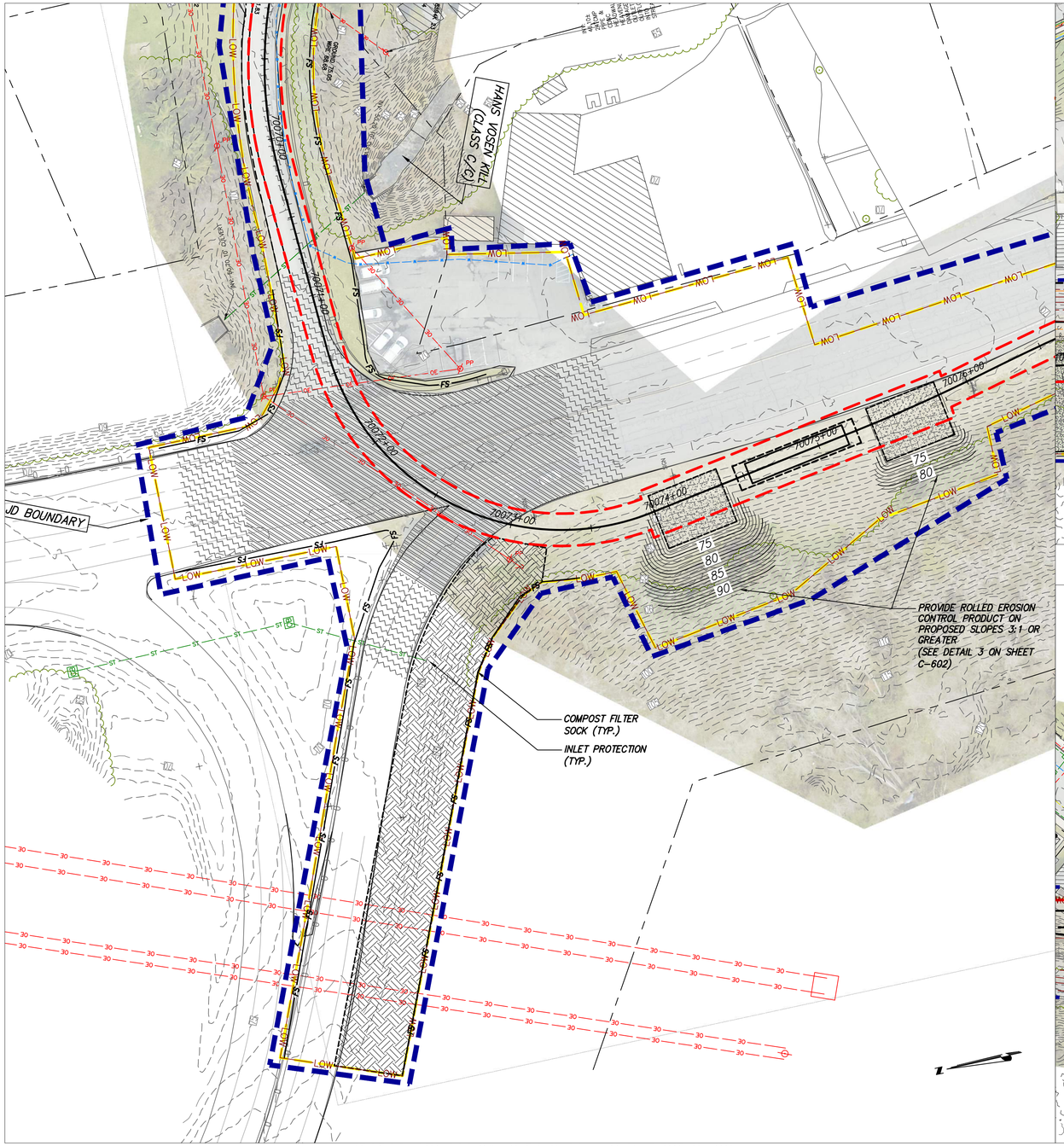
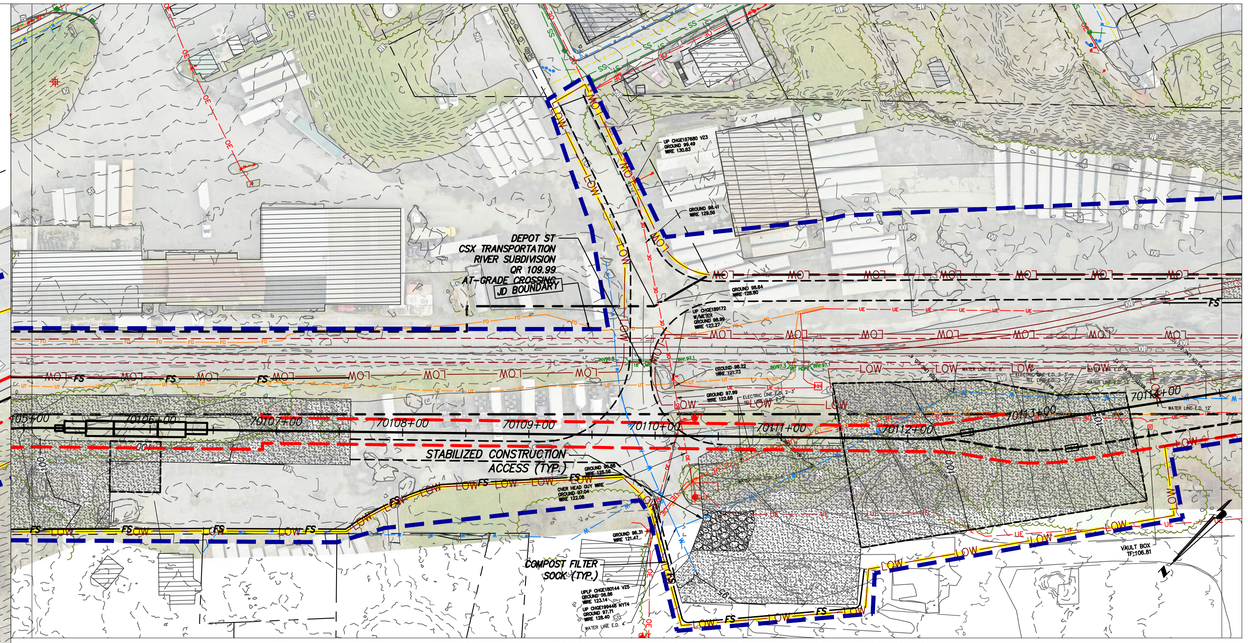
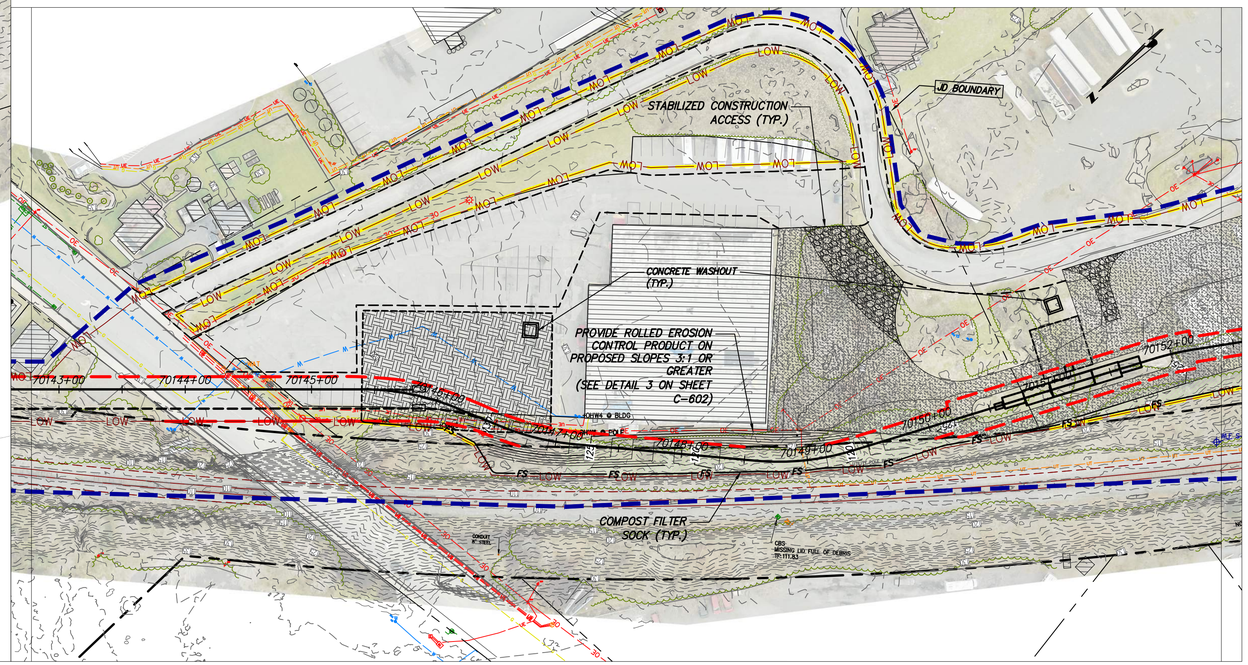


ALLEN STREET ROUTE 9W OPENCUT – STA. 70072+00
SCALE: 1" = 40'



7A–02–RTE – OFF SITE ACCESS OFF DEPOT STREET – STA 70110+00
SCALE: 1" = 60'



7A–04–RTE – OFF SITE ACCESS OFF WEST BRIDGE ST. – STA 70145+00
SCALE: 1" = 60'

CHPE Champlain Hudson Power Express

Kiewit

Engineering and Land Surveying, P.C.

STATE OF NEW YORK · SEAN LENAHAN · 102293 · LICENSED PROFESSIONAL ENGINEER

No.	DATE	SUBMITTAL / REVISION DESCRIPTION	DB	APP
	06/19/2023	ISSUED FOR CONSTRUCTION SUBMISSION	SL	JL

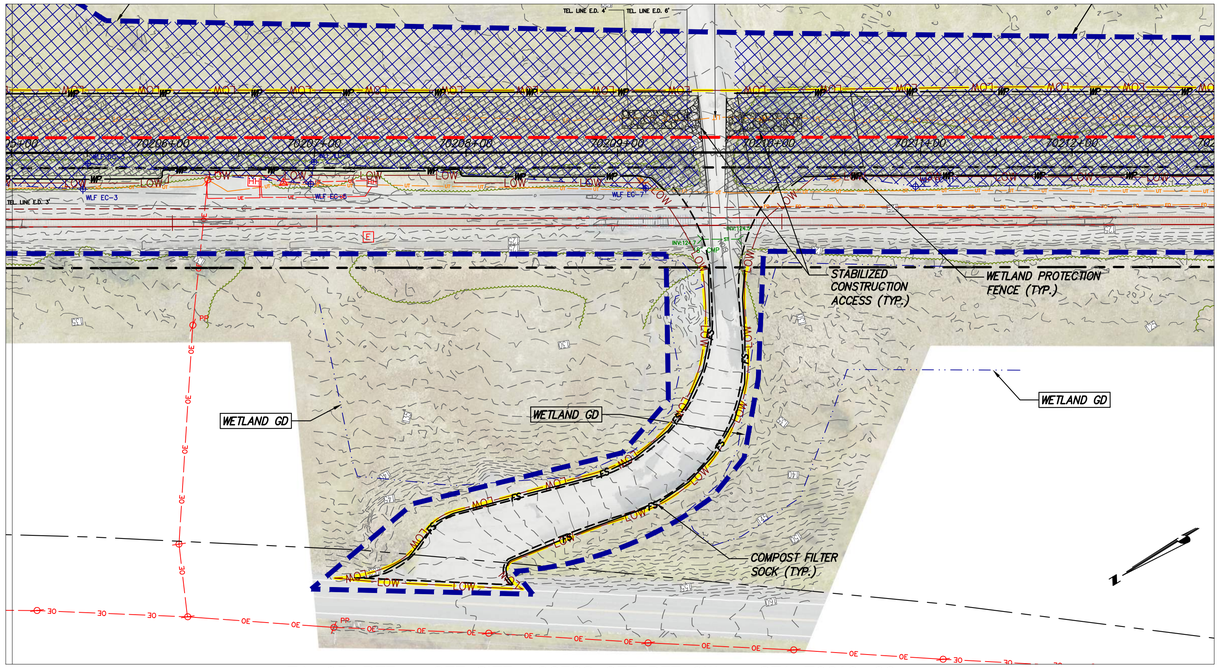
CHAMPLAIN HUDSON POWER EXPRESS

SEGMENT 11 (PACKAGE 7A) - CSX: CATSKILL

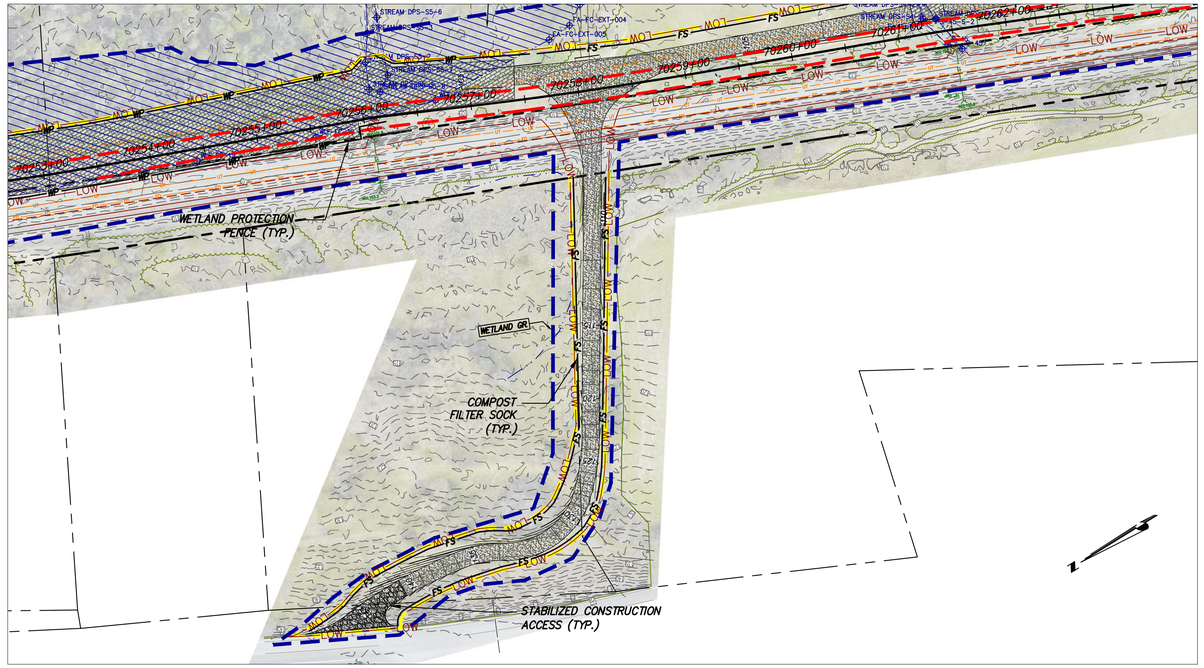
EROSION AND SEDIMENT CONTROL PLAN
OFF SITE ACCESS ROADS (SHEET 1)

KIEWIT PROJECT NO.	21162
KC PROJECT NO.	120174
DRAWING NO.	**C-432**

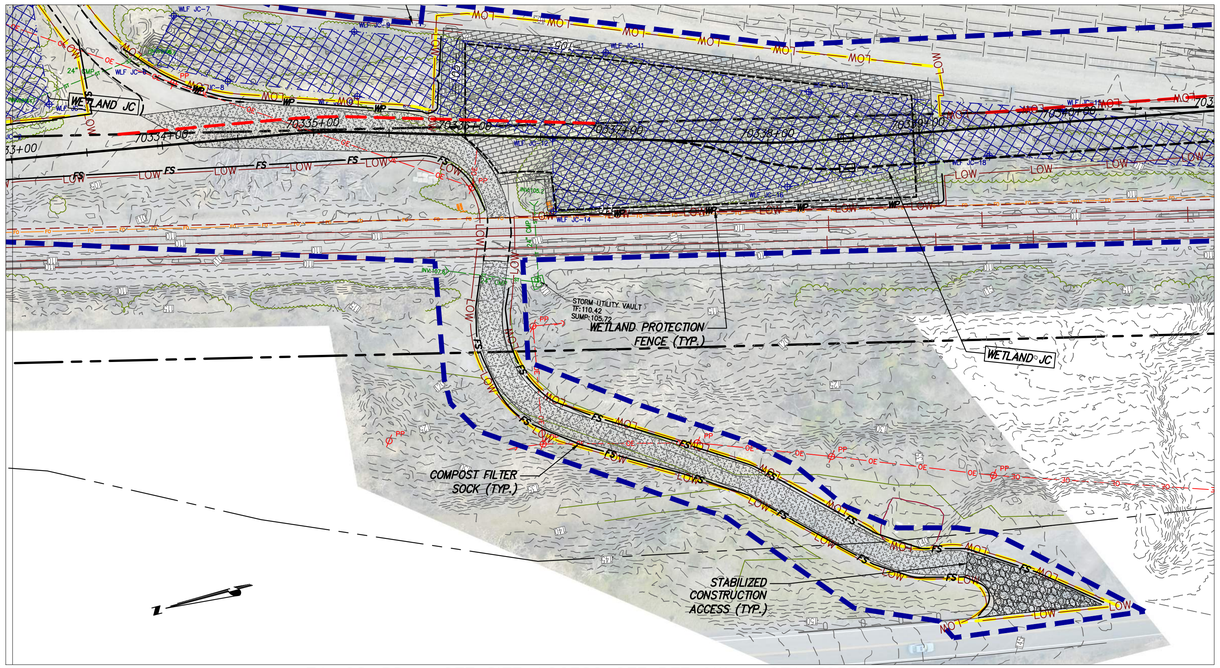
DRAWN BY: BL | DESIGNED BY: SL | APPROVED BY: JL | SCALE AS SHOWN | REV. NO. 0 | DATE 06/19/2023 | SH.NO. OF



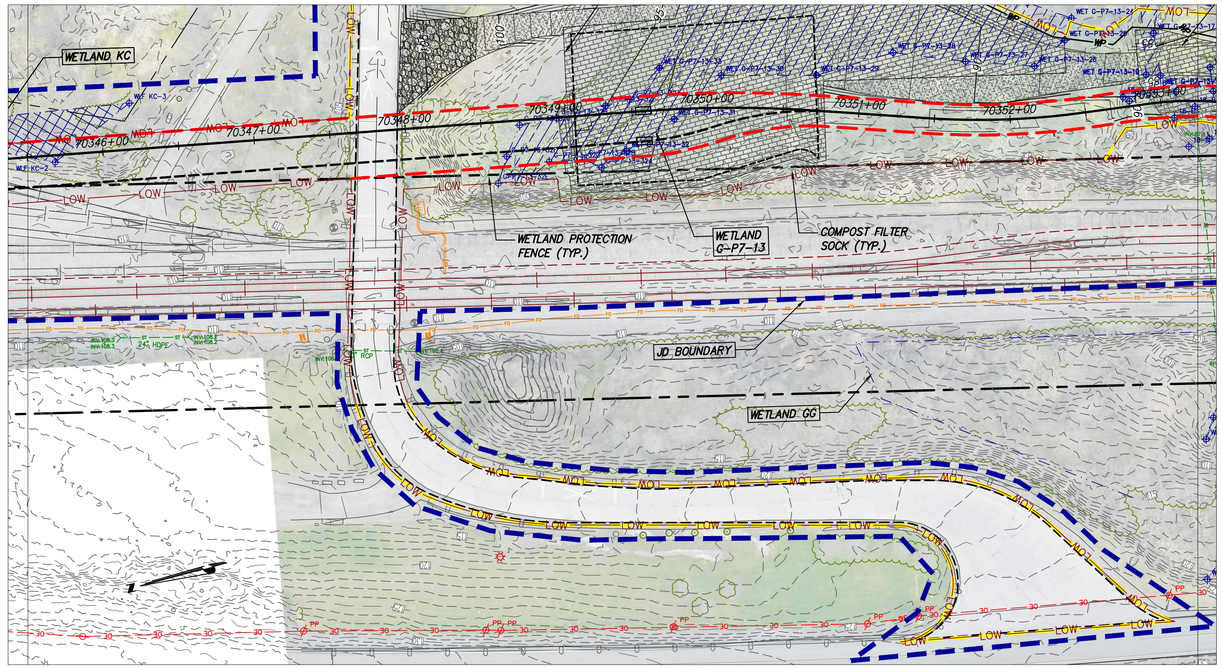
7A-05-RTE – OFF SITE ACCESS OFF RTE 9W. – STA 70210+00
SCALE: 1" = 50'



7A-06-RD – OFF SITE ACCESS OFF RTE 9W. – STA 70258+00
SCALE: 1" = 70'



7A-08-RD – OFF SITE ACCESS OFF RTE 9W. – STA 70337+00
SCALE: 1" = 50'



7A-09-RTE – OFF SITE ACCESS OFF RTE 9W. – STA 70348+00
SCALE: 1" = 50'

CHPE Champlain Hudson Power Express

Kiewit

Engineering and Land Surveying, P.C.

STATE OF NEW YORK · SEAN LENAHAN · 102293 · LICENSED PROFESSIONAL ENGINEER

No.	DATE	SUBMITTAL / REVISION DESCRIPTION	DB	APP
	06/19/2023	ISSUED FOR CONSTRUCTION SUBMISSION	SL	JL

CHAMPLAIN HUDSON POWER EXPRESS

SEGMENT 11 (PACKAGE 7A) - CSX: CATSKILL

EROSION AND SEDIMENT CONTROL PLAN
OFF SITE ACCESS ROADS (SHEET 2)

KIEWIT PROJECT NO.	21162
KC PROJECT NO.	120174
DRAWING NO.	**C-433**

DRAWN BY: BL | DESIGNED BY: SL | APPROVED BY: JL | SCALE AS SHOWN | REV. NO. 0 | DATE 06/19/2023 | SH.NO. OF

File: P:\120174-CHPE_CABLE_INSTALL-KIEWIT\60_CAD\20_ENGINEERING_CAD_FILES\PACKAGE_7A\NY_ENVIRONMENTAL_(EROSION_CONTROL)\01_ACE\SHEET_FILES\21162_7A_C_432-433.DWG Saved: 6/20/2023 1:23:04 PM Plotted: 6/20/2023 1:27:55 PM Current User: Benson Lam LastSavedBy: blam

Appendix M Temporary Drainage Report

Champlain Hudson Power

Segment 11 (Packages 7A)

Temporary Drainage Analysis

Catskill, NY

KC Engineering Project Number: 120174

Prepared for:

Transmission
Developers Inc. 1301
Avenue of the Americas, 26th
Floor
New York, NY 10019

Prepared by:

KC Engineering and Land Surveying ,P.C.
7 Penn Plaza, Suite 1604
New York 10001

June 2023

Table of Contents:

Appendices:

- Appendix A – Project Location Map
- Appendix B – Drainage Feature Model Input Data and Analysis
- Appendix C – NRCS Soil Survey Map
- Appendix D – NYSDOT Highway Design Manual Exhibits
- Appendix E – Streamstats Reports

Project Description:

The proposed Champlain Hudson Power Express (CHPE) project involves the construction of ±339 miles of high voltage direct current underground and underwater transmission line from Montreal, Canada to Queens, New York. It will bring 1,250 megawatts of hydropower to replace the use of fossil fuel, reduce carbon emission, and to help achieve clean renewable energy by the year 2025.

The proposed +/- 16.29 miles of upland cable installation for Segments 11 (Package 7A) begins and ends in Catskill, NY Refer to Appendix A for the Project Location Map. Proposed work consists of installing two 8-inch-diameter PVC casings. All trenching activities and directional drilling work will be located within public roadway and railroad Right-Of-Ways (ROWs). All temporary construction storage and staging areas will also be accomplished within the grounds of the existing ROWs or agreement with private landowners.

Limits of proposed disturbances and restoration areas are identified on the plans and reference site specific details regarding the required restoration. Once the construction activity is completed, all disturbed grounds will be topsoiled, seeded, and stabilized. The proposed grading of the roads and side slopes on site will have minimal ground disturbance to the greatest extent practical while maintaining existing drainage patterns.

Background:

The following report details the temporary drainage and hydraulic analysis prepared for Champlain Hudson Power Express Segment 11 (Package 7A) located within Catskill.

The purpose of this report is to identify the areas where temporary swales or temporary culverts will be required in order to maintain existing flow patterns and to avoid any additional runoff entering onto private properties and railroads along the project limit during construction. All procedures related to dewatering methods are described in Section 4.3.2 of the Environmental Management and Construction Plan (EM&CP) and Spill Prevention Control & Countermeasures Plan (SPCC) in Appendix K of the EM&CP.

Backup calculations have been prepared and are provided within Appendix B of this report that demonstrate the temporary swales and culverts have been sized appropriately during the duration of the project. All temporary drainage practices will be removed in final conditions and the site will be restored to pre-construction conditions.

Project Soils:

A variety of soil types are present within the project limits, See detail in Appendix C for the NRCS soils map within the project area.

Field Observations/ Research:

A combination of survey base mapping and google street view were utilized to confirm record plan information to the greatest extent possible. Location of the proposed temporary swales and culverts were delineated from base mapping based on existing & proposed temporary grading. The basis for temporary swales and culverts is to avoid additional flow from entering onto private properties and railroad as well as maintain existing flow patterns during construction.

Hydrology:

Drainage basins were delineated based on the existing ground survey provided. The hydrological analysis method used for peak flow analysis is Rational Method, because of the size of all contributing basins being smaller than 80 hectares (197 acres). The Rational Method predicts peak flows based on the rainfall intensity and the contributing drainage area. Runoff coefficients(C) used were consistent with New York State Department of Transportation (NYSDOT) Highway Design Manual (HDM) Exhibit 8-4. The times of concentration were based on NYSDOT guidelines, and a minimum time of concentration of 6 minutes was used. A 2-year design storm frequency was selected for the culverts and the ditches in accordance with HDM Exhibit 8-3. The exception to this is swales within the CSX right of way, in these cases a 25 year design storm was used.

The rainfall intensity (I) was calculated from the NOAA Atlas 14 precipitation frequency estimates.

Based on the Rational Method, total runoff from the system was calculated using Q = CIA (ft3/s). A combination of the U.S. Department of Transportation Federal Highway Administration's HY-8 Culvert Hydraulic Analysis Program and Hydraulic Toolbox were used to develop peak flows.

