

FLOOD INSURANCE STUDY

FEDERAL EMERGENCY MANAGEMENT AGENCY

VOLUME 5 OF 5



WESTCHESTER COUNTY, NEW YORK (ALL JURISDICTIONS)

COMMUNITY NAME	NUMBER	COMMUNITY NAME	NUMBER
ARDSLEY, VILLAGE OF	360902	NEW ROCHELLE, CITY OF	360922
BEDFORD, TOWN OF	360903	NORTH CASTLE, TOWN OF	360923
BRIARCLIFF MANOR, VILLAGE OF	360904	NORTH SALEM, TOWN OF	361240
BRONXVILLE, VILLAGE OF	360905	OSSINING, TOWN OF	361241
BUCHANAN, VILLAGE OF	361534	OSSINING, VILLAGE OF	361021
CORTLANDT, TOWN OF	360906	PEEKSKILL, CITY OF	360924
CROTON-ON-HUDSON, VILLAGE OF	360907	PELHAM, VILLAGE OF	360925
DOBBS FERRY, VILLAGE OF	360908	PELHAM MANOR, VILLAGE OF	360926
EASTCHESTER, TOWN OF	360909	PLEASANTVILLE, VILLAGE OF	360927
ELMSFORD, VILLAGE OF	360910	PORT CHESTER, VILLAGE OF	360928
GREENBURGH, TOWN OF	360911	POUND RIDGE, TOWN OF	360929
HARRISON, TOWN OF	360912	RYE, CITY OF	360931
HASTINGS-ON-HUDSON, VILLAGE OF	360913	RYE BROOK, VILLAGE OF	360930
IRVINGTON, VILLAGE OF	360914	SCARSDALE, VILLAGE OF	360932
LARCHMONT, VILLAGE OF	360915	SLEEPY HOLLOW, VILLAGE OF	361515
LEWISBORO, TOWN OF	361227	SOMERS, TOWN OF	361242
MAMARONECK, TOWN OF	360917	TARRYTOWN, VILLAGE OF	360933
MAMARONECK, VILLAGE OF	360916	TUCKAHOE, VILLAGE OF	360934
MOUNT KISCO, VILLAGE OF	360918	WHITE PLAINS, CITY OF	360935
MOUNT PLEASANT, TOWN OF	360919	YONKERS, CITY OF	360936
MOUNT VERNON, CITY OF	360920	YORKTOWN, TOWN OF	360937
NEW CASTLE, TOWN OF	360921		

PRELIMINARY

December 8, 2014

FLOOD INSURANCE STUDY NUMBER
36119CV001B

Version Number 2.2.2.1



FEMA

TABLE OF CONTENTS

Volume 1

	<u>Page</u>
SECTION 1.0 – INTRODUCTION	1
1.1 The National Flood Insurance Program	1
1.2 Purpose of this Flood Insurance Study Report	2
1.3 Jurisdictions Included in the Flood Insurance Study Project	2
1.4 Considerations for using this Flood Insurance Study Report	10
SECTION 2.0 – FLOODPLAIN MANAGEMENT APPLICATIONS	22
2.1 Floodplain Boundaries	22
2.2 Floodways	22
2.3 Base Flood Elevations	39
2.4 Non-Encroachment Zones	39
2.5 Coastal Flood Hazard Areas	40
2.5.1 Water Elevations and the Effects of Waves	40
2.5.2 Floodplain Boundaries and BFEs for Coastal Areas	41
2.5.3 Coastal High Hazard Areas	43
2.5.4 Limit of Moderate Wave Action	44
SECTION 3.0 – INSURANCE APPLICATIONS	45
3.1 National Flood Insurance Program Insurance Zones	45
3.2 Coastal Barrier Resources System	46
SECTION 4.0 – AREA STUDIED	47
4.1 Basin Description	47
4.2 Principal Flood Problems	47
4.3 Non-Levee Flood Protection Measures	50
4.4 Levees	51
SECTION 5.0 – ENGINEERING METHODS	54
5.1 Hydrologic Analyses	54
5.2 Hydraulic Analyses	79
5.3 Coastal Analyses	95
5.3.1 Total Stillwater Elevations	96
5.3.2 Waves	100
5.3.3 Coastal Erosion	100
5.3.4 Wave Hazard Analyses	100
5.4 Alluvial Fan Analyses	125
SECTION 6.0 – MAPPING METHODS	125
6.1 Vertical and Horizontal Control	125
6.2 Base Map	126
6.3 Floodplain and Floodway Delineation	126
6.4 Coastal Flood Hazard Mapping	181
6.5 FIRM Revisions	188

