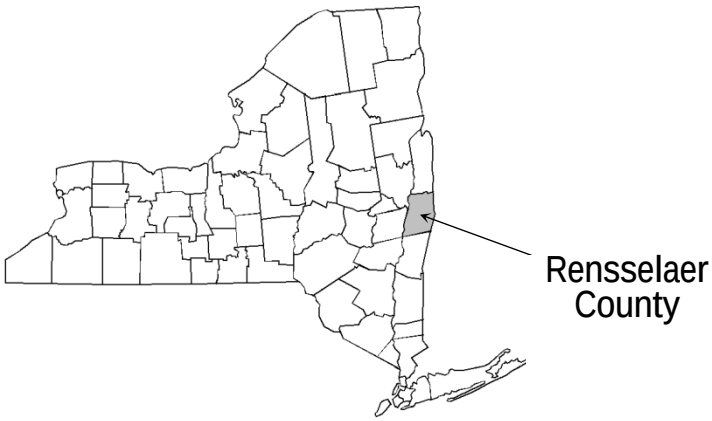
FLOOD INSURANCE STUDY

RENSSELAER COUNTY, NEW YORK
(ALL JURISDICTIONS)



COMMUNITY NAME	COMMUNITY NUMBER	COMMUNITY NAME	COMMUNITY NUMBER
*BERLIN, TOWN OF	360672	*PETERSBURGH, TOWN OF	361165
*BRUNSWICK, TOWN OF	361130	PITTSTOWN, TOWN OF	361166
*CASTLETON-ON-HUDSON, VILLAGE OF	360673	*POESTENKILL, TOWN OF	360676
*EAST GREENBUSH, TOWN OF	361133	*RENSSELAER, CITY OF	361032
*EAST NASSAU, VILLAGE OF	360257	*SAND LAKE, TOWN OF	361167
*GRAFTON, TOWN OF	361150	SCHAGHTICOKE, TOWN OF	361168
HOOSICK FALLS, VILLAGE OF	360674	SCHAGHTICOKE, VILLAGE OF	361058
HOOSICK, TOWN OF	361154	*SCHODACK, TOWN OF	361169
*NASSAU, TOWN OF	361155	*STEPHENTOWN, TOWN OF	361170
*NASSAU, VILLAGE OF	360675	*TROY, CITY OF	360677
*NORTH GREENBUSH, TOWN OF	361164	VALLEY FALLS, VILLAGE OF	361469

*Community is not included in this partial countywide Flood Insurance Study and will retain its existing, separately published FIS and/or FIRM

PRELIMINARY:
April 11, 2014

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER
36083CV000A

NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study (FIS) may not contain all data available within the repository. It is advisable to contact the community repository for any additional data.

The Federal Emergency Management Agency (FEMA) my revise or republish part or all of this FIS report at any time. In addition, FEMA may be revise part of this FIS report by the Letter of Map Revision process, which does not involve republication or redistribution of the FIS report. Therefore, users should consult with community officials and check the Community Map Repository to obtain the most current FIS report components.

Selected Flood Insurance Rate Map (FIRM) panels for this community contain information that was previously shown separately on the corresponding Flood Boundary and Floodway Map (FBFM) panels (e.g., floodways and cross sections). In addition, former flood hazard zone designations have been changed as follows.

Old Zone	New Zone
A1 through A30	AE
V1 through V30	VE
B	X
C	X

ATTENTION: On FIRM panel 36083C0088D, the Hoosic River levees/floodwall have not been demonstrated by the community or levee owner(s) to meet the requirements of Section 65.10 of the NFIP regulations in 44 CFR as it relates to the levee's capacity to provide 1% annual chance flood protection. The subject areas are identified on FIRM panels (with notes and bounding lines) and in the FIS report as potential areas of flood hazard data changes based on further review.

FEMA has updated levee analysis and mapping protocols. Until such time as FEMA is able to initiate a new flood risk project to apply the new protocols, the flood hazard information on the aforementioned FIRM panel(s) that are affected by the Hoosic River levees are being added as a snapshot of the prior effective information presented on the FIRMs and FIS report dated February 4, 2005 for the Village of Hoosick Falls. As indicated above, it is expected that affected flood hazard data within the subject area could be significantly revised. This may result in floodplain boundary changes, 1% annual chance flood elevation changes, and/or changes to flood hazard zone designations.

The effective FIRM panels (and the FIS) will again be revised to update the flood hazard information associated with the Hoosic River levees when FEMA is able to initiate and complete a new flood risk project to apply the new protocols.

Initial Countywide FIS Effective Date:

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Flood Insurance Rate Map

FLOOD INSURANCE STUDY
RENSSELAER COUNTY, NEW YORK (ALL JURISDICTIONS)

1.0 INTRODUCTION

1.1 Purpose of Study

This partial countywide Flood Insurance Study (FIS) investigates the existence and severity of flood hazards in, or revises and updates previous FISs/Flood Insurance Rate Maps (FIRMs) for portions of the geographic area of Rensselaer County, New York, including: the Towns of Hoosick, Pittstown, and Schaghticoke; and the Villages of Hoosick Falls, Schaghticoke, and Valley Falls (hereinafter referred to collectively as Rensselaer County). The remaining portions of Rensselaer County will be shown at a later date. Effective FIRMs and FISs for communities not included in this partial countywide are not superseded by this study.

This FIS aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This FIS has developed flood risk data for various areas of the county that will be used to establish actuarial flood insurance rates. This information will also be used by Rensselaer County to update existing floodplain regulations as part of the Regular Phase of the National Flood Insurance Program (NFIP), and will also be used by local and regional planners to further promote sound land use and floodplain development. Minimum floodplain management requirements for participation in the NFIP are set forth in the Code of Federal Regulations at 44 CFR§ 60.3.

In some States or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the State (or other jurisdictional agency) will be able to explain them.

Please also note that FEMA has identified one or more levees in the Village of Hoosick Falls that have not been demonstrated by the community or levee owner(s) to meet the requirements of 44 CFR Part 65.10 of the NFIP regulations as it relates to the levee's capacity to provide 1% annual chance flood protection. As such, there are temporary actions being taken until such time as FEMA is able to initiate a new flood risk project to apply new protocols. Please refer to the Notice to Flood Insurance Study Users page at the front of this FIS report for more information.

1.2 Authority and Acknowledgments

The sources of authority for this FIS are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

This partial countywide FIS was prepared to include the Rensselaer County communities listed above into a countywide format. Information on the authority

and acknowledgments for each jurisdiction included in this partial countywide FIS, as compiled from their previously printed FIS reports, is shown below.

Hoosick Falls, Village of:	The hydrologic and hydraulic analyses from the FIS report dated February 4, 2005, were performed by Leonard Jackson Associates, for the FEMA, under Contract No. EMN-96-CO-0026. That work was completed in May 2001.
Pittstown, Town of:	The hydrologic and hydraulic analyses from the FIS report dated September 5, 1990, were prepared by the New York State Department of Environmental Conservation (NYSDEC) and Dewberry & Davis for FEMA, under Contract No. H-4547. That work was completed in April 1983.
Schaghticoke, Town of:	The hydrologic and hydraulic analyses from the FIS report dated January 16, 1984, were prepared by the NYSDEC and Dewberry & Davis for FEMA, under Contract No. H-4547. That work was completed in April 1983.
Schaghticoke, Village of:	The hydrologic and hydraulic analyses from the FIS report dated December 5, 1985, were prepared by the NYSDEC and Dewberry & Davis for FEMA, under Contract No. H-4547. That work was completed in April 1983.
Valley Falls, Village of:	The hydrologic and hydraulic analyses from the FIS report dated December 5, 1984, were prepared by the NYSDEC and Dewberry & Davis for FEMA, under Contract No. H-4547. That work was completed in April 1983.

There are no previous FISs for the Town of Hoosick; therefore, the previous authority and acknowledgment information for this community is not included in this partial countywide FIS.

For this partial countywide FIS, revised hydrologic and hydraulic analyses for the Hoosic River and Woods Creek were prepared by Dewberry for the NYSDEC under its Cooperating Technical Partner agreement with FEMA. Additionally, floodplain boundaries for all unrevised flooding sources previously studied using detailed methodology were updated using topographic data provided to NYSDEC by Rensselaer County. This work was completed by Dewberry in June 2011. Flood hazard areas previously assessed using approximate methods were

re-analyzed throughout the county and results were then mapped using the Rensselaer County topographic data. This work was completed in November 2011.

Base map information for this FIRM was developed from digital orthoimagery provided by the New York State Office of Cyber Security & Critical infrastructure Coordination. This imagery was derived for 1- and 2-foot resolution natural color orthoimagery from photography dated April 2007.

The coordinate system used for the production of this FIRM is Universal Transverse Mercator (UTM), North American Datum of 1983 (NAD 83), GRS80 spheroid. Corner coordinates shown on the FIRM are in latitude and longitude referenced to the UTM projection, NAD 83. Differences in the datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent counties may result in slight positional differences in map features at the county boundaries. These differences do not affect the accuracy of information shown on the FIRM.

1.3 Coordination

Consultation Coordination Officer's (CCO) meetings may be held for each jurisdiction in this partial countywide FIS. An initial CCO meeting is held typically with representatives of FEMA, the community, and the study contractor to explain the nature and purpose of a FIS, and to identify the streams to be studied by detailed methods. A final CCO meeting is held typically with representatives of FEMA, the community, and the study contractor to review the results of the study.

The dates of the initial and final CCO meetings held for jurisdictions within Rensselaer County are shown in TABLE 1, "Initial and Final CCO Meetings."

TABLE 1 – INITIAL AND FINAL CCO MEETINGS

Community	Initial CCO Date	Final CCO Date
Town of Hoosick	*	*
Village of Hoosick Falls	April 9, 2002[1]	October 23, 2003
Town of Pittstown	January 17, 1989[1]	July 20, 1989
Town of Schaghticoke	July 8, 1977	August 18, 1983
Village of Schaghticoke	*	June 21, 1984
Village of Valley Falls	*	June 26, 1984

[1]Notified by letter
*Data not available

The initial CCO meetings for this partial countywide were held on April 17 and 18, 2007. The meetings were attended by representatives of the Cities of Rensselaer and Troy; the Towns of Berlin, Brunswick, East Greenbush, Hoosick, Nassau, North Greenbush, Petersburgh, Poestenkill, Schaghticoke, Schodack, and

Stephentown; the Villages of Castleton-On-Hudson and Valley Falls; Rensselaer County; and the Capital District Regional Planning Commission, as well as NYSDEC and FEMA staff.

2.0 AREA STUDIED

2.1 Scope of Study

This FIS covers the geographic area of the communities listed in Section 1.1 in Rensselaer County, New York.

The areas studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development and proposed construction. All or portions of the flooding sources listed in TABLE 2, "Flooding Sources Studied by Detailed Methods," were studied by detailed methods. Limits of detailed study are indicated on the Flood Profiles (Exhibit 1) and on the FIRM (Exhibit 2).

TABLE 2 – FLOODING SOURCES STUDIED BY DETAILED METHODS

Hoosic River	Tomhannock Reservoir
Hudson River	Woods Brook
Tomhannock Creek	

Riverine flooding sources throughout the county have been studied by detailed methods at different times and prior to this partial countywide FIS, often on a community-by-community basis. TABLE 3, “Model Dates for Riverine Flooding Sources,” below represents the hydraulic modeling dates for the detailed study flooding sources in the county.

TABLE 3 – MODEL DATES FOR RIVERINE FLOODING

STREAM NAME	COMMUNITY	MOST RECENT MODEL DATE
Hoosic River	Town of Hoosick	November 2011
	Village of Hoosick Falls	November 2011
	Town of Pittstown	November 2011
	Town of Schaghticoke	April 1983
	Town of Schaghticoke	November 2011
	Village of Schaghticoke	April 1983
Hudson River	Town of Schaghticoke	April 1983
Tomhannock Creek	Town of Schaghticoke	April 1983
Woods Brook	Town of Hoosick	November 2011
	Village of Hoosick Falls	November 2011

As part of the partial countywide FIS, updated analysis were included for the flooding sources in TABLE 4, "Scope of Revision."

TABLE 4 – SCOPE OF REVISION

Stream	Limits of Revised or New Detailed Study
Hoosic River	From approximately 1.0 mile upstream of State Highway 40 to approximately 0.6 mile upstream of State Highway 22 (River Street)
Tomhannock Reservoir	Entire shoreline
Woods Brook	From confluence with the Hoosic River to approximately 63 feet upstream of Johnson Hill Road

All or portions of numerous flooding sources in the county were studied by approximate methods. Approximate analyses were used to study those areas having a low development potential or minimal flood hazards, or where resources were unavailable to conduct more refined and detailed analyses.

For this partial countywide FIS, all areas of approximate flood hazard analyses were updated using the topography provided by Rensselaer County and the flood frequency estimation techniques developed by the U.S. Geological Survey (USGS).

2.2 Community Description

Rensselaer County is located in the eastern portion of the State of New York. It is bordered on the north by Washington County; on the east by Bennington County, Vermont and Berkshire County, Massachusetts; on the south by Columbia County; and to the west by Albany and Saratoga Counties.

The climate of the area is characterized as humid continental. The average annual temperature in Rensselaer County ranges from 43 degrees Fahrenheit (°F) to 49°F, with an average annual minimum ranging from 9°F to 15°F and an average annual maximum ranging from 75°F to 83°F. The average annual precipitation in Rensselaer County ranges from 37" to 57". These temperature and precipitation averages are based on data from 1971 to 2000 (United States Department of Agriculture, 2006).

According to the 2010 U.S. Census, the population for Rensselaer County was 159,429 and the land area was 653.96 square miles.

2.3 Principal Flood Problems

In the Village of Hoosick Falls, the Flood Control Project undertaken by the U.S. Army Corps of Engineers (USACE) in 1952 has precluded flooding on the Hoosic River (USACE, 1950). Woods Brook was channelized and a culvert was constructed to contain flooding on Woods Brook in the area of Water Street, Lyman Street, and Superior Street. The principal areas removed from the floodplain were Water Street and Superior Street along the Hoosic River.

In the Town of Pittstown, no information concerning principal flooding problems is available.

In the Town of Schaghticoke the principal flooding sources are the Hudson River, the Hoosic River, and Tomhannock Creek. Low-lying areas in the town are subject to periodic flooding caused by the overflow of the Hudson River. Heavy rainfall, especially occurring in the spring, combined with snowmelt causes high water and local flooding.

In the Village of Schaghticoke the principal flooding source is the Hoosic River. Low-lying areas in the village are subject to periodic flooding caused by the overflow of the Hoosic River. Heavy rainfall, especially occurring in the spring, combined with snowmelt causes high water and local flooding.

In the Village of Valley Falls the principal flooding source is the Hoosic River. Low-lying areas in the village are subject to periodic flooding caused by the overflow of the Hoosic River. Heavy rainfall, especially occurring in the spring, combined with snowmelt causes high water and local flooding.

2.4 Flood Protection Measures

Within the Village of Hoosick Falls there is one or more levees that have not been demonstrated by the community or levee owner(s) to meet the requirements of 44 CFR Part 65.10 of the NFIP regulations as it relates to the levee's capacity to provide 1% annual chance flood protection. Please refer to the Notice to Flood Insurance Study Users page at the front of this FIS report for more information.

In the Village of Hoosick Falls, in 1952 the USACE constructed a series of levees and floodwalls to protect the village from flooding related to the Hoosic River.

A floodwall exists on both banks of the Hoosic River between the Church Street Bridge and the railroad bridge. The floodwall has the capacity to contain the 1% annual chance flood with the 3 feet of freeboard required by FEMA. Upstream of the railroad bridge, a levee exists only on the right bank of the Hoosic River. The right bank levee also contains the 1% annual chance flood with the 3 feet of freeboard required by FEMA. Levees were not placed on the left bank due to the absence of development; however, excavations were performed on this side of the stream to ease conveyance. The Village of Hoosick Falls, in conjunction with the

NYSDEC, is responsible for providing maintenance and monitoring of the Hoosick Falls Flood Control Project.

In the Town of Schaghticoke some protection from flooding by the upper Hudson River is afforded by Great Sacandaga Lake and Indian Lake. Great Sacandaga Lake provides flood control and low-water stream regulation for sanitary improvement, navigation and power. The USACE completed a flood control project on the Hoosic River in 1952 that included the widening of a 3,300 foot portion of the channel and the excavation of 700 feet of channel. This project is located above the Schaghticoke corporate limits, in the Village of Hoosick Falls; it offers no protection from flooding in the study area (USACE, 1955).

3.0 ENGINEERING METHODS

For the flooding sources studied in detail in the county, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this FIS. Flood events of a magnitude which are expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10-, 2-, 1-, and 0.2-percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long term average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood which equals or exceeds the 100-year flood (1-percent chance of annual exceedence) in any 50-year period is approximately 40 percent (4 in 10), and, for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the county at the time of completion of this FIS. Maps and flood elevations will be amended periodically to reflect future changes.

Note: Within the Village of Hoosick Falls there are one or more levees that have not been demonstrated by the community or levee owner(s) to meet the requirements of 44 CFR Part 65.10 of the NFIP regulations as it relates to the levee's capacity to provide 1% annual chance flood protection. Please refer to the Notice to Flood Insurance Study Users page at the front of this FIS report for more information.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish peak discharge-frequency relationships for each riverine flooding source studied by detailed methods affecting the county.

For each community within Rensselaer County included in this partial countywide FIS that had a previously printed FIS report, the unrevised hydrologic analyses described in those reports have been compiled and are summarized below.

Peak discharges for the Hoosic River in the Towns of Pittstown and Schaghticoke, and the Villages of Hoosick Falls, Schaghticoke, and Valley Falls were based on a log-Pearson Type III flood-frequency analysis preformed on data from the USGS gage (No. 01334500) located near Eagle Bridge, New York (Water Resources Council, 1976). The discharges were transferred to specific locations on the river according to the following drainage area-discharge formula:

$$Q/Qg = (A_1/A_2)^T$$

Where Q is the peak discharge at a specific location, A_1 is the discharge area at the location, Qg is the peak discharge at the gage, A_2 is the drainage area at the gage, the "T" is the transfer coefficient. A "T" value of 0.779 was used for the Hoosic River.

