]	

Remarks, Photo Details, Flagging, etc.:

- hand-held Dutch-style auger
- test pit dug upgradient of flag 4-10

HYDROLOGY

Field Observations:			
Surface Water Present?	Yes [ ]	No [✓]	Depth (inches)_____
Water Table Present?	Yes [ ]	No [✓]	Depth (inches)_____
Saturation Present (including capillary fringe)?	Yes [ ]	No [✓]	Depth (inches)_____

Wetland Hydrology Indicators

Reliable Indicators of Wetlands Hydrology	Indicators that can be Reliable with Proper Interpretation	Indicators of the Influence of Water
[ ] Water-stained leaves	[ ] Hydrological records	[ ] Direct observation of inundation
[ ] Evidence of aquatic fauna	[ ] Free water in a soil test hole	[ ] Drainage patterns
[ ] Iron deposits	[ ] Saturated soil	[ ] Drift lines
[ ] Algal mats or crusts	[ ] Water marks	[ ] Scoured areas
[ ] Oxidized rhizospheres/pore linings	[ ] Moss trim lines	[ ] Sediment deposits
[ ] Thin muck surfaces	[ ] Presence of reduced iron	[ ] Surface soil cracks
[ ] Plants with air-filled tissue (aerenchyma)	[ ] Woody plants with adventitious roots	[ ] Sparsely vegetated concave surface
[ ] Plants with polymorphic leaves	[ ] Trees with shallow root systems	[ ] Microtopographic relief
[ ] Plants with floating leaves	[ ] Woody plants with enlarged lenticels	[ ] Geographic position (depression, toe of slope, fringing lowland
[ ] Hydrogen sulfide odor		

Remarks (describe recorded data from stream gauge, monitoring well, aerial photos, previous inspections, if available):

This form is only for BVW delineations. Other wetland resource areas may be present and should be delineated according to the applicable regulatory provisions.

Sampling Point UPL (4-Series)

VEGETATION – Use both common and scientific names of plants.

Tree Stratum Plot size 30ft

Common name	Scientific name	Indicator Status	Absolute % Cover	Dominant? (yes/no)	Wetland Indictor? (yes/no)
1. Norway Maple	Acer platanoides	FACU	20.5	Yes	No
2. Black Cherry	Prunus serotina	FACU	20.5	Yes	No
3. Green Ash	Fraxinus pennsylvanica	FACW	3.0	No	Yes
4. Red Maple	Acer rubrum	FAC	3.0	No	Yes
5.					
6.					
7.					
8.					
9.					

47.0 = Total Cover

Shrub/Sapling Stratum Plot size 15ft

Common name	Scientific name	Indicator Status	Absolute % Cover	Dominant? (yes/no)	Wetland Indictor? (yes/no)
1. Norway Maple	Acer platanoides	FACU	20.5	Yes	No
2. Green Ash	Fraxinus pennsyvanica	FACW	3.0	No	Yes
3. Black Cherry	Prunus serotina	FACU	3.0	No	No
4. Winged Euonymous	Euonymus atropurpureus	FACU	3.0	No	No
5.					
6.					
7.					
8.					
9.					

29.5 = Total Cover

Herb Stratum Plot size 5ft

Common name	Scientific name	Indicator Status	Absolute % Cover	Dominant? (yes/no)	Wetland Indictor? (yes/no)
1. New York Fern	Thelypteris noveboracensis	FAC	38.0	Yes	Yes
2. Canada Mayflower	Maianthemum canadense	FACU	3.0	No	No
3. Red Oak	Quercus rubra	FACU	3.0	No	No
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					

44.0 = Total Cover

Sampling Point UPL (4-Series)

VEGETATION – continued.

Woody Vine Stratum Plot size _____

Common name	Scientific name	Indicator Status	Absolute % Cover	Dominant? (yes/no)	Wetland Indictor? (yes/no)
1.					
2.					
3.					
4.					
			0.0 = Total Cover		

Rapid Test: Do all dominant species have an indicator status of OBL or FACW? Yes ☐ No ☐

Dominance Test:	Number of dominant species	Number of dominant species that are wetland indicator plants	Do wetland indicator plants make up ≥ 50% of dominant plant species?
	4	1	Yes ☐ No ☑

Prevalence Index:		Total % Cover (all strata)	Multiply by:	Result
	OBL species		X 1	= 0.00
	FACW species		X 2	= 0.00
	FAC species		X 3	= 0.00
	FACU species		X 4	= 0.00
	UPL species		X 5	= 0.00
	Column Totals	(A) 0		(B) 0
	Prevalence Index	B/A = 0.00		Is the Prevalence Index ≤ 3.0? Yes ☐ No ☐

Wetland vegetation criterion met? Yes ☐ No ☑

Definitions of Vegetation Strata

Tree - Woody plants 3 in. (7.62 cm) or more in diameter at breast height (DBH), regardless of height

Shrub / Sapling - Woody plants less than 3 in. (7.62 cm) DBH and greater than or equal to 3.3 ft. (1 m) tall

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Woody vines - All woody vines greater than 3.3 ft. (1 m) in height

Cover Ranges	
Range	Midpoint
1-5 %	3.0 %
6-15 %	10.5 %
15-25 %	20.5 %
26-50 %	38.0 %
51-75 %	63.0 %
76-95 %	85.5 %
96-100 %	98.0 %

Sampling Point UPL (4-Series)

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type[1]	Location[2]		
0-9	10YR 2/2	100.00					VFSL	
9-16	10YR 4/6	100.00					VFSL	
16-23+	2.5Y 5/6	100.00					VFSL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators (Check all that apply)		**Indicators for Problematic Hydric Soils**
☐ Histosol (A1)	☐ Polyvalue Below Surface (S8)	☐ 2 cm Muck (A10)
☐ Histic Epipedon (A2)	☐ Thin Dark Surface (S9)	☐ 5 cm Mucky Peat or Peat (S3)
☐ Black Histic (A3)	☐ Loamy Gleyed Matrix (F2)	☐ Iron-Manganese Masses (F12)
☐ Hydrogen Sulfide (A4)	☐ Depleted Matrix (F3)	☐ Mesic Spodic (A17)
☐ Stratified Layers (A5)	☐ Redox Dark Surface (F6)	☐ Red Parent Material (F21)
☐ Depleted Below Dark Surface (A11)	☐ Depleted Dark Surface (F7)	☐ Very Shallow Dark Surface (F22)
☐ Thick Dark Surface (A12)	☐ Redox Depressions (F8)	
☐ Sandy Mucky Mineral (S1)		
☐ Sandy Gleyed Matrix (S4)		
☐ Sandy Redox (S5)		☐ Other (Include Explanation in Remarks)
☐ Stripped Matrix (S6)		
☐ Dark Surface (S7)		

Restrictive Layer (if observed) Type: _____ Depth (inches): _____

Remarks:

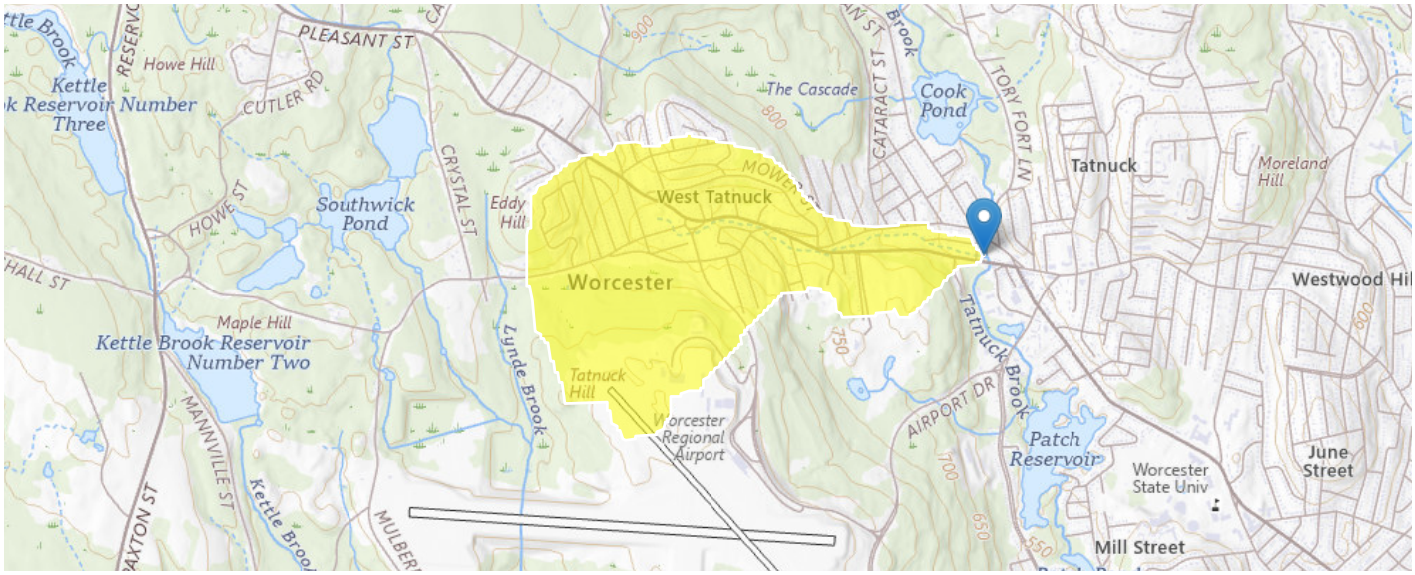
Hydric Soils criterion met? **Yes** ☐ **No** ☑

Appendix C

USGS StreamStats Report

StreamStats Report

Region ID: MA
Clicked Point (Latitude, Longitude): 42.27886, -71.85601
Time: 2026-02-03 14:33:44 -0500



StreamStats Update

Starting with version 4.30.0, the StreamStats application uses services that were redeveloped with open-source software components. Users may observe minor variations in computed results when compared to those from previous versions. These differences are expected and do not reflect errors in the underlying data or analytical methods. Users are advised to consider these potential variations when interpreting or comparing results generated across different versions of StreamStats. Please email streamstats@usgs.gov with any questions or concerns. A full list of changes can be found at **https://www.usgs.gov/streamstats/news/streamstats-data-updates-open-source-code-release (https://www.usgs.gov/streamstats/news/streamstats-data-updates-open-source-code-release)** .

Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
BSLDEM10M	Mean basin slope computed from 10 m DEM	9.6089	percent
DRNAREA	Area that drains to a point on a stream	0.71	square miles
ELEV	Mean Basin Elevation	871.35	feet
FOREST	Percentage of area covered by forest	19.746	percent
LC06STOR	Percentage of water bodies and wetlands determined from the NLCD 2006	1.06	percent
MA_SVI2025	Streamflow Variability Index for Massachusetts, as described in SIR 2025-5058	0.48	dimensionless
MAREGION	Region of Massachusetts 0 for Eastern 1 for Western	0	dimensionless
PCTSNDGRV	Percentage of land surface underlain by sand and gravel deposits	0	percent
SOILAorB	Percentage of area of Hydrologic Soil Type A or B from SSURGO	19.3	percent
TEMP	Mean Annual Temperature	47.8	degrees F

Peak-Flow Statistics

Peak-Flow Statistics Parameters [Peak Statewide 2016 5156]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.71	square miles	0.16	512
ELEV	Mean Basin Elevation	871.35	feet	80.6	1948
LC06STOR	Percent Storage from NLCD2006	1.06	percent	0	32.3

Peak-Flow Statistics Flow Report [Peak Statewide 2016 5156]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error, PC: Percent Correct, RMSE: Root Mean Squared Error, PseudoR^2: Pseudo R Squared (other -- see report)

Statistic	Value	Unit	PIL	PIU	ASEp
50-percent AEP flood	45.3	ft^3/s	22.6	90.6	42.3
20-percent AEP flood	78	ft^3/s	38.4	159	43.4
10-percent AEP flood	105	ft^3/s	50.4	219	44.7
4-percent AEP flood	146	ft^3/s	67.5	316	47.1
2-percent AEP flood	181	ft^3/s	80.8	405	49.4
1-percent AEP flood	219	ft^3/s	94.6	507	51.8
0.5-percent AEP flood	261	ft^3/s	109	624	54.1
0.2-percent AEP flood	322	ft^3/s	128	809	57.6

Peak-Flow Statistics Citations

Zarriello, P.J.,2017, Magnitude of flood flows at selected annual exceedance probabilities for streams in Massachusetts: U.S. Geological Survey Scientific Investigations Report 2016–5156, 99 p. (https://dx.doi.org/10.3133/sir20165156)

Low-Flow Statistics

Low-Flow Statistics Parameters [MA Mainland Low Flows CLS SIR 2025 5082]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.71	square miles	0.49	466.19
MA_SVI2025	Streamflow Variability Index for Massachusetts, as described in SIR 2025-5058	0.48	dimensionless	0.38	0.61

Low-Flow Statistics Parameters [MA Mainland Low Flows GLS SIR 2025 5082]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.71	square miles	0.49	466.19
MA_SVI2025	Streamflow Variability Index for Massachusetts, as described in SIR 2025-5058	0.48	dimensionless	0.38	0.61

Low-Flow Statistics Flow Report [MA Mainland Low Flows CLS SIR 2025 5082]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error, PC: Percent Correct, RMSE: Root Mean Squared Error, PseudoR^2: Pseudo R Squared (other -- see report)

Statistic	Value	Unit	PIL	PIU
7 Day 2 Year Low Flow	0.0275	ft^3/s	0.00379	0.199
7 Day 10 Year Low Flow	0.00662	ft^3/s	0.000531	0.0826

Low-Flow Statistics Flow Report [MA Mainland Low Flows GLS SIR 2025 5082]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error, PC: Percent Correct, RMSE: Root Mean Squared Error, PseudoR^2: Pseudo R Squared (other -- see report)

Statistic	Value	Unit	PIL	PIU
30 Day 2 Year Low Flow	0.062	ft^3/s	0.0238	0.161
30 Day 10 Year Low Flow	0.014	ft^3/s	0.0027	0.0726

Low-Flow Statistics Flow Report [Area-Averaged]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error, PC: Percent Correct, RMSE: Root Mean Squared Error, PseudoR^2: Pseudo R Squared (other -- see report)

Statistic	Value	Unit	PIL	PIU
7 Day 2 Year Low Flow	0.0275	ft^3/s	0.00379	0.199
7 Day 10 Year Low Flow	0.00662	ft^3/s	0.000531	0.0826
30 Day 2 Year Low Flow	0.062	ft^3/s	0.0238	0.161
30 Day 10 Year Low Flow	0.014	ft^3/s	0.0027	0.0726

Low-Flow Statistics Citations

Gardner C. Bent, Elizabeth A. Ahearn, and Jenn H. Fair2025, Equations for Estimating Low-Flow Statistics in Massachusetts, U.S. Geological Survey Scientific Investigations Report 2025-5082 (https://doi.org/10.3133/sir20255082)

Flow-Duration Statistics

Flow-Duration Statistics Parameters [MA Mainland Annual Durations SIR 2025 5082]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.71	square miles	0.49	466.19
MA_SVI2025	Streamflow Variability Index for Massachusetts, as described in SIR 2025-5058	0.48	dimensionless	0.38	0.61
SOILAorB	Percent SSURGO Soil Type A or B	19.3	percent	3.5	85.17

Flow-Duration Statistics Flow Report [MA Mainland Annual Durations SIR 2025 5082]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error, PC: Percent Correct, RMSE: Root Mean Squared Error, PseudoR^2: Pseudo R Squared (other -- see report)

Statistic	Value	Unit	PIL	PIU
50 Percent Duration	0.707	ft^3/s	0.495	1.01
60 Percent Duration	0.485	ft^3/s	0.328	0.717
70 Percent Duration	0.284	ft^3/s	0.177	0.455
75 Percent Duration	0.224	ft^3/s	0.129	0.388
80 Percent Duration	0.154	ft^3/s	0.0814	0.291
85 Percent Duration	0.101	ft^3/s	0.0475	0.215
90 Percent Duration	0.0616	ft^3/s	0.0252	0.15
95 Percent Duration	0.0313	ft^3/s	0.0101	0.0973
98 Percent Duration	0.0154	ft^3/s	0.00368	0.0645
99 Percent Duration	0.00939	ft^3/s	0.00176	0.05

Flow-Duration Statistics Citations

Gardner C. Bent, Elizabeth A. Ahearn, and Jenn H. Fair2025, Equations for Estimating Low-Flow Statistics in Massachusetts, U.S. Geological Survey Scientific Investigations Report 2025-5082 (https://doi.org/10.3133/sir20255082)

Annual Flow Statistics

Annual Flow Statistics Parameters [MA Mainland Annual 7Day Low Flow SIR 2025 5082]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.71	square miles	0.49	466.19
MA_SVI2025	Streamflow Variability Index for Massachusetts, as described in SIR 2025-5058	0.48	dimensionless	0.38	0.61

Annual Flow Statistics Flow Report [MA Mainland Annual 7Day Low Flow SIR 2025 5082]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error, PC: Percent Correct, RMSE: Root Mean Squared Error, PseudoR^2: Pseudo R Squared (other -- see report)

Statistic	Value	Unit	PIL	PIU
Median of annual 7-day low flow	0.0274	ft^3/s	0.0078	0.0963

Annual Flow Statistics Citations

Gardner C. Bent, Elizabeth A. Ahearn, and Jenn H. Fair2025, Equations for Estimating Low-Flow Statistics in Massachusetts, U.S. Geological Survey Scientific Investigations Report 2025-5082 (https://doi.org/10.3133/sir20255082)

Seasonal Flow Statistics

Seasonal Flow Statistics Parameters [MA Mainland Monthly Medians SIR 2025 5082]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.71	square miles	0.49	466.19
MA_SVI2025	Streamflow Variability Index for Massachusetts, as described in SIR 2025-5058	0.48	dimensionless	0.38	0.61
SOILAorB	Percent SSURGO Soil Type A or B	19.3	percent	3.5	85.17
TEMP	Mean Annual Temperature	47.8	degrees F	41.7	51.24

Seasonal Flow Statistics Flow Report [MA Mainland Monthly Medians SIR 2025 5082]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error, PC: Percent Correct, RMSE: Root Mean Squared Error, PseudoR^2: Pseudo R Squared (other -- see report)

Statistic	Value	Unit	PIL	PIU
Med Feb Monthly Mean Flow	1.31	ft^3/s	0.897	1.91
Med Jun Monthly Mean Flow	0.598	ft^3/s	0.391	0.915
Med Aug Monthly Mean Flow	0.177	ft^3/s	0.0797	0.393

Seasonal Flow Statistics Citations

Gardner C. Bent, Elizabeth A. Ahearn, and Jenn H. Fair2025, Equations for Estimating Low-Flow Statistics in Massachusetts, U.S. Geological Survey Scientific Investigations Report 2025-5082 (https://doi.org/10.3133/sir20255082)

June Flow-Duration Statistics

June Flow-Duration Statistics Parameters [MA Mainland June Durations SIR 2025 5082]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.71	square miles	0.49	466.19
SOILAorB	Percent SSURGO Soil Type A or B	19.3	percent	3.5	85.17

June Flow-Duration Statistics Flow Report [MA Mainland June Durations SIR 2025 5082]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error, PC: Percent Correct, RMSE: Root Mean Squared Error, PseudoR^2: Pseudo R Squared (other -- see report)

Statistic	Value	Unit	PIL	PIU
June 50 Percent Duration	0.452	ft^3/s	0.29	0.704
June 90 Percent Duration	0.116	ft^3/s	0.0553	0.243

June Flow-Duration Statistics Citations

Gardner C. Bent, Elizabeth A. Ahearn, and Jenn H. Fair2025, Equations for Estimating Low-Flow Statistics in Massachusetts, U.S. Geological Survey Scientific Investigations Report 2025-5082 (https://doi.org/10.3133/sir20255082)

July Flow-Duration Statistics

July Flow-Duration Statistics Parameters [MA Mainland July Durations SIR 2025 5082]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.71	square miles	0.49	466.19
MA_SVI2025	Streamflow Variability Index for Massachusetts, as described in SIR 2025-5058	0.48	dimensionless	0.38	0.61

July Flow-Duration Statistics Flow Report [MA Mainland July Durations SIR 2025 5082]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error, PC: Percent Correct, RMSE: Root Mean Squared Error, PseudoR^2: Pseudo R Squared (other -- see report)

Statistic	Value	Unit	PIL	PIU
July 50 Percent Duration	0.166	ft^3/s	0.0836	0.33
July 90 Percent Duration	0.035	ft^3/s	0.0117	0.105

July Flow-Duration Statistics Citations

Gardner C. Bent, Elizabeth A. Ahearn, and Jenn H. Fair2025, Equations for Estimating Low-Flow Statistics in Massachusetts, U.S. Geological Survey Scientific Investigations Report 2025-5082 (https://doi.org/10.3133/sir20255082)

August Flow-Duration Statistics

August Flow-Duration Statistics Parameters [MA Mainland August Durations SIR 2025 5082]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.71	square miles	0.49	466.19
MA_SVI2025	Streamflow Variability Index for Massachusetts, as described in SIR 2025-5058	0.48	dimensionless	0.38	0.61

August Flow-Duration Statistics Flow Report [MA Mainland August Durations SIR 2025 5082]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error, PC: Percent Correct, RMSE: Root Mean Squared Error, PseudoR^2: Pseudo R Squared (other -- see report)

Statistic	Value	Unit	PIL	PIU
August 50 Percent Duration	0.0988	ft^3/s	0.0422	0.231
August 90 Percent Duration	0.0161	ft^3/s	0.00378	0.0686

August Flow-Duration Statistics Citations

Gardner C. Bent, Elizabeth A. Ahearn, and Jenn H. Fair2025, Equations for Estimating Low-Flow Statistics in Massachusetts, U.S. Geological Survey Scientific Investigations Report 2025-5082 (https://doi.org/10.3133/sir20255082)

September Flow-Duration Statistics

September Flow-Duration Statistics Parameters [MA Mainland September Durations SIR 2025 5082]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.71	square miles	0.49	466.19
MA_SVI2025	Streamflow Variability Index for Massachusetts, as described in SIR 2025-5058	0.48	dimensionless	0.38	0.61

September Flow-Duration Statistics Flow Report [MA Mainland September Durations SIR 2025 5082]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error, PC: Percent Correct, RMSE: Root Mean Squared Error, PseudoR^2: Pseudo R Squared (other -- see report)

Statistic	Value	Unit	PIL	PIU
September 50 Percent Duration	0.0964	ft^3/s	0.0428	0.217
September 90 Percent Duration	0.0165	ft^3/s	0.00386	0.0706

September Flow-Duration Statistics Citations

Gardner C. Bent, Elizabeth A. Ahearn, and Jenn H. Fair2025, Equations for Estimating Low-Flow Statistics in Massachusetts, U.S. Geological Survey Scientific Investigations Report 2025-5082 (https://doi.org/10.3133/sir20255082)

General Flow Statistics

General Flow Statistics Parameters [MA Mainland Harmonic Mean SIR 2025 5082]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.71	square miles	0.49	466.19
MA_SVI2025	Streamflow Variability Index for Massachusetts, as described in SIR 2025-5058	0.48	dimensionless	0.38	0.61

General Flow Statistics Flow Report [MA Mainland Harmonic Mean SIR 2025 5082]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error, PC: Percent Correct, RMSE: Root Mean Squared Error, PseudoR^2: Pseudo R Squared (other -- see report)

Statistic	Value	Unit	PIL	PIU
Harmonic Mean Streamflow adjusted for proportion of zero flow days	0.139	ft^3/s	0.0524	0.369

General Flow Statistics Citations

Gardner C. Bent, Elizabeth A. Ahearn, and Jenn H. Fair2025, Equations for Estimating Low-Flow Statistics in Massachusetts, U.S. Geological Survey Scientific Investigations Report 2025-5082 (https://doi.org/10.3133/sir20255082)

Bankfull Statistics

Bankfull Statistics Parameters [Bankfull Statewide SIR2013 5155]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
BSLDEM10M	Mean Basin Slope from 10m DEM	9.6089	percent	2.2	23.9
DRNAREA	Drainage Area	0.71	square miles	0.6	329

Bankfull Statistics Parameters [Appalachian Highlands D Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.71	square miles	0.07722	940.1535

Bankfull Statistics Parameters [New England P Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.71	square miles	3.799224	138.999861

Bankfull Statistics Parameters [USA Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.71	square miles	0.07722	59927.7393

Bankfull Statistics Flow Report [Bankfull Statewide SIR2013 5155]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error, PC: Percent Correct, RMSE: Root Mean Squared Error, PseudoR^2: Pseudo R Squared (other -- see report)

Statistic	Value	Unit	ASEp
Bankfull Width	13.9	ft	21.3
Bankfull Depth	0.896	ft	19.8
Bankfull Area	12.3	ft^2	29
Bankfull Streamflow	36	ft^3/s	55

Bankfull Statistics Flow Report [Appalachian Highlands D Bieger 2015]

Statistic	Value	Unit
Bieger_D_channel_width	13.2	ft
Bieger_D_channel_depth	1.02	ft
Bieger_D_channel_cross_sectional_area	13.5	ft^2

Bankfull Statistics Disclaimers [New England P Bieger 2015]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Bankfull Statistics Flow Report [New England P Bieger 2015]

Statistic	Value	Unit
Bieger_P_channel_width	23	ft
Bieger_P_channel_depth	1.28	ft
Bieger_P_channel_cross_sectional_area	29.1	ft^2

Bankfull Statistics Flow Report [USA Bieger 2015]

Statistic	Value	Unit
Bieger_USA_channel_width	11	ft
Bieger_USA_channel_depth	1.12	ft
Bieger_USA_channel_cross_sectional_area	14.2	ft^2

Bankfull Statistics Flow Report [Area-Averaged]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error, PC: Percent Correct, RMSE: Root Mean Squared Error, PseudoR^2: Pseudo R Squared (other -- see report)

Statistic	Value	Unit	ASEp
Bankfull Width	13.9	ft	21.3
Bankfull Depth	0.896	ft	19.8
Bankfull Area	12.3	ft^2	29
Bankfull Streamflow	36	ft^3/s	55
Bieger_D_channel_width	13.2	ft	
Bieger_D_channel_depth	1.02	ft	
Bieger_D_channel_cross_sectional_area	13.5	ft^2	
Bieger_P_channel_width	23	ft	
Bieger_P_channel_depth	1.28	ft	
Bieger_P_channel_cross_sectional_area	29.1	ft^2	
Bieger_USA_channel_width	11	ft	
Bieger_USA_channel_depth	1.12	ft	
Bieger_USA_channel_cross_sectional_area	14.2	ft^2	

Bankfull Statistics Citations

Bent, G.C., and Waite, A.M.,2013, Equations for estimating bankfull channel geometry and discharge for streams in Massachusetts: U.S. Geological Survey Scientific Investigations Report 2013–5155, 62 p., (http://pubs.usgs.gov/sir/2013/5155/)
Bieger, Katrin; Rathjens, Hendrik; Allen, Peter M.; and Arnold, Jeffrey G.,2015, Development and Evaluation of Bankfull Hydraulic Geometry Relationships for the Physiographic Regions of the United States, Publications from USDA-ARS / UNL Faculty, 17p. (https://digitalcommons.unl.edu/usdaarsfacpub/1515?utm_source=digitalcommons.unl.edu%2Fusdaarsfacpub%2F1515&utm_medium=PDF&utm_campaign=PDFCoverPages)

Probability Statistics

Probability Statistics Parameters [Perennial Flow Probability]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.71	square miles	0.01	1.99
FOREST	Percent Forest	19.746	percent	0	100
MAREGION	Massachusetts Region	0	dimensionless	0	1
PCTSNDGRV	Percent Underlain By Sand And Gravel	0	percent	0	100

Probability Statistics Flow Report [Perennial Flow Probability]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error, PC: Percent Correct, RMSE: Root Mean Squared Error, PseudoR^2: Pseudo R Squared (other -- see report)

Statistic	Value	Unit	PC
Probability Stream Flowing Perennially	0.882	dim	71

Probability Statistics Citations

Bent, G.C., and Steeves, P.A.,2006, A revised logistic regression equation and an automated procedure for mapping the probability of a stream flowing perennially in Massachusetts: U.S. Geological Survey Scientific Investigations Report 2006–5031, 107 p. (http://pubs.usgs.gov/sir/2006/5031/pdfs/SIR_2006-5031rev.pdf)

Maximum Probable Flood Statistics

Maximum Probable Flood Statistics Parameters [Crippen Bue Region 2]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.71	square miles	0.1	3000

Maximum Probable Flood Statistics Flow Report [Crippen Bue Region 2]

Statistic	Value	Unit
Maximum Flood Crippen Bue Regional	4420	ft^3/s

Maximum Probable Flood Statistics Citations

Crippen, J.R. and Bue, Conrad D.1977, Maximum Floodflows in the Conterminous United States, Geological Survey Water-Supply Paper 1887, 52p. (https://pubs.usgs.gov/wsp/1887/report.pdf)

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Application Version: 4.31.0
SSHydro Services Version: 1.1.0
SSDelineate Services Version: 1.0.1
NSS Services Version: 2.2.1
GageStats Services Version: 1.2.1
Pourpoint Services Version: 1.2.0
Batch Processor Version: 1.6.1

Attachments

Site Plans
Plan and Profile of Pleasant Street (Route 122), Worcester, MA,
prepared by Toole Design, dated January 9, 2026
(full size)

Stormwater Report,
prepared by Jacobs Engineering, dated March 4, 2026

HIGHWAY GUARD DETAILS
SEE SHEET 111

TRAFFIC SIGNAL CONDUIT
SEE SHEETS 78 - 91

WATER SUPPLY ALTERATIONS
SEE SHEET 110

DRAINAGE DETAILS
SEE SHEET 110

LEGEND:

- HOT MIX ASPHALT (HMA)
- CONCRETE
- HMA DRIVEWAY TIE-IN
- ALL DISTURBED AREAS TO BE 6" LOAMED & SEEDED; RESTORED AS GRASSED AREA
- RUMBLE STRIP

CONSTRUCTION NOTES:

1. FOR CONSTRUCTION BASELINE TIE PLAN, SEE SHEET 8-22.
2. FOR CURB TIE PLAN, SEE SHEETS 49 - 63.
3. FOR DRAINAGE AND UTILITY PLAN, SEE SHEET 78 - 91.
4. FOR PAVEMENT MARKINGS AND SIGNAGE PLAN, SEE SHEET 92 - 108.
5. FOR CONSTRUCTION DETAILS, SEE SHEETS 110 - 114.
6. FOR RUMBLE STRIP DETAILS, SEE SHEET 113.

WORCESTER
PLEASANT STREET - ROUTE 122

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	######	23	181
PROJECT FILE NO.		610535	

CONSTRUCTION PLANS
SHEET 1 OF 14

TOWN OF PAXTON
CITY OF WORCESTER

PROJECT BEGIN
N2928517.7590
E553303.8128
STA 10+79.32

ENTERING WORCESTER/PAXTON SIGN

RELOCATE GUARDRAIL AND REPLACE END TREATMENT WITH MASH COMPLIANT END TERMINAL

12+15.41
OFFSET: 36.61

WIDEN SW FOR 4' MIN CLEARANCE AROUND UP

PROP CONC SW THROUGH DWY (TYP)

11+88.17
OFFSET: 29.44

BEGIN 5' HMA SW

PROP PULL BOX (TYP)
SEE UTILITY PLAN

LIMIT OF GRADING (TYP)

RET EX TREES AND LANSCAPING (TYP)

BENCHMARK: 515
MAG SET IN ULT #138
1' ABOVE GROUND
EL=910.77'

CONTINUED ON SHEET NO. 24

PROP 5' HMA SW (TYP)

RUMBLE STRIPS SEE BUFFER DETAIL FOR TYPE AND PLACEMENT (TYP)

LIMIT OF MILL AND OVERLAY - MEET EX

PCR-4

DWY-1

RET EX VGC

PROP M&O PVMT (TYP)

PLEASANT STREET
(ROUTE 122)

PROP GRAN CURB

SAWCUT (TYP)

PCR-1

PCR-2

PCR-3

R&R EX VGC FOR 6" REVEAL

PROP 5' HMA SW (TYP)

PROP TREE TRIMMING FOR 7' CLEARANCE ABOVE SIDEWALK 375 LF

PROP VGC WITH 6" REVEAL

LIMIT OF MILL AND OVERLAY MEET EX EOP

LIMIT OF WORK

BENCHMARK: 516
SQUARE CUT SET NW CORNER OF CONCRETE BOUND AT TOWN LINE
EL=946.98'

JEWISH WAR VETERANS MEMORIAL HIGHWAY SIGN

WIDEN SW FOR 4' MIN CLEARANCE AROUND UP

DRAINAGE ADJUSTMENT OUTSIDE OF BUFFER ZONE

ADJUSTMENT TO MATCH NEW CURBLINE OF IMPROVED INTERSECTION

NO CHANGE TO EXISTING DRAINAGE PATTERNS

ALL WORK WITHIN PUBLIC ROAD LAYOUT

SUNNYVIEW HEIGHTS
(PUBLIC - 50' WIDE)

SUNNY HILL DRIVE
(PUBLIC - 50' WIDE)

LOCATION LINE OF TOWN LAYOUT H-9821

100' BUFFER ZONE
25' RIVERFRONT AREA
FLOOD ZONE ELEVATION
MASS GIS FLOOD ZONE

N/F
JENNIFER DUPRUIS
PARCEL ID 47-19A-4
BOOK 54797 PAGE 340
1403 A PLEASANT ST

N/F
DAVID H. BATCHELDER AND JESSICA M. GROVER
PARCEL ID 47-19A-5
BOOK 59034 PAGE 275
1403 B PLEASANT ST

N/F
KENNETH COLEBOURN
PARCEL ID 47-19A-3
BOOK 67300 PAGE 7
1401 PLEASANT ST

N/F
DAVID E. WHITE II AND LYNN H. CARPENTER-WHITE
PARCEL ID 47-19A-1-2
BOOK 15598 PAGE 17
1403 PLEASANT ST

N/F
ROBERT C. TREMARCHE AND JEAN M. MORRONE
PARCEL ID 47-19A-10
BOOK 52369 PAGE 100
1399 PLEASANT ST

N/F
ROBERT C. TREMARCHE AND JEAN M. MORRONE
PARCEL ID 47-19A-11
BOOK 52369 PAGE 100
1395 PLEASANT ST

N/F
STEVEN D. CORRIVEAU, JR. AND RYAN J. MARCOUILLIER
BOOK 39828 PAGE 352
PLEASANT STREET

N/F
ALYSSA MONIQUE PRICE AND CHARLENE ANN PRICE
PARCEL ID 47-16-AA
BOOK 62057 PAGE 76
40 SUNNYHILL DR

N/F
MAXWELL KOFI OWUSU AND VIVIAN ASANTE
PARCEL ID 47-16-BB
BOOK 68045 PAGE 106
38 SUNNYHILL DR

N/F
WILLIAM J. MULFORD AND PATRICIA J. MULFORD
PARCEL ID 47-16-43
BOOK 9778 PAGE 206
30 CONGER RD

N/F
AGNES A. SHEEHY
PARCEL ID 47-16-44
BOOK 5295 PAGE 355
28 CONGER RD

N/F
PATRICK J. BROOKS AND LAURA A. BROOKS
PARCEL ID 47-16-45
BOOK 50210 PAGE 29
BOOK 50401 PAGE 234
26 CONGER RD

N/F
RORY R. PERKINS
PARCEL ID 47-16-40-42
BOOK 63264 PAGE 309
32 CONGER ROAD

N/F
HELEN E. GARVEY AND SHEILA L. GARVEY
PARCEL ID 47-16-H
BOOK 17979 PAGE 361
2 SUNNYVIEW HTS

1926 SHLO NO. 2373

1958 SHLO NO. 4747

1958 SHLO NO. 4747 (SECTION 1)

0 20 50 100
SCALE: 1" = 20'

FOR CONSTRUCTION PROFILE:
SEE SHEET NO. 37

COMMONWEALTH OF MASSACHUSETTS
SAID YAHYA CIVIL
NO. 55792
PROFESSIONAL ENGINEER

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HIGHWAY GUARD DETAILS
SEE SHEET 111

TRAFFIC SIGNAL CONDUIT
SEE SHEETS 78 - 91

WATER SUPPLY ALTERATIONS
SEE SHEET 110

DRAINAGE DETAILS
SEE SHEET 110

LEGEND:

- HOT MIX ASPHALT (HMA)
- CONCRETE
- HMA DRIVEWAY TIE-IN
- ALL DISTURBED AREAS TO BE 6" LOAMED & SEEDED; RESTORED AS GRASSED AREA
- RUMBLE STRIP

CONSTRUCTION NOTES:

1. FOR CONSTRUCTION BASELINE TIE PLAN, SEE SHEET 8-22.
2. FOR CURB TIE PLAN, SEE SHEETS 49 - 63.
3. FOR DRAINAGE AND UTILITY PLAN, SEE SHEET 78 - 91.
4. FOR PAVEMENT MARKINGS AND SIGNAGE PLAN, SEE SHEET 92 - 108.
5. FOR CONSTRUCTION DETAILS, SEE SHEETS 110 - 114.
6. FOR RUMBLE STRIP DETAILS, SEE SHEET 113.

WORCESTER
PLEASANT STREET - ROUTE 122

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	#######	24	181
PROJECT FILE NO.	610535		

CONSTRUCTION PLANS
SHEET 2 OF 14

N

MOWER STREET
(PUBLIC - VARIABLE WIDTH)

LOCATION LINE OF 1851 TOWN LAYOUT

TARRYTOWN LANE
(PUBLIC - 50' WIDE)

LIMIT OF WORK

PROP VGC MATCH EX

MATCH EX SW

RET AND PROTECT EX 36" TREE

R&R EX VGC

PROP FULL DEPTH PVMT CONSTRUCTION

R&D EX STUMP

LIMIT OF MILL AND OVERLAY MEET EX EOP

PC +47.67

121+27.62

121

PT +91.20

1926 SHLO NO. 2373

1958 SHLO NO. 4747 (SECTION 2)

WETLAND BUFFER #1

TOTAL ADDED IMPERVIOUS IN BUFFER ZONE
1758 SF

TOTAL ADDED PERVIOUS IN BUFFER ZONE
1207 SF

TOTAL WORK WITHIN BUFFER ZONE
23,413 SF

WIDEN SW FOR 4' MIN CLEARANCE AROUND UP

PROP 5' HMA SW (TYP)

REPLACE END TREATMENT WITH MASH COMPLIANT END TERMINAL

LOCATION OF REDUCED CLEARANCE 36" MIN BETWEEN UP AND GUARDRAIL

LIMIT OF GRADING (TYP)

RET EX GUARD RAIL

EROSION CONTROL (TYP)

LOCATION OF REDUCED CLEARANCE 39" MIN BETWEEN UP AND GUARDRAIL

REPLACE END TREATMENT WITH MASH COMPLIANT END TERMINAL

BENCHMARK: 514
MAG SET IN UPL #134
1' ABOVE GROUND
EL=885.76'

WETLAND BANK

WOODED AREA

510.98 sf

12 sf

1,249.04 sf

40 sf

337.2 sf

19+45.49
OFFSET: 24.14

20+34.59
OFFSET: 23.17

PROP M&O PVMT (TYP)

PT +60.30

PLEASANT STREET
(ROUTE 122)

23,413.15 sf

R&R EX VGC FOR 6" REVEAL

PC +01.84

CLOSE EXISTING ACCESS

PROP VGC WITH 6" REVEAL

198.88 sf

185.01 sf

160.01 sf

PCR-9

SAWCUT (TYP)

PCR-10

80.26 sf

161.54 sf

15.67 sf

RUMBLE STRIPS SEE BUFFER DETAIL FOR TYPE AND PLACEMENT (TYP)

LIMIT OF MILL AND OVERLAY MEET EX EOP

VERTICAL TO SLOPED TRANSITION CURB, SEE DETAIL

RET EX SGC

PT +87.42

131

131+37.25

ASSABET LANE
(PUBLIC - VARIABLE WIDTH)

LIMIT OF WORK

REPAVING IN BUFFER ZONE - MINOR ACTIVITY

100' BUFFER ZONE

SAWCUT (TYP)

PC +69.82

PROP CONC SW THROUGH DWY (TYP)

PROP 5' HMA SW (TYP)

PROP CONC SW THROUGH DWY (TYP)

PROP PULL BOX (TYP) SEE UTILITY PLAN

RET EX WALK (TYP)

R&R EX VGC

PROP HMA WALKWAY

REMOVE EX MEDIAN PROP/FULL DEPTH PVMT CONSTRUCTION

LOAM AND SEED

LIMIT OF FULL DEPTH PVMT CONSTRUCTION SAWCUT AND MEET EX EOP

1958 SHLO NO. 4747 (SECTION 1)

1926 SHLO NO. 2373

DWY-2 DWY-3 DWY-4 DWY-5

PCR-5 PCR-6 PCR-7 PCR-8

CONTINUED ON SHEET NO. 23

CONTINUED ON SHEET NO. 25

N/F PATRICK J. BROOKS AND LAURA A. BROOKS PARCEL ID 47-16-45 BOOK 50210 PAGE 29 BOOK 50401 PAGE 234 26 CONGER RD

N/F JACQUELINE PEREZ SEPULVEDA PARCEL ID 47-16-1B BOOK 35787 PAGE 336 1386 PLEASANT ST

N/F YVONNE POKU-MENSAH PARCEL ID 47-16-1A BOOK 34987 PAGE 276 1384 PLEASANT ST

N/F TANDT ASSOCIATES LLC PARCEL ID 47-16-35 BOOK 61762 PAGE 269 1382 PLEASANT ST

N/F RICHARD V. HARVEY PARCEL ID 47-16-33 BOOK 20069 PAGE 400 25 ASSABET LN

N/F ANTHONY J. MALISZEWSKI, JR AND ROSEMARY MALISZEWSKI PARCEL ID 47-16-32 BOOK 36822 PAGE 214 23 ASSABET LN

N/F GERARD T AUBIN AND MICHELE T AUBIN PARCEL ID 47-19E-12 BOOK 52758 PAGE 317 444 MOWER ST

N/F MICHAEL MCAVEY AND DONNA DULMAINE-MCAVEY PARCEL ID 47-15A-7-7A BOOK 16587 PAGE 96 42 ASSABET LN

N/F BENJAMIN OLIVER AND CAROLYN OLIVER PARCEL ID 47-19E-10 BOOK 55426 PAGE 307 446 MOWER ST

N/F MICHAEL A. AND KELLY A. PARCEL ID 53381 PAGE BOOK 53381 PAGE 448 MOWER ST

100' BUFFER ZONE
25' RIVERFRONT AREA
FLOOD ZONE ELEVATION
MASS GIS FLOOD ZONE

0 20 50 100
SCALE: 1" = 20'

COMMONWEALTH OF MASSACHUSETTS
SAID YAHYA
CIVIL
NO. 55792
PROFESSIONAL ENGINEER

FOR CONSTRUCTION PROFILE:
SEE SHEET NO. 38

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HIGHWAY GUARD DETAILS
SEE SHEET 111

TRAFFIC SIGNAL CONDUIT
SEE SHEETS 78 - 91

WATER SUPPLY ALTERATIONS
SEE SHEET 110

DRAINAGE DETAILS
SEE SHEET 110

LEGEND:

- HOT MIX ASPHALT (HMA)
- CONCRETE
- HMA DRIVEWAY TIE-IN
- ALL DISTURBED AREAS TO BE 6" LOAMED & SEEDED; RESTORED AS GRASSED AREA
- RUMBLE STRIP

CONSTRUCTION NOTES:

1. FOR CONSTRUCTION BASELINE TIE PLAN, SEE SHEET 8-22.
2. FOR CURB TIE PLAN, SEE SHEETS 49 - 63.
3. FOR DRAINAGE AND UTILITY PLAN, SEE SHEET 78 - 91.
4. FOR PAVEMENT MARKINGS AND SIGNAGE PLAN, SEE SHEET 92 - 108.
5. FOR CONSTRUCTION DETAILS, SEE SHEETS 110 - 114.
6. FOR RUMBLE STRIP DETAILS, SEE SHEET 113.

WORCESTER
PLEASANT STREET - ROUTE 122

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	######	25	181
PROJECT FILE NO.		610535	

CONSTRUCTION PLANS
SHEET 3 OF 14

N

LIMIT OF WORK
LIMIT OF MILL AND OVERLAY MEET EX EOP
LOCATION LINE OF 1851 TOWN LAYOUT

MOWER STREET
(PUBLIC - VARIABLE WIDTH)

PLEASANT STREET
(ROUTE 122)
6,242.01 sf

WETLAND BUFFER #2
TOTAL ADDED IMPERVIOUS IN BUFFER ZONE SEE NEXT PAGE
TOTAL ADDED PERVIOUS IN BUFFER ZONE SEE NEXT PAGE
TOTAL WORK WITHIN BUFFER ZONE SEE NEXT PAGE
BUFFER DETAIL FOR TYPE AND PLACEMENT (TYP.)

CONTINUED ON SHEET NO. 24
CONTINUED ON SHEET NO. 26

PROP CONC SW THROUGH DWY (TYP)
PROP RRFB PULLBOX
8' WIDE BUS STOP WAITING AREA
CONCRETE BACK CURB WITH 15" REVEAL
VGC 6" REVEAL
BIKE LANE BEGINS
R&R EX VGC FOR 6" REVEAL
LOCATION OF REDUCED CLEARANCE - 48" MIN
PROP M&O PVMT (TYP)
R&R EX VGC FOR 6" REVEAL
RET EX VGC
SAWCUT (TYP)
END SW
PT +67.36
PC +98.95
RET EX VGC
PROP 5' HMA SW R&D EX SW (TYP)
PROP CONC SW THROUGH DWY (TYP)
EROSION CONTROL (TYP)
PROP TREE TRIMMING FOR 7' CLEARANCE ABOVE SIDEWALK 230 LF
REPAVING IN BUFFER ZONE - MINOR ACTIVITY
PROP RRFB WITH CROSSWALK LIGHTING
PROP 5' HMA SW (TYP)
PROP CONC SW THROUGH DWY (TYP)
R&R EX HYDRANT
LOCATION OF REDUCED CLEARANCE - 48" MIN
RET EX WALK
BENCHMARK: 513 MAG SET IN UPL 30-1 1' ABOVE GROUND EL=860.78'

DWY-6 DWY-7 DWY-8 DWY-9 DWY-10 DWY-11
PCR-11 PCR-12 PCR-13 PCR-14 PCR-15

1958 SHLO NO. 4747
1926 SHLO 2373
100' BUFFER ZONE
18" TWO BUFFER ZONE
4" VCP
20" TWIN
24"

N/F GERARD T AUBIN ID MICHELE T AUBIN PARCEL ID 47-19E-12 BOOK 52758 PAGE 319 444 MOWER ST
N/F MICHAEL MCAVEY AND DONNA DULMAINE-MCAVEY PARCEL ID 47-15A-7-7A BOOK 16587 PAGE 96 42 ASSABET LN
N/F THAMIR H. MAHMOOD AND BASHAYER ADEL AL-EYADAH PARCEL ID 47-15A-9 BOOK 67927 PAGE 16 1360 PLEASANT ST
N/F EUGENE J. P. DESROSIERS PARCEL ID 47-15A-8 BOOK 56303 PAGE 343 1364 PLEASANT ST
N/F BRETT GREEN PARCEL ID 47-15-9 BOOK 56847 PAGE 289 1356 PLEASANT ST
N/F MARIE ROSEMAY VALCOURT AND BERTIN POMPEE PARCEL ID 47-15-9A BOOK 69704 PAGE 103 1350 PLEASANT ST
N/F STARK REALTY TRUST PARCEL ID 40-39-11 BOOK 23846 PAGE 382 1349 PLEASANT ST
N/F NANCY JEAN WHITE REVOCABLE TRUST 2016 PARCEL ID 40-39-10A BOOK 56709 PAGE 157 1347 PLEASANT ST
N/F WHITNEY MARSHALL PARCEL ID 40-39-10 BOOK 66065 PAGE 330 415 MOWER ST
N/F JARED K SHAH PARCEL ID 40-39-9 BOOK 68366 PAGE 58 1345 PLEASANT ST
N/F TRANG XD NGHIEM AND ANH P. NGUYEN PARCEL ID 40-39-8 BOOK 54852 PAGE 29 1343 PLEASANT ST

100' BUFFER ZONE
25' RIVERFRONT AREA
FLOOD ZONE ELEVATION
MASS GIS FLOOD ZONE

COMMONWEALTH OF MASSACHUSETTS
SAID YAHYA CIVIL NO. 55792
PROFESSIONAL ENGINEER

0 20 50 100
SCALE: 1" = 20'

FOR CONSTRUCTION PROFILE:
SEE SHEET NO. 39

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WORCESTER
PLEASANT STREET - ROUTE 122

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	#######	26	181
PROJECT FILE NO.	610535		

CONSTRUCTION PLANS
SHEET 4 OF 14

LEGEND:

- HOT MIX ASPHALT (HMA)
- CONCRETE
- HMA DRIVEWAY TIE-IN
- ALL DISTURBED AREAS TO BE 6" LOAMED & SEEDED; RESTORED AS GRASSED AREA
- RUMBLE STRIP

CONSTRUCTION NOTES:

1. FOR CONSTRUCTION BASELINE TIE PLAN, SEE SHEET 8-22.
2. FOR CURB TIE PLAN, SEE SHEETS 49 - 63.
3. FOR DRAINAGE AND UTILITY PLAN, SEE SHEET 78 - 91.
4. FOR PAVEMENT MARKINGS AND SIGNAGE PLAN, SEE SHEET 92 - 108.
5. FOR CONSTRUCTION DETAILS, SEE SHEETS 110 - 114.
6. FOR RUMBLE STRIP DETAILS, SEE SHEET 113.

WETLAND BUFFER #2

TOTAL ADDED IMPERVIOUS IN BUFFER ZONE
0 SF

TOTAL ADDED PERVIOUS IN BUFFER ZONE
0 SF

ALL WORK WITHIN BUFFER ZONE ARE CONSIDERED MINOR ACTIVITIES (REPAVING)

TOTAL WORK WITHIN BUFFER ZONE
16,339 SF

AIRPORT DRIVE LIMIT OF WORK (CONT)

100' BUFFER ZONE
25' RIVERFRONT AREA
FLOOD ZONE ELEVATION
MASS GIS FLOOD ZONE

0 20 50 100
SCALE: 1" = 20'

FOR CONSTRUCTION PROFILE:
SEE SHEET NO. 40

COMMONWEALTH OF MASSACHUSETTS
SAID YAHYA CIVIL NO. 55792
PROFESSIONAL ENGINEER

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HIGHWAY GUARD DETAILS
SEE SHEET 111

TRAFFIC SIGNAL CONDUIT
SEE SHEETS 78 - 91

WATER SUPPLY ALTERATIONS
SEE SHEET 110

DRAINAGE DETAILS
SEE SHEET 110

LEGEND:

- HOT MIX ASPHALT (HMA)
- CONCRETE
- HMA DRIVEWAY TIE-IN
- ALL DISTURBED AREAS TO BE 6" LOAMED & SEEDED; RESTORED AS GRASSED AREA
- RUMBLE STRIP

CONSTRUCTION NOTES:

1. FOR CONSTRUCTION BASELINE TIE PLAN, SEE SHEET 8-22.
2. FOR CURB TIE PLAN, SEE SHEETS 49 - 63.
3. FOR DRAINAGE AND UTILITY PLAN, SEE SHEET 78 - 91.
4. FOR PAVEMENT MARKINGS AND SIGNAGE PLAN, SEE SHEET 92 - 108.
5. FOR CONSTRUCTION DETAILS, SEE SHEETS 110 - 114.
6. FOR RUMBLE STRIP DETAILS, SEE SHEET 113.

WORCESTER
PLEASANT STREET - ROUTE 122

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	#######	27	181
PROJECT FILE NO.	610535		

CONSTRUCTION PLANS
SHEET 5 OF 14

N

LONG VUE TERRACE
(PRIVATE - 40' WIDE)

EDWIDGE STREET
(PUBLIC - 40' WIDE)

PLEASANT STREET
(ROUTE 122)

AIPORT DRIVE

LOCATION LINE OF PLAN BOOK 111 PLAN 53

LOCATION LINE OF 1967 TOWN LAYOUT H-10038

N/F SANDRA STERLIN PARCEL ID 40-39-2 BOOK 61583 PAGE 26 1325 PLEASANT ST

N/F CATHERINE RUTH CAMPANALE AND CASEY JAMES CAMPANALE PARCEL ID 40-39-1 BOOK 70024 PAGE 61 1329 PLEASANT ST

N/F ROLAND MYZYRI AND BRUNILDA MYZYRI PARCEL ID 40-36-5A BOOK 34555 PAGE 186 1321 PLEASANT ST

N/F ROBERT L. HARDEN, JR. AND BARBARA R. HARDEN PARCEL ID 40-36-10B BOOK 35869 PAGE 17 2 EDWIDGE ST

N/F ANDREW J. O'CONNOR PARCEL ID 40-36-11 BOOK 43253 PAGE 267 1311 PLEASANT ST

N/F EMMITT BRISBON PARCEL ID 40-36-13 BOOK 58125 PAGE 363 1313 PLEASANT ST

N/F RICHARD FRATIELLO-NGO AND HUY FRATIELLO-NGO PARCEL ID 40-36-12 BOOK 68447 PAGE 360 1309 PLEASANT ST

N/F CHRISTOPHER ZONGHETTI AND MEGAN ZONGHETTI PARCEL ID 40-36-19 BOOK 58989 PAGE 321 1305 PLEASANT ST

N/F MARK R OLIVER AND MATTHEW A OLIVER PARCEL ID 47-12-5 BOOK 54455 PAGE 324 10 MEADOW LN

N/F CHARLES R. CLANCEY PARCEL ID 47-12-6 BOOK 14787 PAGE 363 12 MEADOW LN

N/F LOUIS TUREK PARCEL ID 47-12-7 BOOK 65885 PAGE 32 14 MEADOW LN

WORCESTER REGIONAL AIRPORT

CONTINUED ON SHEET NO. 28

CONTINUED ON SHEET NO. 28

1926 SHLO NO. 2373

1958 SHLO NO. 4747

1959 SHLO NO. 4906

34+95.23
OFFSET: 29.84

35+02.35
OFFSET: 23.42

35+61.12
OFFSET: 23.41

PC +85.76

34 PT +03.76

LIMIT OF WORK

PROP PULL BOX (TYP) SEE UTILITY PLAN

PCR-18
PCR-19
PCR-20
PCR-21
PCR-22
PCR-23

DWY-13
DWY-14
DWY-15
DWY-16
DWY-17

SAWCUT (TYP)

PROP M&O PVMT (TYP)

REMOVE EX MEDIAN

LOAM AND SEED

EROSION CONTROL (TYP)

LIMIT OF MILL AND OVERLAY MEET EX EOP

RUMBLE STRIPS, SEE BUFFER DETAIL FOR TYPE AND PLACEMENT (TYP)

PROP 8' HMA SW/BUS STOP

REPAVING EXISTING SIDEWALK AND ROADWAY - MINOR ACTIVITY

R&D EX GUARD RAIL

PROP NEW GUARD RAIL AT THE FACE OF CURB SEE MASSDOT DETAIL 601.0.5

PROP 5' HMA SW (TYP)

RET EX VGC

REPLACE END TREATMENT WITH MASH COMPLIANT END TERMINAL

END PROP 5' HMA SW MATCH EXISTING

PROP LIMIT OF 633 LF BRUSH AND TREE LIMB CLEARING AT LEAST 1 FT BEHIND THE EX GUARD RAIL FOR 7' VERTICAL CLEARANCE

LIMIT OF GRADING (TYP)

PROP 5' HMA SW (TYP)

186.55 sf

508.08 sf

11,410.72 sf

100' BUFFER ZONE

WETLAND BUFFER #3

TOTAL ADDED IMPERVIOUS IN BUFFER ZONE
SEE NEXT PAGE

TOTAL ADDED PERVIOUS IN BUFFER ZONE
SEE NEXT PAGE

TOTAL WORK WITHIN BUFFER ZONE
SEE NEXT PAGE

BENCHMARK: 511
BRASS DISK FND W38
EL=803.07

100' BUFFER ZONE
25' RIVERFRONT AREA
FLOOD ZONE ELEVATION
MASS GIS FLOOD ZONE

COMMONWEALTH OF MASSACHUSETTS
SAID YAHYA CIVIL NO. 55792
PROFESSIONAL ENGINEER

FOR CONSTRUCTION PROFILE:
SEE SHEET NO. 41

0 20 50 100
SCALE: 1" = 20'

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HIGHWAY GUARD DETAILS
SEE SHEET 111

TRAFFIC SIGNAL CONDUIT
SEE SHEETS 78 - 91

WATER SUPPLY ALTERATIONS
SEE SHEET 110

DRAINAGE DETAILS
SEE SHEET 110

LEGEND:

- HOT MIX ASPHALT (HMA)
- CONCRETE
- HMA DRIVEWAY TIE-IN
- ALL DISTURBED AREAS TO BE 6" LOAMED & SEEDED; RESTORED AS GRASSED AREA
- RUMBLE STRIP

CONSTRUCTION NOTES:

1. FOR CONSTRUCTION BASELINE TIE PLAN, SEE SHEET 8-22.
2. FOR CURB TIE PLAN, SEE SHEETS 49 - 63.
3. FOR DRAINAGE AND UTILITY PLAN, SEE SHEET 78 - 91.
4. FOR PAVEMENT MARKINGS AND SIGNAGE PLAN, SEE SHEET 92 - 108.
5. FOR CONSTRUCTION DETAILS, SEE SHEETS 110 - 114.
6. FOR RUMBLE STRIP DETAILS, SEE SHEET 113.

WORCESTER
PLEASANT STREET - ROUTE 122

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	#######	28	181
PROJECT FILE NO.	610535		

CONSTRUCTION PLANS
SHEET 6 OF 14

N

ROCKWOOD AVENUE
(PUBLIC - 50' WIDE)

PLEASANT STREET
(ROUTE 122)

JEREMIAH'S LANE
(PUBLIC - 50' WIDE)

LOCATION LINE OF 1954 TOWN LAYOUT H-9776

LOCATION LINE OF 1954 TOWN LAYOUT H-11351

N/F MILDRED SANTANA PARCEL ID 40-36-20 BOOK 66833 PAGE 287 1301 PLEASANT ST

N/F PHER ZONGHETTI GAN ZONGHETTI . ID 40-36-19 8989 PAGE 321 PLEASANT ST

N/F LAWRENCE A. LANDRY AND SHEILA H. LANDRY PARCEL ID 40-35-7 BOOK 5215 PAGE 59 1299 PLEASANT ST

N/F KENNETH L. ROY PARCEL ID 40-35-8 BOOK 46856 PAGE 63 1297 PLEASANT ST

N/F ANDRE O. WALKER PARCEL ID 40-35-9 BOOK 66610 PAGE 141 1293 PLEASANT ST

N/F MAANAS MYLAVARAPU AND CHITRANGADA KANDI PARCEL ID 40-35-10 BOOK 71565 PAGE 16 1289 PLEASANT ST

N/F STAKE REALTY LLC PARCEL ID 40-35-11B BOOK 55611 PAGE 395 1285 PLEASANT ST

N/F MARK R OLIVER AND MATTHEW A OLIVER PARCEL ID 47-12-5 BOOK 54455 PAGE 324 10 MEADOW LN

N/F PEDRO LUIS APONTE MELENDEZ PARCEL ID 47-12-4 BOOK 65654 PAGE 245 8 MEADOW LN

N/F DOROTHY HARGROVE PARCEL ID 47-12-3 BOOK 27345 PAGE 118 6 MEADOW LN

N/F TANYA OJEDA AND JASON OJEDA PARCEL ID 47-12-2 BOOK 55824 PAGE 220 4 MEADOW LN

N/F RALPH A. METCALF JR. AND ELIZABETH R. LAMSON PARCEL ID 47-12-1 BOOK 6898 PAGE 40 4 PROUTY LN

BENCHMARK: 510
MAG SET IN UPL #115
1' ABOVE GROUND
EL=776.79'

CONTINUED ON SHEET NO. 27

PROP CONC SW THROUGH DWY (TYP)

PROP 5' HMA SW (TYP)

EROSION CONTROL (TYP)

LIMIT OF MILL AND OVERLAY MEET EX EOP

SEE DETAILED GRADING SHEETS FOR REDUCED ROADWAY CROSS SLOPES AND RAISED GUTTER GRADE FOR ADA COMPLIANT CROSSWALK

LIMIT OF WORK

WIDEN SW FOR 4' MIN CLEARANCE AROUND UP

PROP HMA 5' SW (TYP)

RETAIN ALL SHRUBS AND TREES

PROP CONC BACK CURB WITH 12" REVEAL

PROP CONC BACK CURB WITH 9" REVEAL

TIE INTO EXISTING STAIRS

WIDEN SW FOR 4' MIN CLEARANCE AROUND UP

RET EX VGC

SAWCUT (TYP)

RET EX GUARD RAIL

RETAIN EX HMA SW

RUMBLE STRIPS SEE BUFFER DETAIL FOR TYPE AND PLACEMENT (TYP)

PROP LIMIT OF BRUSH AND TREE LIMB CLEARING AT LEAST 1 FT BEHIND THE EX GUARD RAIL FOR 7' VERTICAL CLEARANCE

RELOCATE EX MB BEHIND SW

RET EX VGC (TYP)

RET EX HMA SW

RET EX GUARD RAIL

PROP LIMIT OF BRUSH AND TREE LIMB CLEARING AT LEAST 1 FT BEHIND THE EX GUARD RAIL FOR 7' VERTICAL CLEARANCE

REPAVING EXISTING SIDEWALK/PAVEMENT

MINOR ACTIVITY

RET EX PVMT

BEGIN 5' HMA SW

CONTINUED ON SHEET NO. 29

DWY-17 · DWY-18 · DWY-19 · DWY-20

PCR-24 · PCR-25 · PCR-26 · PCR-27 · PCR-28 · PCR-29

PT +73.96 · PC +76.09

679.55 sf · 560.29 sf · 99.77 sf · 245.8 sf · 386.84 sf · 34,682.63 sf

1958 SHLO NO. 4747 · 1959 SHLO NO. 4906

100' BUFFER ZONE

WETLAND BUFFER #3

TOTAL ADDED IMPERVIOUS IN BUFFER ZONE
2624 SF

TOTAL ADDED PERVIOUS IN BUFFER ZONE
0 SF

TOTAL WORK WITHIN BUFFER ZONE
53,365 SF

100' BUFFER ZONE
25' RIVERFRONT AREA
FLOOD ZONE ELEVATION
MASS GIS FLOOD ZONE

0 20 50 100
SCALE: 1" = 20'

COMMONWEALTH OF MASSACHUSETTS
SAID YAHYA
CIVIL
NO. 55792
PROFESSIONAL ENGINEER

FOR CONSTRUCTION PROFILE:
SEE SHEET NO. 42

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LEGEND:

- HOT MIX ASPHALT (HMA)
- CONCRETE
- HMA DRIVEWAY TIE-IN
- ALL DISTURBED AREAS TO BE 6" LOAMED & SEEDED; RESTORED AS GRASSED AREA
- RUMBLE STRIP

CONSTRUCTION NOTES:

1. FOR CONSTRUCTION BASELINE TIE PLAN, SEE SHEET 8-22.
2. FOR CURB TIE PLAN, SEE SHEETS 49 - 63.
3. FOR DRAINAGE AND UTILITY PLAN, SEE SHEET 78 - 91.
4. FOR PAVEMENT MARKINGS AND SIGNAGE PLAN, SEE SHEET 92 - 108.
5. FOR CONSTRUCTION DETAILS, SEE SHEETS 110 - 114.
6. FOR RUMBLE STRIP DETAILS, SEE SHEET 113.

WORCESTER
PLEASANT STREET - ROUTE 122

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	#######	29	181
PROJECT FILE NO.	610535		

CONSTRUCTION PLANS
SHEET 7 OF 14

N

N/F STAKE REALTY LLC PARCEL ID 40-35-11B BOOK 55611 PAGE 395 1285 PLEASANT ST

N/F STAKE REALTY LLC PARCEL ID 40-33-7 BOOK 41661 PAGE 364 1283A PLEASANT ST

N/F STAKE REALTY LLC PARCEL ID 40-35-11A BOOK 41661 PAGE 364 1283 PLEASANT ST

N/F ERIN MARGARETT MICHELOTTI AND JOSEPH CHRISTOPHER PARCEL ID 40-33-6 BOOK 67910 PAGE 329 32 BAXTER ST

N/F MARIA G. CARBONE GENTILE AND LUIGI ALPHONSO GENTILE PARCEL ID 40-33-3 BOOK 55511 PAGE 183 30 BAXTER ST

N/F CADY KOENIGS AND PATRICK TEEBAGY PARCEL ID 40-33-2 BOOK 69784 PAGE 1 24 BAXTER ST

CONTINUED ON SHEET NO. 28

REPAVING EXISTING SIDEWALK/PAVEMENT

MINOR ACTIVITY

REDUCE CLEAR PATH TO 4' WIDE

LIMIT OF GRADING (TYP)

PROP CONC BACK CURB WITH 12" REVEAL

RELOCATE STONE WALL

LIMIT OF MILL AND OVERLAY MEET EX EOP

LIMIT OF WORK

LOCATION LINE OF PLAN BOOK 468 PLAN 47

BAXTER STREET
(PUBLIC - 50' WIDE)

LOCATION LINE OF BOOK 21492 PAGE 247

RUMBLE STRIPS, SEE BUFFER DETAIL FOR TYPE AND PLACEMENT (TYP)

PROP HMA DWY (TYP)

RET EX VGC

PCR-29

DWY-21 SAWCUT (TYP)

PCR-33

1926 SHLO NO. 2373

PT +86.77

PLEASANT STREET
(ROUTE 122)

EROSION CONTROL (TYP)
7,272.01 sf

PCR-28

PCR-30

PCR-31

PCR-32

DWY-22

DWY-23

PROP CB SEE UTILITY & DRAINAGE PLAN

PROP M&O PVMT (TYP)

DWY-24

SAWCUT (TYP)

DWY-25

PCR-34

PCR-35

CONTINUED ON SHEET NO. 30

LIMIT OF WORK

LOCATION LINE PLAN BOOK 878 PLAN 49

PROUTY LANE
(PUBLIC - 49.5' WIDE)

R&R SEE PVMT MARKING PLAN

PROP PULL BOX (TYP) SEE UTILITY PLAN

R&R GRAN MONUMENT IN PLACE TO CONSTRUCT SIDEWALK

PROP 5' HMA SW (TYP)

LIMIT OF M&O MEET EX EOP

PROP VGC WITH 6" REVEAL

RET AND PROT EX TREE

PROP 5' HMA SW

PROP CONC SW THROUGH DWY (TYP)

RETAIN AND PROT EX TREES

WIDEN SW FOR MIN 4' CLEARANCE AROUND UP

PROP CONC SW THROUGH DWY (TYP)

SEE DETAILED GRADING SHEETS FOR REDUCED ROADWAY CROSS SLOPES AND RAISED GUTTER GRADE FOR ADA COMPLIANT CROSSWALK

LIMIT OF MILL AND OVERLAY MEET EX EOP

LIMIT OF WORK

BENCHMARK: 508 MAG SET IN UPL #106-1 1' ABOVE GROUND EL=746.39'

JOPPA ROAD
(PUBLIC - 50' WIDE)

N/F TRYFOS LLC PARCEL ID 47-10-65 BOOK 58550 PAGE 61 1 PROUTY LN

N/F TRYFOS LLC PARCEL ID 47-10-64 BOOK 58550 PAGE 61 1282 PLEASANT ST

N/F NET YEOAH AND VAN HONG PARCEL ID 47-10-7 BOOK 33501 PAGE 190 1280 PLEASANT ST

N/F DAVID H. LAZOTT PARCEL ID 47-10-8-10 BOOK 14529 PAGE 34 1278 PLEASANT ST

N/F FELIX GONZALEZ PARCEL ID 47-10-11 BOOK 51797 PAGE 118 1276 PLEASANT ST

N/F ELISE TAYLOR PARCEL ID 47-10-13 BOOK 69989 PAGE 122 1274 PLEASANT ST

N/F ROSE ADINA CLAXTON AND SHARON K. CLAXTON PARCEL ID 47-10-14 BOOK 68933 PAGE 209 1272 PLEASANT ST

N/F US BANK NATIONAL ASSOCIATION PARCEL ID 40-33-1F BOOK 59728 PAGE 200 21 BAXTER ST

N/F RICHARD AND TERESA PARCEL ID 47 BOOK 8685 F JOPPA

WETLAND BUFFER #3

TOTAL ADDED IMPERVIOUS IN BUFFER ZONE
SEE PREVIOUS PAGE

TOTAL ADDED PERVIOUS IN BUFFER ZONE
SEE PREVIOUS PAGE

TOTAL WORK WITHIN BUFFER ZONE
SEE PREVIOUS PAGE

100' BUFFER ZONE
25' RIVERFRONT AREA
FLOOD ZONE ELEVATION
MASS GIS FLOOD ZONE

DRAINAGE ADJUSTMENT

ADDED BASIN TO MATCH NEW CURBLINE OF IMPROVED INTERSECTION

NO CHANGE TO EXISTING DRAINAGE PATTERNS

ALL WORK WITHIN PUBLIC ROAD LAYOUT

0 20 50 100
SCALE: 1" = 20'

COMMONWEALTH OF MASSACHUSETTS
SAID YAHYA CIVIL No. 55792
PROFESSIONAL ENGINEER

FOR CONSTRUCTION PROFILE:
SEE SHEET NO. 43

Proposal No. 610535-134928
A00860 - 70
610535_HD(CONSTRUCTION PLAN).DWG Plotted on 9-Jan-2026 12:29 PM

HIGHWAY GUARD DETAILS
SEE SHEET 111

TRAFFIC SIGNAL CONDUIT
SEE SHEETS 78 - 91

WATER SUPPLY ALTERATIONS
SEE SHEET 110

DRAINAGE DETAILS
SEE SHEET 110

LEGEND:

- HOT MIX ASPHALT (HMA)
- CONCRETE
- HMA DRIVEWAY TIE-IN
- ALL DISTURBED AREAS TO BE 6" LOAMED & SEEDED; RESTORED AS GRASSED AREA
- RUMBLE STRIP

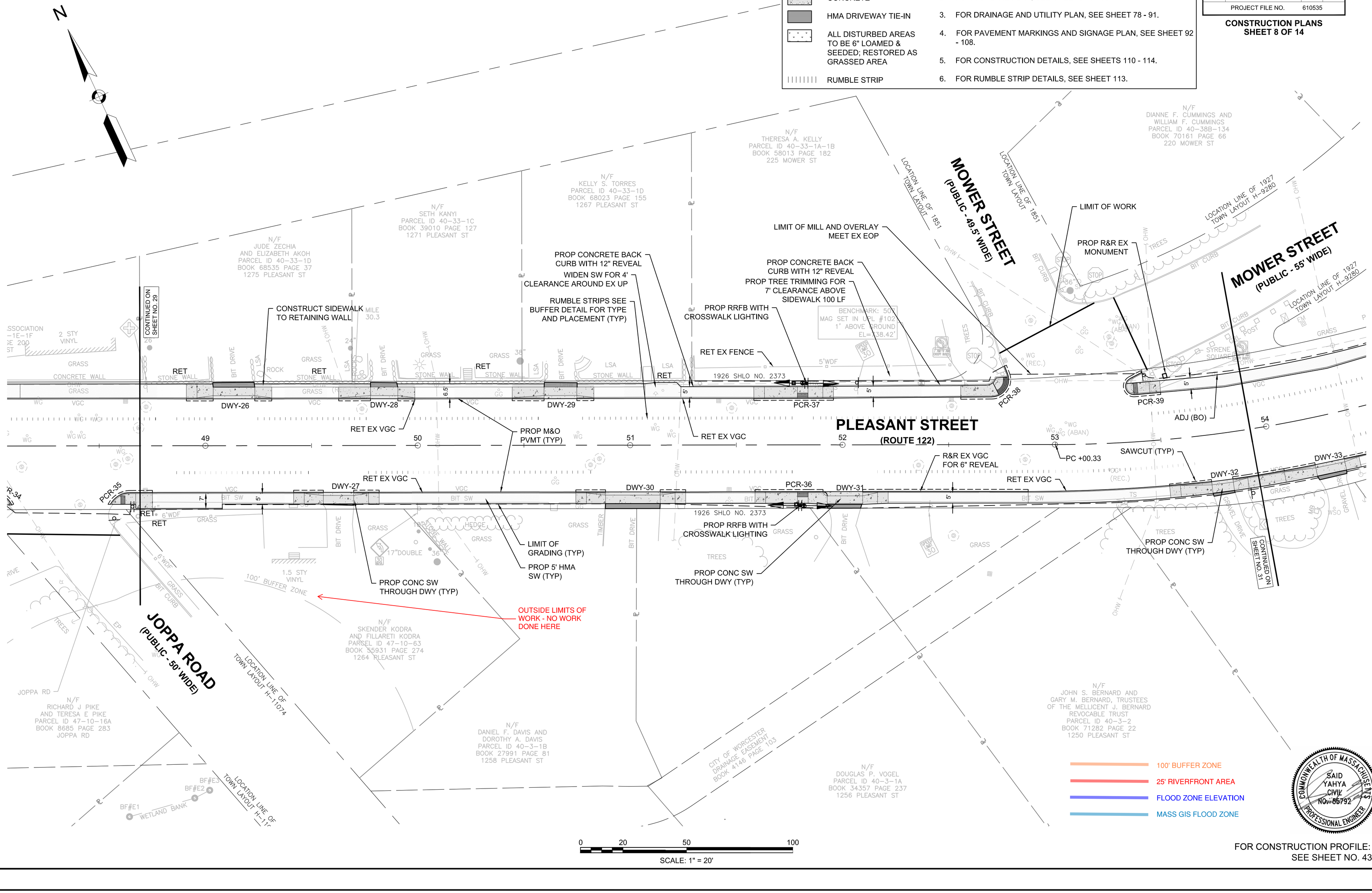
CONSTRUCTION NOTES:

1. FOR CONSTRUCTION BASELINE TIE PLAN, SEE SHEET 8-22.
2. FOR CURB TIE PLAN, SEE SHEETS 49 - 63.
3. FOR DRAINAGE AND UTILITY PLAN, SEE SHEET 78 - 91.
4. FOR PAVEMENT MARKINGS AND SIGNAGE PLAN, SEE SHEET 92 - 108.
5. FOR CONSTRUCTION DETAILS, SEE SHEETS 110 - 114.
6. FOR RUMBLE STRIP DETAILS, SEE SHEET 113.

WORCESTER
PLEASANT STREET - ROUTE 122

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	######	30	181
PROJECT FILE NO.	610535		

CONSTRUCTION PLANS
SHEET 8 OF 14



0 20 50 100
SCALE: 1" = 20'

COMMONWEALTH OF MASSACHUSETTS
SAID YAHYA
CIVIL
No. 55792
PROFESSIONAL ENGINEER

FOR CONSTRUCTION PROFILE:
SEE SHEET NO. 43

610535_HD(CONSTRUCTION PLAN).DWG Plotted on 9-Jan-2026 12:30 PM

HIGHWAY GUARD DETAILS
SEE SHEET 111

TRAFFIC SIGNAL CONDUIT
SEE SHEETS 78 - 91

WATER SUPPLY ALTERATIONS
SEE SHEET 110

DRAINAGE DETAILS
SEE SHEET 110

LEGEND:

- HOT MIX ASPHALT (HMA)
- CONCRETE
- HMA DRIVEWAY TIE-IN
- ALL DISTURBED AREAS TO BE 6" LOAMED & SEEDED; RESTORED AS GRASSED AREA
- RUMBLE STRIP

CONSTRUCTION NOTES:

1. FOR CONSTRUCTION BASELINE TIE PLAN, SEE SHEET 8-22.
2. FOR CURB TIE PLAN, SEE SHEETS 49 - 63.
3. FOR DRAINAGE AND UTILITY PLAN, SEE SHEET 78 - 91.
4. FOR PAVEMENT MARKINGS AND SIGNAGE PLAN, SEE SHEET 92 - 108.
5. FOR CONSTRUCTION DETAILS, SEE SHEETS 110 - 114.
6. FOR RUMBLE STRIP DETAILS, SEE SHEET 113.

