DOCUMENT A00862

WORCESTER DIVISION OF PLANNING & REGULATORY SERVICES COMMENTS ON THE NOTICE OF INTENT

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March 23rd, 2026

Andrea Kendall
LEC Environmental Consultants, Inc.
100 Grove Street, Suite 310
Worcester, MA 01605

DPRS Staff Comments – Pleasant Street Right-of-Way (CC-2026-011 & DEP File #: TBD)

Ms. Kendall,

Staff from the Division of Planning & Regulatory Services (DPRS) have reviewed the Notice of Intent filing referenced above and offer the following comments. These comments are intended to identify items the Conservation Commission will likely want addressed prior to the upcoming meeting, with the goal of streamlining the public hearing process.

1. Add a plan detail or clarifying note to specify the measures proposed for: "Erosion Control (TYP)".
2. The proposed work includes modification to an area that discharges to Tatnuck Brook, a Cold-Water Fishery. The Stormwater Report and Checklist should be updated to reflect the applicability of Standard 6 and detail compliance to the extent applicable.
3. A plan detail for inlet protections for catch basins within the limit of work should be added to the plans.

Any questions or follow-up regarding these comments may be directed to the DPRS staff liaisons to the Conservation Commission:

Eric Flint, CFM
Conservation Agent
P: 508-799-1400 ext. 31441
E: FlintE@worcesterma.gov

Mattie VandenBoom
Assistant Conservation Agent
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E: VandenBoomM@worcesterma.gov

Larner, Erica N. (DOT)

From: CERO_NOI@MassMail.state.ma.us
Sent: Monday, March 23, 2026 3:18 PM
To: Larner, Erica N. (DOT); Rebula, Thomas (DEP); Kendall, Andrea (EXT)
Cc: CERO_NOI (DEP); planning@worcesterma.gov; flinte; vandenboomm@worcesterma.gov; CERO_NOI (DEP)
Subject: MassDEP NOI File Number

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY & ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
CENTRAL REGIONAL OFFICE
8 NEW BOND STREET, WORCESTER, MA 01606 508-792-7650

Date: 03/23/2026 Municipality WORCESTER

RE: **NOTIFICATION OF WETLANDS PROTECTION ACT FILE NUMBER**

The Department of Environmental Protection has received a Notice of Intent filed in accordance with the Wetlands Protection Act (M.G.L. c. 131, §40):

Applicant	MASSACHUSETTS DOT- HIGHWAY DIVISION	
Address	10 PARK PLAZA, ROOM 7360,BOSTON MA 02116	**Owner Address**
Locus	PLEASANT STREET (ROUTE 122) , WORCESTER MA 01602	

This project has been assigned the following file # : **CE 349-1445**

ISSUANCE OF A FILE NUMBER INDICATES ONLY COMPLETENESS OF SUBMITTAL, NOT APPROVAL OF APPLICATION

Although a file # is being issued, please note the following:

No Comment

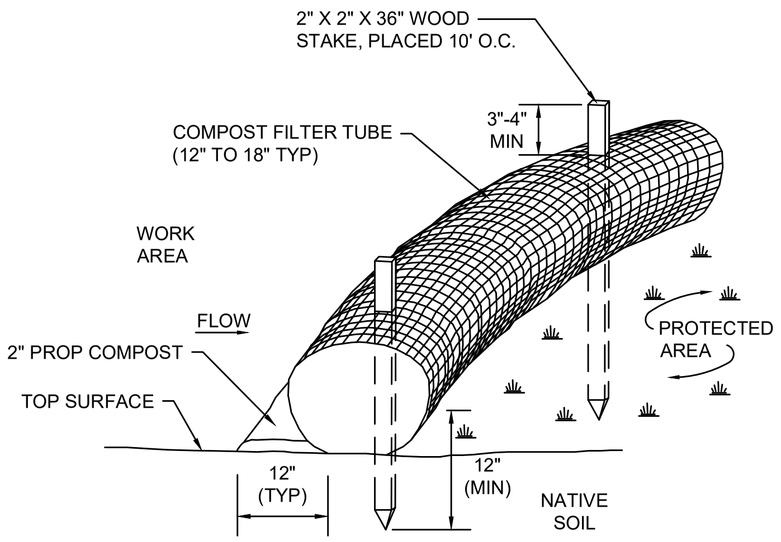
Regards,

for MassDEP,

(508)-767-2721
Thomas.Rebula@Mass.gov



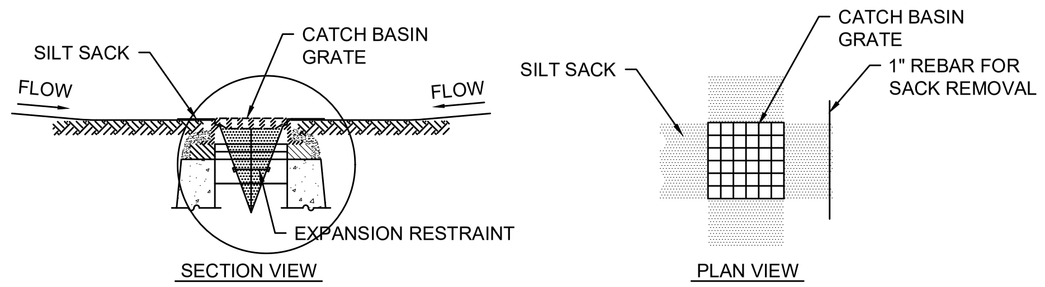
Proposal No. 610535-134928
610535_HD(CONST DETAILS).DWG Plotted on 17-Mar-2026 2:23 PM
A00862 - 5



NOTES:

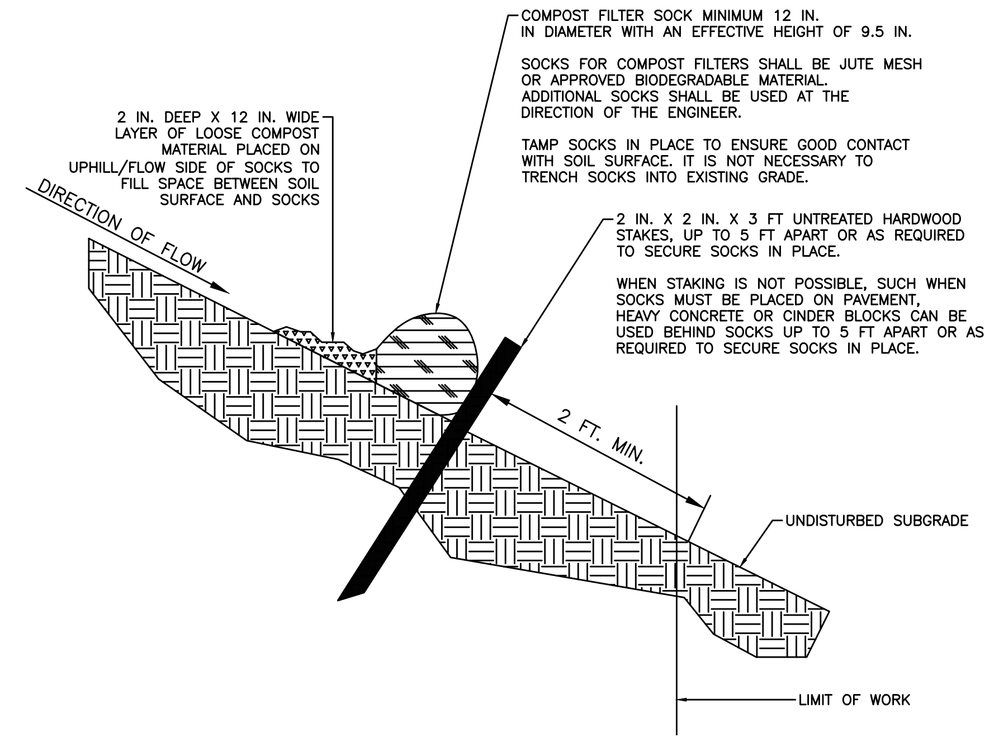
1. FILTER TUBE SHALL BE FILLED BY BLOWN IN ORGANIC COMPOST AND PLACED AS ILLUSTRATED ON THE PROJECT PLANS.
2. COMPOST FILTER TUBES SHALL BE INSPECTED PERIODICALLY AND AFTER ALL STORM EVENTS, AND REPAIRED OR REPLACED AS NEEDED.
3. AT COMPLETION OF PROJECT, COMPOST FILTER TUBES SHALL BE CUT OPEN AND COMPOST MATERIAL SHALL BE DISPERSED ON SITE, AS DETERMINED BY THE ENGINEER.
4. THE EMPTY FILTER TUBE FABRIC SHALL BE COLLECTED AND DISPOSED OF PROPERLY.

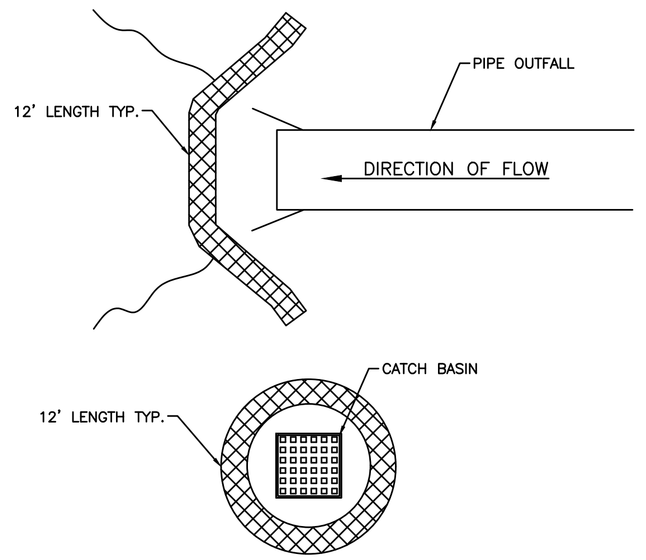
COMPOST FILTER TUBE
NOT TO SCALE

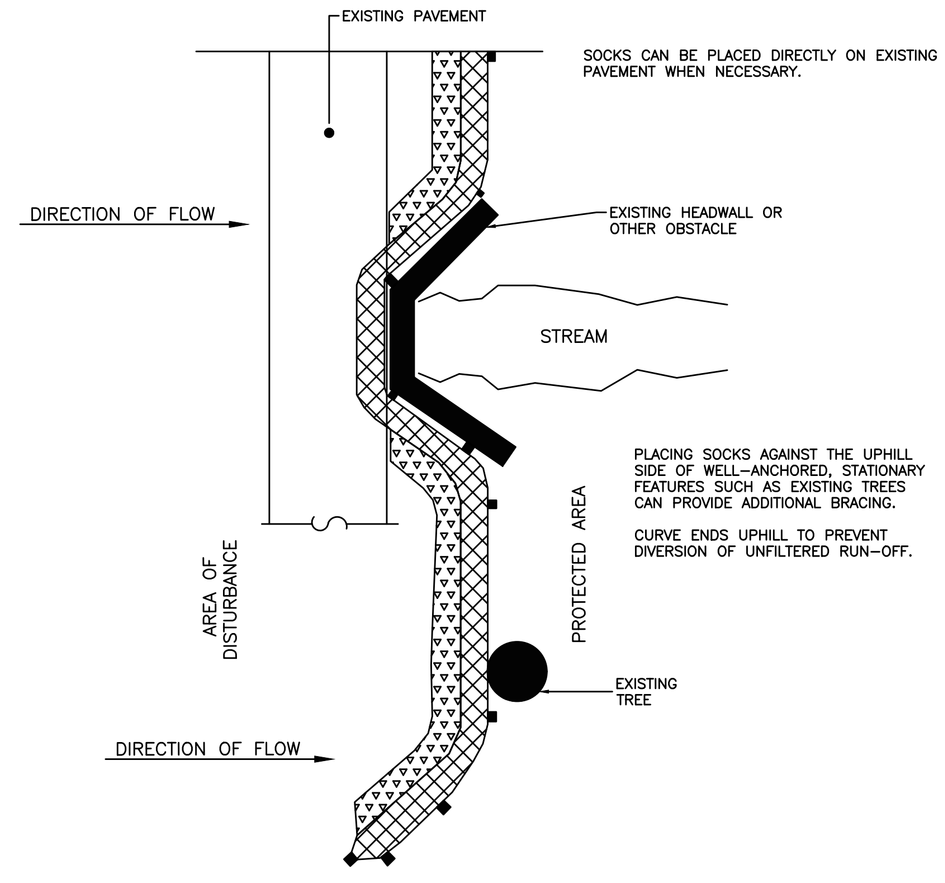


NOTES:
1. INSTALL INLET PROTECTION SACK IN EXISTING CATCH BASINS, BEFORE COMMENCING WORK, AND IN NEW CATCH BASINS IMMEDIATELY AFTER INSTALLATION OF STRUCTURE. MAINTAIN UNTIL BINDER COURSE PAVING IS COMPLETE OR A PERMANENT STAND OF GRASS HAS BEEN ESTABLISHED.
2. GRATE TO BE PLACED OVER INLET PROTECTION SACK.
3. INLET PROTECTION SACK SHALL BE INSPECTED PERIODICALLY AND AFTER ALL STORM EVENTS AND CLEANING OR REPLACEMENT SHALL BE PERFORMED.

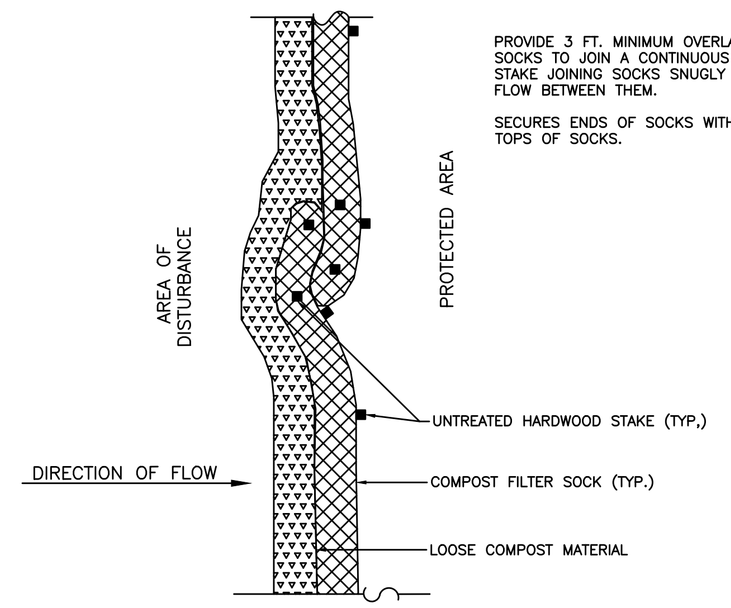
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NOT TO SCALE







PLAN VIEW



PLAN VIEW – JOIN DETAIL

COMPOST FILTER TUBE
NOT TO SCALE

Technical Memorandum

Jacobs

Pedestrian and Bicycle Improvements on Pleasant St (MassDOT Proj #6100535) Standard 6 - Critical Area

Date:	April 9, 2026
Project name:	Pleasant Street (Route 122)
Project no:	610535
Attention:	Worcester Conservation Commission
Client:	MassDOT
Prepared by:	Jacobs Engineering

Jacobs
120 St James Avenue
5th Floor
Boston, MA 02116
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Jacobs.com

Background:

In February 2026, MassDOT filed a Notice of Intent (CC-2026-011 & DEP File No. 349-1445) with the Worcester Conservation Commission (the Commission) to construct improvements along Route 122 (Pleasant) Street to enhance safety and mobility for all modes of transportation. The project will improve the safety of Pleasant Street by restriping the roadway to provide buffered bicycle lanes in each direction, constructing approximately 4,075 feet of new sidewalk, and installing new rectangular rapid flashing beacons at several crosswalk locations. The project will not widen Pleasant Street, and the existing curbs will remain in their current location. The overall stormwater catchment remains the same in both pre- and post-conditions, although there will be a 4.18% increase in impervious cover. Existing flow patterns and stormwater drainage networks have been maintained. The project proposes minor improvements to the existing stormwater infrastructure within the project limits including deep sump catch basins at several street intersections. It has been determined that the Project will meet Standards 1, 5, 6, 7, 8, 9 and 10 of the Stormwater Standards (the Standards). Standards 2, 3 and 4 will be met to the maximum extent practicable (MEP).[1]

In 2014, the Commission issued an Order of Conditions under DEP File No. 349-1096 for the MassDOT Worcester Pleasant Street Stormwater Retrofit Project (Proj # 607002) completed under their Impaired Waterways Program. Specifically, the project included stormwater drainage and water quality improvements through the construction of three separate Stormwater Best Management Practices BMPs now referred to as Stormwater Control Measures (SCMs). The SCMs selected and installed are specifically recommended by the MA Stormwater Handbook for the protection of Cold-Water Fisheries. They included an infiltration basin with a forebay and four strategically placed leaching catch basins that are currently mitigating the effects of 80,000 square feet of impervious cover associated with Pleasant Street through promoting groundwater infiltration and stormwater water quality improvements. Specifically, the Stormwater Retrofit Project is successfully reducing flow rates, is removing total suspended solids from the stormwater, and is promoting groundwater recharge – all of which result in a significant improvement to the water quality being ultimately discharged to Tatnuck Brook, a Cold-Water Fishery resource.

[1] Stormwater Management Report – Pedestrian and Bicycle Improvements on Pleasant Street, prepared by Jacobs Engineering, dated February 2026.

Stormwater Standard 6 – Critical Area

MassDOT acknowledges DPRS's March 23, 2026 comments that the proposed project includes modifications to an area that discharges to Tatnuck Brook, a Cold-Water Fishery. As applicable, the Stormwater Report and Checklist were updated to reflect applicability and compliance with Stormwater Standard 6 – Critical Area.

The Project Team has determined that a strong likelihood of a significant impact to Tatnuck Brook as a result of the current proposed project does not exist taking into account site specific factors such as the significant stormwater water quality improvements and thermal mitigation resulting from the 2014 Pleasant Street Stormwater Retrofit Project, the minimal increase in new impervious surface to areas that discharge to Tatnuck Brook (517 square feet), the fact that there are no new stormwater discharges to Tatnuck Brook, and the addition of the proposed practicable structural SCMs described above.

Since the project does not pose a strong likelihood of a significant impact to Tatnuck Brook, the use of specific source control and pollution prevention measures determined to be suitable for managing discharges to such areas as described in the Massachusetts Stormwater Handbook and the MassDOT Stormwater Design Guide 2023 Edition are not required. Nonetheless, MassDOT considered SCMs as part of the current project but concluded that additional measures were not practicable given that there is very minimal to no available area within the public right-of-way and that the 2014 Pleasant Street Stormwater Retrofit Project provided stormwater water quality improvements from almost two acres of impervious road surface contributing to areas that discharge to Tatnuck Brook.

Stormwater Standard Compliance

The current project proposed meets the DEP Stormwater Regulations and Standards by complying with Standards 1, 5, 6, 7, 8, 9 and 10. Standards 2, 3 and 4 will be met to the maximum extent practicable (MEP).

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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Appendix B: Soils and FEMA Information
Appendix C: Supporting Calculations
Appendix D: Hydraulic and Hydrologic Data
Appendix E: O&M Plan and LTPPP
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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.

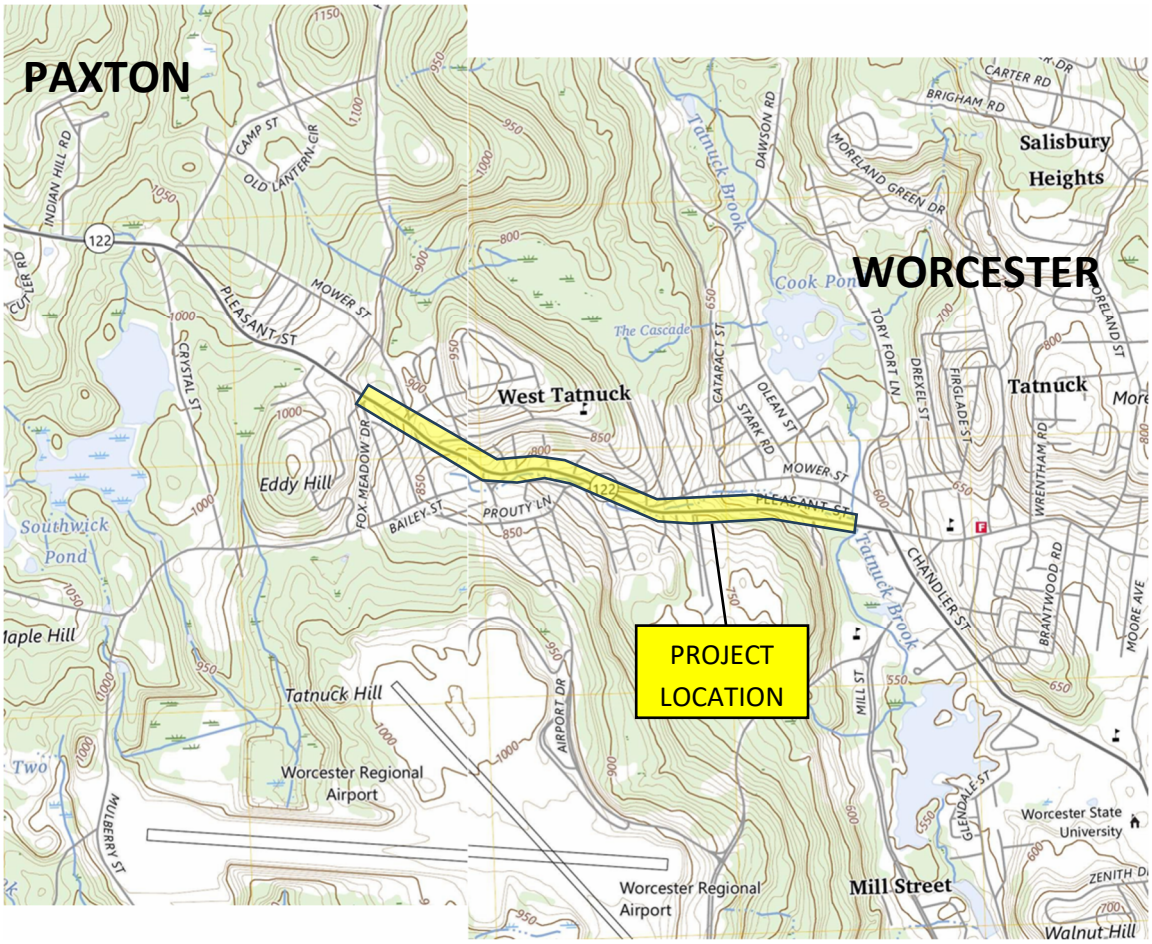
The following is a summary of key areas and how they are affected by the project:

- 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, 7, 8, 9, and 10 of the MA Stormwater Standards. Standards 2, 3, 4, and 6 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, 7, 8, 9, and 10. Standards 2, 3, 4, and 6 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.

Within the project area, Pleasant Street crosses over Tatnuck Brook, which is a Cold Water Fishery (ID 5133050). There is an existing stormwater drainage system that discharges to the bank of the Tatnuck Brook in the southwest corner of the bridge. Tthis project is a redevelopment project and there are no proposed alterations to the existing stormwater systems or existing drainage patterns; therefore, there is no strong likelihood of a significant impact to this critical area. All other applicable Stormwater Standards are being met.

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.

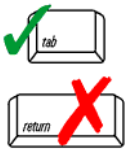
Appendix A: MassDEP Checklist for Stormwater Report

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.

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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

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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.

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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.

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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.

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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.

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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;

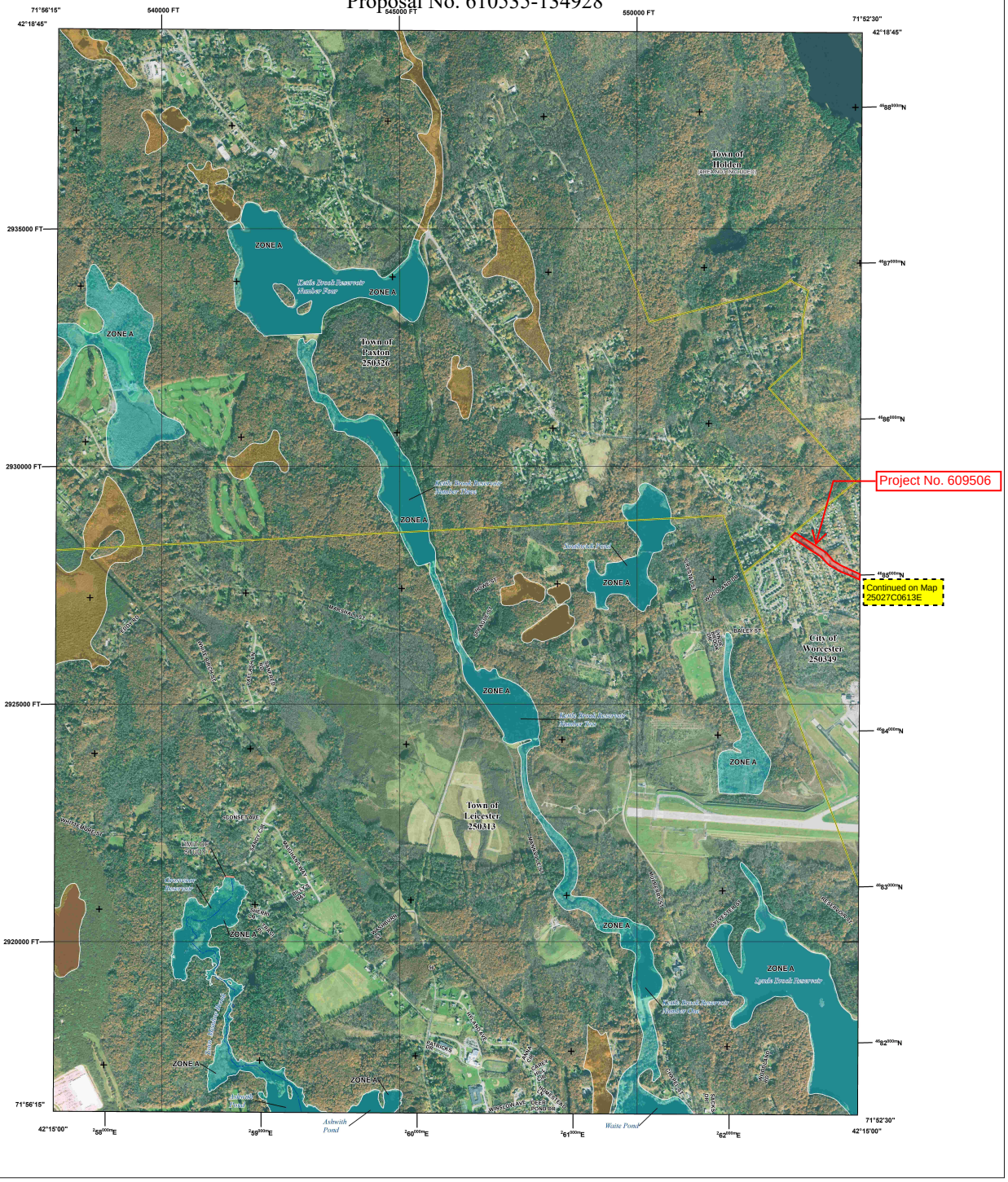
☐ An Illicit Discharge Compliance Statement is attached;

☐ 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

OTHER FEATURES
- 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)
- 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

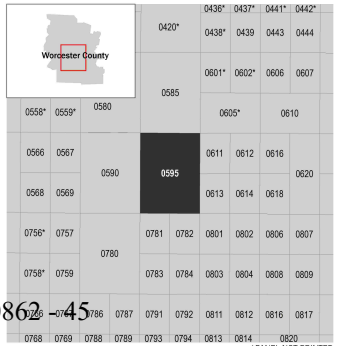
Map Projection:
NAD 1983 StatePlane Massachusetts Mainland FIPS 2001 Feet; North American 1983; Western Hemisphere; Vertical Datum: NAVD 88

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.

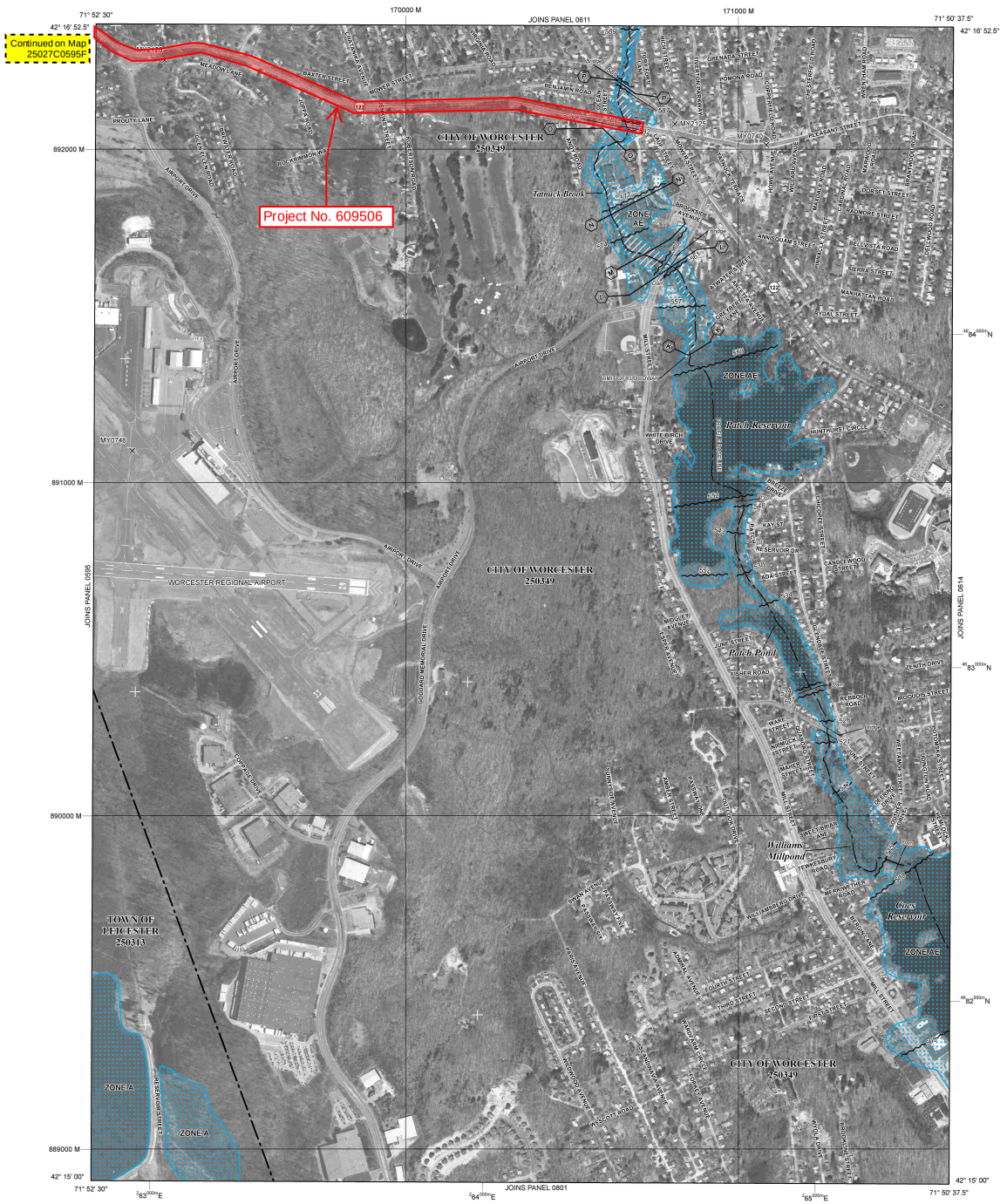
Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

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.

Project No. 609506



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 (EL 987) Base Flood Elevation line and value; elevation in feet*

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, 4989000mN 1000-meter ticks: Massachusetts State Plane Mainland Zone (FIPS Zone 2001), Lambert Conformal Conic projection; 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

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.

NFIP NATIONAL FLOOD INSURANCE PROGRAM

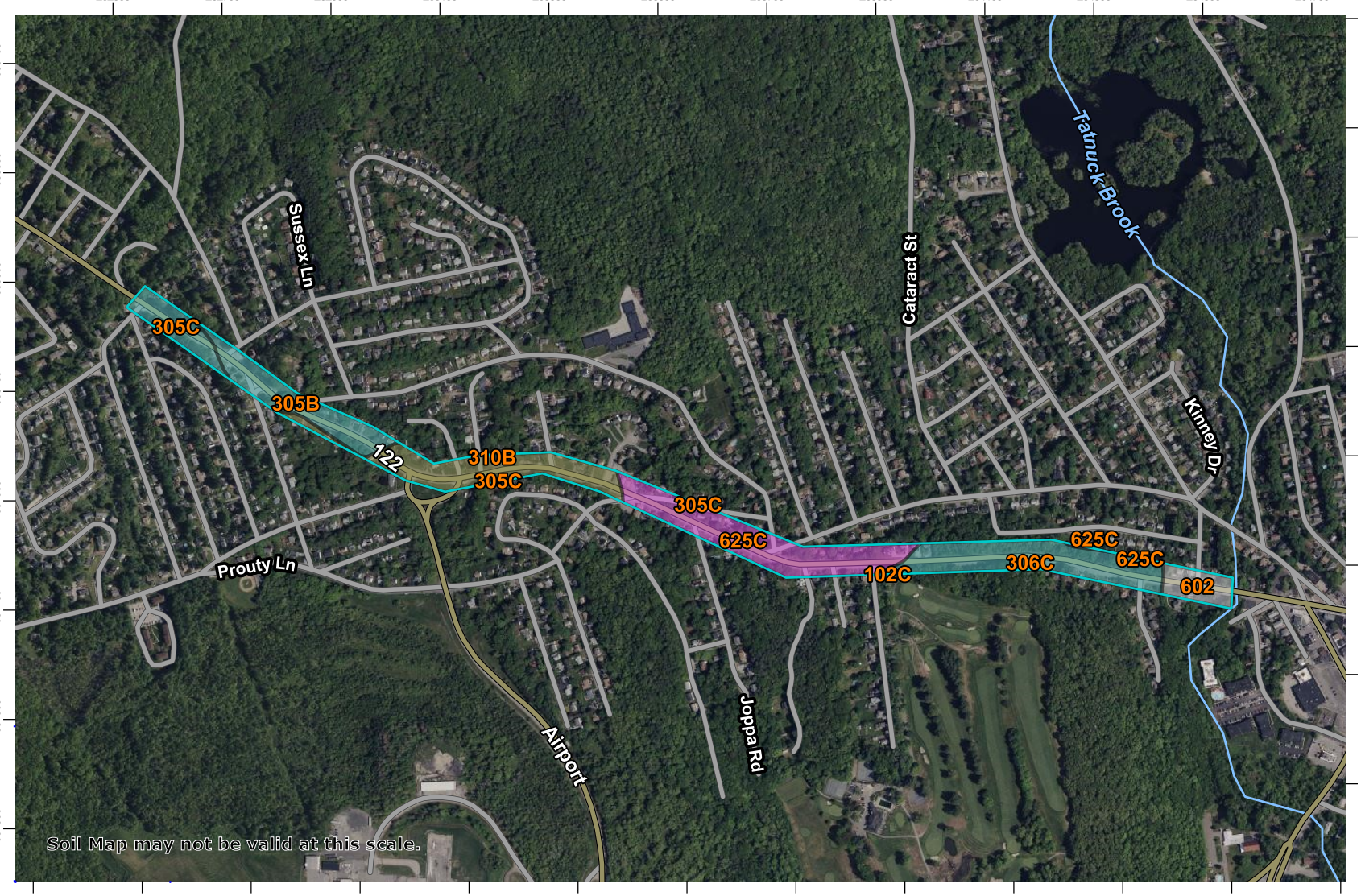
MAP NUMBER 25027C0613E

EFFECTIVE DATE JULY 4, 2011

Federal Emergency Management Agency

A00862441

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



Proposal No. 610535-134928

A00862 - 47

71° 52' 58" W — 71° 51' 11" W

42° 17' 17" N — 42° 16' 25" N

262500 262700 262900 263100 263300 263500 263700 263900 264100 264300 264500 264700

4685700 4685500 4685300 4685100 4684900 4684700 4684500 4684300

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

A00862 - 48

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.

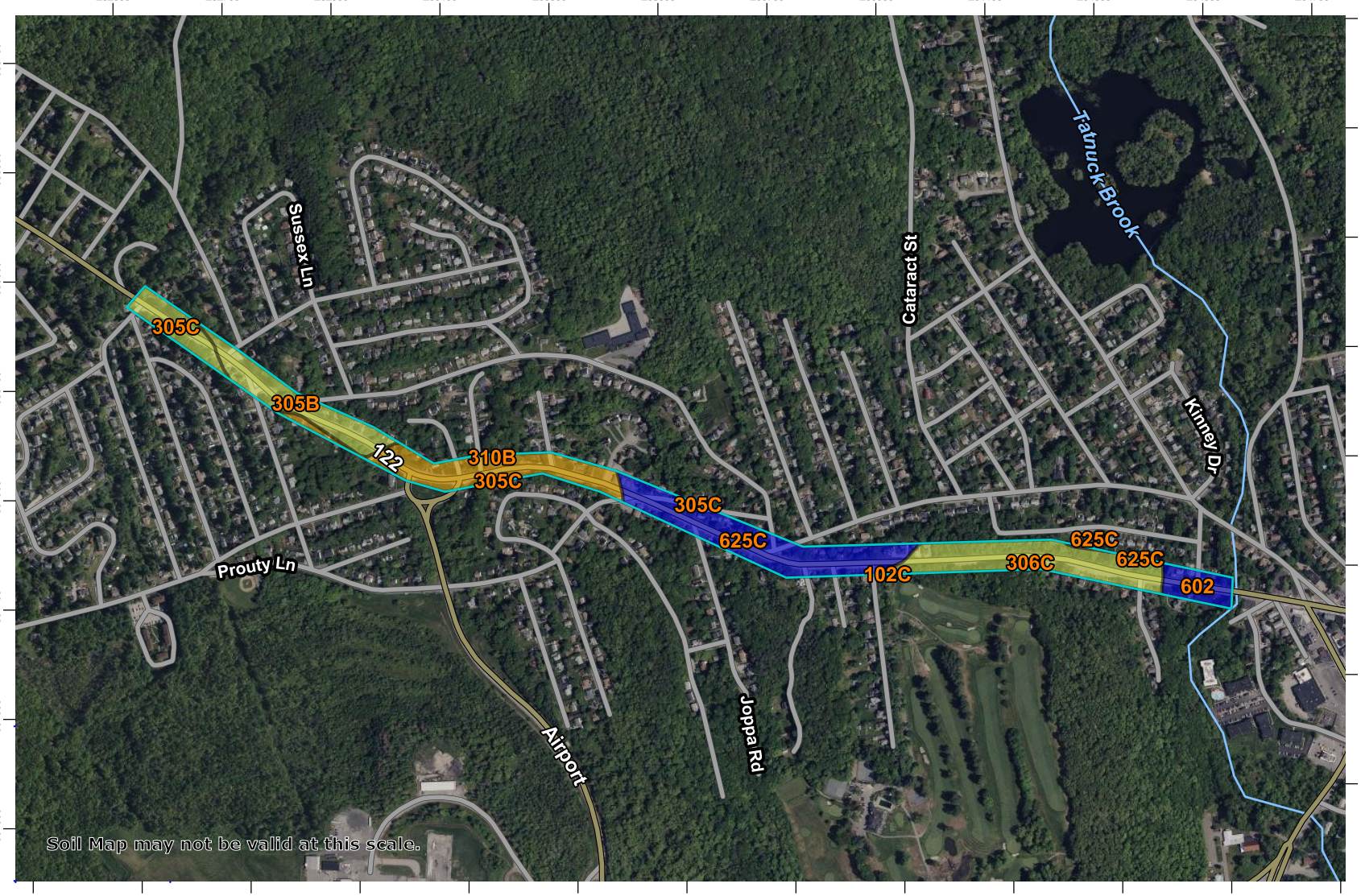
Rating Options

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

A00862 - 51

Proposal No. 610535-134928

A00862 - 52

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)

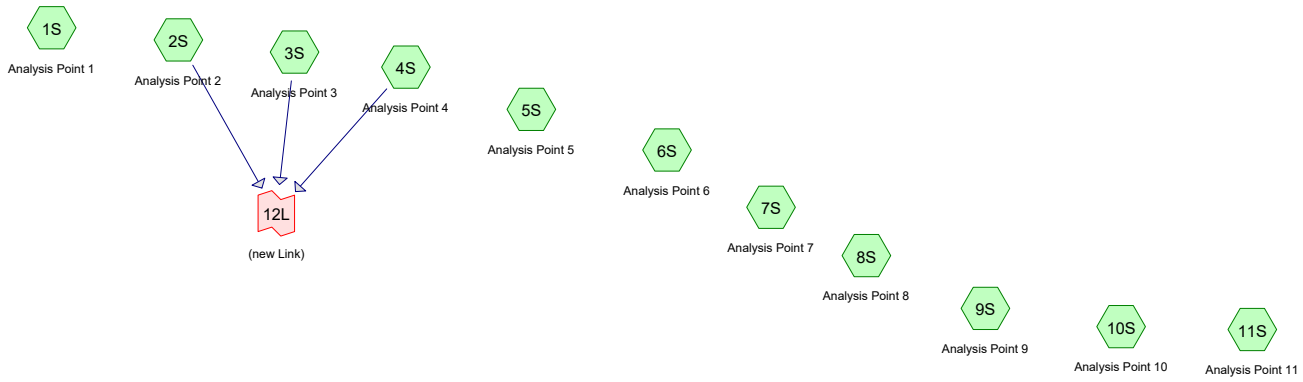
D_{WQ} = Water Quality Depth: one-inch for discharges within a Zone II or Interim Wellhead Protection Area, to or near another critical area, runoff from a LUHPPL, or exfiltration to soils with infiltration rate greater than 2.4 inches/hour or greater; ½-inch for discharges near or to other areas.

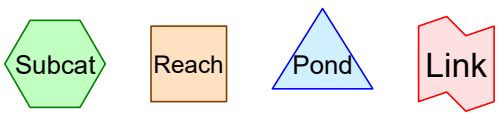
A_{IMP} = Increase in Impervious Area (SF)

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
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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**

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

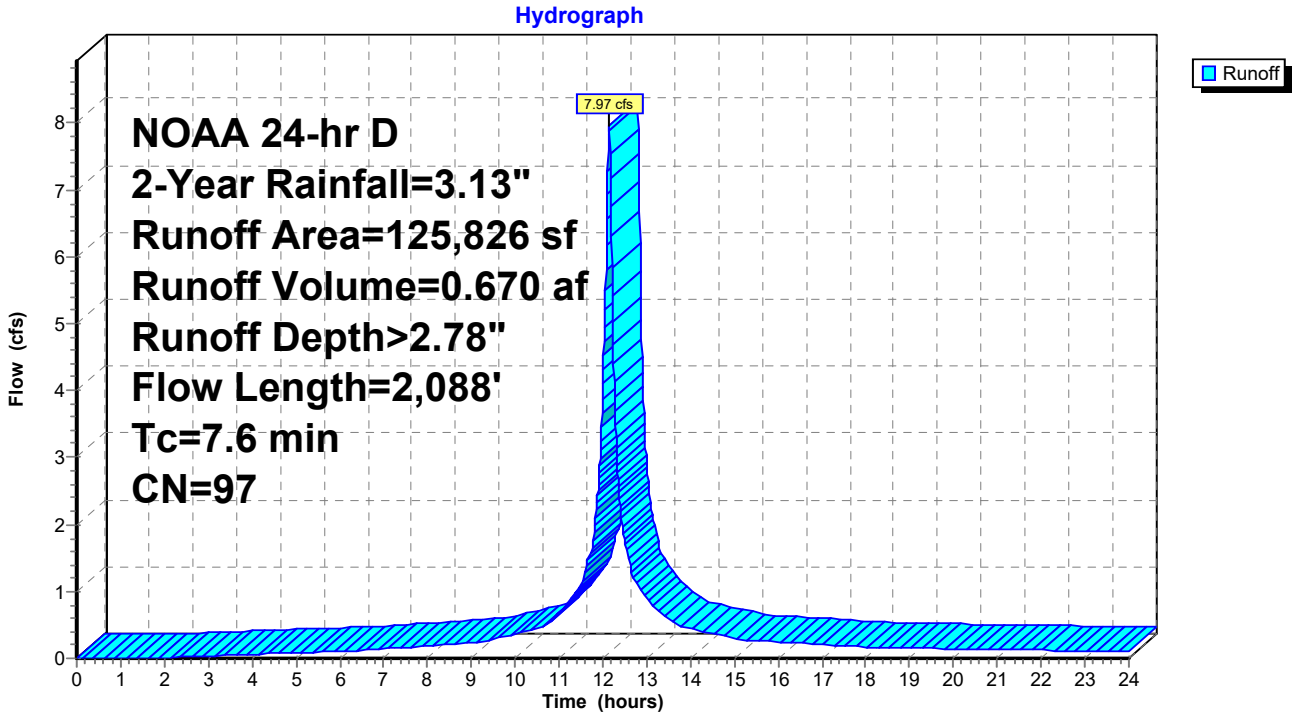
Runoff = 7.97 cfs @ 12.15 hrs, Volume= 0.670 af, Depth> 2.78"

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

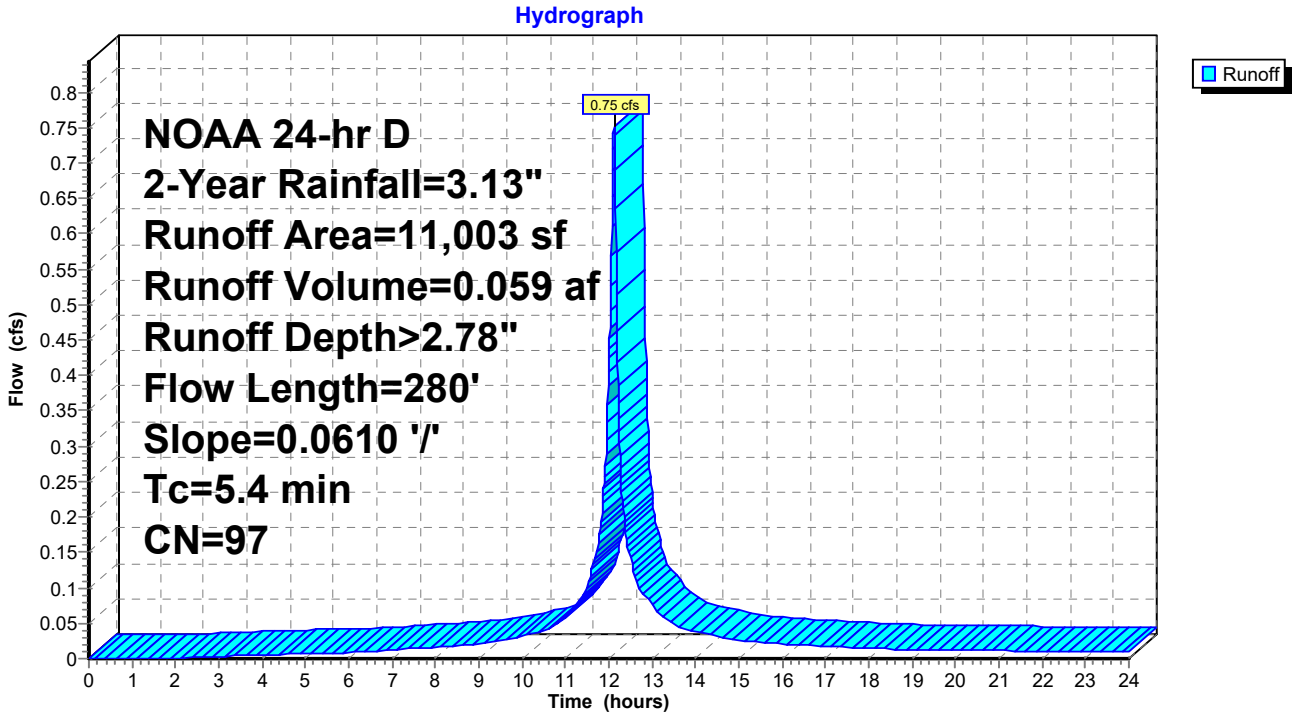
Runoff = 0.75 cfs @ 12.12 hrs, Volume= 0.059 af, Depth> 2.78"

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

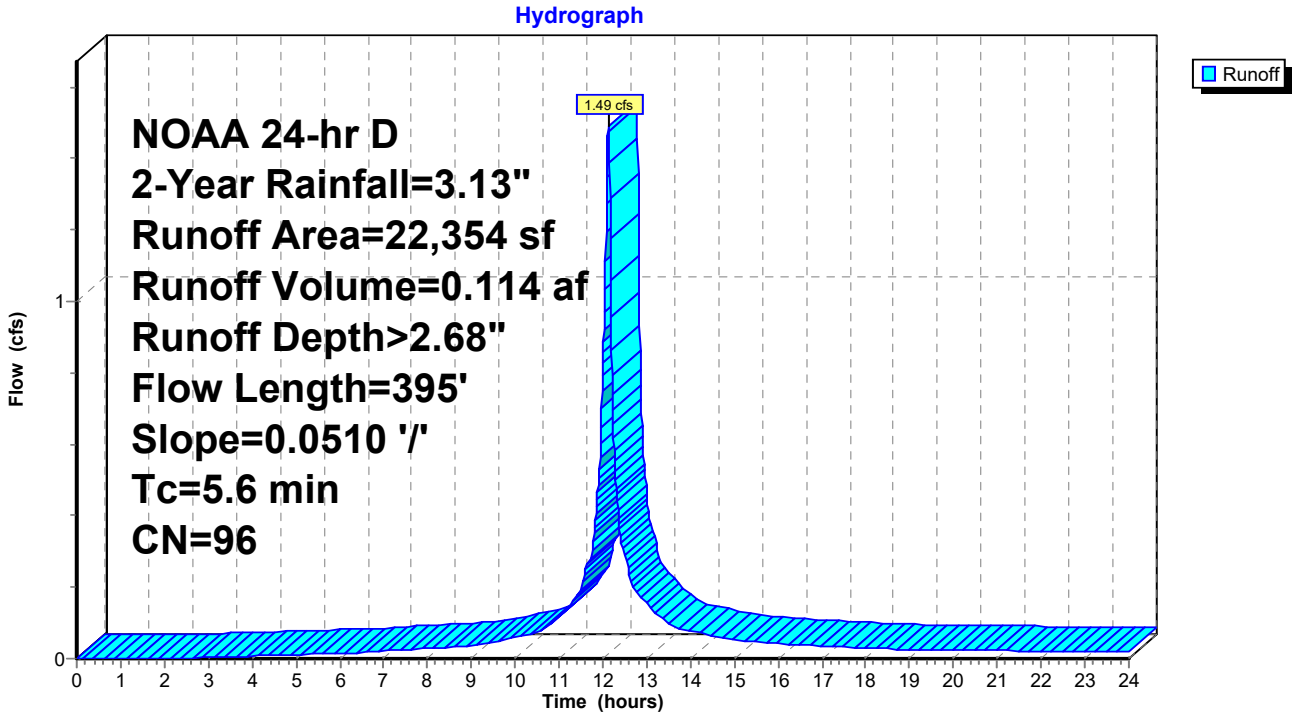
Runoff = 1.49 cfs @ 12.13 hrs, Volume= 0.114 af, Depth> 2.68"

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

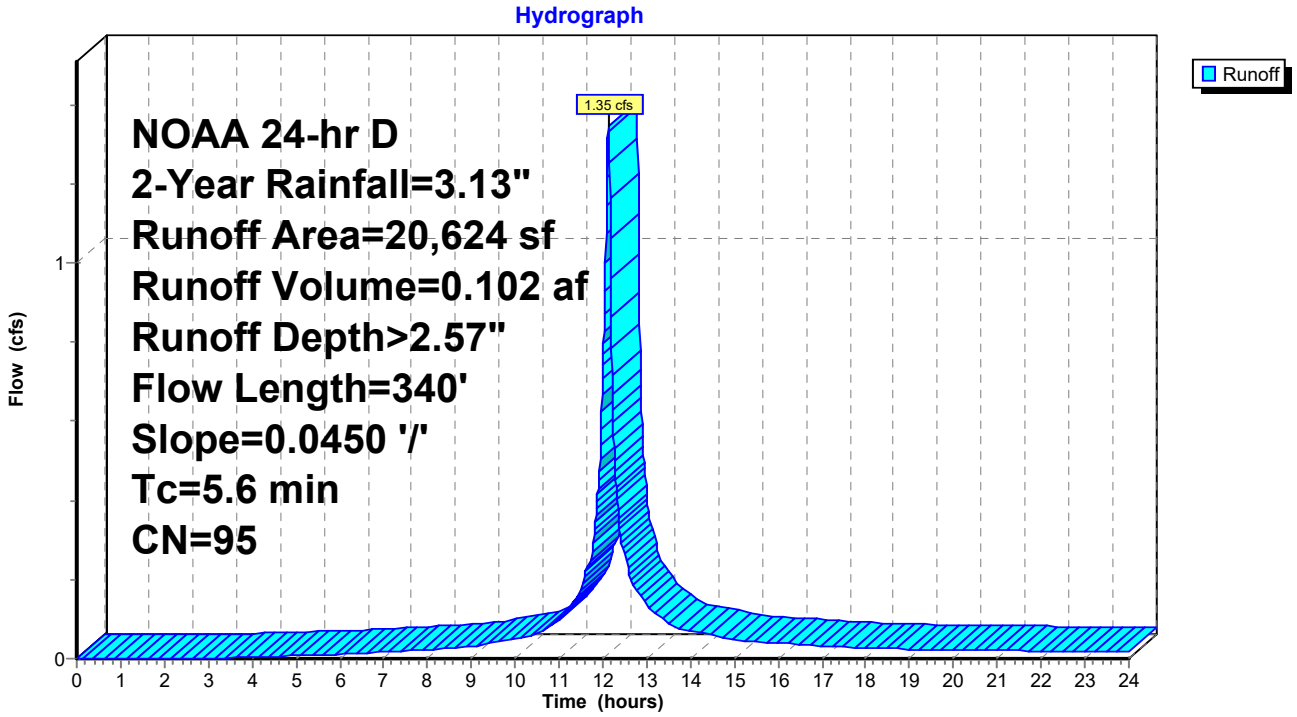
Runoff = 1.35 cfs @ 12.13 hrs, Volume= 0.102 af, Depth> 2.57"

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

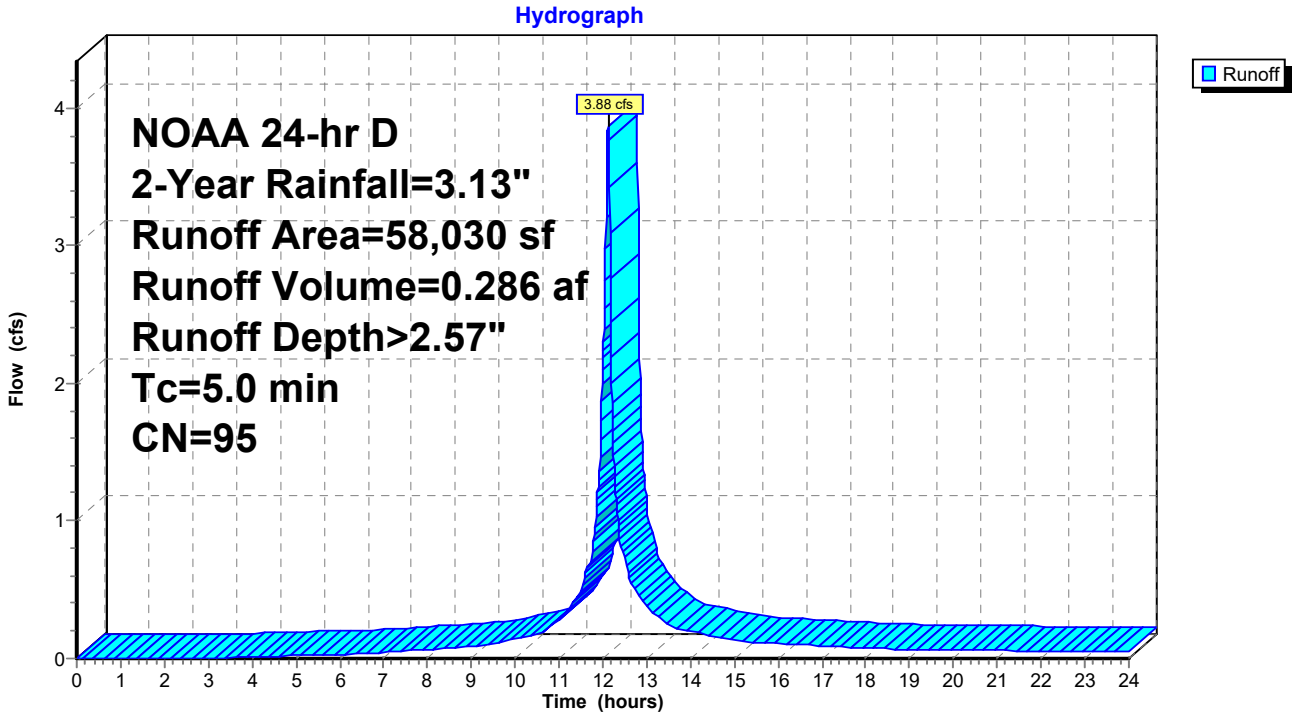
Runoff = 3.88 cfs @ 12.12 hrs, Volume= 0.286 af, Depth> 2.57"

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

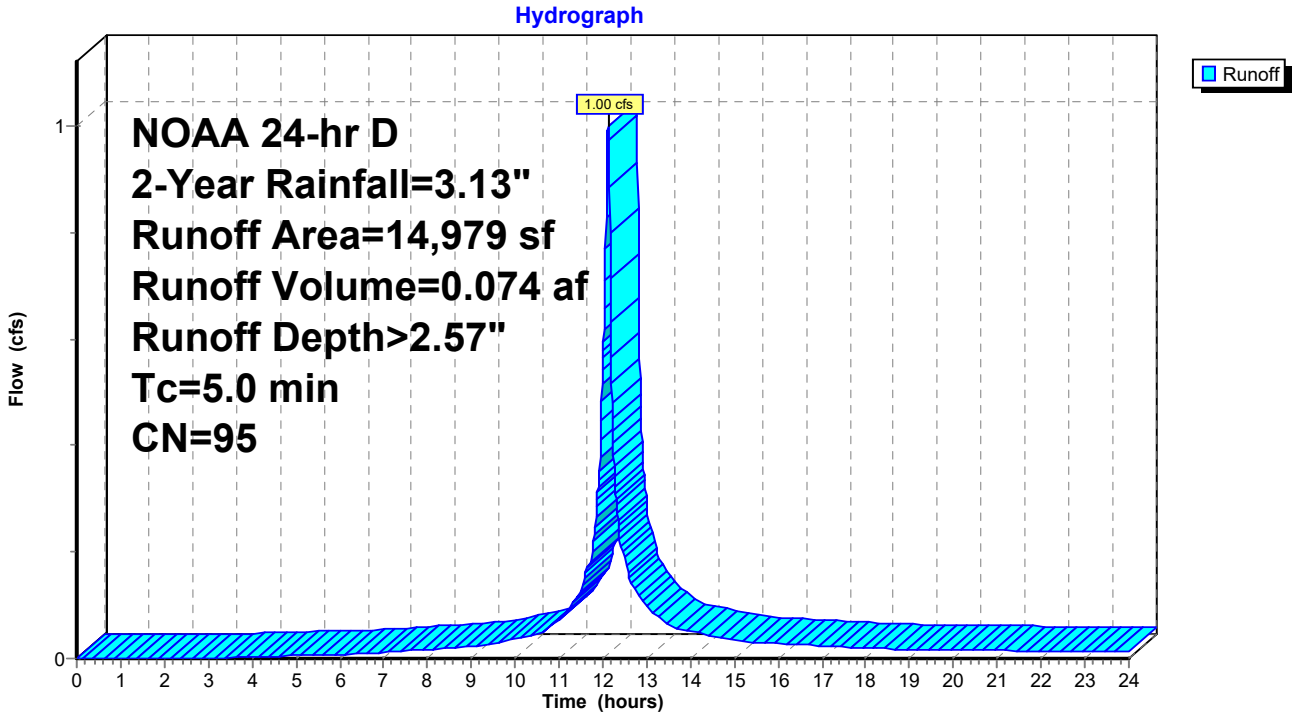
Runoff = 1.00 cfs @ 12.12 hrs, Volume= 0.074 af, Depth> 2.57"

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

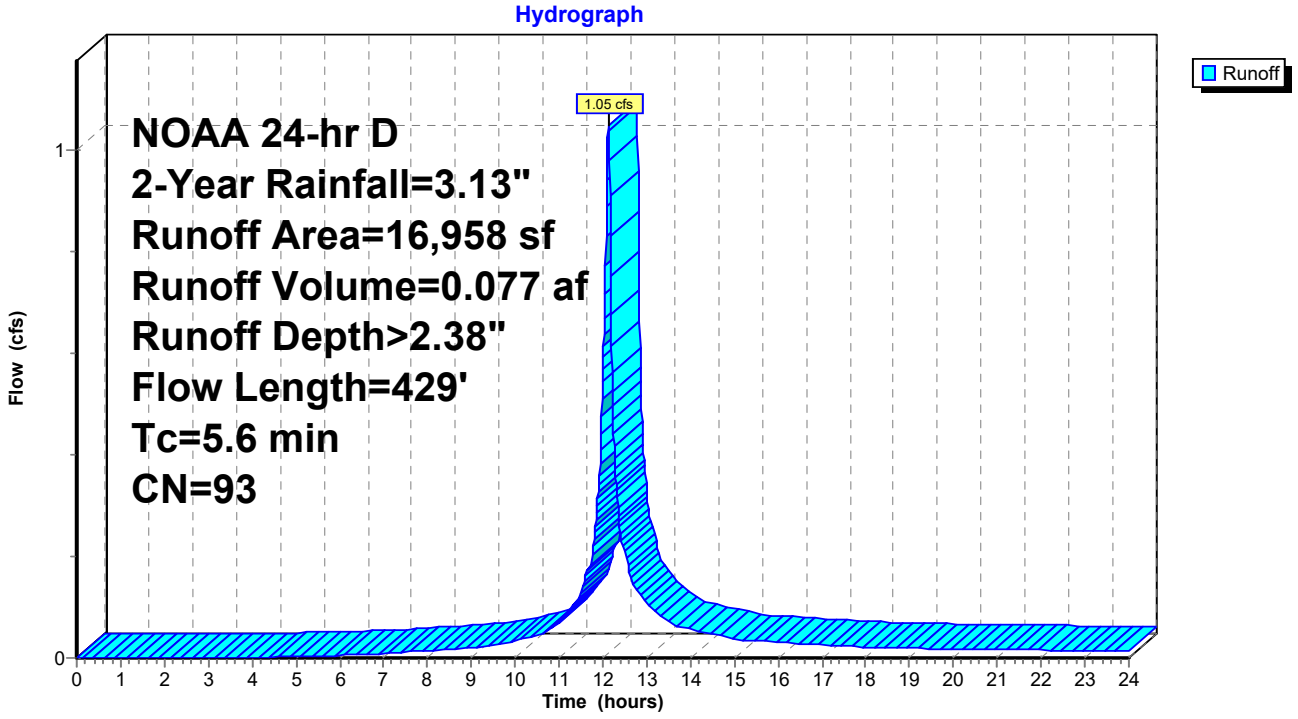
Runoff = 1.05 cfs @ 12.13 hrs, Volume= 0.077 af, Depth> 2.38"

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

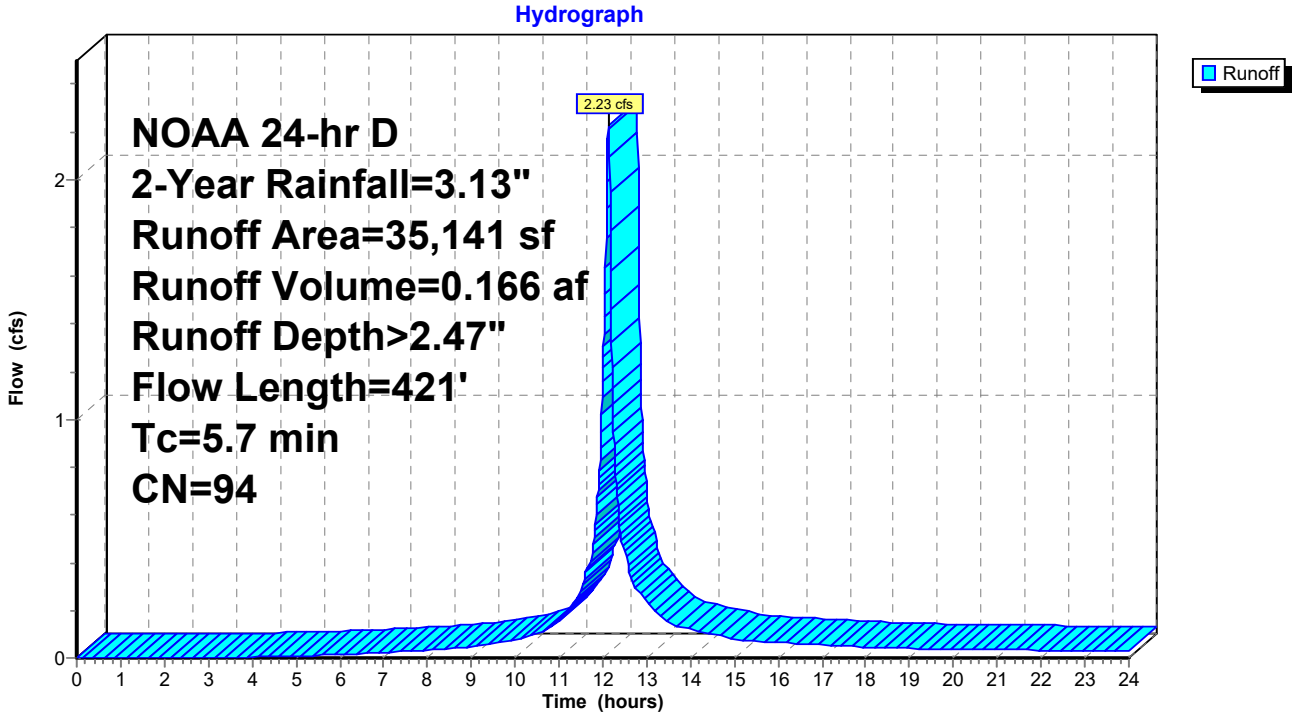
Runoff = 2.23 cfs @ 12.13 hrs, Volume= 0.166 af, Depth> 2.47"

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

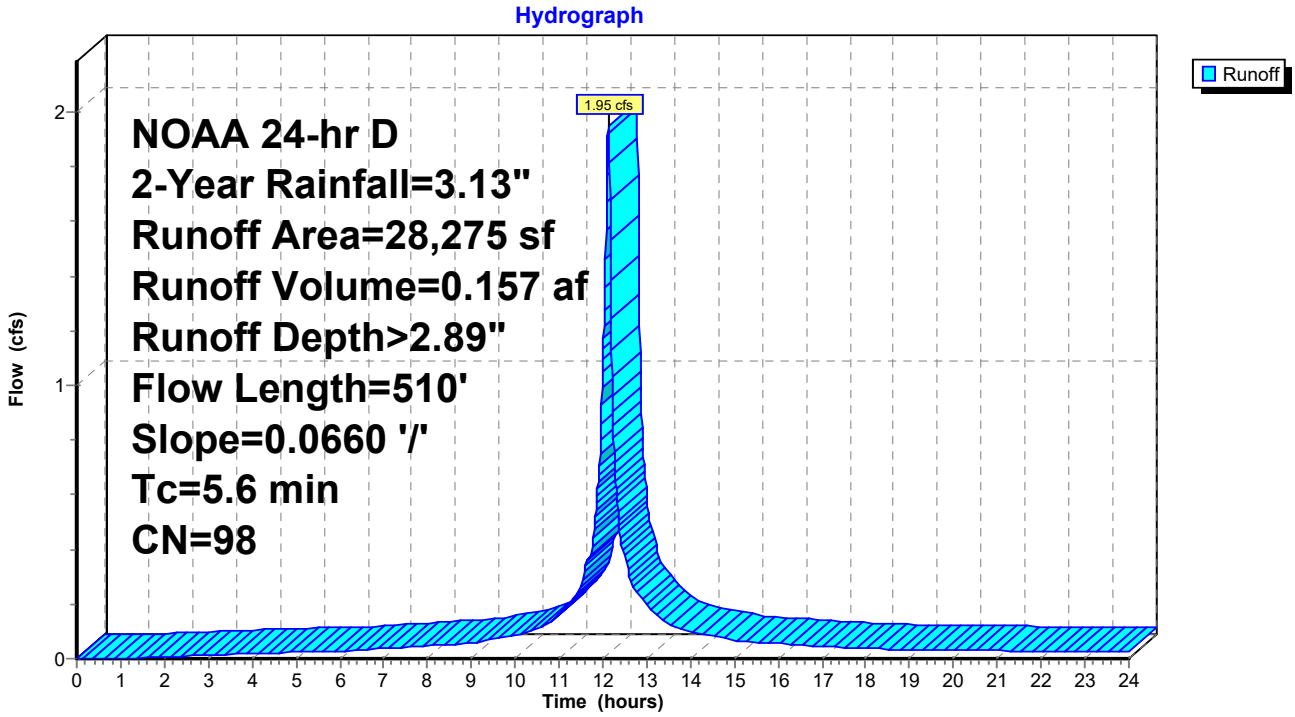
Runoff = 1.95 cfs @ 12.13 hrs, Volume= 0.157 af, Depth> 2.89"

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

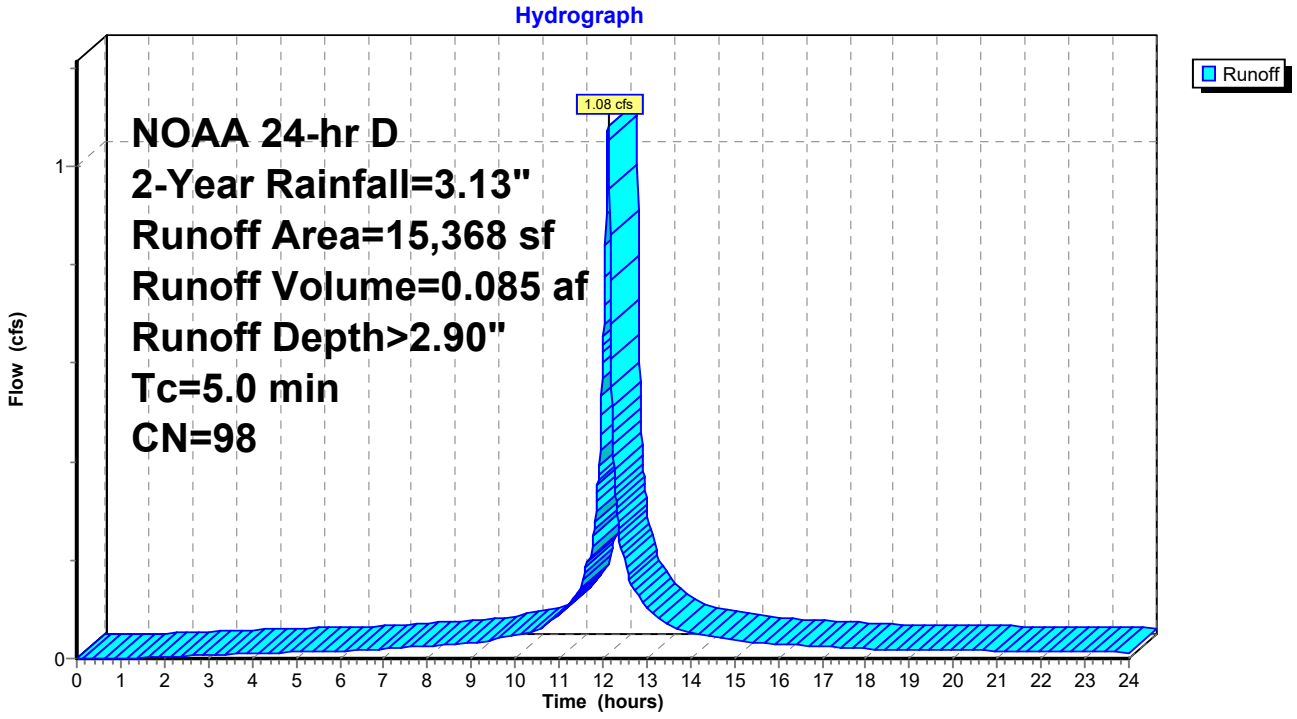
Runoff = 1.08 cfs @ 12.12 hrs, Volume= 0.085 af, Depth> 2.90"

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

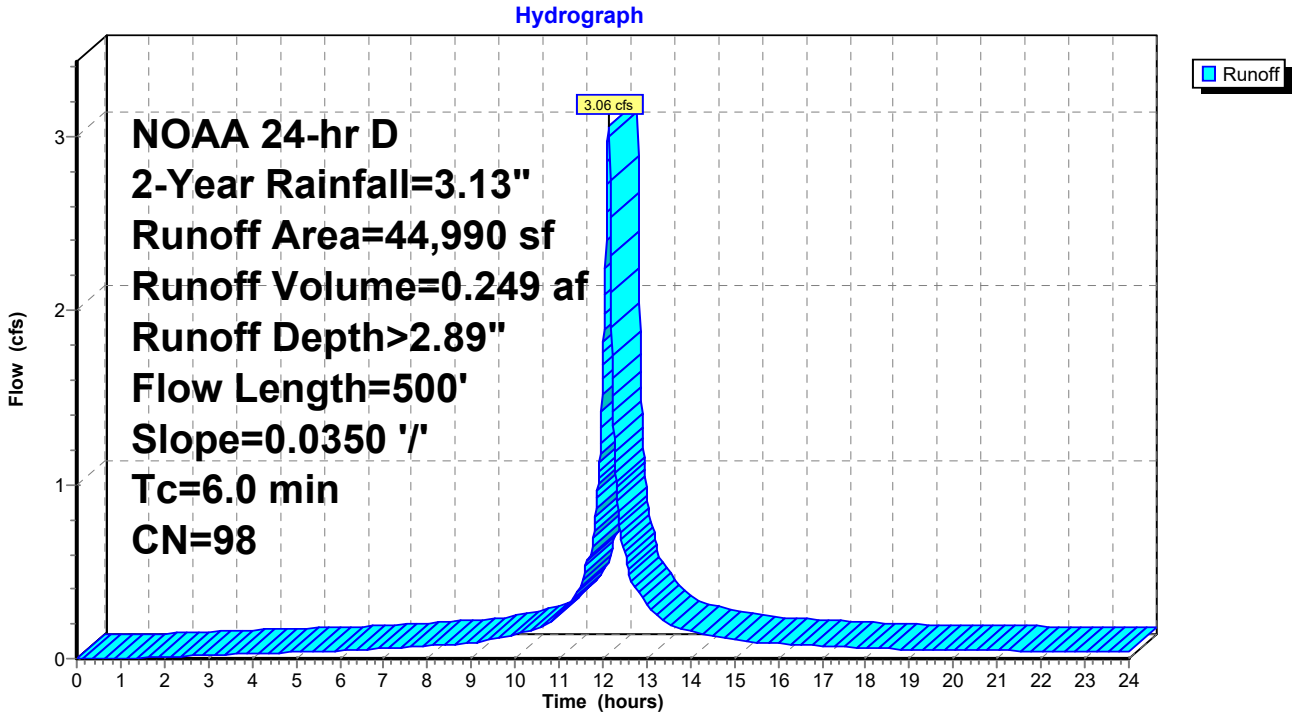
Runoff = 3.06 cfs @ 12.13 hrs, Volume= 0.249 af, Depth> 2.89"

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

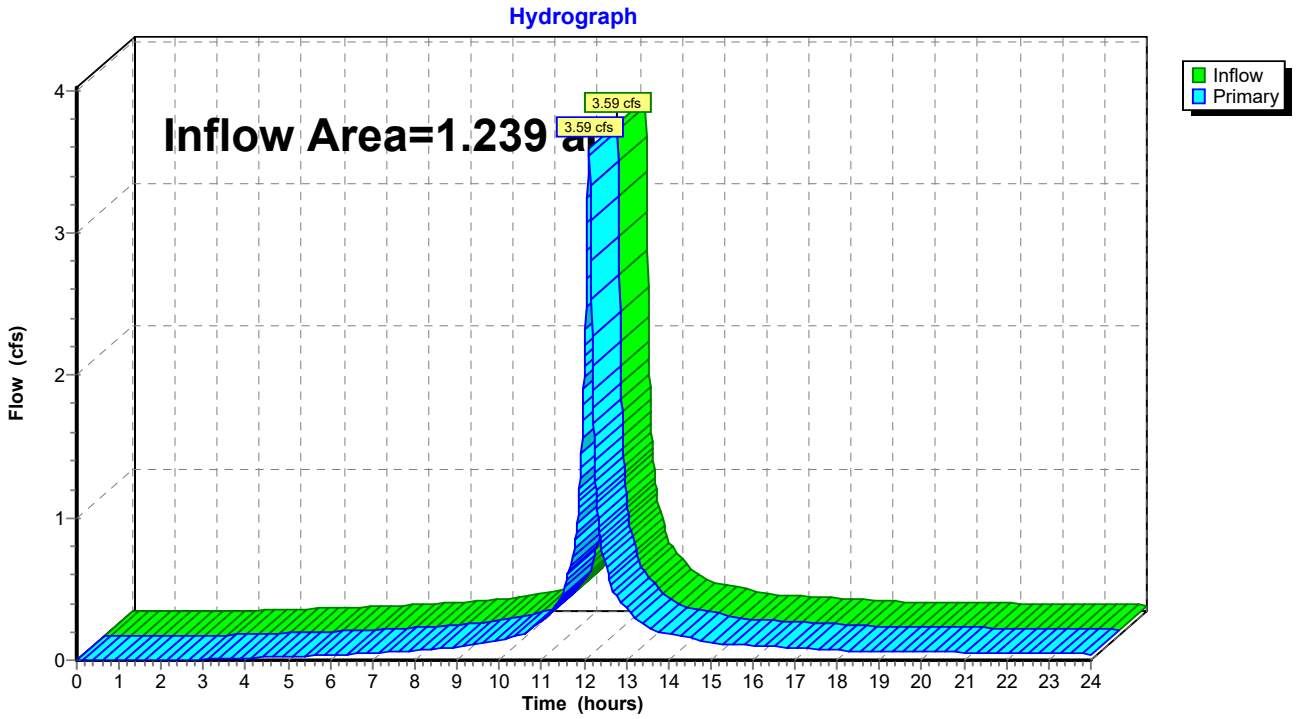


Summary for Link 12L: (new Link)

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

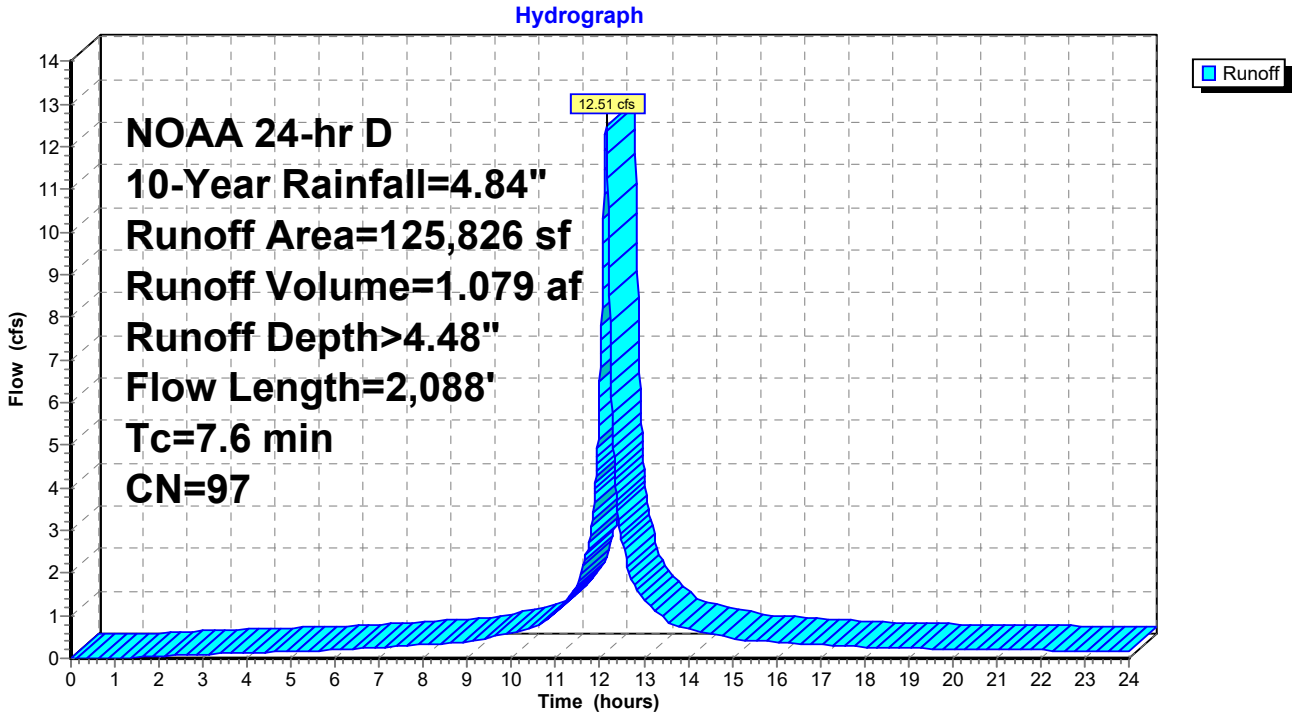
Runoff = 12.51 cfs @ 12.15 hrs, Volume= 1.079 af, Depth> 4.48"

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

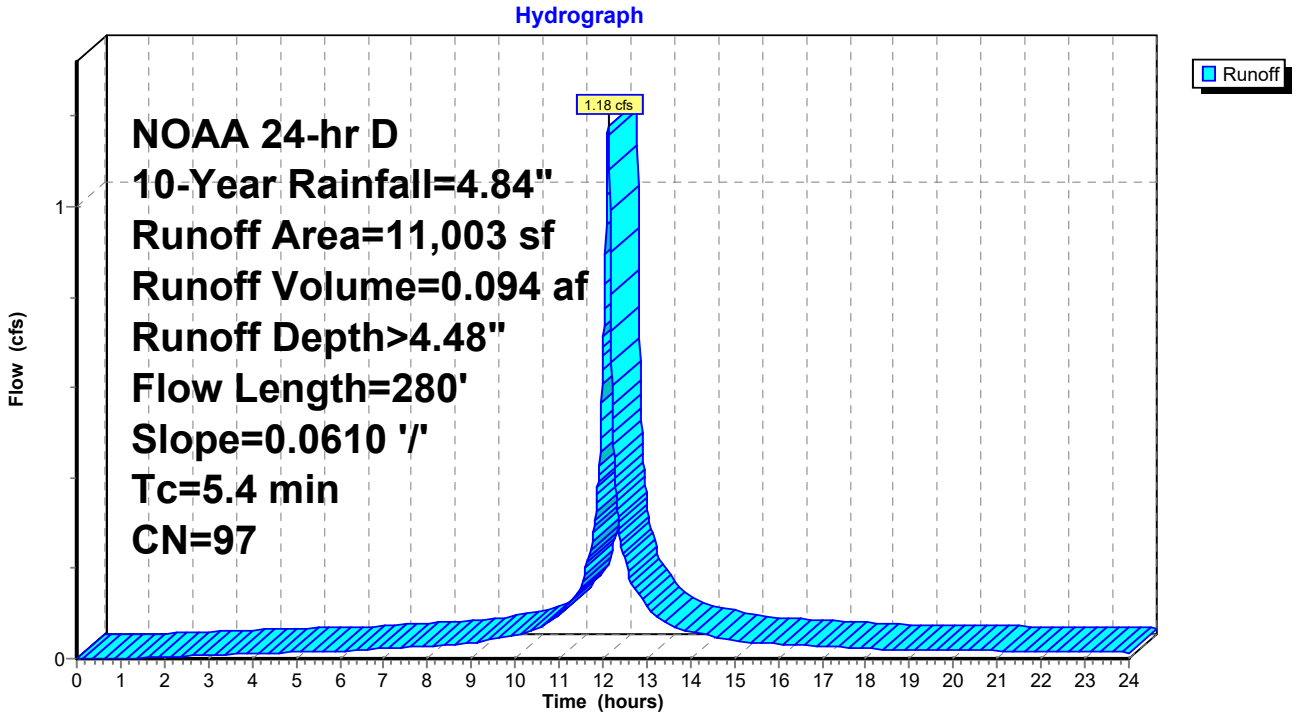
Runoff = 1.18 cfs @ 12.12 hrs, Volume= 0.094 af, Depth> 4.48"

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

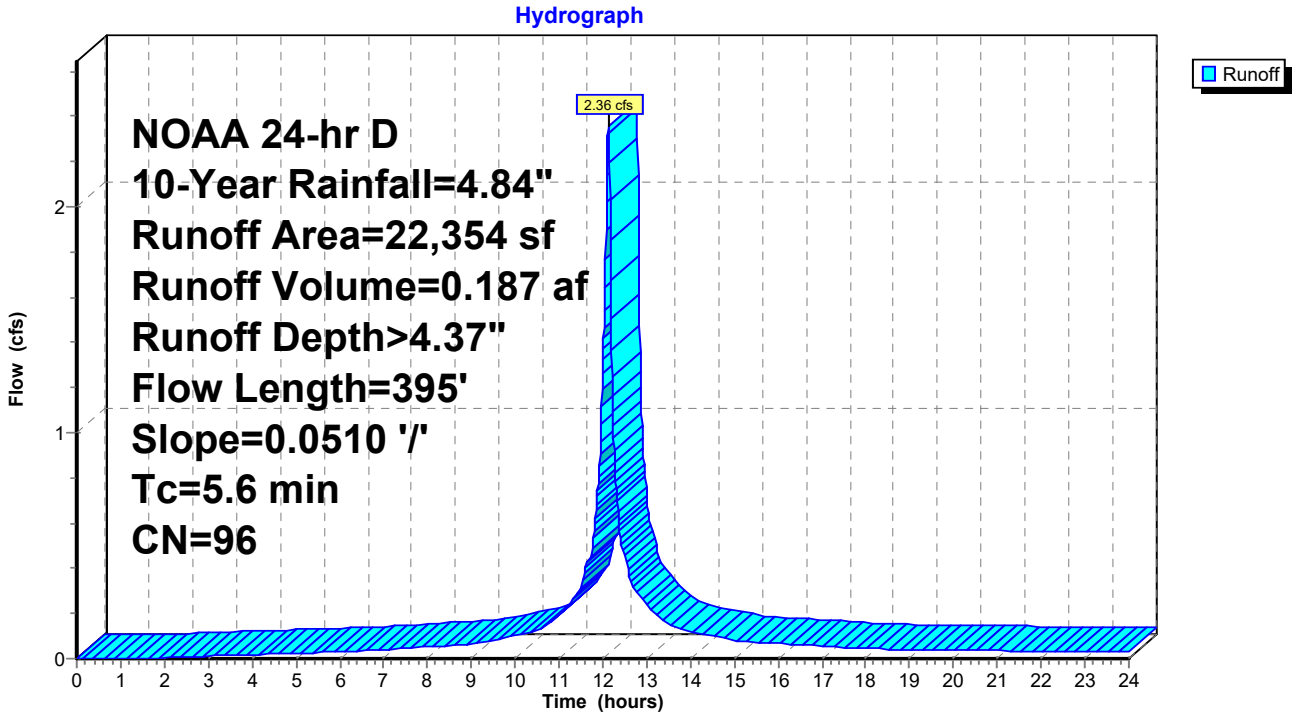
Runoff = 2.36 cfs @ 12.13 hrs, Volume= 0.187 af, Depth> 4.37"

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

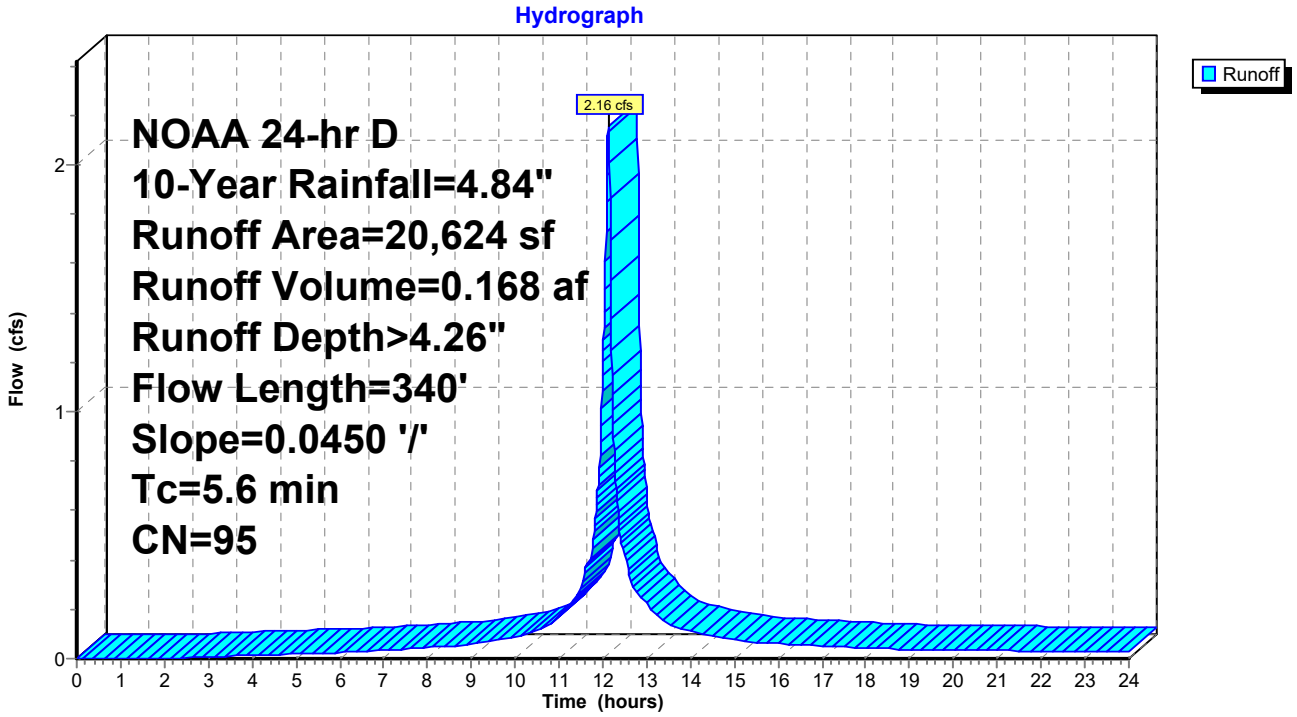
Runoff = 2.16 cfs @ 12.13 hrs, Volume= 0.168 af, Depth> 4.26"

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

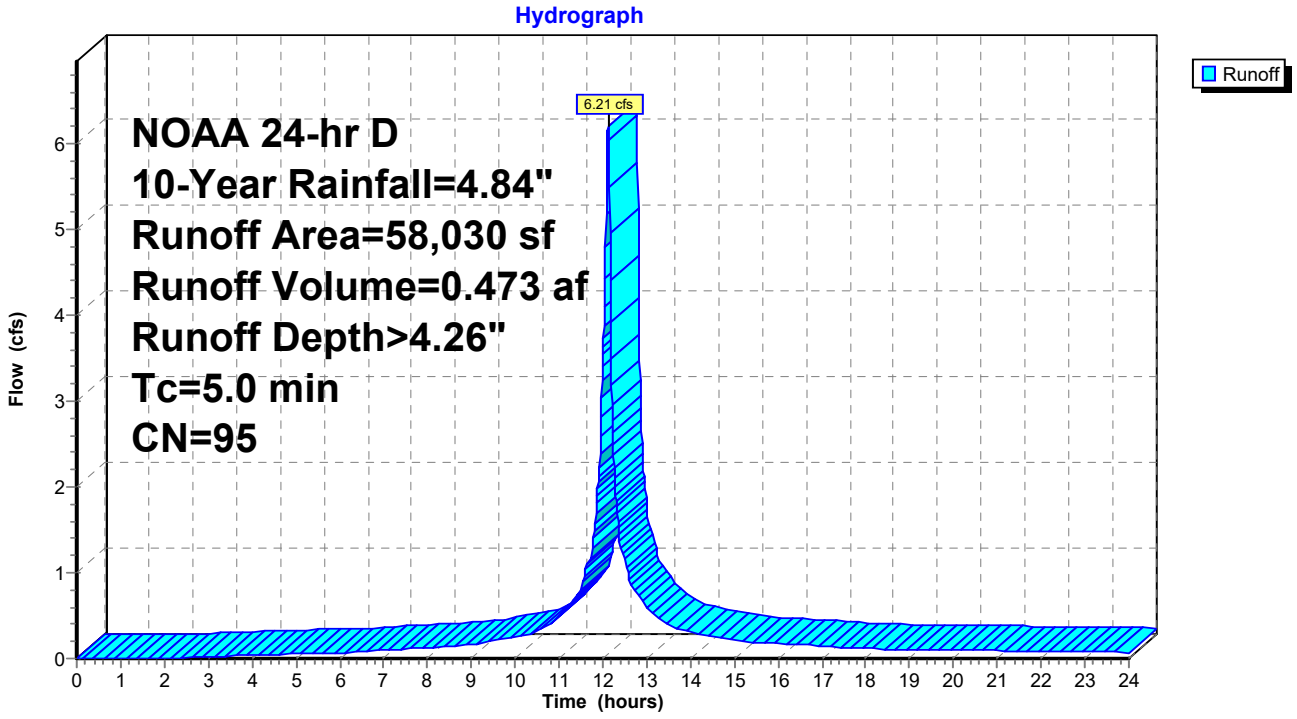
Runoff = 6.21 cfs @ 12.12 hrs, Volume= 0.473 af, Depth> 4.26"