In the Town of Schaghticoke peak discharges for the Hudson River were obtained from the FISs for the Towns of Waterford and Northumberland (FEMA, 1979; FEMA, 1982) were based on a log-Pearson Type III flood-frequency analysis preformed on data from the USGS gage (No. 01358000) located on the Hudson River at Green Island and at (No. 01335500) at Mechanicville. The discharges were transferred to specific locations on the river according to the following drainage area-discharge formula:

$$Q/Qg = (A_1/A_2)^T$$

Where Q is the peak discharge at a specific location, A_1 is the discharge area at the location, Qg is the peak discharge at the gage, A_2 is the drainage area at the gage, the "T" is the transfer coefficient. A "T" value of 0.779 was used for the Hoosic River.

In the Town of Schaghticoke peak discharges for Tomhannock Creek were developed using USGS Circular 454 (USGS, 1961). Circular 454 utilizes a flood-frequency curve to determine discharges. The curve expresses the relationship between the mean annual flood, floods of specified recurrence intervals, and the drainage area of the stream being studied, and can be applied to any stream in New York. The Circular 454 discharges were adjusted for reservoir storage.

Fort this [*date*] FIS techniques provided in *Magnitude and Frequency of Floods in New York*, USGS Scientific Investigations Report (SIR) 2006-5112 (USGS, 2006) formed the basis of the revised hydrologic analyses conducted for this partial countywide study. Details on techniques used for each of the two revised streams are presented below.

For ease of use, information on flooding sources in Rensselaer County was organized based on its 11-digit Hydrologic Unit Code (HUC). The USGS has developed the 8-digit HUC system as a hierarchical classification system of hydrologic drainage basins in the United States. NYSDEC, in conjunction with the USGS, and the Natural Resources Conservation Service (NRCS) of the USDA, developed 11- digit HUCs for classification at the subwatershed level.

The HUC hierarchy corresponds to codes with 2, 4, 6, 8, and 11 digits. In decreasing area (increasing number of digits in the HUC) order each is made up by several of the contiguous watersheds of lower hierarchy. The first two digits of the HUC are the code for the Regional Boundary (e.g., 02, for the Mid-Atlantic Region). The next two digits of the HUC are the code for the Subregional boundary (e.g., 0202, Upper Hudson). The next two digits are the code for the Accounting Unit (e.g., 020200, the Upper Hudson basin). The next two digits of the HUC are the Cataloging Unit (e.g., 02020004, Mohawk). The last three digits of the HUC are the code for the NRCS Watershed Boundary (e.g., 02020004390, Stony Clove).

02020003232-
Hoosic River

The Hoosic River is located in the Towns of Hoosick, Pittstown, and Schaghticoke and the Villages of Hoosick Falls, Schaghticoke and Valley Falls. The Hoosic River forms a drainage basin with a watershed area of approximately 636.30 square miles.

For the Hoosic River, Log-Pearson Type III analysis from available gage data results were used to transfer discharge from gaged to ungaged sites. USGS gage (with gage number 01334500) located on the Hoosic River near Eagle Bridge, NY has 98 years of peak discharge record. Since the gage is used to estimate flow for both detailed and approximate study stream, an updated Log-Pearson Type III analysis was performed.

For the Hoosic River, regression discharge predicts a decreasing discharge pattern as the drainage area increases. Therefore weighted-average discharge was not transferred to ungaged site along the Hoosic River. Moreover the regression discharges estimate at the gage is about 35% lower than Log-Pearson Type III results. Therefore the discharge transfer was performed according to drainage area – peak discharge ratio. The following equation has been used:

$$Q/Qg = (A_1/A_2)^T$$

Where Q is the peak discharge at ungaged location, A_1 is the drainage area at that location, Q_g the peak discharge at the gage, A_2 is the drainage area at the gage and T is the transfer coefficient. A “T” value of 0.813, 0.796, 0.79 and 0.779 was used for 10-, 2-, 1-, and 0.2-percent-annual-chance flood discharges respectively. These values were obtained from the power of the USGS (SIR) 2006-5112 drainage only regression equation.

02020003232-
Woods Brook

Woods Brook forms a drainage basin with a watershed area of approximately 224 square miles. For Woods Brook, full parameter USGS regression equations, (SIR 2006-5112), were used to compute the 10-, 2-, 1-, and 0.2-percent-annual-chance flood discharges.

Recurrence Interval (year)	Regression Equations
Region 1	
Q10 =	$2310\ (A)^{0.968}\ (ST+1)^{-0.184}\ (P)^{1.241}\ (LAG+1)^{-0.482}\ (FOR+80)^{-1.549}$
Q50 =	$7030\ (A)^{0.963}\ (ST+1)^{-0.197}\ (P)^{1.131}\ (LAG+1)^{-0.511}\ (FOR+80)^{-1.610}$
Q100 =	$10300\ (A)^{0.962}\ (ST+1)^{-0.202}\ (P)^{1.106}\ (LAG+1)^{-0.520}\ (FOR+80)^{-1.638}$
Q500 =	$22000\ (A)^{0.959}\ (ST+1)^{-0.210}\ (P)^{1.067}\ (LAG+1)^{-0.539}\ (FOR+80)^{-1.704}$
Region 2	
Q10 =	$41.6\ (A)^{0.909}\ (ST+5)^{-0.977}\ (LAG+1)^{-0..385}\ (RUNF)^{0.968}$
Q50 =	$49.7\ (A)^{0.902}\ (ST+5)^{-0.939}\ (LAG+1)^{-0.441}\ (RUNF)^{1.068}$
Q100 =	$52.3\ (A)^{0.900}\ (ST+5)^{-0.918}\ (LAG+1)^{-0.461}\ (RUNF)^{1.104}$
Q500 =	$55.9\ (A)^{0.895}\ (ST+5)^{-0.860}\ (LAG+1)^{-0.500}\ (RUNF)^{1.183}$

Where,

A, is drainage area, in square miles
ST, is basin storage, percent of total drainage area as shown as lakes, ponds and swamps (wetland), in percent
LAG, is basin lag factor
FOR, is basin forested area, in percent
P, is mean annual precipitation in inches
RUNF, is mean annual runoff, in inches

For basins that fall under two hydrologic regions, region 1 and 2, an area weighted average discharge is computed.

New York USGS StreamStats web application was used to compute desired percent-annual-chance flood discharges (USGS, 2011).

For streams studied by approximate methods, except for Walloomsac River, full parameter USGS regression equations, (SIR 2006-5112), were used to compute the 10-, 2-, 1-, and 0.2-percent-annual-chance flood discharges. For Walloomsac River, an updated Log-Pearson Type III analysis from available gage data results were used to transfer discharge from gaged to ungaged sites.

A summary of the drainage area-peak discharge relationships for all the streams studied by detailed methods is shown in TABLE 5, "Summary of Discharges."

TABLE 5 – SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-PERCENT	2-PERCENT	1-PERCENT	0.2-PERCENT
HOOSIC RIVER					
At its confluence with the Hudson River	713.0	26,500	43,500	52,000	71,000
At the Pittstown downstream corporate boundary	636.30	25,947	40,942	48,852	71,738
Approximately 7,000 feet above Village of Valley Falls corporate boundary	630.06	25,740	40,622	48,473	71,189
Approximately 1,600 feet above Bridge Street	606.17	24,943	39,391	47,015	69,078
Near Washington County boundary	590.72	24,425	38,590	46,066	67,703
Above confluence with Pencil Brook	577.13	23,967	37,881	45,227	66,486
Above confluence with Owl Kill	516.19	21,889	34,662	41,410	60,950
At USGS gage 01334500	511.30	21,720	34,400	41,100	60,500
Above confluence with the Walloomsac River	352.43	16,050	25,581	30,632	45,276
Downstream of Hoosick Falls Village corporate boundary	351.25	16,006	25,513	30,551	45,158
Above confluence with Woods Brook	347.87	15,881	25,318	30,319	44,819
Approximately 700 feet downstream of River Street	347.69	15,874	25,307	30,306	44,801
HUDSON RIVER					
Above the confluence of Fourth Branch Mohawk River	4,620.0	72,000	101,000	112,000	140,000
Above the confluence of the Hoosic River	3,782.0	50,015	63,890	69,595	83,270
TOMHANNOCK CREEK					
At confluence with the Hoosic River	72.0	3,650	7,110	9,070	14,500

TABLE 5 – SUMMARY OF DISCHARGES - continued

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-PERCENT	2-PERCENT	1-PERCENT	0.2-PERCENT
WOODS BROOK					
Above confluence with the Hoosic River	2.24	285	426	496	665
Approximately 2,200 feet below Hoosick Falls Village corporate boundary	2.05	270	404	470	629
Above unknown street	1.49	206	309	360	483
Approximately 1,100 feet above Ball Street	0.87	130	196	229	308

For the Tomhannock Reservoir, the annual (water year) peak lake levels from 1966 to 2010 were obtained from the City of Troy. The USACE's Statistical Software Package (HEC-SSP, Version 2) was used to fit the lake level data to a Weibull distribution (USACE, 2010). The guidelines of the Subcommittee on Hydrology's Hydrologic Frequency Analysis Work Group for Bulletin 17-B recommend using the Weibull distribution for analyzing lake level frequency (http://acwi.gov/hydrology/Frequency/B17bFAQ.html#lake#lake) (USGS, 1982). A probability curve for 10-, 2-, 1- and 0.2% annual chance flood elevations was computed from peak lake levels from 1966 to 2010.

The stillwater elevations have been determined for the 10-, 2-, 1-, and 0.2%-annual chance floods for the flooding sources studied by detailed methods and are summarized in TABLE 6, "Summary of Stillwater Elevations."

TABLE 6 - SUMMARY OF STILLWATER ELEVATIONS

FLOODING SOURCE AND LOCATION	ELEVATION (feet NAVD*) 10-PERCENT	2-PERCENT	1-PERCENT	0.2-PERCENT
TOMHANNOCK RESERVOIR				
Entire shoreline	390.8	391.0	391.1	391.2

*North American Vertical Datum of 1988

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the source studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals. Users should be aware that flood elevations shown on the FIRM represent rounded whole-foot elevations and may not exactly reflect the elevations shown on

the Flood Profiles or in the Floodway Data tables in the FIS report. For construction and/or floodplain management purposes, users are encouraged to use the flood elevation data presented in this FIS in conjunction with the data shown on the FIRM.

Cross sections for the flooding sources studied by detailed methods were obtained from field surveys. All bridges, dams, and culverts were field surveyed to obtain elevation data and structural geometry.

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway was computed (Section 4.2), selected cross section locations are also shown on the FIRM (Exhibit 2). Flood profiles were drawn showing computed water-surface elevations for floods of the selected recurrence intervals.

For each community within Rensselaer County included in this partial countywide FIS that had a previously printed FIS report, the unrevised hydraulic analyses described in those reports have been compiled and are summarized below.

Water-surface elevations (WSELs) of floods of the selected recurrence intervals for the Hoosic River, the Hudson River, and Tomhannock Creek were computed using the USACE HEC-2 step-backwater computer program (USACE, 1976; USACE, 1982; USACE, 1984). Flood profiles were drawn showing computed WSELs for floods of the selected recurrence intervals.

In the Towns of Pittstown and Schaghticoke and the Village of Schaghticoke starting WSELs for the Hoosic River, the Hudson River, and Tomhannock Creek were calculated using slope/area method.

In the Village of Hoosick Falls starting WSELs for the Hoosic River were calculated using critical depth.

For this [*date*] FIS for ease of use, information on the methodology used to study different streams is organized based on 11-digit HUC. See Section 3.1 for an explanation of the HUC system.

In Rensselaer County, revised analyses were performed for a portion of the Hoosic River, Tomhannock Reservoir and Woods Brook.

02020003232-
Hoosic River
Woods Branch

For all revised detailed streams, field survey was obtained for both natural stream cross sections as well as hydraulic obstructions such as bridges, culverts, dams, and weirs. This information was combined with topographic data provided by Rensselaer County in the form of bare earth mass points and break lines to create a bare earth surface for the stream corridor. This information was preprocessed using the HEC GeoRAS Version 4.2.93 interface for ArcGIS 9.3 (USACE, 2009). The

interface prepared the geometry file for HEC-RAS and was eventually used to visualize results from the simulations.

WSELs of flood profiles of the selected recurrence intervals for all revised detailed streams were computed using the USACE HEC-RAS computer program, Version 4.1 (USACE, 2010).

A total of 516 hydraulic cross sections were cut from the terrain dataset (developed from Light Detection and Ranging (LiDAR)) for the HEC-RAS hydraulic model. Generally, the survey data were used to develop the channel portion of the cross-section geometry while the terrain was the source of overbank topography. For the sections between the surveyed cross sections, the channel portion was obtained by linear interpolation between the banks, and the overbank topography was obtained from the terrain dataset. A GIS-based utility program was used to integrate the survey data into the cross-section station and elevation information. Elevations obtained for locations along the cross sections, where the vertices from the survey data and vertices from the terrain were adjacent, provided further validations of the accuracy of the LiDAR data.

At the downstream boundary the Hoosic River study reach ties into an existing detailed study reach at the Village of Schaghticoke/Town of Schaghticoke municipal border. Therefore, the model started with known WSELs from the effective Town of Schaghticoke FIS. Woods Brook flows into the Hoosic River at the mouth. The invert of the Woods Brook at the mouth is higher than the Hoosic River therefore critical depth is used as the boundary condition.

Roughness factors (Manning's "n") used in the hydraulic computations were chosen by engineering judgment and were based on field observations of the streams and floodplain areas. Roughness factors for all streams studied by detailed methods are shown in TABLE 7, "Manning's "n" Values."

TABLE 7 – MANNING'S "n" VALUES

Stream	Channel “n”	Overbank “n”
Hoosic River	0.030	0.025-0.100
Hudson River	0.015-0.030	0.020-0.070
Tomhannock Creek	0.030	0.060
Woods Brook	0.016-0.048	0.02-0.150

Qualifying bench marks within a given jurisdiction that are cataloged by the National Geodetic Survey (NGS) and entered into the National Spatial Reference System (NSRS) as First or Second Order Vertical and have a vertical stability classification of A, B, or C are shown and labeled on the FIRM with their 6-character NSRS Permanent Identifier.

Bench marks cataloged by the NGS and entered into the NSRS vary widely in vertical stability classification. NSRS vertical stability classifications are as follows:

- Stability A: Monuments of the most reliable nature, expected to hold position/elevation well (e.g., mounted in bedrock)
- Stability B: Monuments which generally hold their position/elevation well (e.g., concrete bridge abutment)
- Stability C: Monuments which may be affected by surface ground movements (e.g., concrete monument below frost line)
- Stability D: Mark of questionable or unknown vertical stability (e.g., concrete monument above frost line, or steel witness post)

In addition to NSRS bench marks, the FIRM may also show vertical control monuments established by a local jurisdiction; these monuments will be shown on the FIRM with the appropriate designations. Local monuments will only be placed on the FIRM if the community has requested that they be included, and if the monuments meet the aforementioned NSRS inclusion criteria.

To obtain current elevation, description, and/or location information for bench marks shown on the FIRM for this jurisdiction, please contact the Information Services Branch of the NGS at (301) 713-3242, or visit their Web site at www.ngs.noaa.gov.

It is important to note that temporary vertical monuments are often established during the preparation of a flood hazard analysis for the purpose of establishing local vertical control. Although these monuments are not shown on the FIRM, they may be found in the Technical Support Data Notebook associated with this FIS and FIRM. Interested individuals may contact FEMA to access this data.

3.3 Vertical Datum

All FISs and FIRMs are referenced to a specific vertical datum. The vertical datum provides a starting point against which flood, ground, and structure elevations can be referenced and compared. Until recently, the standard vertical datum in use for newly created or revised FISs and FIRMs was the National Geodetic Vertical Datum of 1929 (NGVD 29). With the finalization of the North American Vertical Datum of 1988 (NAVD 88), many FIS reports and FIRMs are being prepared using NAVD 88 as the referenced vertical datum.

All flood elevations shown in this FIS report and on the FIRM are referenced to NAVD 88. Structure and ground elevations in the community must, therefore, be referenced to NAVD 88. It is important to note that adjacent communities may be referenced to NGVD 29. This may result in differences in base flood elevations across the corporate limits between the communities.

Prior versions of the FIS report and FIRM were referenced to NGVD 29. When a datum conversion is effected for an FIS report and FIRM, the Flood Profiles, base flood elevations (BFEs) and ERMs reflect the new datum values. To compare structure and ground elevations to 1-percent annual chance flood elevations shown in the FIS and on the FIRM, the subject structure and ground elevations must be referenced to the new datum values.

As noted above, the elevations shown in the FIS report and on the FIRM for Rensselaer County are referenced to NAVD 88. Ground, structure, and flood elevations may be compared and/or referenced to NGVD 29 by applying a standard conversion factor. The conversion factor to NGVD 29 is +0.6. The conversion between the datums may be expressed as an equation:

NGVD 29 = NAVD 88 + 0.6 foot

The BFEs shown on the FIRM represent whole-foot rounded values. For example, a BFE of 102.4 will appear as 102 on the FIRM and 102.6 will appear as 103. Therefore, users that wish to convert the elevations in this FIS to NGVD 29 should apply the stated conversion factor(s) to elevations shown on the Flood Profiles and supporting data tables in the FIS report, which are shown at a minimum to the nearest 0.1 foot.

For more information on NAVD 88, see Converting the National Flood Insurance Program to the North American Vertical Datum of 1988, FEMA Publication FIA-20/June 1992, or contact the Spatial Reference System Division, National Geodetic Survey, NOAA, Silver Spring Metro Center, 1315 East-West Highway, Silver Spring, Maryland 20910 (Internet address http://www.ngs.noaa.gov).