WORCESTER
PLEASANT STREET - ROUTE 122

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	#######	31	181
PROJECT FILE NO.		610535	

CONSTRUCTION PLANS
SHEET 9 OF 14

N

MOWER STREET
(PUBLIC - 55' WIDE)

PLEASANT STREET
(ROUTE 122)

LAUREL DALE ROAD
(PRIVATE - 15' WIDE)

JENKINS STREET
(PUBLIC - 40' WIDE)

ROBERTSON ROAD
(PUBLIC - 29.5' WIDE)

CONTINUED ON SHEET NO. 30

CONTINUED ON SHEET NO. 32

LOCATION LINE OF 1927 TOWN LAYOUT H-9280

LIMIT OF GRADING (TYP)

PROP 5' HMA SW (TYP)

WIDEN SW FOR 4' CLEARANCE AROUND EX UP

RUMBLE STRIPS SEE BUFFER DETAIL FOR TYPE AND PLACEMENT (TYP)

PROP CONC SW THROUGH DWY (TYP)

WIDEN SW FOR 4' MIN CLEARANCE AROUND UP

PROP BRICK WALKWAY TIE-IN

PROP GRAN CURB 9" REVEAL

WIDEN SW FOR 4' MIN CLEARANCE AROUND UP

GUY WIRE ADJUST CLEARANCE OVER SW SEE UTILITY PLAN

BENCHMARK: 506
MAG SET UPL #98
1' ABOVE GROUND
EL=719.74'

RET EX VGC

PROP M&O PVMT (TYP)

PT +67.35

TIE INTO EXISTING STAIRS

PROP GRAN CURB 9" REVEAL

RET EX. MAILBOX

LIMIT OF WORK

SEE DETAILED GRADING SHEETS FOR REDUCED ROADWAY CROSS SLOPES AND RAISED GUTTER GRADE FOR ADA COMPLIANT CROSSWALK

RET EX STONE RETAINING WALL TIE IN WITH SW

PROP HMA SW WITH VARIABLE WIDTH TO FACE OF STONE WALL

LIMIT OF MILL AND OVERLAY MEET EX EOP

PROP BACK CURB 9" REVEAL

DWY-32 DWY-33 DWY-34 DWY-35 DWY-36

PCR-39 PCR-40 PCR-41 PCR-42 PCR-43

54 55 56 57 58 59

N/F DIANNE F. CUMMINGS AND WILLIAM F. CUMMINGS PARCEL ID 40-38B-134 BOOK 70161 PAGE 66 220 MOWER ST

N/F NICOLE XIFARAS PARCEL ID 40-31-1-3-4 BOOK 68059 PAGE 199 1235 PLEASANT ST

N/F WORCESTER GAS LIGHT COMPANY BOOK 3587 PAGE 498

CITY OF WORCESTER DRAINAGE EASEMENT BOOK 4146 PAGE 252

N/F SUSAN PARCEL ID BOOK 137 1231 PL

N/F JACOB G. TYE AND KULAY C. TYE PARCEL ID 40-2-13A2 BOOK 63023 PAGE 150 1238 PLEASANT ST

N/F SAID NAFAI AND ELI STEVENS-NAFAI PARCEL ID 40-2-13A BOOK 29193 PAGE 54 1236 PLEASANT ST

N/F JOHNNY MONESTIME PARCEL ID 40-2-2 BOOK 56236 PAGE 362 1230 PLEASANT ST

N/F STEVEN D. BROWN AND MARITZA E. PEREZ-BROWN PARCEL ID 40-2-15 BOOK 64717 PAGE 282 1228 PLEASANT ST

N/F ATC PLEASANT LLC PARCEL ID 40-2-1 BOOK 67469 PAGE 225 1226 PLEASANT ST

N/F MARK A ANDERSON AND JO-ANNE ANDERSON PARCEL ID 40-3-3 BOOK 18769 PAGE 272 1240 PLEASANT ST

N/F JOANNE G. DUNLEVY PARCEL ID 40-3-4 BOOK 52574 PAGE 90 1246 PLEASANT ST

LOCATION LINE OF PLAN BOOK 810 PLAN 96

LOCATION LINE OF PLAN BOOK 810 PLAN 96

LOCATION LINE OF PLAN BOOK 227 PLAN 61

LOCATION LINE OF PLAN BOOK 227 PLAN 61

LOCATION LINE OF TOWN LAYOUT H-1124 1978

LOCATION LINE OF TOWN LAYOUT H-1124 1978

100' BUFFER ZONE
25' RIVERFRONT AREA
FLOOD ZONE ELEVATION
MASS GIS FLOOD ZONE

COMMONWEALTH OF MASSACHUSETTS
SAID YAHYA CIVIL
NO. 55792
PROFESSIONAL ENGINEER

FOR CONSTRUCTION PROFILE:
SEE SHEET NO. 44

0 20 50 100
SCALE: 1" = 20'

610535_HD(CONSTRUCTION PLAN).DWG Plotted on 9-Jan-2026 12:30 PM

Proposal No. 610535-134928

A00860 - 72

HIGHWAY GUARD DETAILS
SEE SHEET 111

TRAFFIC SIGNAL CONDUIT
SEE SHEETS 78 - 91

WATER SUPPLY ALTERATIONS
SEE SHEET 110

DRAINAGE DETAILS
SEE SHEET 110

LEGEND:

- HOT MIX ASPHALT (HMA)
- CONCRETE
- HMA DRIVEWAY TIE-IN
- ALL DISTURBED AREAS TO BE 6" LOAMED & SEEDED; RESTORED AS GRASSED AREA
- RUMBLE STRIP

CONSTRUCTION NOTES:

1. FOR CONSTRUCTION BASELINE TIE PLAN, SEE SHEET 8-22.
2. FOR CURB TIE PLAN, SEE SHEETS 49 - 63.
3. FOR DRAINAGE AND UTILITY PLAN, SEE SHEET 78 - 91.
4. FOR PAVEMENT MARKINGS AND SIGNAGE PLAN, SEE SHEET 92 - 108.
5. FOR CONSTRUCTION DETAILS, SEE SHEETS 110 - 114.
6. FOR RUMBLE STRIP DETAILS, SEE SHEET 113.

WORCESTER
PLEASANT STREET - ROUTE 122

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	######	32	181
PROJECT FILE NO.	610535		

CONSTRUCTION PLANS
SHEET 10 OF 14

N

CONSTRUCT SIDEWALK AROUND TREE
PROP CONC SW THROUGH DWY (TYP)
PROP 6.5' HMA SW FOR CLEARANCE AROUND UTILITIES
BACK OF WALK REVEAL (SEE GRADING PLANS AND DETAIL SHEETS)
WIDEN SW FOR 4' MIN CLEARANCE AROUND UP
PROP CONC SW THROUGH DWY (TYP)
PROP VGC 3" REVEAL
PROP PULL BOX (TYP) SEE UTILITY PLAN
END PROP 5' HMA SW
REPLACE END TREATMENT WITH MASH COMPLIANT END TERMINAL
RET EX VGC (TYP)
RET & PROT
RET EX VGC
SAWCUT (TYP)
PROP M&O PVMT (TYP)
PROP 5' HMA SW (TYP)
PROP GRAN. CURB 9" REVEAL BEHIND SIDEWALK
PROP TREE TRIMMING FOR 7' CLEARANCE ABOVE SIDEWALK 350 LF
RET EX VGC
RUMBLE STRIPS SEE BUFFER DETAIL FOR TYPE AND PLACEMENT (TYP)
REPLACE END TREATMENT WITH MASH COMPLIANT END TERMINAL
PROP 5' HMA SW (TYP)
EROSION CONTROL (TYP)
CONSTRUCT SIDEWALK AROUND COLUMN
PROP CONCRETE BACK CURB 12" REVEAL
SEE DETAILED GRADING SHEETS FOR REDUCED ROADWAY CROSS SLOPES AND RAISED GUTTER GRADE FOR ADA COMPLIANT CROSSWALK
LIMIT OF MILL AND OVERLAY MEET EX EOP
LIMIT OF WORK
REPAVING EXISTING SIDEWALK/PAVEMENT
MINOR ACTIVITY

PLEASANT STREET
(ROUTE 122)
PC +89.84
PT +07.93

ROBERTSON ROAD
(PUBLIC - 29.5' WIDE)

BENCHMARK: 505
MAG SET ULT #95-56
1' ABOVE GROUND
EL=697.86'

BENCHMARK: 504
X-CUT SET ON GUARDRAIL
POST WEST OF MMAG #8
EL=671.59'

1926 SHLO NO. 2373
1958 SHLO NO. 4747 (SECTION 6)

N/F GLADYS NYAME PARCEL ID 40-30-9 BOOK 40104 PAGE 55 1223 PLEASANT ST
N/F TREVIS A. COLEMAN PARCEL ID 40-30-10 BOOK 55263 PAGE 255 1221 PLEASANT ST
N/F JAMES SCALLY AND JUDITH M. SCALLY PARCEL ID 40-30-11 BOOK 33648 PAGE 58 1219 PLEASANT ST
N/F JULIET KUFE PARCEL ID 40-30-8 BOOK 62843 PAGE 163 1225 PLEASANT ST
N/F TATNUCK COUNTRY CLUB PARCEL ID 47-INX-3 BOOK 1604 PAGE 581 1222 PLEASANT ST
N/F C PLEASANT LLC PARCEL ID 40-2-1 K 67469 PAGE 225 26 PLEASANT ST

LOCATION LINE OF PLAN BOOK 227 PLAN 61

CONTINUED ON SHEET NO. 31
CONTINUED ON SHEET NO. 33

DWY-36 DWY-37 DWY-38 DWY-39 DWY-40 DWY-41
PCR-42 PCR-43 PCR-44 PCR-45

WETLAND BUFFER #4

TOTAL ADDED IMPERVIOUS IN BUFFER ZONE
SEE NEXT PAGE

TOTAL ADDED PERVIOUS IN BUFFER ZONE
SEE NEXT PAGE

TOTAL WORK WITHIN BUFFER ZONE
SEE NEXT PAGE

- 100' BUFFER ZONE
- 25' RIVERFRONT AREA
- FLOOD ZONE ELEVATION
- MASS GIS FLOOD ZONE

2,243 sf

COMMONWEALTH OF MASSACHUSETTS
SAID YAHYA CIVIL NO. 55792
PROFESSIONAL ENGINEER

FOR CONSTRUCTION PROFILE:
SEE SHEET NO. 45

0 20 50 100
SCALE: 1" = 20'

610535_HD(CONSTRUCTION PLAN).DWG Plotted on 9-Jan-2026 12:30 PM

Proposal No. 610535-134928

A00860 - 73

HIGHWAY GUARD DETAILS
SEE SHEET 111

TRAFFIC SIGNAL CONDUIT
SEE SHEETS 78 - 91

WATER SUPPLY ALTERATIONS
SEE SHEET 110

DRAINAGE DETAILS
SEE SHEET 110

LEGEND:

- HOT MIX ASPHALT (HMA)
- CONCRETE
- HMA DRIVEWAY TIE-IN
- ALL DISTURBED AREAS TO BE 6" LOAMED & SEEDED; RESTORED AS GRASSED AREA
- RUMBLE STRIP

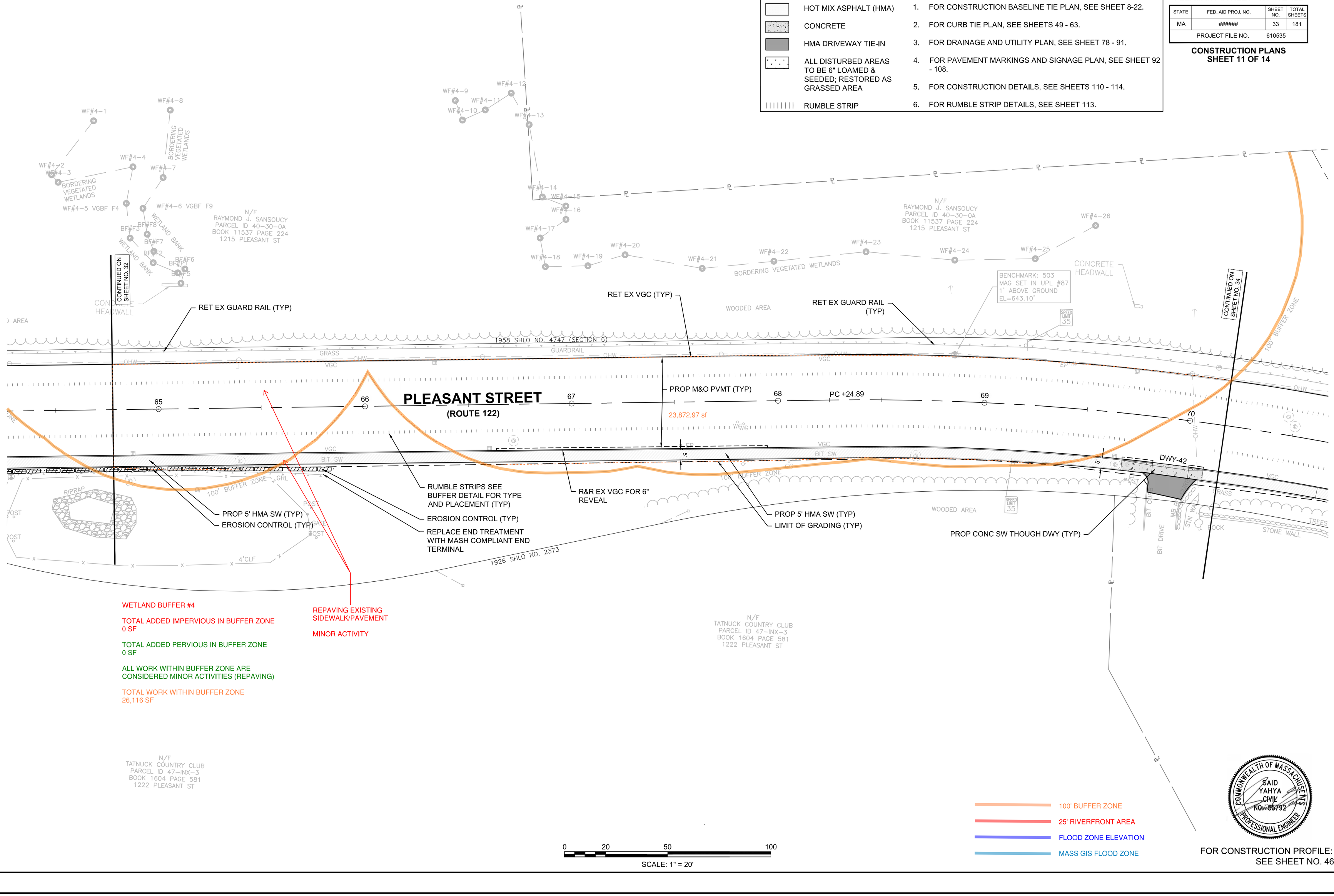
CONSTRUCTION NOTES:

1. FOR CONSTRUCTION BASELINE TIE PLAN, SEE SHEET 8-22.
2. FOR CURB TIE PLAN, SEE SHEETS 49 - 63.
3. FOR DRAINAGE AND UTILITY PLAN, SEE SHEET 78 - 91.
4. FOR PAVEMENT MARKINGS AND SIGNAGE PLAN, SEE SHEET 92 - 108.
5. FOR CONSTRUCTION DETAILS, SEE SHEETS 110 - 114.
6. FOR RUMBLE STRIP DETAILS, SEE SHEET 113.

WORCESTER
PLEASANT STREET - ROUTE 122

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	#######	33	181
PROJECT FILE NO.	610535		

CONSTRUCTION PLANS
SHEET 11 OF 14



FOR CONSTRUCTION PROFILE:
SEE SHEET NO. 46

610535_HD(CONSTRUCTION PLAN).DWG Plotted on 9-Jan-2026 12:30 PM

HIGHWAY GUARD DETAILS	TRAFFIC SIGNAL CONDUIT	WATER SUPPLY ALTERATIONS	DRAINAGE DETAILS
SEE SHEET 111	SEE SHEETS 78 - 91	SEE SHEET 110	SEE SHEET 110

LEGEND:

- HOT MIX ASPHALT (HMA)
- CONCRETE
- HMA DRIVEWAY TIE-IN
- ALL DISTURBED AREAS TO BE 6" LOAMED & SEEDED; RESTORED AS GRASSED AREA
- RUMBLE STRIP

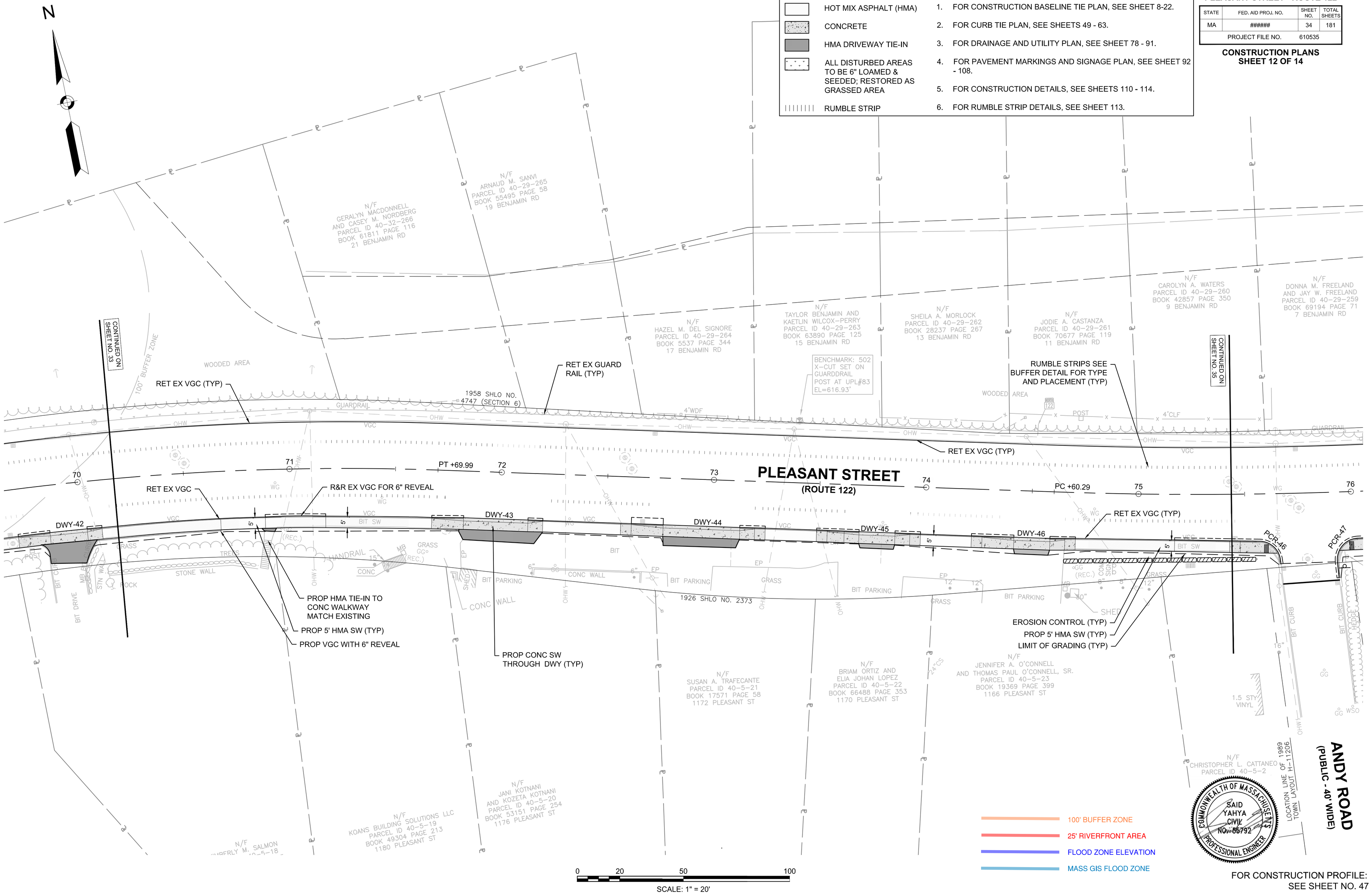
CONSTRUCTION NOTES:

1. FOR CONSTRUCTION BASELINE TIE PLAN, SEE SHEET 8-22.
2. FOR CURB TIE PLAN, SEE SHEETS 49 - 63.
3. FOR DRAINAGE AND UTILITY PLAN, SEE SHEET 78 - 91.
4. FOR PAVEMENT MARKINGS AND SIGNAGE PLAN, SEE SHEET 92 - 108.
5. FOR CONSTRUCTION DETAILS, SEE SHEETS 110 - 114.
6. FOR RUMBLE STRIP DETAILS, SEE SHEET 113.

WORCESTER
PLEASANT STREET - ROUTE 122

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	######	34	181
PROJECT FILE NO.	610535		

CONSTRUCTION PLANS
SHEET 12 OF 14



FOR CONSTRUCTION PROFILE:
SEE SHEET NO. 47

610535_HD(CONSTRUCTION PLAN).DWG Plotted on 9-Jan-2026 12:31 PM
Proposal No. 610535-134928
A00860 - 75
75

WORCESTER
PLEASANT STREET - ROUTE 122

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	#######	35	181
PROJECT FILE NO.	610535		

CONSTRUCTION PLANS
SHEET 13 OF 14

LEGEND:

- HOT MIX ASPHALT (HMA)
- CONCRETE
- HMA DRIVEWAY TIE-IN
- ALL DISTURBED AREAS TO BE 6" LOAMED & SEEDED; RESTORED AS GRASSED AREA
- RUMBLE STRIP

CONSTRUCTION NOTES:

1. FOR CONSTRUCTION BASELINE TIE PLAN, SEE SHEET 8-22.
2. FOR CURB TIE PLAN, SEE SHEETS 49 - 63.
3. FOR DRAINAGE AND UTILITY PLAN, SEE SHEET 78 - 91.
4. FOR PAVEMENT MARKINGS AND SIGNAGE PLAN, SEE SHEET 92 - 108.
5. FOR CONSTRUCTION DETAILS, SEE SHEETS 110 - 114.
6. FOR RUMBLE STRIP DETAILS, SEE SHEET 113.

INSET

VOLUME ANALYSIS
CUT: 5.72 CU YARDS
FILL: 5.24 CU YARDS
NET: 0.48 CU YARDS CUT

PLEASANT STREET
(ROUTE 122)

S OLEAN STREET
(PUBLIC - 50' WIDE)

ANDY ROAD
(PUBLIC - 40' WIDE)

9 SF PAVEMENT REMOVAL (MITIGATION)
47 SF ADDITIONAL PAVEMENT FOR ACCESSIBLE RAMP
INTERSECTION REPAVING FOR ACCESSIBILITY
PROP RRFB WITH CROSSWALK LIGHTING
PROP REPAVE EXISTING SIDEWALK
PROP 5' HMA SW (TYP)
END PROP 5' HMA SW MATCH EX
PROP LIMIT OF BRUSH CLEARING
LIMIT OF WORK
LIMIT OF MILL AND OVERLAY MEET EX EOP
PROP CONC SW THROUGH DWY (TYP)
RELOCATE EX FENCE
WIDEN SW FOR 4' MIN CLEARANCE AROUND UP
REPLACE END TREATMENT WITH MASH COMPLIANT END TERMINAL
RET EX GUARD RAIL (TYP)
PROP M&O PVMT (TYP)
R&R EX VGC FOR 6" REVEAL
RUMBLE STRIPS SEE BUFFER DETAIL FOR TYPE AND PLACEMENT (TYP)
LIMIT OF GRADING (TYP)
REPAVING ONLY
EXISTING GRADES TO BE MAINTAINED WITHIN ROADWAY AND ON SOUTH SIDEWALK
PROP CONC SW THROUGH DWY (TYP)
END PROP 5' CONC SW MATCH EX
REPAVING EXISTING SIDEWALK/DRIVEWAY /ROADWAY
MINOR ACTIVITY
LIMIT OF CONSTRUCTION
LIMIT OF MILL AND OVERLAY
RET EX VGC
8,303.87 sf
2,720.44 sf
25.7 sf
PT +19.89
PI +27.74
PI +67.26
OTHER PAVING TO BE RESURFACED ONLY
FILL (CURBING)
CUT (LEVEL LANDING)
79+41.74 OFFSET 38.27' LT 587.11 TC 586.73 BC
79+51.50 OFFSET 29.42' LT 586.56 TC/BC
79+53.09 OFFSET 24.42' LT 587.02 TC 586.52 BC
79+41.94 OFFSET 29.50' LT 586.62 TC/BC
79+48.13 OFFSET 24.45' LT 587.01 TC 586.51 BC
79+47.73 OFFSET 22.54' LT 586.98 TC 586.64 BC
79+53.06 OFFSET 21.70' LT 586.97 TC 586.52 BC
79+59.06 OFFSET 21.62' LT 586.41 TC/BC
79+66.06 OFFSET 21.52' LT 586.85 TC 586.35 BC
79+71.06 OFFSET 21.46' LT 586.85 TC 586.35 BC
PCR-46
PCR-47
PCR-48
PCR-49
PCR-50
PCR-51
DWY-47
DWY-48
DWY-49
DWY-50
CONTINUED ON SHEET NO. 34
CONTINUED ON SHEET NO. 36
1926 SHLO NO. 2373
1958 SHLO NO. 4747
BENCHMARK: 50 MAG SET IN PL 1' ABOVE GROUND EL=590.62'
N/F CAROLYN A. WATERS PARCEL ID 40-29-260 BOOK 42857 PAGE 350 9 BENJAMIN RD
N/F DONNA M. FREELAND AND JAY W. FREELAND PARCEL ID 40-29-259 BOOK 69194 PAGE 71 7 BENJAMIN RD
N/F PAMELA E. STUKOWSKI LIVING TRUST PARCEL ID 40-29-258 BOOK 70593 PAGE 155 5 BENJAMIN RD
N/F GRAHAM EVENSEN TENA SUSAN EVENSEN TENA PARCEL ID 40-29-282 BOOK 63899 PAGE 1 1153 PLEASANT ST
N/F JULIET BEM PHAM PARCEL ID 40-29-283 BOOK 48643 PAGE 233 1 OLEAN ST SOUTH
N/F DENNIS P. SEAVER AND LORI A. SEAVER PARCEL ID 40-20-210 BOOK 22731 PAGE 71 1145 PLEASANT ST
N/F CHRISTOPHER L. CATTANEO PARCEL ID 40-5-2 BOOK 62156 PAGE 282 1164 PLEASANT ST
N/F AOUDE REALTY LLC PARCEL ID 40-5-3 BOOK 49211 PAGE 240 1160 PLEASANT ST
JEWISH WAR VETERANS MEMORIAL HIGHWAY
CITY OF WORCESTER DRAINAGE EASEMENT BOOK 4146 PAGE 103
LOCATION LINE OF 1989 TOWN LAYOUT H-11206
FEMA ZONE AE BASE FLOOD ELEVATION 587'
100' BUFFER ZONE
1.5 STY VINYL
2 STY VINYL
1 STY VINYL
2 STY BRICK & VINYL
GARAGE
HEDGE
SHRUB
TREES
GRASS
BIT DRIVE
BIT SW
VGC
BIT CURB
CHAIRRAIL
4'CLF
6'VLF
2.5X3" POST
STATE HIGHWAY BEGINS
STATE HIGHWAY ENDS
RIPRAP
RIVERFRONT AREA
WETLAND #2
WETLAND #3
BF#G1
BF#G2
BF#G3
BF#G11

WETLAND BUFFER #5

TOTAL ADDED IMPERVIOUS IN BUFFER ZONE
27 SF

TOTAL ADDED PERVIOUS IN BUFFER ZONE
0 SF

TOTAL WORK WITHIN BUFFER ZONE
2,720 SF

TOTAL WORK WITHIN FLOODZONE
8,304 SF

NO WORK WITHIN RIVERFRONT AREA

100' BUFFER ZONE
25' RIVERFRONT AREA
FLOOD ZONE ELEVATION
MASS GIS FLOOD ZONE

FEMA BASE ELEVA

SCALE: 1" = 20'

FOR CONSTRUCTION PROFILE:
SEE SHEET NO. 48

COMMONWEALTH OF MASSACHUSETTS
SAID YAHYA CIVIL NO. 55792
PROFESSIONAL ENGINEER

610535_HD(CONSTRUCTION PLAN).DWG Plotted on 9-Jan-2026 12:31 PM

Proposal No. 610535-134928

A00860 - 76

HIGHWAY GUARD DETAILS
SEE SHEET 111

TRAFFIC SIGNAL CONDUIT
SEE SHEETS 78 - 91

WATER SUPPLY ALTERATIONS
SEE SHEET 110

DRAINAGE DETAILS
SEE SHEET 110

LEGEND:

- HOT MIX ASPHALT (HMA)
- CONCRETE
- HMA DRIVEWAY TIE-IN
- ALL DISTURBED AREAS TO BE 6" LOAMED & SEEDED; RESTORED AS GRASSED AREA
- RUMBLE STRIP

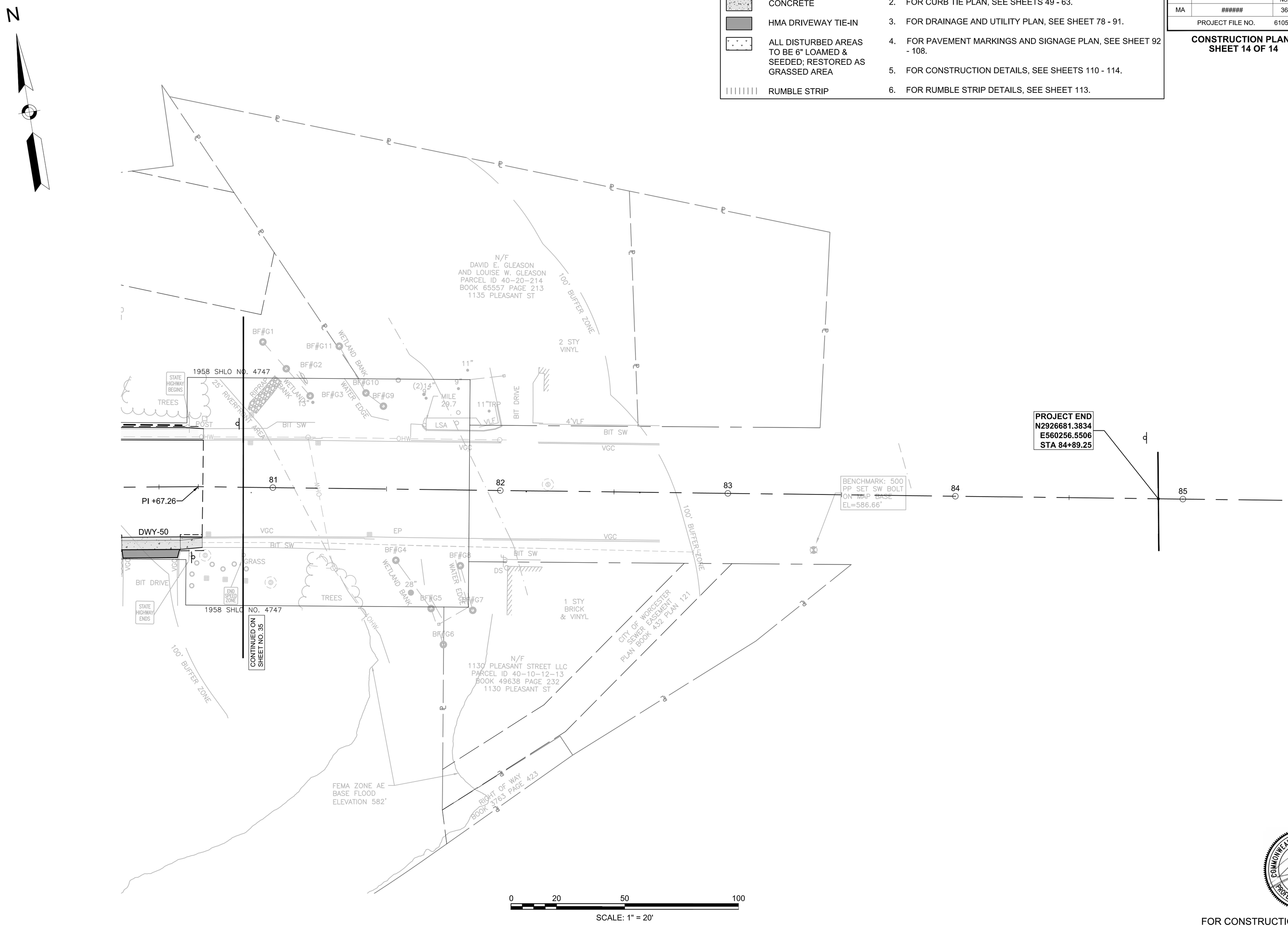
CONSTRUCTION NOTES:

1. FOR CONSTRUCTION BASELINE TIE PLAN, SEE SHEET 8-22.
2. FOR CURB TIE PLAN, SEE SHEETS 49 - 63.
3. FOR DRAINAGE AND UTILITY PLAN, SEE SHEET 78 - 91.
4. FOR PAVEMENT MARKINGS AND SIGNAGE PLAN, SEE SHEET 92 - 108.
5. FOR CONSTRUCTION DETAILS, SEE SHEETS 110 - 114.
6. FOR RUMBLE STRIP DETAILS, SEE SHEET 113.

WORCESTER
PLEASANT STREET - ROUTE 122

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	######	36	181
PROJECT FILE NO.	610535		

CONSTRUCTION PLANS
SHEET 14 OF 14



COMMONWEALTH OF MASSACHUSETTS
SAID YAHYA CIVIL
No. 55792
PROFESSIONAL ENGINEER

FOR CONSTRUCTION PROFILE:
SEE SHEET NO. 48

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Stormwater Management Report

Pedestrian and Bicycle Improvements on Pleasant Street

MassDOT Project #610535
Worcester, Massachusetts

PREPARED FOR

massDOT

10 Park Plaza
Boston, MA 02116

PREPARED BY

Jacobs

Jacobs
120 St. James Avenue
Boston, MA 02116

February 2026

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1

Introduction

This Stormwater Management Report has been prepared to demonstrate compliance with the Massachusetts Stormwater Management Standards (the Standards) in accordance with the Massachusetts Wetlands Protection Act Regulations (310 CMR 10.00) and Water Quality Certification Regulations (314 CMR 9.00). Appendix A includes a completed Massachusetts Department of Environmental Protection (MassDEP) Checklist for Stormwater Report, stamped by a Massachusetts registered professional engineer.

The Project follows the guidance presented in the MassDOT Stormwater Design Guide (SDG), and stormwater management systems are designed in accordance with the Standards.

The following MassDOT standard methodologies are being employed in this project:

- Use of the Macro Approach to meet requirements on a project-wide scale.

2

Project Summary

The Applicant, MassDOT, is proposing Project 610535 to construct improvements along Route 122 (Pleasant Street) in Worcester MA. The Project shall improve the safety of Route 122 (Pleasant Street) by restriping the roadway to provide buffered bicycle lanes in each direction, constructing approximately 4,075 feet (0.77 miles) of new sidewalk along the north side of the roadway, and installing new rectangular rapid flashing beacons at several crosswalk locations to meet MassDOT's Healthy Transportation Policy. The roadway pavement shall be milled and overlaid with hot mix asphalt. At a number of side street intersections, side street alignments and curb radii shall be reset to promote safer crossings for pedestrians. The total project length is approximately 1.40 miles.

The Project is needed because of the lack of bicycle and pedestrian facilities through this corridor. Pleasant Street currently has two travel lanes in the westbound direction and one travel lane in the eastbound direction. Shoulder widths vary between 2 feet and 4 feet in width, which is unsuitable for safe bicycle use in consideration of the traffic volume. In addition, there is no sidewalk on the north side of Pleasant Street, the existing sidewalk does not meet current day ADA standard, and there are only four existing crosswalk locations.

The project will not widen Pleasant Street; the existing curbs will remain in their current location. The proposed restriping converts the westbound direction from 2 travel lanes to a single travel lane.

The proposed improvements shall result in an increase of impervious area, which is primarily attributed to the addition of sidewalks. The overall catchment area remains the same in the existing and proposed conditions. The overall areas and impervious surface cover areas are summarized in Table 1 below.

Table 1 Change in Impervious Surface Cover

Exist. Project Catchment Area (SF)	Exist. Impervious Surface Cover (SF)	Prop. Project Catchment Area (SF)	Prop. Impervious Surface Cover (SF)	Change in Impervious Cover (SF)	Percent Change in Impervious Cover
393,548	372,527	393,548	388,093	+15,566	+4.18%

Existing flow patterns and stormwater drainage networks within the Project limits have been maintained. The project proposes minor improvements to the existing stormwater

infrastructure within the project limits, including the installation of deep sump (4-ft) catch basins at several side street intersections where the curbline is modified.

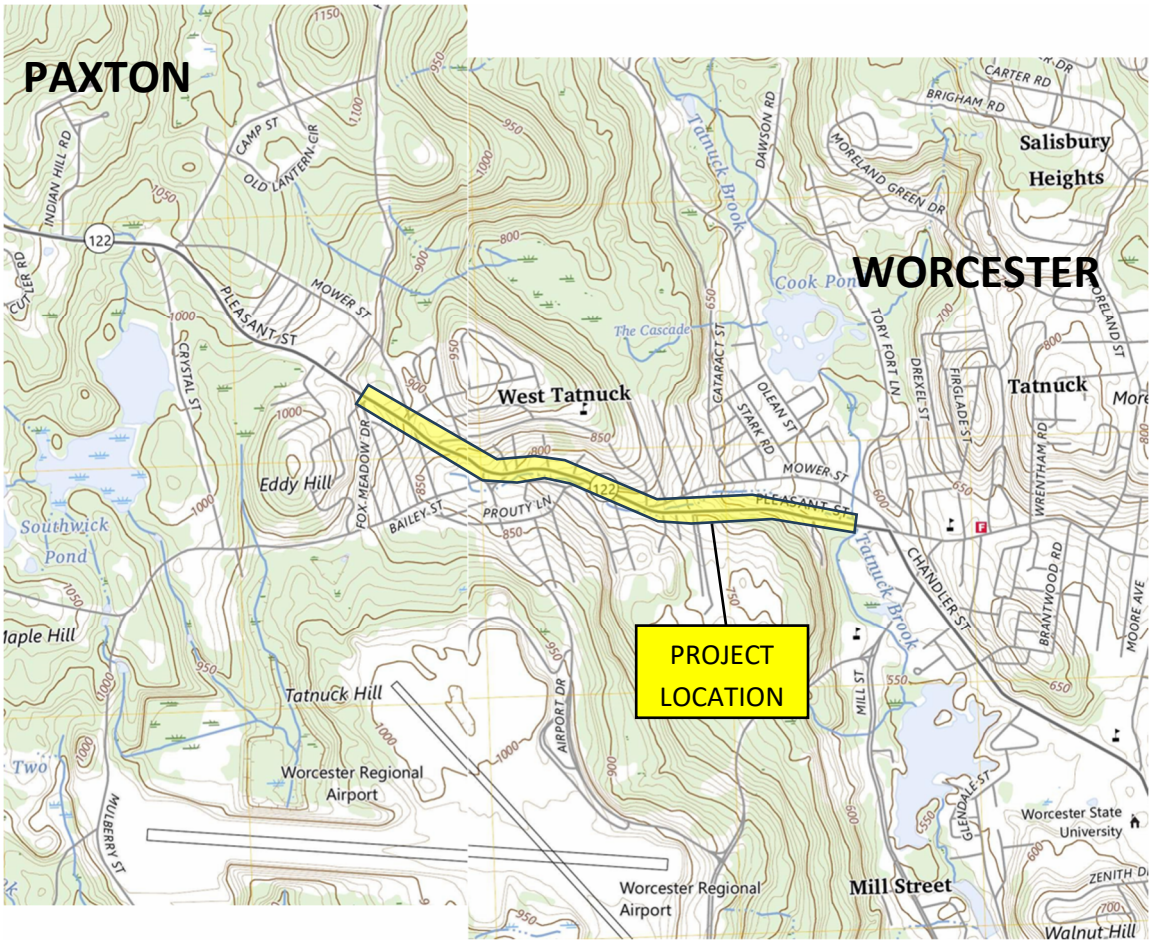
The following is a summary of key areas and how they are affected by the project:

- The project is not located within a Zone II or Interim Wellhead Protection Area.
- The proposed work does not impact the FEMA flood zone along Tatnuck Brook.
- No wetland resource areas are impacted by the project.
- There are no Land Uses with Higher Potential Pollutant Loads (LUHPPLs) within the project area.

The purpose of this report is to provide a summary of the Project's stormwater management approach and compliance with the Massachusetts Stormwater Standards. This project is considered to be a redevelopment project. The proposed work is located in a previously developed area and will reconstruct existing sidewalks, construct new sidewalks, and mill and overlay the existing roadway pavement. No roadway widening is proposed.

It was determined that the Project will meet Standards 1, 5, 6, 7, 8, 9, and 10 of the MA Stormwater Standards. Standards 2, 3, and 4 will be met to the maximum extent practicable (MEP).

Figure 1 Locus Figure



3

Existing Conditions

The existing total pavement width of Pleasant Street is approximately 44 feet. Shoulder widths vary between 2 and 4 feet in width. The roadway is curbed along both sides. A paved sidewalk is present along the south side of Pleasant Street.

Within the project limits, the existing Pleasant Street corridor is largely defined by residential development. The density of development is greater at the east end of the project. The topography is hilly, with a downhill slope from the west end of the project to the east end.

Stormwater runoff is collected via catch basins for the entire length of the project. The stormwater is conveyed through closed systems to various discharge points listed below. There is one Stormwater Control Measure (SCM) located along the south side of Pleasant Street.

12 Analysis Points (APs) have been identified for this project and are described below:

- AP-1: A 24-inch pipe connection to an existing 72-inch drainage pipe between Bailey Road and Airport Drive (Sta. 32+00 RT+/-).
- AP-2: A 12-inch pipe outlet at a headwall adjacent to a 72-inch pipe outlet at a wetland resource area on the south side of Pleasant Street (Sta. 36+80 RT+/-).
- AP-3: A 12-inch pipe outlet in a headwall to the wetland resource area on the south side of Pleasant Street (Sta. 38+50 RT+/-).
- AP-4: A 12-inch pipe outlet in a headwall to the wetland resource area on the south side of Pleasant Street (Sta. 42+40 RT+/-).
- AP-5: A 24-inch pipe connection to an existing off-site storm drainage system in a drainage easement (Sta. 52+55 RT+/-).
- AP-6: A 12-inch pipe connection to an existing off-site storm drainage system on the north side of Pleasant Street (Sta. 54+75 LT+/-).
- AP-7: A 24-inch pipe connection to an existing off-site storm drainage system on the north side of Pleasant Street (Sta. 59+60 LT+/-).
- AP-8: An 18-inch pipe outlet into an existing SCM on the south side of Pleasant Street (Sta. 64+50 RT+/-).
- AP-9: An 18-inch pipe outlet in a headwall near a wetland resource area on the north side of Pleasant Street (Sta. 69+70 LT+/-).

- AP-10: A 12-inch pipe connection to an existing off-site storm drainage system on the north side of Pleasant Street (Sta. 72+75 LT+/-).
- AP-11: A 12-inch pipe connection to an existing off-site storm drainage system on the south side of Pleasant Street near Tatnuck Brook (Sta. 80+50 RT+/-).

Table 2 presents the existing drainage areas and their characteristics. Areas were developed using AutoCAD and are included in Appendix C. Appendix F shows existing drainage patterns and drainage area delineations contributing to each analysis point.

Table 2 Existing Drainage Areas

Analysis Point	Drainage Area*	Area (acres)	Curve Number
AP-1	1S	2.889	97
AP-2	2S	0.253	97
AP-3	3S	0.513	96
AP-4	4S	0.473	95
AP-5	5S	1.332	95
AP-6	6S	0.344	95
AP-7	7S	0.389	93
AP-8	8S	0.807	94
AP-9	9S	0.649	98
AP-10	10S	0.353	98
AP-11	11S	1.033	98
	TOTAL=	**9.035**	

*Label assigned for HydroCAD modeling

Key features in and around the project area include:

- The project is not located within a Zone II or Interim Wellhead Protection Area.
- The proposed work does not impact the FEMA flood zone along Tatnuck Brook.
- No wetland resource areas are impacted by the project.
- There are no Land Uses with Higher Potential Pollutant Loads (LUHPPLs) within the project area.

According to the most recently issued Flood Insurance Rate Maps, Map Nos. 25027C0595F and 25027C0613E, produced by the Federal Emergency Management Agency (FEMA), a portion of the project area is located within the floodplain along Tatnuck Brook. The proposed work within the floodplain includes reconstructing existing sidewalks and driveways, as well as roadway pavement milling and overlay. The activities will not alter the existing ground elevations nor require placement of fill materials. No impact to the floodplain is anticipated.

According to the Natural Resources Conservation Service soil survey for Worcester County, approximately 46.1% of the project area is Paxton fine sandy loam with a hydrologic soil group

(HSG) rating of C. The other soil types found within the project area include Woodbridge fine sandy loam (HSG C/D), Hinckley-Urban land complex (HSG A), and Urban land. Appendix B provides detailed soils information, including the NRCS soil survey data for the project area.

One unnamed intermittent stream was delineated in several different locations within the project area. There is one perennial stream, Tatnuck Brook. Wetland resource areas are listed in Table 3.

Table 3 Wetland Resource Areas

Wetland Resource Area	Wetland Type	Description
Intermittent Stream A, B, D	Intermittent Stream	An intermittent stream crosses under Pleasant Street in culverts in several locations and flows through a closed pipe drainage system in certain segments.
Wetland 4	BVW	Wetland 4 was delineated in the wooded area on the north side of Pleasant Street between Mower Street and Pleasant Street.
Perennial Stream G	Perennial Stream	Perennial Stream G (Tatnuck Brook) was delineated at the eastern end of the project where Pleasant Street cross over Tatnuck Brook.

Figure 2 Existing Drainage Patterns

See Appendix F.

Figure 3 FEMA Flood Insurance Rate Map

See Appendix B.

Figure 4 NRCS Soils Information

See Appendix B.

4

Proposed Conditions

The project has been designed to comply with the requirements for a "Redevelopment Project".

The proposed work includes:

- Milling and paving the existing roadway surface.
- Construction of approximately 4,075 feet (0.77 miles) of new sidewalk.
- Reconstruction of approximately 6,760 feet (1.28 miles) of existing sidewalk.
- Installation of new pavement markings and signage.

The proposed drainage work for this project includes the installation of three new, deep sump catch basins.

Table 4 provides existing and proposed impervious areas for the project.

Table 4 Impervious Area

Condition	Impervious Area (ac)
Existing	8.552
Proposed	8.909
Net	**+0.357**

The Project proposes to retain all existing stormwater outlet locations. No new outlets are proposed. The analysis points for the proposed conditions are the same as those identified for the existing conditions and are described in Section 3 of this report.

The opportunities to construct additional SCMs or incorporate Low Impact Development (LID) techniques are extremely limited, primarily due to the existing topography and limited right-of-way width. There are also numerous locations with underground and/or overhead utilities along the edges of the roadway that preclude SCMs and LID techniques. Stormwater Alternatives Analysis Plans, which show the site constraints and opportunities for SCMs and LID techniques, are included in Appendix F.

HydroCAD models for the existing and proposed conditions have been provided in Appendix D. Plans depicting catchment areas within the Project limits are included in Appendix F.

Efforts have been made during the design development process to limit the footprint of disturbance. The intent is to preserve as many of the existing trees and natural vegetation as possible. For much of the project, the proposed limit of work has been maintained in close proximity to the back of sidewalk and edge of roadway.

The proposed project is not located within a Zone II or Interim Wellhead Protection Area, and there are no LUHPPLs located within the project limits. The required Water Quality Volume (WQV) is 1/2-inch over the impervious area.

The project does not impact any wetland resource areas, but does require work within BVW 100 ft buffer zone and 200 ft Riverfront areas.

Table 5 presents the proposed drainage areas and their characteristics. Areas were developed using AutoCAD and are included in Appendix C. Figures in Appendix F show proposed drainage patterns and drainage area delineations contributing to each analysis point.

Figure 5 Proposed Drainage Patterns

See Appendix F.

Table 5 Proposed Drainage Areas

Analysis Point	Drainage Area*	Area (acres)	Curve Number
AP-1	1S	2.889	97
AP-2	2S	0.253	96
AP-3	3S	0.513	97
AP-4	4S	0.473	98
AP-5	5S	1.332	98
AP-6	6S	0.344	98
AP-7	7S	0.389	98
AP-8	8S	0.807	98
AP-9	9S	0.649	98
AP-10	10S	0.353	98
AP-11	11S	1.033	98
	TOTAL=	**9.035**	

*Label assigned for HydroCAD modeling

5

Impaired Waters and TMDLs

As described under the Proposed Conditions section, a portion of the Project discharges to Tatnuck Brook, which is impaired based on the MassDEP Year 2022 Integrated List of Waters, also known as the 303(d) list.

Table 6 lists the 303(d) category and impairments listed in MassDEP Year 2022 Integrated List of Waters. MassDOT is expecting to receive a Transportation Separate Storm Sewer System (TS4) Permit from EPA, which will require that pollutant reductions presented in the TMDL be met on the watershed scale. As a result, the TMDL reductions do not need to be met by MassDOT on a project-by-project basis, but rather, MassDOT strives to make incremental progress towards achieving the required TMDL pollutant reductions with each project.

Table 6 Impaired Waters and TMDL Information

Water Body	303(d) Category	303(d) Impairments
Tatnuck Brook (MA51-15)	5	Fanwort* Flow Regime Modification* Benthic Macroinvertabrates Escherichia Coli (E. Coli) Sedimentation/Siltation

*TMDL not required (Non-pollutant)

TMDLs for the Tatnuck Brook are listed in the Massachusetts Department of Environmental Protection December 2024 *Final Massachusetts Statewide Total Maximum Daily Load for Pathogen-Impaired Waterbodies, Appendix J: Blackstone River Basin.*

6

Stormwater Management Standards

This Project is a Redevelopment Project. The project is located in a previously developed area and will reconstruct existing sidewalks, construct new sidewalks, and mill and overlay the existing roadway pavement. No roadway widening is proposed. Proposed drainage work includes three new catch basins with a 4-foot-deep sump for improved water quality. The following Stormwater Management Standards are met: Standards 1, 5, 6, 7, 8, 9, and 10. Standards 2, 3, and 4 are met only to the maximum extent practicable.

Standard 1: No New Untreated Discharges

No new stormwater conveyances may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.

No new stormwater outfalls are proposed for the Project. The Project does not propose to construct any new untreated stormwater conveyances or discharges that may cause erosion in wetlands or waters of the Commonwealth. The Project is a Redevelopment project, and consists of milling and hot mix asphalt overlay of the pavement surface, reconstructing existing sidewalks, and constructing new sidewalks to eliminate gaps in the pedestrian network.

Stormwater runoff within the project limits is currently collected via catch basins and closed drainage systems. All of the existing stormwater outlets are located beyond the project limits and will not be modified as part of this project.

Standard 2: Peak Rate Attenuation

Stormwater management systems shall be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates. This Standard may be waived for discharges to land subject to coastal storm flowage as defined in 310 CMR 10.04.

As a Redevelopment Project, the project is required to meet Standard 2 only to the maximum extent practicable. For this project, the post-development peak discharge rates are slightly higher than the pre-development peak discharge rates due to the construction of new sidewalk.

HydroCAD modeling software was used to model the existing and proposed conditions for the 2-year, 10-year, and 100-year storm events. The outputs from the HydroCAD analyses are included in Appendix D.

Rainfall depths for the 2-year, 10-year, and 100-year 24-hour storm events are based on rainfall distributions from NOAA Atlas 14 and are shown in Table 7, below.

Table 7 Rainfall Depths (in)

Design Storm Event	Rainfall Depth (in)
2-year	*3.13*
10-year	*4.84*
100-year	*7.56*

Tables 8.1, 8.2, and 8.3 provide a summary of peak flow rates for each design point under existing and proposed conditions.

Table 8.1 2-Year Peak Discharge Rates (cfs)

Analysis Point	Existing Peak Discharge (cfs)	Proposed Peak Discharge (cfs)	Net Change Peak Discharge (cfs)
AP-1	7.97	7.97	0.00
AP-2	0.75	0.74	-0.01
AP-3	1.49	1.52	+0.03
AP-4	1.35	1.42	+0.07
AP-5	3.88	4.09	+0.21
AP-6	1.00	1.06	+0.06
AP-7	1.05	1.17	+0.12
AP-8	2.23	2.42	+0.19
AP-9	1.95	1.95	0.00
AP-10	1.08	1.08	0.00
AP-11	3.06	3.06	0.00
		Project Total	+0.67

Table 8.2 10-Year Peak Discharge Rates (cfs)

Analysis Point	Existing Peak Discharge (cfs)	Proposed Peak Discharge (cfs)	Net Change Peak Discharge (cfs)
AP-1	12.51	12.51	0.00
AP-2	1.18	1.17	-0.01
AP-3	2.36	2.39	+0.03
AP-4	2.16	2.22	+0.06
AP-5	6.21	6.37	+0.16
AP-6	1.60	1.64	+0.04
AP-7	1.73	1.82	+0.09
AP-8	3.62	3.76	+0.14
AP-9	3.04	3.04	0.00
AP-10	1.69	1.69	0.00
AP-11	4.77	4.77	0.00
		Project Total	+0.51

Table 8.3 100-Year Peak Discharge Rates (cfs)

Analysis Point	Existing Peak Discharge (cfs)	Proposed Peak Discharge (cfs)	Net Change Peak Discharge (cfs)
AP-1	19.68	19.68	0.00
AP-2	1.86	1.85	-0.01
AP-3	3.74	3.75	+0.01
AP-4	3.43	3.47	+0.04
AP-5	9.86	9.98	+0.12
AP-6	2.55	2.58	+0.03
AP-7	2.78	2.86	+0.08
AP-8	5.79	5.90	+0.11
AP-9	4.76	4.76	0.00
AP-10	2.64	2.64	0.00
AP-11	7.47	7.47	0.00
		Project Total	+0.38

For this project, the post-development peak discharge rates are higher than existing at all of the analysis points. The minor increases can be attributed to the addition of new sidewalks. The scope of work for this project does not include modifying the existing stormwater systems with the exception of several new deep sump catch basins as mentioned previously.

The opportunities to construct SCMs or incorporate Low Impact Development (LID) techniques to attenuate peak discharge rates within the project area are extremely limited, primarily due to the existing topography, limited right-of-way width, roadside development, and presence

of underground and overhead utilities. Stormwater Alternatives Analysis Plans, which show the project site constraints for SCMs and LID techniques, are included in Appendix F.

Standard 3: Recharge

Loss of annual recharge to groundwater shall be eliminated or minimized through the use of infiltration measures, including environmentally sensitive site design, low impact development techniques, stormwater best management practices, and good operation and maintenance. At a minimum, the annual recharge from the post-development site shall approximate the annual recharge from pre-development conditions based on soil type. This Standard is met when the stormwater management system is designed to infiltrate the required recharge volume as determined in accordance with the Massachusetts Stormwater Handbook.

As a Redevelopment Project, the project is required to meet Standard 3 only to the maximum extent practicable. For this project, the required recharge volume is greater than the provided recharge volume. Table 9 provides the required recharge volume for the Project.

Table 9 Required Recharge Volume for Project

	HSG A	HSG B	HSG C	HSG D	Total
Existing Impervious (sq. ft.)	135,444	0	237,083	0	372,527
Proposed Impervious (sq. ft.)	145,732	0	242,361	0	372,527
New Impervious Area (sq. ft.)	10,288	0	5,278	0	15,566
Target depth, F (in)	0.60	0.35	0.25	0.10	-
Required Recharge Volume, ReV (cf)	**514**	**0**	**110**	**0**	**624**

ReV = F (ft) x Impervious Area (sf)

The Macro Approach is being used for compliance with this standard due to constraints at the project site. The required recharge volume for this project is 624 cubic feet.

Table 10 shows the recharge volumes required and provided for each Analysis Point.

Table 10 Provided Recharge Volumes at Each Analysis Point

Analysis Point	SCM	New Impervious Area (SF)	Required Recharge ReV Volume (CF)	*Provided Recharge Volume (CF)
AP-1	-	+3,509	73	0
AP-2	-	-429	-9	0
AP-3	-	+1,502	31	0
AP-4	-	+1,333	67	0
AP-5	-	+3,468	173	0
AP-6	-	+984	49	0
AP-7	-	+1,670	84	0
AP-8	-	+2,833	142	0
AP-9	-	+117	2	0
AP-10	-	+62	1	0
AP-11	-	+517	11	0

Analysis Point	SCM	New Impervious Area (SF)	Required Recharge ReV Volume (CF)	*Provided Recharge Volume (CF)
Project Total		**+15,566**	**624**	**0**

The project will not meet the required recharge volume. The scope of work for this project does not include modifying the existing stormwater systems with the exception of three new catch basins as mentioned previously.

The opportunities to construct SCMs or incorporate Low Impact Development (LID) techniques to recharge groundwater within the project area are extremely limited, primarily due to the existing topography, limited right-of-way width, roadside development, and presence of underground and overhead utilities. Stormwater Alternatives Analysis Plans, which show the site constraints and opportunities for SCMs and LID techniques, are included in Appendix F.

Standard 4: Water Quality Treatment

Stormwater management systems shall be designed to remove 80% of the average annual post-construction load of Total Suspended Solids (TSS). This Standard is met when:

- *Suitable practices for source control and pollution prevention are identified in a long-term pollution prevention plan, and thereafter are implemented and maintained.*
- *Structural stormwater best management practices are sized to capture the required water quality volume determined in accordance with the Massachusetts Stormwater Handbook.*
- *Pretreatment is provided in accordance with the Massachusetts Stormwater Handbook.*

As a Redevelopment Project, the project is required to meet the pretreatment and structural stormwater best management practice requirements of Standard 4 to the maximum extent practicable.

The three new catch basins shall have a deep (4') sump.

No part of the project area is located within a Zone II or Interim Wellhead Protection Area. There are no Land Uses with Higher Potential Pollutant Loads (LUHPPLs) in or near the project area. The water quality volume shall defined as 0.5 inches of runoff from impervious areas with no LUHPPLs. Appendix C contains water quality volume calculations.

Table 11 provides the water quality volume for each analysis point.

Table 11 WQV at Each Analysis Point

Analysis Point	SCM	New Impervious Area (sf)	Pre-treatment	WQV Required (cf)	WQV Provided (cf)	Meets Total WQV	Meets Required WQV for New IA
AP-1	-	+3,509	-	146	0	No	No
AP-2	-	-429	-	-18	0	No	No
AP-3	-	+1,502	-	63	0	No	No
AP-4	-	+1,333	-	56	0	No	No
AP-5	-	+3,468	-	145	0	No	No
AP-6	-	+984	-	41	0	No	No
AP-7	-	+1,670	-	70	0	No	No
AP-8	-	+2,833	-	118	0	No	No
AP-9	-	+117	-	5	0	No	No
AP-10	-	+62	-	3	0	No	No
AP-11	-	+517	-	22	0	No	No
Project Total		**+15,566**		**651**	**0**	**No**	**No**

The goal of 80% TSS removal for the stormwater systems will not be met. The scope of work for this project does not include modifying the existing stormwater systems with the exception of the new catch basins noted previously.

This project does not propose to construct any new SCMs. The scope of the project does not alter the existing curblines along Pleasant Street, so the existing catch basins will be retained. There is an existing SCM that was constructed circa 2018. The exact function of the SCM is not known, but it does appear to be some type of detention pond with sediment forebay. The proposed work will not modify or impact this existing SCM.

The opportunities to construct SCMs or incorporate Low Impact Development (LID) techniques to provide stormwater quality treatment within the project area are extremely limited, primarily due to the existing topography, limited right-of-way width, roadside development, and presence of underground and overhead utilities. Stormwater Alternatives Analysis Plans, which show the site constraints for SCMs and LID techniques, are included in Appendix F.

For MassDOT facilities, Long-Term Pollution Prevention Plans (LTPPPs) are implemented at a programmatic level through MassDOT's highway operation and maintenance program by district. Appendix E includes the LTPPP for this project.

Standard 5: Land Uses with Higher Potential Pollutant Loads

For Land Uses with Higher Potential Pollutant Loads (LUHPPLs), source control and pollution prevention shall be implemented in accordance with the Massachusetts Stormwater Handbook to eliminate or reduce the discharge of stormwater runoff from such land uses to the maximum extent practicable. If through source control and/or pollution prevention all LHPPLs cannot be completely protected from exposure to rain, snow, snow melt, and stormwater runoff, the proponent shall use the specific structural stormwater BMPs determined by the Department to be suitable for such uses as provided in the Massachusetts Stormwater Handbook. Stormwater discharges from LUHPPLs shall also comply with the requirements of the Massachusetts Clean Waters Act, M.G.L. c. 21, §§ 26-53 and the regulations promulgated thereunder at 314 CMR 3.00, 314 CMR 4.00 and 314 CMR 5.00.

There are no LUHPPLs located within the project limits.

Standard 6: Critical Areas

Stormwater discharges within the Zone II or Interim Wellhead Protection Area of a public water supply and stormwater discharges near or to any other critical area require the use of the specific source control and pollution prevention measures and the specific structural stormwater best management practices determined by the Department to be suitable for managing discharges to such areas as provided in the Massachusetts Stormwater Handbook. A discharge is near a critical area if there is a strong likelihood of a significant impact occurring to said area, taking into account site-specific factors. Stormwater discharges to Outstanding Resource Waters and Special Resource Waters shall be removed and set back from the receiving water or wetland and receive the highest and best practical method of treatment. A "stormwater discharge" as defined in 314 CMR 3.04(2)(a)1 or (b), to an Outstanding Resource Water or Special Resource Water shall comply with 314 CMR 3.00 and 314 CMR 4.00. Stormwater discharges to a Zone I or Zone A are prohibited unless essential to the operation of a public water supply.

The proposed project is not located within a Zone II or Interim Wellhead Protection Area.

Standard 7: Redevelopment

A redevelopment project is required to meet the following Stormwater Management Standards only to the maximum extent practicable: Standard 2, Standard 3, and the pretreatment and structural best management practice requirements of Standards 4, 5, and 6. Existing stormwater discharges shall comply with Standard 1 only to the maximum extent practicable. A redevelopment project shall also comply with all other requirements of the Stormwater Management Standards and improve existing conditions.

The Project is a redevelopment project. In accordance with Massachusetts Stormwater Handbook, a redevelopment project is defined to include maintenance and improvement of existing roadways, including widening less than a single lane, adding shoulders, correcting substandard intersections, improving existing drainage systems, and repaving. This project is located in a previously developed area and will reconstruct existing sidewalks, construct new sidewalks, and mill and overlay the existing roadway pavement. No roadway widening is proposed.

A redevelopment project is required to meet the following Stormwater Management Standards only to the maximum extent practicable: Standard 2, Standard 3, and the pretreatment and structural best management practice requirements of Standards 4, 5, and 6. A redevelopment project shall also comply with all other requirements of the Stormwater Management Standards and improve existing conditions.

Standard 8: Erosion and Sediment Control

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

The Project complies with Standard 8. A Stormwater Pollution Prevention Plan in accordance with the regulations of the EPA Construction General Permit shall be prepared and submitted by the Contractor prior to construction activities. The implementation of erosion and sediment (E&S) controls during construction is considered a standard practice for all MassDOT projects. E&S controls will be installed before any land disturbance begins for the Project and will remain in place for the duration of the Project. The E&S controls for the Project are shown on the project plans and include compost filter tubes, and filters at drain inlets. Erosion and sedimentation controls are proposed throughout the Project limits to prevent sediment and other suspended solids from migrating into the existing drainage infrastructure and downgradient wetland resource areas. The Contractor will be alerted that control of erosion and sedimentation is critically important in and around the areas indicated on the plans and adjacent to jurisdictional resource areas. The Contractor will implement the erosion and sedimentation controls as indicated on the plans. The Contractor will also be alerted to the fact that field conditions may warrant additional protection measures to comply with the regulations. It is the intention that the contractor will replace erosion controls as needed or at the direction of permit issuing authorities, MassDOT or the Environmental Monitor, but not less than twice a year.

Erosion controls shall consist of compost filter tubes and catch basin sedimentation collection sack. No hay bales shall be used at any time on this project. The erosion and sedimentation control measures will be constructed in accordance with the Massachusetts Erosion and Sediment Control Guidelines for Urban and Suburban Areas, March 1997, and the U.S.D.A. SCS's Erosion and Sediment control in the Site Development, Massachusetts Conservation Guide, September 1983.

Temporary erosion and sedimentation control measures shall be installed prior to the commencement of any site work, maintained during construction, and shall remain in place until the site work is completed, and ground cover is established (at least 75% uniform coverage by new seedlings). All erosion and sedimentation control measures shall be maintained in effective condition throughout the construction period. The contractor shall inspect the erosion controls daily and clean accumulated materials from behind them as necessary. All erosion and sedimentation control measures found to need repair or replacement shall be immediately corrected. Any sediment removed from control structures shall be disposed of in an appropriate manner. No equipment or material of any kind shall be stockpiled or deposited in any regulated area.

Stockpiled soil within jurisdictional areas shall be surrounded with siltation fences to prevent and control siltation and erosion. Stockpiles that will remain exposed for more than 30 days shall be stabilized with mulch or seeded for temporary vegetative cover. All disturbed areas that remain exposed or undisturbed for a period of fourteen days or longer shall be stabilized with mulch or seeded for temporary vegetative cover.

The Contractor shall inspect all portions of the site in anticipation of rainfall events to determine if site grading is sufficient to prevent erosion of slopes and/or the transportation of sediments to wetlands or watercourses within the project limits. All disturbed earth slopes shall be stabilized with permanent vegetative cover as soon as possible. There shall be no direct discharge from dewatering operations into any wetland, watercourse or drainage system unless allowed by regulatory permits.

Standard 9: Operation and Maintenance Plan

A long-term operation and maintenance plan shall be developed and implemented to ensure that stormwater management systems function as designed.

MassDOT O&M plans are implemented on a programmatic level by each MassDOT district. Each MassDOT district office is responsible for providing operation and maintenance for the MassDOT stormwater management systems within their respective jurisdictions. Appendix E includes the O&M Plan for this project.

Standard 10: Prohibition of Illicit Discharges

All illicit discharges to the stormwater management system are prohibited.

Illicit Discharge Statement

The project's stormwater management system, as shown on the plans submitted with this report, have been designed in full compliance with Standard 10. The project area does not have any known illicit connections. Any illicit connections to the stormwater management system found in the project limit of work during construction will be removed and/or resolved through MassDOT's Illicit Discharge Detention and Elimination (IDDE) Program. The Long-Term Pollution Prevention Plan, provided in Appendix E, includes measures to prevent illicit discharges.

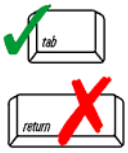
Appendix A: MassDEP Checklist for Stormwater Report

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

Checklist for Stormwater Report

A. Introduction

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



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

The Stormwater Report must include:

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

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

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

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

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

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

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

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

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

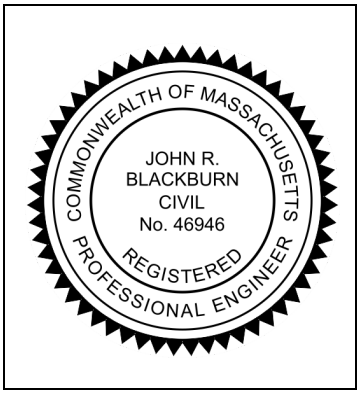
Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the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

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

Registered Professional Engineer's Certification

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

Registered Professional Engineer Block and Signature



Signature and Date

Checklist

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

☐ New development

☒ Redevelopment

☐ Mix of New Development and Redevelopment

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

Checklist for Stormwater Report

Checklist (continued)

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

- [X] No disturbance to any Wetland Resource Areas
- [ ] Site Design Practices (e.g. clustered development, reduced frontage setbacks)
- [ ] Reduced Impervious Area (Redevelopment Only)
- [X] Minimizing disturbance to existing trees and shrubs
- [ ] LID Site Design Credit Requested:
  - [ ] Credit 1
  - [ ] Credit 2
  - [ ] Credit 3
- [ ] Use of "country drainage" versus curb and gutter conveyance and pipe
- [ ] Bioretention Cells (includes Rain Gardens)
- [ ] Constructed Stormwater Wetlands (includes Gravel Wetlands designs)
- [ ] Treebox Filter
- [ ] Water Quality Swale
- [ ] Grass Channel
- [ ] Green Roof
- [ ] Other (describe): _____

Standard 1: No New Untreated Discharges

- [X] No new untreated discharges
- [ ] Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth
- [ ] Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.

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

Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

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

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

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

Standard 3: Recharge

☒ Soil Analysis provided.

☒ Required Recharge Volume calculation provided.

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

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

☐ Static ☐ Simple Dynamic ☐ Dynamic Field[1]

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

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

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

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

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

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

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

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

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

Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

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

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

Standard 4: Water Quality

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

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

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

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

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

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

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

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

Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

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

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

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

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

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

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

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

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

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

☐ All exposure has been eliminated.

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

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

Standard 6: Critical Areas

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

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

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

Checklist for Stormwater Report

Checklist (continued)

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

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

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

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

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

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

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

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

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

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

Checklist for Stormwater Report

Checklist (continued)

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

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

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

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

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

Standard 9: Operation and Maintenance Plan

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

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

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

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

Standard 10: Prohibition of Illicit Discharges

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

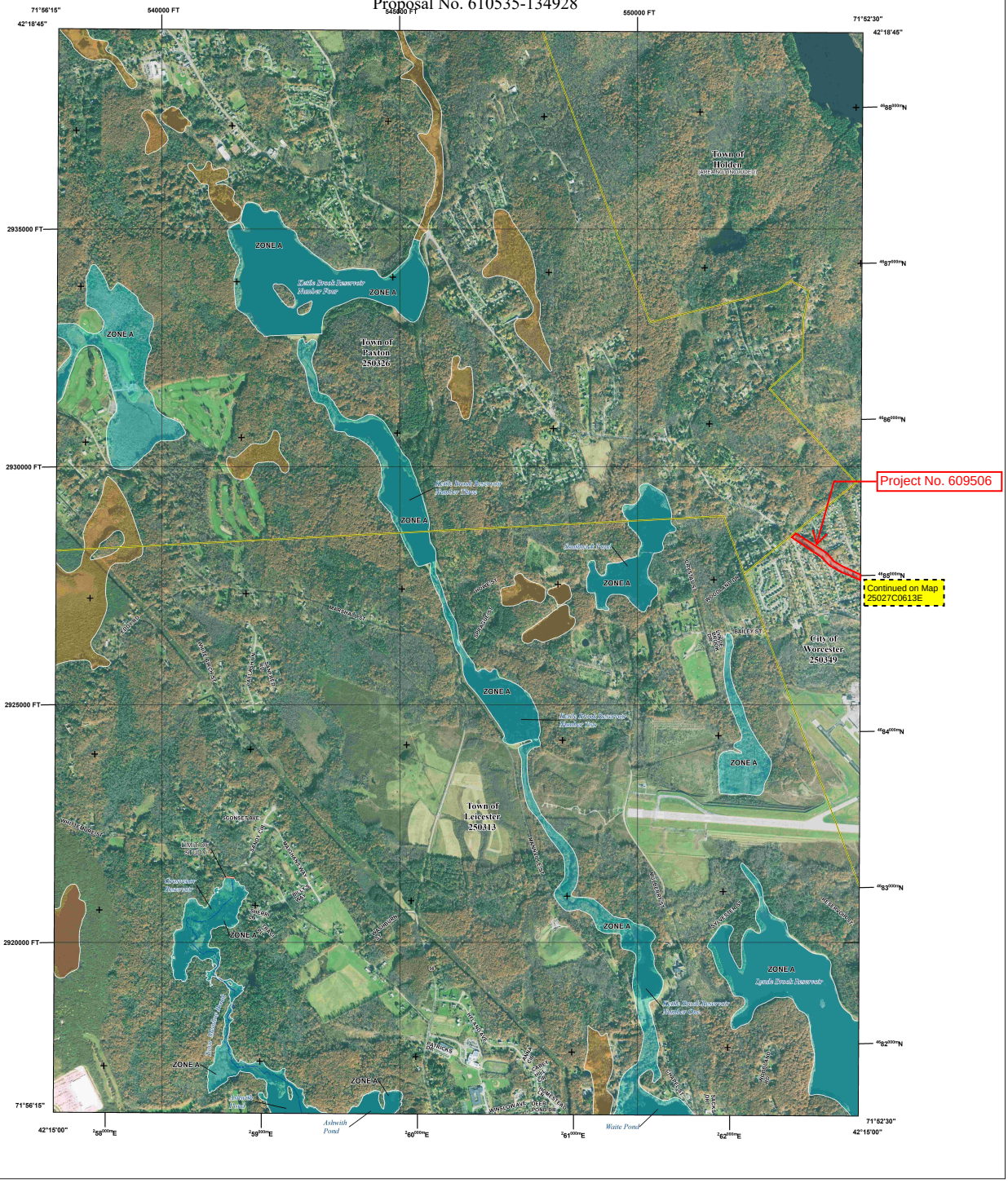
☐ An Illicit Discharge Compliance Statement is attached;

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

Appendix B: Soils and FEMA Information

- FEMA Flood Insurance Rate Map (FIRM)
- NRCS Soil Survey Information

Proposal No. 610535-134928



FLOOD HAZARD INFORMATION

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

THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT HTTPS://MSC.FEMA.GOV

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

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

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

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall
- 18.2 / 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- Coastal Transect
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature
- 513 Base Flood Elevation Line (BFE)

OTHER FEATURES
- Limit of Study
- Jurisdiction Boundary

NOTES TO USERS

For information and questions about this Flood Insurance Rate Map (FIRM), available products associated with this FIRM, including historic versions, the current map date for each FIRM panel, how to order products, or the National Flood Insurance Program (NFIP) in general, please call the FEMA Mapping and Insurance eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Flood Map Service Center website at msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM index. These may be ordered directly from the Flood Map Service Center at the number listed above.

For community and countywide map dates refer to 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.

Base map information shown on this FIRM was derived from digital orthophotography provided by the NAIP. The imagery was flown in 2018 and was produced at 0.6 meter resolution.

SCALE

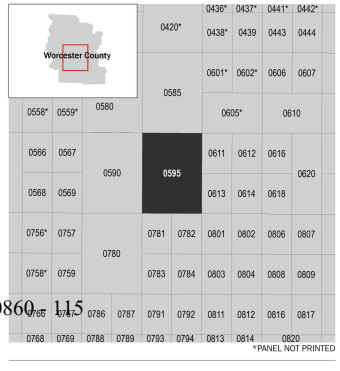
Map Projection:
NAD 1983 StatePlane Massachusetts Mainland FIPS 2001 Feet; North American 1983; Western Hemisphere; Vertical Datum: NAVD 88

1 inch = 1,000 feet 1:12,000

0 1,000 2,000 4,000 feet

0 250 500 1,000 meters

PANEL LOCATOR



*PANEL NOT PRINTED

FEMA

National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP

WORCESTER COUNTY, MASSACHUSETTS

All Jurisdictions

PANEL 595 OF 1075

FEMA

Panel Contains:

COMMUNITY	NUMBER	PANEL	SUFFIX
LEICESTER, TOWN OF	250313	0595	F
PAXTON, TOWN OF	250326	0595	F
WORCESTER, CITY OF	250349	0595	F

VERSION NUMBER 2.6.3.6

MAP NUMBER 25027C0595F

MAP REVISED JUNE 21, 2023

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Massachusetts State Plane Mainland Zone (FIPS zone 2001). The **horizontal datum** was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from digital orthophotography. Base map files were provided in digital format by Massachusetts Geographic Information Systems (MassGIS). Ortho imagery was produced at a scale of 1:5,000. Aerial photography is dated April 2005.

The **profile baselines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the **profile baseline**, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

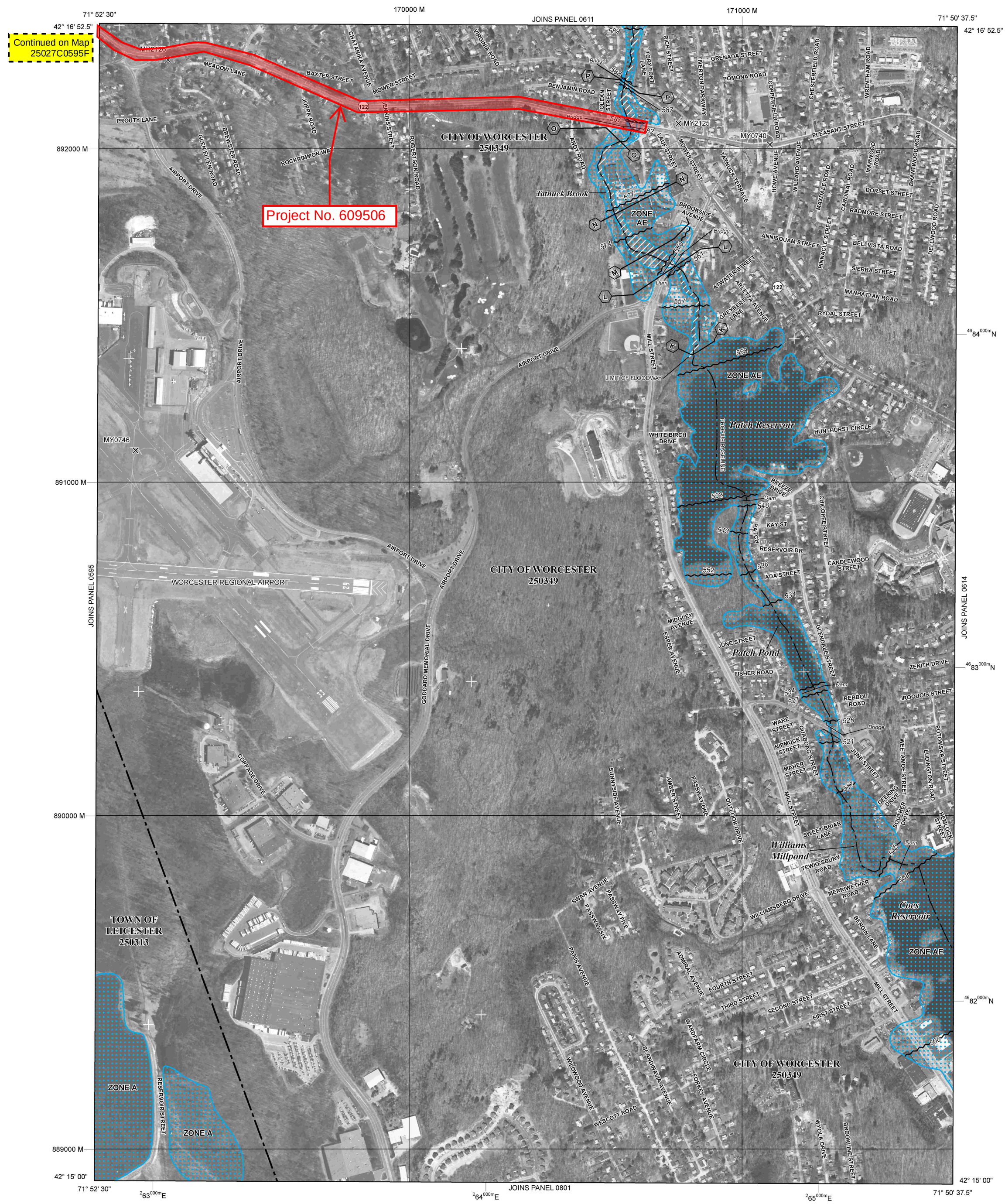
Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map**, how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

Proposal No. 610535-134928



LEGEND

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

The 1% annual chance 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 Areas 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 provide 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.