The storm event analysis output files for HydroCAD and HY-8 models are attached in Appendix B. The proposed temporary drainage was designed to meet NYSDOT Highway Design Manual Chapter 8 requirements.

In some cases, pipe sizes were selected based on the pipes upstream and downstream of the crossing.

Summary of Drainage:

A summary of the temporary swales and culverts that will be utilized in Package 7A are shown on the following sheets. All temporary swales will be V-shaped with 3:1 side slopes. The minimum depth of the temporary swales is 1'. Temporary check dams will be installed within the temporary swales in accordance with New York State Standards and Specifications for Erosion and Sediment Control.

TABLE 1 - STORMWATER SUMMARY

ID	Location		Type of Drainage	Length	Pipe Diameter/Swale Side Slope	Flow Depth (ft)	Material	Storm	Tributary Area	Flow cfs
	Start	End								
404-1	70047+00	70044+50	V-Shaped Swale	265	3:1	.24	Earth	2	31860	0.62
404-2	70047+00	70049+00	V-Shaped Swale	165	3:1	.31	Earth	2	44148	1.21
404-3	70051+00	70049+50	V-Shaped Swale	190	3:1	.24	Earth	2	24285	0.47
405-1	70051+00	70056+00	V-Shaped Swale	540	3:1	.4	Earth	2	85823	1.74
405-2	70057+50	70056+00	V-Shaped Swale	140	3:1	.32	Earth	2	54014	1.06
405-3	70057+50	70059+50	V-Shaped Swale	200	3:1	.2	Earth	2	19227	0.38
405-C1	70056+00	70056+00	Culvert	45	18"	.26	HDPE	2	139837	2.55
406-C1	70085+00	70085+50	Culvert	32	2 x 18"	*	HDPE	*	*	*
409-C1	70134+00	70133+50	Culvert	40	2 x 36"	.26	HDPE	2	53000000**	7.96**
409-1	70130+25	70133+75	V-Shaped Swale	340	3:1	.29	Earth	2	22492	0.7
411-1	70154+50	70157+60	V-Shaped Swale	300	3:1	.28	Earth	2	55747	1.22
411-2	70163+50	70162+00	V-Shaped Swale	140	3:1	.25	Earth	2	27257	0.81
411-C1	70162+00	70163+00	Culvert	90	24"	1.24	HDPE	2	4181760**	9.85**
412-1	70168+00	70166+00	V-Shaped Swale	165	3:1	.21	Earth	2	26235	0.68
412-C1	70166+00	70166+00	Culvert	45	30"	*	HDPE	*	*	*

ID	Location		Type of Drainage	Length	Pipe Diameter/Swale Side Slope	Flow Depth (ft)	Material	Storm	Tributary Area	Flow cfs
	Start	End								
412-2	70166+40	70167+25	V-Shaped Swale	85	3:1	.12	Earth	2	4954	0.19
415-1	70224+30	70226+25	V-Shaped Swale	265	3:1	.3	Earth	2	32808	1.62
415-C1	70223+50	70224+00	Culvert	50	18"	*	HDPE	2	*	*
416-1	70233+00	70229+25	V-Shaped Swale	390	3:1	.64	Earth	25	54911	9.72
416-C1	70229+00	70229+00	Culvert	40	24"	*	HDPE	2	*	*
418-C1	70256+00	70256+00	Culvert	61	18"	*	HDPE	2	*	*
418-1	70261+25	70259+25	V-Shaped Swale	200	3:1	.26	Earth	2	12392	0.42
418-2	70264+50	70261+50	V-Shaped Swale	295	3:1	.26	Earth	2	17896	0.6
423-C1	70329+50	70329+50	Culvert	91	24"	.6	HDPE	2	30945000**	14.3**
423-C2	70336+50	70336+00	Culvert	90	24"	*	HDPE	*	*	*
424-C1	70353+50	70353+00	Culvert	65	2 x 24"	*	HDPE	*	*	*
427-1	70404+50	70405+50	V-Shaped Swale	100	3:1	.16	Earth	2	7396	0.37
427-C1	70403+75	70403+75	Culvert	70	18"	.13	HDPE	2	20254	0.63
428-C1	70405+50	70405+50	Culvert	73	24"	*	HDPE	2	*	*
428-1	70408+00	70405+50	V-Shaped Swale	220	3:1	.16	Earth	2	9200	0.34
428-2	70409+00	70414+00	V-Shaped Swale	510	3:1	.27	Earth	2	41602	0.91
428-5	70417+00	70414+00	V-Shaped Swale	200	3:1	.26	Earth	2	20390	0.77

ID	Location		Type of Drainage	Length	Pipe Diameter/Swale Side Slope	Flow Depth (ft)	Material	Storm	Tributary Area	Flow cfs
	Start	End								
428-6	70404+50	70405+50	V-Shaped Swale	100	3:1	.2	Earth	2	21428	0.61
428-7	70407+50	70405+50	V-Shaped Swale	200	3:1	.22	Earth	2	25274	0.67
428-C2	70416+50	70417+50	Culvert	90	18"	.12	HDPE	2	9787	0.42
430-1	70440+50	70442+00	V-Shaped Swale	150	3:1	.13	Earth	2	12249	0.24
430-2	70442+00	70447+00	V-Shaped Swale	480	3:1	.2	Earth	2	26153	0.51

***Culvert size chosen based on immediately preceding and/or succeeding culverts.**
****Flow and contributing drainage area estimated using Streamstats, see Appendix F.**

References:

Highway Design Manual, Chapter 8, NYSDOT, 50 Wolf Road, Albany, NY 12232.

https://www.dot.ny.gov/divisions/engineering/design/dqab/hdm/chapter-8

Standard Specifications, Construction and Materials, NYSDOT, 50 Wolf Road, Albany, NY 12232.

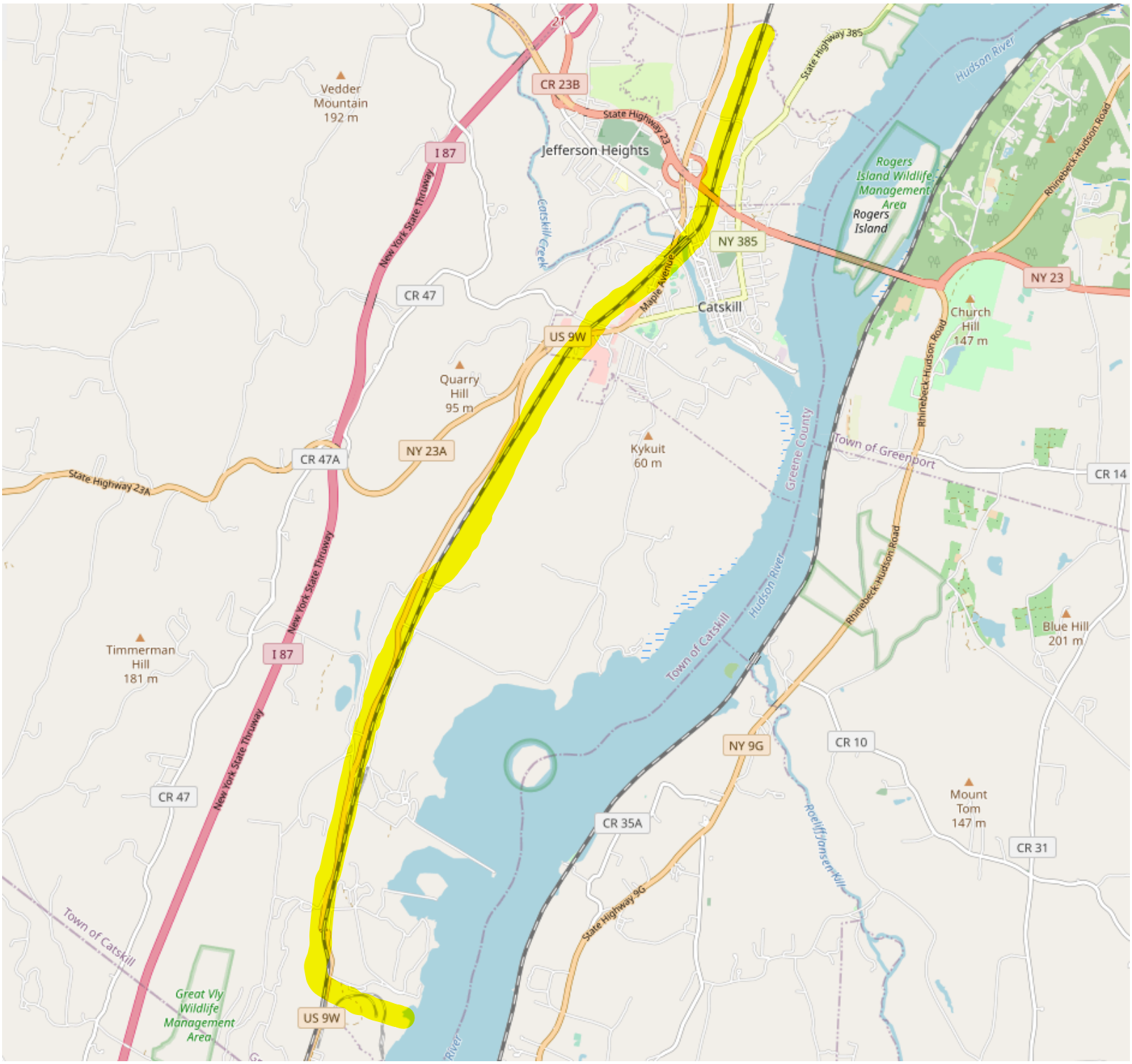
https://www.dot.ny.gov/main/business-center/engineering/specifications

Hydraulic Engineering Circular No. 22, 2nd Edition, Urban Drainage Design Manual, August 2001, FHWA

APPENDIX A

PROJECT LOCATION MAP

CHAIMPLAIN HUDSON POWER EXPRESS
SEGMENT 11, PACKAGE 7A
LOCATION MAP



APPENDIX B

DRAINAGE FEATURE MODEL INPUT DATA AND ANALYSIS

Time span=0.00-3.00 hrs, dt=0.01 hrs, 301 points
Runoff by Rational method, Rise/Fall=1.0/1.0 xTc
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment428-C2: 428-C2 Runoff Area=9,787 sf 43.37% Impervious Runoff Depth=0.16"
Tc=6.0 min C=0.55 Runoff=0.42 cfs 0.003 af

SubcatchmentC-427: C-427 Runoff Area=20,254 sf 15.45% Impervious Runoff Depth=0.12"
Tc=6.0 min C=0.40 Runoff=0.63 cfs 0.005 af

SubcatchmentDA403-3: 404-3 Runoff Area=24,285 sf 0.00% Impervious Runoff Depth=0.07"
Tc=6.0 min C=0.25 Runoff=0.47 cfs 0.003 af

SubcatchmentDA404-1: 404-1 Runoff Area=31,860 sf 0.00% Impervious Runoff Depth=0.07"
Tc=6.0 min C=0.25 Runoff=0.62 cfs 0.004 af

SubcatchmentDA404-2: 404-2 Runoff Area=44,148 sf 0.00% Impervious Runoff Depth=0.10"
Tc=6.0 min C=0.35 Runoff=1.21 cfs 0.009 af

SubcatchmentDA405-1: 405-1 Runoff Area=85,823 sf 0.00% Impervious Runoff Depth=0.08"
Tc=6.0 min C=0.26 Runoff=1.74 cfs 0.012 af

SubcatchmentDA405-2: 405-2 Runoff Area=54,014 sf 0.00% Impervious Runoff Depth=0.07"
Tc=6.0 min C=0.25 Runoff=1.06 cfs 0.008 af

SubcatchmentDA405-3: 405-3 Runoff Area=19,227 sf 0.00% Impervious Runoff Depth=0.07"
Tc=6.0 min C=0.25 Runoff=0.38 cfs 0.003 af

SubcatchmentDA405-5: 405-5 Runoff Area=8,252 sf 0.00% Impervious Runoff Depth=0.13"
Tc=6.0 min C=0.46 Runoff=0.30 cfs 0.002 af

SubcatchmentDA409-1: 409-1 Runoff Area=22,492 sf 0.00% Impervious Runoff Depth=0.12"
Tc=6.0 min C=0.40 Runoff=0.70 cfs 0.005 af

SubcatchmentDA411-1: 411-1 Runoff Area=55,747 sf 0.90% Impervious Runoff Depth=0.08"
Tc=6.0 min C=0.28 Runoff=1.22 cfs 0.009 af

SubcatchmentDA411-2: 411-2 Runoff Area=27,257 sf 0.00% Impervious Runoff Depth=0.11"
Tc=6.0 min C=0.38 Runoff=0.81 cfs 0.006 af

SubcatchmentDA412-1: 412-1 Runoff Area=26,235 sf 0.00% Impervious Runoff Depth=0.10"
Tc=6.0 min C=0.33 Runoff=0.68 cfs 0.005 af

SubcatchmentDA412-2: 412-2 Runoff Area=4,954 sf 0.00% Impervious Runoff Depth=0.14"
Tc=6.0 min C=0.48 Runoff=0.19 cfs 0.001 af

SubcatchmentDA413-1: 413-1 Runoff Area=9,442 sf 0.00% Impervious Runoff Depth=0.10"
Tc=6.0 min C=0.35 Runoff=0.26 cfs 0.002 af

SubcatchmentDA415-1: 415-1 Runoff Area=32,808 sf 0.00% Impervious Runoff Depth=0.18"
Tc=6.0 min C=0.63 Runoff=1.62 cfs 0.012 af

SubcatchmentDA418-1: 418-1 Runoff Area=12,392 sf 0.00% Impervious Runoff Depth=0.13"
Tc=6.0 min C=0.43 Runoff=0.42 cfs 0.003 af

SubcatchmentDA418-2: 418-2 Runoff Area=17,896 sf 0.00% Impervious Runoff Depth=0.13"
Tc=6.0 min C=0.43 Runoff=0.60 cfs 0.004 af

SubcatchmentDA427-1: 427-1 Runoff Area=7,396 sf 0.00% Impervious Runoff Depth=0.19"
Tc=6.0 min C=0.64 Runoff=0.37 cfs 0.003 af

SubcatchmentDA428-1: 428-1 Runoff Area=9,200 sf 31.63% Impervious Runoff Depth=0.14"
Tc=6.0 min C=0.47 Runoff=0.34 cfs 0.002 af

SubcatchmentDA428-2: 428-2 Runoff Area=41,602 sf 0.00% Impervious Runoff Depth=0.08"
Tc=6.0 min C=0.28 Runoff=0.91 cfs 0.006 af

SubcatchmentDA428-5: 428-5 Runoff Area=20,390 sf 32.35% Impervious Runoff Depth=0.14"
Tc=6.0 min C=0.48 Runoff=0.77 cfs 0.005 af

SubcatchmentDA428-6: 428-6 Runoff Area=21,248 sf 17.61% Impervious Runoff Depth=0.11"
Tc=6.0 min C=0.37 Runoff=0.61 cfs 0.004 af

SubcatchmentDA428-7: 428-7 Runoff Area=25,274 sf 12.70% Impervious Runoff Depth=0.10"
Tc=6.0 min C=0.34 Runoff=0.67 cfs 0.005 af

SubcatchmentDA430-1: 430-1 Runoff Area=12,249 sf 0.00% Impervious Runoff Depth=0.07"
Tc=6.0 min C=0.25 Runoff=0.24 cfs 0.002 af

SubcatchmentDA430-2: 430-2 Runoff Area=26,153 sf 0.00% Impervious Runoff Depth=0.07"
Tc=6.0 min C=0.25 Runoff=0.51 cfs 0.004 af

Reach C405-1: Culvert 405-1 Inflow=2.55 cfs 0.020 af
Outflow=2.55 cfs 0.020 af

Reach S404-1: 404-1 Avg. Flow Depth=0.24' Max Vel=3.46 fps Inflow=0.62 cfs 0.004 af
n=0.022 L=165.0' S=0.0485 '/' Capacity=27.14 cfs Outflow=0.58 cfs 0.004 af

Reach S404-2: 404-2 Avg. Flow Depth=0.31' Max Vel=4.10 fps Inflow=1.21 cfs 0.009 af
n=0.022 L=165.0' S=0.0485 '/' Capacity=27.14 cfs Outflow=1.14 cfs 0.009 af

Reach S404-3: 404-3 Avg. Flow Depth=0.24' Max Vel=2.32 fps Inflow=0.47 cfs 0.003 af
n=0.022 L=190.0' S=0.0211 '/' Capacity=113.55 cfs Outflow=0.41 cfs 0.003 af

Reach S405-1: 405-1 Avg. Flow Depth=0.40' Max Vel=3.26 fps Inflow=1.74 cfs 0.012 af
n=0.022 L=190.0' S=0.0211 '/' Capacity=113.55 cfs Outflow=1.58 cfs 0.012 af

Reach S405-2: 405-2 Avg. Flow Depth=0.32' Max Vel=3.25 fps Inflow=1.06 cfs 0.008 af
n=0.022 L=140.0' S=0.0286 '/' Capacity=132.28 cfs Outflow=0.99 cfs 0.008 af

Reach S405-3: 405-3 Avg. Flow Depth=0.20' Max Vel=2.66 fps Inflow=0.38 cfs 0.003 af
n=0.022 L=200.0' S=0.0350 '/' Capacity=23.06 cfs Outflow=0.33 cfs 0.003 af

Reach S405-5: 405-5 Avg. Flow Depth=0.14' Max Vel=4.77 fps Inflow=0.30 cfs 0.002 af
n=0.022 L=105.0' S=0.1810 '/' Capacity=332.89 cfs Outflow=0.28 cfs 0.002 af

Reach S409-1: 409-1 Avg. Flow Depth=0.29' Max Vel=1.96 fps Inflow=0.70 cfs 0.005 af
n=0.022 L=340.0' S=0.0118 '/' Capacity=84.88 cfs Outflow=0.49 cfs 0.005 af

Reach S411-1: 411-1 Avg. Flow Depth=0.28' Max Vel=4.82 fps Inflow=1.22 cfs 0.009 af
n=0.022 L=300.0' S=0.0767 '/' Capacity=216.68 cfs Outflow=1.10 cfs 0.009 af

Reach S411-2: 411-2 Avg. Flow Depth=0.25' Max Vel=4.31 fps Inflow=0.81 cfs 0.006 af
n=0.022 L=140.0' S=0.0714 '/' Capacity=209.15 cfs Outflow=0.78 cfs 0.006 af

Reach S412-1: 412-1 Avg. Flow Depth=0.21' Max Vel=5.12 fps Inflow=0.68 cfs 0.005 af
n=0.022 L=165.0' S=0.1273 '/' Capacity=43.97 cfs Outflow=0.65 cfs 0.005 af

Reach S412-2: 412-2 Avg. Flow Depth=0.12' Max Vel=4.50 fps Inflow=0.19 cfs 0.001 af
n=0.022 L=85.0' S=0.2118 '/' Capacity=56.72 cfs Outflow=0.18 cfs 0.001 af

Reach S413-1: 413-1 Avg. Flow Depth=0.19' Max Vel=2.05 fps Inflow=0.26 cfs 0.002 af
n=0.022 L=175.0' S=0.0229 '/' Capacity=18.63 cfs Outflow=0.22 cfs 0.002 af

Reach S415-1: 415-1 Avg. Flow Depth=0.30' Max Vel=5.64 fps Inflow=1.62 cfs 0.012 af
n=0.022 L=265.0' S=0.0943 '/' Capacity=240.37 cfs Outflow=1.49 cfs 0.012 af

Reach S418-1: 418-1 Avg. Flow Depth=0.26' Max Vel=1.66 fps Inflow=0.42 cfs 0.003 af
n=0.022 L=200.0' S=0.0100 '/' Capacity=78.26 cfs Outflow=0.33 cfs 0.003 af

Reach S418-2: 418-2 Avg. Flow Depth=0.26' Max Vel=2.37 fps Inflow=0.60 cfs 0.004 af
n=0.022 L=295.0' S=0.0203 '/' Capacity=111.61 cfs Outflow=0.47 cfs 0.004 af

Reach S427-1: 427-1 Avg. Flow Depth=0.16' Max Vel=4.69 fps Inflow=0.37 cfs 0.003 af
n=0.022 L=100.0' S=0.1500 '/' Capacity=303.09 cfs Outflow=0.36 cfs 0.003 af

Reach S428-1: 428-1 Avg. Flow Depth=0.16' Max Vel=4.33 fps Inflow=0.34 cfs 0.002 af
n=0.022 L=220.0' S=0.1318 '/' Capacity=284.13 cfs Outflow=0.31 cfs 0.002 af

Reach S428-2: 428-2 Avg. Flow Depth=0.27' Max Vel=3.02 fps Inflow=0.91 cfs 0.006 af
n=0.022 L=510.0' S=0.0314 '/' Capacity=138.61 cfs Outflow=0.64 cfs 0.006 af

Reach S428-5: 428-5 Avg. Flow Depth=0.26' Max Vel=3.37 fps Inflow=0.77 cfs 0.005 af
n=0.022 L=200.0' S=0.0400 '/' Capacity=156.51 cfs Outflow=0.69 cfs 0.005 af

Reach S428-6: 428-6 Avg. Flow Depth=0.20' Max Vel=5.20 fps Inflow=0.61 cfs 0.004 af
n=0.022 L=100.0' S=0.1400 '/' Capacity=292.81 cfs Outflow=0.59 cfs 0.004 af

Reach S428-7: 428-7 Avg. Flow Depth=0.22' Max Vel=4.46 fps Inflow=0.67 cfs 0.005 af
n=0.022 L=200.0' S=0.0900 '/' Capacity=234.77 cfs Outflow=0.63 cfs 0.005 af

Reach S430-1: 430-1 Avg. Flow Depth=0.13' Max Vel=4.44 fps Inflow=0.24 cfs 0.002 af
n=0.022 L=150.0' S=0.1733 '/' Capacity=325.81 cfs Outflow=0.23 cfs 0.002 af

Reach S430-2: 430-2 Avg. Flow Depth=0.20' Max Vel=3.19 fps Inflow=0.51 cfs 0.004 af
n=0.022 L=480.0' S=0.0521 '/' Capacity=178.60 cfs Outflow=0.38 cfs 0.004 af

Total Runoff Area = 15.390 ac Runoff Volume = 0.126 af Average Runoff Depth = 0.10"
96.37% Pervious = 14.831 ac 3.63% Impervious = 0.559 ac

Time span=0.00-3.00 hrs, dt=0.01 hrs, 301 points
Runoff by Rational method, Rise/Fall=1.0/1.0 xTc
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment DA416-1: 416-1 Runoff Area=54,911 sf 0.00% Impervious Runoff Depth=0.32"
Tc=6.0 min C=0.70 Runoff=4.72 cfs 0.034 af

Reach CULV-17: 17-C Avg. Flow Depth=0.36' Max Vel=15.14 fps Inflow=5.00 cfs 1.244 af
18.0" Round Pipe n=0.012 L=60.0' S=0.1167 '/' Capacity=38.87 cfs Outflow=5.00 cfs 1.238 af

Reach S416-1: 416-1 Avg. Flow Depth=0.64' Max Vel=7.59 fps Inflow=9.72 cfs 1.272 af
n=0.022 L=390.0' S=0.0615 '/' Capacity=30.57 cfs Outflow=9.34 cfs 1.259 af

Total Runoff Area = 1.261 ac Runoff Volume = 0.034 af Average Runoff Depth = 0.32"
100.00% Pervious = 1.261 ac 0.00% Impervious = 0.000 ac

HY-8 Culvert Analysis Report

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0.00 cfs

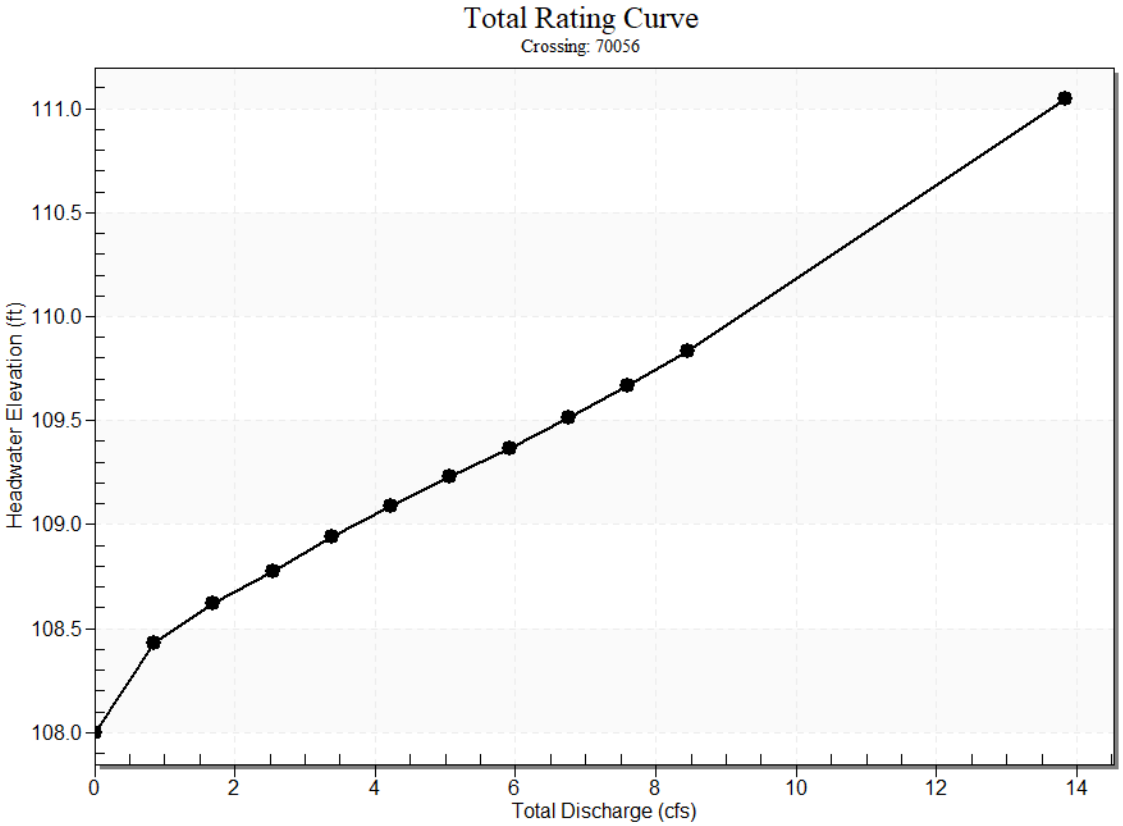
Design Flow: 2.55 cfs

Maximum Flow: 8.45 cfs

Table 1 - Summary of Culvert Flows at Crossing: 70056

Headwater Elevation (ft)	Total Discharge (cfs)	405-C1 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
108.00	0.00	0.00	0.00	1
108.43	0.84	0.84	0.00	1
108.62	1.69	1.69	0.00	1
108.78	2.55	2.55	0.00	1
108.94	3.38	3.38	0.00	1
109.09	4.22	4.22	0.00	1
109.23	5.07	5.07	0.00	1
109.37	5.92	5.92	0.00	1
109.51	6.76	6.76	0.00	1
109.67	7.60	7.60	0.00	1
109.83	8.45	8.45	0.00	1
111.00	12.82	12.82	0.00	Overtopping

Rating Curve Plot for Crossing: 70056



Culvert Data: 405-C1

Table 1 - Culvert Summary Table: 405-C1

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00 cfs	0.00 cfs	108.00	0.00	0.000	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
0.84 cfs	0.84 cfs	108.43	0.43	0.0*	1-S2n	0.15	0.34	0.15	0.11	8.80	0.77
1.69 cfs	1.69 cfs	108.62	0.62	0.0*	1-S2n	0.21	0.49	0.21	0.16	10.86	1.00
2.55 cfs	2.55 cfs	108.78	0.78	0.0*	1-S2n	0.26	0.60	0.26	0.21	12.25	1.17
3.38	3.38	108.94	0.94	0.0*	1-	0.30	0.70	0.3	0.24	12.7	1.30

cfs	cfs				S2 n			1		2	
4.22 cfs	4.22 cfs	109.09	1.09	0.0*	1-S2 n	0.34	0.79	0.36	0.28	13.11	1.41
5.07 cfs	5.07 cfs	109.23	1.23	0.0*	1-S2 n	0.37	0.87	0.40	0.31	13.48	1.51
5.92 cfs	5.92 cfs	109.37	1.37	0.0*	1-S2 n	0.40	0.94	0.43	0.34	13.99	1.59
6.76 cfs	6.76 cfs	109.51	1.51	0.0*	5-S2 n	0.43	1.01	0.43	0.37	16.25	1.67
7.60 cfs	7.60 cfs	109.67	1.67	0.0*	5-S2 n	0.45	1.07	0.49	0.39	14.96	1.74
8.45 cfs	8.45 cfs	109.83	1.83	0.0*	5-S2 n	0.48	1.13	0.52	0.42	15.42	1.81

* Full Flow Headwater elevation is below inlet invert.