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. To assist in this endeavor, each FIS provides 1% annual chance floodplain data, which may include a combination of the following: 10-, 2-, 1-, and 0.2% annual chance flood elevations; delineations of the 1- and 0.2-% annual chance floodplains; and 1% annual chance floodway. This information is presented on the FIRM and in many components of the FIS, including Flood Profiles, Floodway Data tables, and Summary of Stillwater Elevation tables. Users should reference the data presented in the FIS as well as additional information that may be available at the local community map repository before making flood elevation and/or floodplain boundary determinations.

4.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1% annual chance flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2-percent annual chance flood is employed to indicate additional areas of flood risk in the county. For the streams studied in

detail, the 1- and 0.2-percent annual chance floodplain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using bare earth digital elevation data provided by Rensselaer County. The topographic data was composed of bare earth mass points and 3-D breaklines. The point elevation data is comprised mostly of LiDAR with some spot heights generated from aerial photography flown within the same year in support of digital orthophotography acquisition (NYSDEC, 2010). The 3-D breaklines were produced from 1”=1000’ high precision color aerial photography collected in 2001 using photogrammetric methods. WSEL triangular irregular networks (TINs) were created from the model cross sections and intersected with the bare earth ground TIN to produce the floodplain corridor. The resulting floodplains were smoothed and incorporated in the DFIRM.

Similarly, using datum-converted effective flood profiles for non-revised, detailed streams, all flood boundaries were made current with the topography supplied by the county to FEMA.

The 1- and 0.2% annual chance floodplain boundaries are shown on the FIRM (Exhibit 2). On this map, the 1-percent annual chance floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A and AE), and the 0.2% annual chance floodplain boundary corresponds to the boundary of areas of moderate flood hazards. In cases where the 1- and 0.2%chance floodplain boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

For the streams studied by approximate methods, only the 1% annual chance floodplain boundary is shown on the FIRM (Exhibit 2). These boundaries were also delineated using the topographic data provided by Rensselaer County.

Within the Village of Hoosick Falls there are one or more levees that have not been demonstrated by the community or levee owner(s) to meet the requirements of 44 CFR Part 65.10 of the NFIP regulations as it relates to the levee’s capacity to provide 1% annual chance flood protection. As such, the floodplain boundaries in this area are subject to change. Please refer to the Notice to Flood Insurance Study Users page at the front of this FIS report for more information on how this may affect the floodplain boundaries shown on this FIRM.

4.2 Floodways

Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard. For purposes of the NFIP, a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of the 1-percent annual chance floodplain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights. Minimum federal standards limit such increases to 1.0 foot, provided that hazardous velocities are not produced. The floodways in this FIS are presented to local agencies as minimum standards that can be adopted directly or that can be used as a basis for additional floodway studies.

The floodways presented in this FIS were computed for certain stream segments on the basis of equal conveyance reduction from each side of the floodplain. Floodway widths were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. The results of the floodway computations are tabulated for selected cross sections (Table 8). The computed floodways are shown on the FIRM (Exhibit 2). In cases where the floodway and 1% annual chance floodplain boundaries are either close together or collinear, only the floodway boundary is shown.

Portions of the floodway for the Hoosic River and the Hudson River extend beyond the county boundary.

Encroachment into areas subject to inundation by floodwaters having hazardous velocities aggravates the risk of flood damage, and heightens potential flood hazards by further increasing velocities. A listing of stream velocities at selected cross sections is provided in Table 8, "Floodway Data." In order to reduce the risk of property damage in areas where the stream velocities are high, the community may wish to restrict development in areas outside the floodway.

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Hoosic River								
A	350	315	3,252	16.0	81.6	78.3[2]	79.3	1.0
B	1,210	274	2,831	18.4	86.1	86.1	86.1	0.0
C	2,345	420	8,729	6.0	92.0	92.0	92.1	0.1
D	3,330	401	7,019	7.4	92.0	92.0	92.1	0.1
E	4,480	555	8,069	6.4	92.5	92.5	93.1	0.6
F	5,600	645	7,141	7.3	92.9	92.9	93.6	0.7
G	6,730	366	5,616	9.3	93.8	93.8	94.3	0.5
H	7,785	340	4,812	10.8	94.7	94.7	95.2	0.5
I	8,780	344	4,439	11.7	95.9	95.9	96.5	0.6
J	9,745	338	4,675	11.1	98.2	98.2	98.8	0.6
K	10,740	1,060	13,975	3.7	100.4	100.4	101.1	0.7
L	11,620	2,400	22,810	2.3	100.5	100.5	101.4	0.9
M	13,065	2,500	16,793	3.1	100.8	100.8	101.6	0.8
N	14,440	2,800	18,436	2.8	101.6	102.2	102.4	0.8
O	15,915	1,400	8,619	6.0	102.2	102.2	102.9	0.7
P	17,250	1,438	11,460	4.5	104.2	104.2	104.9	0.7
Q	18,300	866	5,404	9.6	104.2	104.2	104.9	0.7
R	19,580	527	5,693	9.1	107.6	107.6	107.8	0.2
S	20,630	422	4,344	12.0	108.3	108.3	108.6	0.3
T	21,455	368	4,293	12.1	110.2	110.2	110.3	0.1
U	22,725	273	3,834	13.6	113.6	113.6	113.6	0.0
V	24,020	1,053	12,682	4.1	116.6	116.6	117.2	0.6
W	25,360	256	2,766	18.8	116.6	116.6	117.2	0.6
X	26,530	218	3,084	16.9	120.6	120.6	121.6	1.0
Y	27,755	340	4,844	10.7	126.5	126.5	126.5	0.0
Z	28,815	380	4,078	12.7	127.8	127.8	127.9	0.1

[1]Feet above confluence with the Hudson River
[2]Elevation computed without consideration of backwater effects from the Hudson River

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

RENSSELAER COUNTY, NY (ALL JURISDICTIONS)

FLOODWAY DATA

HOOSIC RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Hoosic River (continued)								
AA	29,680	285	3,307	15.7	129.9	129.9	129.9	0.0
AB	30,455	261	2,996	17.4	132.7	132.7	132.7	0.0
AC	30,640	243	3,848	13.5	137.7	137.7	138.3	0.6
AD	31,060	239	2,712	19.2	137.8	137.8	138.3	0.5
AE	32,350	201	2,564	20.3	149.2	149.2	149.2	0.0
AF	32,885	130	2,209	23.5	156.6	156.6	156.8	0.2
AG	33,730	176	2,713	19.2	165.5	165.5	165.5	0.0
AH	34,320	204	3,825	13.6	172.5	172.5	172.5	0.0
AI	35,195	517	10,643	4.9	176.0	176.0	176.2	0.2
AJ	36,125	666	6,594	7.9	176.0	176.0	176.3	0.3
AK	37,175	199	2,542	20.5	176.7	176.7	176.7	0.0
AL	37,935	354	3,068	17.0	188.1	188.1	188.1	0.0
AM	38,480	317	2,964	17.5	222.3	222.3	222.3	0.0
AN	39,450	377	3,774	13.4	274.1	274.1	274.1	0.0
AO	39,775	590	10,514	4.8	275.5	275.5	276.3	0.8
AP	40,685	478	9,292	5.4	275.7	275.7	276.4	0.7
AQ	41,590	565	10,122	5.0	276.0	276.0	276.8	0.8
AR	42,475	469	8,277	6.1	276.1	276.1	276.9	0.8
AS	43,370	424	7,842	6.5	276.4	276.4	277.2	0.8
AT	44,030	250	4,464	10.9	278.7	278.7	279.3	0.6
AU	44,899	229	4,176	11.7	281.8	281.8	282.3	0.5
AV	45,800	343	5,282	9.3	285.8	285.8	286.1	0.3
AW	45,955	343	5,098	9.6	286.0	286.0	286.3	0.3
AX	46,406	549	8,016	6.1	287.3	287.3	287.5	0.2
AY	47,269	722	9,111	5.4	287.7	287.7	287.9	0.2
AZ	48,458	597	6,795	7.2	288.7	288.7	288.9	0.2

[1]Feet above confluence with the Hudson River

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

RENSSELAER COUNTY, NY (ALL JURISDICTIONS)

FLOODWAY DATA

HOOSIC RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Hoosic River (continued)								
BA	49,354	312	4,513	10.8	289.4	289.4	289.7	0.3
BB	51,856	314	7,251	6.7	312.3	312.3	312.5	0.2
BC	56,817	394	7,078	6.9	313.9	313.9	314.1	0.2
BD	61,585	309	5,487	8.8	316.3	316.3	316.7	0.4
BE	65,572	1,116	8,759	5.5	318.5	318.5	318.9	0.4
BF	68,835	184	3,567	13.6	320.4	320.4	320.7	0.3
BG	69,232	329	6,055	8.0	323.7	323.7	323.9	0.2
BH	71,441	1,032	16,793	2.8	352.8	352.8	352.9	0.1
BI	76,638	1,066	13,038	3.6	353.4	353.4	353.5	0.1
BJ	84,410	1,476	19,497	2.4	355.7	355.7	355.8	0.1
BK	92,883	784[2]	13,121	3.5	358.2	358.2	358.3	0.1
BL	98,931	1,058[2]	12,441	3.7	359.7	359.7	359.7	0.0
BM	100,950	1,459[2]	16,161	2.8	360.0	360.0	360.2	0.2
BN	107,816	1,109[2]	15,569	2.9	363.0	363.0	363.4	0.4
BO	113,238	288[2]	5,429	8.3	369.8	369.8	369.8	0.0
BP	117,068	1,526[2]	18,509	2.2	373.3	373.3	373.6	0.3
BQ	126,914	460	5,063	8.1	378.4	378.4	378.8	0.4
BR	132,135	190	2,826	10.8	387.3	387.3	388.0	0.7
BS	138,078	212	3,814	8.0	415.5	415.5	415.8	0.3
BT	140,079	220	2,444	12.5	419.0	419.0	419.3	0.3
BU	142,578	244	3,458	8.8	427.9	427.9	428.0	0.1
BV	144,353	192	3,275	9.3	431.4	431.4	431.6	0.2

[1]Feet above confluence with the Hudson River
[2]Width extends beyond county boundary

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

RENSSELAER COUNTY, NY (ALL JURISDICTIONS)

FLOODWAY DATA

HOOSIC RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)[2]	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Hudson River								
A	390	790	20,200	5.5	35.0	35.0	35.4	0.4
B	2,280	650	17,100	6.6	35.4	35.4	35.8	0.4
C	3,120	920	23,000	4.9	36.5	36.5	36.7	0.2
D	7,120	830	23,000	4.9	37.1	37.1	37.6	0.5
E	8,760	1,150	28,600	3.9	37.3	37.3	38.0	0.7
F	12,575	1,122	24,473	4.6	37.6	37.6	38.6	1.0
G	12,620	1,165	24,837	4.5	37.9	37.9	38.9	1.0
H	13,490	1,170	23,092	4.9	38.0	38.0	38.9	0.9
I	16,490	1,100	20,013	5.6	38.7	38.7	39.6	0.9
J	18,840	905	17,744	6.3	39.4	39.4	40.1	0.7
K	21,215	835	18,684	6.0	40.1	40.1	40.9	0.8
L	22,915	894	17,616	6.4	40.5	40.5	41.2	0.7
M	26,040	803	15,335	7.3	41.6	41.6	42.3	0.7
N	28,515	912	18,959	5.9	42.8	42.8	43.4	0.6
O	31,415	847	17,814	6.3	43.6	43.6	44.1	0.5
P	33,615	820	13,388	8.4	44.2	44.2	44.7	0.5
Q	33,720	1,920	27,383	4.1	59.6	59.6	60.1	0.5
R	34,395	1,918	34,149	3.3	59.7	59.7	60.3	0.6
S	37,895	854	16,252	6.9	60.0	60.0	60.5	0.5
T	40,685	1,252	20,727	5.4	61.3	61.3	61.7	0.4
U	42,845	564	13,383	8.4	61.6	61.6	62.0	0.4
V	43,745	544	11,328	9.9	61.8	61.8	62.2	0.4
W	43,935	648	13,496	8.3	62.4	62.4	63.4	1.0
X	46,535	623	11,312	9.9	64.0	64.0	64.8	0.8
Y	46,695	775	25,094	4.5	81.0	81.0	81.7	0.7
Z	48,220	1,440	32,501	3.4	81.2	81.2	81.9	0.7

[1]Feet above Limit of Detailed Study, Limit of Detailed Study is approximately 12,578 feet downstream of Lock No. 1
[2]Width extends beyond county boundary

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

RENSSELAER COUNTY, NY (ALL JURISDICTIONS)

FLOODWAY DATA

HUDSON RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Hudson River (continued)								
AA	49,470[1]	1,230[3]	27,481	4.1	81.2	81.2	81.9	0.7
AB	49,660[1]	1,210[3]	29,087	3.9	81.3	81.3	82.3	1.0
AC	50,510[1]	1,427[3]	34,510	3.2	81.4	81.4	82.4	1.0
AD	52,260[1]	2,123[3]	34,271	3.3	81.6	81.6	82.6	1.0
AE	57,010[1]	1,145[3]	25,886	2.7	82.0	82.0	82.9	0.9
AF	57,660[1]	960[3]	21,242	3.3	82.0	82.0	82.9	0.9
AG	57,770[1]	1,119[3]	22,434	3.1	91.6	91.6	92.5	0.9
AH	58,445[1]	667[3]	9,630	7.2	91.6	91.6	92.5	0.9
AI	58,675[1]	684[3]	9,370	7.4	91.6	91.6	92.5	0.9
AJ	59,375[1]	760[3]	15,769	4.4	92.2	92.2	93.0	0.8
AK	60,525[1]	742[3]	13,773	5.1	92.4	92.4	93.2	0.8
AL	62,175[1]	848[3]	17,604	4.0	92.9	92.9	93.6	0.7
Tomhannock Creek								
A	300[2]	77	704	12.9	104.4	100.8[4]	101.8	1.0
B	515[2]	103	835	10.9	104.4	103.1[4]	103.6	0.5
C	1,565[2]	200	1,525	5.9	106.6	106.6	106.6	0.0
D	2,485[2]	200	1,470	6.2	109.4	109.4	109.5	0.1
E	3,265[2]	200	1,494	6.1	111.8	111.8	111.8	0.0
F	4,475[2]	250	1,894	4.9	112.9	112.9	113.8	0.9
G	5,835[2]	169	1,011	9.0	115.3	115.3	115.5	0.2
H	7,195[2]	200	1,030	8.5	120.3	120.3	120.3	0.0
I	8,455[2]	150	861	10.5	125.3	125.3	126.2	0.9

[1]Feet above Limit of Detailed Study, Limit of Detailed Study is approximately 12,578 feet downstream of Lock No. 1
[2]Feet above confluence with the Hoosic River
[3]Width extends beyond county boundary
[4]Elevation computed without consideration of backwater effects from the Hoosic River

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

RENSSELAER COUNTY, NY (ALL JURISDICTIONS)

FLOODWAY DATA

HUDSON RIVER – TOMHANNOCK CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Woods Brook								
A	494	13	53	9.4	429.0	429.0	429.1	0.1
B	728	23	86	5.8	433.6	433.6	434.6	1.0
C	872	25	85	5.8	435.5	435.5	436.2	0.7
D	1,012	8	14	7.5	439.7	439.7	440.4	0.7
E	1,493	24	33	3.1	455.7	455.7	456.0	0.3
F	2,223	25	132	3.8	467.6	467.6	468.1	0.5
G	2,824	22	71	7.0	478.0	478.0	478.4	0.4
H	3,311	24	105	4.7	489.5	489.5	490.1	0.6
I	3,902	19	55	8.5	500.8	500.8	500.9	0.1
J	4,385	106	293	1.6	518.3	518.3	518.3	0.0
K	4,932	16	48	9.8	525.8	525.8	525.9	0.1
L	5,387	31	100	4.7	535.2	535.2	536.0	0.8
M	6,360	51	85	5.5	554.4	554.4	554.6	0.2
N	7,244	40	88	5.3	574.9	574.9	575.3	0.4
O	7,917	35	117	4.0	589.3	589.3	589.9	0.6
P	8,359	80	89	4.0	599.0	599.0	599.1	0.1
Q	8,898	14	48	7.5	610.7	610.7	611.1	0.4
R	9,327	10	46	7.8	618.8	618.8	619.7	0.9
S	9,799	22	57	6.3	628.9	628.9	629.0	0.1
T	10,226	51	86	4.2	637.2	637.2	637.5	0.3
U	10,825	15	44	8.3	651.0	651.0	651.0	0.0
V	11,164	12	37	9.8	657.2	657.2	657.2	0.0
W	11,363	28	59	6.0	662.6	662.6	662.9	0.3
X	12,092	52	90	4.0	678.0	678.0	678.0	0.0
Y	12,604	56	59	3.9	688.6	688.6	688.7	0.1
Z	12,868	30	46	5.0	694.0	694.0	694.0	0.0

[1]Feet above confluence with the Hoosic River

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

RENSSELAER COUNTY, NY (ALL JURISDICTIONS)

FLOODWAY DATA

WOODS BROOK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Woods Brook (continued)								
AA	13,478	58	74	3.1	707.2	707.2	707.2	0.0
AB	14,020	24	35	6.6	715.1	715.1	715.2	0.1
AC	14,783	29	44	5.2	729.6	729.6	729.7	0.1
AD	15,914	27	40	5.8	757.8	757.8	757.9	0.1
AE	16,779	21	34	6.8	779.4	779.4	779.5	0.1

[1]Feet above confluence with the Hoosic River

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

RENSSELAER COUNTY, NY (ALL JURISDICTIONS)

FLOODWAY DATA

WOODS BROOK

Near the mouths of streams studied in detail, floodway computations are made without regard to flood elevations on the receiving water body. Therefore, "Without Floodway" elevations presented in Table 8 for certain downstream cross sections of the Hoosic River, Tomhannock Creek, and Woods Brook are lower than the regulatory flood elevations in that area, which must take into account the 1% annual chance flooding due to backwater from other sources.

The area between the floodway and 1-percent annual chance floodplain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the floodplain that could be completely obstructed without increasing the WSEL of the 1% annual chance flood by more than 1.0 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in FIGURE 1.