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

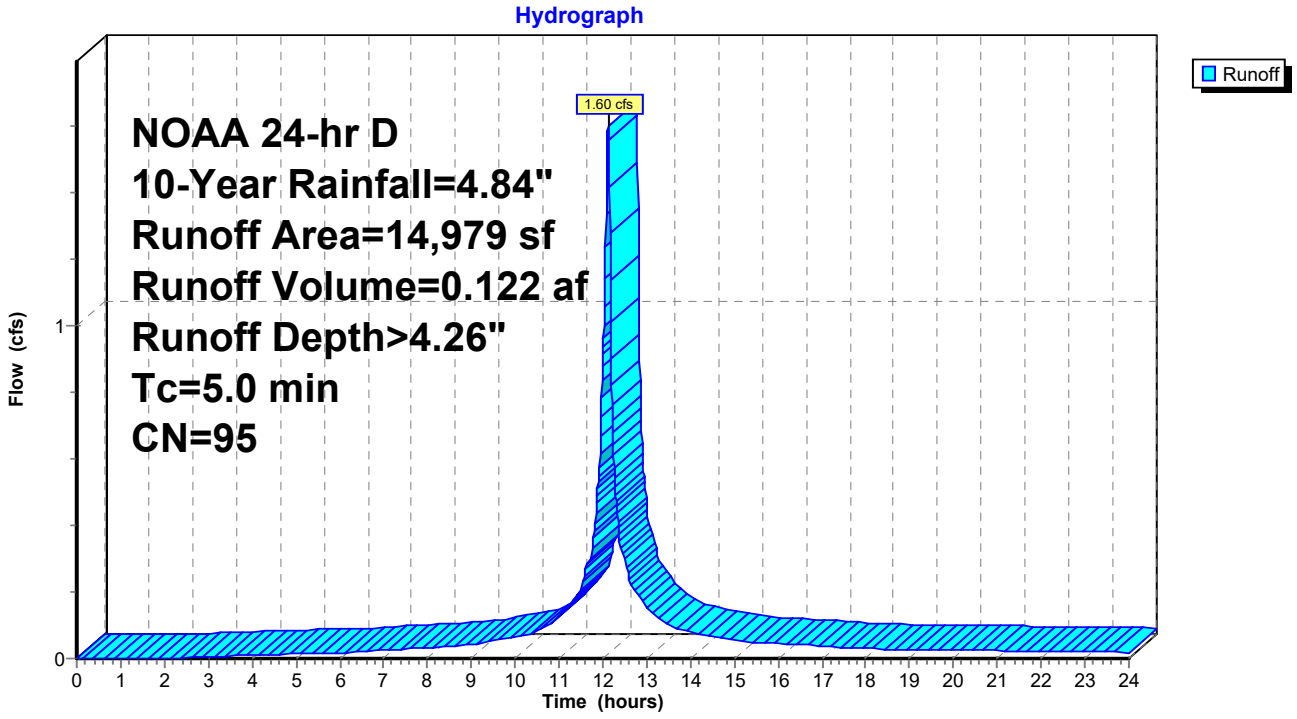
Runoff = 1.60 cfs @ 12.12 hrs, Volume= 0.122 af, Depth> 4.26"

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

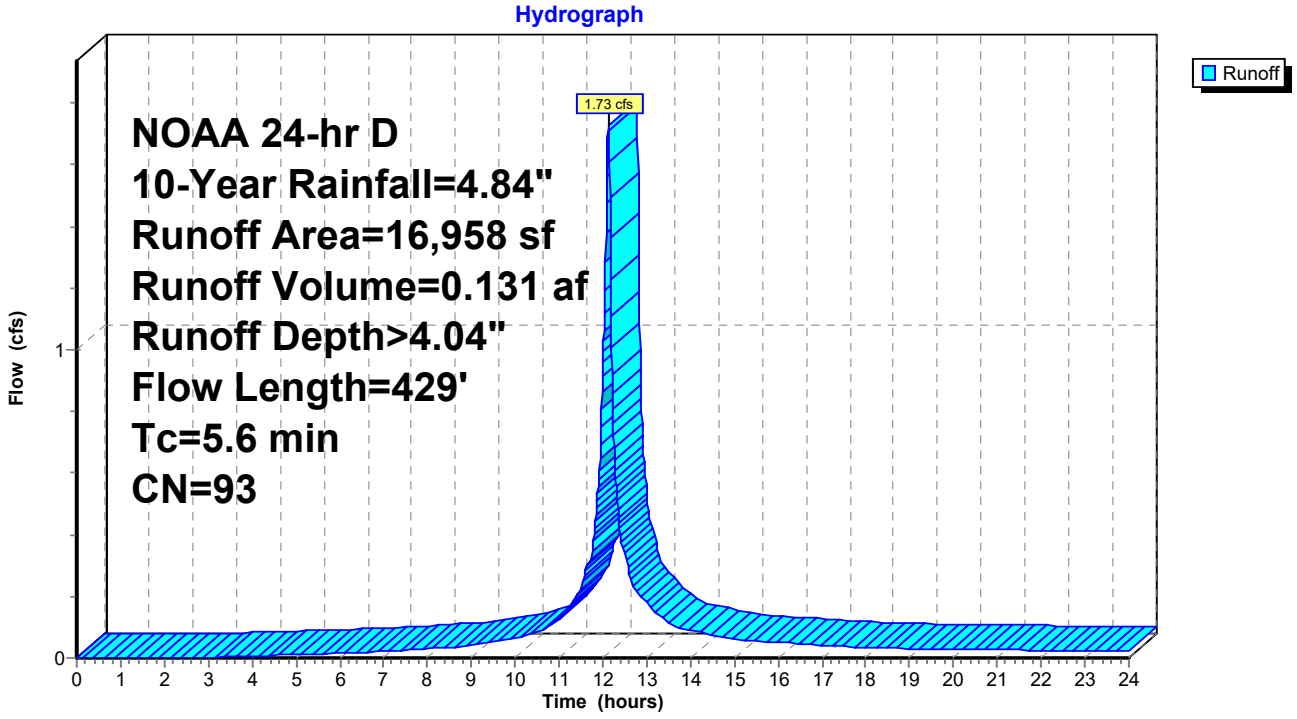
Runoff = 1.73 cfs @ 12.13 hrs, Volume= 0.131 af, Depth> 4.04"

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

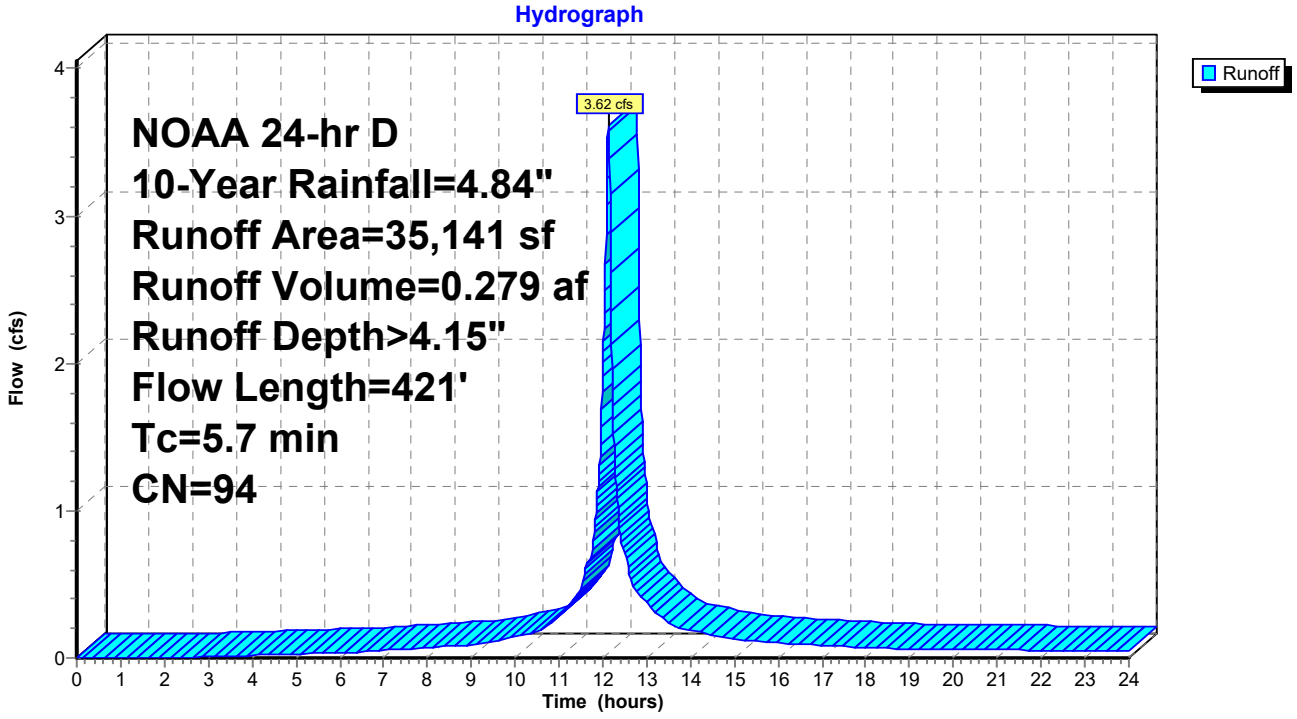
Runoff = 3.62 cfs @ 12.13 hrs, Volume= 0.279 af, Depth> 4.15"

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

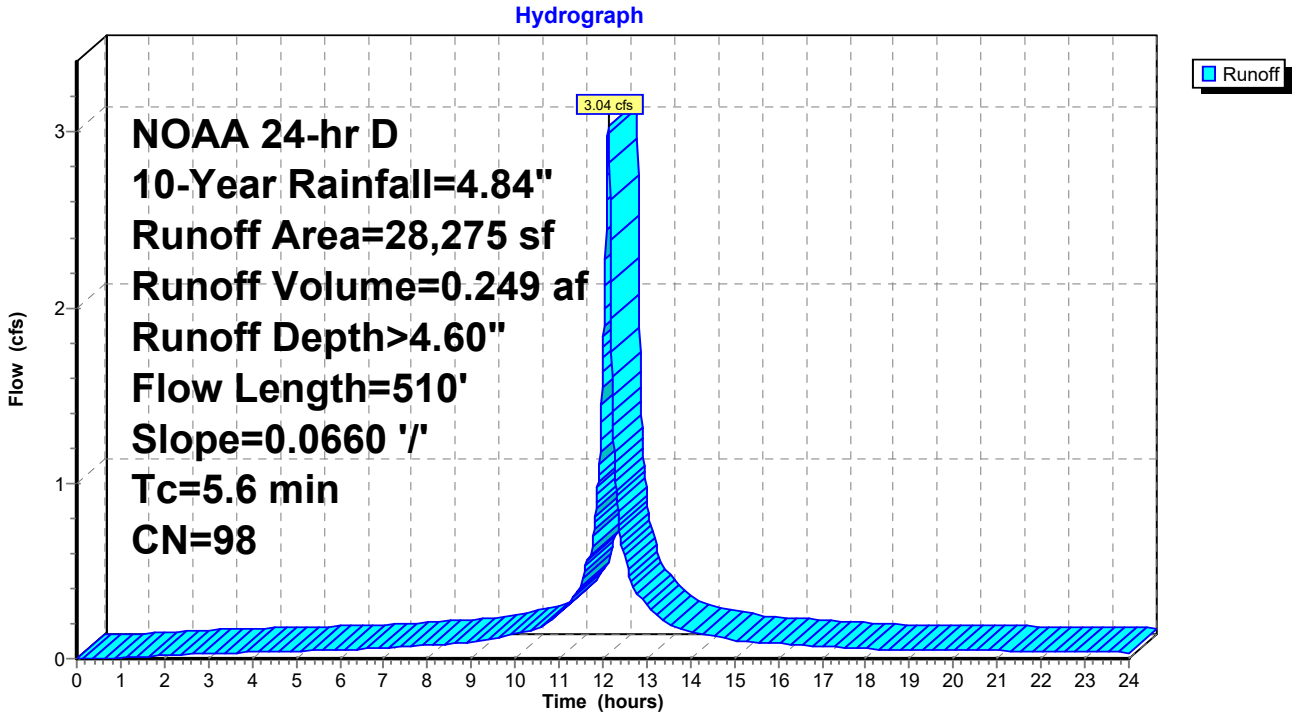
Runoff = 3.04 cfs @ 12.13 hrs, Volume= 0.249 af, Depth> 4.60"

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

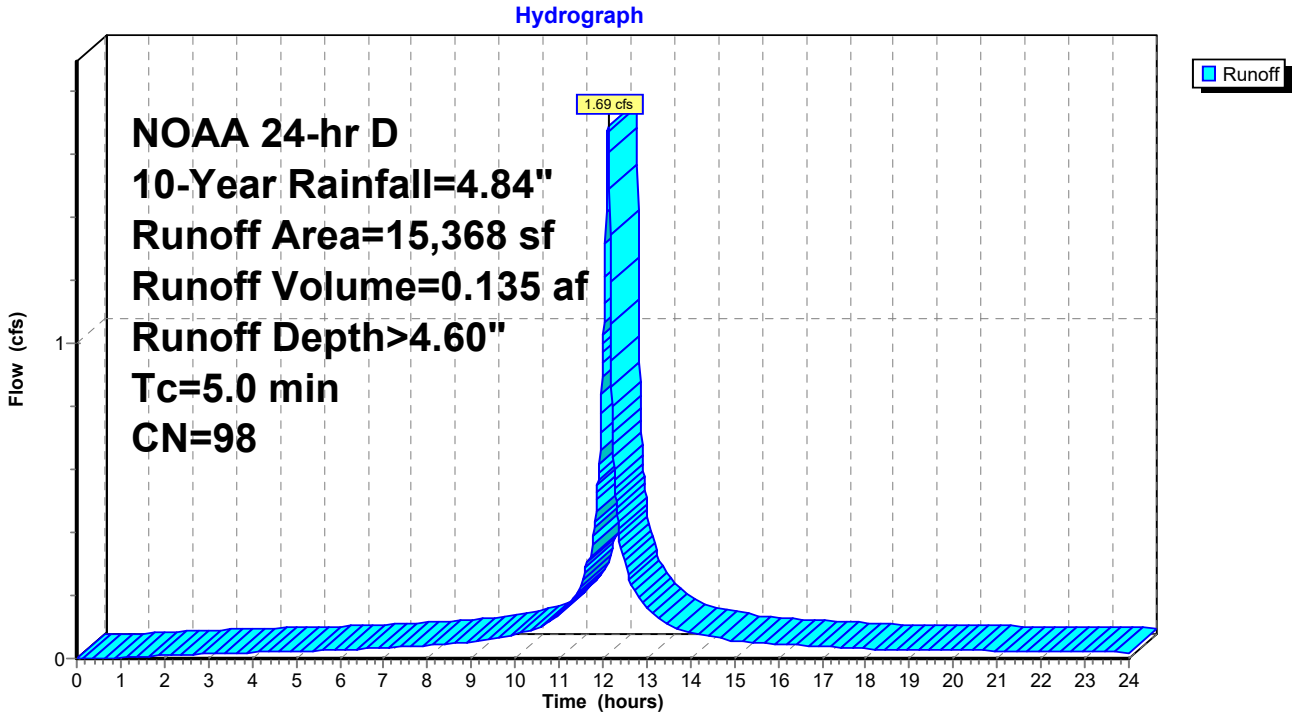
Runoff = 1.69 cfs @ 12.12 hrs, Volume= 0.135 af, Depth> 4.60"

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

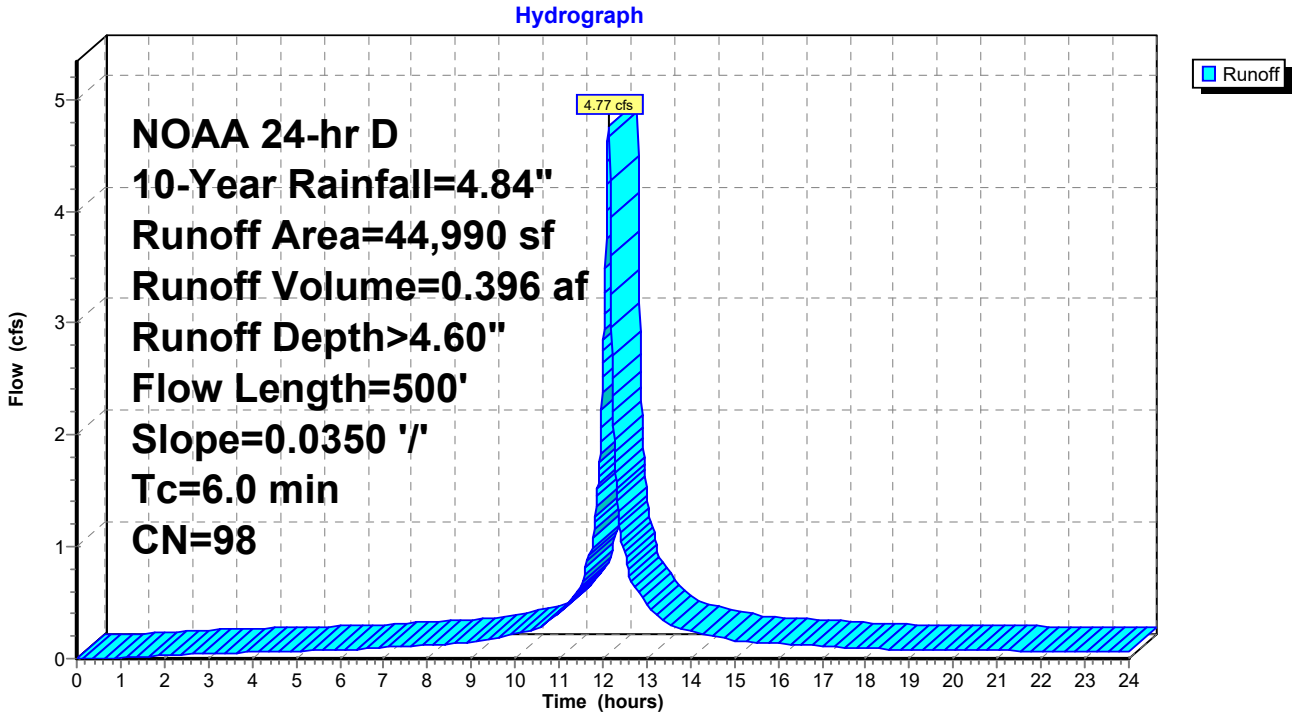
Runoff = 4.77 cfs @ 12.13 hrs, Volume= 0.396 af, Depth> 4.60"

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

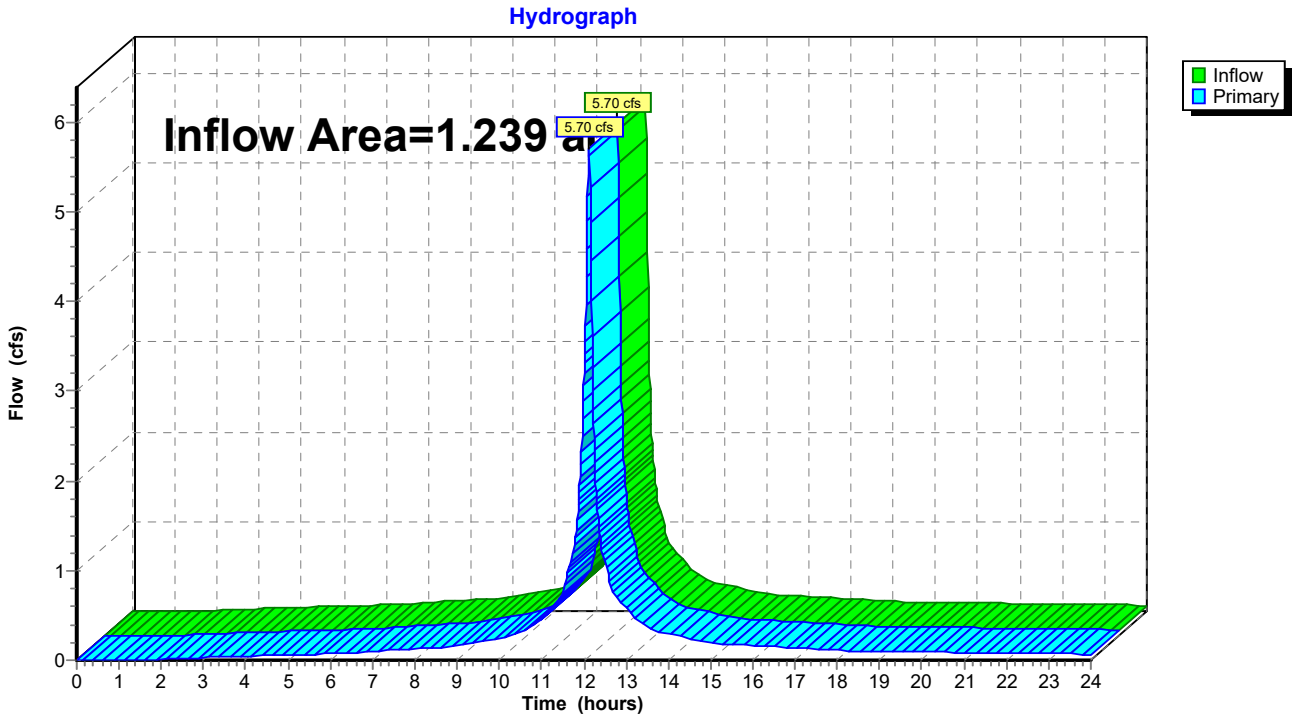


Summary for Link 12L: (new Link)

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

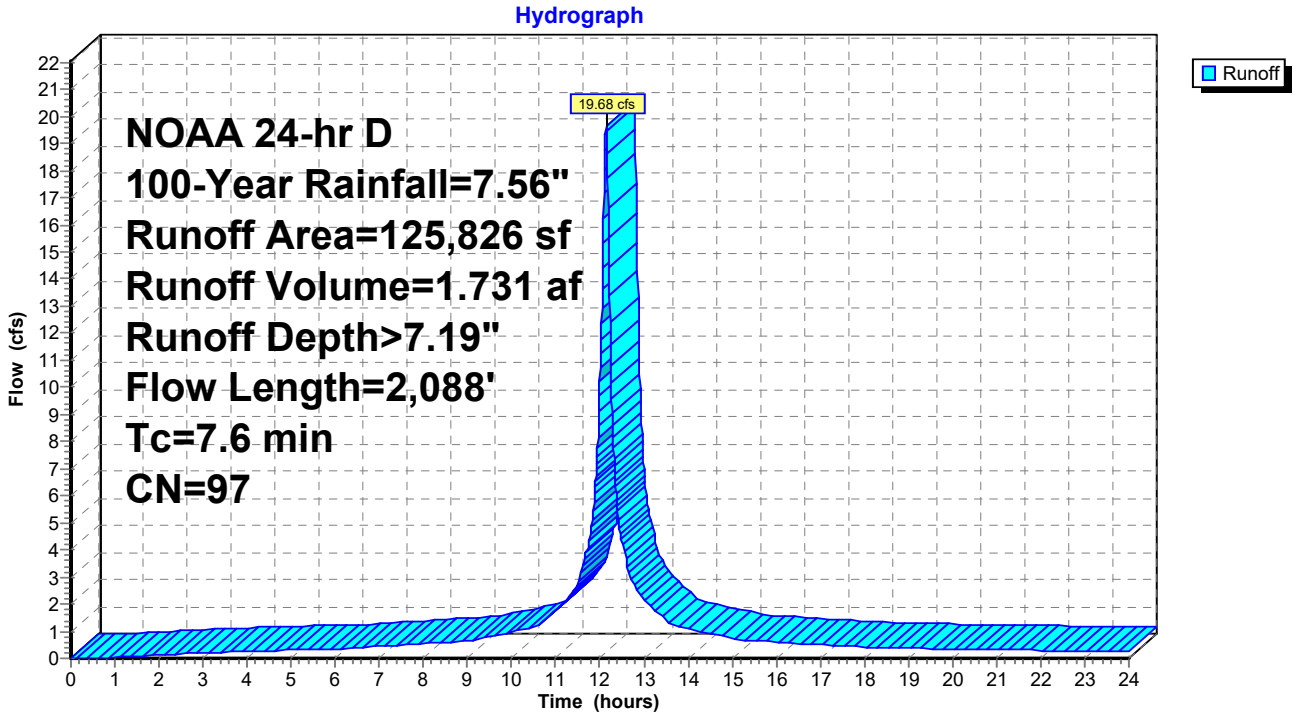
Runoff = 19.68 cfs @ 12.15 hrs, Volume= 1.731 af, Depth> 7.19"

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

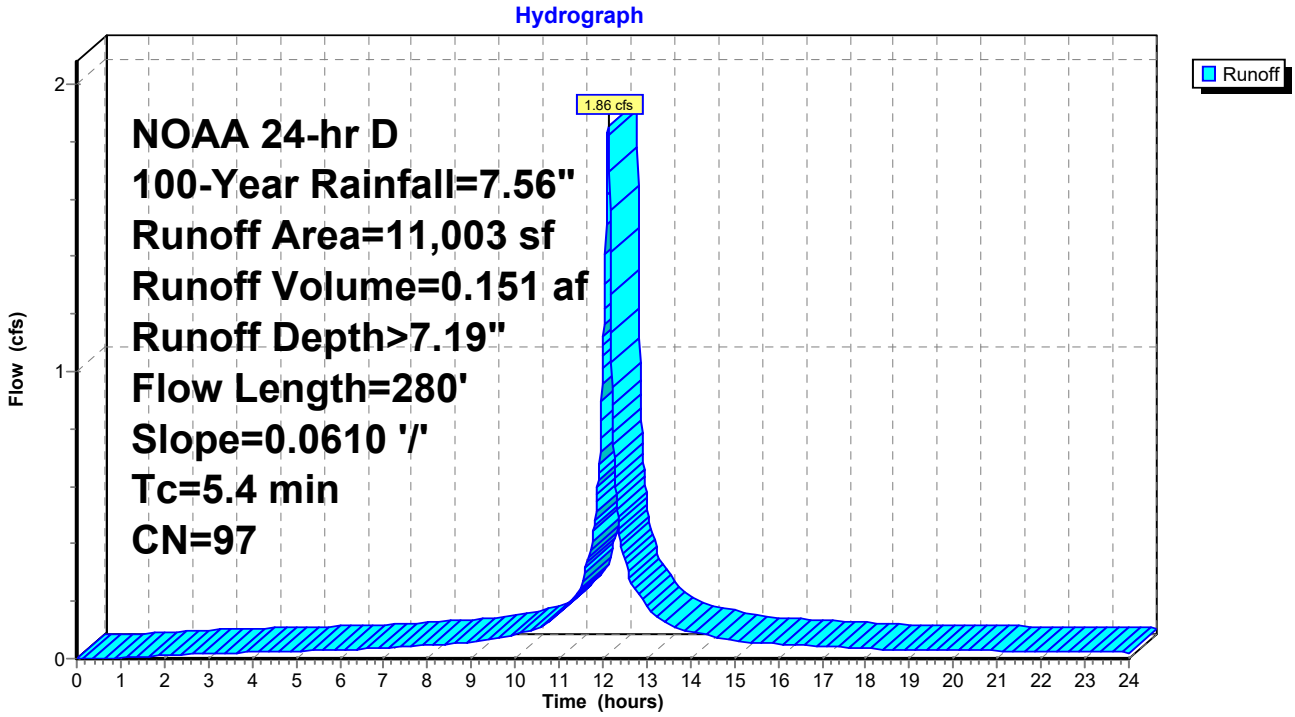
Runoff = 1.86 cfs @ 12.12 hrs, Volume= 0.151 af, Depth> 7.19"

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

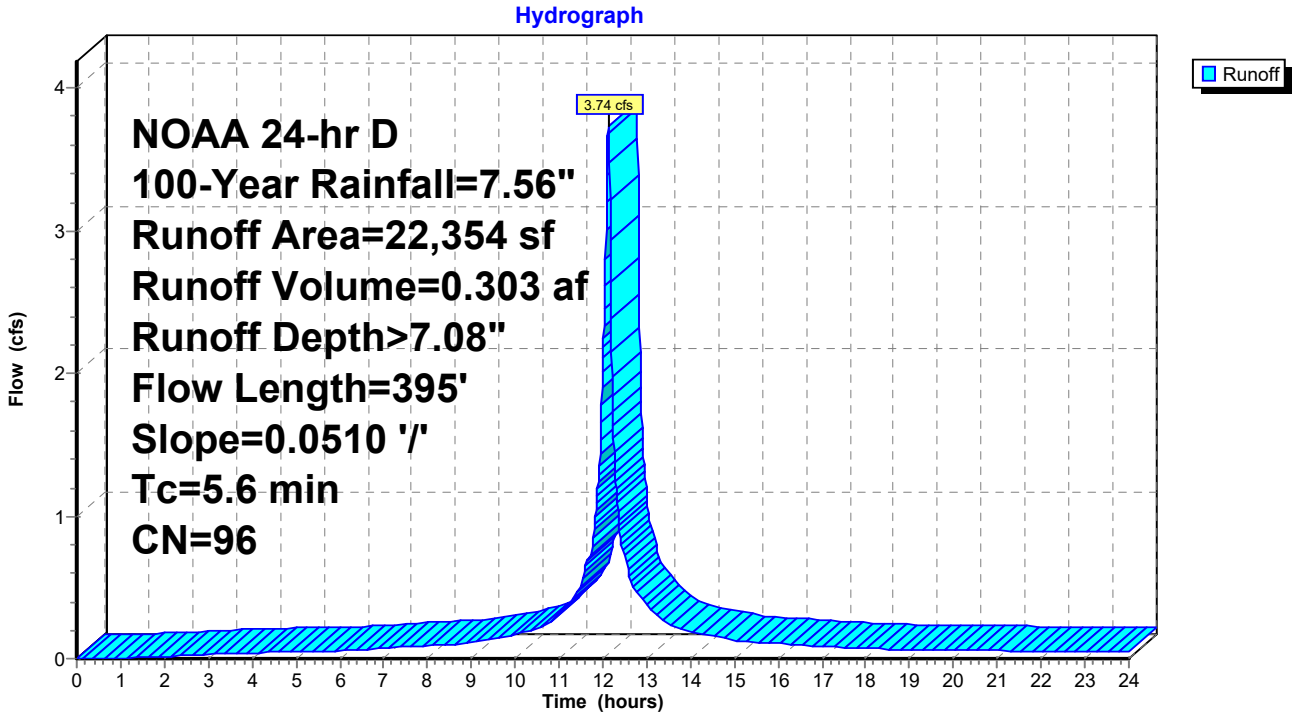
Runoff = 3.74 cfs @ 12.13 hrs, Volume= 0.303 af, Depth> 7.08"

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

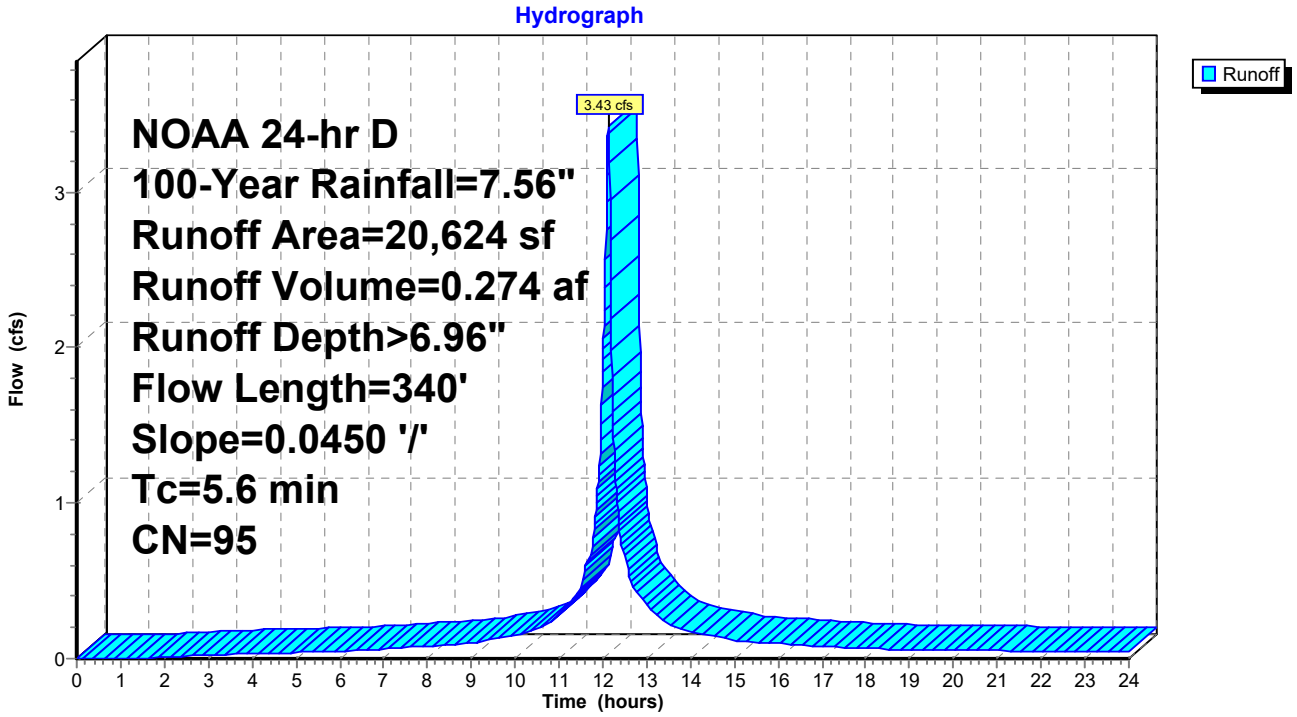
Runoff = 3.43 cfs @ 12.13 hrs, Volume= 0.274 af, Depth> 6.96"

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

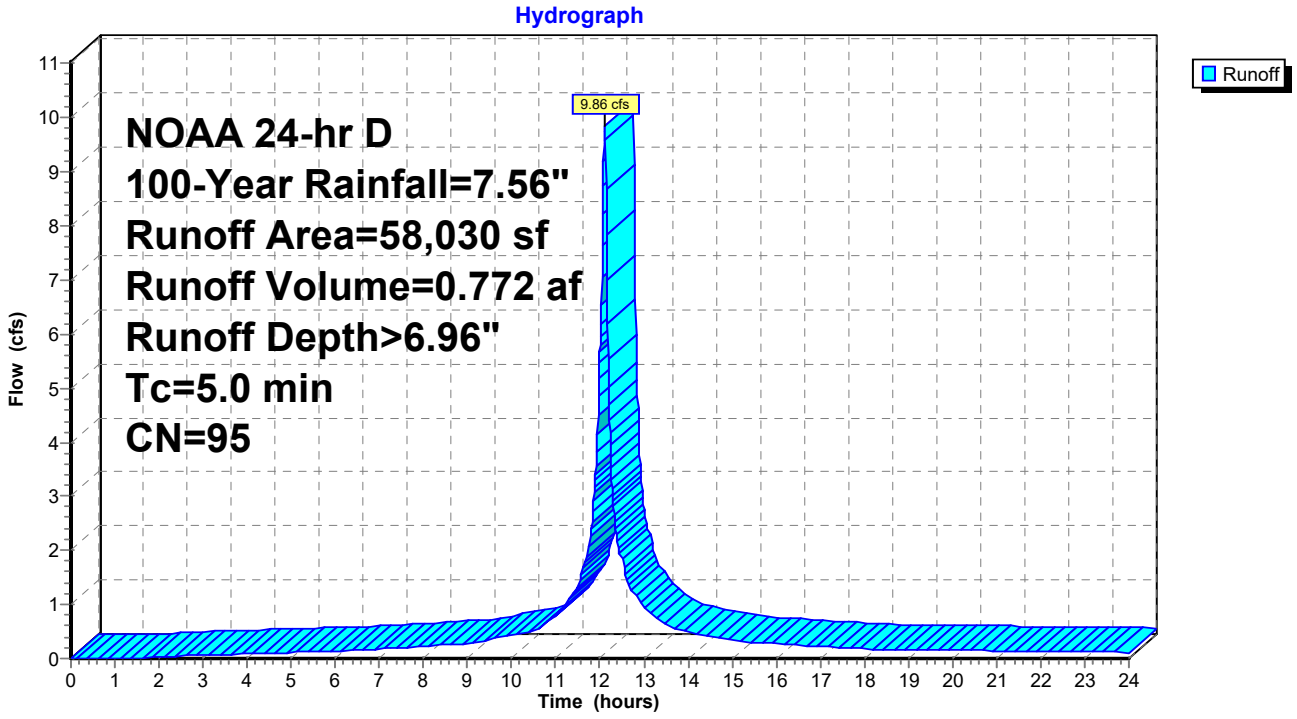
Runoff = 9.86 cfs @ 12.12 hrs, Volume= 0.772 af, Depth> 6.96"

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

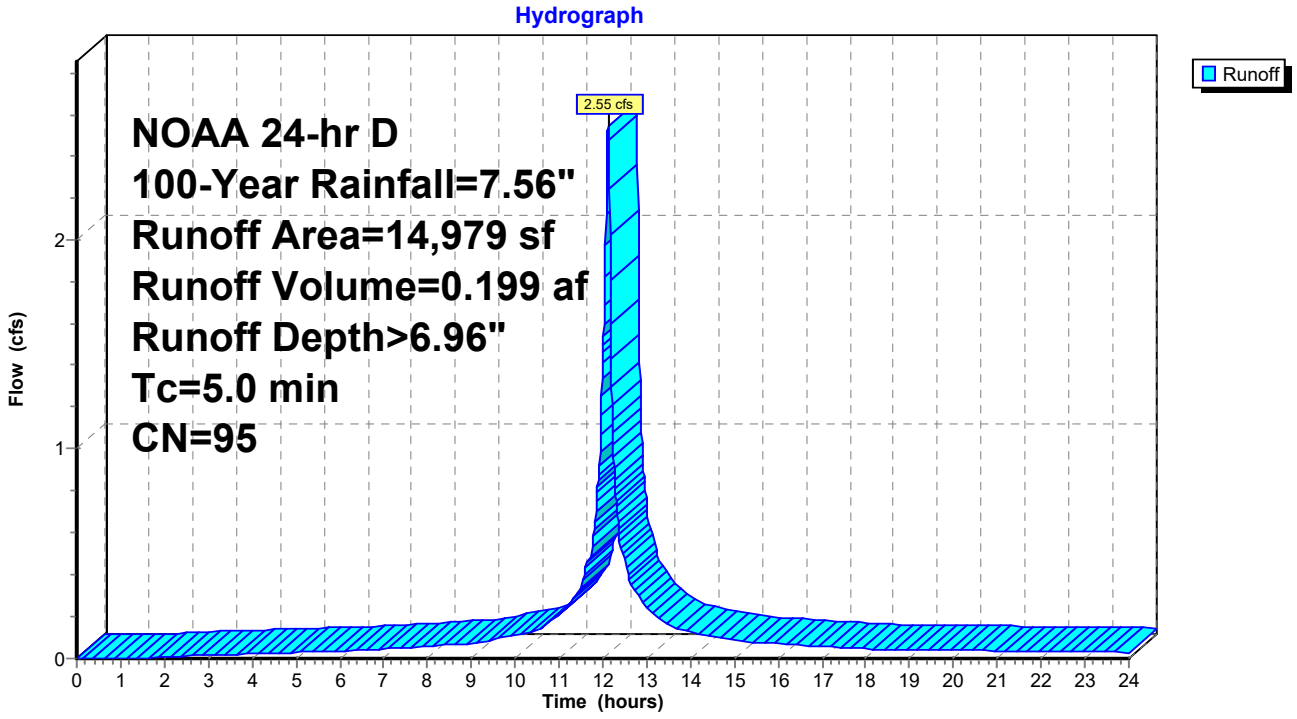
Runoff = 2.55 cfs @ 12.12 hrs, Volume= 0.199 af, Depth> 6.96"

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

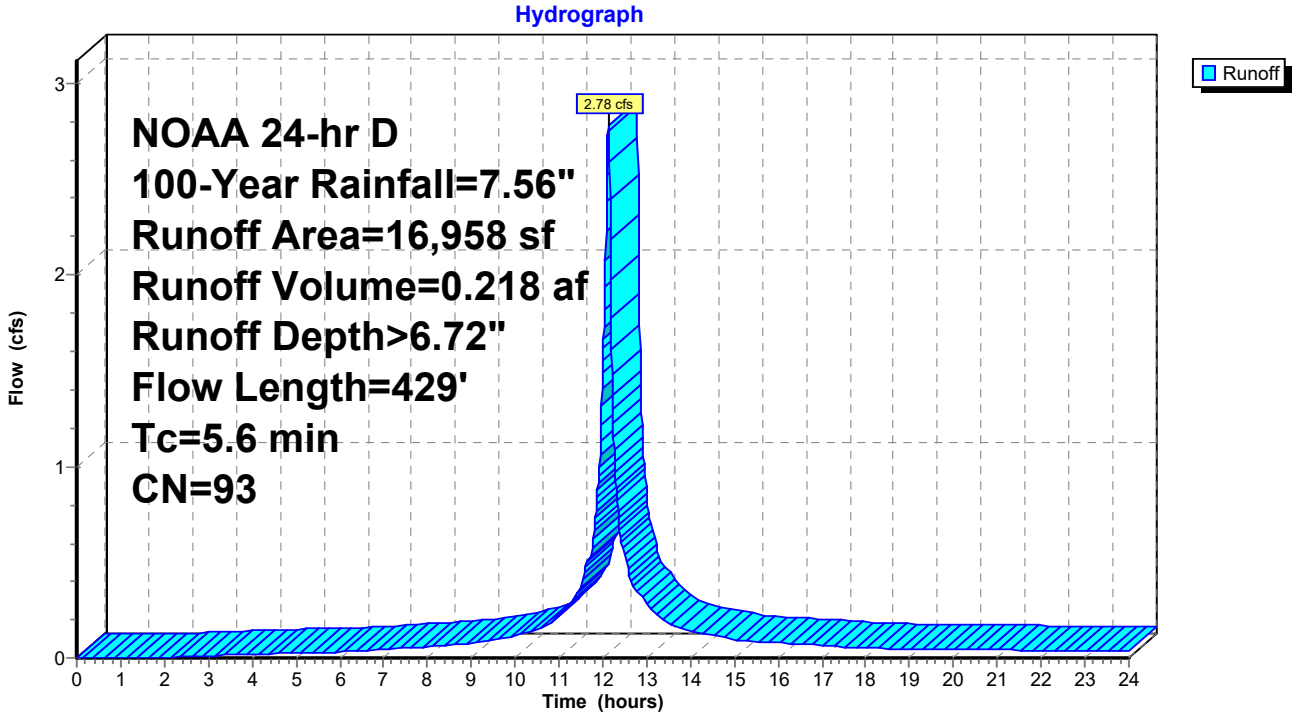
Runoff = 2.78 cfs @ 12.13 hrs, Volume= 0.218 af, Depth> 6.72"

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

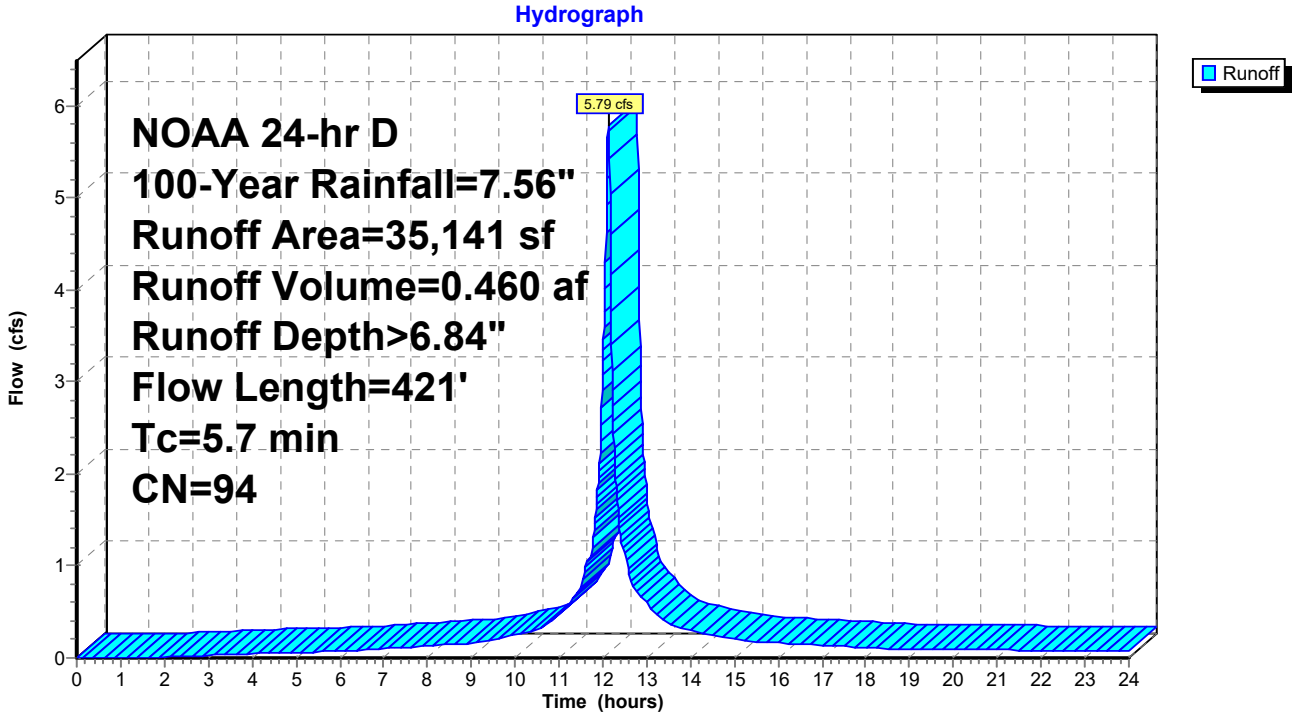
Runoff = 5.79 cfs @ 12.13 hrs, Volume= 0.460 af, Depth> 6.84"

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

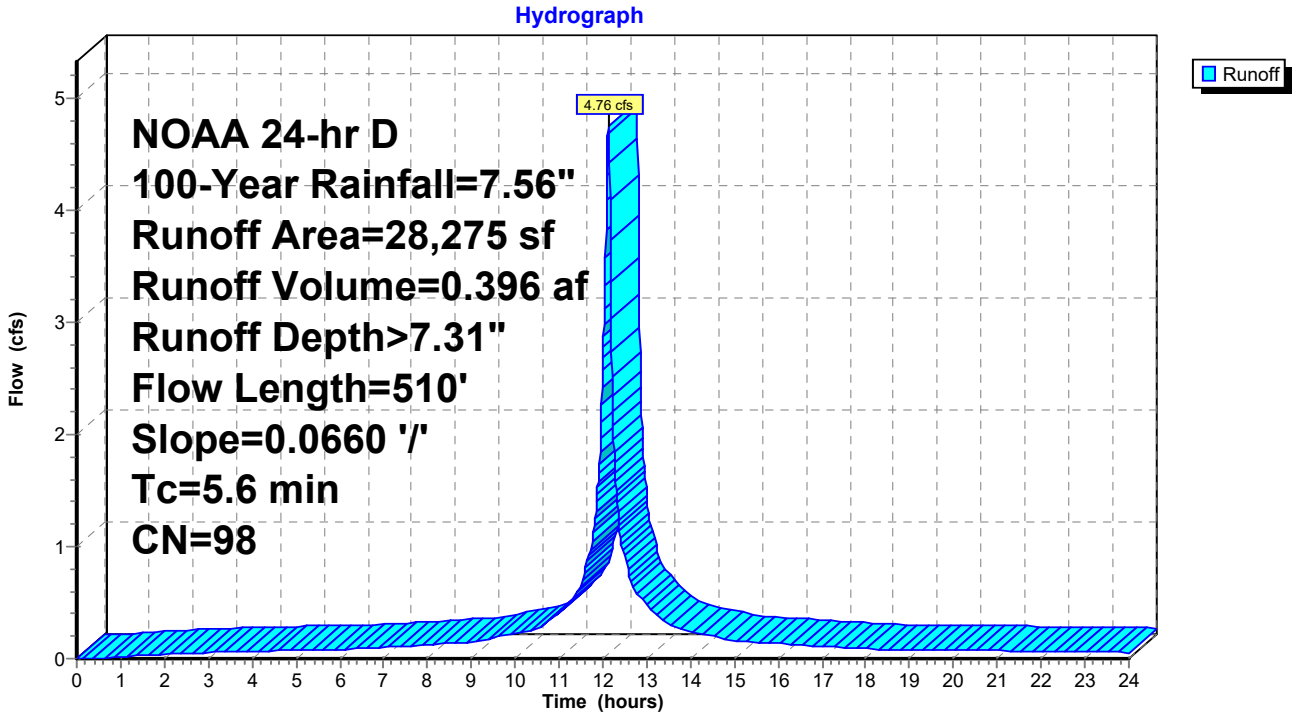
Runoff = 4.76 cfs @ 12.13 hrs, Volume= 0.396 af, Depth> 7.31"

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

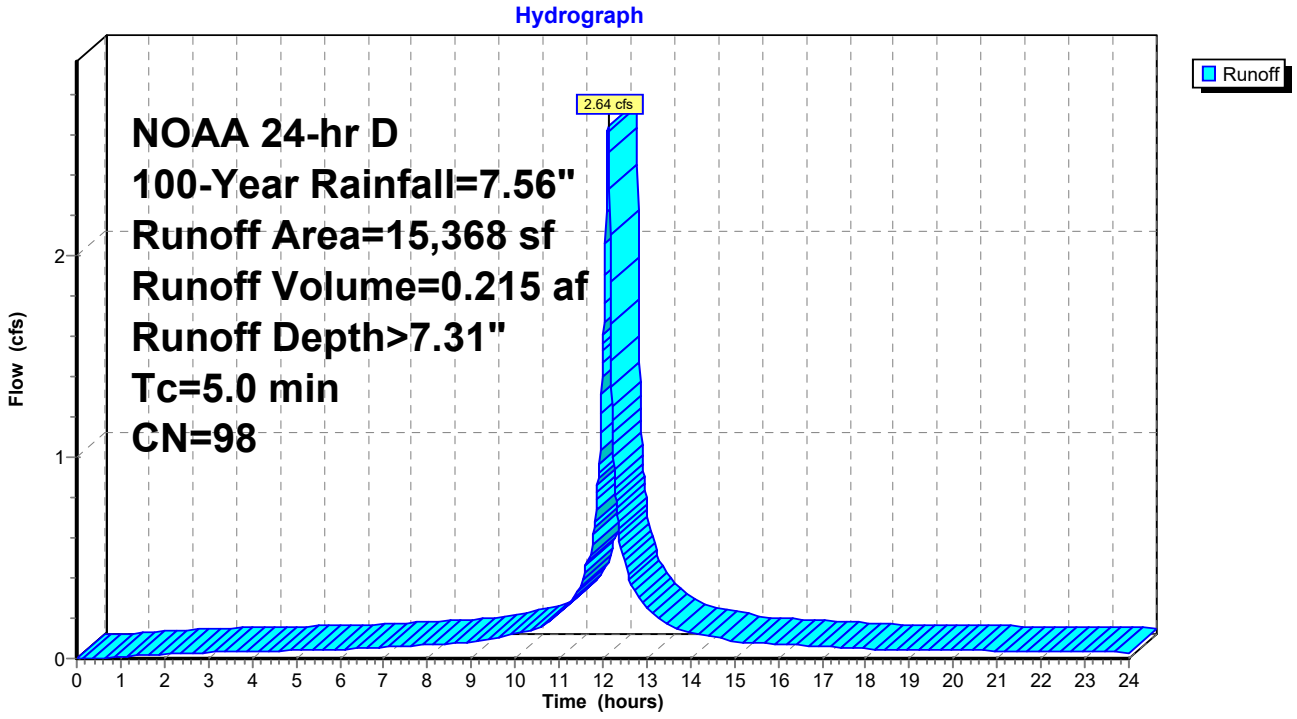
Runoff = 2.64 cfs @ 12.12 hrs, Volume= 0.215 af, Depth> 7.31"

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

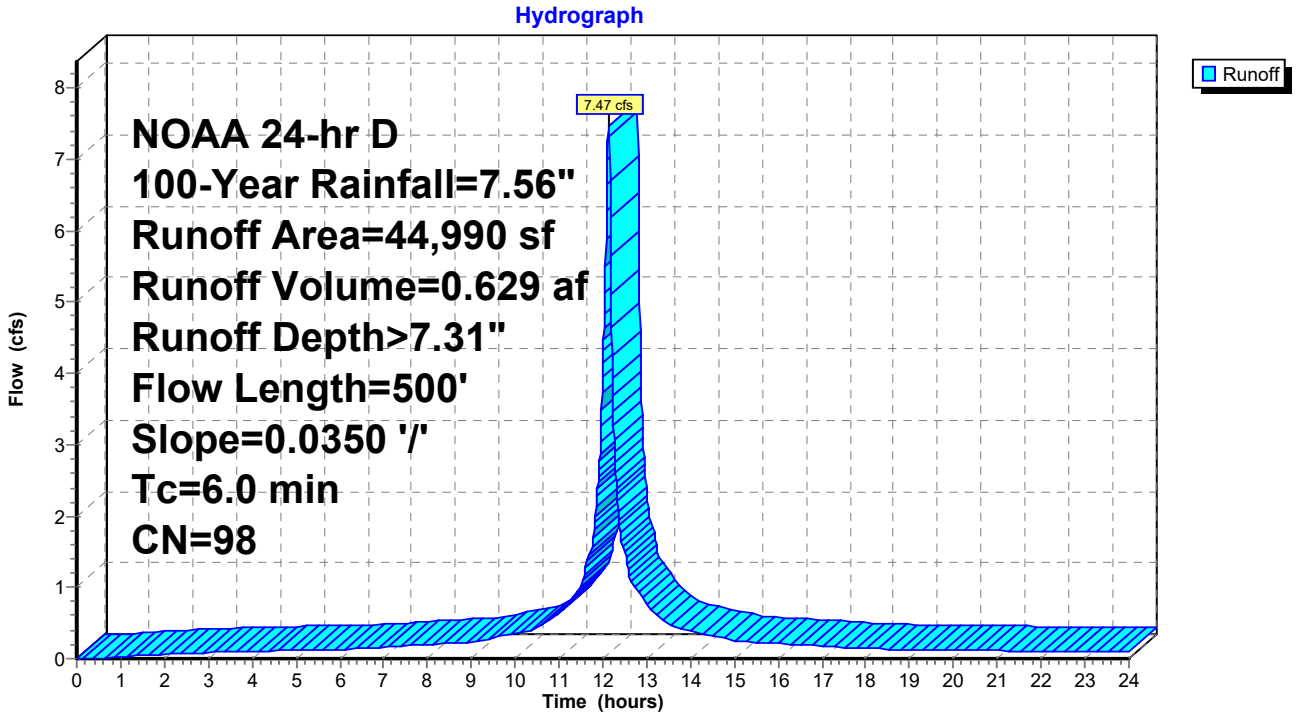
Runoff = 7.47 cfs @ 12.13 hrs, Volume= 0.629 af, Depth> 7.31"

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

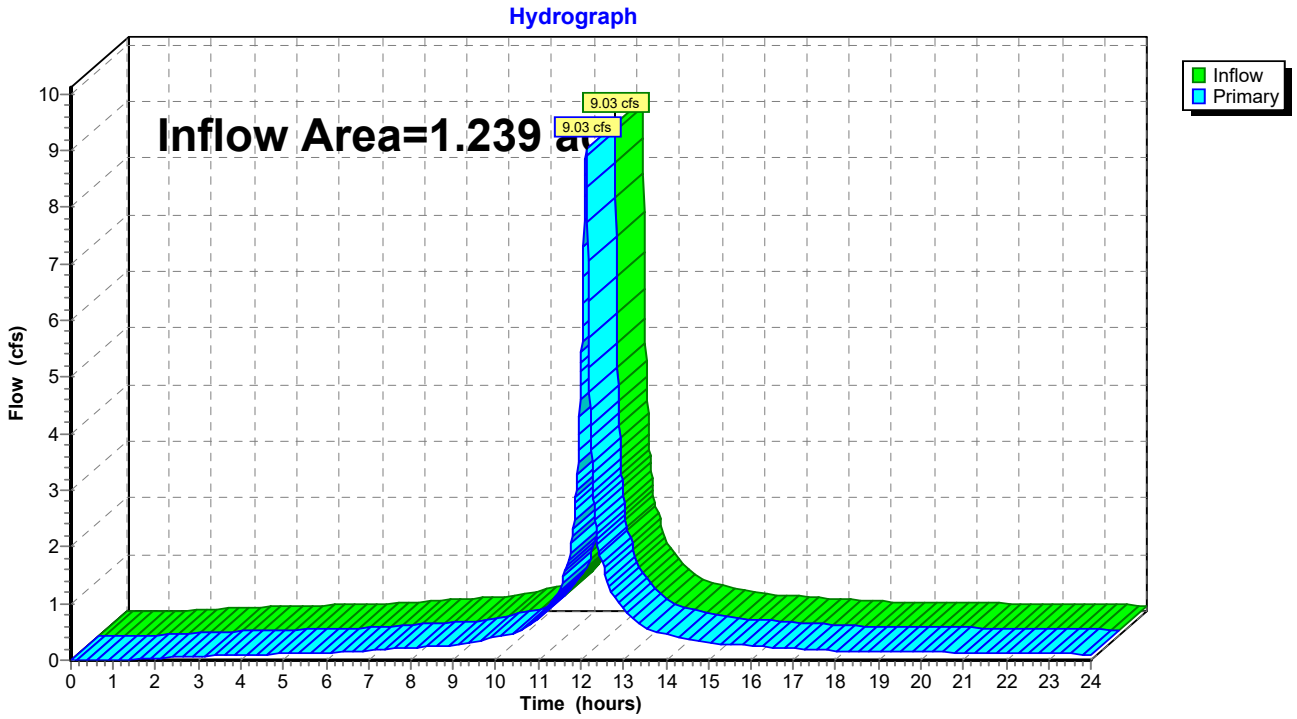


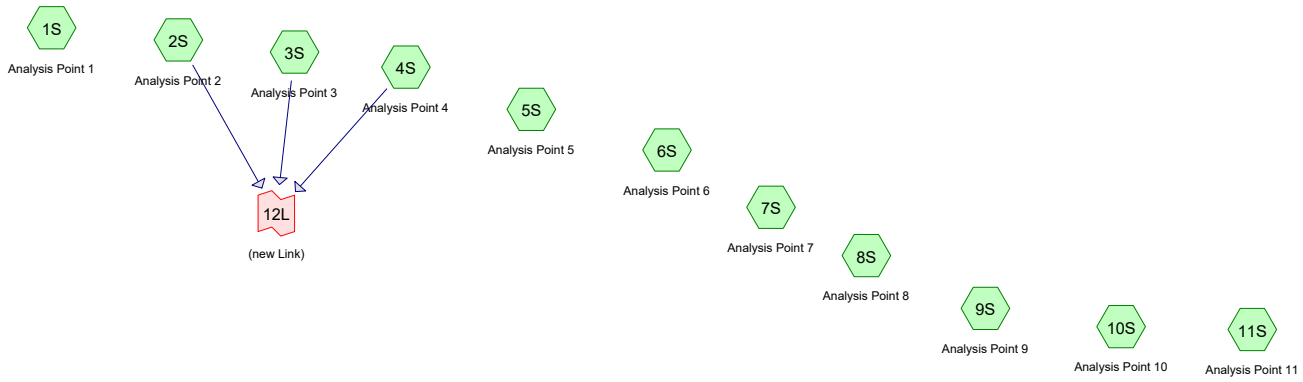
Summary for Link 12L: (new Link)

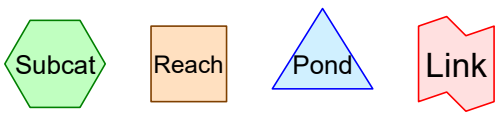
Inflow Area = 1.239 ac, 91.94% Impervious, Inflow Depth > 7.05" for 100-Year event
Inflow = 9.03 cfs @ 12.13 hrs, Volume= 0.728 af
Primary = 9.03 cfs @ 12.13 hrs, Volume= 0.728 af, Atten= 0%, Lag= 0.0 min

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
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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**

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

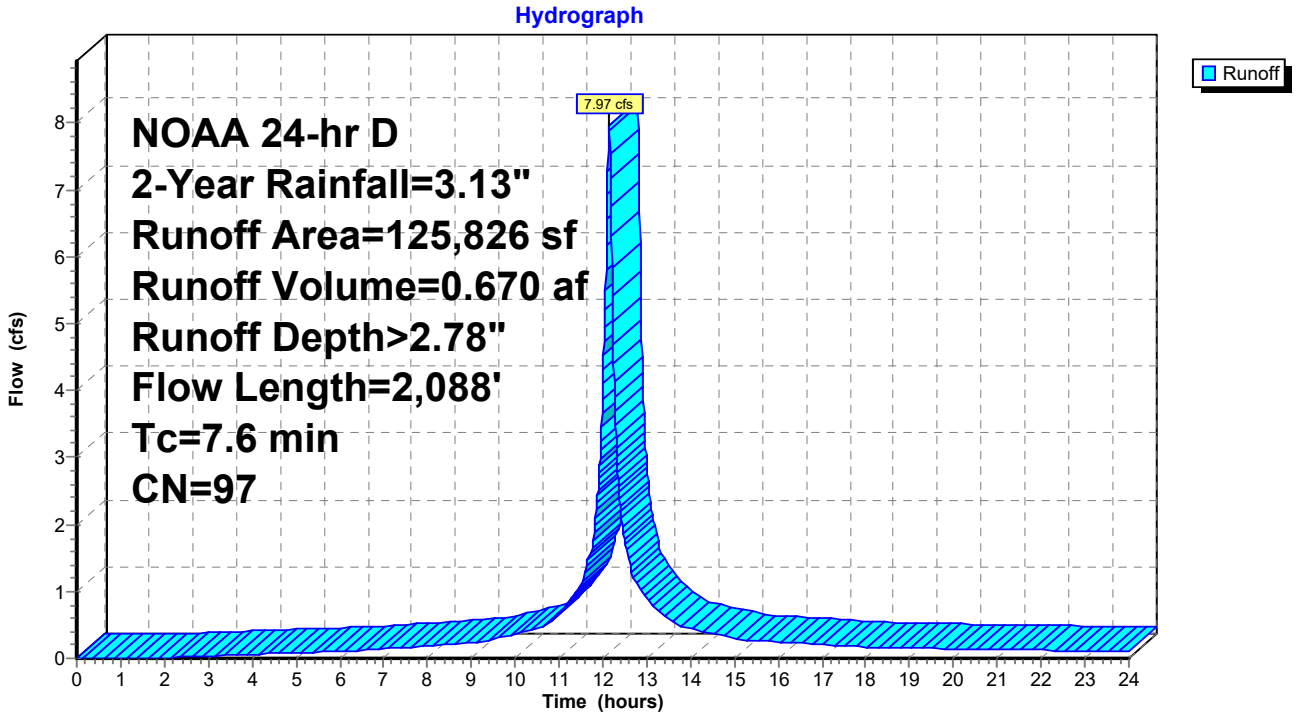
Runoff = 7.97 cfs @ 12.15 hrs, Volume= 0.670 af, Depth> 2.78"

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

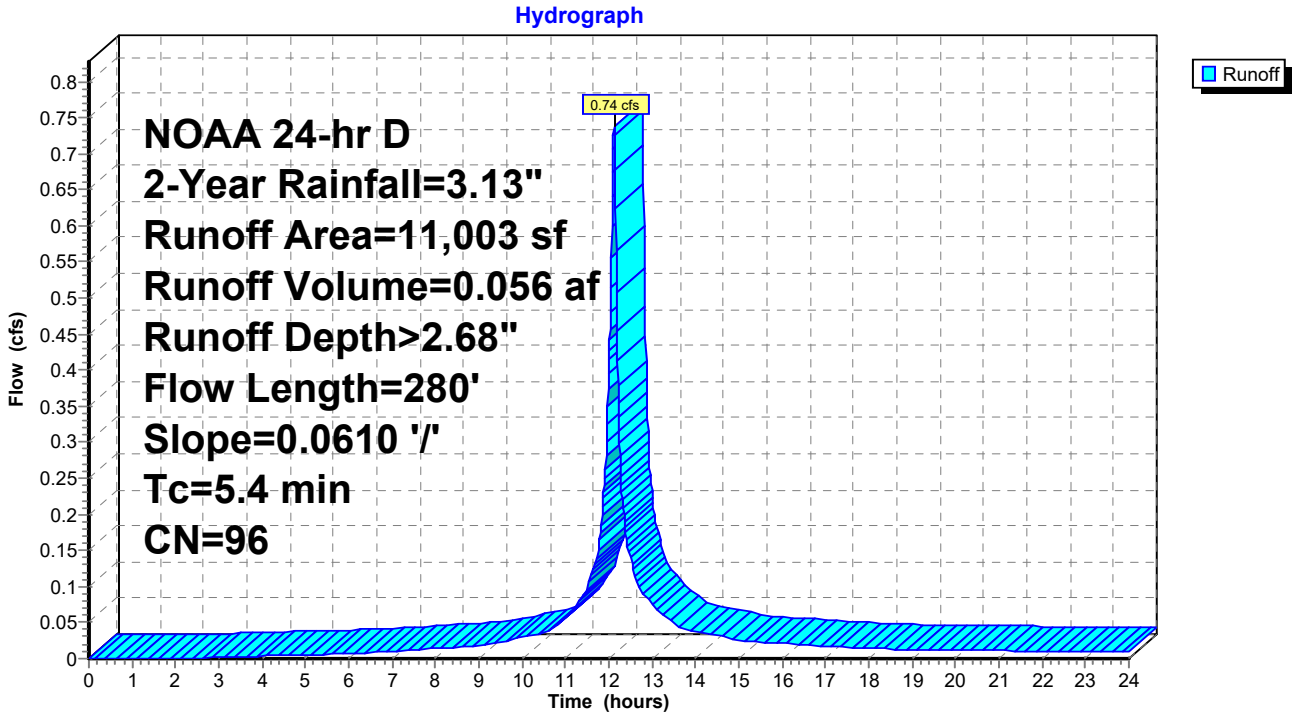
Runoff = 0.74 cfs @ 12.12 hrs, Volume= 0.056 af, Depth> 2.68"

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

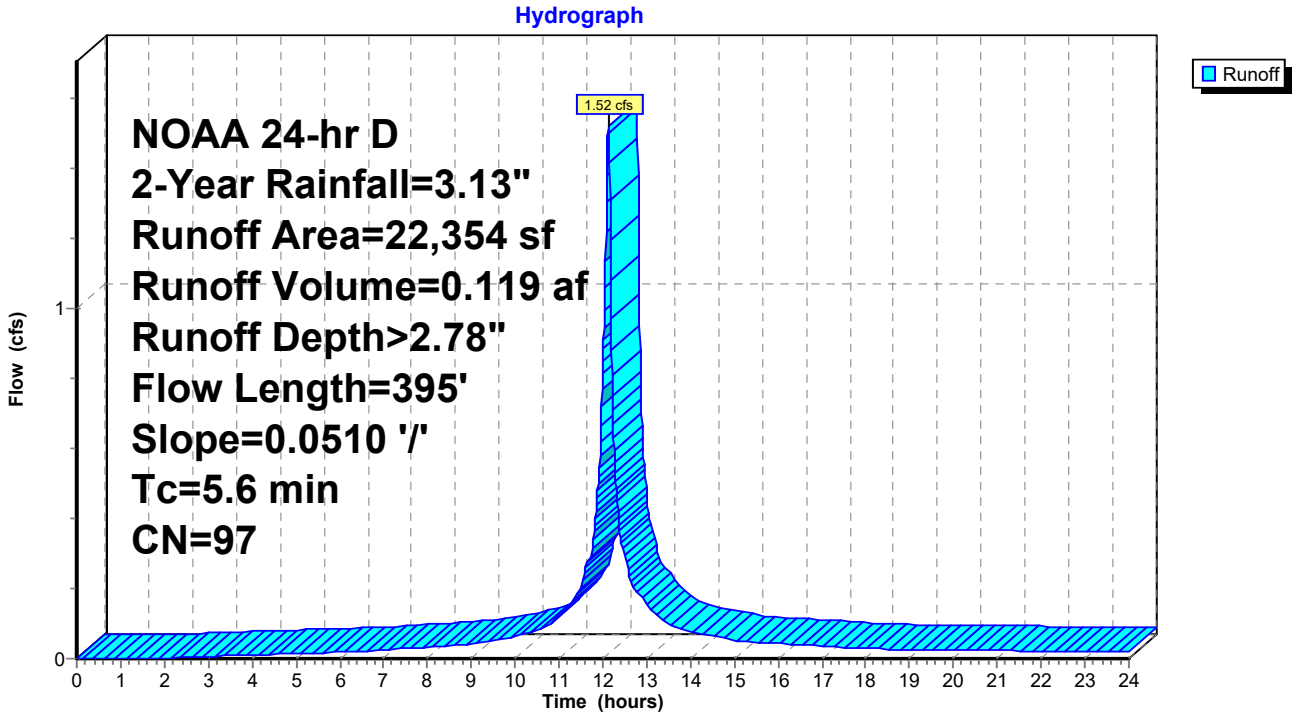
Runoff = 1.52 cfs @ 12.13 hrs, Volume= 0.119 af, Depth> 2.78"

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

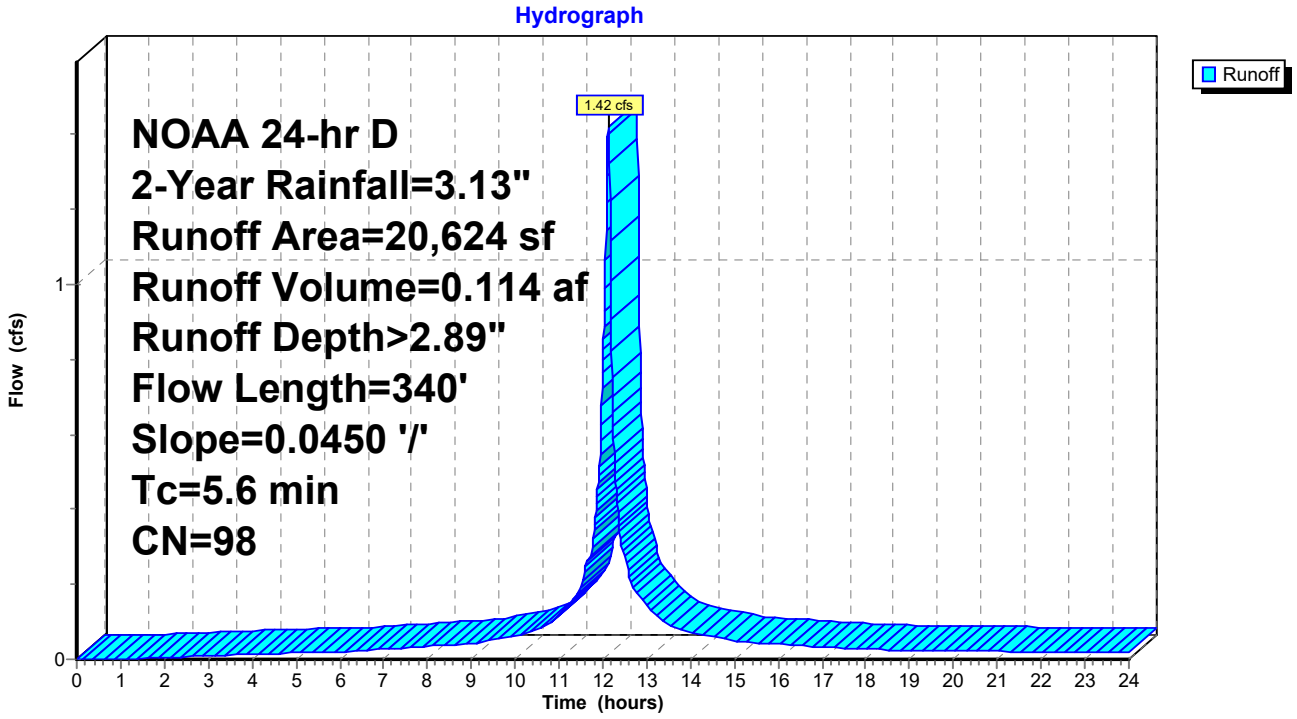
Runoff = 1.42 cfs @ 12.13 hrs, Volume= 0.114 af, Depth> 2.89"

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

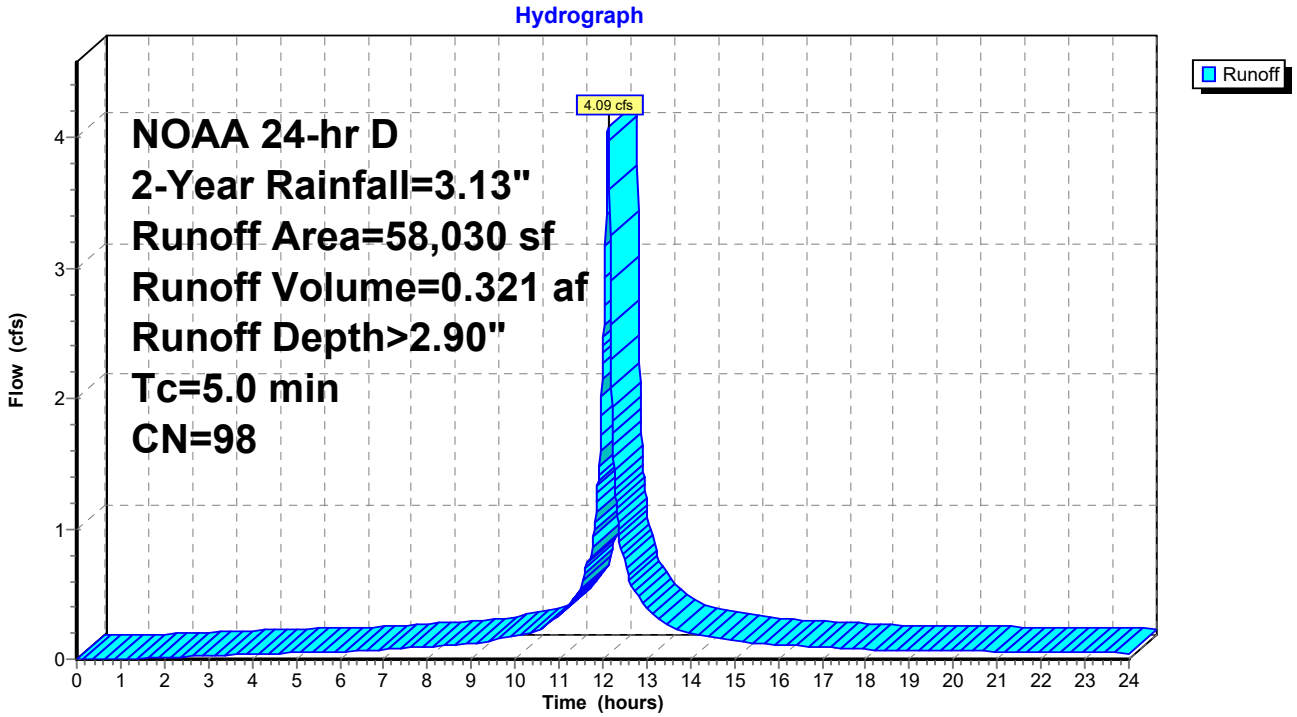
Runoff = 4.09 cfs @ 12.12 hrs, Volume= 0.321 af, Depth> 2.90"

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

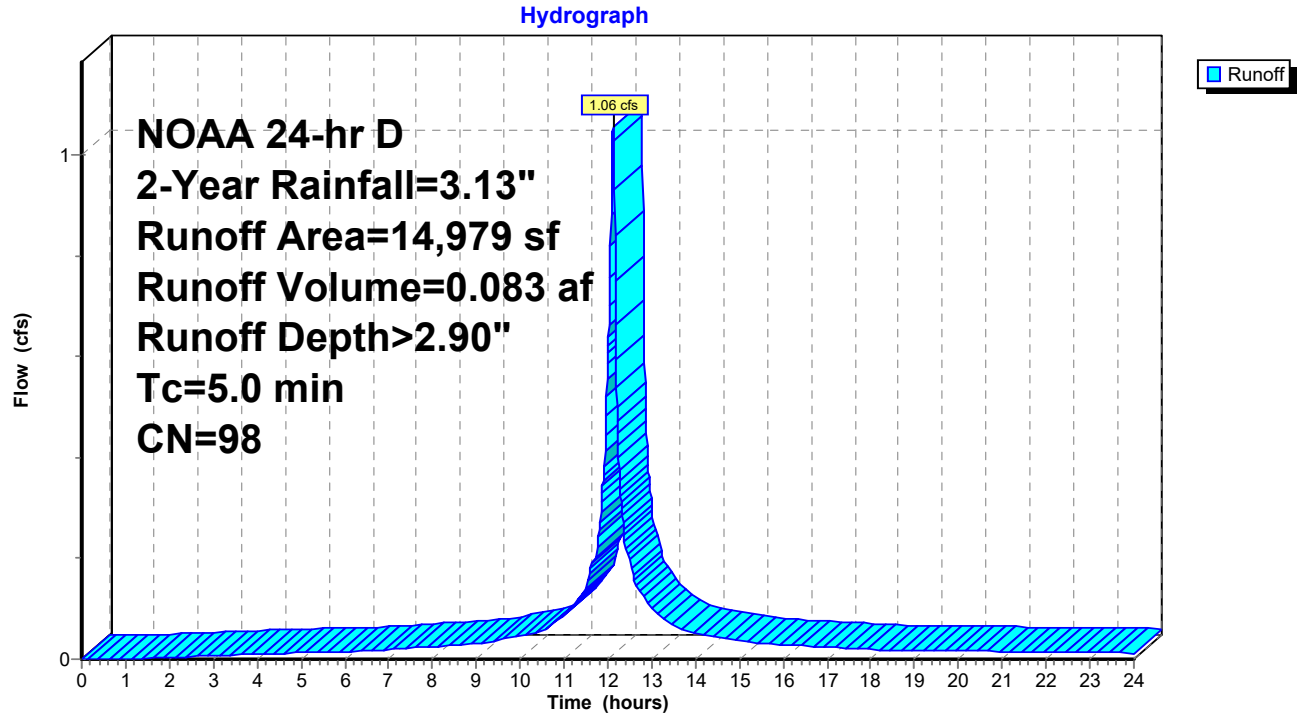
Runoff = 1.06 cfs @ 12.12 hrs, Volume= 0.083 af, Depth> 2.90"

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

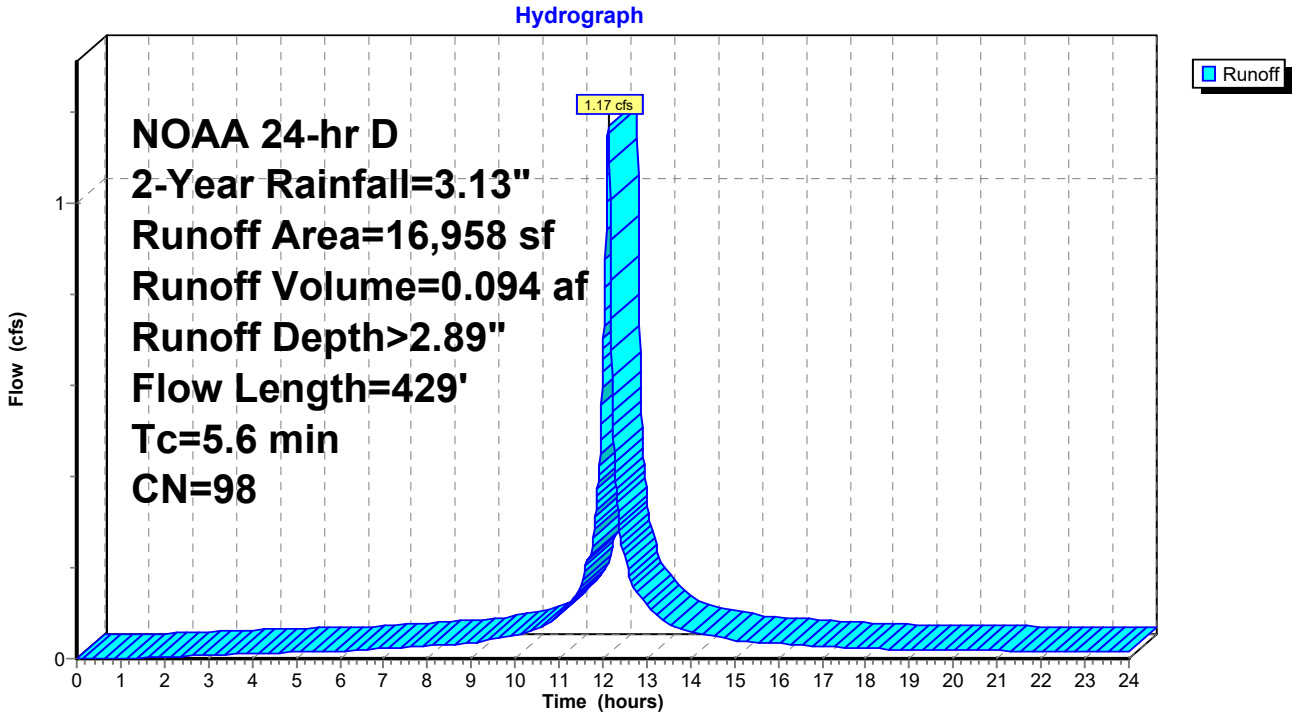
Runoff = 1.17 cfs @ 12.13 hrs, Volume= 0.094 af, Depth> 2.89"

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

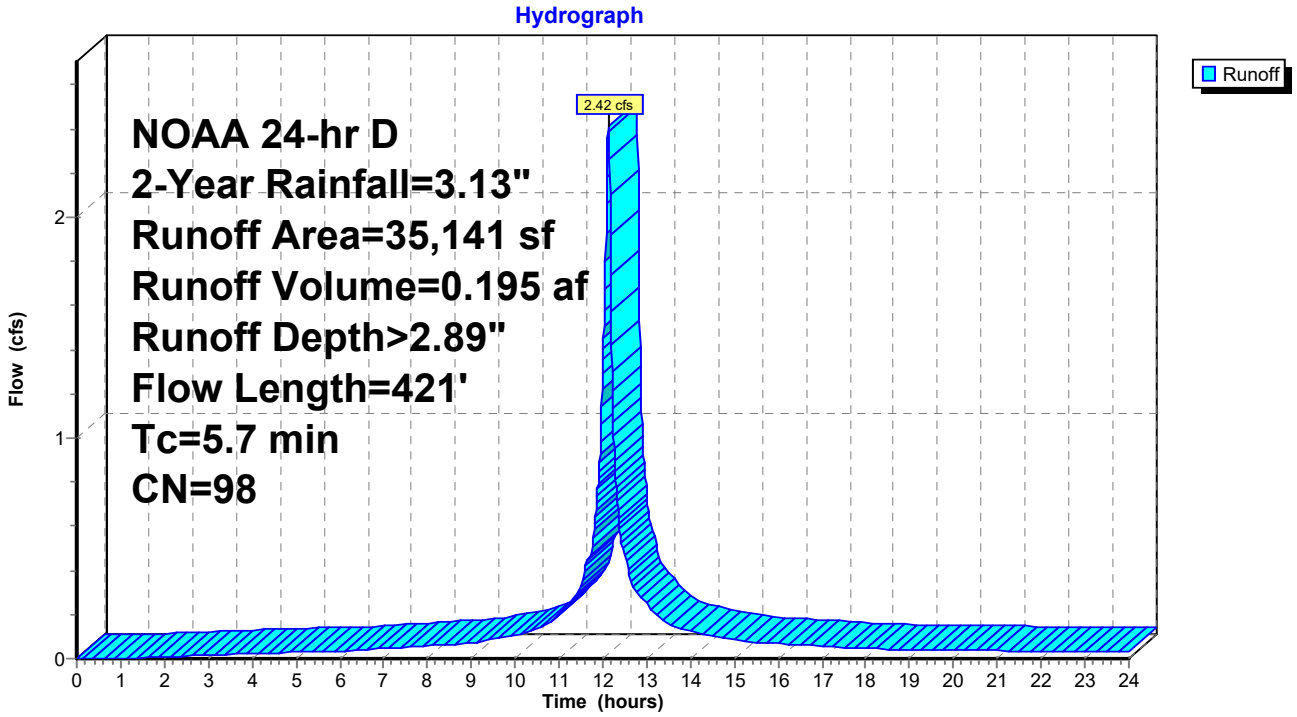
Runoff = 2.42 cfs @ 12.13 hrs, Volume= 0.195 af, Depth> 2.89"

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

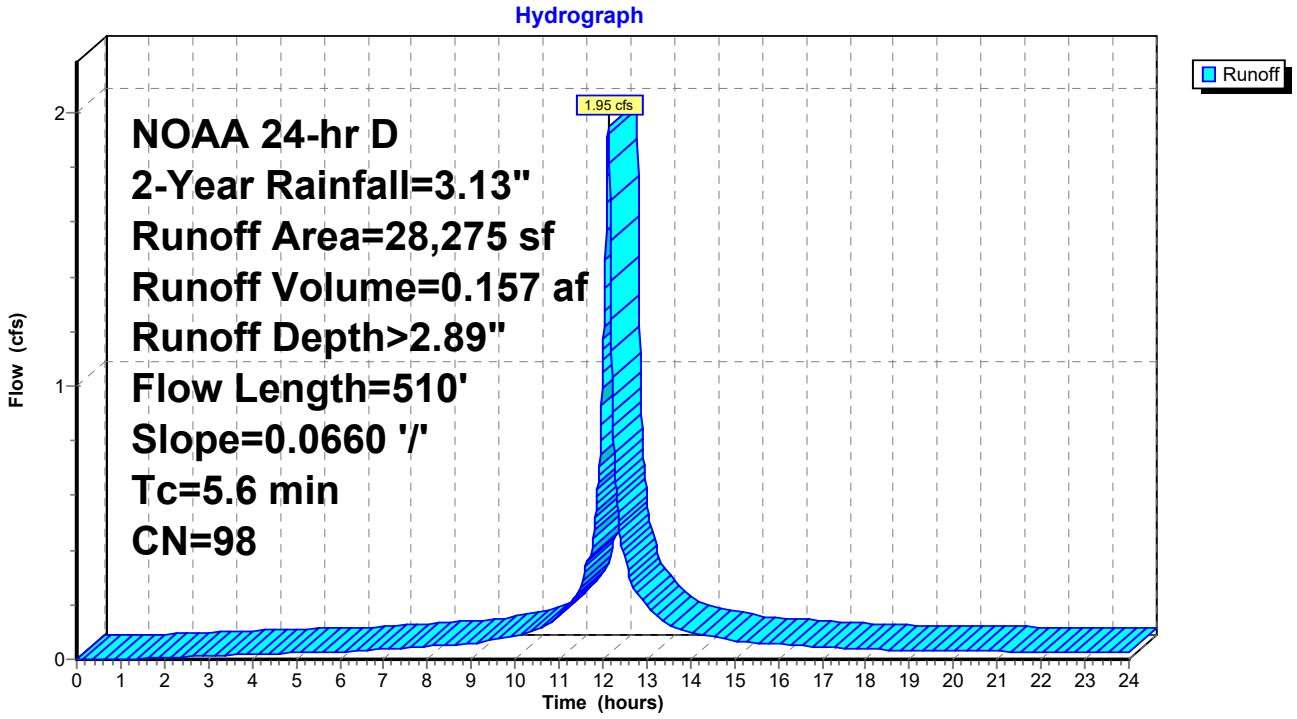
Runoff = 1.95 cfs @ 12.13 hrs, Volume= 0.157 af, Depth> 2.89"

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

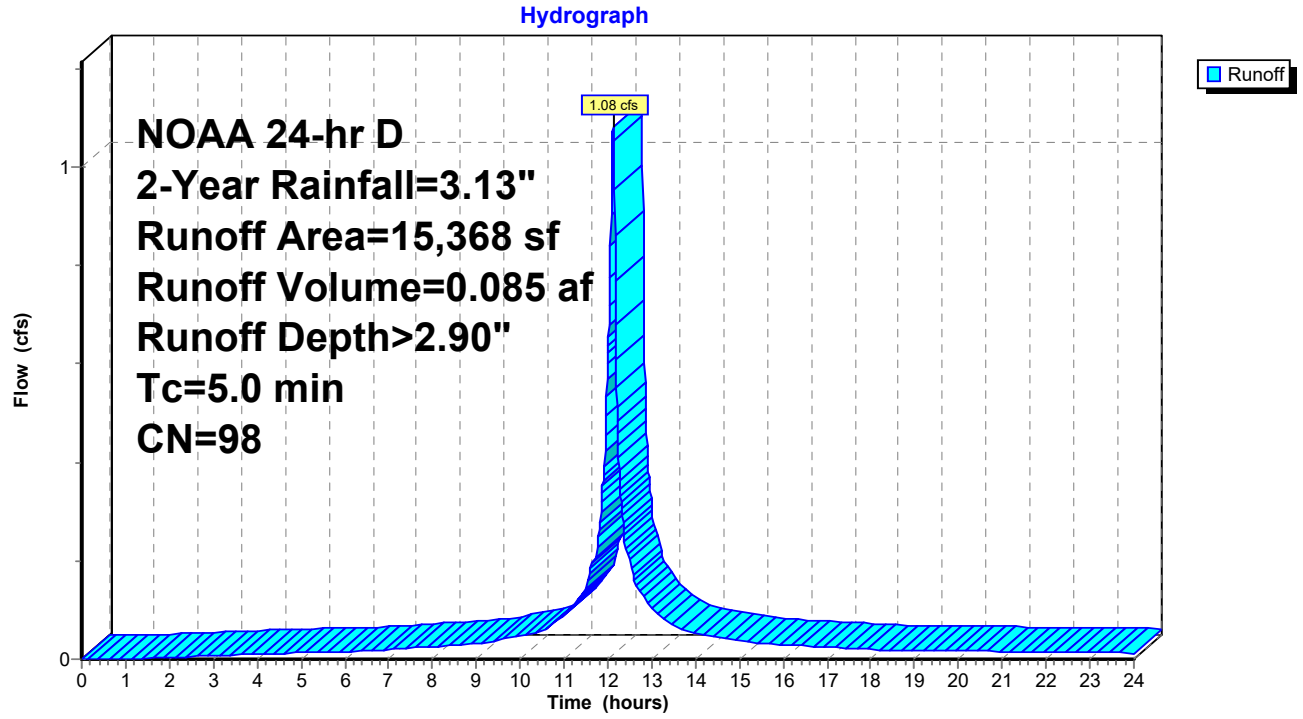
Runoff = 1.08 cfs @ 12.12 hrs, Volume= 0.085 af, Depth> 2.90"

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

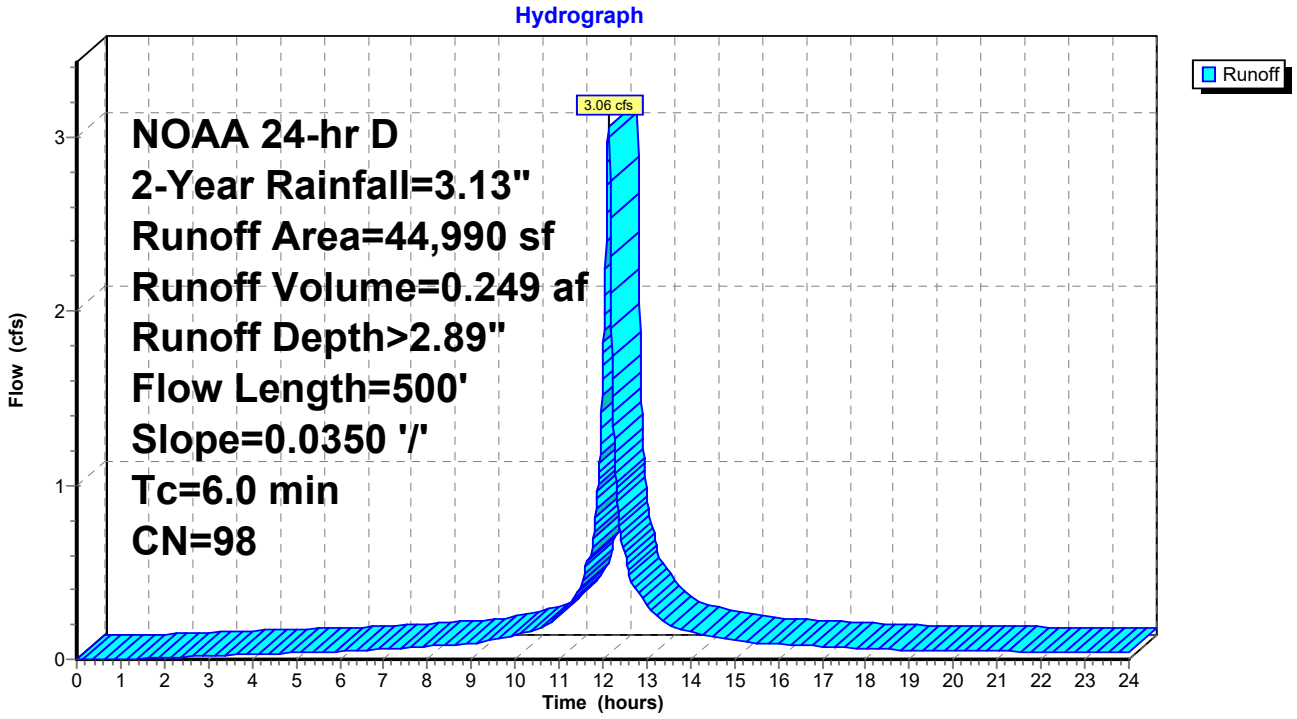
Runoff = 3.06 cfs @ 12.13 hrs, Volume= 0.249 af, Depth> 2.89"