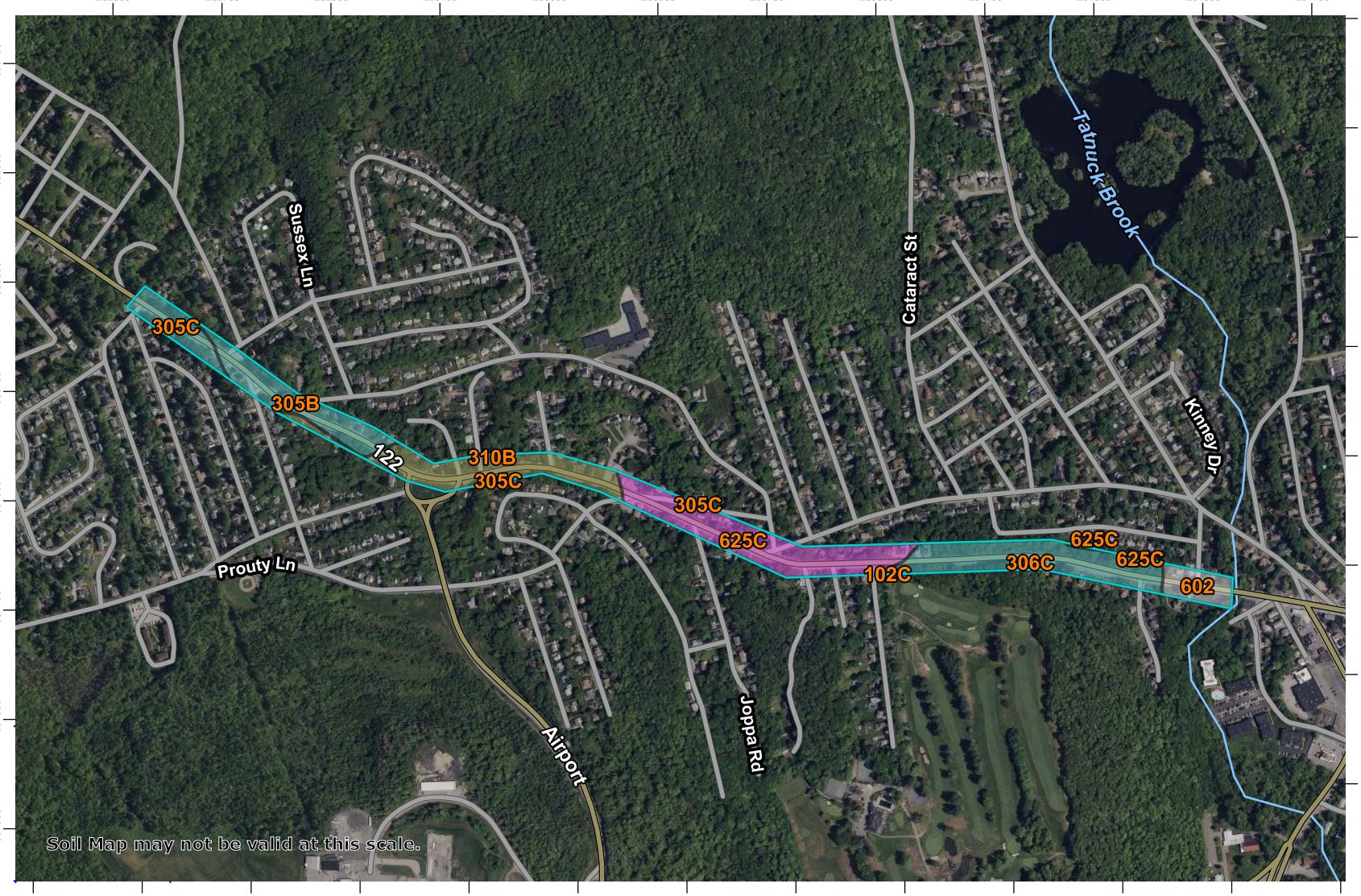
COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

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

(A)—(A) Cross section line
(23)- - -(23) Transect line
Culvert
Bridge
45° 02' 08", 93° 02' 12" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
4989000 M 1000-meter ticks: Massachusetts State Plane Mainland Zone (FIPS Zone 2001), Lambert Conformal Conic projection
$^{48}89^{000m}$N 1000-meter Universal Transverse Mercator grid values, zone 19N
DX5510 × Bench mark (see explanation in Notes to Users section of this FIRM panel)
• M1.5 River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
July 4, 2011

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.

MAP SCALE 1" = 500'
250 0 500 1000 FEET
150 0 150 300 METERS

A00860-116

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0613E

FIRM
FLOOD INSURANCE RATE MAP
WORCESTER COUNTY, MASSACHUSETTS (ALL JURISDICTIONS)

PANEL 613 OF 1075
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
LEICESTER, TOWN OF	250313	0613	E
WORCESTER, CITY OF	250349	0613	E

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER 25027C0613E
EFFECTIVE DATE JULY 4, 2011