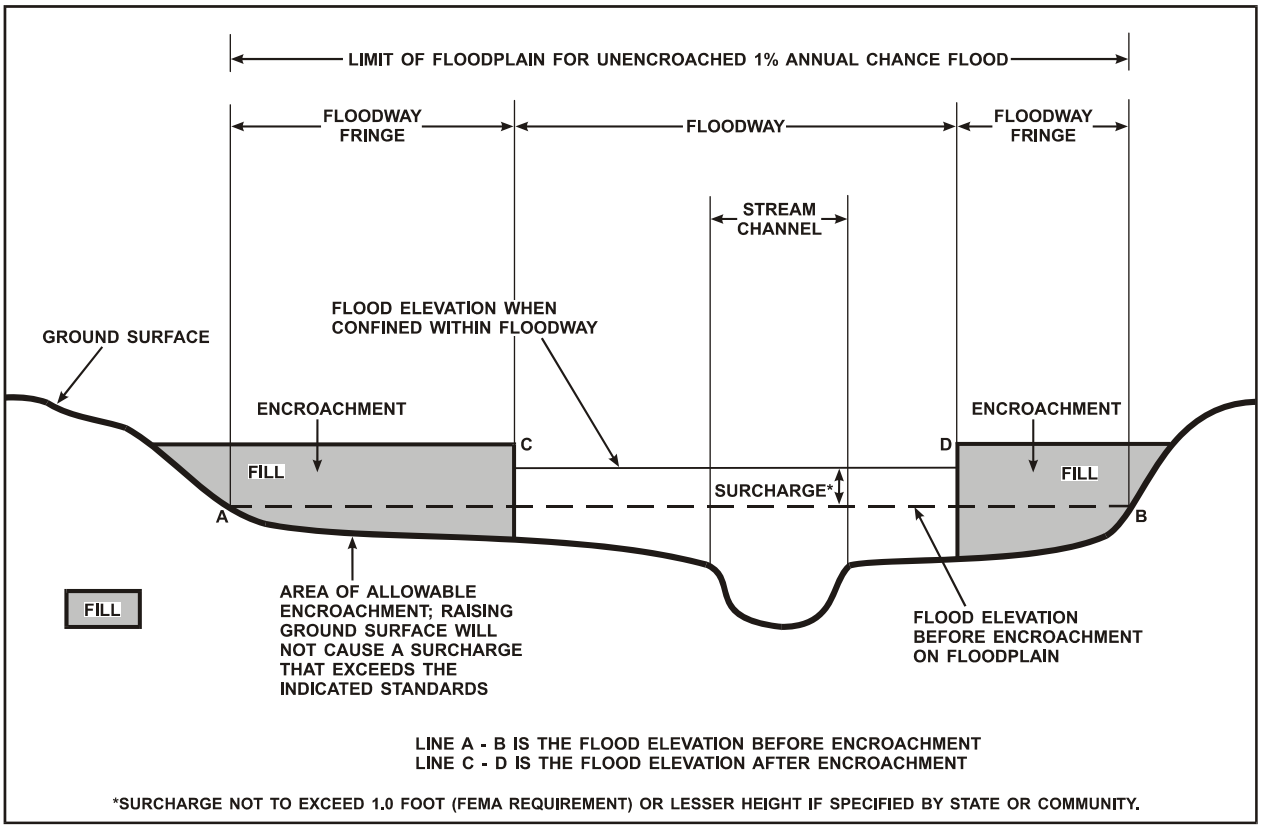

FIGURE 1 – FLOODWAY SCHEMATIC

5.0 INSURANCE APPLICATIONS

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. The zones are as follows:

Zone A

Zone A is the flood insurance rate zone that corresponds to the 1-percent annual chance floodplains that are determined in the FIS by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no base flood elevations or depths are shown within this zone.

Zone AE

Zone AE is the flood insurance rate zone that corresponds to the 1-percent annual chance floodplains that are determined in the FIS by detailed methods. In most instances, whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AH

Zone AH is the flood insurance rate zone that corresponds to the areas of 1-percent annual chance shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AO

Zone AO is the flood insurance rate zone that corresponds to the areas of 1-percent annual chance shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average whole-foot depths derived from the detailed hydraulic analyses are shown within this zone.

Zone AR

Area of special flood hazard formerly protected from the 1-percent annual chance flood event by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1-percent annual chance or greater flood event.

Zone A99

Zone A99 is the flood insurance rate zone that corresponds to areas of the 1-percent annual chance floodplain that will be protected by a Federal flood protection system where construction has reached specified statutory milestones. No base flood elevations or depths are shown within this zone.

Zone V

Zone V is the flood insurance rate zone that corresponds to the 1-percent annual chance coastal floodplains that have additional hazards associated with storm waves. Because approximate hydraulic analyses are performed for such areas, no base flood elevations are shown within this zone.

Zone VE

Zone VE is the flood insurance rate zone that corresponds to the 1-percent annual chance coastal floodplains that have additional hazards associated with storm waves. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone X

Zone X is the flood insurance rate zone that corresponds to areas outside the 0.2-percent annual chance floodplain, areas within the 0.2-percent annual chance floodplain, and to areas of 1-percent annual chance flooding where average depths are less than 1 foot, areas of 1-percent annual chance flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 1-percent annual chance flood by levees. No base flood elevations or depths are shown within this zone.

Zone D

Zone D is the flood insurance rate zone that corresponds to unstudied areas where flood hazards are undetermined, but possible.

6.0 FLOOD INSURANCE RATE MAP

The FIRM is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designates flood insurance rate zones as described in Section 5.0 and, in the 1% annual chance floodplains that were studied by detailed methods, shows selected whole-foot base flood elevations or average depths. Insurance agents use the zones and base flood elevations in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For floodplain management applications, the map shows by tints, screens, and symbols, the 1- and 0.2% annual chance floodplains. Floodways and the locations of selected cross sections used in the hydraulic analyses and floodway computations are shown where applicable.

The current FIRM presents flooding information for the entire geographic area of Rensselaer County. Previously, separate Flood Hazard Boundary Maps (FHBMs) and/or FIRMs were prepared for each incorporated community with identified flood hazard areas

within the county. Historical map dates relating to the pre-countywide FIRMs for each community are presented in Table 9, "Community Map History."

Within the Village of Hoosick Falls there are one or more levees that have not been demonstrated by the community or levee owner(s) to meet the requirements of 44 CFR Part 65.10 of the NFIP regulations as it relates to the levee's capacity to provide 1% annual chance flood protection. Please refer to the Notice to Flood Insurance Study Users page at the front of this FIS report for more information on how this may affect the FIRM.

7.0 OTHER STUDIES

Information pertaining to revised and unrevised flood hazards for each above mentioned jurisdictions within Rensselaer County has been compiled into this FIS. Therefore, this FIS supersedes all previously printed FIS Reports, FHBMs, FBFMs, and FIRMs for the previously listed jurisdictions within Rensselaer County.

8.0 LOCATION OF DATA

Information concerning the pertinent data used in preparation of this FIS can be obtained by contacting FEMA, Federal Insurance and Mitigation Division, 26 Federal Plaza, Room 1337, New York, New York 10278.

COMMUNITY NAME	INITIAL NFIP MAP DATE	FLOOD HAZARD BOUNDARY MAP REVISIONS DATE	INITIAL FIRM DATE	FIRM REVISIONS DATE
Hoosick, Town of	November 1, 1974	August 6, 1976	August 1, 1987	
Hoosick Falls, Village of	May 10, 1974	June 18, 1976	May 16, 1980	February 4, 2005
Pittstown, Town of	November 29, 1974	None	February 1, 1988	September 5, 1990
Schaghticoke, Town of	December 20, 1974	None	July 16, 1984	
Schaghticoke, Village of	January 23, 1976	None	June 11, 1982	June 5, 1985
Valley Falls, Village of	November 22, 1974	July 23, 1976	June 5, 1985	

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

RENSSELAER COUNTY, NY (ALL JURISDICTIONS)

COMMUNITY MAP HISTORY

9.0 BIBLIOGRAPHY AND REFERENCES

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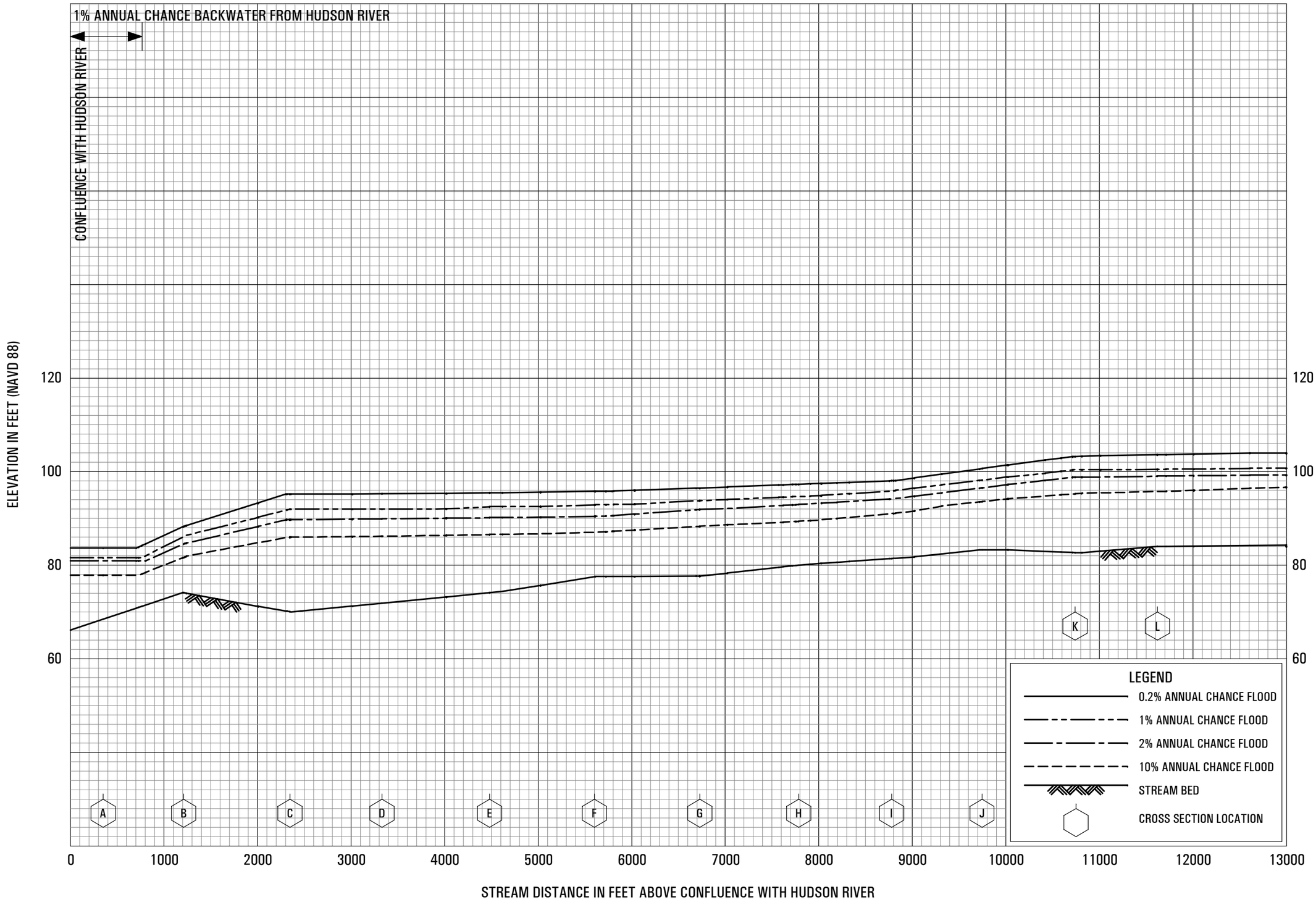

FLOOD PROFILES

HOOSIC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

RENSSELAER COUNTY, NY

(ALL JURISDICTIONS)

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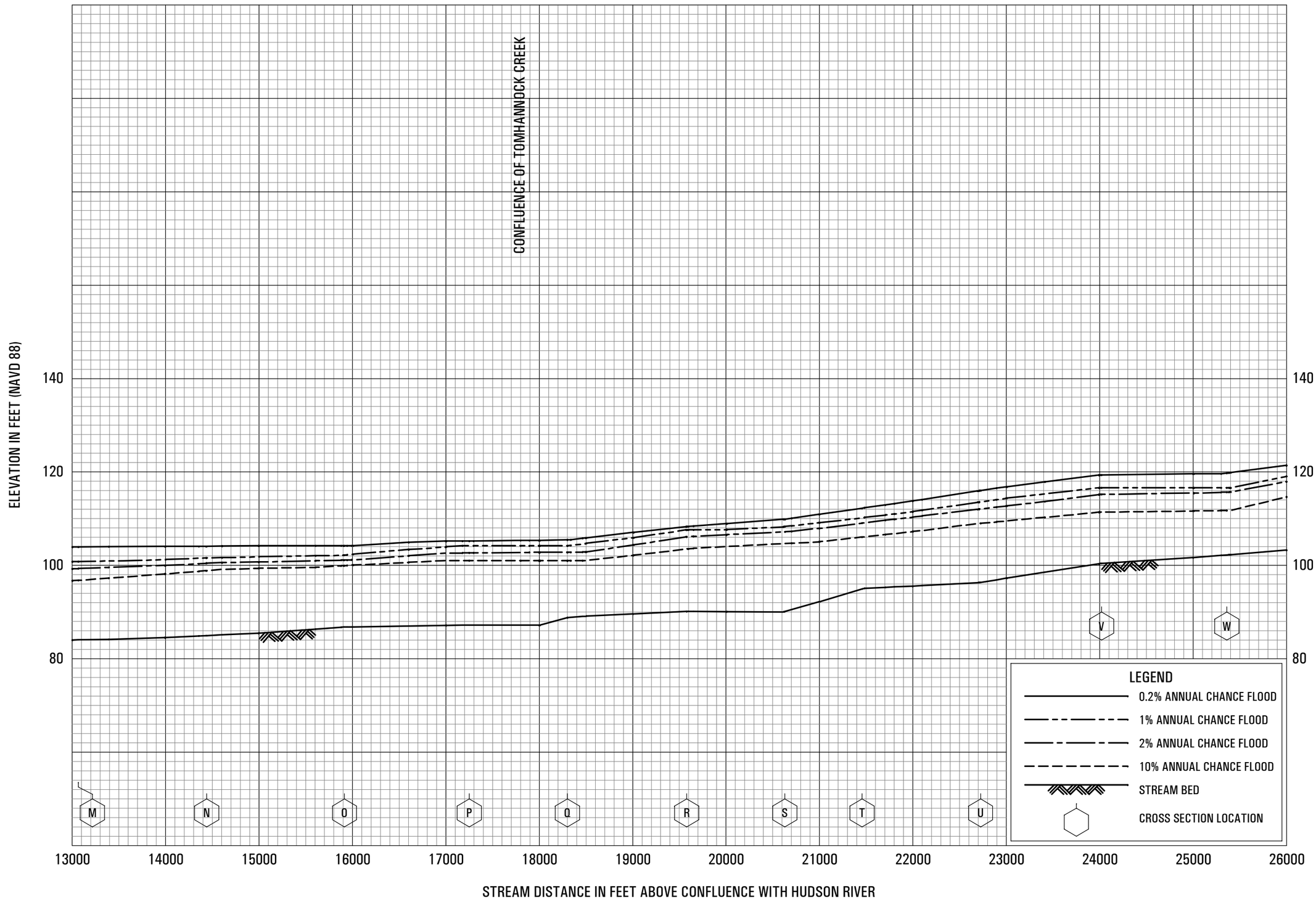

FLOOD PROFILES

HOOSIC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

RENSSELAER COUNTY, NY

(ALL JURISDICTIONS)

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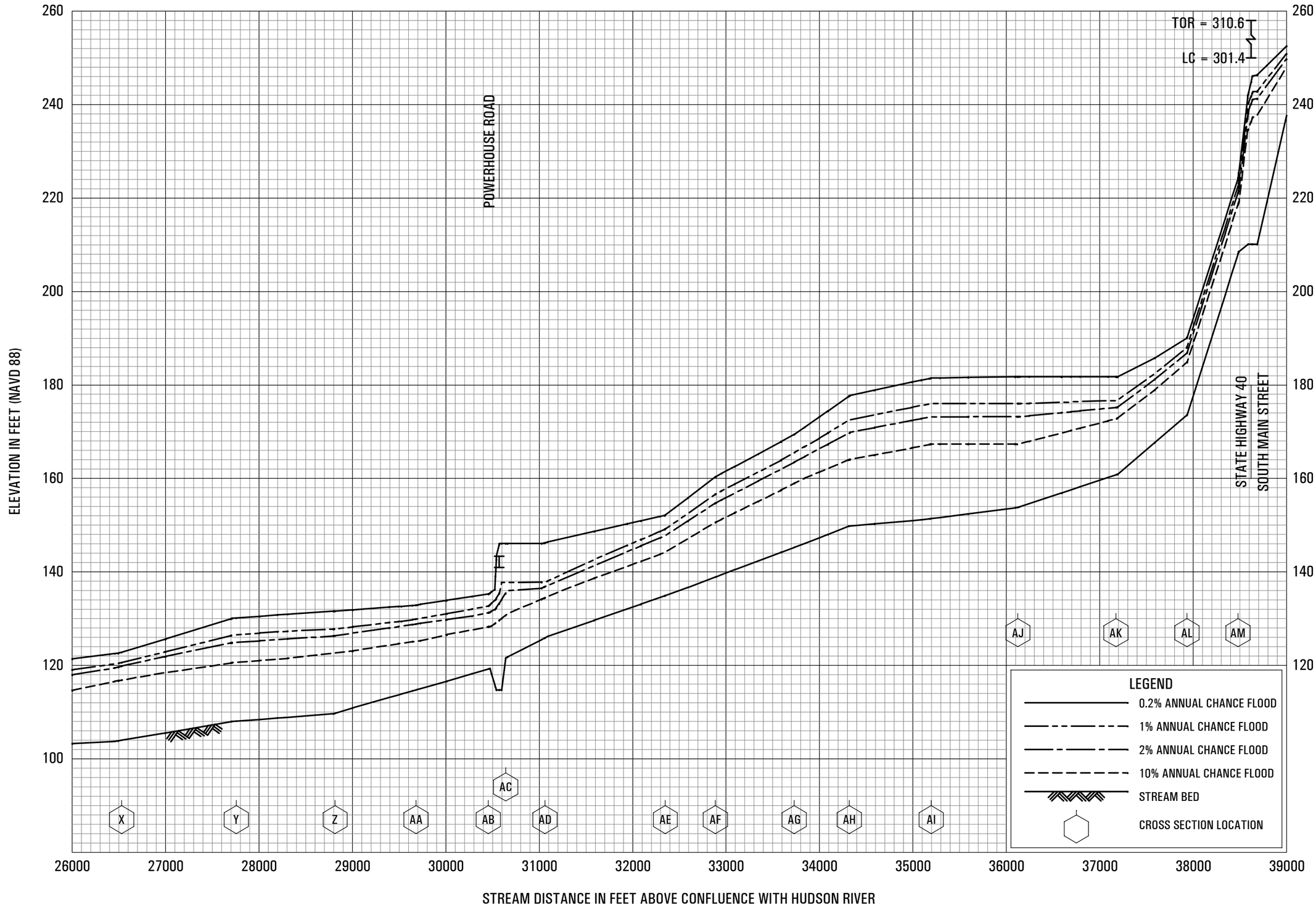