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

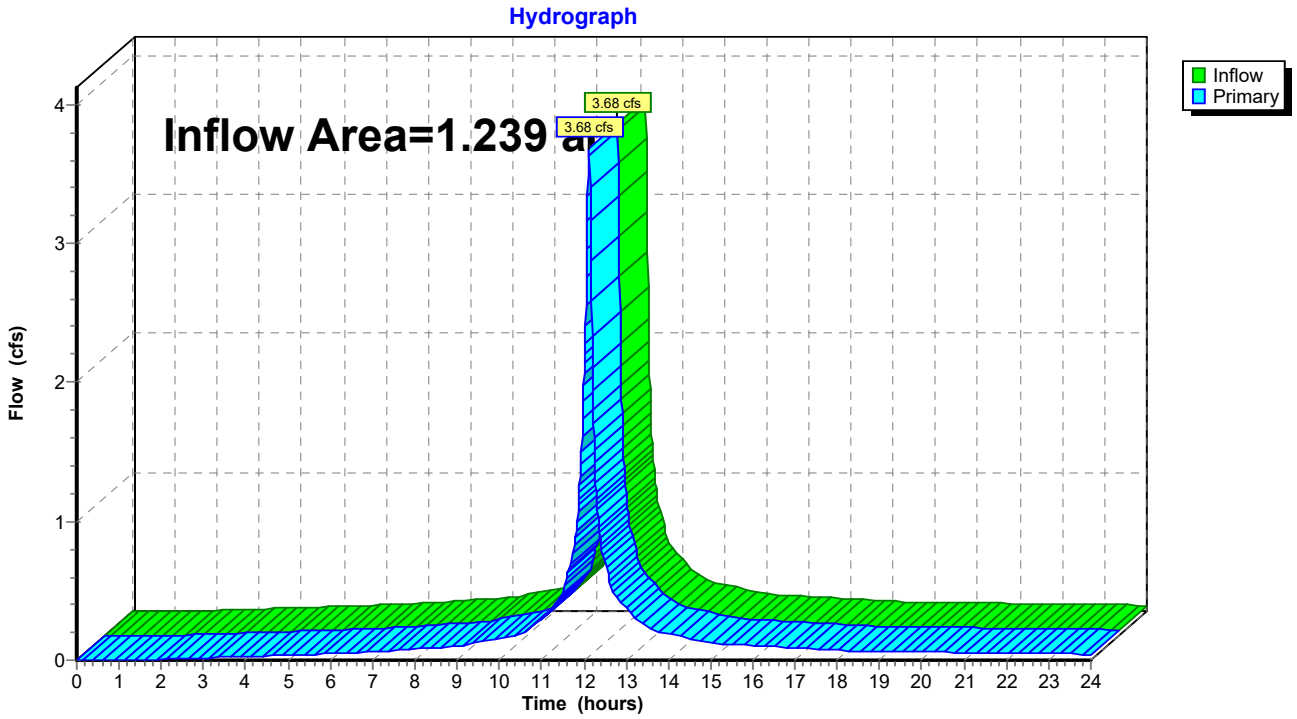


Summary for Link 12L: (new Link)

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

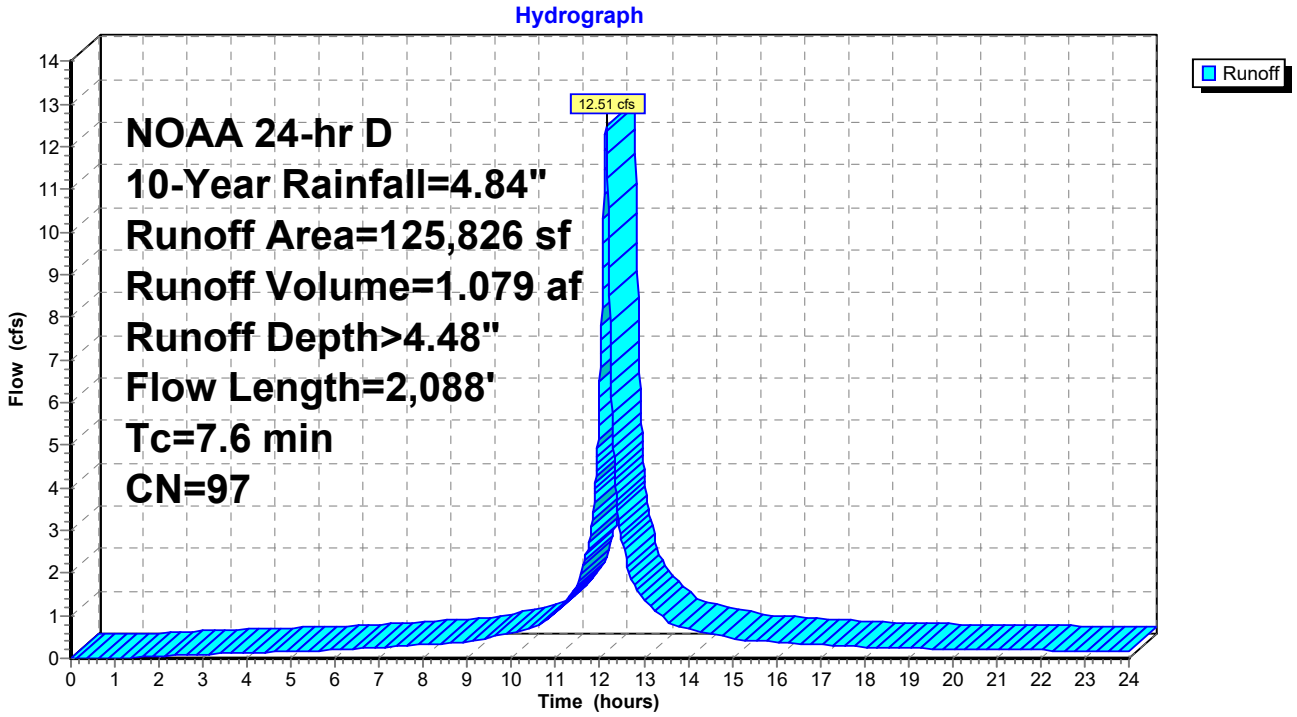
Runoff = 12.51 cfs @ 12.15 hrs, Volume= 1.079 af, Depth> 4.48"

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

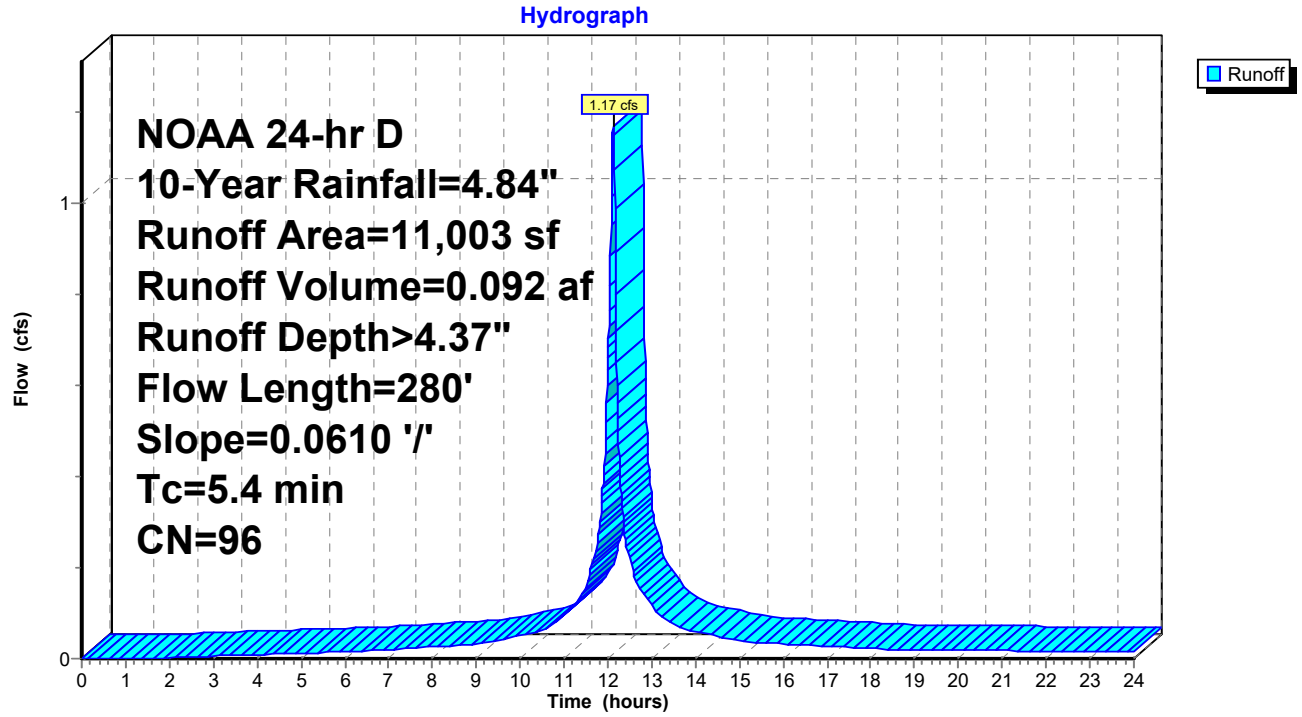
Runoff = 1.17 cfs @ 12.12 hrs, Volume= 0.092 af, Depth> 4.37"

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

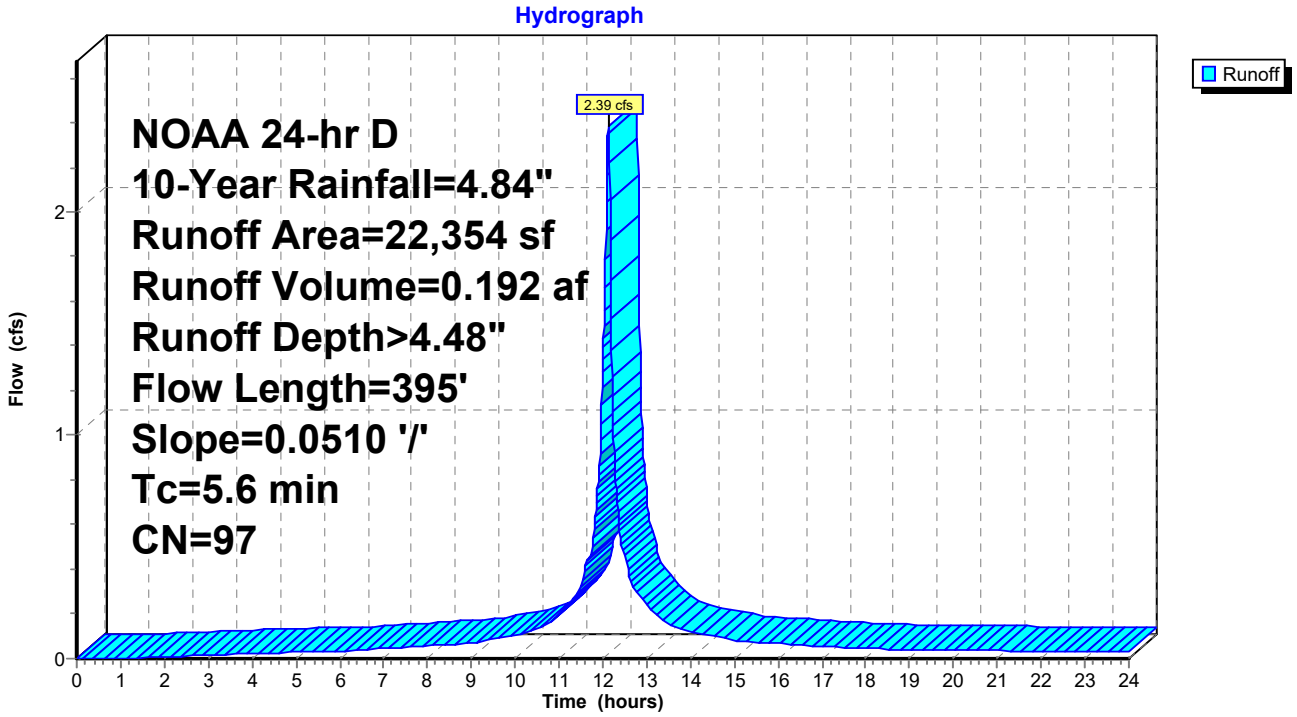
Runoff = 2.39 cfs @ 12.13 hrs, Volume= 0.192 af, Depth> 4.48"

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

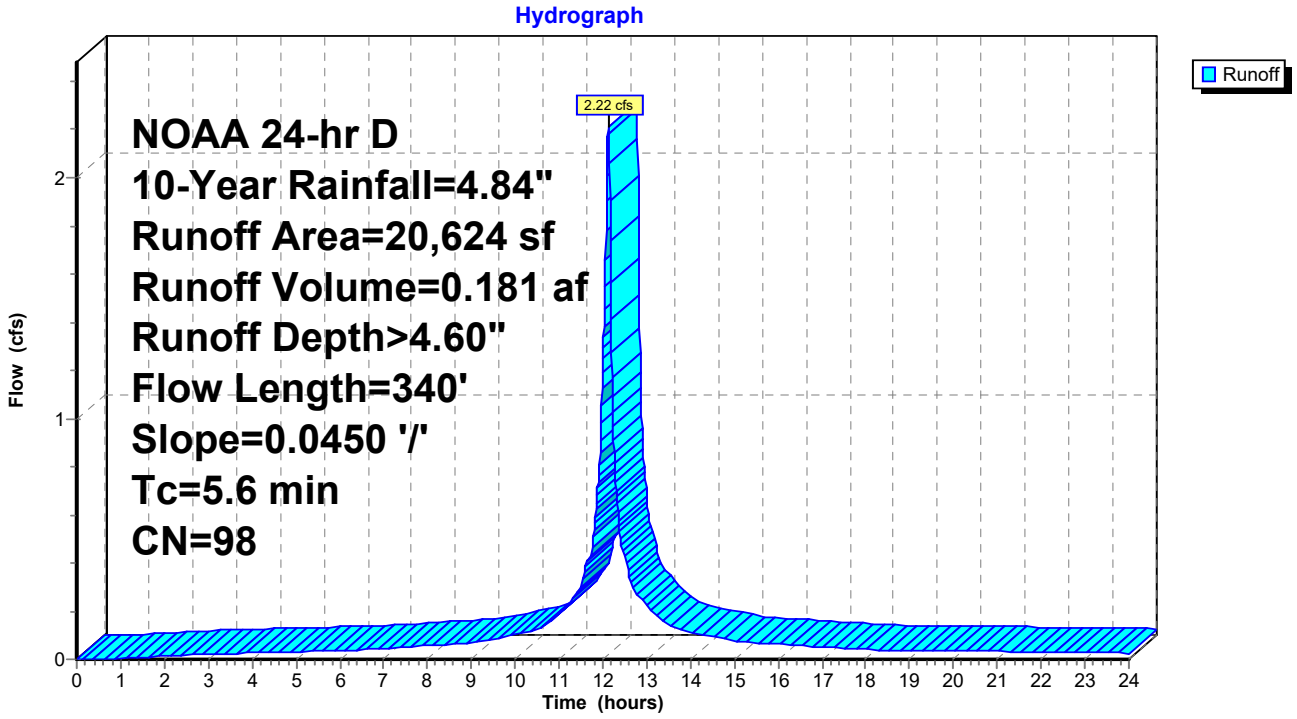
Runoff = 2.22 cfs @ 12.13 hrs, Volume= 0.181 af, Depth> 4.60"

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

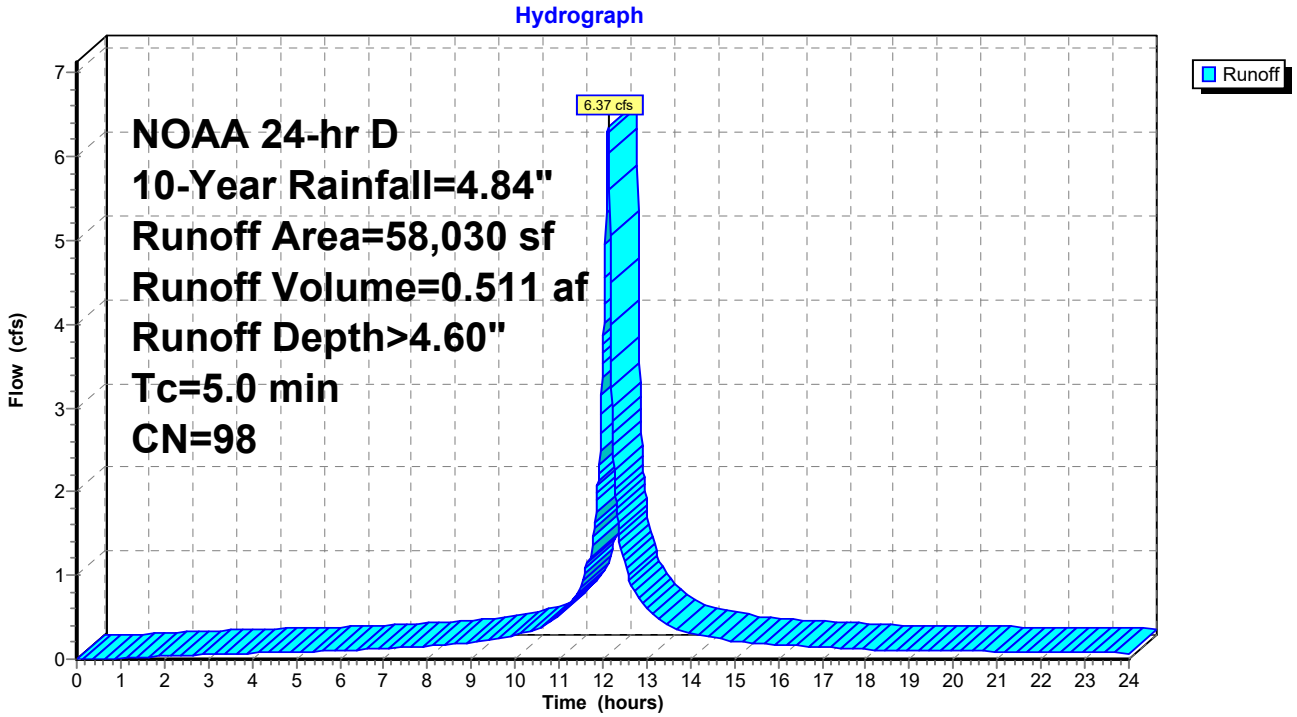
Runoff = 6.37 cfs @ 12.12 hrs, Volume= 0.511 af, Depth> 4.60"

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

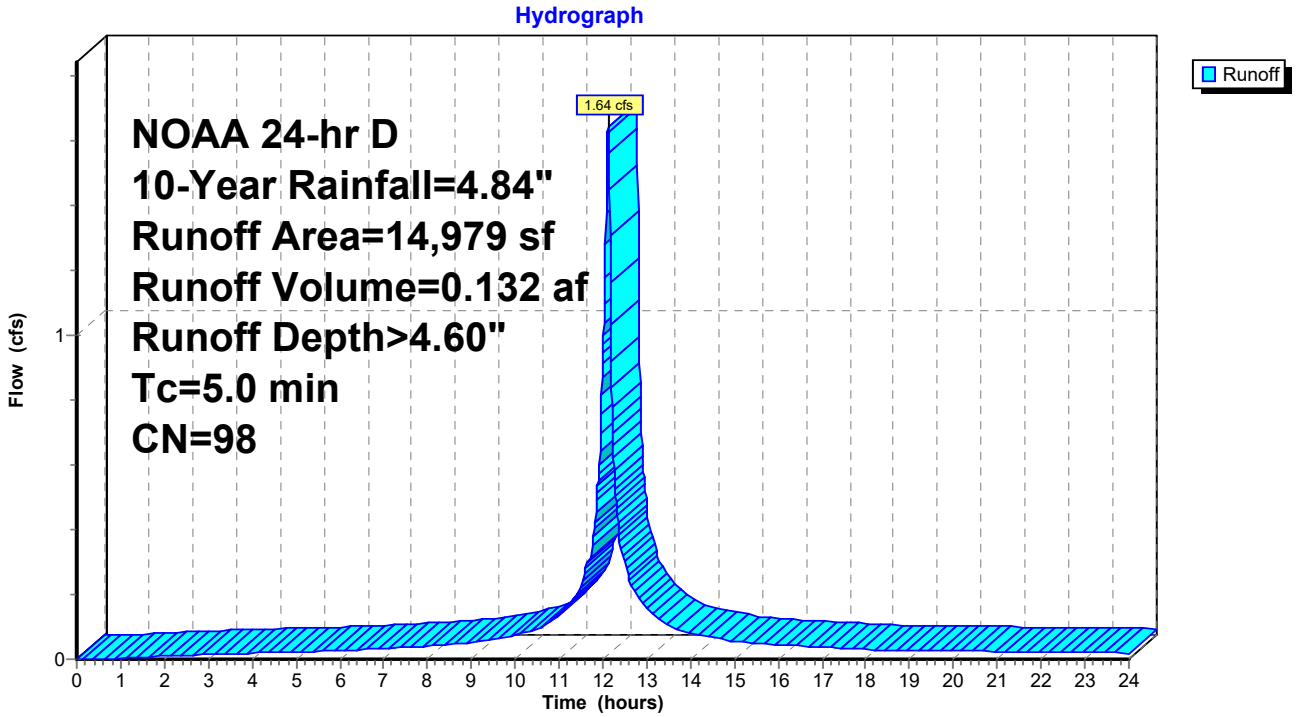
Runoff = 1.64 cfs @ 12.12 hrs, Volume= 0.132 af, Depth> 4.60"

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

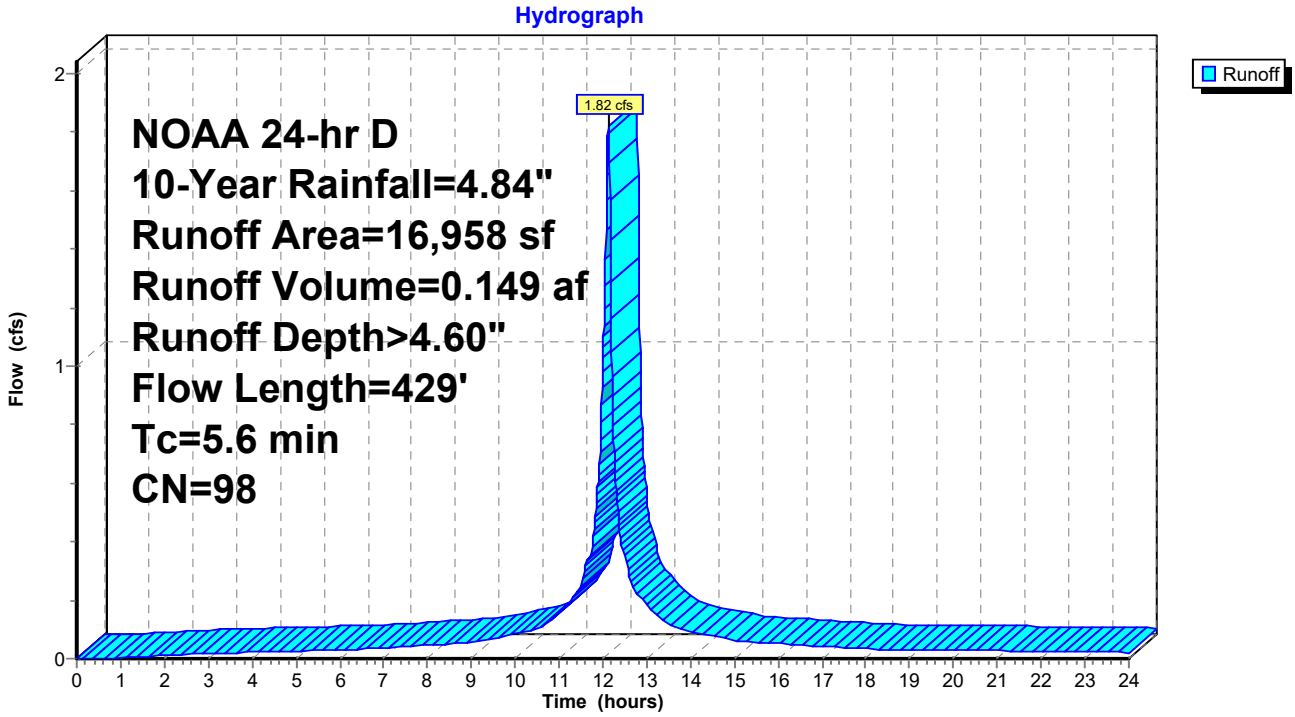
Runoff = 1.82 cfs @ 12.13 hrs, Volume= 0.149 af, Depth> 4.60"

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

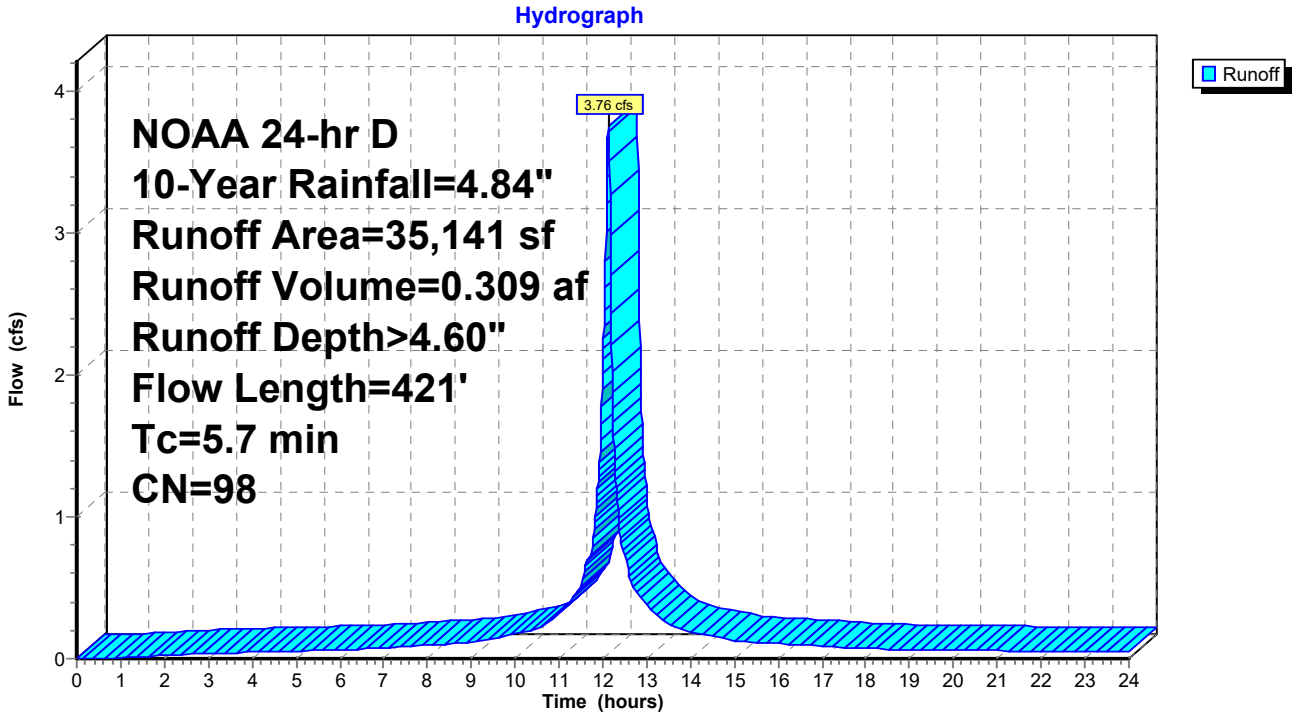
Runoff = 3.76 cfs @ 12.13 hrs, Volume= 0.309 af, Depth> 4.60"

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

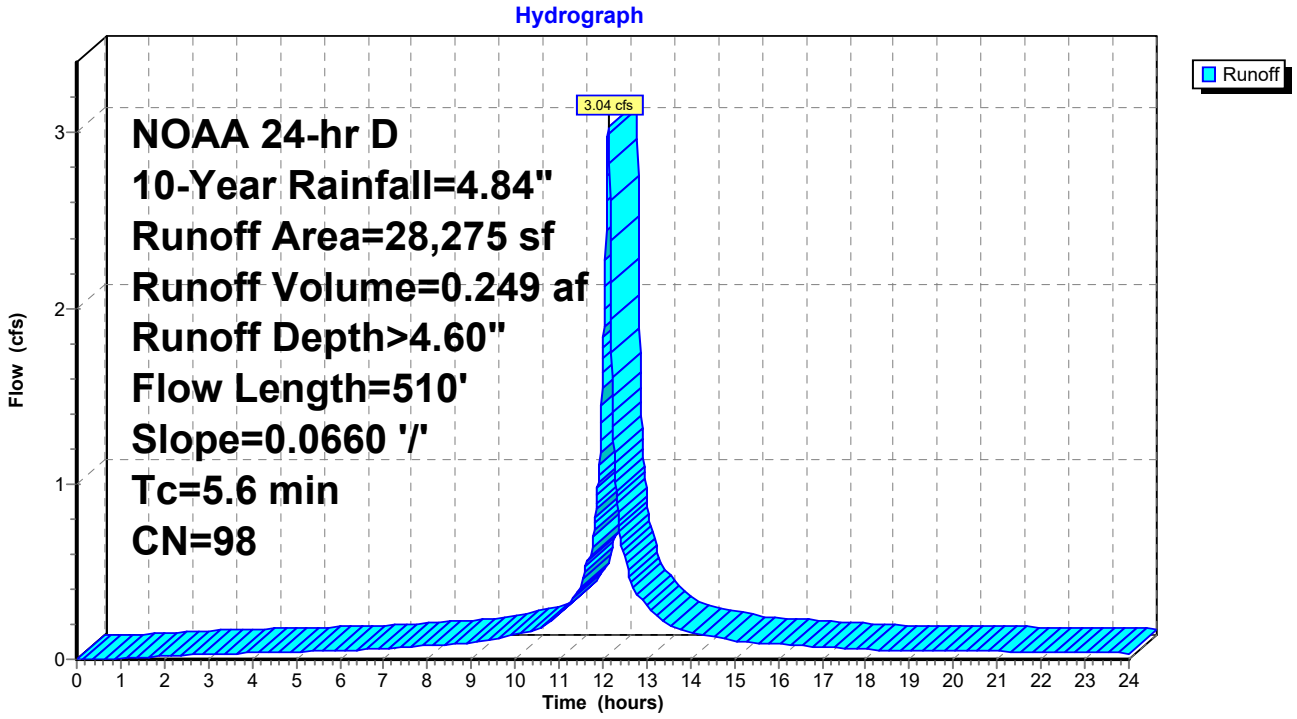
Runoff = 3.04 cfs @ 12.13 hrs, Volume= 0.249 af, Depth> 4.60"

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

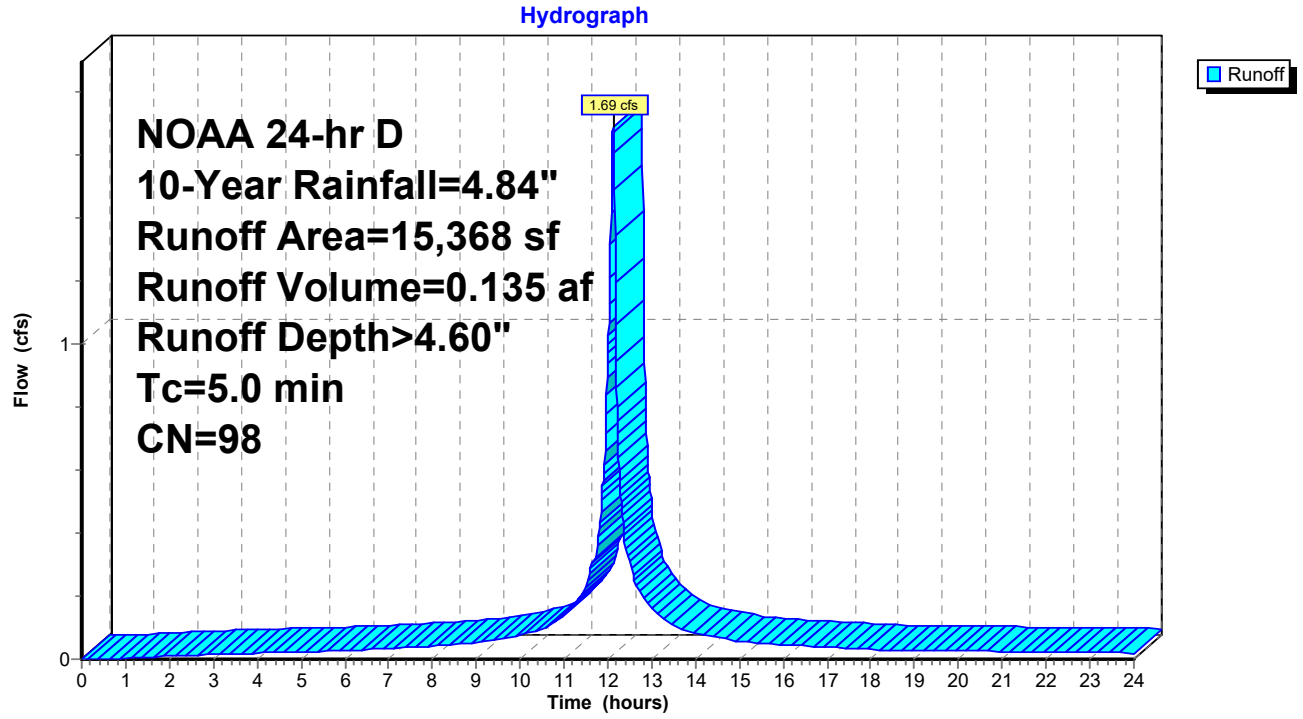
Runoff = 1.69 cfs @ 12.12 hrs, Volume= 0.135 af, Depth> 4.60"

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

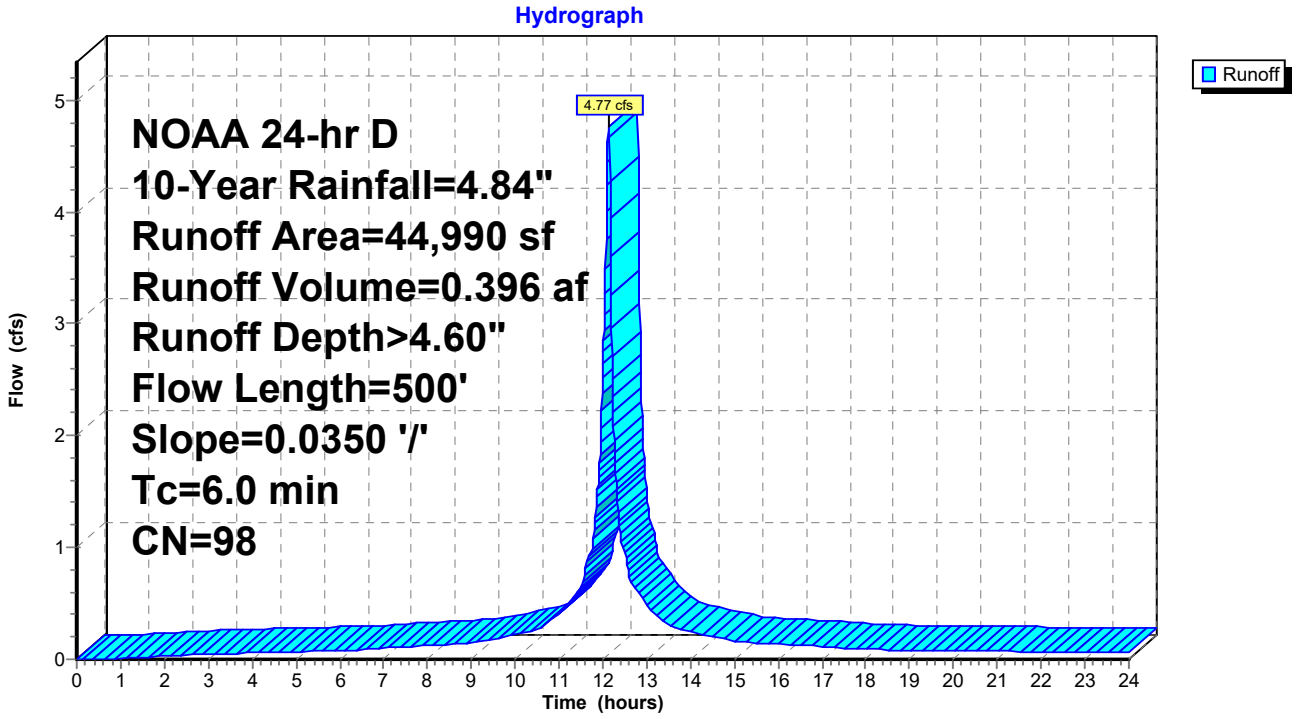
Runoff = 4.77 cfs @ 12.13 hrs, Volume= 0.396 af, Depth> 4.60"

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

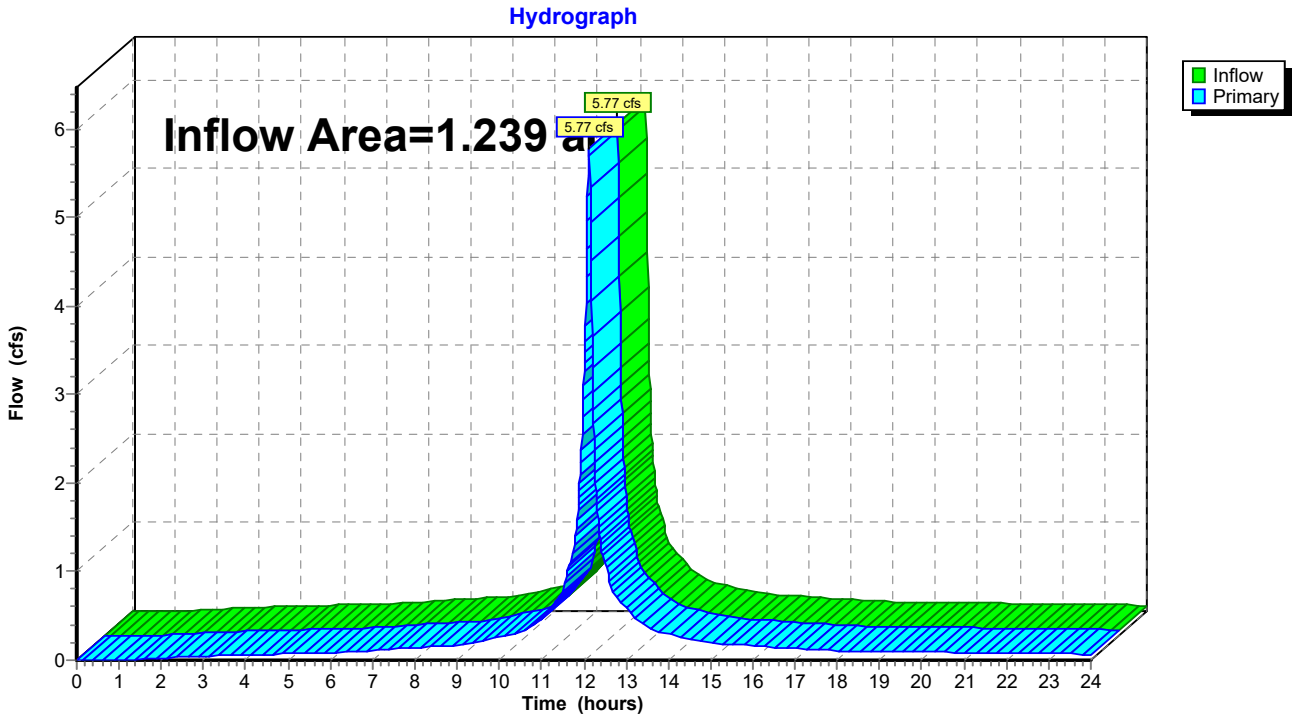


Summary for Link 12L: (new Link)

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

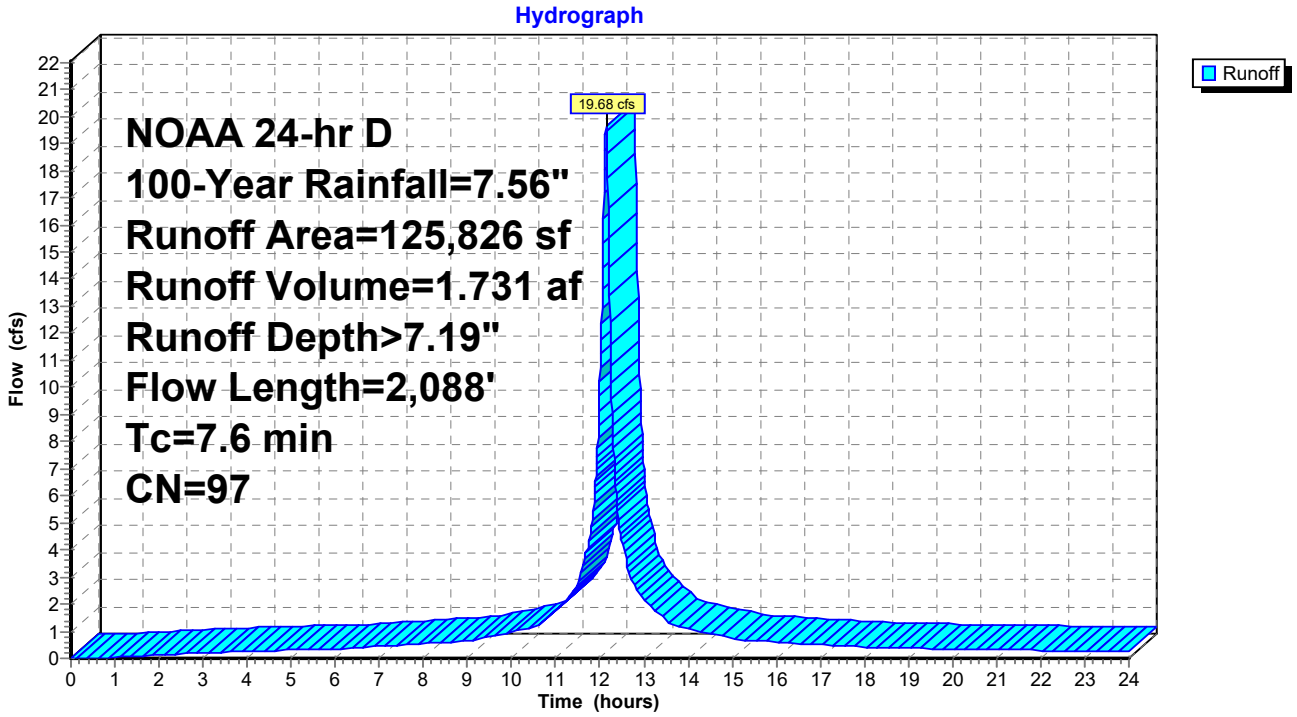
Runoff = 19.68 cfs @ 12.15 hrs, Volume= 1.731 af, Depth> 7.19"

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

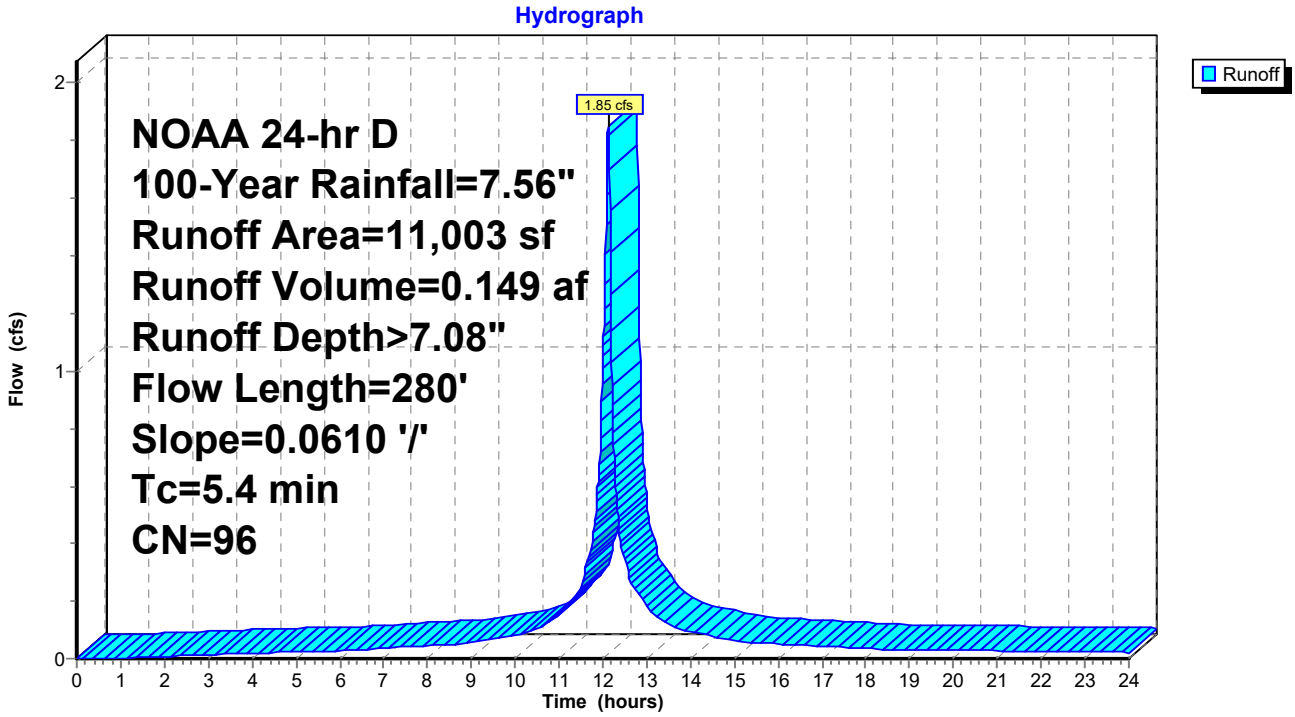
Runoff = 1.85 cfs @ 12.12 hrs, Volume= 0.149 af, Depth> 7.08"

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

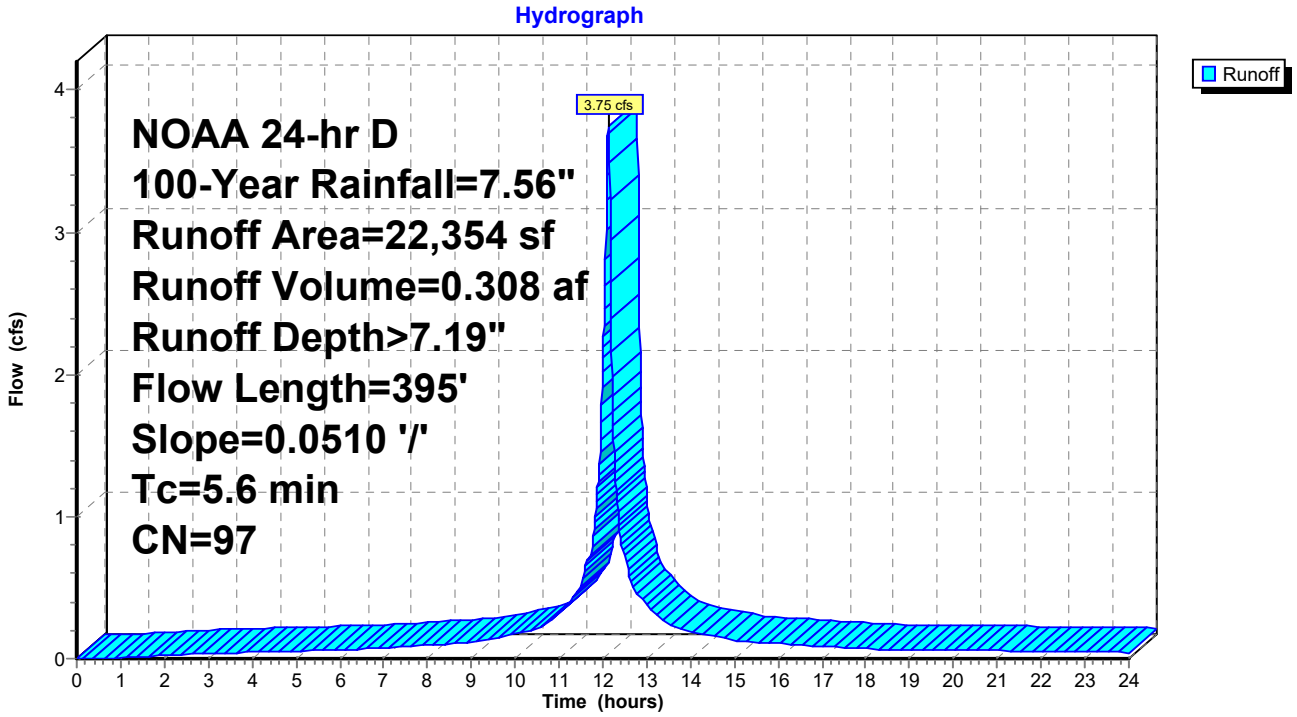
Runoff = 3.75 cfs @ 12.13 hrs, Volume= 0.308 af, Depth> 7.19"

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

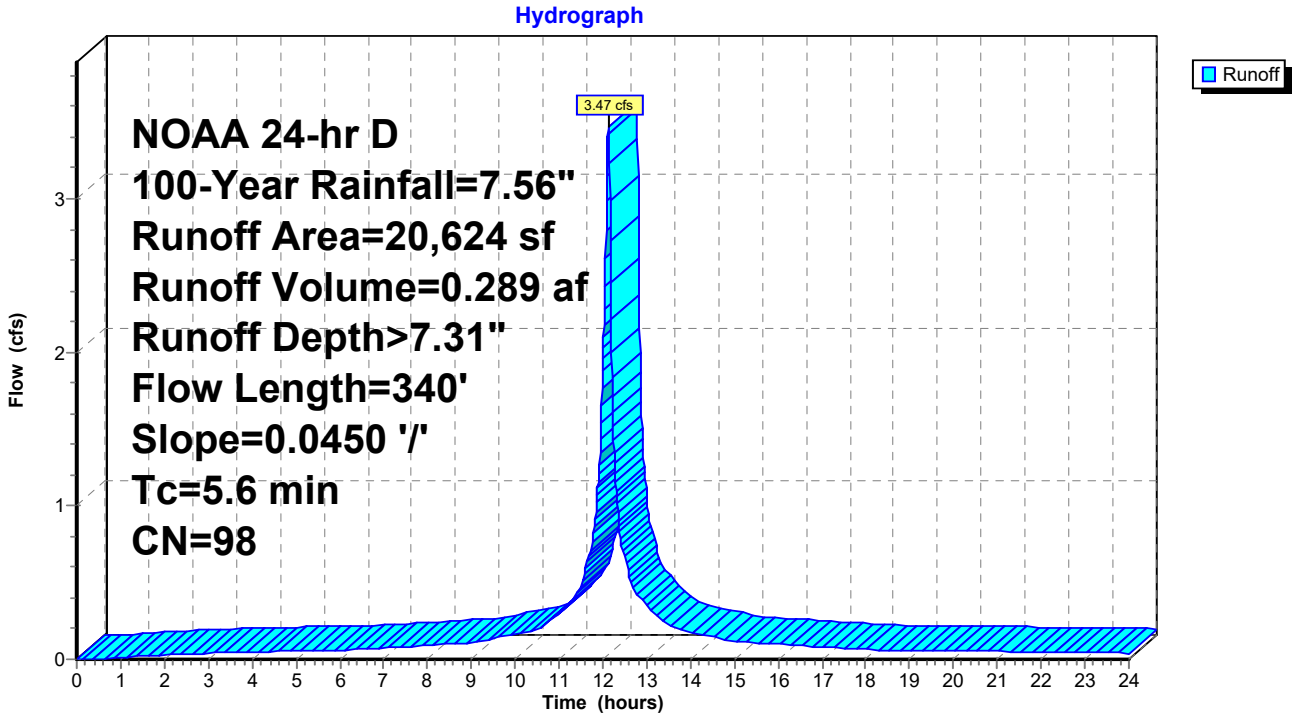
Runoff = 3.47 cfs @ 12.13 hrs, Volume= 0.289 af, Depth> 7.31"

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

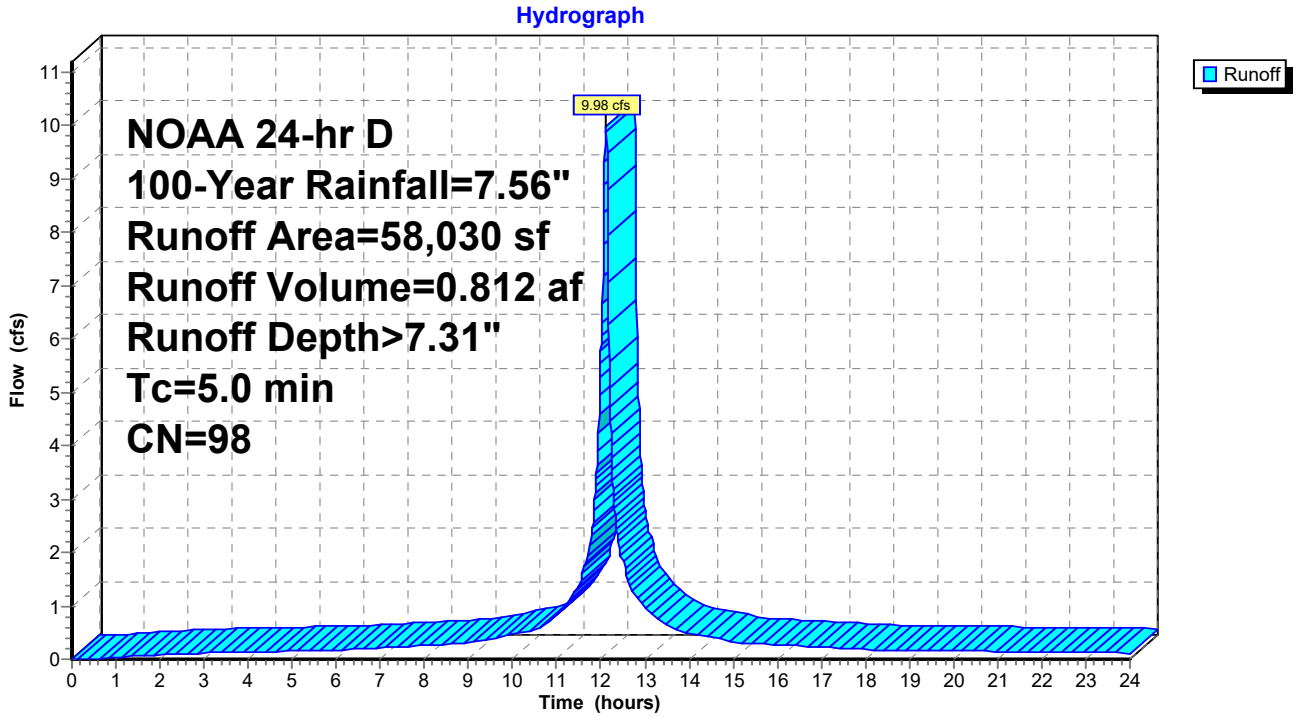
Runoff = 9.98 cfs @ 12.12 hrs, Volume= 0.812 af, Depth> 7.31"

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

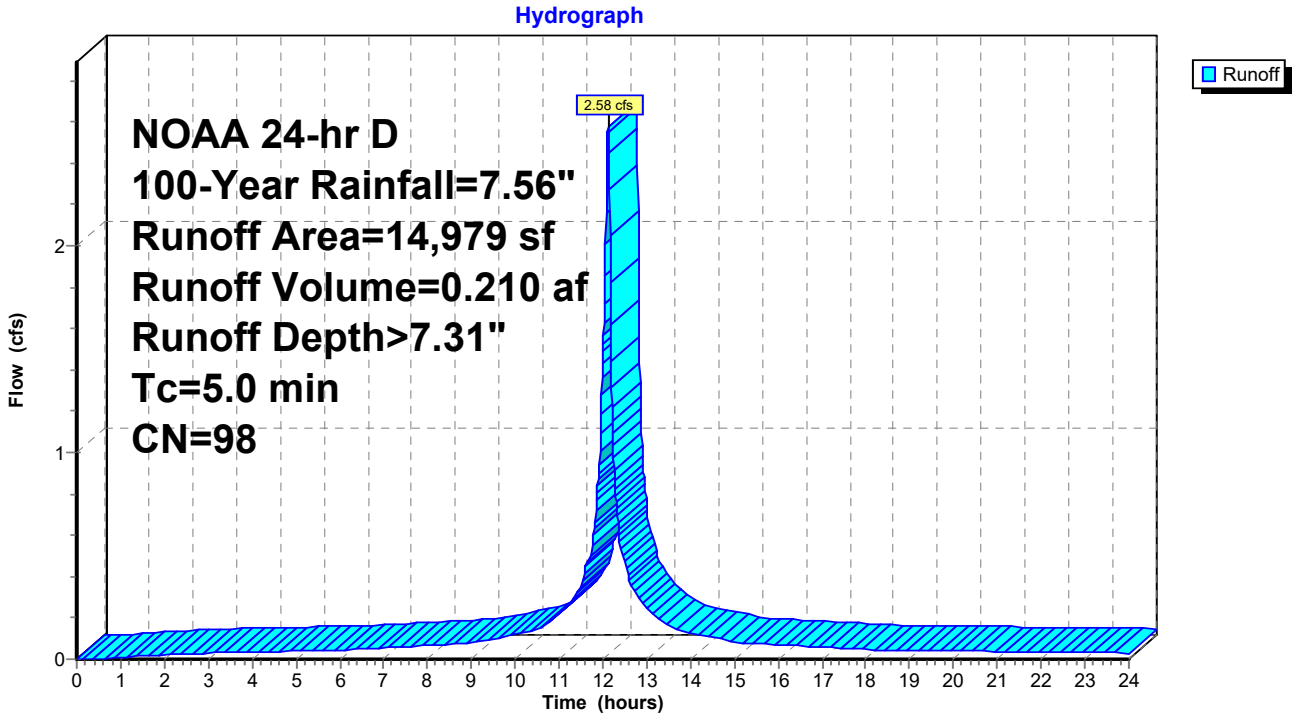
Runoff = 2.58 cfs @ 12.12 hrs, Volume= 0.210 af, Depth> 7.31"

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

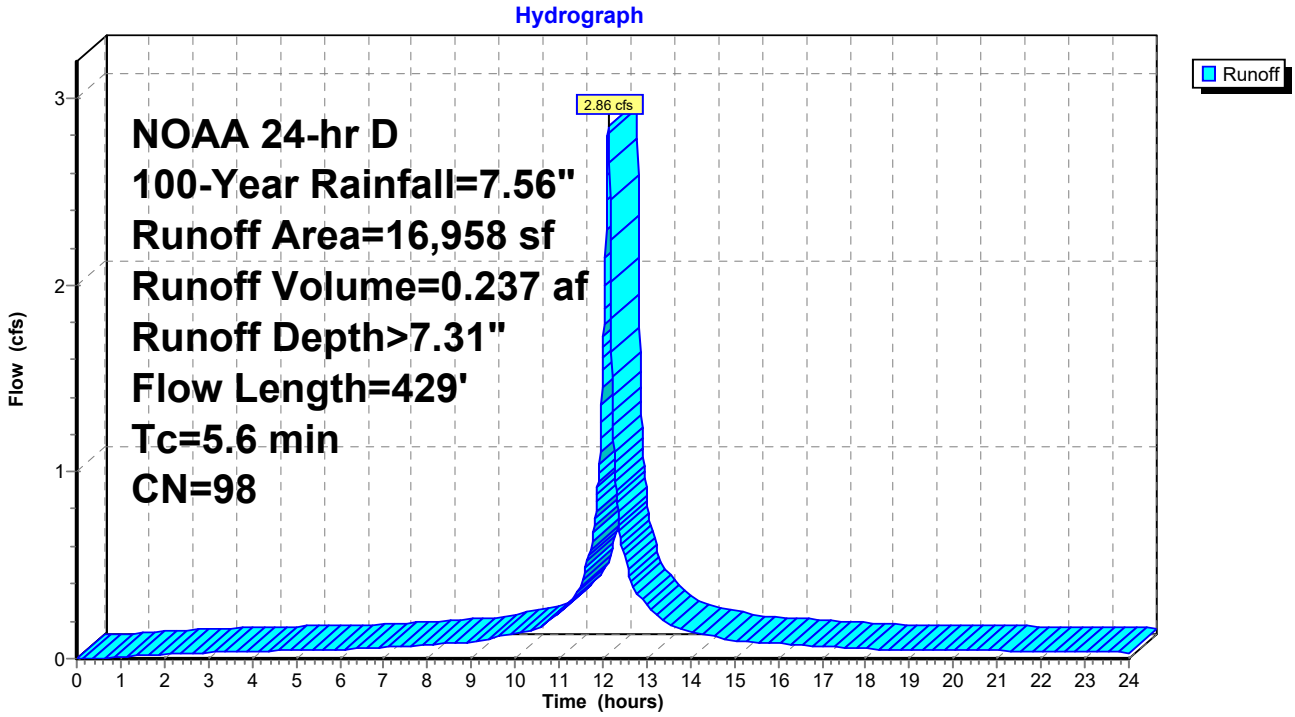
Runoff = 2.86 cfs @ 12.13 hrs, Volume= 0.237 af, Depth> 7.31"

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

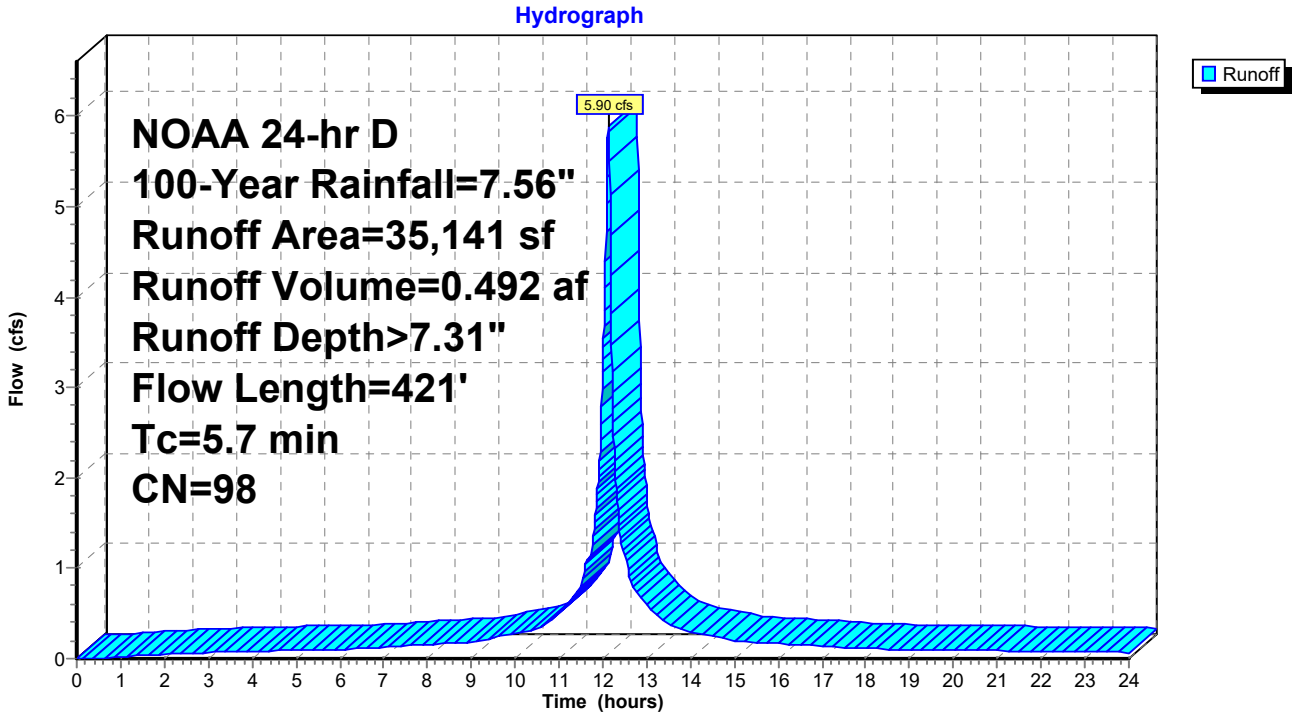
Runoff = 5.90 cfs @ 12.13 hrs, Volume= 0.492 af, Depth> 7.31"

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

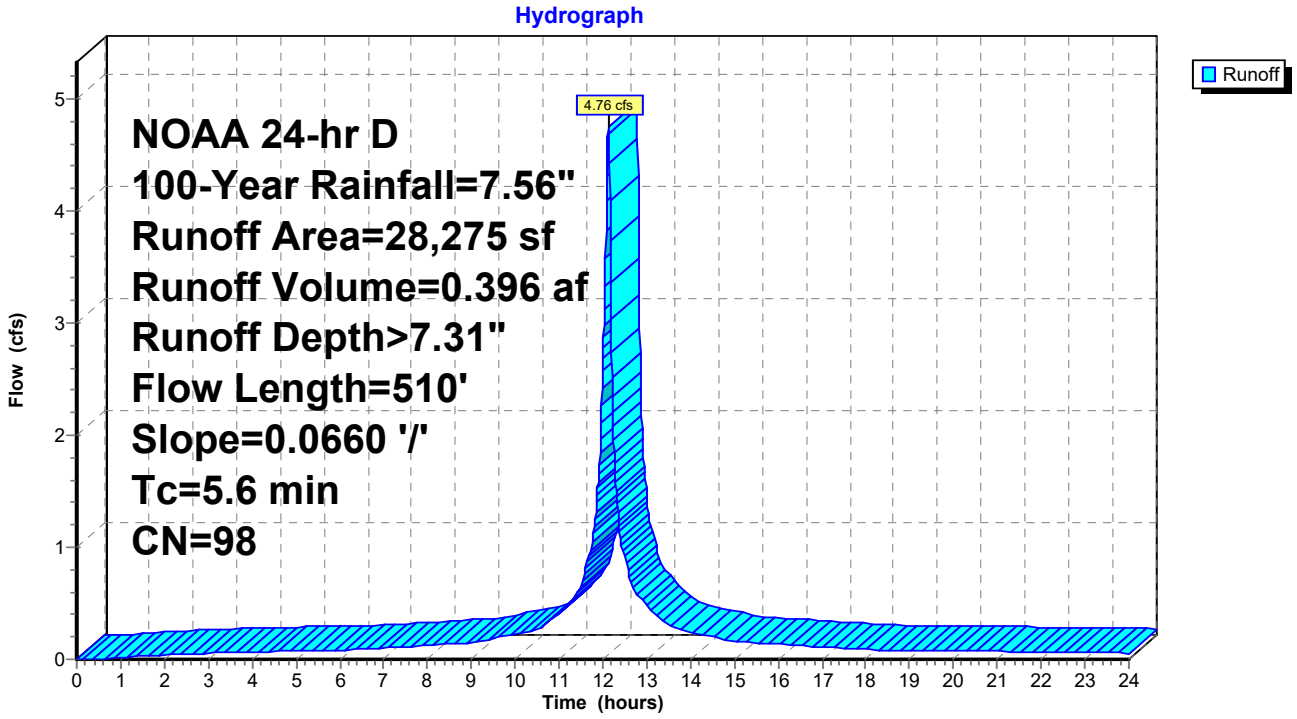
Runoff = 4.76 cfs @ 12.13 hrs, Volume= 0.396 af, Depth> 7.31"

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

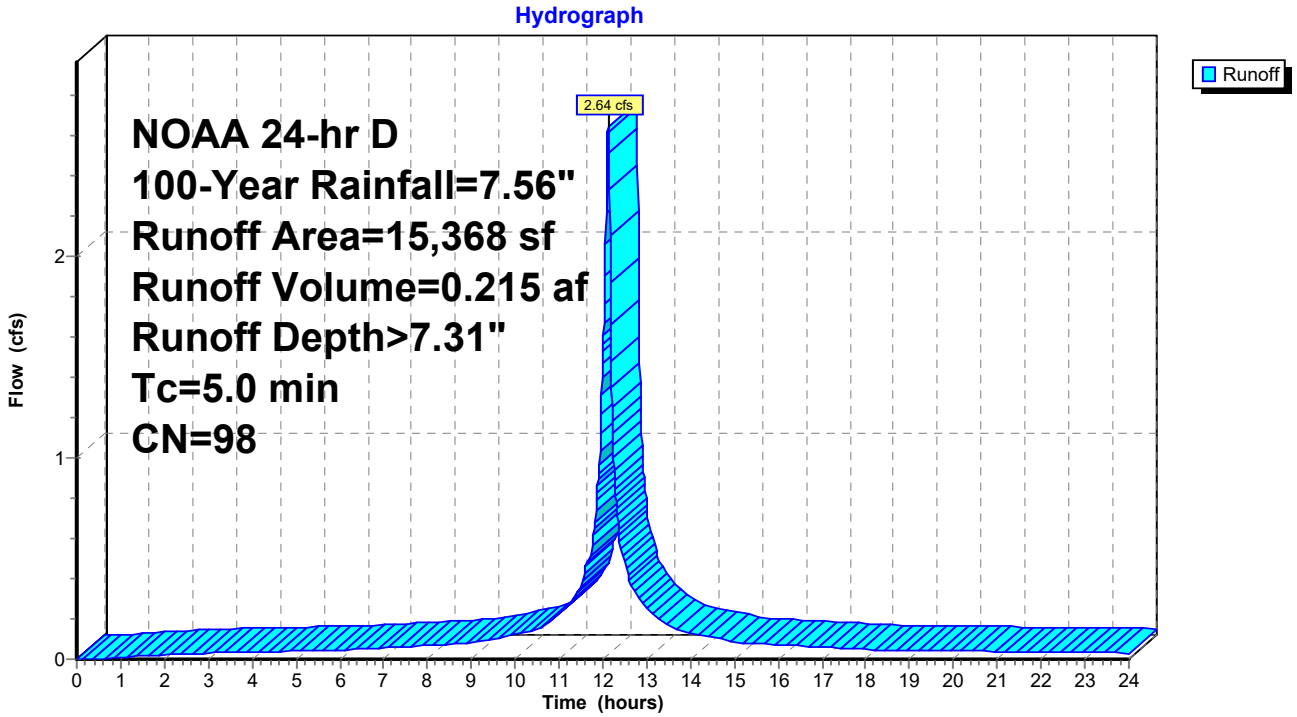
Runoff = 2.64 cfs @ 12.12 hrs, Volume= 0.215 af, Depth> 7.31"

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

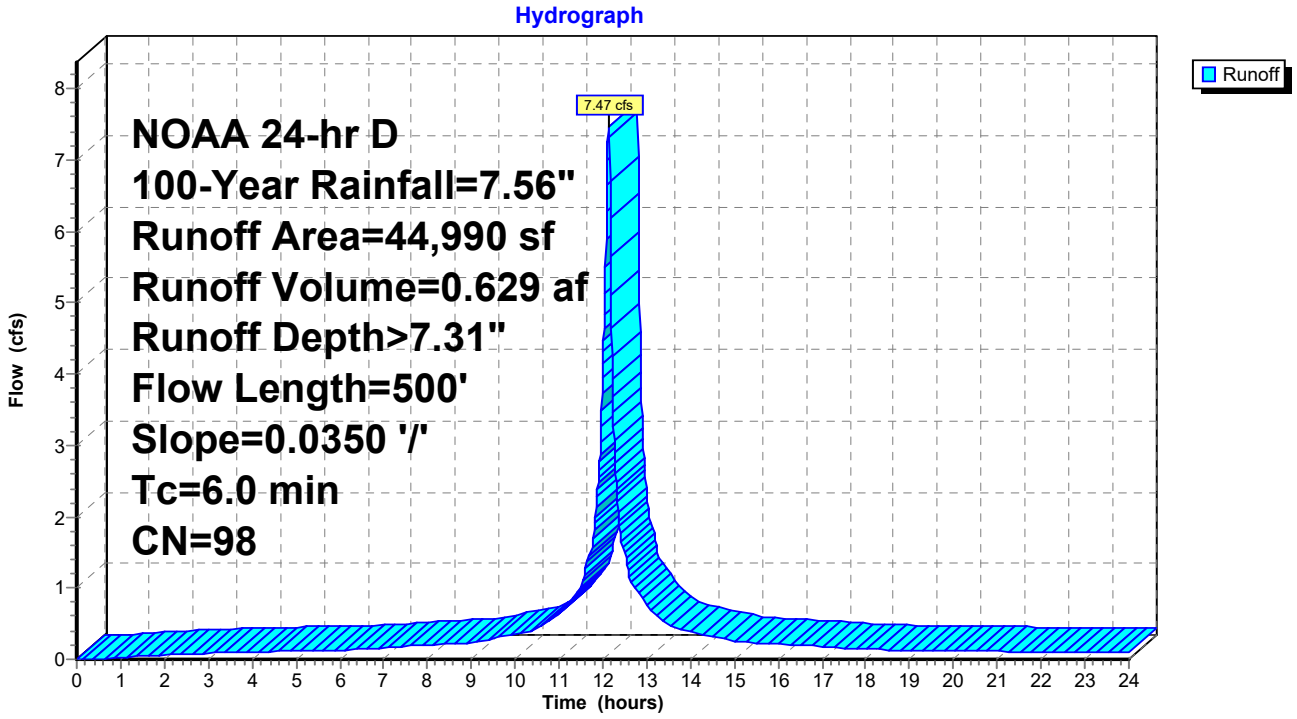
Runoff = 7.47 cfs @ 12.13 hrs, Volume= 0.629 af, Depth> 7.31"

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

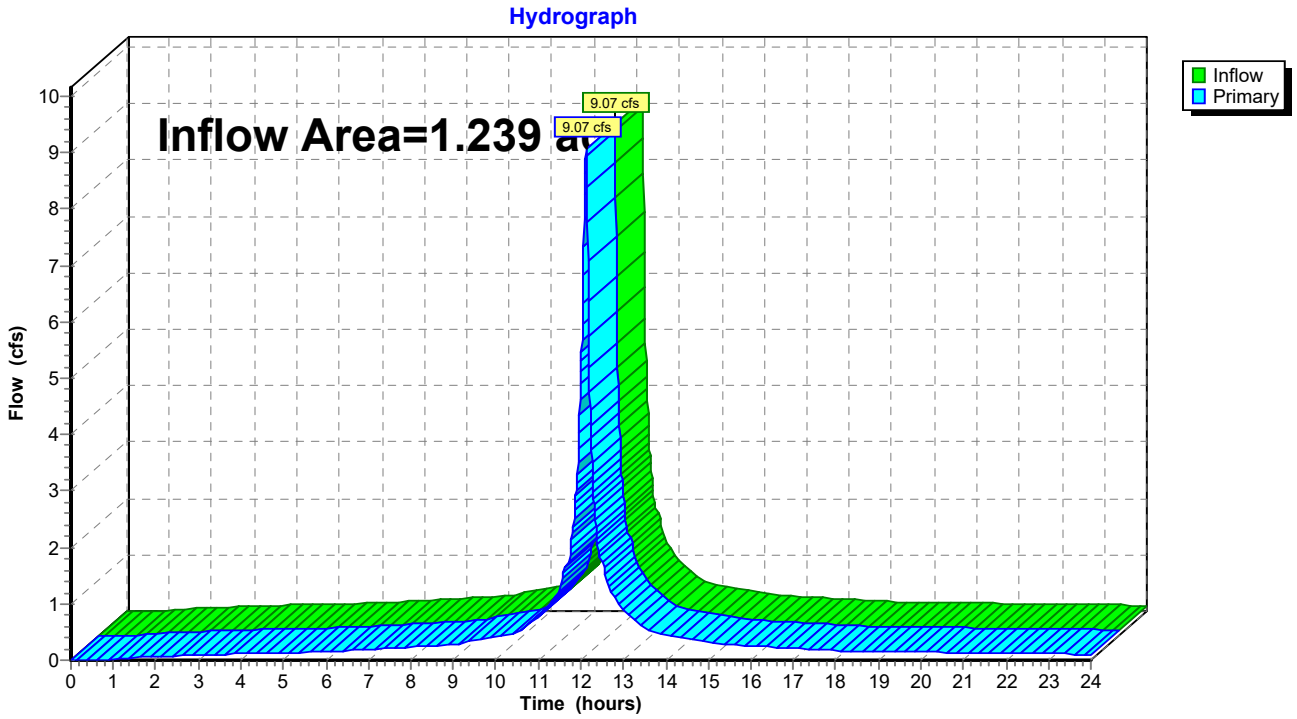


Summary for Link 12L: (new Link)

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

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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

610535_UT(UTILS-DRAINAGE).DWG Plotted on 9-Jan-2026 12:51 PM

N

TOWN OF PAXTON
CITY OF WORCESTER

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

RIGHT OF WAY

Existing State Highway Layout (SHLO)

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

PROP 40 LF CONDUIT AND PULL BOXES FOR FUTURE RRFB

PROP F&G MUNICIPAL STANDARD OR MASSDOT CASCADE TYPE.

R&S EX F&G-4

R&S EX F&G-3

Continued on Sheet 2

1926 SHLO NO. 2373

1926 SHLO BASELINE

1958 SHLO NO. 4747

1958 SHLO NO. 4747 (SECTION 1)

PT +21.24

PLEASANT STREET
(ROUTE 122)

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'

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

PROP CB WITH DEEP SUMP

CBCI-1

CIT-2

PROP 54 LF CONDUIT AND PULL BOX FOR FUTURE RRFB

5 LF OF 12" RCP @ 2%

LIMIT OF WORK

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

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

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

SUNNYVIEW HEIGHTS
(PUBLIC - 50' WIDE)

SUNNY HILL DRIVE
(PUBLIC - 50' WIDE)

Limited width between back of sidewalk and SHLO

SMH 10122
RIM=944.69'
INV.(A)=936.62'
INV.(B)=937.19'
SUMP=936.89'

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'

CB 10001
RIM=935.47'
INV.(A)=932.57'
T.O.S=929.47'
T.O.W=931.67'
SUMP=928.17'

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=925.92'
INV=930.70

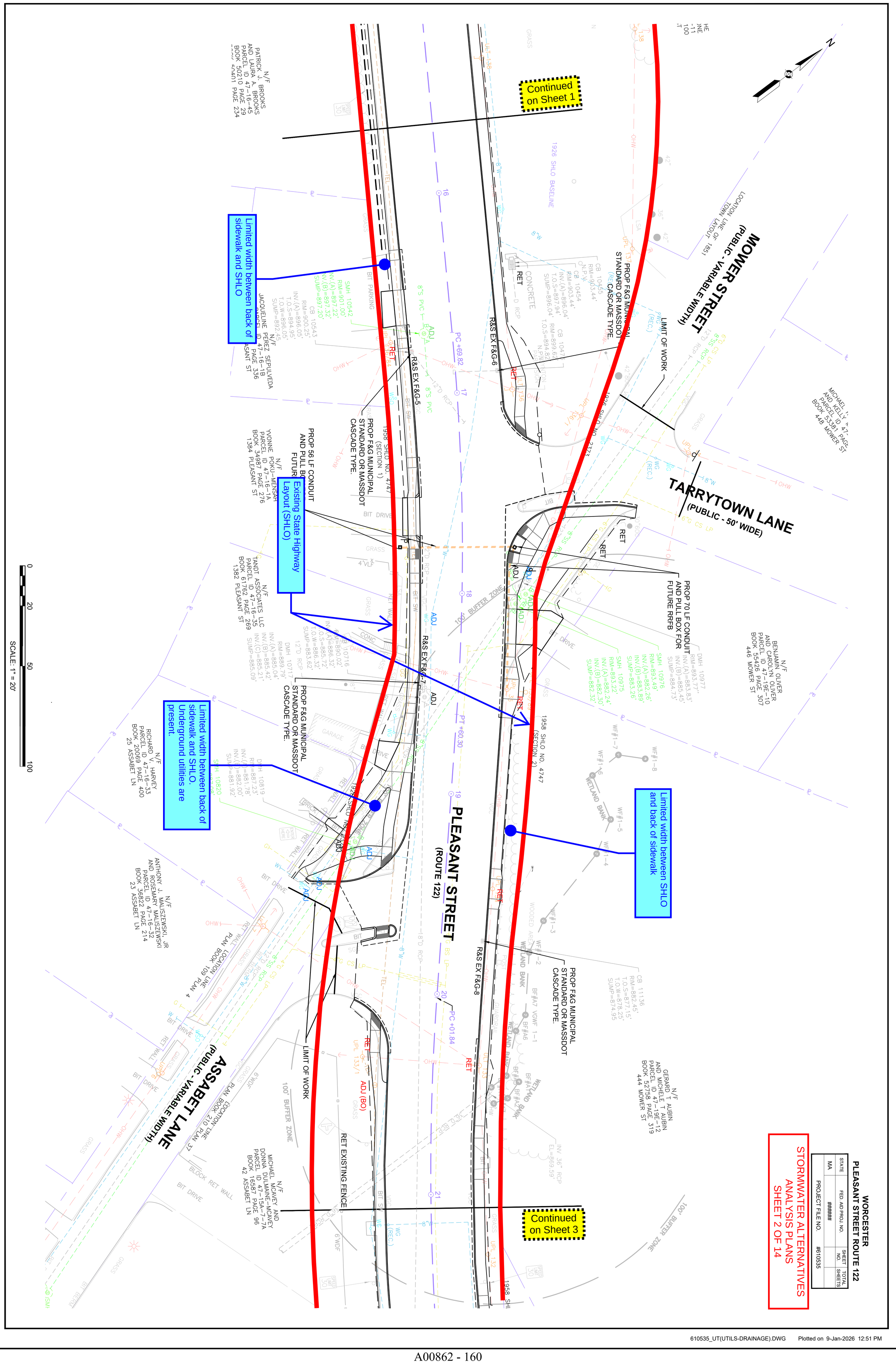
CB 10004
RIM=937.93'
INV.(A)=934.93'
T.O.S=931.43'
T.O.W=934.73'
SUMP=930.43'

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'

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 2 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 3 OF 14

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

LIMIT OF WORK

PROP RRFB, PULLBOX AND 11 LF CONDUIT

PROP RRFB, PULLBOX, AND 59 FT CONDUIT

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.

R&S EX F&G-9

R&S EX F&G-10

R&S EX F&G-11

R&S EX F&G-12

R&R EX HYDRANT FOR MIN 4' CLEARANCE

UTILITY NOTES

Continued on Sheet 2

Continued on Sheet 4

N/F
GERARD T AUBIN
D MICHELE T AUBIN
RCEL ID 47-19E-12
OK 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'

1958 SHLO NO. 4747

1926 SHLO 2373

100' BUFFER ZONE

0 20 50
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	

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.

R&R EX HYDRANT FOR 4' MIN CLEARANCE

PROP F&G MUNICIPAL STANDARD OR MASSDOT CASCADE TYPE

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

WORCESTER
PLEASANT STREET ROUTE 122

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

STORMWATER ALTERNATIVES ANALYSIS PLANS
SHEET 5 OF 14

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 overhead and underground utilities

Steep topography limits locations for potential SCMs and LIDs

Continued on Sheet 4

Continued on Sheet 6

LONG VUE TERRACE (PRIVATE - 40' WIDE)

EDWIDGE STREET (PUBLIC - 40' WIDE)

PLEASANT STREET (ROUTE 122)

AIPORT DRIVE

LIMIT OF WORK

PROP 9 LF CONDUIT AND PULL BOX FOR FUTURE RRFB

PROP F&G MUNICIPAL STANDARD OR MASSDOT CASCADE TYPE.

PROP 82 LF CONDUIT AND PULL BOX FOR FUTURE RRFB

Analysis Point 2

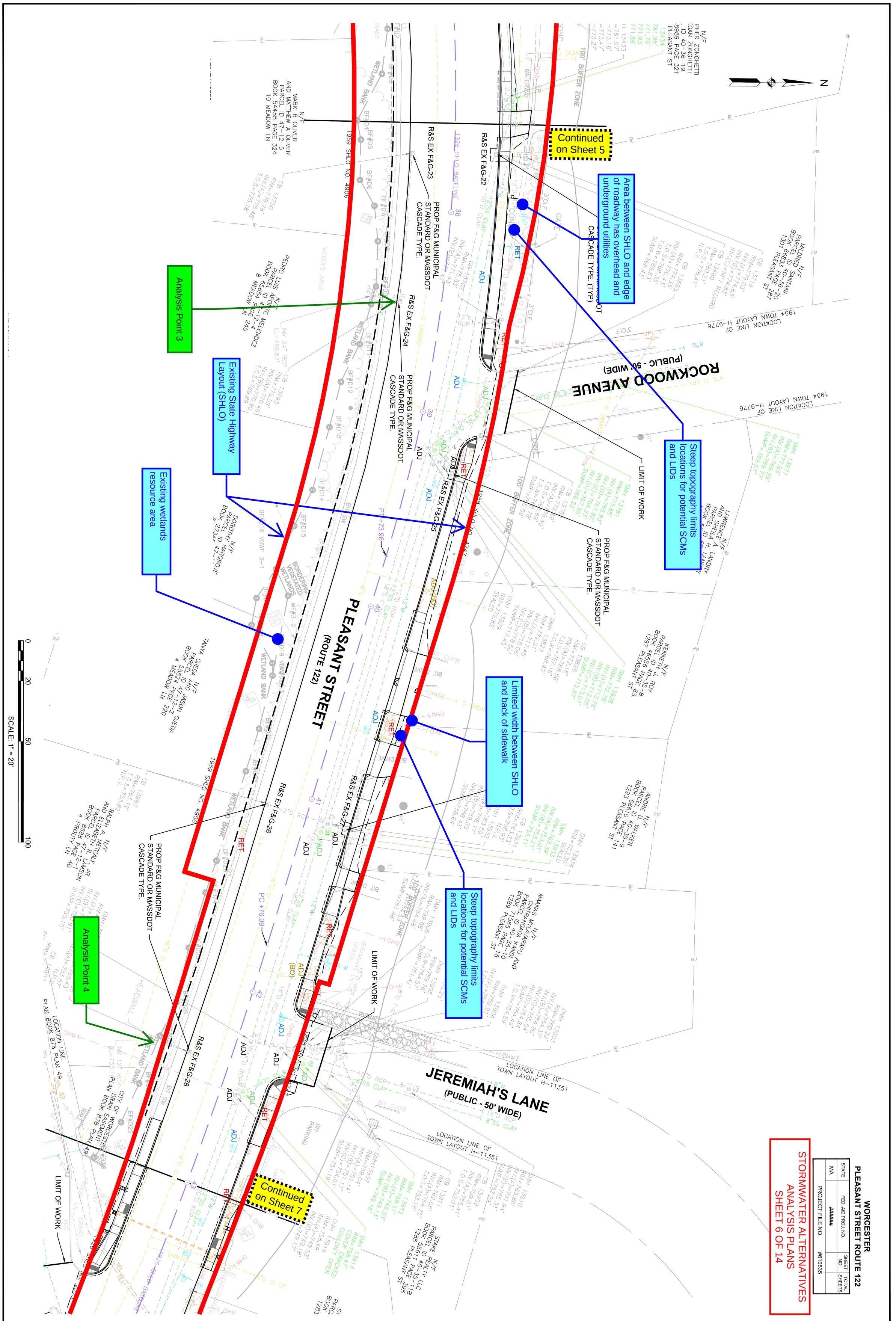
Existing State Highway Layout (SHLO)

Existing wetlands resource area

Area between SHLO and edge of roadway has underground stormwater drainage

SCALE: 1" = 20'

Proposal No. 610535-134928
610535_UT(UTILS-DRAINAGE).DWG Plotted on 9-Jan-2026 12:52 PM
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Continued on Sheet 5
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
Existing State Highway Layout (SHLO)
Existing wetlands resource area
Analysis Point 3
Analysis Point 4
LIMIT OF WORK
PROP F&G MUNICIPAL STANDARD OR MASSDOT CASCADE TYPE.
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
1959 SHLO NO. 4906
1926 SHLO BASELINE
1958 SHLO NO. 4747
ROCKWOOD AVENUE (PUBLIC - 50' WIDE)
PLEASANT STREET (ROUTE 122)
JEREMIAH'S LANE (PUBLIC - 50' WIDE)
100' BUFFER ZONE
WETLAND BANK
BORDERING VEGETATED WETLANDS
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 OJEDA AND JASON OJEDA PARCEL ID 47-12-2 BOOK 55624 PAGE 220 4 MEADOW LN
N/F DOROTHY HARGROVE PARCEL ID 47-1-
N/F RALPH A METCALF AND ELIZABETH R LAWSON JR PARCEL ID 47-12-1 BOOK 8898 PAGE 40 4 PROUTY LN
N/F CITY OF WORCESTER DRAIN EASEMENT 878 PLAN 49
N/F KENNETH J ROY PARCEL ID 40-35-8 BOOK 46656 PAGE 63 1297 PLEASANT ST
N/F ANDRE D WALKER PARCEL ID 40-35-9 BOOK 66610 PAGE 141 1293 PLEASANT ST
N/F MAANAS MYLAVARAPU CHITRANGADA KAND AND PARCEL ID 40-35-10 BOOK 71565 PAGE 1289 PLEASANT ST 18
N/F STAKE REALTY LLC PARCEL ID 40-35-11B BOOK 55611 PAGE 1285 PLEASANT ST
N/F LAWRENCE A AND SHEILA H LANDRY PARCEL ID 40 BOOK 59
N/F MILDRED S SANTANA PARCEL ID 40-36-20 BOOK 66833 PAGE 1301 PLEASANT ST 287
N/F PHER ZONGHETTI GAN ZONGHETTI ID 40-36-19 8989 PAGE 321 PLEASANT ST
N
0
20
50
100
SCALE: 1" = 20'
WORCESTER
PLEASANT STREET ROUTE 122
STATE MA
FED. AID PROJ. NO. #######
PROJECT FILE NO. #610535
SHEET NO.
TOTAL SHEETS
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

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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 40-35-11A 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

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

LOCATION LINE OF PLAN BOOK 468 PLAN 47

BAXTER STREET
(PUBLIC - 50' WIDE)

LOCATION LINE OF BOOK 21492 PAGE 247

SHLO is adjacent to back of sidewalk

PROP F&G MUNICIPAL STANDARD OR MASSDOT CASCADE TYPE.

Continued on Sheet 6

Continued on Sheet 8

1926 SHLO NO. 2373

1926 SHLO BASELINE

R&S EX F&G-29

R&S EX F&G-31

R&S EX F&G-33

R&S EX F&G-34

R&S EX F&G-32

PT +86.77

PROP 19 LF OF 12" RCP @1%

PROP 55 LF CONDUIT AND PULL BOXES FOR FUTURE RRFB

CB-30
SW=753.23
RIM=752.50
INV=747.80

PLEASANT STREET
(ROUTE 122)

CITY OF WORCESTER DRAIN EASEMENT PLAN BOOK 878 PLAN 49

LOCATION LINE PLAN BOOK 878 PLAN 49

LIMIT OF WORK

PROP. CB WITH DEEP SUMP AND FRAME AND GRATE VERTICAL TYPE, SEE DETAIL

PROP 58 LF CONDUIT AND PULL BOXES FOR FUTURE RRFB

PROUTY LANE
(PUBLIC - 49.5' 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

INV=747.70

Limited width between SHLO and back of sidewalk

PROP F&G MUNICIPAL STANDARD OR MASSDOT CASCADE TYPE.