Federal Emergency Management Agency
~~~

Hydrologic Soil Group—Worcester County, Massachusetts, Northeastern Part
(610535 Worcester)



Map Scale: 1:11,200 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 150 300 600 900

Feet: 0 500 1000 2000 3000

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

Proposal No. 610535-134928

A00860 - 117

Proposal No. 610535-134928

A00860 - 118

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

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

Soil Rating Lines

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

Soil Rating Points

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

Water Features

- Streams and Canals

Transportation

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

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

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

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Worcester County, Massachusetts, Northeastern Part
Survey Area Data: Version 20, Sep 5, 2025

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

Date(s) aerial images were photographed: May 22, 2022—Jun 5, 2022

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
70A	Ridgebury fine sandy loam, 0 to 3 percent slopes	D	0	0%
102C	Chatfield-Hollis-Rock outcrop complex, 0 to 15 percent slopes	B	0.0	0.0%
305B	Paxton fine sandy loam, 3 to 8 percent slopes	C	4.3	15.1%
305C	Paxton fine sandy loam, 8 to 15 percent slopes	C	2.3	8.1%
306C	Paxton fine sandy loam, 8 to 15 percent slopes, very stony	C	6.5	22.9%
310B	Woodbridge fine sandy loam, 3 to 8 percent slopes	C/D	5.8	20.6%
602	Urban land		1.8	6.4%
625C	Hinckley-Urban land complex, 0 to 15 percent slopes	A	7.6	26.9%
Totals for Area of Interest			**28.4**	**100.0%**

Description

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

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

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

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

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

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

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

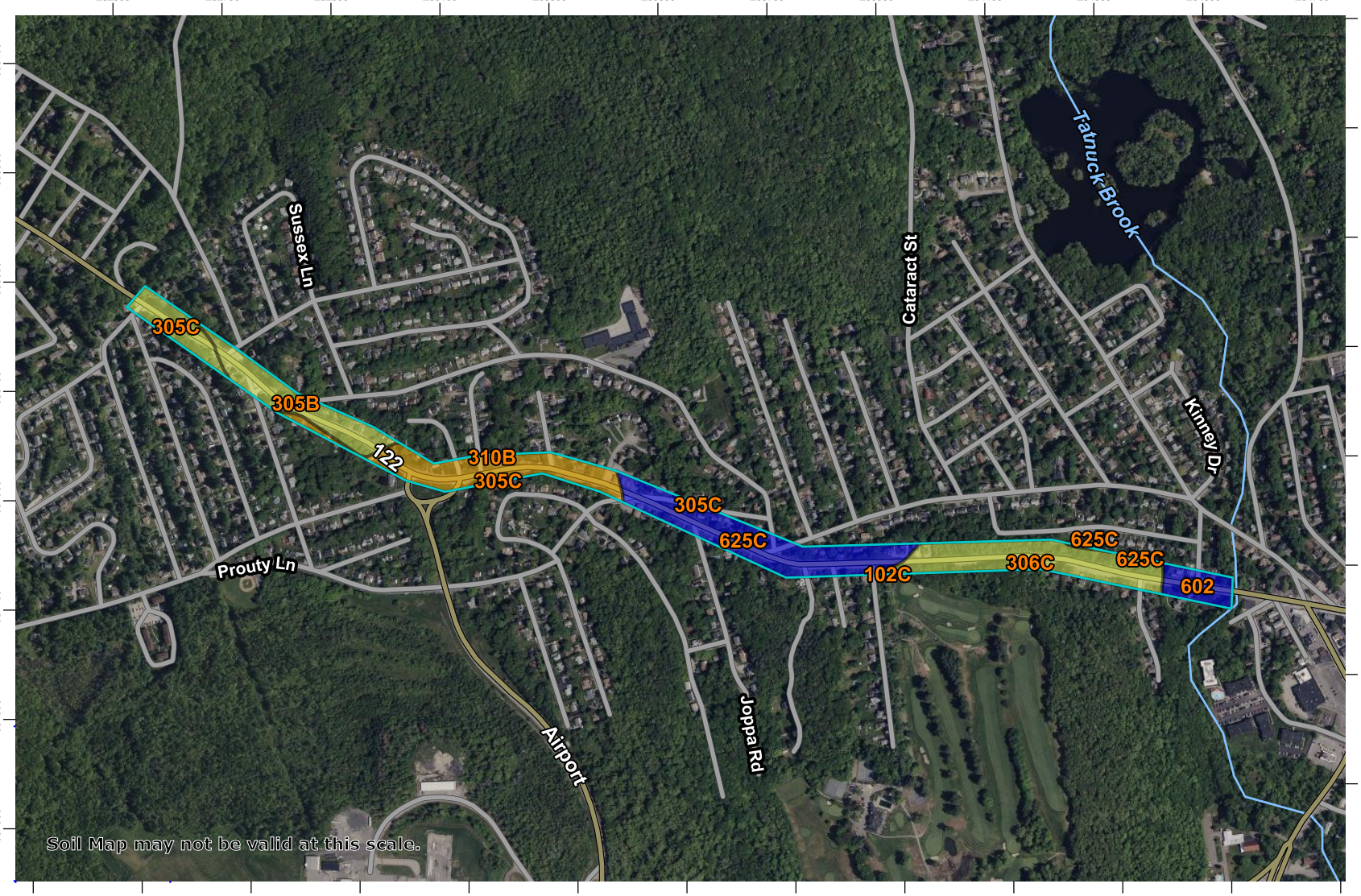
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Depth to Water Table—Worcester County, Massachusetts, Northeastern Part
(610535 Worcester)



Map Scale: 1:11,200 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 150 300 600 900

Feet: 0 500 1000 2000 3000

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

Proposal No. 610535-134928

A00860 - 121

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Soil Rating Lines
- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Soil Rating Points
- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

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

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Worcester County, Massachusetts, Northeastern Part
Survey Area Data: Version 20, Sep 5, 2025

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

Date(s) aerial images were photographed: May 22, 2022—Jun 5, 2022

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

Depth to Water Table

Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
70A	Ridgebury fine sandy loam, 0 to 3 percent slopes	8	0	0%
102C	Chatfield-Hollis-Rock outcrop complex, 0 to 15 percent slopes	>200	0.0	0.0%
305B	Paxton fine sandy loam, 3 to 8 percent slopes	61	4.3	15.1%
305C	Paxton fine sandy loam, 8 to 15 percent slopes	61	2.3	8.1%
306C	Paxton fine sandy loam, 8 to 15 percent slopes, very stony	66	6.5	22.9%
310B	Woodbridge fine sandy loam, 3 to 8 percent slopes	46	5.8	20.6%
602	Urban land	>200	1.8	6.4%
625C	Hinckley-Urban land complex, 0 to 15 percent slopes	>200	7.6	26.9%
Totals for Area of Interest			**28.4**	**100.0%**

Description

"Water table" refers to a saturated zone in the soil. It occurs during specified months. Estimates of the upper limit are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

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

Rating Options

Units of Measure: centimeters

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Interpret Nulls as Zero: No

Beginning Month: January

Ending Month: December

Appendix C: Supporting Calculations

- Catchment Areas and Impervious Area Calculations
- Required Water Quality Volume Calculations

Jacobs

JOB NO. 610535 Worcester Pleasant Street
SHEET NO. 1 OF 1
CALCULATED BY: CG DATE: 2/2/2026
CHECKED BY: JRB DATE: 2/3/2026

Pre-development Catchment and Impervious Areas (from AutoCAD)

Catchment Area	Total Area (sqft)	Pervious Area (sqft)	Impervious Area (sqft)	HSG		HydroCAD Subcatchment	Total Area (sqft)	Total Area (ac)	Pervious Area (sqft)	Impervious Area (sqft)
1	1367.84	0	1367.84	C		1S	125826.11	2.889	7017.54	118808.57
2	14882.4	1264.78	13617.62	C						
3	8189.23	182.64	8006.59	C						
4	8201.38	1556.93	6644.45	C						
5	54630.73	2294.98	52335.75	C						
6	10891.52	1076.79	9814.73	C						
7	14701.33	532.61	14168.72	C						
8	9367.1	108.81	9258.29	C						
9	3594.58	0	3594.58	C						
10	11002.74	587.51	10415.23	C		2S	11002.74	0.253	587.51	10415.23
11	11671.15	2217.02	9454.13	C		3S	22353.69	0.513	2432.03	19921.66
12	10682.54	215.01	10467.53	C						
13	20623.9	1333.17	19290.73	A		4S	20623.9	0.473	1333.17	19290.73
14	22745.7	727.72	22017.98	A		5S	58030.31	1.332	3467.9	54562.41
15	24561.78	1968.05	22593.73	A						
16	7631.74	217.82	7413.92	A						
17	3091.09	554.31	2536.78	A						
18	14979.08	984.12	13994.96	A		6S	14979.08	0.344	984.12	13994.96
19	16957.64	1669.91	15287.73	A		7S	16957.64	0.389	1669.91	15287.73
20	28485.42	2795.66	25689.76	A		8S	35141.19	0.807	2833.39	32307.8
21	6655.77	37.73	6618.04	A						
22	12299.95	117.4	12182.55	C		9S	28275.67	0.649	117.4	28158.27
23	15975.72	0	15975.72	C						
24	15368.14	61.82	15306.32	C		10S	15368.14	0.353	61.82	15306.32
25	7694.81	52.99	7641.82	C		11S	44989.9	1.033	516.84	44473.06
26	6438.04	0	6438.04	C						
27	16957.9	223.23	16734.67	C						
28	5491.23	140.24	5350.99	C						
29	6873.02	100.38	6772.64	C						
30	1534.9	0	1534.9	C						
	393548.37	**21021.63**	**372526.74**				393548.37	9.035	21021.63	372526.74

Jacobs

JOB NO. 610535 Worcester Pleasant Street
SHEET NO. 1 OF 1
CALCULATED BY: CG DATE: 2/2/2026
CHECKED BY: JRB DATE: 2/3/2026

Post-development Catchment and Impervious Areas (from AutoCAD)

Catchment Area	Total Area (sqft)	Pervious Area (sqft)	Impervious Area (sqft)	HSG		HydroCAD Subcatchment	Total Area (sqft)	Total Area (ac)	Pervious Area (sqft)	Impervious Area (sqft)		Change in Impervious Area (sqft)
1	1367.84	0	1367.84	C								
2	14882.4	308.17	14574.23	C								
3	8189.23	0	8189.23	C								
4	8201.38	48.98	8152.4	C								
5	54630.73	58.84	54571.89	C		1S	125826.11	2.889	3508.10	122318.01		102396.35
6	10891.52	1391.9	9499.62	C								
7	14701.33	957.35	13743.98	C								
8	9367.1	742.86	8624.24	C								
9	3594.58	0	3594.58	C								
10	11002.74	1016.59	9986.15	C		2S	11002.74	0.253	1016.59	9986.15		-22321.65
11	11671.15	930.46	10740.69	C		3S	22353.69	0.513	930.46	21423.23		21423.23
12	10682.54	0	10682.54	C								
13	20623.9	0	20623.9	A		4S	20623.9	0.473	0	20623.9		20623.9
14	22745.7	0	22745.7	A								
15	24561.78	0	24561.78	A		5S	58030.31	1.332	0	58030.31		42723.99
16	7631.74	0	7631.74	A								
17	3091.09	0	3091.09	A								
18	14979.08	0	14979.08	A		6S	14979.08	0.344	0	14979.08		14979.08
19	16957.64	0	16957.64	A		7S	16957.64	0.389	0	16957.64		16957.64
20	28485.42	0	28485.42	A		8S	35141.19	0.807	0	35141.19		35141.19
21	6655.77	0	6655.77	A								
22	12299.95	0	12299.95	C		9S	28275.67	0.649	0	28275.67		28275.67
23	15975.72	0	15975.72	C								
24	15368.14	0	15368.14	C		10S	15368.14	0.353	0	15368.14		15368.14
25	7694.81	0	7694.81	C								
26	6438.04	0	6438.04	C								
27	16957.9	0	16957.9	C		11S	44989.9	1.033	0	44989.9		44989.9
28	5491.23	0	5491.23	C								
29	6873.02	0	6873.02	C								
30	1534.9	0	1534.9	C								
	393548.37	**5455.15**	**388093.22**				393548.37	9.035	5455.15	388093.22		320557.44

Jacobs

JOB NO. 610535 Worcester Pleasant Street
SHEET NO. 1 OF 1
CALCULATED BY: JRB DATE: 1/30/2026
CHECKED BY: DATE:

Calculate Required Water Quality Volume for each Analysis Point

Equation: $V_{WQ} = (D_{WQ} / 12 \text{ inches/foot}) * (A_{IMP})$

V_{WQ} = Required Water Quality Volume (in cubic feet)

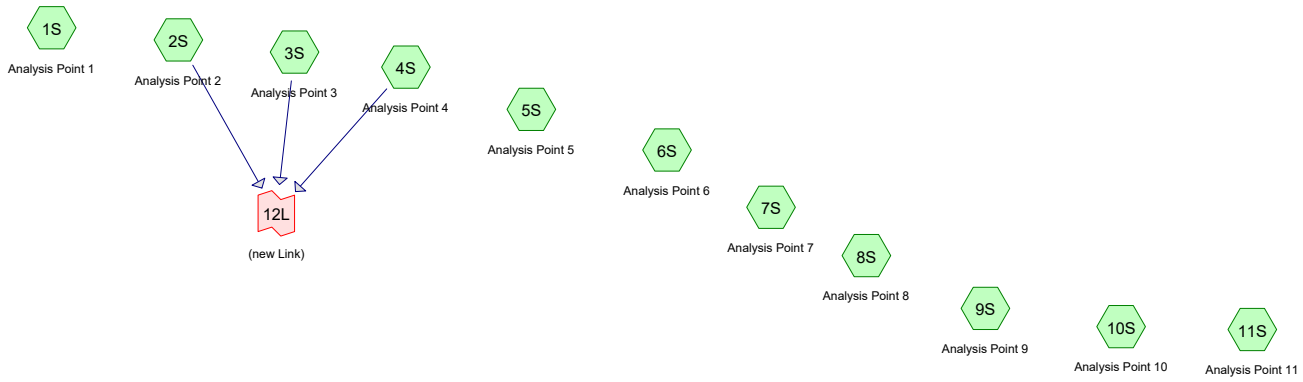
D_{WQ} = Water Quality Depth: one-inch for discharges within a Zone II or Interim Wellhead Protection Area, to or near another critical area, runoff from a LUHPPL, or exfiltration to soils with infiltration rate greater than 2.4 inches/hour or greater; ½-inch for discharges near or to other areas.

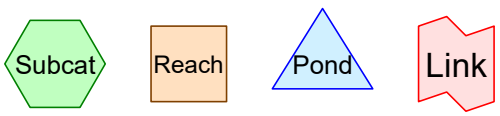
A_{IMP} = Increase in Impervious Area (SF)

Analysis Point	*LUHPPL?*	*Existing* A_{IMP} (sq ft)	*Proposed* A_{IMP} (sq ft)	*Change in* A_{IMP} (sq ft)	D_{WQ} (inches)	V_{WQ} *(cf)*
AP-1	N	118809	122318	3509	0.5	146
AP-2	N	10415	9986	-429	0.5	-18
AP-3	N	19922	21423	1501	0.5	63
AP-4	N	19291	20624	1333	0.5	56
AP-5	N	54562	58030	3468	0.5	145
AP-6	N	13995	14979	984	0.5	41
AP-7	N	15288	16958	1670	0.5	70
AP-8	N	32308	35141	2833	0.5	118
AP-9	N	28158	28276	118	0.5	5
AP-10	N	15306	15368	62	0.5	3
AP-11	N	44473	44990	517	0.5	22
			Total for Project:	15566		651

Appendix D: Hydraulic and Hydrologic Data

- HydroCAD Pre-Construction Analyses (Existing Conditions), 2-Year, 10-Year, 100-Year
- HydroCAD Post-Construction Analyses (Proposed Conditions), 2-Year, 10-Year, 100-Year





Routing Diagram for Worcester 610535 Existing
Prepared by Jacobs, Printed 2/3/2026
HydroCAD® 10.00-25 s/n 03058 © 2019 HydroCAD Software Solutions LLC

Worcester 610535 Existing
Prepared by Jacobs
Printed 2/3/2026
HydroCAD® 10.00-25 s/n 03058 © 2019 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.236	49	50-75% Grass cover, Fair, HSG A (4S, 5S, 6S, 7S, 8S)
0.246	79	50-75% Grass cover, Fair, HSG C (1S, 2S, 3S, 9S, 10S, 11S)
1.925	98	Paved roads w/curbs & sewers, HSG A (5S, 6S, 7S)
3.900	98	Paved roads w/curbs & sewers, HSG C (2S, 3S, 4S, 8S, 9S, 10S, 11S)
2.727	98	Paved roads w/curbs & sewers, HSG D (1S)
9.035	**96**	**TOTAL AREA**

Worcester 610535 Existing *NOAA 24-hr D 2-Year Rainfall=3.13"*
Prepared by Jacobs Printed 2/3/2026
HydroCAD® 10.00-25 s/n 03058 © 2019 HydroCAD Software Solutions LLC

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

Subcatchment1S: Analysis Point 1 Runoff Area=125,826 sf 94.42% Impervious Runoff Depth>2.78"
Flow Length=2,088' Tc=7.6 min CN=97 Runoff=7.97 cfs 0.670 af

Subcatchment2S: Analysis Point 2 Runoff Area=11,003 sf 94.66% Impervious Runoff Depth>2.78"
Flow Length=280' Slope=0.0610 '/' Tc=5.4 min CN=97 Runoff=0.75 cfs 0.059 af

Subcatchment3S: Analysis Point 3 Runoff Area=22,354 sf 89.12% Impervious Runoff Depth>2.68"
Flow Length=395' Slope=0.0510 '/' Tc=5.6 min CN=96 Runoff=1.49 cfs 0.114 af

Subcatchment4S: Analysis Point 4 Runoff Area=20,624 sf 93.54% Impervious Runoff Depth>2.57"
Flow Length=340' Slope=0.0450 '/' Tc=5.6 min CN=95 Runoff=1.35 cfs 0.102 af

Subcatchment5S: Analysis Point 5 Runoff Area=58,030 sf 94.02% Impervious Runoff Depth>2.57"
Tc=5.0 min CN=95 Runoff=3.88 cfs 0.286 af

Subcatchment6S: Analysis Point 6 Runoff Area=14,979 sf 93.43% Impervious Runoff Depth>2.57"
Tc=5.0 min CN=95 Runoff=1.00 cfs 0.074 af

Subcatchment7S: Analysis Point 7 Runoff Area=16,958 sf 90.15% Impervious Runoff Depth>2.38"
Flow Length=429' Tc=5.6 min CN=93 Runoff=1.05 cfs 0.077 af

Subcatchment8S: Analysis Point 8 Runoff Area=35,141 sf 91.94% Impervious Runoff Depth>2.47"
Flow Length=421' Tc=5.7 min CN=94 Runoff=2.23 cfs 0.166 af

Subcatchment9S: Analysis Point 9 Runoff Area=28,275 sf 99.59% Impervious Runoff Depth>2.89"
Flow Length=510' Slope=0.0660 '/' Tc=5.6 min CN=98 Runoff=1.95 cfs 0.157 af

Subcatchment10S: Analysis Point 10 Runoff Area=15,368 sf 99.60% Impervious Runoff Depth>2.90"
Tc=5.0 min CN=98 Runoff=1.08 cfs 0.085 af

Subcatchment11S: Analysis Point 11 Runoff Area=44,990 sf 98.85% Impervious Runoff Depth>2.89"
Flow Length=500' Slope=0.0350 '/' Tc=6.0 min CN=98 Runoff=3.06 cfs 0.249 af

Link 12L: (new Link) Inflow=3.59 cfs 0.275 af
Primary=3.59 cfs 0.275 af

Total Runoff Area = 9.035 ac Runoff Volume = 2.038 af Average Runoff Depth = 2.71"
5.34% Pervious = 0.483 ac 94.66% Impervious = 8.552 ac

Summary for Subcatchment 1S: Analysis Point 1

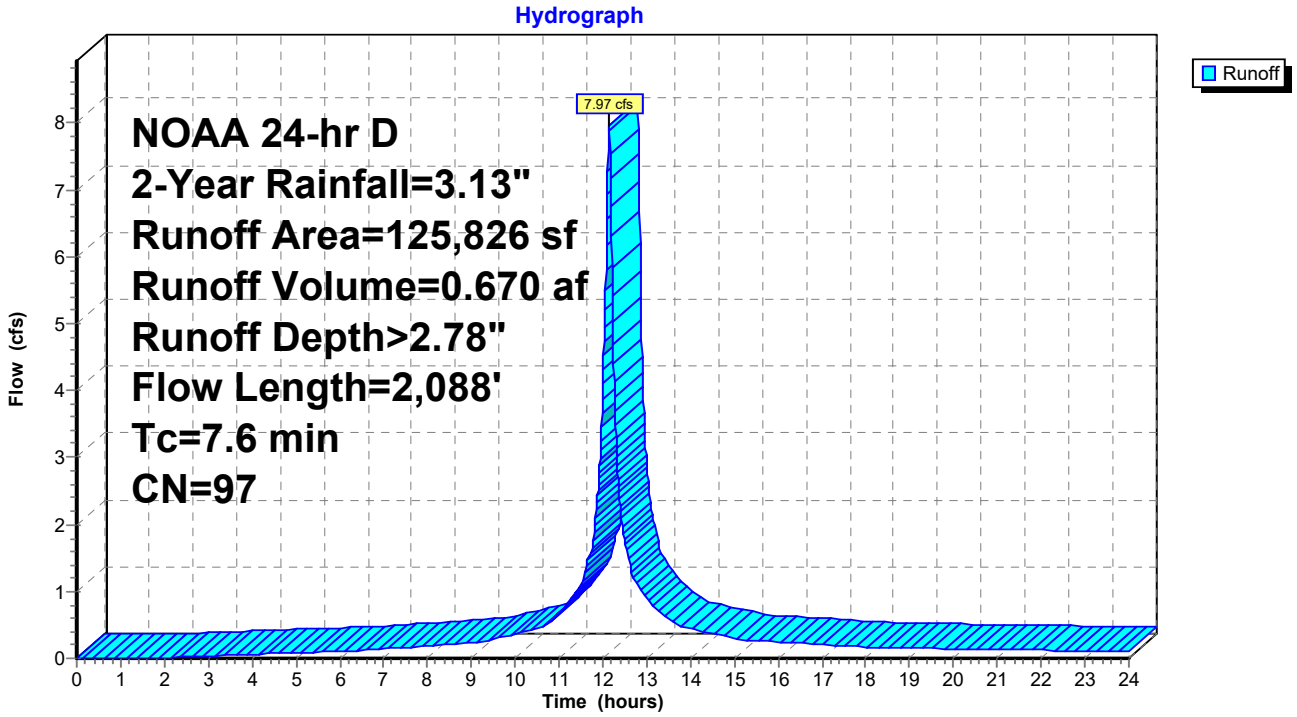
Runoff = 7.97 cfs @ 12.15 hrs, Volume= 0.670 af, Depth> 2.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
118,809	98	Paved roads w/curbs & sewers, HSG D
7,017	79	50-75% Grass cover, Fair, HSG C
125,826	97	Weighted Average
7,017		5.58% Pervious Area
118,809		94.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**
1.1	767	0.0620	11.30	8.87	**Pipe Channel, 12" RCP** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
1.2	1,036	0.0590	14.44	25.51	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.3	285	0.0490	15.94	50.08	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
7.6	2,088	Total			

Subcatchment 1S: Analysis Point 1



Summary for Subcatchment 2S: Analysis Point 2

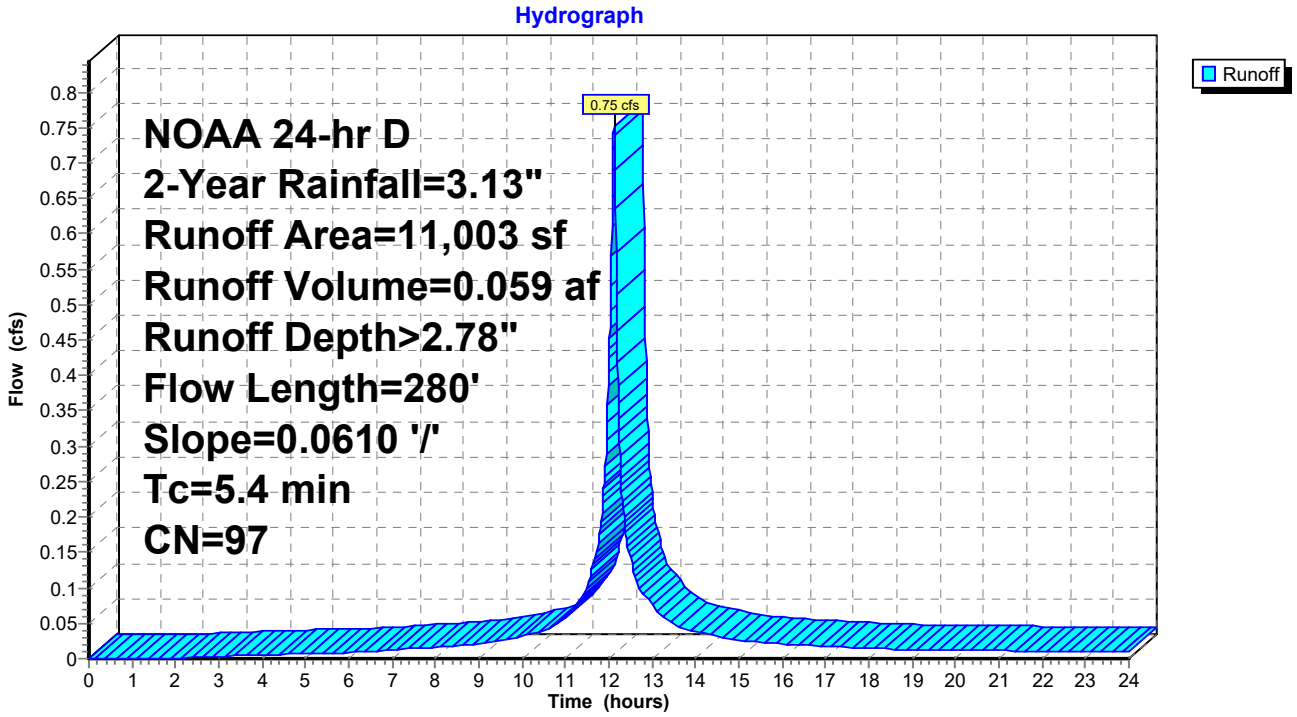
Runoff = 0.75 cfs @ 12.12 hrs, Volume= 0.059 af, Depth> 2.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
10,415	98	Paved roads w/curbs & sewers, HSG C
588	79	50-75% Grass cover, Fair, HSG C
11,003	97	Weighted Average
588		5.34% Pervious Area
10,415		94.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**
0.4	280	0.0610	11.20	8.80	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
5.4	280	Total			

Subcatchment 2S: Analysis Point 2



Summary for Subcatchment 3S: Analysis Point 3

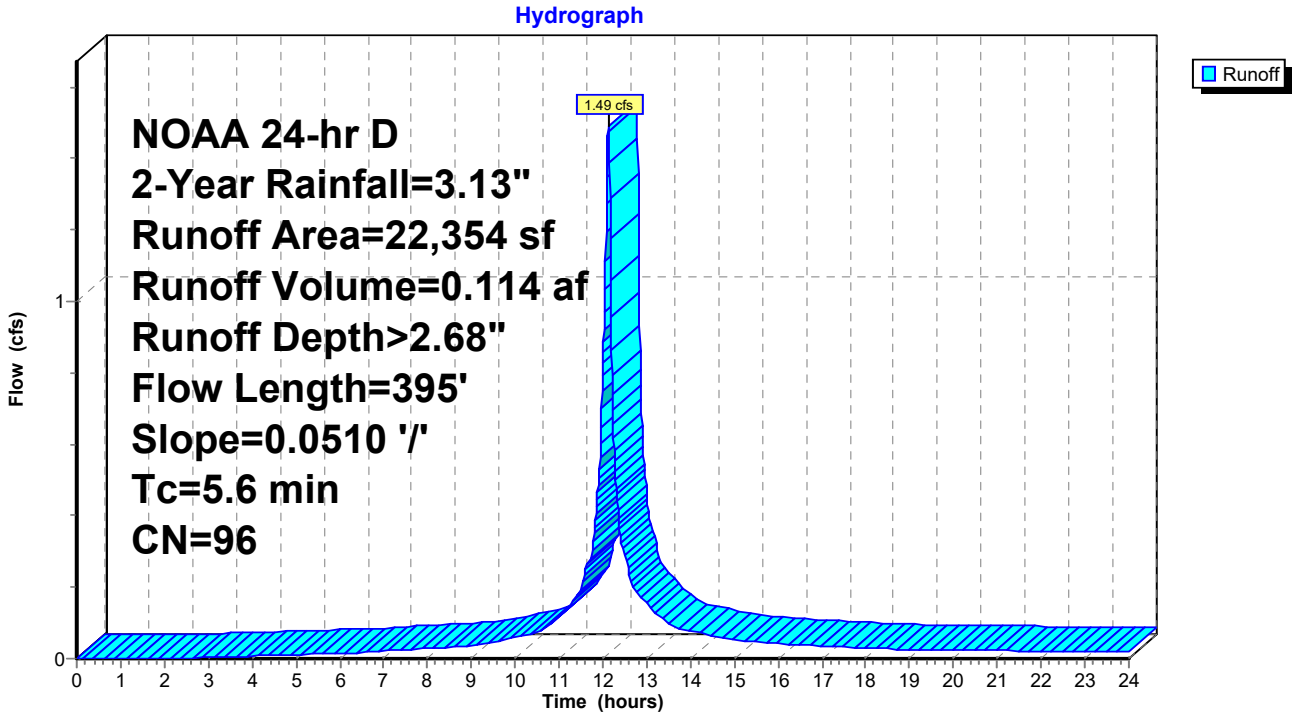
Runoff = 1.49 cfs @ 12.13 hrs, Volume= 0.114 af, Depth> 2.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
19,922	98	Paved roads w/curbs & sewers, HSG C
2,432	79	50-75% Grass cover, Fair, HSG C
22,354	96	Weighted Average
2,432		10.88% Pervious Area
19,922		89.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**
0.6	395	0.0510	10.24	8.05	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
5.6	395	Total			

Subcatchment 3S: Analysis Point 3



Summary for Subcatchment 4S: Analysis Point 4

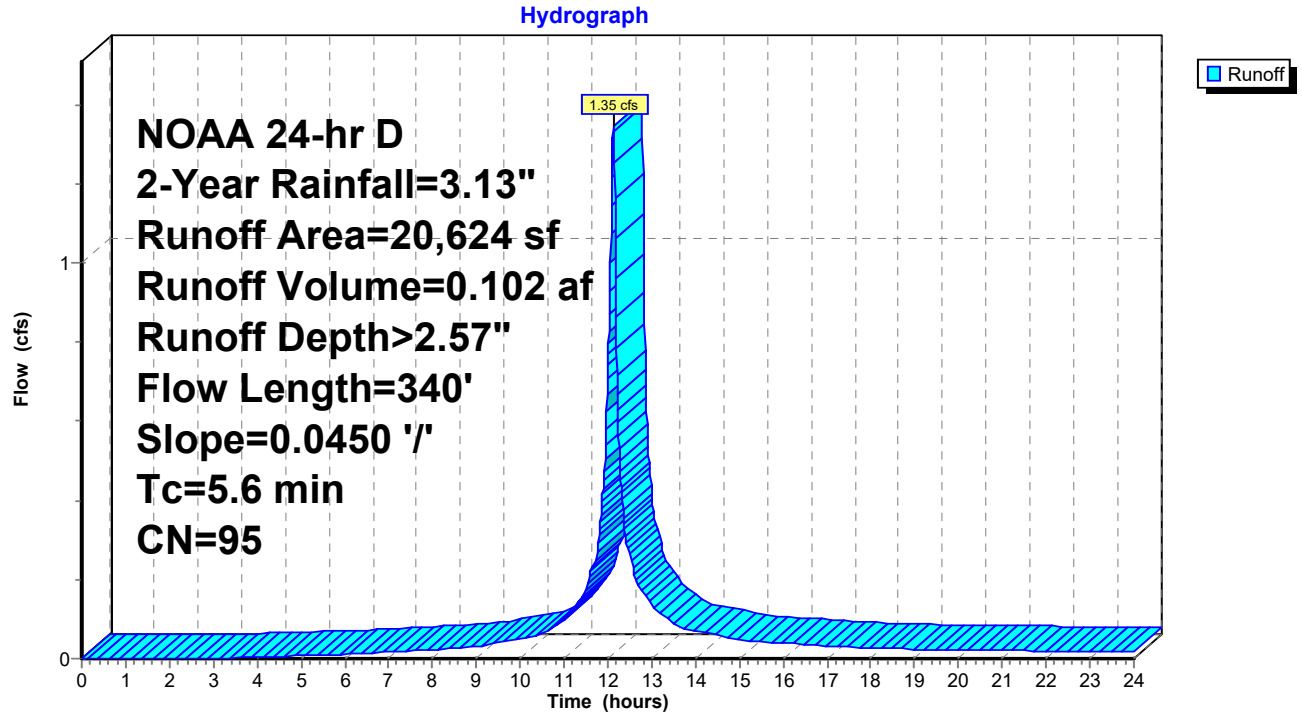
Runoff = 1.35 cfs @ 12.13 hrs, Volume= 0.102 af, Depth> 2.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
19,291	98	Paved roads w/curbs & sewers, HSG C
1,333	49	50-75% Grass cover, Fair, HSG A
20,624	95	Weighted Average
1,333		6.46% Pervious Area
19,291		93.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**
0.6	340	0.0450	9.62	7.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
5.6	340	Total			

Subcatchment 4S: Analysis Point 4



Summary for Subcatchment 5S: Analysis Point 5

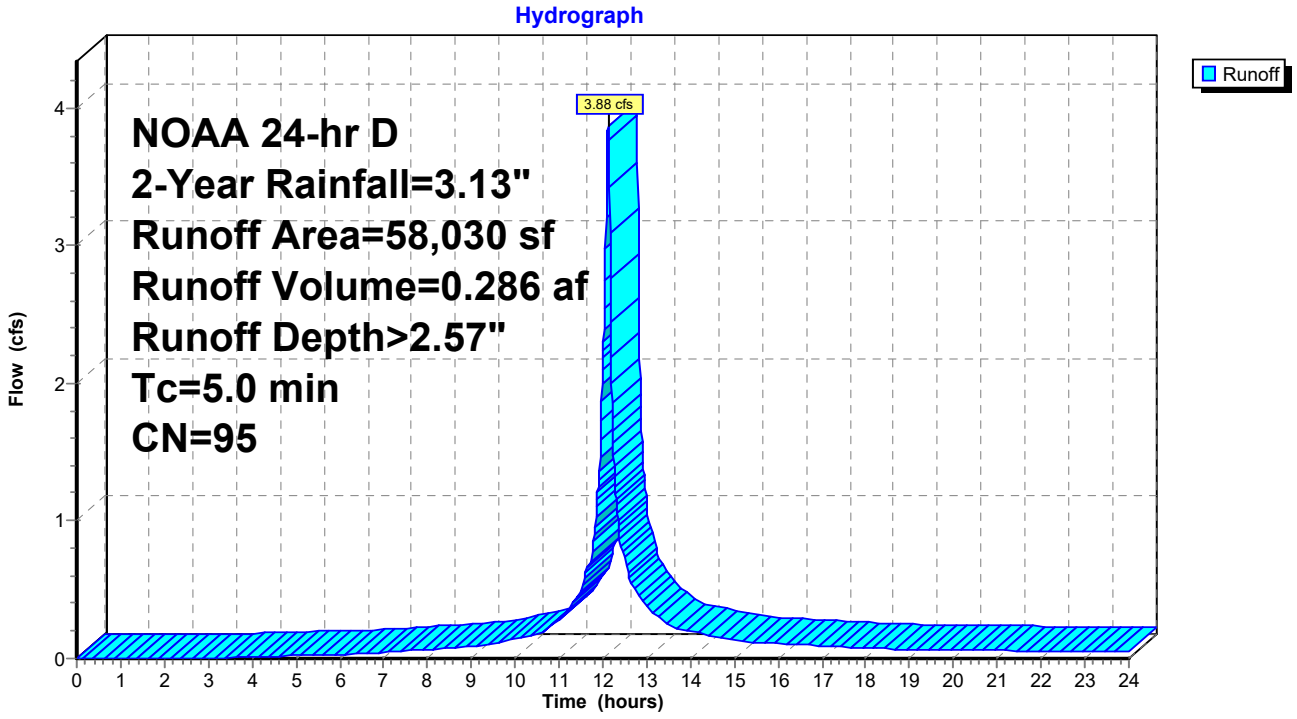
Runoff = 3.88 cfs @ 12.12 hrs, Volume= 0.286 af, Depth> 2.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
54,562	98	Paved roads w/curbs & sewers, HSG A
3,468	49	50-75% Grass cover, Fair, HSG A
58,030	95	Weighted Average
3,468		5.98% Pervious Area
54,562		94.02% Impervious Area

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

Subcatchment 5S: Analysis Point 5



Summary for Subcatchment 6S: Analysis Point 6

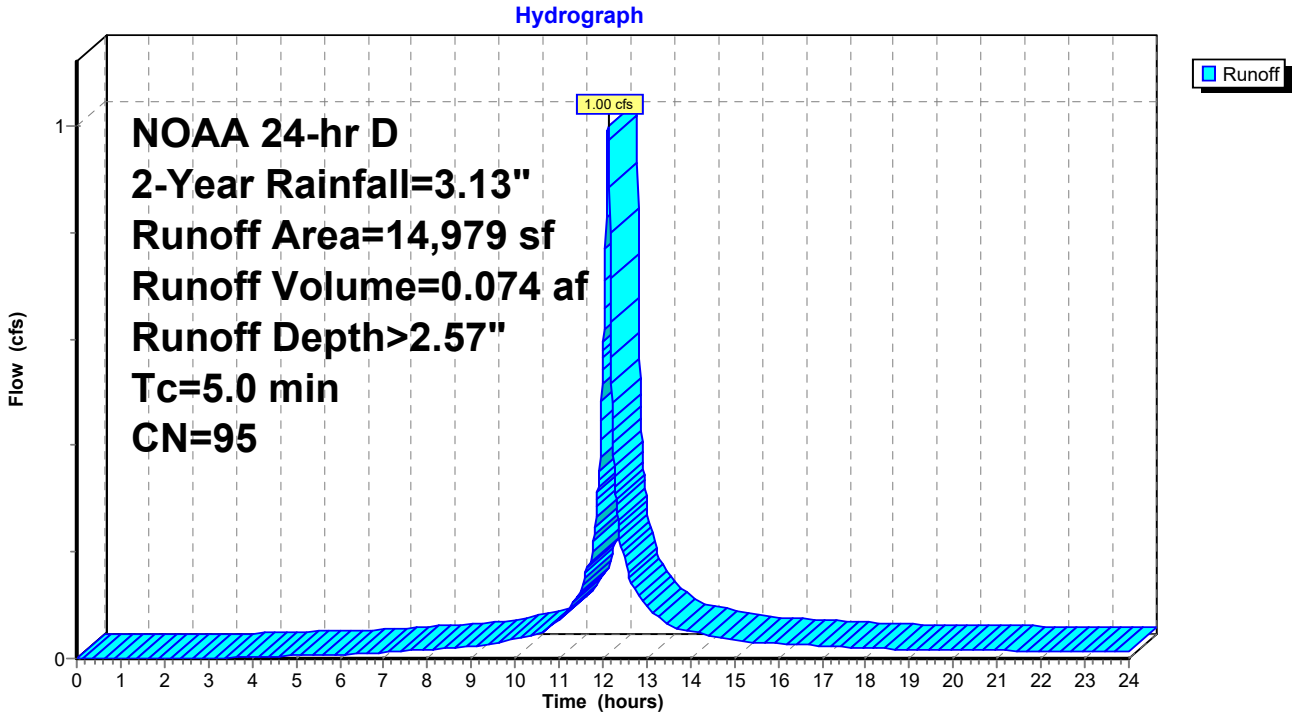
Runoff = 1.00 cfs @ 12.12 hrs, Volume= 0.074 af, Depth> 2.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
13,995	98	Paved roads w/curbs & sewers, HSG A
984	49	50-75% Grass cover, Fair, HSG A
14,979	95	Weighted Average
984		6.57% Pervious Area
13,995		93.43% Impervious Area

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

Subcatchment 6S: Analysis Point 6



Summary for Subcatchment 7S: Analysis Point 7

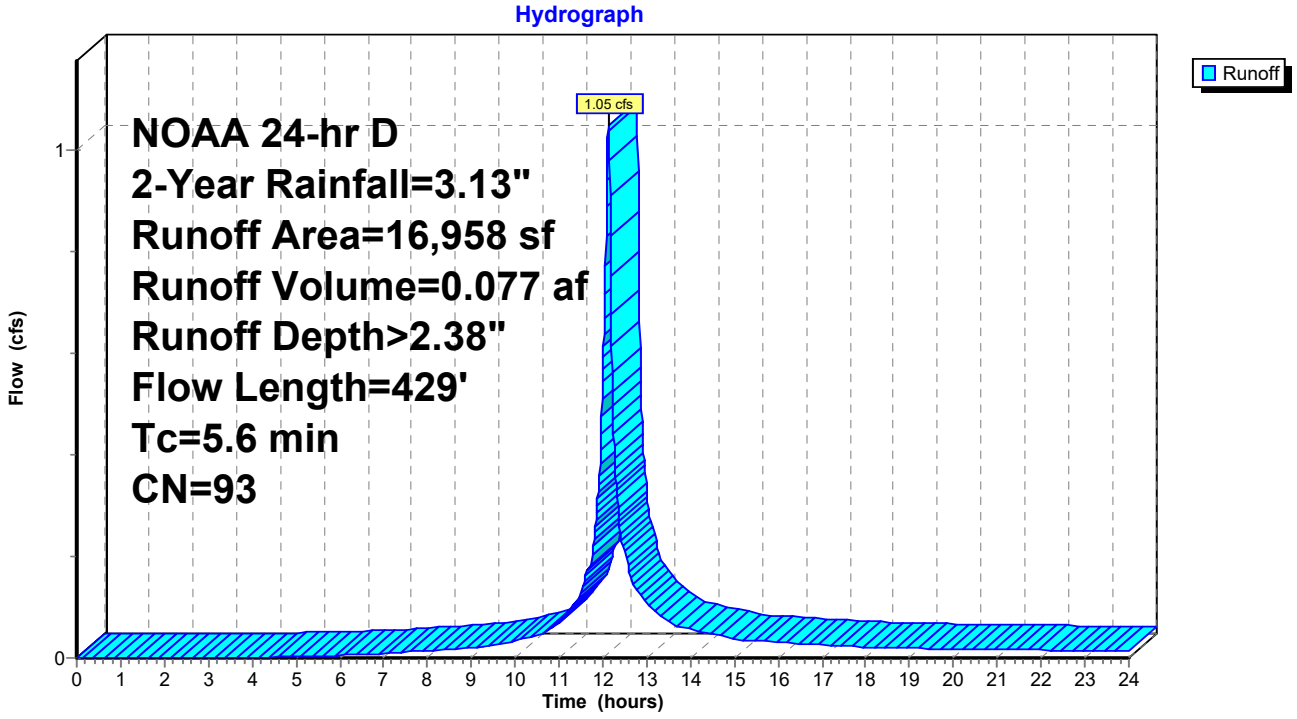
Runoff = 1.05 cfs @ 12.13 hrs, Volume= 0.077 af, Depth> 2.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
15,288	98	Paved roads w/curbs & sewers, HSG A
1,670	49	50-75% Grass cover, Fair, HSG A
16,958	93	Weighted Average
1,670		9.85% Pervious Area
15,288		90.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**
0.6	389	0.0600	11.11	8.73	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
0.0	40	0.0610	17.78	55.87	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
5.6	429	Total			

Subcatchment 7S: Analysis Point 7



Summary for Subcatchment 8S: Analysis Point 8

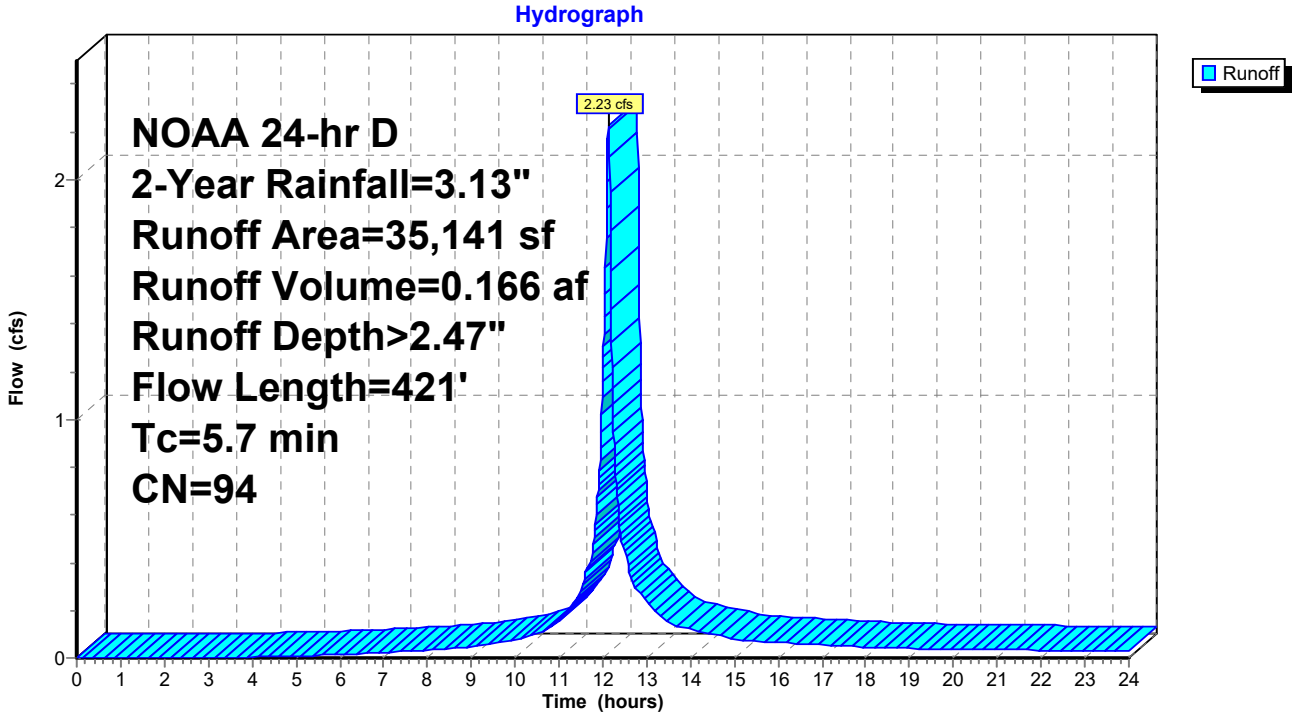
Runoff = 2.23 cfs @ 12.13 hrs, Volume= 0.166 af, Depth> 2.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
32,308	98	Paved roads w/curbs & sewers, HSG C
2,833	49	50-75% Grass cover, Fair, HSG A
35,141	94	Weighted Average
2,833		8.06% Pervious Area
32,308		91.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**
0.6	390	0.0660	11.65	9.15	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
0.1	31	0.0070	4.97	8.79	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
5.7	421	Total			

Subcatchment 8S: Analysis Point 8



Summary for Subcatchment 9S: Analysis Point 9

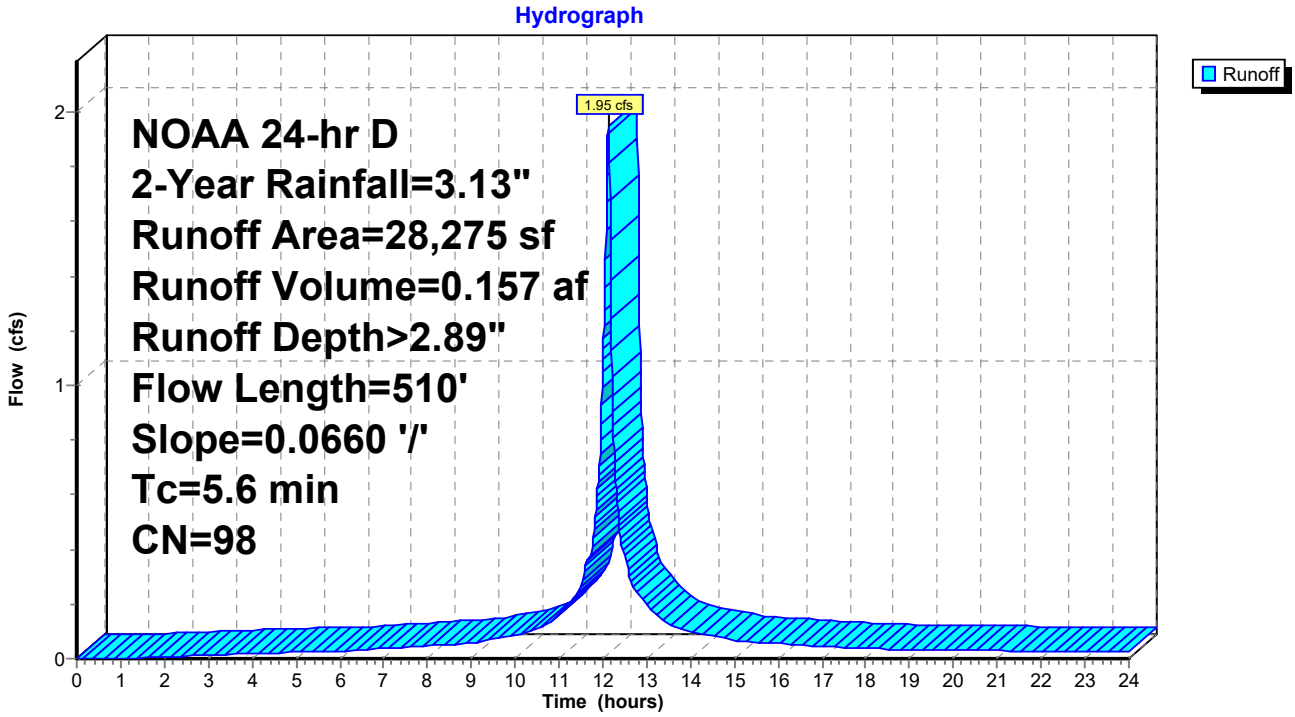
Runoff = 1.95 cfs @ 12.13 hrs, Volume= 0.157 af, Depth> 2.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
28,158	98	Paved roads w/curbs & sewers, HSG C
117	79	50-75% Grass cover, Fair, HSG C
28,275	98	Weighted Average
117		0.41% Pervious Area
28,158		99.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**
0.6	510	0.0660	15.27	26.99	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
5.6	510	Total			

Subcatchment 9S: Analysis Point 9



Summary for Subcatchment 10S: Analysis Point 10

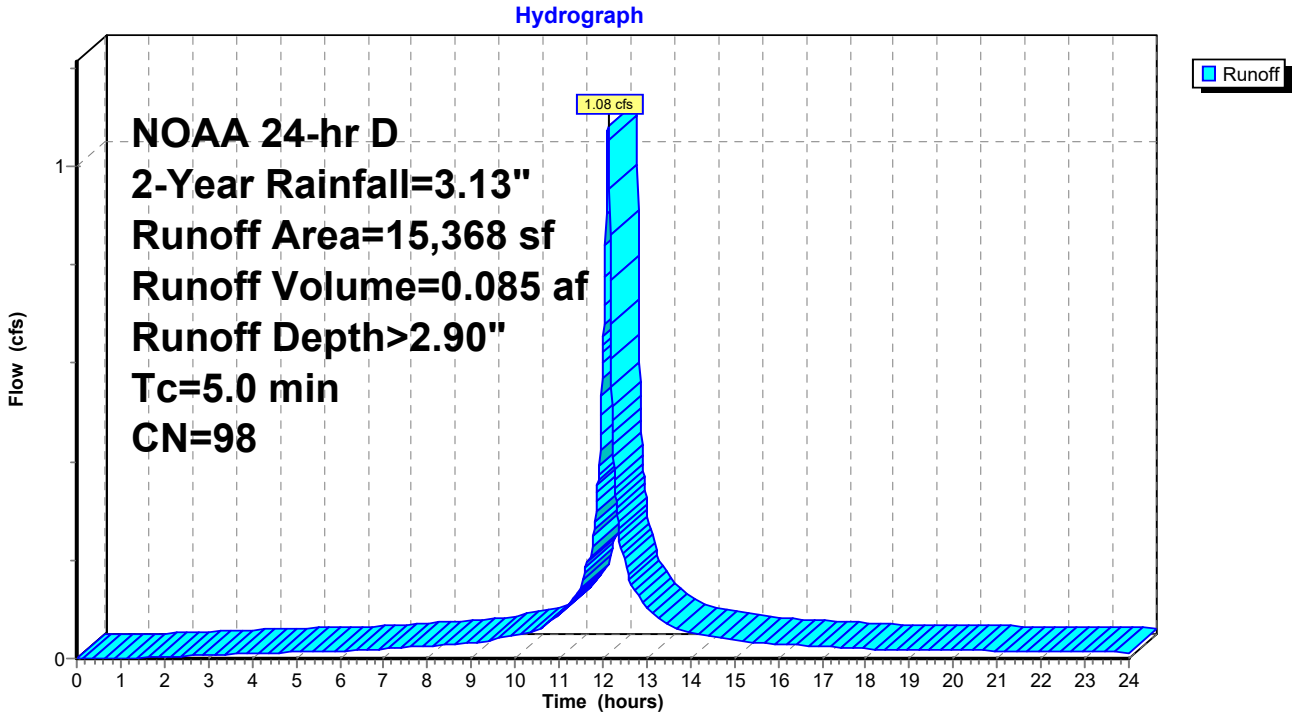
Runoff = 1.08 cfs @ 12.12 hrs, Volume= 0.085 af, Depth> 2.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
15,306	98	Paved roads w/curbs & sewers, HSG C
62	79	50-75% Grass cover, Fair, HSG C
15,368	98	Weighted Average
62		0.40% Pervious Area
15,306		99.60% Impervious Area

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

Subcatchment 10S: Analysis Point 10



Summary for Subcatchment 11S: Analysis Point 11

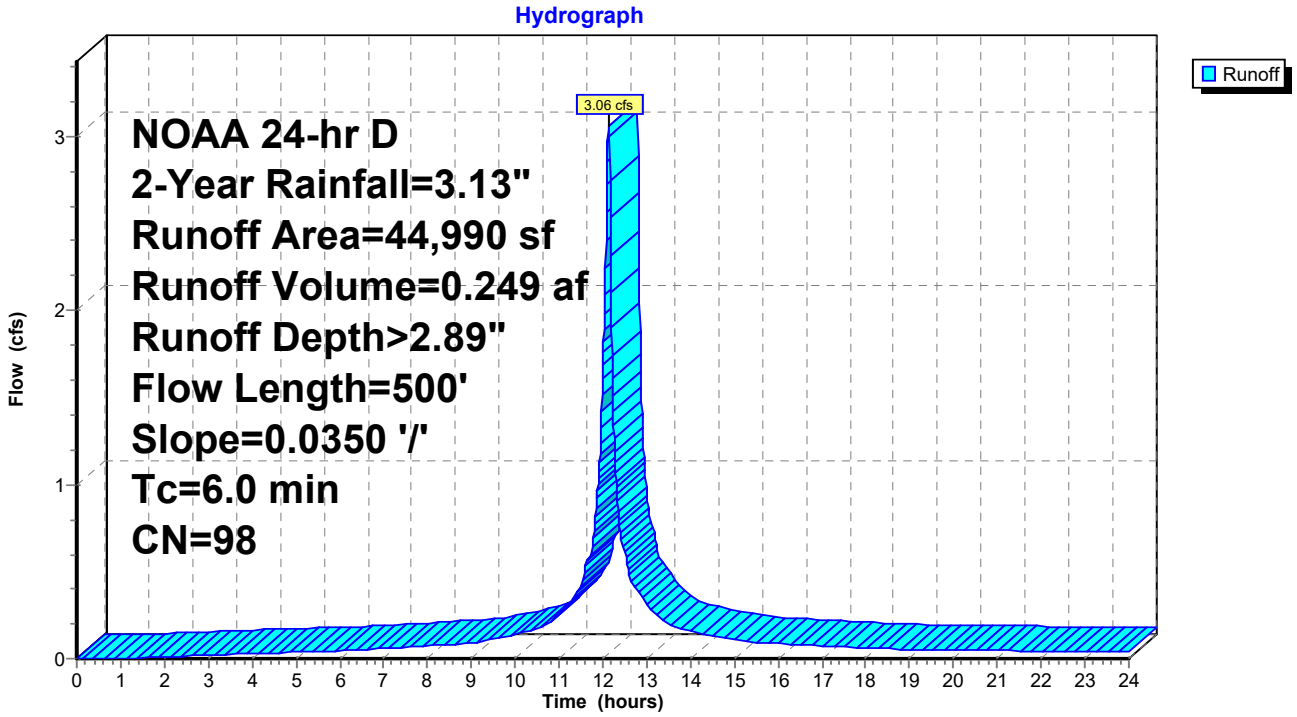
Runoff = 3.06 cfs @ 12.13 hrs, Volume= 0.249 af, Depth> 2.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
44,473	98	Paved roads w/curbs & sewers, HSG C
517	79	50-75% Grass cover, Fair, HSG C
44,990	98	Weighted Average
517		1.15% Pervious Area
44,473		98.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**
1.0	500	0.0350	8.49	6.67	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
6.0	500	Total			

Subcatchment 11S: Analysis Point 11

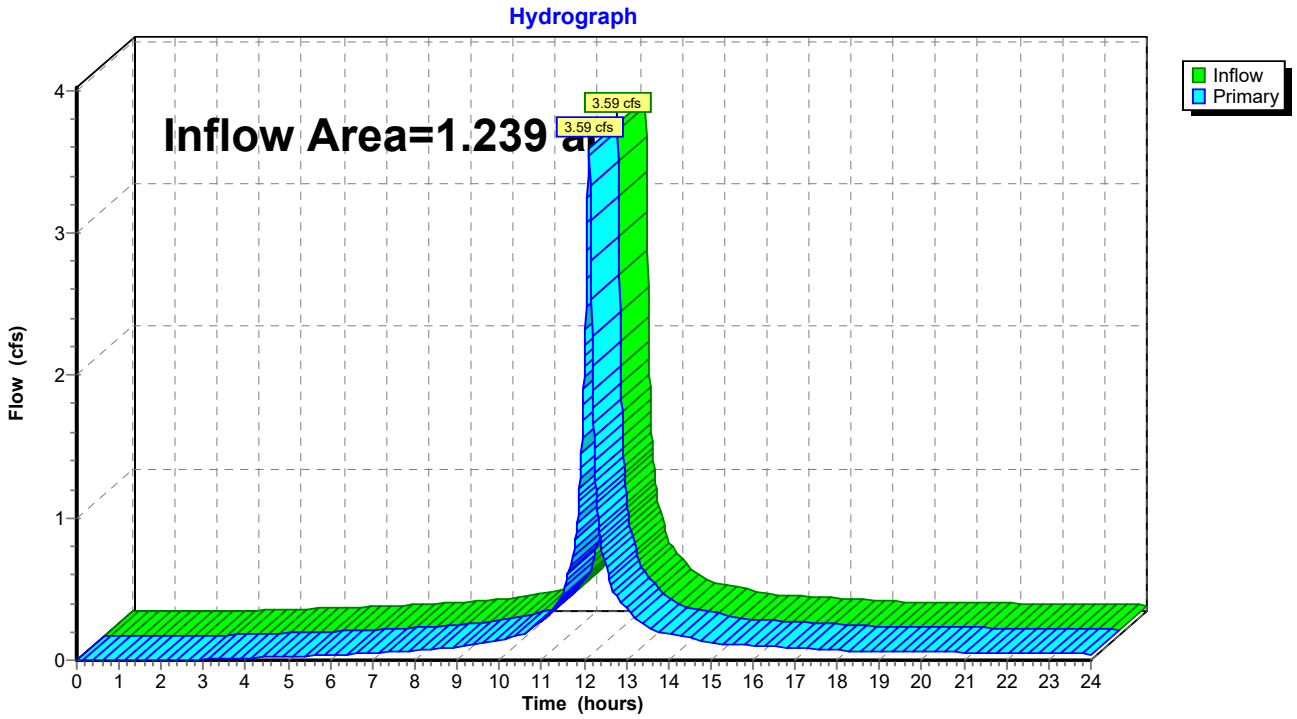


Summary for Link 12L: (new Link)

Inflow Area = 1.239 ac, 91.94% Impervious, Inflow Depth > 2.66" for 2-Year event
Inflow = 3.59 cfs @ 12.13 hrs, Volume= 0.275 af
Primary = 3.59 cfs @ 12.13 hrs, Volume= 0.275 af, Atten= 0%, Lag= 0.0 min

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

Link 12L: (new Link)



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

Subcatchment1S: Analysis Point 1 Runoff Area=125,826 sf 94.42% Impervious Runoff Depth>4.48"
Flow Length=2,088' Tc=7.6 min CN=97 Runoff=12.51 cfs 1.079 af

Subcatchment2S: Analysis Point 2 Runoff Area=11,003 sf 94.66% Impervious Runoff Depth>4.48"
Flow Length=280' Slope=0.0610 '/' Tc=5.4 min CN=97 Runoff=1.18 cfs 0.094 af

Subcatchment3S: Analysis Point 3 Runoff Area=22,354 sf 89.12% Impervious Runoff Depth>4.37"
Flow Length=395' Slope=0.0510 '/' Tc=5.6 min CN=96 Runoff=2.36 cfs 0.187 af

Subcatchment4S: Analysis Point 4 Runoff Area=20,624 sf 93.54% Impervious Runoff Depth>4.26"
Flow Length=340' Slope=0.0450 '/' Tc=5.6 min CN=95 Runoff=2.16 cfs 0.168 af

Subcatchment5S: Analysis Point 5 Runoff Area=58,030 sf 94.02% Impervious Runoff Depth>4.26"
Tc=5.0 min CN=95 Runoff=6.21 cfs 0.473 af

Subcatchment6S: Analysis Point 6 Runoff Area=14,979 sf 93.43% Impervious Runoff Depth>4.26"
Tc=5.0 min CN=95 Runoff=1.60 cfs 0.122 af

Subcatchment7S: Analysis Point 7 Runoff Area=16,958 sf 90.15% Impervious Runoff Depth>4.04"
Flow Length=429' Tc=5.6 min CN=93 Runoff=1.73 cfs 0.131 af

Subcatchment8S: Analysis Point 8 Runoff Area=35,141 sf 91.94% Impervious Runoff Depth>4.15"
Flow Length=421' Tc=5.7 min CN=94 Runoff=3.62 cfs 0.279 af

Subcatchment9S: Analysis Point 9 Runoff Area=28,275 sf 99.59% Impervious Runoff Depth>4.60"
Flow Length=510' Slope=0.0660 '/' Tc=5.6 min CN=98 Runoff=3.04 cfs 0.249 af

Subcatchment10S: Analysis Point 10 Runoff Area=15,368 sf 99.60% Impervious Runoff Depth>4.60"
Tc=5.0 min CN=98 Runoff=1.69 cfs 0.135 af

Subcatchment11S: Analysis Point 11 Runoff Area=44,990 sf 98.85% Impervious Runoff Depth>4.60"
Flow Length=500' Slope=0.0350 '/' Tc=6.0 min CN=98 Runoff=4.77 cfs 0.396 af

Link 12L: (new Link) Inflow=5.70 cfs 0.449 af
Primary=5.70 cfs 0.449 af

Total Runoff Area = 9.035 ac Runoff Volume = 3.312 af Average Runoff Depth = 4.40"
5.34% Pervious = 0.483 ac 94.66% Impervious = 8.552 ac

Summary for Subcatchment 1S: Analysis Point 1

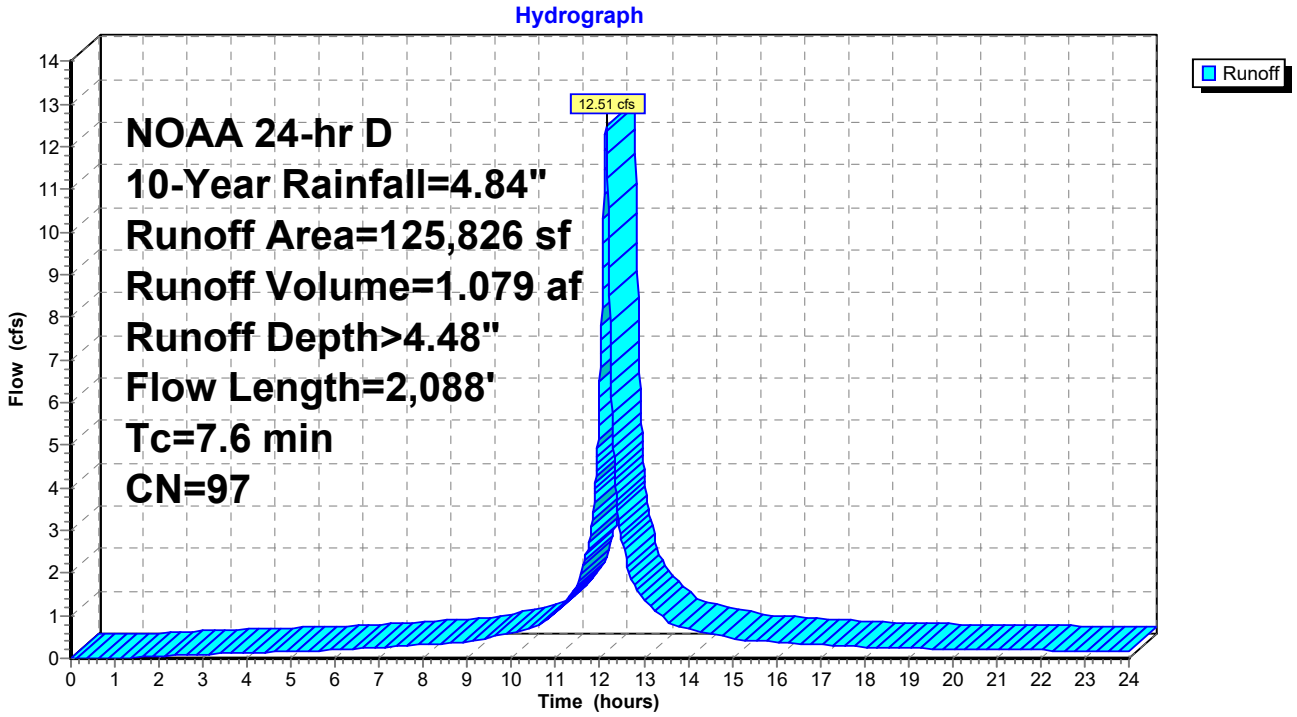
Runoff = 12.51 cfs @ 12.15 hrs, Volume= 1.079 af, Depth> 4.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Rainfall=4.84"

Area (sf)	CN	Description
118,809	98	Paved roads w/curbs & sewers, HSG D
7,017	79	50-75% Grass cover, Fair, HSG C
125,826	97	Weighted Average
7,017		5.58% Pervious Area
118,809		94.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**
1.1	767	0.0620	11.30	8.87	**Pipe Channel, 12" RCP** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
1.2	1,036	0.0590	14.44	25.51	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.3	285	0.0490	15.94	50.08	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
7.6	2,088	Total			

Subcatchment 1S: Analysis Point 1



Summary for Subcatchment 2S: Analysis Point 2

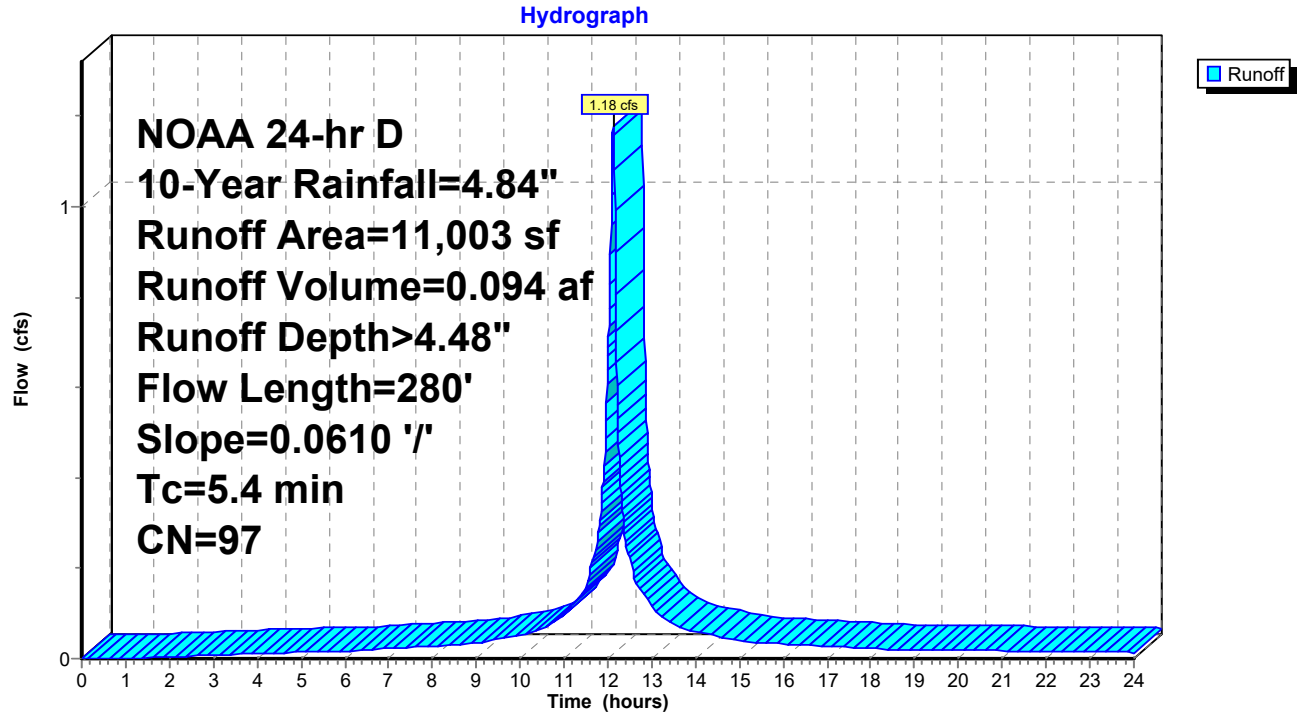
Runoff = 1.18 cfs @ 12.12 hrs, Volume= 0.094 af, Depth> 4.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Rainfall=4.84"

Area (sf)	CN	Description
10,415	98	Paved roads w/curbs & sewers, HSG C
588	79	50-75% Grass cover, Fair, HSG C
11,003	97	Weighted Average
588		5.34% Pervious Area
10,415		94.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**
0.4	280	0.0610	11.20	8.80	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
5.4	280	Total			

Subcatchment 2S: Analysis Point 2



Summary for Subcatchment 3S: Analysis Point 3

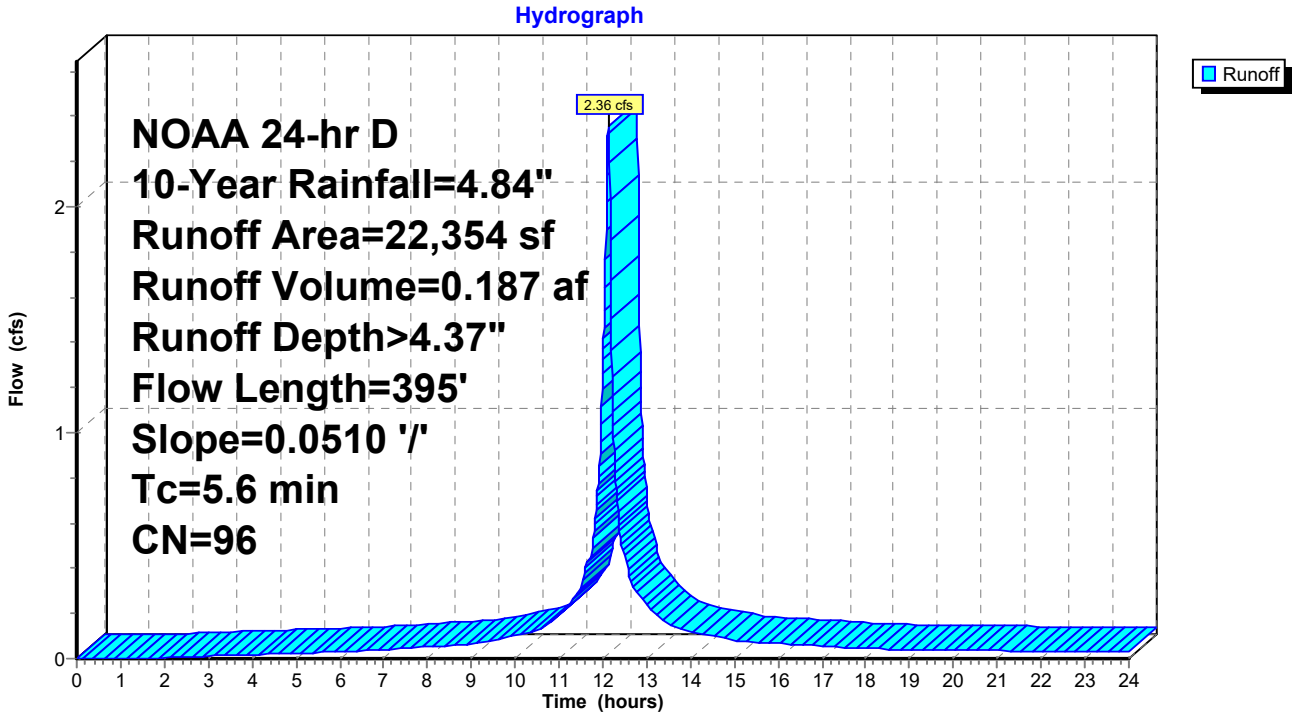
Runoff = 2.36 cfs @ 12.13 hrs, Volume= 0.187 af, Depth> 4.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Rainfall=4.84"

Area (sf)	CN	Description
19,922	98	Paved roads w/curbs & sewers, HSG C
2,432	79	50-75% Grass cover, Fair, HSG C
22,354	96	Weighted Average
2,432		10.88% Pervious Area
19,922		89.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**
0.6	395	0.0510	10.24	8.05	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
5.6	395	Total			

Subcatchment 3S: Analysis Point 3



Summary for Subcatchment 4S: Analysis Point 4

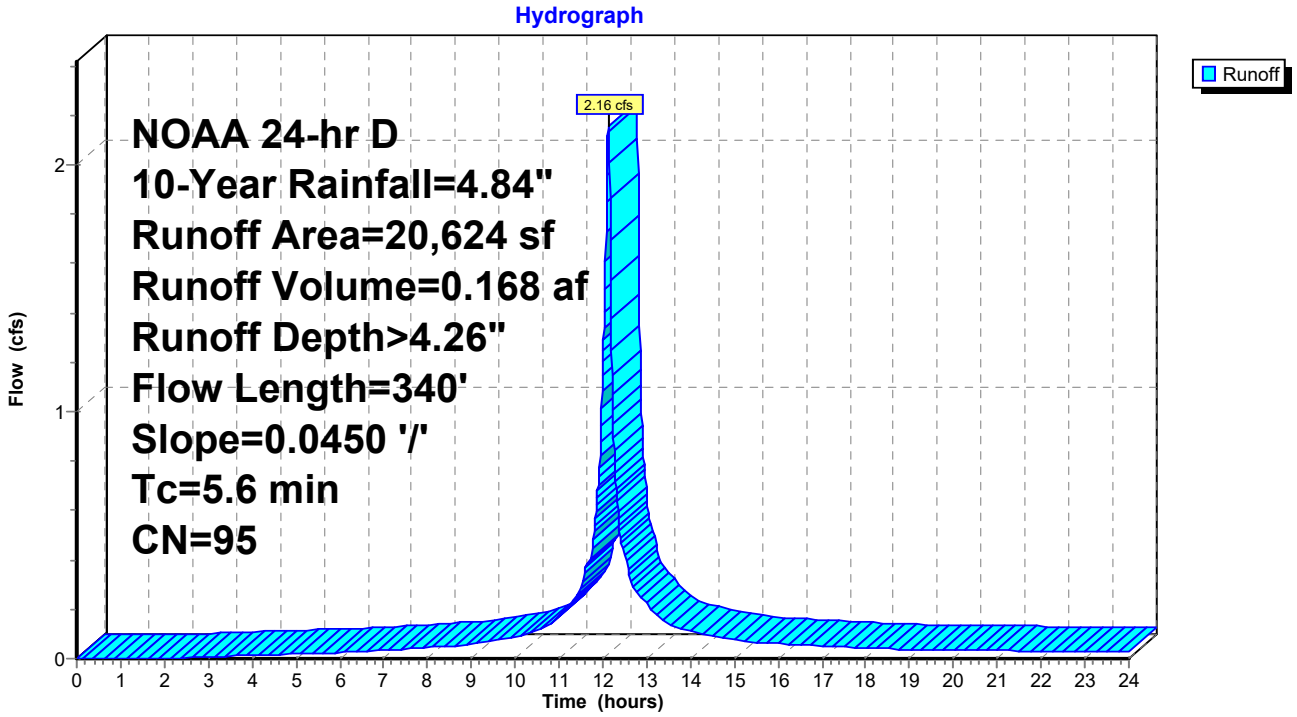
Runoff = 2.16 cfs @ 12.13 hrs, Volume= 0.168 af, Depth> 4.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Rainfall=4.84"

Area (sf)	CN	Description
19,291	98	Paved roads w/curbs & sewers, HSG C
1,333	49	50-75% Grass cover, Fair, HSG A
20,624	95	Weighted Average
1,333		6.46% Pervious Area
19,291		93.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**
0.6	340	0.0450	9.62	7.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
5.6	340	Total			

Subcatchment 4S: Analysis Point 4



Summary for Subcatchment 5S: Analysis Point 5

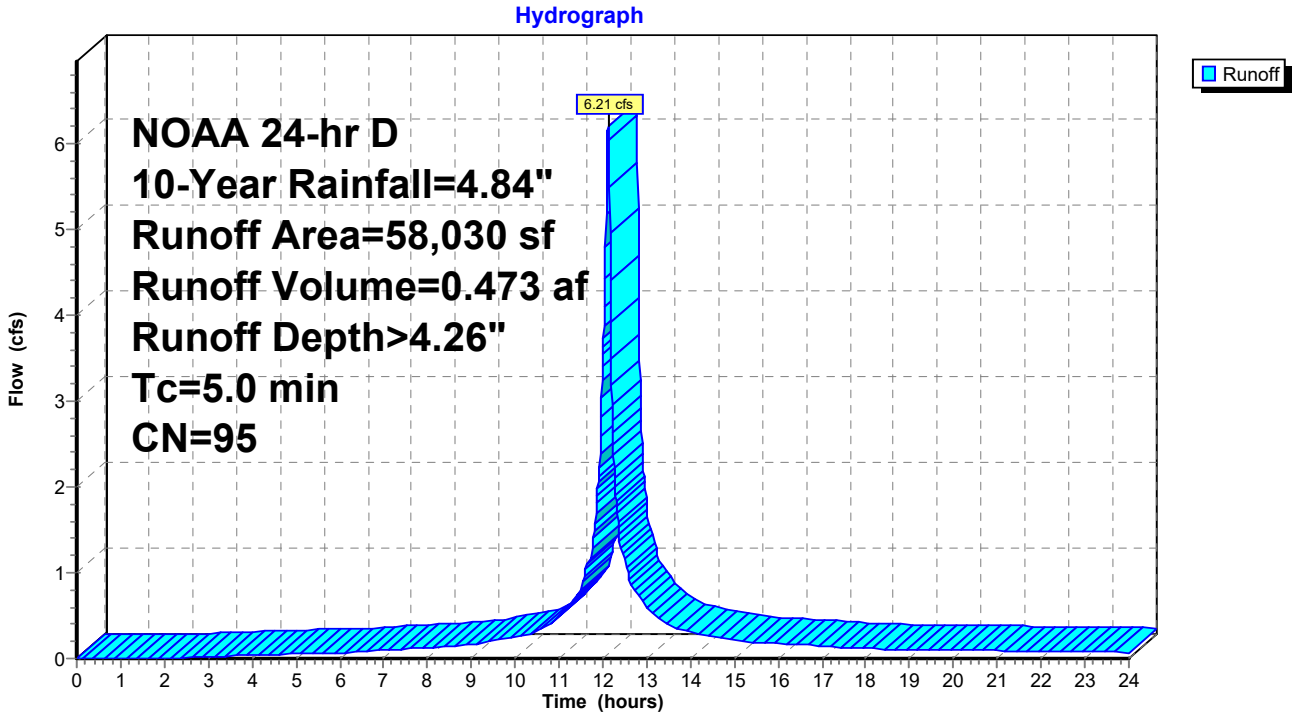
Runoff = 6.21 cfs @ 12.12 hrs, Volume= 0.473 af, Depth> 4.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Rainfall=4.84"

Area (sf)	CN	Description
54,562	98	Paved roads w/curbs & sewers, HSG A
3,468	49	50-75% Grass cover, Fair, HSG A
58,030	95	Weighted Average
3,468		5.98% Pervious Area
54,562		94.02% Impervious Area

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

Subcatchment 5S: Analysis Point 5



Summary for Subcatchment 6S: Analysis Point 6

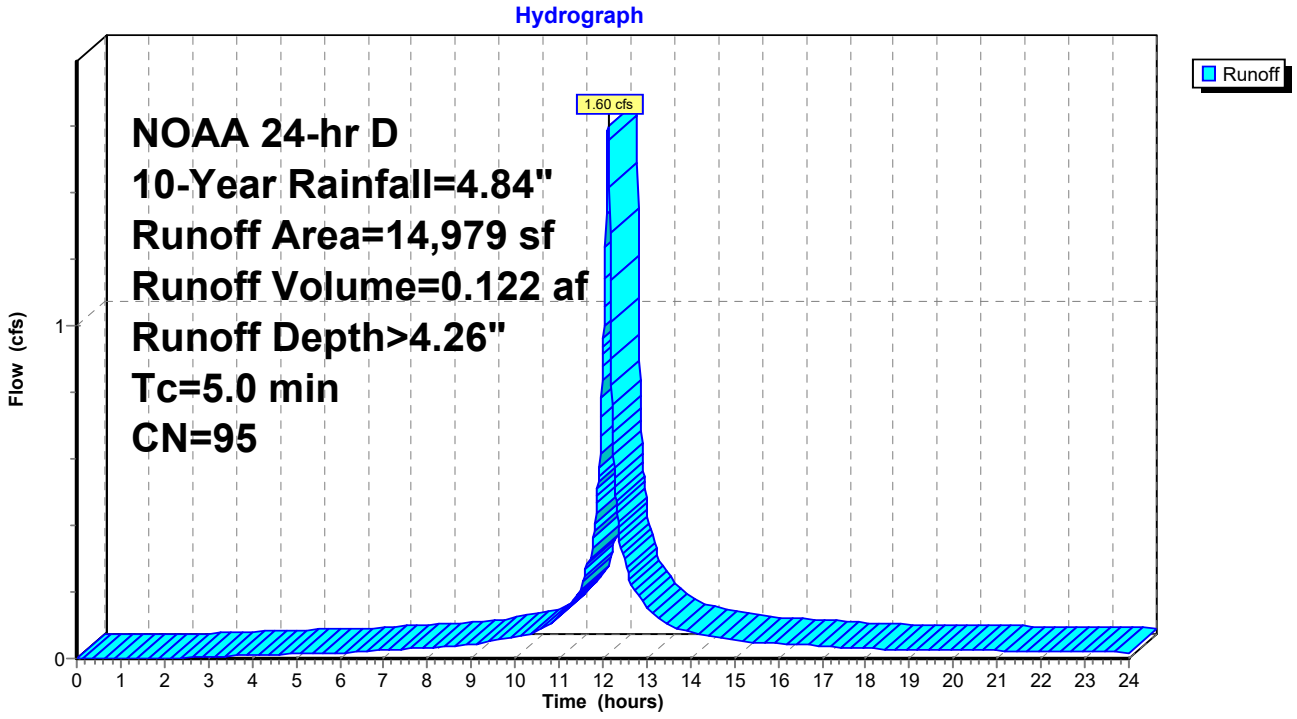
Runoff = 1.60 cfs @ 12.12 hrs, Volume= 0.122 af, Depth> 4.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Rainfall=4.84"

Area (sf)	CN	Description
13,995	98	Paved roads w/curbs & sewers, HSG A
984	49	50-75% Grass cover, Fair, HSG A
14,979	95	Weighted Average
984		6.57% Pervious Area
13,995		93.43% Impervious Area

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

Subcatchment 6S: Analysis Point 6



Summary for Subcatchment 7S: Analysis Point 7

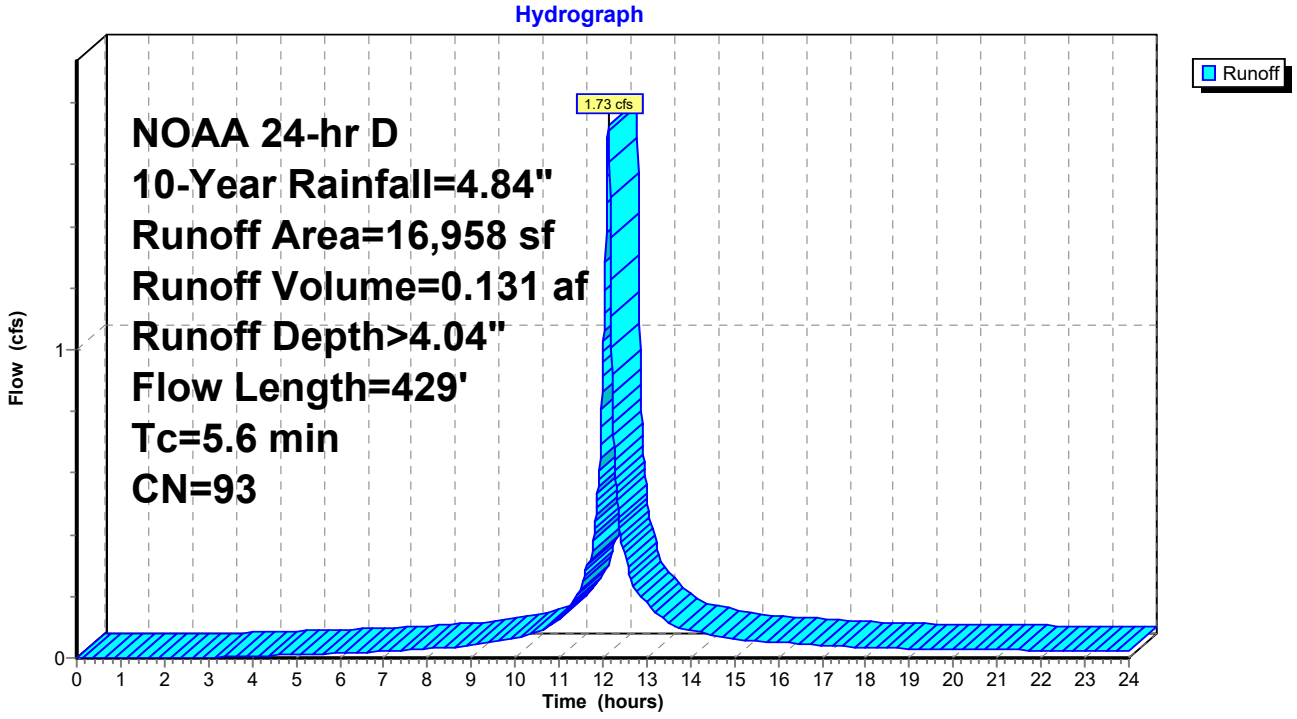
Runoff = 1.73 cfs @ 12.13 hrs, Volume= 0.131 af, Depth> 4.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Rainfall=4.84"

Area (sf)	CN	Description
15,288	98	Paved roads w/curbs & sewers, HSG A
1,670	49	50-75% Grass cover, Fair, HSG A
16,958	93	Weighted Average
1,670		9.85% Pervious Area