6.5.1	Letters of Map Amendment	188
6.5.2	Letters of Map Revision Based on Fill	188
6.5.3	Letters of Map Revision	188
6.5.4	Physical Map Revisions	189
6.5.5	Contracted Restudies	189
6.5.6	Community Map History	190
SECTION 7.0 – CONTRACTED STUDIES AND COMMUNITY COORDINATION		192
7.1	Contracted Studies	192
7.2	Community Meetings	199
SECTION 8.0 – ADDITIONAL INFORMATION		204
SECTION 9.0 – BIBLIOGRAPHY AND REFERENCES		207

Figures

	<u>Page</u>
Figure 1: FIRM Panel Index	13
Figure 2: FIRM Notes to Users	15
Figure 3: Map Legend for FIRM	18
Figure 4: Floodway Schematic	23
Figure 5: Wave Runup Transect Schematic	41
Figure 6: Coastal Transect Schematic	44
Figure 7: Frequency Discharge-Drainage Area Curves	77
Figure 8: 1% Annual Chance Total Stillwater Elevations for Coastal Areas	98
Figure 9: Transect Location Map	123

Tables

	<u>Page</u>
Table 1: Listing of NFIP Jurisdictions	2
Table 2: Flooding Sources Included in this FIS Report	25
Table 3: Flood Zone Designations by Community	45
Table 4: Coastal Barrier Resources System Information	47
Table 5: Basin Characteristics	47
Table 6: Principal Flood Problems	48
Table 7: Historic Flooding Elevations	49
Table 8: Non-Levee Flood Protection Measures	51
Table 9: Levees	53
Table 10: Summary of Discharges	55
Table 11: Summary of Non-Coastal Stillwater Elevations	78
Table 12: Stream Gage Information used to Determine Discharges	78
Table 13: Summary of Hydrologic and Hydraulic Analyses	80
Table 14: Roughness Coefficients	94
Table 15: Summary of Coastal Analyses	96
Table 16: Tide Gage Analysis Specifics	100
Table 17: Coastal Transect Parameters	102

Table 18: Summary of Alluvial Fan Analyses	125
Table 19: Results of Alluvial Fan Analyses	125
Table 20: Countywide Vertical Datum Conversion	126
Table 21: Stream-by-Stream Vertical Datum Conversion	126
Table 22: Base Map Sources	126
Table 23: Summary of Topographic Elevation Data used in Mapping	127
Table 24: Floodway Data	128
Table 25: Flood Hazard and Non-Encroachment Data for Selected Streams	181
Table 26: Summary of Coastal Transect Mapping Considerations	182
Table 27: Incorporated Letters of Map Change	189
Table 28: Community Map History	191
Table 29: Summary of Contracted Studies Included in this FIS Report	193
Table 30: Community Meetings	200
Table 31: Map Repositories	204
Table 32: Additional Information	206
Table 33: Bibliography and References	208

Volume 2
Exhibits

Flood Profiles

Barney Brook	Panels 01P-06P
Barney Brook Tributary	Panels 07P-12P
Bear Gutter Creek	Panels 13P-14P
Beaver Swamp Brook	Panels 15P-23P
Blind Brook	Panels 24P-31P
Branch Brook	Panels 32P-36P
Branch 1 Hutchinson River	Panel 37P
Branch 2 Kisco River	Panel 38P
Brentwood Brook	Panels 39P-45P
Bronx River	Panels 46P-57P
Brown Brook	Panels 58P-62P
Byram River Reach 1	Panels 63P-64P
Byram River Reach 2	Panels 65P-68P
Caney Brook	Panels 69P-72P
Clove Brook	Panel 73P
Crook Brook	Panels 74P-77P
Croton River	Panels 78P-80P
David's Brook	Panel 81P
East Branch Blind Brook	Panels 82P-85P
East Branch Mamaroneck River	Panels 86P-89P
East Branch Sheldrake River	Panels 90P-92P
Fly Kill Brook	Panels 93P-96P