Culvert Barrel Data

Culvert Barrel Type Straight Culvert

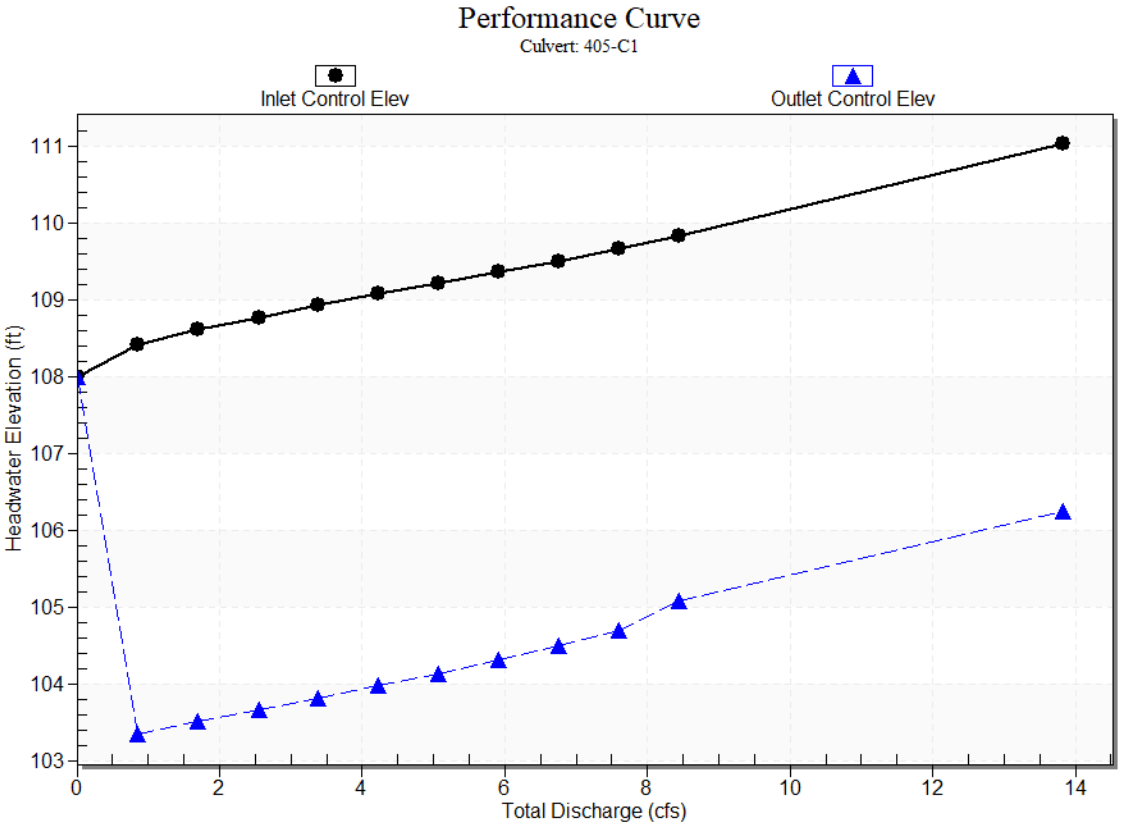
Inlet Elevation (invert): 108.00 ft,

Outlet Elevation (invert): 103.00 ft

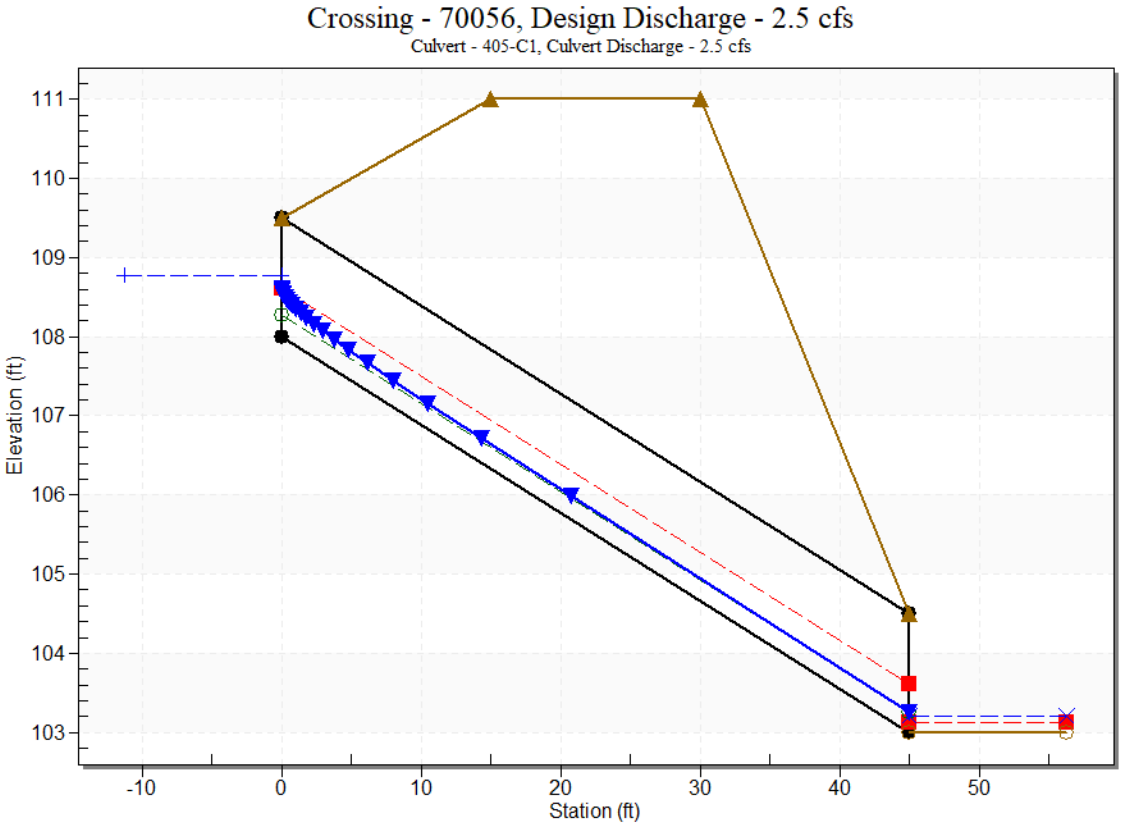
Culvert Length: 45.28 ft,

Culvert Slope: 0.1111

Culvert Performance Curve Plot: 405-C1



Water Surface Profile Plot for Culvert: 405-C1



Site Data - 405-C1

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 108.00 ft

Outlet Station: 45.00 ft

Outlet Elevation: 103.00 ft

Number of Barrels: 1

Culvert Data Summary - 405-C1

Barrel Shape: Circular

Barrel Diameter: 1.50 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall (Ke=0.5)

Inlet Depression: None

Tailwater Data for Crossing: 70056

Table 2 - Downstream Channel Rating Curve (Crossing: 70056)

Flow (cfs)	Water Surface Elev (ft)	Velocity (ft/s)	Depth (ft)	Shear (psf)	Froude Number
0.00	103.00	0.00	0.00	0.00	0.00
0.84	103.11	0.11	0.77	0.03	0.42
1.69	103.16	0.16	1.00	0.05	0.45
2.55	103.21	0.21	1.17	0.06	0.47
3.38	103.24	0.24	1.30	0.08	0.48
4.22	103.28	0.28	1.41	0.09	0.49
5.07	103.31	0.31	1.51	0.10	0.50
5.92	103.34	0.34	1.59	0.11	0.50
6.76	103.37	0.37	1.67	0.11	0.51
7.60	103.39	0.39	1.74	0.12	0.52
8.45	103.42	0.42	1.81	0.13	0.52

Tailwater Channel Data - 70056

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 10.00 ft

Side Slope (H:V): 3.00 (_:1)

Channel Slope: 0.0050

Channel Manning's n: 0.0300

Channel Invert Elevation: 103.00 ft

Roadway Data for Crossing: 70056

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 30.00 ft

Crest Elevation: 111.00 ft

Roadway Surface: Paved

Roadway Top Width: 15.00 ft

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0.00 cfs

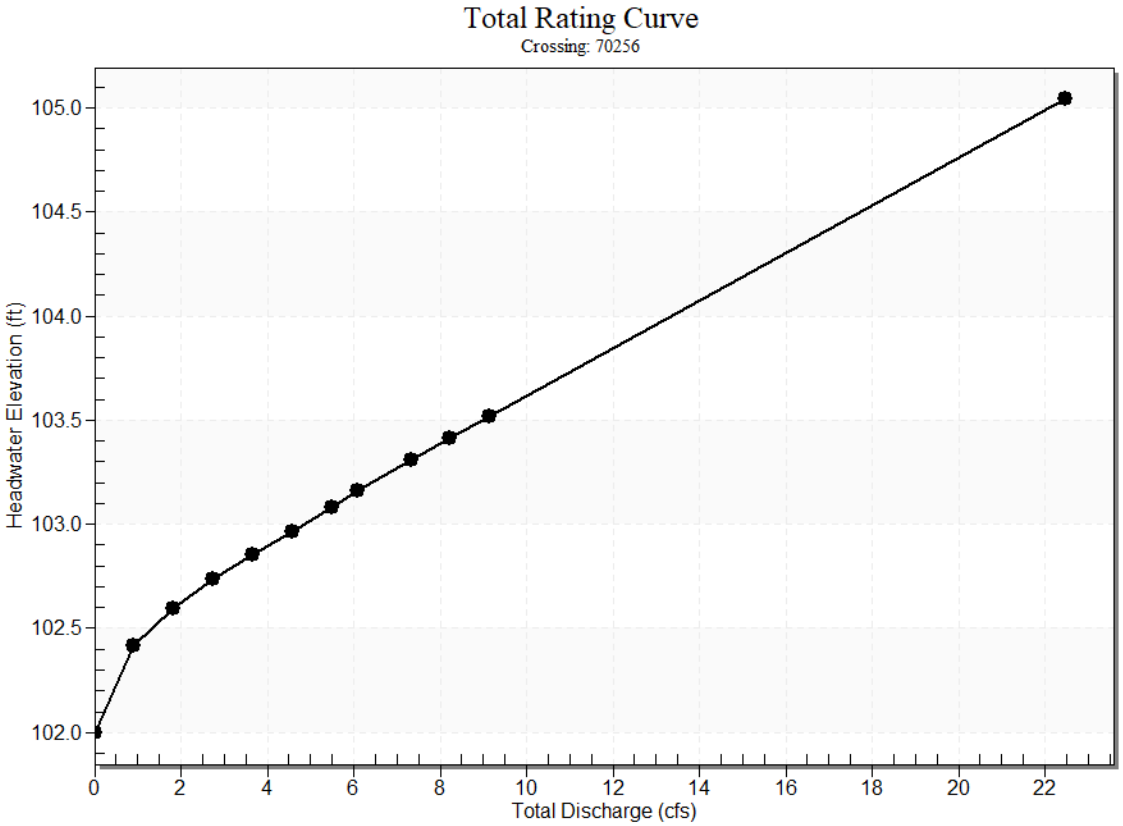
Design Flow: 6.10 cfs

Maximum Flow: 9.15 cfs

Table 3 - Summary of Culvert Flows at Crossing: 70256

Headwater Elevation (ft)	Total Discharge (cfs)	418-C1 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
102.00	0.00	0.00	0.00	1
102.42	0.92	0.92	0.00	1
102.59	1.83	1.83	0.00	1
102.73	2.75	2.75	0.00	1
102.86	3.66	3.66	0.00	1
102.96	4.58	4.58	0.00	1
103.08	5.49	5.49	0.00	1
103.16	6.10	6.10	0.00	1
103.31	7.32	7.32	0.00	1
103.42	8.23	8.23	0.00	1
103.52	9.15	9.15	0.00	1
105.00	20.97	20.97	0.00	Overtopping

Rating Curve Plot for Crossing: 70256



Culvert Data: 418-C1

Table 2 - Culvert Summary Table: 418-C1

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00 cfs	0.00 cfs	102.00	0.00	0.000	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
0.92 cfs	0.92 cfs	102.42	0.42	0.0*	1-S2n	0.15	0.33	0.15	0.10	8.30	1.41
1.83 cfs	1.83 cfs	102.59	0.59	0.0*	1-S2n	0.21	0.47	0.21	0.15	10.26	1.81
2.75 cfs	2.75 cfs	102.73	0.73	0.0*	1-S2n	0.26	0.58	0.26	0.19	11.56	2.09
3.66	3.66	102.86	0.86	0.0*	1-	0.30	0.67	0.3	0.23	12.6	2.31

cfs	cfs				S2 n			0		1	
4.58 cfs	4.58 cfs	102.96	0.96	0.0*	1-S2 n	0.33	0.75	0.33	0.26	13.48	2.50
5.49 cfs	5.49 cfs	103.08	1.08	0.0*	1-S2 n	0.36	0.83	0.36	0.29	14.20	2.66
6.10 cfs	6.10 cfs	103.16	1.16	0.0*	1-S2 n	0.38	0.87	0.40	0.31	13.52	2.75
7.32 cfs	7.32 cfs	103.31	1.31	0.0*	1-S2 n	0.42	0.96	0.44	0.34	14.17	2.92
8.23 cfs	8.23 cfs	103.42	1.42	0.0*	1-S2 n	0.44	1.02	0.47	0.36	14.58	3.04
9.15 cfs	9.15 cfs	103.52	1.52	0.0*	1-S2 n	0.47	1.08	0.49	0.39	15.43	3.14

* Full Flow Headwater elevation is below inlet invert.

Culvert Barrel Data

Culvert Barrel Type Straight Culvert

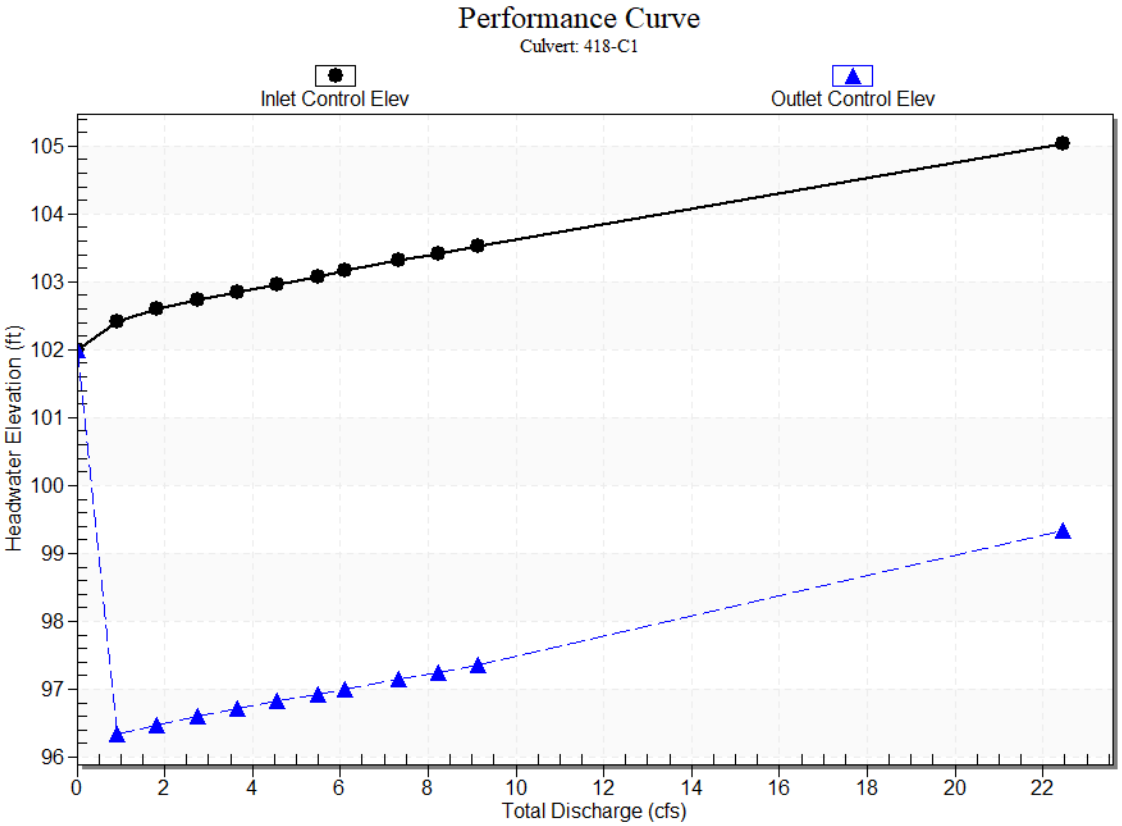
Inlet Elevation (invert): 102.00 ft,

Outlet Elevation (invert): 96.00 ft

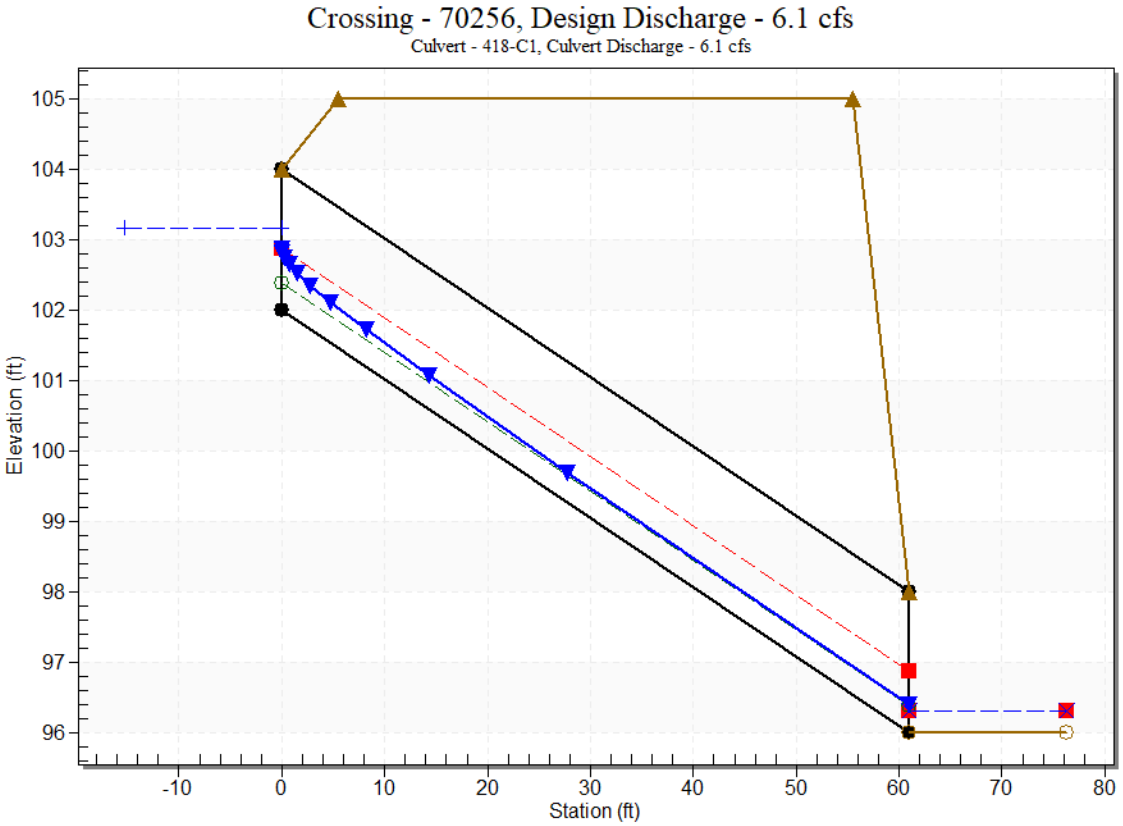
Culvert Length: 61.29 ft,

Culvert Slope: 0.0984

Culvert Performance Curve Plot: 418-C1



Water Surface Profile Plot for Culvert: 418-C1



Site Data - 418-C1

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 102.00 ft

Outlet Station: 61.00 ft

Outlet Elevation: 96.00 ft

Number of Barrels: 1

Culvert Data Summary - 418-C1

Barrel Shape: Circular

Barrel Diameter: 2.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall (Ke=0.5)

Inlet Depression: None

Tailwater Data for Crossing: 70256

Table 4 - Downstream Channel Rating Curve (Crossing: 70256)

Flow (cfs)	Water Surface Elev (ft)	Velocity (ft/s)	Depth (ft)	Shear (psf)	Froude Number
0.00	96.00	0.00	0.00	0.00	0.00
0.92	96.10	0.10	1.41	0.06	0.80
1.83	96.15	0.15	1.81	0.10	0.85
2.75	96.19	0.19	2.09	0.12	0.89
3.66	96.23	0.23	2.31	0.14	0.91
4.58	96.26	0.26	2.50	0.16	0.92
5.49	96.29	0.29	2.66	0.18	0.94
6.10	96.31	0.31	2.75	0.19	0.95
7.32	96.34	0.34	2.92	0.21	0.96
8.23	96.36	0.36	3.04	0.23	0.97
9.15	96.39	0.39	3.14	0.24	0.98

Tailwater Channel Data - 70256

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 6.00 ft

Side Slope (H:V): 4.00 (_:1)

Channel Slope: 0.0100

Channel Manning's n: 0.0220

Channel Invert Elevation: 96.00 ft

Roadway Data for Crossing: 70256

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 50.00 ft

Crest Elevation: 105.00 ft

Roadway Surface: Paved

Roadway Top Width: 50.00 ft

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0.00 cfs

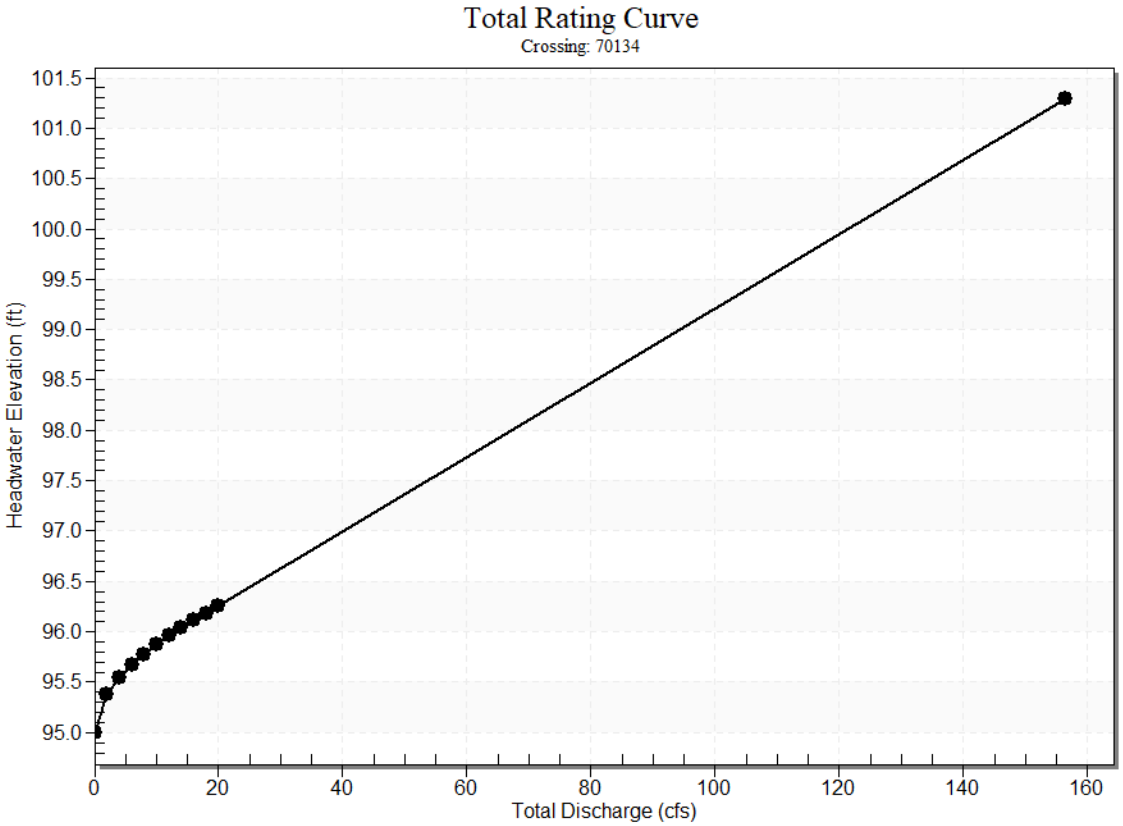
Design Flow: 7.96 cfs

Maximum Flow: 20.00 cfs

Table 5 - Summary of Culvert Flows at Crossing: 70134

Headwater Elevation (ft)	Total Discharge (cfs)	409-C1 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
95.00	0.00	0.00	0.00	1
95.38	2.00	2.00	0.00	1
95.54	4.00	4.00	0.00	1
95.67	6.00	6.00	0.00	1
95.77	7.96	7.96	0.00	1
95.87	10.00	10.00	0.00	1
95.96	12.00	12.00	0.00	1
96.04	14.00	14.00	0.00	1
96.11	16.00	16.00	0.00	1
96.18	18.00	18.00	0.00	1
96.25	20.00	20.00	0.00	1
101.00	145.41	145.41	0.00	Overtopping

Rating Curve Plot for Crossing: 70134



Culvert Data: 409-C1

Table 3 - Culvert Summary Table: 409-C1

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00 cfs	0.00 cfs	95.00	0.00	0.000	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
2.00 cfs	2.00 cfs	95.38	0.38	0.0*	1-S2n	0.13	0.31	0.13	0.14	9.01	1.73
4.00 cfs	4.00 cfs	95.54	0.54	0.0*	1-S2n	0.18	0.44	0.18	0.21	11.00	2.24
6.00 cfs	6.00 cfs	95.67	0.67	0.0*	1-S2n	0.23	0.54	0.23	0.26	12.22	2.60
7.96	7.96	95.77	0.77	0.0*	1-	0.26	0.62	0.2	0.31	13.4	2.88

cfs	cfs				S2n			6		2	
10.00 cfs	10.00 cfs	95.87	0.87	0.0*	1-S2n	0.29	0.70	0.30	0.35	13.51	3.12
12.00 cfs	12.00 cfs	95.96	0.96	0.0*	1-S2n	0.32	0.77	0.34	0.39	13.52	3.32
14.00 cfs	14.00 cfs	96.04	1.04	0.0*	1-S2n	0.34	0.83	0.37	0.43	13.78	3.50
16.00 cfs	16.00 cfs	96.11	1.11	0.0*	1-S2n	0.36	0.89	0.36	0.47	16.47	3.66
18.00 cfs	18.00 cfs	96.18	1.18	0.0*	1-S2n	0.38	0.95	0.42	0.50	14.86	3.81
20.00 cfs	20.00 cfs	96.25	1.25	0.0*	1-S2n	0.40	1.00	0.45	0.53	15.24	3.95

* Full Flow Headwater elevation is below inlet invert.