15,288		90.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**
0.6	389	0.0600	11.11	8.73	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
0.0	40	0.0610	17.78	55.87	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
5.6	429	Total			

Subcatchment 7S: Analysis Point 7



Summary for Subcatchment 8S: Analysis Point 8

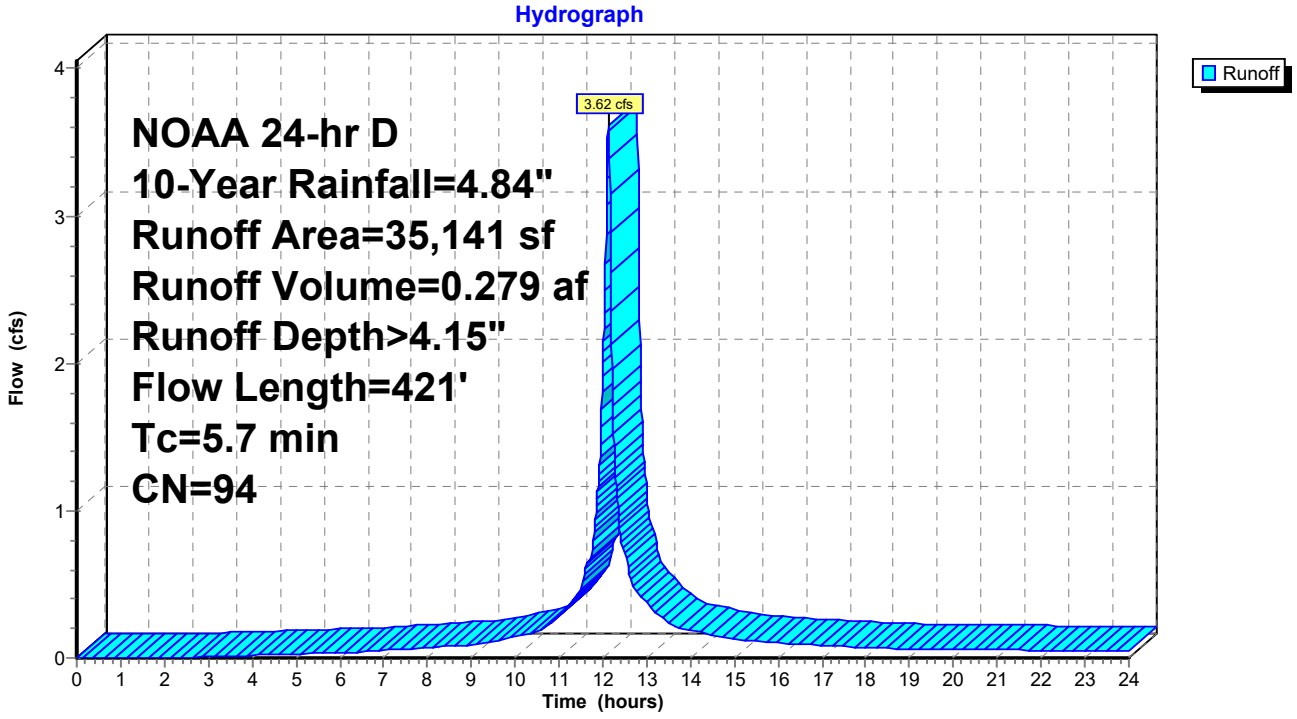
Runoff = 3.62 cfs @ 12.13 hrs, Volume= 0.279 af, Depth> 4.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Rainfall=4.84"

Area (sf)	CN	Description
32,308	98	Paved roads w/curbs & sewers, HSG C
2,833	49	50-75% Grass cover, Fair, HSG A
35,141	94	Weighted Average
2,833		8.06% Pervious Area
32,308		91.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**
0.6	390	0.0660	11.65	9.15	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
0.1	31	0.0070	4.97	8.79	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
5.7	421	Total			

Subcatchment 8S: Analysis Point 8



Summary for Subcatchment 9S: Analysis Point 9

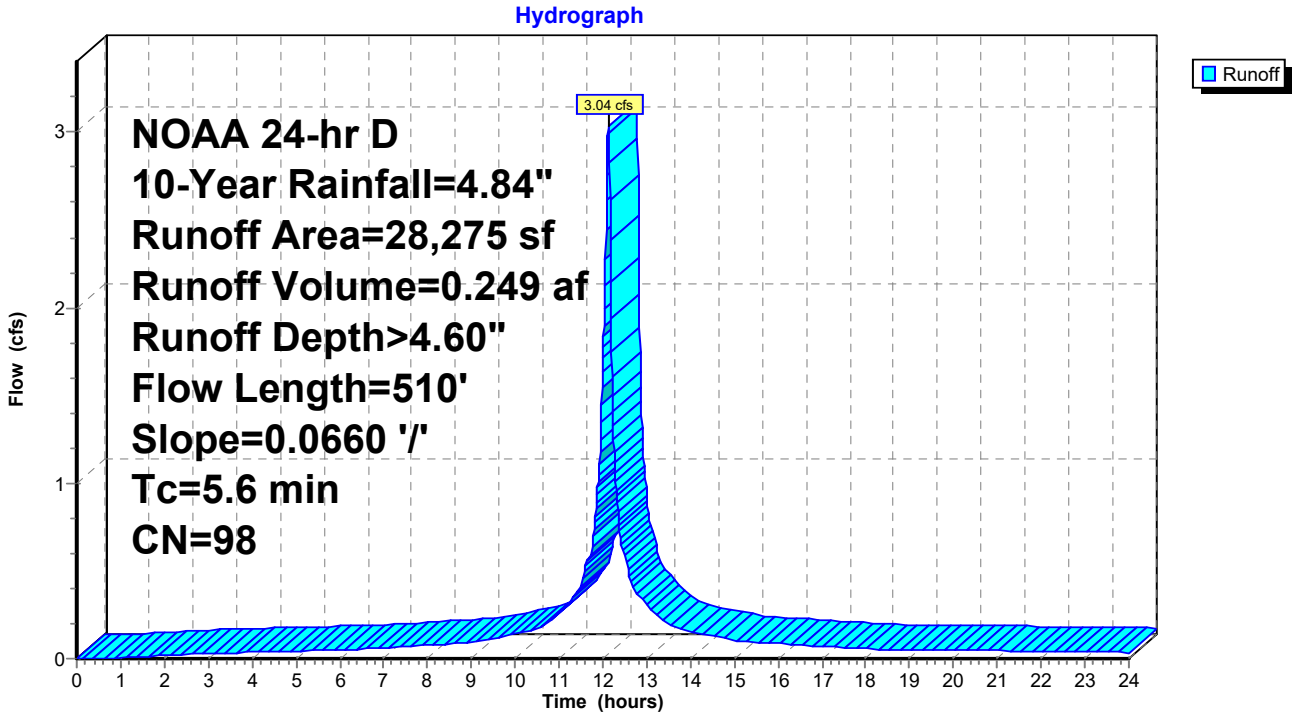
Runoff = 3.04 cfs @ 12.13 hrs, Volume= 0.249 af, Depth> 4.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Rainfall=4.84"

Area (sf)	CN	Description
28,158	98	Paved roads w/curbs & sewers, HSG C
117	79	50-75% Grass cover, Fair, HSG C
28,275	98	Weighted Average
117		0.41% Pervious Area
28,158		99.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**
0.6	510	0.0660	15.27	26.99	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
5.6	510	Total			

Subcatchment 9S: Analysis Point 9



Summary for Subcatchment 10S: Analysis Point 10

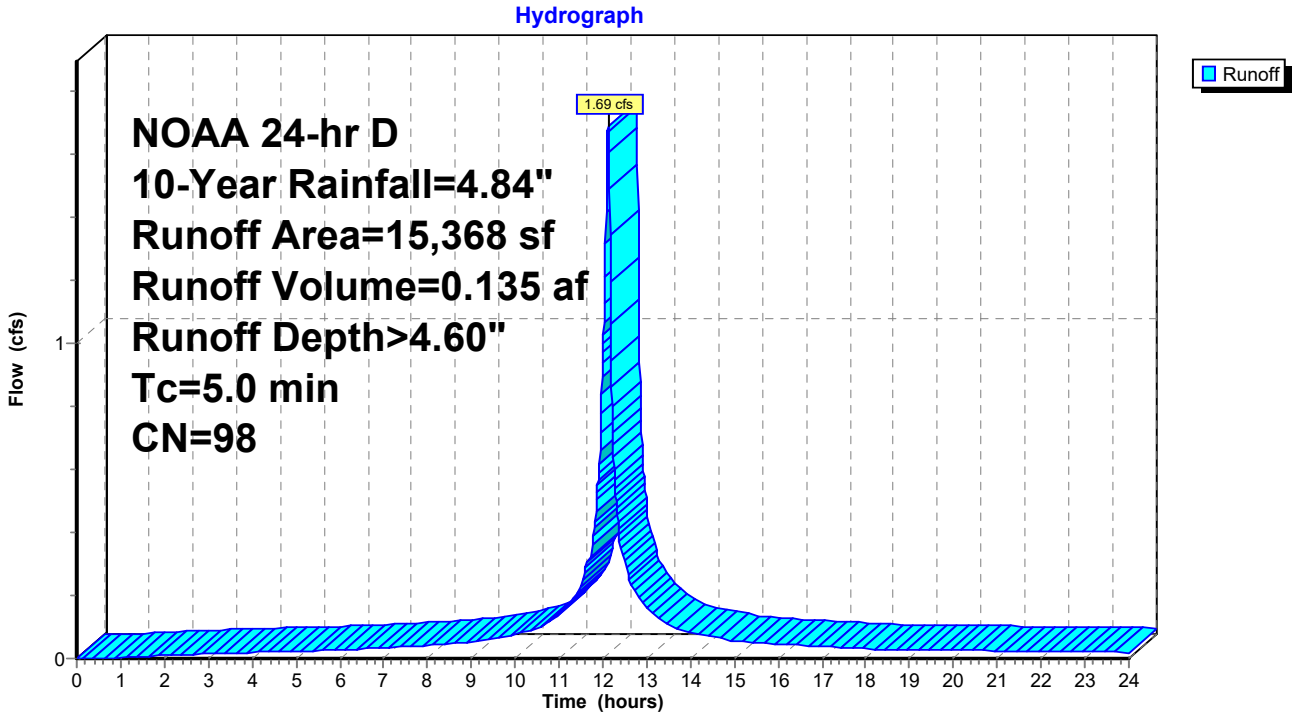
Runoff = 1.69 cfs @ 12.12 hrs, Volume= 0.135 af, Depth> 4.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Rainfall=4.84"

Area (sf)	CN	Description
15,306	98	Paved roads w/curbs & sewers, HSG C
62	79	50-75% Grass cover, Fair, HSG C
15,368	98	Weighted Average
62		0.40% Pervious Area
15,306		99.60% Impervious Area

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

Subcatchment 10S: Analysis Point 10



Summary for Subcatchment 11S: Analysis Point 11

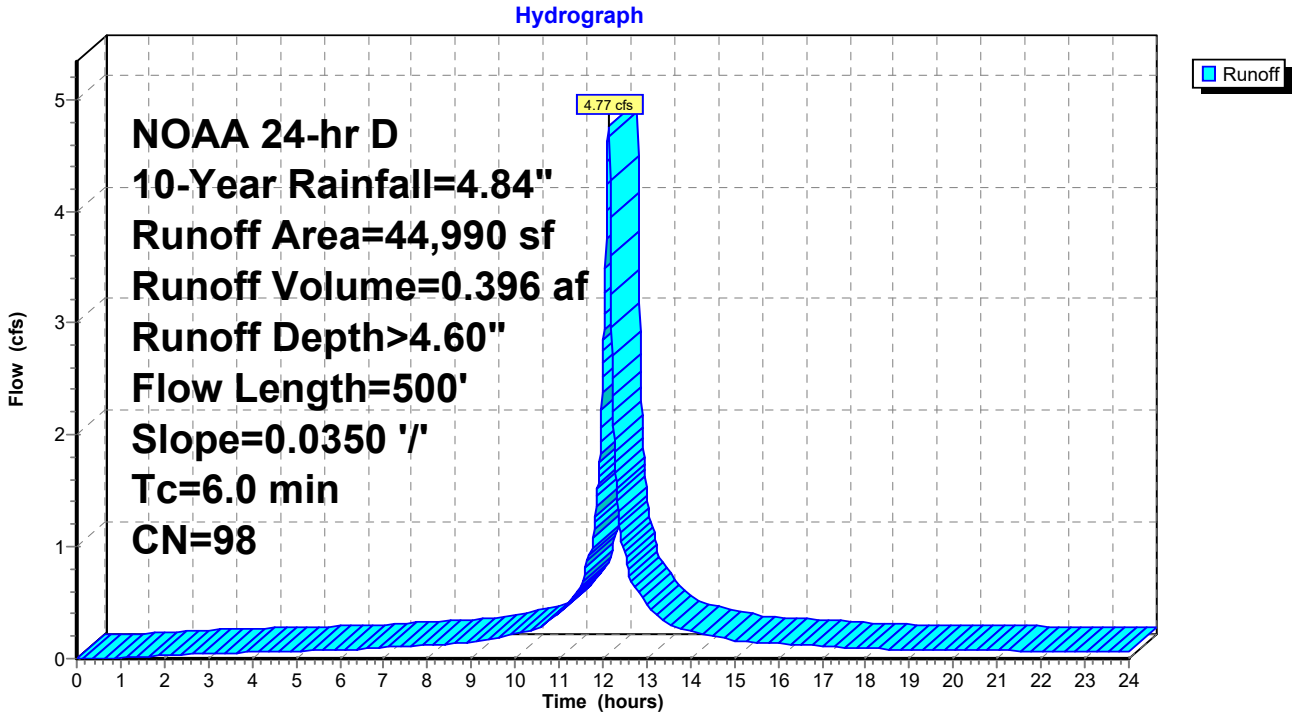
Runoff = 4.77 cfs @ 12.13 hrs, Volume= 0.396 af, Depth> 4.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Rainfall=4.84"

Area (sf)	CN	Description
44,473	98	Paved roads w/curbs & sewers, HSG C
517	79	50-75% Grass cover, Fair, HSG C
44,990	98	Weighted Average
517		1.15% Pervious Area
44,473		98.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**
1.0	500	0.0350	8.49	6.67	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
6.0	500	Total			

Subcatchment 11S: Analysis Point 11

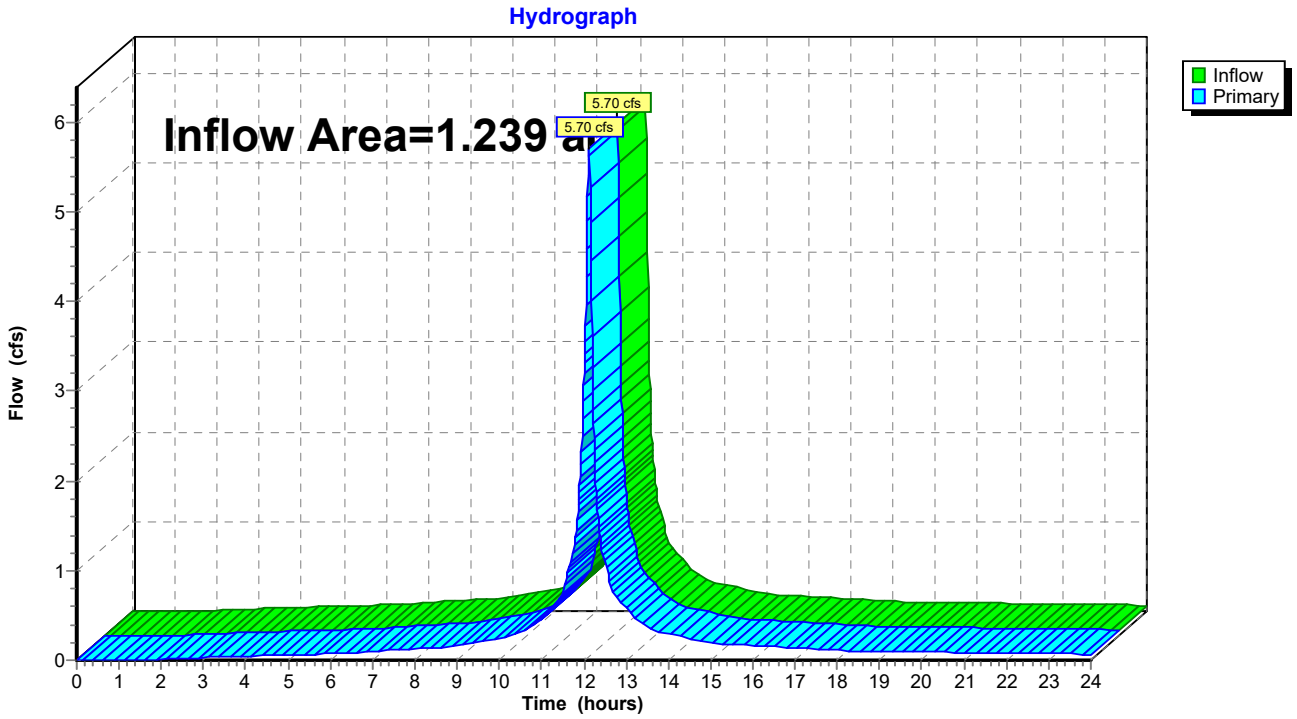


Summary for Link 12L: (new Link)

Inflow Area = 1.239 ac, 91.94% Impervious, Inflow Depth > 4.35" for 10-Year event
Inflow = 5.70 cfs @ 12.13 hrs, Volume= 0.449 af
Primary = 5.70 cfs @ 12.13 hrs, Volume= 0.449 af, Atten= 0%, Lag= 0.0 min

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

Link 12L: (new Link)



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

Subcatchment1S: Analysis Point 1 Runoff Area=125,826 sf 94.42% Impervious Runoff Depth>7.19"
Flow Length=2,088' Tc=7.6 min CN=97 Runoff=19.68 cfs 1.731 af

Subcatchment2S: Analysis Point 2 Runoff Area=11,003 sf 94.66% Impervious Runoff Depth>7.19"
Flow Length=280' Slope=0.0610 '/' Tc=5.4 min CN=97 Runoff=1.86 cfs 0.151 af

Subcatchment3S: Analysis Point 3 Runoff Area=22,354 sf 89.12% Impervious Runoff Depth>7.08"
Flow Length=395' Slope=0.0510 '/' Tc=5.6 min CN=96 Runoff=3.74 cfs 0.303 af

Subcatchment4S: Analysis Point 4 Runoff Area=20,624 sf 93.54% Impervious Runoff Depth>6.96"
Flow Length=340' Slope=0.0450 '/' Tc=5.6 min CN=95 Runoff=3.43 cfs 0.274 af

Subcatchment5S: Analysis Point 5 Runoff Area=58,030 sf 94.02% Impervious Runoff Depth>6.96"
Tc=5.0 min CN=95 Runoff=9.86 cfs 0.772 af

Subcatchment6S: Analysis Point 6 Runoff Area=14,979 sf 93.43% Impervious Runoff Depth>6.96"
Tc=5.0 min CN=95 Runoff=2.55 cfs 0.199 af

Subcatchment7S: Analysis Point 7 Runoff Area=16,958 sf 90.15% Impervious Runoff Depth>6.72"
Flow Length=429' Tc=5.6 min CN=93 Runoff=2.78 cfs 0.218 af

Subcatchment8S: Analysis Point 8 Runoff Area=35,141 sf 91.94% Impervious Runoff Depth>6.84"
Flow Length=421' Tc=5.7 min CN=94 Runoff=5.79 cfs 0.460 af

Subcatchment9S: Analysis Point 9 Runoff Area=28,275 sf 99.59% Impervious Runoff Depth>7.31"
Flow Length=510' Slope=0.0660 '/' Tc=5.6 min CN=98 Runoff=4.76 cfs 0.396 af

Subcatchment10S: Analysis Point 10 Runoff Area=15,368 sf 99.60% Impervious Runoff Depth>7.31"
Tc=5.0 min CN=98 Runoff=2.64 cfs 0.215 af

Subcatchment11S: Analysis Point 11 Runoff Area=44,990 sf 98.85% Impervious Runoff Depth>7.31"
Flow Length=500' Slope=0.0350 '/' Tc=6.0 min CN=98 Runoff=7.47 cfs 0.629 af

Link 12L: (new Link) Inflow=9.03 cfs 0.728 af
Primary=9.03 cfs 0.728 af

Total Runoff Area = 9.035 ac Runoff Volume = 5.349 af Average Runoff Depth = 7.10"
5.34% Pervious = 0.483 ac 94.66% Impervious = 8.552 ac

Summary for Subcatchment 1S: Analysis Point 1

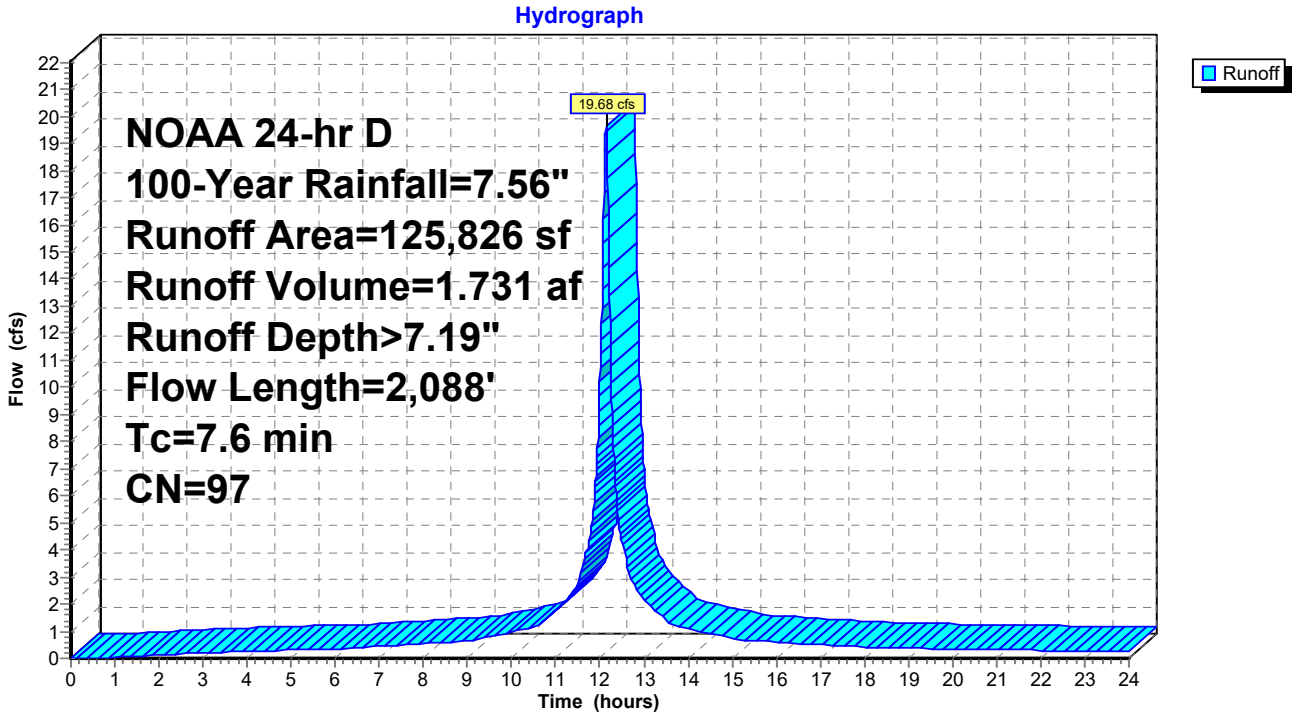
Runoff = 19.68 cfs @ 12.15 hrs, Volume= 1.731 af, Depth> 7.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Rainfall=7.56"

Area (sf)	CN	Description
118,809	98	Paved roads w/curbs & sewers, HSG D
7,017	79	50-75% Grass cover, Fair, HSG C
125,826	97	Weighted Average
7,017		5.58% Pervious Area
118,809		94.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**
1.1	767	0.0620	11.30	8.87	**Pipe Channel, 12" RCP** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
1.2	1,036	0.0590	14.44	25.51	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.3	285	0.0490	15.94	50.08	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
7.6	2,088	Total			

Subcatchment 1S: Analysis Point 1



Summary for Subcatchment 2S: Analysis Point 2

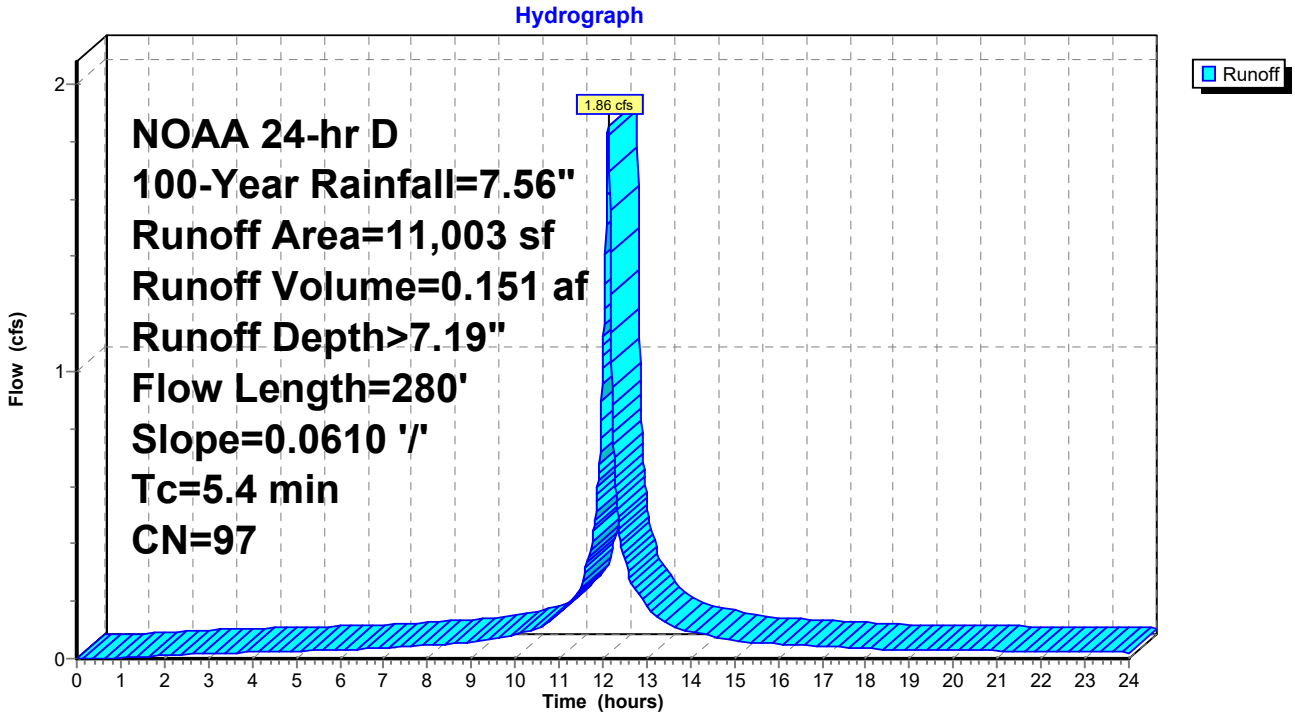
Runoff = 1.86 cfs @ 12.12 hrs, Volume= 0.151 af, Depth> 7.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Rainfall=7.56"

Area (sf)	CN	Description
10,415	98	Paved roads w/curbs & sewers, HSG C
588	79	50-75% Grass cover, Fair, HSG C
11,003	97	Weighted Average
588		5.34% Pervious Area
10,415		94.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**
0.4	280	0.0610	11.20	8.80	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
5.4	280	Total			

Subcatchment 2S: Analysis Point 2



Summary for Subcatchment 3S: Analysis Point 3

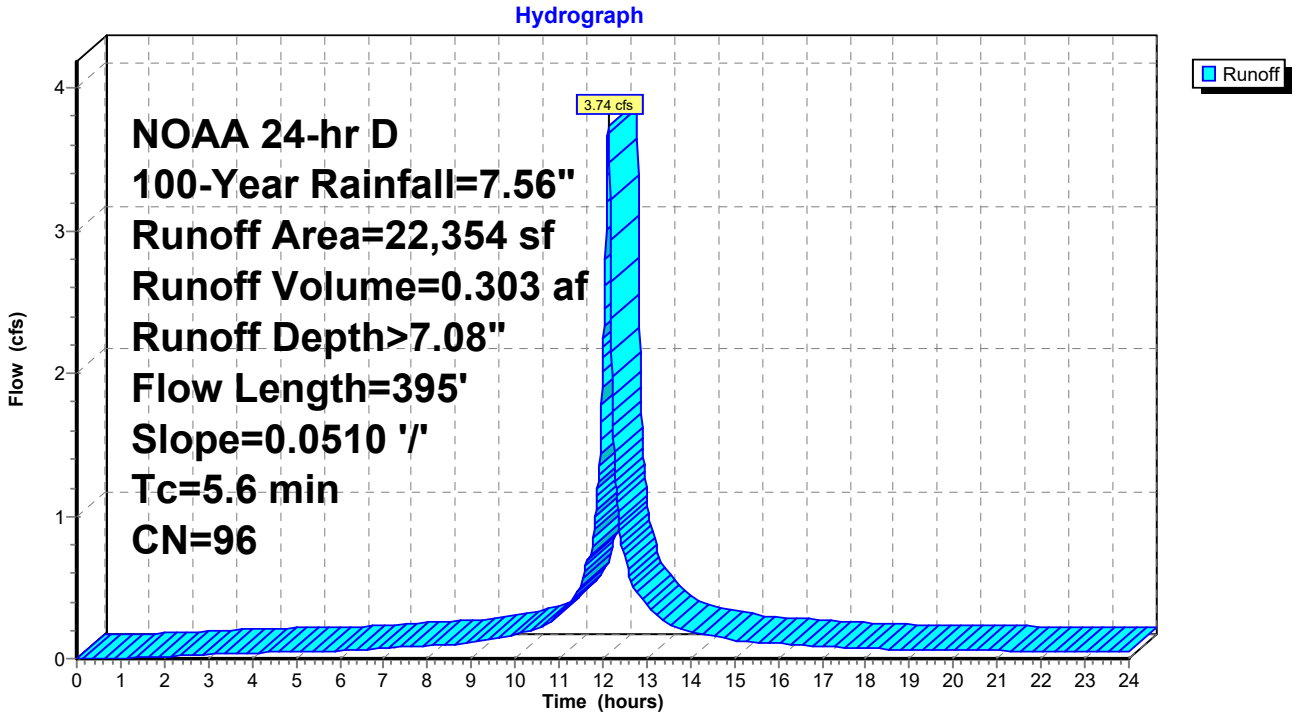
Runoff = 3.74 cfs @ 12.13 hrs, Volume= 0.303 af, Depth> 7.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Rainfall=7.56"

Area (sf)	CN	Description
19,922	98	Paved roads w/curbs & sewers, HSG C
2,432	79	50-75% Grass cover, Fair, HSG C
22,354	96	Weighted Average
2,432		10.88% Pervious Area
19,922		89.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**
0.6	395	0.0510	10.24	8.05	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
5.6	395	Total			

Subcatchment 3S: Analysis Point 3



Summary for Subcatchment 4S: Analysis Point 4

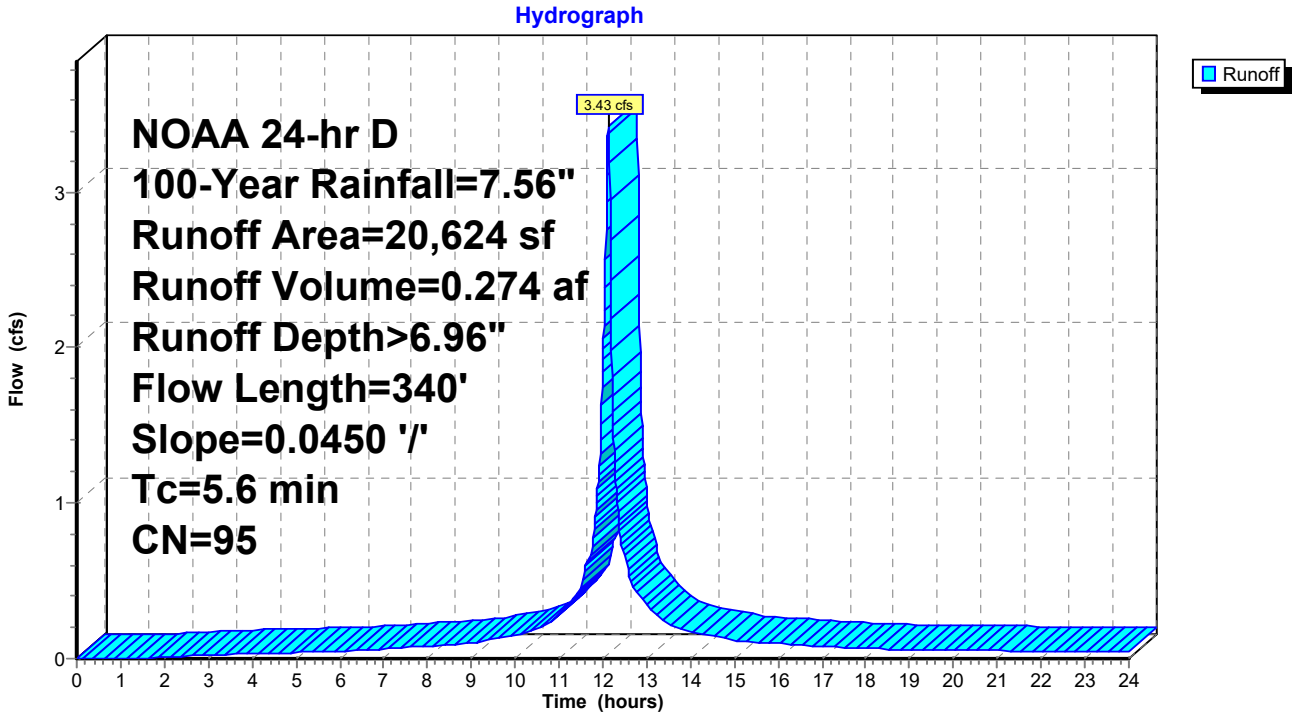
Runoff = 3.43 cfs @ 12.13 hrs, Volume= 0.274 af, Depth> 6.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Rainfall=7.56"

Area (sf)	CN	Description
19,291	98	Paved roads w/curbs & sewers, HSG C
1,333	49	50-75% Grass cover, Fair, HSG A
20,624	95	Weighted Average
1,333		6.46% Pervious Area
19,291		93.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**
0.6	340	0.0450	9.62	7.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
5.6	340	Total			

Subcatchment 4S: Analysis Point 4



Summary for Subcatchment 5S: Analysis Point 5

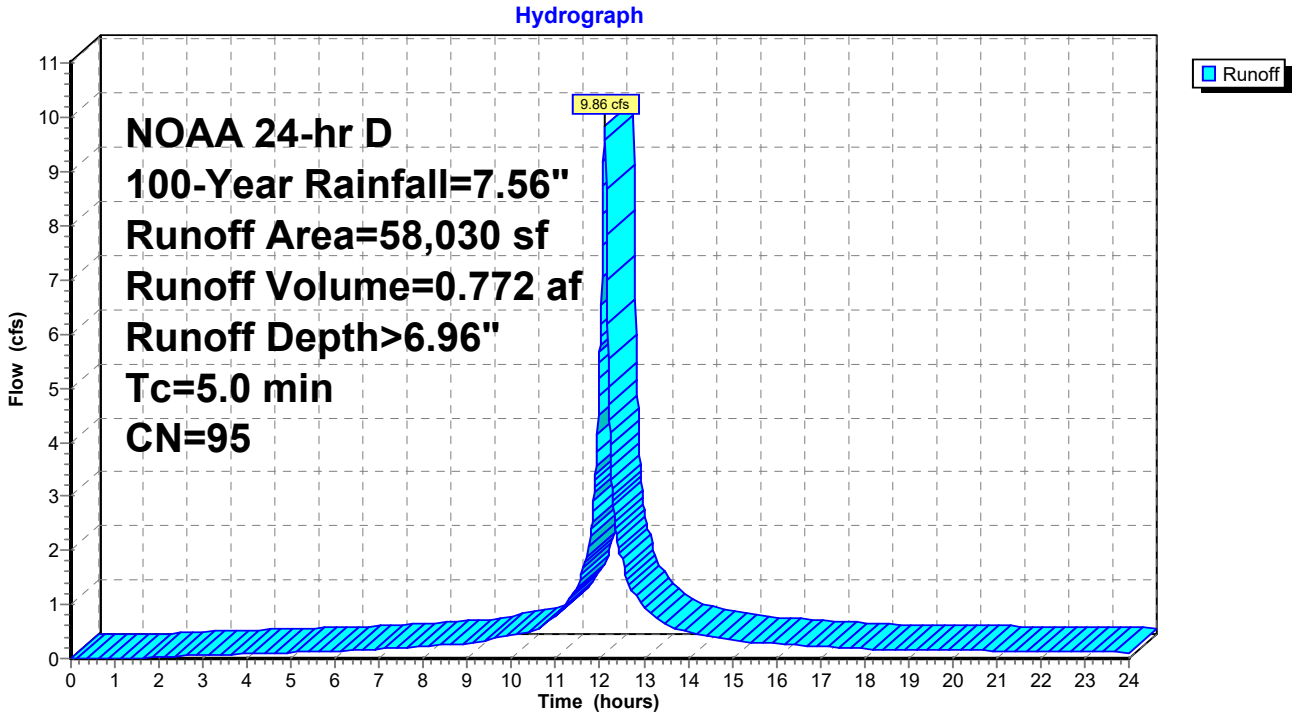
Runoff = 9.86 cfs @ 12.12 hrs, Volume= 0.772 af, Depth> 6.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Rainfall=7.56"

Area (sf)	CN	Description
54,562	98	Paved roads w/curbs & sewers, HSG A
3,468	49	50-75% Grass cover, Fair, HSG A
58,030	95	Weighted Average
3,468		5.98% Pervious Area
54,562		94.02% Impervious Area

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

Subcatchment 5S: Analysis Point 5



Summary for Subcatchment 6S: Analysis Point 6

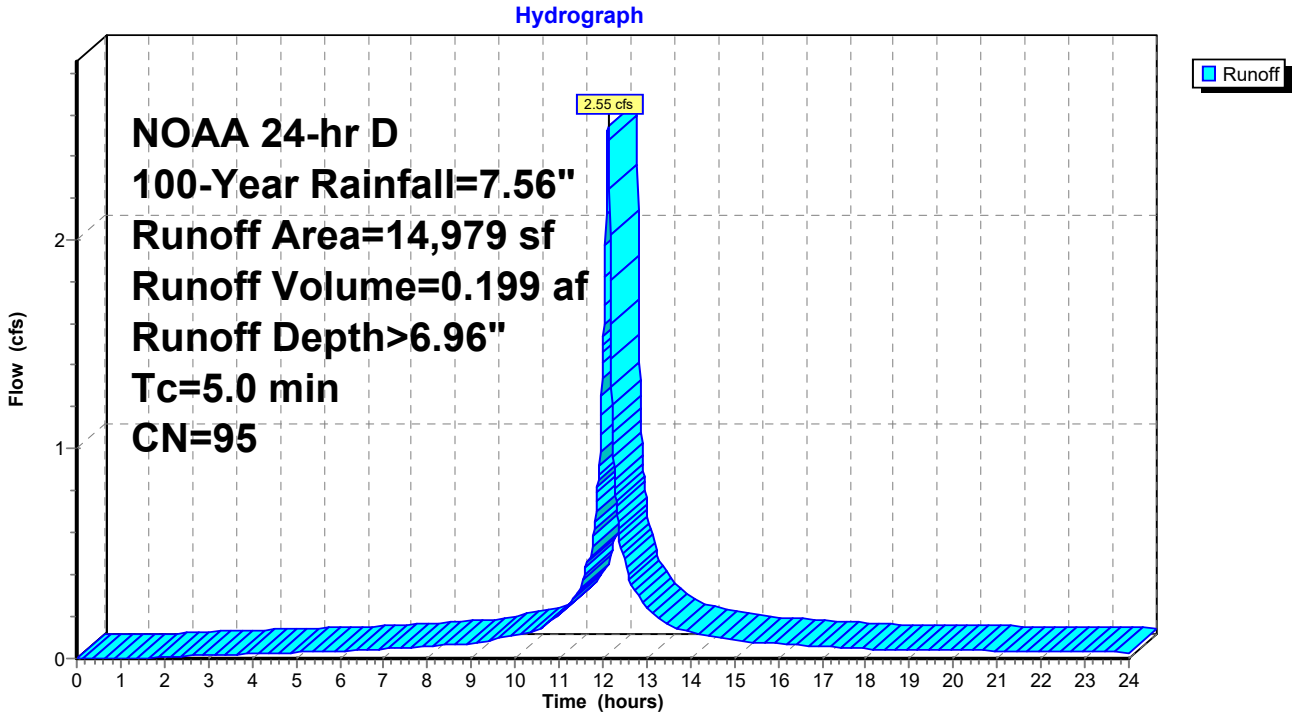
Runoff = 2.55 cfs @ 12.12 hrs, Volume= 0.199 af, Depth> 6.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Rainfall=7.56"

Area (sf)	CN	Description
13,995	98	Paved roads w/curbs & sewers, HSG A
984	49	50-75% Grass cover, Fair, HSG A
14,979	95	Weighted Average
984		6.57% Pervious Area
13,995		93.43% Impervious Area

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

Subcatchment 6S: Analysis Point 6



Summary for Subcatchment 7S: Analysis Point 7

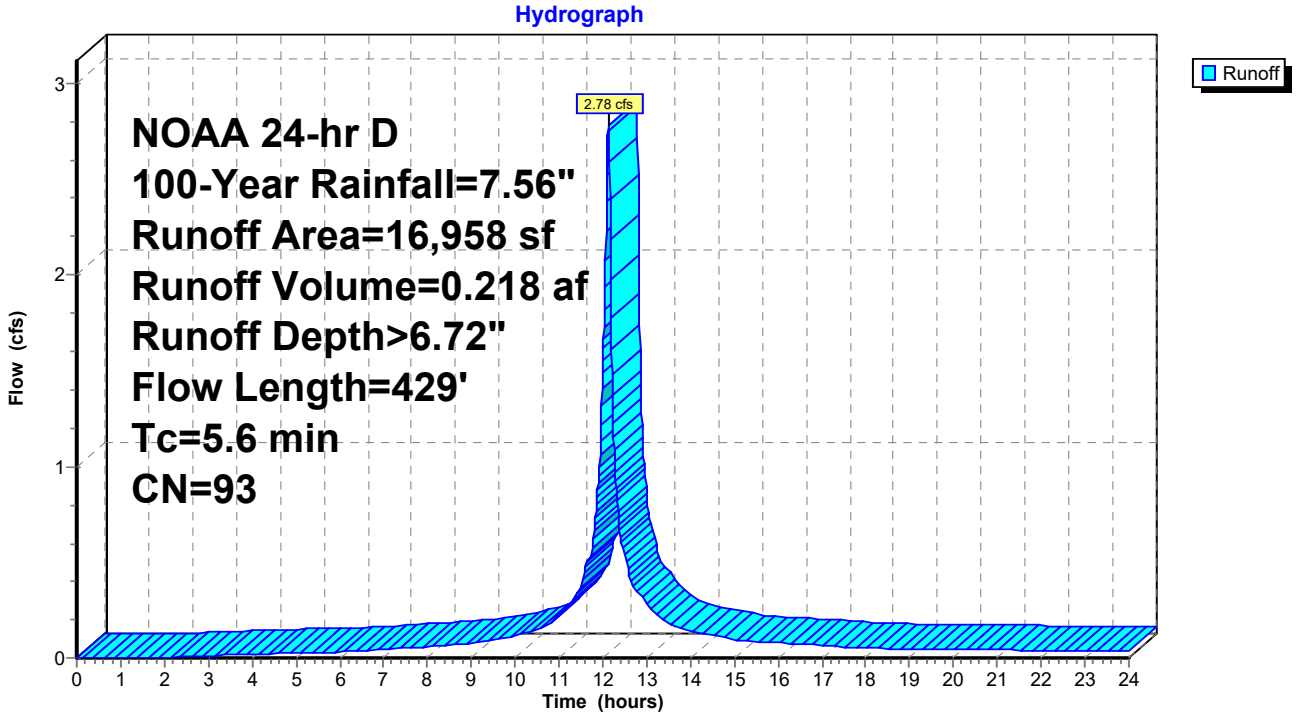
Runoff = 2.78 cfs @ 12.13 hrs, Volume= 0.218 af, Depth> 6.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Rainfall=7.56"

Area (sf)	CN	Description
15,288	98	Paved roads w/curbs & sewers, HSG A
1,670	49	50-75% Grass cover, Fair, HSG A
16,958	93	Weighted Average
1,670		9.85% Pervious Area
15,288		90.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**
0.6	389	0.0600	11.11	8.73	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
0.0	40	0.0610	17.78	55.87	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
5.6	429	Total			

Subcatchment 7S: Analysis Point 7



Summary for Subcatchment 8S: Analysis Point 8

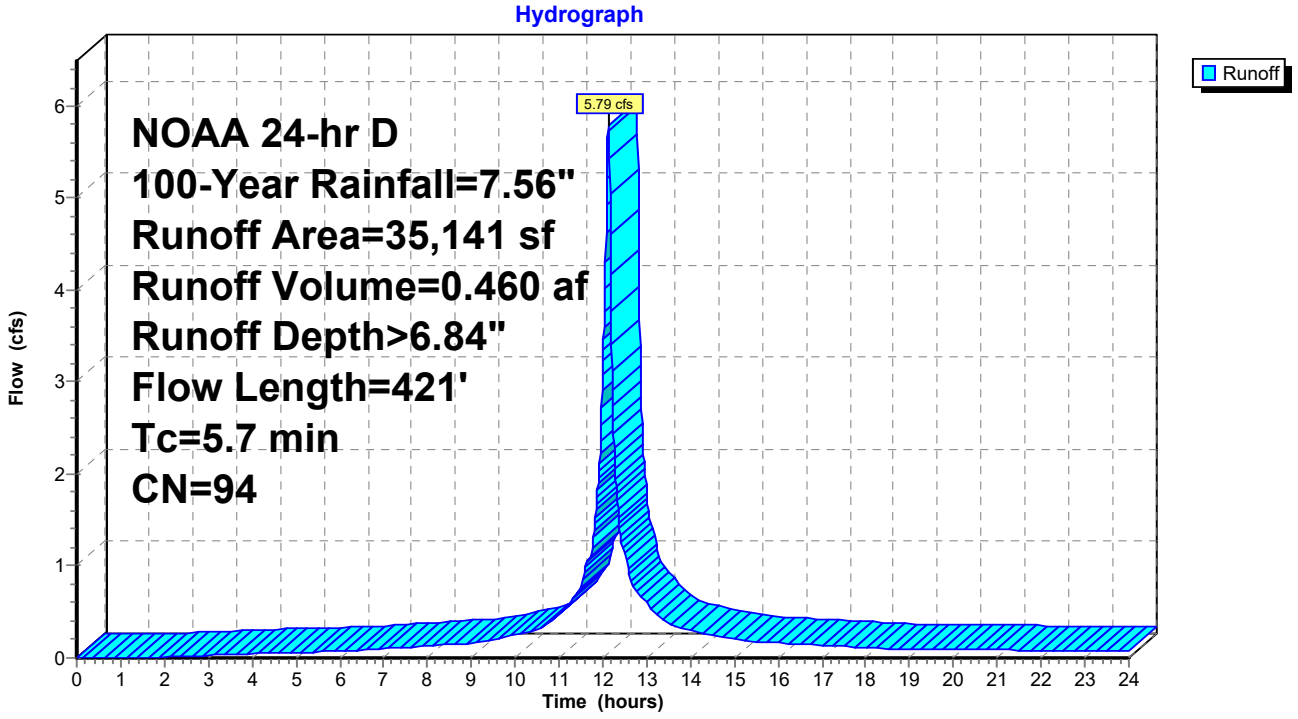
Runoff = 5.79 cfs @ 12.13 hrs, Volume= 0.460 af, Depth> 6.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Rainfall=7.56"

Area (sf)	CN	Description
32,308	98	Paved roads w/curbs & sewers, HSG C
2,833	49	50-75% Grass cover, Fair, HSG A
35,141	94	Weighted Average
2,833		8.06% Pervious Area
32,308		91.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**
0.6	390	0.0660	11.65	9.15	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
0.1	31	0.0070	4.97	8.79	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
5.7	421	Total			

Subcatchment 8S: Analysis Point 8



Summary for Subcatchment 9S: Analysis Point 9

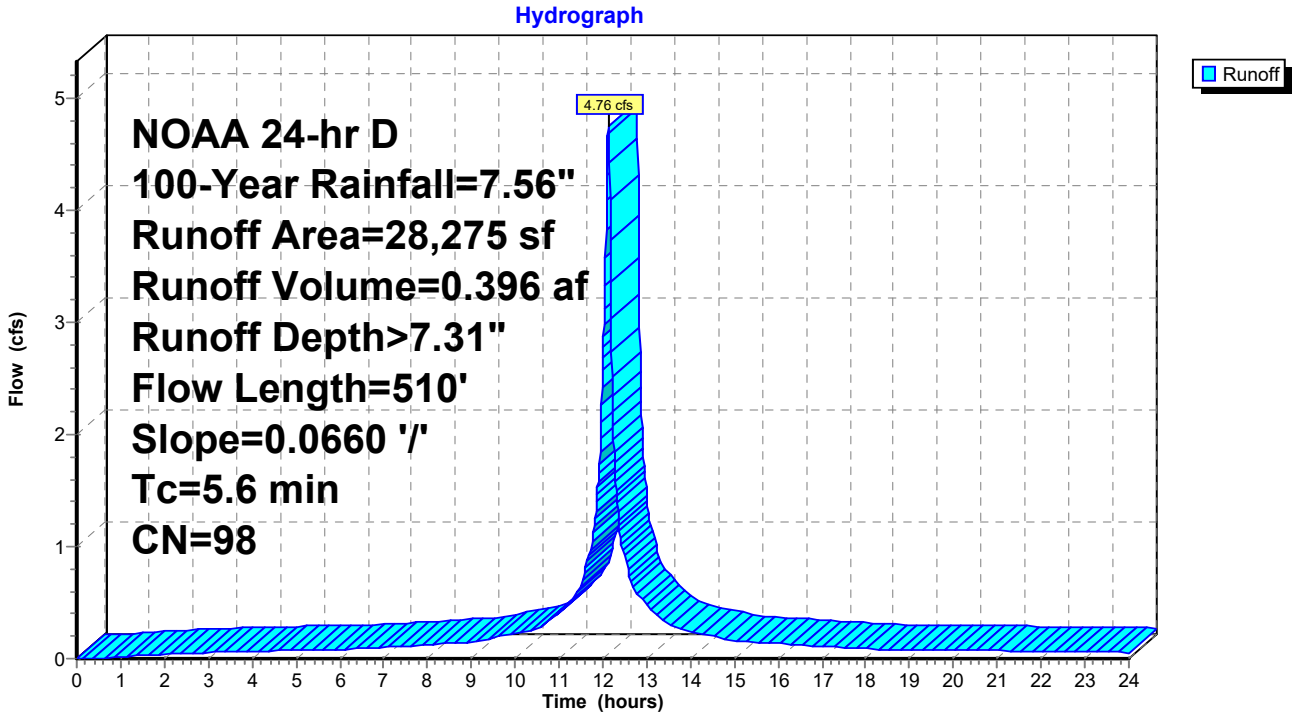
Runoff = 4.76 cfs @ 12.13 hrs, Volume= 0.396 af, Depth> 7.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Rainfall=7.56"

Area (sf)	CN	Description
28,158	98	Paved roads w/curbs & sewers, HSG C
117	79	50-75% Grass cover, Fair, HSG C
28,275	98	Weighted Average
117		0.41% Pervious Area
28,158		99.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**
0.6	510	0.0660	15.27	26.99	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
5.6	510	Total			

Subcatchment 9S: Analysis Point 9



Summary for Subcatchment 10S: Analysis Point 10

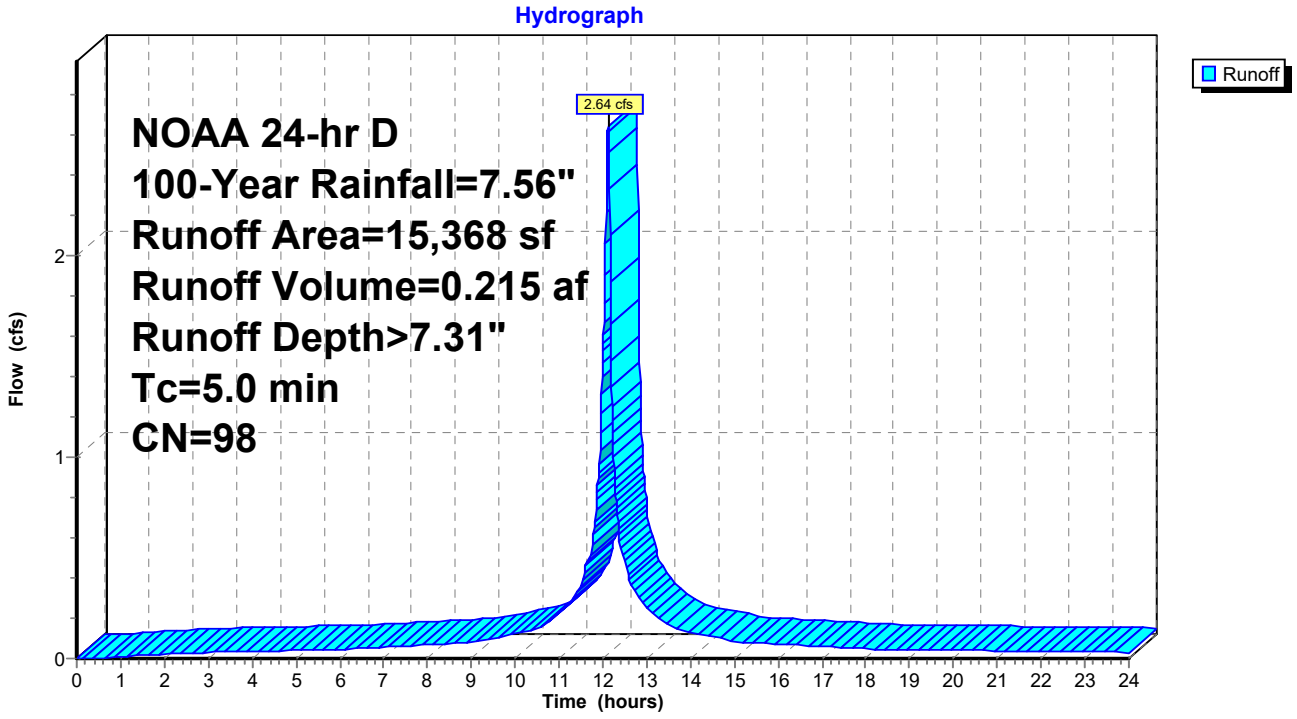
Runoff = 2.64 cfs @ 12.12 hrs, Volume= 0.215 af, Depth> 7.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Rainfall=7.56"

Area (sf)	CN	Description
15,306	98	Paved roads w/curbs & sewers, HSG C
62	79	50-75% Grass cover, Fair, HSG C
15,368	98	Weighted Average
62		0.40% Pervious Area
15,306		99.60% Impervious Area

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

Subcatchment 10S: Analysis Point 10



Summary for Subcatchment 11S: Analysis Point 11

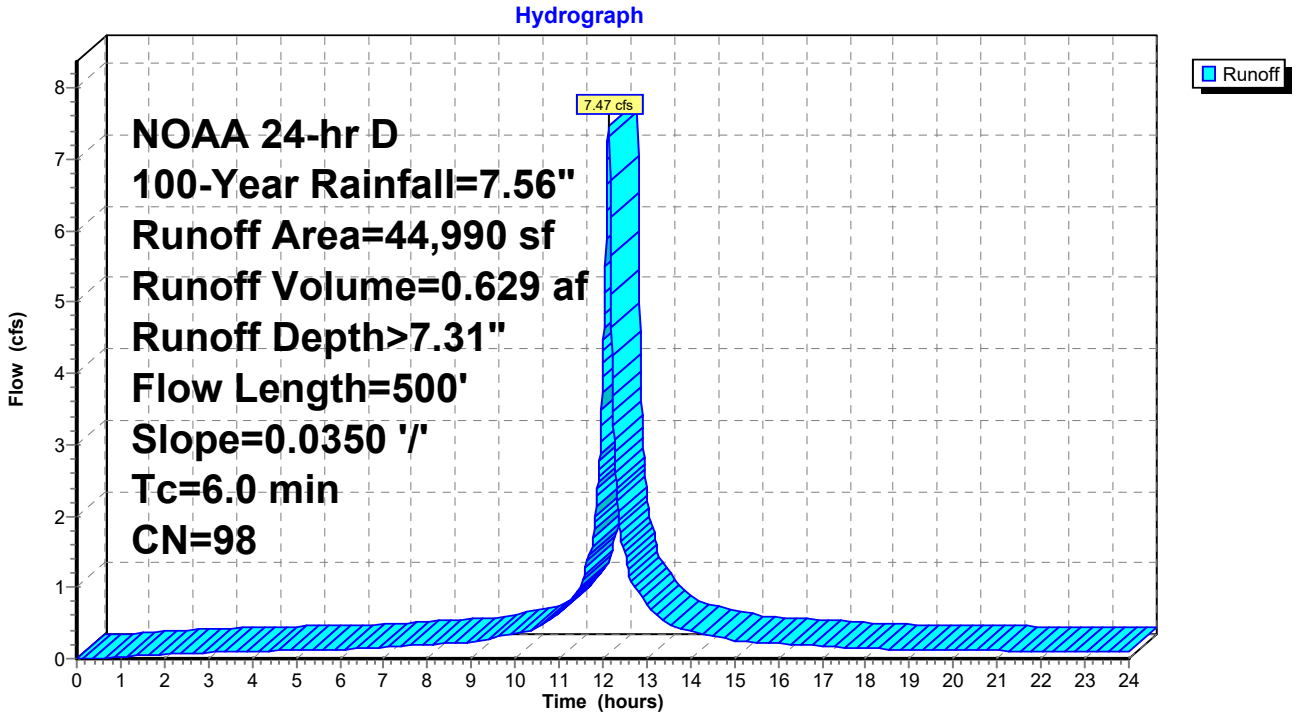
Runoff = 7.47 cfs @ 12.13 hrs, Volume= 0.629 af, Depth> 7.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Rainfall=7.56"

Area (sf)	CN	Description
44,473	98	Paved roads w/curbs & sewers, HSG C
517	79	50-75% Grass cover, Fair, HSG C
44,990	98	Weighted Average
517		1.15% Pervious Area
44,473		98.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**
1.0	500	0.0350	8.49	6.67	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
6.0	500	Total			

Subcatchment 11S: Analysis Point 11

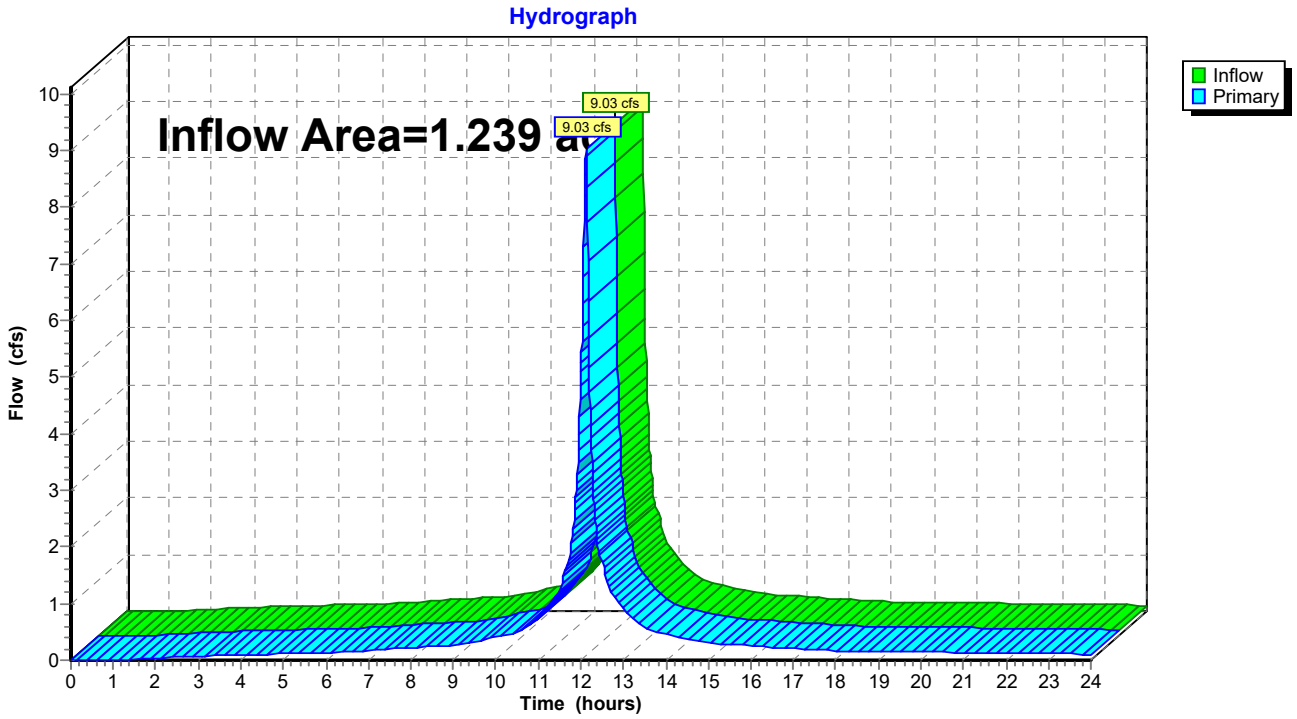


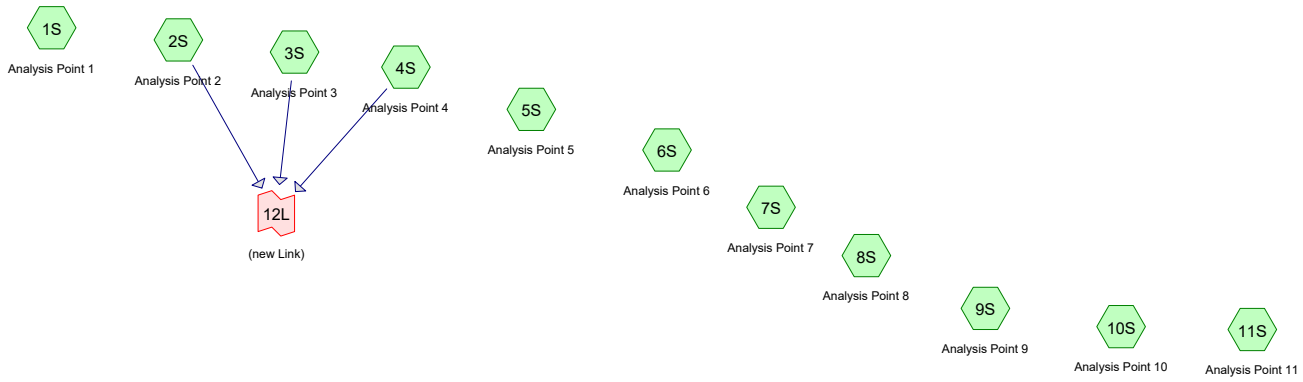
Summary for Link 12L: (new Link)

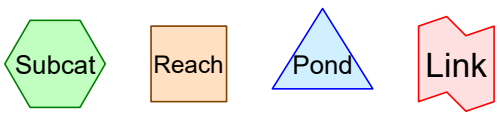
Inflow Area = 1.239 ac, 91.94% Impervious, Inflow Depth > 7.05" for 100-Year event
Inflow = 9.03 cfs @ 12.13 hrs, Volume= 0.728 af
Primary = 9.03 cfs @ 12.13 hrs, Volume= 0.728 af, Atten= 0%, Lag= 0.0 min

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

Link 12L: (new Link)







Routing Diagram for Worcester 610535 Proposed
Prepared by Jacobs, Printed 2/3/2026
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Worcester 610535 Proposed
Prepared by Jacobs
Printed 2/3/2026
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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.125	79	50-75% Grass cover, Fair, HSG C (1S, 2S, 3S)
2.065	98	Paved roads w/curbs & sewers, HSG A (5S, 6S, 7S)
4.036	98	Paved roads w/curbs & sewers, HSG C (2S, 3S, 4S, 8S, 9S, 10S, 11S)
2.808	98	Paved roads w/curbs & sewers, HSG D (1S)
9.035	**98**	**TOTAL AREA**

Worcester 610535 Proposed *NOAA 24-hr D 2-Year Rainfall=3.13"*
Prepared by Jacobs Printed 2/3/2026
HydroCAD® 10.00-25 s/n 03058 © 2019 HydroCAD Software Solutions LLC

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

Subcatchment1S: Analysis Point 1 Runoff Area=125,826 sf 97.21% Impervious Runoff Depth>2.78"
Flow Length=2,088' Tc=7.6 min CN=97 Runoff=7.97 cfs 0.670 af

Subcatchment2S: Analysis Point 2 Runoff Area=11,003 sf 90.76% Impervious Runoff Depth>2.68"
Flow Length=280' Slope=0.0610 '/' Tc=5.4 min CN=96 Runoff=0.74 cfs 0.056 af

Subcatchment3S: Analysis Point 3 Runoff Area=22,354 sf 95.84% Impervious Runoff Depth>2.78"
Flow Length=395' Slope=0.0510 '/' Tc=5.6 min CN=97 Runoff=1.52 cfs 0.119 af

Subcatchment4S: Analysis Point 4 Runoff Area=20,624 sf 100.00% Impervious Runoff Depth>2.89"
Flow Length=340' Slope=0.0450 '/' Tc=5.6 min CN=98 Runoff=1.42 cfs 0.114 af

Subcatchment5S: Analysis Point 5 Runoff Area=58,030 sf 100.00% Impervious Runoff Depth>2.90"
Tc=5.0 min CN=98 Runoff=4.09 cfs 0.321 af

Subcatchment6S: Analysis Point 6 Runoff Area=14,979 sf 100.00% Impervious Runoff Depth>2.90"
Tc=5.0 min CN=98 Runoff=1.06 cfs 0.083 af

Subcatchment7S: Analysis Point 7 Runoff Area=16,958 sf 100.00% Impervious Runoff Depth>2.89"
Flow Length=429' Tc=5.6 min CN=98 Runoff=1.17 cfs 0.094 af

Subcatchment8S: Analysis Point 8 Runoff Area=35,141 sf 100.00% Impervious Runoff Depth>2.89"
Flow Length=421' Tc=5.7 min CN=98 Runoff=2.42 cfs 0.195 af

Subcatchment9S: Analysis Point 9 Runoff Area=28,275 sf 100.00% Impervious Runoff Depth>2.89"
Flow Length=510' Slope=0.0660 '/' Tc=5.6 min CN=98 Runoff=1.95 cfs 0.157 af

Subcatchment10S: Analysis Point 10 Runoff Area=15,368 sf 100.00% Impervious Runoff Depth>2.90"
Tc=5.0 min CN=98 Runoff=1.08 cfs 0.085 af

Subcatchment11S: Analysis Point 11 Runoff Area=44,990 sf 100.00% Impervious Runoff Depth>2.89"
Flow Length=500' Slope=0.0350 '/' Tc=6.0 min CN=98 Runoff=3.06 cfs 0.249 af

Link 12L: (new Link) Inflow=3.68 cfs 0.290 af
Primary=3.68 cfs 0.290 af

Total Runoff Area = 9.035 ac Runoff Volume = 2.143 af Average Runoff Depth = 2.85"
1.39% Pervious = 0.125 ac 98.61% Impervious = 8.909 ac

Summary for Subcatchment 1S: Analysis Point 1

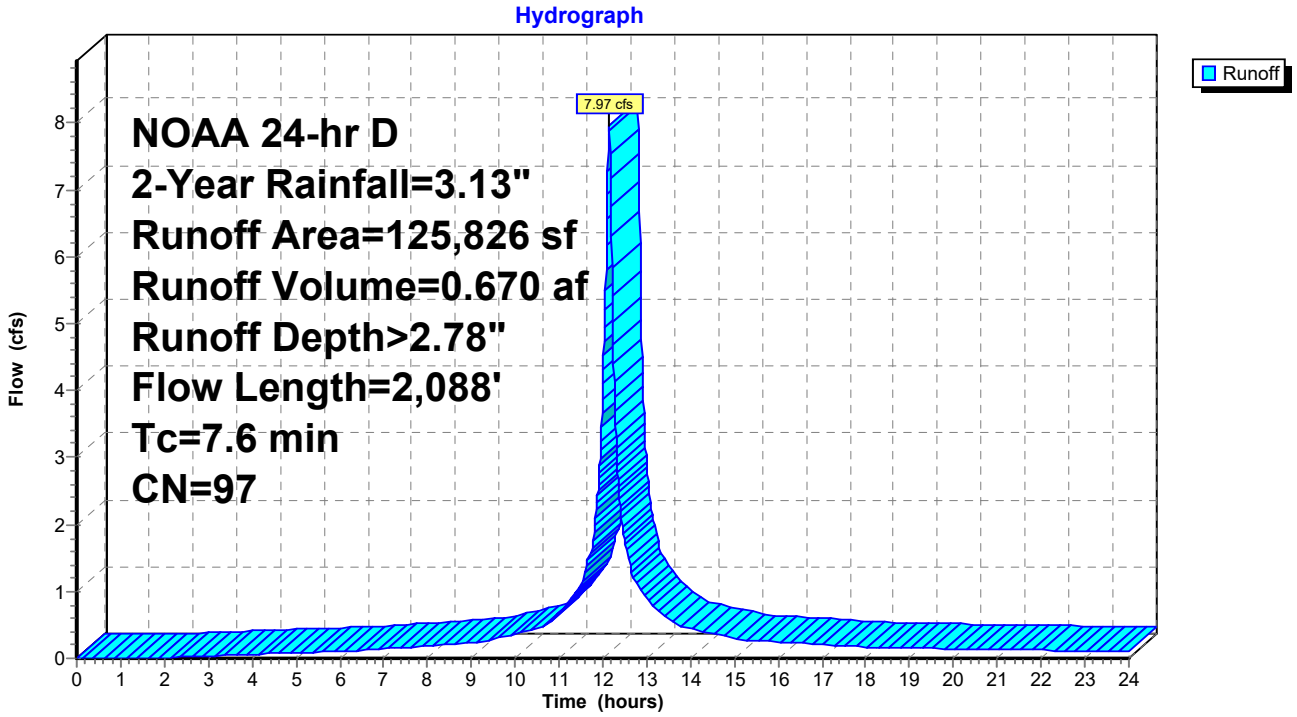
Runoff = 7.97 cfs @ 12.15 hrs, Volume= 0.670 af, Depth> 2.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
122,318	98	Paved roads w/curbs & sewers, HSG D
3,508	79	50-75% Grass cover, Fair, HSG C
125,826	97	Weighted Average
3,508		2.79% Pervious Area
122,318		97.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**
1.1	767	0.0620	11.30	8.87	**Pipe Channel, 12" RCP** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
1.2	1,036	0.0590	14.44	25.51	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.3	285	0.0490	15.94	50.08	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
7.6	2,088	Total			

Subcatchment 1S: Analysis Point 1



Summary for Subcatchment 2S: Analysis Point 2

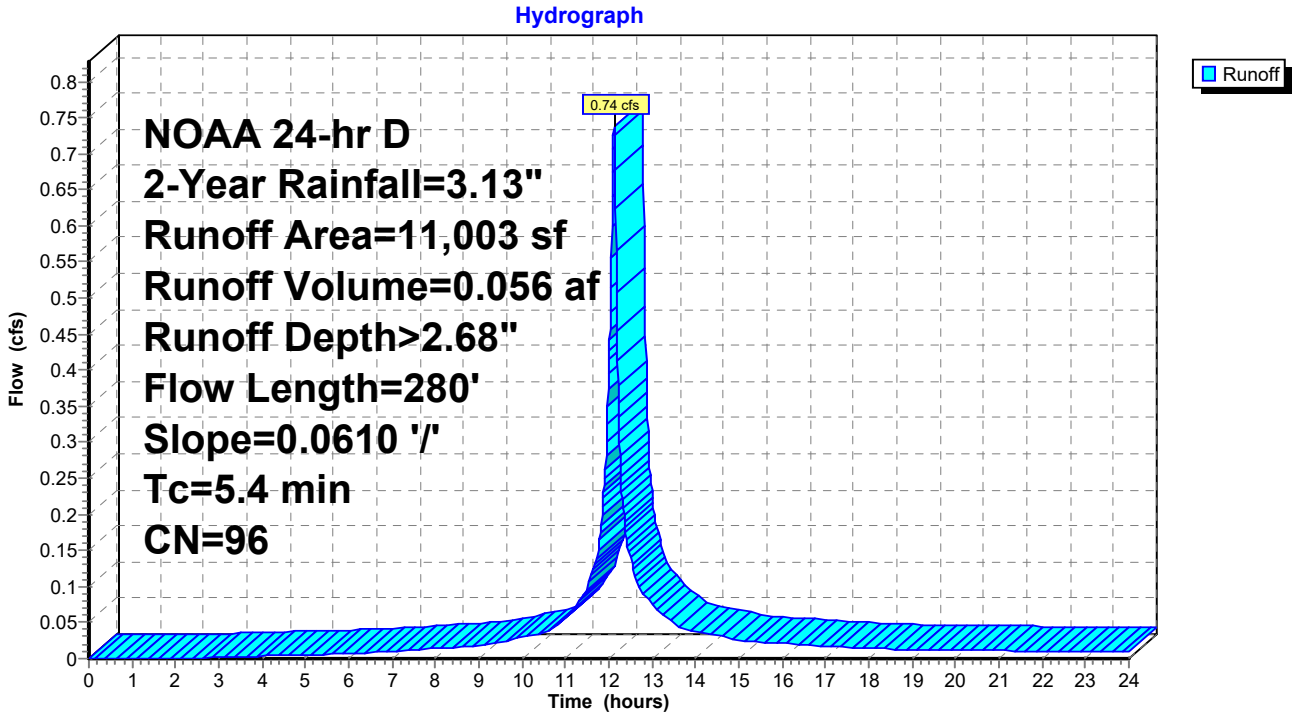
Runoff = 0.74 cfs @ 12.12 hrs, Volume= 0.056 af, Depth> 2.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
9,986	98	Paved roads w/curbs & sewers, HSG C
1,017	79	50-75% Grass cover, Fair, HSG C
11,003	96	Weighted Average
1,017		9.24% Pervious Area
9,986		90.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**
0.4	280	0.0610	11.20	8.80	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
5.4	280	Total			

Subcatchment 2S: Analysis Point 2



Summary for Subcatchment 3S: Analysis Point 3

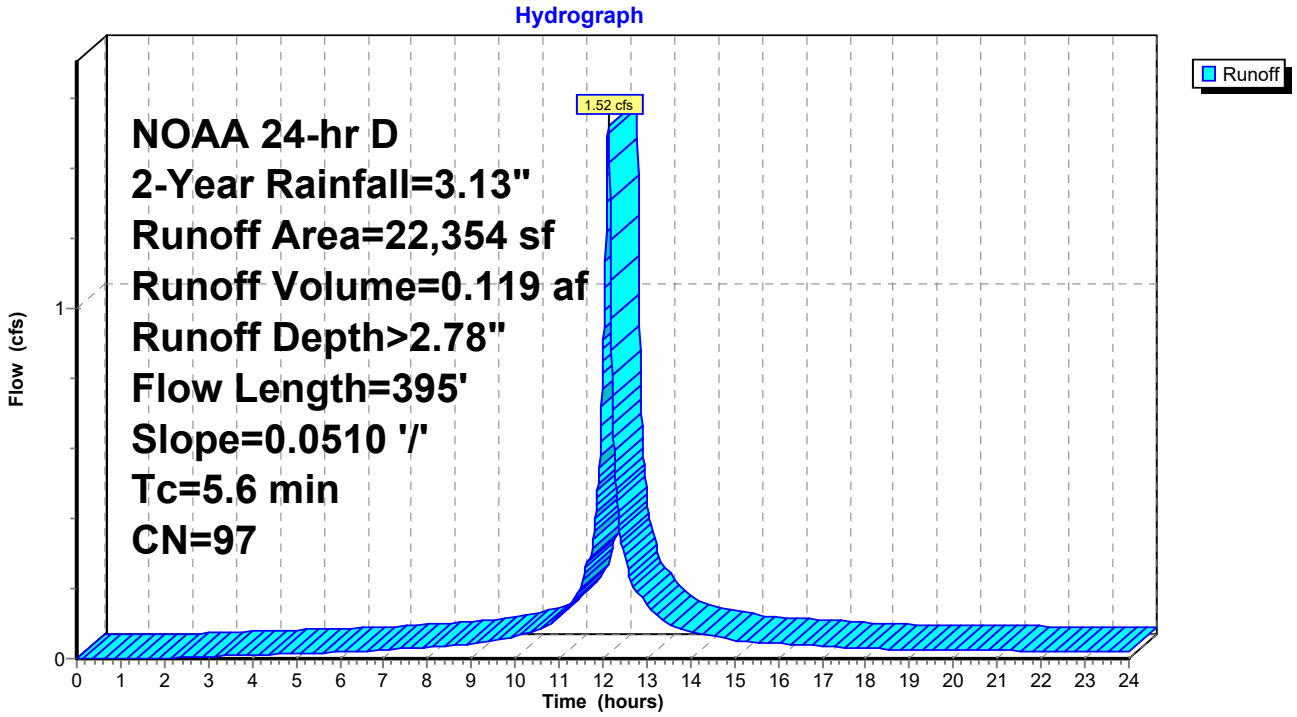
Runoff = 1.52 cfs @ 12.13 hrs, Volume= 0.119 af, Depth> 2.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
21,423	98	Paved roads w/curbs & sewers, HSG C
931	79	50-75% Grass cover, Fair, HSG C
22,354	97	Weighted Average
931		4.16% Pervious Area
21,423		95.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**
0.6	395	0.0510	10.24	8.05	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
5.6	395	Total			

Subcatchment 3S: Analysis Point 3



Summary for Subcatchment 4S: Analysis Point 4

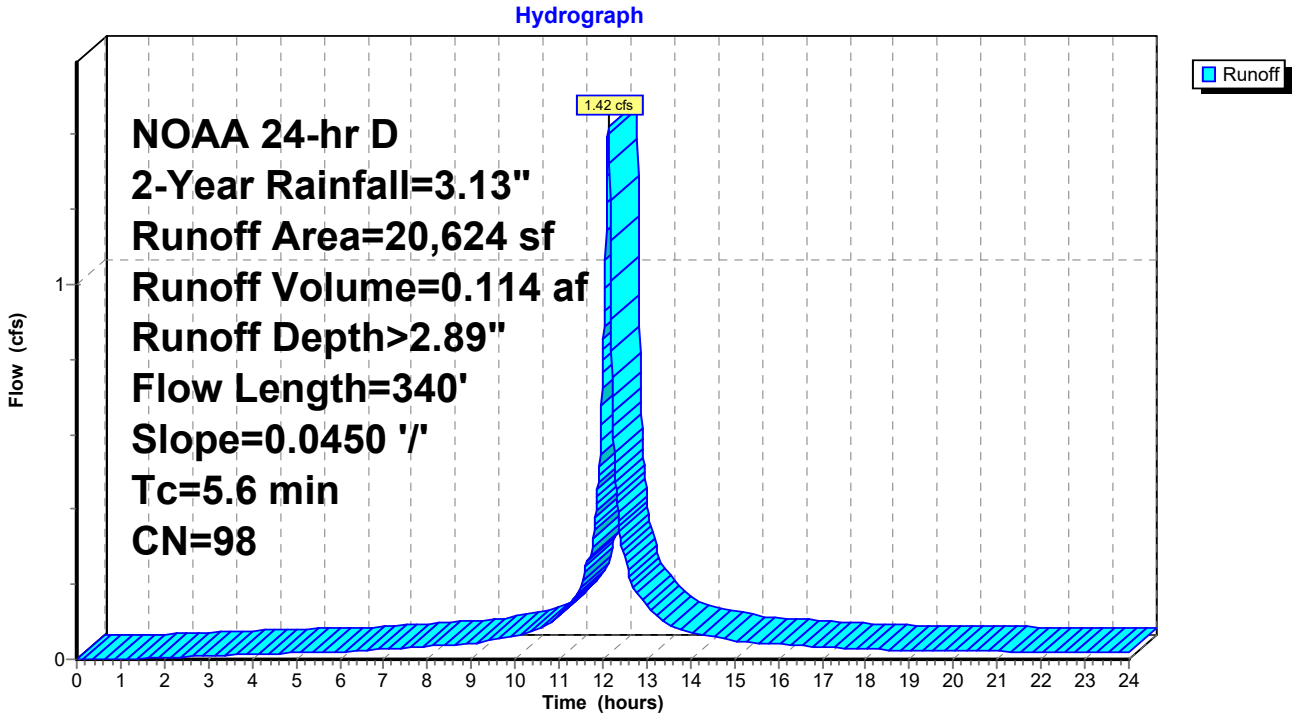
Runoff = 1.42 cfs @ 12.13 hrs, Volume= 0.114 af, Depth> 2.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
20,624	98	Paved roads w/curbs & sewers, HSG C
20,624		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**
0.6	340	0.0450	9.62	7.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
5.6	340	Total			

Subcatchment 4S: Analysis Point 4



Summary for Subcatchment 5S: Analysis Point 5

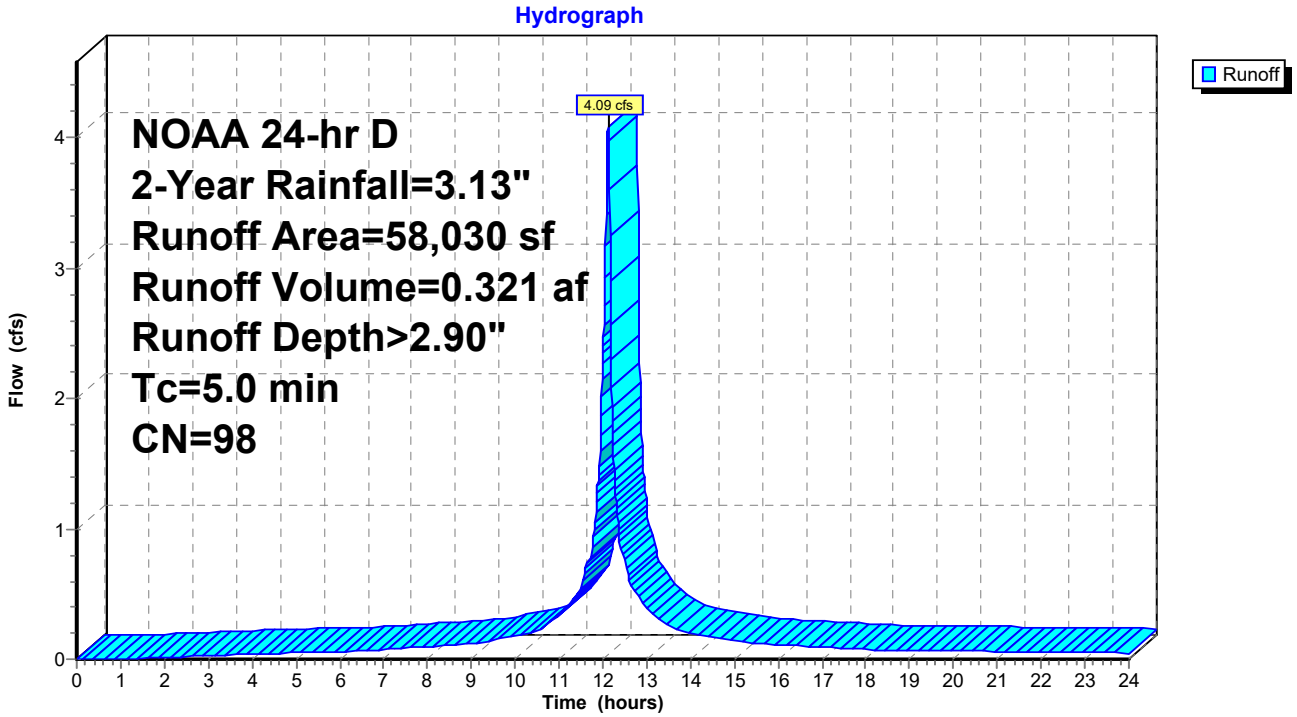
Runoff = 4.09 cfs @ 12.12 hrs, Volume= 0.321 af, Depth> 2.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
58,030	98	Paved roads w/curbs & sewers, HSG A
58,030		100.00% Impervious Area

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

Subcatchment 5S: Analysis Point 5



Summary for Subcatchment 6S: Analysis Point 6

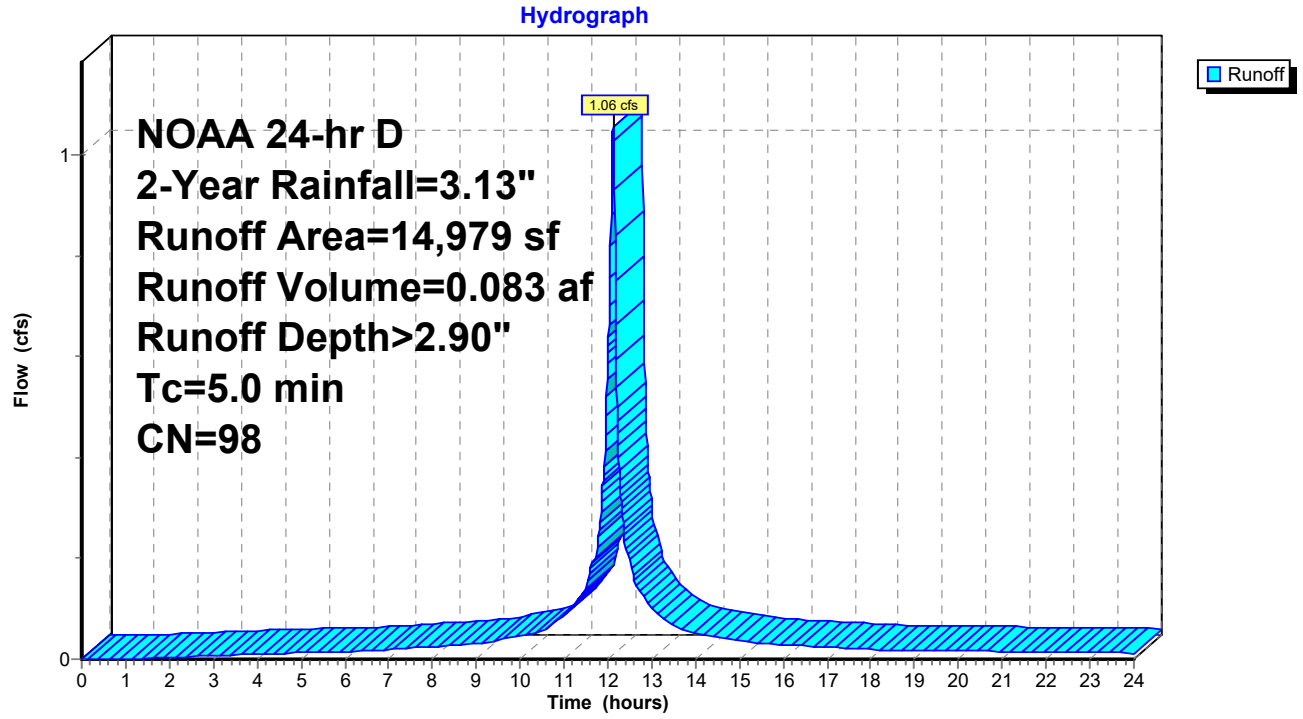
Runoff = 1.06 cfs @ 12.12 hrs, Volume= 0.083 af, Depth> 2.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
14,979	98	Paved roads w/curbs & sewers, HSG A
14,979		100.00% Impervious Area

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

Subcatchment 6S: Analysis Point 6



Summary for Subcatchment 7S: Analysis Point 7

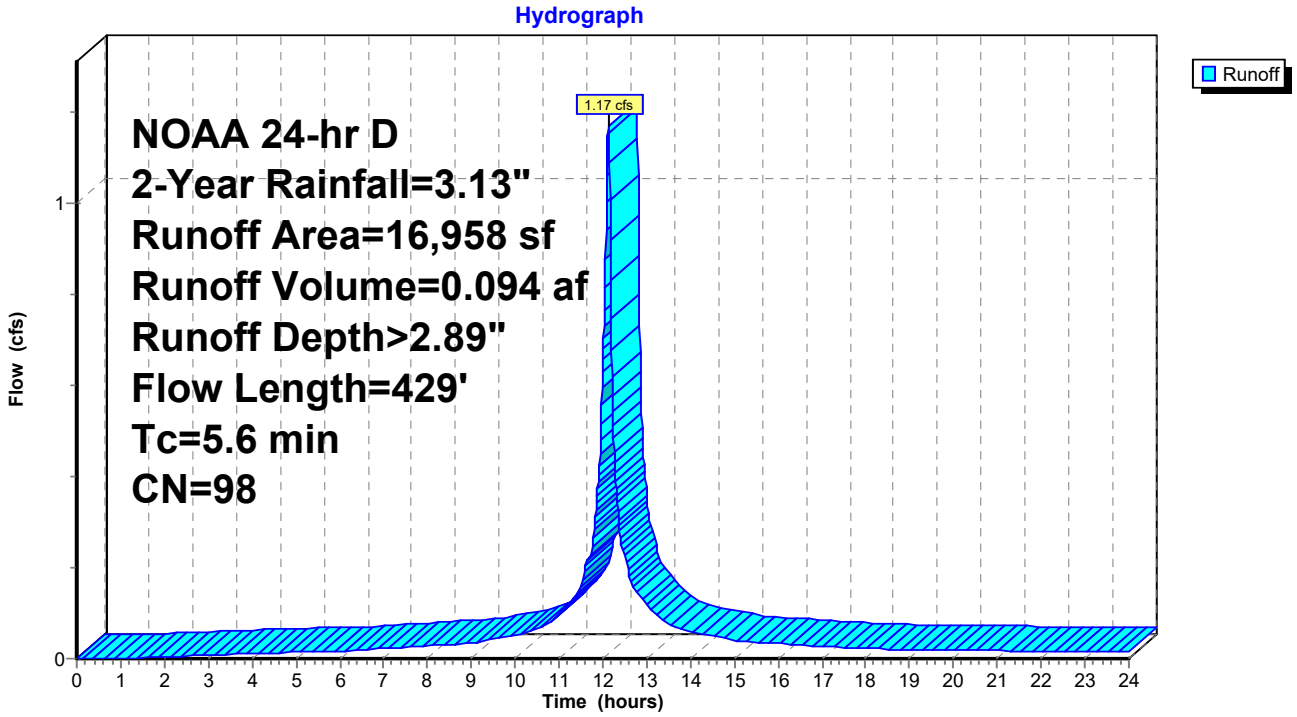
Runoff = 1.17 cfs @ 12.13 hrs, Volume= 0.094 af, Depth> 2.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
16,958	98	Paved roads w/curbs & sewers, HSG A
16,958		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**
0.6	389	0.0600	11.11	8.73	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
0.0	40	0.0610	17.78	55.87	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
5.6	429	Total			

Subcatchment 7S: Analysis Point 7



Summary for Subcatchment 8S: Analysis Point 8

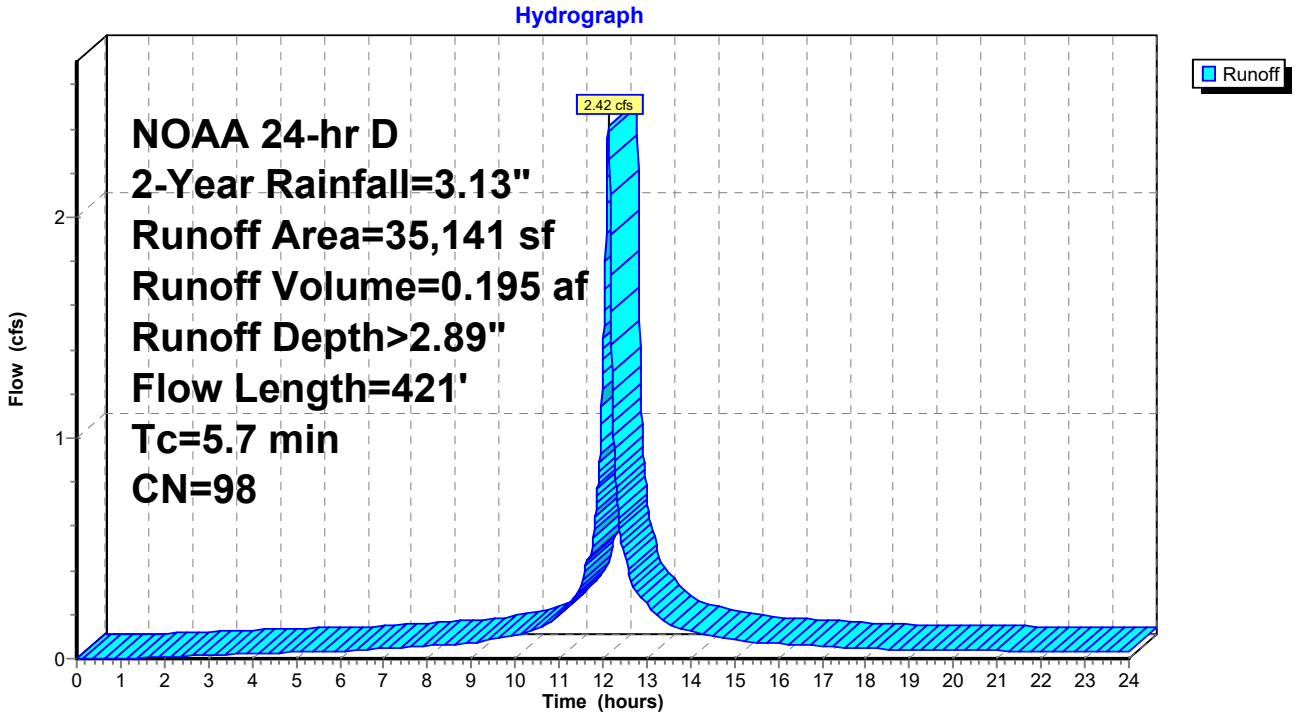
Runoff = 2.42 cfs @ 12.13 hrs, Volume= 0.195 af, Depth> 2.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
35,141	98	Paved roads w/curbs & sewers, HSG C
35,141		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**
0.6	390	0.0660	11.65	9.15	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
0.1	31	0.0070	4.97	8.79	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
5.7	421	Total			

Subcatchment 8S: Analysis Point 8



Summary for Subcatchment 9S: Analysis Point 9

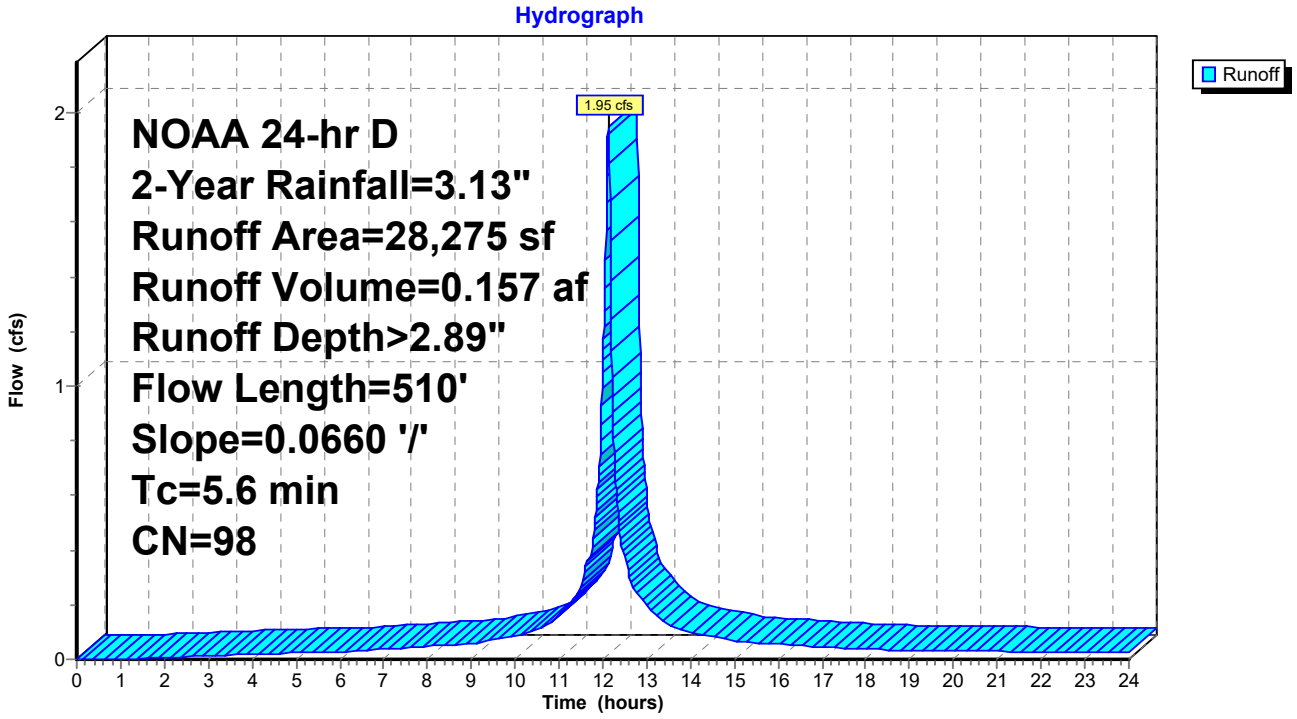
Runoff = 1.95 cfs @ 12.13 hrs, Volume= 0.157 af, Depth> 2.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
28,275	98	Paved roads w/curbs & sewers, HSG C
28,275		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**
0.6	510	0.0660	15.27	26.99	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
5.6	510	Total			

Subcatchment 9S: Analysis Point 9



Summary for Subcatchment 10S: Analysis Point 10

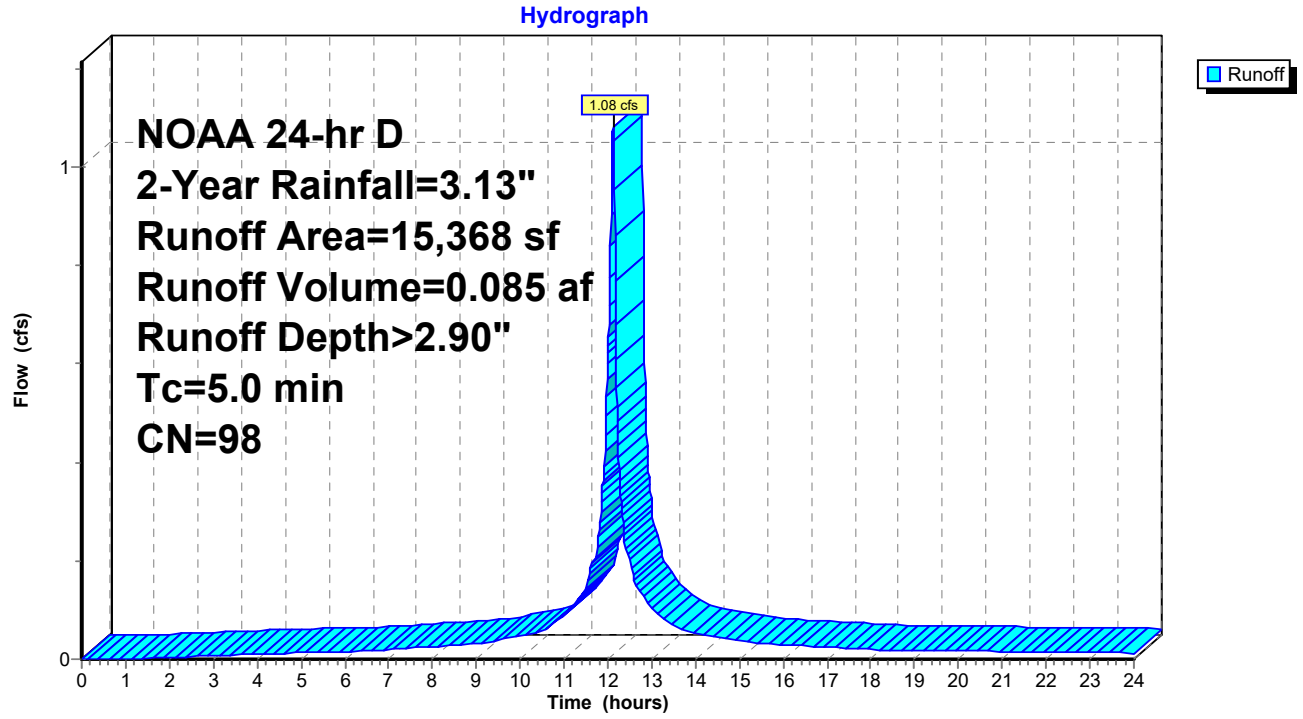
Runoff = 1.08 cfs @ 12.12 hrs, Volume= 0.085 af, Depth> 2.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
15,368	98	Paved roads w/curbs & sewers, HSG C
15,368		100.00% Impervious Area

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

Subcatchment 10S: Analysis Point 10



Summary for Subcatchment 11S: Analysis Point 11

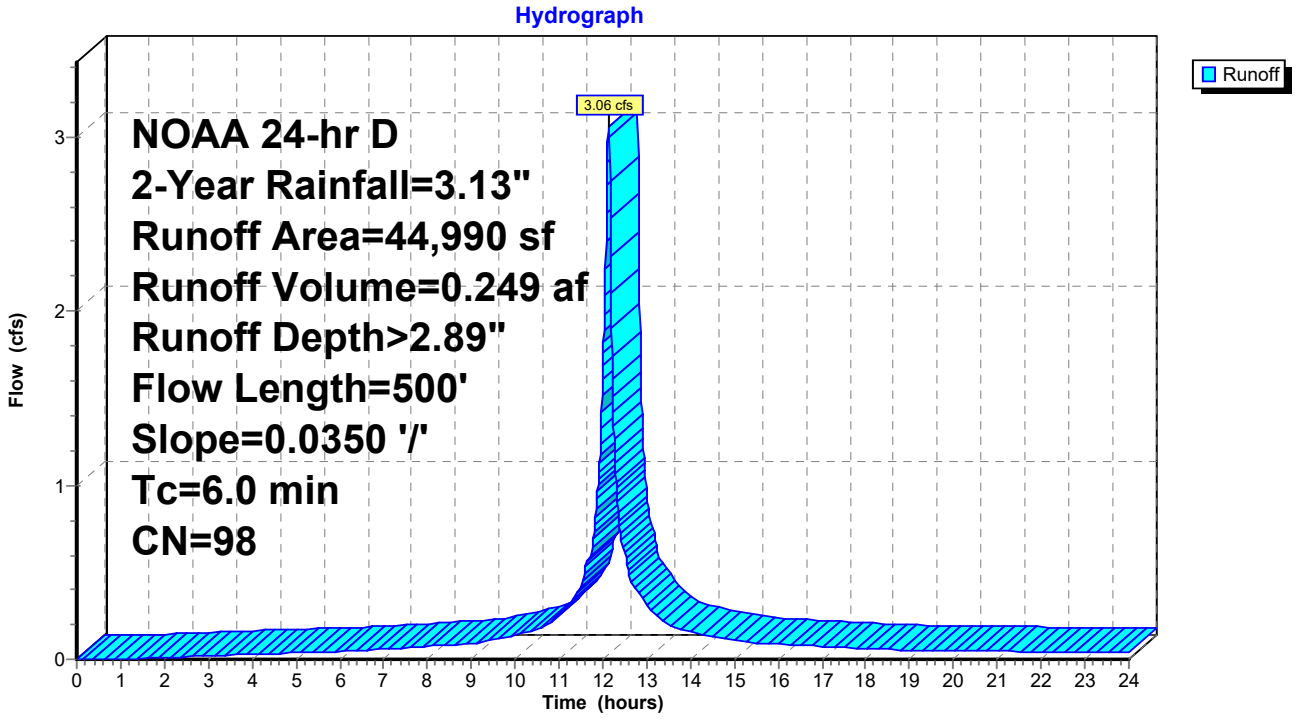
Runoff = 3.06 cfs @ 12.13 hrs, Volume= 0.249 af, Depth> 2.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
44,990	98	Paved roads w/curbs & sewers, HSG C
44,990		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**
1.0	500	0.0350	8.49	6.67	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
6.0	500	Total			

Subcatchment 11S: Analysis Point 11

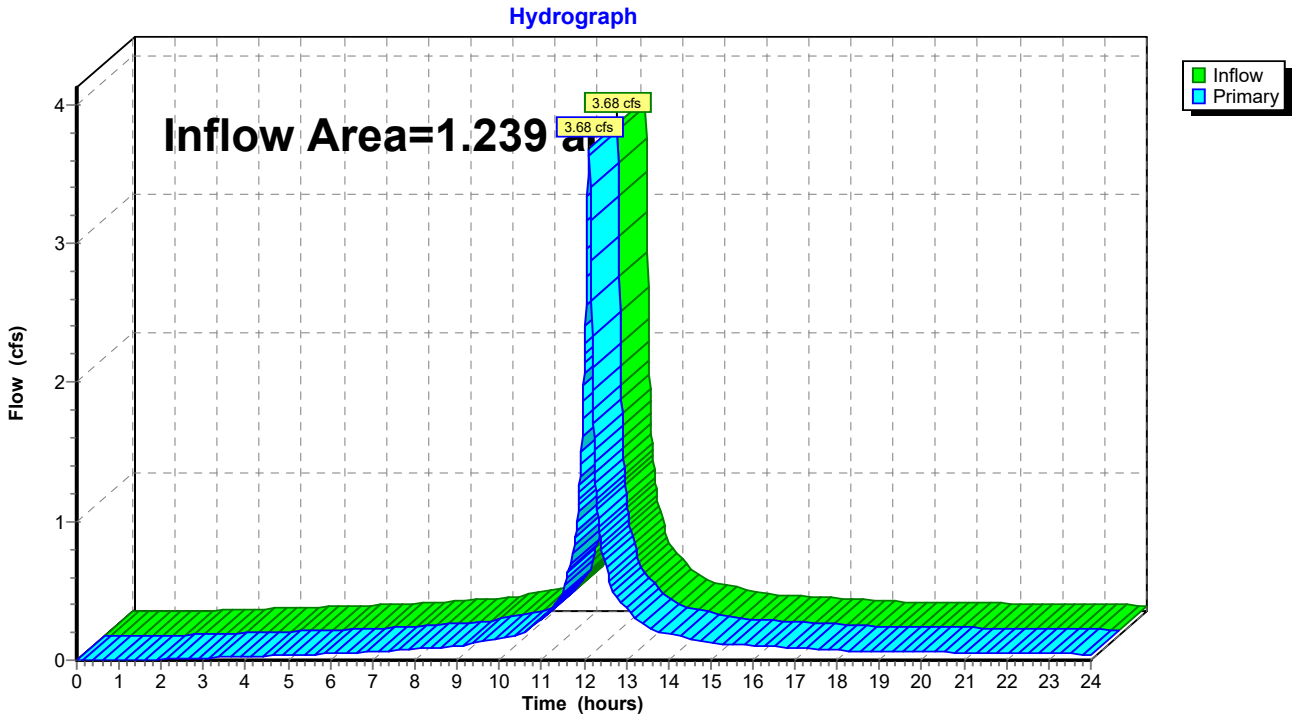


Summary for Link 12L: (new Link)

Inflow Area = 1.239 ac, 96.39% Impervious, Inflow Depth > 2.80" for 2-Year event
Inflow = 3.68 cfs @ 12.13 hrs, Volume= 0.290 af
Primary = 3.68 cfs @ 12.13 hrs, Volume= 0.290 af, Atten= 0%, Lag= 0.0 min

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

Link 12L: (new Link)



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

Subcatchment1S: Analysis Point 1 Runoff Area=125,826 sf 97.21% Impervious Runoff Depth>4.48"
Flow Length=2,088' Tc=7.6 min CN=97 Runoff=12.51 cfs 1.079 af

Subcatchment2S: Analysis Point 2 Runoff Area=11,003 sf 90.76% Impervious Runoff Depth>4.37"
Flow Length=280' Slope=0.0610 '/' Tc=5.4 min CN=96 Runoff=1.17 cfs 0.092 af

Subcatchment3S: Analysis Point 3 Runoff Area=22,354 sf 95.84% Impervious Runoff Depth>4.48"
Flow Length=395' Slope=0.0510 '/' Tc=5.6 min CN=97 Runoff=2.39 cfs 0.192 af

Subcatchment4S: Analysis Point 4 Runoff Area=20,624 sf 100.00% Impervious Runoff Depth>4.60"
Flow Length=340' Slope=0.0450 '/' Tc=5.6 min CN=98 Runoff=2.22 cfs 0.181 af

Subcatchment5S: Analysis Point 5 Runoff Area=58,030 sf 100.00% Impervious Runoff Depth>4.60"
Tc=5.0 min CN=98 Runoff=6.37 cfs 0.511 af

Subcatchment6S: Analysis Point 6 Runoff Area=14,979 sf 100.00% Impervious Runoff Depth>4.60"
Tc=5.0 min CN=98 Runoff=1.64 cfs 0.132 af

Subcatchment7S: Analysis Point 7 Runoff Area=16,958 sf 100.00% Impervious Runoff Depth>4.60"
Flow Length=429' Tc=5.6 min CN=98 Runoff=1.82 cfs 0.149 af

Subcatchment8S: Analysis Point 8 Runoff Area=35,141 sf 100.00% Impervious Runoff Depth>4.60"
Flow Length=421' Tc=5.7 min CN=98 Runoff=3.76 cfs 0.309 af

Subcatchment9S: Analysis Point 9 Runoff Area=28,275 sf 100.00% Impervious Runoff Depth>4.60"
Flow Length=510' Slope=0.0660 '/' Tc=5.6 min CN=98 Runoff=3.04 cfs 0.249 af

Subcatchment10S: Analysis Point 10 Runoff Area=15,368 sf 100.00% Impervious Runoff Depth>4.60"
Tc=5.0 min CN=98 Runoff=1.69 cfs 0.135 af

Subcatchment11S: Analysis Point 11 Runoff Area=44,990 sf 100.00% Impervious Runoff Depth>4.60"
Flow Length=500' Slope=0.0350 '/' Tc=6.0 min CN=98 Runoff=4.77 cfs 0.396 af

Link 12L: (new Link) Inflow=5.77 cfs 0.465 af
Primary=5.77 cfs 0.465 af

Total Runoff Area = 9.035 ac Runoff Volume = 3.425 af Average Runoff Depth = 4.55"
1.39% Pervious = 0.125 ac 98.61% Impervious = 8.909 ac

Summary for Subcatchment 1S: Analysis Point 1

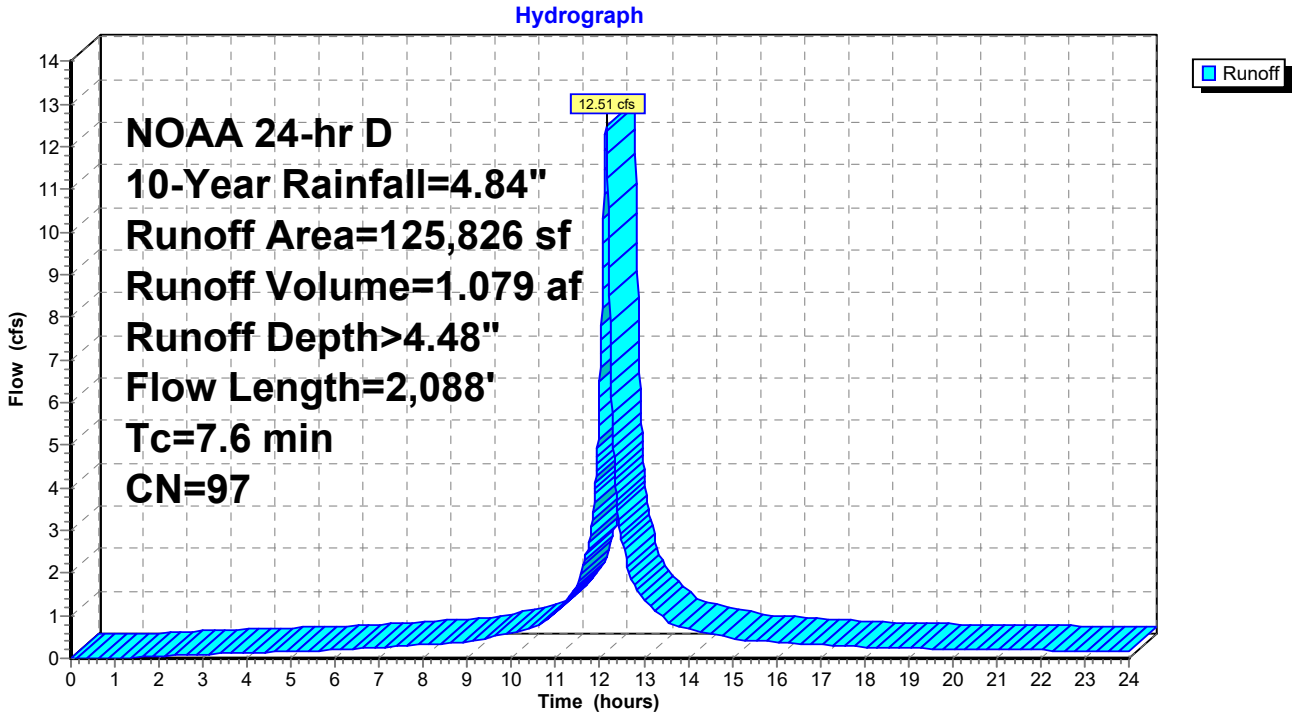
Runoff = 12.51 cfs @ 12.15 hrs, Volume= 1.079 af, Depth> 4.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Rainfall=4.84"

Area (sf)	CN	Description
122,318	98	Paved roads w/curbs & sewers, HSG D
3,508	79	50-75% Grass cover, Fair, HSG C
125,826	97	Weighted Average
3,508		2.79% Pervious Area
122,318		97.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**
1.1	767	0.0620	11.30	8.87	**Pipe Channel, 12" RCP** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
1.2	1,036	0.0590	14.44	25.51	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.3	285	0.0490	15.94	50.08	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
7.6	2,088	Total			

Subcatchment 1S: Analysis Point 1



Summary for Subcatchment 2S: Analysis Point 2

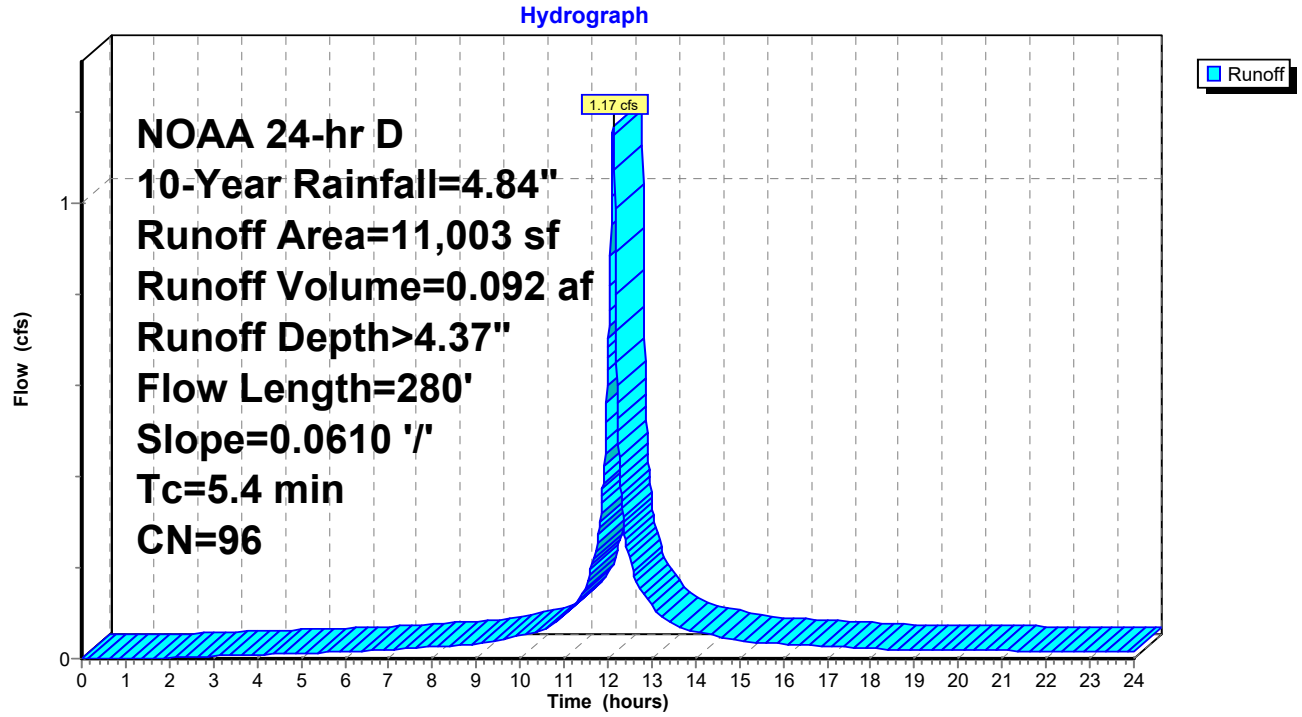
Runoff = 1.17 cfs @ 12.12 hrs, Volume= 0.092 af, Depth> 4.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Rainfall=4.84"

Area (sf)	CN	Description
9,986	98	Paved roads w/curbs & sewers, HSG C
1,017	79	50-75% Grass cover, Fair, HSG C
11,003	96	Weighted Average
1,017		9.24% Pervious Area
9,986		90.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**
0.4	280	0.0610	11.20	8.80	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
5.4	280	Total			

Subcatchment 2S: Analysis Point 2



Summary for Subcatchment 3S: Analysis Point 3

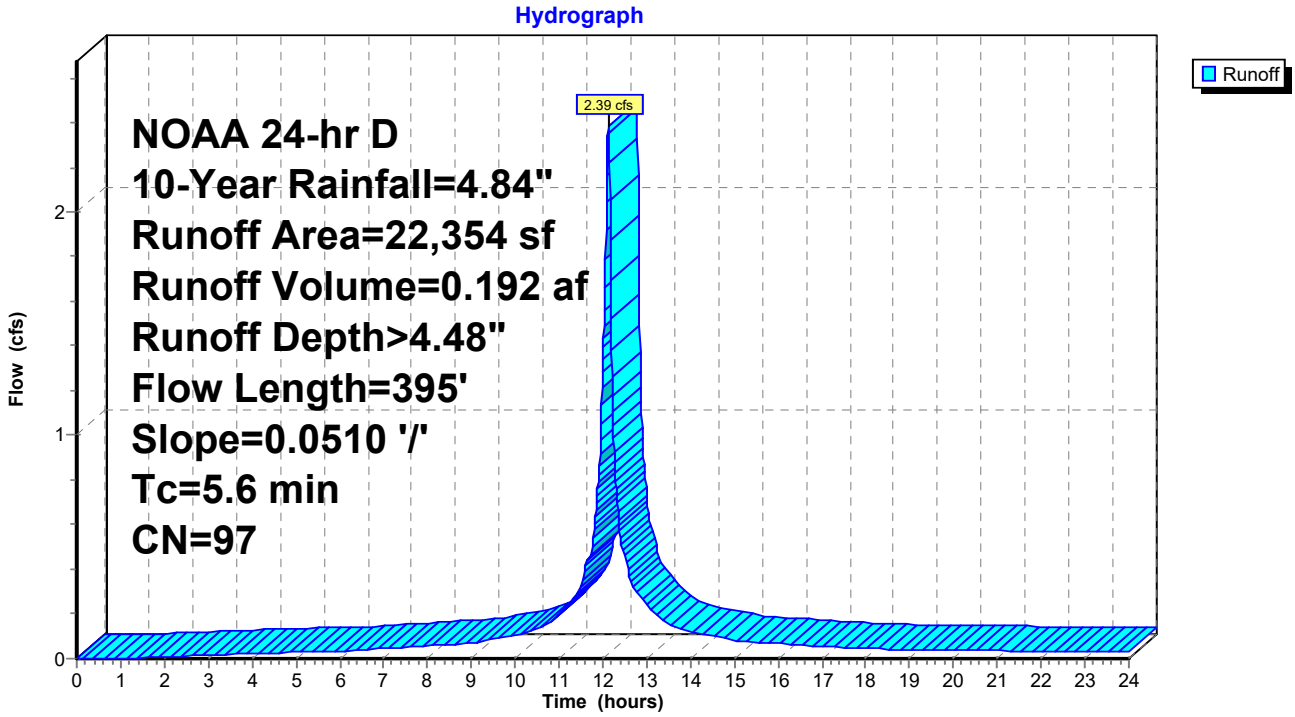
Runoff = 2.39 cfs @ 12.13 hrs, Volume= 0.192 af, Depth> 4.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Rainfall=4.84"

Area (sf)	CN	Description
21,423	98	Paved roads w/curbs & sewers, HSG C
931	79	50-75% Grass cover, Fair, HSG C
22,354	97	Weighted Average
931		4.16% Pervious Area
21,423		95.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**
0.6	395	0.0510	10.24	8.05	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
5.6	395	Total			

Subcatchment 3S: Analysis Point 3



Summary for Subcatchment 4S: Analysis Point 4

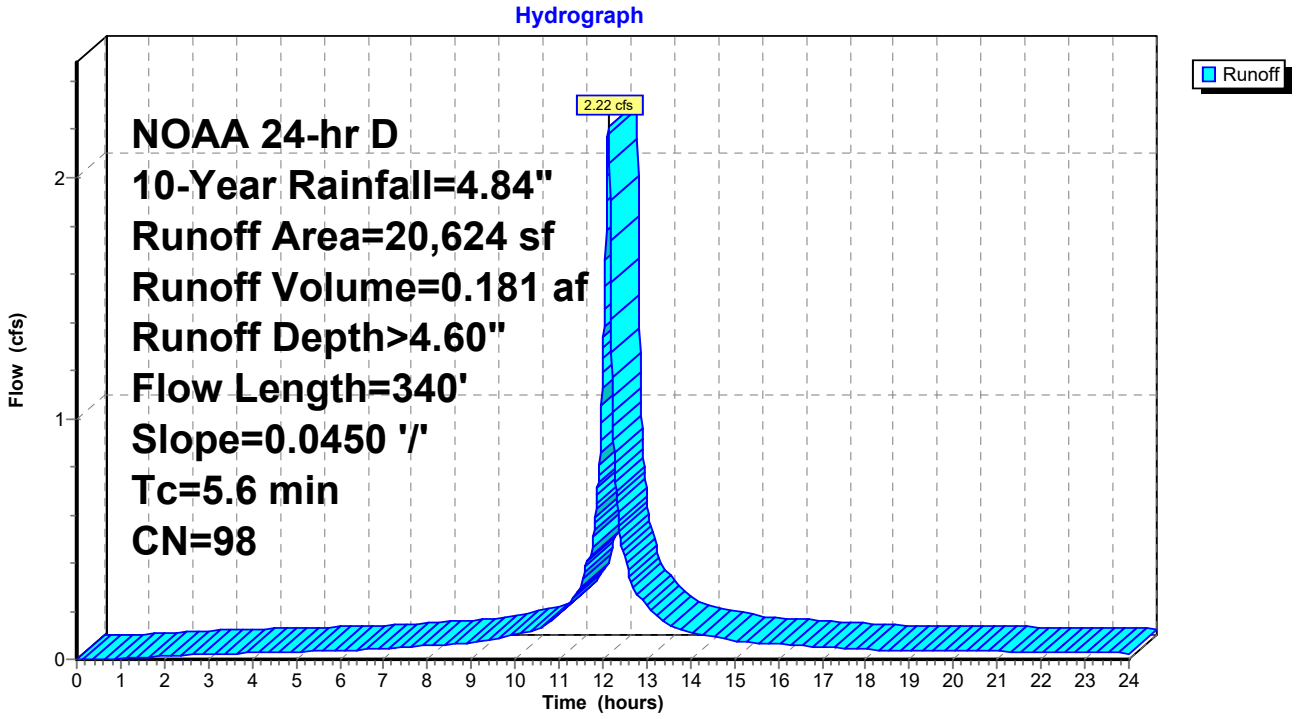
Runoff = 2.22 cfs @ 12.13 hrs, Volume= 0.181 af, Depth> 4.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Rainfall=4.84"

Area (sf)	CN	Description
20,624	98	Paved roads w/curbs & sewers, HSG C