Volume 3
Exhibits

Furnace Brook	Panels 97P-103P
Gedney Brook	Panels 104P-107P
Grassy Sprain Brook	Panel 108P
Hallocks Mill Brook	Panels 109P-112P

Hallocks Mill Brook Tributary 1	Panels 113P-115P
Hallocks Mill Brook Tributary 2	Panels 116P-118P
Highland Avenue Brook	Panels 119P-120P
Hillside Avenue Brook	Panels 121P-122P
Hutchinson River	Panels 123P-130P
Kensico Road Tributary	Panels 131P-131P
Kil Brook	Panels 133P-140P
Kisco River	Panels 141P-148P
Kisco River Tributary 1	Panel 149P
Knollwood Brook	Panels 150P-151P
Lecount Creek	Panel 152P
Leroy Avenue Brook	Panels 153P-155P
Mamaroneck River Lower Reach	Panels 156P-157P
Mamaroneck River Upper Reach	Panels 158P-159P
Manhattan Park Brook	Panels 160P-161P
Mianus River	Panels 162P-166P
Mill River	Panels 167P-168P
Mohegan Outlet	Panels 169P-174P
Muscoot River	Panels 175P-178P
Nanny Hagen Brook	Panels 179P-181P
Nelson Creek	Panels 182P-183P
Peekskill Hollow Brook	Panels 184P-188P
Peekskill Hollow Brook Tributary	Panels 189P-195P