Culvert Barrel Data

Culvert Barrel Type Straight Culvert

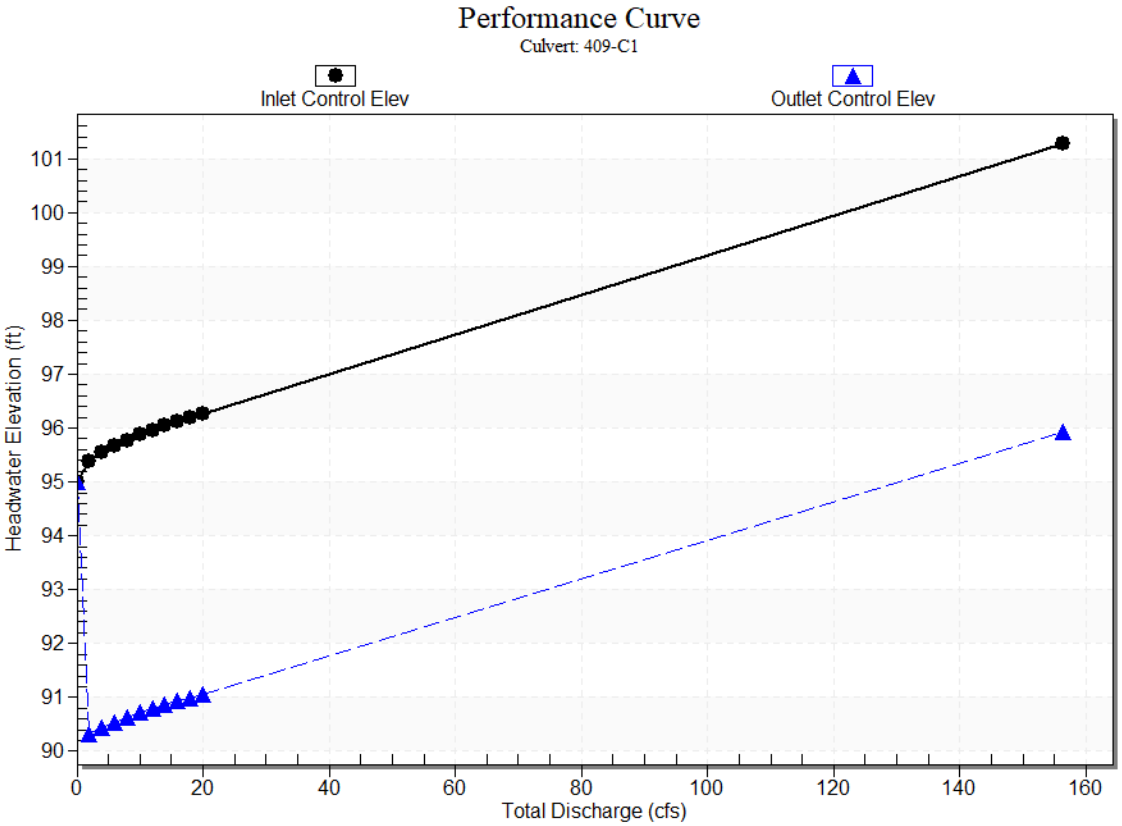
Inlet Elevation (invert): 95.00 ft,

Outlet Elevation (invert): 90.00 ft

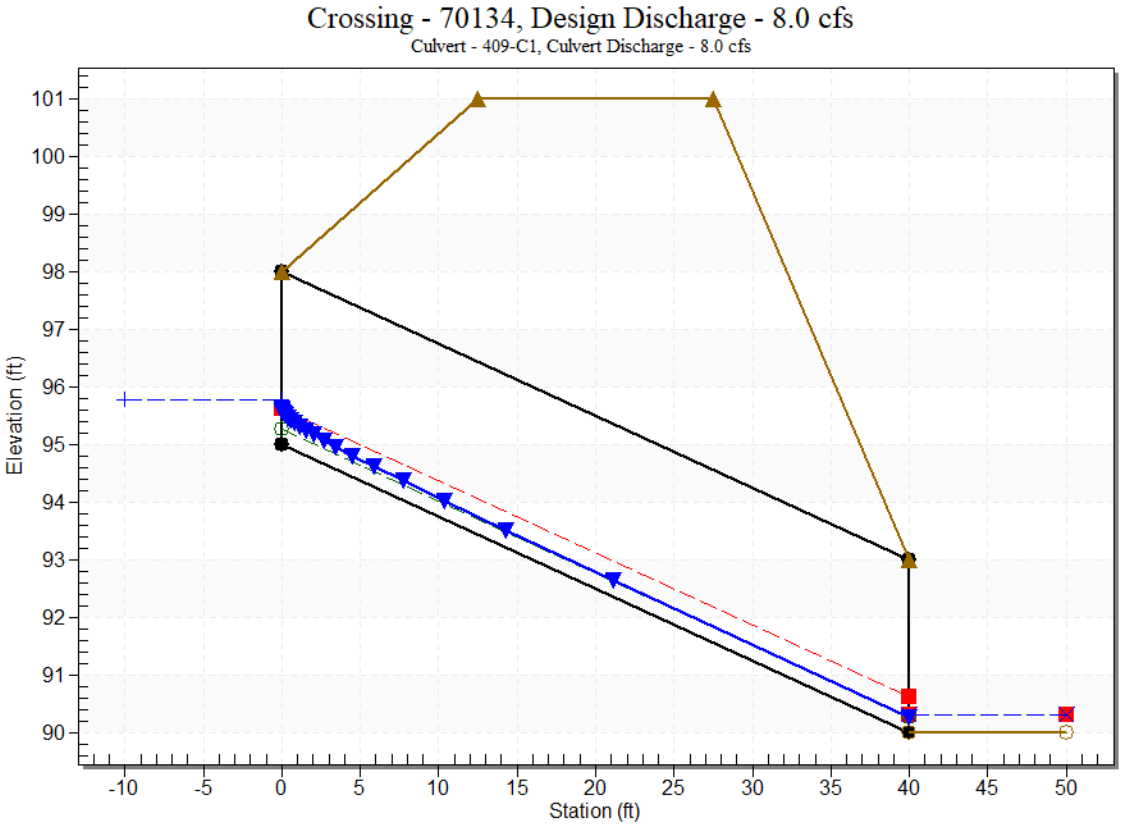
Culvert Length: 40.31 ft,

Culvert Slope: 0.1250

Culvert Performance Curve Plot: 409-C1



Water Surface Profile Plot for Culvert: 409-C1



Site Data - 409-C1

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 95.00 ft

Outlet Station: 40.00 ft

Outlet Elevation: 90.00 ft

Number of Barrels: 2

Culvert Data Summary - 409-C1

Barrel Shape: Circular

Barrel Diameter: 3.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: None

Tailwater Data for Crossing: 70134

Table 6 - Downstream Channel Rating Curve (Crossing: 70134)

Flow (cfs)	Water Surface Elev (ft)	Velocity (ft/s)	Depth (ft)	Shear (psf)	Froude Number
0.00	90.00	0.00	0.00	0.00	0.00
2.00	90.14	0.14	1.73	0.09	0.84
4.00	90.21	0.21	2.24	0.13	0.90
6.00	90.26	0.26	2.60	0.16	0.93
7.96	90.31	0.31	2.88	0.19	0.96
10.00	90.35	0.35	3.12	0.22	0.98
12.00	90.39	0.39	3.32	0.25	0.99
14.00	90.43	0.43	3.50	0.27	1.00
16.00	90.47	0.47	3.66	0.29	1.01
18.00	90.50	0.50	3.81	0.31	1.02
20.00	90.53	0.53	3.95	0.33	1.03

Tailwater Channel Data - 70134

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 8.00 ft

Side Slope (H:V): 3.00 (_:1)

Channel Slope: 0.0100

Channel Manning's n: 0.0220

Channel Invert Elevation: 90.00 ft

Roadway Data for Crossing: 70134

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 15.00 ft

Crest Elevation: 101.00 ft

Roadway Surface: Gravel

Roadway Top Width: 15.00 ft

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0.00 cfs

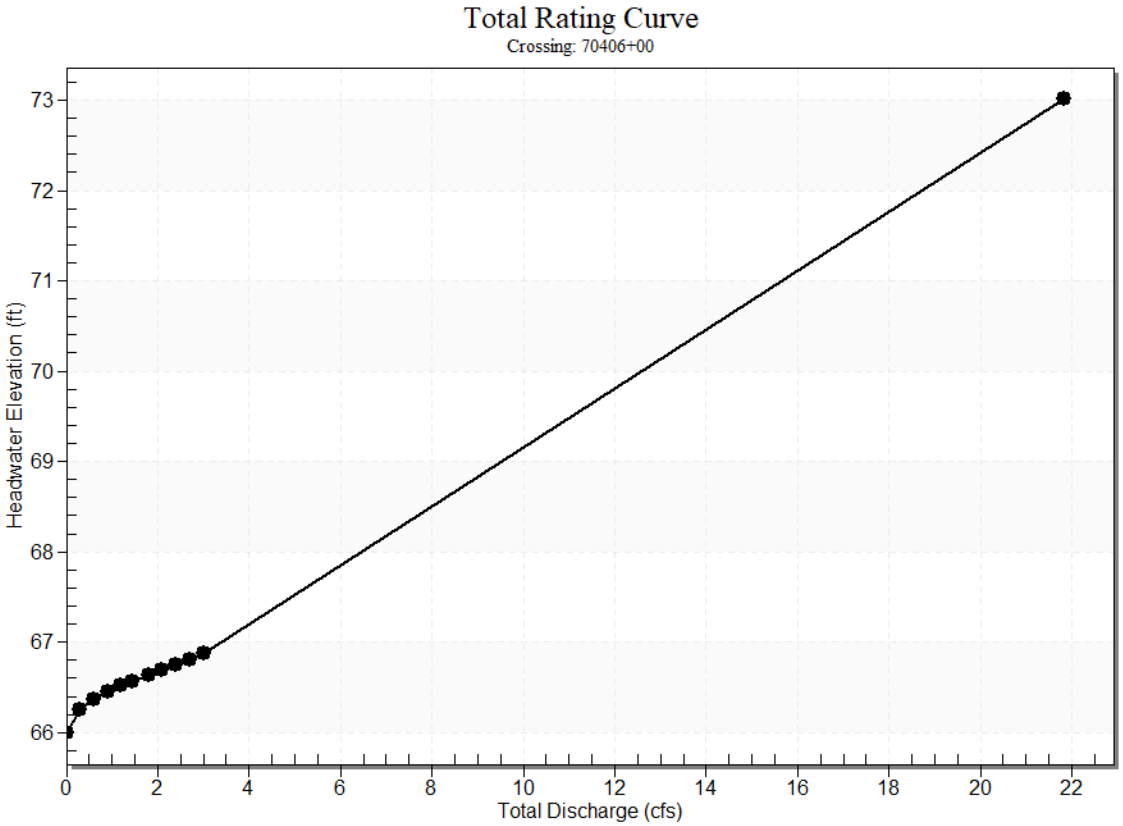
Design Flow: 1.45 cfs

Maximum Flow: 3.00 cfs

Table 7 - Summary of Culvert Flows at Crossing: 70406+00

Headwater Elevation (ft)	Total Discharge (cfs)	428-C1 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
66.00	0.00	0.00	0.00	1
66.25	0.30	0.30	0.00	1
66.36	0.60	0.60	0.00	1
66.44	0.90	0.90	0.00	1
66.52	1.20	1.20	0.00	1
66.57	1.45	1.45	0.00	1
66.64	1.80	1.80	0.00	1
66.69	2.10	2.10	0.00	1
66.75	2.40	2.40	0.00	1
66.81	2.70	2.70	0.00	1
66.87	3.00	3.00	0.00	1
73.00	21.65	21.65	0.00	Overtopping

Rating Curve Plot for Crossing: 70406+00



Culvert Data: 428-C1

Table 4 - Culvert Summary Table: 428-C1

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00 cfs	0.00 cfs	66.00	0.00	0.000	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
0.30 cfs	0.30 cfs	66.25	0.25	0.0*	1-S2n	0.09	0.20	0.09	0.06	6.51	0.99
0.60 cfs	0.60 cfs	66.36	0.36	0.0*	1-S2n	0.13	0.29	0.13	0.09	7.95	1.29
0.90 cfs	0.90 cfs	66.44	0.44	0.0*	1-S2n	0.16	0.35	0.16	0.11	8.93	1.50
1.20	1.20	66.52	0.52	0.0*	1-	0.18	0.41	0.1	0.13	9.74	1.67

cfs	cfs				S2 n			8			
1.45 cfs	1.45 cfs	66.57	0.57	0.0*	1-S2 n	0.20	0.45	0.2 0	0.15	10.3 0	1.79
1.80 cfs	1.80 cfs	66.64	0.64	0.0*	1-S2 n	0.22	0.50	0.2 2	0.17	10.9 8	1.93
2.10 cfs	2.10 cfs	66.69	0.69	0.0*	1-S2 n	0.24	0.55	0.2 4	0.18	11.5 0	2.04
2.40 cfs	2.40 cfs	66.75	0.75	0.0*	1-S2 n	0.26	0.59	0.2 6	0.20	11.9 6	2.14
2.70 cfs	2.70 cfs	66.81	0.81	0.0*	1-S2 n	0.27	0.62	0.2 7	0.21	12.3 6	2.23
3.00 cfs	3.00 cfs	66.87	0.87	0.0*	1-S2 n	0.29	0.66	0.2 9	0.23	12.7 7	2.32

* Full Flow Headwater elevation is below inlet invert.

Culvert Barrel Data

Culvert Barrel Type Straight Culvert

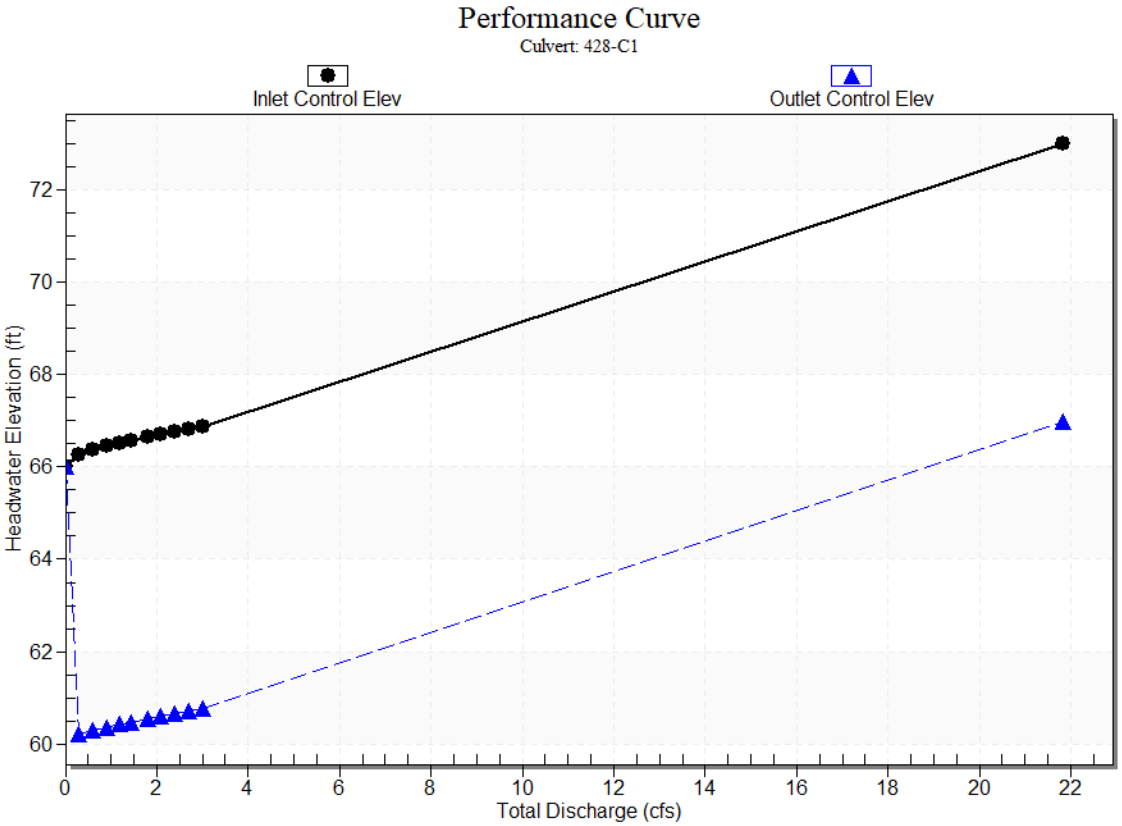
Inlet Elevation (invert): 66.00 ft,

Outlet Elevation (invert): 60.00 ft

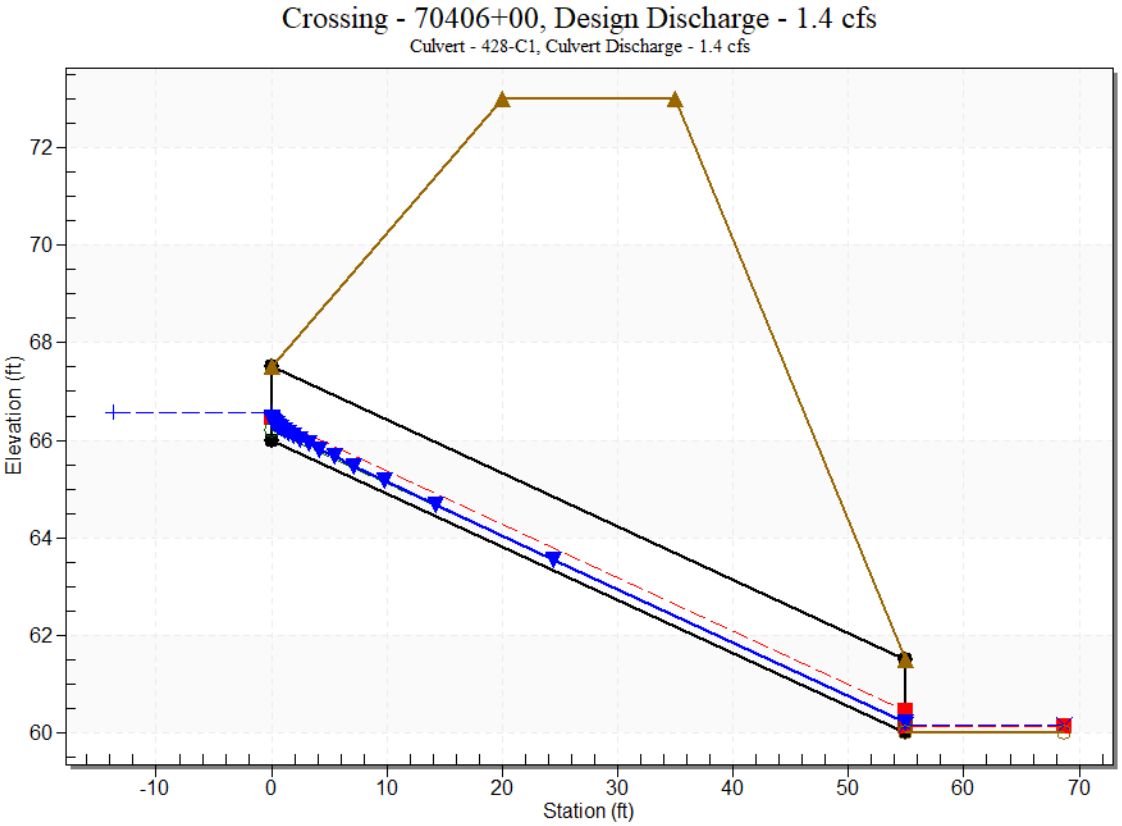
Culvert Length: 55.33 ft,

Culvert Slope: 0.1091

Culvert Performance Curve Plot: 428-C1



Water Surface Profile Plot for Culvert: 428-C1



Site Data - 428-C1

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 66.00 ft

Outlet Station: 55.00 ft

Outlet Elevation: 60.00 ft

Number of Barrels: 1

Culvert Data Summary - 428-C1

Barrel Shape: Circular

Barrel Diameter: 1.50 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: None

Tailwater Data for Crossing: 70406+00

Table 8 - Downstream Channel Rating Curve (Crossing: 70406+00)

Flow (cfs)	Water Surface Elev (ft)	Velocity (ft/s)	Depth (ft)	Shear (psf)	Froude Number
0.00	60.00	0.00	0.00	0.00	0.00
0.30	60.06	0.06	0.99	0.04	0.73
0.60	60.09	0.09	1.29	0.06	0.78
0.90	60.11	0.11	1.50	0.07	0.82
1.20	60.13	0.13	1.67	0.08	0.84
1.45	60.15	0.15	1.79	0.09	0.85
1.80	60.17	0.17	1.93	0.11	0.87
2.10	60.18	0.18	2.04	0.12	0.88
2.40	60.20	0.20	2.14	0.12	0.89
2.70	60.21	0.21	2.23	0.13	0.90
3.00	60.23	0.23	2.32	0.14	0.91

Tailwater Channel Data - 70406+00

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 5.00 ft

Side Slope (H:V): 3.00 (_:1)

Channel Slope: 0.0100

Channel Manning's n: 0.0220

Channel Invert Elevation: 60.00 ft

Roadway Data for Crossing: 70406+00

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 50.00 ft

Crest Elevation: 73.00 ft

Roadway Surface: Gravel

Roadway Top Width: 15.00 ft

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0.00 cfs

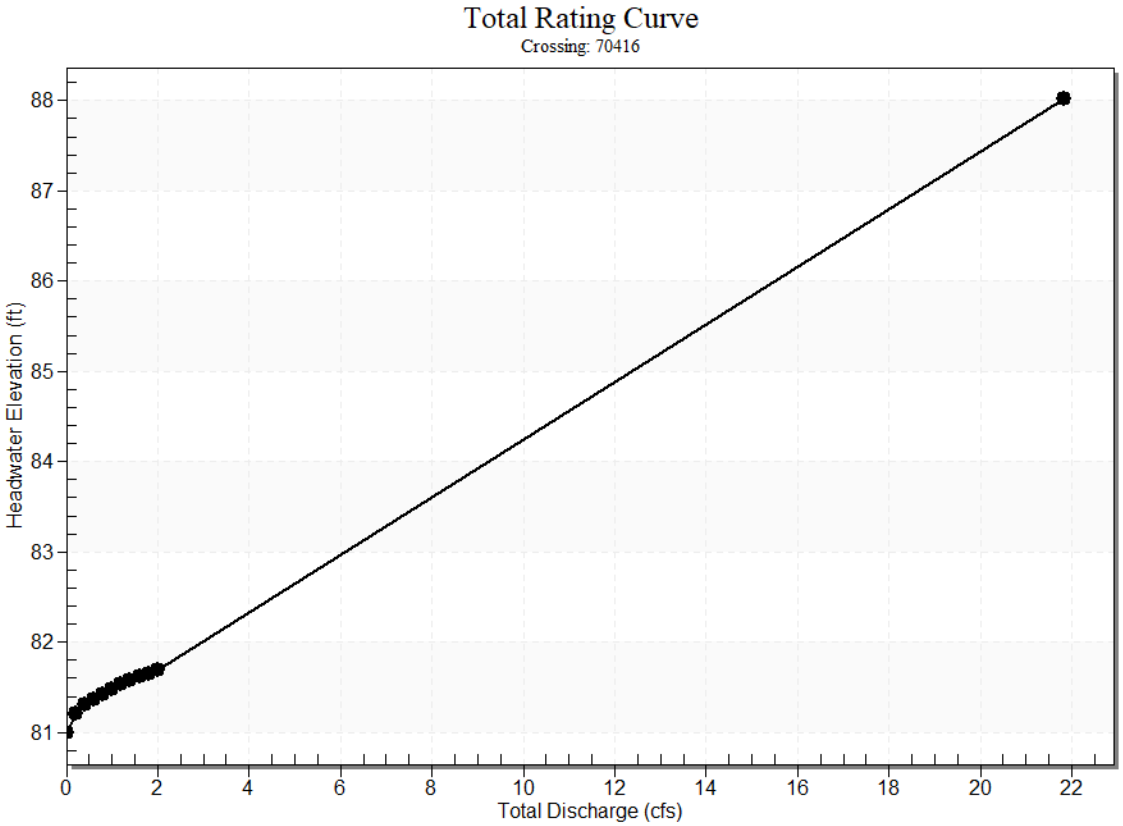
Design Flow: 0.42 cfs

Maximum Flow: 2.00 cfs

Table 9 - Summary of Culvert Flows at Crossing: 70416

Headwater Elevation (ft)	Total Discharge (cfs)	428-C2 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
81.00	0.00	0.00	0.00	1
81.21	0.20	0.20	0.00	1
81.31	0.42	0.42	0.00	1
81.37	0.60	0.60	0.00	1
81.43	0.80	0.80	0.00	1
81.48	1.00	1.00	0.00	1
81.53	1.20	1.20	0.00	1
81.57	1.40	1.40	0.00	1
81.62	1.60	1.60	0.00	1
81.66	1.80	1.80	0.00	1
81.69	2.00	2.00	0.00	1
88.00	21.58	21.58	0.00	Overtopping

Rating Curve Plot for Crossing: 70416



Culvert Data: 428-C2

Table 5 - Culvert Summary Table: 428-C2

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00 cfs	0.00 cfs	81.00	0.00	0.000	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
0.20 cfs	0.20 cfs	81.21	0.21	0.0*	1-S2n	0.08	0.16	0.08	0.11	5.09	3.11
0.42 cfs	0.42 cfs	81.31	0.31	0.0*	1-S2n	0.12	0.24	0.12	0.15	6.32	3.75
0.60 cfs	0.60 cfs	81.37	0.37	0.0*	1-S2n	0.14	0.29	0.14	0.17	7.05	4.09
0.80	0.80	81.43	0.43	0.0*	1-	0.16	0.33	0.1	0.19	7.67	4.40

cfs	cfs				S2 n			6			
1.00 cfs	1.00 cfs	81.48	0.48	0.0*	1-S2 n	0.18	0.37	0.18	0.21	8.20	4.65
1.20 cfs	1.20 cfs	81.53	0.53	0.0*	1-S2 n	0.20	0.41	0.20	0.22	8.64	4.87
1.40 cfs	1.40 cfs	81.57	0.57	0.0*	1-S2 n	0.21	0.44	0.21	0.24	9.06	5.06
1.60 cfs	1.60 cfs	81.62	0.62	0.0*	1-S2 n	0.23	0.47	0.23	0.25	9.40	5.23
1.80 cfs	1.80 cfs	81.66	0.66	0.0*	1-S2 n	0.24	0.50	0.24	0.26	9.75	5.39
2.00 cfs	2.00 cfs	81.69	0.69	0.0*	1-S2 n	0.25	0.53	0.25	0.27	10.06	5.53

* Full Flow Headwater elevation is below inlet invert.