FLOOD PROFILES

HOOSIC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

RENSSELAER COUNTY, NY

(ALL JURISDICTIONS)

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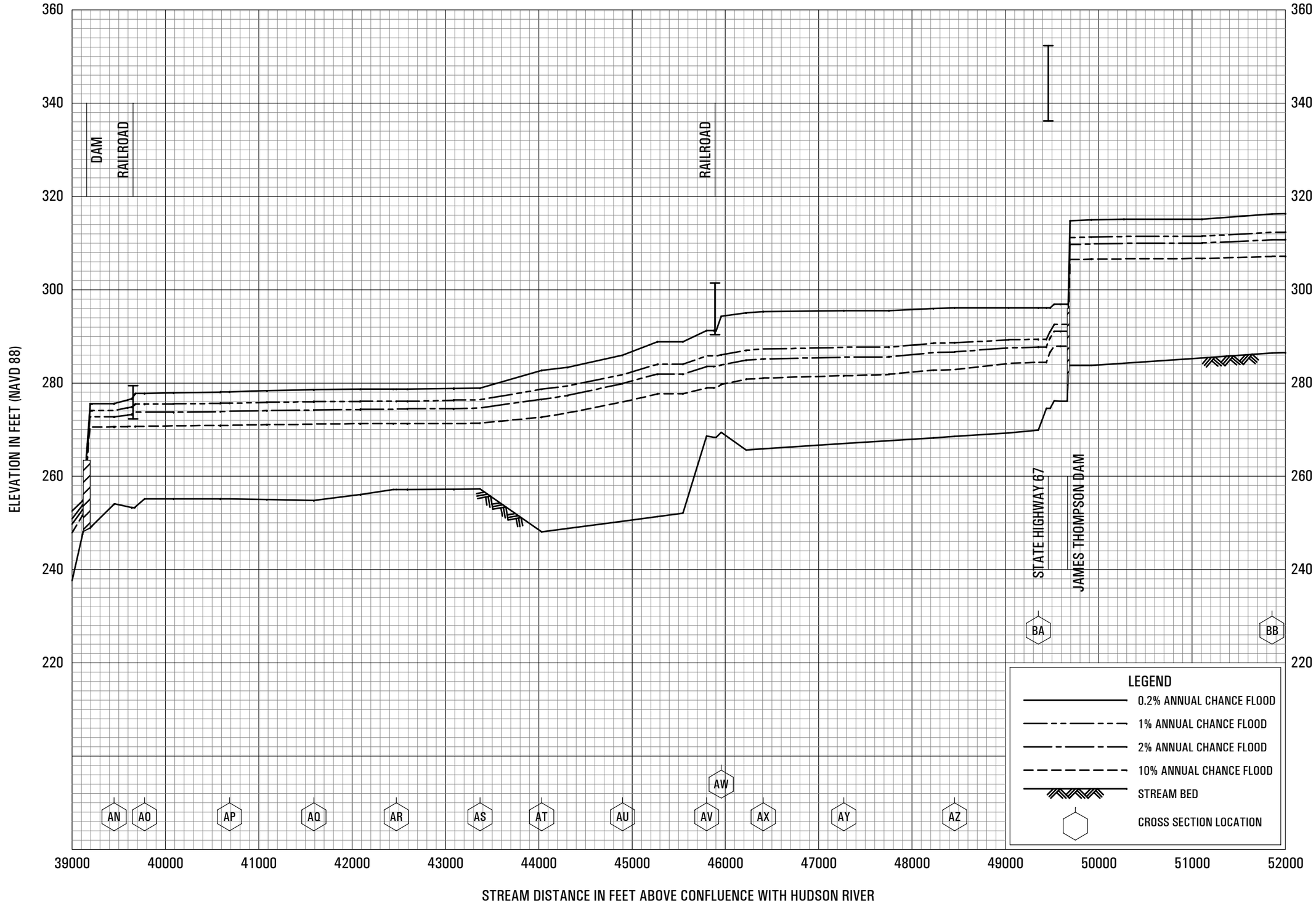


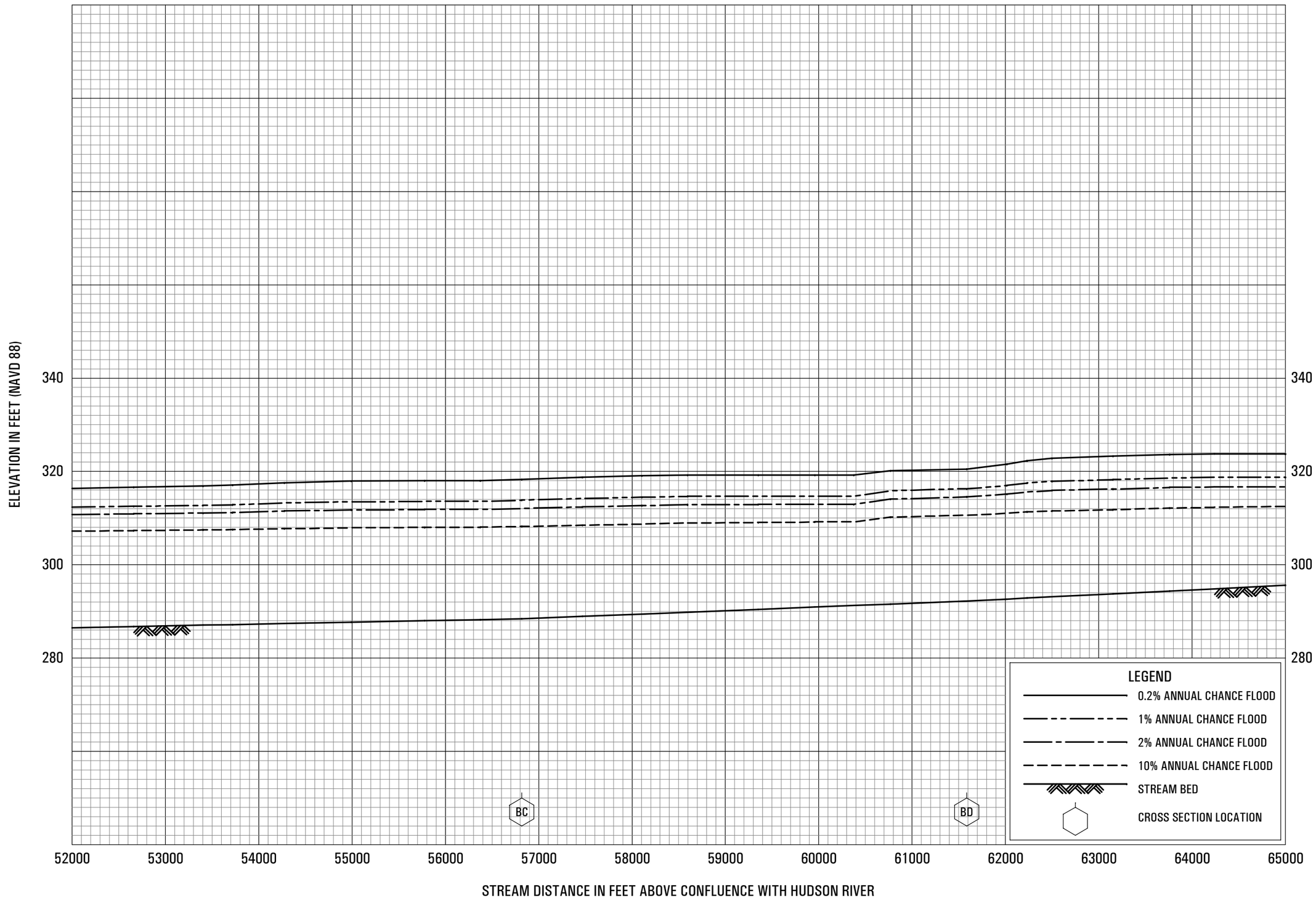
FLOOD PROFILES

HOOSIC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

RENSSELAER COUNTY, NY

(ALL JURISDICTIONS)



FLOOD PROFILES

HOOSIC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

RENSSELAER COUNTY, NY

(ALL JURISDICTIONS)

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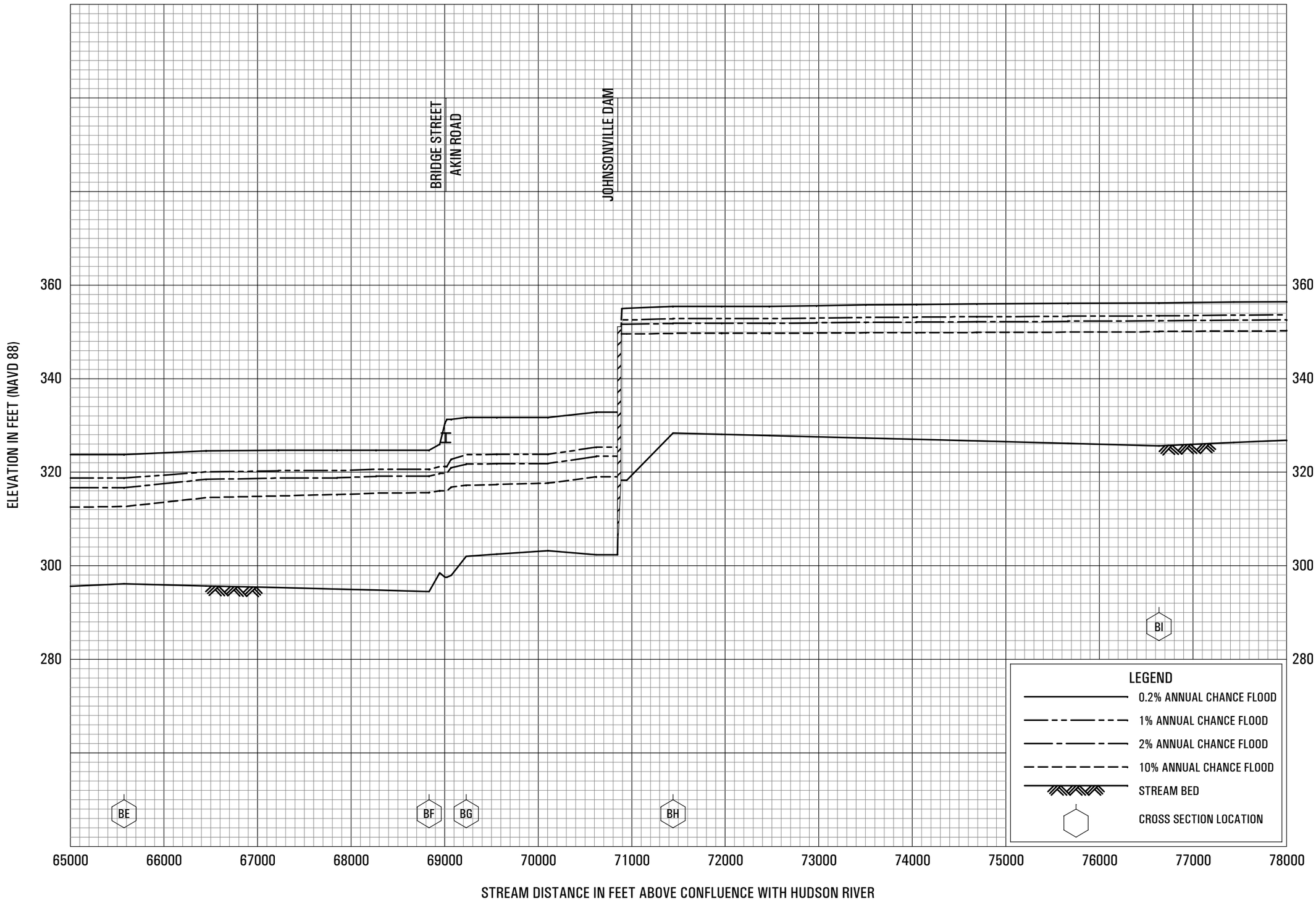

FLOOD PROFILES

HOOSIC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

RENSSELAER COUNTY, NY

(ALL JURISDICTIONS)

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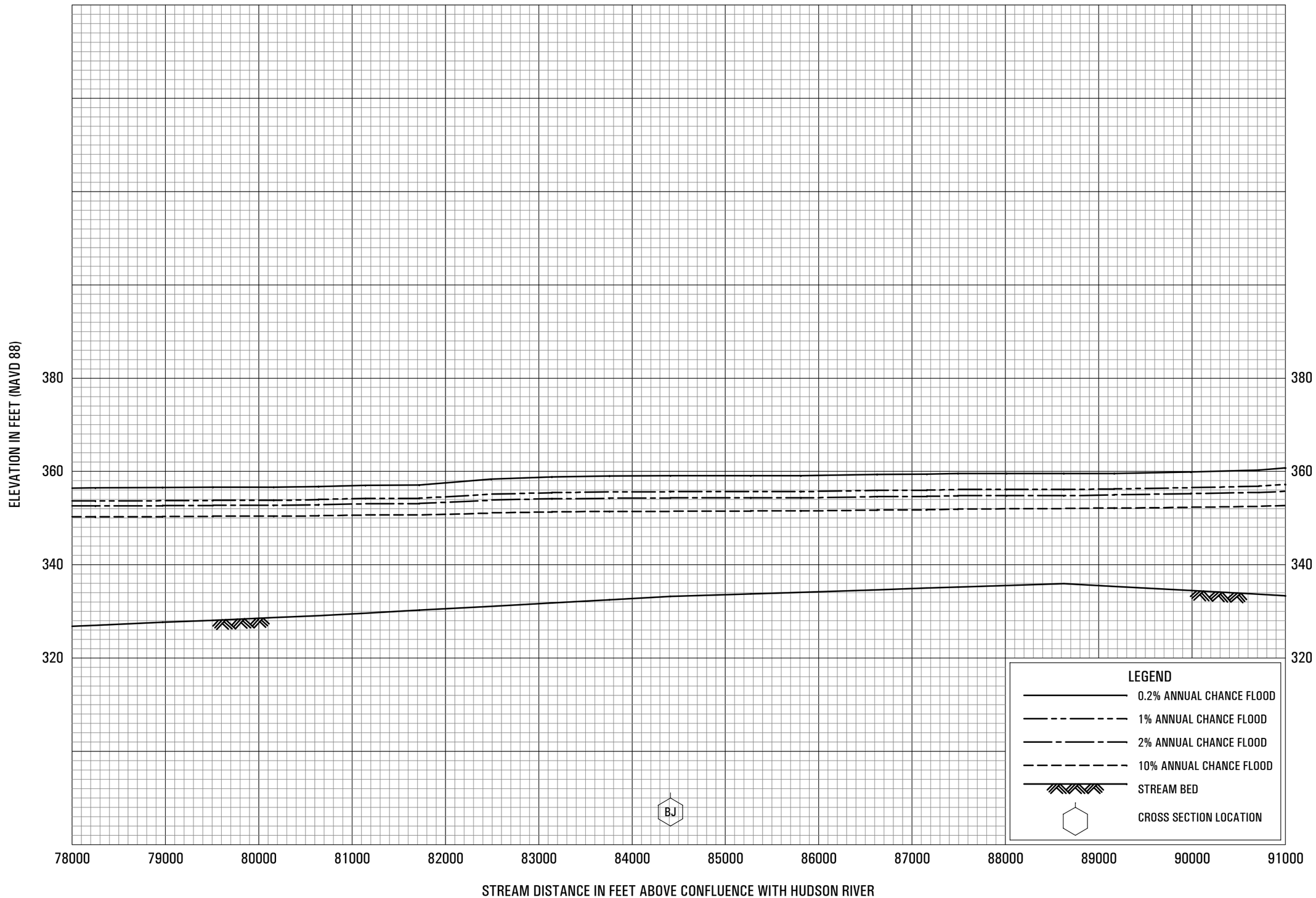

FLOOD PROFILES

HOOSIC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

RENSSELAER COUNTY, NY

(ALL JURISDICTIONS)