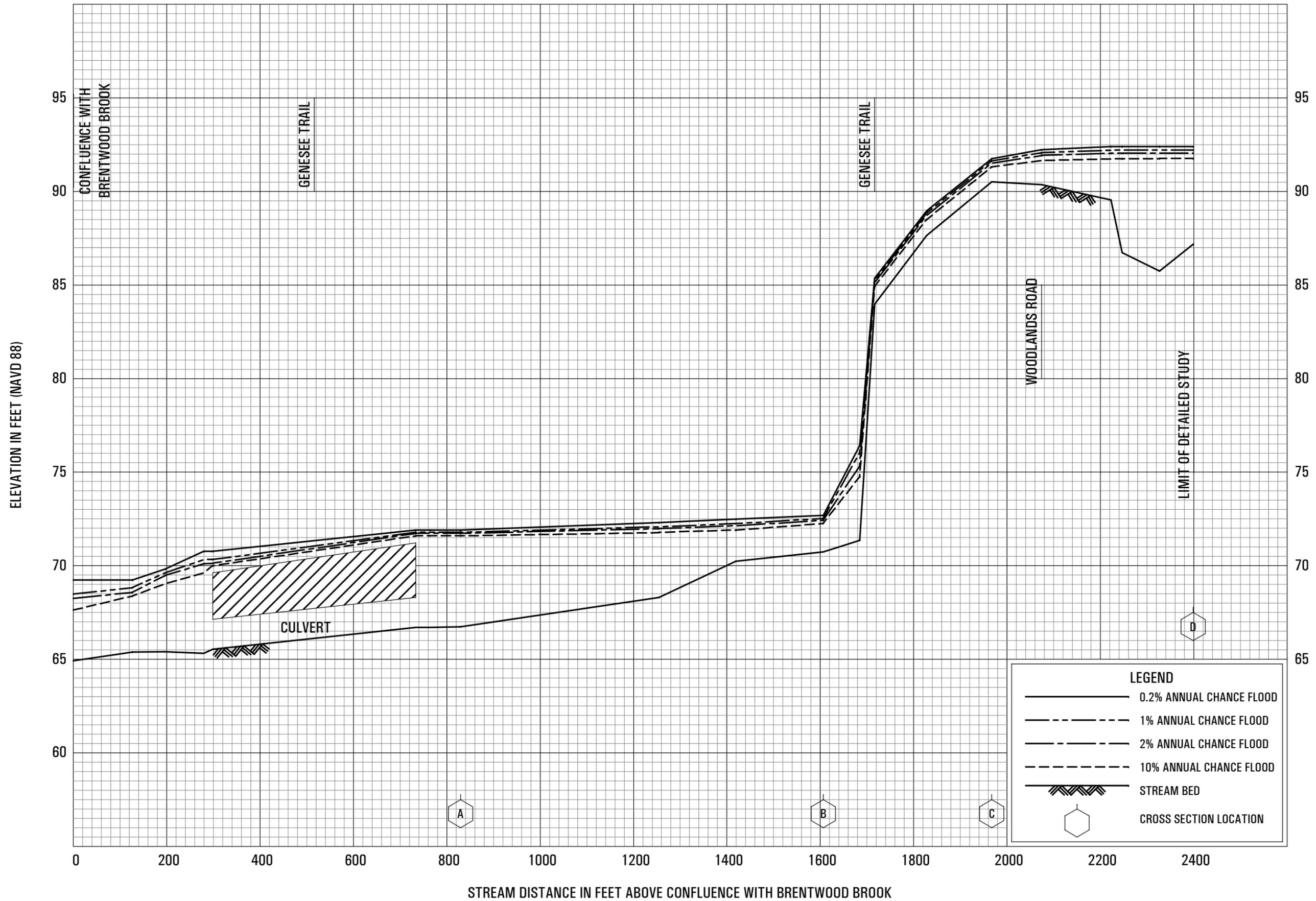
Volume 4
Exhibits

Pitch Swamp Brook	Panel 196P
Plum Brook	Panels 197P-209P
Plum Brook Tributary 1	Panels 210P-211P
Pocantico River Lower Reach	Panels 212P-218P
Pocantico River Upper Reach	Panels 219P-224P
Saw Mill Creek	Panels 225P-229P
Saw Mill River	Panels 230P-248P
Saw Mill River West Channel	Panel 249P
Sheldrake River	Panels 250P-255P
Shrub Oak Brook	Panels 256P-258P
Shrub Oak Brook Tributary 1	Panel 259P
Sing Sing Creek	Panels 260P-263P
South Fox Meadow Brook	Panels 264P-269P
Sprain Brook	Panels 270P-271P
Sprout Brook	Panels 272P-273P
Stone Hill River	Panels 274P-276P
Sunnyside Brook	Panels 277P-283P
Tibbetts Brook	Panel 284P
Titicus River	Panels 285P-288P
Tributary to Laurel Reservoir	Panels 289P-290P

Volume 5
Exhibits (continued)

Flood Profiles

Tributary to Mill River	Panels 291P-293P
Tributary 1 to Wampus River	Panels 294P-296P
Tributary 2 to Wampus River	Panels 297P-299P
Tributary 3 to Wampus River	Panels 300P-302P
Troublesome Brook Reach 1	Panels 303P-305P
Unnamed Tributary to Plum Brook	Panel 306P
Wampus River	Panels 307P-309P
West Branch Blind Brook	Panels 310P-312P
Wickers Creek	Panels 313P-314P
Woodlands Road Brook 1	Panel 315P
Woodlands Road Brook 2	Panel 316P