Existing State Highway Layout (SHLO)

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

N/F RICHARD J PIKE AND TERESA E PIKE PARCEL ID 47-10-16A BOOK 8685 PAGE 283 JOPPA RD

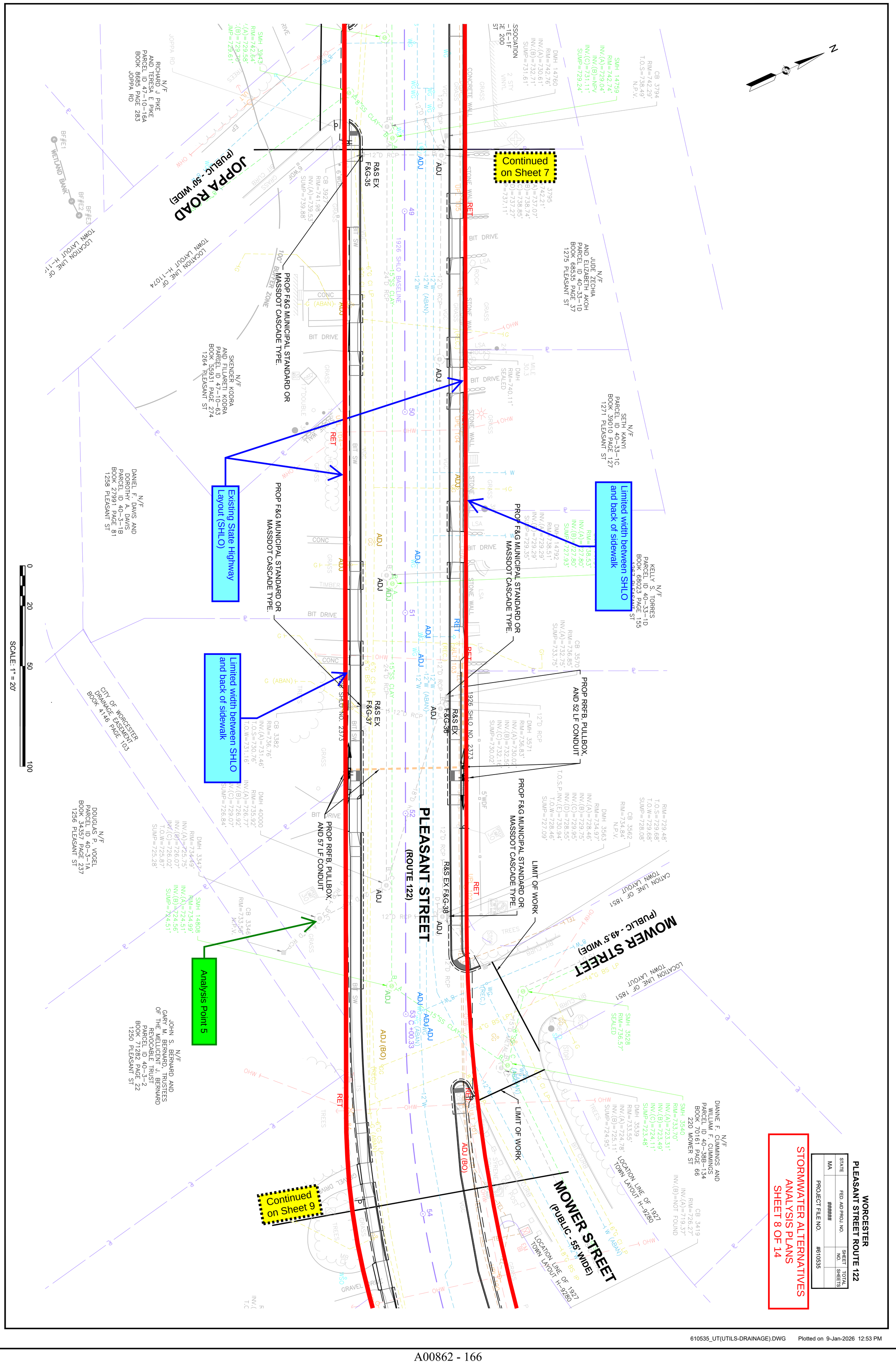
JOPPA ROAD
(PUBLIC - 50' WIDE)

100' BUFFER ZONE

WETLAND BANK

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 8 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 9 OF 14

610535_UT(UTILS-DRAINAGE).DWG Plotted on 9-Jan-2026 12:54 PM

N

Existing State Highway Layout (SHLO)

Analysis Point 6

Limited width between SHLO and back of sidewalk

Limited width between SHLO and back of sidewalk

Continued on Sheet 8

Continued on Sheet 10

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)

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 JAMES W. CLAFLIN AND MARGARET M. CLAFLIN
PARCEL ID 40-31-6A
BOOK 22099 PAGE 266
1227 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 SAID NAFAI AND ELI STEVENS-NAFAI
PARCEL ID 40-2-13A
BOOK 29193 PAGE 54
1236 PLEASANT ST

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

PROP F&G MUNICIPAL STANDARD OR MASSDOT CASCADE TYPE.

PROP 6' SW GUY REM EX GUY (BO)

R&S EX F&G-42

R&S EX F&G-43

R&S EX F&G-40

R&S EX F&G-39

1926 SHLO NO. 2373

1926 SHLO BASELINE

PT +67.35

LIMIT OF WORK

LOCATION LINE OF 1927 TOWN LAYOUT H-9280

LOCATION LINE OF PLAN BOOK 96 PLAN 810

LOCATION LINE OF TOWN LAYOUT H-1124 OF 1978

LOCATION LINE OF PLAN BOOK 227 PLAN 61

LOCATION LINE OF PLAN 727 PLAN 61

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 10 OF 14

610535_UT(UTILS-DRAINAGE).DWG Plotted on 9-Jan-2026 12:54 PM

N

WF#4-1 WF#4-8 BORDERING VEGETATED WETLANDS WF#4-2 WF#4-3 WF#4-4 WF#4-7 BORDERING VEGETATED WETLANDS WF#4-5 VGBF F4 WF#4-6 VGBF F9 BF#F3 BF#F8 WETLAND BANK BF#F7 BF#F2 BF#F6 BF#F5 WETLAND BANK WETLAND BANK

Continued on Sheet 9

Continued on Sheet 11

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.

PLEASANT STREET
(ROUTE 122)

ROBERTSON ROAD
(PUBLIC - 29.5' WIDE)

Limited width between SHLO and back of sidewalk

Existing State Highway Layout (SHLO)

PROP F&G MUNICIPAL STANDARD OR MASSDOT CASCADE TYPE.

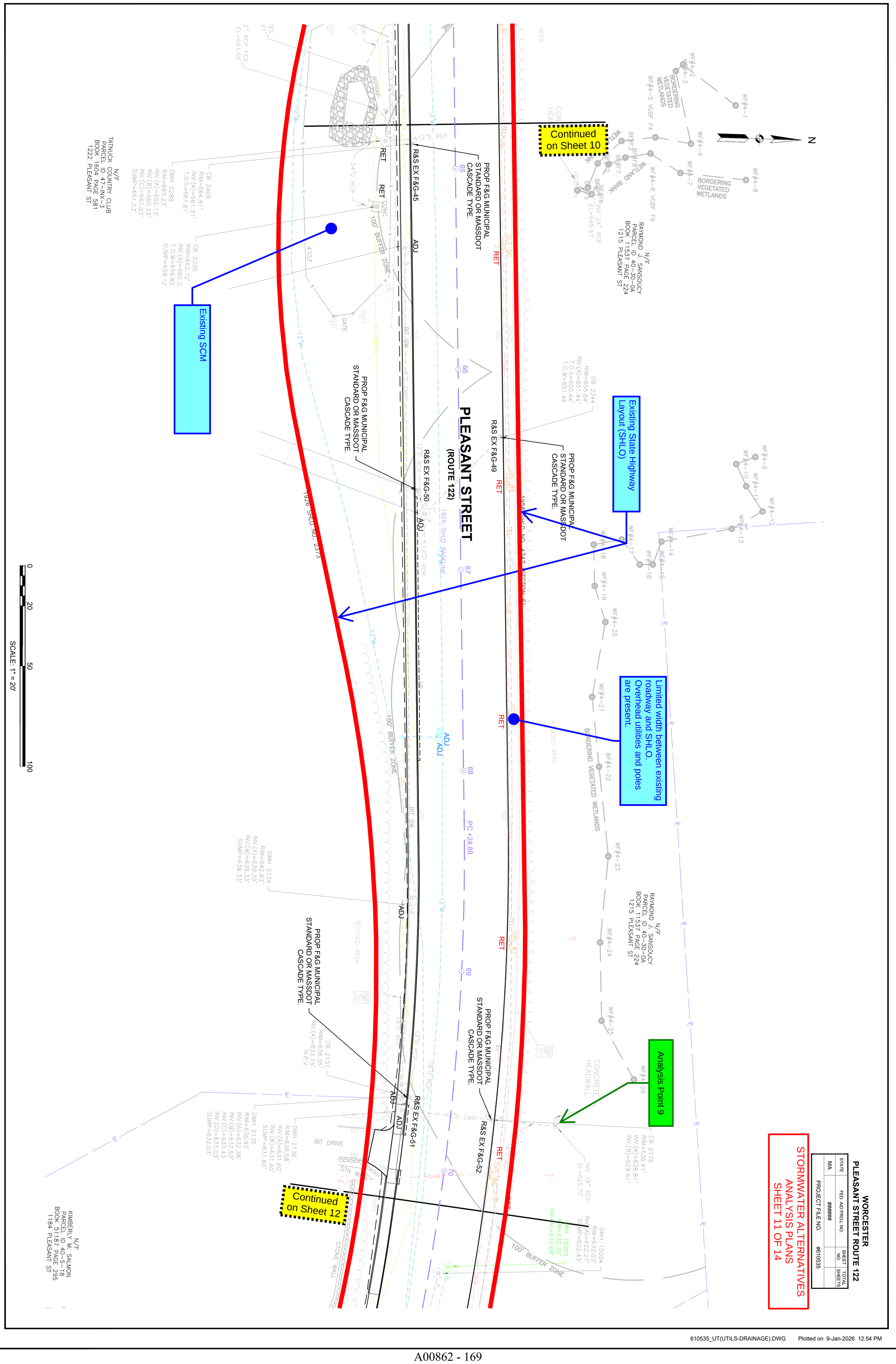
PROP 56 LF CONDUIT AND PULL BOXES FOR FUTURE RRFB

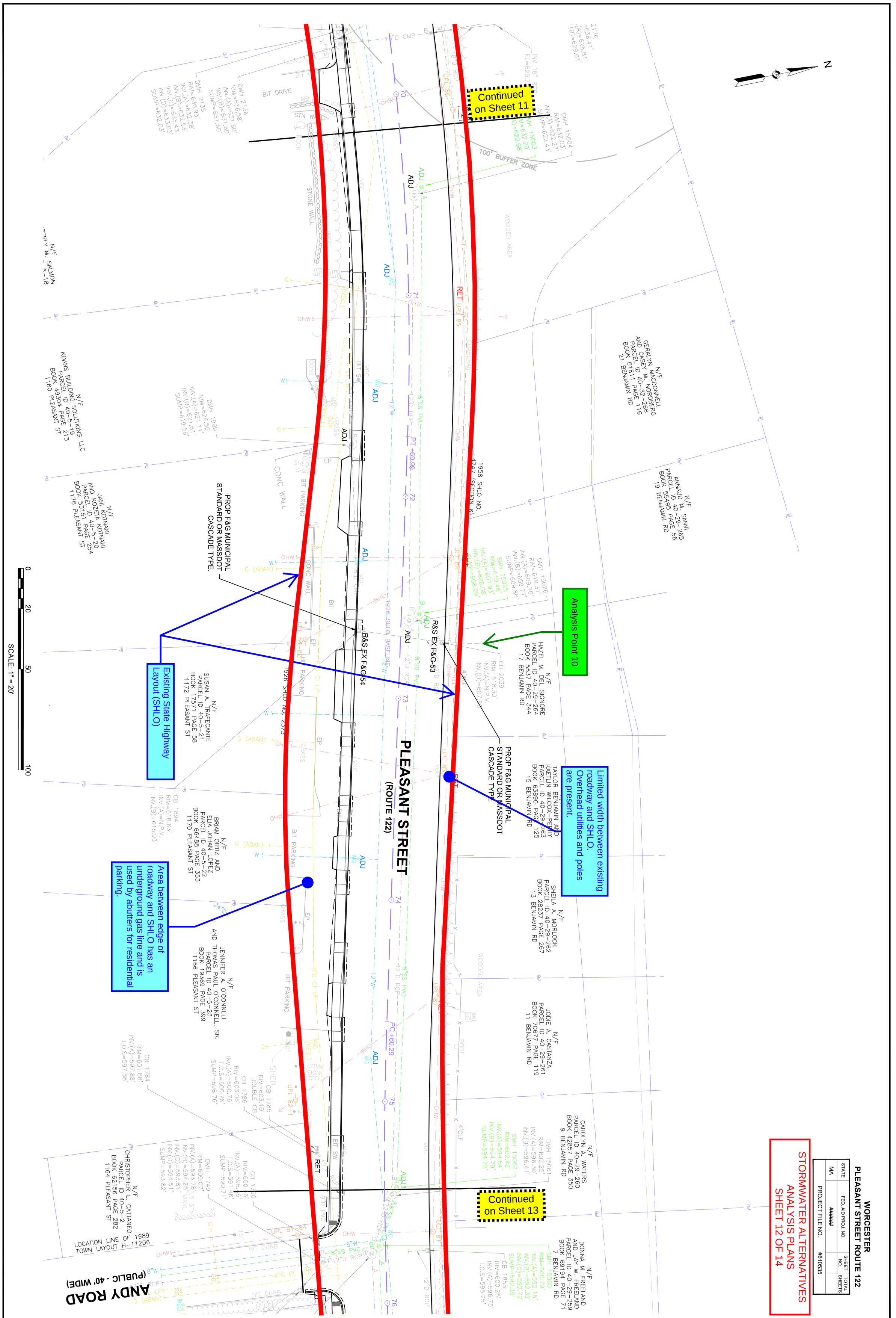
Existing SCM

Analysis Point 8

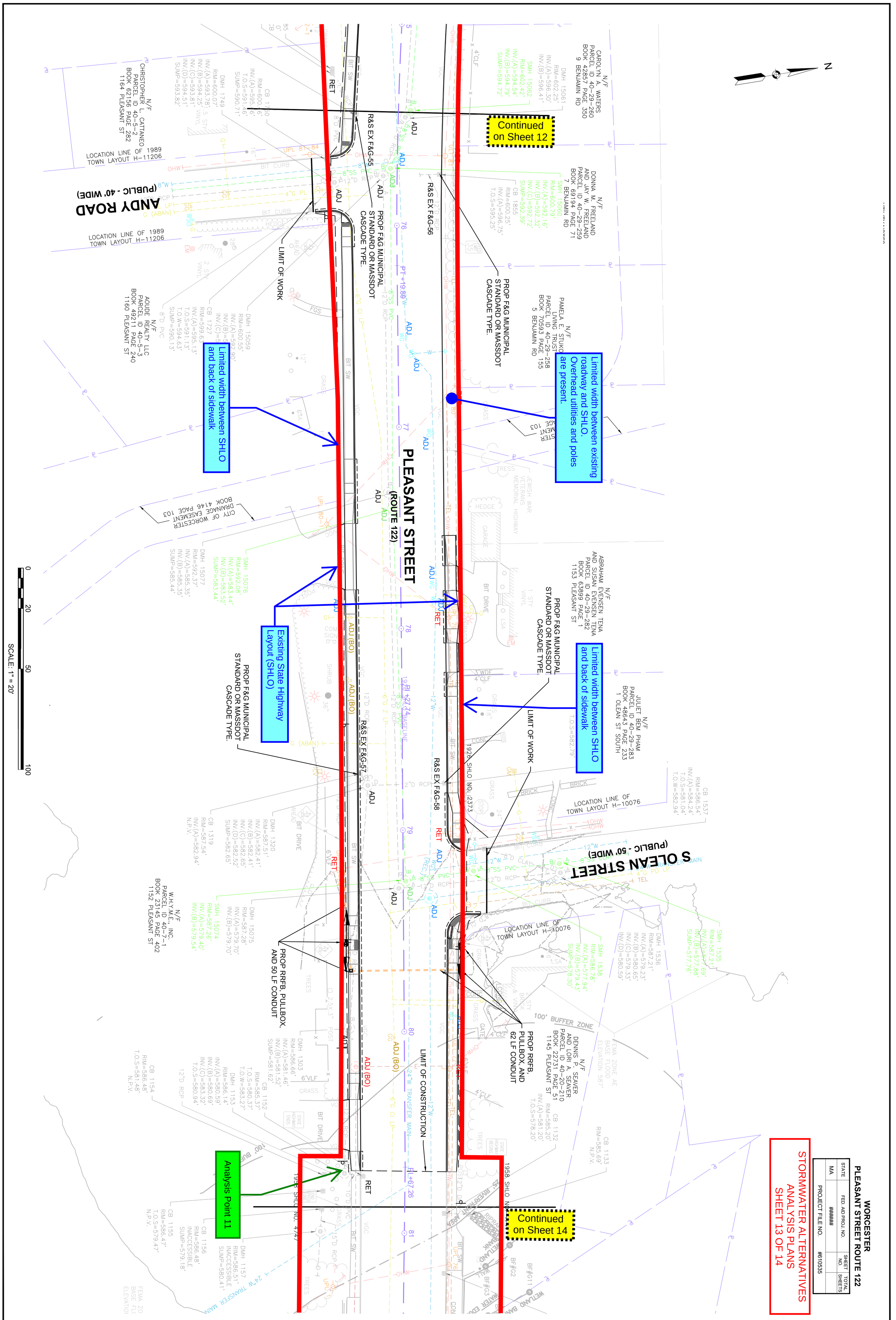
0 20 50 100

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.
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
BORDERING VEGETATED WETLANDS
WETLAND BANK
WOODED AREA
CONCRETE HEADWALL
100' BUFFER ZONE
CB 2409
CB 2335
CB 2344
CB 2176
CB 2137
DMH 2288
DMH 2134
DMH 2135
DMH 2136
DMH 15003
DMH 15004
INV 24" RCP EL=645.57'
INV 18" RCP EL=625.72'
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
610535_UT(UTILS-DRAINAGE).DWG
Plotted on 9-Jan-2026 12:54 PM



610535_UT(UTILS-DRAINAGE).DWG Plotted on 9-Jan-2026 12:55 PM

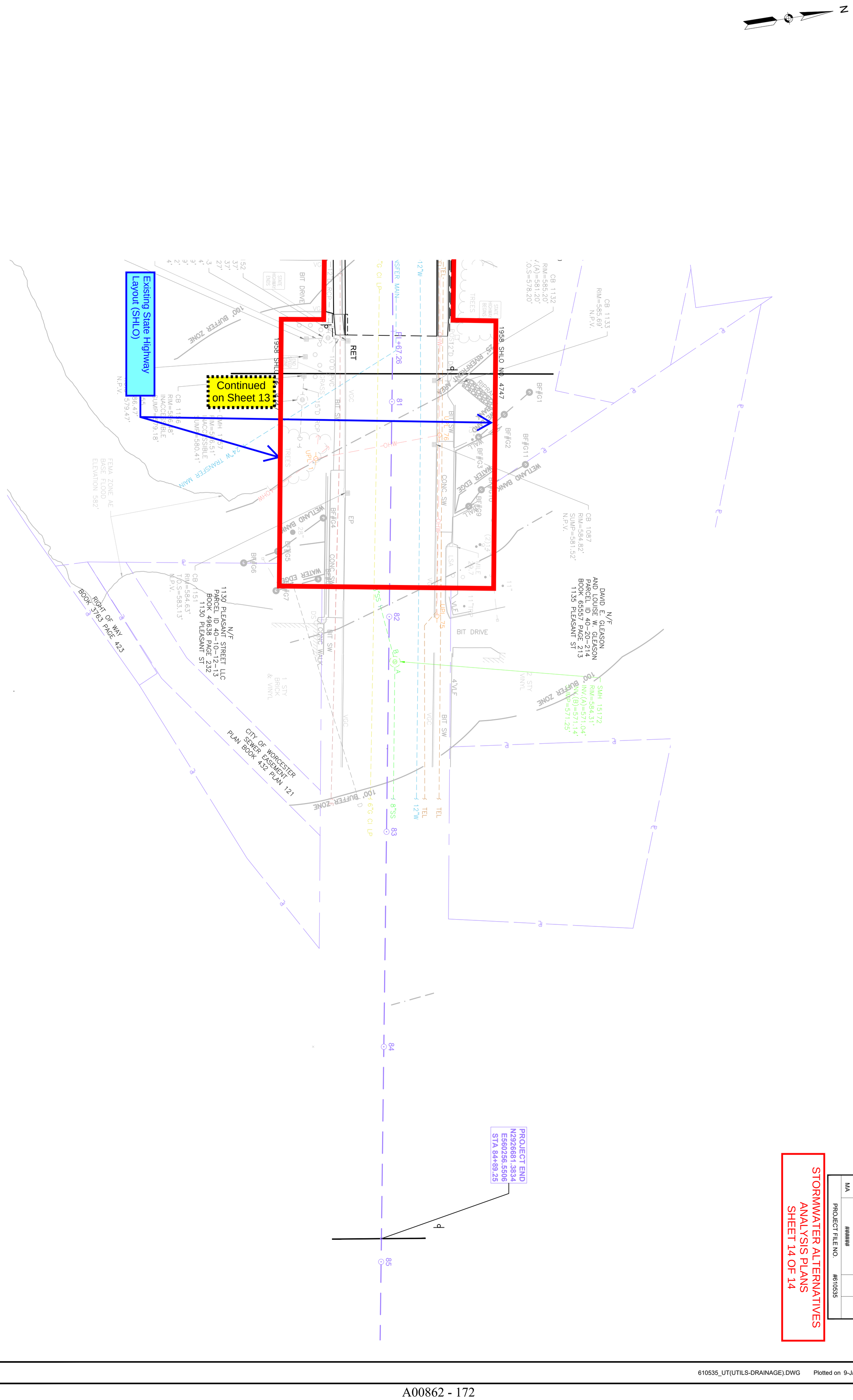


WORCESTER
PLEASANT STREET ROUTE 122

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

STORMWATER ALTERNATIVES ANALYSIS PLANS SHEET 13 OF 14

610535_UT(UTILS-DRAINAGE).DWG Plotted on 9-Jan-2026 12:55 PM

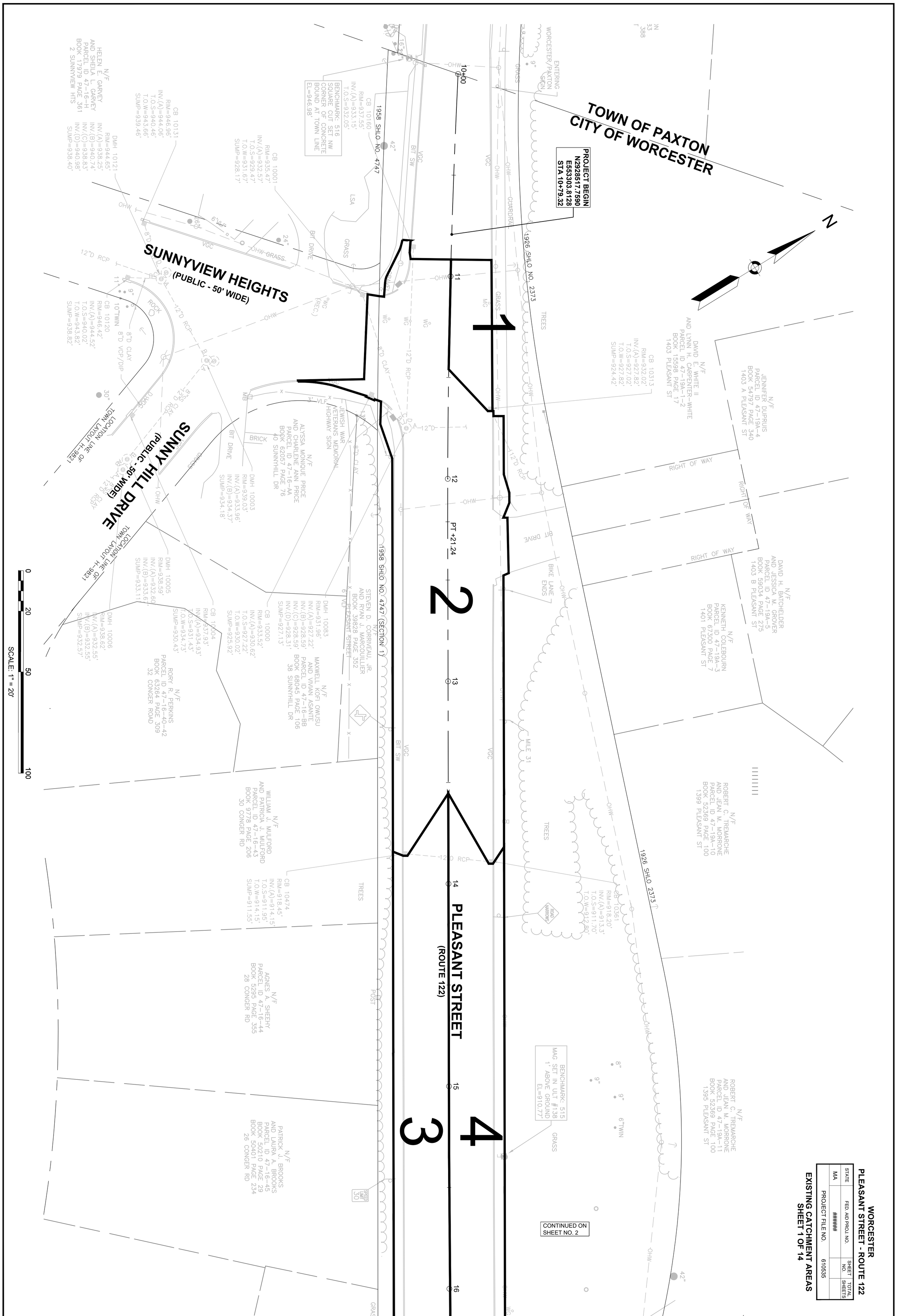


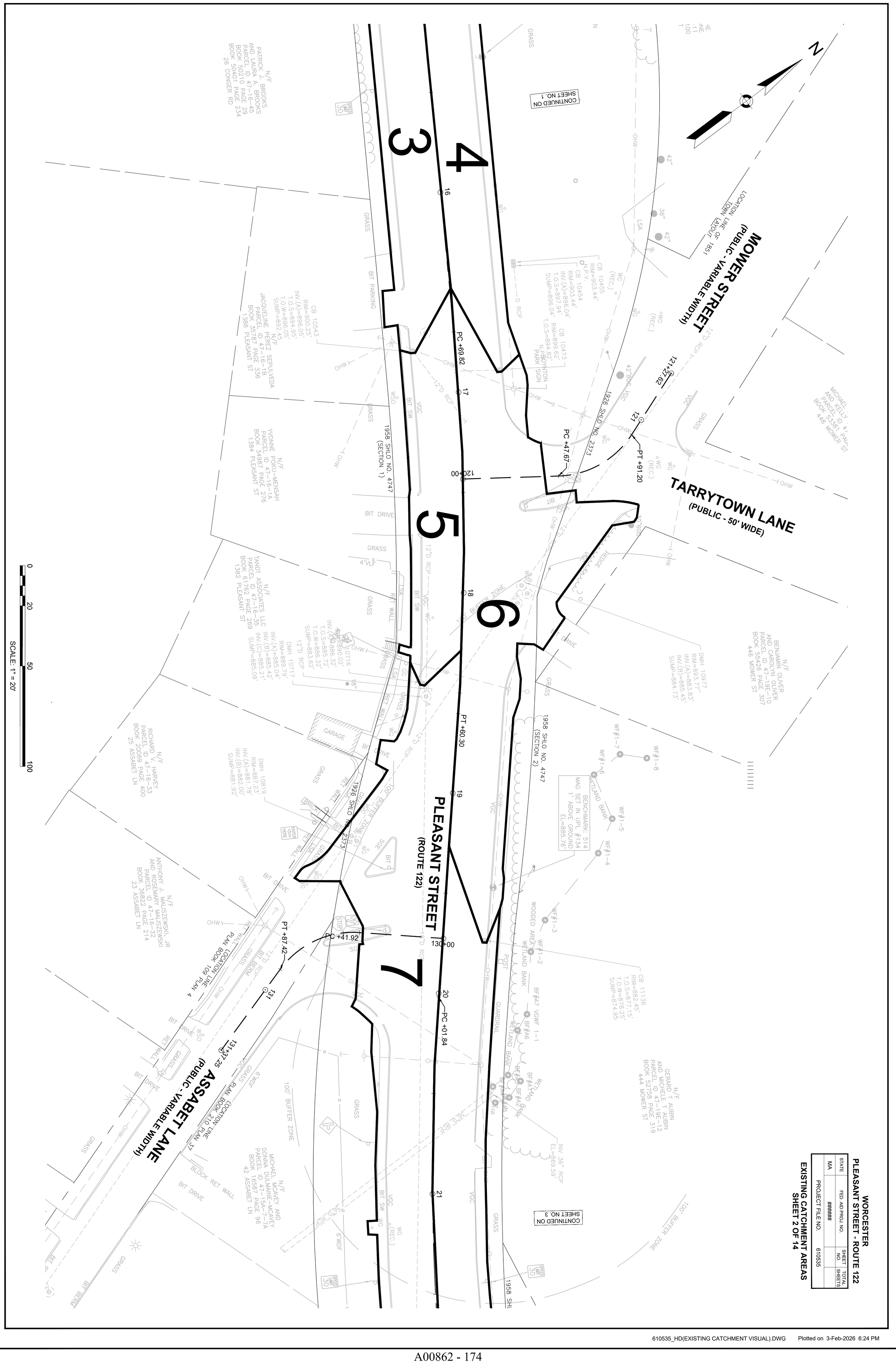
WORCESTER
PLEASANT STREET ROUTE 122

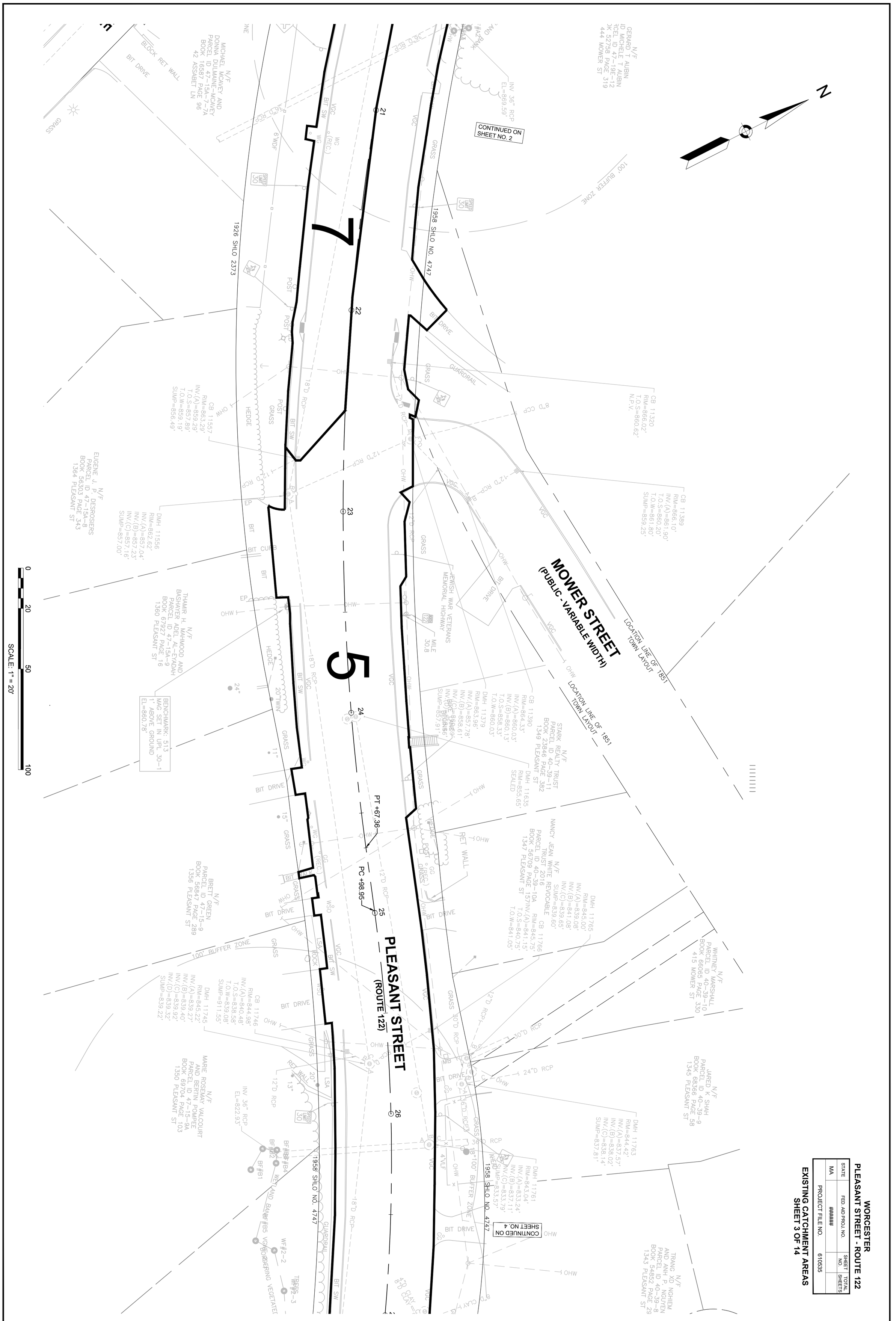
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	######		
PROJECT FILE NO.	#610535		

STORMWATER ALTERNATIVES
ANALYSIS PLANS
SHEET 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)
10+00
11
12
13
14
15
16
PT +21.24
1
2
3
4
N
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.
#######
SHEET NO.
TOTAL SHEETS
PROJECT FILE NO.
610535
0
20
50
100
SCALE: 1" = 20'
610535_HD(EXISTING CATCHMENT VISUAL).DWG
Plotted on 3-Feb-2026 6:23 PM


WORCESTER
PLEASANT STREET - ROUTE 122
EXISTING CATCHMENT AREAS
SHEET 2 OF 14
STATE: MA
FED. AID PROJ. NO.: #######
SHEET NO.:
TOTAL SHEETS:
PROJECT FILE NO.: 610535
SCALE: 1" = 20'
0
20
50
100
PLEASANT STREET
(ROUTE 122)
TARRYTOWN LANE
(PUBLIC - 50' WIDE)
MOWER STREET
(PUBLIC - VARIABLE WIDTH)
ASSABET LANE
(PUBLIC - VARIABLE WIDTH)
1958 SHLO NO. 4747
(SECTION 1)
1958 SHLO NO. 4747
(SECTION 2)
1926 SHLO NO. 2373
3
4
5
6
7
PC +69.82
PC +47.67
PT +91.20
PT +60.30
PC +41.92
PT +87.42
PC +01.84
120+00
130+00
CONTINUED ON SHEET NO. 1
CONTINUED ON SHEET NO. 3
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
BENCHMARK: 514 MAG SET IN UPL #134 1' ABOVE GROUND EL=885.76'
LOCATION LINE OF TOWN LAYOUT 1851
LOCATION LINE PLAN BOOK 109 PLAN 4
LOCATION LINE PLAN BOOK 210 PLAN 37
121+27.62
131+37.25
121
PT +91.20
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.: #######
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
PT +67.36
PC +98.95
BENCHMARK: 513
MAG SET IN UPL 30-1
1" ABOVE GROUND
EL=860.78'
SCALE: 1" = 20'
0
20
50
100
610535_HD(EXISTING CATCHMENT VISUAL).DWG
Plotted on 3-Feb-2026 6:25 PM

Proposal No. 610535-134928

610535_HD(EXISTING CATCHMENT VISUAL).DWG Plotted on 3-Feb-2026 6:26 PM

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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 4 OF 14

N

5

8

9

PLEASANT STREET
(ROUTE 122)

BAILEY STREET
(PUBLIC - 49.5' WIDE)

AIPORT DRIVE

AIRPORT DRIVE LIMIT OF WORK (CONT)

AIRPORT DRIVE

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

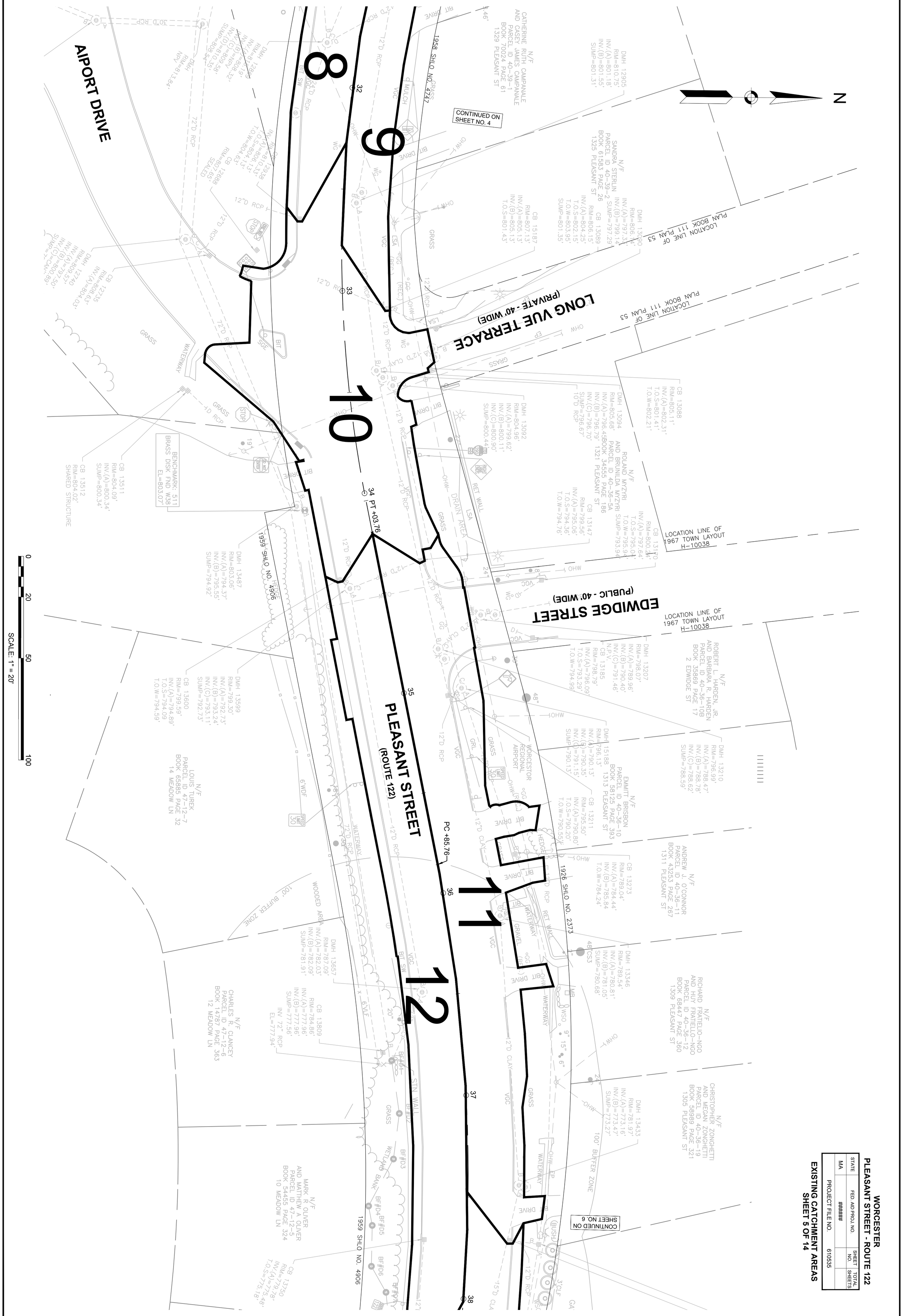
LOCATION LINE OF FEBRUARY 1851 CITY LAYOUT (CITY OF WORCESTER RELOCATION PLAN H-9409)

1958 SHLO NO. 4747

BENCHMARK: 512
MAG SET IN UPL 112
1' ABOVE GROUND
EL=836.79'

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		

EXISTING CATCHMENT AREAS
SHEET 5 OF 14

610535_HD(EXISTING CATCHMENT VISUAL).DWG Plotted on 3-Feb-2026 6:28 PM

Proposal No. 610535-134928

WORCESTER
PLEASANT STREET - ROUTE 122

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

EXISTING CATCHMENT AREAS
SHEET 6 OF 14

610535_HD(EXISTING CATCHMENT VISUAL).DWG Plotted on 3-Feb-2026 6:29 PM

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N

ROCKWOOD AVENUE
(PUBLIC - 50' WIDE)

JEREMIAH'S LANE
(PUBLIC - 50' WIDE)

PLEASANT STREET
(ROUTE 122)

LOCATION LINE OF 1954 TOWN LAYOUT H-9776

LOCATION LINE OF 1954 TOWN LAYOUT H-9776

LOCATION LINE OF TOWN LAYOUT H-1735

LOCATION LINE OF TOWN LAYOUT H-1735

LOCATION LINE PLAN BOOK 878 PLAN 49

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

CONTINUED ON SHEET NO. 5

CONTINUED ON SHEET NO. 7

PT +73.96

PC +76.09

12

13

14

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 18
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 55624 PAGE 220
4 MEADOW LN

N/F
RALPH A. METCALF, JR.
AND ELIZABETH R. LAMSON
PARCEL ID 47-12-1
BOOK 8898 PAGE 40
4 PROUTY LN

1958 SHLO NO. 4747

1959 SHLO NO. 4906

1926 SHLO NO. 2373

100' BUFFER ZONE

WETLAND BANK

WOODED AREA

BORDERING VEGETATED WETLANDS

HEADWALL

CITY OF WORCESTER DRAIN EASEMENT PLAN BOOK 878 PLAN 49

0 20 50 100

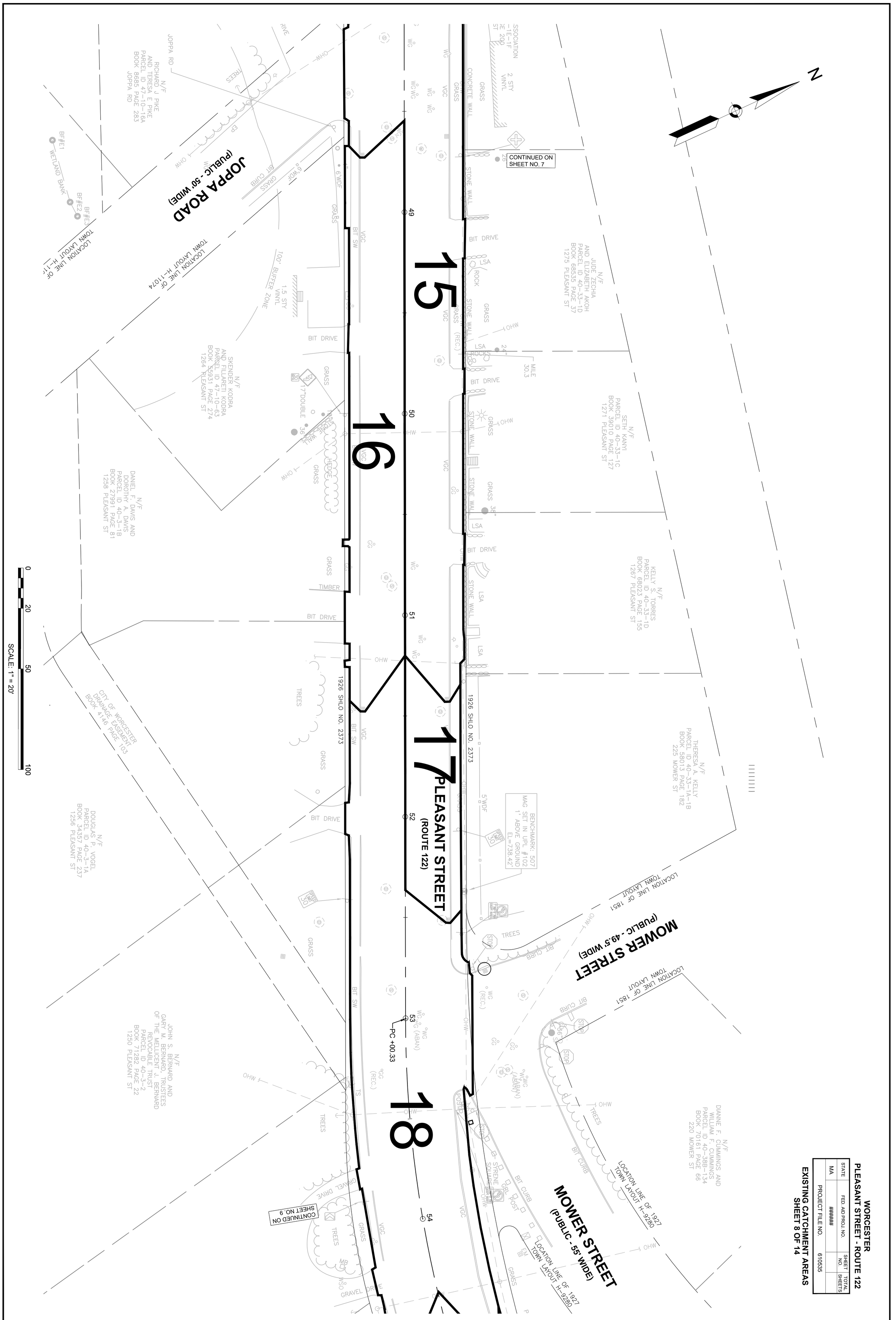
SCALE: 1" = 20'

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

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

Proposal No. 610535-134928

610535_HD(EXISTING CATCHMENT VISUAL).DWG Plotted on 3-Feb-2026 6:33 PM

A00862 - 181

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

54 55 56 57 58 59

PT +67.35

LOCATION LINE OF 1927 TOWN LAYOUT H-9280

CONTINUED ON SHEET NO. 8

CONTINUED ON SHEET NO. 10

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

1926 SHLO NO. 2373

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

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

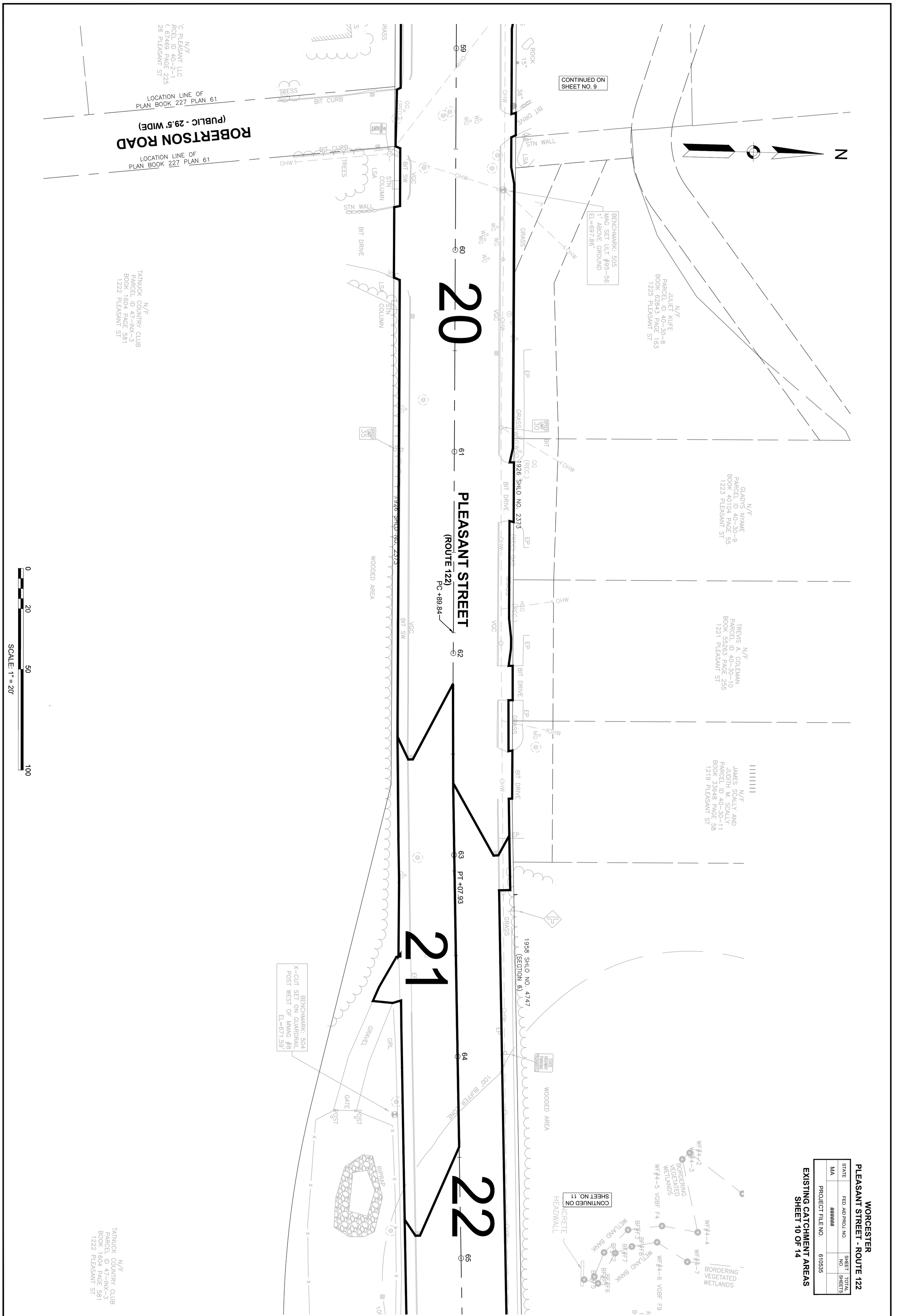
LOCATION LINE OF PLAN 96 BOOK 81 PLAN 96

LOCATION LINE OF PLAN 191 BOOK 227 PLAN 191

LOCATION LINE OF H-11124 OF 1978

LOCATION LINE OF 1927 TOWN LAYOUT H-9280

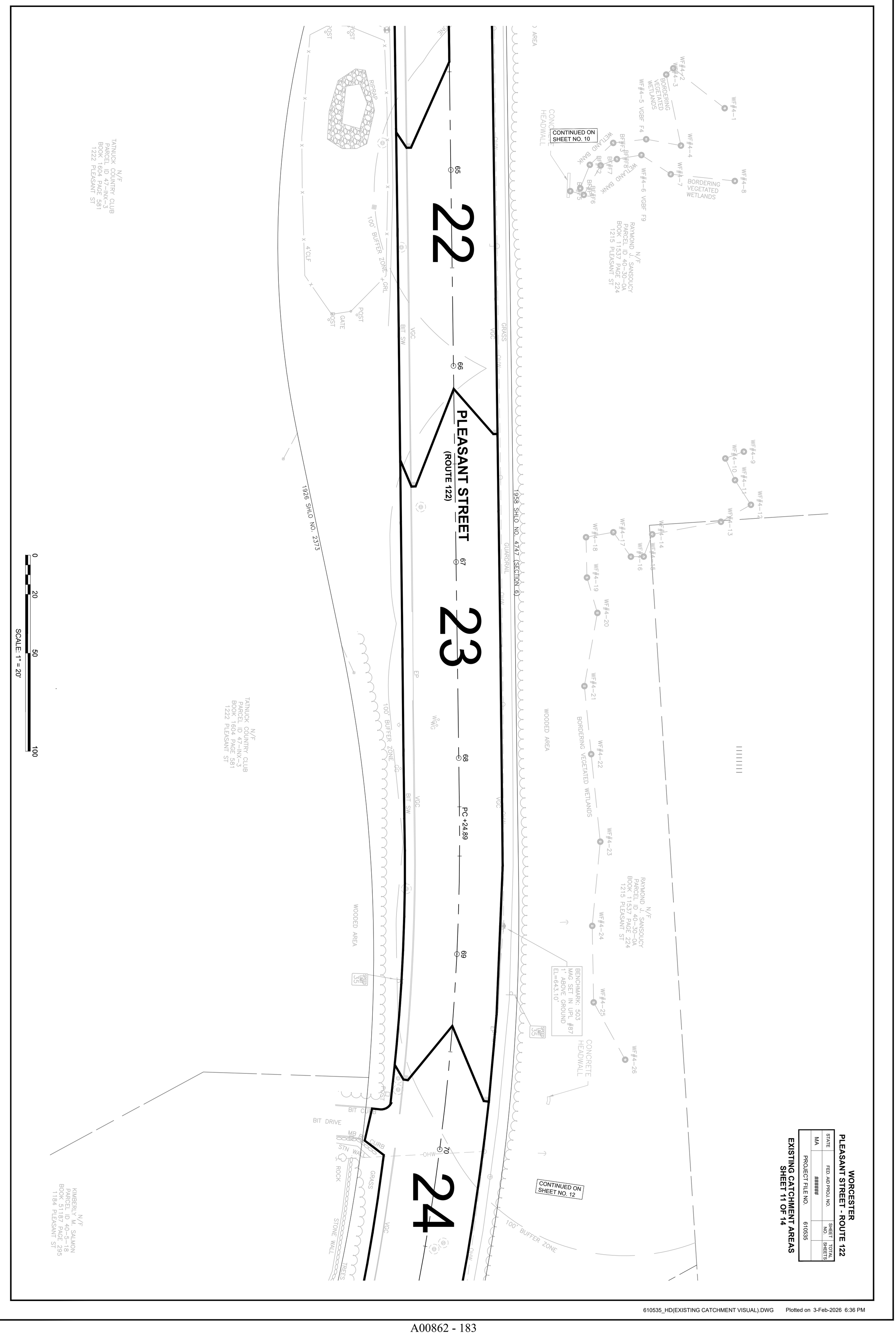
0 20 50 100
SCALE: 1" = 20'



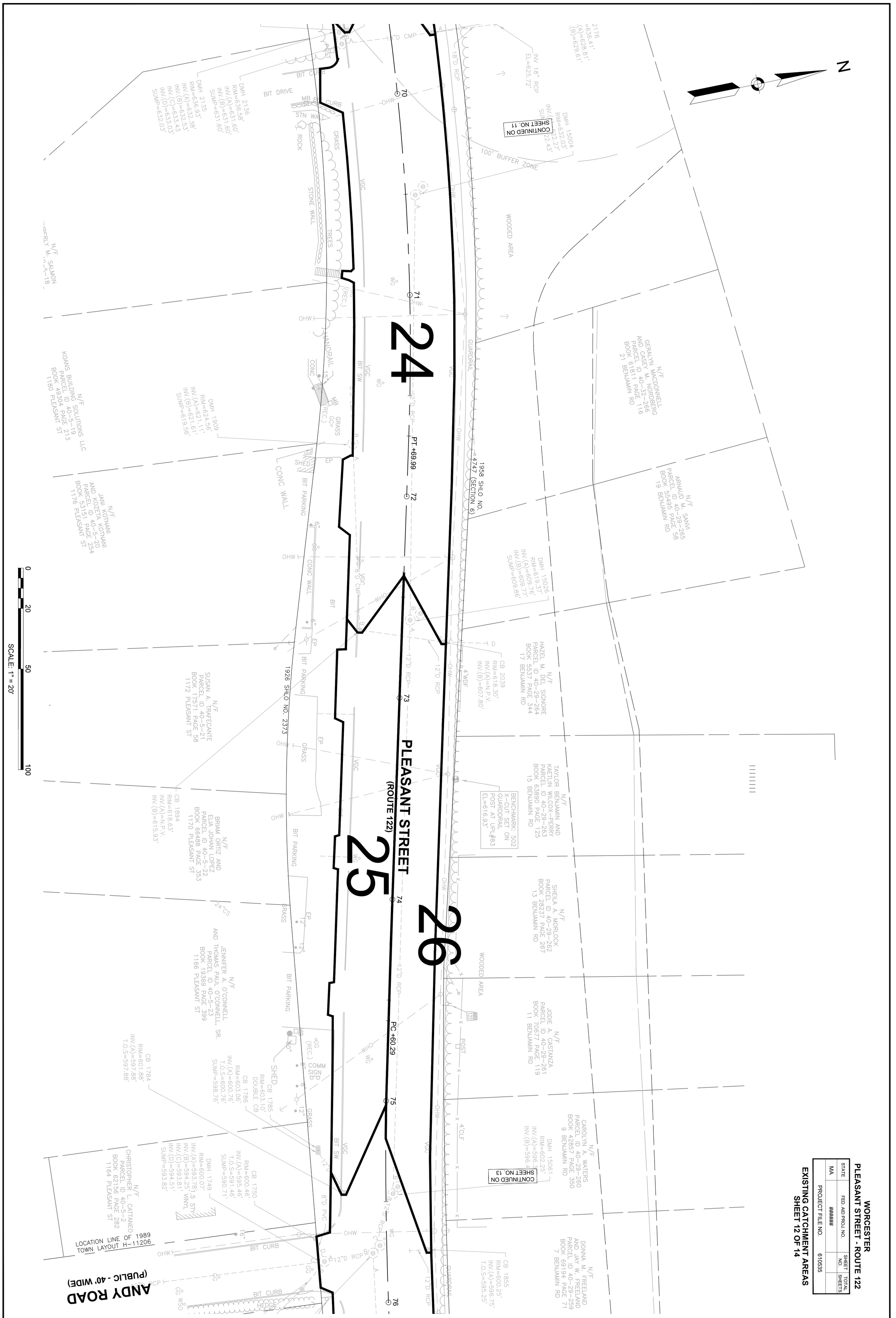
WORCESTER
PLEASANT STREET - ROUTE 122
EXISTING CATCHMENT AREAS
SHEET 10 OF 14

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 6:35 PM



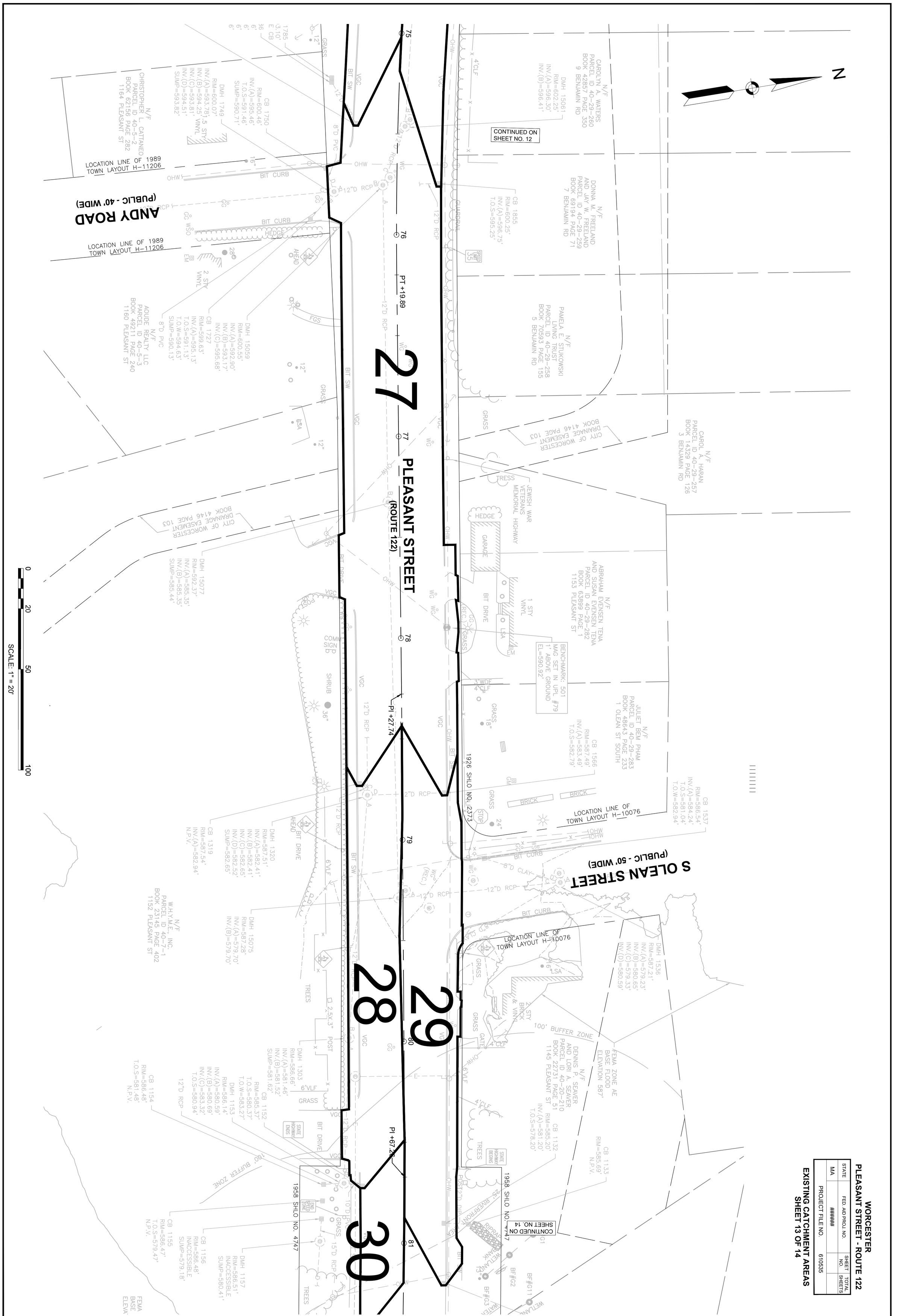
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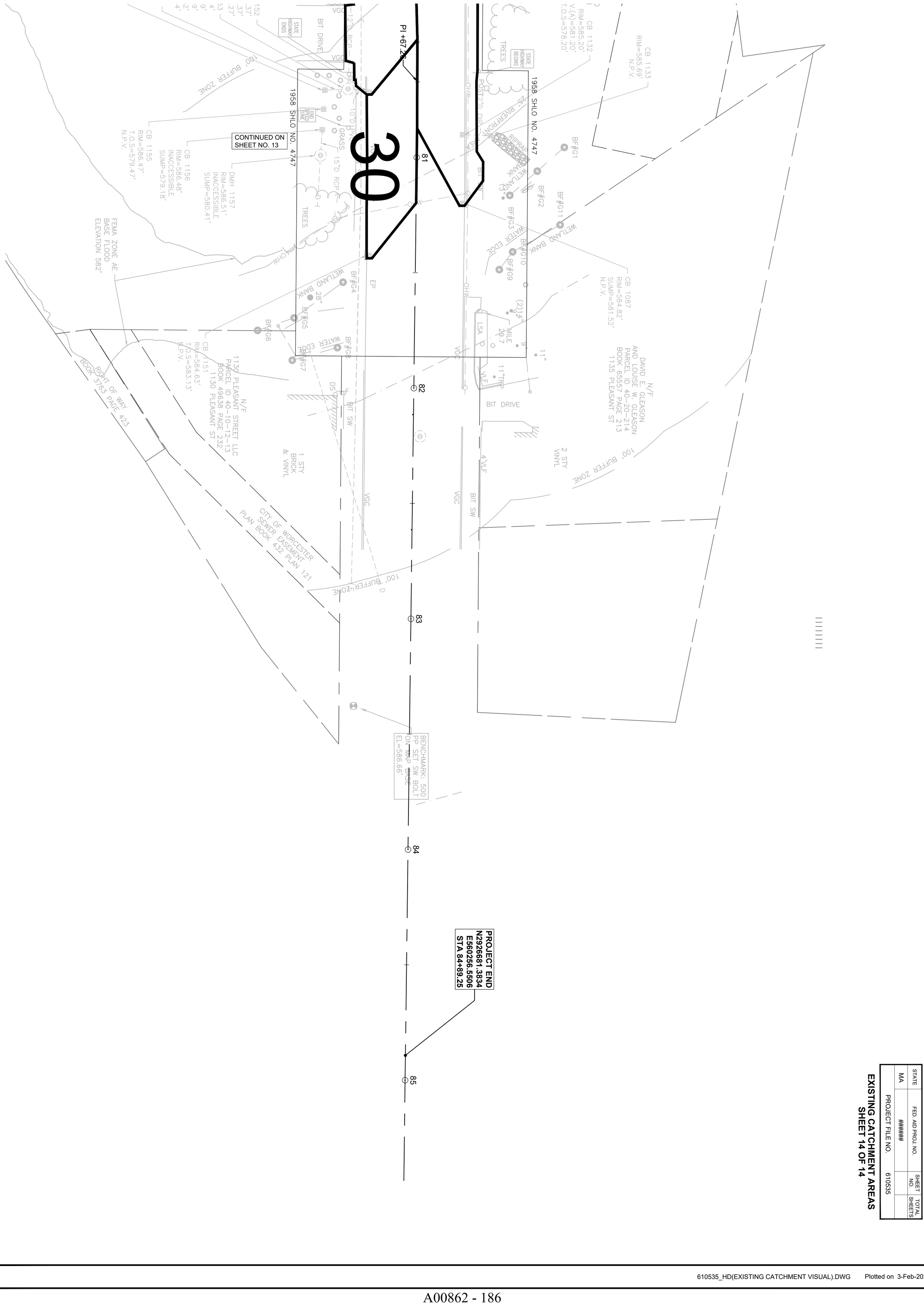


WORCESTER
PLEASANT STREET - ROUTE 122
EXISTING CATCHMENT AREAS
SHEET 12 OF 14

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 6:37 PM


ANDY ROAD
(PUBLIC - 40' WIDE)
S OLEAN STREET
(PUBLIC - 50' WIDE)
PLEASANT STREET
(ROUTE 122)
WORCESTER
N
SCALE: 1" = 20'
0
20
50
100
CONTINUED ON SHEET NO. 12
CONTINUED ON SHEET NO. 14
LOCATION LINE OF 1989 TOWN LAYOUT H-11206
LOCATION LINE OF TOWN LAYOUT H-10076
1926 SHLO NO. 2373
1958 SHLO NO. 4747
CITY OF WORCESTER DRAINAGE EASEMENT BOOK 4146 PAGE 103
100' BUFFER ZONE
PT +19.89
PI +27.74
PI +67.29
BENCHMARK: 501
MAG SET IN UPL #79
1' ABOVE GROUND
EL=590.92'
BENCHMARK: 502
MAG SET IN UPL #80
1' ABOVE GROUND
EL=590.92'
FEMA ZONE AE
BASE FLOOD
ELEVATION 587'
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
JEWISH WAR VETERANS MEMORIAL HIGHWAY
WORCESTER
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

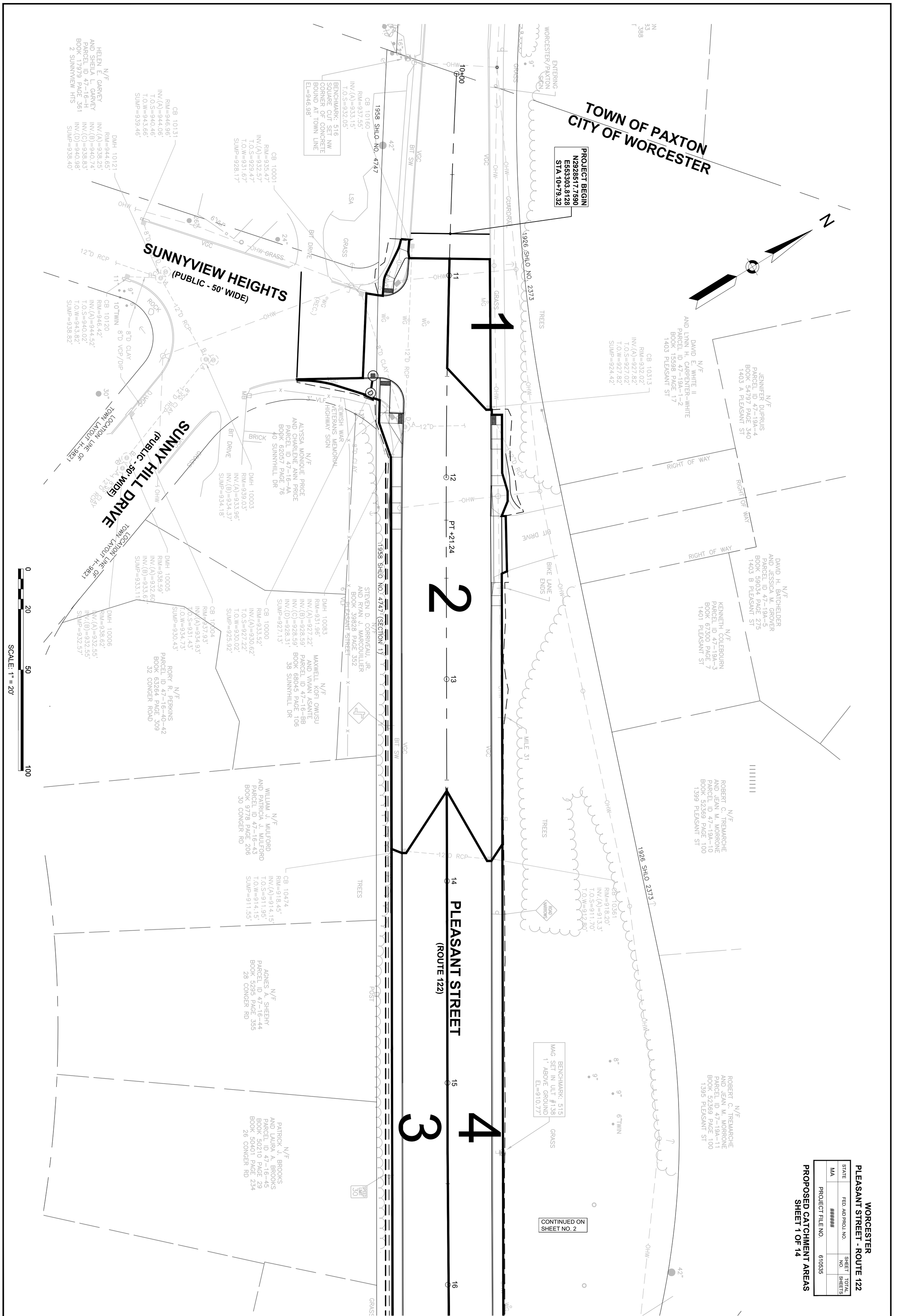


WORCESTER
PLEASANT STREET - ROUTE 122

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
N
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)
10+00
11
12
13
14
15
16
PT +21.24
1
2
3
4
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
PROPOSED CATCHMENT AREAS
SHEET 1 OF 14
STATE
MA
FED. AID PROJ. NO.
######
PROJECT FILE NO.
610535
SHEET NO.
TOTAL SHEETS
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

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

PROPOSED CATCHMENT AREAS
SHEET 2 OF 14

Proposal No. 610535-134928

610535_HD/PROPOSED CATCHMENT VISUAL).DWG Plotted on 3-Feb-2026 4:57 PM

A00862 - 188

N

MOWER STREET
(PUBLIC - VARIABLE WIDTH)
LOCATION LINE OF 1851 TOWN LAYOUT

TARRYTOWN LANE
(PUBLIC - 50' WIDE)

PLEASANT STREET
(ROUTE 122)

ASSABET LANE
(PUBLIC - VARIABLE WIDTH)
LOCATION LINE
PLAN BOOK 109 PLAN 4
LOCATION LINE
PLAN BOOK 210 PLAN 37

121+27.62
121
PT +91.20
PC +47.67
PC +69.82
PT +60.30
130+00
PC +01.84
PC +41.92
PT +87.42
131
131+37.25

1926 SHLO NO. 2373
1958 SHLO NO. 4747 (SECTION 1)
1958 SHLO NO. 4747 (SECTION 2)

CONTINUED ON SHEET NO. 1
CONTINUED ON SHEET NO. 3

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
MICHAEL AND KELLY A.
PARCEL ID 53381 PAG
BOOK 55381 PAGE
448 MOWER ST

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
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

DMH 10977
RIM=893.77'
INV.(A)=883.83'
INV.(B)=885.45'
SUMP=884.73'

CB 10455
RIM=903.44'
N.P.V.

CB 10454
RIM=903.44'
INV.(A)=896.04'
T.O.S=897.94'
SUMP=896.04'

CB 10473
RIM=899.62'
T.O.S=894.82'

CB 10543
RIM=900.25'
INV.(A)=896.05'
T.O.S=894.95'
T.O.W=896.05'
SUMP=892.45

CB 10716
RIM=890.02'
INV.(A)=886.32'
T.O.S=885.72'
T.O.W=886.32'
SUMP=883.62'

DMH 10717
RIM=889.79'
INV.(A)=885.04'
INV.(B)=885.42'
INV.(C)=885.21'
SUMP=885.09'

DMH 10819
RIM=887.23'
INV.(A)=881.78'
INV.(B)=882.00'
SUMP=881.92'

CB 11136
RIM=882.45'
T.O.S=877.15'
T.O.W=878.25'
SUMP=874.95

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

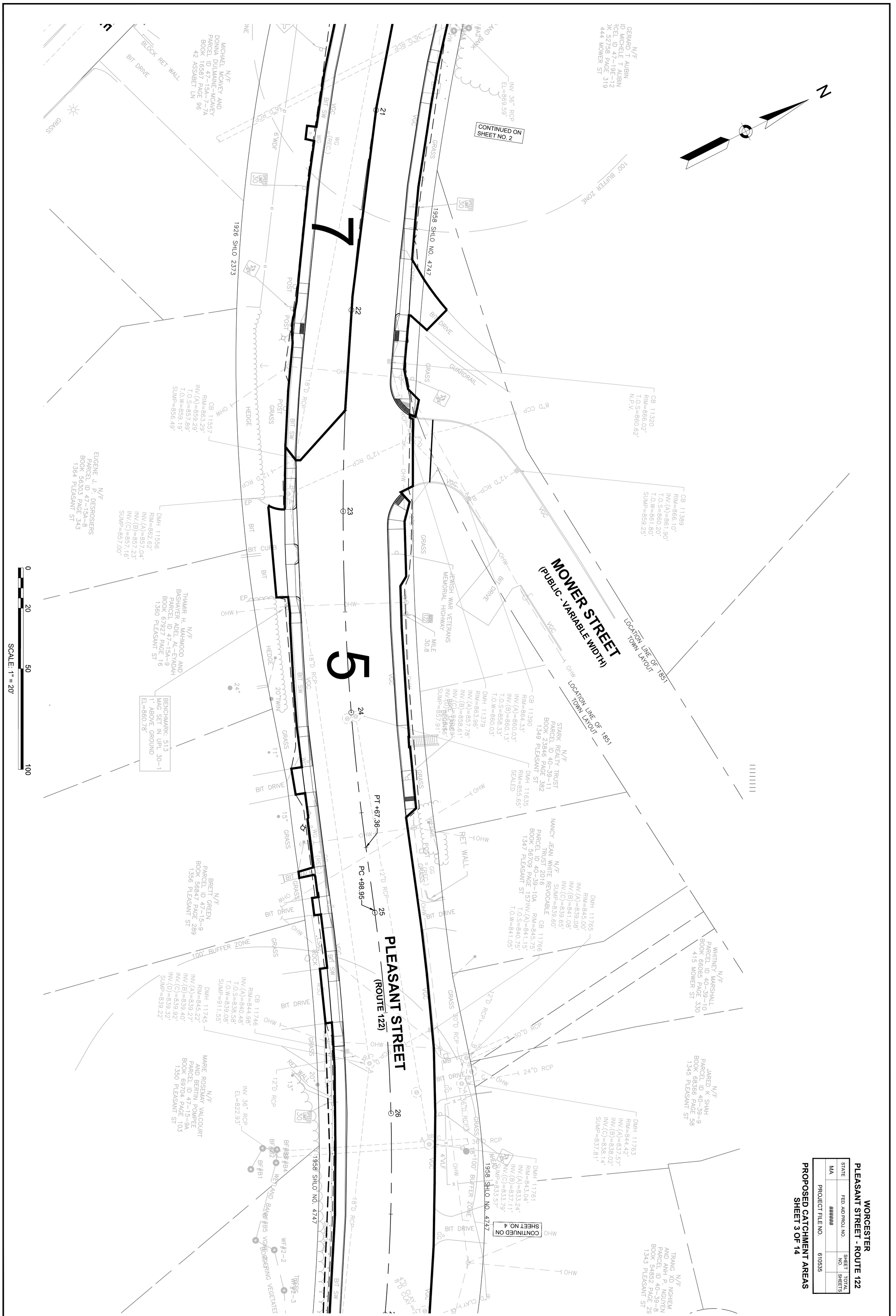
INV 36" RCP
EL=869.59'

WF#1-8
WF#1-7
WF#1-6
WF#1-5
WF#1-4
WF#1-3
WF#1-2
WETLAND BANK
WOODED AREA
BF#A7 VGWF 1-1
BF#A6
BF#A5
BF#A4
BF#A3
BF#A2
BF#A1

4
5
6
7
3
16
17
18
19
20
21

100' BUFFER ZONE
6'WDF
SPEED LIMIT 30

0 20 50 100
SCALE: 1" = 20'


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
BENCHMARK: 513
MAG SET IN UPL 30-1
1" ABOVE GROUND
EL=860.78'
SCALE: 1" = 20'
0
20
50
100
610535_HD(PROPOSED CATCHMENT VISUAL).DWG
Plotted on 3-Feb-2026 4:57 PM

Proposal No. 610535-134928

610535_HD/PROPOSED CATCHMENT VISUAL).DWG Plotted on 3-Feb-2026 4:58 PM

A00862 - 190

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

N

5

8

9

PLEASANT STREET
(ROUTE 122)

BAILEY STREET
(PUBLIC - 49.5' WIDE)

AIPORT DRIVE

AIRPORT DRIVE LIMIT OF WORK (CONT)

AIRPORT DRIVE

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'

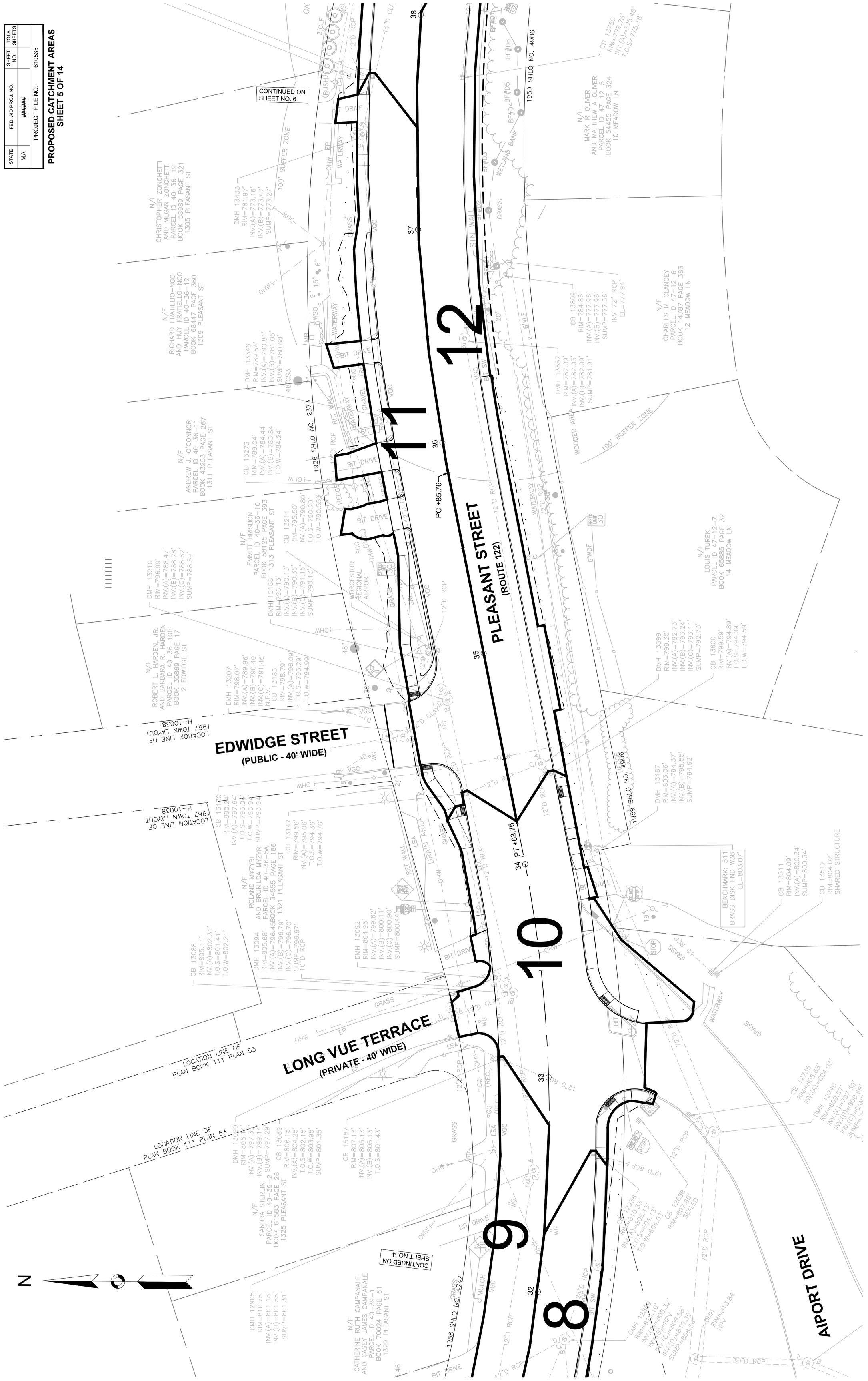
0 20 50 100

SCALE: 1" = 20'

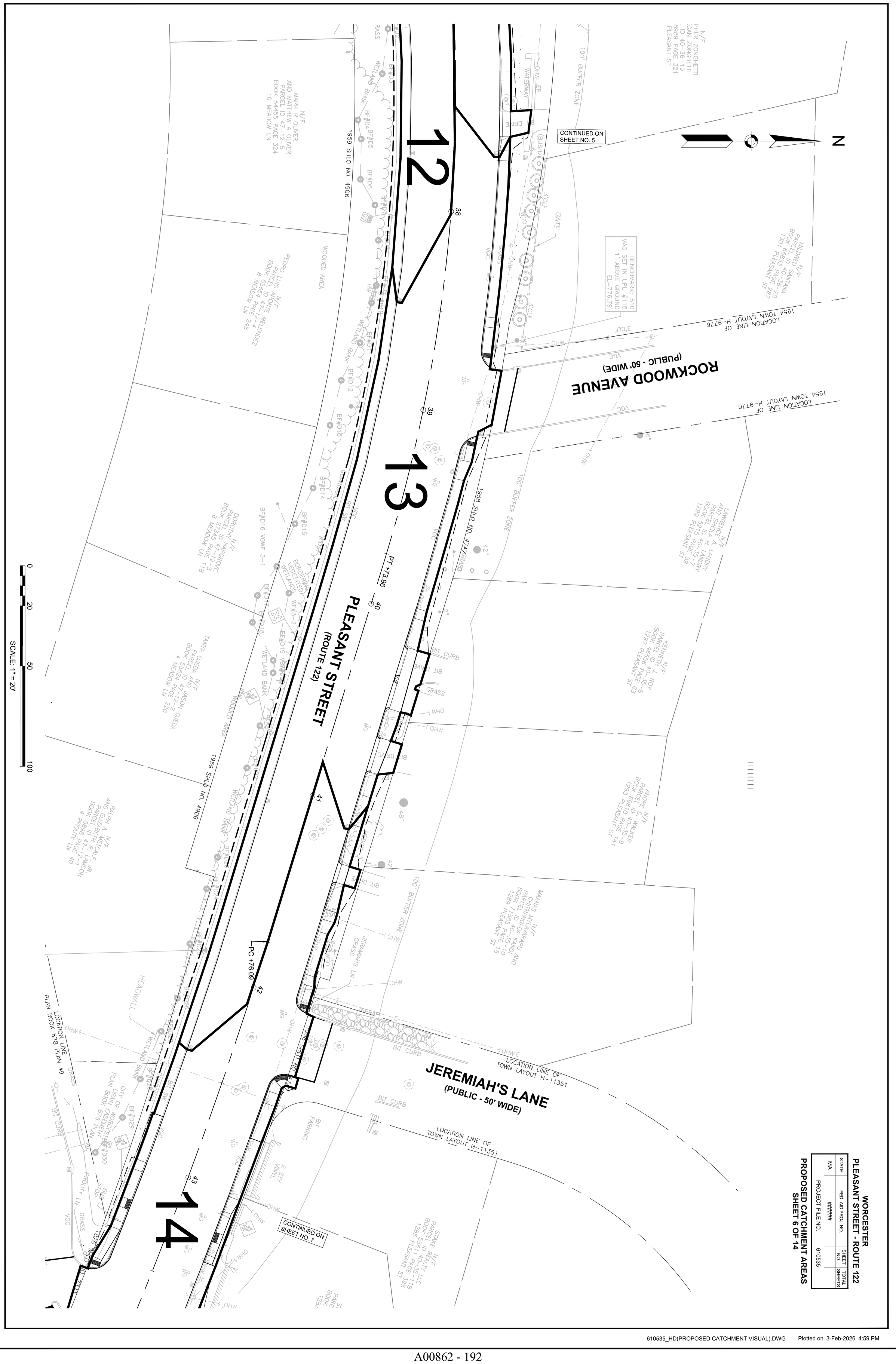
WORCESTER
PLEASANT STREET - ROUTE 122

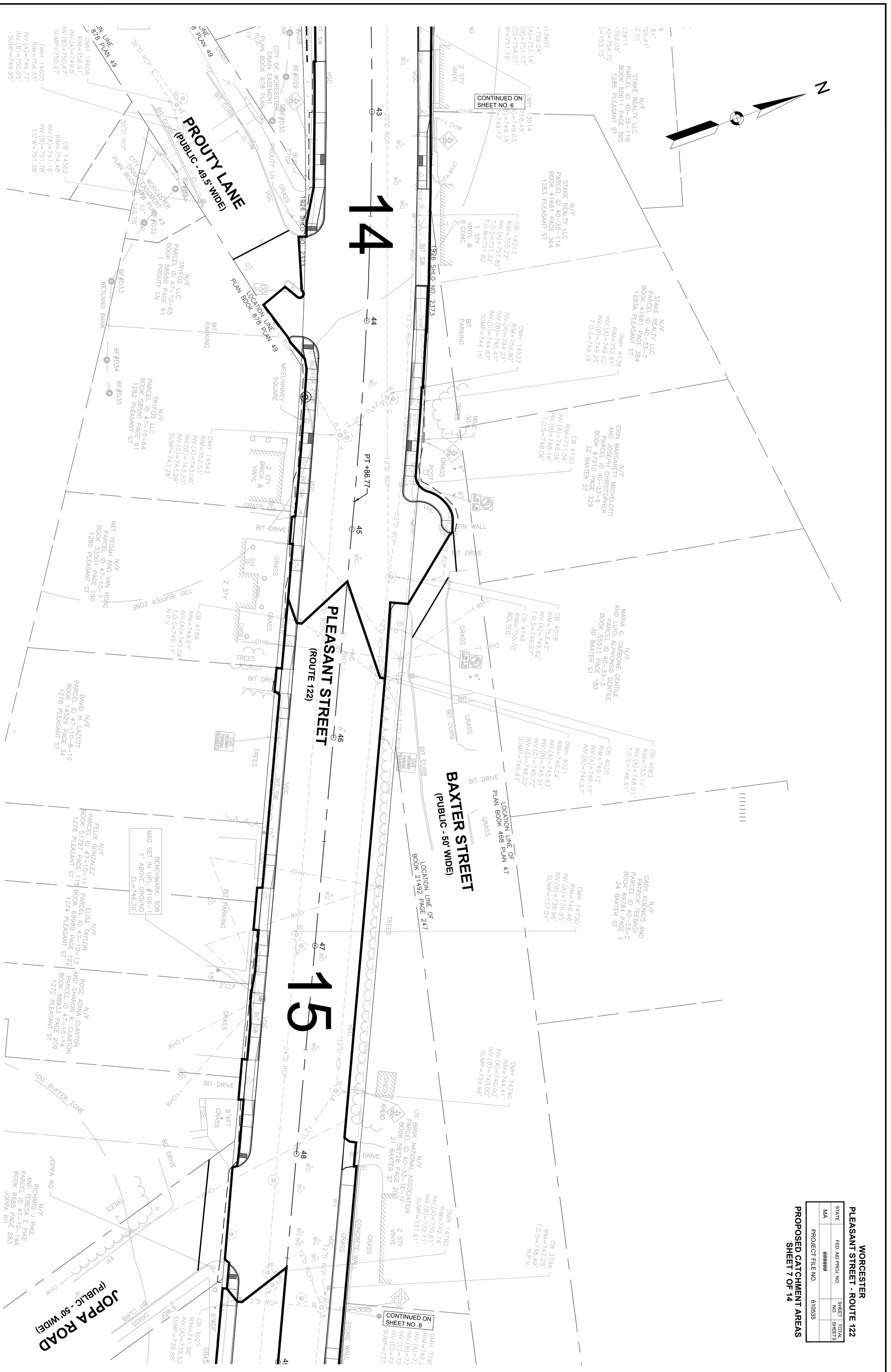
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	#######		
	PROJECT FILE NO. 610535		

PROPOSED CATCHMENT AREAS
SHEET 5 OF 14



610535_HD(PROPOSED CATCHMENT VISUAL).DWG Plotted on 3-Feb-2026 4:59 PM


ROCKWOOD AVENUE
(PUBLIC - 50' WIDE)
PLEASANT STREET
(ROUTE 122)
JEREMIAH'S LANE
(PUBLIC - 50' WIDE)
12
13
14
38
39
40
41
42
43
PT +73.96
PC +76.09
CONTINUED ON SHEET NO. 5
CONTINUED ON SHEET NO. 7
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 65664 PAGE 245 8 MEADOW LN
N/F DOROTHY HARGROVE PARCEL ID 47-12-3 BOOK 27345 PAGE 118 6 MEADOW LN
N/F TANYA QUEDA AND JASON QUEDA PARCEL ID 47-12-2 BOOK 56624 PAGE 220 4 MEADOW LN
N/F RALPH A METCALF AND ELIZABETH R. LAMSON JR PARCEL ID 47-12-1 BOOK 8898 PAGE 40 4 PROUTY LN
N/F CHRISTOPHER ZONGHETTI AND MEGAN ZONGHETTI PARCEL ID 40-36-19 BOOK 8989 PAGE 321 PLEASANT ST
N/F MILDRED N/F SANTANA PARCEL ID 66833 40-36-20 1301 PLEASANT ST 287
N/F KENNETH J. ROY PARCEL ID 46556 40-35-8 1297 PLEASANT ST 63
N/F ANDRE D. WALKER PARCEL ID 66610 40-35-9 1293 PLEASANT ST 141
N/F MAANAS MYLAVARAPU CHITRANGADA KANDI PARCEL ID 71565 40-35-10 1289 PLEASANT ST 18
N/F STAKE REALTY LLC PARCEL ID 55611 40-35-11B BOOK 1285 PLEASANT ST 395
N/F LAWRENCE AND SHEILA A. LANDRY PARCEL ID 5215 40-35-7 BOOK 1299 PAGE 59 PLEASANT ST
1959 SHLO NO. 4906
1958 SHLO NO. 4747
1926 SHLO NO. 7777
1956 SHLO NO. 8388
LOCATION LINE OF 1954 TOWN LAYOUT H-9776
LOCATION LINE OF TOWN LAYOUT H-11351
LOCATION LINE PLAN BOOK 878 PLAN 49
100' BUFFER ZONE
WETLAND BANK
WOODED AREA
BORDERING VEGETATED WETLANDS
BENCHMARK: 510 MAG SET IN UPL #115 1' ABOVE GROUND EL=776.79'
CITY OF WORCESTER #D30 PLAN DRAIN EASEMENT BOOK 878 PLAN
BUS STOP
GATE
2 STY VINYL
BIT PARKING
BIT CURB
BIT DRIVE
GRASS
VGC
WG
OHW
0
20
50
100
SCALE: 1" = 20'
WORCESTER
PLEASANT STREET - ROUTE 122
PROPOSED CATCHMENT AREAS
SHEET 6 OF 14
STATE: MA
FED. AID PROJ. NO.: #######
SHEET NO.:
TOTAL SHEETS:
PROJECT FILE NO.: 610535
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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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Proposal No. 610535-134928

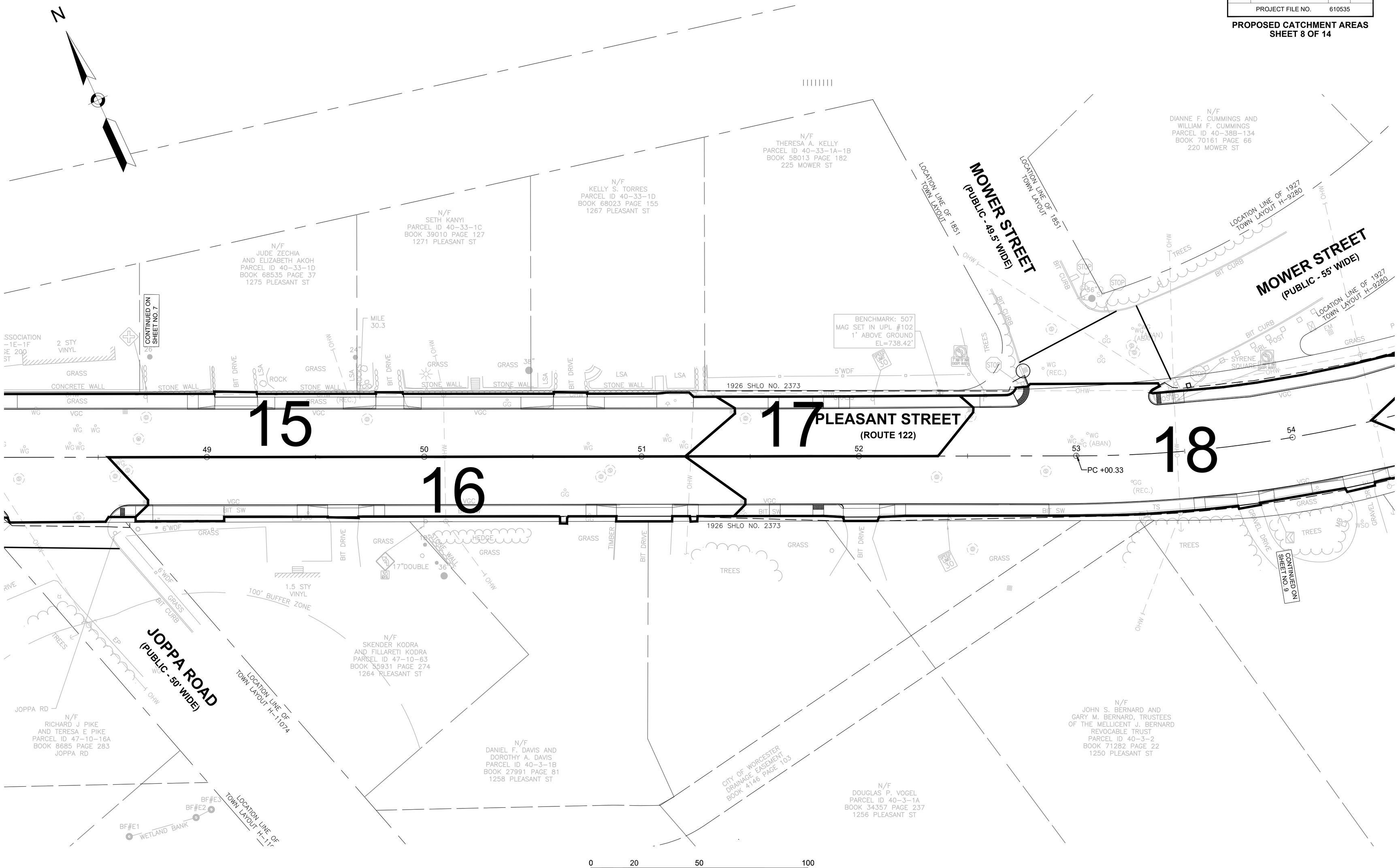
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WORCESTER
PLEASANT STREET - ROUTE 122

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

PROPOSED CATCHMENT AREAS
SHEET 8 OF 14



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

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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

LOCATION LINE OF 1918 TOWN LAYOUT H-1124

LOCATION LINE OF PLAN 99 BOOK 8 OF PLANS

LOCATION LINE OF PLAN 227 PLAN 61

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
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

0 20 50 100
SCALE: 1" = 20'

Proposal No. 610535-134928

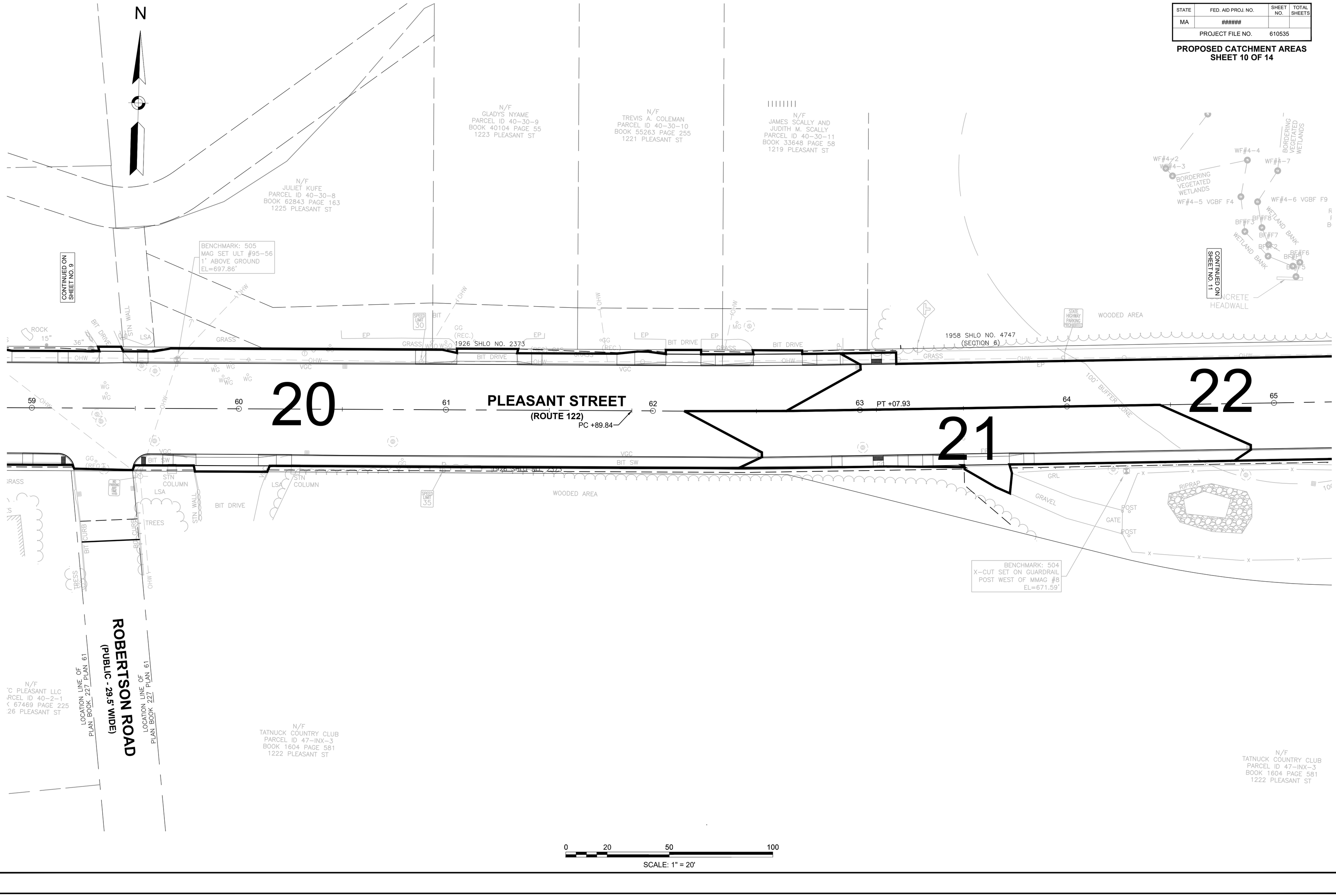
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WORCESTER
PLEASANT STREET - ROUTE 122

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

PROPOSED CATCHMENT AREAS
SHEET 10 OF 14



WORCESTER
PLEASANT STREET - ROUTE 122

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

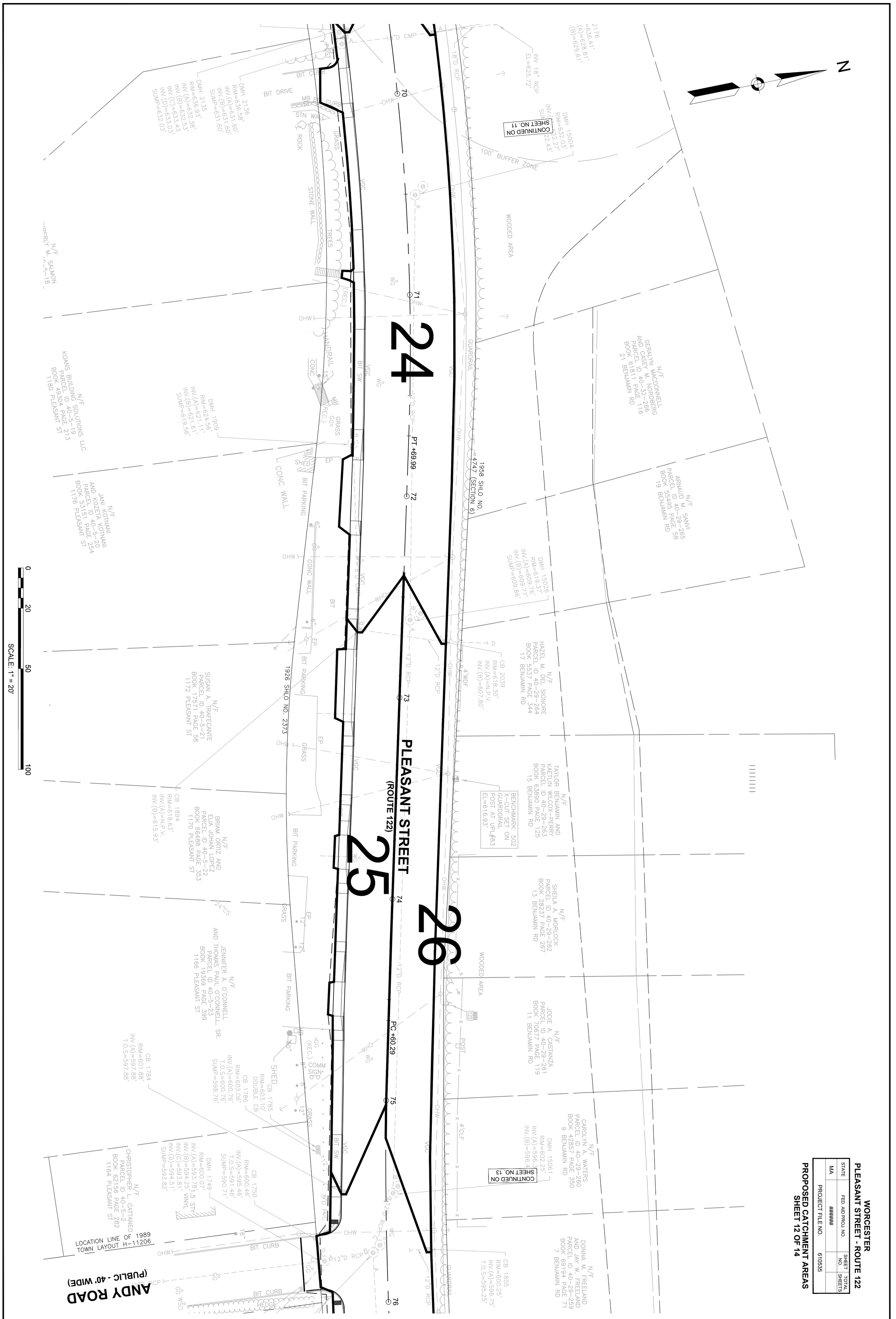
PROPOSED CATCHMENT AREAS
SHEET 11 OF 14

Proposal No. 610535-134928

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A00862 - 197

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#F3
BF#F8
BF#F7
BF#F2
BF#F6
BF#F1
BF#F5
CONCRETE HEADWALL
CONTINUED ON SHEET NO. 10
N/F
RAYMOND J. SANSOUCY
PARCEL ID 40-30-0A
BOOK 11537 PAGE 224
1215 PLEASANT ST
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
WOODED AREA
BENCHMARK: 503
MAG SET IN UPL #87
1' ABOVE GROUND
EL=643.10'
CONCRETE HEADWALL
CONTINUED ON SHEET NO. 12
100' BUFFER ZONE
SPEED LIMIT 35
1958 SHLO NO. 4747 (SECTION 6)
GRASS
GUARDRAIL
OHW
VGC
EP
22
23
24
65
66
67
68
PC +24.89
69
70
PLEASANT STREET
(ROUTE 122)
VGC
BIT SW
EP
BC
WG
WW
OHW
100' BUFFER ZONE
RIPRAP
GRL
POST
GATE
4'CLF
1926 SHLO NO. 2373
WOODED AREA
SPEED LIMIT 35
BIT CB
BIT DRIVE
MB
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
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
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 12 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		

PROPOSED CATCHMENT AREAS
SHEET 13 OF 14

PLEASANT STREET (ROUTE 122)

ANDY ROAD (PUBLIC - 40' WIDE)

S OLEAN STREET (PUBLIC - 50' WIDE)

1926 SHLO NO. 2373

1958 SHLO NO. 4747

CONTINUED ON SHEET NO. 12

CONTINUED ON SHEET NO. 14

LOCATION LINE OF 1989 TOWN LAYOUT H-11206

LOCATION LINE OF TOWN LAYOUT H-10076

CITY OF WORCESTER DRAINAGE EASEMENT BOOK 4146 PAGE 103

100' BUFFER ZONE

FEMA ZONE AE BASE FLOOD ELEVATION 587'

SCALE: 1" = 20'

0 20 50 100

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N

SCALE: 1" = 20'

0 20 50 100

30

PI +67.25

1958 SHLO NO. 4747

CONTINUED ON SHEET NO. 13

81 82 83 84 85

BENCHMARK: 500
PP SET SW BOLT
ON MAP BASE
EL=586.66'

PROJECT END
N2926681.3834
E560256.5506
STA 84+89.25

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

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3 **Existing Conditions** **5**

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5 **Impaired Waters and TMDLs** **10**

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Appendix A: MassDEP Checklist for Stormwater Report
Appendix B: Soils and FEMA Information
Appendix C: Supporting Calculations
Appendix D: Hydraulic and Hydrologic Data
Appendix E: O&M Plan and LTPPP
Appendix F: Figures

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.