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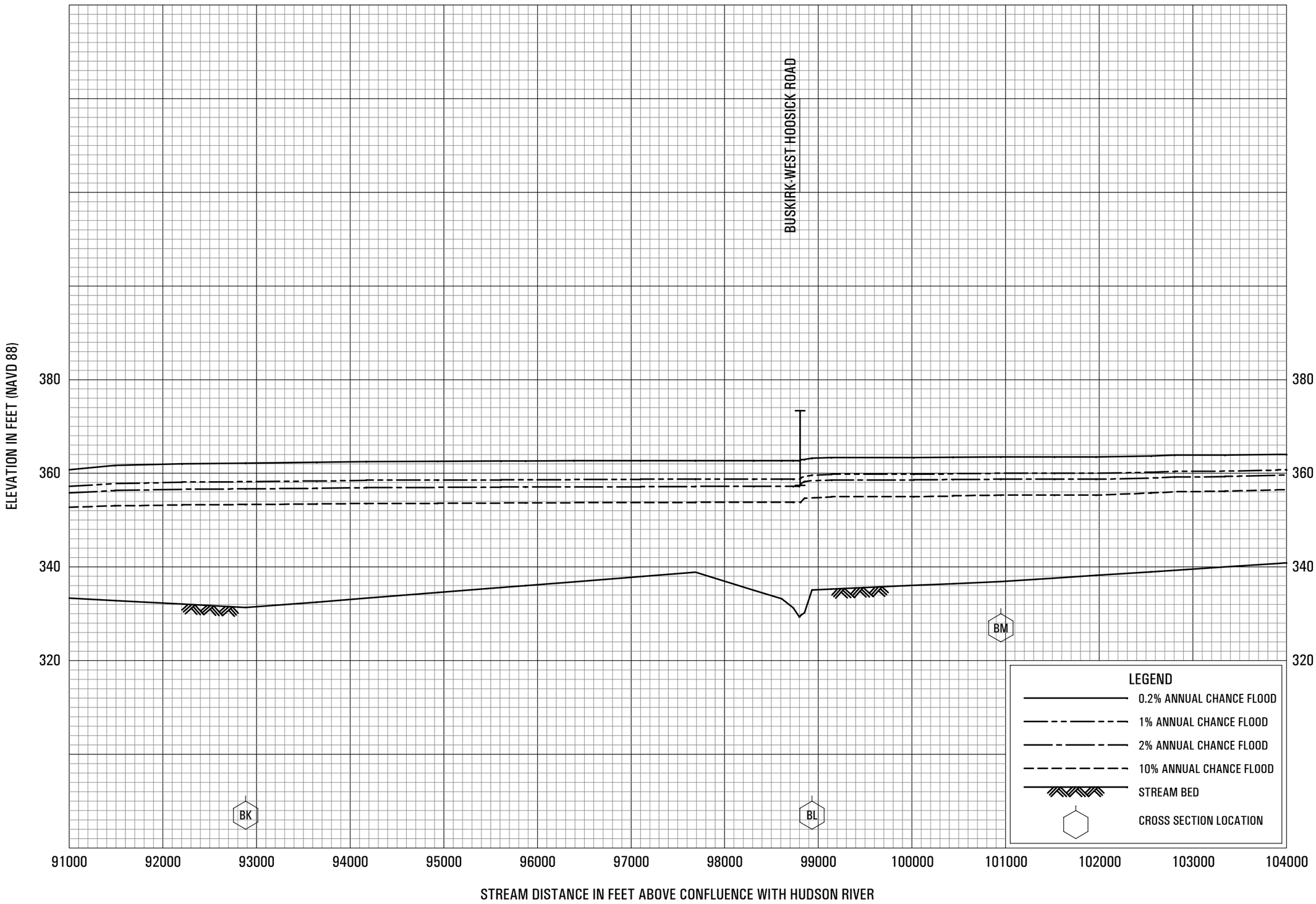

FLOOD PROFILES

HOOSIC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

RENSSELAER COUNTY, NY

(ALL JURISDICTIONS)

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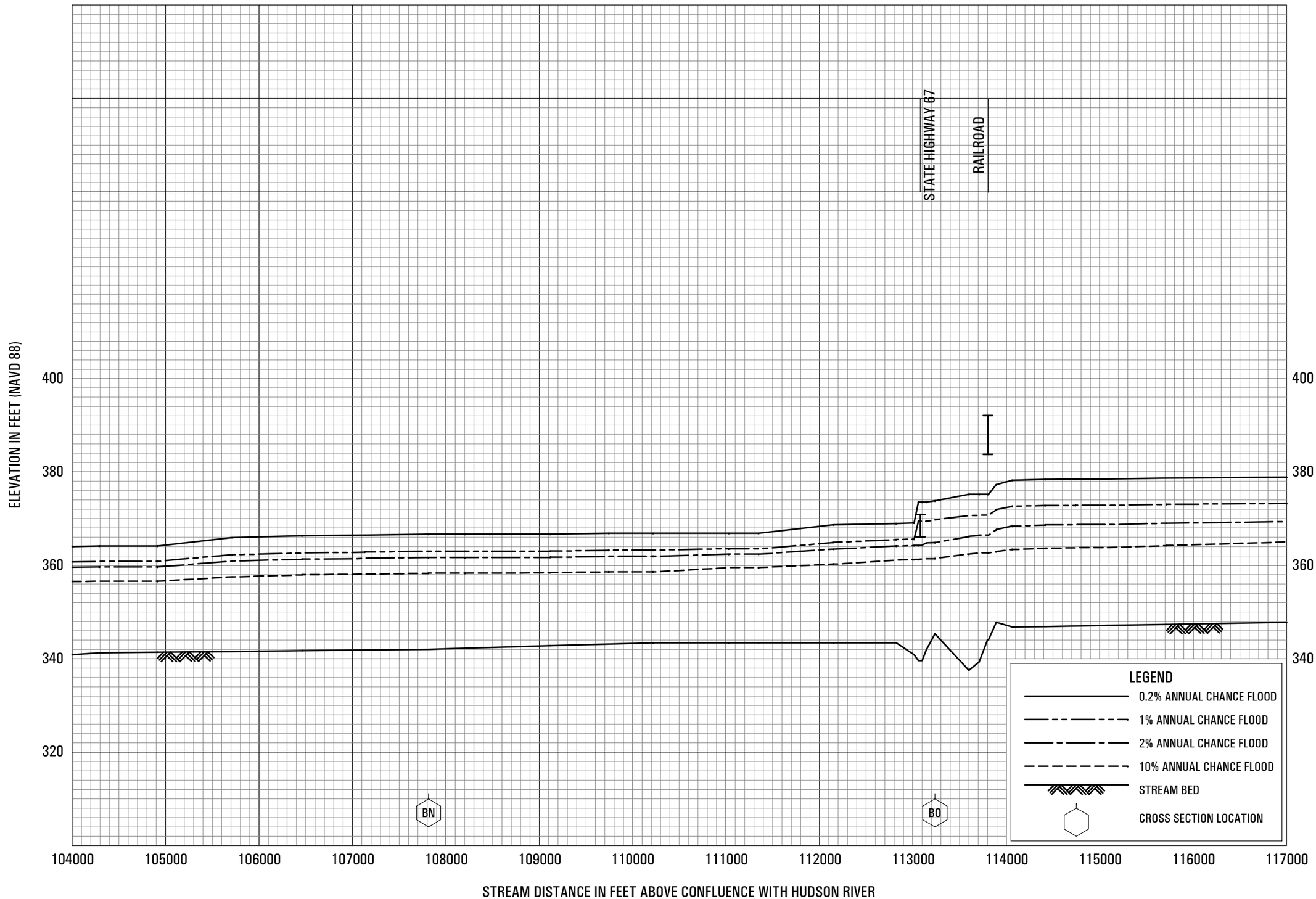

FLOOD PROFILES

HOOSIC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

RENSSELAER COUNTY, NY

(ALL JURISDICTIONS)

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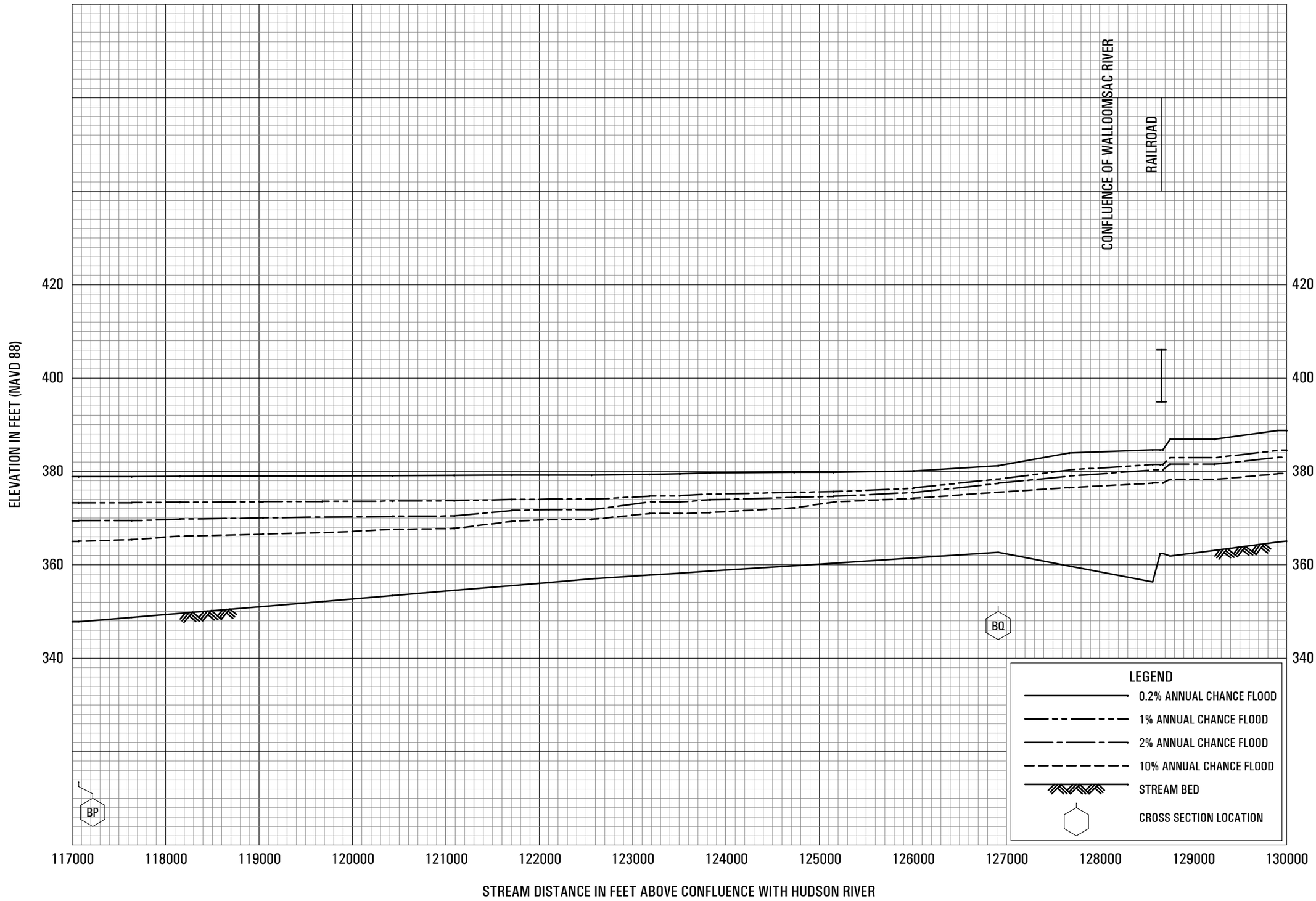


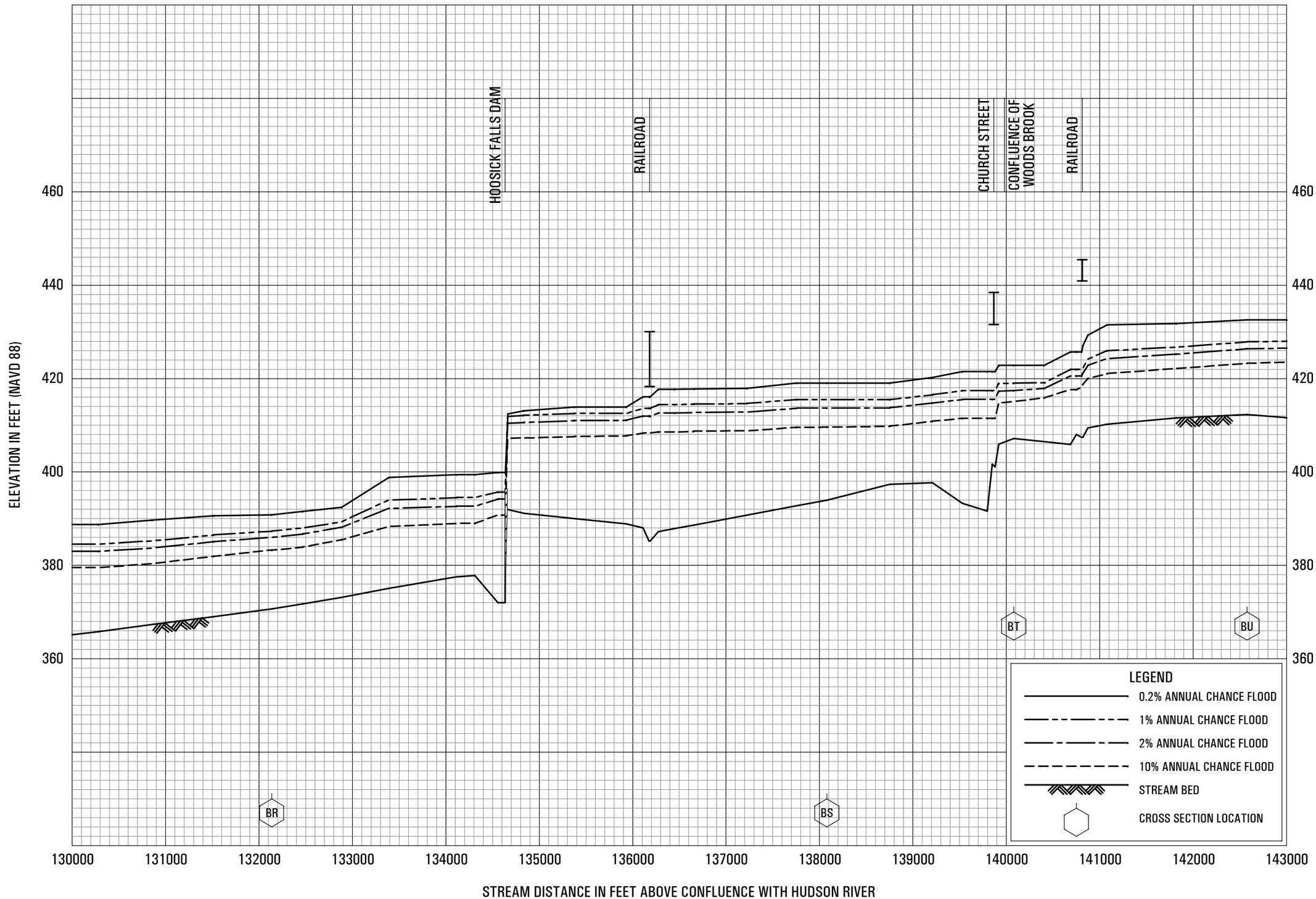
FLOOD PROFILES

HOOSIC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

RENSSELAER COUNTY, NY

(ALL JURISDICTIONS)



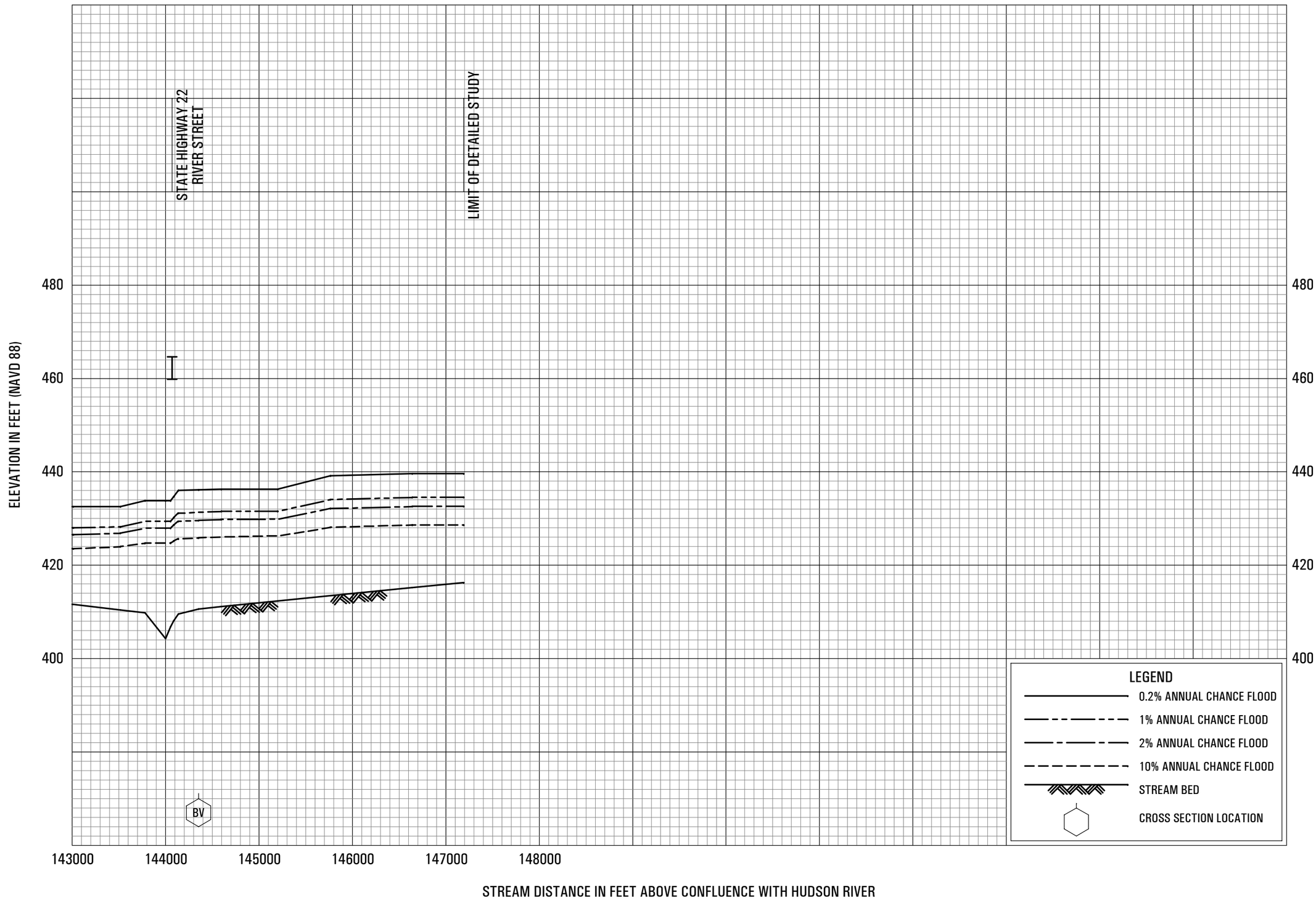
FLOOD PROFILES

HOOSIC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

RENSSELAER COUNTY, NY

(ALL JURISDICTIONS)