20,624		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**
0.6	340	0.0450	9.62	7.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
5.6	340	Total			

Subcatchment 4S: Analysis Point 4



Summary for Subcatchment 5S: Analysis Point 5

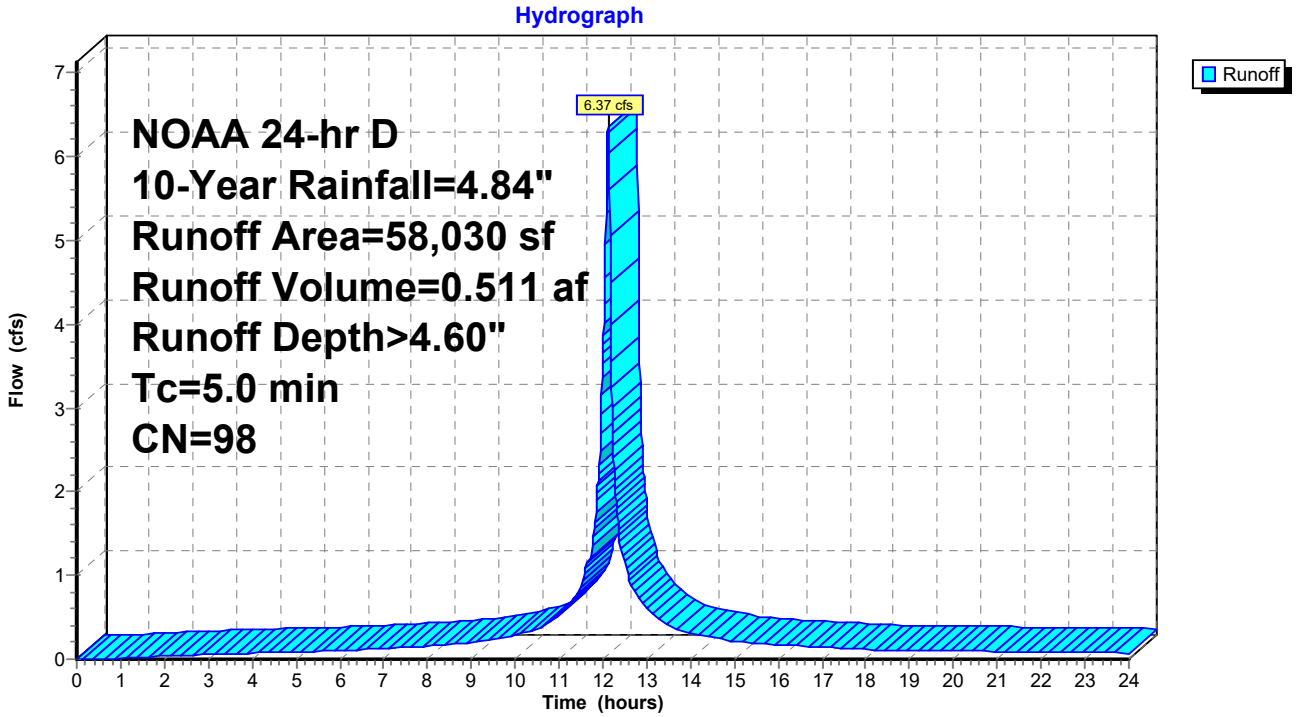
Runoff = 6.37 cfs @ 12.12 hrs, Volume= 0.511 af, Depth> 4.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Rainfall=4.84"

Area (sf)	CN	Description
58,030	98	Paved roads w/curbs & sewers, HSG A
58,030		100.00% Impervious Area

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

Subcatchment 5S: Analysis Point 5



Summary for Subcatchment 6S: Analysis Point 6

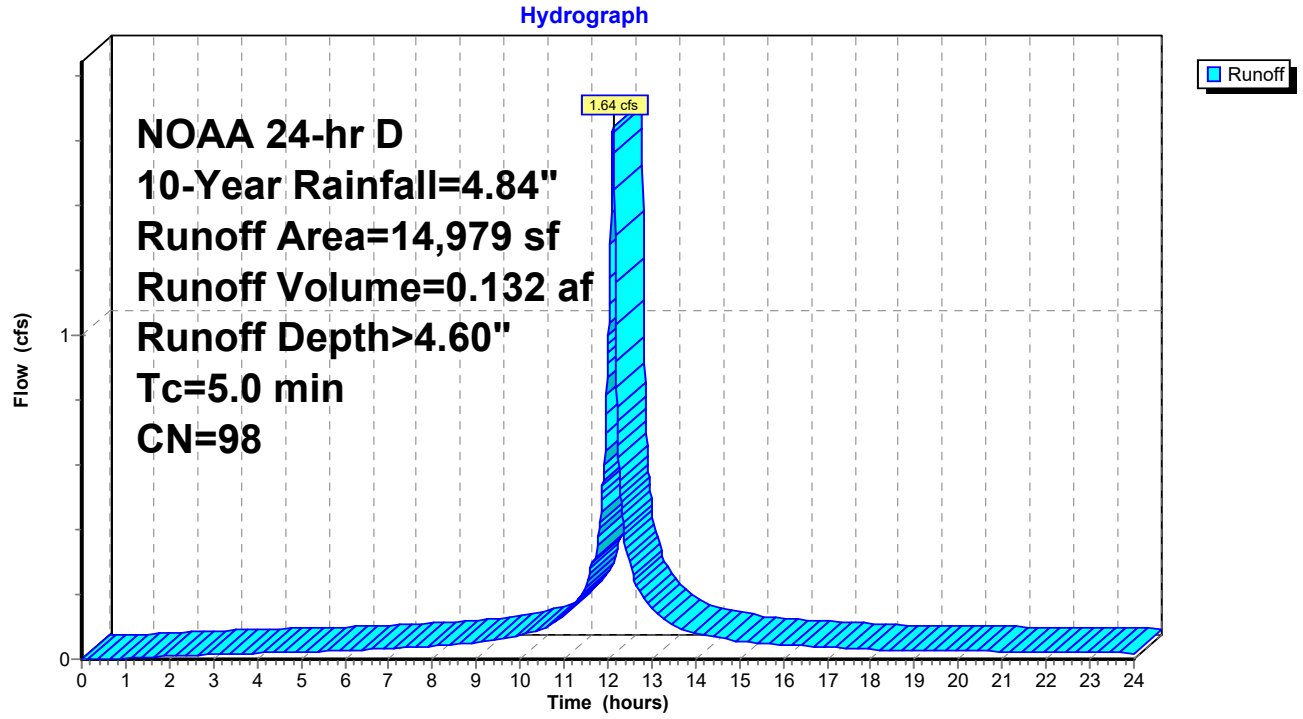
Runoff = 1.64 cfs @ 12.12 hrs, Volume= 0.132 af, Depth> 4.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Rainfall=4.84"

Area (sf)	CN	Description
14,979	98	Paved roads w/curbs & sewers, HSG A
14,979		100.00% Impervious Area

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

Subcatchment 6S: Analysis Point 6



Summary for Subcatchment 7S: Analysis Point 7

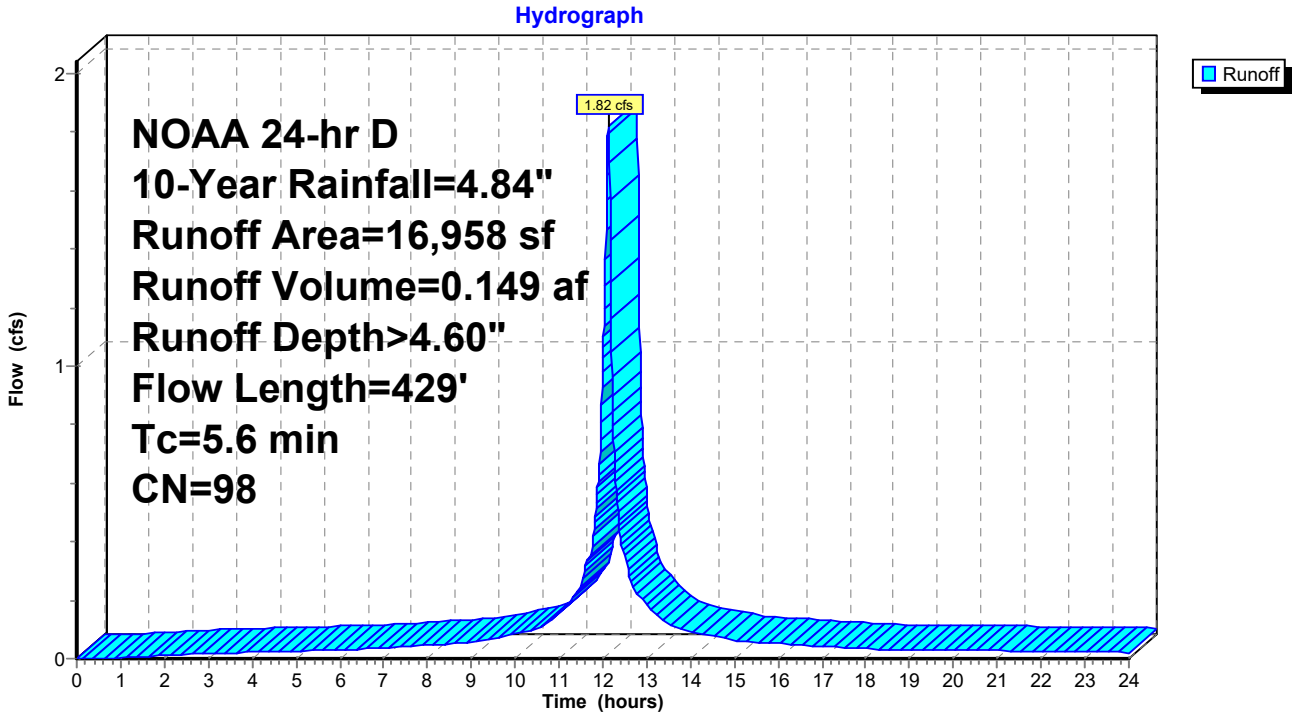
Runoff = 1.82 cfs @ 12.13 hrs, Volume= 0.149 af, Depth> 4.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Rainfall=4.84"

Area (sf)	CN	Description
16,958	98	Paved roads w/curbs & sewers, HSG A
16,958		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**
0.6	389	0.0600	11.11	8.73	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
0.0	40	0.0610	17.78	55.87	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
5.6	429	Total			

Subcatchment 7S: Analysis Point 7



Summary for Subcatchment 8S: Analysis Point 8

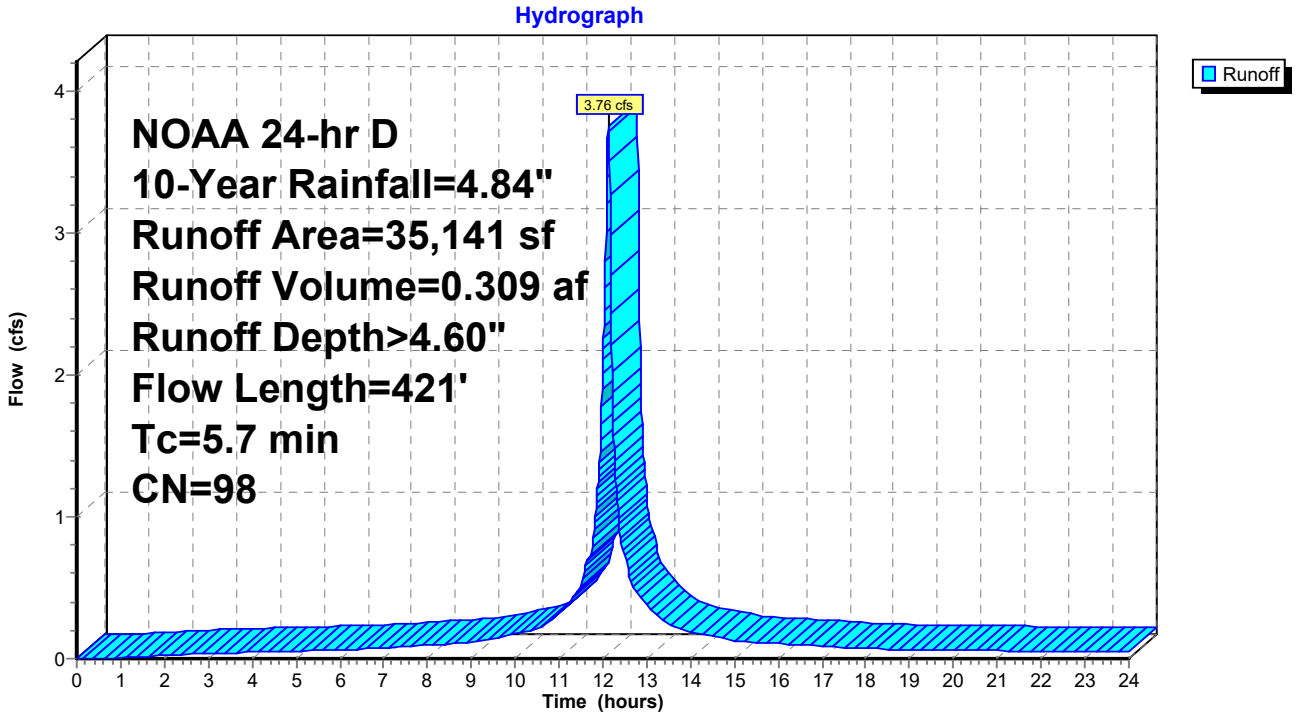
Runoff = 3.76 cfs @ 12.13 hrs, Volume= 0.309 af, Depth> 4.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Rainfall=4.84"

Area (sf)	CN	Description
35,141	98	Paved roads w/curbs & sewers, HSG C
35,141		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**
0.6	390	0.0660	11.65	9.15	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
0.1	31	0.0070	4.97	8.79	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
5.7	421	Total			

Subcatchment 8S: Analysis Point 8



Summary for Subcatchment 9S: Analysis Point 9

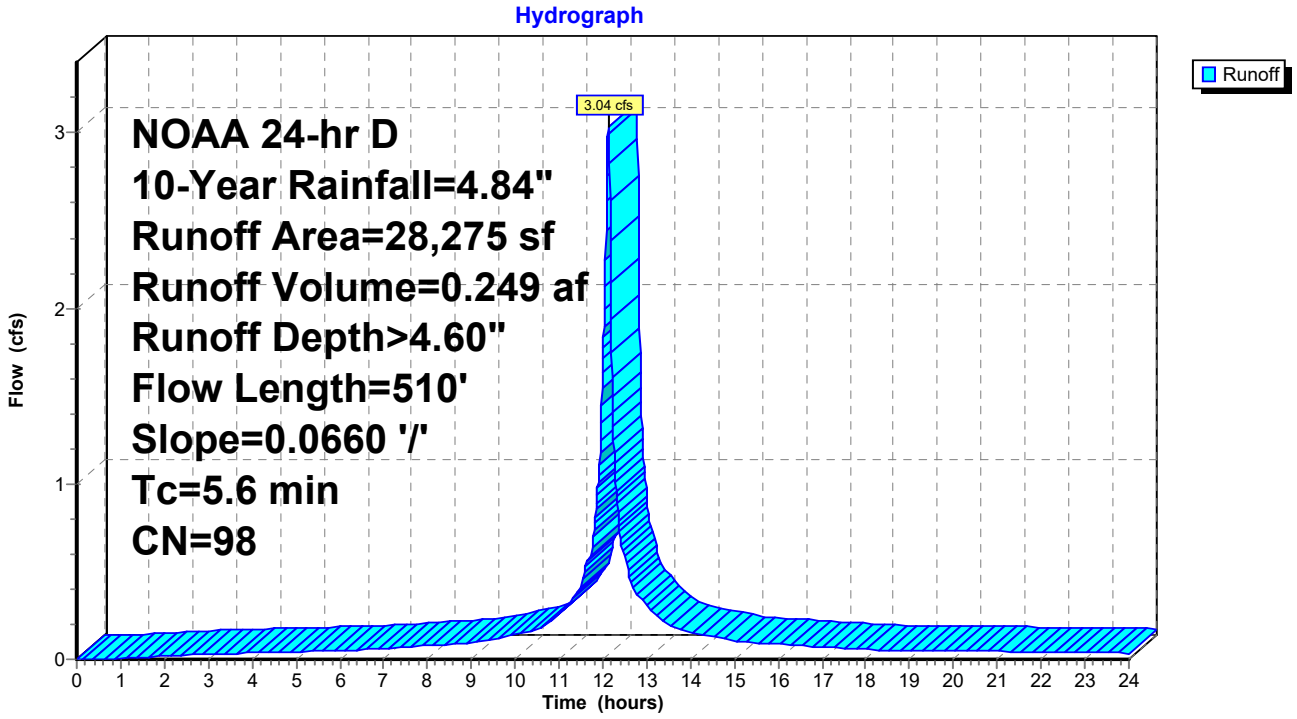
Runoff = 3.04 cfs @ 12.13 hrs, Volume= 0.249 af, Depth> 4.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Rainfall=4.84"

Area (sf)	CN	Description
28,275	98	Paved roads w/curbs & sewers, HSG C
28,275		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**
0.6	510	0.0660	15.27	26.99	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
5.6	510	Total			

Subcatchment 9S: Analysis Point 9



Summary for Subcatchment 10S: Analysis Point 10

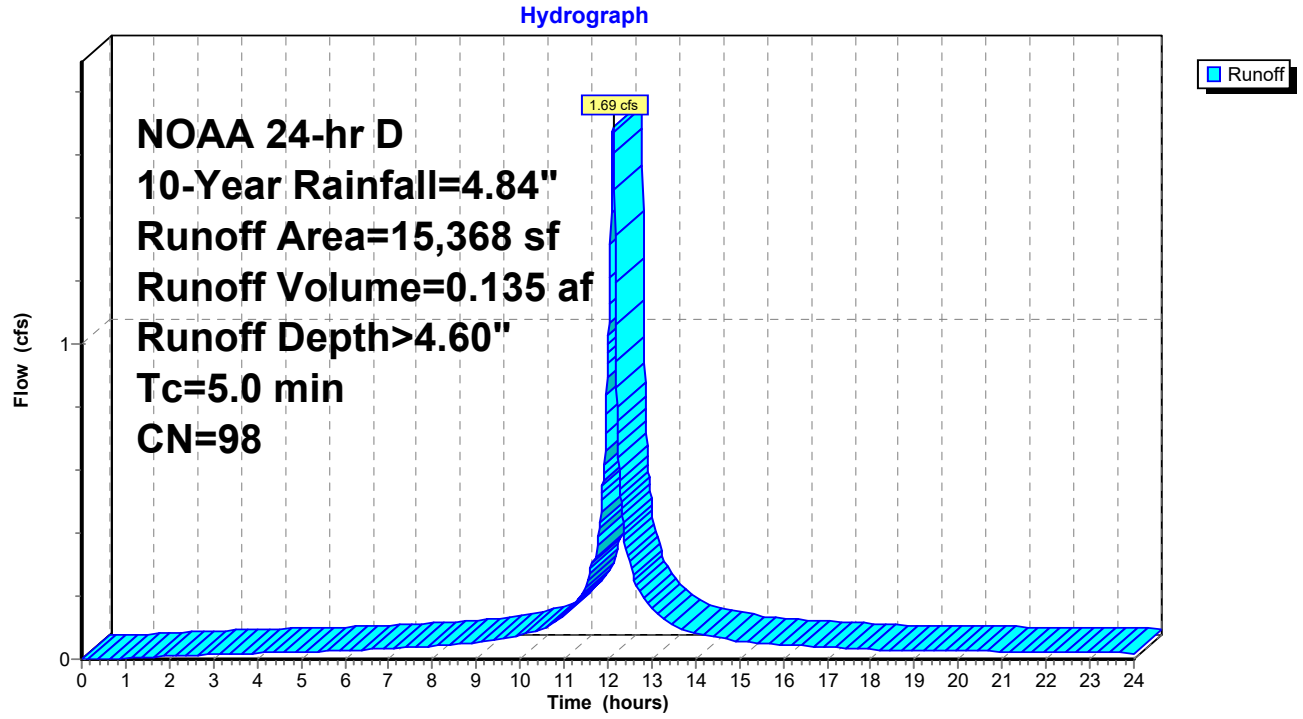
Runoff = 1.69 cfs @ 12.12 hrs, Volume= 0.135 af, Depth> 4.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Rainfall=4.84"

Area (sf)	CN	Description
15,368	98	Paved roads w/curbs & sewers, HSG C
15,368		100.00% Impervious Area

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

Subcatchment 10S: Analysis Point 10



Summary for Subcatchment 11S: Analysis Point 11

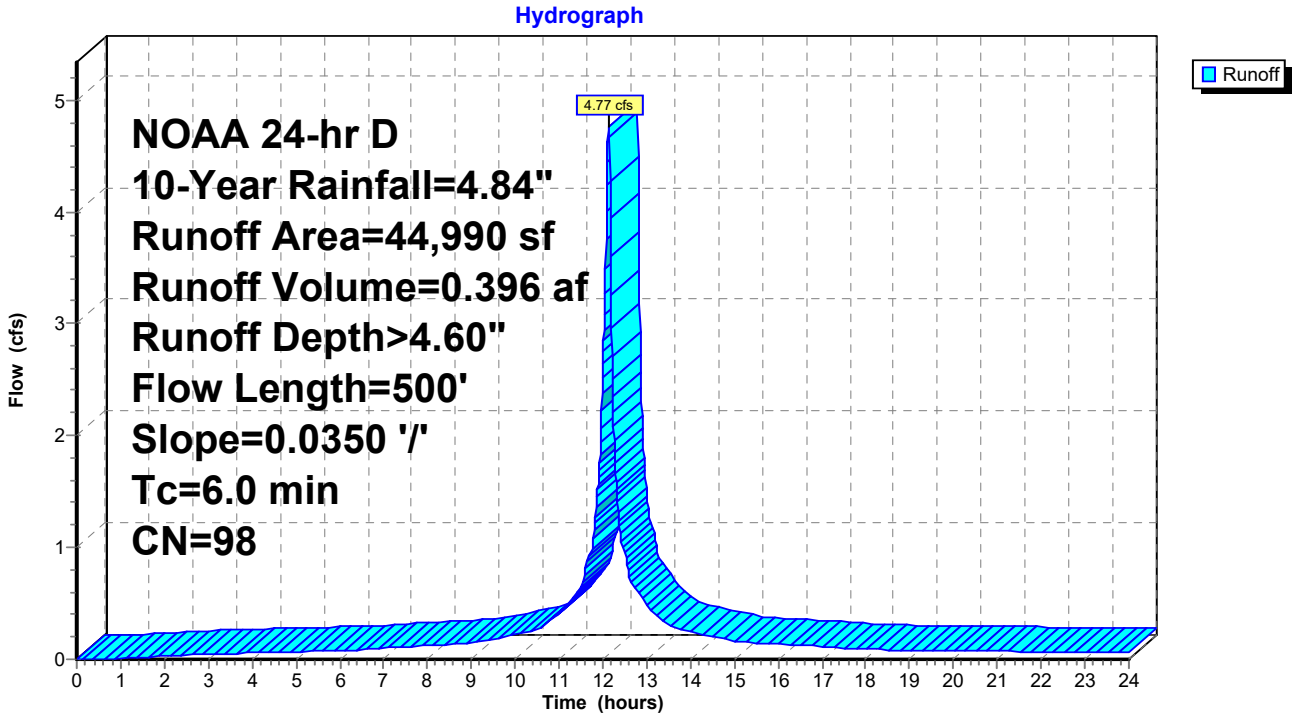
Runoff = 4.77 cfs @ 12.13 hrs, Volume= 0.396 af, Depth> 4.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Rainfall=4.84"

Area (sf)	CN	Description
44,990	98	Paved roads w/curbs & sewers, HSG C
44,990		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**
1.0	500	0.0350	8.49	6.67	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
6.0	500	Total			

Subcatchment 11S: Analysis Point 11

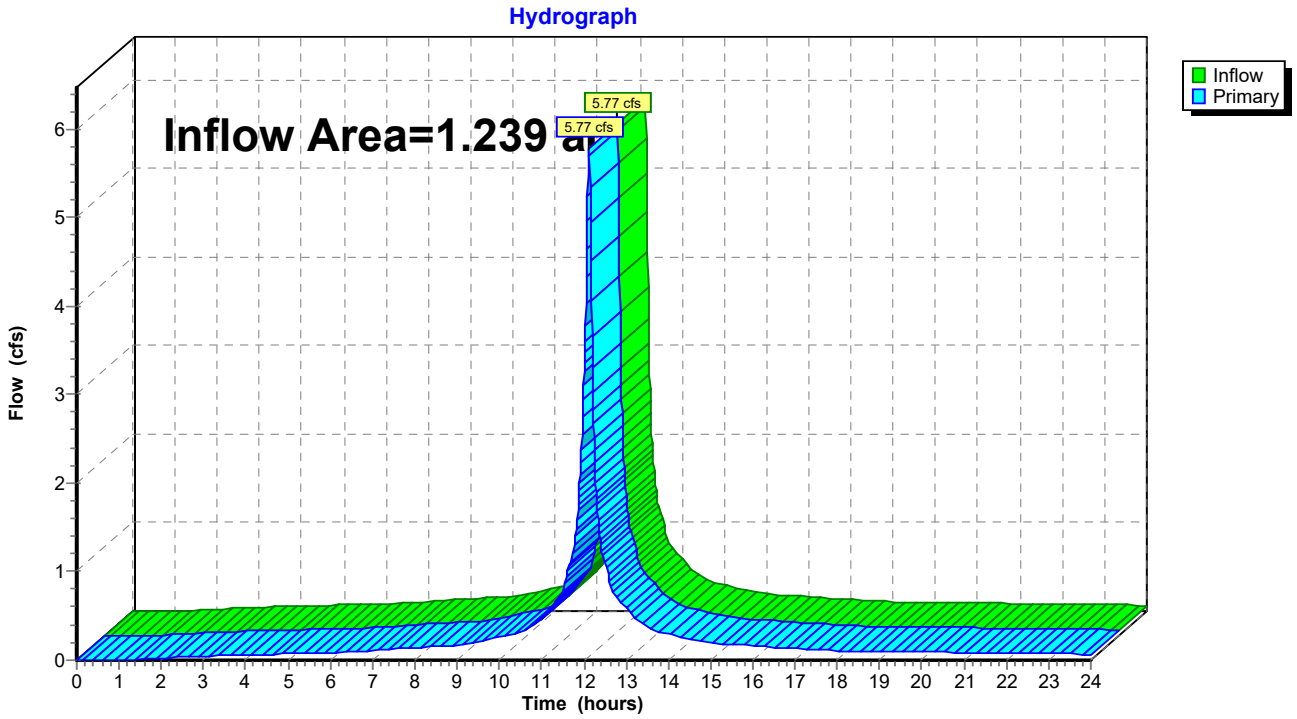


Summary for Link 12L: (new Link)

Inflow Area = 1.239 ac, 96.39% Impervious, Inflow Depth > 4.50" for 10-Year event
Inflow = 5.77 cfs @ 12.13 hrs, Volume= 0.465 af
Primary = 5.77 cfs @ 12.13 hrs, Volume= 0.465 af, Atten= 0%, Lag= 0.0 min

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

Link 12L: (new Link)



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

Subcatchment1S: Analysis Point 1 Runoff Area=125,826 sf 97.21% Impervious Runoff Depth>7.19"
Flow Length=2,088' Tc=7.6 min CN=97 Runoff=19.68 cfs 1.731 af

Subcatchment2S: Analysis Point 2 Runoff Area=11,003 sf 90.76% Impervious Runoff Depth>7.08"
Flow Length=280' Slope=0.0610 '/' Tc=5.4 min CN=96 Runoff=1.85 cfs 0.149 af

Subcatchment3S: Analysis Point 3 Runoff Area=22,354 sf 95.84% Impervious Runoff Depth>7.19"
Flow Length=395' Slope=0.0510 '/' Tc=5.6 min CN=97 Runoff=3.75 cfs 0.308 af

Subcatchment4S: Analysis Point 4 Runoff Area=20,624 sf 100.00% Impervious Runoff Depth>7.31"
Flow Length=340' Slope=0.0450 '/' Tc=5.6 min CN=98 Runoff=3.47 cfs 0.289 af

Subcatchment5S: Analysis Point 5 Runoff Area=58,030 sf 100.00% Impervious Runoff Depth>7.31"
Tc=5.0 min CN=98 Runoff=9.98 cfs 0.812 af

Subcatchment6S: Analysis Point 6 Runoff Area=14,979 sf 100.00% Impervious Runoff Depth>7.31"
Tc=5.0 min CN=98 Runoff=2.58 cfs 0.210 af

Subcatchment7S: Analysis Point 7 Runoff Area=16,958 sf 100.00% Impervious Runoff Depth>7.31"
Flow Length=429' Tc=5.6 min CN=98 Runoff=2.86 cfs 0.237 af

Subcatchment8S: Analysis Point 8 Runoff Area=35,141 sf 100.00% Impervious Runoff Depth>7.31"
Flow Length=421' Tc=5.7 min CN=98 Runoff=5.90 cfs 0.492 af

Subcatchment9S: Analysis Point 9 Runoff Area=28,275 sf 100.00% Impervious Runoff Depth>7.31"
Flow Length=510' Slope=0.0660 '/' Tc=5.6 min CN=98 Runoff=4.76 cfs 0.396 af

Subcatchment10S: Analysis Point 10 Runoff Area=15,368 sf 100.00% Impervious Runoff Depth>7.31"
Tc=5.0 min CN=98 Runoff=2.64 cfs 0.215 af

Subcatchment11S: Analysis Point 11 Runoff Area=44,990 sf 100.00% Impervious Runoff Depth>7.31"
Flow Length=500' Slope=0.0350 '/' Tc=6.0 min CN=98 Runoff=7.47 cfs 0.629 af

Link 12L: (new Link) Inflow=9.07 cfs 0.745 af
Primary=9.07 cfs 0.745 af

Total Runoff Area = 9.035 ac Runoff Volume = 5.467 af Average Runoff Depth = 7.26"
1.39% Pervious = 0.125 ac 98.61% Impervious = 8.909 ac

Summary for Subcatchment 1S: Analysis Point 1

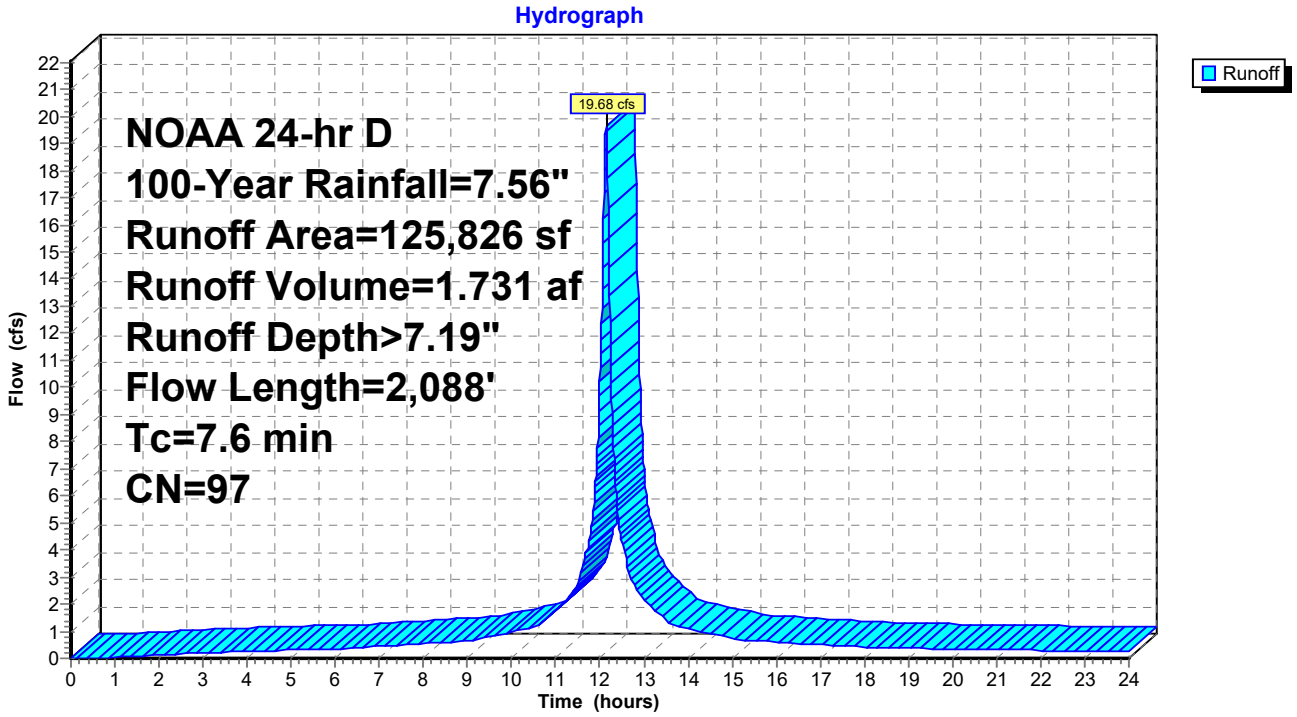
Runoff = 19.68 cfs @ 12.15 hrs, Volume= 1.731 af, Depth> 7.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Rainfall=7.56"

Area (sf)	CN	Description
122,318	98	Paved roads w/curbs & sewers, HSG D
3,508	79	50-75% Grass cover, Fair, HSG C
125,826	97	Weighted Average
3,508		2.79% Pervious Area
122,318		97.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**
1.1	767	0.0620	11.30	8.87	**Pipe Channel, 12" RCP** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
1.2	1,036	0.0590	14.44	25.51	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.3	285	0.0490	15.94	50.08	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
7.6	2,088	Total			

Subcatchment 1S: Analysis Point 1



Summary for Subcatchment 2S: Analysis Point 2

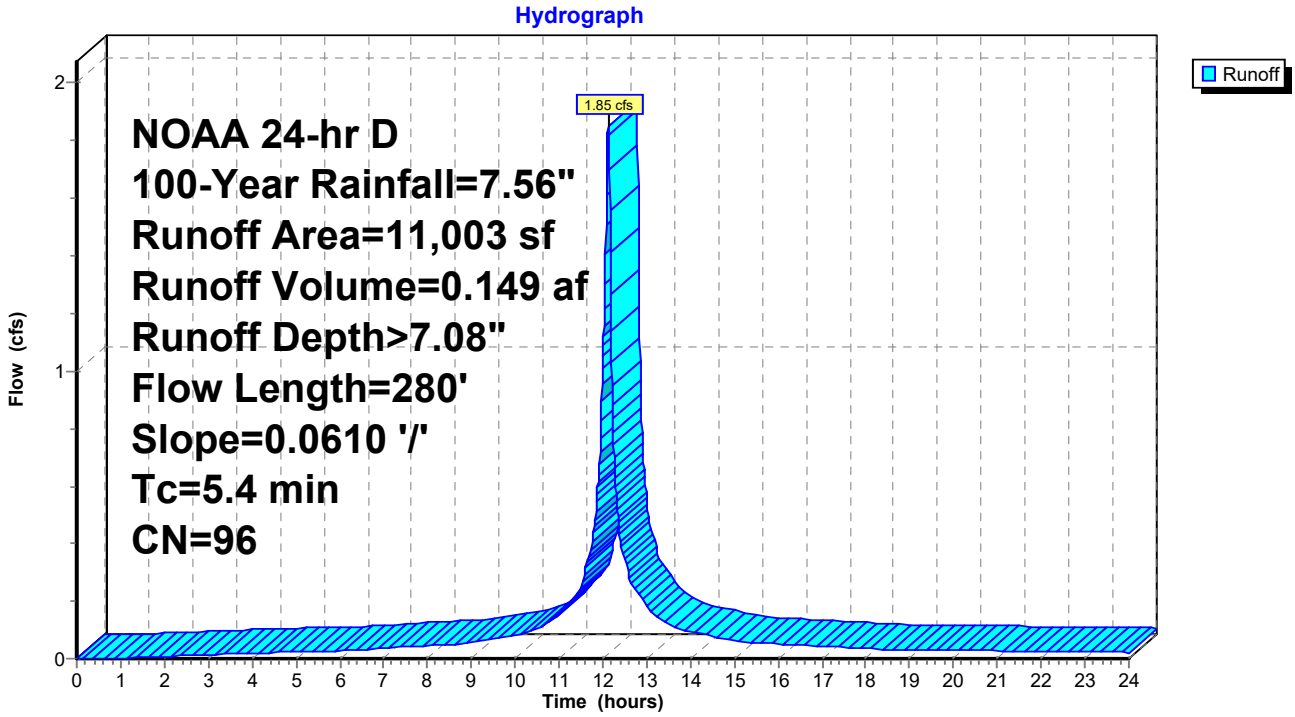
Runoff = 1.85 cfs @ 12.12 hrs, Volume= 0.149 af, Depth> 7.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Rainfall=7.56"

Area (sf)	CN	Description
9,986	98	Paved roads w/curbs & sewers, HSG C
1,017	79	50-75% Grass cover, Fair, HSG C
11,003	96	Weighted Average
1,017		9.24% Pervious Area
9,986		90.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**
0.4	280	0.0610	11.20	8.80	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
5.4	280	Total			

Subcatchment 2S: Analysis Point 2



Summary for Subcatchment 3S: Analysis Point 3

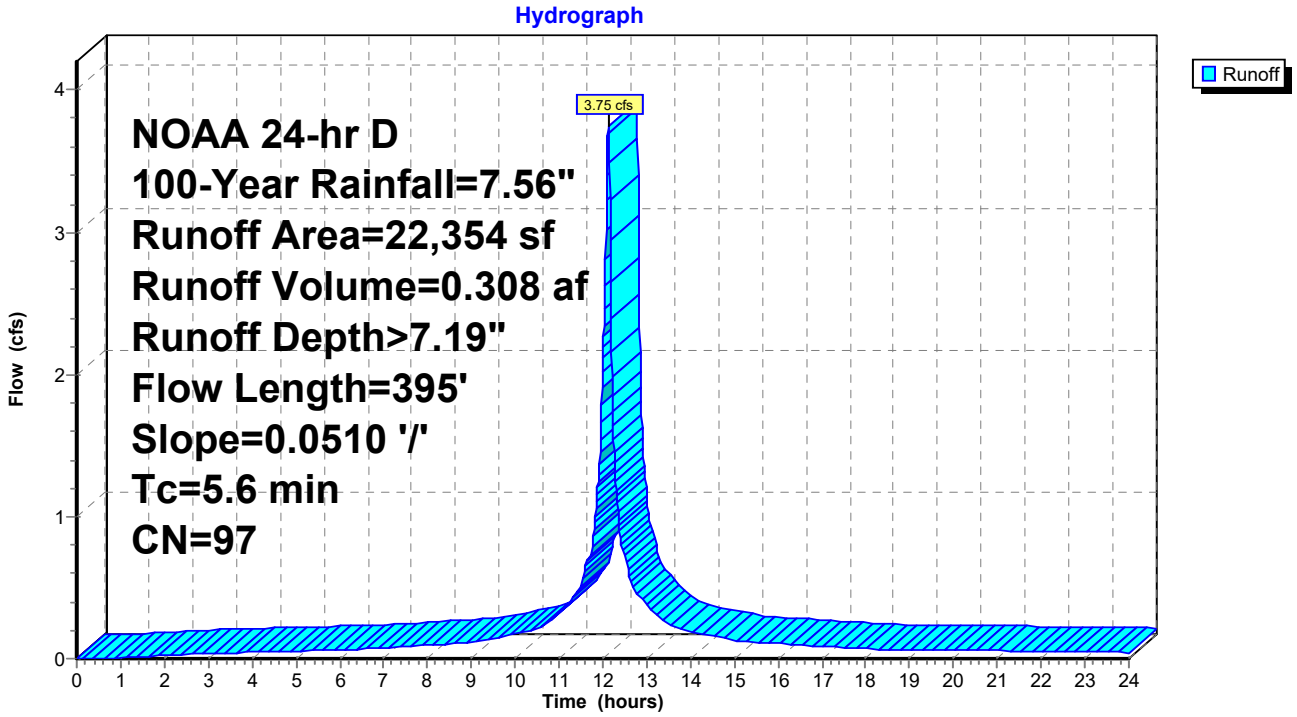
Runoff = 3.75 cfs @ 12.13 hrs, Volume= 0.308 af, Depth> 7.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Rainfall=7.56"

Area (sf)	CN	Description
21,423	98	Paved roads w/curbs & sewers, HSG C
931	79	50-75% Grass cover, Fair, HSG C
22,354	97	Weighted Average
931		4.16% Pervious Area
21,423		95.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**
0.6	395	0.0510	10.24	8.05	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
5.6	395	Total			

Subcatchment 3S: Analysis Point 3



Summary for Subcatchment 4S: Analysis Point 4

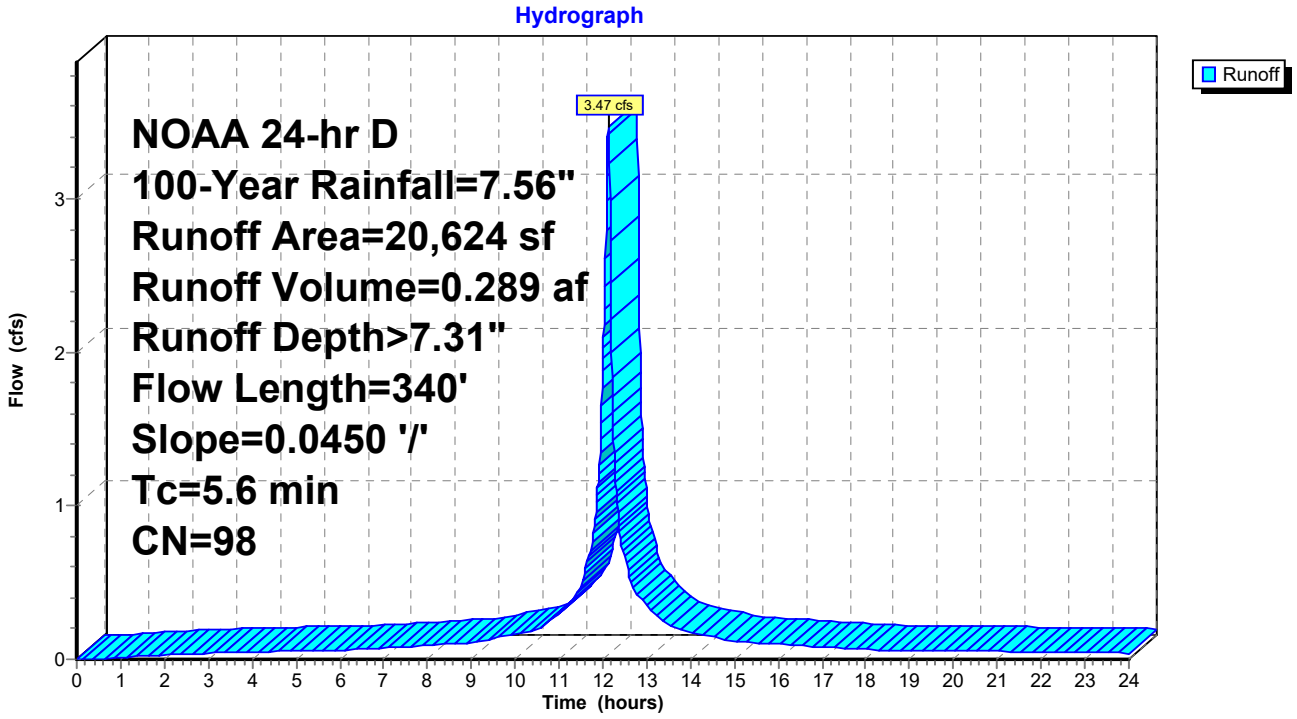
Runoff = 3.47 cfs @ 12.13 hrs, Volume= 0.289 af, Depth> 7.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Rainfall=7.56"

Area (sf)	CN	Description
20,624	98	Paved roads w/curbs & sewers, HSG C
20,624		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**
0.6	340	0.0450	9.62	7.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
5.6	340	Total			

Subcatchment 4S: Analysis Point 4



Summary for Subcatchment 5S: Analysis Point 5

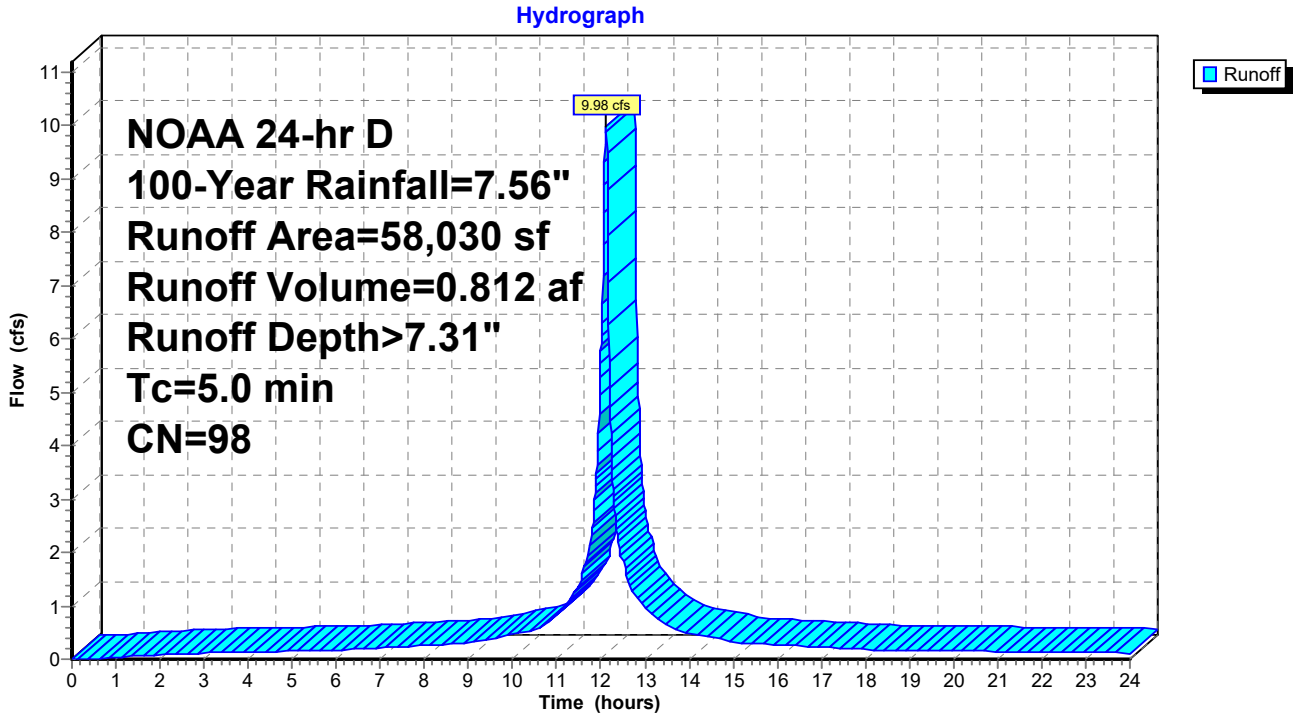
Runoff = 9.98 cfs @ 12.12 hrs, Volume= 0.812 af, Depth> 7.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Rainfall=7.56"

Area (sf)	CN	Description
58,030	98	Paved roads w/curbs & sewers, HSG A
58,030		100.00% Impervious Area

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

Subcatchment 5S: Analysis Point 5



Summary for Subcatchment 6S: Analysis Point 6

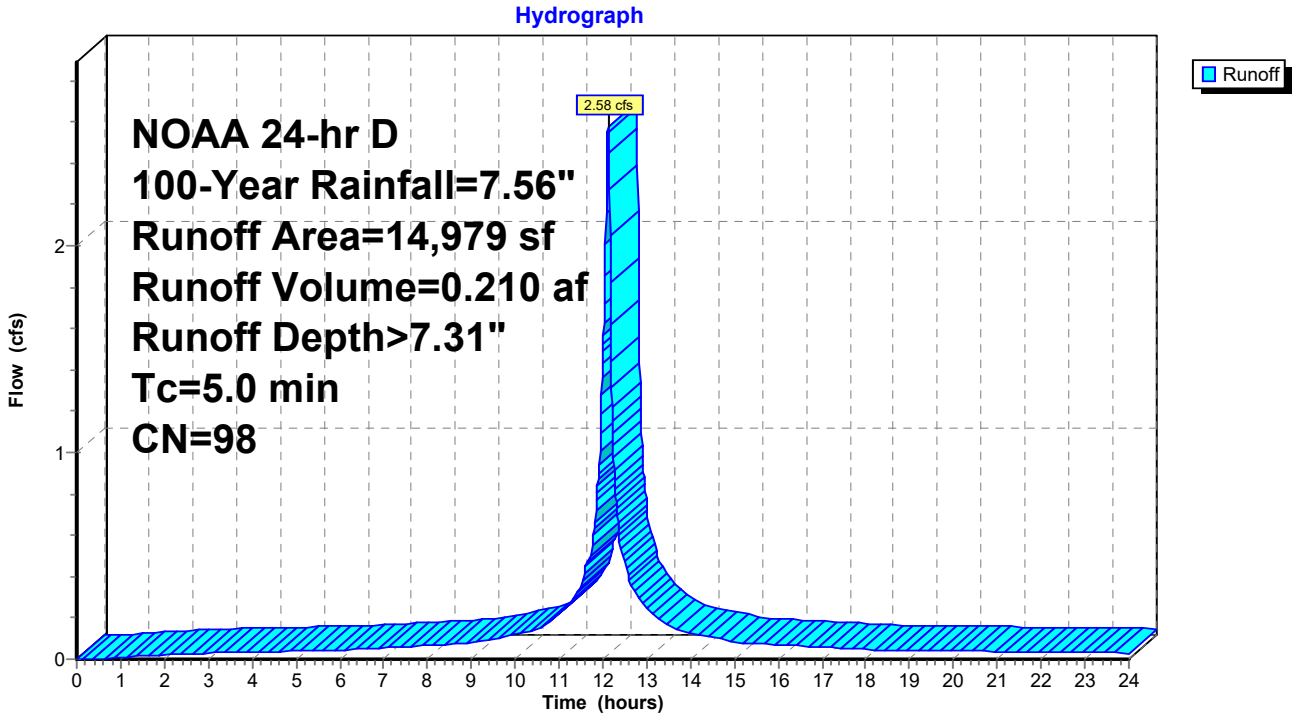
Runoff = 2.58 cfs @ 12.12 hrs, Volume= 0.210 af, Depth> 7.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Rainfall=7.56"

Area (sf)	CN	Description
14,979	98	Paved roads w/curbs & sewers, HSG A
14,979		100.00% Impervious Area

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

Subcatchment 6S: Analysis Point 6



Summary for Subcatchment 7S: Analysis Point 7

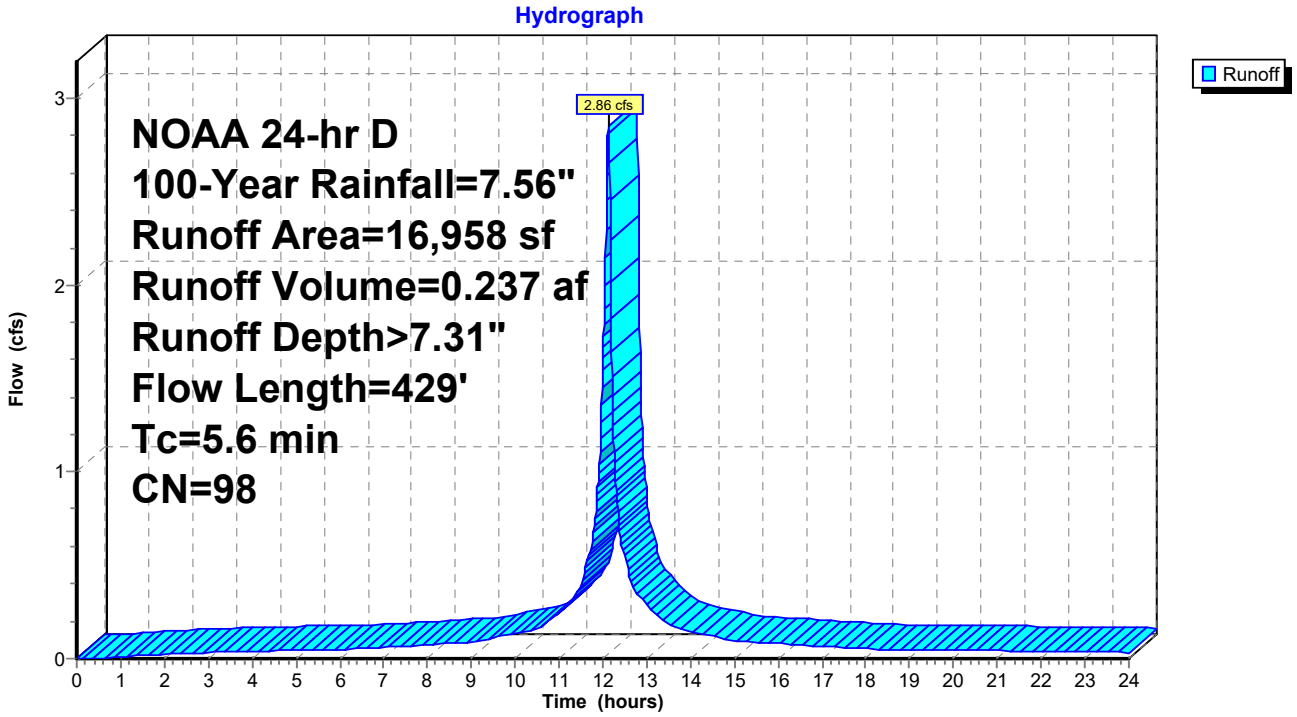
Runoff = 2.86 cfs @ 12.13 hrs, Volume= 0.237 af, Depth> 7.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Rainfall=7.56"

Area (sf)	CN	Description
16,958	98	Paved roads w/curbs & sewers, HSG A
16,958		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**
0.6	389	0.0600	11.11	8.73	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
0.0	40	0.0610	17.78	55.87	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
5.6	429	Total			

Subcatchment 7S: Analysis Point 7



Summary for Subcatchment 8S: Analysis Point 8

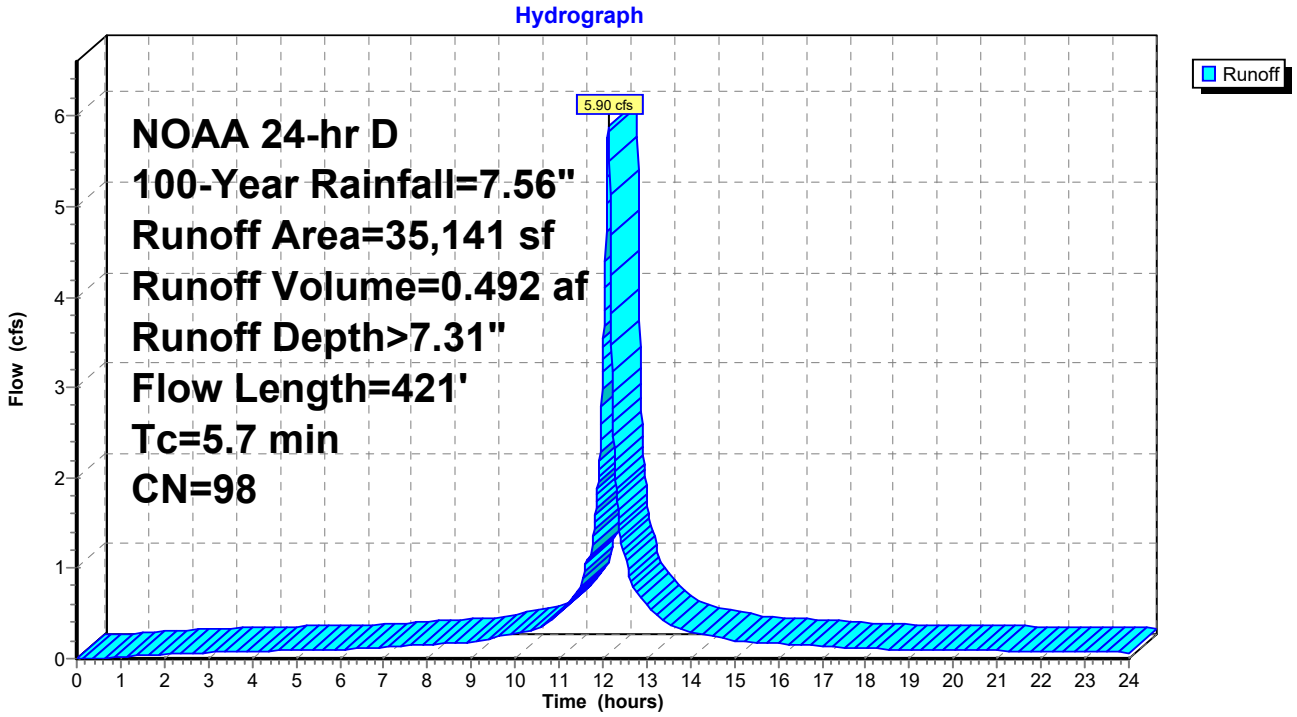
Runoff = 5.90 cfs @ 12.13 hrs, Volume= 0.492 af, Depth> 7.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Rainfall=7.56"

Area (sf)	CN	Description
35,141	98	Paved roads w/curbs & sewers, HSG C
35,141		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**
0.6	390	0.0660	11.65	9.15	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
0.1	31	0.0070	4.97	8.79	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
5.7	421	Total			

Subcatchment 8S: Analysis Point 8



Summary for Subcatchment 9S: Analysis Point 9

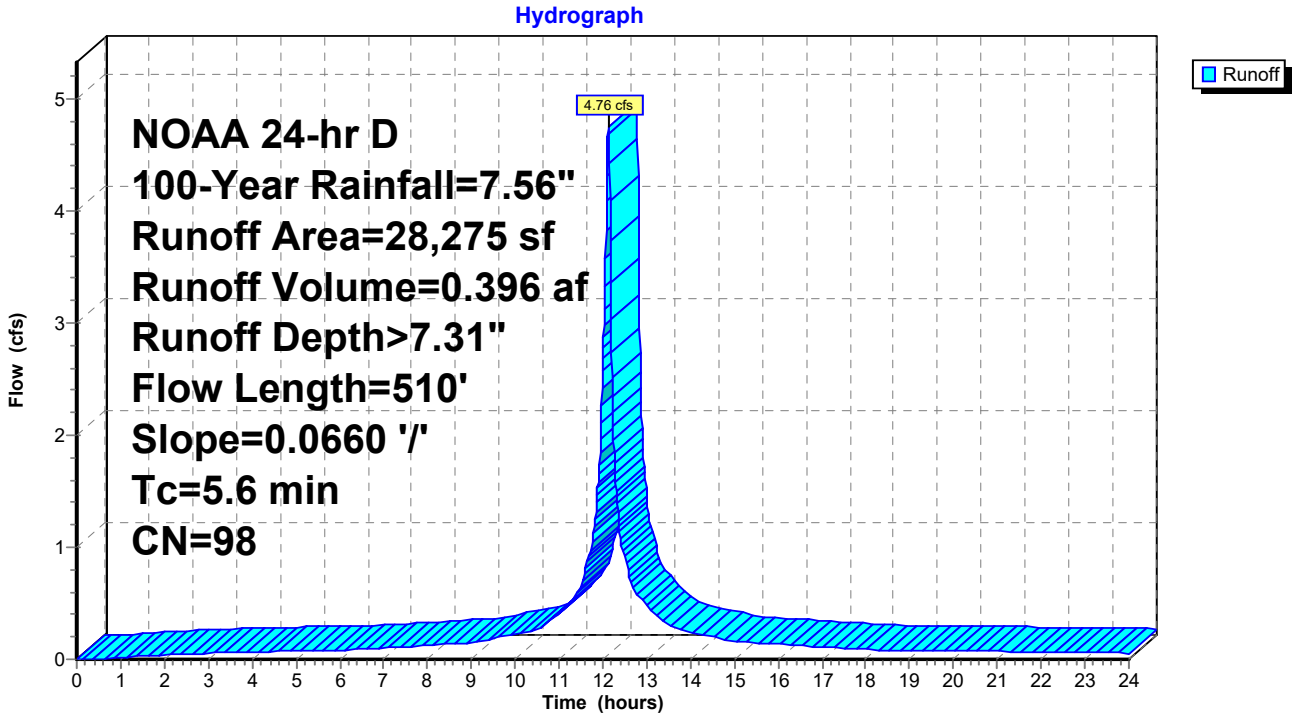
Runoff = 4.76 cfs @ 12.13 hrs, Volume= 0.396 af, Depth> 7.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Rainfall=7.56"

Area (sf)	CN	Description
28,275	98	Paved roads w/curbs & sewers, HSG C
28,275		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**
0.6	510	0.0660	15.27	26.99	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
5.6	510	Total			

Subcatchment 9S: Analysis Point 9



Summary for Subcatchment 10S: Analysis Point 10

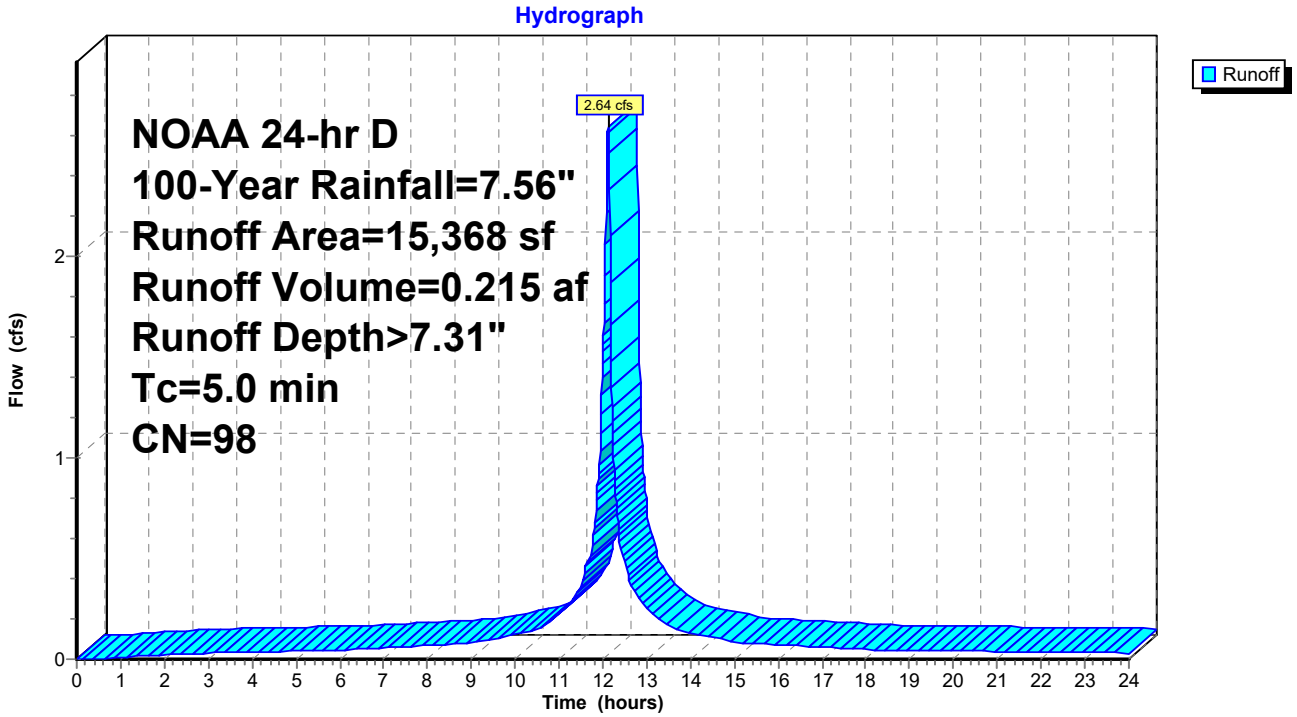
Runoff = 2.64 cfs @ 12.12 hrs, Volume= 0.215 af, Depth> 7.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Rainfall=7.56"

Area (sf)	CN	Description
15,368	98	Paved roads w/curbs & sewers, HSG C
15,368		100.00% Impervious Area

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

Subcatchment 10S: Analysis Point 10



Summary for Subcatchment 11S: Analysis Point 11

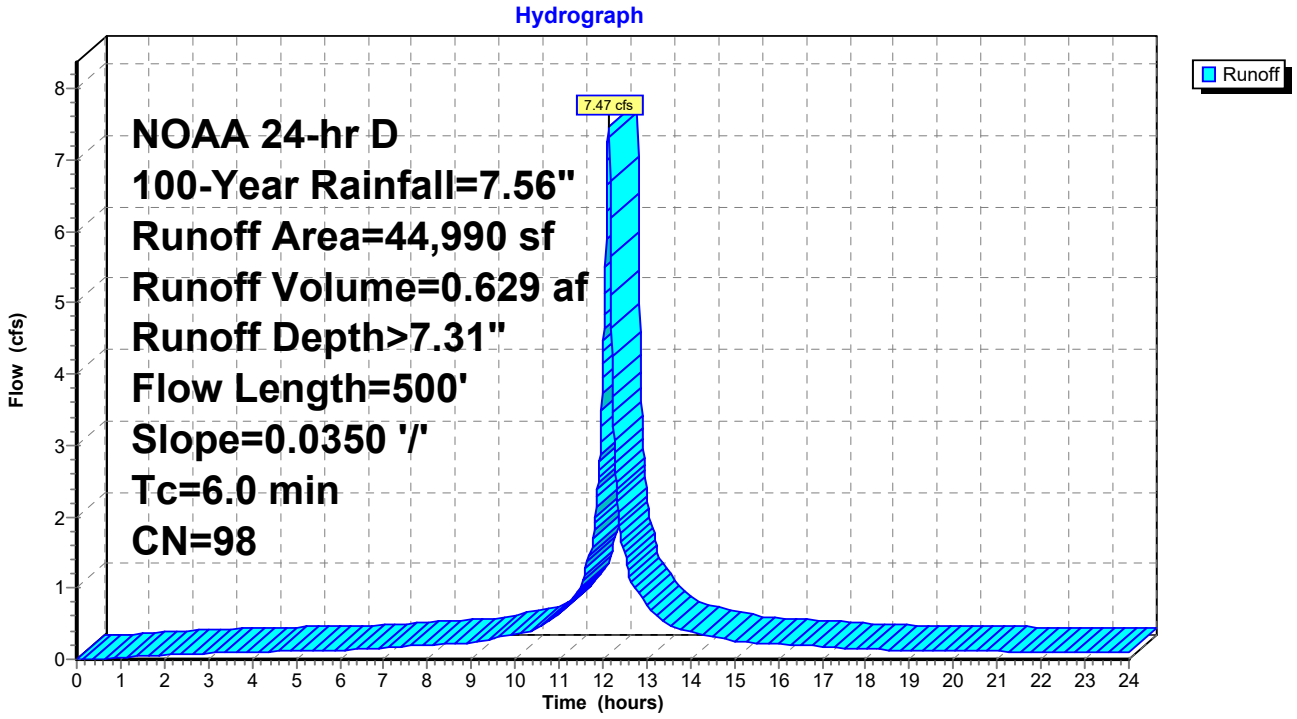
Runoff = 7.47 cfs @ 12.13 hrs, Volume= 0.629 af, Depth> 7.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Rainfall=7.56"

Area (sf)	CN	Description
44,990	98	Paved roads w/curbs & sewers, HSG C
44,990		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**
1.0	500	0.0350	8.49	6.67	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
6.0	500	Total			

Subcatchment 11S: Analysis Point 11

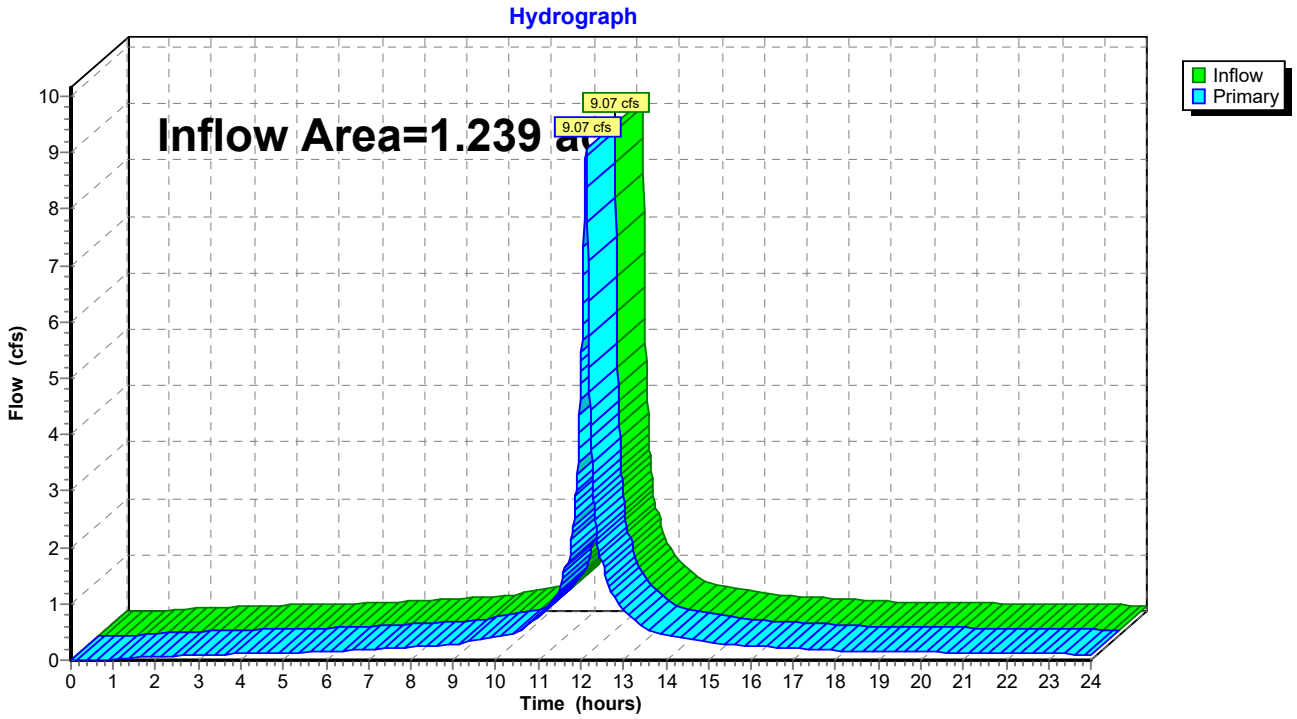


Summary for Link 12L: (new Link)

Inflow Area = 1.239 ac, 96.39% Impervious, Inflow Depth > 7.22" for 100-Year event
Inflow = 9.07 cfs @ 12.12 hrs, Volume= 0.745 af
Primary = 9.07 cfs @ 12.12 hrs, Volume= 0.745 af, Atten= 0%, Lag= 0.0 min

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

Link 12L: (new Link)



Appendix E: O&M Plan and LTPPP

Pedestrian and Bicycle Improvements on Pleasant Street

Stormwater Management System Operation and Maintenance Plan and Long-Term Pollution Prevention Plan

MassDOT Project# 610535
Worcester, MA

PREPARED FOR

massDOT

10 Park Plaza
Boston, MA 02116

PREPARED BY

Jacobs

Jacobs
120 St. James Avenue
Boston, MA 02116

February 2026

Table of Contents

1

Stormwater Management System Operation and Maintenance (O&M) Plan

This Stormwater Management System Operation and Maintenance (O&M) Plan describes the approach for inspection and maintenance of drainage infrastructure and structural stormwater control measures (SCMs) to minimize contaminant loading for the Pedestrian and Bicycle Improvements on Pleasant Street in Worcester. In general, inspection and maintenance activities will be conducted consistent with the National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer System (MS4) and MassDOT's anticipated NPDES Transportation Separate Storm Sewer System (TS4) Permit.

This document has been prepared per the requirements of Massachusetts Department of Environmental Protection (MassDEP) Regulations 310 CMR 10.05 (6)(k)(9) and satisfies the requirements of Massachusetts Stormwater Standard 9.

1.1 Responsible Party

In accordance with MassDOT procedures, the MassDOT District 3 office located in Worcester, MA, is responsible for the maintenance of all stormwater management systems on MassDOT roads within the project area.

Questions or concerns regarding activities associated with this O&M Plan should be addressed to MassDOT's District 3 office located at *499 Plantation Street, Worcester, MA 01605,* phone *(857) 368-3000*, during regular weekday hours, or to MassDOT's Highway Operations Center located in South Boston, MA at (800) 227-0608 during all other times and days, including weekends and holidays.

1.2 Inspection and Maintenance Measures and Record-Keeping

The stormwater management system covered by this O&M Plan consists of the following measures:

- *Deep sump catch basins*

MassDOT uses a performance-based inspection and maintenance program for catch basins. For catch basins, MassDOT's overall approach is to perform maintenance at an interval that maintains the functionality of the catch basin (e.g., sump is less than 50% full of sediment).

Catch basin inspections, including documentation of sediment accumulation, and maintenance will generally occur simultaneously.

MassDOT's O&M program is data driven. Inspections and maintenance are recorded by personnel using hand-held tablets in the field to document sediment accumulation, maintenance action performed, and follow-up actions needed. Data is recorded in MassDOT's asset management system which is accessible in the field (mobile) or the office (desktop).

The table below summarizes data that is generally collected for each asset type. For all assets, the inspector and inspection date are recorded. Photo documentation of structure condition is taken and attached to the inspection record.

Inspection Form	Applicable Stormwater Assets	Information Collected
Inlets	› Catch basins › Outlet control structures	› Sediment accumulation › Trash/Debris accumulation › Signs of contamination › Frame and grate condition › Overall structure condition
Storm Discharge Points	› Outlets to SCMs	› Presence of flow › Signs of contaminated flow › Sediment accumulation › Level of erosion › Pipe condition › Scour protection condition › Overall structure condition

Inspection and maintenance records can be made available using the asset management system through request with the MassDOT District 3 Environmental Engineer. Records will be kept for at least three years. Representatives of the Worcester Conservation Commission(s), MassDEP, and US EPA may obtain access to these records, upon request. Additionally, MassDOT will allow members and agents of MassDEP and the Conservation Commission(s) to enter and inspect the premises, upon request, to evaluate and ensure that the Operation and Maintenance Plan requirements are being followed.

Maintenance actions will not occur at any set frequency, but rather will be based on condition and impact to functionality. Maintenance to be performed on the stormwater system includes:

Stormwater Feature	*Potential Maintenance Actions*	
Surface SCMs	• *Remove and properly dispose of accumulated material (e.g., sediment, trash, leaf litter, debris)* • *Mow vegetated areas and remove and dispose of grass clippings* • *Regrade areas that show signs of unwanted ponding and channelization* • *Stabilize or reconstruct eroded areas and reseed* • *Replace stones/soil and/or replant vegetation*	• *Remove woody growth* • *Treat invasive plants according to MassDOT Landscape Design Section* • *Infiltration and bioretention SCMs only:* ○ *Address issues of standing water* ○ *Drain and reconstruct SCM* ○ *If rehabilitation is not possible, then retrofit to be a wet SCM while considering safety implications*

Based on the results of the inspection, repairs will be made in accordance with MassDOT standard practices. Maintenance will be prioritized given the urgency of the required maintenance and availability of staff, contracts, etc. Maintenance may require contracting if existing contracts are unavailable to perform the work. More intensive remedial activities may require permitting and/or an engineering solution.

1.3 Erosion and Sediment Control Measures during Maintenance Activities

For maintenance activities that could result in discharges of sediments or other contaminants into wetlands, waterways, or other resource areas regulated under 310 CMR 10.00, the responsible maintenance personnel will employ measures to prevent migration of these sediments/contaminants. Such temporary measures may include, but are not necessarily limited to, the use of siltation barriers, catch basin silt sacks/filter bags, pipe plugs, cofferdams deployed within the stormwater structure, turbidity curtains, or other practices designed to prevent such discharges.

- *The MassDOT Erosion and Sediment Control Field Guide includes detailed descriptions, photographs, and illustrations of E&S controls that the designer may incorporate into the plans.*
- *Chapter 8 of the MassDOT Project Development & Design Guide,[1] Section 8.5 - Erosion During Construction, includes a description of common construction period E&S control practices.*
- *The Massachusetts Erosion and Sediment Control Guidelines for Urban and Suburban Areas[2] is an authoritative reference on erosion prevention measures.*

1 See MassDOT PDDG at: https://www.mass.gov/lists/design-guides-and-manuals.

2 See Complete Erosion and Sedimentation Control Guidelines: A Guide for Planners, Designers, and Municipal Officials (May 2003) at: https://www.mass.gov/service-details/stormwater.

- *The Massachusetts Nonpoint Source Pollution Management Manual[3] provides an innovative user interface to present comprehensive detailed guidance on E&S controls for construction projects.*

Where maintenance occurs in areas that are confined, with no risk of discharge to adjacent water bodies, no special measures may be needed. Examples include, but are not limited to: (1) cleaning of a forebay under dry conditions when the work can be completed and exposed surfaces stabilized prior to placing it back into service; and (2) catch basin cleaning where the activity is limited to removing material from a sump below the elevation of the outlet pipe.

1.4 O&M Budget

MassDOT performs maintenance for stormwater management systems as part of their routine operation and maintenance budget for roadways and bridges. Budgets are managed at the district level and vary by fiscal year, depending on funding sources.

3 See Massachusetts Nonpoint Source Pollution Management Manual at: https://megamanual.geosyntec.com/npsmanual/default.aspx.

2

Long-Term Pollution Prevention Plan

This Long-Term Pollution Prevention Plan (LTPPP) describes the approach for pollution prevention and related maintenance activities for the Pedestrian and Bicycle Improvements on Pleasant Street. In general, long-term pollution prevention and related maintenance activities will be conducted consistent with:

- The National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer System (MS4),
- MassDOT's anticipated NPDES Transportation Separate Storm Sewer System (TS4) Permit, and
- Measures outlined in MassDOT's Stormwater Management Plan (SWMP).

This LTPPP satisfies the requirements related to pollution prevention under Massachusetts Stormwater Standards 4, 5, 6, and 10.

2.1 Practices for Long-Term Pollution Prevention

For the facilities covered, long-term pollution prevention includes the following measures.

- *good housekeeping;*
- *storing materials and waste products inside or under cover;*
- *vehicle washing;*
- *routine inspections and maintenance of SCMs;*
- *spill prevention and response;*
- *maintenance of lawns, gardens, and other landscaped areas;*
- *storage and use of fertilizers, herbicides, and pesticides;*
- *pet waste management;*
- *operation and management of septic systems; and*
- *proper management of deicing chemicals and snow.*

2.1.1 Litter Pick-up

MassDOT will conduct litter pick-up from the stormwater management facilities in conjunction with routine road maintenance activities.

2.1.2 Inspection and Maintenance of Stormwater Assets

MassDOT will conduct inspection and maintenance of drainage infrastructure and the stormwater control measures (SCMs) in accordance with the O&M Plan, as described in Section 1.

2.1.3 Maintenance of Landscaped Areas

Routine mowing will be conducted according to standard MassDOT practices.

Except in rare circumstances, MassDOT does not use fertilizers, herbicides, and pesticides for the maintenance of facilities. Exceptions include using fertilizer to ensure the survival of new plantings and herbicides to control invasive plants. Use of fertilizers and herbicides is reviewed and approved by the MassDOT Landscape Design Section and District 3 Environmental Engineer prior to application. Local Conservation Commission review may also be required.

2.1.4 Snow and Ice Management

Snow and Ice Management will be conducted consistent with the practices outlined in the MassDOT Snow and Ice Control Program Environmental Status and Planning Report (ESPR), formerly known as the Snow and Ice Control Generic Environmental Impact Report (GEIR).

In accordance with the Snow and Ice Control ESPR, no sand is used on MassDOT properties for snow and ice control. The exception to this rule is within reduced salt areas where high sodium levels have been found in drinking water sources.

2.1.5 Street Sweeping

Routine highway cleaning, with a brush-type street sweeper, will be conducted in accordance with standard MassDOT practices. Sweeping will occur annually in the Spring.

2.1.6 Prohibition of Illicit Discharges

The MassDEP Stormwater Management Standard 10 prohibits illicit discharges to the stormwater management system. Illicit discharges are discharges that do not consist entirely of stormwater, except for certain specified non-stormwater discharges.

In accordance with the existing MS4 permit and anticipated TS4 permit requirements, examples of discharges from the following sources are not considered illicit discharges:

- Firefighting activities*
- Foundation drains
- Water line flushing
- Footing drains
- Landscape irrigation
- Individual residential car washing
- Uncontaminated groundwater
- Flows from riparian habitats/wetlands
- Potable water sources
- Dechlorinated swimming pool water
- Street wash waters
- Wash water from residential buildings (no detergents)
- Condensation from air conditioning units
- Run-on from private driveways caused by precipitation

- Rising groundwater
- Diverted stream flows
- Lawn watering
- Water from crawl space pumps

*Water from firefighting activities is allowed and need only be addressed where they are identified as significant sources of pollutants to waters of the United States.

Based on plan review, there are no known or proposed illicit connections associated with the proposed work limits for this project. Should an interconnection to the stormwater management system be identified, the MassDOT PM will coordinate with the District Permits Engineer to confirm if the connections are authorized. For unauthorized connections, the MassDOT PM and/or MassDOT Environmental Services Section will investigate the connections and if they are determined to be illicit, the connections will be managed through MassDOT's Illicit Discharge Detection and Elimination (IDDE) program and/or through other agencies.