Culvert Barrel Data

Culvert Barrel Type Straight Culvert

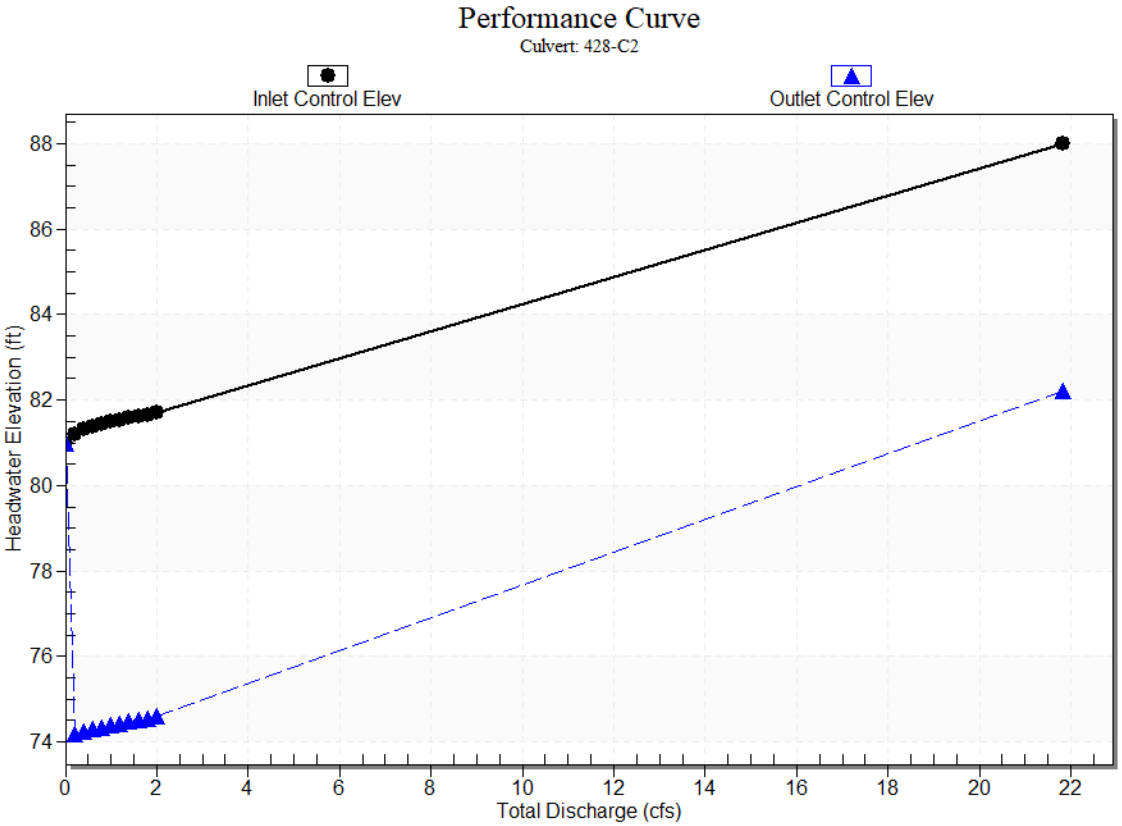
Inlet Elevation (invert): 81.00 ft,

Outlet Elevation (invert): 74.00 ft

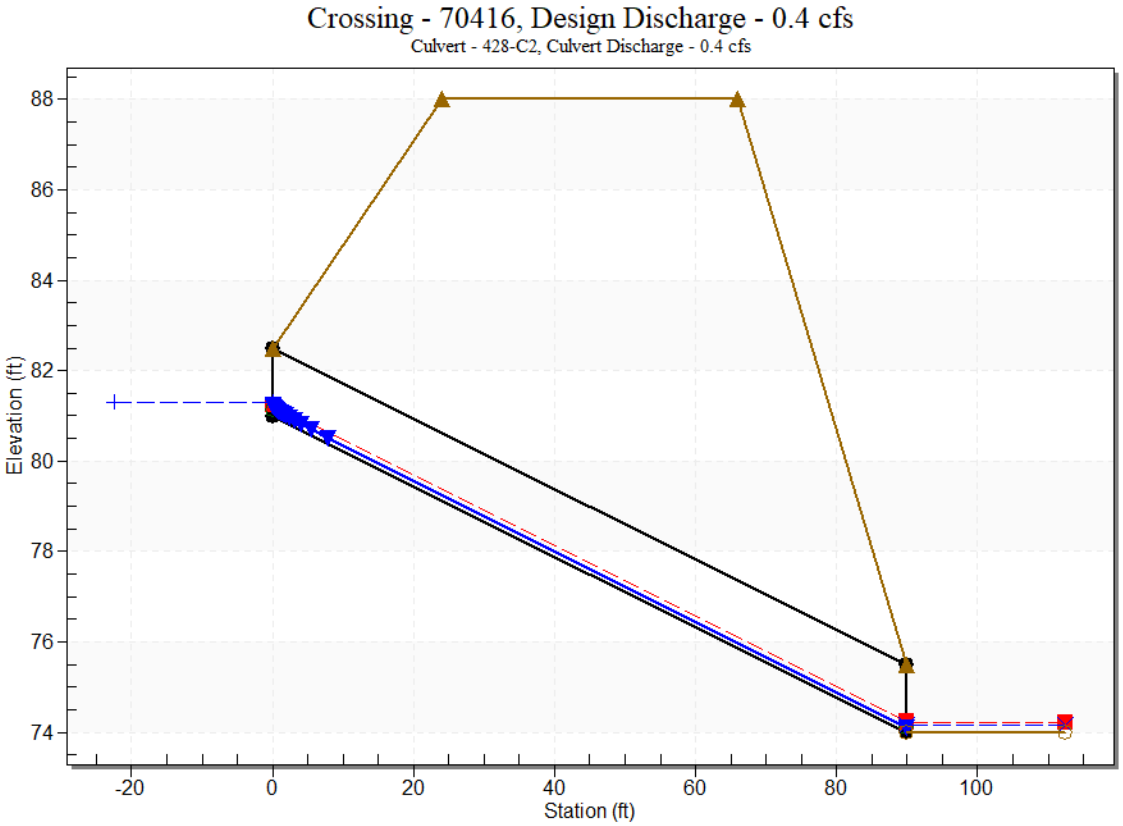
Culvert Length: 90.27 ft,

Culvert Slope: 0.0778

Culvert Performance Curve Plot: 428-C2



Water Surface Profile Plot for Culvert: 428-C2



Site Data - 428-C2

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 81.00 ft

Outlet Station: 90.00 ft

Outlet Elevation: 74.00 ft

Number of Barrels: 1

Culvert Data Summary - 428-C2

Barrel Shape: Circular

Barrel Diameter: 1.50 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: None

Tailwater Data for Crossing: 70416

Table 10 - Downstream Channel Rating Curve (Crossing: 70416)

Flow (cfs)	Water Surface Elev (ft)	Velocity (ft/s)	Depth (ft)	Shear (psf)	Froude Number
0.00	74.00	0.00	0.00	0.00	0.00
0.20	74.11	0.11	3.11	0.71	2.30
0.42	74.15	0.15	3.75	0.93	2.41
0.60	74.17	0.17	4.09	1.07	2.47
0.80	74.19	0.19	4.40	1.19	2.51
1.00	74.21	0.21	4.65	1.29	2.55
1.20	74.22	0.22	4.87	1.39	2.58
1.40	74.24	0.24	5.06	1.47	2.60
1.60	74.25	0.25	5.23	1.54	2.62
1.80	74.26	0.26	5.39	1.61	2.64
2.00	74.27	0.27	5.53	1.68	2.66

Tailwater Channel Data - 70416

Tailwater Channel Option: Triangular Channel

Side Slope (H:V): 5.00 (_:1)

Channel Slope: 0.1000

Channel Manning's n: 0.0220

Channel Invert Elevation: 74.00 ft

Roadway Data for Crossing: 70416

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 42.00 ft

Crest Elevation: 88.00 ft

Roadway Surface: Gravel

Roadway Top Width: 42.00 ft

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0.00 cfs

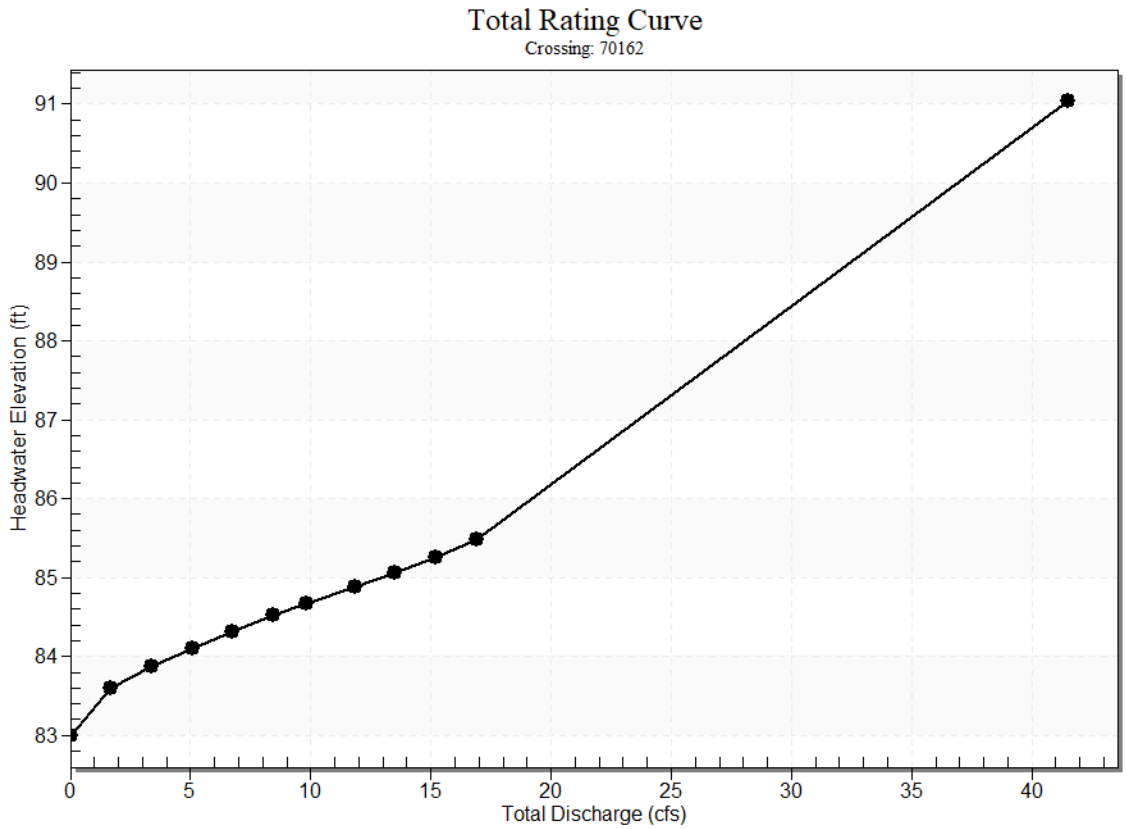
Design Flow: 9.85 cfs

Maximum Flow: 16.90 cfs

Table 11 - Summary of Culvert Flows at Crossing: 70162

Headwater Elevation (ft)	Total Discharge (cfs)	411-C1 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
83.00	0.00	0.00	0.00	1
83.60	1.69	1.69	0.00	1
83.87	3.38	3.38	0.00	1
84.10	5.07	5.07	0.00	1
84.32	6.76	6.76	0.00	1
84.52	8.45	8.45	0.00	1
84.67	9.85	9.85	0.00	1
84.88	11.83	11.83	0.00	1
85.06	13.52	13.52	0.00	1
85.26	15.21	15.21	0.00	1
85.48	16.90	16.90	0.00	1
91.00	40.36	40.36	0.00	Overtopping

Rating Curve Plot for Crossing: 70162



Culvert Data: 411-C1

Table 6 - Culvert Summary Table: 411-C1

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00 cfs	0.00 cfs	83.00	0.00	0.000	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
1.69 cfs	1.69 cfs	83.60	0.60	0.0*	1-S2n	0.29	0.45	0.29	0.02	5.95	1.61
3.38 cfs	3.38 cfs	83.87	0.87	0.0*	1-S2n	0.41	0.64	0.42	0.03	7.16	2.13
5.07 cfs	5.07 cfs	84.10	1.10	0.0*	1-S2n	0.50	0.79	0.50	0.04	8.20	2.51
6.76 cfs	6.76 cfs	84.32	1.32	0.0*	1-S2n	0.58	0.92	0.59	0.05	8.67	2.81
8.45 cfs	8.45 cfs	84.52	1.52	0.0*	1-S2n	0.65	1.04	0.67	0.05	9.19	3.07
9.85 cfs	9.85 cfs	84.67	1.67	0.0*	1-S2n	0.71	1.12	0.73	0.06	9.55	3.27
11.83 cfs	11.83 cfs	84.88	1.88	0.0*	1-S2n	0.78	1.24	0.81	0.07	9.87	3.51
13.52 cfs	13.52 cfs	85.06	2.06	0.027	5-S2n	0.84	1.32	0.87	0.07	10.27	3.71
15.21 cfs	15.21 cfs	85.26	2.26	0.296	5-S2n	0.90	1.41	0.94	0.08	10.49	3.89
16.90 cfs	16.90 cfs	85.48	2.48	0.581	5-S2n	0.95	1.48	1.00	0.08	10.81	4.05

* Full Flow Headwater elevation is below inlet invert.

Culvert Barrel Data

Culvert Barrel Type Straight Culvert

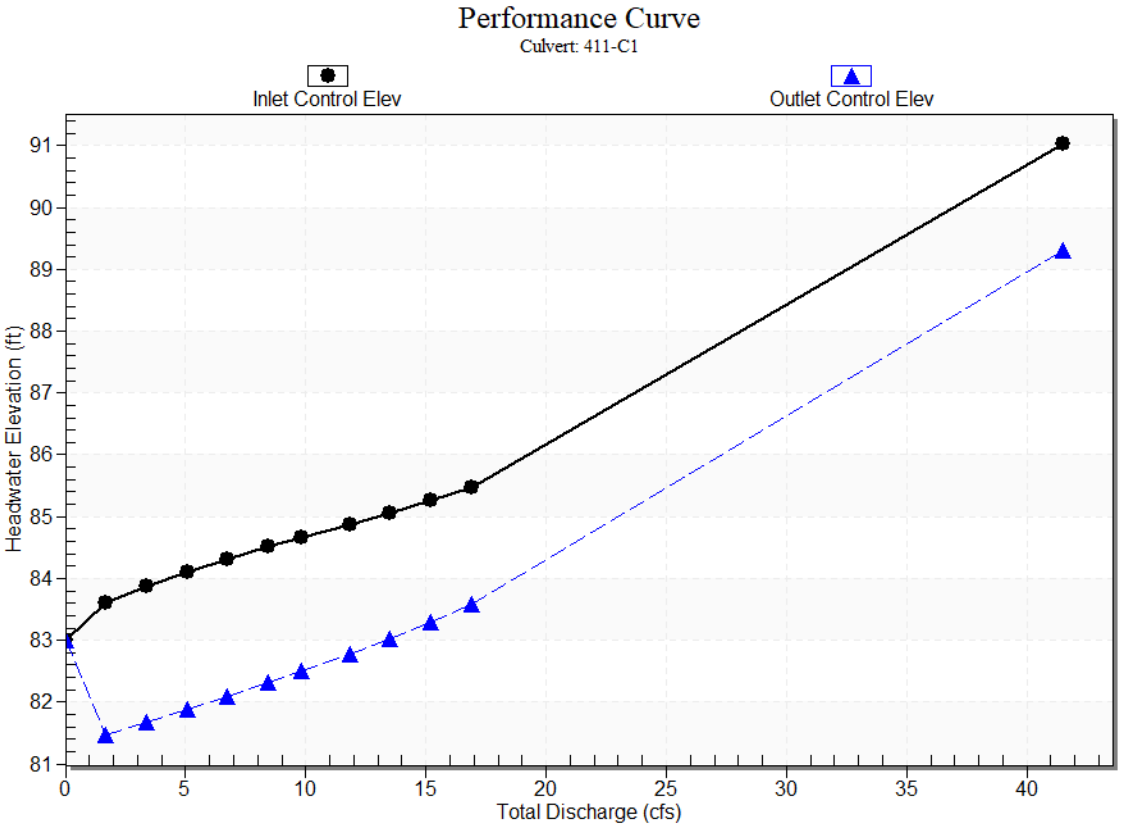
Inlet Elevation (invert): 83.00 ft,

Outlet Elevation (invert): 81.00 ft

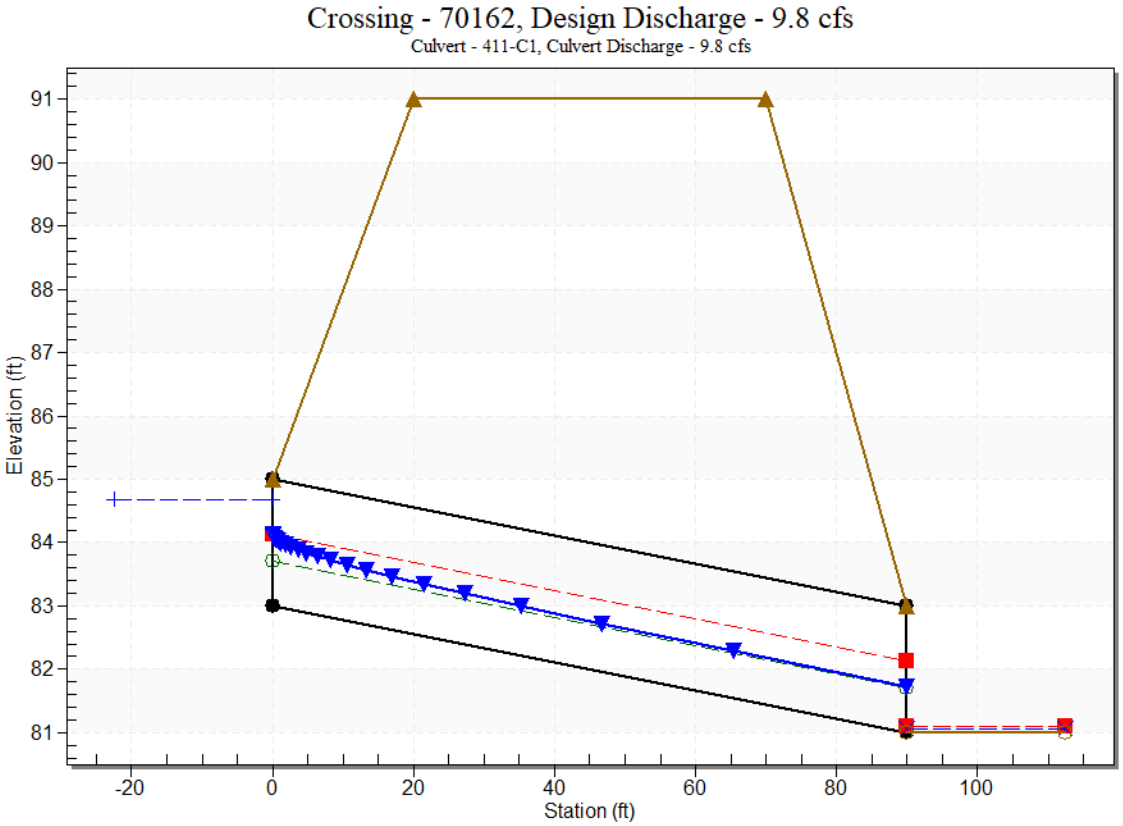
Culvert Length: 90.02 ft,

Culvert Slope: 0.0222

Culvert Performance Curve Plot: 411-C1



Water Surface Profile Plot for Culvert: 411-C1



Site Data - 411-C1

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 83.00 ft

Outlet Station: 90.00 ft

Outlet Elevation: 81.00 ft

Number of Barrels: 1

Culvert Data Summary - 411-C1

Barrel Shape: Circular

Barrel Diameter: 2.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall (Ke=0.5)

Inlet Depression: None

Tailwater Data for Crossing: 70162

Table 12 - Downstream Channel Rating Curve (Crossing: 70162)

Flow (cfs)	Water Surface Elev (ft)	Velocity (ft/s)	Depth (ft)	Shear (psf)	Froude Number
0.00	81.00	0.00	0.00	0.00	0.00
1.69	81.02	0.02	1.61	0.13	1.97
3.38	81.03	0.03	2.13	0.20	2.11
5.07	81.04	0.04	2.51	0.25	2.21
6.76	81.05	0.05	2.81	0.30	2.27
8.45	81.05	0.05	3.07	0.34	2.32
9.85	81.06	0.06	3.27	0.37	2.36
11.83	81.07	0.07	3.51	0.42	2.40
13.52	81.07	0.07	3.71	0.45	2.43
15.21	81.08	0.08	3.89	0.49	2.46
16.90	81.08	0.08	4.05	0.52	2.48

Tailwater Channel Data - 70162

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 50.00 ft

Side Slope (H:V): 3.00 (_:1)