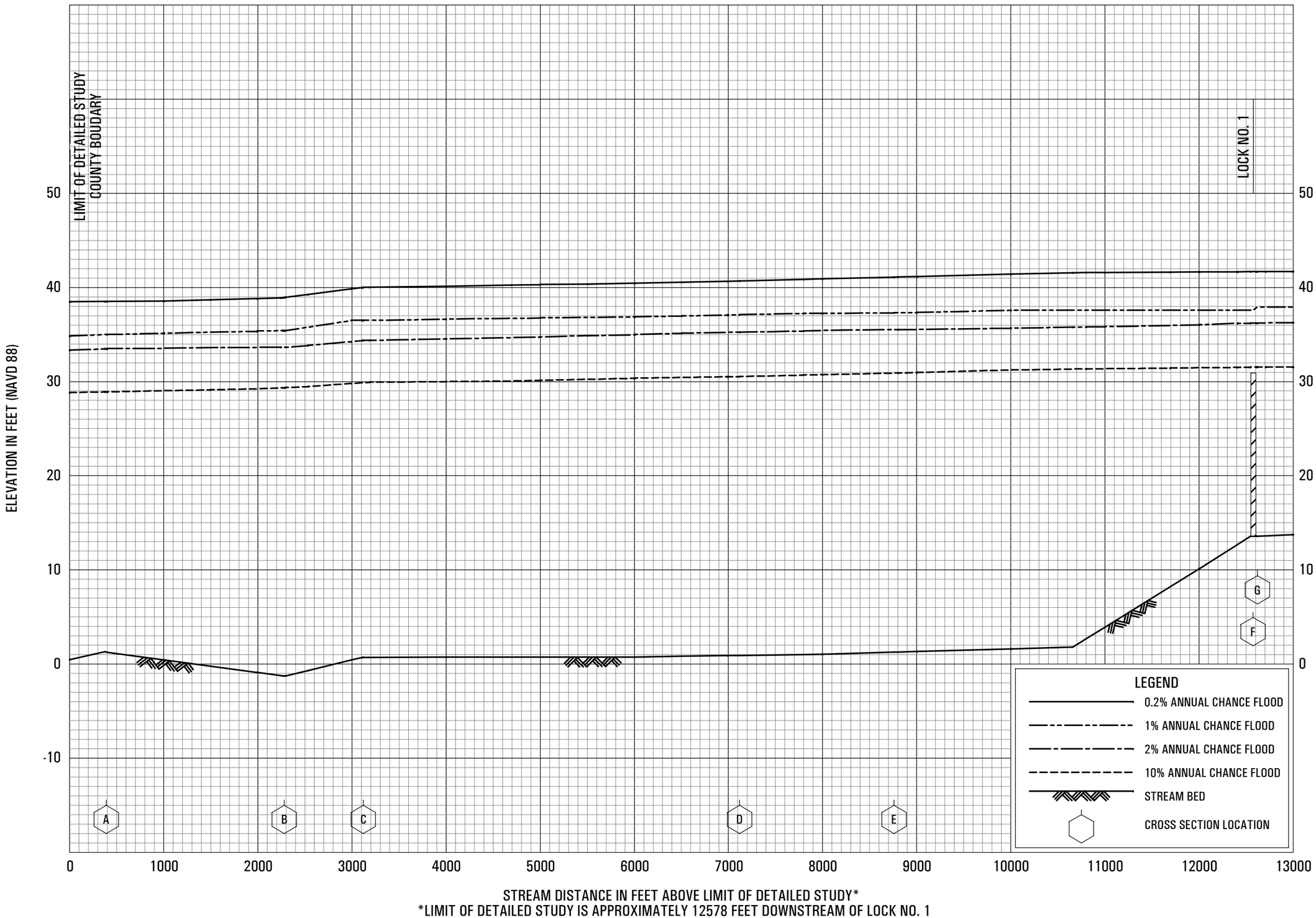
FLOOD PROFILES

HOOSIC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

RENSSELAER COUNTY, NY

(ALL JURISDICTIONS)



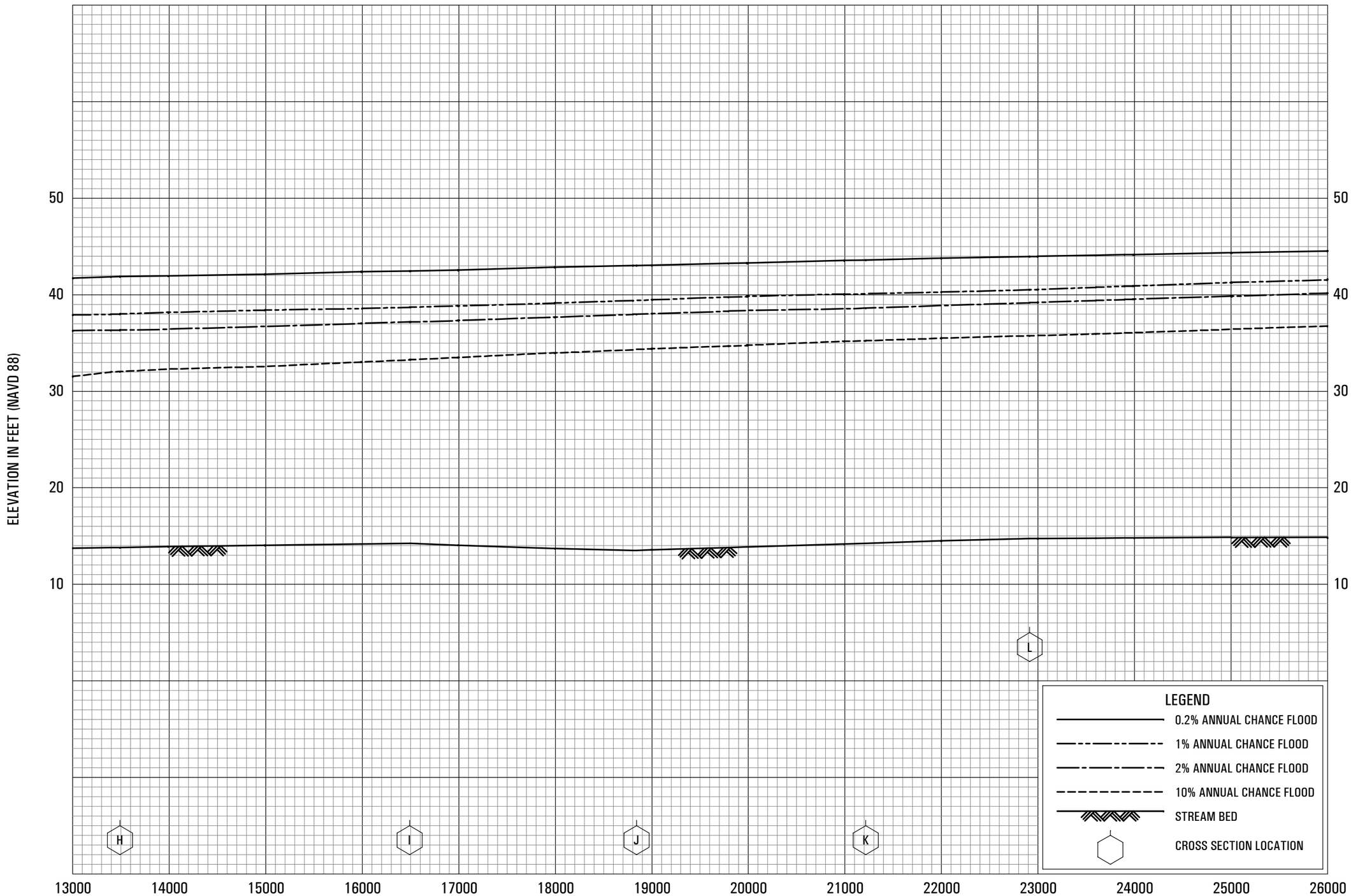
FLOOD PROFILES

HUDSON RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

RENSSELAER COUNTY, NY

(ALL JURISDICTIONS)



STREAM DISTANCE IN FEET ABOVE LIMIT OF DETAILED STUDY*
*LIMIT OF DETAILED STUDY IS APPROXIMATELY 12578 FEET DOWNSTREAM OF LOCK NO. 1

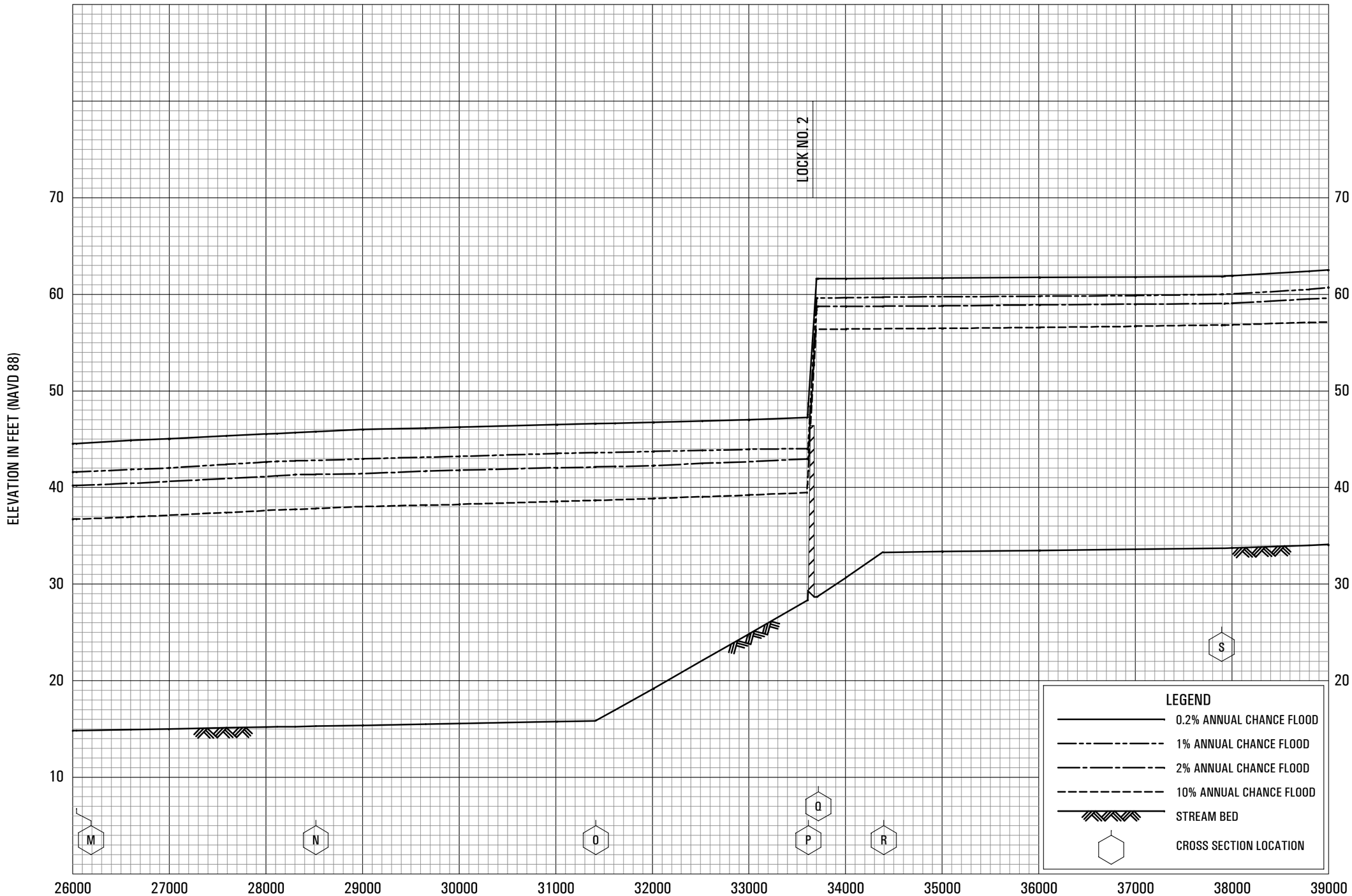
FLOOD PROFILES

HUDSON RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

RENSSELAER COUNTY, NY

(ALL JURISDICTIONS)



FLOOD PROFILES

HUDSON RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

RENSSELAER COUNTY, NY

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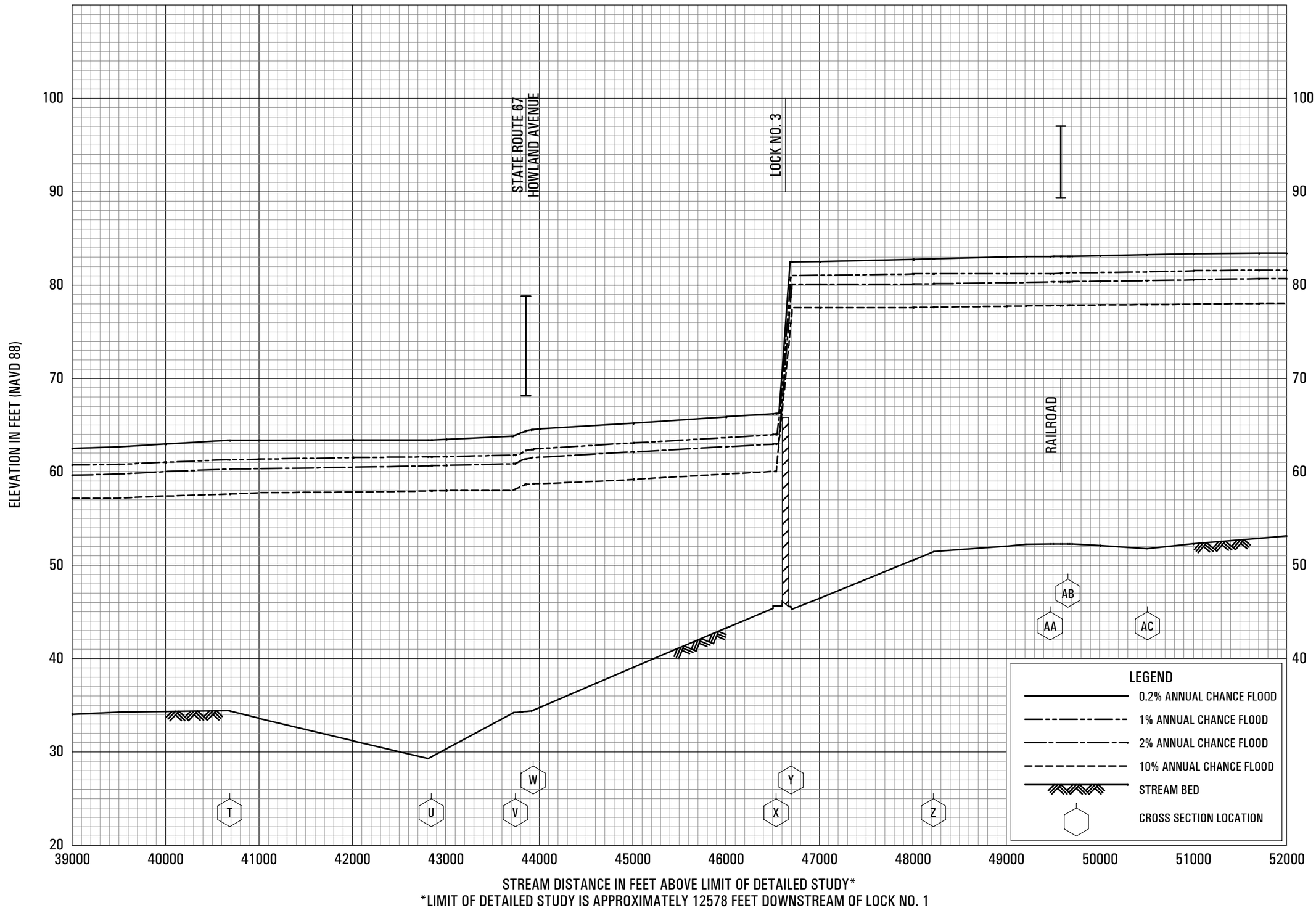