2.1.7 Spill Prevention and Response

Response procedures will be implemented at *all outfalls that discharge to the adjacent resourve areas* for any significant release of hazardous materials such as fuels, oils, or chemical materials that have the potential of discharging to Yokum Brook.

Reportable quantities will immediately be reported to the applicable Federal, State, and local agencies as required by law. Reportable quantities of chemical, fuels, or oils are established under the Clean Water Act and enforced through MassDEP. The MassDEP Emergency Response Program shall be immediately notified in accordance with required procedures for the report of a release (telephone (888) 304-1133).

MassDOT works with first responders and/or public water supply owners to determine the best approach to protect water supplies, and provides training and materials to carry out action plans. In the case of a spill, applicable containment and clean-up procedures will be performed immediately. These procedures are implemented in accordance with the Unified Response Manual at the local level by first responders, which includes the Worcester local public safety departments (e.g., fire, police, public works, board of health). MassDOT will be on-site to aid with traffic control and to provide clean-up supplies, as necessary. Spill material collected during the response will be promptly removed and disposed of in accordance with Federal, State, and local requirements. If necessary, a licensed emergency response contractor will assist in cleanup of releases depending on the amount of the release and the ability of the responsible party to perform the required response.

Appendix F: Figures

- Stormwater Alternatives Analysis Plans
- HydroCAD Existing Contributing Areas Plan
- HydroCAD Proposed Contributing Areas Plan

WORCESTER
PLEASANT STREET ROUTE 122

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	######		
PROJECT FILE NO.	#610535		

STORMWATER ALTERNATIVES ANALYSIS PLANS
SHEET 1 OF 14

Proposal No. 610535-134928

610535_UT(UTILS-DRAINAGE).DWG Plotted on 9-Jan-2026 12:51 PM

A00860 - 229

TOWN OF PAXTON
CITY OF WORCESTER

PROJECT BEGIN
N2928517.7590
E553303.8128
STA 10+79.32

Existing State Highway Layout (SHLO)

PROP 40 LF CONDUIT AND PULL BOXES FOR FUTURE RRFB

PROP 54 LF CONDUIT AND PULL BOX FOR FUTURE RRFB

PROP CB WITH DEEP SUMP

5 LF OF 12" RCP @ 2%

CONTRACTOR TO EVAULATE THE CONDITION OF EX STORM DRAIN PIPES AND STRUCTURES BENEATH PROP SIDEWALK AND CONSULT WITH RESIDENT ON NEED FOR REPLACING EX PIPES AND STRUCTURES

DESIGNER RECOMMENDS UPGRADING DOWNSTREAM 8" CLAY PIPE TO 12" RCP OR INSTALLING 8" SDR 35 PVC.

RIM=934.06
INV=930.80

LIMIT OF WORK

PROP F&G MUNICIPAL STANDARD OR MASSDOT CASCADE TYPE.

PROP F&G MUNICIPAL STANDARD OR MASSDOT CASCADE TYPE.

R&S EX F&G-4

R&S EX F&G-3

Limited width between back of sidewalk and SHLO

Continued on Sheet 2

PLEASANT STREET
(ROUTE 122)

SUNNYVIEW HEIGHTS
(PUBLIC - 50' WIDE)

SUNNY HILL DRIVE
(PUBLIC - 50' WIDE)

1926 SHLO NO. 2373
1926 SHLO BASELINE
1958 SHLO NO. 4747
1958 SHLO NO. 4747 (SECTION 1)

N/F
JENNIFER DUPRUIS
PARCEL ID 47–19A–4
BOOK 54797 PAGE 340
1403 A PLEASANT ST

N/F
DAVID H. BATCHELDER
AND JESSICA M. GROVER
PARCEL ID 47–19A–5
BOOK 59034 PAGE 275
1403 B PLEASANT ST

N/F
DAVID E. WHITE II
AND LYNN H. CARPENTER–WHITE
PARCEL ID 47–19A–1–2
BOOK 15598 PAGE 17
1403 PLEASANT ST

N/F
KENNETH COLEBOURN
PARCEL ID 47–19A–3
BOOK 67300 PAGE 7
1401 PLEASANT ST

N/F
ROBERT C. TREMARCHE
AND JEAN M. MORRONE
PARCEL ID 47–19A–10
BOOK 52369 PAGE 100
1399 PLEASANT ST

N/F
ROBERT C. TREMARCHE
AND JEAN M. MORRONE
PARCEL ID 47–19A–11
BOOK 52369 PAGE 100
1395 PLEASANT ST

N/F
ALYSSA MONIQUE PRICE
AND CHARLENE ANN PRICE
PARCEL ID 47–16–AA
BOOK 62057 PAGE 76
40 SUNNYHILL DR

N/F
MAXWELL KOFI OWUSU
AND VIVIAN ASANTE
PARCEL ID 47–16–BB
BOOK 68045 PAGE 106
38 SUNNYHILL DR

N/F
STEVEN D. CORRIVEAU, JR.
AND RYAN J. MARCOUILLIER
BOOK 39828 PAGE 352
PLEASANT STREET

N/F
WILLIAM J. MULFORD
AND PATRICIA J. MULFORD
PARCEL ID 47–16–43
BOOK 9778 PAGE 206
30 CONGER RD

N/F
RORY R. PERKINS
PARCEL ID 47–16–40–42
BOOK 63264 PAGE 309
32 CONGER ROAD

N/F
AGNES A. SHEEHY
PARCEL ID 47–16–44
BOOK 5295 PAGE 355
28 CONGER RD

N/F
PATRICK J. BROOKS
AND LAURA A. BROOKS
PARCEL ID 47–16–45
BOOK 50210 PAGE 29
BOOK 50401 PAGE 234
26 CONGER RD

N/F
HELEN E. GARVEY
AND SHEILA L. GARVEY
PARCEL ID 47–16–H
BOOK 17979 PAGE 361
2 SUNNYVIEW HTS

CB 10313
RIM=932.02'
INV.(A)=927.82'
T.O.S=927.02'
T.O.W=927.82'
SUMP=924.42'

CB 10361
RIM=918.20'
INV.(A)=913.3'
T.O.S=911.70'
T.O.W=912.80'

CB 10160
CB 10001
RIM=935.47'
INV.(A)=932.57'
T.O.S=929.47'
T.O.W=931.67'
SUMP=928.17'

CB 10131
RIM=946.96'
INV.(A)=944.06'
T.O.S=940.46'
T.O.W=943.66'
SUMP=939.46'

DMH 10121
RIM=944.65'
INV.(A)=938.25'
INV.(B)=940.74'
INV.(C)=938.83'
INV.(D)=940.98'
SUMP=938.40'

CB 10120
RIM=946.42'
INV.(A)=944.52'
T.O.S=940.02'
T.O.W=943.82'
SUMP=938.82'

SMH 10122
RIM=944.69'
INV.(A)=936.62'
INV.(B)=937.19'
SUMP=936.89'

SMH 10002
RIM=938.92'
INV.(A)=931.46'
INV.(B)=931.86'
SUMP=931.64'

DMH 10003
RIM=939.03'
INV.(A)=933.96'
INV.(B)=934.37'
SUMP=934.18'

DMH 10083
RIM=931.96'
INV.(A)=927.22'
INV.(B)=928.59'
INV.(C)=928.59'
INV.(D)=928.31'
SUMP=927.13'

CB 10000
RIM=933.52'
INV.(A)=930.62'
T.O.S=927.22'
T.O.W=930.02'
SUMP=925.02'
INV=930.70

CB 10004
RIM=937.93'
INV.(A)=934.93'
T.O.S=931.43'
T.O.W=934.73'
SUMP=930.43'

DMH 10005
RIM=938.59'
INV.(A)=932.60'
INV.(B)=933.67'
SUMP=933.11'

DMH 10006
RIM=938.62'
INV.(A)=932.55'
INV.(B)=932.55'
SUMP=932.57'

CB 10474
RIM=918.45'
INV.(A)=914.15'
T.O.S=911.95'
T.O.W=914.15'
SUMP=911.55'

CBCI-1
CIT-2

0 20 50 100
SCALE: 1" = 20'

Continued on Sheet 1

Limited width between back of sidewalk and SHLO

Existing State Highway Layout (SHLO)

Limited width between back of sidewalk and SHLO. Underground utilities are present.

Limited width between SHLO and back of sidewalk

Continued on Sheet 3

MOWER STREET (PUBLIC - VARIABLE WIDTH)

TARRYTOWN LANE (PUBLIC - 50' WIDE)

PLEASANT STREET (ROUTE 122)

ASSABET LANE (PUBLIC - VARIABLE WIDTH)

LIMIT OF WORK

100' BUFFER ZONE

RET EXISTING FENCE

PROP F&G MUNICIPAL STANDARD OR MASSDOT CASCADE TYPE.

PROP 56 LF CONDUIT AND PULL BOX FOR FUTURE RRFB

PROP 70 LF CONDUIT AND PULL BOX FOR FUTURE RRFB

R&S EX F&G-5

R&S EX F&G-6

R&S EX F&G-7

R&S EX F&G-8

1926 SHLO BASELINE

1958 SHLO NO. 4747 (SECTION 1)

1958 SHLO NO. 4747 (SECTION 2)

N/F PATRICK J. BROOKS AND LAURA A. BROOKS PARCEL ID 47-16-45 BOOK 50210 PAGE 29

N/F JACQUELINE PEREZ SEPULVEDA PARCEL ID 47-16-1B PAGE 336 PLEASANT ST

N/F YVONNE POKU-MENSAH PARCEL ID 47-16-1A BOOK 34987 PAGE 276 1384 PLEASANT ST

N/F TANDT ASSOCIATES LLC PARCEL ID 47-16-35 BOOK 61762 PAGE 269 1382 PLEASANT ST

N/F RICHARD V. HARVEY PARCEL ID 47-16-33 BOOK 20069 PAGE 400 25 ASSABET LN

N/F ANTHONY J. MALISZEWSKI, JR AND ROSEMARY MALISZEWSKI PARCEL ID 47-16-32 BOOK 36822 PAGE 214 23 ASSABET LN

N/F MICHAEL MCAVEY AND DONNA DULMAINE-MCAVEY PARCEL ID 47-15A-7-7A BOOK 16587 PAGE 96 42 ASSABET LN

N/F BENJAMIN OLIVER AND CAROLYN OLIVER PARCEL ID 47-19E-10 BOOK 55426 PAGE 307 446 MOWER ST

N/F GERARD T AUBIN AND MICHELE T AUBIN PARCEL ID 47-19E-12 BOOK 52758 PAGE 319 444 MOWER ST

N/F MICHAEL [illegible] AND KELLY [illegible] PARCEL ID 47- BOOK 53381 PAGE 448 MOWER ST

LOCATION LINE OF TOWN LAYOUT 1851

LOCATION LINE PLAN BOOK 109 PLAN 4

LOCATION LINE PLAN BOOK 210 PLAN 37

WETLAND BANK

SCALE: 1" = 20'

0 20 50 100

WORCESTER
PLEASANT STREET ROUTE 122

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	#######		
PROJECT FILE NO.	#610535		

STORMWATER ALTERNATIVES
ANALYSIS PLANS
SHEET 2 OF 14

610535_UT(UTILS-DRAINAGE).DWG Plotted on 9-Jan-2026 12:51 PM

WORCESTER
PLEASANT STREET ROUTE 122

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	######		
PROJECT FILE NO.	#610535		

STORMWATER ALTERNATIVES ANALYSIS PLANS
SHEET 3 OF 14

610535_UT(UTILS-DRAINAGE).DWG Plotted on 9-Jan-2026 12:52 PM

Steep topography limits locations for potential SCMs and LIDs

Existing State Highway Layout (SHLO)

Steep topography limits locations for potential SCMs and LIDs

Area between SHLO and edge of roadway has overhead and underground utilities

Steep topography limits locations for potential SCMs and LIDs

Limited width between back of sidewalk and SHLO

MOWER STREET
(PUBLIC - VARIABLE WIDTH)

PLEASANT STREET
(ROUTE 122)

LOCATION LINE OF 1851 TOWN LAYOUT

100' BUFFER ZONE

LIMIT OF WORK

PROP RRFB, PULLBOX AND 11 LF CONDUIT

PROP F&G MUNICIPAL STANDARD OR MASSDOT CASCADE TYPE.

PROP RRFB, PULLBOX, AND 59 FT CONDUIT

R&R EX HYDRANT FOR MIN 4' CLEARANCE

UTILITY NOTES

R&S EX F&G-9

R&S EX F&G-10

R&S EX F&G-11

R&S EX F&G-12

Continued on Sheet 2

Continued on Sheet 4

N/F GERARD T AUBIN D MICHELE T AUBIN PARCEL ID 47-19E-12 BOOK 52758 PAGE 319 444 MOWER ST

N/F MICHAEL MCAVEY AND DONNA DULMAINE-MCAVEY PARCEL ID 47-15A-7-7A BOOK 16587 PAGE 96 42 ASSABET LN

N/F STARK REALTY TRUST PARCEL ID 40-39-11 BOOK 23846 PAGE 382 1349 PLEASANT ST

N/F NANCY JEAN WHITE REVOCABLE TRUST 2016 PARCEL ID 40-39-10A BOOK 56709 PAGE 157 1347 PLEASANT ST

N/F WHITNEY MARSHALL PARCEL ID 40-39-10 BOOK 66065 PAGE 330 415 MOWER ST

N/F JARED K SHAH PARCEL ID 40-39-9 BOOK 68366 PAGE 58 1345 PLEASANT ST

N/F TRANG XD NGHIEM AND ANH P. NGUYEN PARCEL ID 40-39-8 BOOK 54852 PAGE 29 1343 PLEASANT ST

N/F THAMIR H. MAHMOOD AND BASHAYER ADEL AL-EYADAH PARCEL ID 47-15A-9 BOOK 67927 PAGE 16 1360 PLEASANT ST

N/F EUGENE J. P. DESROSIERS PARCEL ID 47-15A-8 BOOK 56303 PAGE 343 1364 PLEASANT ST

CB 11389 RIM=866.10' INV.(A)=861.90' T.O.S=860.20' T.O.W=861.80' SUMP=859.25'

CB 11320 RIM=866.02' T.O.S=860.62' N.P.V.

CB 11340 RIM=863.33' INV.(A)=860.03' INV.(B)=860.13' T.O.S=858.33' T.O.W=860.03'

DMH 11379 RIM=863.96' INV.(A)=857.78' INV.(B)=858.61' INV.(C)=860.69' INV.(D)=858.46' SUMP=857.91'

DMH 11635 RIM=855.65' SEALED

SMH 11634 RIM=855.68' SEALED

DMH 11765 RIM=845.00' INV.(A)=839.08' INV.(B)=841.08' INV.(C)=839.65' SUMP=839.60'

CB 11766 RIM=845.75' INV.(A)=841.15' T.O.S=840.75' T.O.W=841.05'

SMH 11764 RIM=844.77' INV.(A)=837.05' INV.(B)=837.08' SUMP=837.17'

DMH 11763 RIM=844.42' INV.(A)=837.57' INV.(B)=838.02' INV.(C)=838.14' SUMP=837.81'

SMH 11762 RIM=844.47' INV.(A)=838.47' INV.(B)=838.69' INV.(C)=838.56' INV.(D)=838.93' SUMP=836.56'

DMH 11761 RIM=843.04' INV.(A)=833.24' INV.(B)=837.11' INV.(C)=833.79' SUMP=833.57'

SMH 11755 RIM=838.90' INV.(A)=830.94' INV.(B)=831.05' SUMP=831.00'

CB 11746 RIM=844.98' INV.(A)=840.48'

CB 11557 RIM=863.29' INV.(A)=859.29' T.O.S=857.89' T.O.W=859.19' SUMP=856.49'

DMH 11556 RIM=862.62' INV.(A)=857.04' INV.(B)=857.23' INV.(C)=857.16' SUMP=857.00'

0 20 50

SCALE: 1" = 20'

610535_UT(UTILS-DRAINAGE).DWG Plotted on 9-Jan-2026 12:52 PM

WORCESTER
PLEASANT STREET ROUTE 122

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	#######		
PROJECT FILE NO.	#610535		

STORMWATER ALTERNATIVES ANALYSIS PLANS SHEET 4 OF 14

Area between SHLO and edge of roadway has overhead and underground utilities

Steep topography limits locations for potential SCMs and LIDs

Area between SHLO and edge of roadway has overhead and underground utilities

Steep topography limits locations for potential SCMs and LIDs

Limited width between back of sidewalk and SHLO

Existing State Highway Layout (SHLO)

Limited width between back of sidewalk and SHLO

Analysis Point 1

Continued on Sheet 3

Continued on Sheet 5

PROP F&G MUNICIPAL STANDARD OR MASSDOT CASCADE TYPE.

PROP F&G MUNICIPAL STANDARD OR MASSDOT CASCADE TYPE.

R&R EX HYDRANT FOR 4' MIN CLEARANCE

PROP CB WITH DEEP SUMP, CONNECT TO EX. 12" RCP

R&S F&G, R&D CB

CBCI-15
TEST PIT FOR WATER
RIM=824.81
INV=819.28 (EX)

LIMIT OF WORK

PLEASANT STREET (ROUTE 122)

BAILEY ST (PUBLIC - 49' WIDE)

AIPORT DRIVE

R&S EX F&G-13

R&S EX F&G-14

R&S EX F&G-16

1926 SHLO BASELINE

1958 SHLO NO. 4747

100' BUFFER ZONE

BORDERING VEGETATED WETLANDS

N/F RAMSY AZEEZ AND SARAH M. ISMAEL CABLE TRUST PARCEL ID 40-39-6 BOOK 69868 PAGE 395 1339 PLEASANT ST

N/F TAYLOR BREWITT AND THOMAS GUGLIELMO PARCEL ID 40-39-5 BOOK 64952 PAGE 83 1337 PLEASANT ST

N/F CHRISTOPHER M. WHALEN AND TIMOTHY P. WHALEN PARCEL ID 40-39-5A BOOK 51049 PAGE 324 1333 PLEASANT ST

N/F SANDRA STERLIN PARCEL ID 40-39-2 BOOK 61583 PAGE 26 1325 PLEASANT ST

N/F CATHERINE RUTH CAMPANALE AND CASEY JAMES CAMPANALE PARCEL ID 40-39-1 BOOK 70024 PAGE 61 1329 PLEASANT ST

N/F JAMES T. ALLAN PARCEL ID 47-15-8 BOOK 53189 PAGE 192 1342 PLEASANT ST

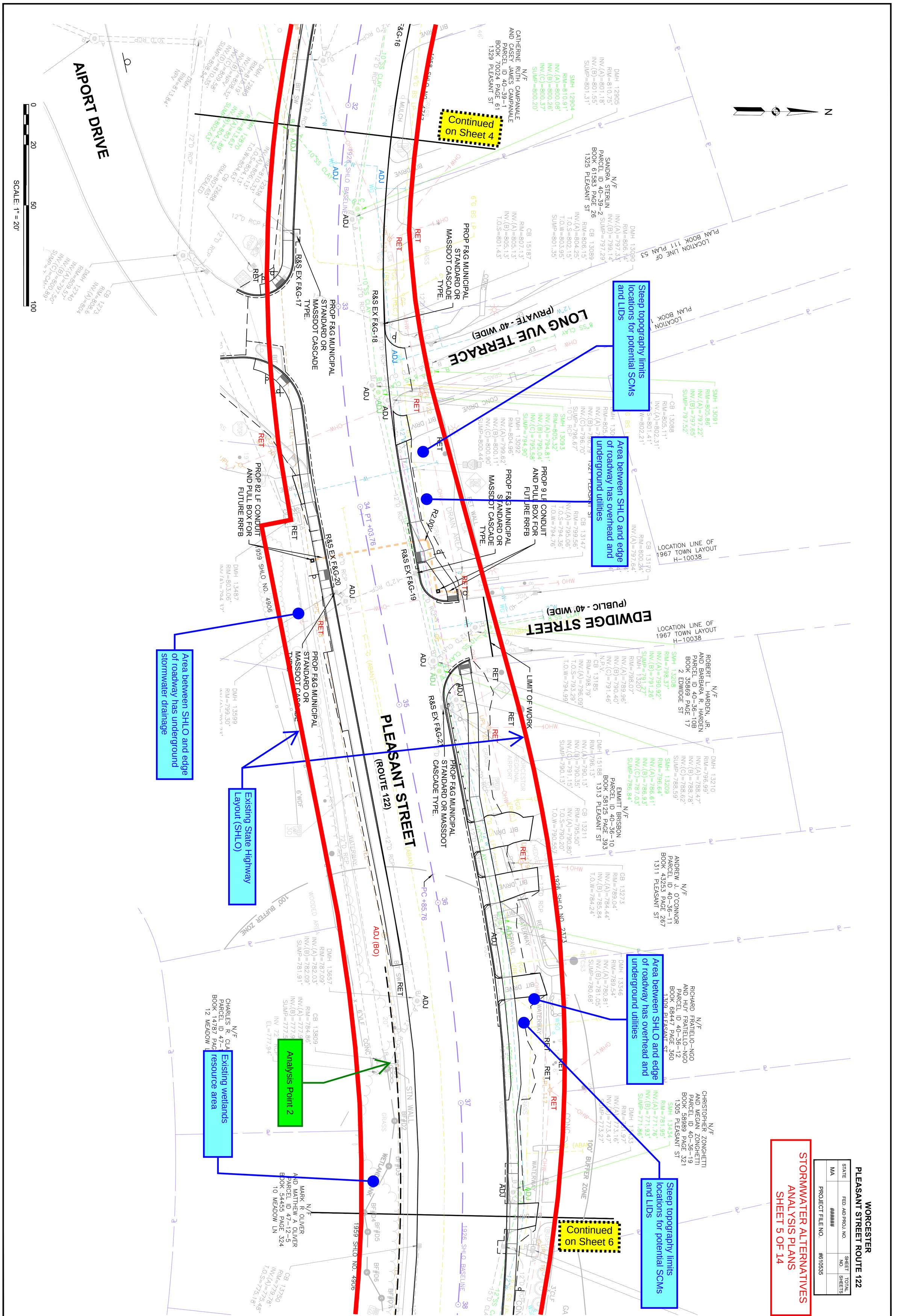
N/F JEANNETTE L. ANAS AND ROBERTA J. ANAS PARCEL ID 47-15-7 BOOK 47992 PAGE 262 10 BAILEY ST

LOCATION LINE OF FEBRUARY 1851 CITY LAYOUT (CITY OF WORCESTER RELOCATION PLAN H-9409)

0 20 50 100

SCALE: 1" = 20'

FOR CONSTRUCTION PROFILE: SEE SHEET NO. 40


AIPORT DRIVE
SCALE: 1" = 20'
0
20
50
100
Continued on Sheet 4
Steep topography limits locations for potential SCMs and LIDs
Area between SHLO and edge of roadway has overhead and underground utilities
Area between SHLO and edge of roadway has underground stormwater drainage
Existing State Highway Layout (SHLO)
Existing wetlands resource area
Analysis Point 2
Steep topography limits locations for potential SCMs and LIDs
Area between SHLO and edge of roadway has overhead and underground utilities
Continued on Sheet 6
LONG VUE TERRACE (PRIVATE - 40' WIDE)
EDWIDGE STREET (PUBLIC - 40' WIDE)
PLEASANT STREET (ROUTE 122)
LIMIT OF WORK
LOCATION LINE OF 1967 TOWN LAYOUT H-10038
LOCATION LINE OF PLAN BOOK 111 PLAN 53
100' BUFFER ZONE
R&S EX F&G-16
R&S EX F&G-17
R&S EX F&G-18
R&S EX F&G-19
R&S EX F&G-20
R&S EX F&G-21
PROP F&G MUNICIPAL STANDARD OR MASSDOT CASCADE TYPE.
PROP 82 LF CONDUIT AND PULL BOX FOR FUTURE RRFB
PROP 9 LF CONDUIT AND PULL BOX FOR FUTURE RRFB
1959 SHLO NO. 4906
1926 SHLO NO. 4773
1926 SHLO BASELINE
CATHERINE RUTH CAMPANALE AND CASEY JAMES CAMPANALE PARCEL ID 40-39-1 BOOK 70024 PAGE 61 1329 PLEASANT ST
SANDRA STERLIN PARCEL ID 40-39-2 BOOK 61583 PAGE 26 1325 PLEASANT ST
ROBERT L. HARDEN, JR. AND BARBARA R. HARDEN PARCEL ID 40-36-10B BOOK 35869 PAGE 17 2 EDWIDGE ST
EMMITT BRISBON PARCEL ID 40-36-10 BOOK 58125 PAGE 393 1313 PLEASANT ST
ANDREW J. O'CONNOR PARCEL ID 40-36-11 BOOK 43253 PAGE 267 1311 PLEASANT ST
RICHARD FRATIELLO-NGO AND HUY FRATIELLO-NGO PARCEL ID 40-36-12 BOOK 68447 PAGE 360 1309 PLEASANT ST
CHRISTOPHER ZONGHETTI AND MEGAN ZONGHETTI PARCEL ID 40-36-19 BOOK 58989 PAGE 321 1305 PLEASANT ST
CHARLES R. CLA PARCEL ID 47- BOOK 14787 PAG 12 MEADOW L
MARK R. OLIVER AND MATTHEW A. OLIVER PARCEL ID 47-12-5 BOOK 54455 PAGE 324 10 MEADOW LN
WORCESTER
PLEASANT STREET ROUTE 122
STATE MA
FED. AID PROJ. NO. ######
SHEET NO.
TOTAL SHEETS
PROJECT FILE NO. #610535
STORMWATER ALTERNATIVES ANALYSIS PLANS SHEET 5 OF 14
610535_UT(UTILS-DRAINAGE).DWG Plotted on 9-Jan-2026 12:52 PM

Continued on Sheet 5

Continued on Sheet 7

Area between SHLO and edge of roadway has overhead and underground utilities

Steep topography limits locations for potential SCMs and LIDs

Limited width between SHLO and back of sidewalk

Steep topography limits locations for potential SCMs and LIDs

Analysis Point 3

Existing State Highway Layout (SHLO)

Existing wetlands resource area

Analysis Point 4

ROCKWOOD AVENUE (PUBLIC - 50' WIDE)

PLEASANT STREET (ROUTE 122)

JEREMIAH'S LANE (PUBLIC - 50' WIDE)

R&S EX F&G-22

R&S EX F&G-23

R&S EX F&G-24

R&S EX F&G-25

R&S EX F&G-26

R&S EX F&G-27

R&S EX F&G-28

PROP F&G MUNICIPAL STANDARD OR MASSDOT CASCADE TYPE.

LIMIT OF WORK

100' BUFFER ZONE

WETLAND BANK

BORDERING VEGETATED WETLANDS

1959 SHLO NO. 4906

1926 SHLO BASELINE

1958 SHLO NO. 4747

LOCATION LINE OF TOWN LAYOUT H-9776

LOCATION LINE OF TOWN LAYOUT H-11351

N/F MARK R OLIVER AND MATTHEW A OLIVER PARCEL ID 47-12-5 BOOK 54455 PAGE 324 10 MEADOW LN

N/F PEDRO LUIS APONTE MELENDEZ PARCEL ID 47-12-4 BOOK 65654 PAGE 245 8 MEADOW LN

N/F TANYA QUEDA AND JASON QUEDA PARCEL ID 47-12-2 BOOK 55624 PAGE 220 4 MEADOW LN

N/F DOROTHY HARGROVE PARCEL ID 47-1, BOOK 27[illegible]

N/F RALPH A METCALF AND ELIZABETH R LAWSON JR PARCEL ID 47-12-1 BOOK 8898 PAGE 40 4 PROUTY LN

N/F CHRISTOPHER GIAN ZONGHETTI PARCEL ID 40-36-19 BOOK 8989 PAGE 321 PLEASANT ST

N/F MILDRED S SANTANA PARCEL ID 40-36-20 BOOK 66833 PAGE 287 PLEASANT ST

N/F KENNETH J ROY PARCEL ID 40-35-8 BOOK 46556 PAGE 63 1297 PLEASANT ST

N/F ANDRE D WALKER PARCEL ID 40-35-9 BOOK 66610 PAGE 141 1293 PLEASANT ST

N/F LAWRENCE A AND SHEILA H LANDRY PARCEL ID 40-35-[illegible] BOOK 5[illegible] PAGE 1[illegible] 1[illegible] PLEASANT ST

N/F MAANAS MYLAVARAPU CHITRANGADA KAND AND PARCEL ID 40-35-10 BOOK 71565 PAGE 1289 PLEASANT ST 18

N/F STATE REALTY LLC PARCEL ID 40-35-11B BOOK 55611 PAGE 1285 PLEASANT ST 395

0 20 50 100

SCALE: 1" = 20'

WORCESTER
PLEASANT STREET ROUTE 122

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	#######		
PROJECT FILE NO.	#610535		

STORMWATER ALTERNATIVES
ANALYSIS PLANS
SHEET 6 OF 14

610535_UT(UTILS-DRAINAGE).DWG Plotted on 9-Jan-2026 12:53 PM

WORCESTER
PLEASANT STREET ROUTE 122

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	#######		
PROJECT FILE NO.	#610535		

STORMWATER ALTERNATIVES ANALYSIS PLANS
SHEET 7 OF 14

610535_UT(UTILS-DRAINAGE).DWG Plotted on 9-Jan-2026 12:53 PM

Proposal No. 610535-134928

A00860 - 235

N

PROP 29 LF CONDUIT AND PULL BOXES FOR FUTURE RRFB

PROP F&G MUNICIPAL STANDARD OR MASSDOT CASCADE TYPE.

PROP 2 LF CONDUIT AND PULL BOXES FOR FUTURE RRFB

PROP F&G MUNICIPAL STANDARD OR MASSDOT CASCADE TYPE.

LIMIT OF WORK

PROP F&G MUNICIPAL STANDARD OR MASSDOT CASCADE TYPE.

LOCATION LINE OF PLAN BOOK 468 PLAN 47

SHLO is adjacent to back of sidewalk

PROP F&G MUNICIPAL STANDARD OR MASSDOT CASCADE TYPE.

Continued on Sheet 6

Continued on Sheet 8

BAXTER STREET
(PUBLIC - 50' WIDE)

LOCATION LINE OF BOOK 21492 PAGE 247

PLEASANT STREET
(ROUTE 122)

PROUTY LANE
(PUBLIC - 49.5' WIDE)

JOPPA ROAD
(PUBLIC - 50' WIDE)

PROP 55 LF CONDUIT AND PULL BOXES FOR FUTURE RRFB

PROP 19 LF OF 12" RCP @1%

CB-30
SW=753.23
RIM=752.50
INV=747.80

PROP. CB WITH DEEP SUMP AND FRAME AND GRATE VERTICAL TYPE, SEE DETAIL

PROP 58 LF CONDUIT AND PULL BOXES FOR FUTURE RRFB

INV=747.70

LIMIT OF WORK

PROP F&G MUNICIPAL STANDARD OR MASSDOT CASCADE TYPE.

Limited width between SHLO and back of sidewalk

Existing State Highway Layout (SHLO)

LIMIT OF WORK

N/F
STAKE REALTY LLC
PARCEL ID 40-35-11B
BOOK 55611 PAGE 395
1285 PLEASANT ST

N/F
STAKE REALTY LLC
PARCEL ID 40-35-11A
BOOK 41661 PAGE 364
1283 PLEASANT ST

N/F
STAKE REALTY LLC
PARCEL ID 40-33-7
BOOK 41661 PAGE 364
1283A PLEASANT ST

N/F
ERIN MARGARETT MICHELOTTI AND JOSEPH CHRISTOPHER
PARCEL ID 40-33-6
BOOK 67910 PAGE 329
32 BAXTER ST

N/F
MARIA G. CARBONE GENTILE AND LUIGI ALPHONSO GENTILE
PARCEL ID 40-33-3
BOOK 55511 PAGE 183
30 BAXTER ST

N/F
CADY KOENIGS AND PATRICK TEEBAGY
PARCEL ID 40-33-2
BOOK 69784 PAGE 1
24 BAXTER ST

N/F
US BANK NATIONAL ASSOCIATION
PARCEL ID 40-33-1E-1F
BOOK 59728 PAGE 200
21 BAXTER ST

N/F
TRYFOS LLC
PARCEL ID 47-10-65
BOOK 58550 PAGE 61
1 PROUTY LN

N/F
TRYFOS LLC
PARCEL ID 47-10-64
BOOK 58550 PAGE 61
1282 PLEASANT ST

N/F
NET YEOAH AND VAN HOAC
PARCEL ID 47-10-7
BOOK 33501 PAGE 190
1280 PLEASANT ST

N/F
DAVID H. LAZOTT
PARCEL ID 47-10-8-10
BOOK 14529 PAGE 34
1278 PLEASANT ST

N/F
FELIX GONZALEZ
PARCEL ID 47-10-11
BOOK 51797 PAGE 118
1276 PLEASANT ST

N/F
ELISE TAYLOR
PARCEL ID 47-10-13
BOOK 69989 PAGE 122
1274 PLEASANT ST

N/F
ROSE ADINA CLAXTON AND SHARON K. CLAXTON
PARCEL ID 47-10-14
BOOK 68933 PAGE 209
1272 PLEASANT ST

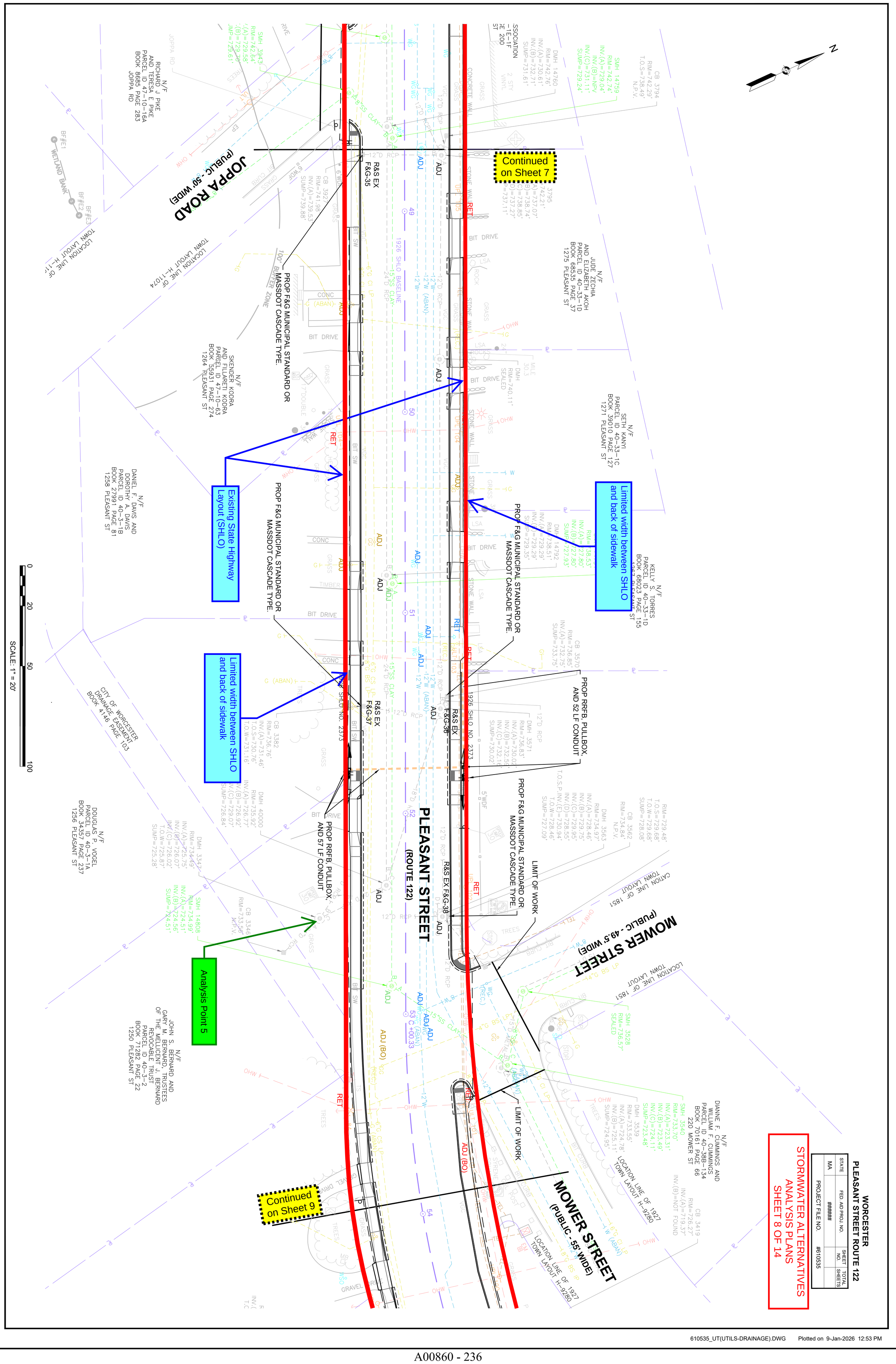
N/F
RICHARD J PIKE AND TERESA E PIKE
PARCEL ID 47-10-16A
BOOK 8685 PAGE 283
JOPPA RD

CITY OF WORCESTER DRAIN EASEMENT PLAN BOOK 878 PLAN 49

WETLAND BANK

100' BUFFER ZONE

0 20 50 100
SCALE: 1" = 20'


JOPPA ROAD
(PUBLIC - 50' WIDE)
MOWER STREET
(PUBLIC - 49.5' WIDE)
PLEASANT STREET
(ROUTE 122)
MOWER STREET
(PUBLIC - 55' WIDE)
Continued on Sheet 7
Continued on Sheet 9
Existing State Highway Layout (SHLO)
Limited width between SHLO and back of sidewalk
Limited width between SHLO and back of sidewalk
Analysis Point 5
PROP F&G MUNICIPAL STANDARD OR MASSDOT CASCADE TYPE.
PROP F&G MUNICIPAL STANDARD OR MASSDOT CASCADE TYPE.
PROP F&G MUNICIPAL STANDARD OR MASSDOT CASCADE TYPE.
PROP RRFB, PULLBOX, AND 52 LF CONDUIT
PROP RRFB, PULLBOX, AND 57 LF CONDUIT
LIMIT OF WORK
LIMIT OF WORK
100' BUFFER ZONE
R&S EX F&G-35
R&S EX F&G-36
R&S EX F&G-37
R&S EX F&G-38
1926 SHLO BASELINE
1926 SHLO NO. 2373
CONCRETE WALL
STONE WALL/RET
BIT DRIVE
BIT SW
GRASS
TREES
ROCK
LSA
N/F RICHARD J PIKE AND TERESA E PIKE PARCEL ID 47-10-16A BOOK 8685 PAGE 283 JOPPA RD
N/F JUDE ZECHIA AND ELIZABETH AKOH PARCEL ID 40-33-1D BOOK 68535 PAGE 37 1275 PLEASANT ST
N/F SETH KANYI PARCEL ID 40-33-1C BOOK 39010 PAGE 127 1271 PLEASANT ST
N/F KELLY S. TORRES PARCEL ID 40-33-1D BOOK 68023 PAGE 155 1267 PLEASANT ST
N/F SKENDER KODRA AND FILLARETI KODRA PARCEL ID 47-10-63 BOOK 55931 PAGE 274 1264 PLEASANT ST
N/F DANIEL F. DAVIS AND DOROTHY A. DAVIS PARCEL ID 40-3-1B BOOK 27991 PAGE 81 1258 PLEASANT ST
N/F DOUGLAS P. VOGEL PARCEL ID 40-3-1A BOOK 34357 PAGE 237 1256 PLEASANT ST
CITY OF WORCESTER DRAINAGE EASEMENT BOOK 4146 PAGE 103
N/F JOHN S. BERNARD AND GARY M. BERNARD, TRUSTEES OF THE MELLICENT J. BERNARD REVOCABLE TRUST PARCEL ID 40-3-2 BOOK 71282 PAGE 22 1250 PLEASANT ST
N/F DIANNE F. CUMMINGS AND WILLIAM F. CUMMINGS PARCEL ID 40-38B-134 BOOK 70161 PAGE 66 220 MOWER ST
LOCATION LINE OF H-1174 TOWN LAYOUT
LOCATION LINE OF H-1174 TOWN LAYOUT
LOCATION LINE OF 1851 TOWN LAYOUT
LOCATION LINE OF 1927 TOWN LAYOUT H-9280
LOCATION LINE OF 1927 TOWN LAYOUT H-9280
WETLAND BANK
BF#E1
BF#E2
BF#E3
SCALE: 1" = 20'
0
20
50
100
WORCESTER
PLEASANT STREET ROUTE 122
STATE MA
FED. AID PROJ. NO. #######
SHEET NO.
TOTAL SHEETS
PROJECT FILE NO. #610535
STORMWATER ALTERNATIVES ANALYSIS PLANS SHEET 8 OF 14
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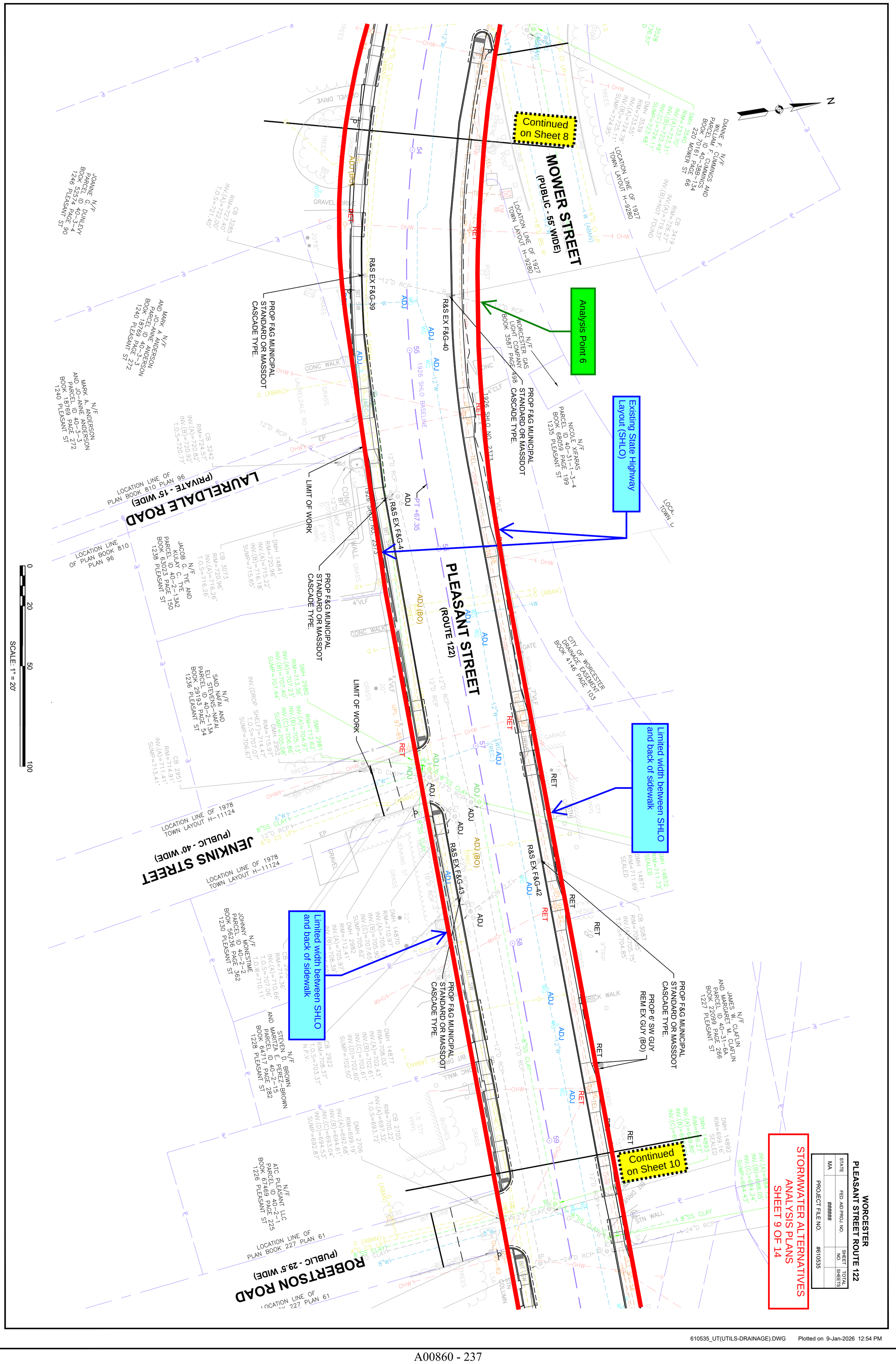


610535_UT(UTILS-DRAINAGE).DWG Plotted on 9-Jan-2026 12:54 PM

Proposal No. 610535-134928

WORCESTER
PLEASANT STREET ROUTE 122

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	#######		
PROJECT FILE NO.	#610535		

STORMWATER ALTERNATIVES ANALYSIS PLANS
SHEET 10 OF 14

610535_UT(UTILS-DRAINAGE).DWG Plotted on 9-Jan-2026 12:54 PM

A00860 - 238

N

Continued on Sheet 9

Analysis Point 7

SHLO is adjacent to back of sidewalk

PROP F&G MUNICIPAL STANDARD OR MASSDOT CASCADE TYPE.

PROP 24 LF CONDUIT AND PULL BOXES FOR FUTURE RRFB

Limited width between existing roadway and SHLO. Overhead utilities and poles are present.

Continued on Sheet 11

PLEASANT STREET
(ROUTE 122)

ROBERTSON ROAD
(PUBLIC - 29.5' WIDE)

R&S EX F&G-45

R&S EX F&G-44

R&S EX F&G-46

R&S EX F&G-47

PROP F&G MUNICIPAL STANDARD OR MASSDOT CASCADE TYPE.

PROP F&G MUNICIPAL STANDARD OR MASSDOT CASCADE TYPE.

Limited width between SHLO and back of sidewalk

Existing State Highway Layout (SHLO)

PROP 56 LF CONDUIT AND PULL BOXES FOR FUTURE RRFB

Existing SCM

Analysis Point 8

1926 SHLO NO. 2373

1958 SHLO NO. 4747 (SECTION 6)

PC +89.64

PT +07.93

DMH 2637
RIM=697.01'
INV.(A)=689.73'
INV.(B)=689.99'
INV.(C)=690.61'
SUMP=689.91'

SMH 2636
RIM=697.35'
INV.(A)=684.13'
INV.(B)=688.05'
INV.(C)=684.24'
SUMP=684.43'

DMH 14892
RIM=699.16'
SEALED

SMH 14893
RIM=699.27'
INV.(A)=689.80'
INV.(B)=690.02'
INV.(C)=690.03'

N/F
JULIET KUFE
PARCEL ID 40-30-8
BOOK 62843 PAGE 163
1225 PLEASANT ST

CB 2594
RIM=691.28'
INV.(A)=688.18'
T.O.S=686.28'

N/F
GLADYS NYAME
PARCEL ID 40-30-9
BOOK 40104 PAGE 55
1223 PLEASANT ST

N/F
TREVIS A. COLEMAN
PARCEL ID 40-30-10
BOOK 55263 PAGE 255
1221 PLEASANT ST

N/F
JAMES SCALLY AND
JUDITH M. SCALLY
PARCEL ID 40-30-11
BOOK 33648 PAGE 58
1219 PLEASANT ST

DMH 2478
RIM=679.78'
INV.(A)=673.74'
INV.(B)=674.93'
T.O.W=674.68'
SUMP=673.26'

CB 2456
RIM=676.04'
INV.(A)=671.29'
T.O.S=671.04'

DMH 14891
RIM=697.09'
INV.(A)=692.43'
INV.(B)=692.84'
SUMP=692.54'

CB 2704
RIM=699.81'
INV.(A)=697.71'
T.O.S=693.81'
T.O.W=697.01'

DMH 14916
RIM=690.10'

CB 2546

DMH 2532
RIM=676.33'
A)=668.28'
B)=670.76'
C)=668.50'
D)=668.42'
I=668.38'

DMH 2414
RIM=669.18'
INV.(A)=662.43'
INV.(B)=662.75'
SUMP=661.63'

INV 18" RCP FES
EL=662.21'

INV 12" RCP FES
EL=661.59'

DMH 2288
RIM=665.23'
INV.(A)=652.13'
INV.(B)=660.33'
INV.(C)=660.03'
SUMP=651.53'

N/F
TATNUCK COUNTRY CLUB
PARCEL ID 47-INX-3
BOOK 1604 PAGE 581
1222 PLEASANT ST

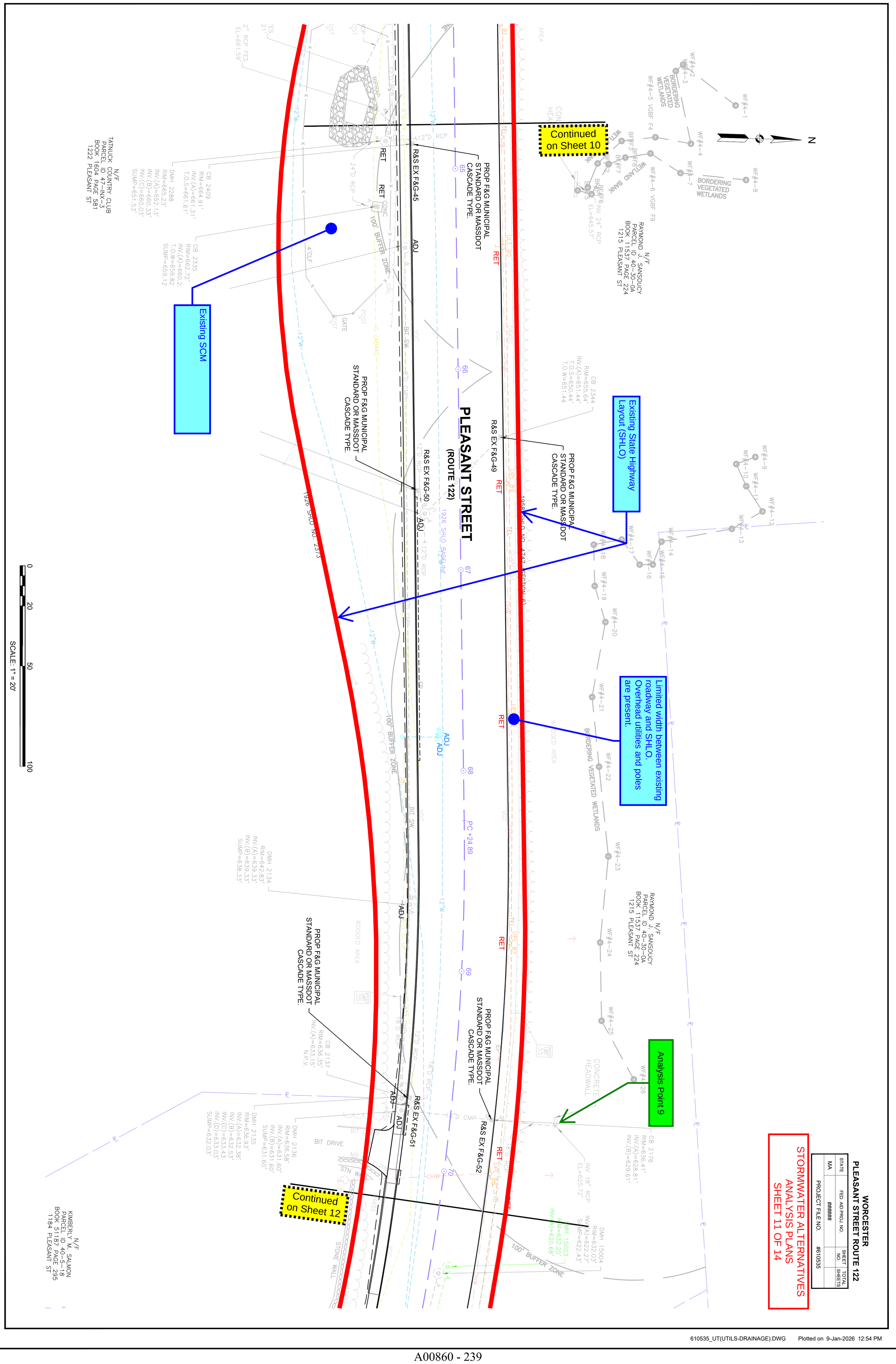
N/F
TC PLEASANT LLC
ARCEL ID 40-2-1
K 67469 PAGE 225
26 PLEASANT ST

LOCATION LINE OF PLAN BOOK 227 PLAN 61

LOCATION LINE OF PLAN BOOK 227 PLAN 61