Channel Slope: 0.1000

Channel Manning's n: 0.0220

Channel Invert Elevation: 81.00 ft

Roadway Data for Crossing: 70162

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 50.00 ft

Crest Elevation: 91.00 ft

Roadway Surface: Paved

Roadway Top Width: 50.00 ft

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0.00 cfs

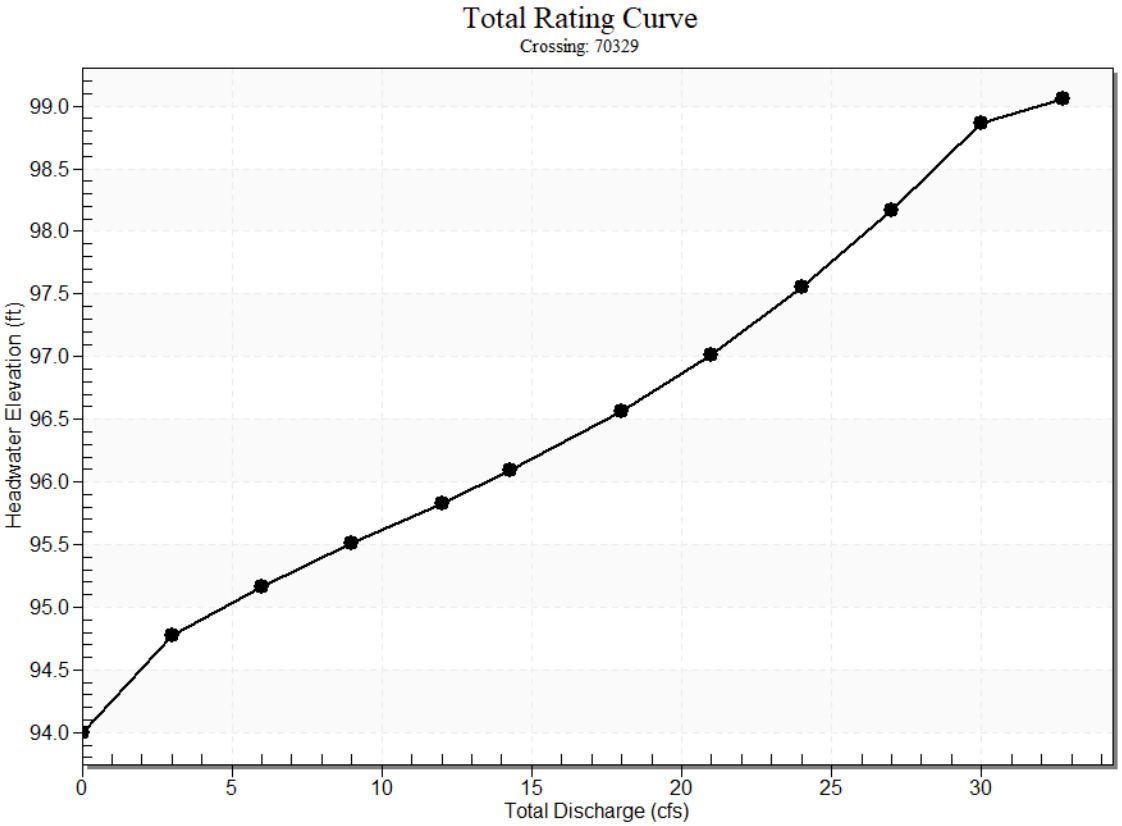
Design Flow: 14.30 cfs

Maximum Flow: 30.00 cfs

Table 13 - Summary of Culvert Flows at Crossing: 70329

Headwater Elevation (ft)	Total Discharge (cfs)	423-C1 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
94.00	0.00	0.00	0.00	1
94.78	3.00	3.00	0.00	1
95.16	6.00	6.00	0.00	1
95.51	9.00	9.00	0.00	1
95.83	12.00	12.00	0.00	1
96.09	14.30	14.30	0.00	1
96.56	18.00	18.00	0.00	1
97.02	21.00	21.00	0.00	1
97.55	24.00	24.00	0.00	1
98.17	27.00	27.00	0.00	1
98.87	30.00	30.00	0.00	1
99.00	30.54	30.54	0.00	Overtopping

Rating Curve Plot for Crossing: 70329



Culvert Data: 423-C1

Table 7 - Culvert Summary Table: 423-C1

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00 cfs	0.00 cfs	94.00	0.00	0.000	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
3.00 cfs	3.00 cfs	94.78	0.78	0.0*	1-S2n	0.28	0.60	0.28	0.30	11.44	6.66
6.00 cfs	6.00 cfs	95.16	1.16	0.0*	1-S2n	0.39	0.87	0.39	0.39	14.03	7.92
9.00 cfs	9.00 cfs	95.51	1.51	0.0*	1-S2n	0.47	1.07	0.49	0.45	15.13	8.76
12.00	12.00	95.83	1.83	0.0*	1-	0.55	1.24	0.5	0.50	16.0	9.41

cfs	cfs				S2 n			7		8	
14.30 cfs	14.30 cfs	96.09	2.09	0.0*	5-S2 n	0.60	1.36	0.62	0.54	17.07	9.84
18.00 cfs	18.00 cfs	96.56	2.56	0.0*	5-S2 n	0.68	1.53	0.72	0.59	17.78	10.42
21.00 cfs	21.00 cfs	97.02	3.02	0.0*	5-S2 n	0.74	1.64	0.78	0.62	18.45	10.83
24.00 cfs	24.00 cfs	97.55	3.55	0.0*	5-S2 n	0.79	1.73	0.84	0.65	19.12	11.20
27.00 cfs	27.00 cfs	98.17	4.17	0.0*	5-S2 n	0.84	1.81	0.90	0.68	19.56	11.53
30.00 cfs	30.00 cfs	98.87	4.87	0.0*	5-S2 n	0.89	1.86	0.96	0.71	20.03	11.84

* Full Flow Headwater elevation is below inlet invert.

Culvert Barrel Data

Culvert Barrel Type Straight Culvert

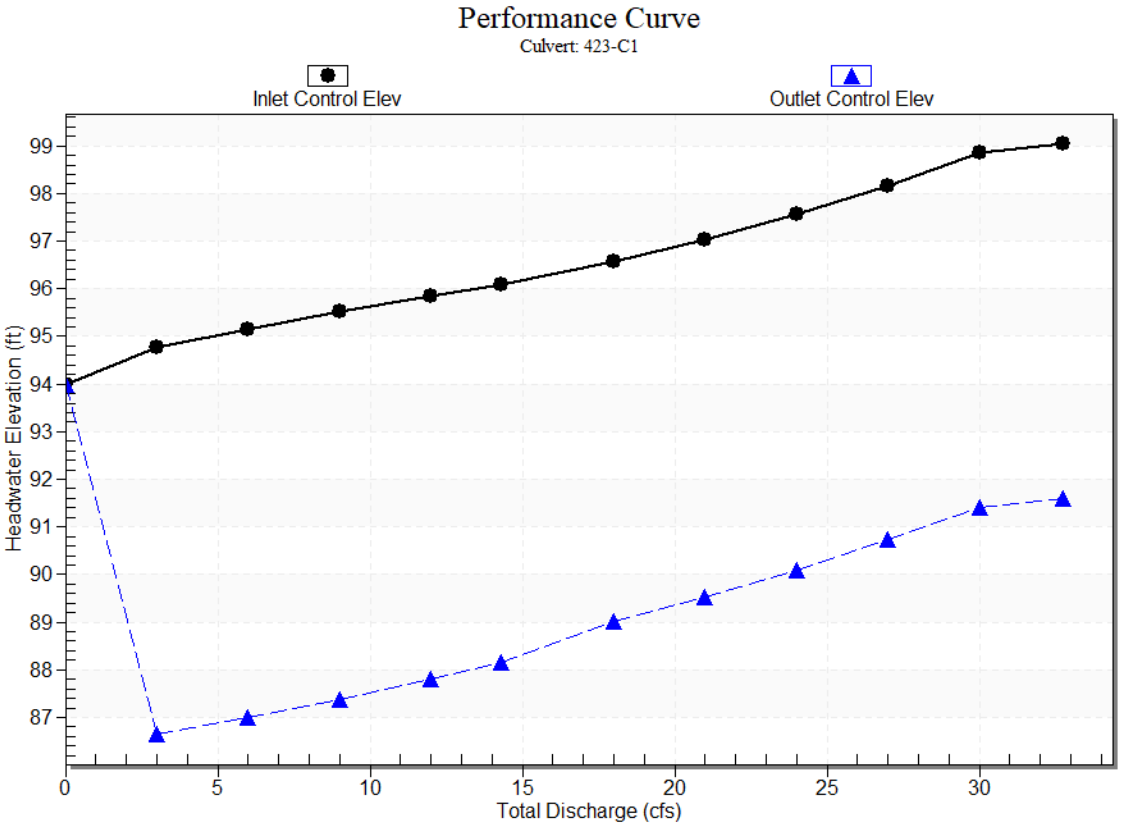
Inlet Elevation (invert): 94.00 ft,

Outlet Elevation (invert): 86.00 ft

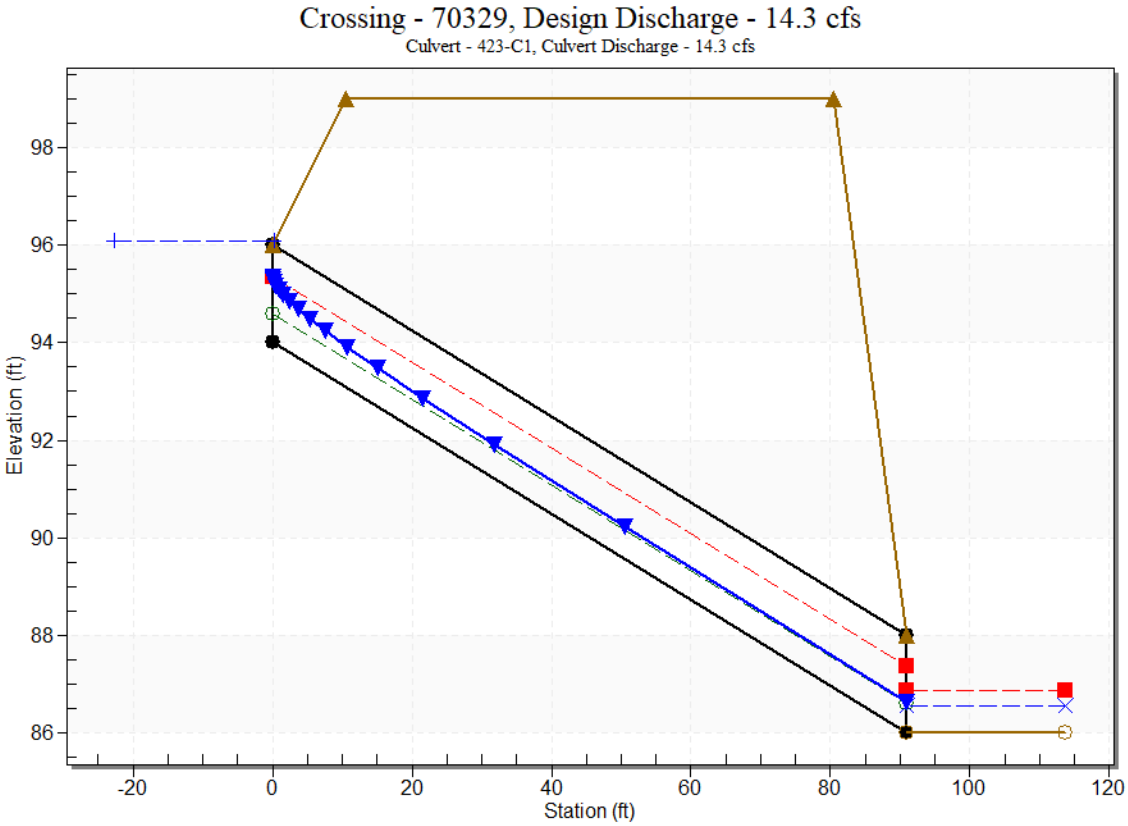
Culvert Length: 91.35 ft,

Culvert Slope: 0.0879

Culvert Performance Curve Plot: 423-C1



Water Surface Profile Plot for Culvert: 423-C1



Site Data - 423-C1

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 94.00 ft

Outlet Station: 91.00 ft

Outlet Elevation: 86.00 ft

Number of Barrels: 1

Culvert Data Summary - 423-C1

Barrel Shape: Circular

Barrel Diameter: 2.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall (Ke=0.5)

Inlet Depression: None

Tailwater Data for Crossing: 70329

Table 14 - Downstream Channel Rating Curve (Crossing: 70329)

Flow (cfs)	Water Surface Elev (ft)	Velocity (ft/s)	Depth (ft)	Shear (psf)	Froude Number
0.00	86.00	0.00	0.00	0.00	0.00
3.00	86.30	0.30	6.66	2.34	3.03
6.00	86.39	0.39	7.92	3.04	3.16
9.00	86.45	0.45	8.76	3.54	3.24
12.00	86.50	0.50	9.41	3.94	3.30
14.30	86.54	0.54	9.84	4.21	3.34
18.00	86.59	0.59	10.42	4.58	3.39
21.00	86.62	0.62	10.83	4.86	3.42
24.00	86.65	0.65	11.20	5.11	3.45
27.00	86.68	0.68	11.53	5.34	3.47
30.00	86.71	0.71	11.84	5.55	3.50

Tailwater Channel Data - 70329

Tailwater Channel Option: Triangular Channel

Side Slope (H:V): 5.00 (_:1)

Channel Slope: 0.1250

Channel Manning's n: 0.0220

Channel Invert Elevation: 86.00 ft

Roadway Data for Crossing: 70329

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 50.00 ft

Crest Elevation: 99.00 ft

Roadway Surface: Paved

Roadway Top Width: 70.00 ft

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0.00 cfs

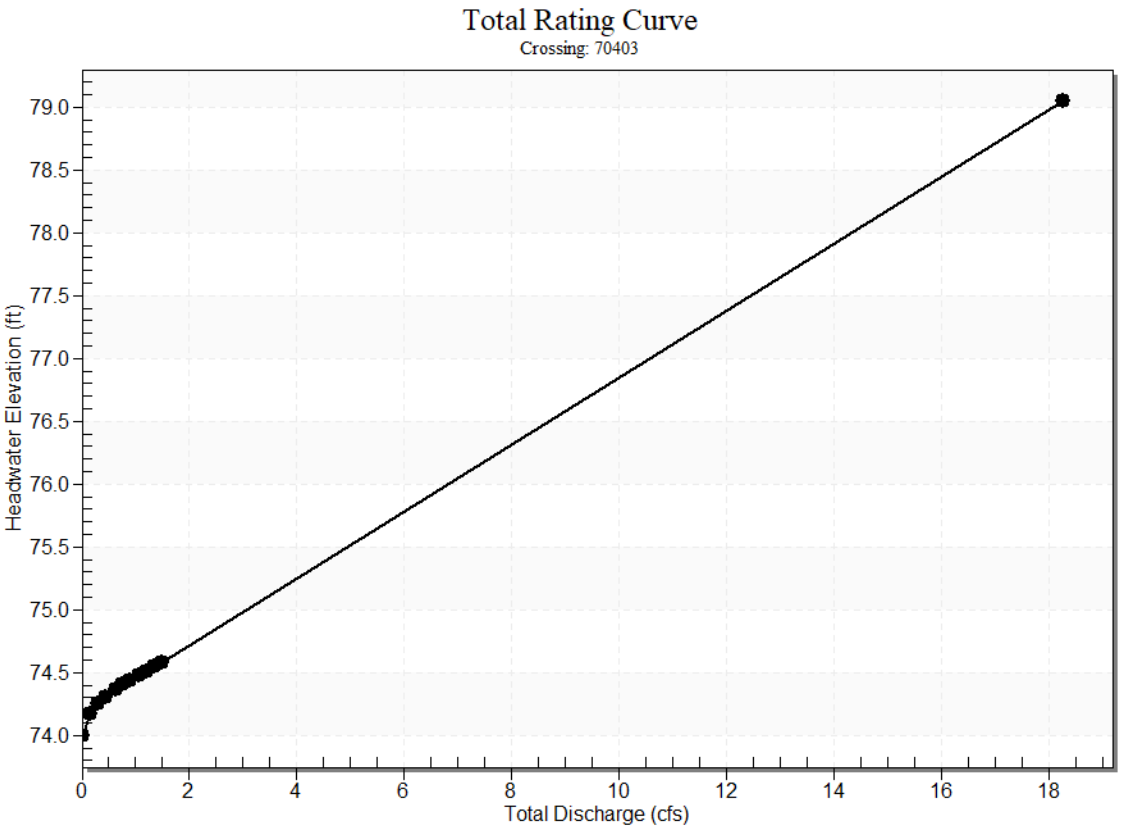
Design Flow: 0.63 cfs

Maximum Flow: 1.50 cfs

Table 15 - Summary of Culvert Flows at Crossing: 70403

Headwater Elevation (ft)	Total Discharge (cfs)	427-C1 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
74.00	0.00	0.00	0.00	1
74.18	0.15	0.15	0.00	1
74.25	0.30	0.30	0.00	1
74.31	0.45	0.45	0.00	1
74.37	0.63	0.63	0.00	1
74.40	0.75	0.75	0.00	1
74.44	0.90	0.90	0.00	1
74.48	1.05	1.05	0.00	1
74.51	1.20	1.20	0.00	1
74.55	1.35	1.35	0.00	1
74.58	1.50	1.50	0.00	1
79.00	17.87	17.87	0.00	Overtopping

Rating Curve Plot for Crossing: 70403



Culvert Data: 427-C1

Table 8 - Culvert Summary Table: 427-C1

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00 cfs	0.00 cfs	74.00	0.00	0.000	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
0.15 cfs	0.15 cfs	74.18	0.18	0.0*	1-S2n	0.06	0.14	0.06	0.12	5.53	3.24
0.30 cfs	0.30 cfs	74.25	0.25	0.0*	1-S2n	0.09	0.20	0.09	0.16	6.73	3.85
0.45 cfs	0.45 cfs	74.31	0.31	0.0*	1-S2n	0.11	0.25	0.11	0.19	7.50	4.26
0.63 cfs	0.63 cfs	74.37	0.37	0.0*	1-S2n	0.13	0.29	0.13	0.21	8.35	4.63
0.75 cfs	0.75 cfs	74.40	0.40	0.0*	1-S2n	0.14	0.32	0.14	0.23	8.77	4.84
0.90 cfs	0.90 cfs	74.44	0.44	0.0*	1-S2n	0.16	0.35	0.16	0.24	9.22	5.06
1.05 cfs	1.05 cfs	74.48	0.48	0.0*	1-S2n	0.17	0.38	0.17	0.26	9.70	5.26
1.20 cfs	1.20 cfs	74.51	0.51	0.0*	1-S2n	0.18	0.41	0.18	0.27	10.08	5.44
1.35 cfs	1.35 cfs	74.55	0.55	0.0*	1-S2n	0.19	0.44	0.19	0.28	10.41	5.60
1.50 cfs	1.50 cfs	74.58	0.58	0.0*	1-S2n	0.20	0.46	0.20	0.29	10.76	5.75

* Full Flow Headwater elevation is below inlet invert.

Culvert Barrel Data

Culvert Barrel Type Straight Culvert

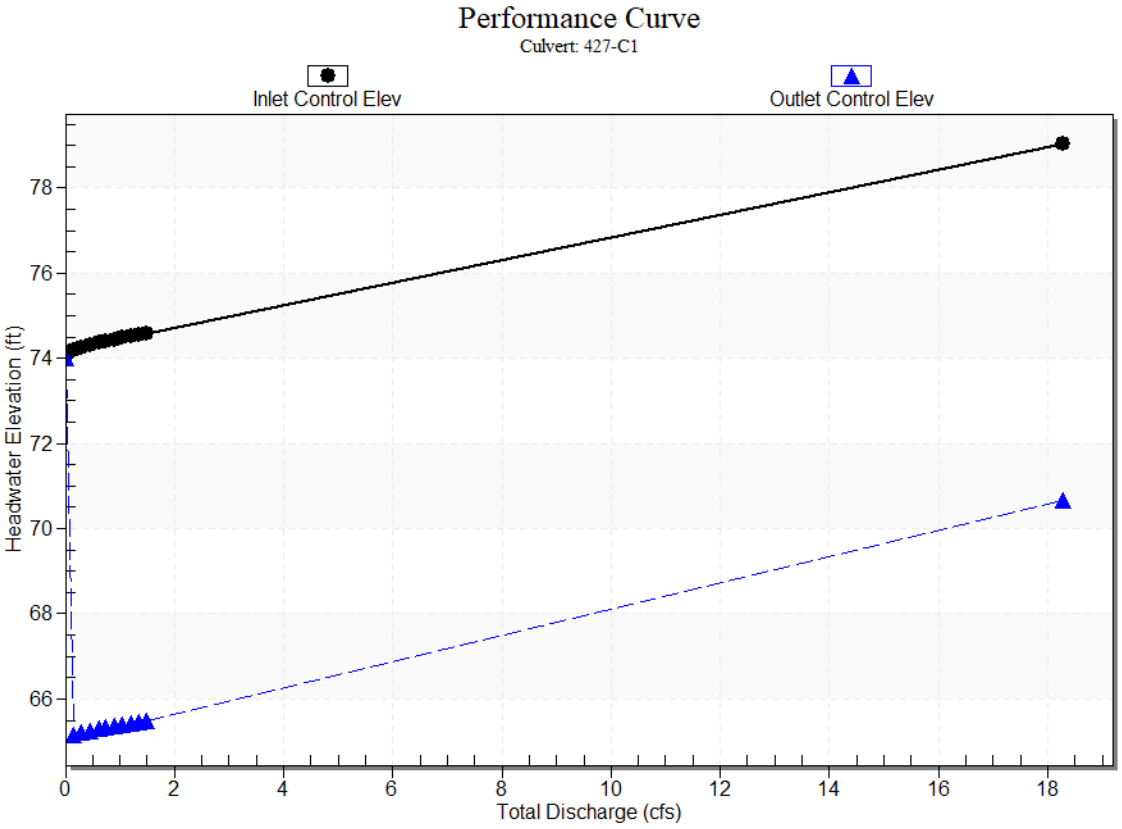
Inlet Elevation (invert): 74.00 ft,

Outlet Elevation (invert): 65.00 ft

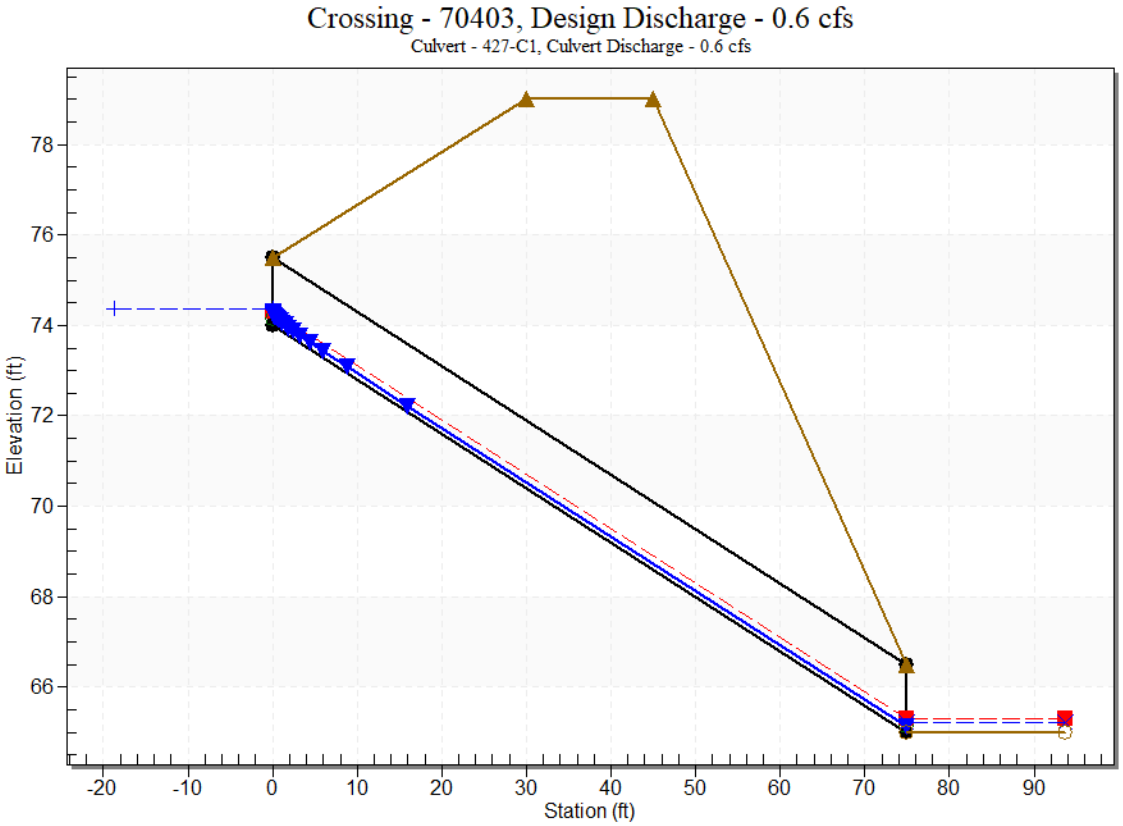
Culvert Length: 75.54 ft,

Culvert Slope: 0.1200

Culvert Performance Curve Plot: 427-C1



Water Surface Profile Plot for Culvert: 427-C1



Site Data - 427-C1

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 74.00 ft

Outlet Station: 75.00 ft

Outlet Elevation: 65.00 ft

Number of Barrels: 1

Culvert Data Summary - 427-C1

Barrel Shape: Circular

Barrel Diameter: 1.50 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: None

Tailwater Data for Crossing: 70403

Table 16 - Downstream Channel Rating Curve (Crossing: 70403)

Flow (cfs)	Water Surface Elev (ft)	Velocity (ft/s)	Depth (ft)	Shear (psf)	Froude Number
0.00	65.00	0.00	0.00	0.00	0.00
0.15	65.12	0.12	3.24	0.78	2.29
0.30	65.16	0.16	3.85	1.01	2.39
0.45	65.19	0.19	4.26	1.17	2.45
0.63	65.21	0.21	4.63	1.33	2.50
0.75	65.23	0.23	4.84	1.42	2.53
0.90	65.24	0.24	5.06	1.52	2.56
1.05	65.26	0.26	5.26	1.61	2.58
1.20	65.27	0.27	5.44	1.69	2.60
1.35	65.28	0.28	5.60	1.77	2.62
1.50	65.29	0.29	5.75	1.84	2.64

Tailwater Channel Data - 70403

Tailwater Channel Option: Triangular Channel

Side Slope (H:V): 3.00 (_:1)