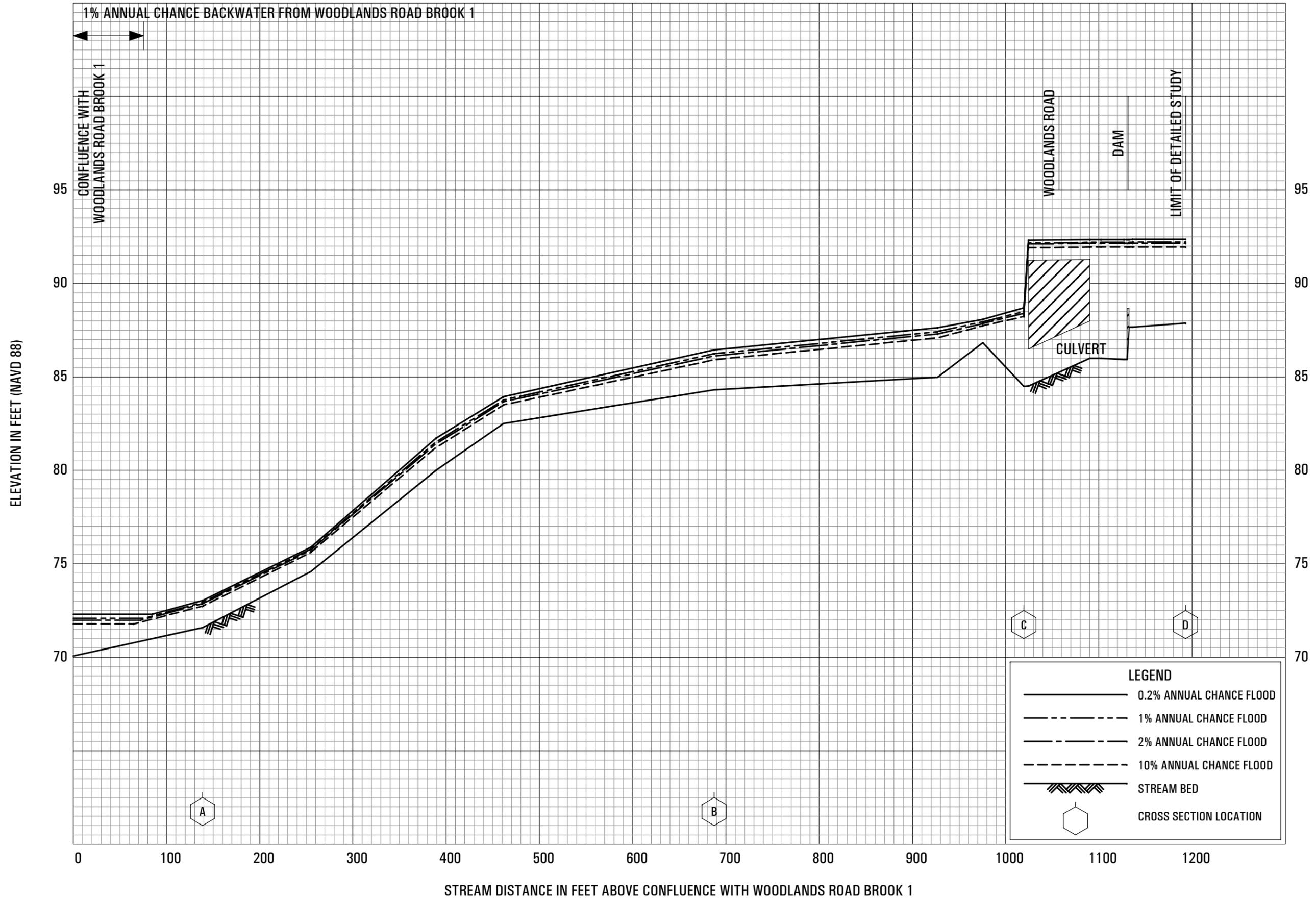


LEGEND	
	0.2% ANNUAL CHANCE FLOOD
	1% ANNUAL CHANCE FLOOD
	2% ANNUAL CHANCE FLOOD
	10% ANNUAL CHANCE FLOOD
	STREAM BED
	CROSS SECTION LOCATION

FLOOD PROFILES

WOODLANDS ROAD BROOK 1

FEDERAL EMERGENCY MANAGEMENT AGENCY
WESTCHESTER COUNTY, NY
 (ALL JURISDICTIONS)



FLOOD PROFILES

WOODLANDS ROAD BROOK 2

**FEDERAL EMERGENCY MANAGEMENT AGENCY
WESTCHESTER COUNTY, NY
(ALL JURISDICTIONS)**