WF#4-1
WF#4-2
WF#4-3
WF#4-4
WF#4-5 VGBF F4
WF#4-6 VGBF F9
WF#4-7
WF#4-8
BORDERING VEGETATED WETLANDS
WETLAND BANK
BF#F2
BF#F3
BF#F5
BF#F6
BF#F7
BF#F8

0 20 50 100
SCALE: 1" = 20'


Continued on Sheet 10
Existing State Highway Layout (SHLO)
Existing SCM
Limited width between existing roadway and SHLO. Overhead utilities and poles are present.
Analysis Point 9
Continued on Sheet 12
PLEASANT STREET
(ROUTE 122)
1926 SHLO NO. 2375
1958 SHLO NO. 4747 SECTION 6
1926 SHLO BASELINE
R&S EX F&G-45
R&S EX F&G-49
R&S EX F&G-50
R&S EX F&G-51
R&S EX F&G-52
PROP F&G MUNICIPAL STANDARD OR MASSDOT CASCADE TYPE.
100' BUFFER ZONE
BORDERING VEGETATED WETLANDS
WETLAND BANK
N/F RAYMOND J. SANSOUCY PARCEL ID 40-30-0A BOOK 11537 PAGE 224 1215 PLEASANT ST
N/F COUNTRY CLUB PARCEL ID 47-INX-3 BOOK 1604 PAGE 581 1222 PLEASANT ST
N/F KIMBERLY M. SALMON PARCEL ID 40-5-18 BOOK 51187 PAGE 295 1184 PLEASANT ST
CB 2409
CB 2335
CB 2344
CB 2176
CB 2137
DMH 2288
DMH 2134
DMH 2135
DMH 2136
DMH 15003
DMH 15004
SCALE: 1" = 20'
0
20
50
100
WORCESTER
PLEASANT STREET ROUTE 122
STATE: MA
FED. AID PROJ. NO.: #######
PROJECT FILE NO.: #610535
SHEET NO.
TOTAL SHEETS
STORMWATER ALTERNATIVES
ANALYSIS PLANS
SHEET 11 OF 14
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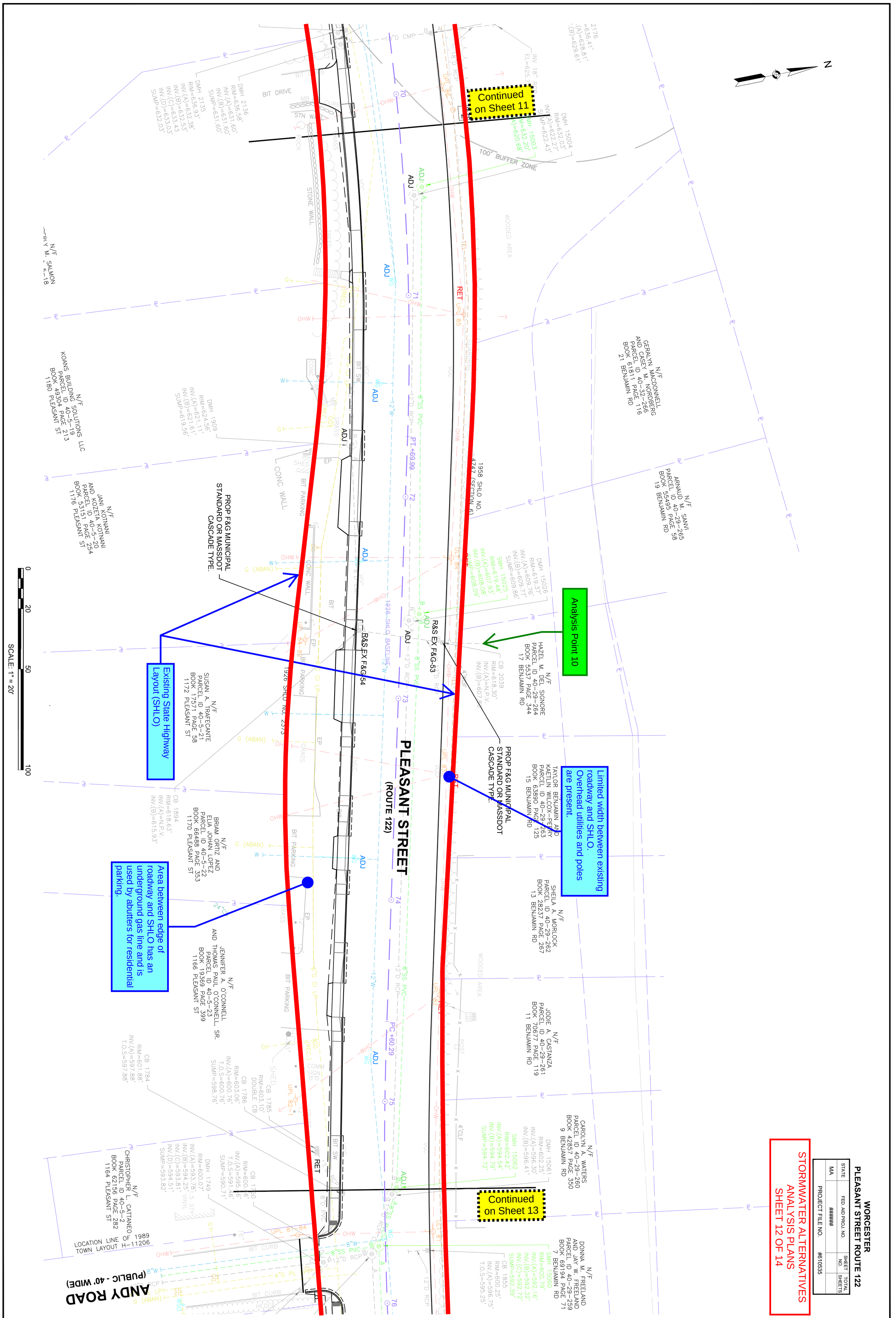
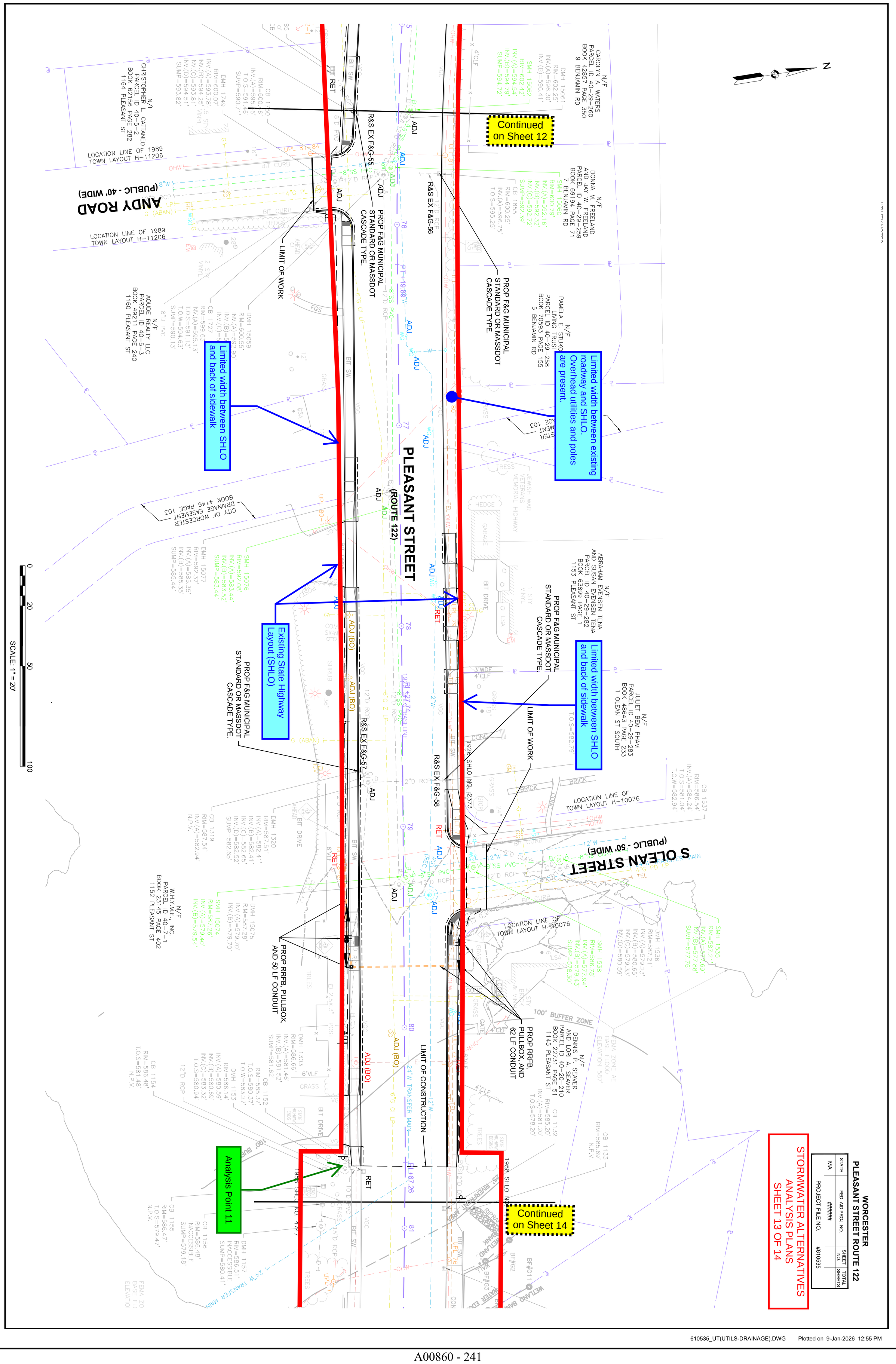


WORCESTER
PLEASANT STREET ROUTE 122

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	#######		
PROJECT FILE NO.	#610535		

STORMWATER ALTERNATIVES
ANALYSIS PLANS
SHEET 12 OF 14

610535_UT(UTILS-DRAINAGE).DWG Plotted on 9-Jan-2026 12:55 PM



610535_UT(UTILS-DRAINAGE).DWG Plotted on 9-Jan-2026 12:55 PM

N

Existing State Highway Layout (SHLO)

Continued on Sheet 13

1958 SHLO NO. 4747

RET

BIT DRIVE

BIT SW

CONC SW

CONC WALK

EP

VGC

TEL

12"W

8"SS

6"G CI LP

4"VLF

BF#G1 BF#G2 BF#G3 BF#G4 BF#G5 BF#G6 BF#G7 BF#G9 BF#G11

WETLAND BANK

WATER EDGE

RIVERFRONT AREA

100' BUFFER ZONE

FEMA ZONE AE BASE FLOOD ELEVATION 582'

CB 1132 RIM=585.20' INV.(A)=581.20' T.O.S=578.20'

CB 1133 RIM=585.69' N.P.V.

CB 1116 RIM=586.68' INACCESSIBLE SUMP=579.18'

CB 1151 RIM=584.63' T.O.S=583.13' N.P.V.

CB 1087 RIM=584.82' SUMP=581.52' N.P.V.

DMH 1157 RIM=576.51' INACCESSIBLE SUMP=580.41'

SMH 15172 RIM=584.31' INV.(A)=571.04' INV.(B)=571.14' SUMP=571.25'

N/F DAVID E. GLEASON AND LOUISE W. GLEASON PARCEL ID 40-20-214 BOOK 65557 PAGE 213 1135 PLEASANT ST

N/F 1130 PLEASANT STREET LLC PARCEL ID 40-10-12-13 BOOK 49638 PAGE 232 1130 PLEASANT ST

RIGHT OF WAY BOOK 3763 PAGE 423

CITY OF WORCESTER SEWER EASEMENT PLAN BOOK 432 PLAN 121

PROJECT END
N2926681.3834
E560256.5506
STA 84+89.25

81 82 83 84 85

0 20 50 100

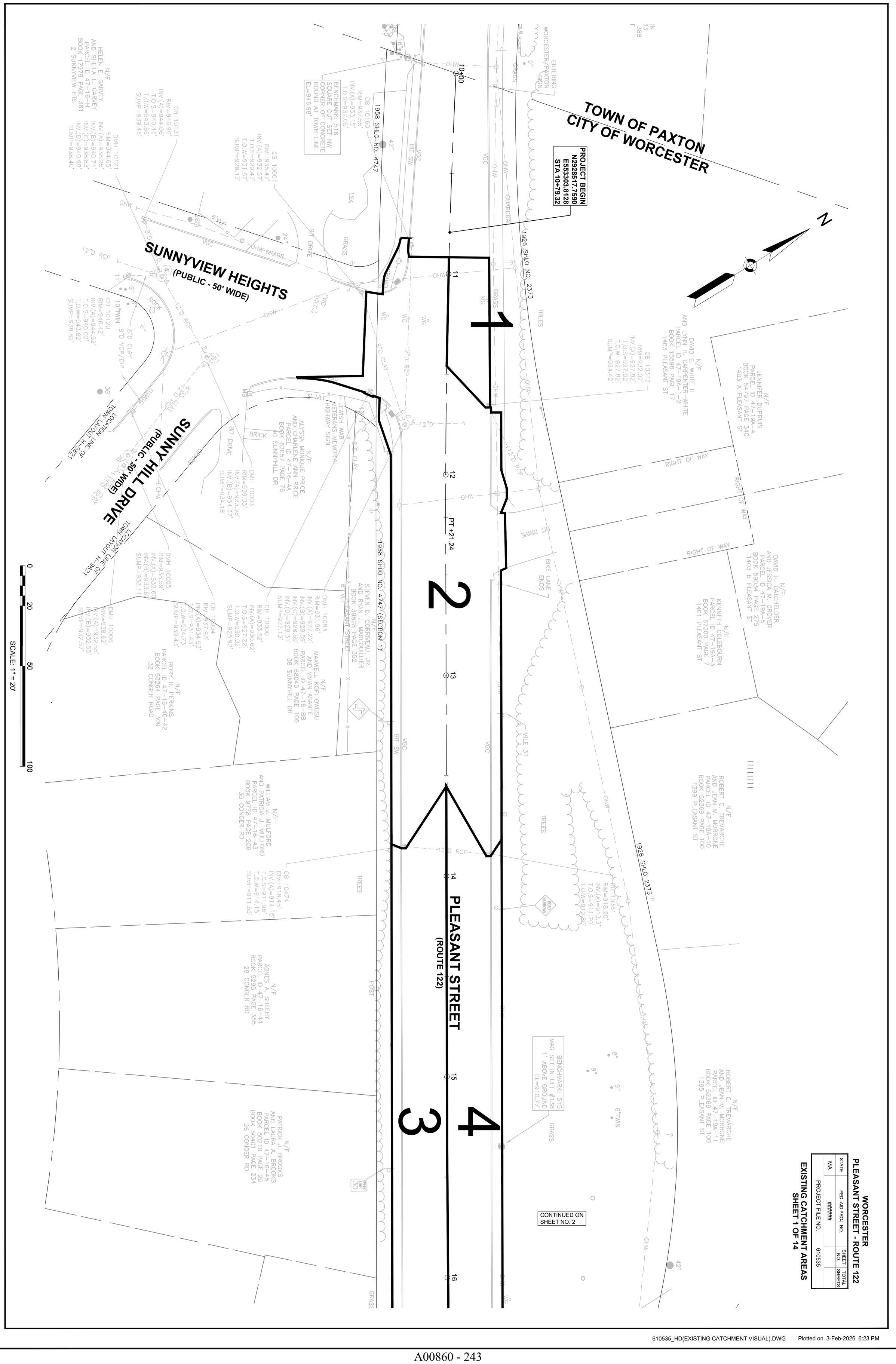
SCALE: 1" = 20'

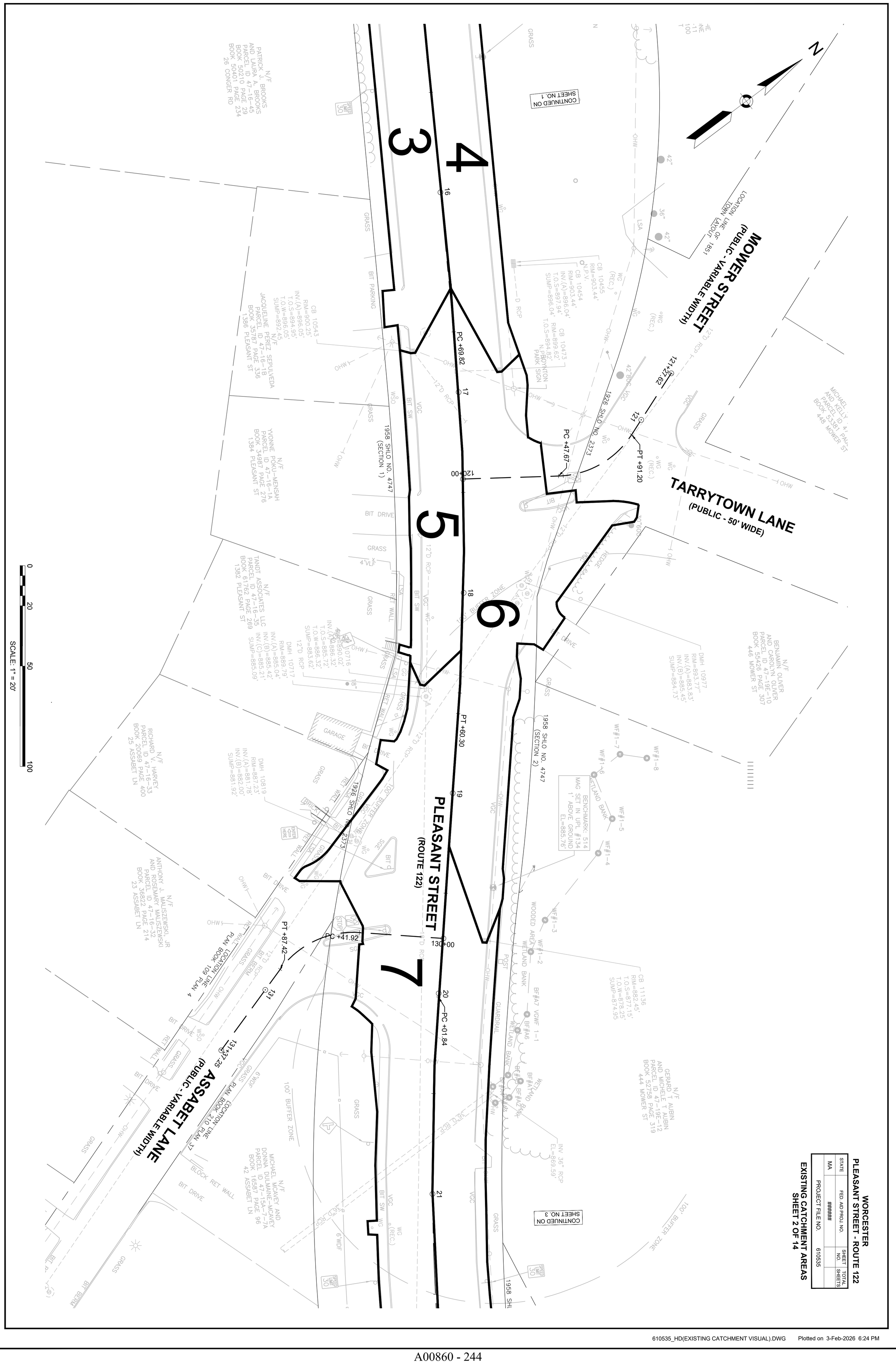
WORCESTER
PLEASANT STREET ROUTE 122

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	######		
PROJECT FILE NO.	#610535		

STORMWATER ALTERNATIVES
ANALYSIS PLANS
SHEET 14 OF 14

610535_UT(UTILS-DRAINAGE).DWG Plotted on 9-Jan-2026 12:55 PM


TOWN OF PAXTON
CITY OF WORCESTER
PROJECT BEGIN
N2928517.7590
E553303.8128
STA 10+79.32
SUNNYVIEW HEIGHTS
(PUBLIC - 50' WIDE)
SUNNY HILL DRIVE
(PUBLIC - 50' WIDE)
PLEASANT STREET
(ROUTE 122)
1926 SHLO NO. 2373
1958 SHLO NO. 4747
1958 SHLO NO. 4747 (SECTION 1)
BENCHMARK: 516
SQUARE CUT SET NW
CORNER OF CONCRETE
BOUND AT TOWN LINE
EL=946.98'
BENCHMARK: 515
MAG SET IN ULT #138
1' ABOVE GROUND
EL=910.77'
CONTINUED ON
SHEET NO. 2
WORCESTER
PLEASANT STREET - ROUTE 122
EXISTING CATCHMENT AREAS
SHEET 1 OF 14
STATE
MA
FED. AID PROJ. NO.
#######
PROJECT FILE NO.
610535
SHEET NO.
TOTAL SHEETS
610535_HD(EXISTING CATCHMENT VISUAL).DWG
Plotted on 3-Feb-2026 6:23 PM
SCALE: 1" = 20'

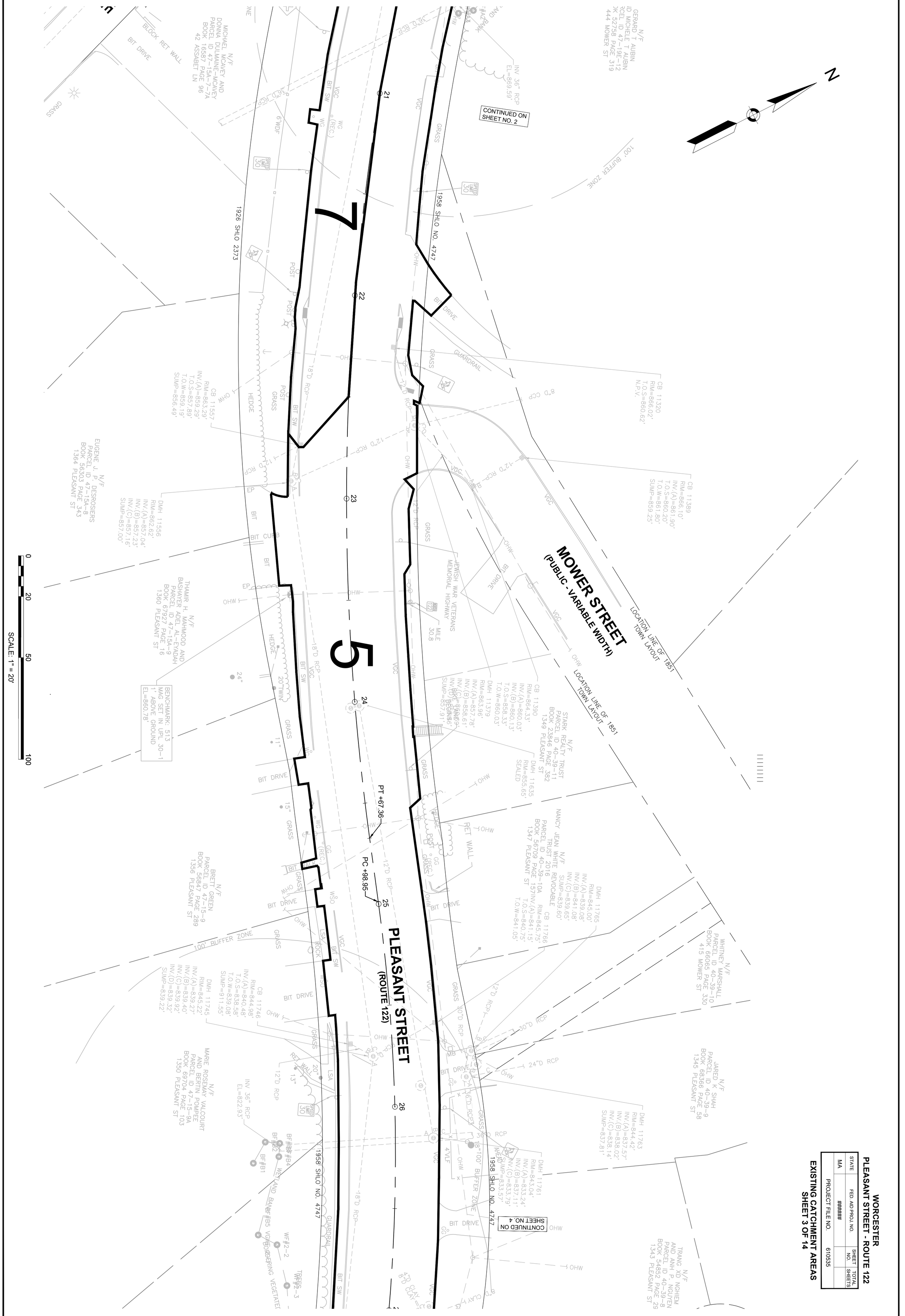


WORCESTER
PLEASANT STREET - ROUTE 122

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	#######		
	PROJECT FILE NO. 610535		

EXISTING CATCHMENT AREAS
SHEET 2 OF 14

610535_HD(EXISTING CATCHMENT VISUAL).DWG Plotted on 3-Feb-2026 6:24 PM

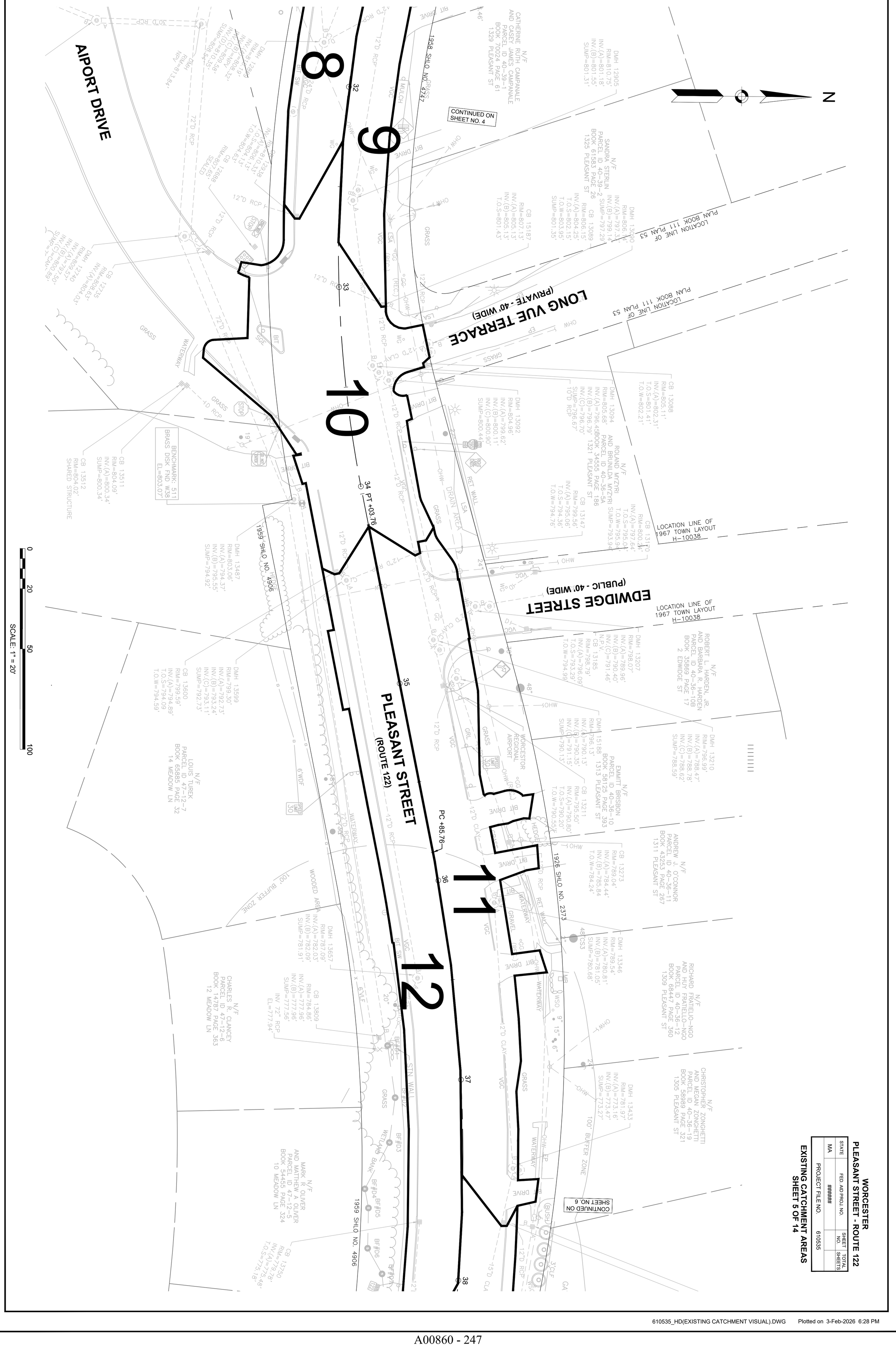

MOWER STREET
(PUBLIC - VARIABLE WIDTH)
PLEASANT STREET
(ROUTE 122)
WORCESTER
PLEASANT STREET - ROUTE 122
EXISTING CATCHMENT AREAS
SHEET 3 OF 14
STATE: MA
FED. AID PROJ. NO.: #######
PROJECT FILE NO.: 610535
SHEET NO.
TOTAL SHEETS
SCALE: 1" = 20'
0
20
50
100
CONTINUED ON SHEET NO. 2
CONTINUED ON SHEET NO. 4
1926 SHLO 2373
1958 SHLO NO. 4747
LOCATION LINE OF 1851 TOWN LAYOUT
100' BUFFER ZONE
JEWISH WAR VETERANS MEMORIAL HIGHWAY
MILE 30.8
PT +67.36
PC +98.95
BENCHMARK: 513
MAG SET IN UPL 30-1
1" ABOVE GROUND
EL=860.78'
610535_HD(EXISTING CATCHMENT VISUAL).DWG
Plotted on 3-Feb-2026 6:25 PM

WORCESTER
PLEASANT STREET - ROUTE 122

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	#######		
PROJECT FILE NO.	610535		

EXISTING CATCHMENT AREAS
SHEET 4 OF 14

610535_HD(EXISTING CATCHMENT VISUAL).DWG Plotted on 3-Feb-2026 6:26 PM

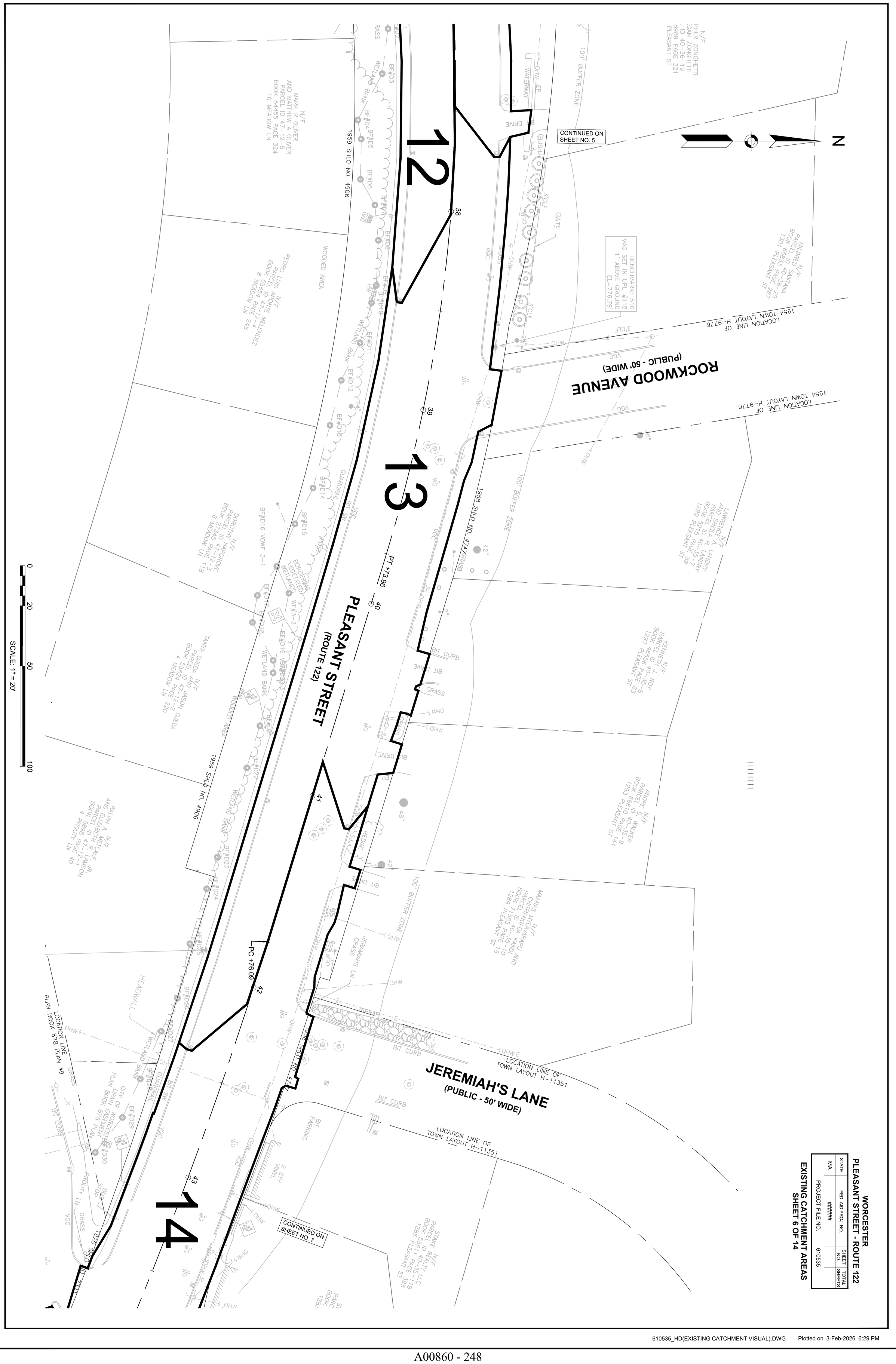


WORCESTER
PLEASANT STREET - ROUTE 122

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	#######		
PROJECT FILE NO. 610535			

EXISTING CATCHMENT AREAS
SHEET 5 OF 14

610535_HD(EXISTING CATCHMENT VISUAL).DWG Plotted on 3-Feb-2026 6:28 PM



WORCESTER
PLEASANT STREET - ROUTE 122
EXISTING CATCHMENT AREAS
SHEET 6 OF 14

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	######		
PROJECT FILE NO. 610535			

610535_HD(EXISTING CATCHMENT VISUAL).DWG Plotted on 3-Feb-2026 6:29 PM

WORCESTER
PLEASANT STREET - ROUTE 122
EXISTING CATCHMENT AREAS
SHEET 7 OF 14

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	#######		
PROJECT FILE NO.	610535		

SCALE: 1" = 20'

610535_HD(EXISTING CATCHMENT VISUAL).DWG Plotted on 3-Feb-2026 6:31 PM

WORCESTER
PLEASANT STREET - ROUTE 122

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	#######		
	PROJECT FILE NO. 610535		

EXISTING CATCHMENT AREAS
SHEET 8 OF 14

SCALE: 1" = 20'

610535_HD(EXISTING CATCHMENT VISUAL).DWG Plotted on 3-Feb-2026 6:32 PM

WORCESTER
PLEASANT STREET - ROUTE 122

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	#######		
PROJECT FILE NO.	610535		

EXISTING CATCHMENT AREAS
SHEET 9 OF 14

Plotted on 3-Feb-2026 6:33 PM

610535_HD(EXISTING CATCHMENT VISUAL).DWG

Proposal No. 610535-134928

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N

MOWER STREET
(PUBLIC - 55' WIDE)

PLEASANT STREET
(ROUTE 122)

LAURELDALE ROAD
(PRIVATE - 15' WIDE)

JENKINS STREET
(PUBLIC - 40' WIDE)

ROBERTSON ROAD
(PUBLIC - 29.5' WIDE)

18 19 20

CONTINUED ON SHEET NO. 8

CONTINUED ON SHEET NO. 10

LOCATION LINE OF 1927 TOWN LAYOUT H-9280

BENCHMARK: 506
MAG SET UPL #98
1' ABOVE GROUND
EL=719.74'

1926 SHLO NO. 2373

PT +67.35

DIANNE F. CUMMINGS AND WILLIAM F. CUMMINGS N/F
PARCEL ID 40-38B-134
BOOK 70161 PAGE 66
220 MOWER ST

N/F
NICOLE XIFARAS
PARCEL ID 40-31-1-3-4
BOOK 68059 PAGE 199
1235 PLEASANT ST

N/F
WORCESTER GAS LIGHT COMPANY
BOOK 3587 PAGE 498

CITY OF WORCESTER
DRAINAGE EASEMENT
BOOK 4146 PAGE 103

N/F
JACOB G. TYE AND KULAY C. TYE
PARCEL ID 40-2-13A2
BOOK 63023 PAGE 150
1238 PLEASANT ST

N/F
SAID NAFAI AND ELI STEVENS-NAFAI
PARCEL ID 40-2-13A
BOOK 29193 PAGE 54
1236 PLEASANT ST

N/F
JOHNNY MONESTIME
PARCEL ID 40-2-2
BOOK 56236 PAGE 362
1230 PLEASANT ST

N/F
STEVEN D. BROWN AND MARITZA E. PEREZ-BROWN
PARCEL ID 40-2-15
BOOK 64717 PAGE 282
1228 PLEASANT ST

N/F
ATC PLEASANT LLC
PARCEL ID 40-2-1
BOOK 67469 PAGE 225
1226 PLEASANT ST

N/F
MARK A ANDERSON AND JO-ANNE ANDERSON
PARCEL ID 40-3-3
BOOK 18769 PAGE 272
1240 PLEASANT ST

N/F
JOANNE G. DUNLEVY
PARCEL ID 40-3-4
BOOK 52574 PAGE 90
1246 PLEASANT ST

N/F
MARK A. ANDERSON AND JO-ANNE ANDERSON
PARCEL ID 40-3-3
BOOK 18769 PAGE 272
1240 PLEASANT ST

LOCATION LINE OF PLAN 95 BOOK 61 PAGE 95

LOCATION LINE OF PLAN 95 BOOK 61 PAGE 96

LOCATION LINE OF H-11124 OF 1978

LOCATION LINE OF 2/27 PLAN 91

LOCATION LINE OF 2/27 PLAN 91

0 20 50 100
SCALE: 1" = 20'

Proposal No. 610535-134928

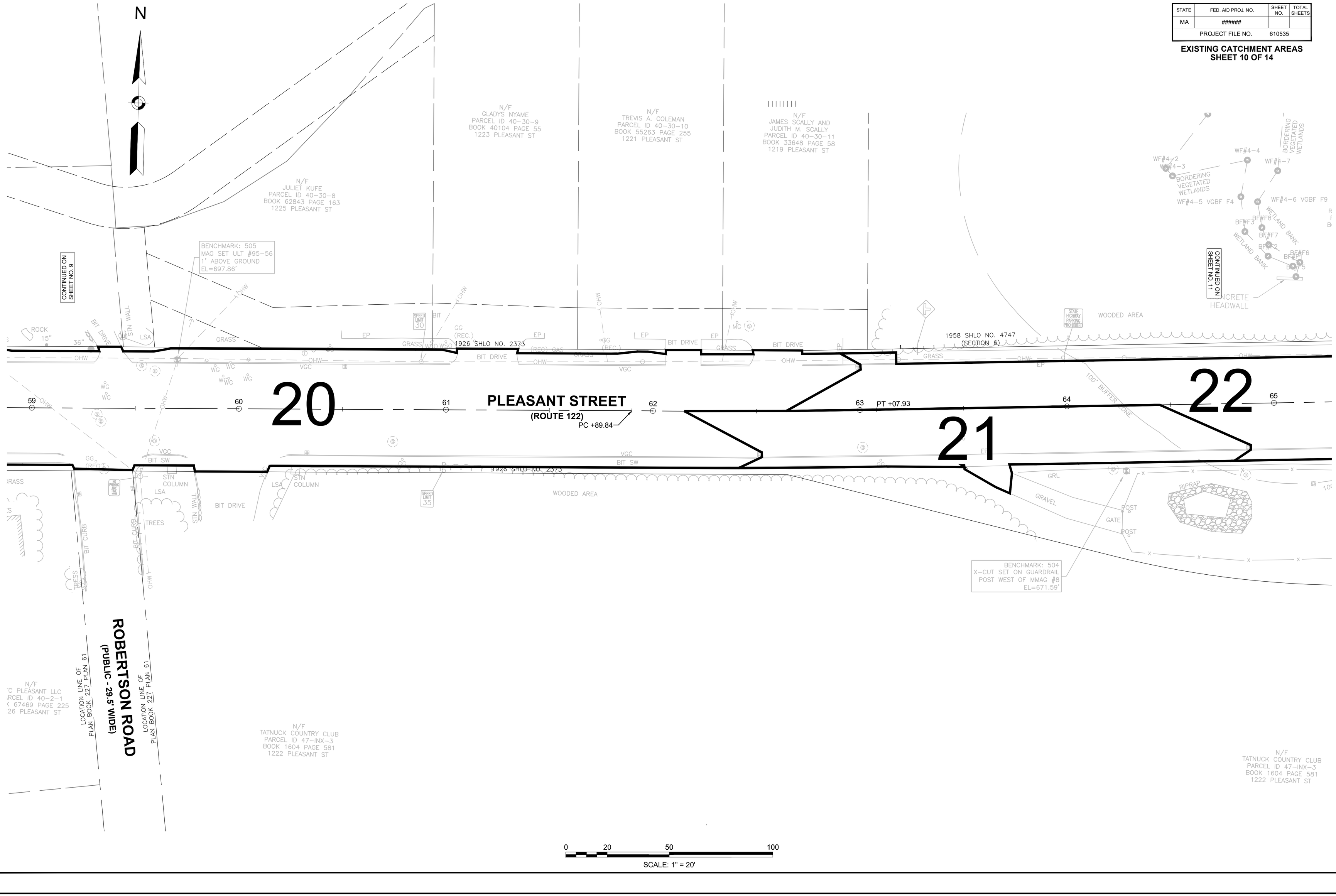
A00860 - 252

610535_HD(EXISTING CATCHMENT VISUAL).DWG Plotted on 3-Feb-2026 6:35 PM

WORCESTER
PLEASANT STREET - ROUTE 122

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	######		
PROJECT FILE NO.	610535		

EXISTING CATCHMENT AREAS
SHEET 10 OF 14



0 20 50 100

SCALE: 1" = 20'

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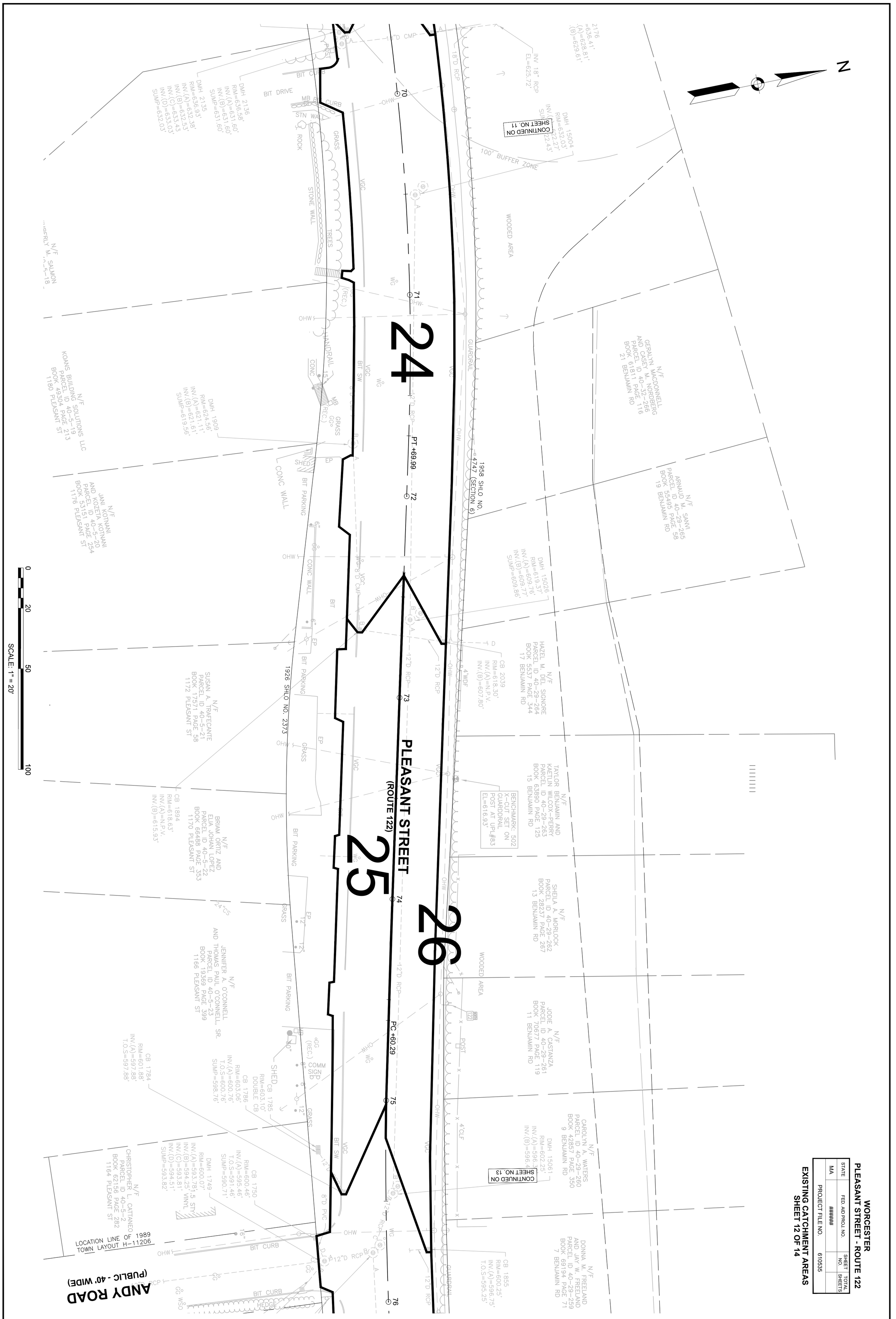
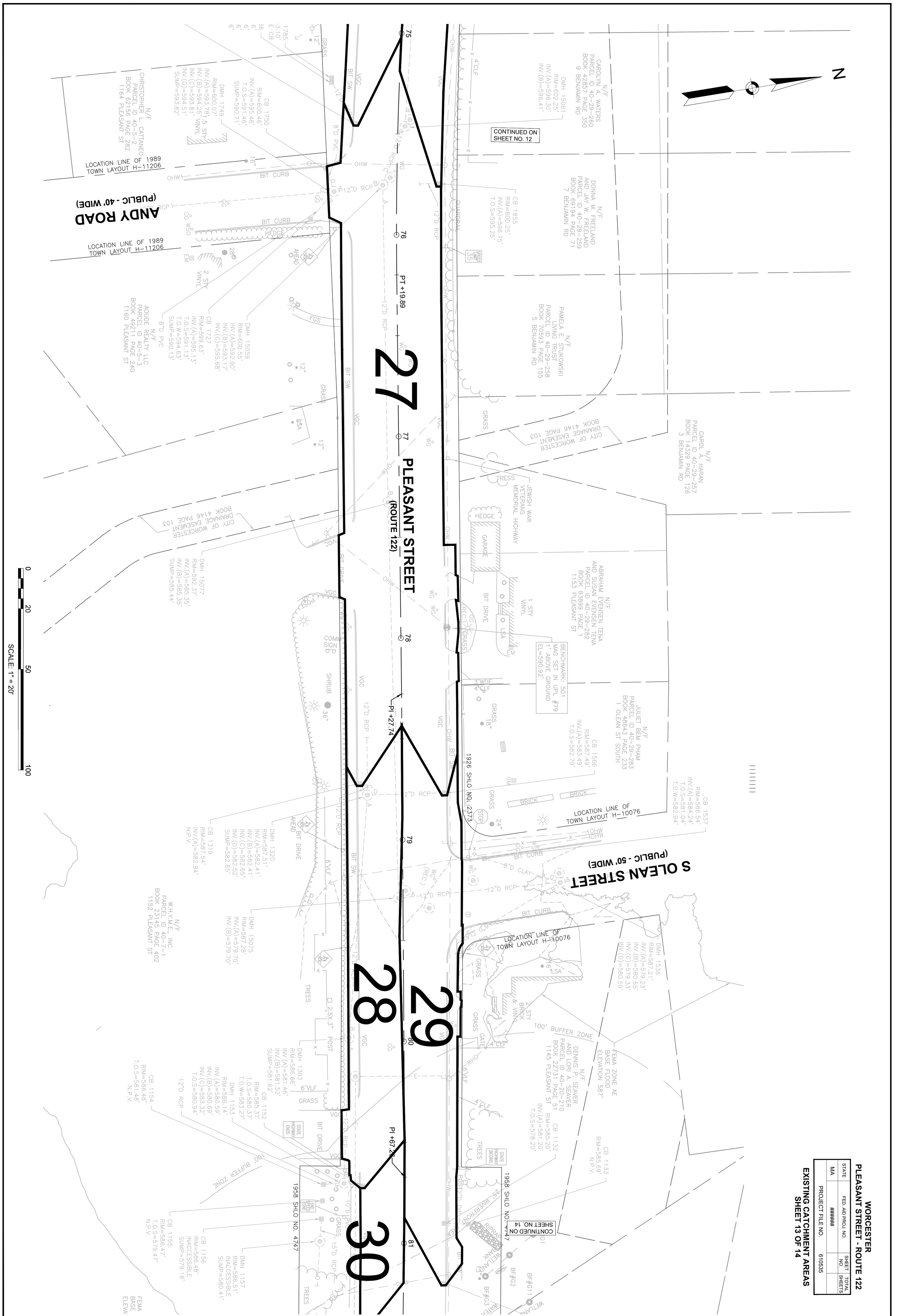


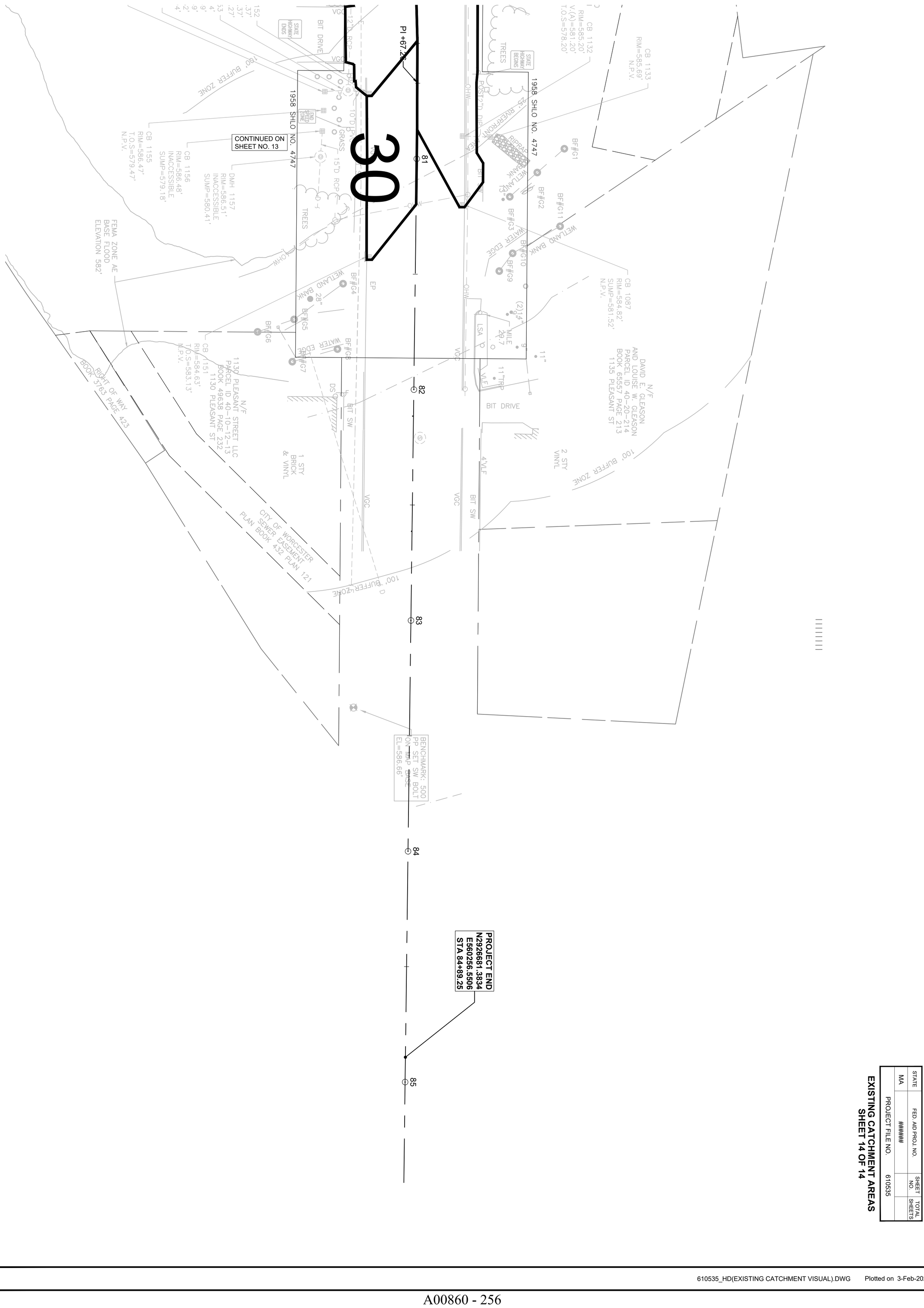
WORCESTER
PLEASANT STREET - ROUTE 122

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	#######		
	PROJECT FILE NO.	610535	

EXISTING CATCHMENT AREAS
SHEET 12 OF 14

610535_HD(EXISTING CATCHMENT VISUAL).DWG Plotted on 3-Feb-2026 6:37 PM


ANDY ROAD
(PUBLIC - 40' WIDE)
S OLEAN STREET
(PUBLIC - 50' WIDE)
PLEASANT STREET
(ROUTE 122)
LOCATION LINE OF 1989 TOWN LAYOUT H-11206
LOCATION LINE OF TOWN LAYOUT H-10076
CONTINUED ON SHEET NO. 12
CONTINUED ON SHEET NO. 14
PT +19.89
PI +27.74
PI +67.23
1926 SHLO NO. 2373
1958 SHLO NO. 4747
100' BUFFER ZONE
CITY OF WORCESTER DRAINAGE EASEMENT BOOK 4146 PAGE 103
N/F CHRISTOPHER L. CATTANEO PARCEL ID 40-5-2 BOOK 62156 PAGE 282 1164 PLEASANT ST
N/F CAROLYN A. WATERS PARCEL ID 40-29-260 BOOK 42857 PAGE 350 9 BENJAMIN RD
N/F DONNA M. FREELAND AND JAY W. FREELAND PARCEL ID 40-29-259 BOOK 69194 PAGE 71 7 BENJAMIN RD
N/F PAMELA E. STUKOWSKI LIVING TRUST PARCEL ID 40-29-258 BOOK 70593 PAGE 155 5 BENJAMIN RD
N/F CAROL A. HARAN PARCEL ID 40-29-257 BOOK 14329 PAGE 126 3 BENJAMIN RD
N/F ABRAHAM EVENSEN TENA AND SUSAN EVENSEN TENA PARCEL ID 40-29-282 BOOK 63899 PAGE 1 1153 PLEASANT ST
N/F JULIET BEM PHAM PARCEL ID 40-29-283 BOOK 48643 PAGE 233 1 OLEAN ST SOUTH
N/F DENNIS P. SEAVER AND LORI A. SEAVER PARCEL ID 40-20-210 BOOK 22731 PAGE 51 1145 PLEASANT ST
N/F AQUDE REALTY LLC PARCEL ID 40-5-3 BOOK 49211 PAGE 240 1160 PLEASANT ST
N/F W.H.Y.M.E., INC. PARCEL ID 40-7-1 BOOK 23145 PAGE 402 1152 PLEASANT ST
BENCHMARK: 501 MAG SET IN UPL #79 1' ABOVE GROUND EL=590.92'
FEMA ZONE AE BASE FLOOD ELEVATION 587'
JEWISH WAR VETERANS MEMORIAL HIGHWAY
27
28
29
30
SCALE: 1" = 20'
0
20
50
100
N
WORCESTER
PLEASANT STREET - ROUTE 122
EXISTING CATCHMENT AREAS
SHEET 13 OF 14
STATE: MA
FED. AID PROJ. NO.: #######
SHEET NO.:
TOTAL SHEETS:
PROJECT FILE NO.: 610535
610535_HD(EXISTING CATCHMENT VISUAL).DWG
Plotted on 3-Feb-2026 6:39 PM

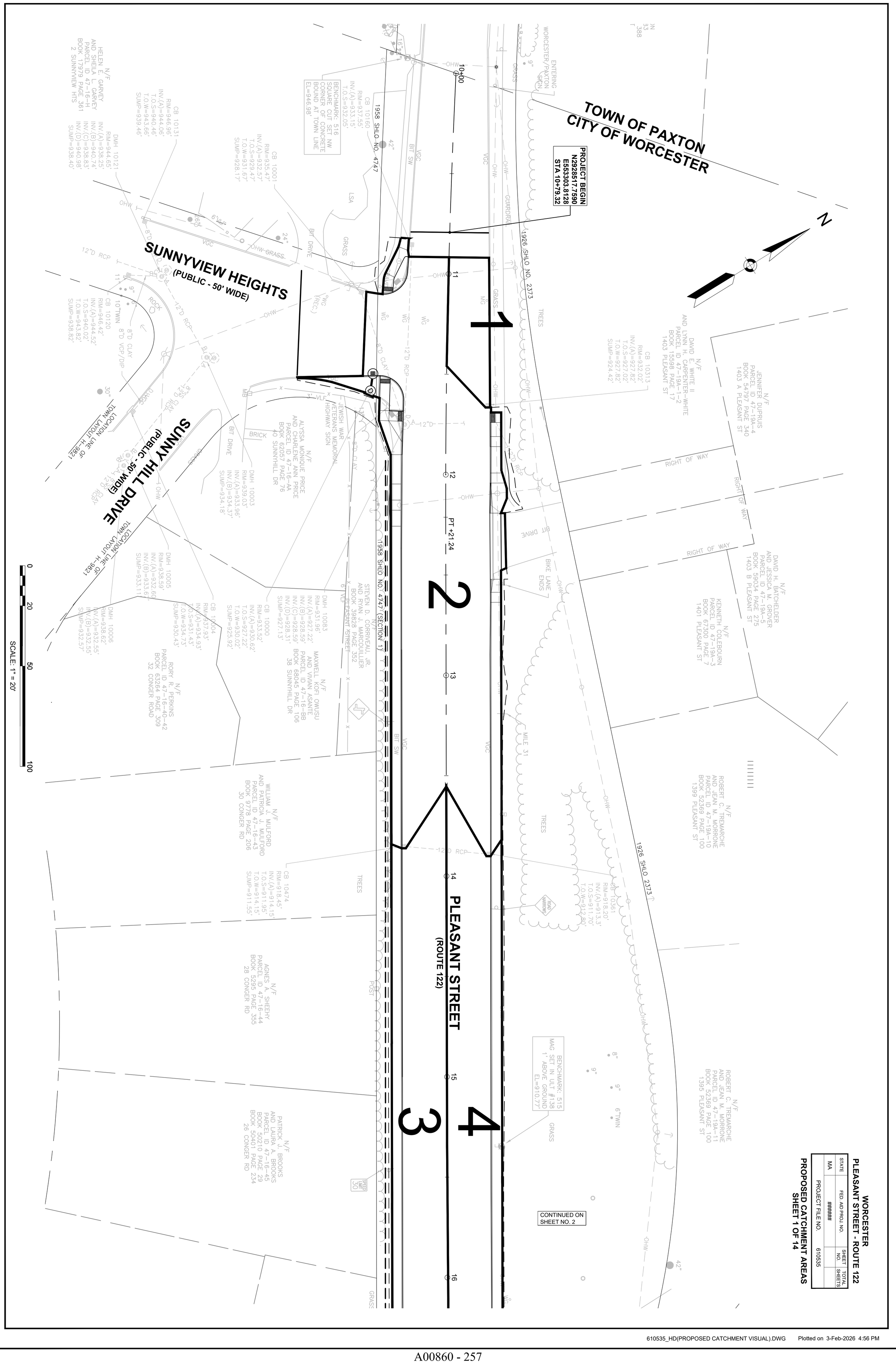


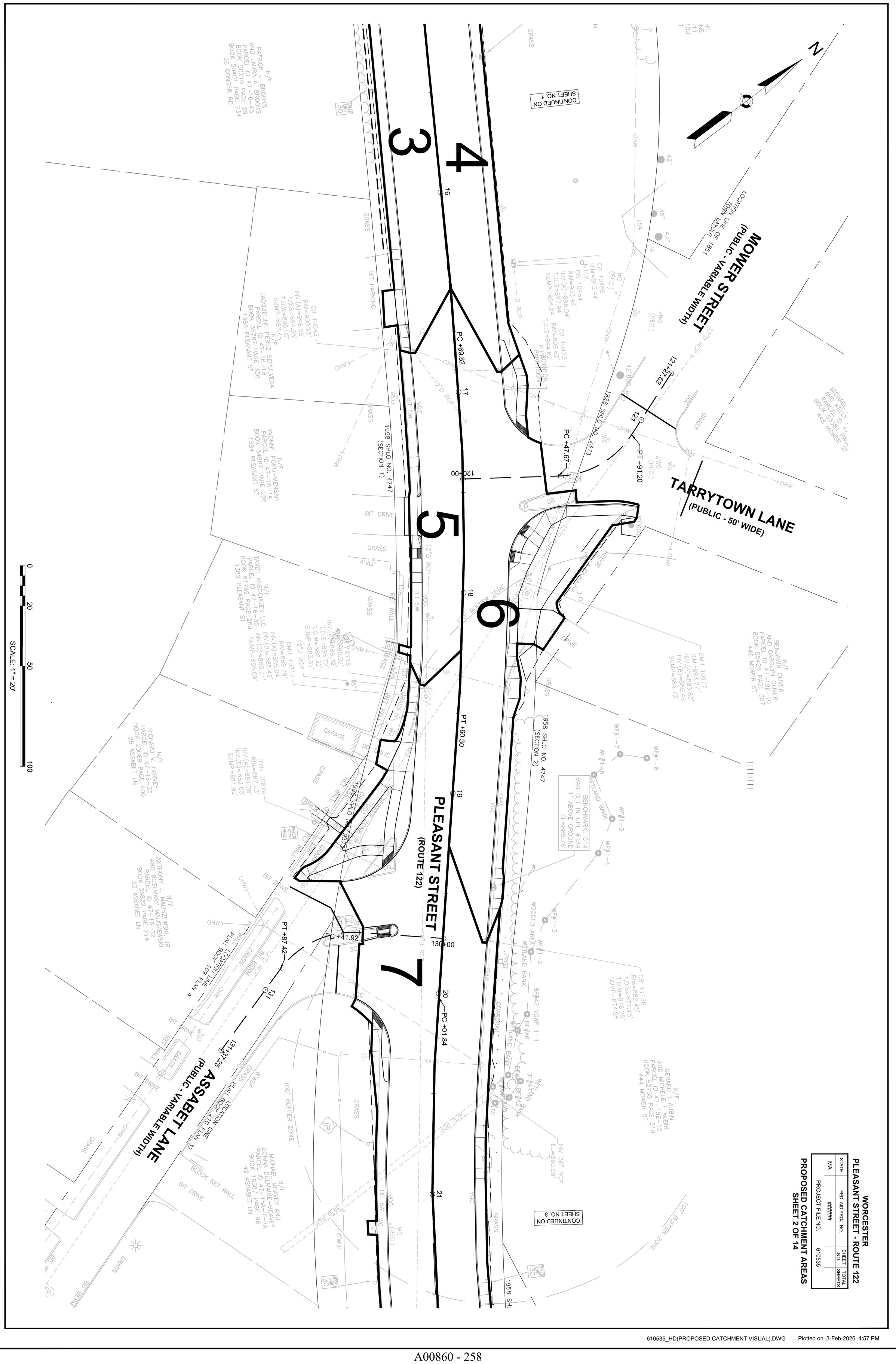
WORCESTER
PLEASANT STREET - ROUTE 122

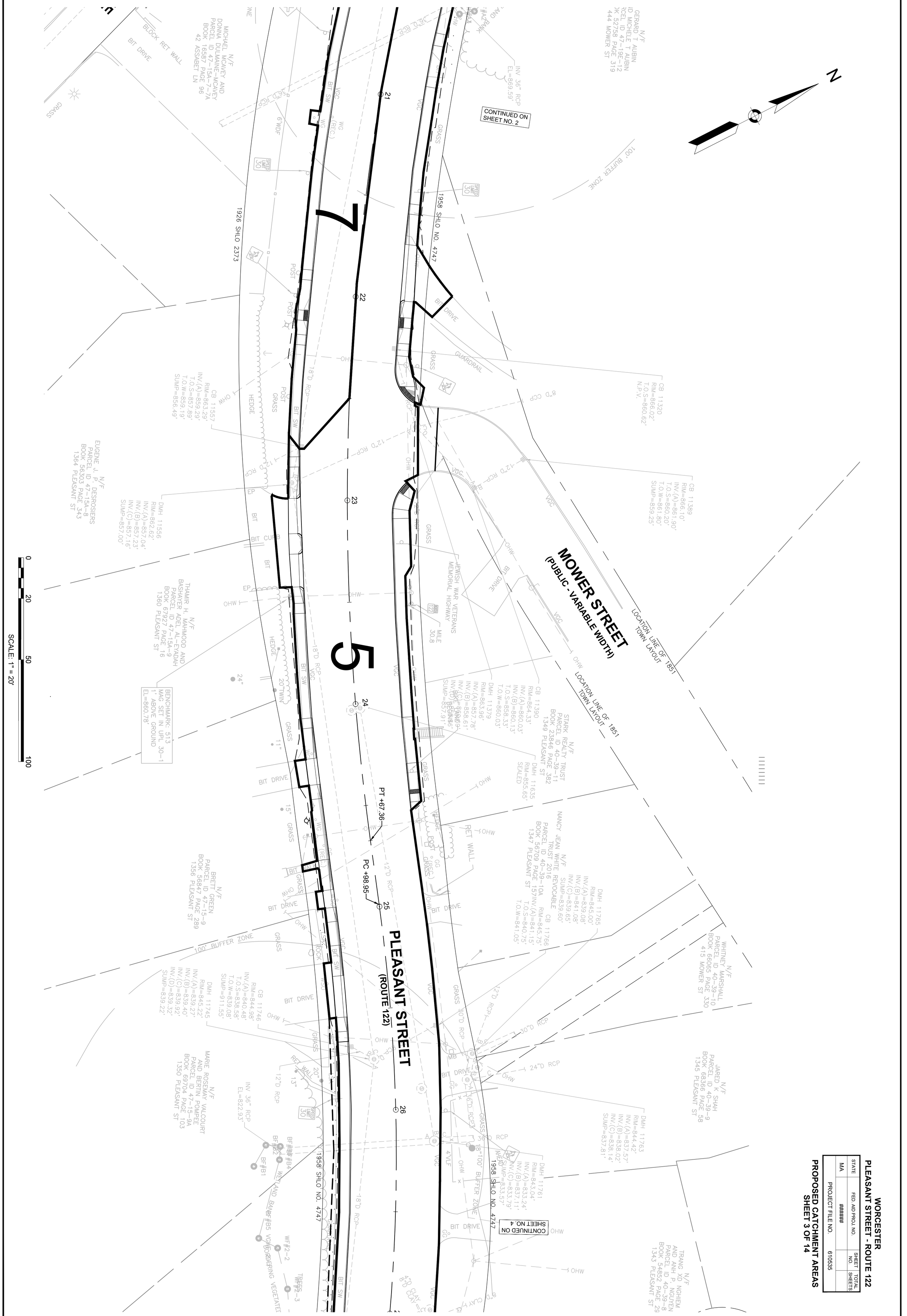
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	#######		
	PROJECT FILE NO.	610535	

EXISTING CATCHMENT AREAS
SHEET 14 OF 14

610535_HD(EXISTING CATCHMENT VISUAL).DWG Plotted on 3-Feb-2026 6:40 PM


TOWN OF PAXTON
CITY OF WORCESTER
PROJECT BEGIN
N2928517.7590
E553303.8128
STA 10+79.32
SUNNYVIEW HEIGHTS
(PUBLIC - 50' WIDE)
SUNNY HILL DRIVE
(PUBLIC - 50' WIDE)
PLEASANT STREET
(ROUTE 122)
1926 SHLO NO. 2373
1958 SHLO NO. 4747
1958 SHLO NO. 4747 (SECTION 1)
BENCHMARK: 516
SQUARE CUT SET NW
CORNER OF CONCRETE
BOUND AT TOWN LINE
EL=946.98'
BENCHMARK: 515
MAG SET IN ULT #138
1' ABOVE GROUND
EL=910.77'
PT +21.24
10+00
11
12
13
14
15
16
1
2
3
4
N
CONTINUED ON
SHEET NO. 2
WORCESTER
PLEASANT STREET - ROUTE 122
PROPOSED CATCHMENT AREAS
SHEET 1 OF 14
STATE
MA
FED. AID PROJ. NO.
######
SHEET NO.
TOTAL SHEETS
PROJECT FILE NO.
610535
0
20
50
100
SCALE: 1" = 20'
610535_HD(PROPOSED CATCHMENT VISUAL).DWG
Plotted on 3-Feb-2026 4:56 PM


WORCESTER
PLEASANT STREET - ROUTE 122
PROPOSED CATCHMENT AREAS
SHEET 2 OF 14
STATE: MA
FED. AID PROJ. NO.: #######
PROJECT FILE NO.: 610535
SHEET NO.
TOTAL SHEETS
PLEASANT STREET (ROUTE 122)
MOWER STREET (PUBLIC - VARIABLE WIDTH)
TARRYTOWN LANE (PUBLIC - 50' WIDE)
ASSABET LANE (PUBLIC - VARIABLE WIDTH)
CONTINUED ON SHEET NO. 1
CONTINUED ON SHEET NO. 3
1958 SHLO NO. 4747 (SECTION 1)
1958 SHLO NO. 4747 (SECTION 2)
1926 SHLO NO. 2373
1926 SHLO NO. 2314
PC +69.82
PC +47.67
PT +91.20
PC +41.92
PT +87.42
PT +60.30
PC +01.84
120+00
130+00
121+27.62
131+37.25
BENCHMARK: 514
MAG SET IN UPL #134
1' ABOVE GROUND
EL=885.76'
N/F PATRICK J. BROOKS AND LAURA A. BROOKS PARCEL ID 47-16-45 BOOK 50210 PAGE 29 BOOK 50401 PAGE 234 26 CONGER RD
N/F JACQUELINE PEREZ SEPULVEDA PARCEL ID 47-16-1B BOOK 35787 PAGE 336 1386 PLEASANT ST
N/F YVONNE POKU-MENSAH PARCEL ID 47-16-1A BOOK 34987 PAGE 276 1384 PLEASANT ST
N/F TANDT ASSOCIATES LLC PARCEL ID 47-16-35 BOOK 61762 PAGE 269 1382 PLEASANT ST
N/F RICHARD V. HARVEY PARCEL ID 47-16-33 BOOK 20069 PAGE 400 25 ASSABET LN
N/F ANTHONY J. MALISZEWSKI JR AND ROSEMARY MALISZEWSKI PARCEL ID 47-16-32 BOOK 36822 PAGE 214 23 ASSABET LN
N/F MICHAEL MCAVEY AND DONNA DULMAINE-MCAVEY PARCEL ID 47-15A-7-7A BOOK 16587 PAGE 96 42 ASSABET LN
N/F BENJAMIN OLIVER AND CAROLYN OLIVER PARCEL ID 47-19E-10 BOOK 55426 PAGE 307 446 MOWER ST
N/F GERARD T AUBIN AND MICHELE T AUBIN PARCEL ID 47-19E-12 BOOK 52758 PAGE 319 444 MOWER ST
N/F MICHAEL AND KELLY PARCEL ID 47 BOOK 53381 448 MOWER ST
LOCATION LINE OF TOWN LAYOUT 1851
LOCATION LINE PLAN BOOK 109 PLAN 4
LOCATION LINE PLAN BOOK 210 PLAN 37
SCALE: 1" = 20'
0
20
50
100
610535_HD(PROPOSED CATCHMENT VISUAL).DWG
Plotted on 3-Feb-2026 4:57 PM


MOWER STREET
(PUBLIC - VARIABLE WIDTH)
PLEASANT STREET
(ROUTE 122)
WORCESTER
PLEASANT STREET - ROUTE 122
PROPOSED CATCHMENT AREAS
SHEET 3 OF 14
STATE: MA
FED. AID PROJ. NO.: #######
SHEET NO.:
TOTAL SHEETS:
PROJECT FILE NO.: 610535
CONTINUED ON SHEET NO. 2
CONTINUED ON SHEET NO. 4
1926 SHLO 2373
1958 SHLO NO. 4747
LOCATION LINE OF 1851 TOWN LAYOUT
100' BUFFER ZONE
SCALE: 1" = 20'
0
20
50
100
BENCHMARK: 513
MAG SET IN UPL 30-1
1" ABOVE GROUND
EL=860.78'
PT +67.36
PC +98.95
N/F MICHAEL MCAVEY AND DONNA DULMAINE-MCAVEY PARCEL ID 47-15A-7-7A BOOK 16587 PAGE 96 42 ASSABET LN
N/F GERARD T AUBIN ID MICHELE T AUBIN PARCEL ID 47-19E-12 BK 52758 PAGE 319 444 MOWER ST
N/F EUGENE J. P. DESROSIERS PARCEL ID 47-15A-8 BOOK 56303 PAGE 343 1364 PLEASANT ST
N/F THAMIR H. MAHMOOD AND BASHAYER ADEL AL-EYADAH PARCEL ID 47-15A-9 BOOK 67927 PAGE 16 1360 PLEASANT ST
N/F STARK REALTY TRUST PARCEL ID 40-39-11 BOOK 23846 PAGE 382 1349 PLEASANT ST
N/F NANCY JEAN WHITE REVOCABLE TRUST 2016 PARCEL ID 40-39-10A BOOK 56709 PAGE 157 1347 PLEASANT ST
N/F BRETT GREEN PARCEL ID 47-15-9 BOOK 56847 PAGE 289 1356 PLEASANT ST
N/F MARIE ROSEMAY VALCOURT AND BERTIN POMPEE PARCEL ID 47-15-9A BOOK 69704 PAGE 103 1350 PLEASANT ST
N/F JARED K SHAH PARCEL ID 40-39-9 BOOK 68366 PAGE 58 1345 PLEASANT ST
N/F TRANG XD NGHIEM AND ANH P. NGUYEN PARCEL ID 40-39-8 BOOK 54852 PAGE 29 1343 PLEASANT ST
N/F WHITNEY MARSHALL PARCEL ID 40-39-10 BOOK 66065 PAGE 330 415 MOWER ST
JEWISH WAR VETERANS MEMORIAL HIGHWAY
MILE 30.8
GUARDRAIL
BIT DRIVE
GRASS
HEDGE
POST
RET WALL
BLOCK RET WALL
100' BUFFER ZONE
20" TWIN
18"D RCP
12"D RCP
24"D RCP
30"D RCP
36"D RCP
SPEED LIMIT 30
CB 11320 RIM=866.02' T.O.S=860.62' N.P.V.
CB 11389 RIM=866.10' INV.(A)=861.90' T.O.S=860.20' T.O.W=861.80' SUMP=859.25'
CB 11390 RIM=864.33' INV.(A)=860.03' INV.(B)=860.13' T.O.S=858.33' T.O.W=860.03'
CB 11557 RIM=863.29' INV.(A)=859.29' T.O.S=857.89' T.O.W=859.19' SUMP=856.49'
DMH 11379 RIM=863.96' INV.(A)=857.78' INV.(B)=858.61' INV.(C)=860.16' INV.(D)=857.91'
DMH 11556 RIM=862.62' INV.(A)=857.04' INV.(B)=857.23' INV.(C)=857.16' SUMP=857.00'
DMH 11635 RIM=855.65' SEALED
DMH 11761 RIM=843.04' INV.(A)=833.24' INV.(B)=837.11' INV.(C)=833.79' SUMP=833.57'
DMH 11763 RIM=844.42' INV.(A)=837.57' INV.(B)=838.02' INV.(C)=838.14' SUMP=837.81'
DMH 11765 RIM=845.00' INV.(A)=839.08' INV.(B)=841.08' INV.(C)=839.65' SUMP=839.60'
CB 11766 RIM=845.75' INV.(A)=841.15' T.O.S=840.75' T.O.W=841.05'
CB 11746 RIM=844.98' INV.(A)=840.48' T.O.S=838.58' T.O.W=839.08' SUMP=911.55'
DMH 11745 RIM=845.22' INV.(A)=839.27' INV.(B)=839.40' INV.(C)=839.92' INV.(D)=839.32' SUMP=839.22'
INV 36" RCP EL=869.59'
INV 36" RCP EL=822.93'
610535_HD(PROPOSED CATCHMENT VISUAL).DWG
Plotted on 3-Feb-2026 4:57 PM

WORCESTER
PLEASANT STREET - ROUTE 122

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	#######		
PROJECT FILE NO.	610535		

PROPOSED CATCHMENT AREAS
SHEET 4 OF 14

Proposal No. 610535-134928

610535_HD\PROPOSED CATCHMENT VISUAL).DWG Plotted on 3-Feb-2026 4:58 PM

A00860 - 260

N

PLEASANT STREET (ROUTE 122)

BAILEY STREET (PUBLIC - 49.5' WIDE)

AIPORT DRIVE

AIRPORT DRIVE LIMIT OF WORK (CONT)

SEE INSERT FOR CONTINUED LIMITS OF WORK

CONTINUED ON SHEET NO. 3

CONTINUED ON SHEET NO. 5

PT +00.78

PC +08.22

PCC +70.35

LOCATION LINE OF FEBRUARY 1851 CITY LAYOUT (CITY OF WORCESTER RELOCATION PLAN H-9409)

1958 SHLO NO. 4747

BENCHMARK: 512
MAG SET IN UPL 112
1' ABOVE GROUND
EL=836.79'

BORDERING VEGETATED WETLANDS

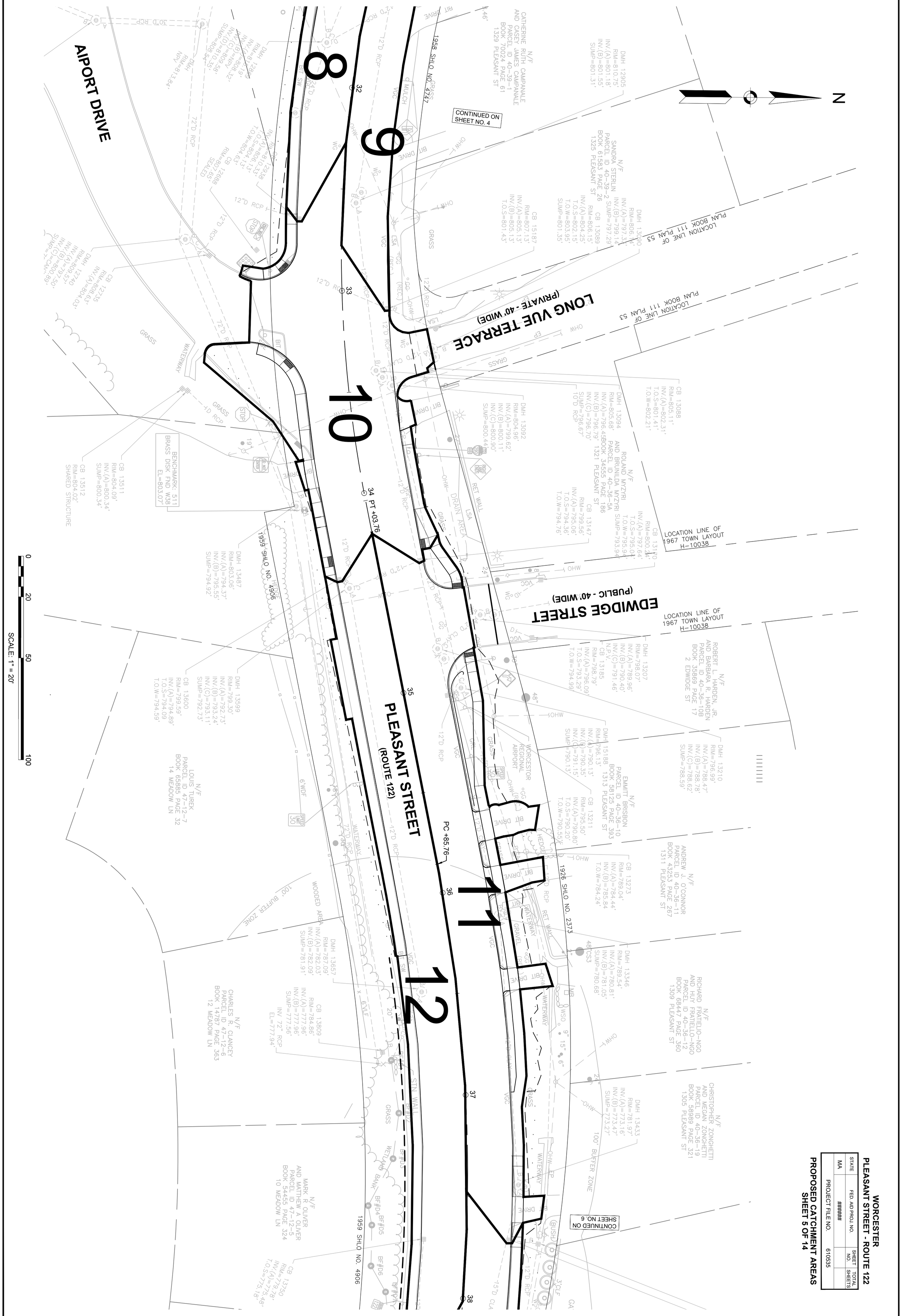
WETLAND BANK

100' BUFFER ZONE

WORCESTOR REGIONAL AIRPORT

0 20 50 100

SCALE: 1" = 20'

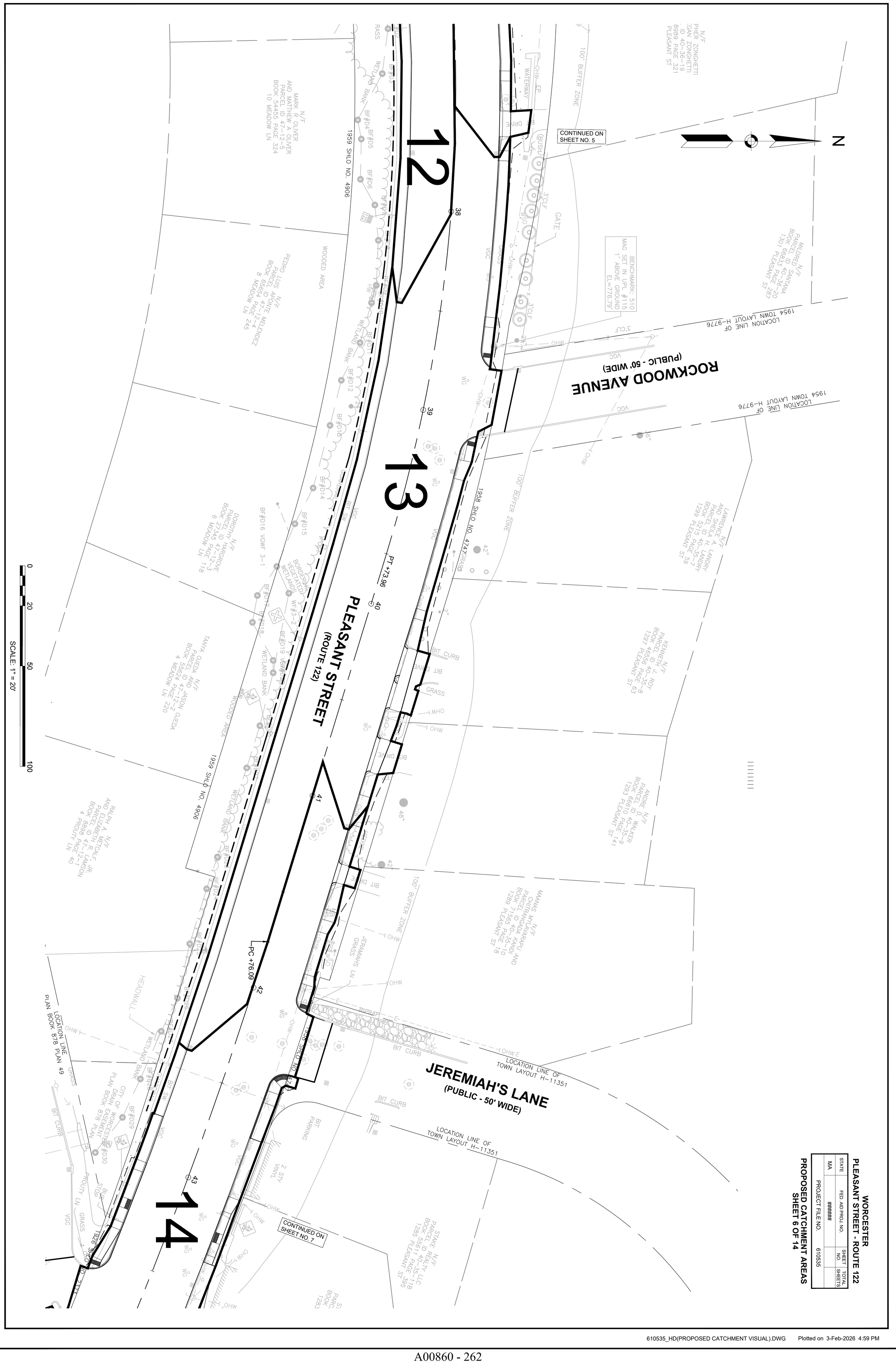


WORCESTER
PLEASANT STREET - ROUTE 122

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	#######		
PROJECT FILE NO. 610535			

PROPOSED CATCHMENT AREAS
SHEET 5 OF 14

610535_HD(PROPOSED CATCHMENT VISUAL).DWG Plotted on 3-Feb-2026 4:59 PM

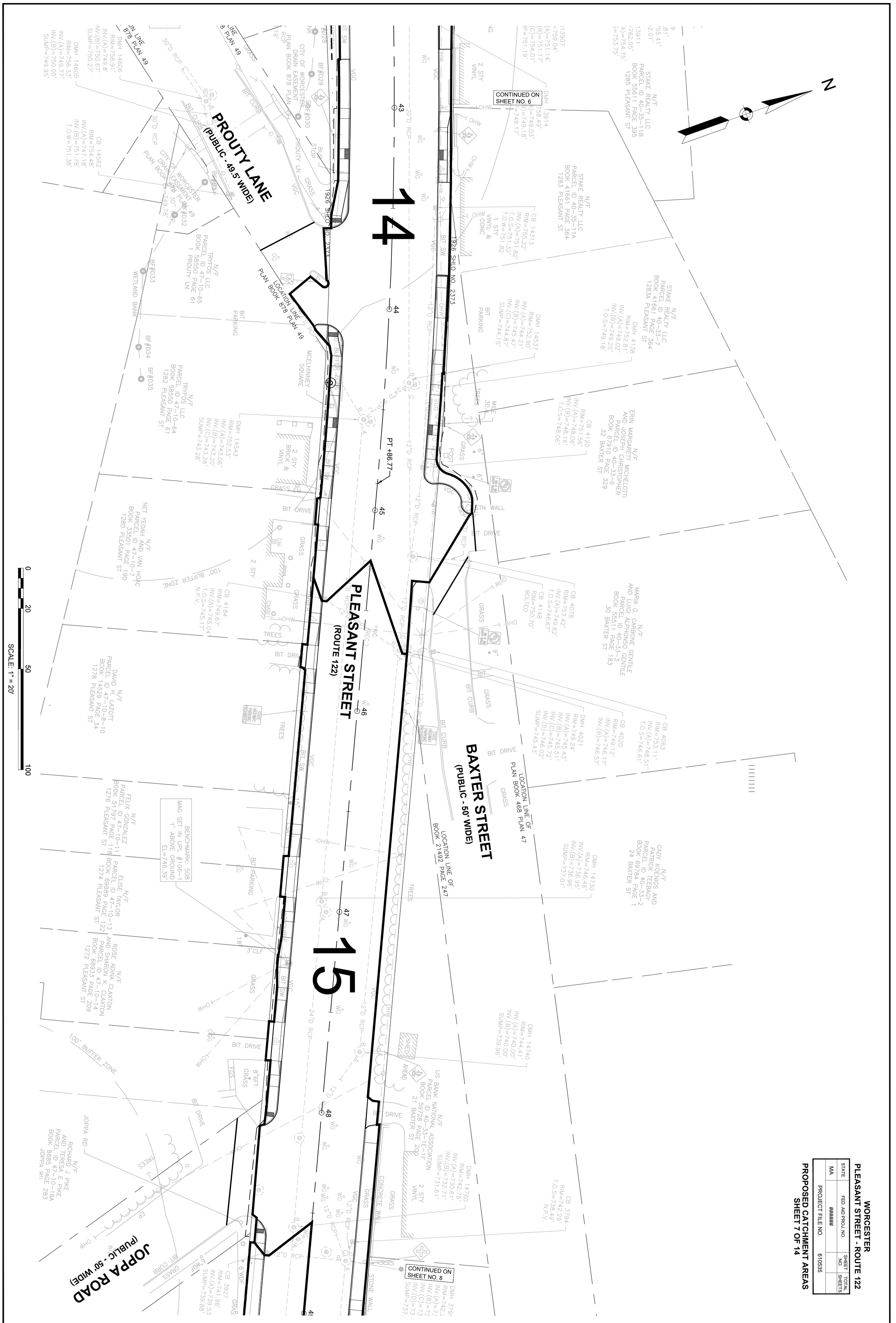


WORCESTER
PLEASANT STREET - ROUTE 122

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	#######		
PROJECT FILE NO. 610535			

PROPOSED CATCHMENT AREAS
SHEET 6 OF 14

610535_HD(PROPOSED CATCHMENT VISUAL).DWG Plotted on 3-Feb-2026 4:59 PM



WORCESTER
PLEASANT STREET - ROUTE 122
PROPOSED CATCHMENT AREAS
SHEET 7 OF 14

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	########		
	PROJECT FILE NO. 610535		

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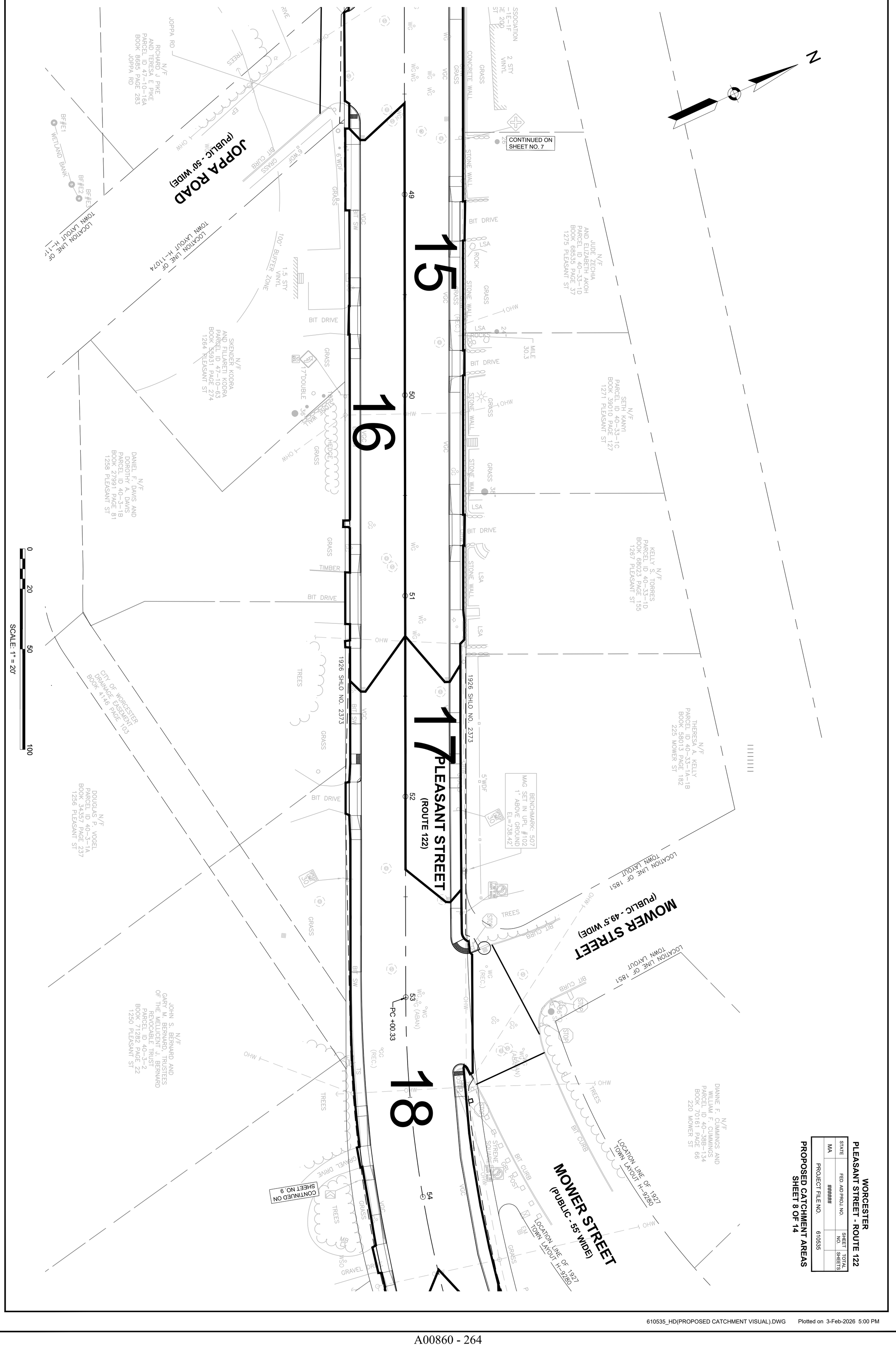


WORCESTER
PLEASANT STREET - ROUTE 122

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	#######		
PROJECT FILE NO.	610535		

PROPOSED CATCHMENT AREAS
SHEET 8 OF 14

610535_HD(PROPOSED CATCHMENT VISUAL).DWG Plotted on 3-Feb-2026 5:00 PM

WORCESTER
PLEASANT STREET - ROUTE 122

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	#######		
PROJECT FILE NO.	610535		

PROPOSED CATCHMENT AREAS
SHEET 9 OF 14

Proposal No. 610535-134928

610535_HD/PROPOSED CATCHMENT VISUAL).DWG Plotted on 3-Feb-2026 5:01 PM

A00860 - 265

N

MOWER STREET
(PUBLIC - 55' WIDE)

PLEASANT STREET
(ROUTE 122)

LAURELDALE ROAD
(PRIVATE - 15' WIDE)

JENKINS STREET
(PUBLIC - 40' WIDE)

ROBERTSON ROAD
(PUBLIC - 29.5' WIDE)

18 19 20

CONTINUED ON SHEET NO. 8

CONTINUED ON SHEET NO. 10

LOCATION LINE OF 1927 TOWN LAYOUT H-9280

LOCATION LINE OF 1918 TOWN LAYOUT H-1124

LOCATION LINE OF PLAN 99 BOOK 8

LOCATION LINE OF PLAN 227 PLAN 91

LOCATION LINE OF PLAN 227 PLAN 61

BENCHMARK: 506
MAG SET UPL #98
1' ABOVE GROUND
EL=719.74'

PT +67.35

1926 SHLO NO. 2373

N/F DIANNE F. CUMMINGS AND WILLIAM F. CUMMINGS PARCEL ID 40-38B-134 BOOK 70161 PAGE 66 220 MOWER ST

N/F NICOLE XIFARAS PARCEL ID 40-31-1-3-4 BOOK 68059 PAGE 199 1235 PLEASANT ST

N/F WORCESTER GAS LIGHT COMPANY BOOK 3587 PAGE 498

CITY OF WORCESTER DRAINAGE EASEMENT BOOK 4146 PAGE 103

N/F SUSAN N, PARCEL ID BOOK 137 1231 PI

N/F JACOB G. TYE AND KULAY C. TYE PARCEL ID 40-2-13A2 BOOK 63023 PAGE 150 1238 PLEASANT ST

N/F SAID NAFAI AND ELI STEVENS-NAFAI PARCEL ID 40-2-13A BOOK 29193 PAGE 54 1236 PLEASANT ST

N/F JOHNNY MONESTIME PARCEL ID 40-2-2 BOOK 56236 PAGE 362 1230 PLEASANT ST

N/F STEVEN D. BROWN AND MARITZA E. PEREZ-BROWN PARCEL ID 40-2-15 BOOK 64717 PAGE 282 1228 PLEASANT ST

N/F ATC PLEASANT LLC PARCEL ID 40-2-1 BOOK 67469 PAGE 225 1226 PLEASANT ST

N/F MARK A ANDERSON AND JO-ANNE ANDERSON PARCEL ID 40-3-3 BOOK 18769 PAGE 272 1240 PLEASANT ST

N/F JOANNE G. DUNLEVY PARCEL ID 40-3-4 BOOK 52574 PAGE 90 1246 PLEASANT ST

0 20 50 100
SCALE: 1" = 20'

Proposal No. 610535-134928

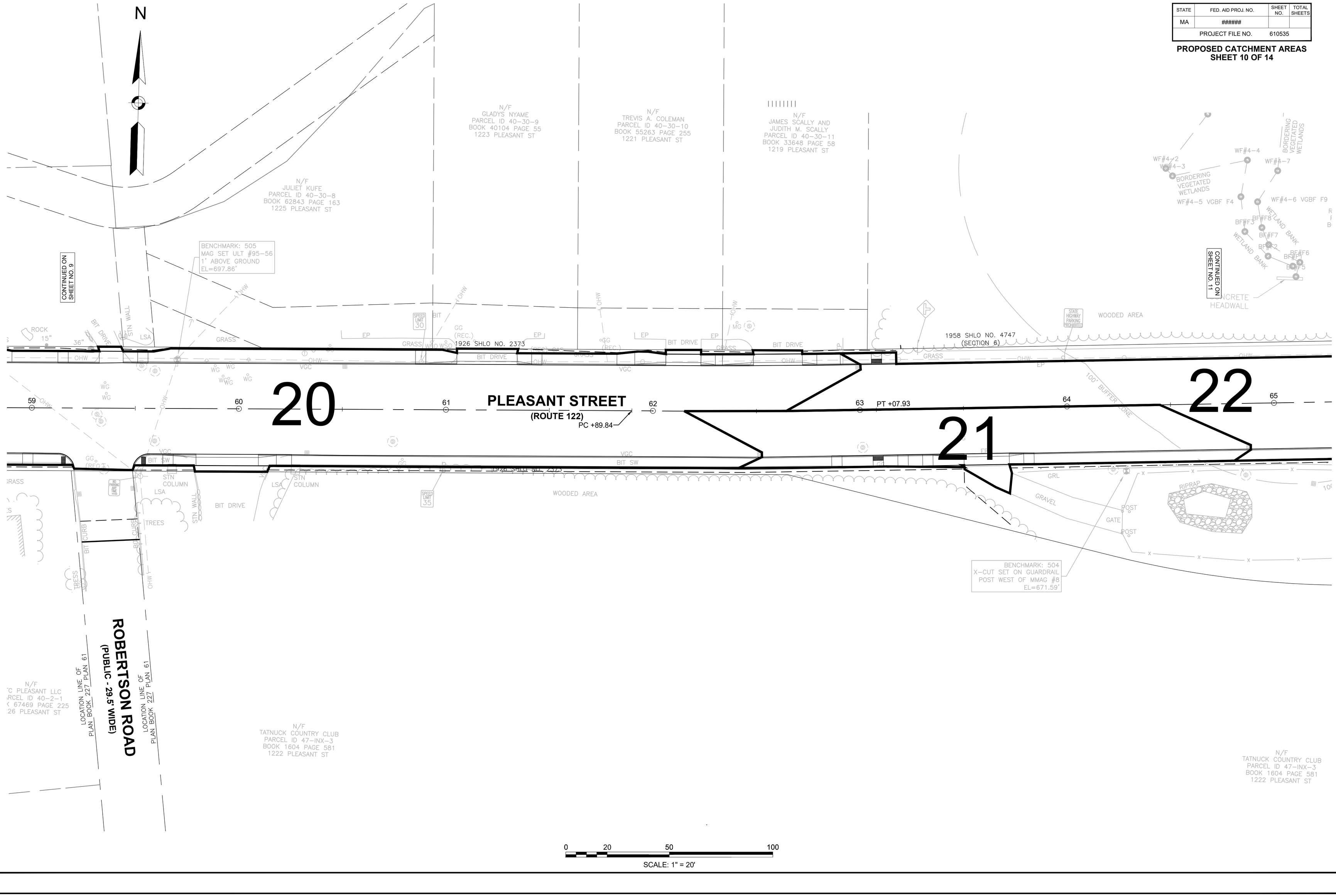
610535_HD\PROPOSED CATCHMENT VISUAL).DWG Plotted on 3-Feb-2026 5:02 PM

A00860 - 266

WORCESTER
PLEASANT STREET - ROUTE 122

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	######		
PROJECT FILE NO.	610535		

PROPOSED CATCHMENT AREAS
SHEET 10 OF 14



WORCESTER
PLEASANT STREET - ROUTE 122

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	######		
PROJECT FILE NO.	610535		

PROPOSED CATCHMENT AREAS
SHEET 11 OF 14

610535_HD\PROPOSED CATCHMENT VISUAL).DWG Plotted on 3-Feb-2026 5:02 PM

Proposal No. 610535-134928

A00860 - 267

WF#4-1 WF#4-2 WF#4-3 WF#4-4 WF#4-5 VGBF F4 WF#4-6 VGBF F9 WF#4-7 WF#4-8 WF#4-9 WF#4-10 WF#4-11 WF#4-12 WF#4-13 WF#4-14 WF#4-15 WF#4-16 WF#4-17 WF#4-18 WF#4-19 WF#4-20 WF#4-21 WF#4-22 WF#4-23 WF#4-24 WF#4-25 WF#4-26

BORDERING VEGETATED WETLANDS

BF#F1 BF#F2 BF#F3 BF#F4 BF#F5 BF#F6 BF#F7 BF#F8

WETLAND BANK

CONTINUED ON SHEET NO. 10

CONCRETE HEADWALL

N/F
RAYMOND J. SANSOUCY
PARCEL ID 40-30-0A
BOOK 11537 PAGE 224
1215 PLEASANT ST

BENCHMARK: 503
MAG SET IN UPL #87
1' ABOVE GROUND
EL=643.10'

CONTINUED ON SHEET NO. 12

WOODED AREA

100' BUFFER ZONE

1958 SHLO NO. 4747 (SECTION 6)

GRASS GUARDRAIL OHW VGC EP

22 65 66 PLEASANT STREET (ROUTE 122) 67 23 68 PC +24.89 69 70 24

VGC BIT SW

RIPRAP POST GATE 4'CLF GRL

1926 SHLO NO. 2373

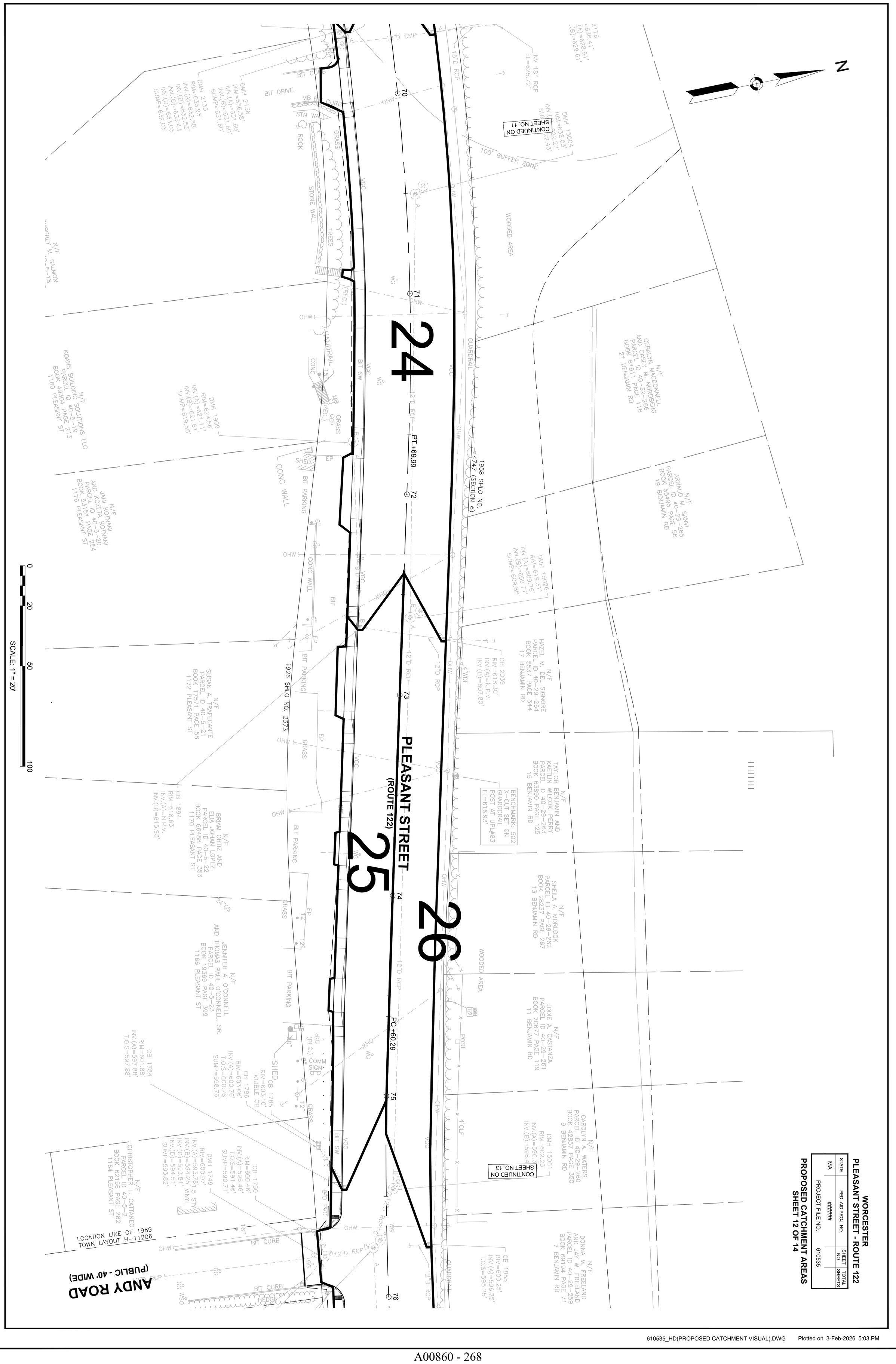
BIT CONC BIT DRIVE MB SIGN SIGN ROCK GRASS TREES STONE WALL

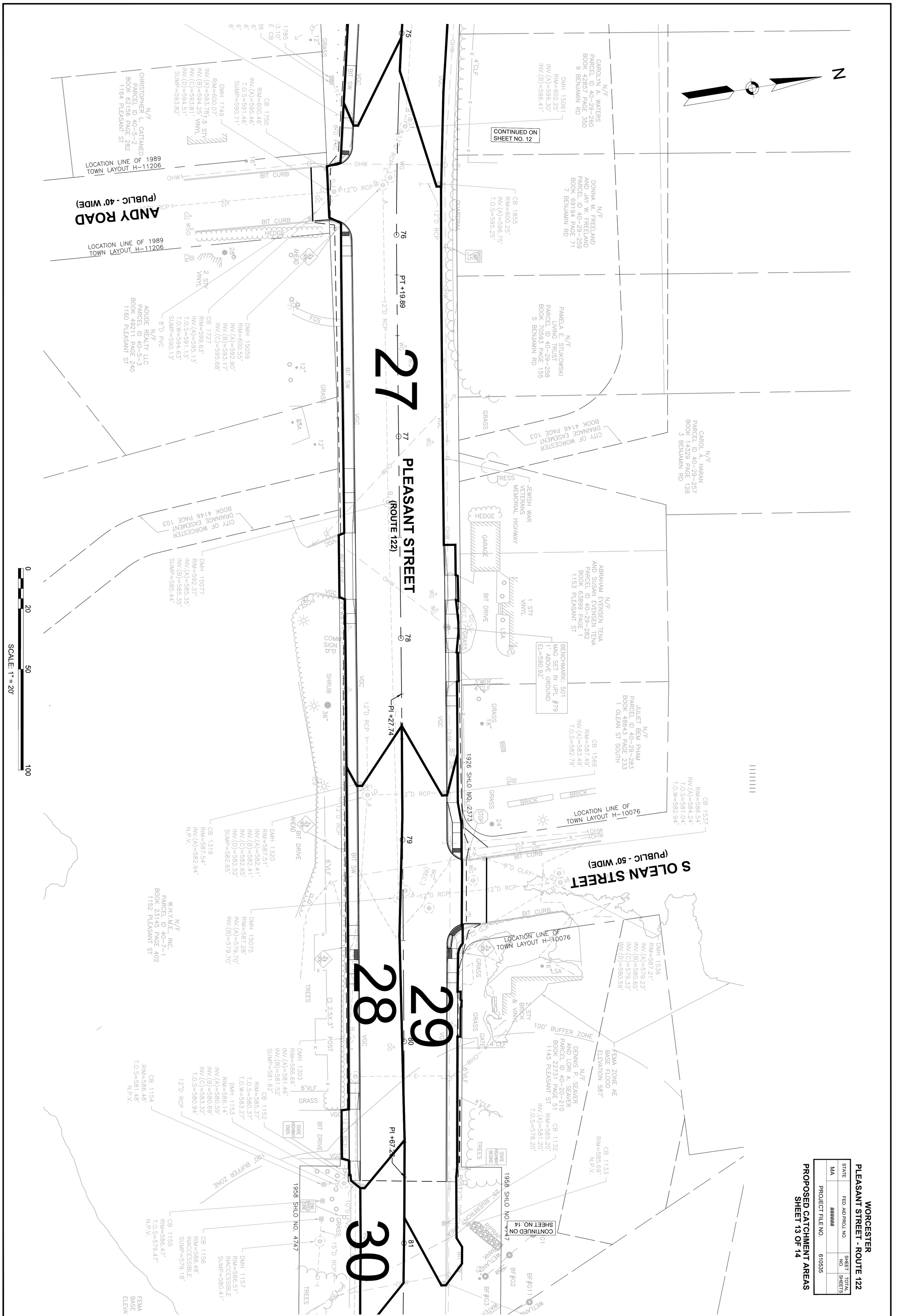
N/F
TATNUCK COUNTRY CLUB
PARCEL ID 47-INX-3
BOOK 1604 PAGE 581
1222 PLEASANT ST

N/F
KIMBERLY M. SALMON
PARCEL ID 40-5-18
BOOK 51187 PAGE 295
1184 PLEASANT ST

SPEED LIMIT 35

0 20 50 100
SCALE: 1" = 20'


N
70
71
72
73
74
75
76
PT +69.99
PC +60.29
1958 SHLO NO. 4747 (SECTION 6)
1926 SHLO NO. 2373
PLEASANT STREET
(ROUTE 122)
ANDY ROAD
(PUBLIC - 40' WIDE)
24
25
26
18"D CMP
18"D RCP
12"D RCP
12"D RCP
4'WDF
4'CLF
8"D PVC
BIT CURB
BIT DRIVE
MB
STN WALL
ROCK
GRASS
STONE WALL
TREES
WOODED AREA
100' BUFFER ZONE
GUARDRAIL
BIT SW
VGC
WG
OHW
CONC
HANDRAIL
SHED
EP
CONC WALL
BIT PARKING
POST
HEDGE
BENCHMARK: 502
X-CUT SET ON GUARDRAIL
POST AT UPI#83
EL=616.93'
CONTINUED ON SHEET NO. 11
CONTINUED ON SHEET NO. 13
DMH 2135
RIM=636.93'
INV.(A)=632.38'
INV.(B)=632.53'
INV.(C)=633.43
INV.(D)=633.03'
SUMP=632.03'
DMH 2136
RIM=636.58'
INV.(A)=631.60'
INV.(B)=631.60'
SUMP=631.60'
INV 18" RCP
EL=625.72'
2176
=636.41'
(A)=628.81'
(B)=629.61'
DMH 15004
RIM=632.03'
INV.(A)=622.27'
SUMP=622.43'
DMH 15026
RIM=619.37'
INV.(A)=609.76'
INV.(B)=609.77'
SUMP=609.86'
DMH 1909
RIM=624.56'
INV.(A)=621.11'
INV.(B)=621.61'
SUMP=619.56'
CB 2039
RIM=618.30'
INV.(A)=N.P.V.
INV.(B)=607.80'
CB 1894
RIM=618.63'
INV.(A)=N.P.V.
INV.(B)=615.93'
CB 1785
RIM=603.10'
DOUBLE CB
CB 1786
RIM=603.06'
INV.(A)=600.76'
T.O.S=600.76'
SUMP=598.76'
CB 1784
RIM=601.88'
INV.(A)=597.88'
T.O.S=597.88'
CB 1750
RIM=600.46'
INV.(A)=595.46'
T.O.S=591.46'
SUMP=590.71'
DMH 1749
RIM=600.07'
INV.(A)=593.78(1.5 STL)
INV.(B)=594.25' VINYL
INV.(C)=593.81'
INV.(D)=594.51'
SUMP=593.82'
CB 1855
RIM=600.25'
INV.(A)=596.75'
T.O.S=595.25'
BENCHMARK: 502
X-CUT SET ON GUARDRAIL
POST AT UPI#83
EL=616.93'
N/F SALMON ... DEFLY M. ... 5-18
N/F KOANS BUILDING SOLUTIONS LLC PARCEL ID 40-5-19 PAGE 213 BOOK 49304 1180 PLEASANT ST
N/F JANI KOTNANI AND KOZETA KOTNANI PARCEL ID 40-5-20 PAGE 254 BOOK 53151 1176 PLEASANT ST
N/F SUSAN A. TRAFECANTE PARCEL ID 40-5-21 PAGE 58 BOOK 17571 1172 PLEASANT ST
N/F BRIAM ORTIZ AND ELIA JOHAN LOPEZ PARCEL ID 40-5-22 PAGE 353 BOOK 66488 1170 PLEASANT ST
N/F CHRISTOPHER L. CATTANEO PARCEL ID 40-5-2 PAGE 282 BOOK 62156 1164 PLEASANT ST
N/F JENNIFER A. O'CONNELL AND THOMAS PAUL O'CONNELL, SR. PARCEL ID 40-5-23 PAGE 399 BOOK 19369 1166 PLEASANT ST
N/F GERALYN MACDONNELL AND CASEY M. NORDBERG PARCEL ID 40-32-266 PAGE 116 BOOK 61811 21 BENJAMIN RD
N/F ARNAUD M. SANVI PARCEL ID 40-29-265 PAGE 58 BOOK 55495 19 BENJAMIN RD
N/F HAZEL M. DEL SIGNORE PARCEL ID 40-29-264 PAGE 344 BOOK 5537 17 BENJAMIN RD
N/F TAYLOR BENJAMIN AND KAETLIN WILCOX-PERRY PARCEL ID 40-29-263 PAGE 125 BOOK 63890 15 BENJAMIN RD
N/F SHEILA A. MORLOCK PARCEL ID 40-29-262 PAGE 267 BOOK 28237 13 BENJAMIN RD
N/F JODIE A. CASTANZA PARCEL ID 40-29-261 PAGE 119 BOOK 70677 11 BENJAMIN RD
N/F CAROLYN A. WATERS PARCEL ID 40-29-260 PAGE 350 BOOK 42857 9 BENJAMIN RD
N/F DONNA M. FREELAND AND JAY W. FREELAND PARCEL ID 40-29-259 PAGE 71 BOOK 69194 7 BENJAMIN RD
0
20
50
100
SCALE: 1" = 20'
WORCESTER
PLEASANT STREET - ROUTE 122
STATE: MA
FED. AID PROJ. NO.: #######
SHEET NO.:
TOTAL SHEETS:
PROJECT FILE NO.: 610535
PROPOSED CATCHMENT AREAS
SHEET 12 OF 14
610535_HD(PROPOSED CATCHMENT VISUAL).DWG
Plotted on 3-Feb-2026 5:03 PM



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SCALE: 1" = 20'
0
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50
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WORCESTER
PLEASANT STREET - ROUTE 122

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	#######		
PROJECT FILE NO.	610535		

PROPOSED CATCHMENT AREAS
SHEET 14 OF 14

610535_HD(PROPOSED CATCHMENT VISUAL).DWG Plotted on 3-Feb-2026 5:04 PM