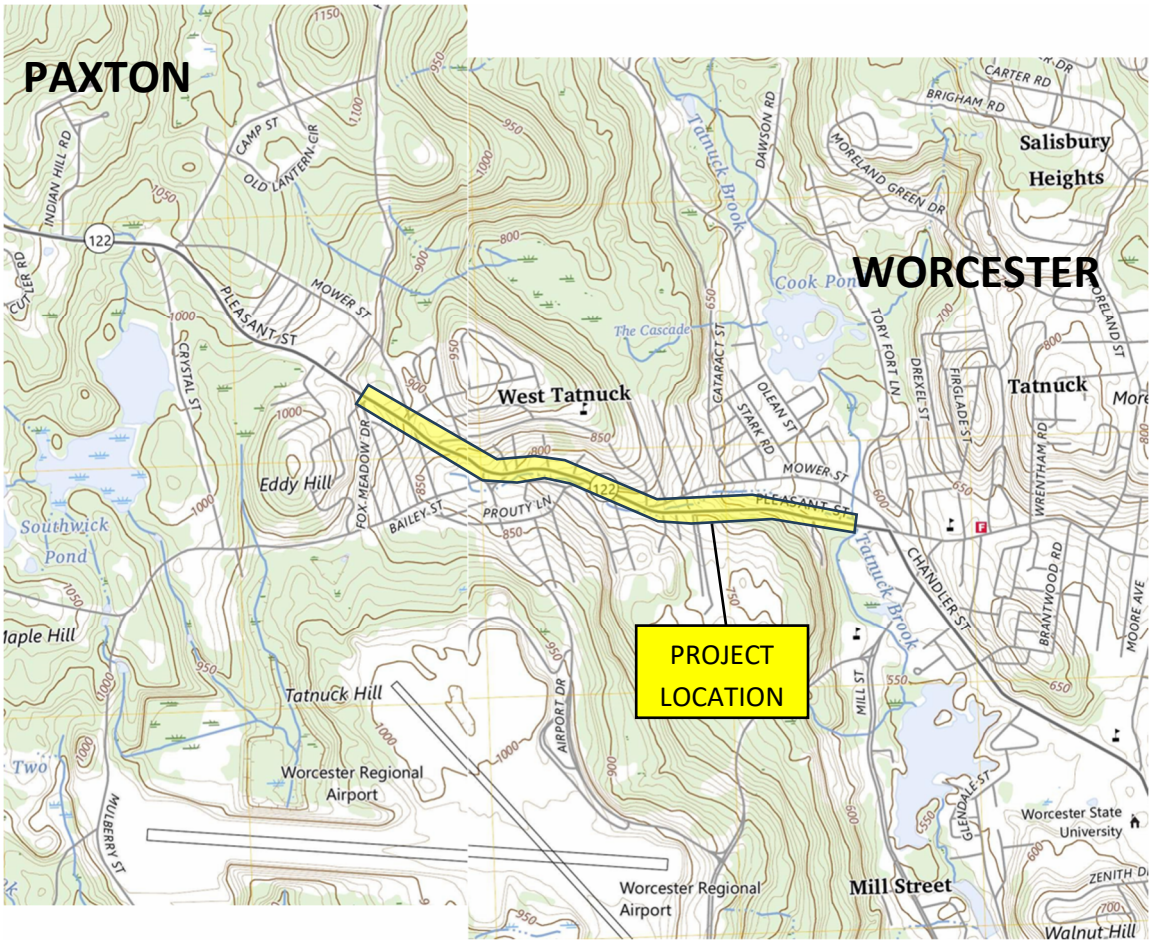
The following is a summary of key areas and how they are affected by the project:

- 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, 7, 8, 9, and 10 of the MA Stormwater Standards. Standards 2, 3, 4, and 6 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, 7, 8, 9, and 10. Standards 2, 3, 4, and 6 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.

Within the project area, Pleasant Street crosses over Tatnuck Brook, which is a Cold Water Fishery (ID 5133050). There is an existing stormwater drainage system that discharges to the bank of the Tatnuck Brook in the southwest corner of the bridge. Tthis project is a redevelopment project and there are no proposed alterations to the existing stormwater systems or existing drainage patterns; therefore, there is no strong likelihood of a significant impact to this critical area. All other applicable Stormwater Standards are being met.

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.

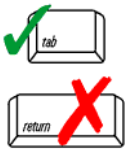
Appendix A: MassDEP Checklist for Stormwater Report

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.

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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

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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.

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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.

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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.

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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.

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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;

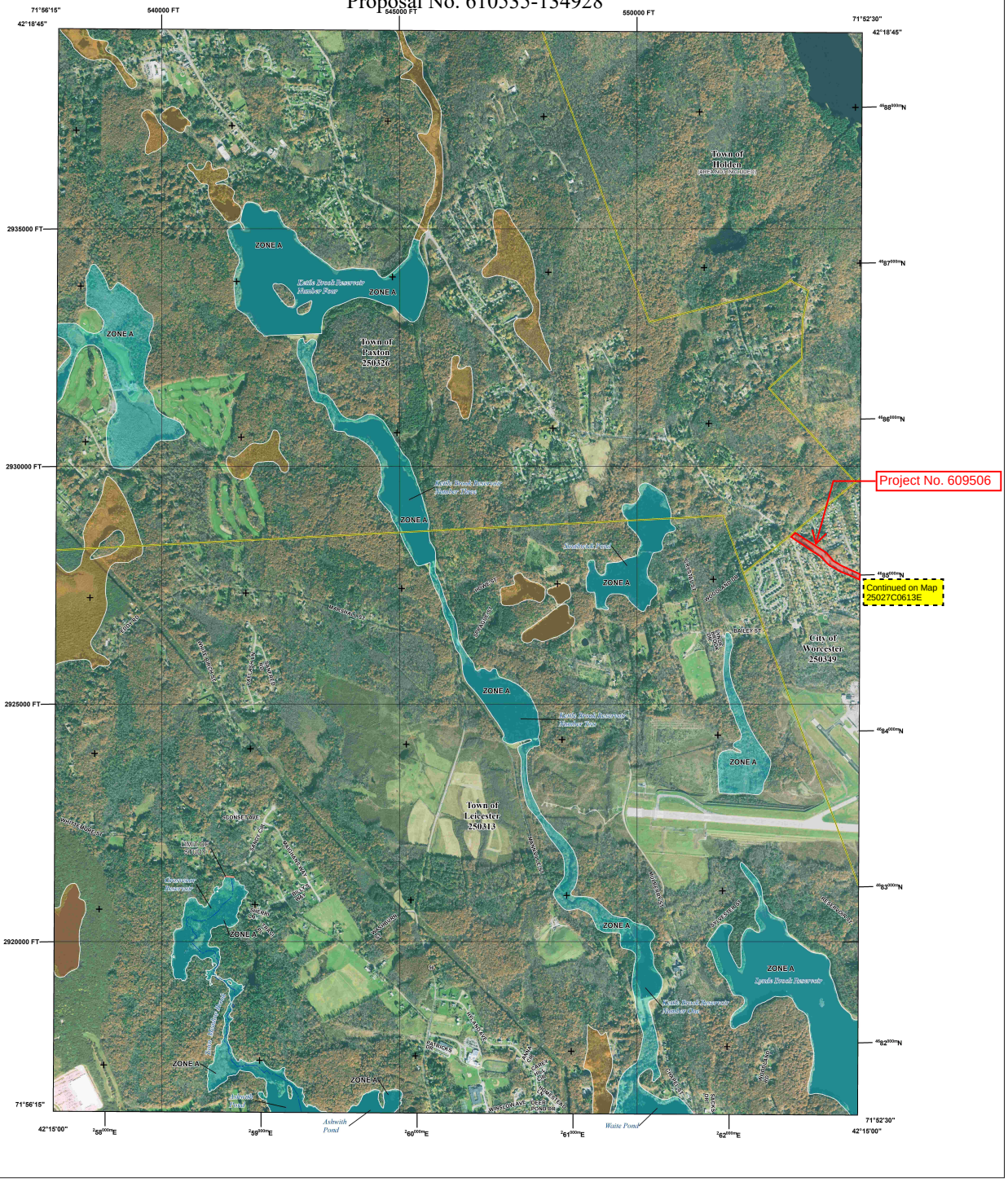
☐ An Illicit Discharge Compliance Statement is attached;

☐ 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

OTHER FEATURES
- 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)
- 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

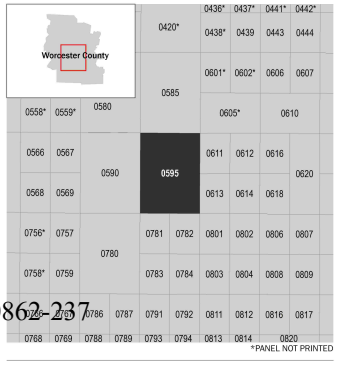
Map Projection:
NAD 1983 StatePlane Massachusetts Mainland FIPS 2001 Feet; North American 1983; Western Hemisphere; Vertical Datum: NAVD 88

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

A00862-237

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.

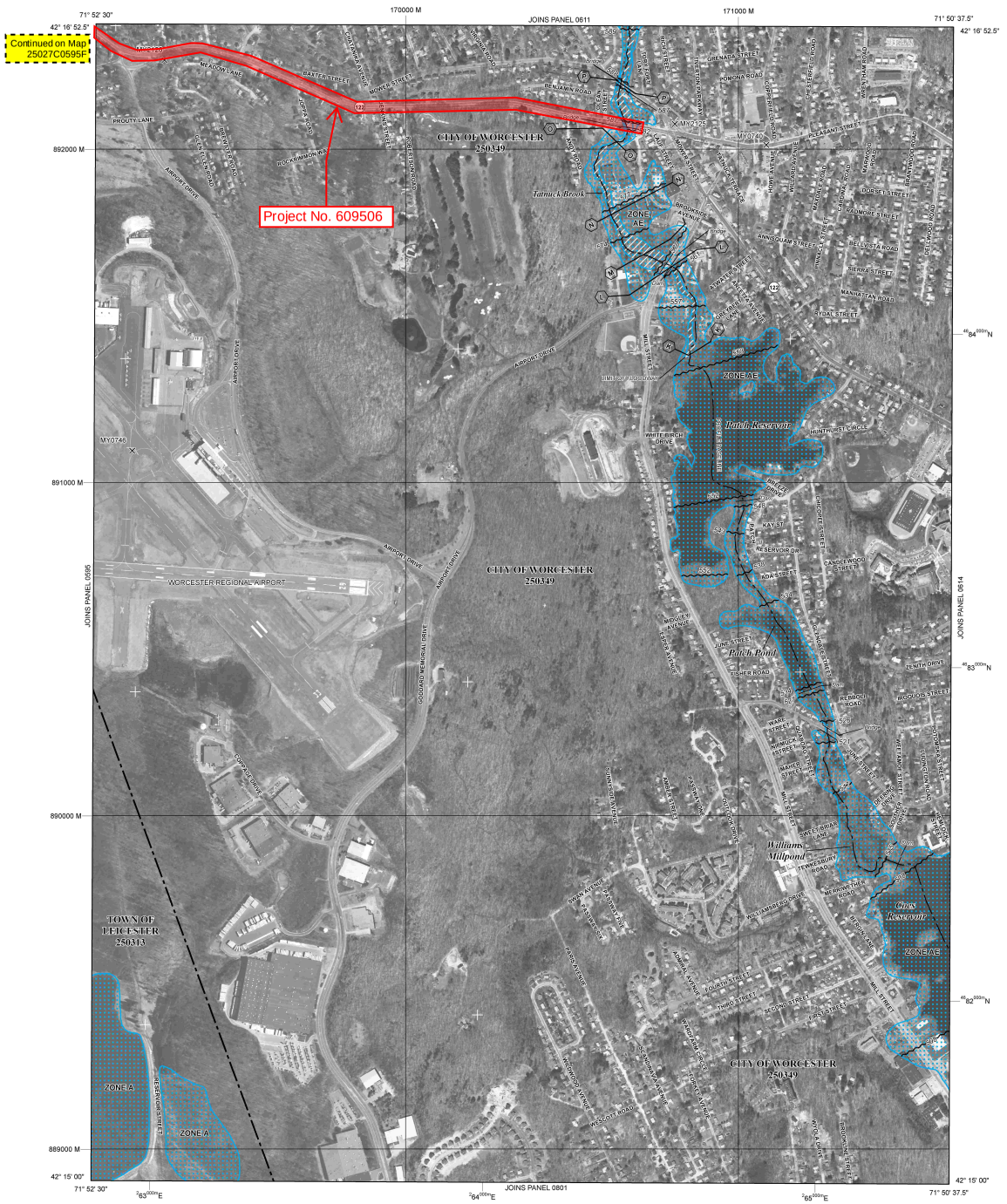
Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

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.

Panel 0613 of 1075
Panel Number: 25027C0613E
Effective Date: July 4, 2011



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 (EL 987) — Base Flood Elevation line and value; elevation in feet* / 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 / 4982000 mN — 1000-meter ticks: Massachusetts State Plane Mainland Zone (FIPS Zone 2001), Lambert Conformal Conic projection / 1000-meter Universal Transverse Mercator grid values, zone 19N
- DX5510 • M1.5 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- 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

A00862303

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

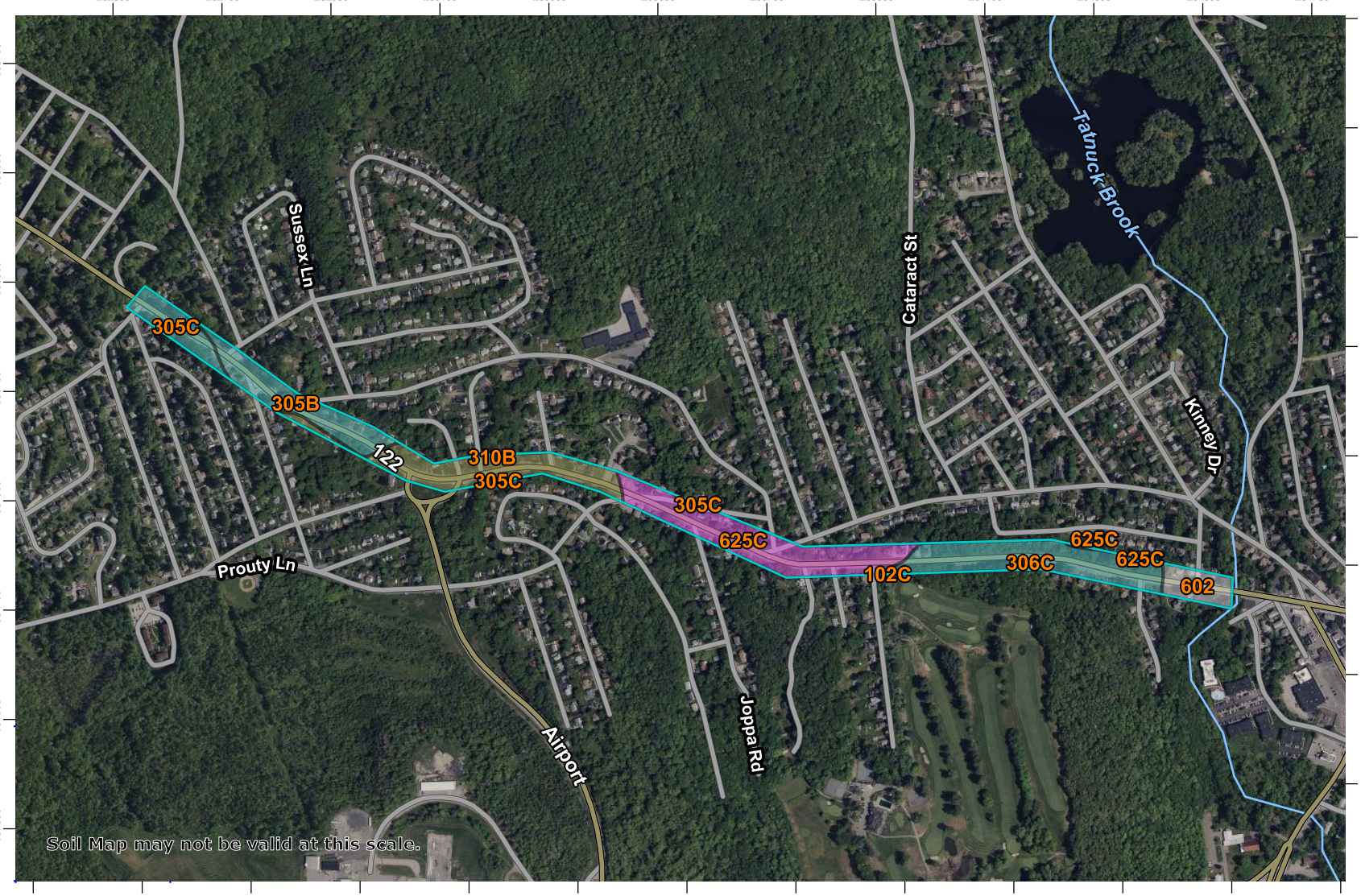
Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

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

A00862-239

Proposal No. 610535-134928

A00862-240

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.

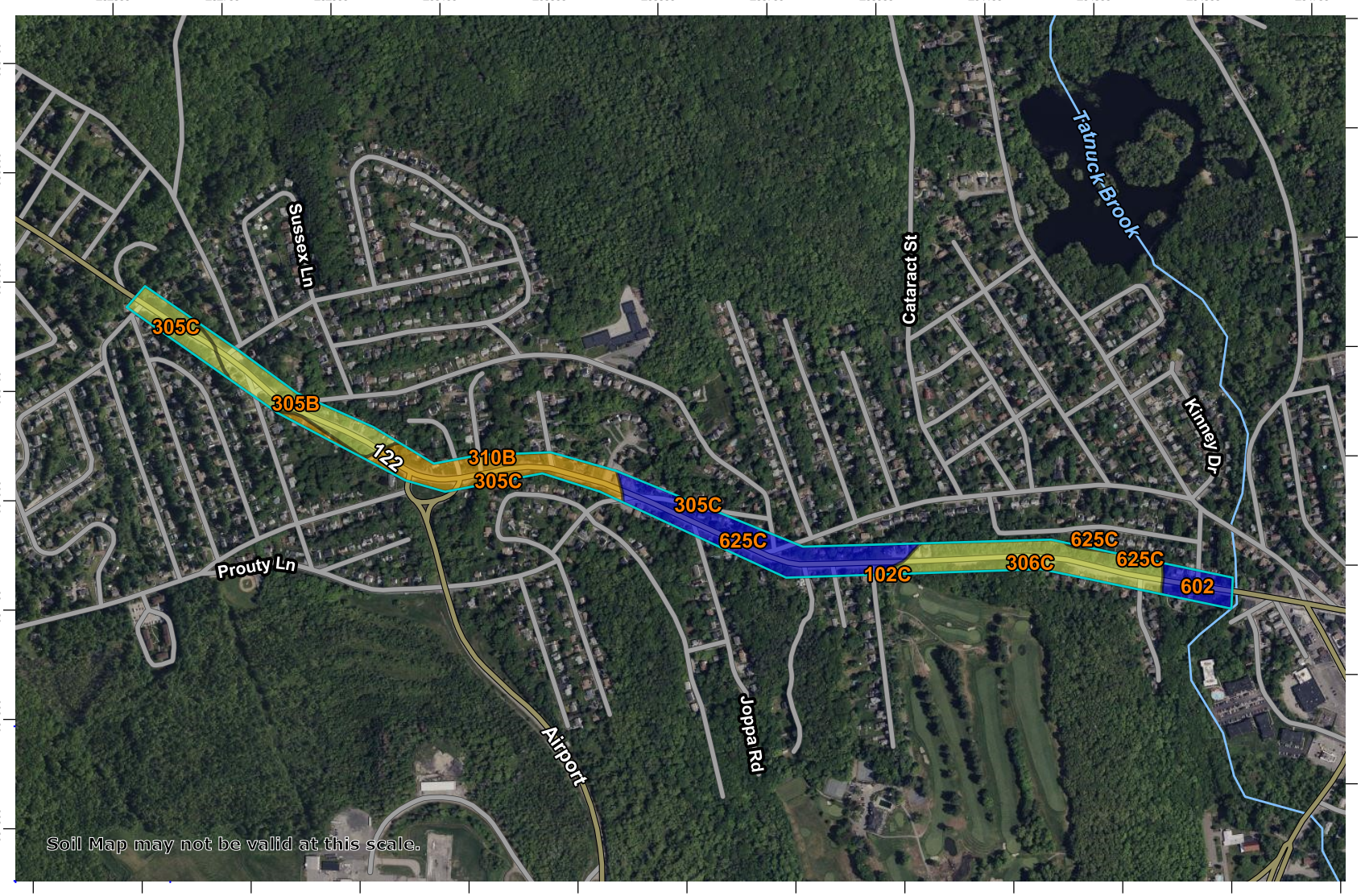
Rating Options

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

A00862-243

Proposal No. 610535-134928

A00862-244

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)

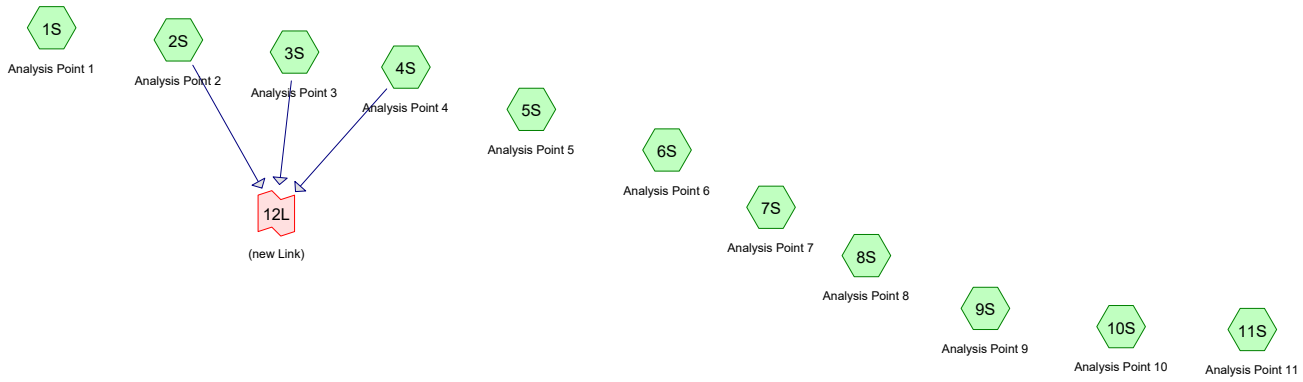
D_{WQ} = Water Quality Depth: one-inch for discharges within a Zone II or Interim Wellhead Protection Area, to or near another critical area, runoff from a LUHPPL, or exfiltration to soils with infiltration rate greater than 2.4 inches/hour or greater; ½-inch for discharges near or to other areas.

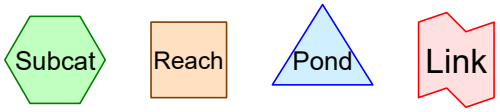
A_{IMP} = Increase in Impervious Area (SF)

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
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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**

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

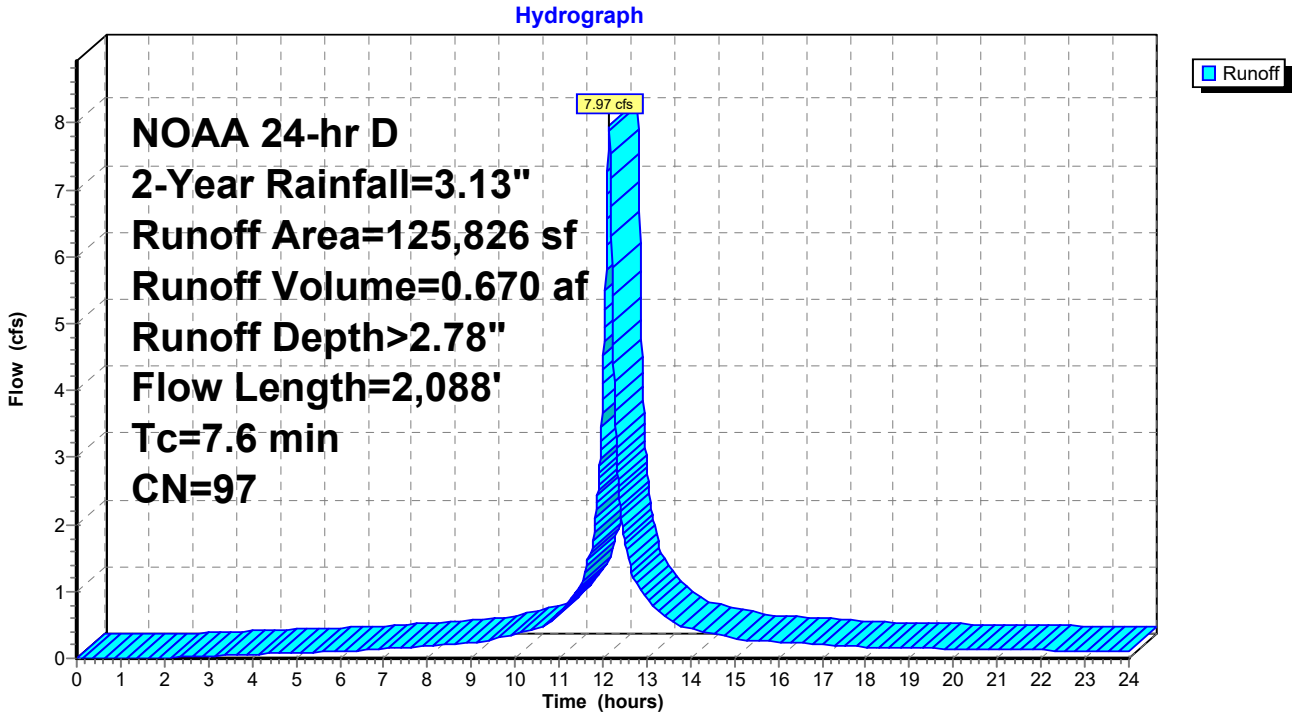
Runoff = 7.97 cfs @ 12.15 hrs, Volume= 0.670 af, Depth> 2.78"

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

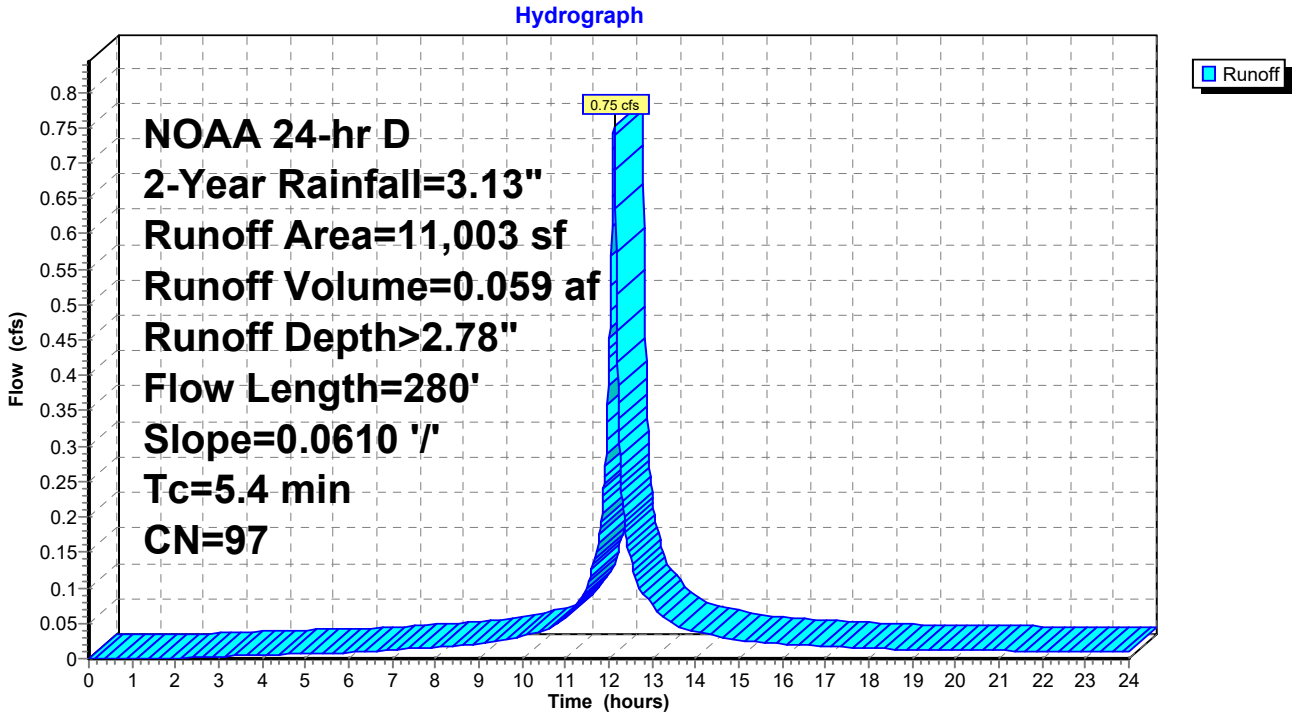
Runoff = 0.75 cfs @ 12.12 hrs, Volume= 0.059 af, Depth> 2.78"

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

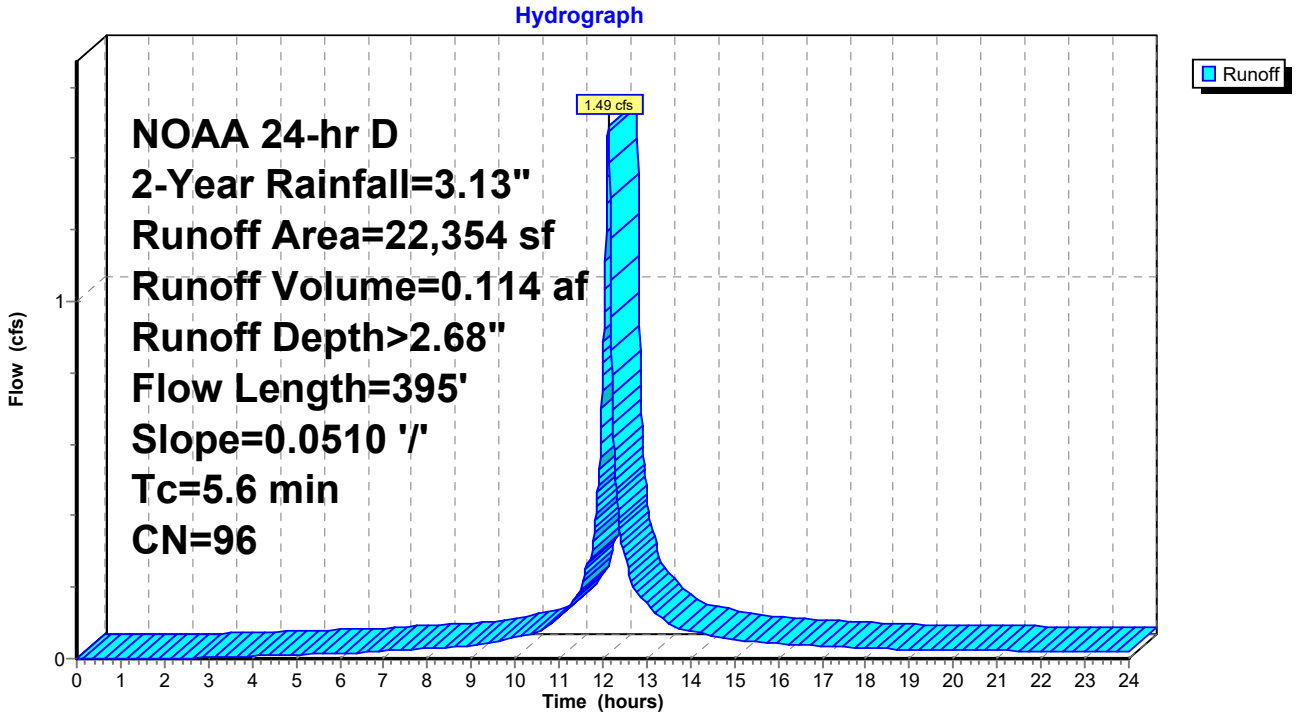
Runoff = 1.49 cfs @ 12.13 hrs, Volume= 0.114 af, Depth> 2.68"

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

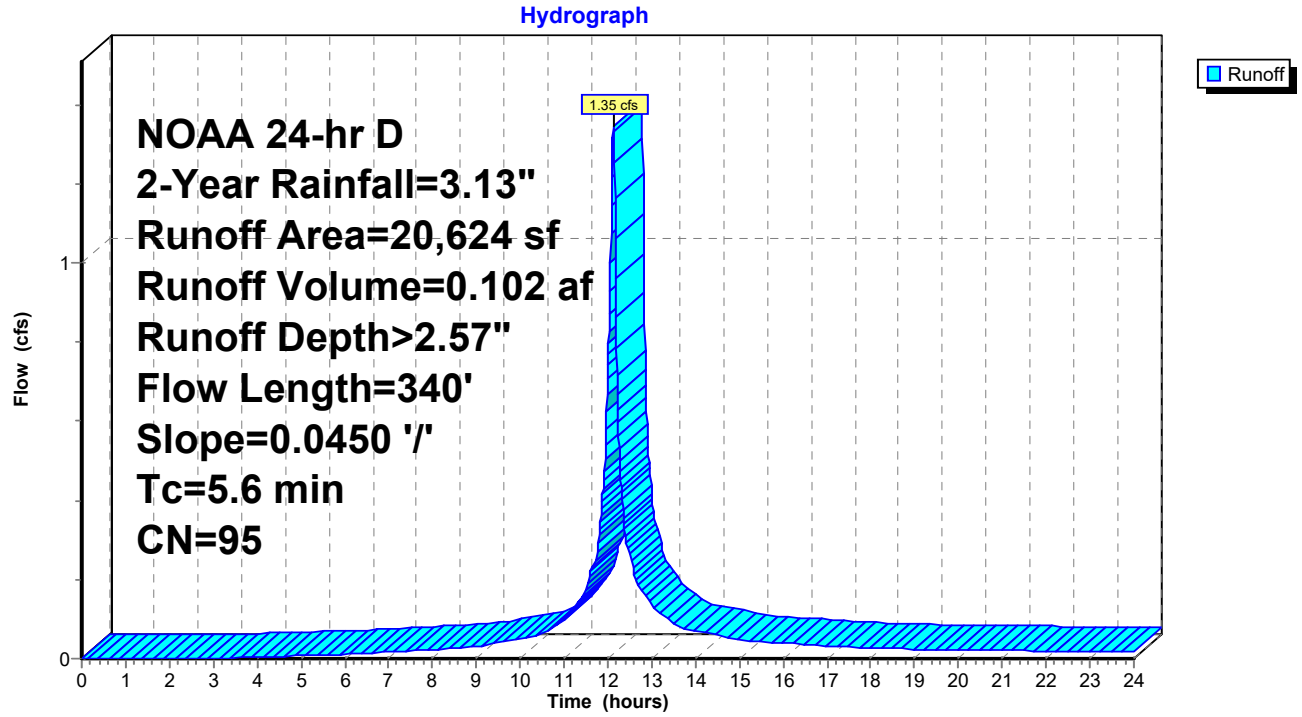
Runoff = 1.35 cfs @ 12.13 hrs, Volume= 0.102 af, Depth> 2.57"

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

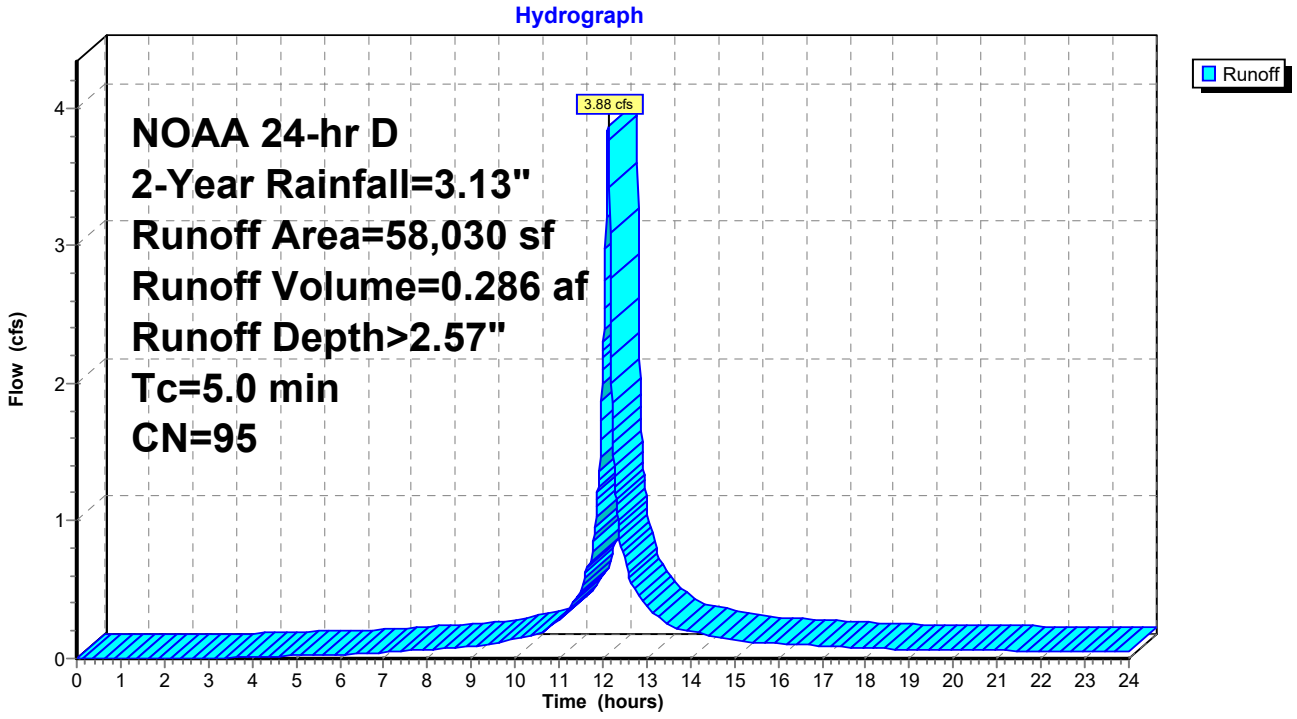
Runoff = 3.88 cfs @ 12.12 hrs, Volume= 0.286 af, Depth> 2.57"

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

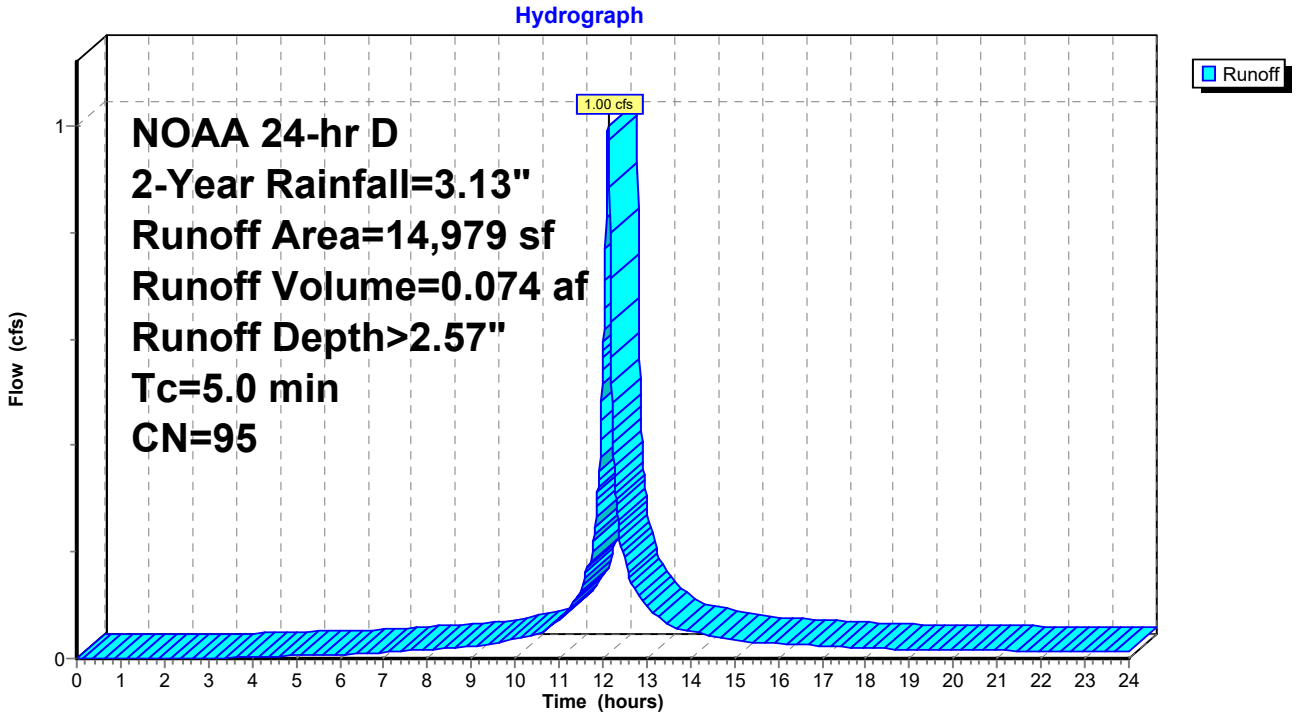
Runoff = 1.00 cfs @ 12.12 hrs, Volume= 0.074 af, Depth> 2.57"

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

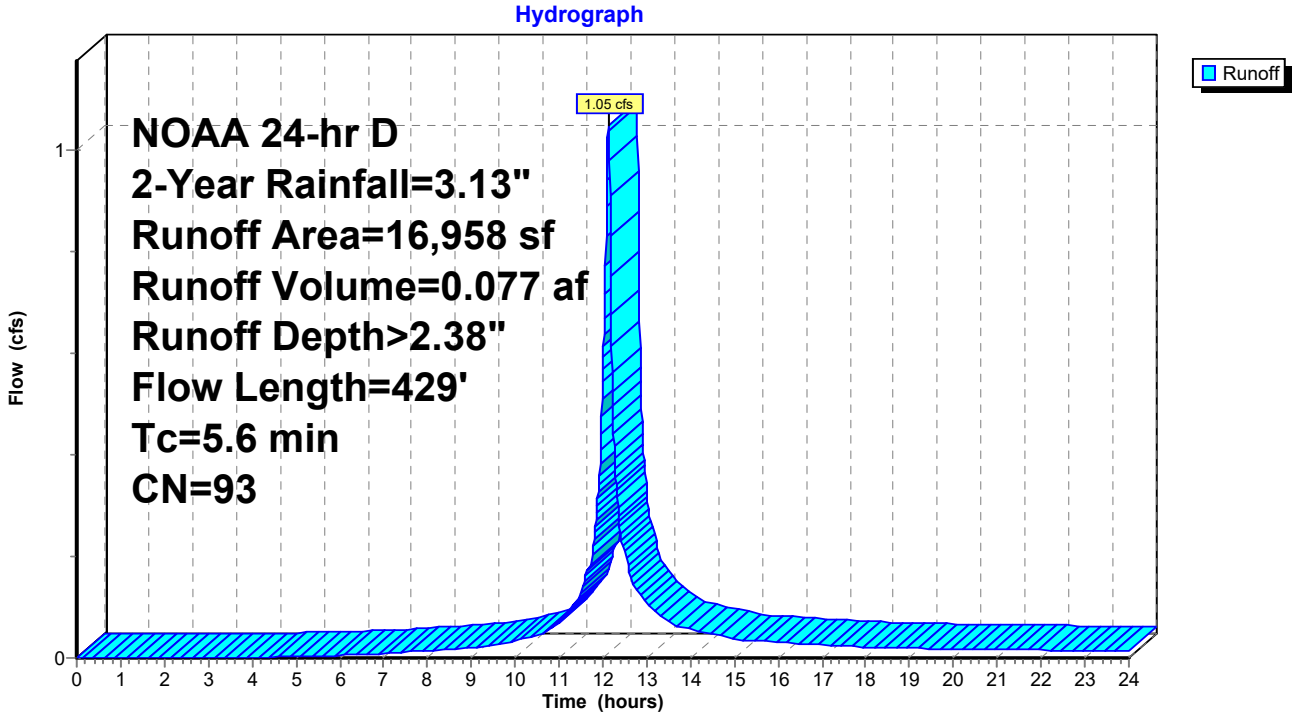
Runoff = 1.05 cfs @ 12.13 hrs, Volume= 0.077 af, Depth> 2.38"

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

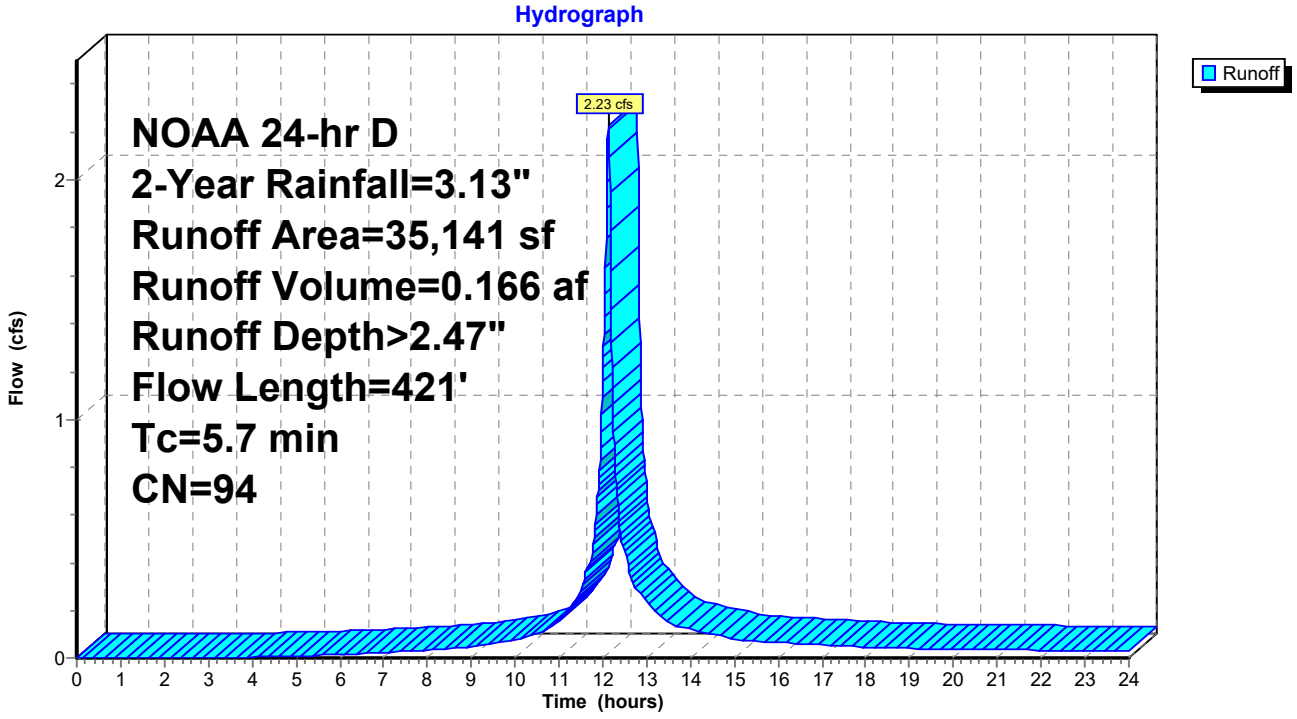
Runoff = 2.23 cfs @ 12.13 hrs, Volume= 0.166 af, Depth> 2.47"

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

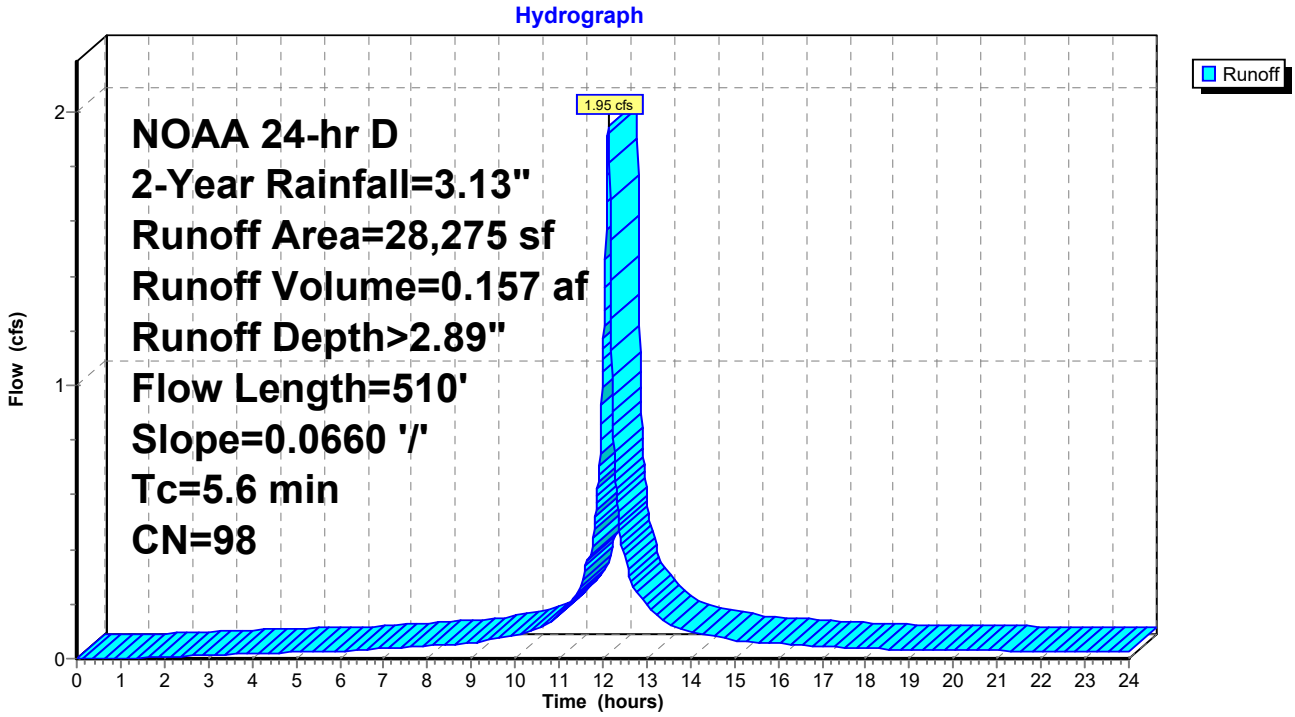
Runoff = 1.95 cfs @ 12.13 hrs, Volume= 0.157 af, Depth> 2.89"

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

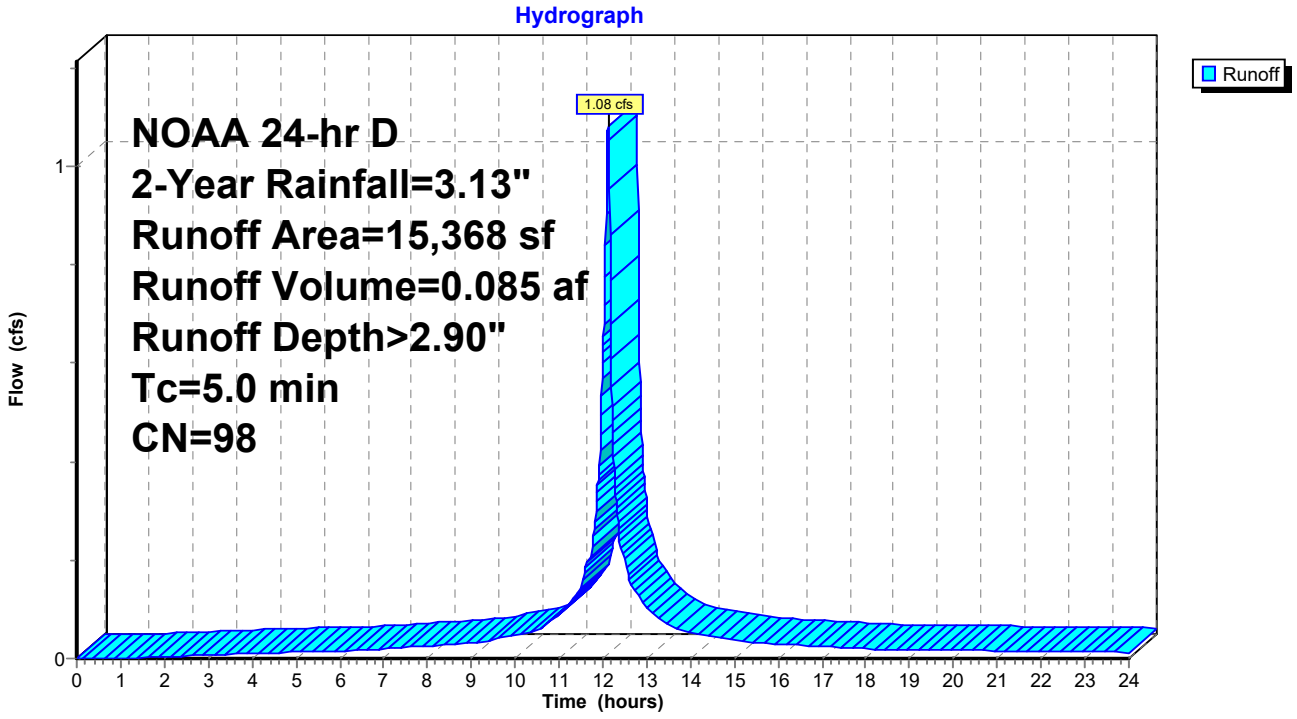
Runoff = 1.08 cfs @ 12.12 hrs, Volume= 0.085 af, Depth> 2.90"

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

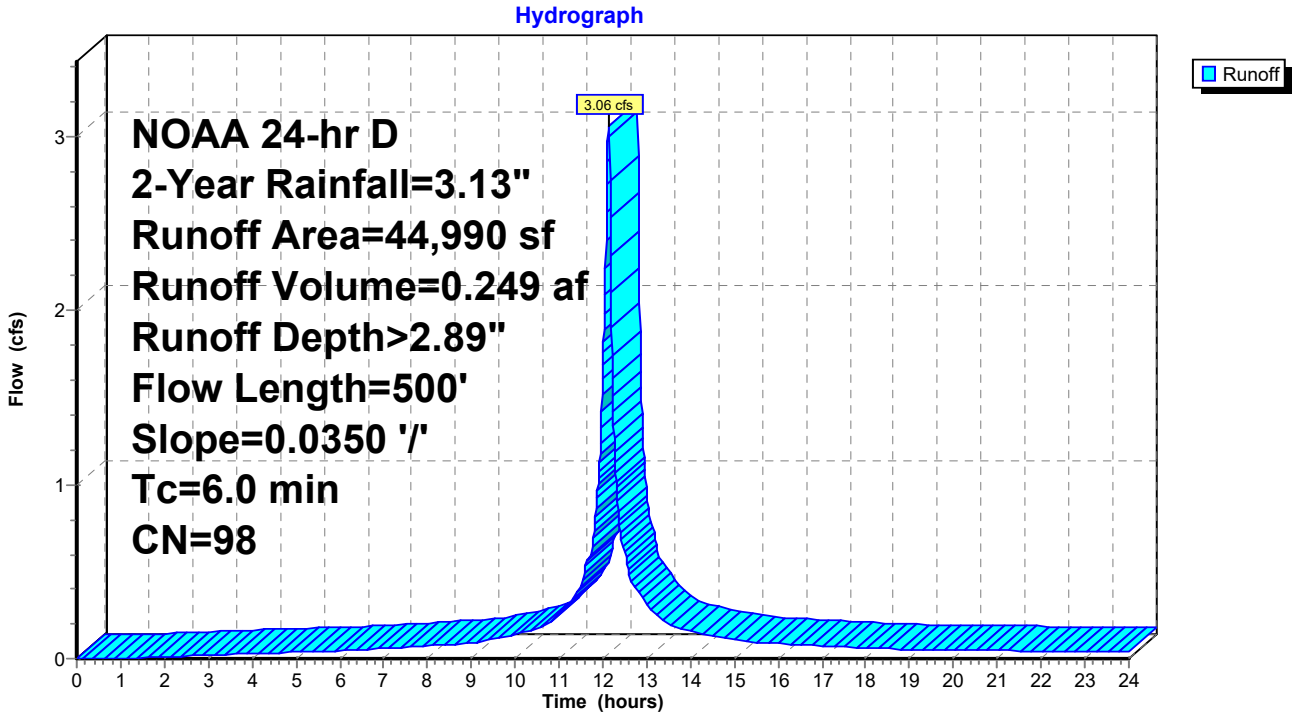
Runoff = 3.06 cfs @ 12.13 hrs, Volume= 0.249 af, Depth> 2.89"

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

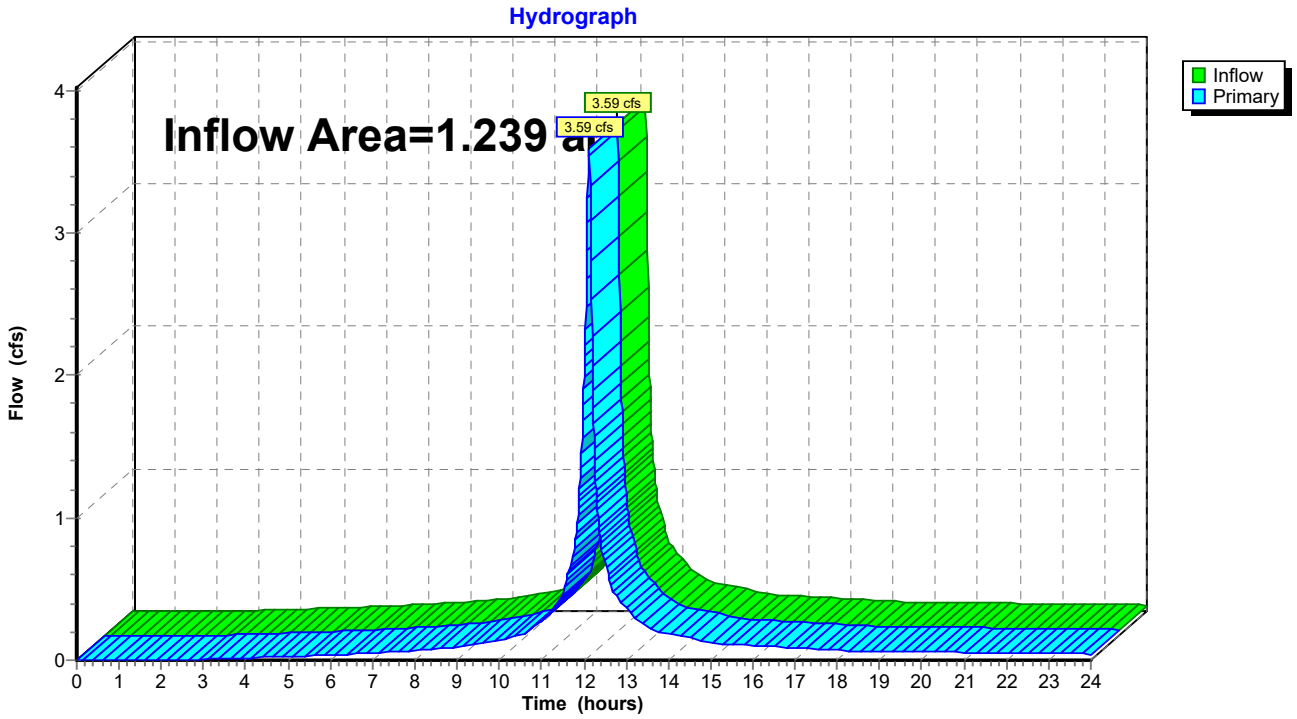


Summary for Link 12L: (new Link)

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

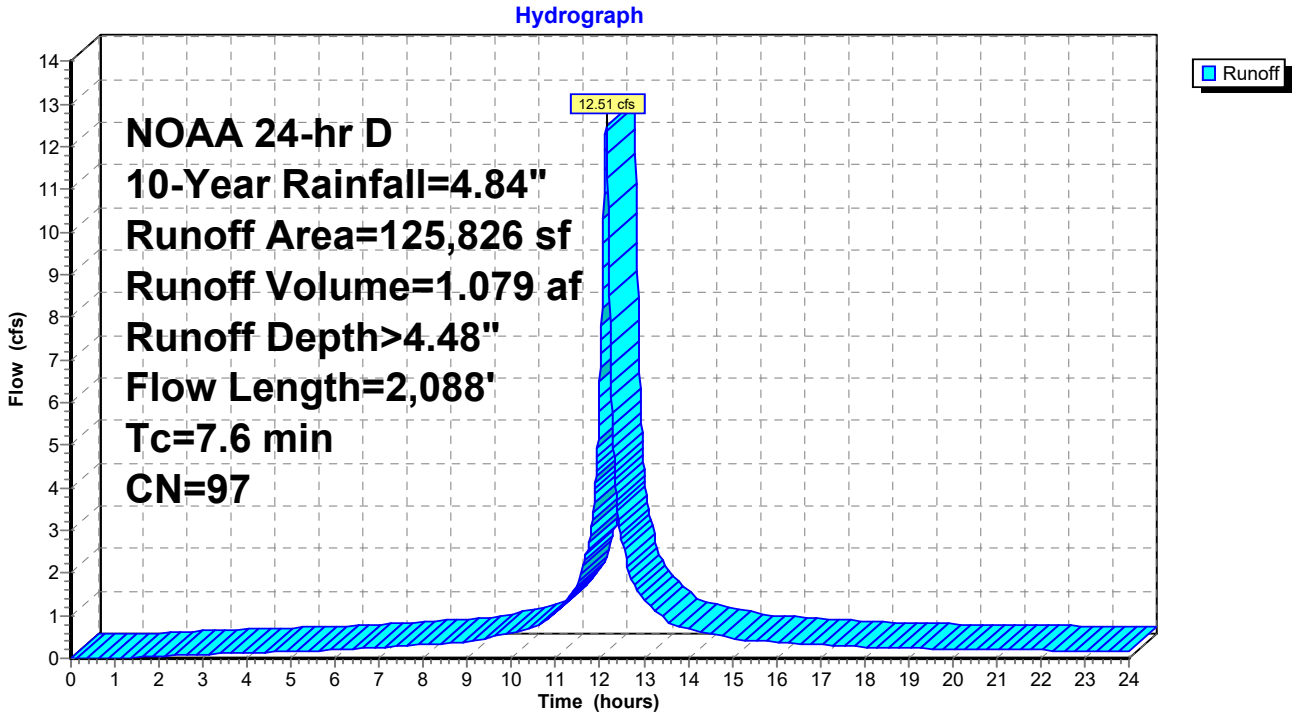
Runoff = 12.51 cfs @ 12.15 hrs, Volume= 1.079 af, Depth> 4.48"

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

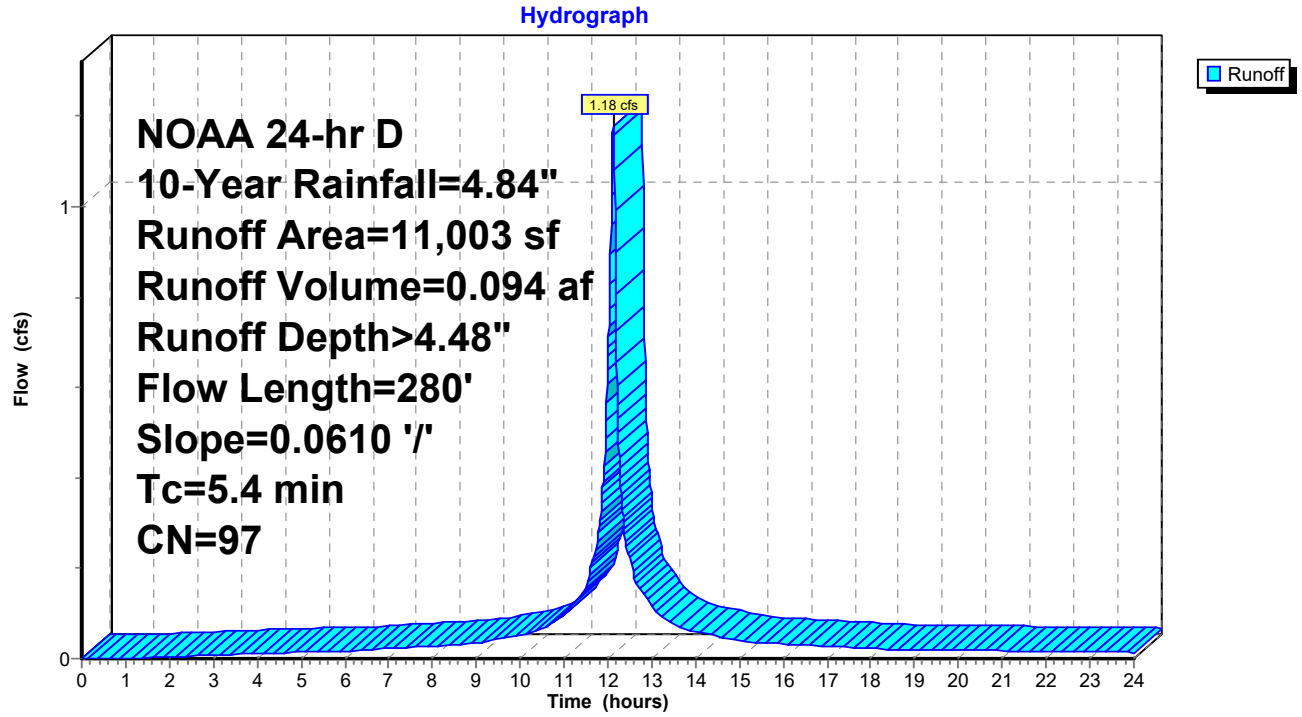
Runoff = 1.18 cfs @ 12.12 hrs, Volume= 0.094 af, Depth> 4.48"

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

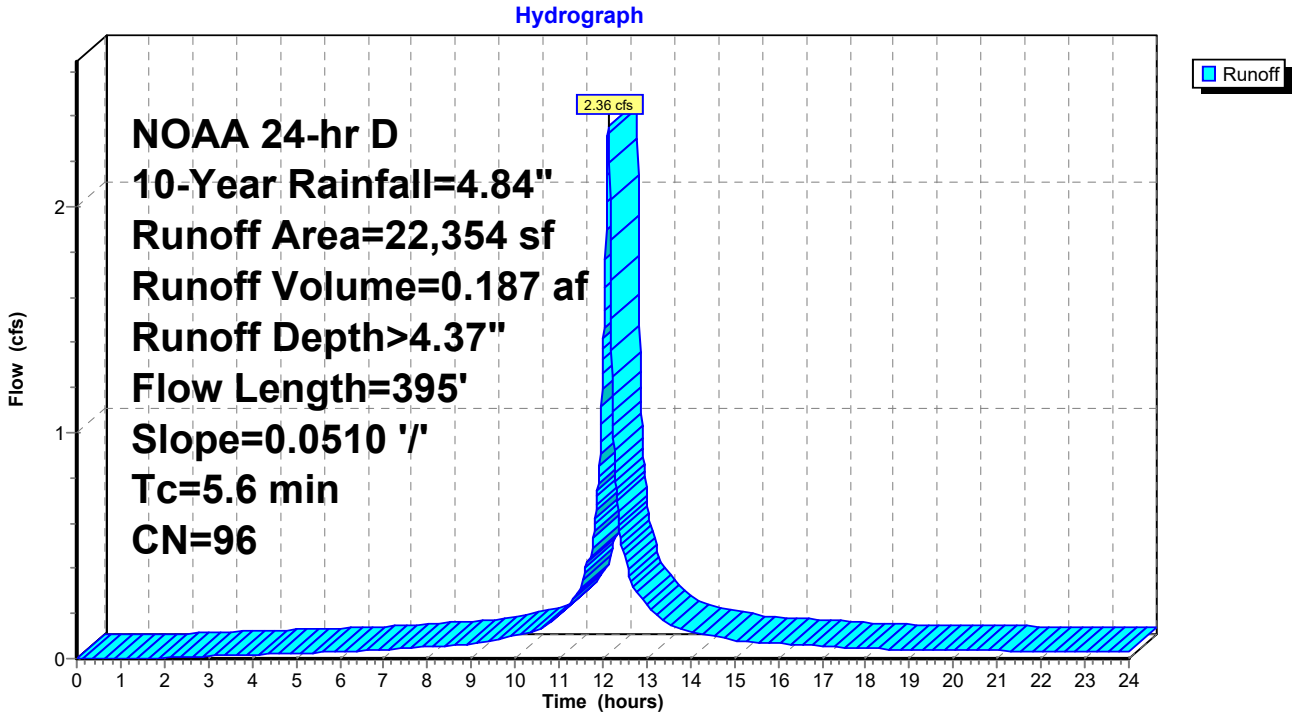
Runoff = 2.36 cfs @ 12.13 hrs, Volume= 0.187 af, Depth> 4.37"

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

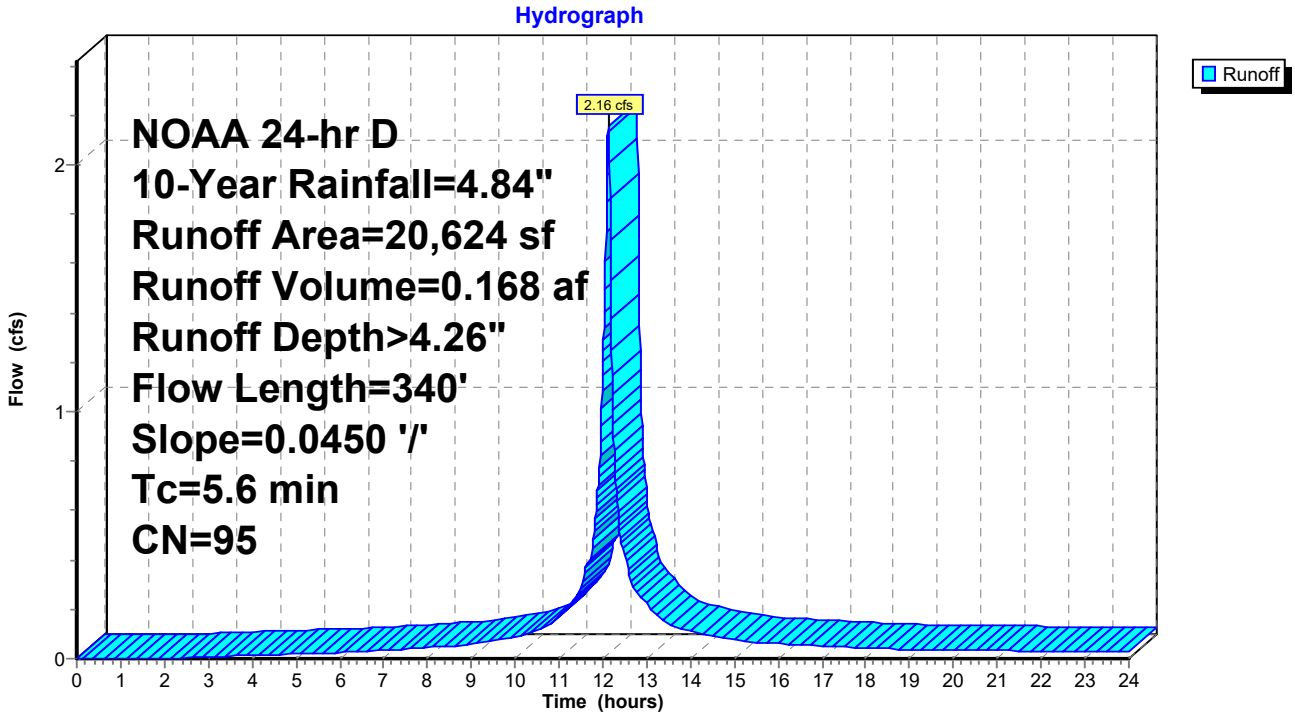
Runoff = 2.16 cfs @ 12.13 hrs, Volume= 0.168 af, Depth> 4.26"

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

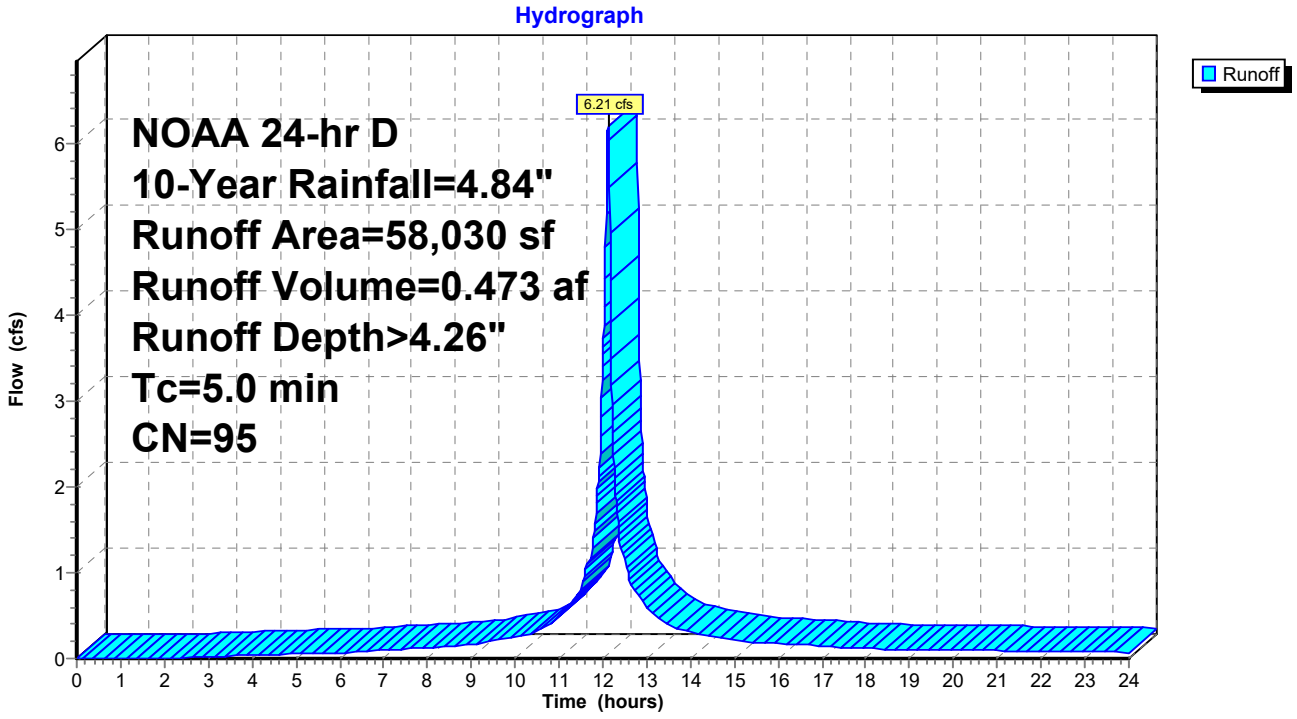
Runoff = 6.21 cfs @ 12.12 hrs, Volume= 0.473 af, Depth> 4.26"

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

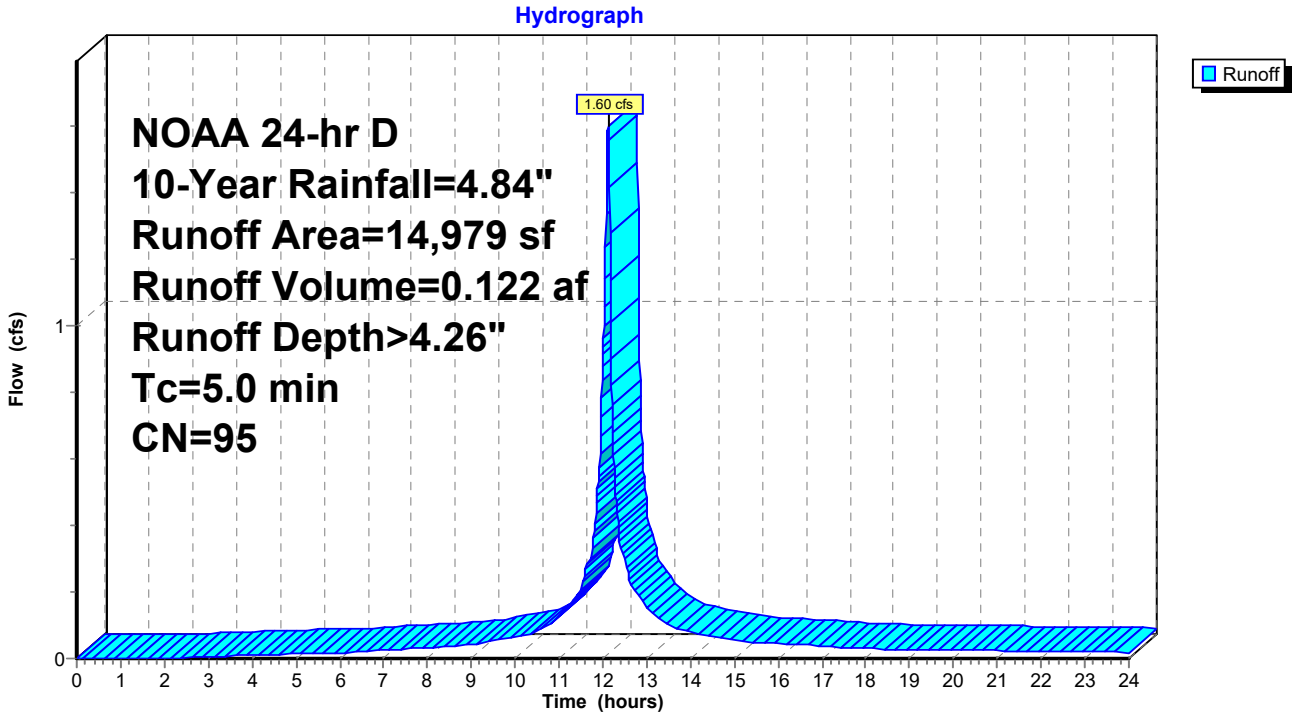
Runoff = 1.60 cfs @ 12.12 hrs, Volume= 0.122 af, Depth> 4.26"

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

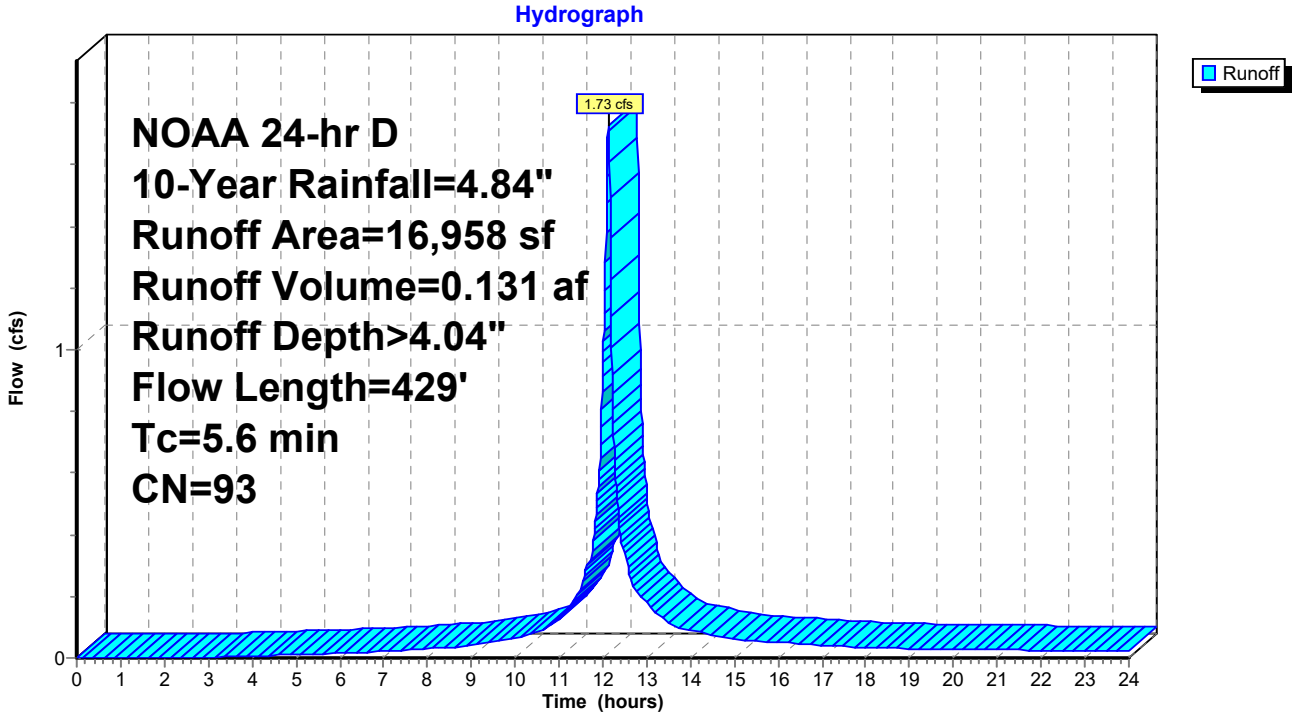
Runoff = 1.73 cfs @ 12.13 hrs, Volume= 0.131 af, Depth> 4.04"

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

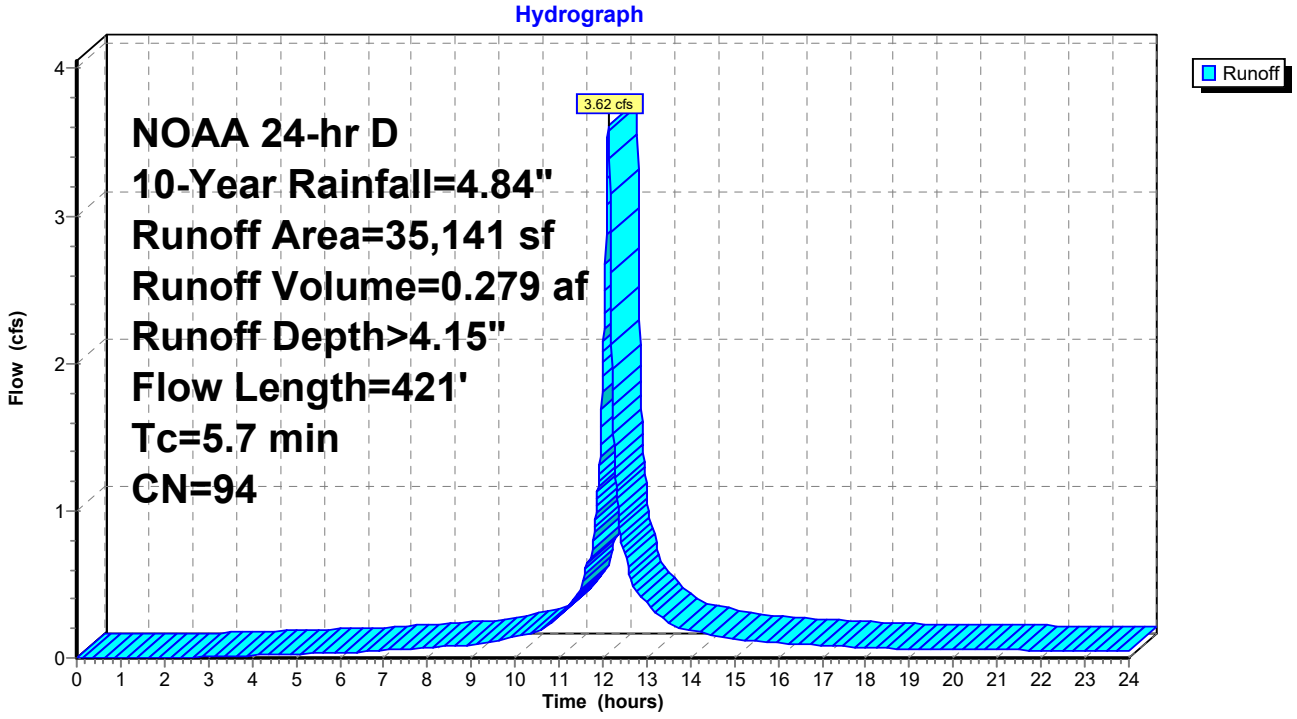
Runoff = 3.62 cfs @ 12.13 hrs, Volume= 0.279 af, Depth> 4.15"