Channel Slope: 0.1000

Channel Manning's n: 0.0220

Channel Invert Elevation: 65.00 ft

Roadway Data for Crossing: 70403

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 10.00 ft

Crest Elevation: 79.00 ft

Roadway Surface: Paved

Roadway Top Width: 15.00 ft

APPENDIX C

NRCS SOIL SURVEY MAP

United States Department of Agriculture

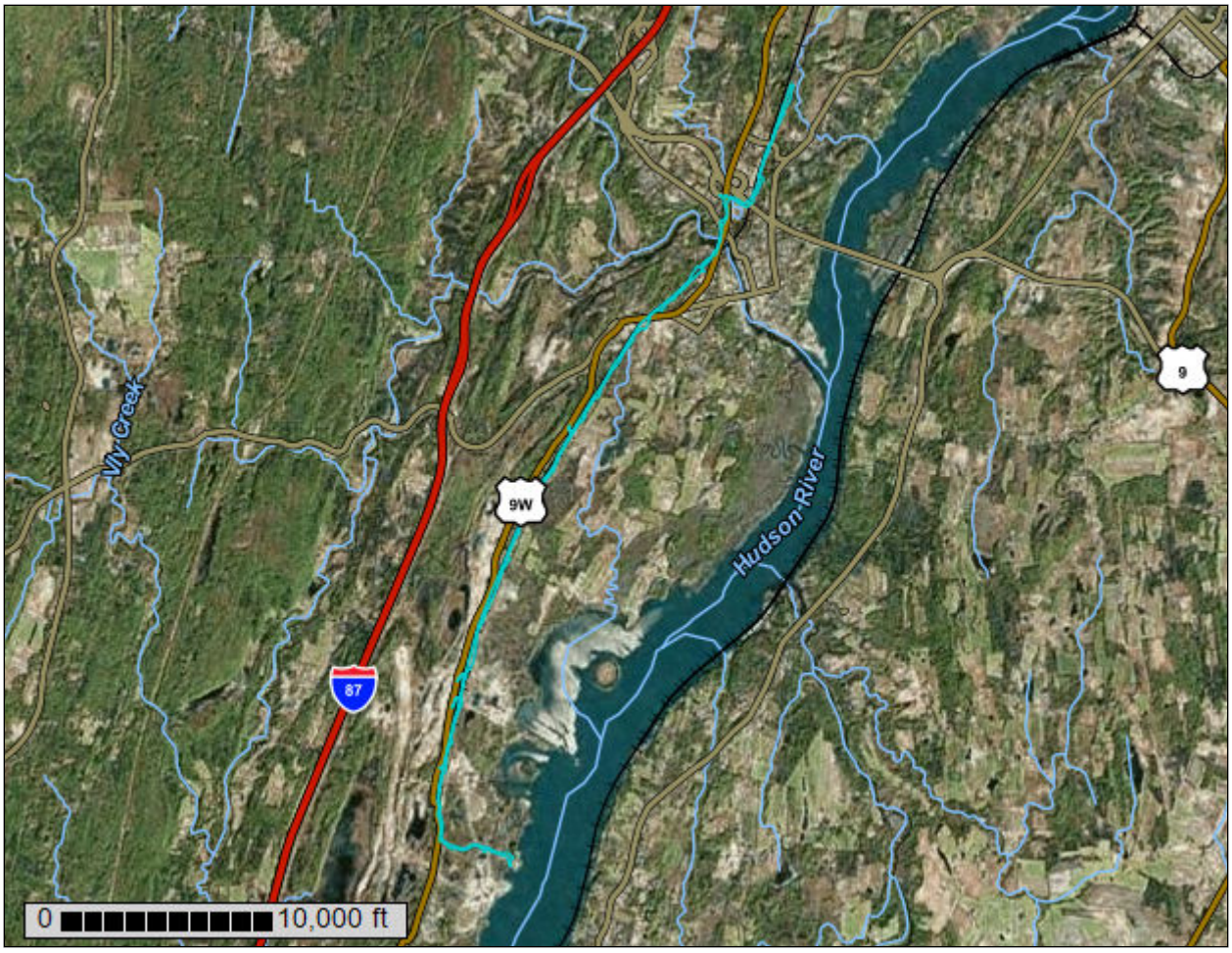
NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Greene County, New York

CHPE 7A



June 2, 2023

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

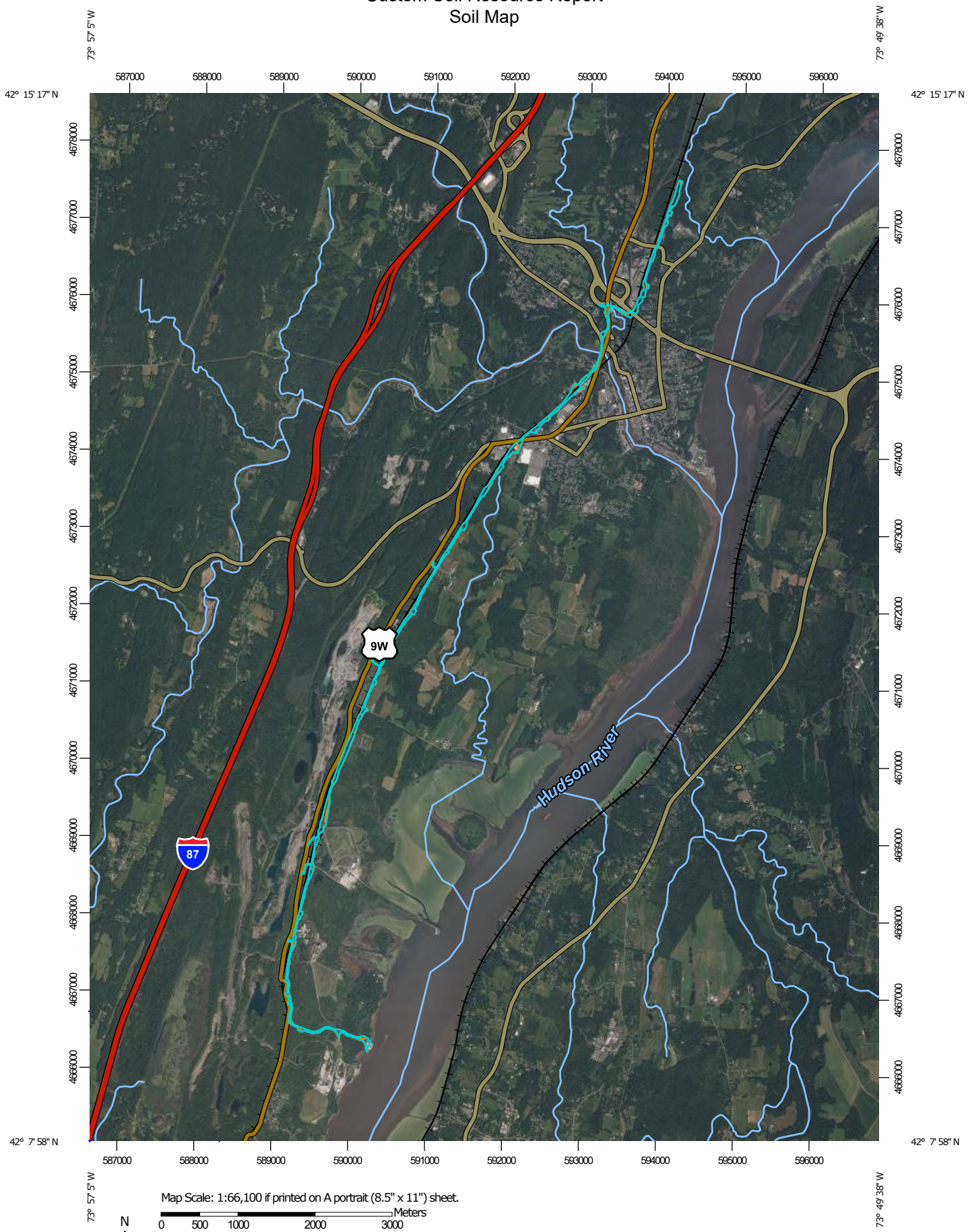
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Scale: 1:66,100 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 500 1000 2000 3000

Feet
0 3000 6000 12000 18000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

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

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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: Greene County, New York
Survey Area Data: Version 21, Sep 10, 2022

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

Date(s) aerial images were photographed: Aug 15, 2021—Nov 8, 2021

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Co	Covington and Madalin soils	5.8	5.5%
FaD	Farmington gravelly silt loam, hilly, rocky	0.8	0.7%
FaE	Farmington gravelly silt loam, steep, rocky	0.6	0.6%
HvB	Hudson and Vergennes soils, 3 to 8 percent slopes	24.9	23.5%
HvC	Hudson and Vergennes soils, 8 to 15 percent slopes	7.8	7.4%
HvE	Hudson and Vergennes soils, 25 to 50 percent slopes	0.9	0.9%
HwD3	Hudson and Vergennes silty clay loams, 15 to 25 percent slopes, severely eroded	3.4	3.3%
KrA	Kingsbury and Rhinebeck soils, 0 to 3 percent slopes	3.4	3.2%
KrB	Kingsbury and Rhinebeck soils, 3 to 8 percent slopes	19.5	18.4%
Mh	Medisaprists-Hydraquents, tidal marsh	0.5	0.5%
NaC	Nassau channery silt loam, rolling	4.5	4.2%
NrC	Nassau channery silt loam, rolling, very rocky	0.3	0.3%
NrD	Nassau channery silt loam, hilly, very rocky	9.4	8.9%
NrE	Nassau channery silt loam, steep, very rocky	1.1	1.1%
RhA	Riverhead loam, 0 to 3 percent slopes	5.0	4.7%
RhB	Riverhead loam, 3 to 8 percent slopes	2.3	2.2%
RhC	Riverhead loam, rolling	0.0	0.0%
TwE	Tunkhannock and Chenango gravelly loams, 25 to 50 percent slopes	2.4	2.3%
Ur	Udorthents, loamy	12.9	12.2%
W	Water	0.3	0.2%
Totals for Area of Interest		**105.8**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas

shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Greene County, New York

Co—Covington and Madalin soils

Map Unit Setting

National map unit symbol: 9sg1
Elevation: 50 to 1,970 feet
Mean annual precipitation: 36 to 44 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 135 to 170 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Covington and similar soils: 45 percent
Madalin and similar soils: 30 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Covington

Setting

Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Calcareous clayey glaciolacustrine deposits or glaciomarine deposits

Typical profile

H1 - 0 to 7 inches: silty clay
H2 - 7 to 28 inches: clay
H3 - 28 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Low (about 5.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: D
Ecological site: F142XB007VT - Wet Clayplain Depression
Hydric soil rating: Yes

Description of Madalin

Setting

Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Clayey and silty glaciolacustrine deposits

Typical profile

H1 - 0 to 9 inches: silt loam
H2 - 9 to 30 inches: silty clay
H3 - 30 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Moderate (about 8.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C/D
Ecological site: F144AY019NH - Wet Lake Plain
Hydric soil rating: Yes

Minor Components

Vergennes

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: No

Rhinebeck

Percent of map unit: 5 percent
Hydric soil rating: No

Hudson

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: No

Kingsbury

Percent of map unit: 5 percent
Hydric soil rating: No

Canandaigua

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

FaD—Farmington gravelly silt loam, hilly, rocky

Map Unit Setting

National map unit symbol: 9sgd
Elevation: 100 to 900 feet
Mean annual precipitation: 36 to 44 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 135 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Farmington and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Farmington

Setting

Landform: Benches, till plains, ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till or congeliturbate derived from limestone, dolomite, shale, and sandstone, and in many places mixed with wind and water deposits

Typical profile

H1 - 0 to 8 inches: gravelly silt loam
H2 - 8 to 13 inches: silt loam
H3 - 13 to 17 inches: unweathered bedrock

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to high (0.00 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Available water supply, 0 to 60 inches: Very low (about 1.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Ecological site: F144AY035MA - Shallow Semi-Rich Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Nassau
Percent of map unit: 5 percent
Hydric soil rating: No

Arnot
Percent of map unit: 5 percent
Hydric soil rating: No

Rock outcrop
Percent of map unit: 5 percent
Hydric soil rating: Unranked

Tuller
Percent of map unit: 5 percent
Hydric soil rating: No

Galway
Percent of map unit: 5 percent
Hydric soil rating: No

FaE—Farmington gravelly silt loam, steep, rocky

Map Unit Setting
National map unit symbol: 9sgf
Elevation: 100 to 900 feet
Mean annual precipitation: 36 to 44 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 135 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition
Farmington and similar soils: 70 percent
Minor components: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Farmington

Setting
Landform: Benches, till plains, ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till or congeliturbate derived from limestone, dolomite, shale, and sandstone, and in many places mixed with wind and water deposits

Typical profile
H1 - 0 to 8 inches: gravelly silt loam
H2 - 8 to 13 inches: silt loam

H3 - 13 to 17 inches: unweathered bedrock

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to high (0.00 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Available water supply, 0 to 60 inches: Very low (about 1.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Ecological site: F144AY035MA - Shallow Semi-Rich Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Rock outcrop

Percent of map unit: 5 percent
Hydric soil rating: Unranked

Arnot

Percent of map unit: 5 percent
Hydric soil rating: No

Rock outcrop

Percent of map unit: 5 percent
Hydric soil rating: Unranked

Galway

Percent of map unit: 5 percent
Hydric soil rating: No

Nassau

Percent of map unit: 5 percent
Hydric soil rating: No

Tuller

Percent of map unit: 5 percent
Hydric soil rating: No

HvB—Hudson and Vergennes soils, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9sgr
Elevation: 50 to 1,800 feet
Mean annual precipitation: 36 to 44 inches

Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 135 to 170 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Hudson and similar soils: 40 percent
Vergennes and similar soils: 35 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hudson

Setting

Landform: Lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Clayey and silty glaciolacustrine deposits

Typical profile

H1 - 0 to 4 inches: silt loam
H2 - 4 to 13 inches: silt loam
H3 - 13 to 30 inches: silty clay loam
H4 - 30 to 60 inches: silty clay

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 18 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Ecological site: F144AY018NY - Moist Lake Plain
Hydric soil rating: No

Description of Vergennes

Setting

Landform: Lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Clayey calcareous glaciolacustrine, glaciomarine, or estuarine deposits

Typical profile

H1 - 0 to 10 inches: loam
H2 - 10 to 17 inches: clay loam
H3 - 17 to 34 inches: clay
H4 - 34 to 60 inches: stratified silty clay to silty clay loam to silt loam to very fine sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Moderate (about 7.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D
Ecological site: F142XB005VT - Clayplain
Hydric soil rating: No

Minor Components

Kingsbury

Percent of map unit: 5 percent
Hydric soil rating: No

Madalin

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Rhinebeck

Percent of map unit: 5 percent
Hydric soil rating: No

Elmridge

Percent of map unit: 5 percent
Hydric soil rating: No

Nunda

Percent of map unit: 5 percent
Hydric soil rating: No

HvC—Hudson and Vergennes soils, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9sgs
Elevation: 50 to 1,800 feet
Mean annual precipitation: 36 to 44 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 135 to 170 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Hudson and similar soils: 40 percent
Vergennes and similar soils: 35 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hudson

Setting

Landform: Lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Clayey and silty glaciolacustrine deposits

Typical profile

H1 - 0 to 4 inches: silt loam
H2 - 4 to 13 inches: silt loam
H3 - 13 to 30 inches: silty clay loam
H4 - 30 to 60 inches: silty clay

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 18 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Ecological site: F144AY018NY - Moist Lake Plain

Hydric soil rating: No

Description of Vergennes

Setting

Landform: Lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Clayey calcareous glaciolacustrine, glaciomarine, or estuarine deposits

Typical profile

H1 - 0 to 10 inches: loam
H2 - 10 to 17 inches: clay loam
H3 - 17 to 34 inches: clay
H4 - 34 to 60 inches: stratified silty clay to silty clay loam to silt loam to very fine sandy loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Moderate (about 7.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Ecological site: F142XB005VT - Clayplain
Hydric soil rating: No

Minor Components

Kingsbury

Percent of map unit: 5 percent
Hydric soil rating: No

Rhinebeck

Percent of map unit: 5 percent
Hydric soil rating: No

Elmridge

Percent of map unit: 5 percent
Hydric soil rating: No

Madalin

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Nunda

Percent of map unit: 5 percent
Hydric soil rating: No

HvE—Hudson and Vergennes soils, 25 to 50 percent slopes

Map Unit Setting

National map unit symbol: 9sgt
Elevation: 50 to 1,800 feet
Mean annual precipitation: 36 to 44 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 135 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Hudson and similar soils: 45 percent
Vergennes and similar soils: 30 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hudson

Setting

Landform: Lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Riser
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Clayey and silty glaciolacustrine deposits

Typical profile

H1 - 0 to 4 inches: silt loam
H2 - 4 to 13 inches: silt loam
H3 - 13 to 30 inches: silty clay loam
H4 - 30 to 60 inches: silty clay

Properties and qualities

Slope: 25 to 50 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 18 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C/D
Ecological site: F144AY018NY - Moist Lake Plain
Hydric soil rating: No

Description of Vergennes

Setting

Landform: Lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Riser
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Clayey calcareous glaciolacustrine, glaciomarine, or estuarine deposits

Typical profile

H1 - 0 to 10 inches: loam
H2 - 10 to 17 inches: clay loam
H3 - 17 to 34 inches: clay
H4 - 34 to 60 inches: stratified silty clay to silty clay loam to silt loam to very fine sandy loam

Properties and qualities

Slope: 25 to 50 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Moderate (about 7.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: F142XB005VT - Clayplain
Hydric soil rating: No

Minor Components

Rhinebeck

Percent of map unit: 5 percent
Hydric soil rating: No

Kingsbury

Percent of map unit: 5 percent
Hydric soil rating: No

Nunda

Percent of map unit: 5 percent
Hydric soil rating: No

Elmridge
Percent of map unit: 5 percent
Hydric soil rating: No

Shaker
Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

HwD3—Hudson and Vergennes silty clay loams, 15 to 25 percent slopes, severely eroded

Map Unit Setting
National map unit symbol: 9sgw
Elevation: 50 to 1,800 feet
Mean annual precipitation: 36 to 44 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 135 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition
Hudson and similar soils: 50 percent
Vergennes and similar soils: 30 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hudson

Setting
Landform: Lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Riser
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Clayey and silty glaciolacustrine deposits

Typical profile
H1 - 0 to 7 inches: silty clay loam
H2 - 7 to 30 inches: silty clay loam
H3 - 30 to 60 inches: silty clay

Properties and qualities
Slope: 15 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 18 to 24 inches
Frequency of flooding: None

Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C/D
Ecological site: F144AY018NY - Moist Lake Plain
Hydric soil rating: No

Description of Vergennes

Setting

Landform: Lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Riser
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Clayey calcareous glaciolacustrine, glaciomarine, or estuarine deposits

Typical profile

H1 - 0 to 6 inches: silty clay loam
H2 - 6 to 34 inches: clay
H3 - 34 to 60 inches: stratified silty clay to silty clay loam to silt loam to very fine sandy loam

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Low (about 5.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: F142XB005VT - Clayplain
Hydric soil rating: No

Minor Components

Rhinebeck

Percent of map unit: 5 percent
Hydric soil rating: No

Burdett

Percent of map unit: 5 percent
Hydric soil rating: No

Kingsbury
Percent of map unit: 5 percent
Hydric soil rating: No

Elmridge
Percent of map unit: 5 percent
Hydric soil rating: No

KrA—Kingsbury and Rhinebeck soils, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: 9sgx
Elevation: 80 to 1,000 feet
Mean annual precipitation: 36 to 44 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 135 to 170 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Kingsbury and similar soils: 40 percent
Rhinebeck and similar soils: 30 percent
Minor components: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kingsbury

Setting
Landform: Lake plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Calcareous, clayey glaciomarine deposits or glaciolacustrine deposits

Typical profile
H1 - 0 to 7 inches: clay loam
H2 - 7 to 14 inches: silty clay loam
H3 - 14 to 36 inches: clay
H4 - 36 to 70 inches: stratified silty clay loam to silt loam to very fine sandy loam

Properties and qualities
Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None

Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Available water supply, 0 to 60 inches: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: D
Ecological site: F144AY018NY - Moist Lake Plain
Hydric soil rating: No

Description of Rhinebeck

Setting

Landform: Lake plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Clayey and silty glaciolacustrine deposits

Typical profile

H1 - 0 to 7 inches: silt loam
H2 - 7 to 19 inches: silty clay loam
H3 - 19 to 32 inches: silty clay
H4 - 32 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Available water supply, 0 to 60 inches: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F144AY018NY - Moist Lake Plain
Hydric soil rating: No

Minor Components

Madalin

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Covington

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Hudson
Percent of map unit: 5 percent
Hydric soil rating: No

Shaker
Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Elmridge
Percent of map unit: 5 percent
Hydric soil rating: No

Vergennes
Percent of map unit: 5 percent
Hydric soil rating: No

KrB—Kingsbury and Rhinebeck soils, 3 to 8 percent slopes

Map Unit Setting
National map unit symbol: 9sgy
Elevation: 80 to 1,000 feet
Mean annual precipitation: 36 to 44 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 135 to 170 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Kingsbury and similar soils: 45 percent
Rhinebeck and similar soils: 30 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kingsbury

Setting
Landform: Lake plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Calcareous, clayey glaciomarine deposits or glaciolacustrine deposits

Typical profile
H1 - 0 to 7 inches: clay loam
H2 - 7 to 14 inches: silty clay loam
H3 - 14 to 36 inches: clay
H4 - 36 to 70 inches: stratified silty clay loam to silt loam to very fine sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Available water supply, 0 to 60 inches: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: D
Ecological site: F144AY018NY - Moist Lake Plain
Hydric soil rating: No

Description of Rhinebeck

Setting

Landform: Lake plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Clayey and silty glaciolacustrine deposits

Typical profile

H1 - 0 to 7 inches: silt loam
H2 - 7 to 19 inches: silty clay loam
H3 - 19 to 32 inches: silty clay
H4 - 32 to 60 inches: silty clay

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Available water supply, 0 to 60 inches: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F144AY018NY - Moist Lake Plain
Hydric soil rating: No

Minor Components

Covington
Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Elmridge
Percent of map unit: 5 percent
Hydric soil rating: No

Hudson
Percent of map unit: 5 percent
Hydric soil rating: No

Vergennes
Percent of map unit: 5 percent
Hydric soil rating: No

Madalin
Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Mh—Medisaprists-Hydraquents, tidal marsh

Map Unit Setting
National map unit symbol: 9shz
Elevation: 10 to 2,400 feet
Mean annual precipitation: 36 to 44 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 135 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition
Medisaprists and similar soils: 45 percent
Hydraquents and similar soils: 30 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Medisaprists

Setting
Landform: Marshes
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Organic material

Typical profile

H1 - 0 to 51 inches: muck
H2 - 51 to 60 inches: silt loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to very high (0.06 to 19.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Very high (about 20.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8w
Hydrologic Soil Group: A/D
Hydric soil rating: Yes

Description of Hydraquents

Setting

Landform: Marshes
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Concave
Across-slope shape: Concave

Typical profile

H1 - 0 to 9 inches: silty clay loam
H2 - 9 to 60 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.06 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8w
Hydrologic Soil Group: C/D
Hydric soil rating: Yes

Minor Components

Canandaigua

Percent of map unit: 5 percent

Landform: Depressions
Hydric soil rating: Yes

Fluvaquents
Percent of map unit: 5 percent
Landform: Flood plains
Hydric soil rating: Yes

Madalin
Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Alden
Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Carlisle
Percent of map unit: 5 percent
Landform: Marshes, swamps
Hydric soil rating: Yes

NaC—Nassau channery silt loam, rolling

Map Unit Setting
National map unit symbol: 9sj5
Elevation: 600 to 1,800 feet
Mean annual precipitation: 36 to 44 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 135 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition
Nassau and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nassau

Setting
Landform: Benches, till plains, ridges
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Channery loamy till derived mainly from local slate or shale

Typical profile
Oi - 0 to 1 inches: slightly decomposed plant material
H1 - 1 to 4 inches: channery silt loam

H2 - 4 to 19 inches: extremely channery silt loam
H3 - 19 to 23 inches: unweathered bedrock

Properties and qualities

Slope: 5 to 15 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

Minor Components

Lordstown

Percent of map unit: 5 percent
Hydric soil rating: No

Arnot

Percent of map unit: 5 percent
Hydric soil rating: No

Oquaga

Percent of map unit: 5 percent
Hydric soil rating: No

Tuller

Percent of map unit: 5 percent
Hydric soil rating: No

NrC—Nassau channery silt loam, rolling, very rocky

Map Unit Setting

National map unit symbol: 9sj6
Elevation: 600 to 1,800 feet
Mean annual precipitation: 36 to 44 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 135 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Nassau and similar soils: 70 percent
Minor components: 30 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nassau

Setting

Landform: Benches, till plains, ridges
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Channery loamy till derived mainly from local slate or shale

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
H1 - 1 to 4 inches: channery silt loam
H2 - 4 to 19 inches: extremely channery silt loam
H3 - 19 to 23 inches: unweathered bedrock

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

Minor Components

Rock outcrop

Percent of map unit: 10 percent
Hydric soil rating: Unranked

Arnot

Percent of map unit: 5 percent
Hydric soil rating: No

Tuller

Percent of map unit: 5 percent
Hydric soil rating: No

Lordstown

Percent of map unit: 5 percent
Hydric soil rating: No

Oquaga

Percent of map unit: 5 percent
Hydric soil rating: No

NrD—Nassau channery silt loam, hilly, very rocky

Map Unit Setting

National map unit symbol: 9sj7
Elevation: 600 to 1,800 feet
Mean annual precipitation: 36 to 44 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 135 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Nassau and similar soils: 70 percent
Minor components: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nassau

Setting

Landform: Benches, till plains, ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Channery loamy till derived mainly from local slate or shale

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
H1 - 1 to 4 inches: channery silt loam
H2 - 4 to 19 inches: extremely channery silt loam
H3 - 19 to 23 inches: unweathered bedrock

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

Minor Components

Valois
Percent of map unit: 5 percent
Hydric soil rating: No

Lordstown
Percent of map unit: 5 percent
Hydric soil rating: No

Arnot
Percent of map unit: 5 percent
Hydric soil rating: No

Rock outcrop
Percent of map unit: 5 percent
Hydric soil rating: Unranked

Tuller
Percent of map unit: 5 percent
Hydric soil rating: No

Oquaga
Percent of map unit: 5 percent
Hydric soil rating: No

NrE—Nassau channery silt loam, steep, very rocky

Map Unit Setting
National map unit symbol: 9sj8
Elevation: 600 to 1,800 feet
Mean annual precipitation: 36 to 44 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 135 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition
Nassau and similar soils: 70 percent
Minor components: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nassau

Setting
Landform: Benches, till plains, ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Channery loamy till derived mainly from local slate or shale

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
H1 - 1 to 4 inches: channery silt loam
H2 - 4 to 19 inches: extremely channery silt loam
H3 - 19 to 23 inches: unweathered bedrock

Properties and qualities

Slope: 25 to 45 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

Minor Components

Rock outcrop

Percent of map unit: 10 percent
Hydric soil rating: Unranked

Lordstown

Percent of map unit: 5 percent
Hydric soil rating: No

Arnot

Percent of map unit: 5 percent
Hydric soil rating: No

Oquaga

Percent of map unit: 5 percent
Hydric soil rating: No

Tuller

Percent of map unit: 5 percent
Hydric soil rating: No

RhA—Riverhead loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 9sjx
Elevation: 590 to 1,970 feet
Mean annual precipitation: 36 to 44 inches

Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 135 to 170 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Riverhead and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Riverhead

Setting

Landform: Deltas, terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits overlying stratified sand and gravel

Typical profile

H1 - 0 to 8 inches: loam
H2 - 8 to 24 inches: sandy loam
H3 - 24 to 60 inches: loamy sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Ecological site: F144AY023CT - Well Drained Outwash
Hydric soil rating: No

Minor Components

Tioga

Percent of map unit: 5 percent
Hydric soil rating: No

Udifluvents

Percent of map unit: 5 percent
Hydric soil rating: No

Chenango

Percent of map unit: 5 percent
Hydric soil rating: No

Elmridge

Percent of map unit: 5 percent

Hydric soil rating: No

Hudson

Percent of map unit: 5 percent
Hydric soil rating: No

RhB—Riverhead loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9sjy
Elevation: 590 to 1,970 feet
Mean annual precipitation: 36 to 44 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 135 to 170 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Riverhead and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Riverhead

Setting

Landform: Deltas, terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits overlying stratified sand and gravel

Typical profile

H1 - 0 to 8 inches: loam
H2 - 8 to 24 inches: sandy loam
H3 - 24 to 60 inches: loamy sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A

Ecological site: F140XY021NY - Dry Outwash
Hydric soil rating: No

Minor Components

Elmridge
Percent of map unit: 5 percent
Hydric soil rating: No

Tioga
Percent of map unit: 5 percent
Hydric soil rating: No

Hudson
Percent of map unit: 5 percent
Hydric soil rating: No

Chenango
Percent of map unit: 5 percent
Hydric soil rating: No

Udifluvents
Percent of map unit: 5 percent
Hydric soil rating: No

RhC—Riverhead loam, rolling

Map Unit Setting
National map unit symbol: 9sjz
Elevation: 590 to 1,970 feet
Mean annual precipitation: 36 to 44 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 135 to 170 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Riverhead and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Riverhead

Setting
Landform: Deltas, terraces
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits overlying stratified sand and gravel

Typical profile
H1 - 0 to 8 inches: loam

H2 - 8 to 24 inches: sandy loam
H3 - 24 to 60 inches: loamy sand

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Ecological site: F144AY023CT - Well Drained Outwash
Hydric soil rating: No

Minor Components

Chenango

Percent of map unit: 5 percent
Hydric soil rating: No

Elmridge

Percent of map unit: 5 percent
Hydric soil rating: No

Valois

Percent of map unit: 5 percent
Hydric soil rating: No

Hudson

Percent of map unit: 5 percent
Hydric soil rating: No

Udifluvents

Percent of map unit: 5 percent
Hydric soil rating: No

TwE—Tunkhannock and Chenango gravelly loams, 25 to 50 percent slopes

Map Unit Setting

National map unit symbol: 9skf
Elevation: 600 to 2,000 feet
Mean annual precipitation: 36 to 44 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 135 to 170 days

Farmland classification: Not prime farmland

Map Unit Composition

Tunkhannock and similar soils: 45 percent
Chenango and similar soils: 35 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tunkhannock

Setting

Landform: Valley trains, terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits, derived mainly from reddish sandstone, siltstone, and shale

Typical profile

H1 - 0 to 7 inches: gravelly loam
H2 - 7 to 25 inches: very gravelly loam
H3 - 25 to 60 inches: stratified extremely gravelly sand

Properties and qualities

Slope: 25 to 45 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Ecological site: F140XY021NY - Dry Outwash
Hydric soil rating: No

Description of Chenango

Setting

Landform: Valley trains, terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits, derived mainly from sandstone, shale, and siltstone

Typical profile

H1 - 0 to 4 inches: gravelly loam
H2 - 4 to 11 inches: gravelly loam

H3 - 11 to 26 inches: very gravelly loam
H4 - 26 to 60 inches: stratified sand to gravel

Properties and qualities

Slope: 25 to 45 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 1 percent
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Ecological site: F140XY021NY - Dry Outwash
Hydric soil rating: No

Minor Components

Barbour

Percent of map unit: 5 percent
Hydric soil rating: No

Wellsboro

Percent of map unit: 5 percent
Hydric soil rating: No

Riverhead

Percent of map unit: 5 percent
Hydric soil rating: No

Basher

Percent of map unit: 5 percent
Hydric soil rating: No

Ur—Udorthents, loamy

Map Unit Setting

National map unit symbol: 9skh
Elevation: 160 to 1,970 feet
Mean annual precipitation: 36 to 44 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 135 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Udorthents and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents

Typical profile

H1 - 0 to 4 inches: gravelly silt loam
H2 - 4 to 70 inches: gravelly silt loam

Properties and qualities

Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.06 to 5.95 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Low (about 5.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Wellsboro

Percent of map unit: 5 percent
Hydric soil rating: No

Valois

Percent of map unit: 5 percent
Hydric soil rating: No

Volusia

Percent of map unit: 5 percent
Hydric soil rating: No

Tunkhannock

Percent of map unit: 5 percent
Hydric soil rating: No

W—Water

Map Unit Setting

National map unit symbol: 9sl3

Mean annual precipitation: 36 to 44 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 135 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

APPENDIX D

NYSDOT Highway Design Manual Exhibits

Exhibit 8-3 Design Flood Frequencies (in years) For Drainage Structures and Channels[1]

Road type or Functional Class	Culvert[2]	Storm Drainage Systems	Driveway Culverts	Ditches [4]
Interstates and Other Freeways	50	10[5]	n/a	25
Principal Arterials	50	10[5]	25	25
Minor Arterials	50[6]	5[7]	10	10
Major Collectors	50[6]	5[7]	10	10
Minor Collectors	50[6]	5[7]	10	10
Local Roads & Streets w/ AADT>400	50[6]	5[7]	10	10
A or B type highways (AADT < 400) [8, 10]	50[6]	5[7]	10	10
C [8,9,10]				

NOTES

1. The values in this table are typical. The selected value for a project should be based upon an assessment of the likely damage to the highway and adjacent landowners from a given flow and the costs of the drainage facility. Note: 100-year requirements must be checked if the proposed highway is in an established regulatory floodway or floodplain.
2. The check flow, used to assess the performance of the facility, should be the 100 year storm event.
3. Relocated natural channels should have the same flow characteristics (geometrics and slope) as the existing channel and should be provided with a lining having roughness characteristics similar to the existing channel.
4. Including lining material (All ditches should have a lining material and not be left untreated).
5. As per 23CFR650A, and Table 1-1 of HDS 2, a 50-year frequency shall be used for stormwater design at the following locations where no overflow relief is available:
   a. sag vertical curves connecting negative and positive grades.
   b. other locations such as underpasses, depressed roadways, etc.
6. A design flood frequency of 10 or 25 years is acceptable if documented in the Design Approval Document, and when identified after design approval, in the drainage report. A design flood frequency of 10 or 25 years should be used in the design of driveway culverts and similar structures.
7. Use a 25-year frequency at the following locations where no overflow relief is available:
   a. sag vertical curves connecting negative and positive grades.
   b. other locations such as underpasses, depressed roadways, etc.
8. Dead end highways should use the Local Road Standard as a minimum for sizing, but the roadway and structure should be armored to handle a larger event without washing out.
9. Existing structures are considered acceptable unless there are known flooding issues which require a more detailed design. In such a case, the A/B standard should be followed.
10. See HDM Chapter 4, Table 4-1 for the definition of Type A, B and C Low Volume Highways.

A. Rational Method

This method is recommended to determine the peak discharge, or runoff rate, from drainage areas up to 200 acres. If a hydrograph is required to consider the effects of storage, use the Modified Soil Cover Complex method, or a similar method.

The Rational Method assumes the following:

1. Peak discharge occurs when all of the drainage area is contributing,
2. A storm that has a duration equal to the time of concentration (T_c) produces the highest peak discharge for the selected frequency,
3. Intensity is uniform over a duration of time equal to or greater than the T_c, and
4. The frequency of the peak flow is equal to the frequency of the intensity.

The rational method formula is:

$Q = CiA$, where:

Q = peak discharge or rate of runoff (cfs)
C = runoff coefficient
i = intensity (in/hr)
A = drainage area (acres)

1. Runoff coefficient. The runoff coefficient selected shall represent the characteristics of the drainage area being analyzed. A weighted runoff coefficient (C_w) should be used in the Rational formula for drainage areas having different runoff characteristics. C_w should be calculated as follows:

$C_w = \sum C_i A_i / A$, where

C_i = runoff coefficient for subarea "i"
A_i = subarea

Refer to Exhibit 8-4 for recommended runoff coefficients.

Exhibit 8-4 Values of Runoff Coefficient (C) for Use in the Rational Method

Type of Surface	Runoff Coefficient (C)[1]
Rural Areas	
Concrete, or Hot Mix Asphalt pavement	0.95 - 0.98
Gravel roadways or shoulders	0.4 - 0.6
Steep grassed areas (1:2, vert.:horiz.)	0.6 - 0.7
Turf meadows	0.1 - 0.4
Forested areas	0.1 - 0.3
Cultivated fields	0.2 - 0.4
Urban/Suburban Areas	
Flat residential, @ 30% of area impervious	0.40
Flat residential, @ 60% of area impervious	0.55
Moderately steep residential, @ 50% of area impervious	0.65
Moderately steep built up area, @ 70% of area impervious	0.80
Flat commercial, @ 90% of area impervious	0.80

NOTE

1. For flat slopes and/or permeable soil, use lower values. For steep slopes and/or impermeable soil, use the higher values.

2. Intensity. Determine intensity i.e., the rate of rainfall upon the drainage area, using intensity-duration-frequency (IDF) curves developed for the area being analyzed, a duration equal to the time of concentration (T_c), and a frequency equal to the design flood frequency.

   IDF relationships are based upon statistical analysis of rainfall data. They describe, for a given flood frequency, the average intensity of rainfall for a storm of a given duration (equal to the time of concentration). The statistical data for New York State is based upon "Technical Paper No. 40" (TP-40) and the "NOAA Technical Memorandum NWS HYDRO-35". The methodology for developing IDF curves is presented in "Drainage of Highway Pavements", Highway Engineering Circular (HEC) No. 12. To construct a set of IDF curves for a given location, HEC-12 uses six data points from HYDRO-35: the 2-year 5, 15 and 60 minute rainfalls and the 100-year 5, 15 and 60 minute rainfalls. the 60 minute rainfall for each intermediate return period is calculated from these points, and then the rainfall intensities for other durations are calculated. IDF curves for some locations are available from the Regional Design Group or should be constructed from known rainfall data.

   To obtain the intensity, the T_c must first be estimated. The T_c is defined as the time required for water to travel from the most remote point in the watershed to the point of interest. The time of concentration path is the longest in time, and is not necessarily the longest in distance. Various methods can be used to determine the T_c of a drainage area. The method used to determine the T_c should be appropriate for the flow path (sheet flow, concentrated flow, or channelized flow). The minimum T_c used shall be 5 minutes.

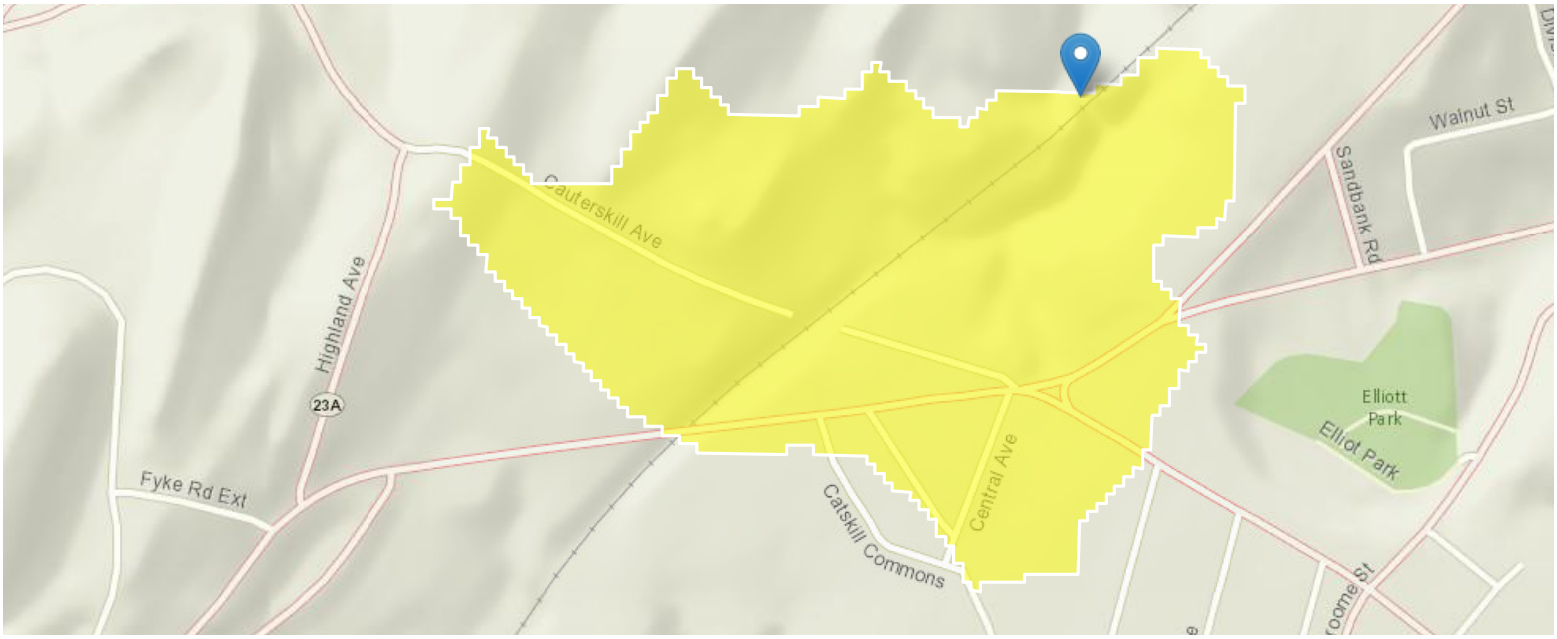
APPENDIX F

StreamStats Reports

FOR CULVERT 409-C1
STATION 70134+00

StreamStats Report

Region ID: NY
Workspace ID: NY20230605192013250000
Clicked Point (Latitude, Longitude): 42.21768, -73.87879
Time: 2023-06-05 15:22:00 -0400



Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.12	square miles
LAGFACTOR	Lag Factor as defined in SIR 2006-5112	0.00426	dimensionless
MAR	Mean annual runoff for the period of record in inches	16.1	inches
STORAGE	Percentage of area of storage (lakes ponds reservoirs wetlands)	0	percent

Peak-Flow Statistics

Peak-Flow Statistics Parameters [2006 Full Region 2]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.12	square miles	1.93	996
LAGFACTOR	Lag Factor	0.00426	dimensionless	0.014	6.997
STORAGE	Percent Storage	0	percent	0	11.88
MAR	Mean Annual Runoff in inches	16.1	inches	16.03	33.95

Peak-Flow Statistics Disclaimers [2006 Full Region 2]

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

Peak-Flow Statistics Flow Report [2006 Full Region 2]

Statistic	Value	Unit
80-percent AEP flood	4.89	ft^3/s
66.7-percent AEP flood	6.14	ft^3/s
50-percent AEP flood	7.96	ft^3/s
20-percent AEP flood	13.7	ft^3/s
10-percent AEP flood	18.5	ft^3/s
4-percent AEP flood	25.4	ft^3/s
2-percent AEP flood	31.4	ft^3/s
1-percent AEP flood	38	ft^3/s
0.5-percent AEP flood	45.2	ft^3/s
0.2-percent AEP flood	56.1	ft^3/s

Peak-Flow Statistics Citations

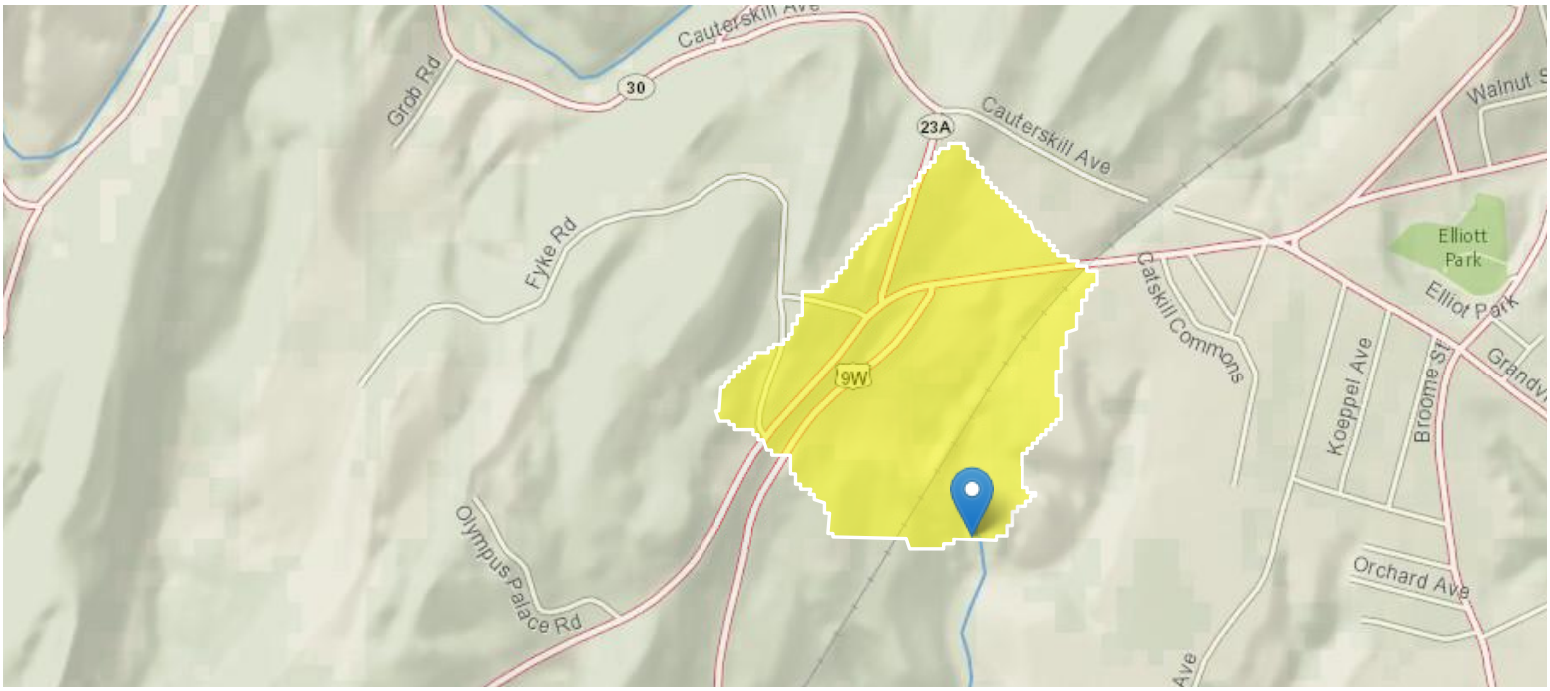
Lumia, Richard, Freehafer, D.A., and Smith, M.J.,2006, Magnitude and Frequency of Floods in New York: U.S. Geological Survey Scientific Investigations Report 2006–5112, 152 p. (http://pubs.usgs.gov/sir/2006/5112/)

Application Version: 4.15.0
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1

FOR CULVERT 411-C1
STATION 70162+00

StreamStats Report

Region ID: NY
Workspace ID: NY20230609161039497000
Clicked Point (Latitude, Longitude): 42.20923, -73.88728
Time: 2023-06-09 12:13:11 -0400



Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.15	square miles
LAGFACTOR	Lag Factor as defined in SIR 2006-5112	0.0026	dimensionless
MAR	Mean annual runoff for the period of record in inches	16.2	inches
STORAGE	Percentage of area of storage (lakes ponds reservoirs wetlands)	0	percent

Peak-Flow Statistics

Peak-Flow Statistics Parameters [2006 Full Region 2]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.15	square miles	1.93	996
LAGFACTOR	Lag Factor	0.0026	dimensionless	0.014	6.997
STORAGE	Percent Storage	0	percent	0	11.88
MAR	Mean Annual Runoff in inches	16.2	inches	16.03	33.95

Peak-Flow Statistics Disclaimers [2006 Full Region 2]

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

Peak-Flow Statistics Flow Report [2006 Full Region 2]

Statistic	Value	Unit
80-percent AEP flood	6.06	ft^3/s
66.7-percent AEP flood	7.6	ft^3/s
50-percent AEP flood	9.85	ft^3/s
20-percent AEP flood	16.9	ft^3/s
10-percent AEP flood	22.8	ft^3/s
4-percent AEP flood	31.4	ft^3/s
2-percent AEP flood	38.7	ft^3/s
1-percent AEP flood	46.8	ft^3/s
0.5-percent AEP flood	55.7	ft^3/s
0.2-percent AEP flood	69.1	ft^3/s

Peak-Flow Statistics Citations

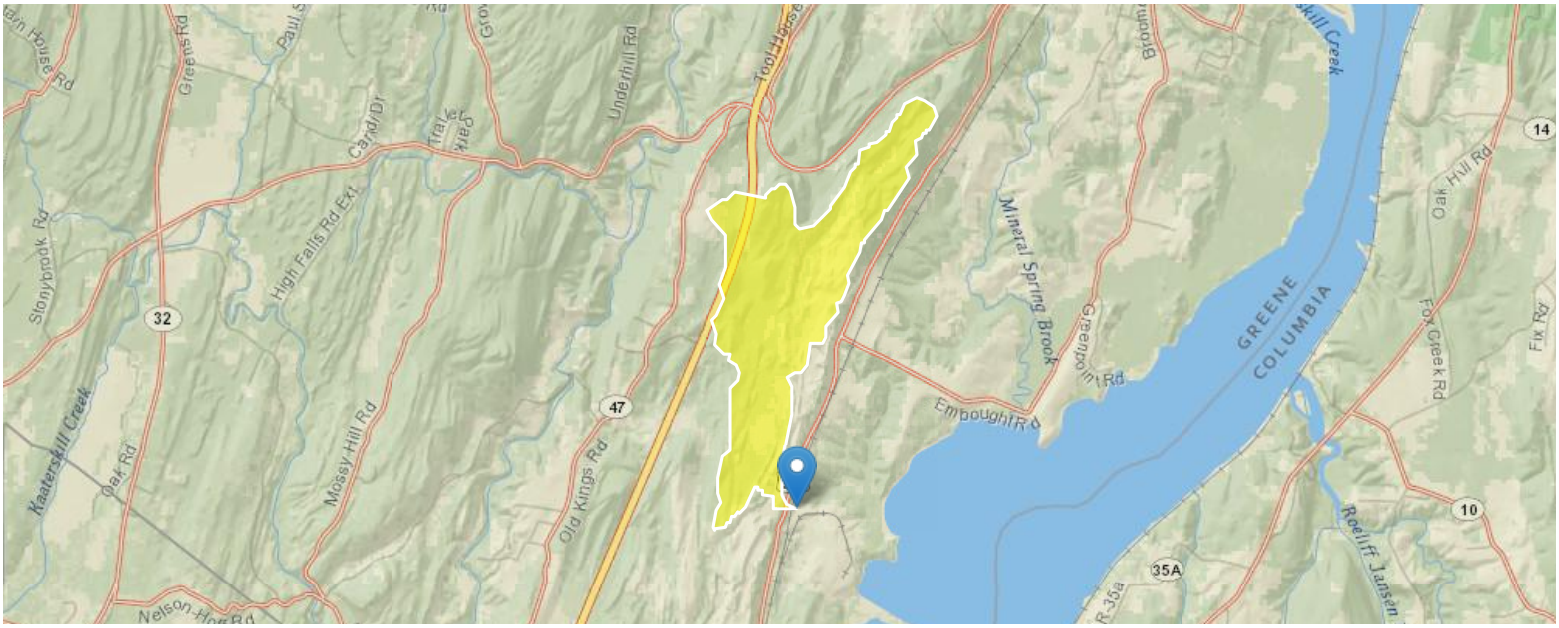
Lumia, Richard, Freehafer, D.A., and Smith, M.J.,2006, Magnitude and Frequency of Floods in New York: U.S. Geological Survey Scientific Investigations Report 2006–5112, 152 p. (http://pubs.usgs.gov/sir/2006/5112/)

Application Version: 4.15.0
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1

FOR CULVERT 423-C1
STATION 70329+00

StreamStats Report

Region ID: NY
Workspace ID: NY20230612190846378000
Clicked Point (Latitude, Longitude): 42.16958, -73.91508
Time: 2023-06-12 15:11:11 -0400



Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	1.11	square miles
LAGFACTOR	Lag Factor as defined in SIR 2006-5112	0.26	dimensionless
MAR	Mean annual runoff for the period of record in inches	17	inches
STORAGE	Percentage of area of storage (lakes ponds reservoirs wetlands)	17	percent

Peak-Flow Statistics

Peak-Flow Statistics Parameters [2006 Full Region 2]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.11	square miles	1.93	996
LAGFACTOR	Lag Factor	0.26	dimensionless	0.014	6.997
STORAGE	Percent Storage	17	percent	0	11.88
MAR	Mean Annual Runoff in inches	17	inches	16.03	33.95

Peak-Flow Statistics Disclaimers [2006 Full Region 2]

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

Peak-Flow Statistics Flow Report [2006 Full Region 2]

Statistic	Value	Unit
80-percent AEP flood	9.52	ft^3/s
66.7-percent AEP flood	11.5	ft^3/s
50-percent AEP flood	14.3	ft^3/s
20-percent AEP flood	23.6	ft^3/s
10-percent AEP flood	31.7	ft^3/s
4-percent AEP flood	44.3	ft^3/s
2-percent AEP flood	55.8	ft^3/s
1-percent AEP flood	69	ft^3/s
0.5-percent AEP flood	84.6	ft^3/s
0.2-percent AEP flood	109	ft^3/s

Peak-Flow Statistics Citations

Lumia, Richard, Freehafer, D.A., and Smith, M.J.,2006, Magnitude and Frequency of Floods in New York: U.S. Geological Survey Scientific Investigations Report 2006–5112, 152 p. (http://pubs.usgs.gov/sir/2006/5112/)

Application Version: 4.15.0
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1