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

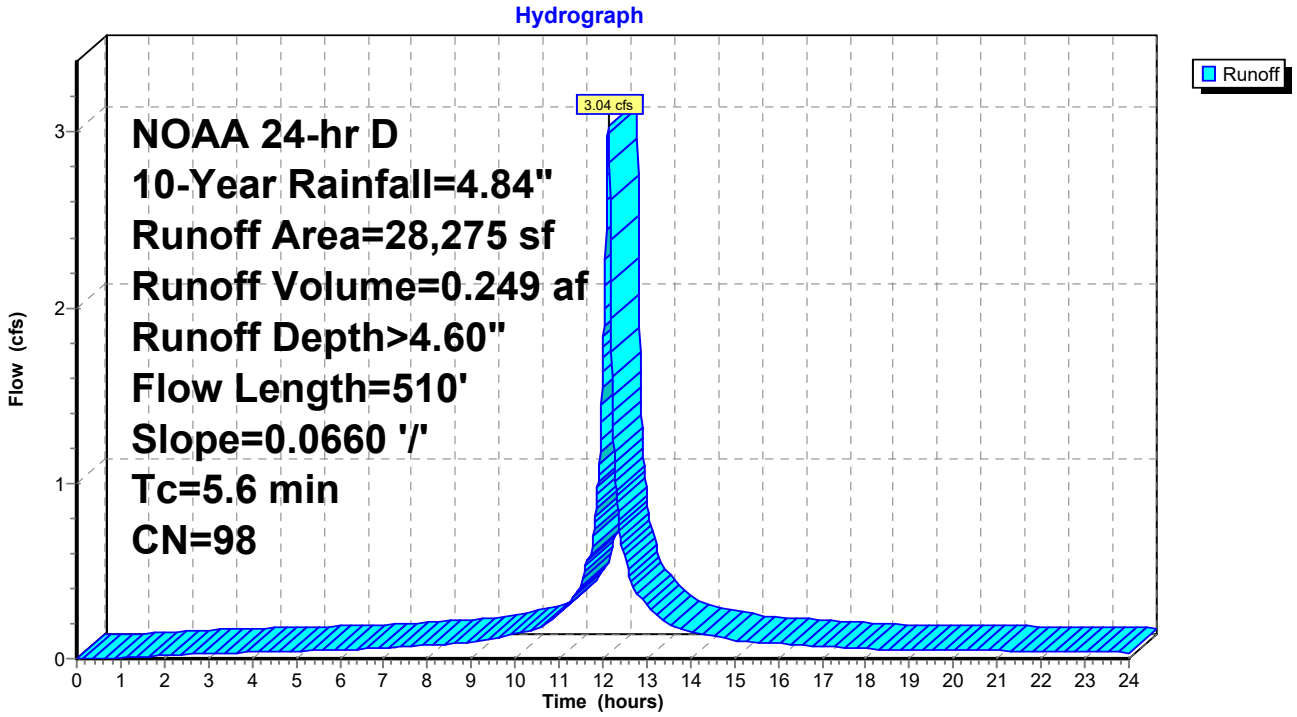
Runoff = 3.04 cfs @ 12.13 hrs, Volume= 0.249 af, Depth> 4.60"

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

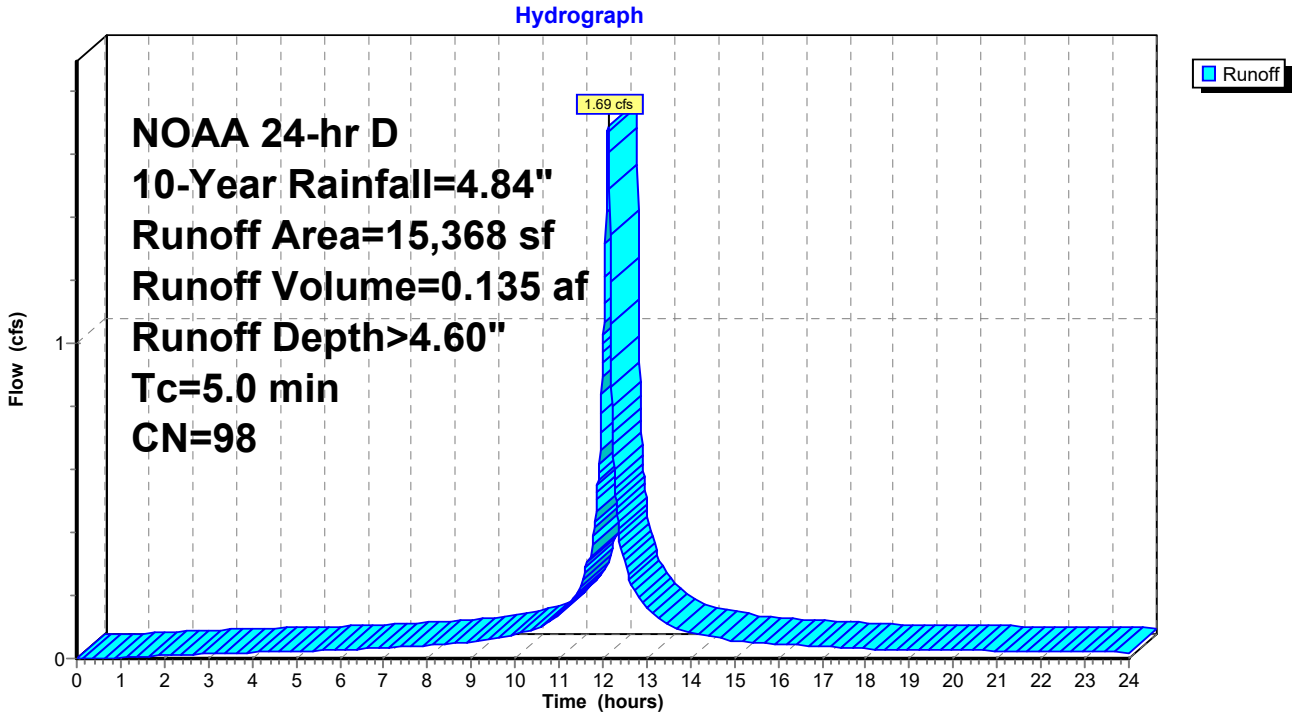
Runoff = 1.69 cfs @ 12.12 hrs, Volume= 0.135 af, Depth> 4.60"

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

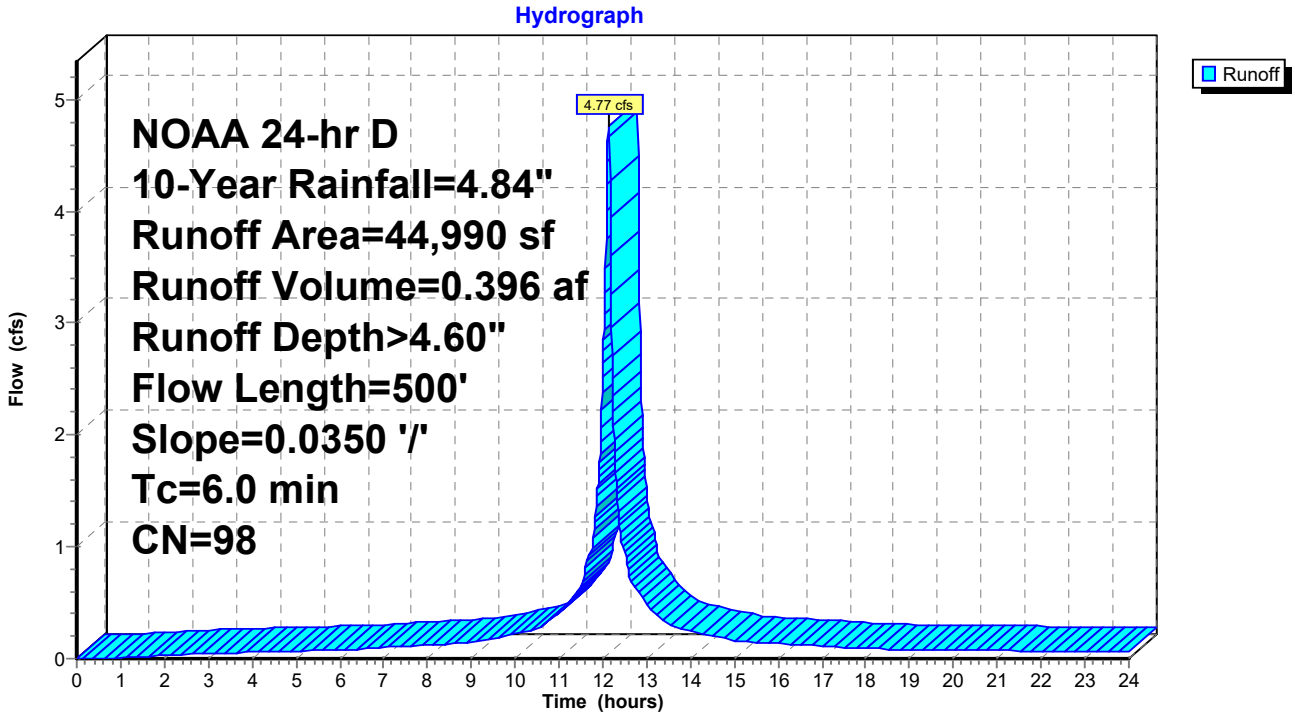
Runoff = 4.77 cfs @ 12.13 hrs, Volume= 0.396 af, Depth> 4.60"

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

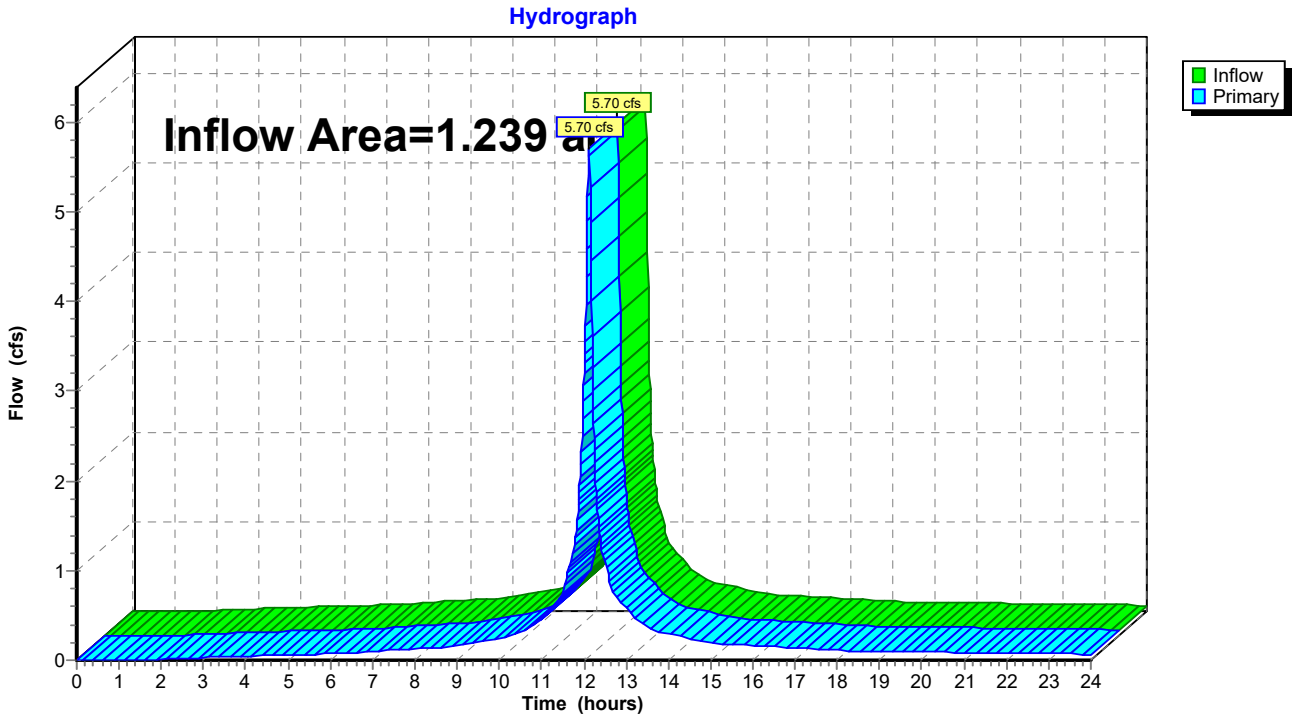


Summary for Link 12L: (new Link)

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

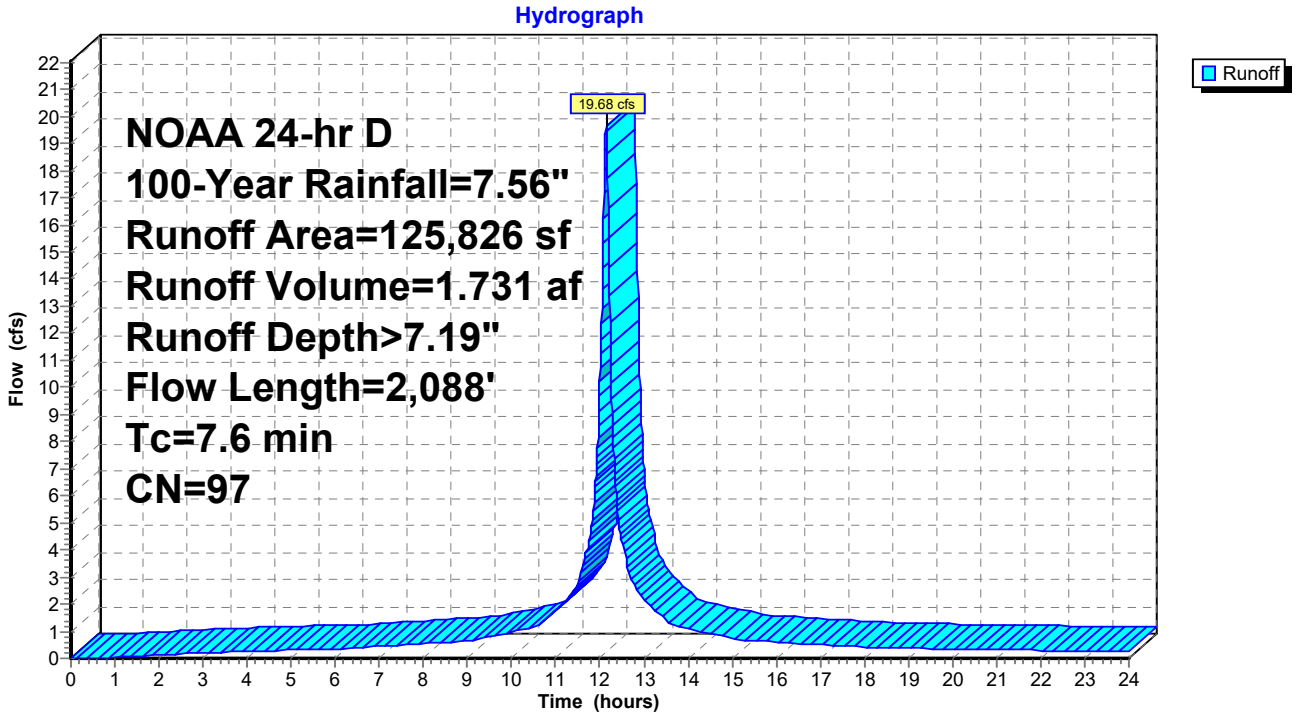
Runoff = 19.68 cfs @ 12.15 hrs, Volume= 1.731 af, Depth> 7.19"

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

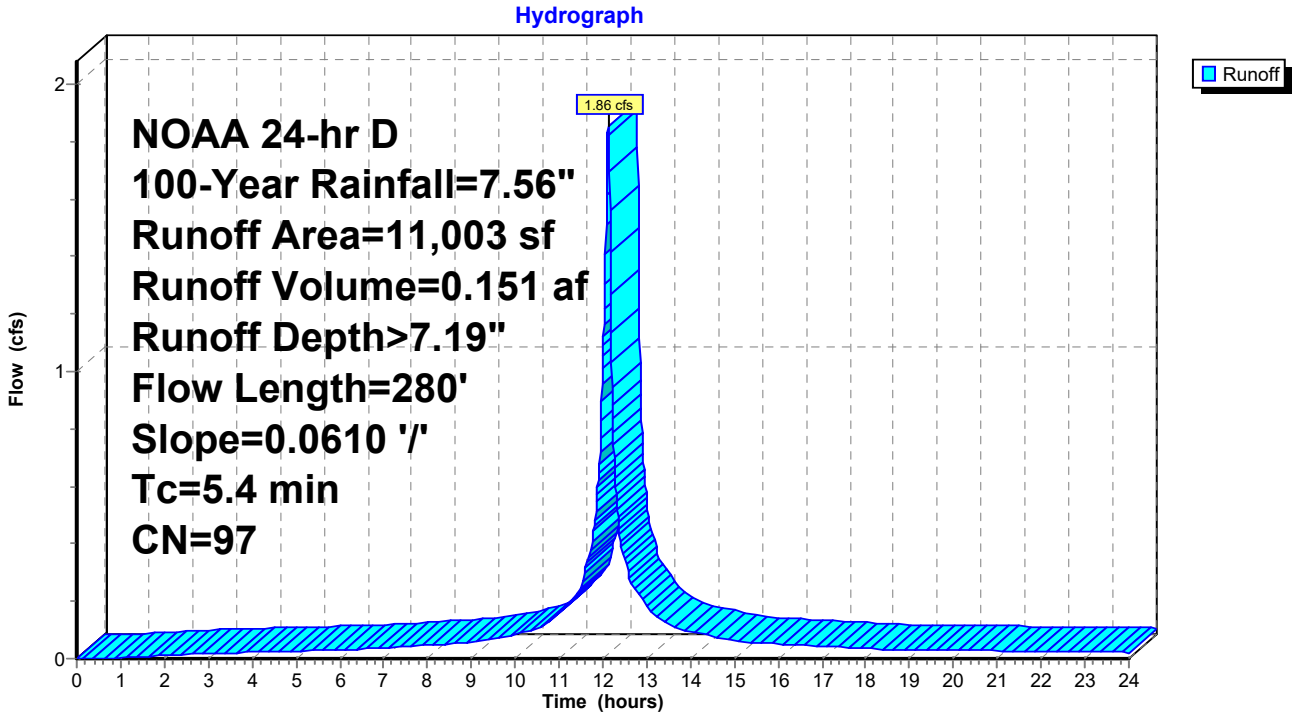
Runoff = 1.86 cfs @ 12.12 hrs, Volume= 0.151 af, Depth> 7.19"

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

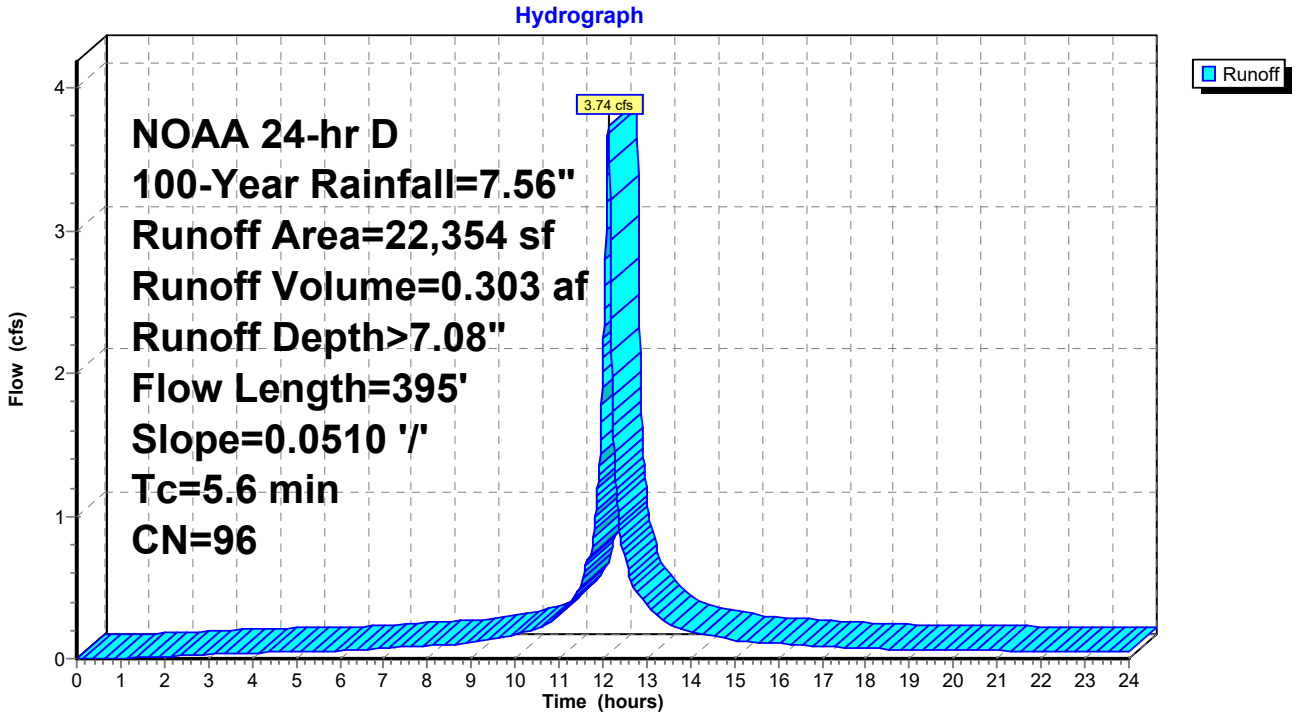
Runoff = 3.74 cfs @ 12.13 hrs, Volume= 0.303 af, Depth> 7.08"

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

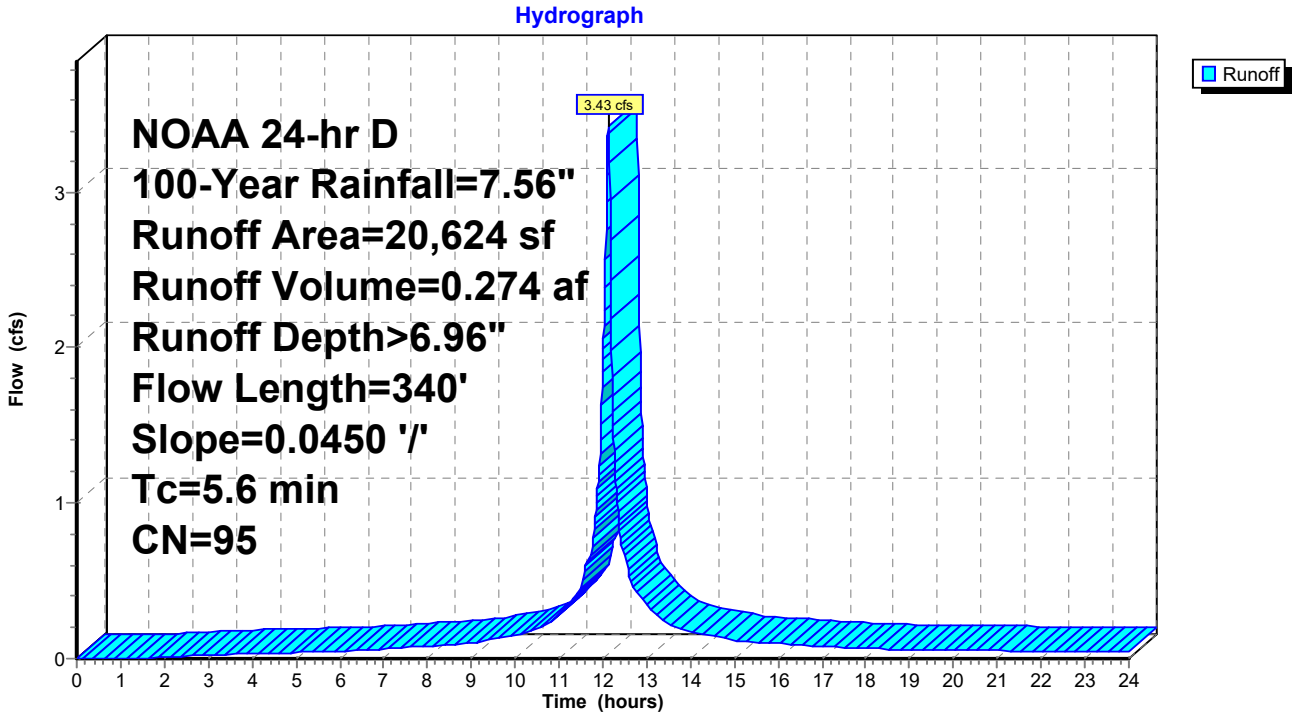
Runoff = 3.43 cfs @ 12.13 hrs, Volume= 0.274 af, Depth> 6.96"

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

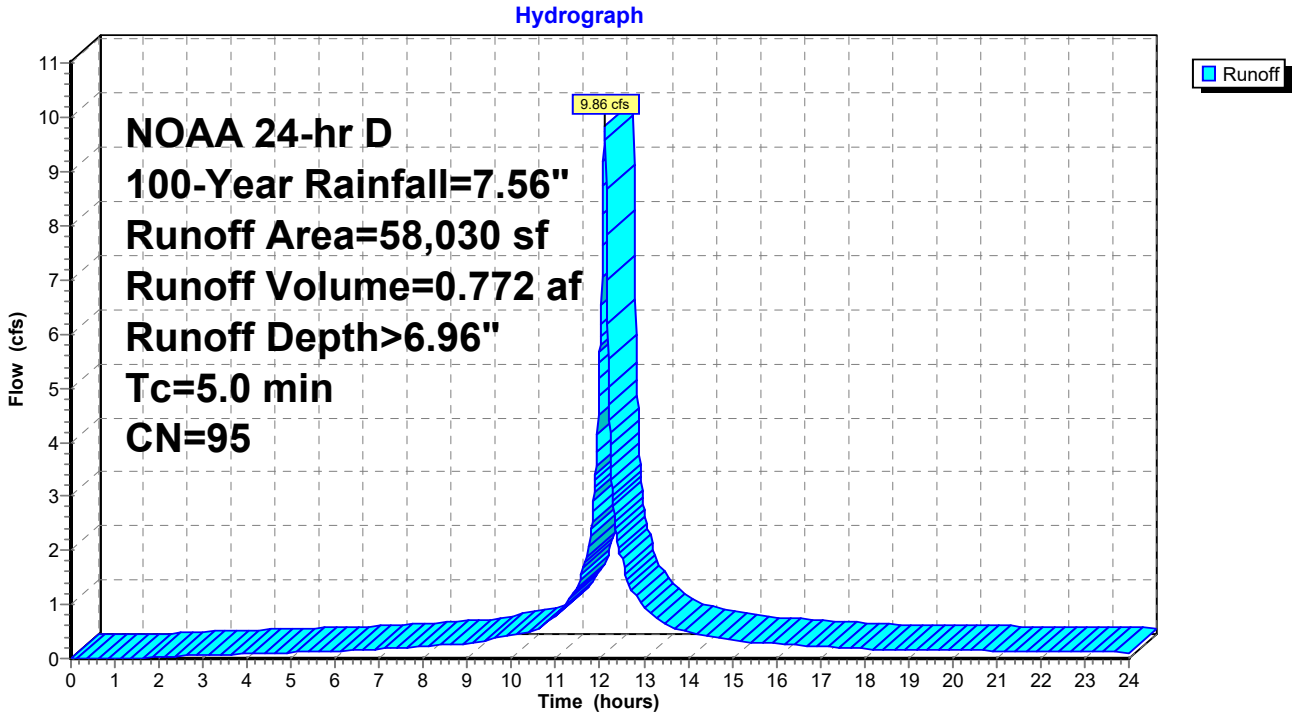
Runoff = 9.86 cfs @ 12.12 hrs, Volume= 0.772 af, Depth> 6.96"

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

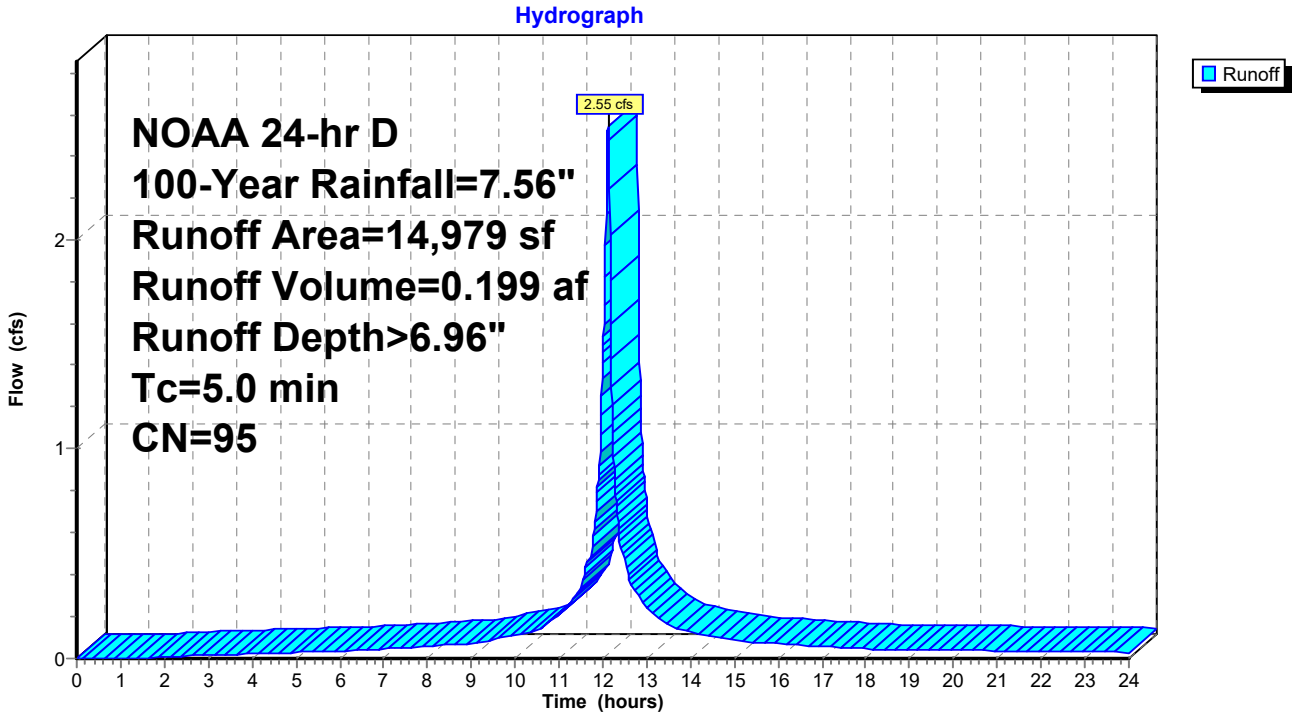
Runoff = 2.55 cfs @ 12.12 hrs, Volume= 0.199 af, Depth> 6.96"

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

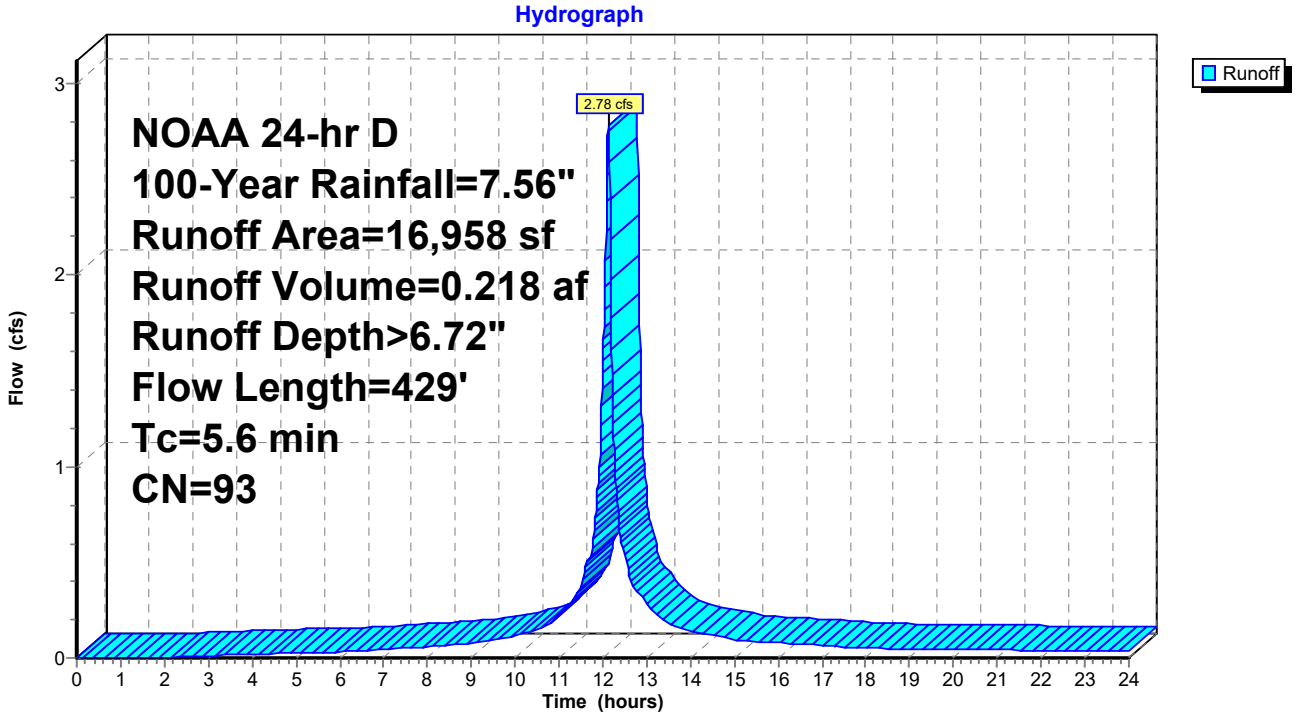
Runoff = 2.78 cfs @ 12.13 hrs, Volume= 0.218 af, Depth> 6.72"

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

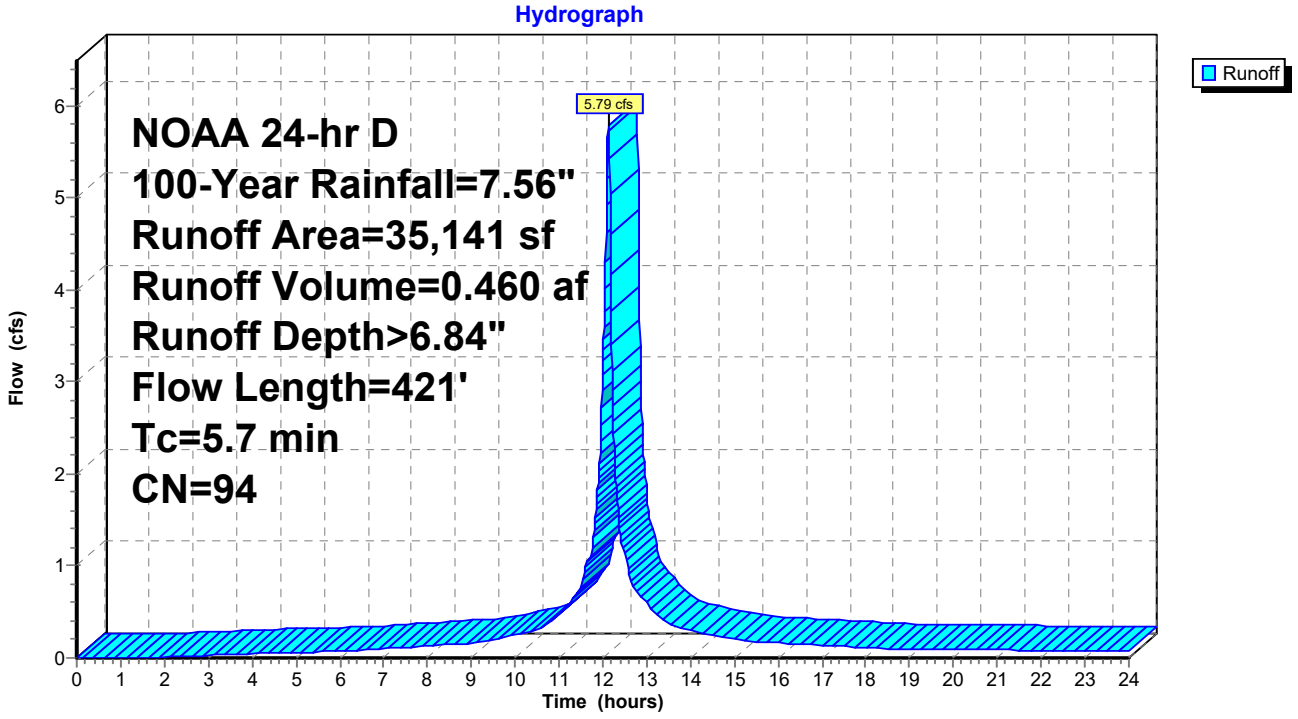
Runoff = 5.79 cfs @ 12.13 hrs, Volume= 0.460 af, Depth> 6.84"

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

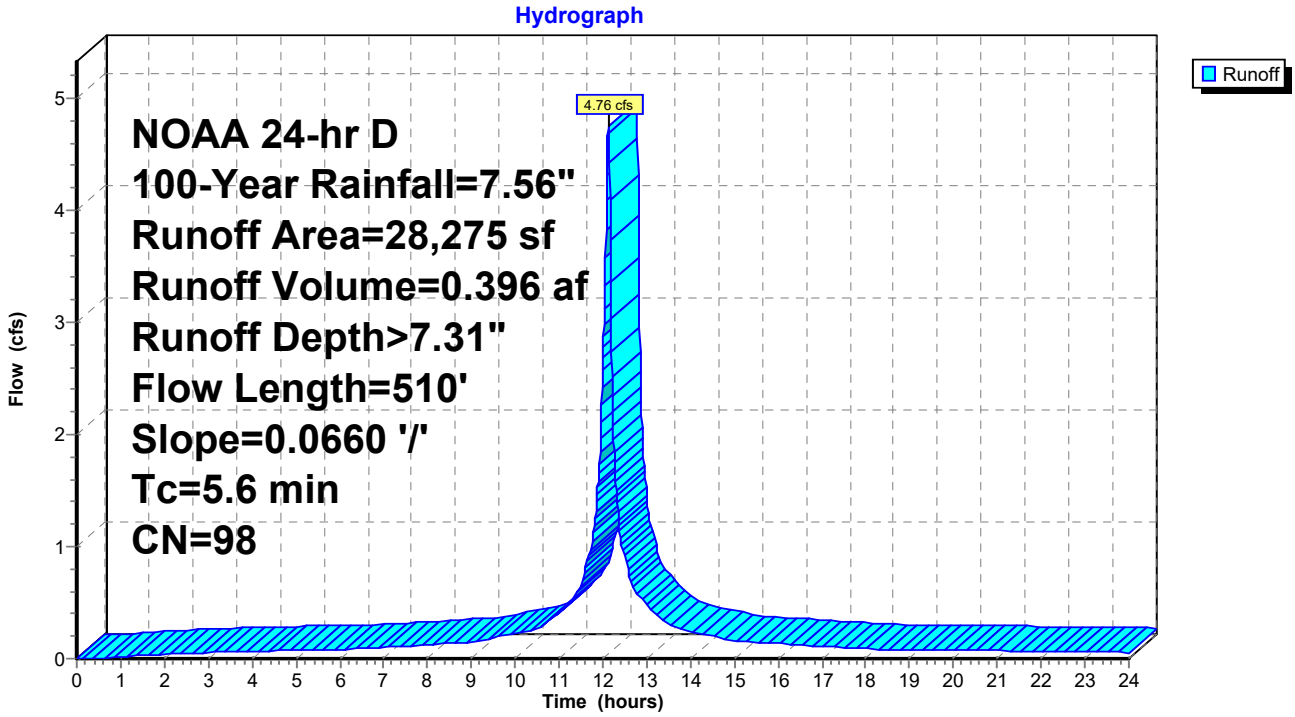
Runoff = 4.76 cfs @ 12.13 hrs, Volume= 0.396 af, Depth> 7.31"

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

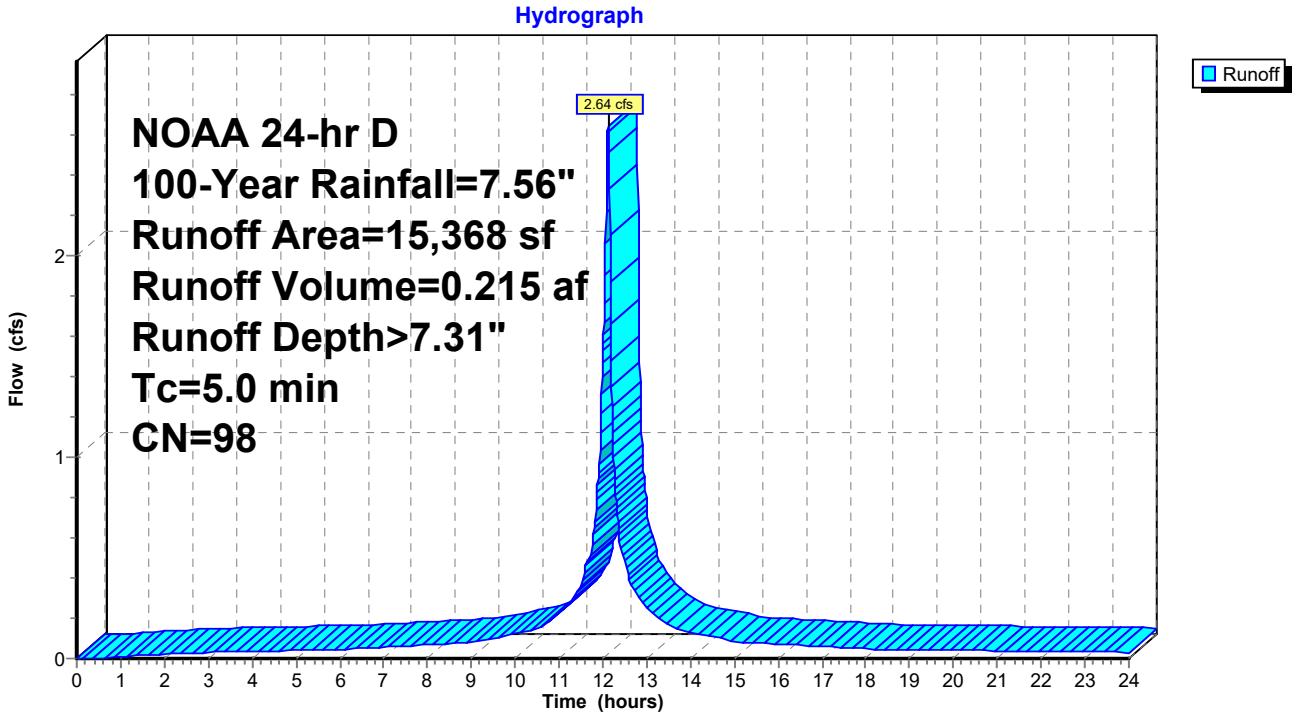
Runoff = 2.64 cfs @ 12.12 hrs, Volume= 0.215 af, Depth> 7.31"

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

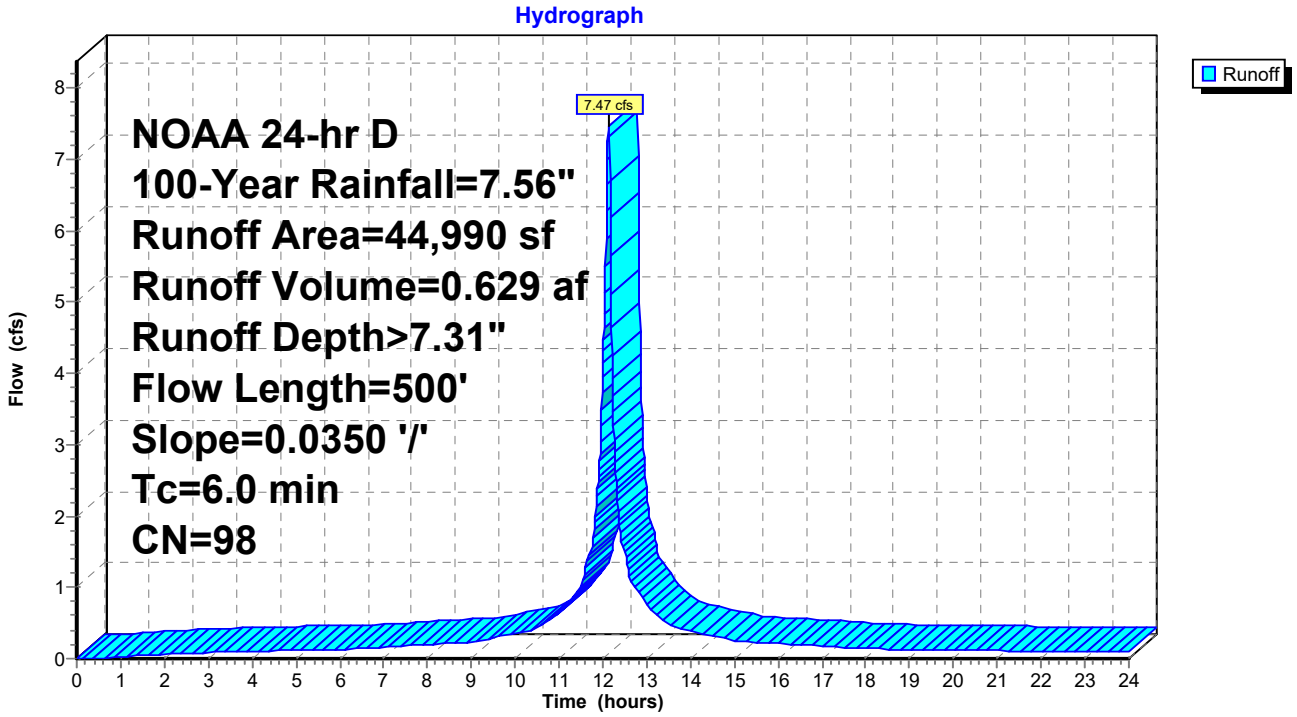
Runoff = 7.47 cfs @ 12.13 hrs, Volume= 0.629 af, Depth> 7.31"

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

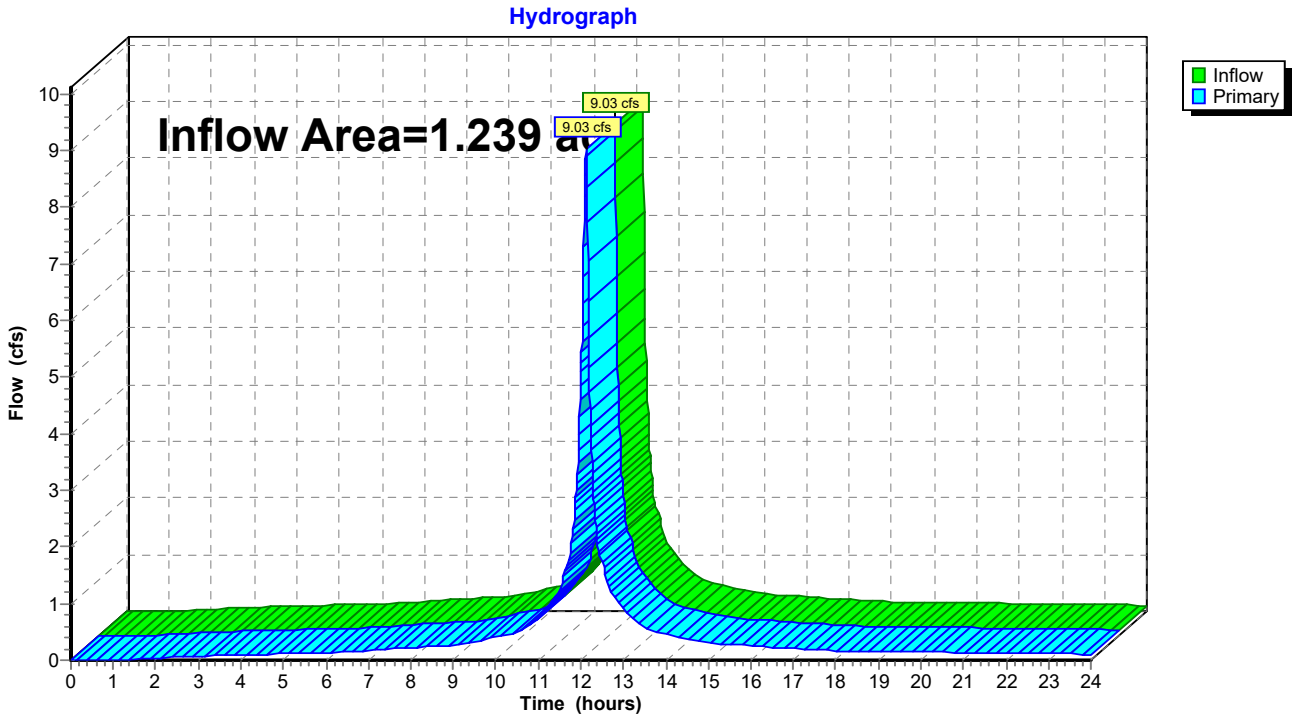


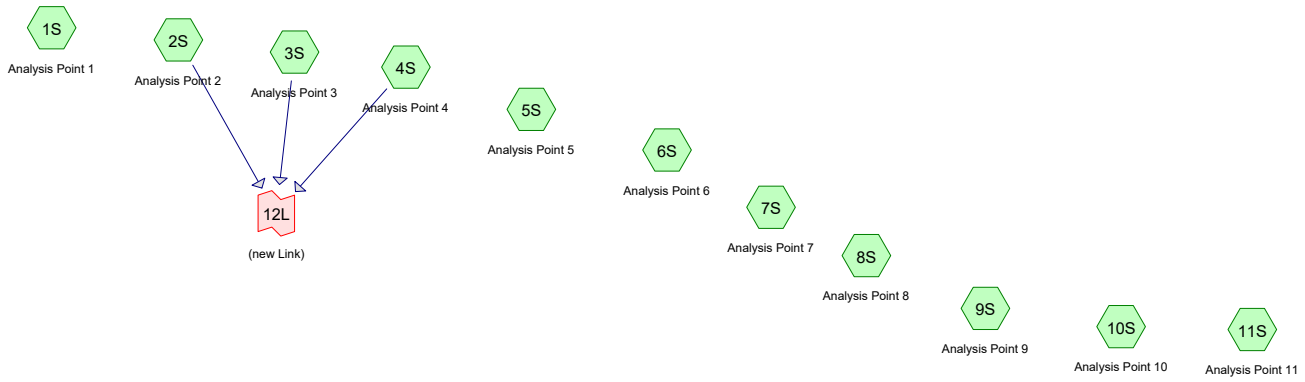
Summary for Link 12L: (new Link)

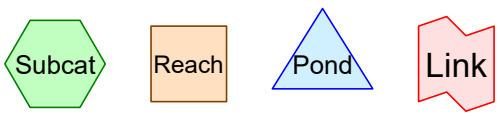
Inflow Area = 1.239 ac, 91.94% Impervious, Inflow Depth > 7.05" for 100-Year event
Inflow = 9.03 cfs @ 12.13 hrs, Volume= 0.728 af
Primary = 9.03 cfs @ 12.13 hrs, Volume= 0.728 af, Atten= 0%, Lag= 0.0 min

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
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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**

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

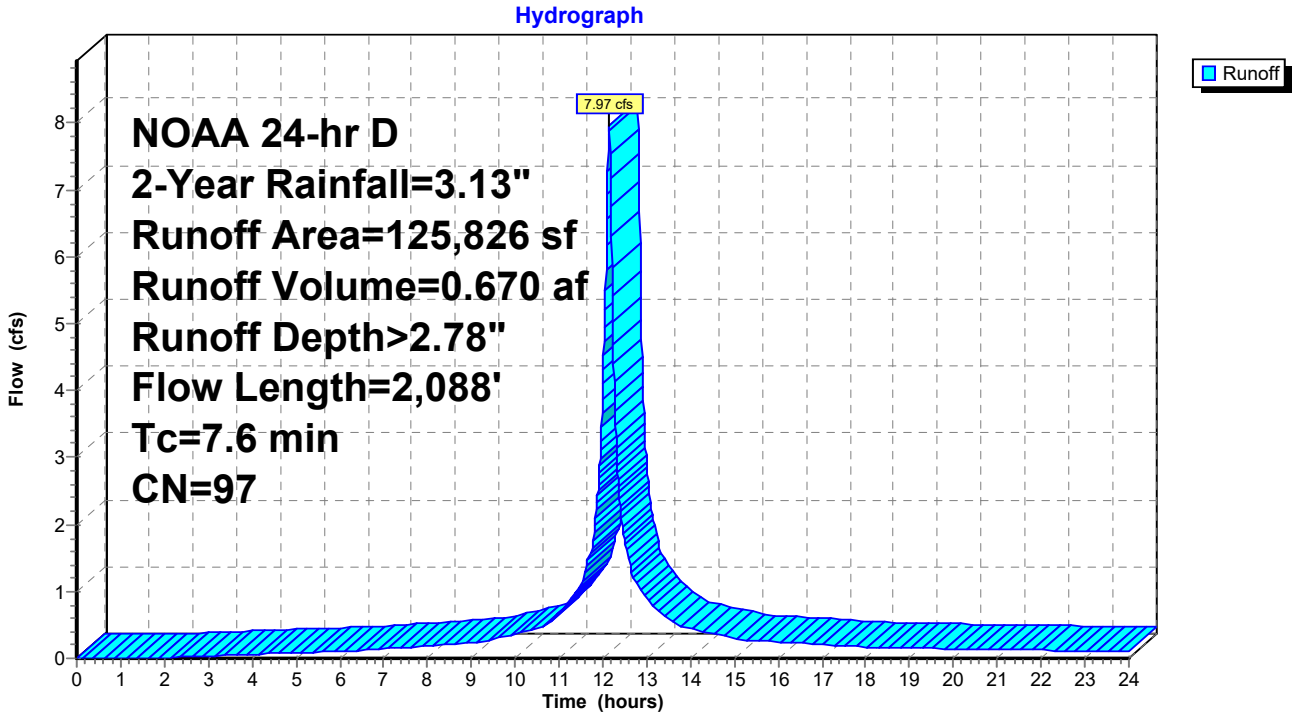
Runoff = 7.97 cfs @ 12.15 hrs, Volume= 0.670 af, Depth> 2.78"

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

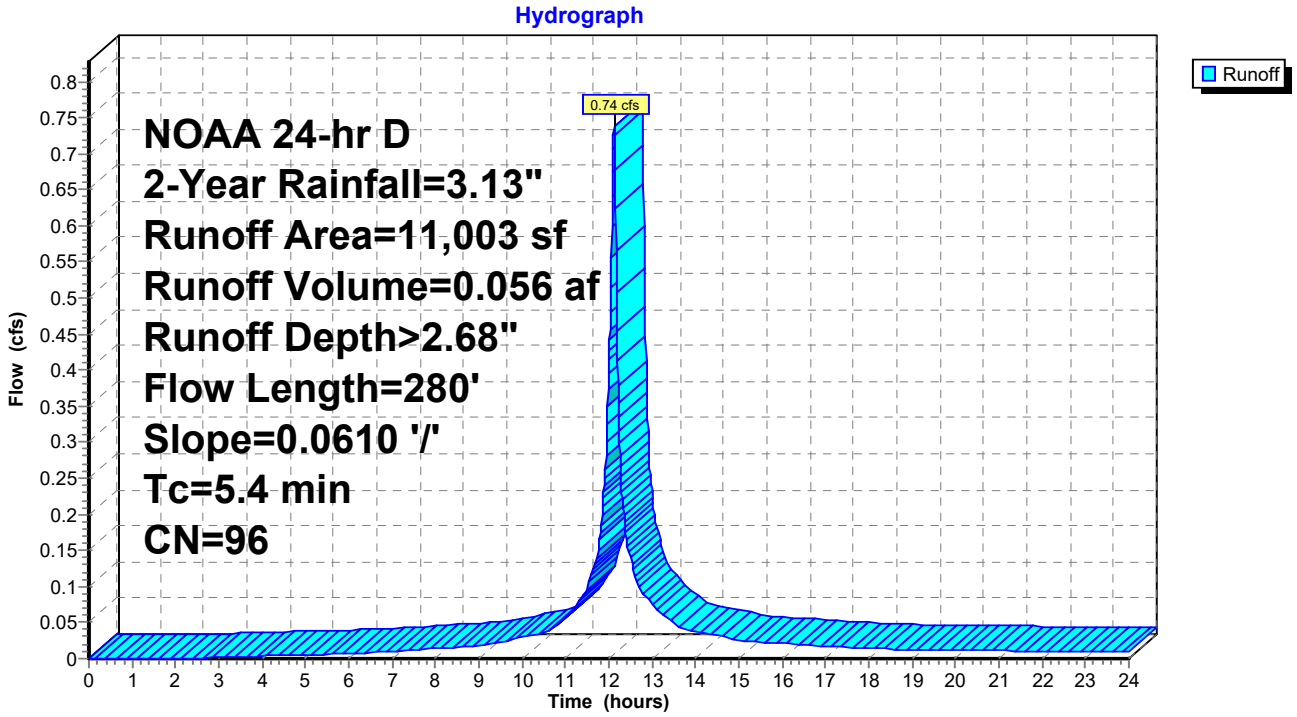
Runoff = 0.74 cfs @ 12.12 hrs, Volume= 0.056 af, Depth> 2.68"

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

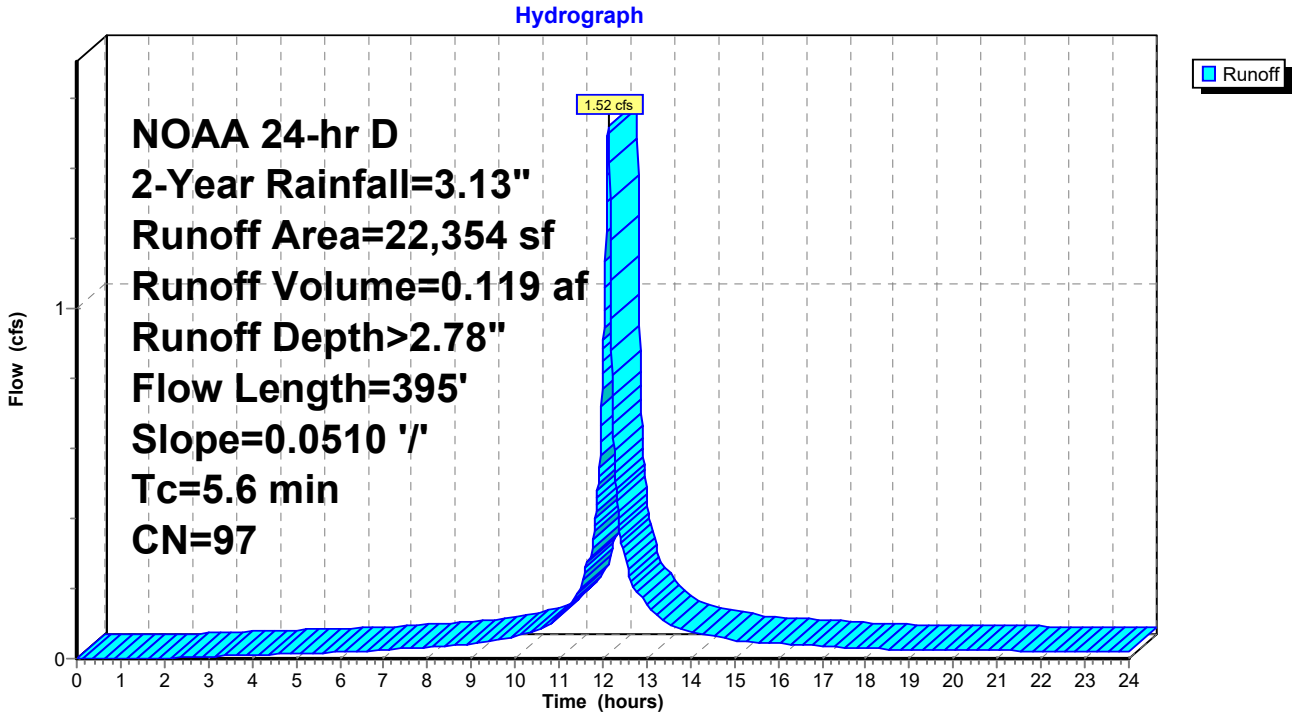
Runoff = 1.52 cfs @ 12.13 hrs, Volume= 0.119 af, Depth> 2.78"

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

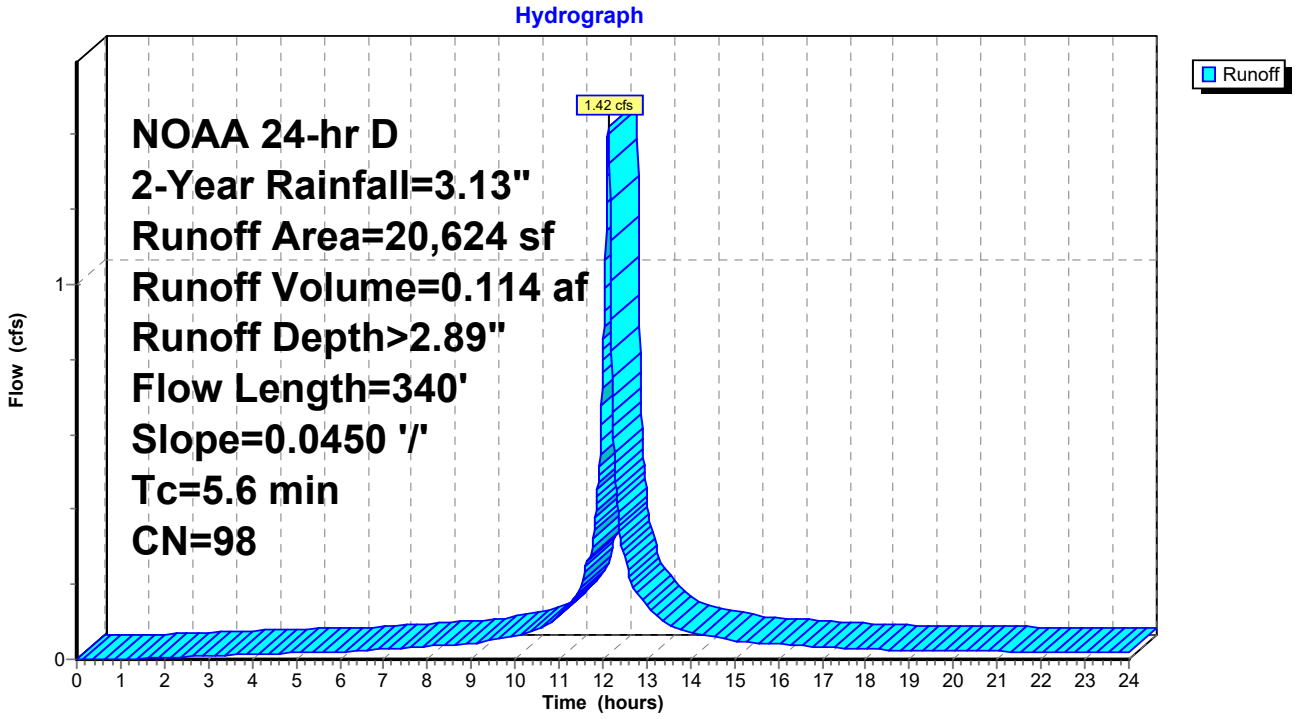
Runoff = 1.42 cfs @ 12.13 hrs, Volume= 0.114 af, Depth> 2.89"

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

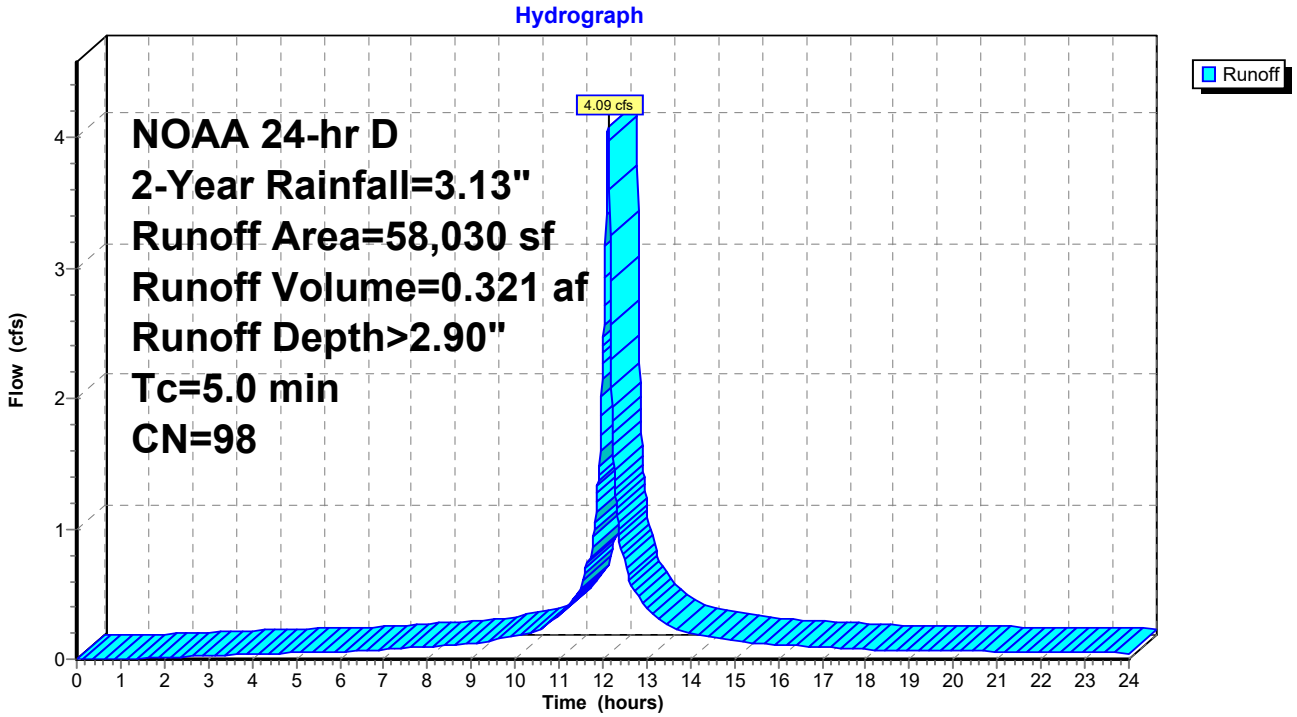
Runoff = 4.09 cfs @ 12.12 hrs, Volume= 0.321 af, Depth> 2.90"

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

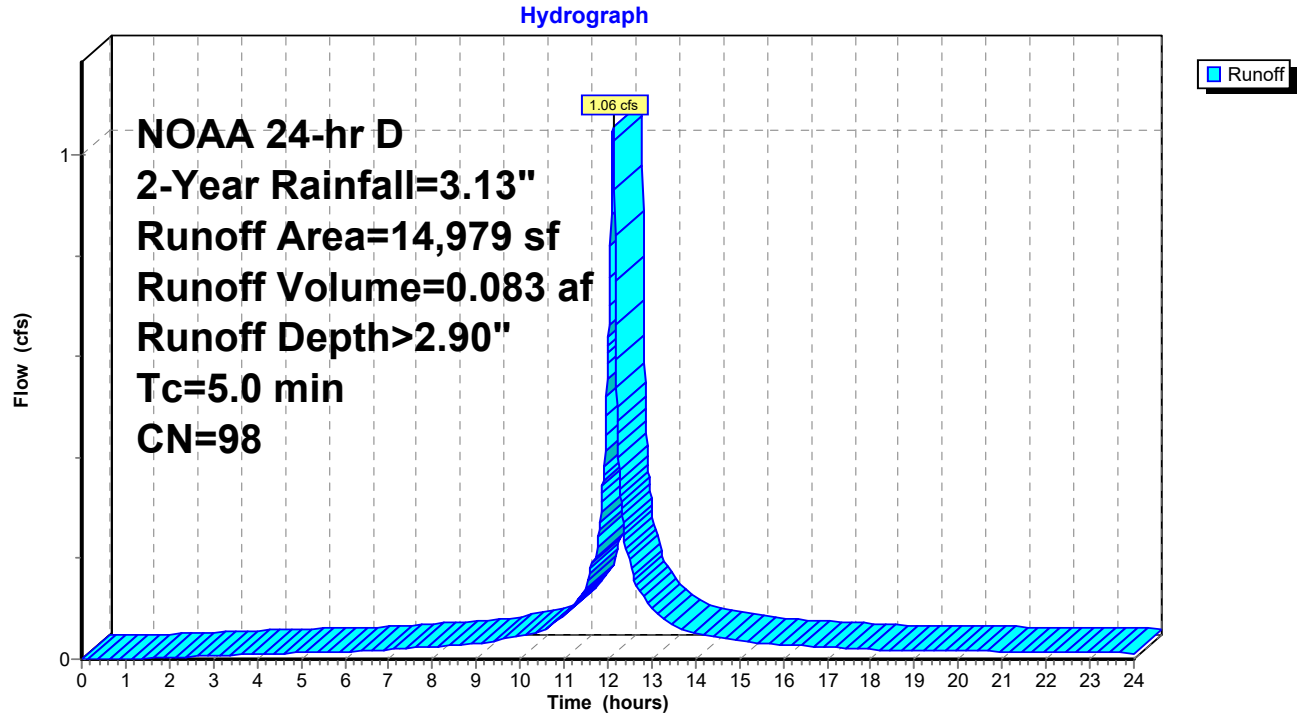
Runoff = 1.06 cfs @ 12.12 hrs, Volume= 0.083 af, Depth> 2.90"

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

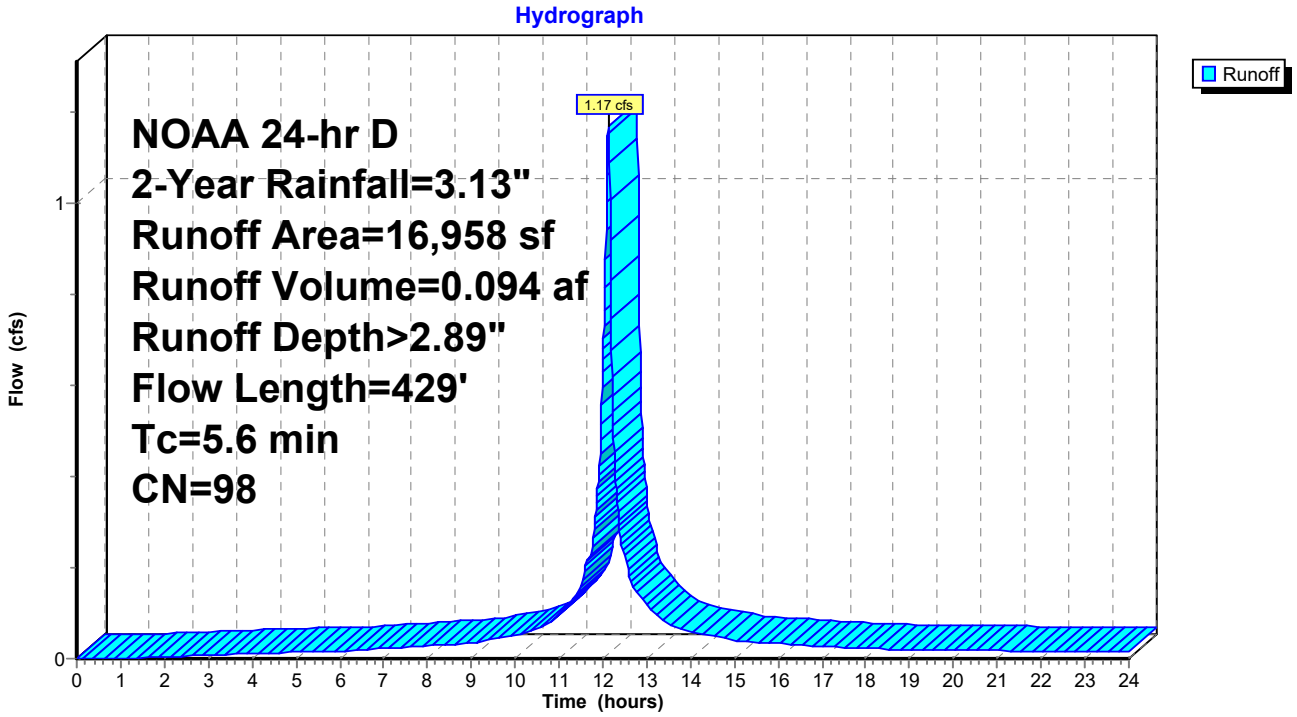
Runoff = 1.17 cfs @ 12.13 hrs, Volume= 0.094 af, Depth> 2.89"

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

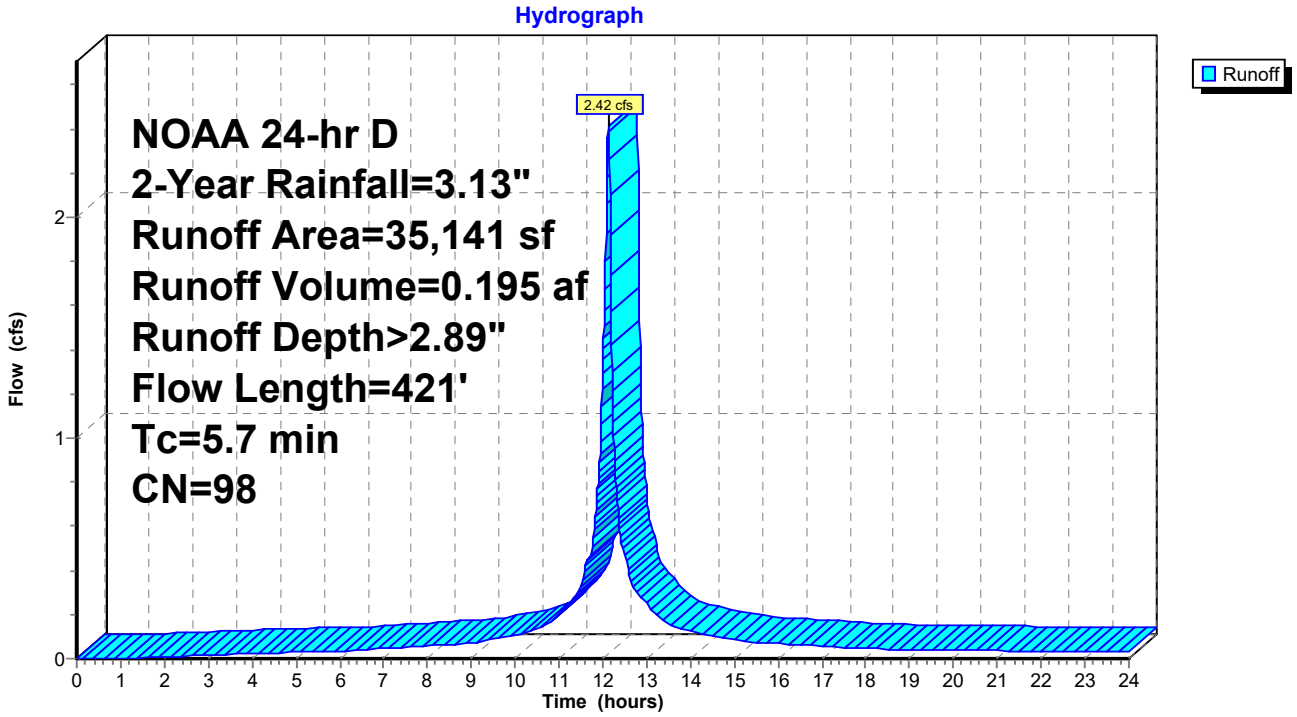
Runoff = 2.42 cfs @ 12.13 hrs, Volume= 0.195 af, Depth> 2.89"

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

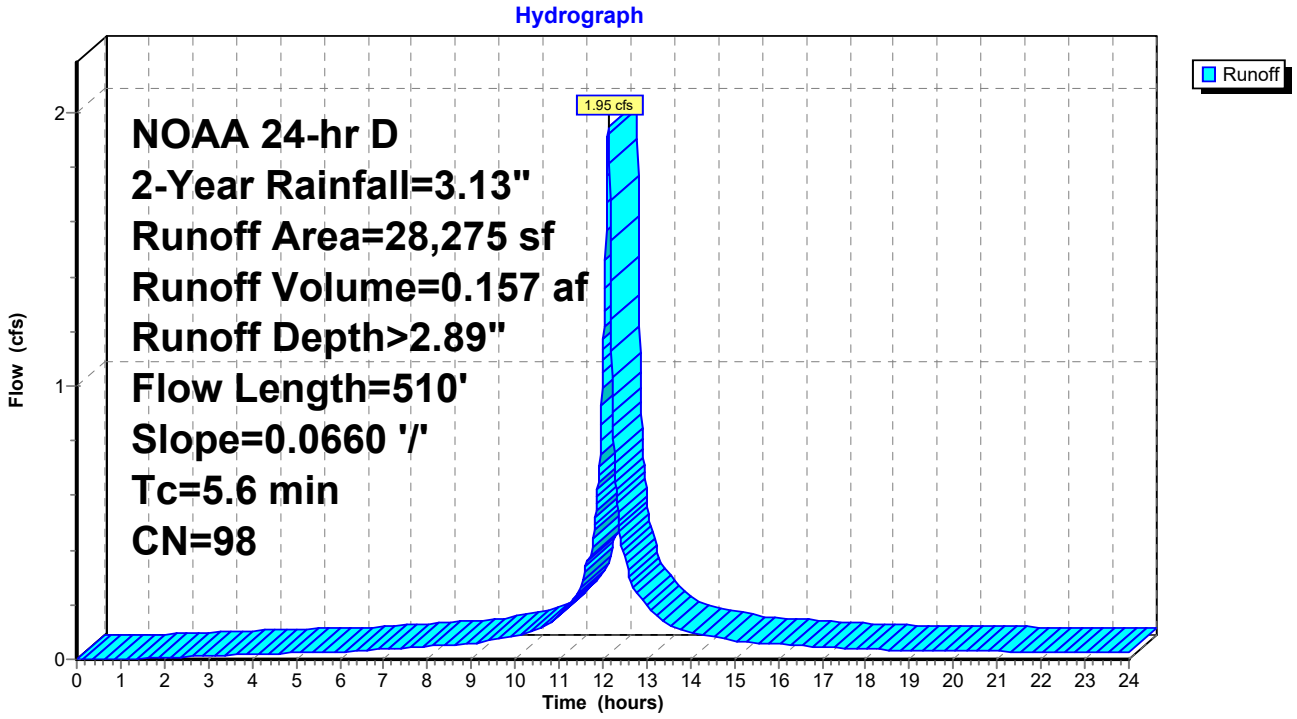
Runoff = 1.95 cfs @ 12.13 hrs, Volume= 0.157 af, Depth> 2.89"

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

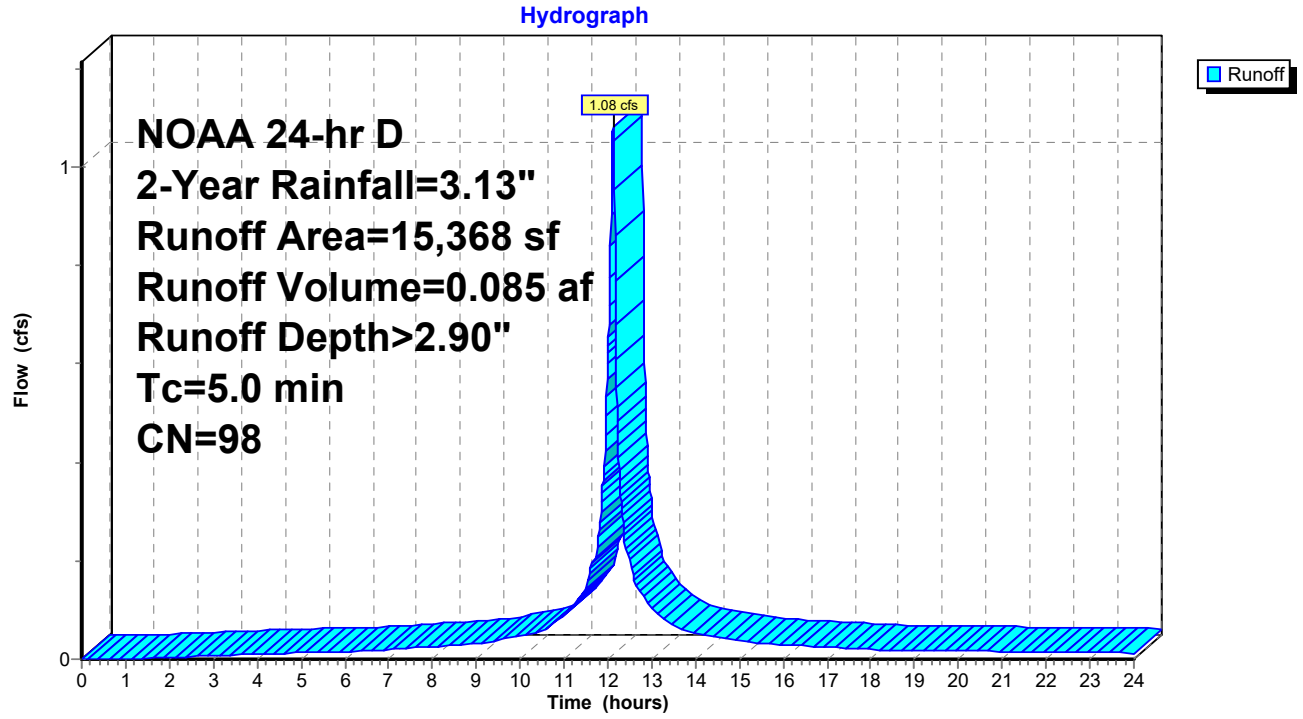
Runoff = 1.08 cfs @ 12.12 hrs, Volume= 0.085 af, Depth> 2.90"

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

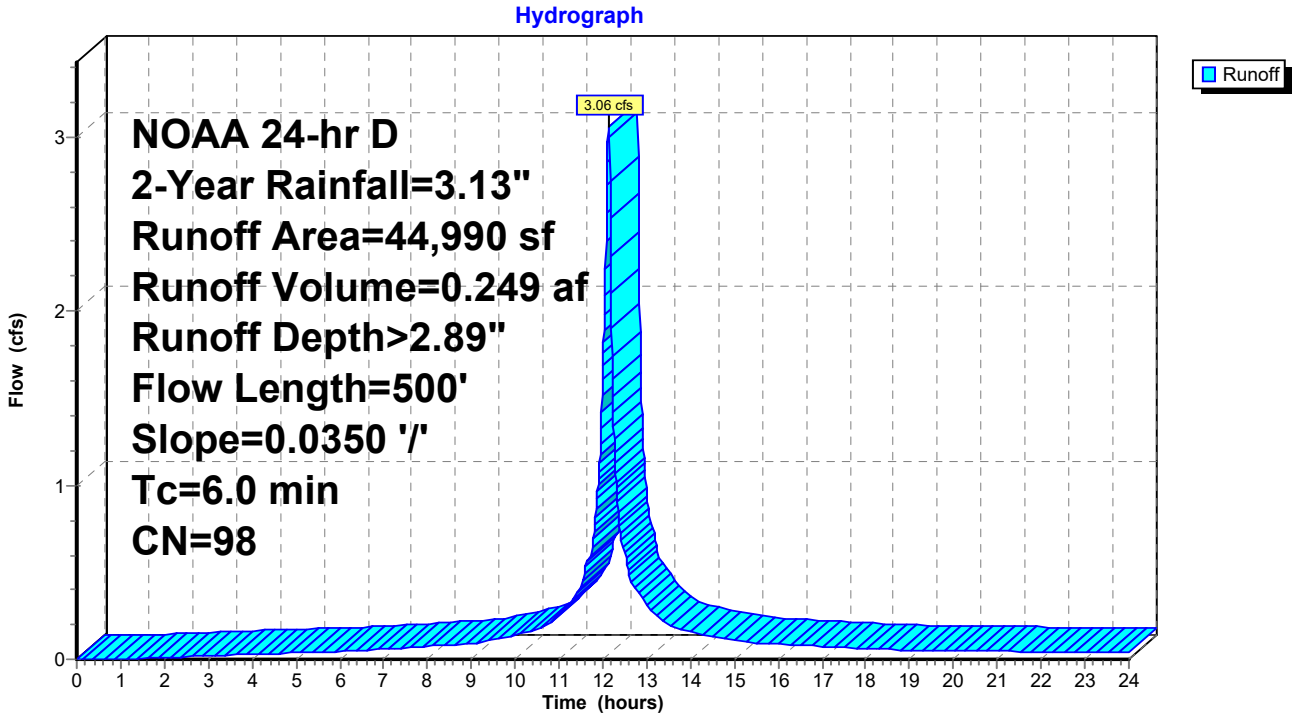
Runoff = 3.06 cfs @ 12.13 hrs, Volume= 0.249 af, Depth> 2.89"

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

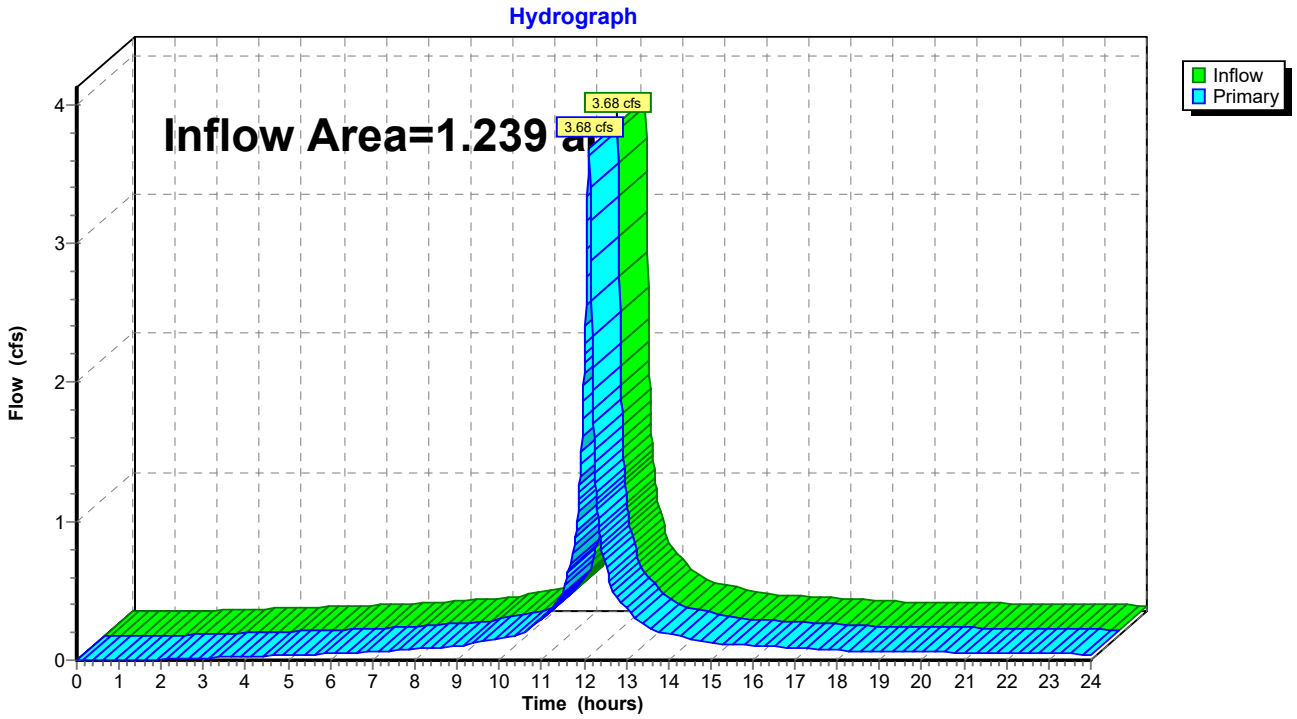


Summary for Link 12L: (new Link)

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

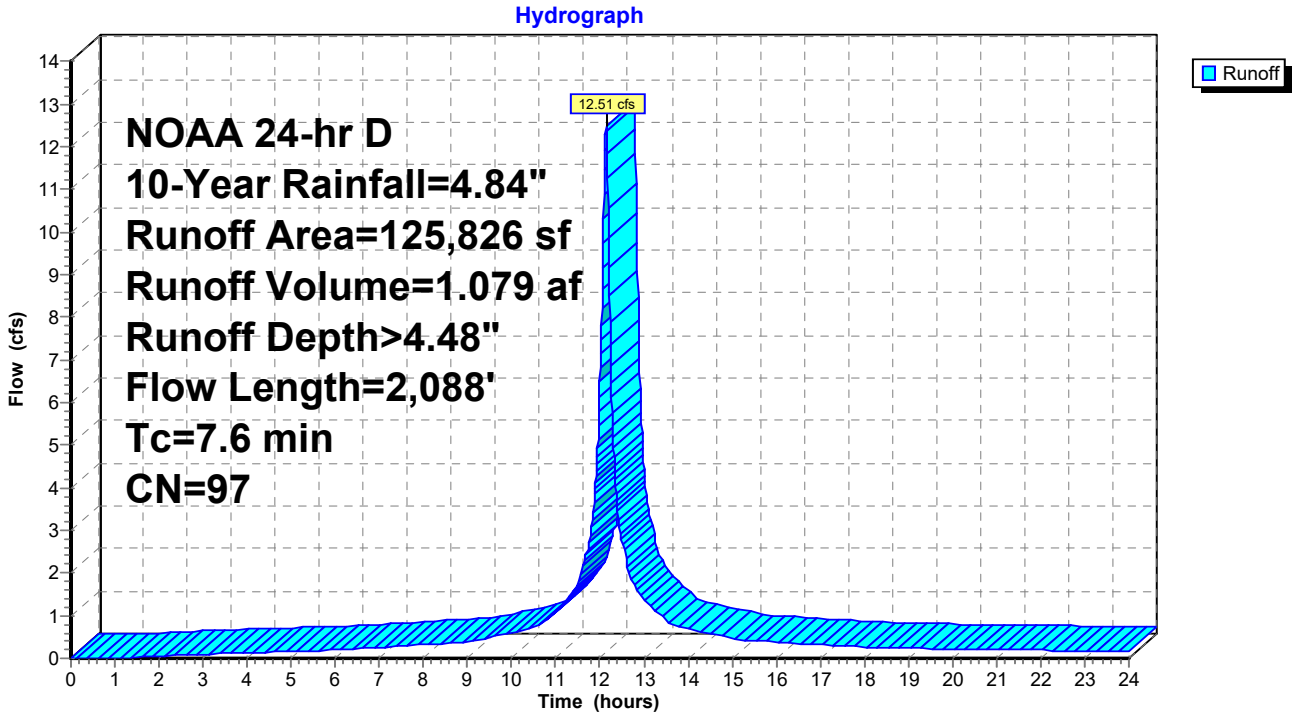
Runoff = 12.51 cfs @ 12.15 hrs, Volume= 1.079 af, Depth> 4.48"

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

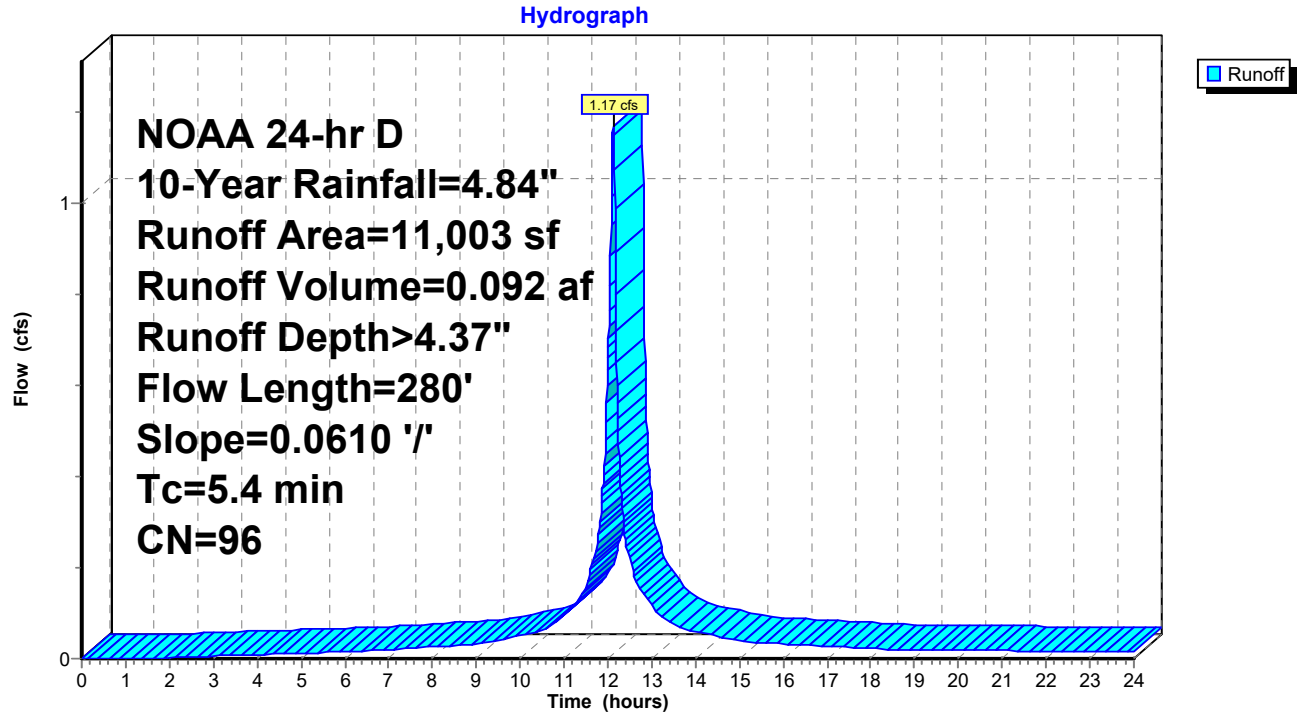
Runoff = 1.17 cfs @ 12.12 hrs, Volume= 0.092 af, Depth> 4.37"

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

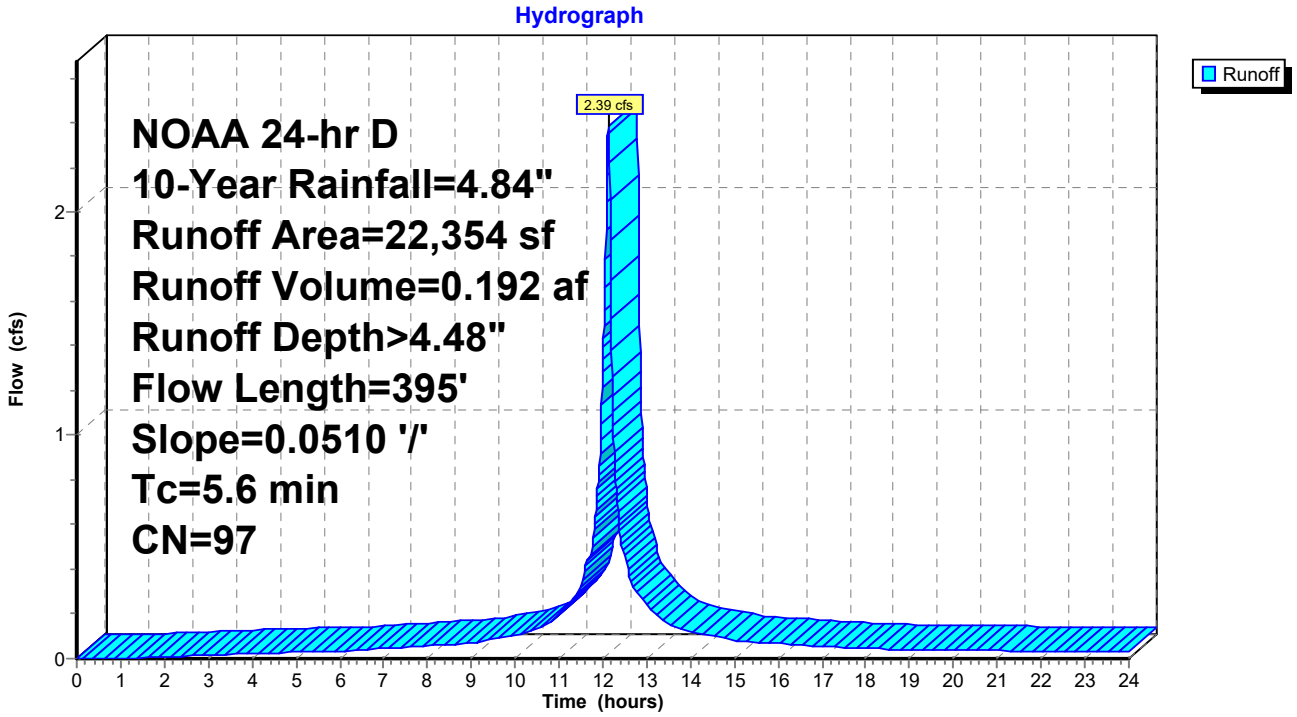
Runoff = 2.39 cfs @ 12.13 hrs, Volume= 0.192 af, Depth> 4.48"

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

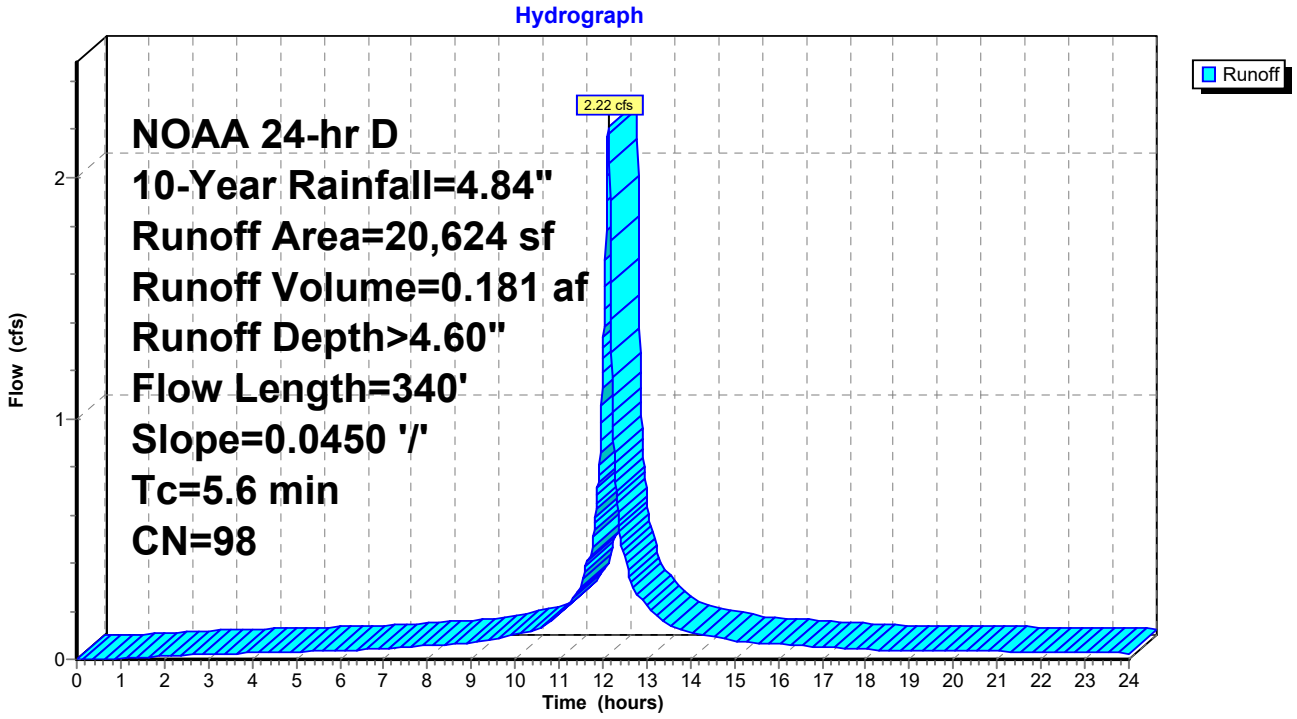
Runoff = 2.22 cfs @ 12.13 hrs, Volume= 0.181 af, Depth> 4.60"

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

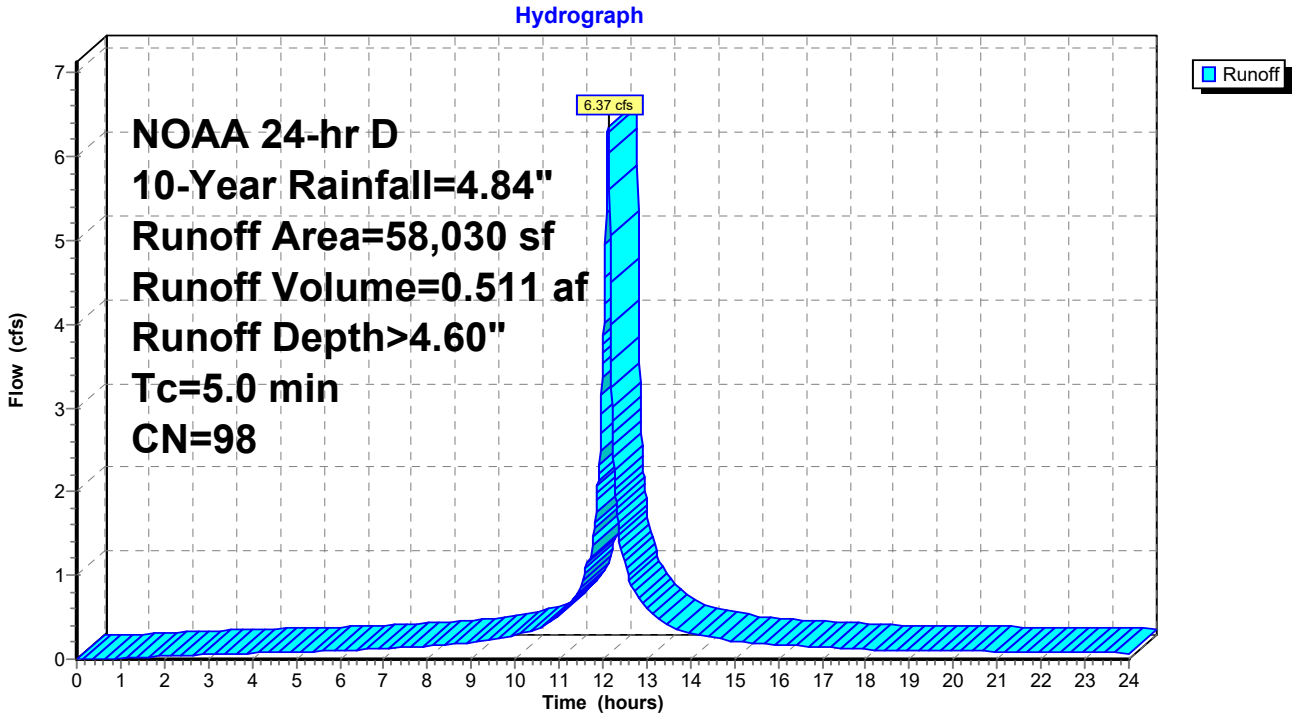
Runoff = 6.37 cfs @ 12.12 hrs, Volume= 0.511 af, Depth> 4.60"

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

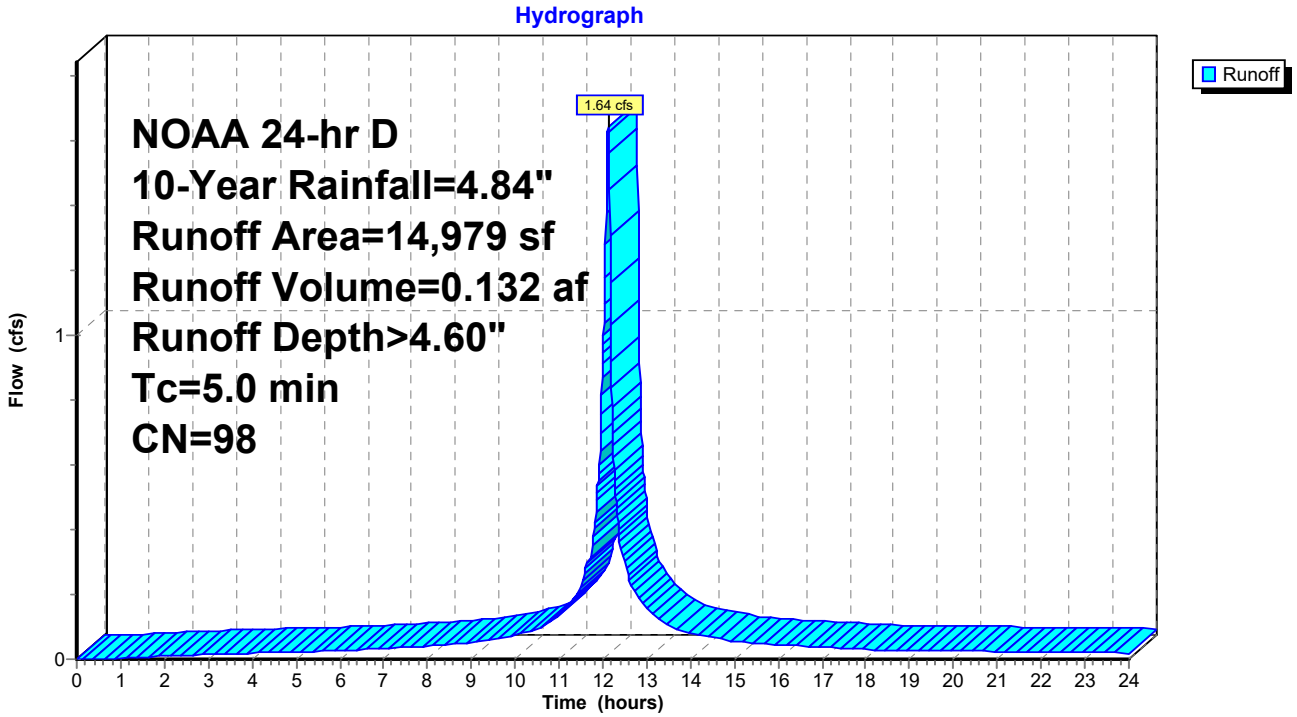
Runoff = 1.64 cfs @ 12.12 hrs, Volume= 0.132 af, Depth> 4.60"

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

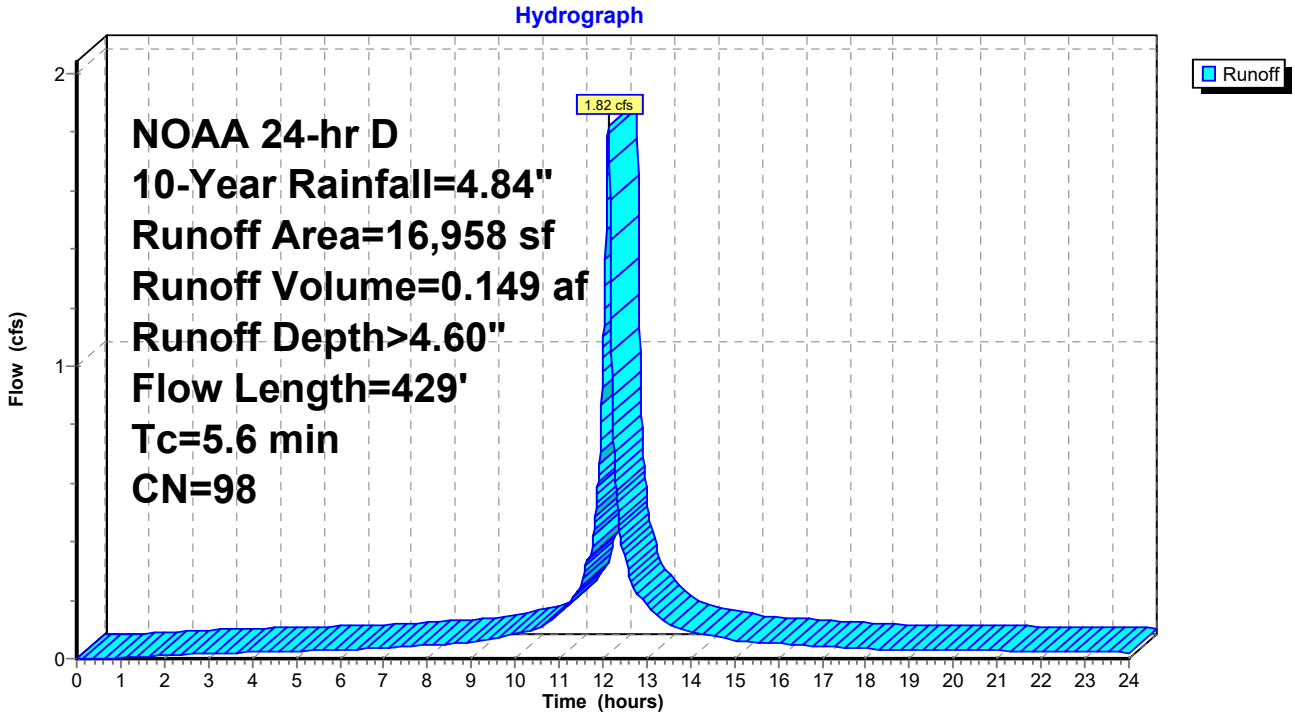
Runoff = 1.82 cfs @ 12.13 hrs, Volume= 0.149 af, Depth> 4.60"

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

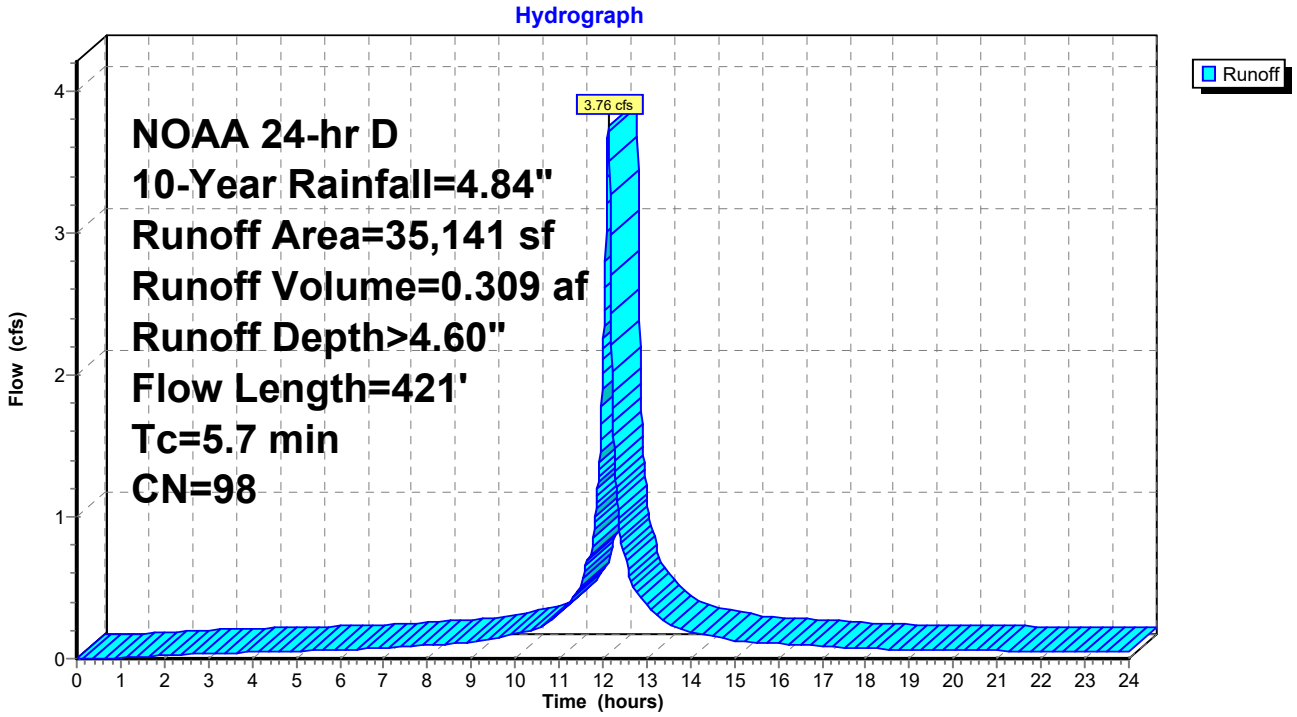
Runoff = 3.76 cfs @ 12.13 hrs, Volume= 0.309 af, Depth> 4.60"

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

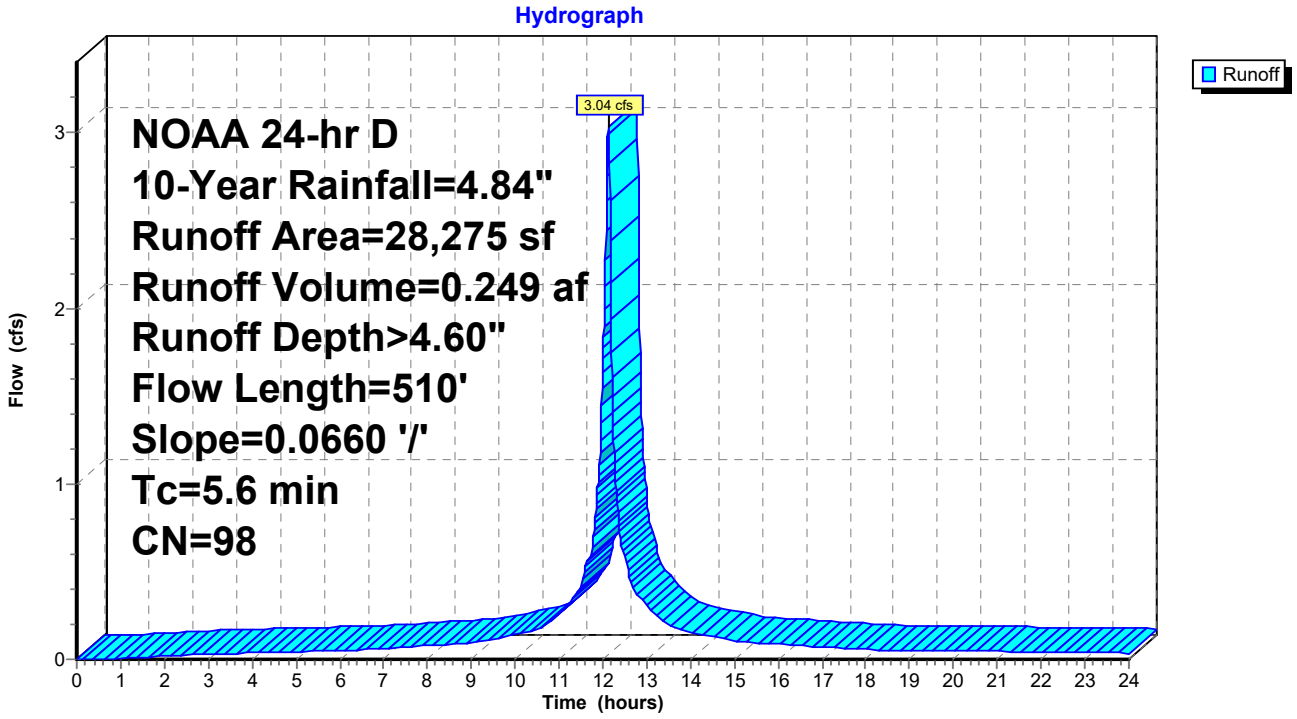
Runoff = 3.04 cfs @ 12.13 hrs, Volume= 0.249 af, Depth> 4.60"

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

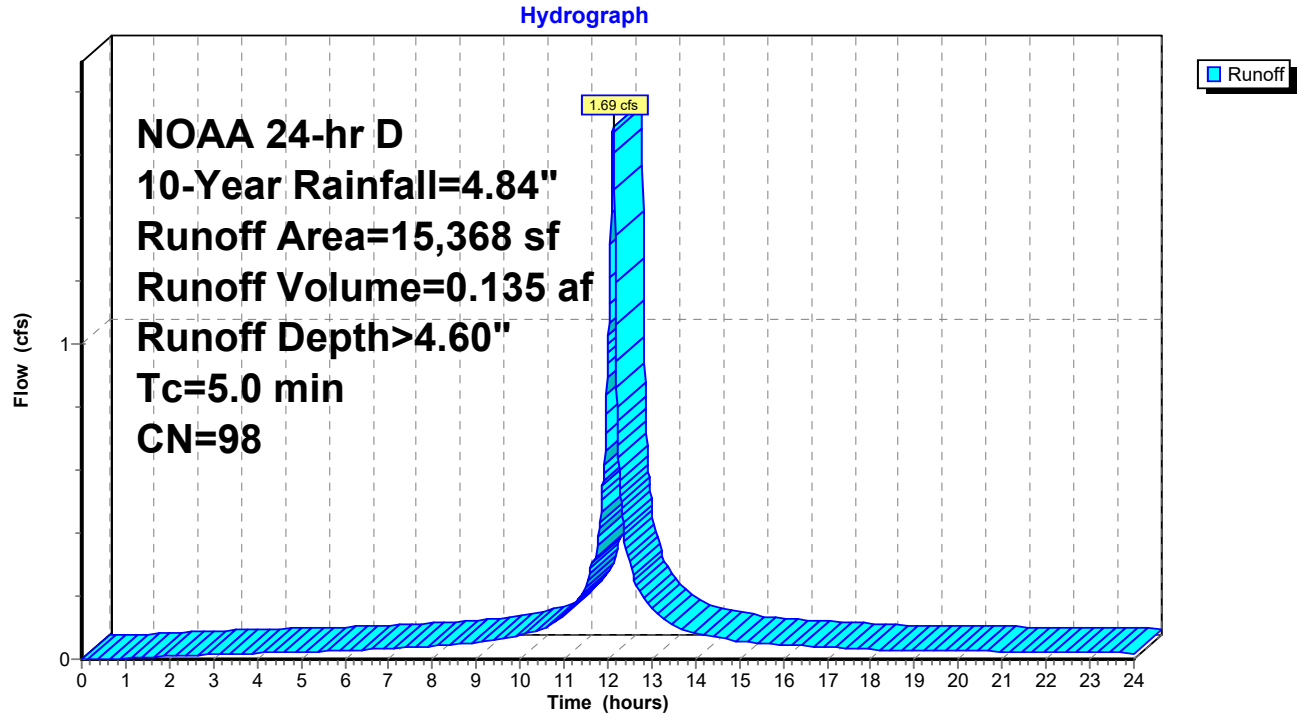
Runoff = 1.69 cfs @ 12.12 hrs, Volume= 0.135 af, Depth> 4.60"

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

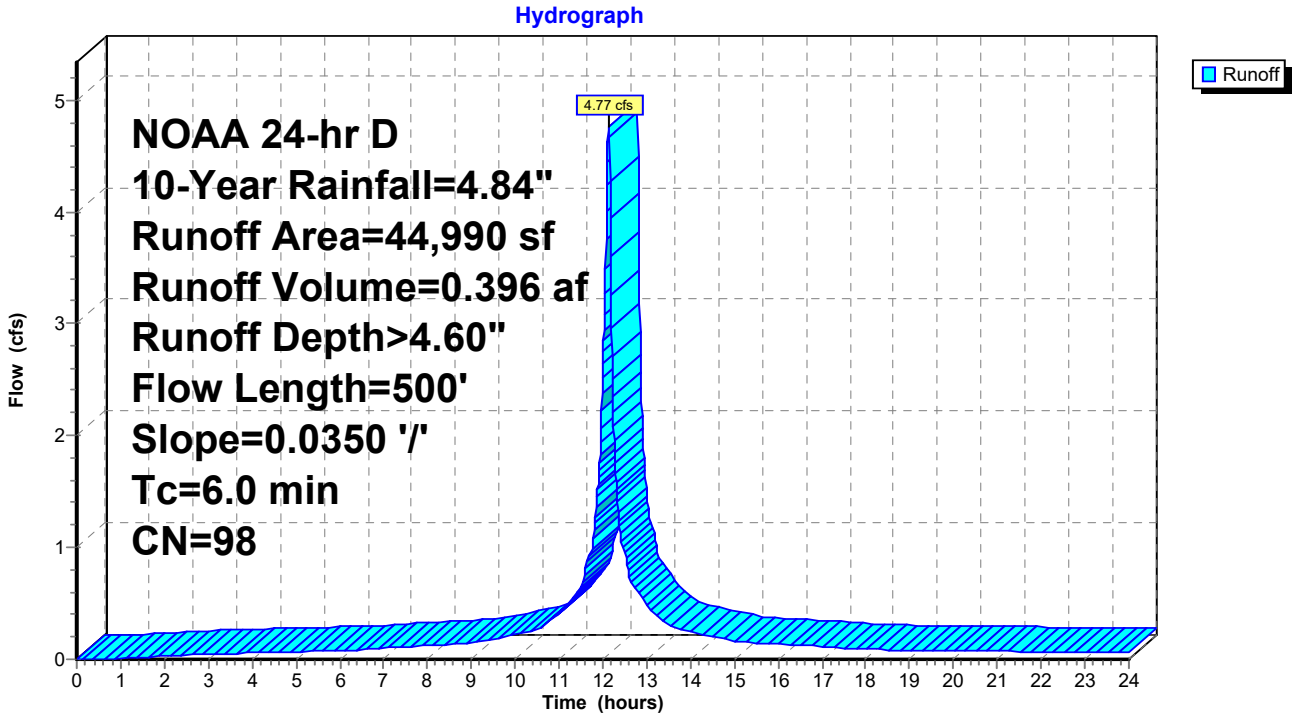
Runoff = 4.77 cfs @ 12.13 hrs, Volume= 0.396 af, Depth> 4.60"

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

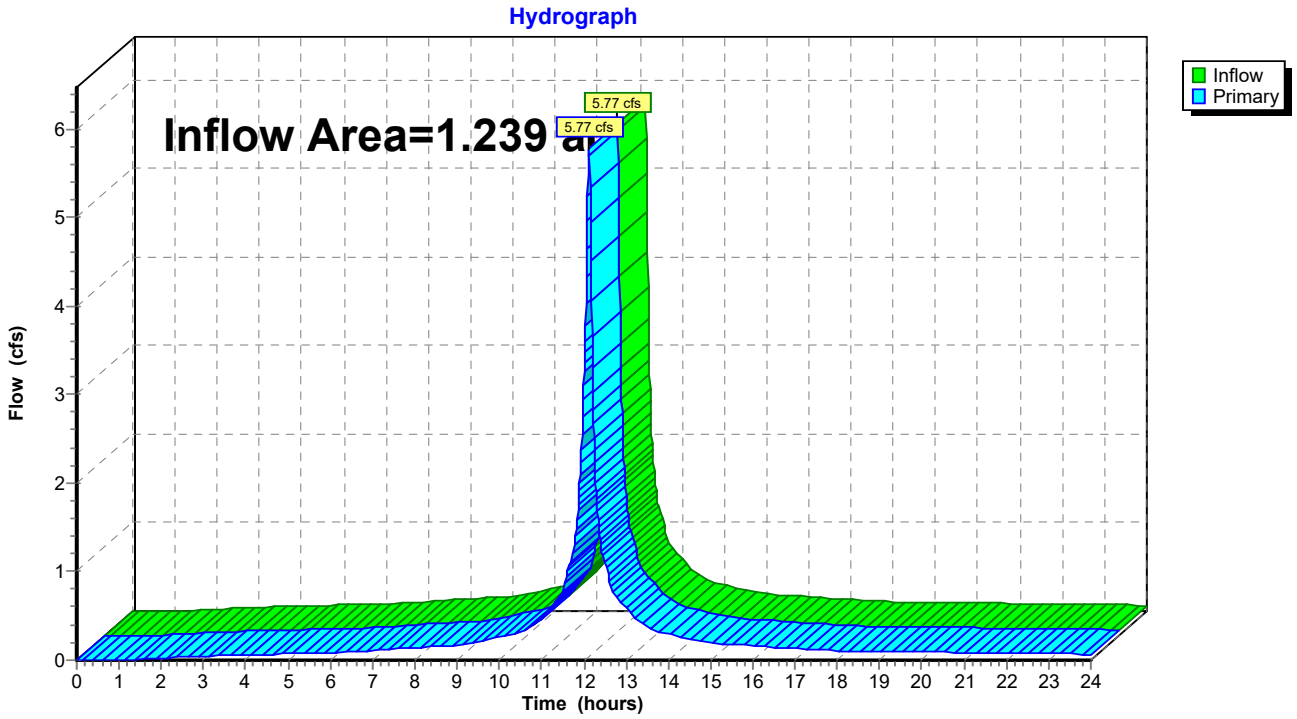


Summary for Link 12L: (new Link)

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

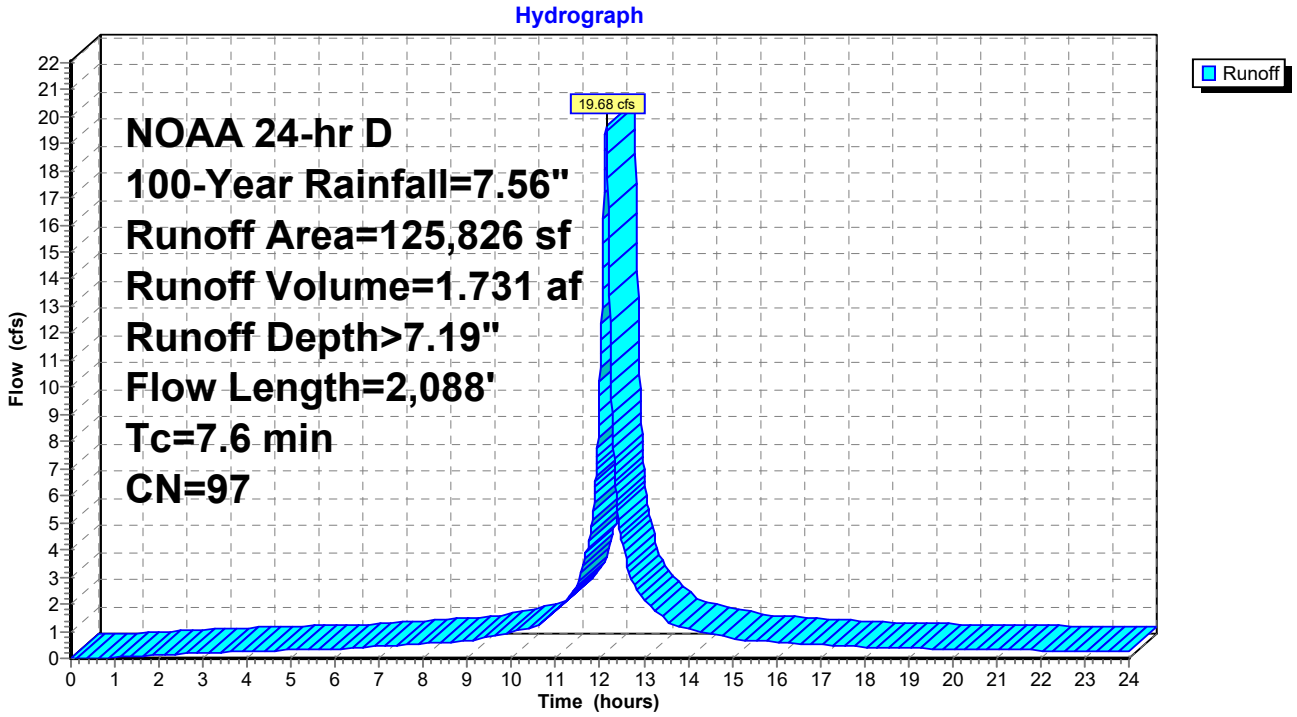
Runoff = 19.68 cfs @ 12.15 hrs, Volume= 1.731 af, Depth> 7.19"

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

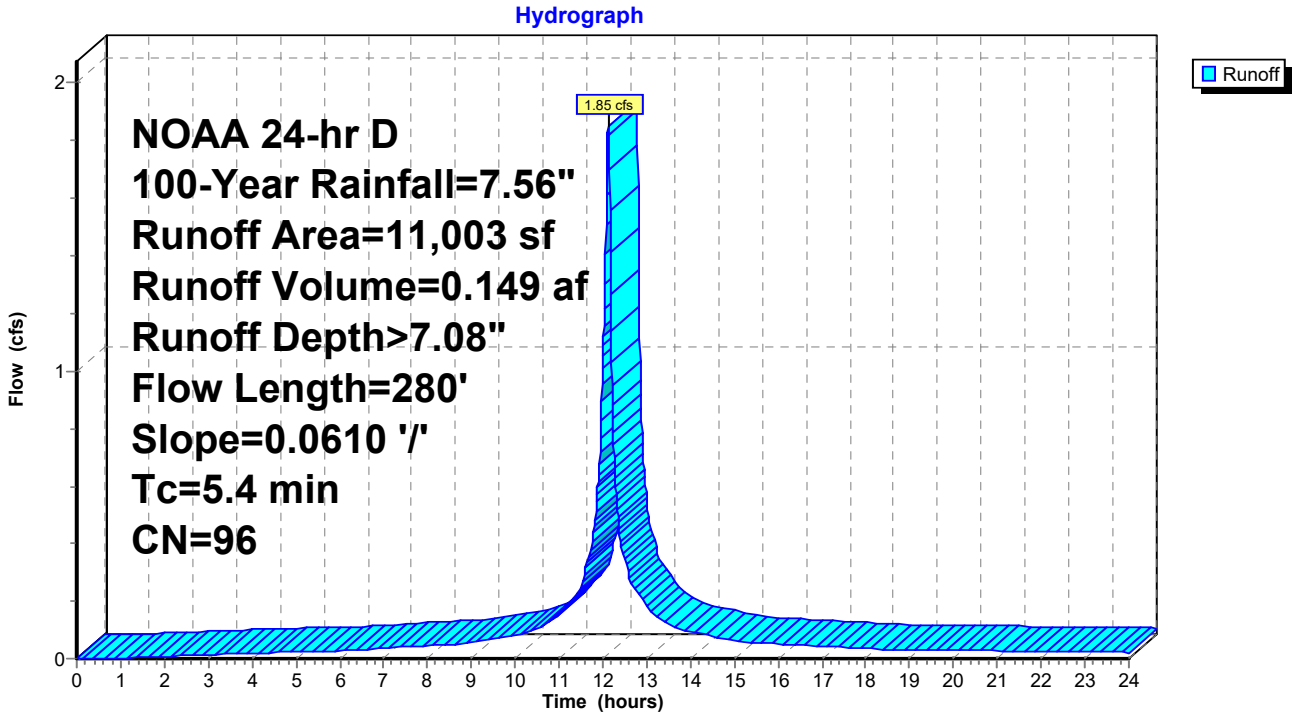
Runoff = 1.85 cfs @ 12.12 hrs, Volume= 0.149 af, Depth> 7.08"

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

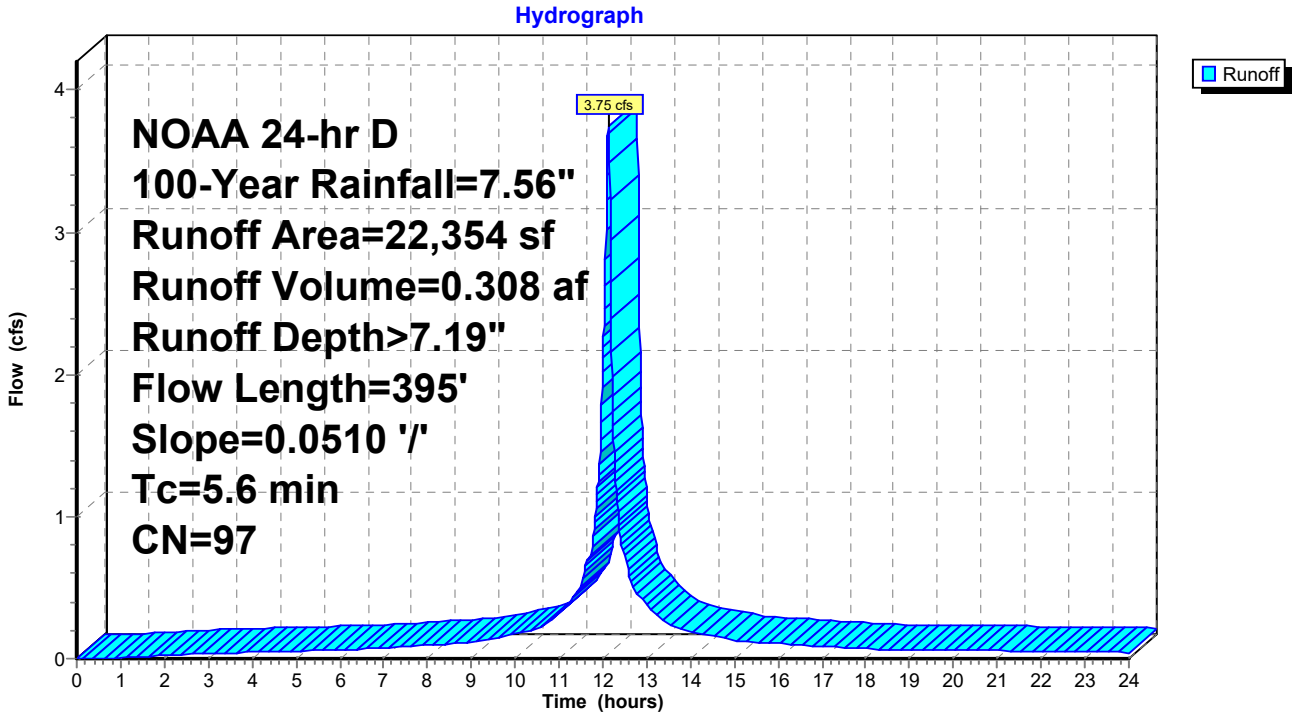
Runoff = 3.75 cfs @ 12.13 hrs, Volume= 0.308 af, Depth> 7.19"

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

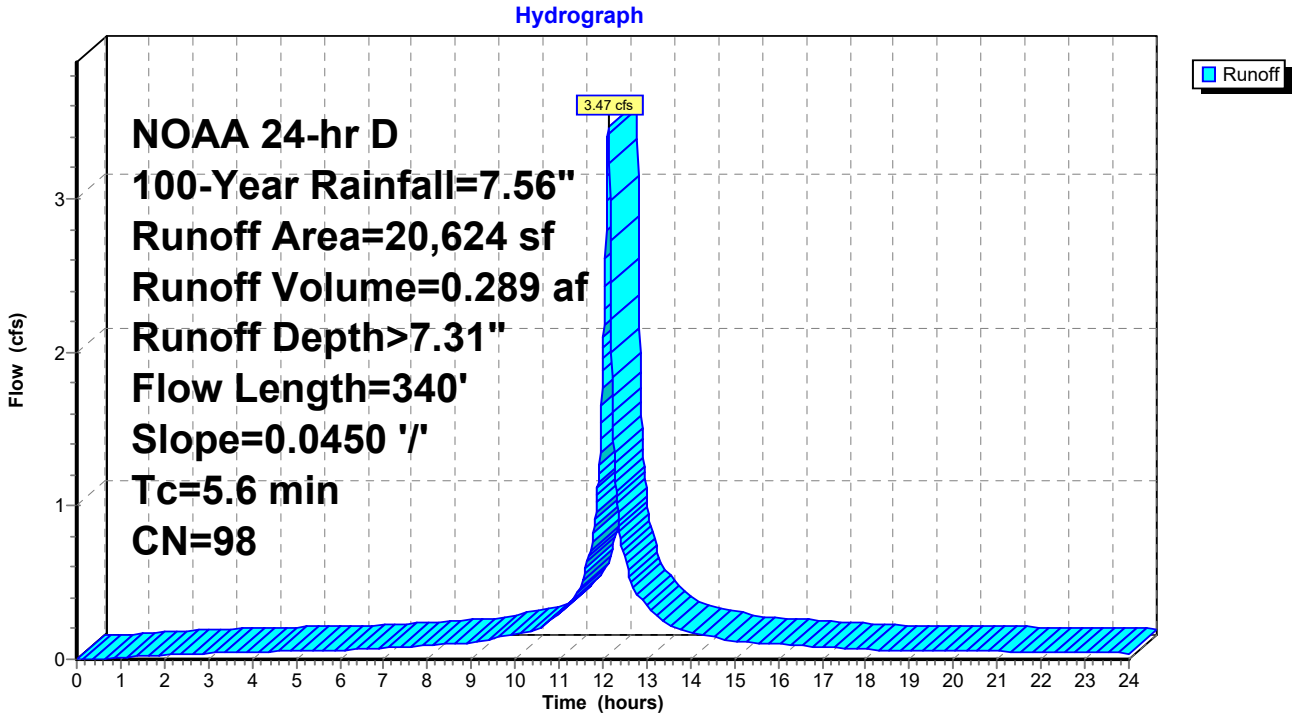
Runoff = 3.47 cfs @ 12.13 hrs, Volume= 0.289 af, Depth> 7.31"

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

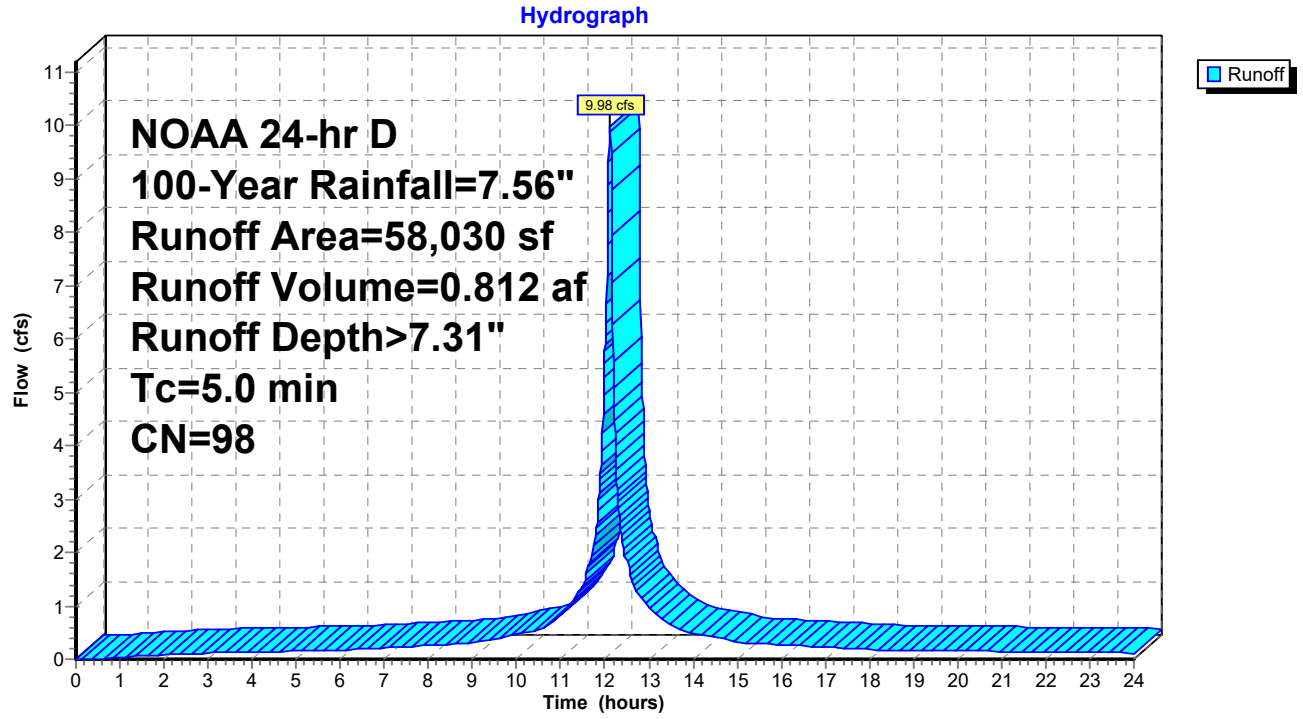
Runoff = 9.98 cfs @ 12.12 hrs, Volume= 0.812 af, Depth> 7.31"

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

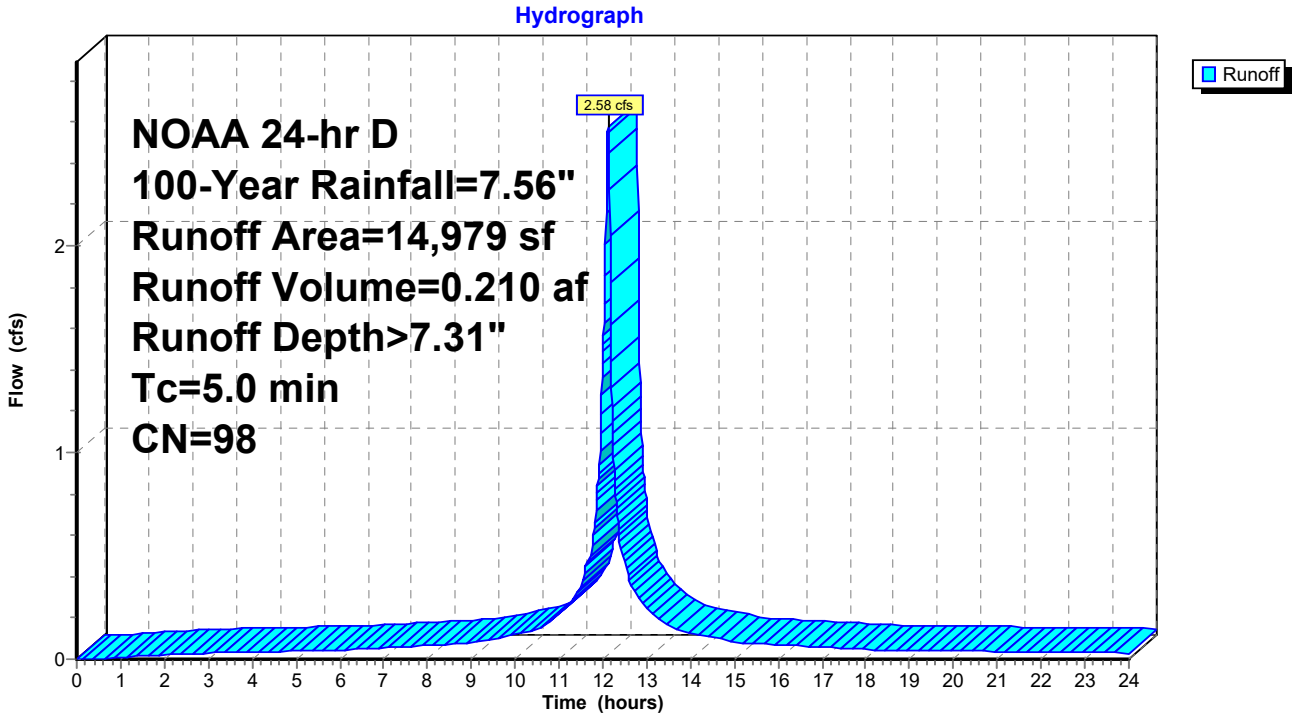
Runoff = 2.58 cfs @ 12.12 hrs, Volume= 0.210 af, Depth> 7.31"

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

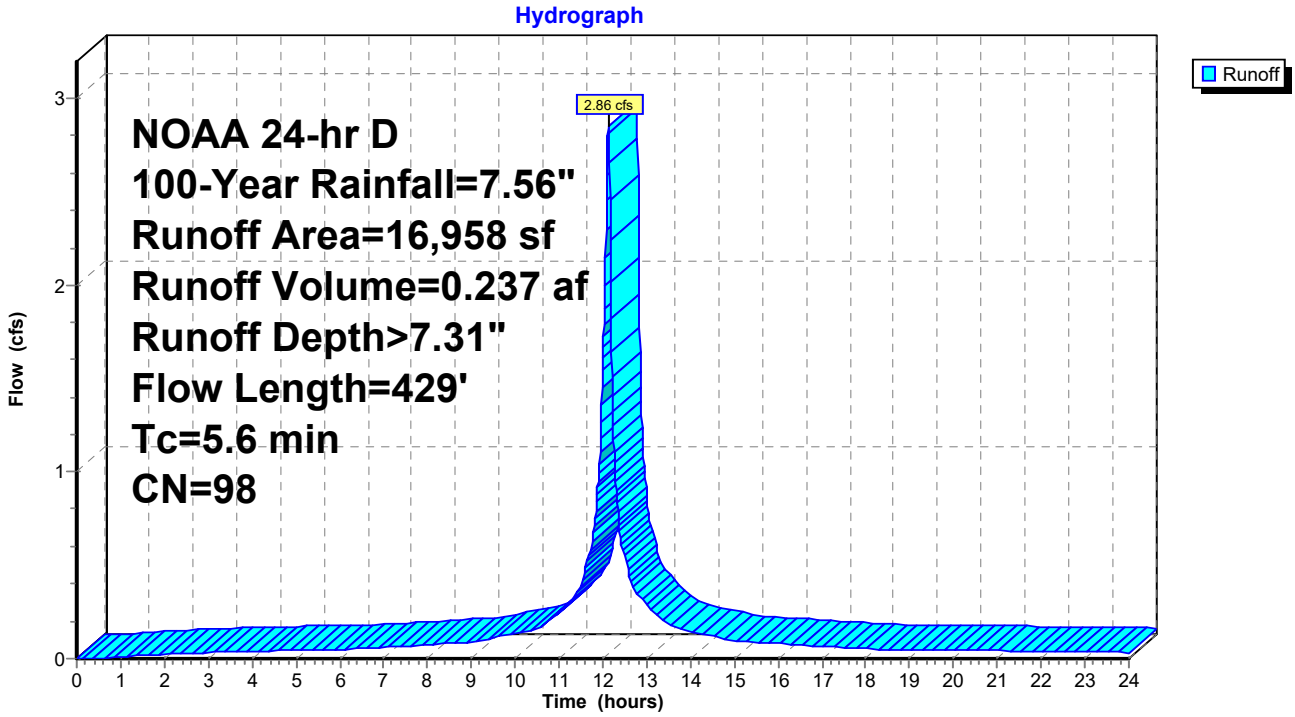
Runoff = 2.86 cfs @ 12.13 hrs, Volume= 0.237 af, Depth> 7.31"

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

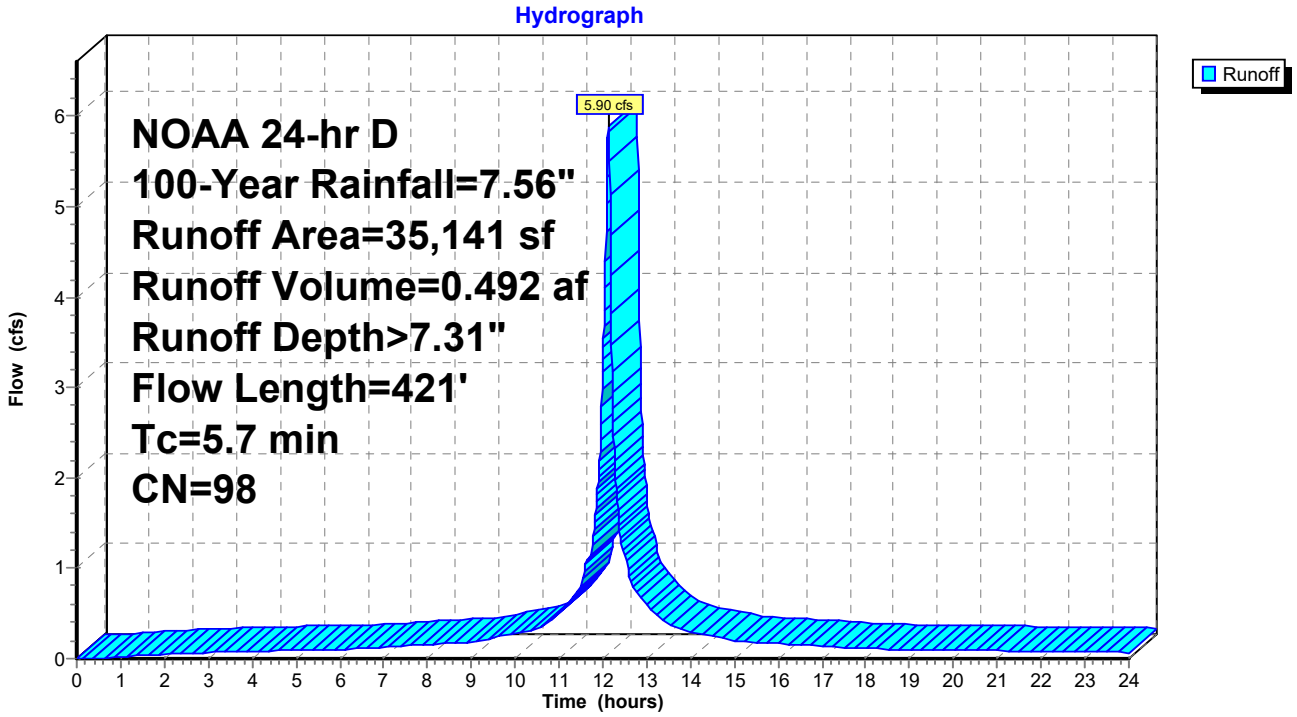
Runoff = 5.90 cfs @ 12.13 hrs, Volume= 0.492 af, Depth> 7.31"

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

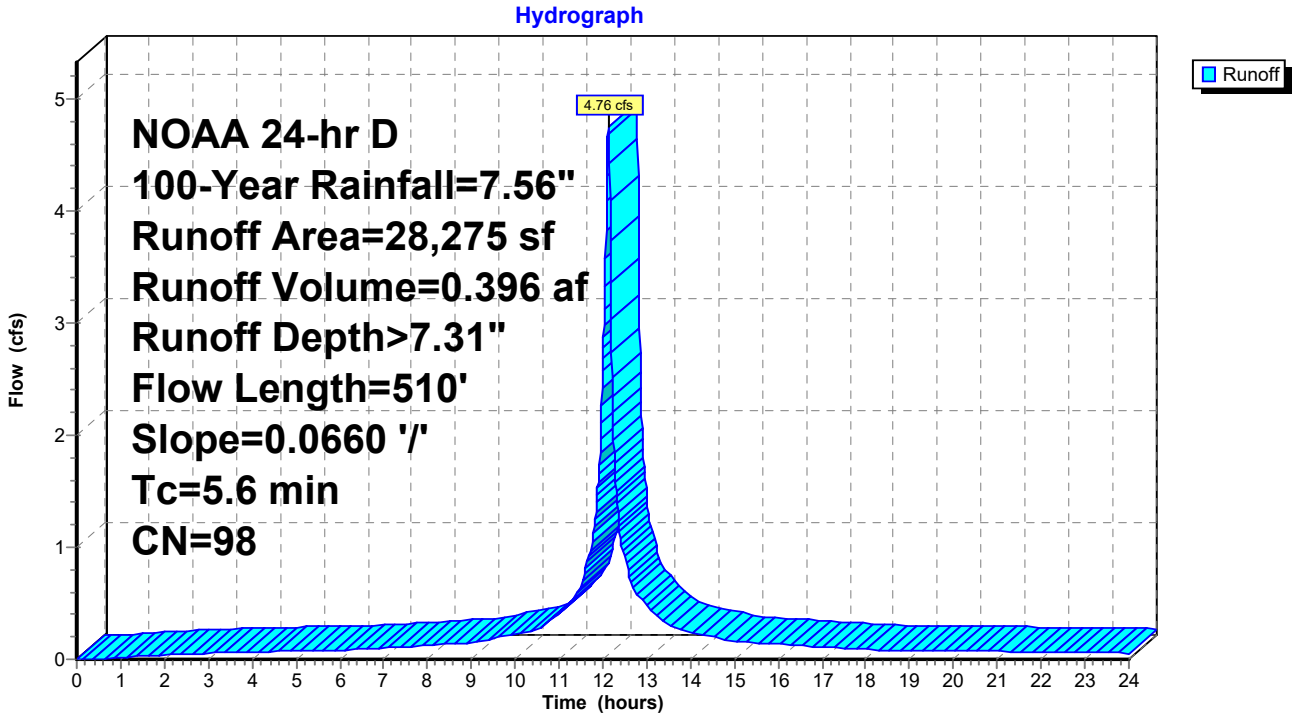
Runoff = 4.76 cfs @ 12.13 hrs, Volume= 0.396 af, Depth> 7.31"

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

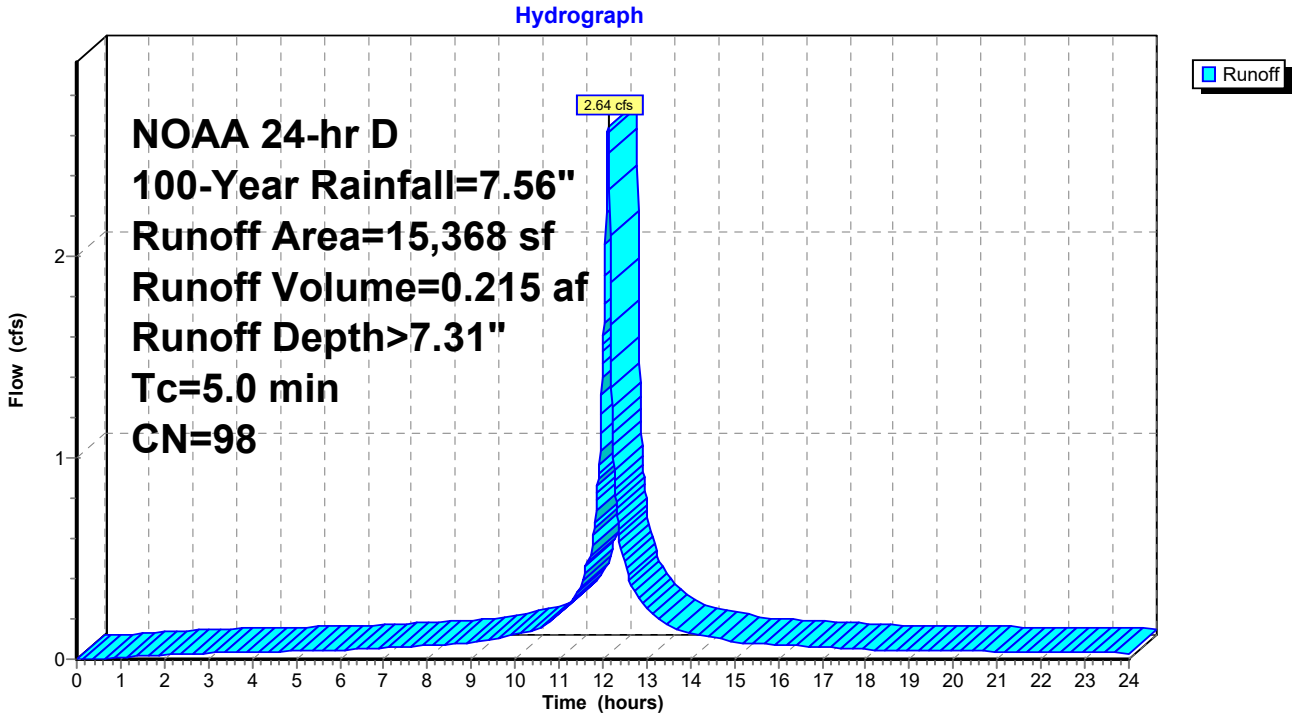
Runoff = 2.64 cfs @ 12.12 hrs, Volume= 0.215 af, Depth> 7.31"

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

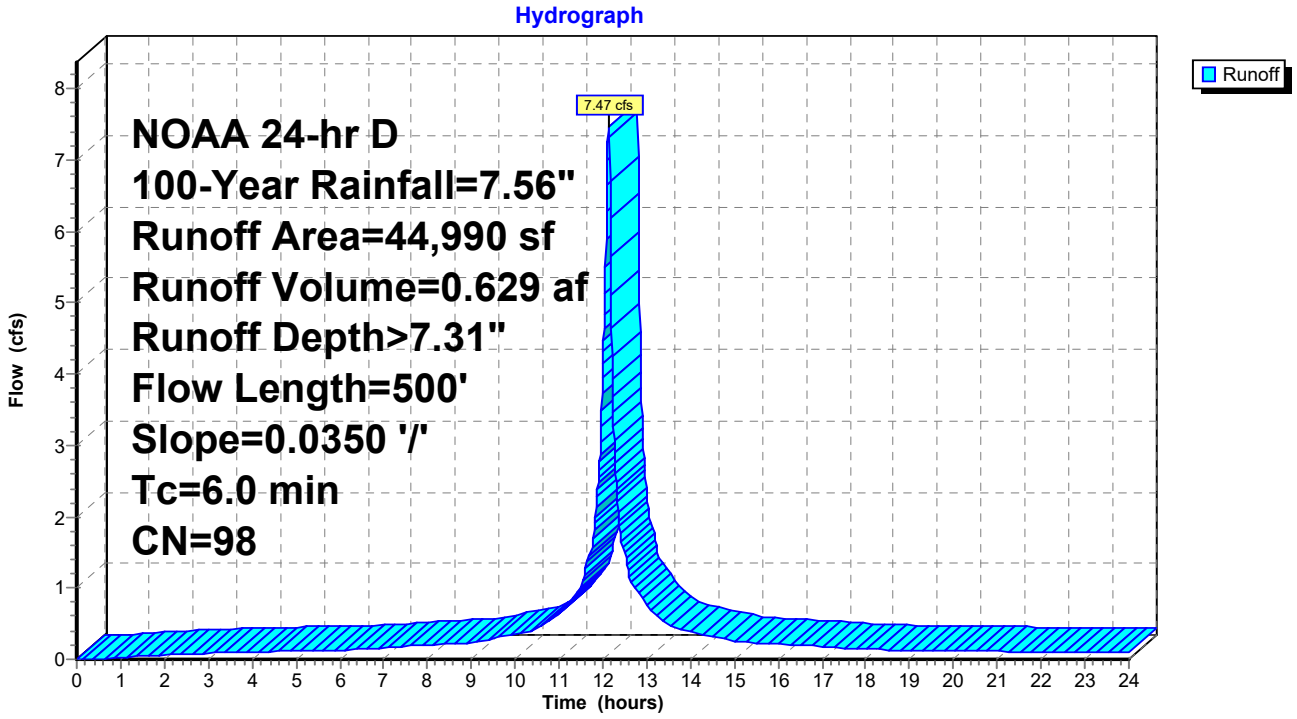
Runoff = 7.47 cfs @ 12.13 hrs, Volume= 0.629 af, Depth> 7.31"

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

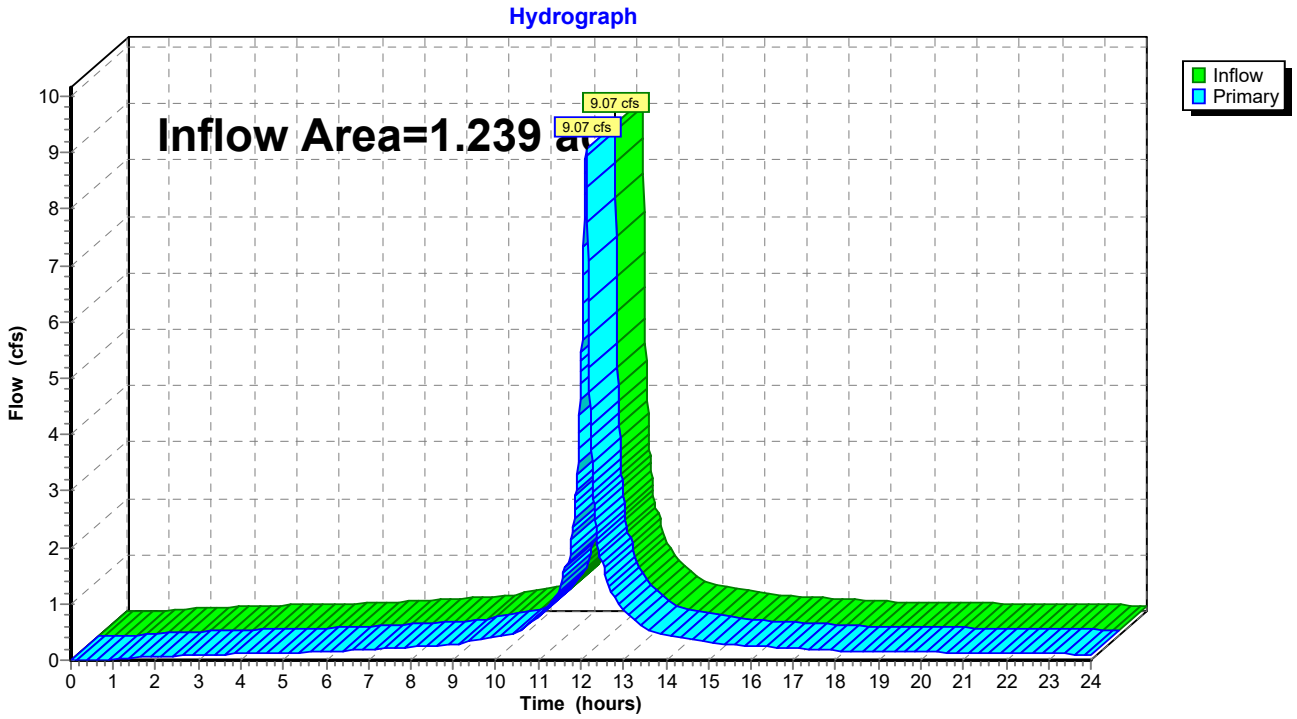


Summary for Link 12L: (new Link)

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

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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

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A00862 - 351

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 F&G MUNICIPAL STANDARD OR MASSDOT CASCADE TYPE.

PROP F&G MUNICIPAL STANDARD OR MASSDOT CASCADE TYPE.

Limited width between back of sidewalk and SHLO

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

INV=930.70

5 LF OF 12" RCP @ 2%

PROP CB WITH DEEP SUMP

LIMIT OF WORK

R&S EX F&G-4

R&S EX F&G-3

PLEASANT STREET
(ROUTE 122)

SUNNYVIEW HEIGHTS
(PUBLIC - 50' WIDE)

SUNNY HILL DRIVE
(PUBLIC - 50' WIDE)

Continued on Sheet 2

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
MAXWELL KOFI OWUSU
AND VIVIAN ASANTE
PARCEL ID 47–16–BB
BOOK 68045 PAGE 106
38 SUNNYHILL DR

N/F
ALYSSA MONIQUE PRICE
AND CHARLENE ANN PRICE
PARCEL ID 47–16–AA
BOOK 62057 PAGE 76
40 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
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'

CB 10120
RIM=946.42'
INV.(A)=944.52'
T.O.S=940.02'
T.O.W=943.82'
SUMP=938.82'

DMH 10121
RIM=944.65'
INV.(A)=938.25'
INV.(B)=940.74'
INV.(C)=938.83'
INV.(D)=940.98'
SUMP=938.40'

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=925.92'

CB 10004
RIM=937.93'
INV.(A)=934.93'
T.O.S=931.43'
T.O.W=934.73'
SUMP=930.43'

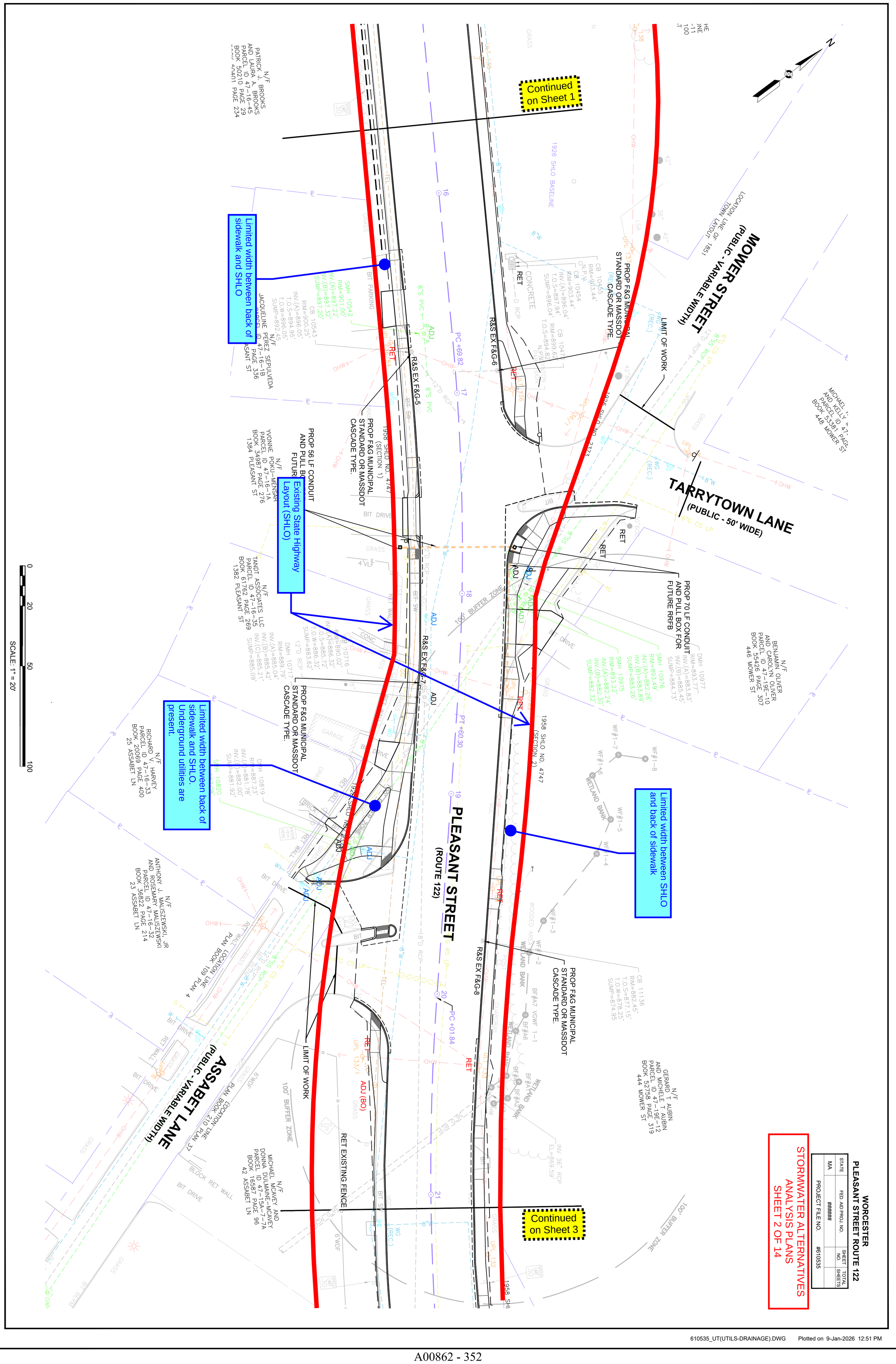
DMH 10005
RIM=938.59'
INV.(A)=932.60'
INV.(B)=933.67'
SUMP=933.11'

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'

1926 SHLO NO. 2373'
1926 SHLO BASELINE
1958 SHLO NO. 4747
1958 SHLO NO. 4747 (SECTION 1)

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
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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)

Area between SHLO and edge of roadway has overhead and underground utilities

Steep topography limits locations for potential SCMs and LIDs

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)

Continued on Sheet 2

Continued on Sheet 4

PROP RRFB, PULLBOX AND 11 LF CONDUIT

PROP RRFB, PULLBOX, AND 59 FT CONDUIT

PROP F&G MUNICIPAL STANDARD OR MASSDOT CASCADE TYPE.

R&S EX F&G-9

R&S EX F&G-10

R&S EX F&G-11

R&S EX F&G-12

R&R EX HYDRANT FOR MIN 4' CLEARANCE

LIMIT OF WORK

UTILITY NOTES

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'

1958 SHLO NO. 4747

1926 SHLO 2373

100' BUFFER ZONE

0 20 50

SCALE: 1" = 20'

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WORCESTER
PLEASANT STREET ROUTE 122

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
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	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

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 F&G MUNICIPAL STANDARD OR MASSDOT CASCADE TYPE.

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 28

1926 SHLO BASELINE

1958 SHLO NO. 4747

1855 SHLO NO. 4747

100' BUFFER ZONE

BORDERING VEGETATED WETLANDS

PT +00.78

PC +08.22

PCC +70.35

N/F RAMSY AZEEZ AND SARAH M. ISMAEL REVOCABLE 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

Continued on Sheet 3

Continued on Sheet 5

0 20 50 100

SCALE: 1" = 20'

FOR CONSTRUCTION PROFILE:
SEE SHEET NO. 40

WORCESTER
PLEASANT STREET ROUTE 122

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

STORMWATER ALTERNATIVES ANALYSIS PLANS
SHEET 5 OF 14

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N

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

Area between SHLO and edge of roadway has overhead and underground utilities

Continued on Sheet 4

Continued on Sheet 6

LONG VUE TERRACE (PRIVATE - 40' WIDE)

EDWIDGE STREET (PUBLIC - 40' WIDE)

PLEASANT STREET (ROUTE 122)

AIPORT DRIVE

LIMIT OF WORK

PROP 9 LF CONDUIT AND PULL BOX FOR FUTURE RRFB

PROP F&G MUNICIPAL STANDARD OR MASSDOT CASCADE TYPE.

PROP 82 LF CONDUIT AND PULL BOX FOR FUTURE RRFB

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

Analysis Point 2

Existing State Highway Layout (SHLO)

Existing wetlands resource area

Area between SHLO and edge of roadway has underground stormwater drainage

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

N/F EMMITT BRISBON PARCEL ID 40–36–10 BOOK 58125 PAGE 393 1313 PLEASANT ST

N/F ANDREW J. O'CONNOR PARCEL ID 40–36–11 BOOK 43253 PAGE 267 1311 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. CLA… PARCEL ID 47–… BOOK 14787 PAG… 12 MEADOW L…

1926 SHLO BASELINE

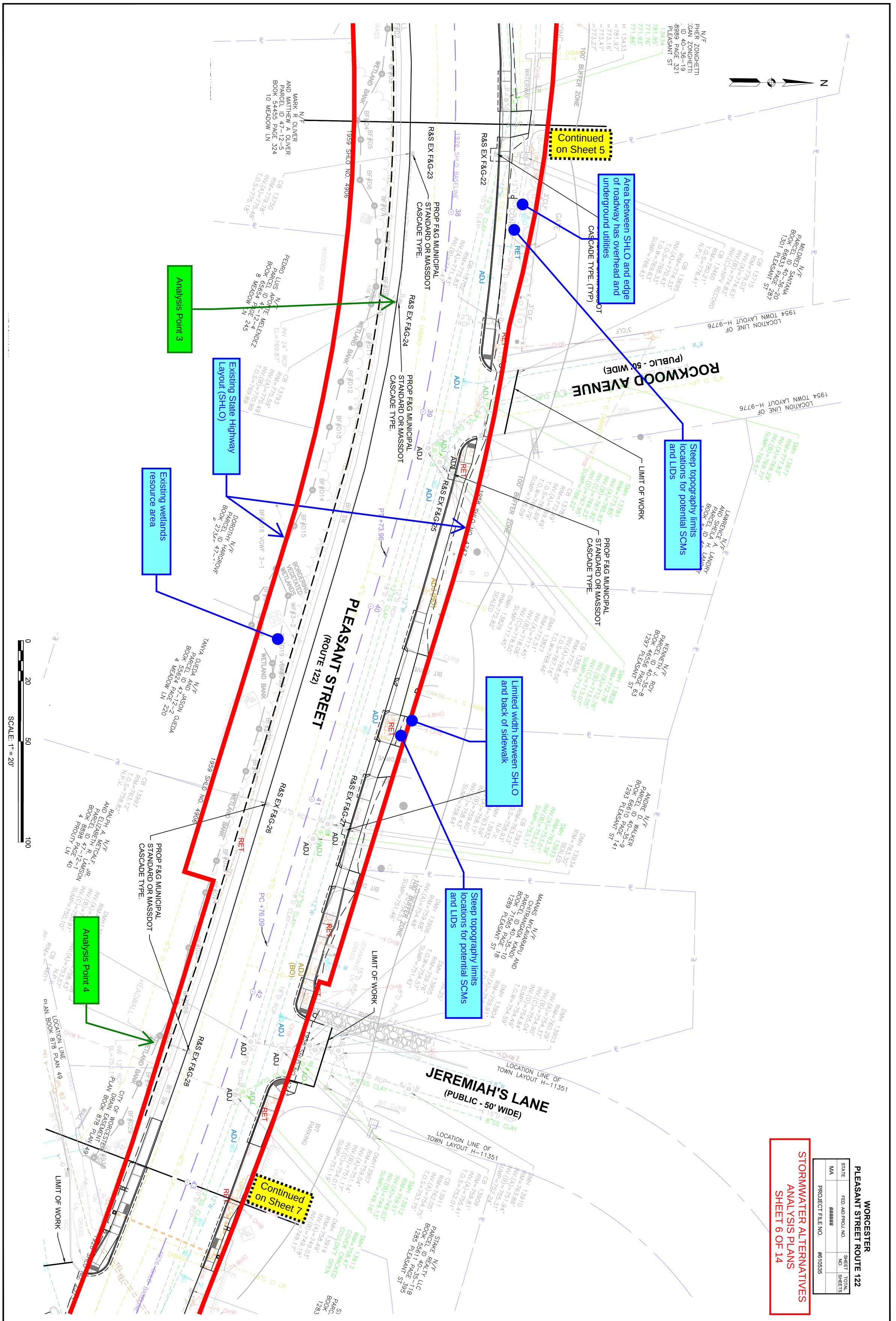
1926 SHLO NO. 2373

1959 SHLO NO. 4906

100' BUFFER ZONE

0 20 50 100

SCALE: 1" = 20'



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

A00862 - 357

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.

SHLO is adjacent to back of sidewalk

PROP F&G MUNICIPAL STANDARD OR MASSDOT CASCADE TYPE.

Continued on Sheet 6

Continued on Sheet 8

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

LIMIT OF WORK

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

Limited width between SHLO and back of sidewalk

PROP F&G MUNICIPAL STANDARD OR MASSDOT CASCADE TYPE.

Existing State Highway Layout (SHLO)

LIMIT OF WORK

BAXTER STREET
(PUBLIC - 50' WIDE)

PLEASANT STREET
(ROUTE 122)

PROUTY LANE
(PUBLIC - 49.5' WIDE)

JOPPA ROAD
(PUBLIC - 50' WIDE)

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

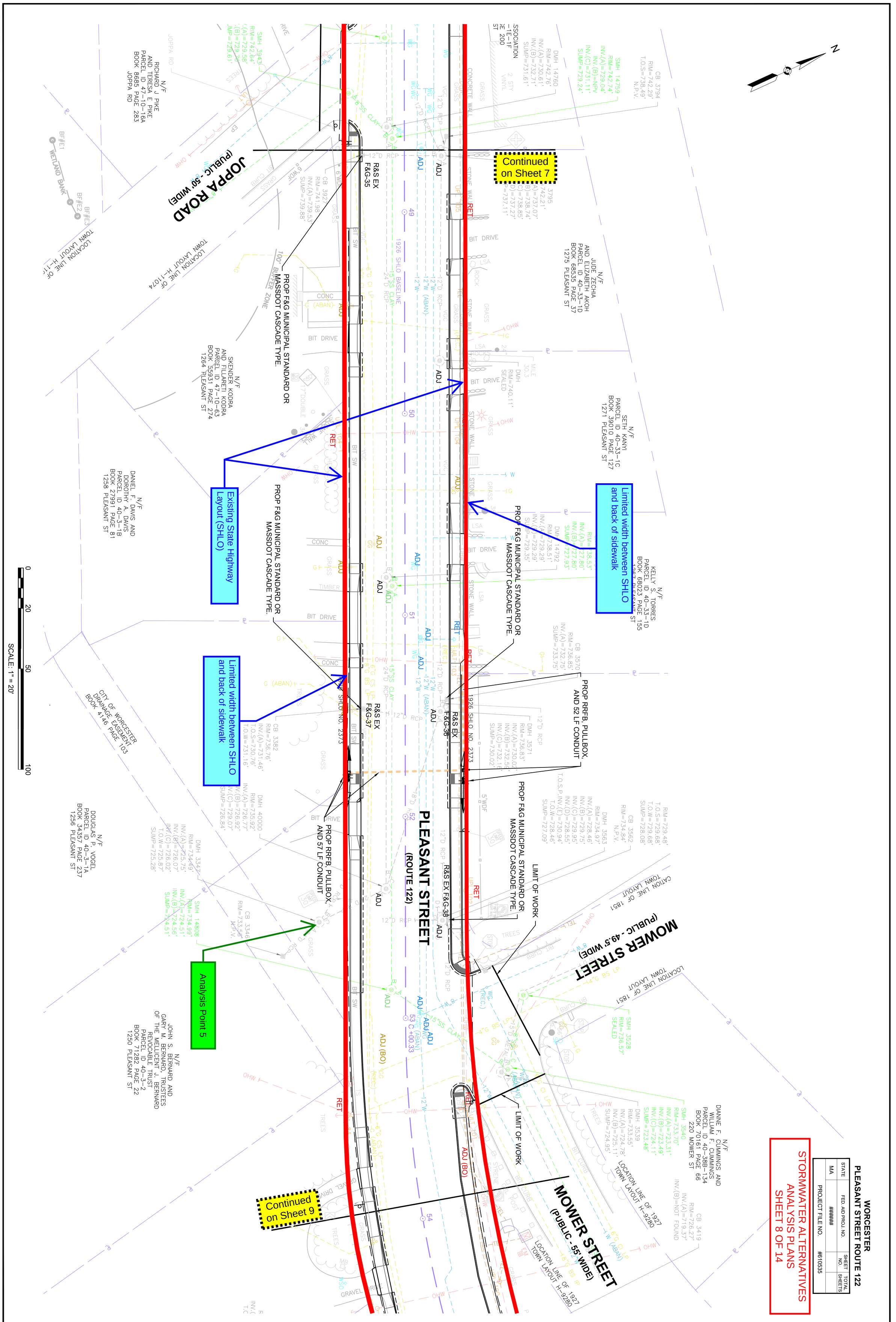
LOCATION LINE PLAN BOOK 878 PLAN 49

LOCATION LINE OF PLAN BOOK 468 PLAN 47

LOCATION LINE OF BOOK 21492 PAGE 247

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
Limited width between SHLO and back of sidewalk
Existing State Highway Layout (SHLO)
Limited width between SHLO and back of sidewalk
Analysis Point 5
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
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 NO. 2373
STONE WALL RET
CONCRETE WALL
BIT DRIVE
N/F RICHARD J PIKE AND TERESA E PIKE PARCEL ID 47-10-16A BOOK 8685 PAGE 283 JOPPA RD
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
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 DIANNE F. CUMMINGS AND WILLIAM F. CUMMINGS PARCEL ID 40-38B-134 BOOK 70161 PAGE 66 220 MOWER ST
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
CITY OF WORCESTER DRAINAGE EASEMENT BOOK 4146 PAGE 103
LOCATION LINE OF TOWN LAYOUT H-1174
LOCATION LINE OF TOWN LAYOUT H-1171
LOCATION LINE OF 1851 TOWN LAYOUT
LOCATION LINE OF 1927 TOWN LAYOUT H-9280
WETLAND BANK
BF#E1
BF#E2
BF#E3
100' BUFFER ZONE
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
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 9 OF 14

610535_UT(UTILS-DRAINAGE).DWG Plotted on 9-Jan-2026 12:54 PM

N

Existing State Highway Layout (SHLO)

Analysis Point 6

Limited width between SHLO and back of sidewalk

Limited width between SHLO and back of sidewalk

Continued on Sheet 8

Continued on Sheet 10

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)

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
JAMES W. CLAFLIN AND MARGARET M. CLAFLIN
PARCEL ID 40-31-6A
BOOK 22099 PAGE 266
1227 PLEASANT ST

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

PROP F&G MUNICIPAL STANDARD OR MASSDOT CASCADE TYPE.

PROP 6' SW GUY REM EX GUY (BO)

R&S EX F&G-42

R&S EX F&G-43

R&S EX F&G-40

R&S EX F&G-39

1926 SHLO NO. 2373

1926 SHLO BASELINE

PT +67.35

LIMIT OF WORK

LOCATION LINE OF 1927 TOWN LAYOUT H-9280

LOCATION LINE OF PLAN BOOK 810 PLAN 96

LOCATION LINE OF H-1178 TOWN LAYOUT

LOCATION LINE OF PLAN BOOK 227 PLAN 61

LOCATION LINE OF PLAN 727 PLAN 61

0 20 50 100

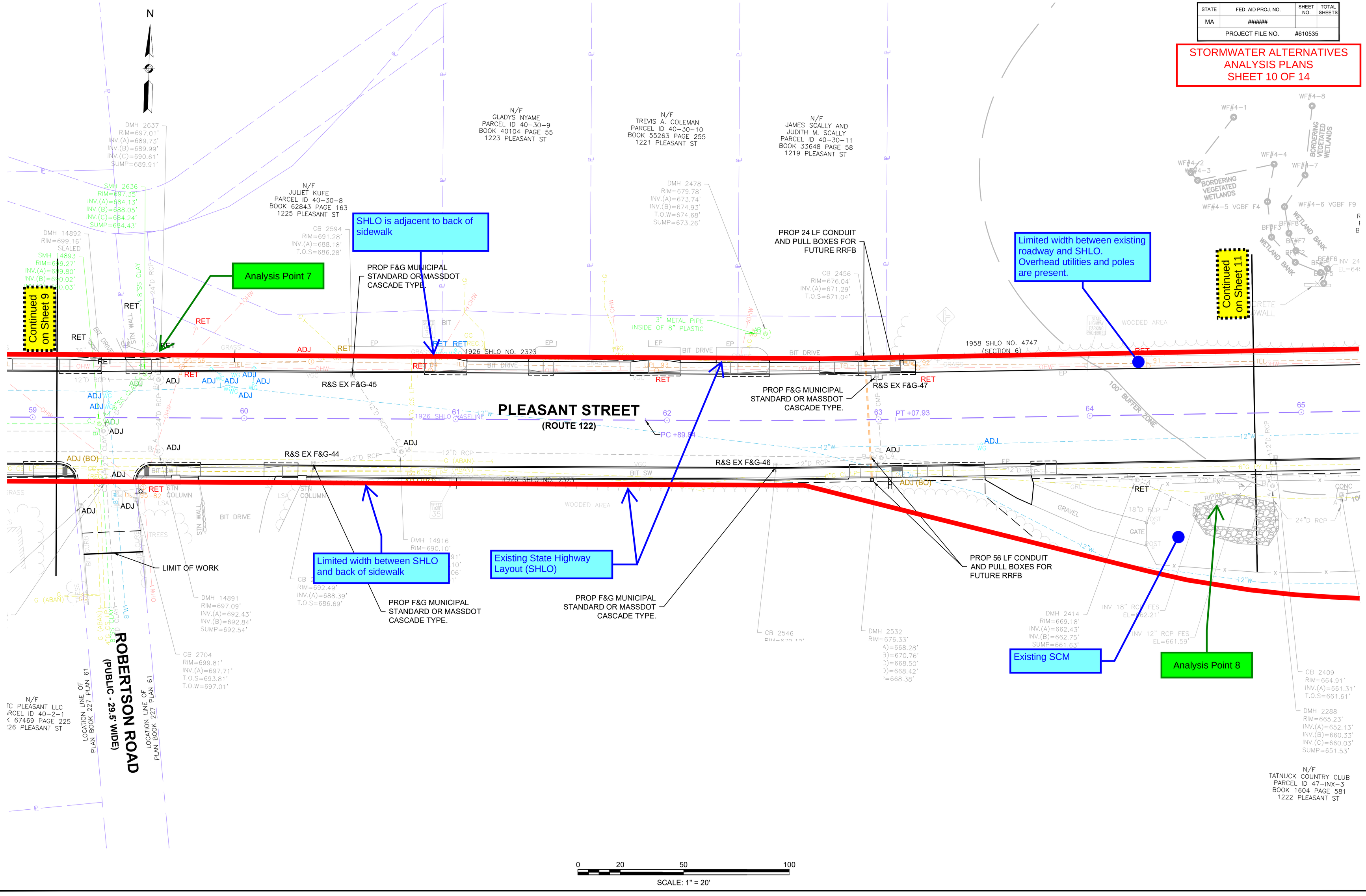
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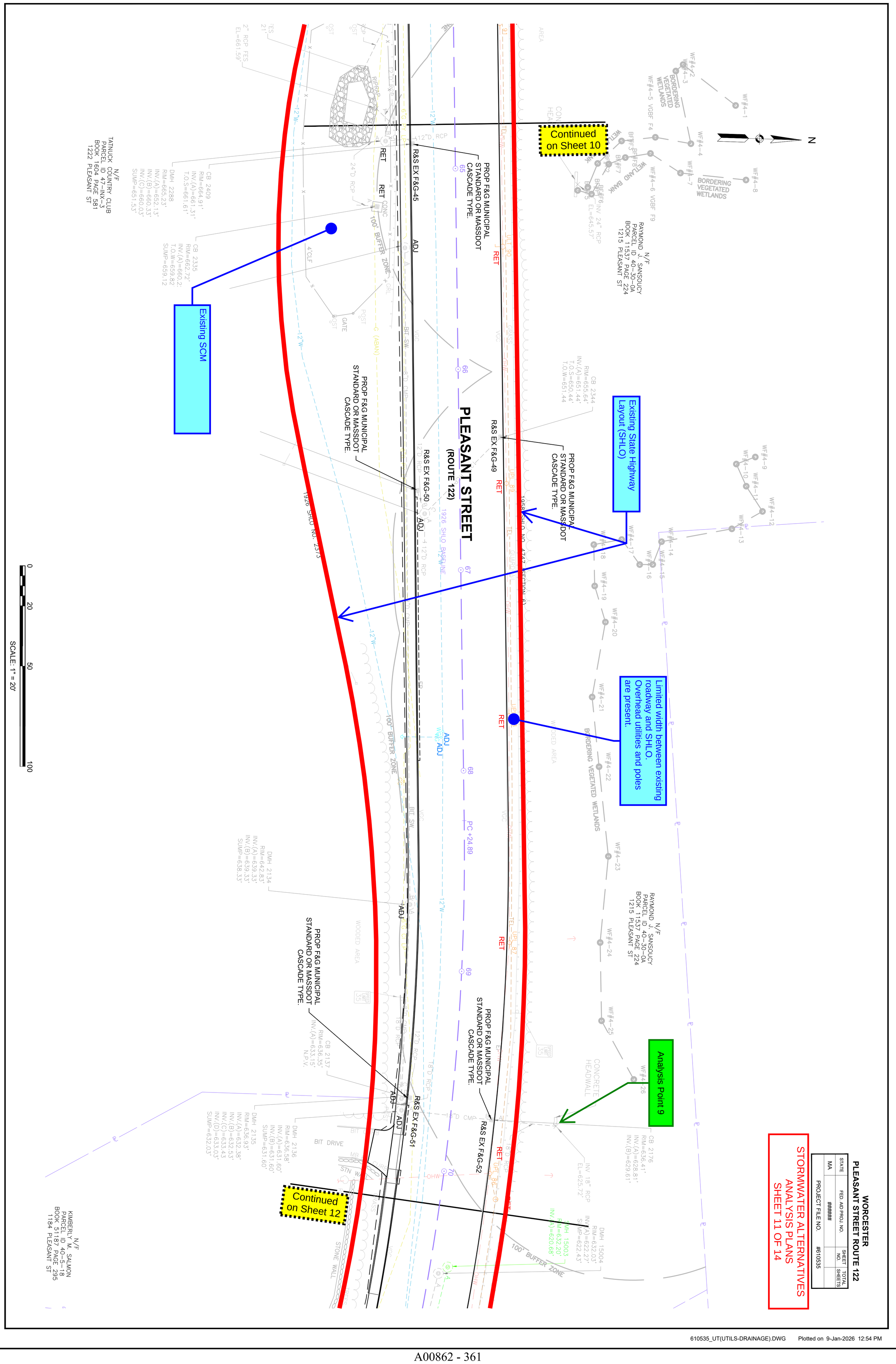
WORCESTER
PLEASANT STREET ROUTE 122

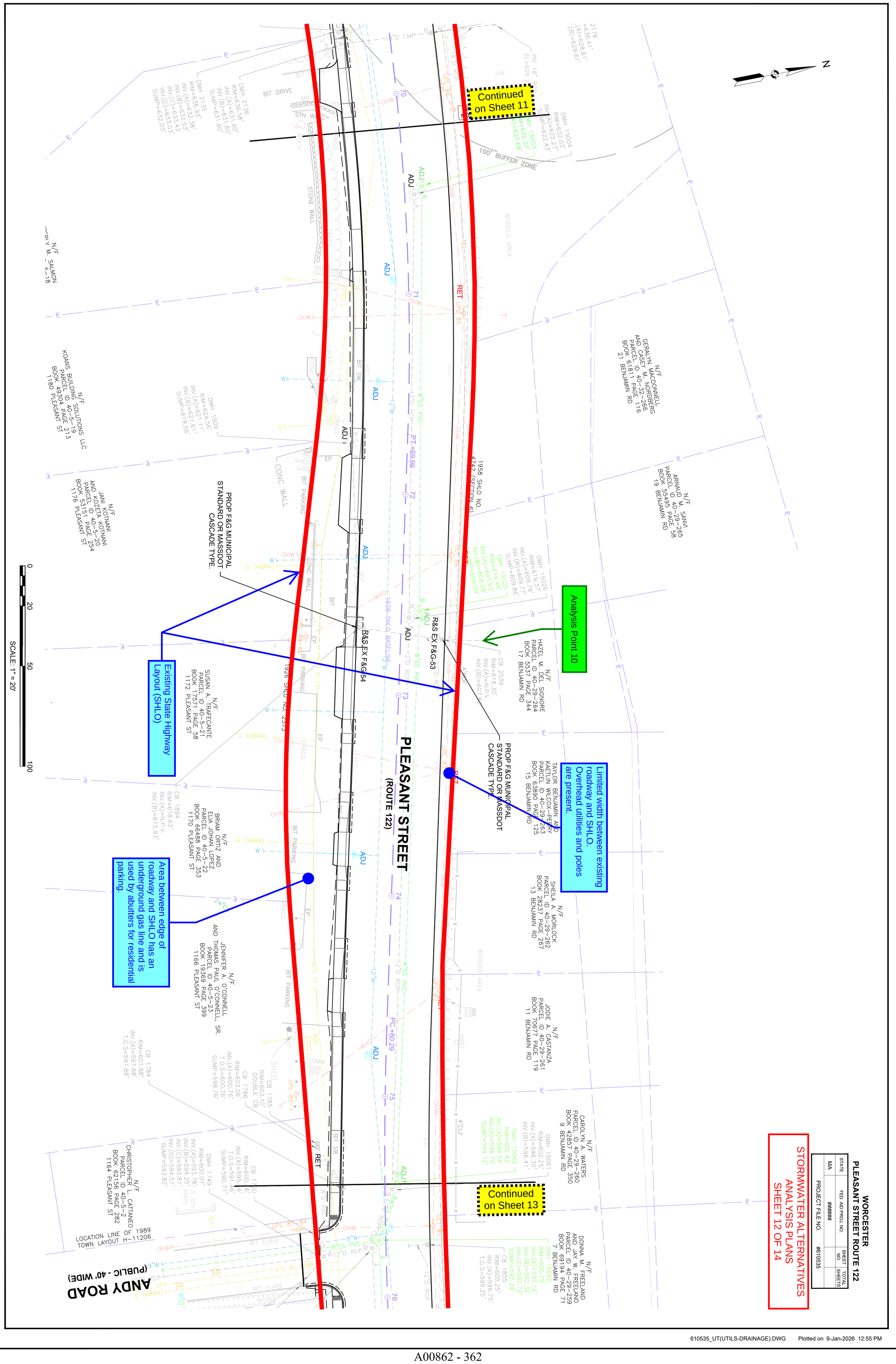
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	#######		
PROJECT FILE NO.	#610535		

STORMWATER ALTERNATIVES
ANALYSIS PLANS
SHEET 10 OF 14

610535_UT(UTILS-DRAINAGE).DWG Plotted on 9-Jan-2026 12:54 PM




Continued on Sheet 10
Existing SCM
Existing State Highway Layout (SHLO)
Limited width between existing roadway and SHLO. Overhead utilities and poles are present.
Analysis Point 9
Continued on Sheet 12
PLEASANT STREET
(ROUTE 122)
PROP F&G MUNICIPAL STANDARD OR MASSDOT CASCADE TYPE.
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
1926 SHLO NO. 2375
1958 SHLO NO. 4747 SECTION 6
1926 SHLO BASELINE
100' BUFFER ZONE
BORDERING VEGETATED WETLANDS
WETLAND BANK
WOODED AREA
CONCRETE HEADWALL
STONE WALL
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
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
STORMWATER ALTERNATIVES
ANALYSIS PLANS
SHEET 11 OF 14
610535_UT(UTILS-DRAINAGE).DWG Plotted on 9-Jan-2026 12:54 PM



STORMWATER ALTERNATIVES
ANALYSIS PLANS
SHEET 12 OF 14

WORCESTER
PLEASANT STREET ROUTE 122

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

610535_UT(UTILS-DRAINAGE).DWG Plotted on 9-Jan-2026 12:55 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 13 OF 14

610535_UT(UTILS-DRAINAGE).DWG Plotted on 9-Jan-2026 12:55 PM

N

PLEASANT STREET
(ROUTE 122)

OLEAN STREET
(PUBLIC - 50' WIDE)

ANDY ROAD
(PUBLIC - 40' WIDE)

Limited width between existing roadway and SHLO. Overhead utilities and poles are present.

Limited width between SHLO and back of sidewalk

Existing State Highway Layout (SHLO)

Limited width between SHLO and back of sidewalk

Continued on Sheet 12

Continued on Sheet 14

PROP F&G MUNICIPAL STANDARD OR MASSDOT CASCADE TYPE.

LIMIT OF WORK

PROP RRFB, PULLBOX, AND 62 LF CONDUIT

PROP RRFB, PULLBOX, AND 50 LF CONDUIT

LIMIT OF CONSTRUCTION

R&S EX F&G-56

R&S EX F&G-55

R&S EX F&G-57

R&S EX F&G-58

Analysis Point 11

1926 SHLO NO. 2373

1958 SHLO NO. 2373

1953 SHLO NO. 4747

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. STUKO LIVING TRUST PARCEL ID 40-29-258 BOOK 70593 PAGE 155 5 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 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

N/F W.H.Y.M.E., INC. PARCEL ID 40-7-1 BOOK 23145 PAGE 402 1152 PLEASANT ST

CITY OF WORCESTER DRAINAGE EASEMENT BOOK 4146 PAGE 103

LOCATION LINE OF 1989 TOWN LAYOUT H-11206

LOCATION LINE OF TOWN LAYOUT H-10076

100' BUFFER ZONE

FEMA ZONE AE BASE FLOOD ELEVATION 587'

0 20 50 100

SCALE: 1" = 20'

N

Existing State Highway Layout (SHLO)

Continued on Sheet 13

1958 SHLO NO. 4747

RET

PROJECT END
N2926681.3834
E560256.5506
STA 84+89.25

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 3163 PAGE 423

CITY OF WORCESTER
SEWER EASEMENT
PLAN BOOK 432 PLAN 121

100' BUFFER ZONE

FEMA ZONE AE
BASE FLOOD
ELEVATION 582'

SCALE: 1" = 20'

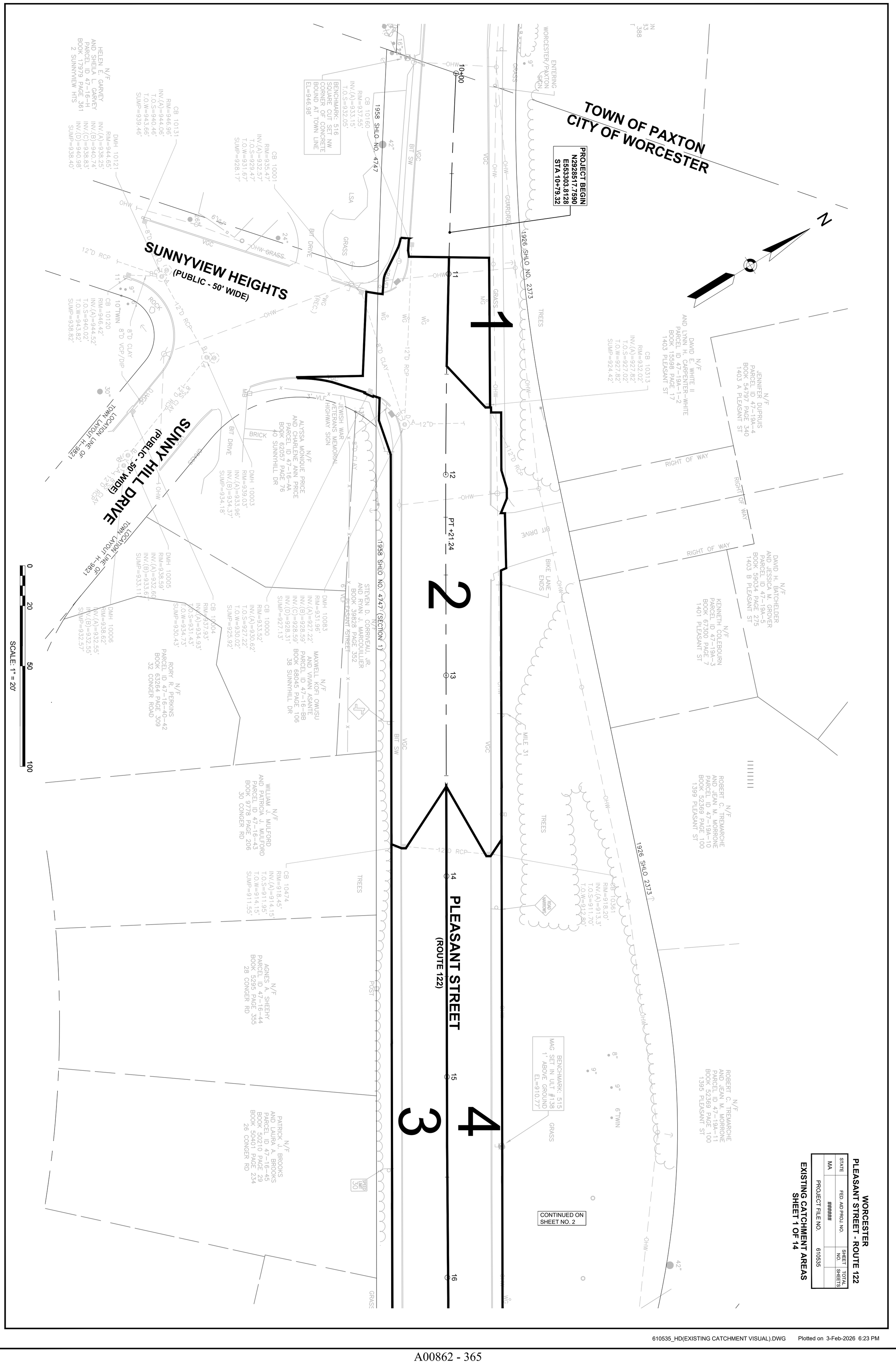
0 20 50 100

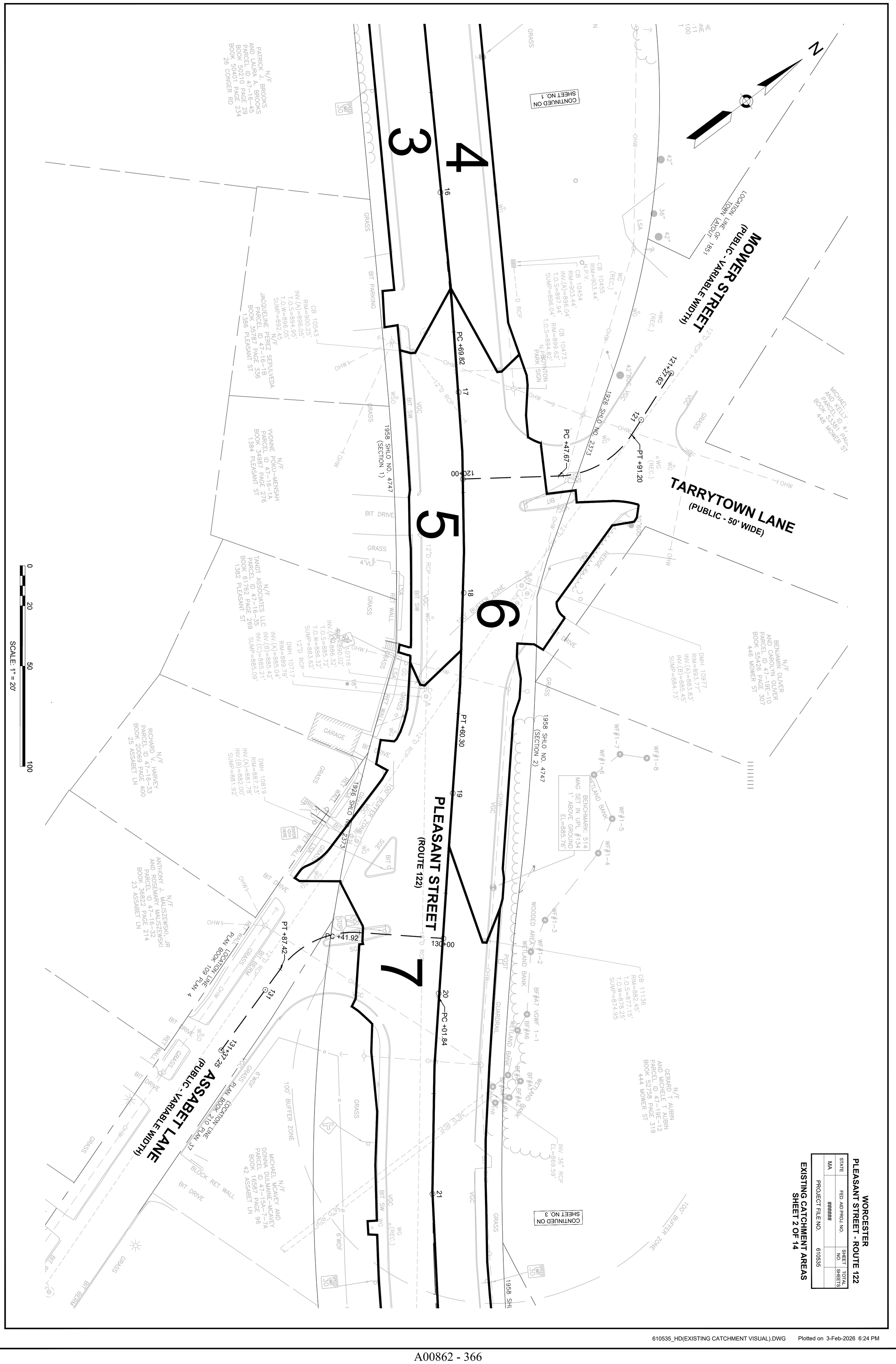
WORCESTER
PLEASANT STREET ROUTE 122

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

STORMWATER ALTERNATIVES
ANALYSIS PLANS
SHEET 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
SCALE: 1" = 20'
610535_HD(EXISTING CATCHMENT VISUAL).DWG
Plotted on 3-Feb-2026 6:23 PM

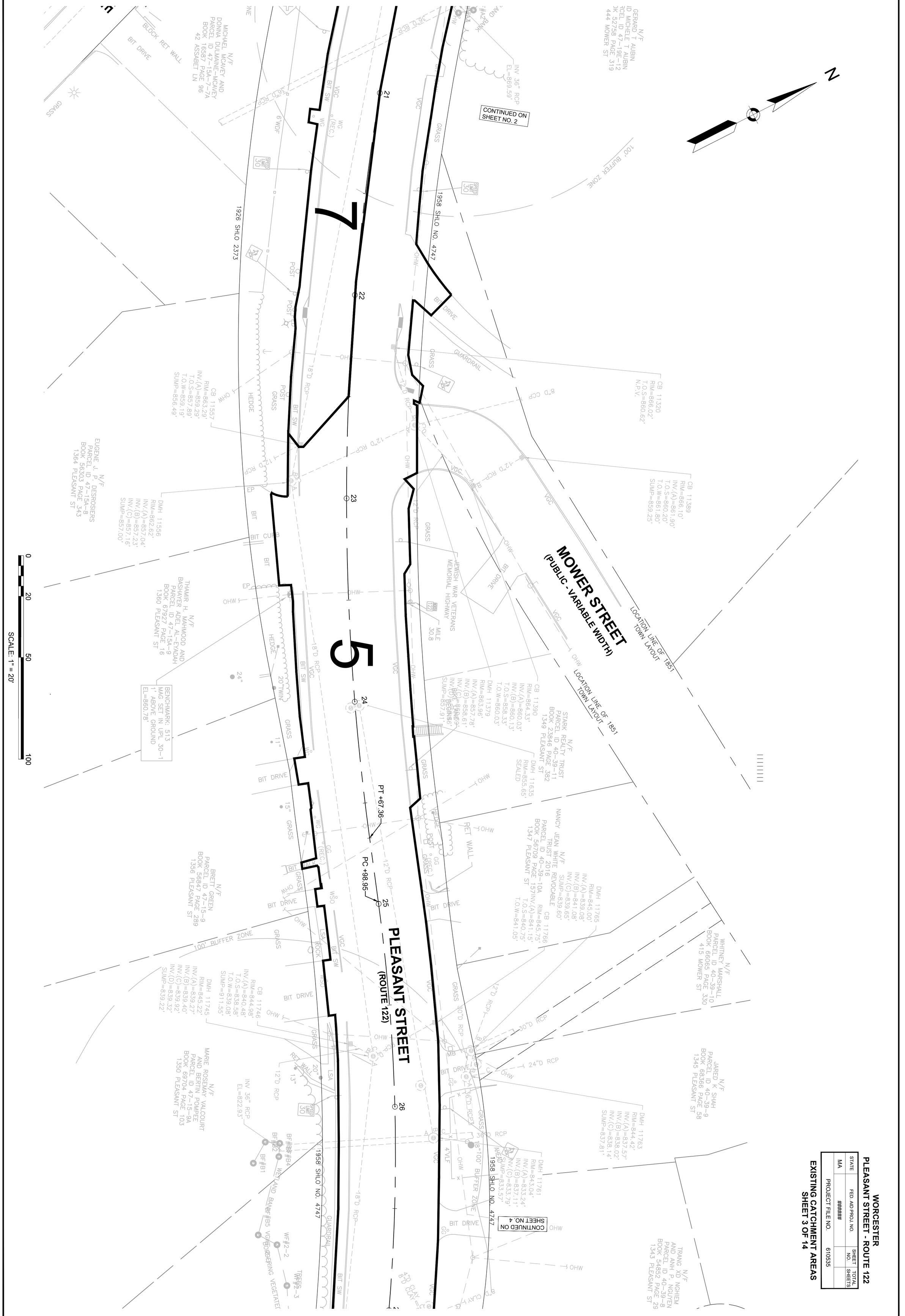


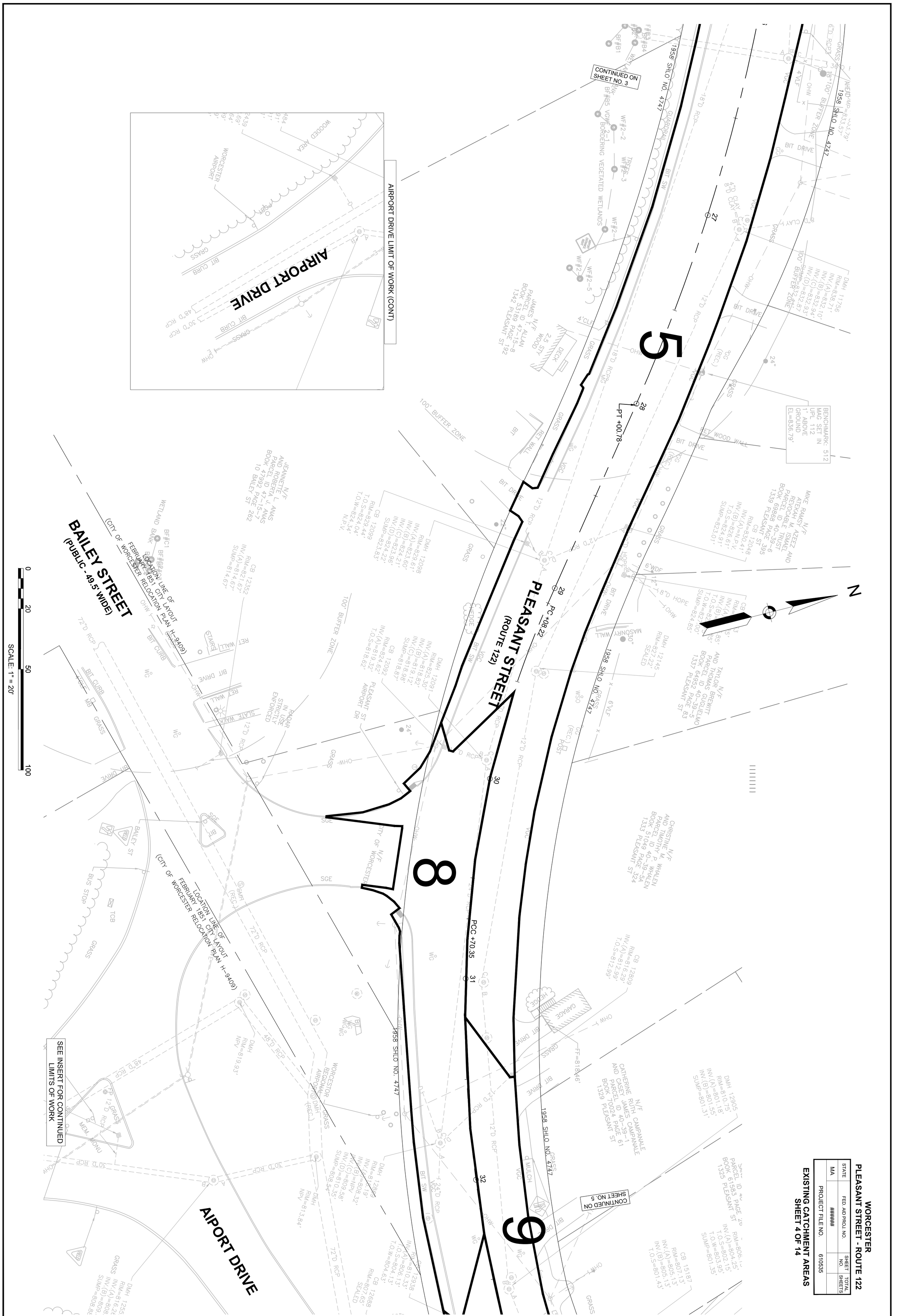
WORCESTER
PLEASANT STREET - ROUTE 122

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.
#######
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
PT +67.36
PC +98.95
BENCHMARK: 513
MAG SET IN UPL 30-1
1" ABOVE GROUND
EL=860.78'
SCALE: 1" = 20'
0
20
50
100
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

N

LOCATION LINE OF PLAN BOOK 111 PLAN 53

LOCATION LINE OF 1967 TOWN LAYOUT H-10038

LONG VUE TERRACE
(PRIVATE - 40' WIDE)

EDWIDGE STREET
(PUBLIC - 40' WIDE)

PLEASANT STREET
(ROUTE 122)

AIPORT DRIVE

1926 SHLO NO. 2373

1958 SHLO NO. 4747

1959 SHLO NO. 4906

PC +85.76

PT +03.76

CONTINUED ON SHEET NO. 4

CONTINUED ON SHEET NO. 6

BENCHMARK: 511
BRASS DISK FND W38
EL=803.07'

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
EMMITT BRISBON
PARCEL ID 40-36-10
BOOK 58125 PAGE 393
1313 PLEASANT ST

N/F
ANDREW J. O'CONNOR
PARCEL ID 40-36-11
BOOK 43253 PAGE 267
1311 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
LOUIS TUREK
PARCEL ID 47-12-7
BOOK 65885 PAGE 32
14 MEADOW LN

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

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

WORCESTOR REGIONAL AIRPORT

100' BUFFER ZONE

WOODED AREA

0 20 50 100
SCALE: 1" = 20'

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			

SCALE: 1" = 20'

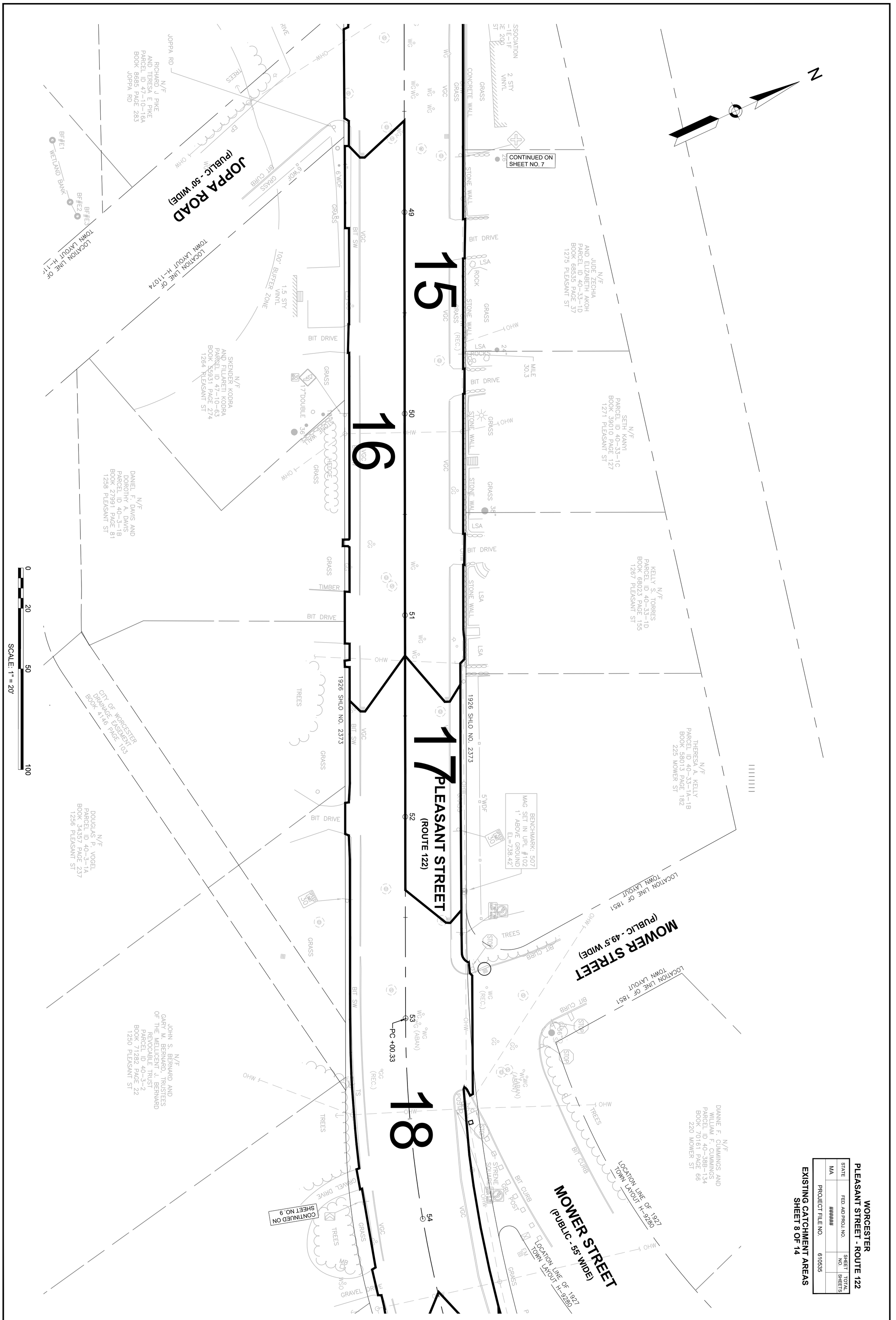
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WORCESTER
PLEASANT STREET - ROUTE 122
EXISTING CATCHMENT AREAS
SHEET 7 OF 14

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



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

WORCESTER
PLEASANT STREET - ROUTE 122
EXISTING CATCHMENT AREAS
SHEET 8 OF 14

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

Proposal No. 610535-134928

610535_HD(EXISTING CATCHMENT VISUAL).DWG Plotted on 3-Feb-2026 6:33 PM

A00862 - 373

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

54 55 56 57 58 59

PT +67.35

CONTINUED ON SHEET NO. 8

CONTINUED ON SHEET NO. 10

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

1926 SHLO NO. 2373

LOCATION LINE OF 1927 TOWN LAYOUT H-9280

LOCATION LINE OF PLAN BOOK 61 PLAN 95

LOCATION LINE OF PLAN BOOK 96 PLAN 95

LOCATION LINE OF H-11,978

LOCATION LINE OF 1927 PLAN 191

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 SUSAN 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

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

610535_HD(EXISTING CATCHMENT VISUAL).DWG Plotted on 3-Feb-2026 6:35 PM

A00862 - 374

N

N/F
JULIET KUFE
PARCEL ID 40-30-8
BOOK 62843 PAGE 163
1225 PLEASANT ST

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

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

CONTINUED ON SHEET NO. 9

CONTINUED ON SHEET NO. 11

1926 SHLO NO. 2373

1958 SHLO NO. 4747
(SECTION 6)

20

21

22

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

59 60 61 62 63 64 65

ROBERTSON ROAD
(PUBLIC - 29.5' WIDE)

LOCATION LINE OF PLAN BOOK 227 PLAN 61

LOCATION LINE OF PLAN BOOK 227 PLAN 61

N/F
TATNUCK COUNTRY CLUB
PARCEL ID 47-INX-3
BOOK 1604 PAGE 581
1222 PLEASANT ST

N/F
TATNUCK COUNTRY CLUB
PARCEL ID 47-INX-3
BOOK 1604 PAGE 581
1222 PLEASANT ST

N/F
'C PLEASANT LLC
RCEL ID 40-2-1
K 67469 PAGE 225
26 PLEASANT ST

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

WF#4-2
WF#4-3
WF#4-4
WF#4-7
WF#4-5 VGBF F4
WF#4-6 VGBF F9
BORDERING VEGETATED WETLANDS
WETLAND BANK
BF#F3
BF#F8
BF#F7
BF#F2
BF#F6
BF#F5
CONCRETE HEADWALL

ROCK
15"
36"
BIT DRIVE
STN WALL
LSA
GRASS
OHW
WG
VGC
BIT
GG (REC.)
EP
SPEED LIMIT 30
MG
BIT SW
STN COLUMN
TREES
BIT CURB
SPEED LIMIT 35
WOODED AREA
STATE HIGHWAY PARKING PROHIBITED
100' BUFFER ZONE
GRL
GRAVEL
POST
GATE
RIPRAP

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		

EXISTING CATCHMENT AREAS
SHEET 11 OF 14

Proposal No. 610535-134928

610535_HD(EXISTING CATCHMENT VISUAL).DWG Plotted on 3-Feb-2026 6:36 PM

A00862 - 375

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

WOODED AREA

BENCHMARK: 503
MAG SET IN UPL #87
1' ABOVE GROUND
EL=643.10'

SPEED LIMIT 35

CONTINUED ON SHEET NO. 12

100' BUFFER ZONE

1958 SHLO NO. 4747 (SECTION 6)

GRASS GUARDRAIL OHW VGC EP BIT SW

22 65 66 PLEASANT STREET (ROUTE 122) 67 23 68 PC +24.89 69 70 24

WW WG

100' BUFFER ZONE +GRL

RIPRAP

POST GATE POST

4'CLF

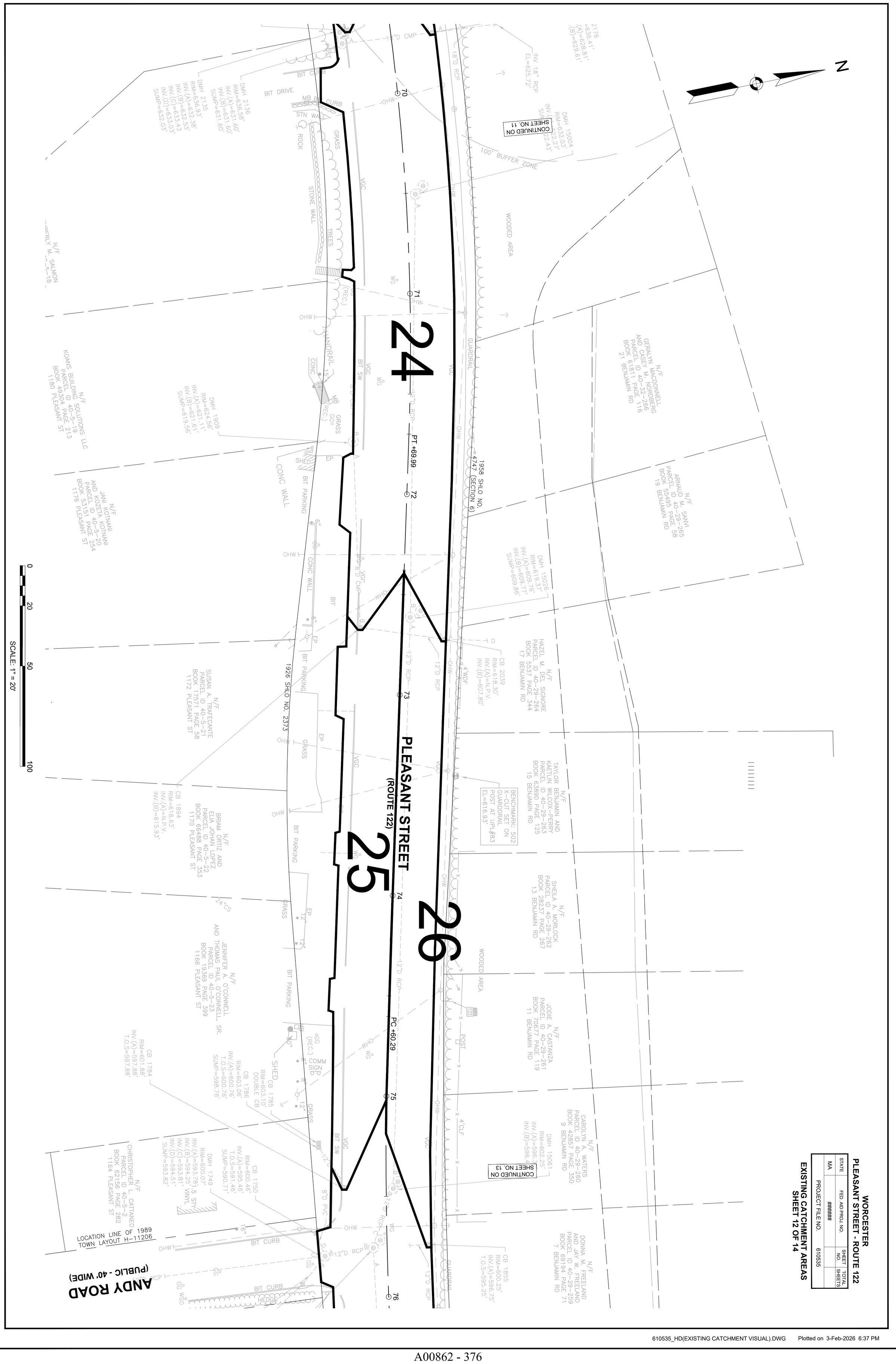
1926 SHLO NO. 2373

BIT DRIVE BIT CURB MB SIDEWALK STW WALL ROCK STONE WALL TREES

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

0 20 50 100
SCALE: 1" = 20'

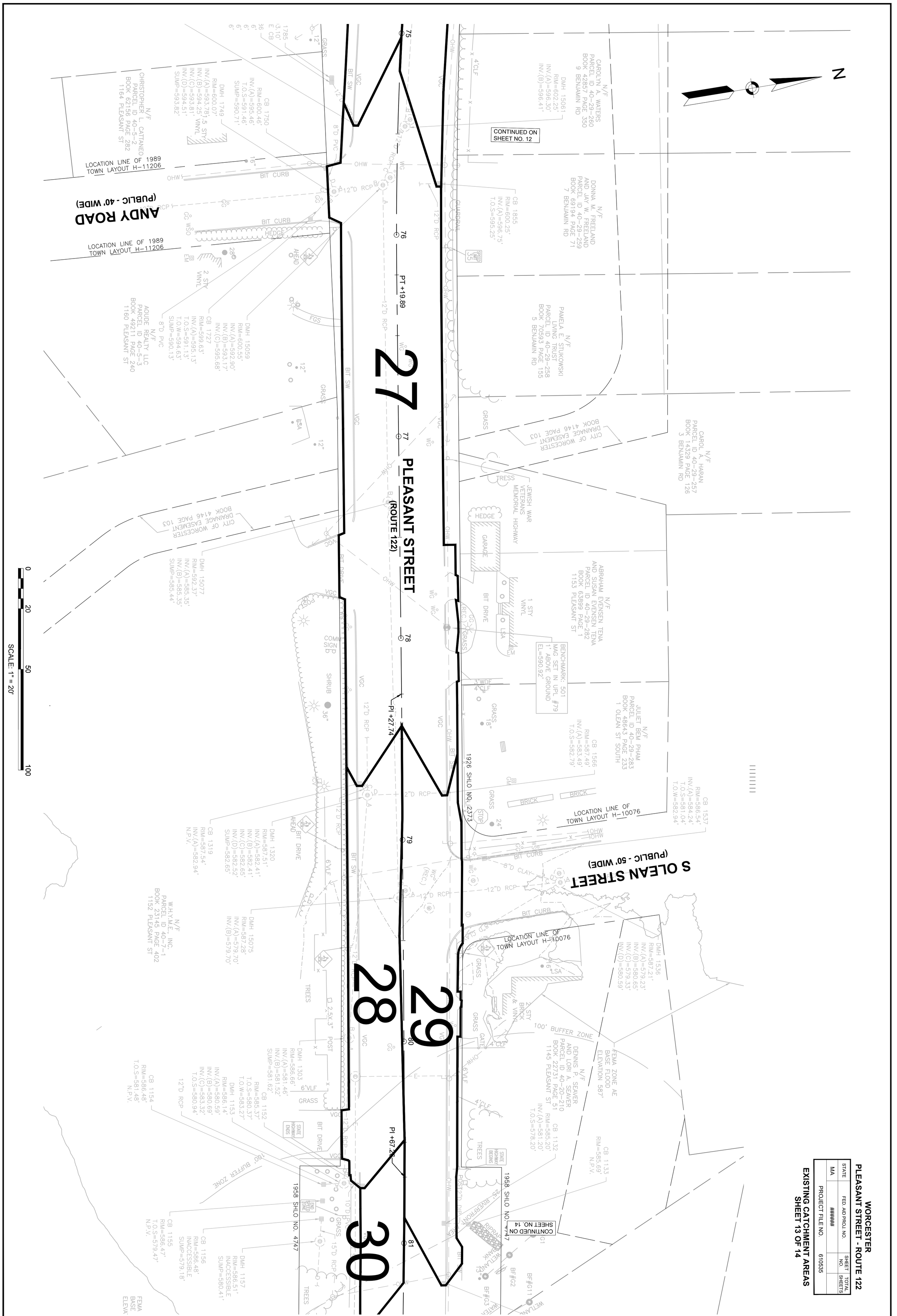


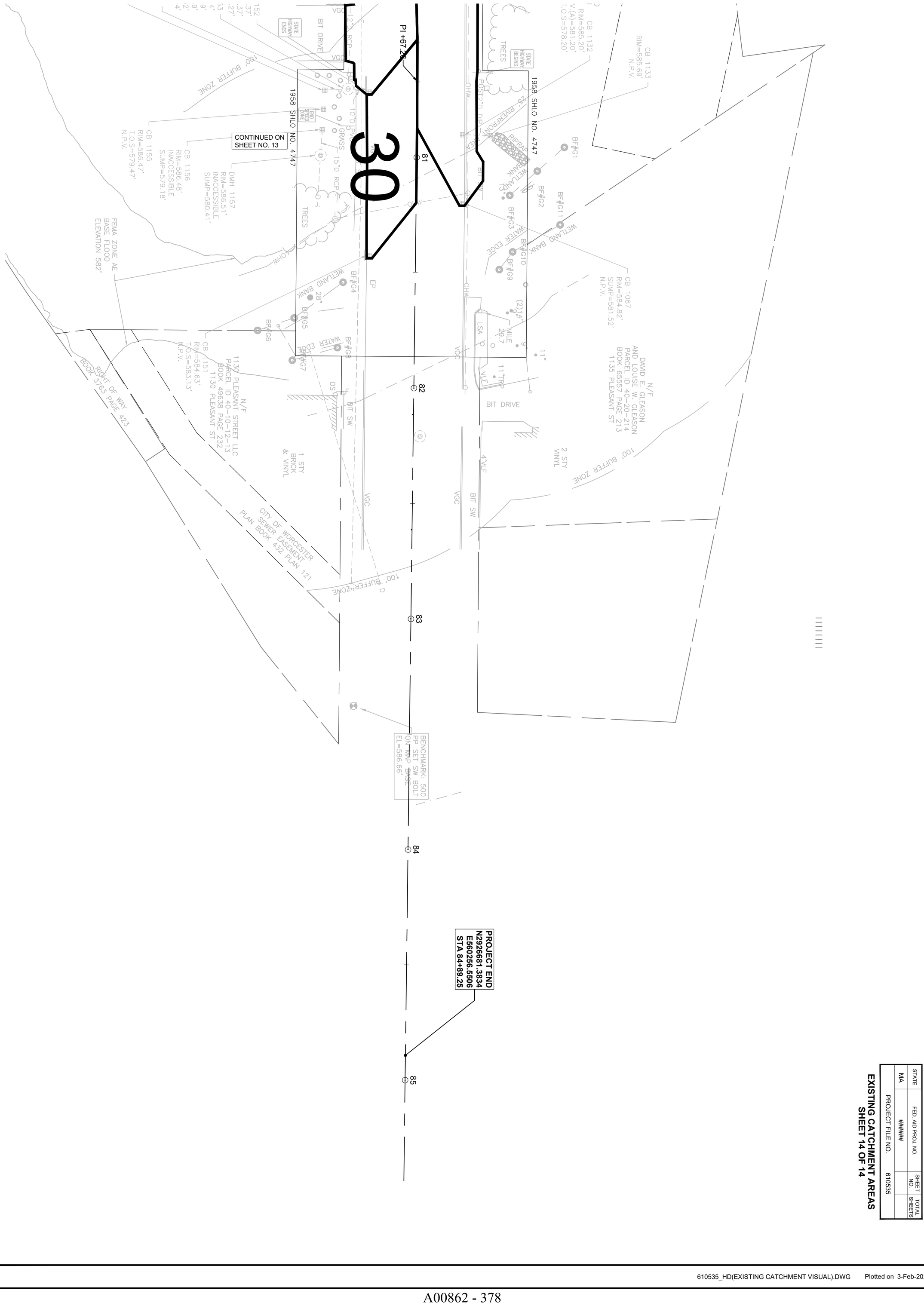
WORCESTER
PLEASANT STREET - ROUTE 122

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

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)
WORCESTER
PLEASANT STREET - ROUTE 122
EXISTING CATCHMENT AREAS
SHEET 13 OF 14
STATE
MA
FED. AID PROJ. NO.
#######
PROJECT FILE NO.
610535
SHEET NO.
TOTAL SHEETS
SCALE: 1" = 20'
0
20
50
100
N
CONTINUED ON SHEET NO. 12
CONTINUED ON SHEET NO. 14
LOCATION LINE OF 1989 TOWN LAYOUT H-11206
LOCATION LINE OF TOWN LAYOUT H-10076
1926 SHLO NO. 2373
1958 SHLO NO. 4747
PT +19.89
PI +27.74
PI +67.23
N/F CHRISTOPHER L. CATTANEO PARCEL ID 40-5-2 BOOK 62156 PAGE 282 1164 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
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 CAROL A. HARAN PARCEL ID 40-29-257 BOOK 14329 PAGE 126 3 BENJAMIN RD
N/F PAMELA E. STUKOWSKI LIVING TRUST PARCEL ID 40-29-258 BOOK 70593 PAGE 155 5 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
CITY OF WORCESTER DRAINAGE EASEMENT BOOK 4146 PAGE 103
BENCHMARK: 501 MAG SET IN UPL #79 1' ABOVE GROUND EL=590.92'
FEMA ZONE AE BASE FLOOD ELEVATION 587'
100' BUFFER ZONE
JEWISH WAR VETERANS MEMORIAL HIGHWAY
BIT CURB
BIT DRIVE
GRASS
HEDGE
TREES
GARAGE
1 STY VINYL
2 STY VINYL
2 STY BRICK & VINYL
BRICK
STOP
SHRUB
FGS
GM
EM
SA
WG
WS
GG
OHW
VGC
BIT SW
12"D RCP
15"D RCP
8"D PVC
8"D CLAY
6'VLF
4'CLF
3'WDE
2.5X3" POST
STATE HIGHWAY BEGINS
STATE HIGHWAY ENDS
END SPEED ZONE
AHEAD
RIPRAP
WETLAND
BF#G1
BF#G2
BF#G3
BF#G11
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' INV.(B)=594.25' INV.(C)=593.81' INV.(D)=594.51' SUMP=593.82'
CB 1727 RIM=599.63' INV.(A)=595.13' T.O.S=591.13' T.O.W=594.63' SUMP=590.13'
DMH 15059 RIM=600.55' INV.(A)=592.90' INV.(B)=593.17' INV.(C)=595.68'
DMH 15061 RIM=602.25' INV.(A)=596.30' INV.(B)=596.41'
CB 1855 RIM=600.25' INV.(A)=596.75' T.O.S=595.25'
CB 1566 RIM=587.49' INV.(A)=583.49' T.O.S=582.79'
CB 1537 RIM=586.54' INV.(A)=584.24' T.O.S=581.04' T.O.W=582.94'
DMH 1536 RIM=587.21' INV.(A)=579.23' INV.(B)=580.65' INV.(C)=579.33' INV.(D)=580.59'
CB 1320 RIM=587.51' INV.(A)=582.41' INV.(B)=582.41' INV.(C)=582.65' INV.(D)=582.52' SUMP=582.65'
CB 1319 RIM=587.54' INV.(A)=582.94' N.P.V.
DMH 15075 RIM=587.28' INV.(A)=579.70' INV.(B)=579.70'
DMH 1303 RIM=586.66' INV.(A)=581.46' INV.(B)=581.52' SUMP=581.62'
CB 1152 RIM=585.37' T.O.S=580.37' T.O.W=583.27'
DMH 1153 RIM=586.14' INV.(A)=580.59' INV.(B)=580.69' INV.(C)=583.32' T.O.S=580.94'
CB 1154 RIM=586.48' T.O.S=581.48' N.P.V.
DMH 15077 RIM=592.37' INV.(A)=585.35' INV.(B)=585.35' SUMP=585.44'
CB 1155 RIM=586.47' T.O.S=579.47' N.P.V.
CB 1156 RIM=586.48' INACCESSIBLE SUMP=579.18'
DMH 1157 RIM=586.51' INACCESSIBLE SUMP=580.41'
75
76
77
78
79
80
81

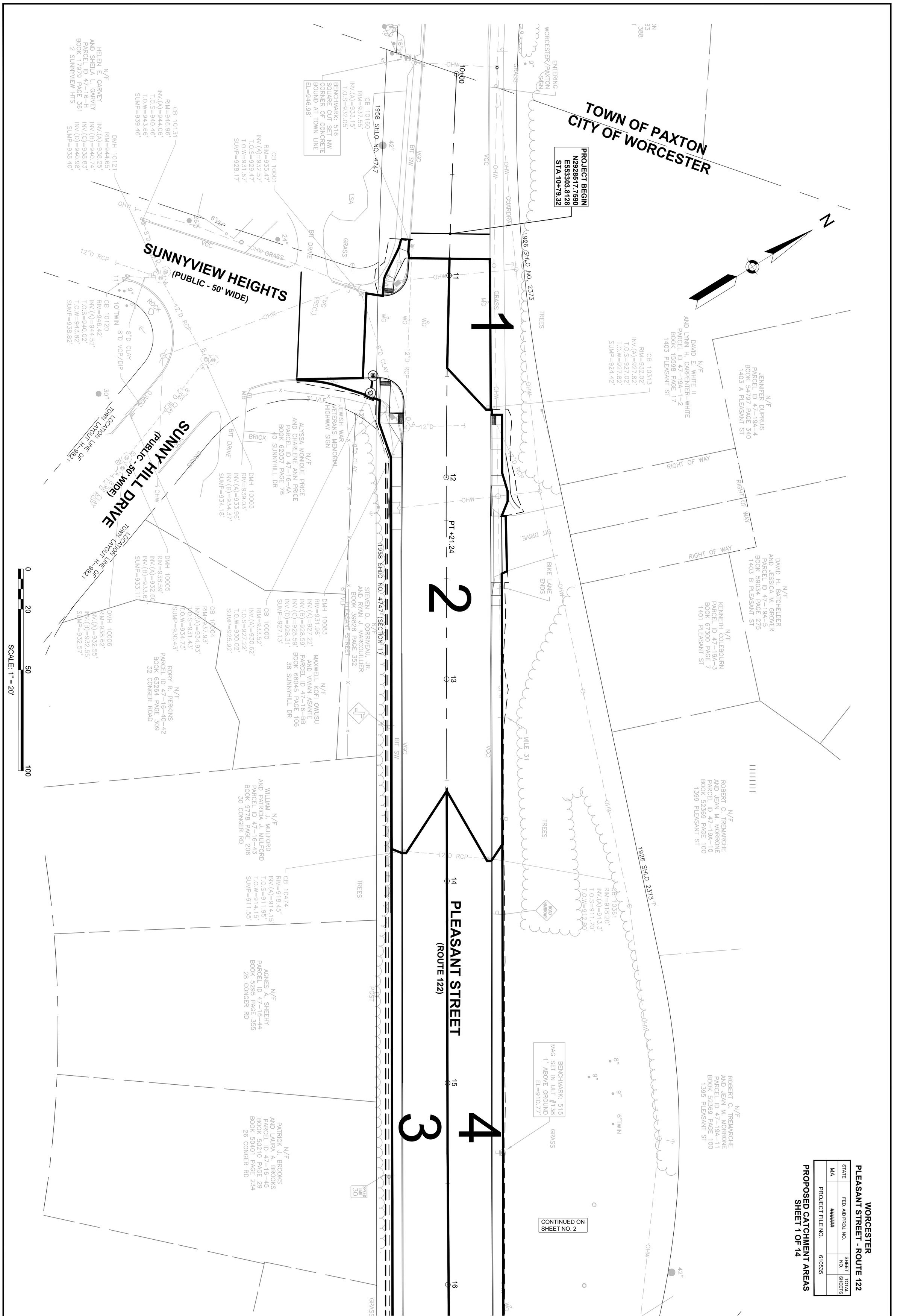


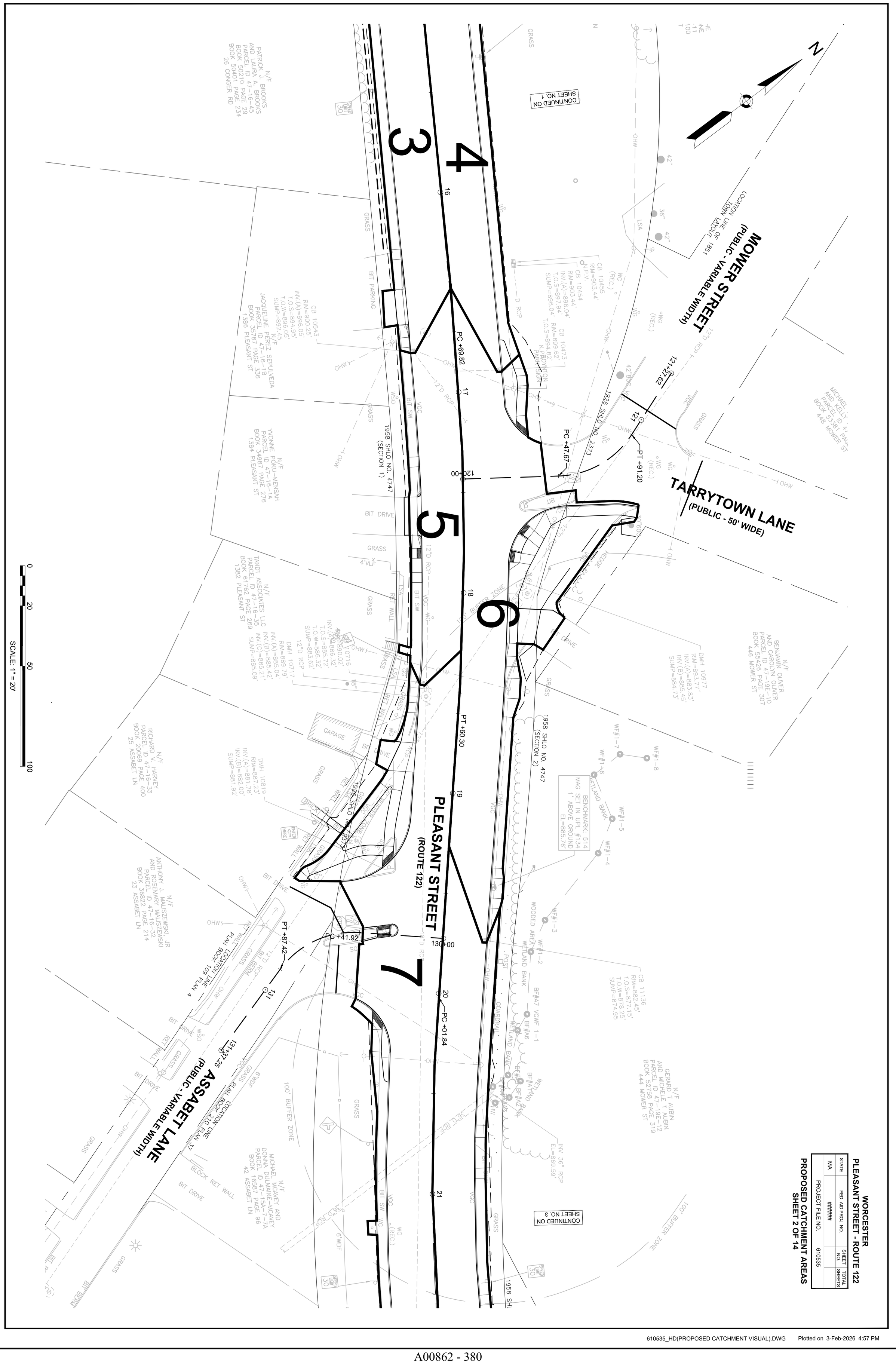
WORCESTER
PLEASANT STREET - ROUTE 122

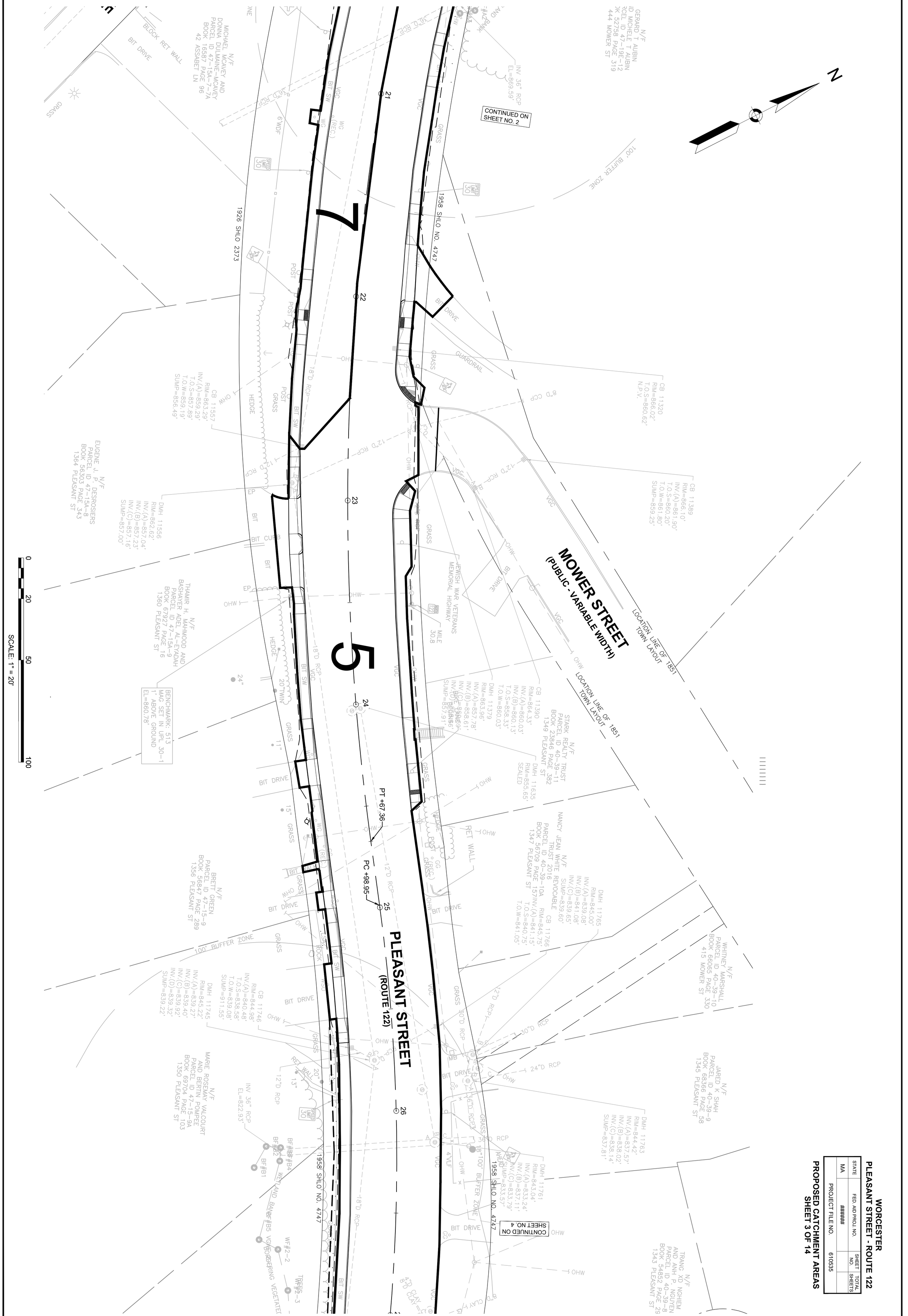
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	#######		
	PROJECT FILE NO.	610535	

EXISTING CATCHMENT AREAS
SHEET 14 OF 14

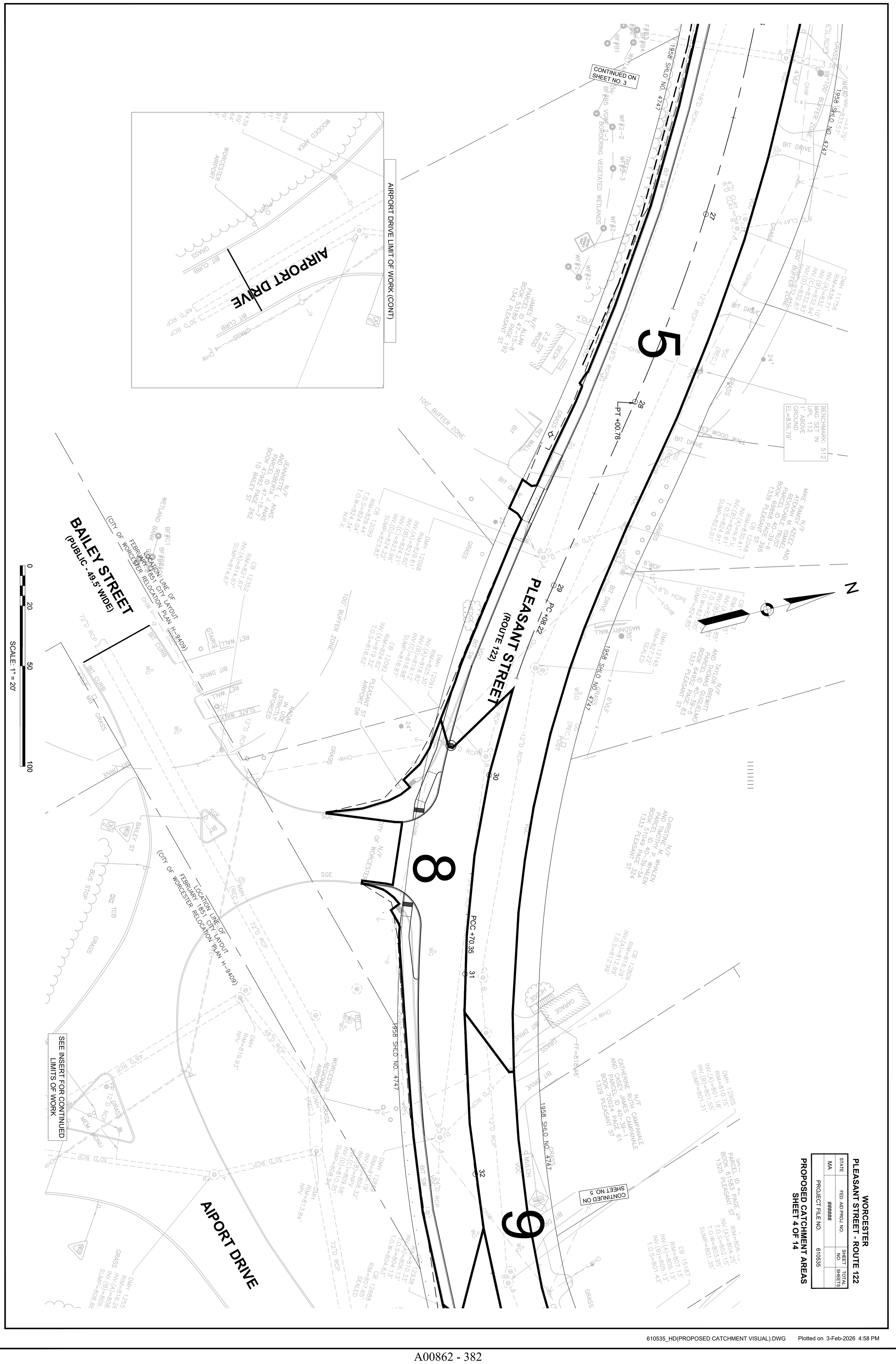
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TOWN OF PAXTON
CITY OF WORCESTER
PROJECT BEGIN
N2928517.7590
E553303.8128
STA 10+79.32
SUNNYVIEW HEIGHTS
(PUBLIC - 50' WIDE)
SUNNY HILL DRIVE
(PUBLIC - 50' WIDE)
PLEASANT STREET
(ROUTE 122)
1926 SHLO NO. 2373
1958 SHLO NO. 4747
1958 SHLO NO. 4747 (SECTION 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
PROPOSED CATCHMENT AREAS
SHEET 1 OF 14
STATE
MA
FED. AID PROJ. NO.
######
SHEET NO.
TOTAL SHEETS
PROJECT FILE NO.
610535
610535_HD(PROPOSED CATCHMENT VISUAL).DWG
Plotted on 3-Feb-2026 4:56 PM
SCALE: 1" = 20'
0
20
50
100


WORCESTER
PLEASANT STREET - ROUTE 122
PROPOSED CATCHMENT AREAS
SHEET 2 OF 14
STATE: MA
FED. AID PROJ. NO.: #######
SHEET NO.:
TOTAL SHEETS:
PROJECT FILE NO.: 610535
PLEASANT STREET (ROUTE 122)
TARRYTOWN LANE (PUBLIC - 50' WIDE)
MOWER STREET (PUBLIC - VARIABLE WIDTH)
ASSABET LANE (PUBLIC - VARIABLE WIDTH)
CONTINUED ON SHEET NO. 1
CONTINUED ON SHEET NO. 3
SCALE: 1" = 20'
610535_HD(PROPOSED CATCHMENT VISUAL).DWG
Plotted on 3-Feb-2026 4:57 PM



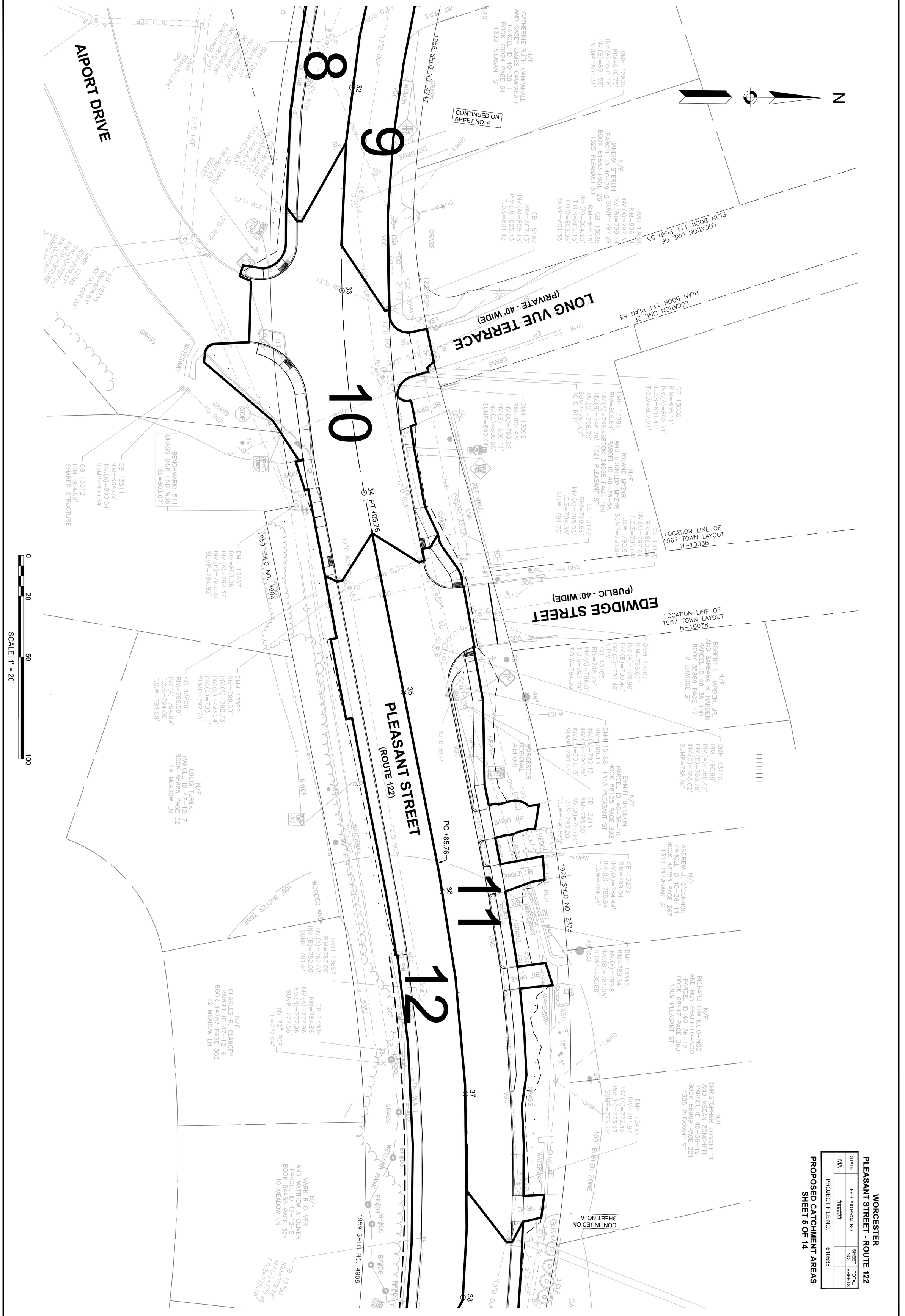
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STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	########		
PROJECT FILE NO.	610535		

WORCESTER
PLEASANT STREET - ROUTE 122
PROPOSED CATCHMENT AREAS
SHEET 4 OF 14

610535_HD(PROPOSED CATCHMENT VISUAL).DWG Plotted on 3-Feb-2026 4:58 PM

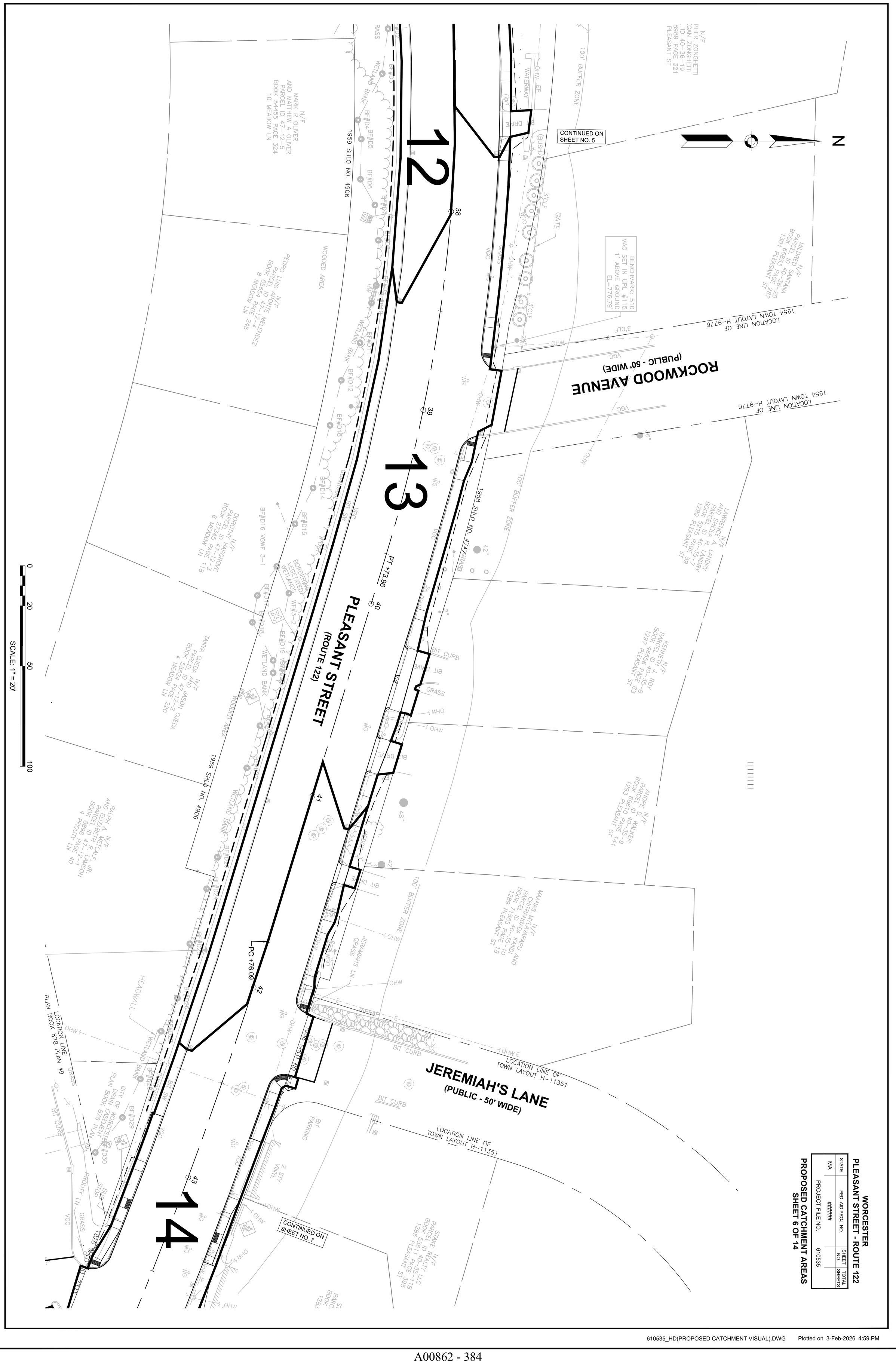


WORCESTER
PLEASANT STREET - ROUTE 122

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

PROPOSED CATCHMENT AREAS
SHEET 5 OF 14

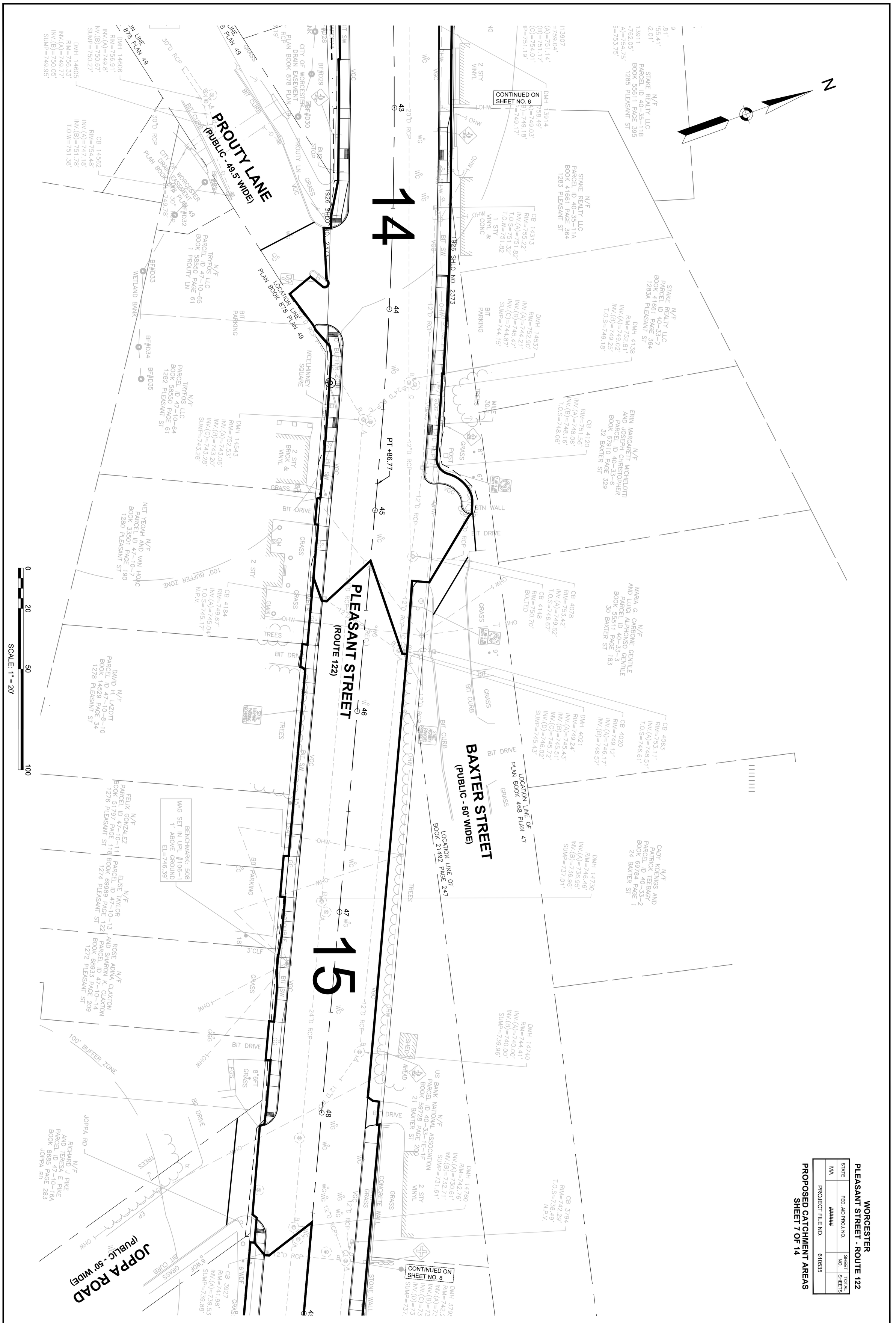
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WORCESTER
PLEASANT STREET - ROUTE 122
PROPOSED CATCHMENT AREAS
SHEET 6 OF 14

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

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		

610535_HD(PROPOSED CATCHMENT VISUAL).DWG Plotted on 3-Feb-2026 5:00 PM

Proposal No. 610535-134928

A00862 - 386

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 8 OF 14

N

MOWER STREET (PUBLIC - 49.5' WIDE)

MOWER STREET (PUBLIC - 55' WIDE)

PLEASANT STREET (ROUTE 122)

JOPPA ROAD (PUBLIC - 50' WIDE)

15 16 17 18

49 50 51 52 53 54

PC +00.33

1926 SHLO NO. 2373

BENCHMARK: 507
MAG SET IN UPL #102
1' ABOVE GROUND
EL=738.42'

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
THERESA A. KELLY
PARCEL ID 40-33-1A-1B
BOOK 58013 PAGE 182
225 MOWER ST

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

N/F
SKENDER KODRA
AND FILLARETI KODRA
PARCEL ID 47-10-63
BOOK 55931 PAGE 274
1264 PLEASANT ST

N/F
RICHARD J PIKE
AND TERESA E PIKE
PARCEL ID 47-10-16A
BOOK 8685 PAGE 283
JOPPA RD

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

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

CITY OF WORCESTER
DRAINAGE EASEMENT
BOOK 4146 PAGE 103

LOCATION LINE OF 1851 TOWN LAYOUT

LOCATION LINE OF 1927 TOWN LAYOUT H-9280

LOCATION LINE OF TOWN LAYOUT H-11074

CONTINUED ON SHEET NO. 7

CONTINUED ON SHEET NO. 9

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 9 OF 14

Proposal No. 610535-134928

A00862 - 387

610535_HD\PROPOSED CATCHMENT VISUAL).DWG Plotted on 3-Feb-2026 5:01 PM

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 PLAN 99

LOCATION LINE OF PLAN BOOK 227 PLAN 61

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
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
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

0 20 50 100
SCALE: 1" = 20'

Proposal No. 610535-134928

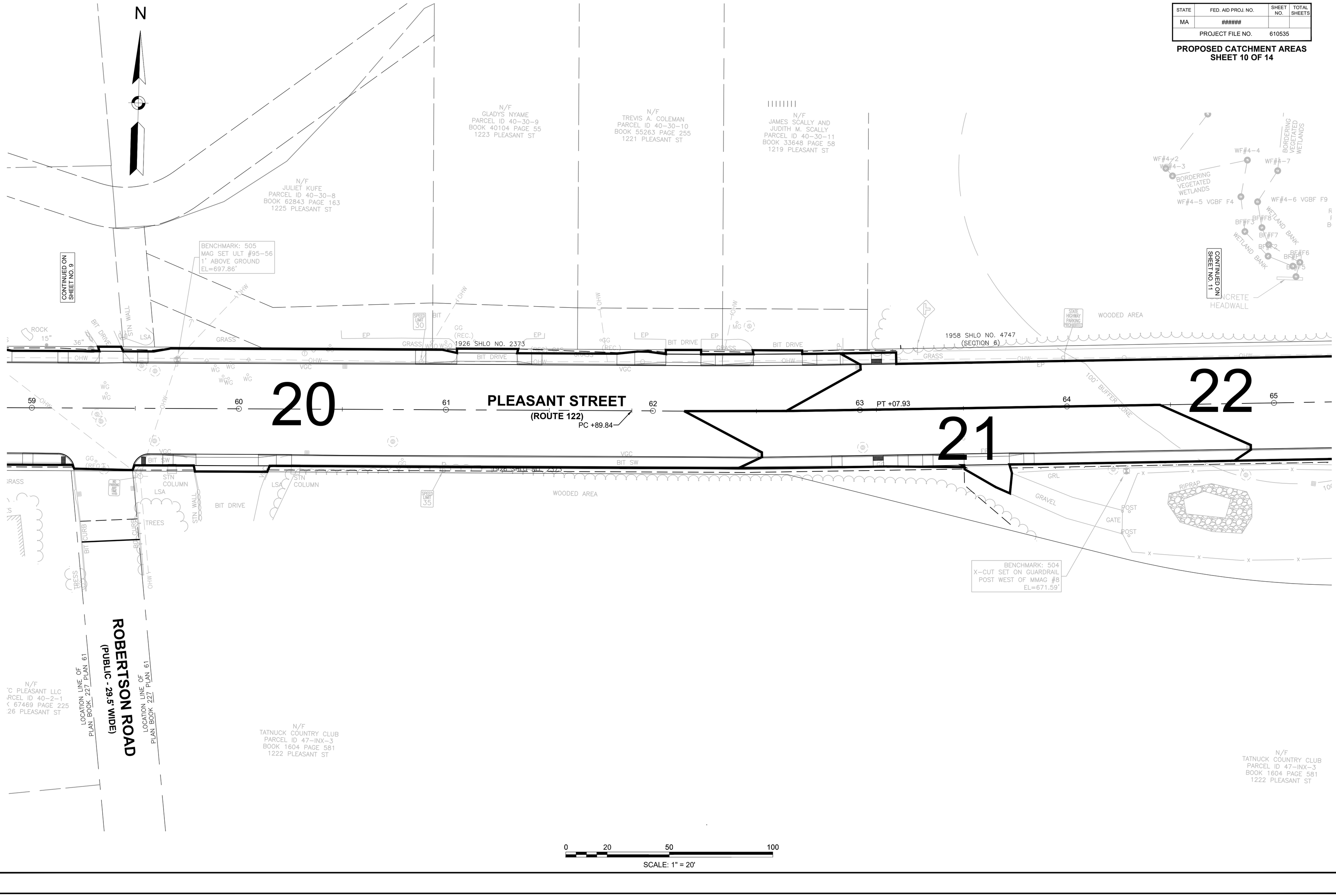
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WORCESTER
PLEASANT STREET - ROUTE 122

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

PROPOSED CATCHMENT AREAS
SHEET 10 OF 14



Proposal No. 610535-134928

WORCESTER
PLEASANT STREET - ROUTE 122

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

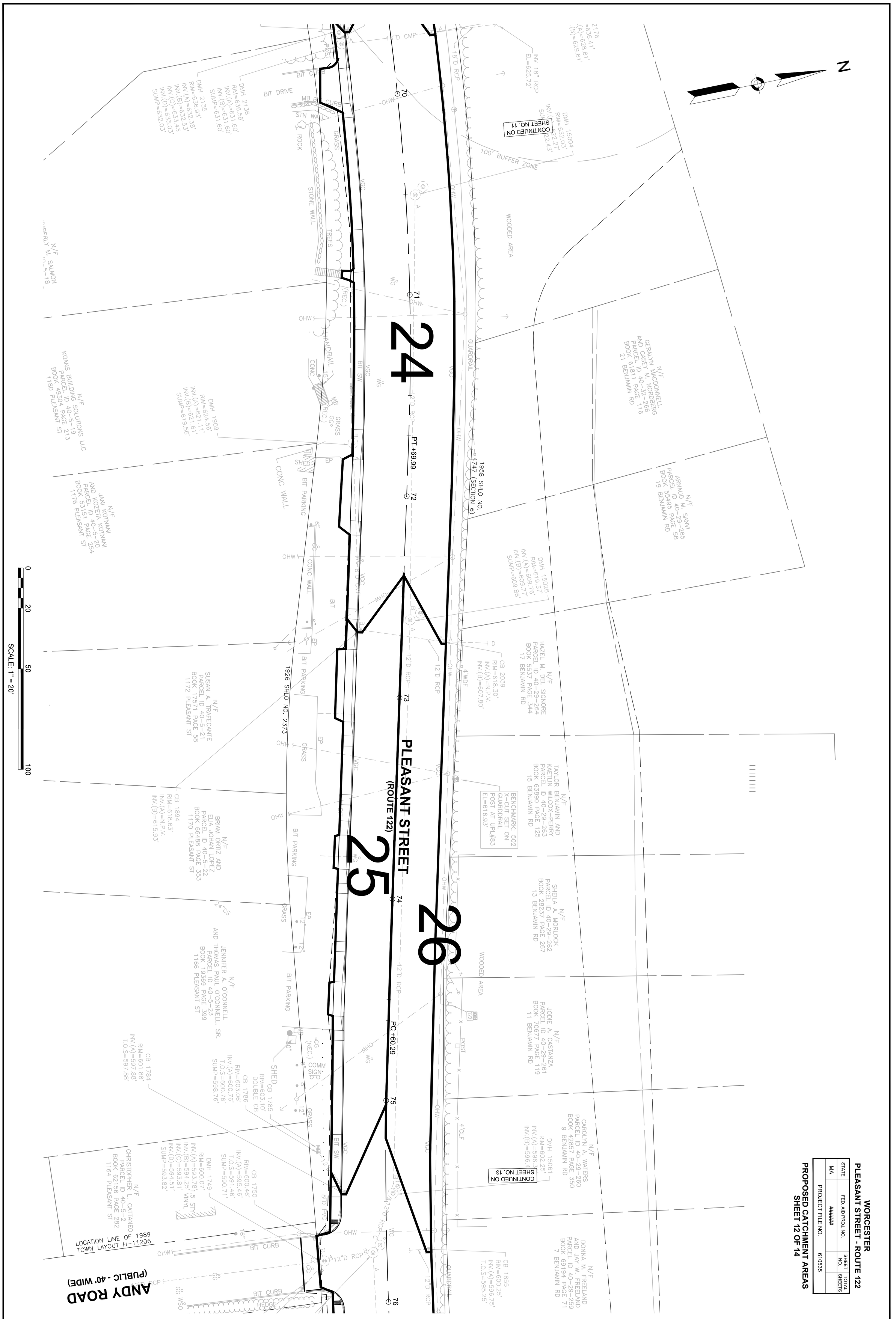
PROPOSED CATCHMENT AREAS
SHEET 11 OF 14

610535_HD\PROPOSED CATCHMENT VISUAL).DWG Plotted on 3-Feb-2026 5:02 PM

A00862 - 389

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
BF#F3
BF#F8
BF#F7
BF#F2
BF#F6
BF#F1
BF#F5
BORDERING VEGETATED WETLANDS
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
WOODED AREA
BENCHMARK: 503
MAG SET IN UPL #87
1' ABOVE GROUND
EL=643.10'
CONTINUED ON SHEET NO. 12
100' BUFFER ZONE
SPEED LIMIT 35
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
BIT SW
RIPRAP
POST
GATE
4'CLF
GRL
1926 SHLO NO. 2373
BC
BIT CURB
BIT DRIVE
MB
STN WALL
ROCK
STONE WALL
TREES
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

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 12 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		

PROPOSED CATCHMENT AREAS
SHEET 13 OF 14

SCALE: 1" = 20'

610535_HD(PROPOSED CATCHMENT VISUAL).DWG Plotted on 3-Feb-2026 5:03 PM

N

CB 1133
RIM=585.69'
N.P.V.

CB 1132
RIM=585.20'
V.(A)=581.20'
T.O.S=578.20'

STATE HIGHWAY BEGINS

TREES

POST"D RIP RAP

RIVERFRONT

WETLAND 13

BF#G1

BF#G2

BF#G11

WETLAND BANK

BF#G3

WATER EDGE

BF#G10

BF#G9

CB 1087
RIM=584.82'
SUMP=581.52'
N.P.V.

N/F
DAVID E. GLEASON
AND LOUISE W. GLEASON
PARCEL ID 40-20-214
BOOK 65557 PAGE 213
1135 PLEASANT ST

100' BUFFER ZONE

2 STY
VINYL

PI +67.25

1958 SHLO NO. 4747

30

81

82

83

84

85

STATE HIGHWAY ENDS

12"D RCP

BIT DRIVE

VGC

100' BUFFER ZONE

END SPEED ZONE

10"D PVC

GRASS

15"D RCP

CONTINUED ON SHEET NO. 13

CB 1155
RIM=586.47'
T.O.S=579.47'
N.P.V.

CB 1156
RIM=586.48'
INACCESSIBLE
SUMP=579.18'

DMH 1157
RIM=586.51'
INACCESSIBLE
SUMP=580.41'

FEMA ZONE AE
BASE FLOOD
ELEVATION 582'

OHW

EP

BF#G4

WETLAND BANK

28"

BF#G5

BF#G6

BF#G8

WATER EDGE

BF#G7

CB 151
RIM=584.63'
T.O.S=583.13'
N.P.V.

N/F
1130 PLEASANT STREET LLC
PARCEL ID 40-10-12-13
BOOK 49638 PAGE 232
1130 PLEASANT ST

1 STY
BRICK
& VINYL

RIGHT OF WAY
BOOK 3763 PAGE 423

CITY OF WORCESTER
SEWER EASEMENT
PLAN BOOK 432 PLAN 121

100' BUFFER ZONE

(2)14"

MILE
29.7

LSA

11"

11"TRP

VLF

4'VLF

BIT SW

VGC

BENCHMARK: 500
PP SET SW BOLT
ON MAP BASE
EL=586.66'

PROJECT END
N2926681.3834
E560256.5506
STA 84+89.25

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 14 OF 14

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Maura Healey, Governor
Kimberley Driscoll, Lieutenant Governor
Phillip Eng, Interim MassDOT Secretary
Jonathan L. Gulliver, Undersecretary and Highway Administrator

MassDOT Massachusetts Department of Transportation Highway Division

March 20, 2026

Eric Flint
Conservation Planner/Agent
Executive Office of Economic Development
Planning & Regulatory Services Division
City of Worcester
455 Main Street
Worcester, MA 01608

Re: Pedestrian and Bicycle Improvements on Pleasant Street MassDOT Local Ordinance Exemption MassDOT Project #610535

Dear Mr. Flint,

It is well-settled law that agencies and authorities of the Commonwealth are exempt from local authority or regulation pursuant to the doctrine of sovereign immunity. MassDOT's enabling statute states that "[the Department] shall not be subject to the supervision or control of said office, or of any board, bureau, department or other center of the commonwealth, except as specifically provided in this chapter." M.G.L. c. 6c Sec. 2(a). Absent a clear statutory statement to the contrary, MassDOT is not subject to regulation by municipalities or by other state agencies. *See* Mass. Op. Atty. Gen. 2 (2001). The City of Worcester's Wetlands Protection Ordinance is promulgated under Article 89 of the Massachusetts Constitution, the "Home Rule Amendment," which includes no such statement.

For a municipality to have jurisdiction over a state authority, the language that provides jurisdiction cannot be presumed or inferred and must explicitly reference the Commonwealth. *See* Mass. Op. Atty. Gen. 2 (2001); Inspector of Bldgs. of Salem v. Salem State Coll., 28 Mass. App. Ct. 92 (1989) (requiring that the authority to regulate state agencies must be "express and unmistakable"); Mass. Op. Atty. Gen. 1 (2000) (the word "persons" does not include the Commonwealth and its agencies); *see also*, *e.g.* Com. v. Voight, 28 Mass. App. Ct. 769, 771 (1990); Harrison v. Massachusetts Bay Transportation Auth., 101 Mass. App. Ct. 659 (2022); Greater Lawrence Sanitary Dist. v. Town of N. Andover, 439 Mass. 16 (2003); MBTA v. Somerville, 451 Mass. 80 (2008); Town of Boxford v. Massachusetts Highway Department, et al., 458 Mass. 596 (2010); Bourne v. Plante, 429 Mass. 329 (1999).

M.G.L. Chapter 131, Section 40, enacted as part of the Wetlands Protection Act subjects state agencies only to the WPA alone, and does not subject state agencies to local wetland ordinances such as the City of Worcester's. The WPA allows local government the authority to enforce the WPA, and does not preclude municipalities from promulgating their own more stringent wetlands ordinances and regulations under separate authorities, however such ordinances do not derive

Ten Park Plaza, Suite 4160, Boston, MA 02116
Tel: 857-368-4636, TTY: 857-368-0655
mass.gov/massdot

Maura Healey, Governor
Kimberley Driscoll, Lieutenant Governor
Phillip Eng, Interim MassDOT Secretary
Jonathan L. Gulliver, Undersecretary and Highway Administrator

massDOT
Massachusetts Department of Transportation
Highway Division

their authority from the WPA itself. *See* M.G.L. c 131 Sec. 40; *See also* Lovequist v. Conservation Comm'n of Town of Dennis, 379 Mass. 7, 15 (1979). As a result, MassDOT is subject only to the WPA and Orders of Conditions issued under the WPA and its regulations, 310 CMR 10. MassDOT is exempt from Worcester's Wetlands Protection Ordinance promulgated under the Home Rule Amendment.

Although MassDOT is exempt from local wetlands ordinances, including local filing fees, every attempt will be made to keep you and the Commission apprised of the status of the Project as it enters its construction phase. In the meantime, please feel free to contact me at 978-429-1172 or melissa.lenker@dot.state.ma.us should you have any questions.

Respectfully,

Melissa Lenker

Melissa Lenker
Wetlands & Water Resources Supervisor
MassDOT Highway Division

Ten Park Plaza, Suite 4160, Boston, MA 02116
Tel: 857-368-4636, TTY: 857-368-0655
mass.gov/massdot