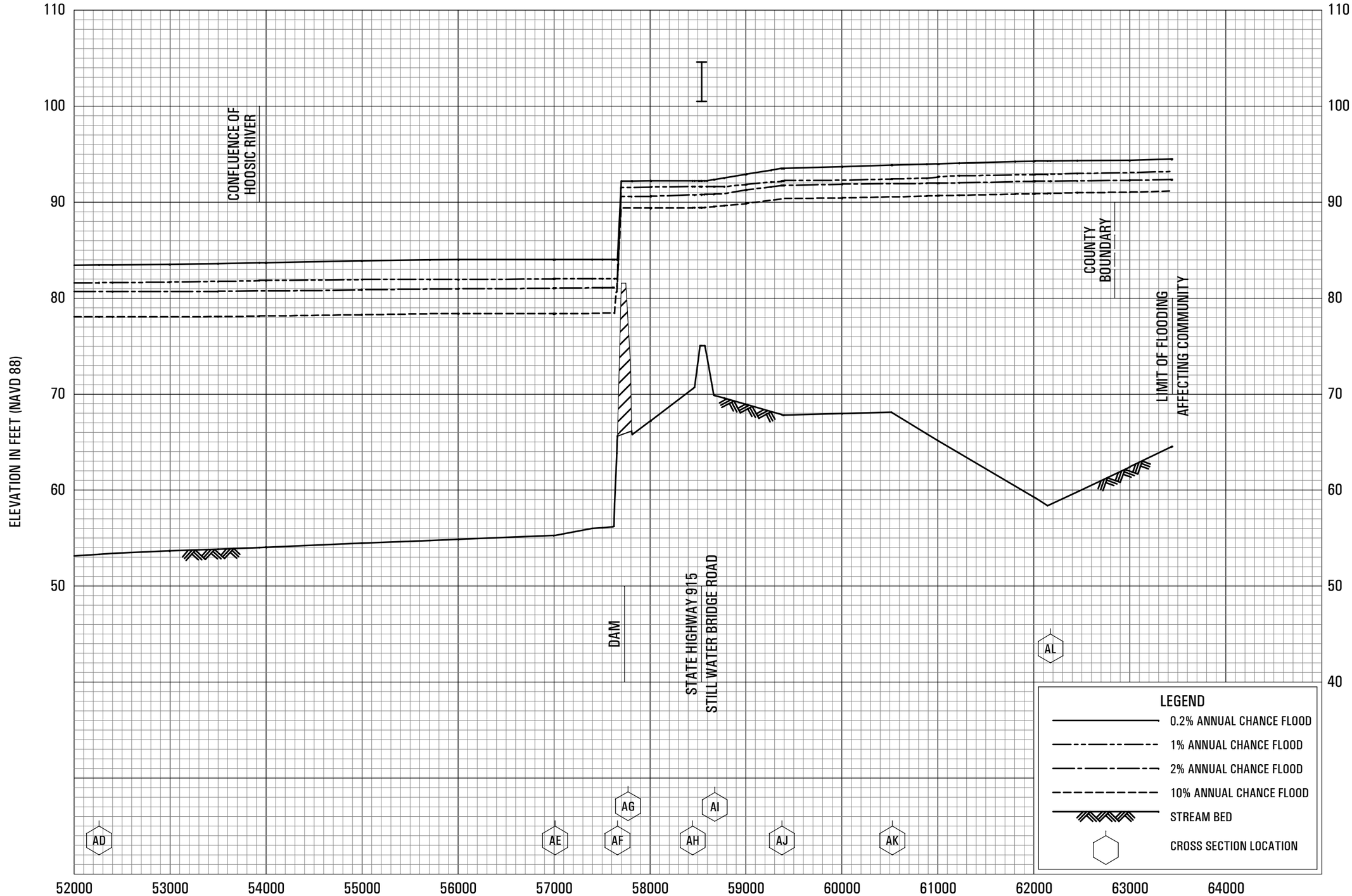
FLOOD PROFILES

HUDSON RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

RENSSELAER COUNTY, NY

(ALL JURISDICTIONS)



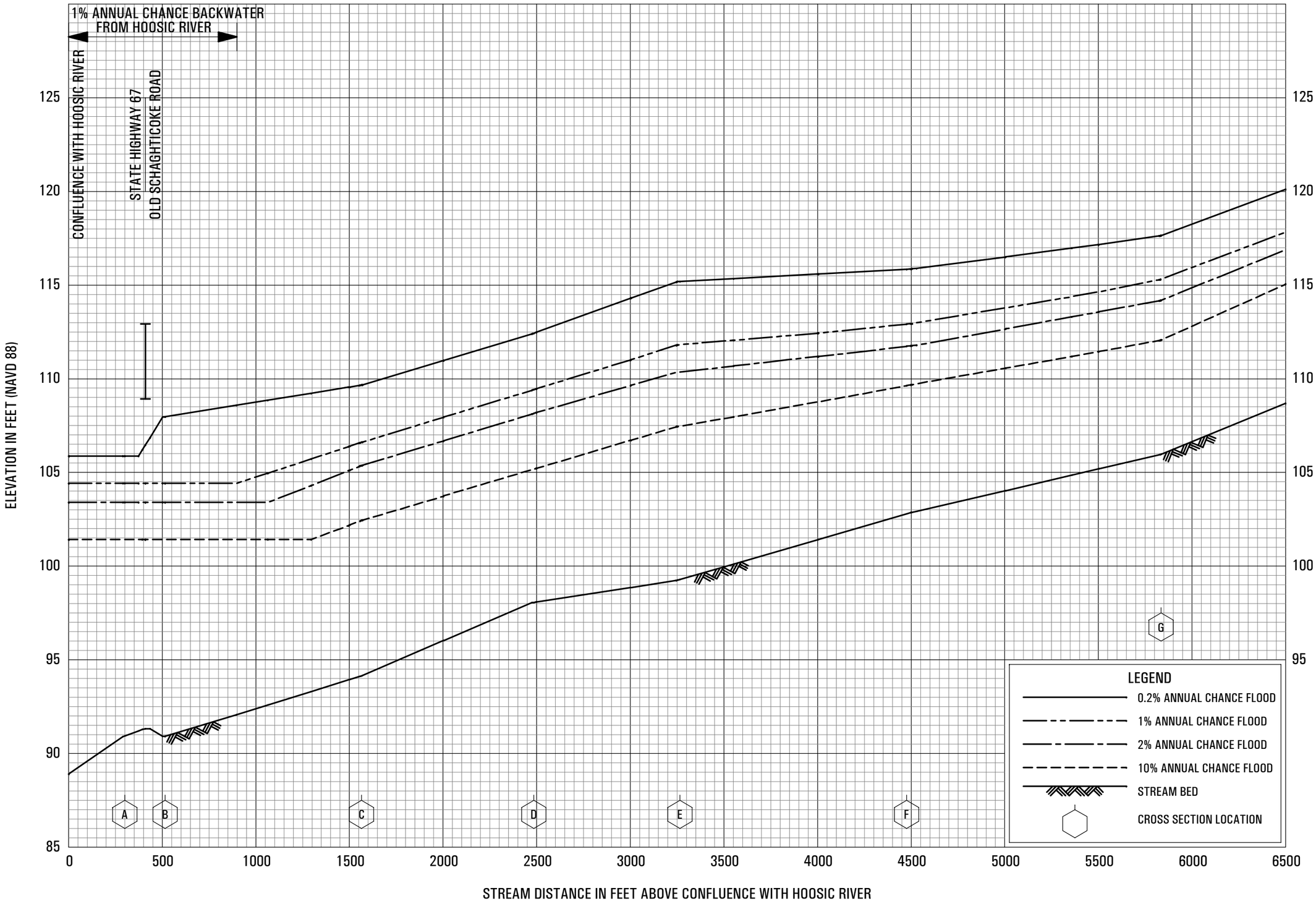
FLOOD PROFILES

HUDSON RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

RENSSELAER COUNTY, NY

(ALL JURISDICTIONS)



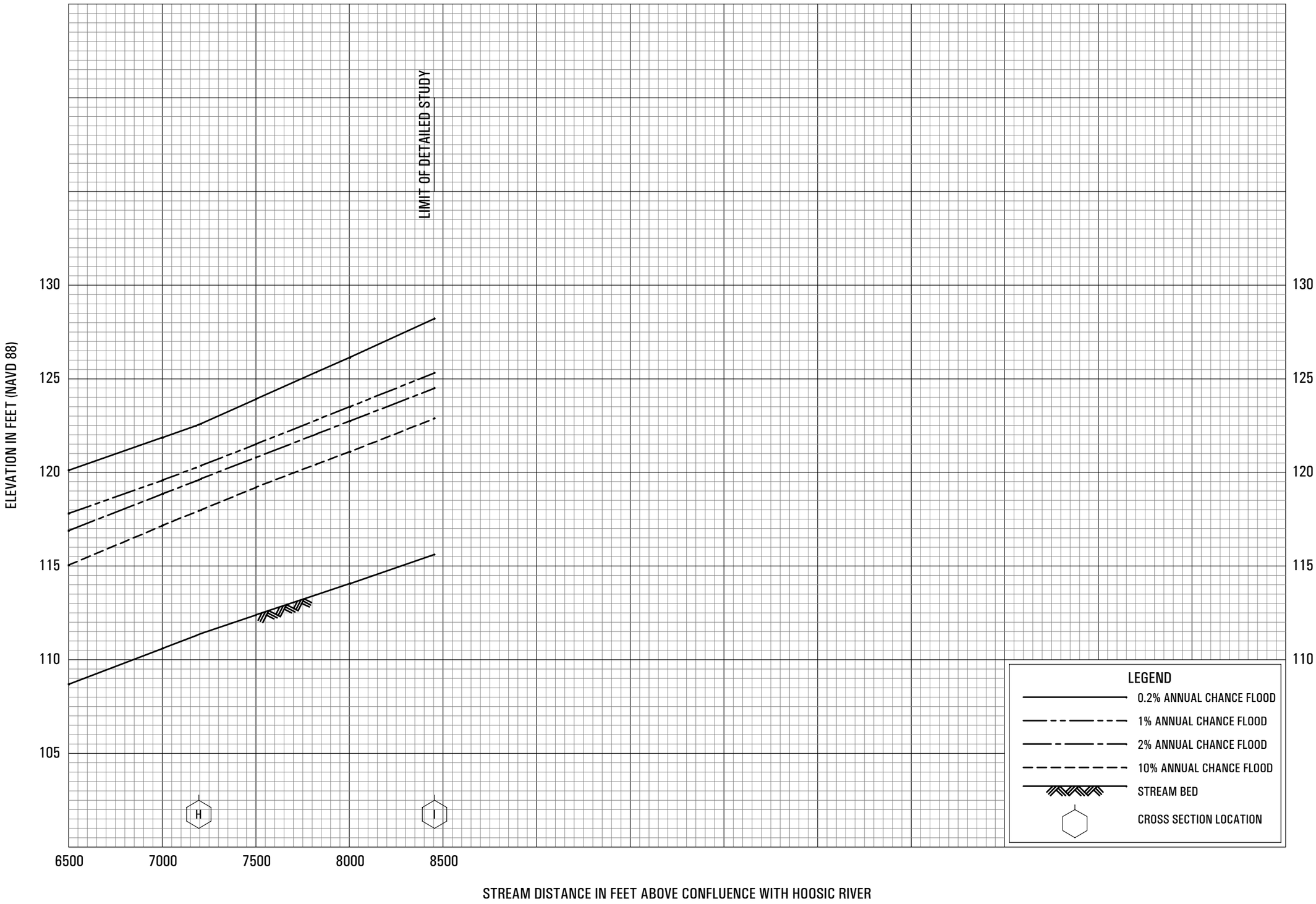
FLOOD PROFILES

TOMHANNOCK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

RENSSELAER COUNTY, NY

(ALL JURISDICTIONS)



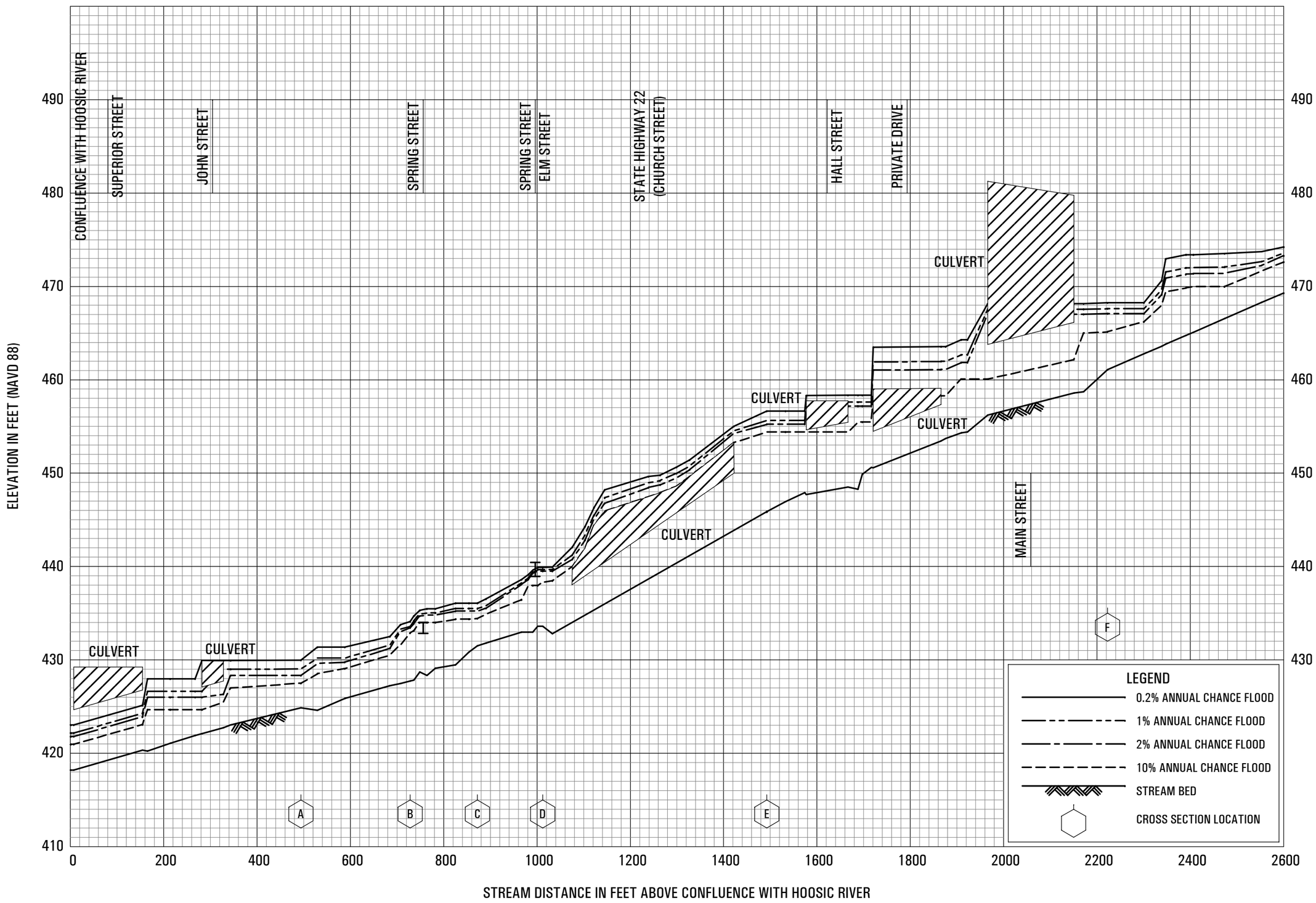
FLOOD PROFILES

TOMHANNOCK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

RENSSELAER COUNTY, NY

(ALL JURISDICTIONS)



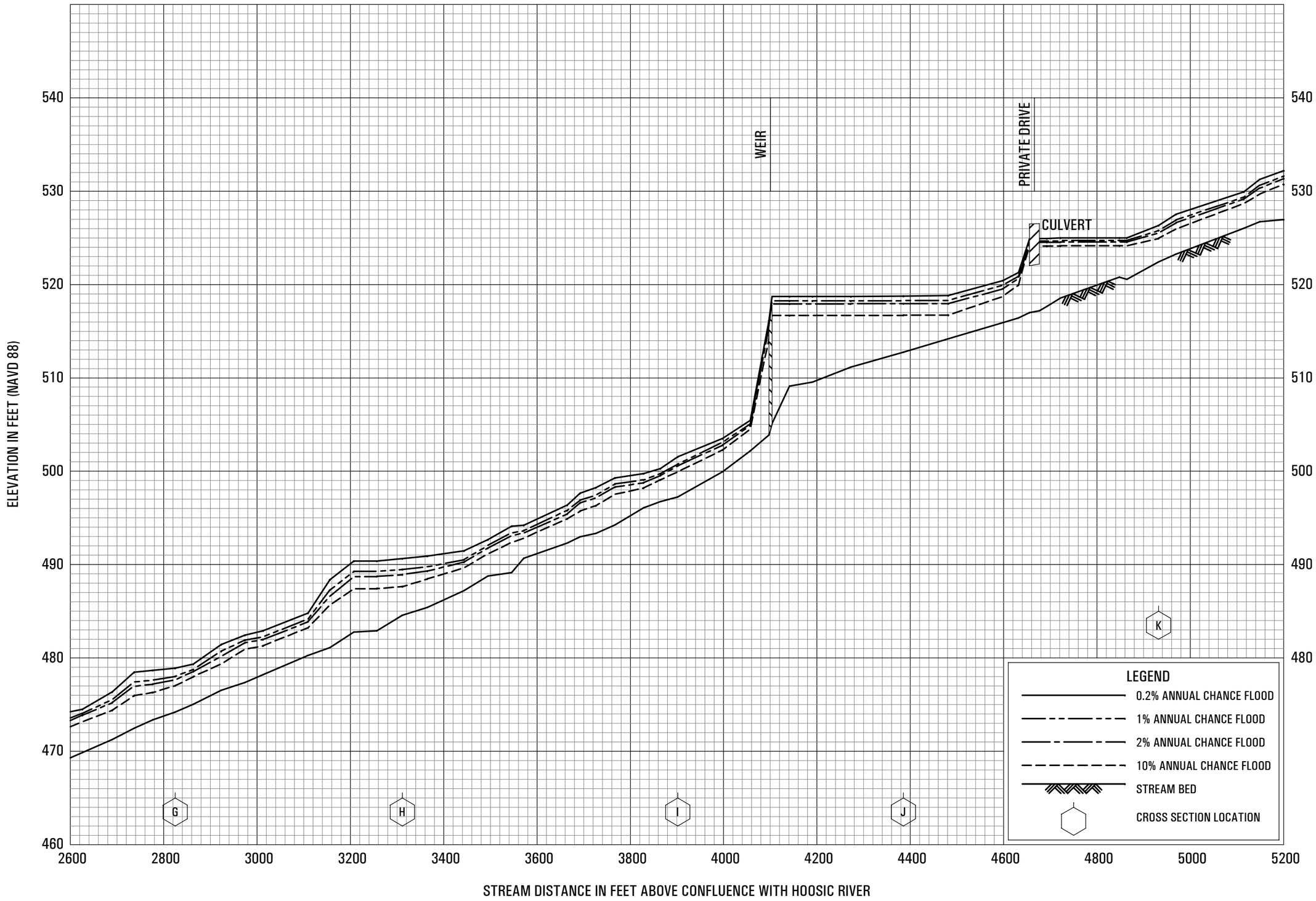
FLOOD PROFILES

WOODS BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

RENSSELAER COUNTY, NY

(ALL JURISDICTIONS)



FLOOD PROFILES

WOODS BROOK

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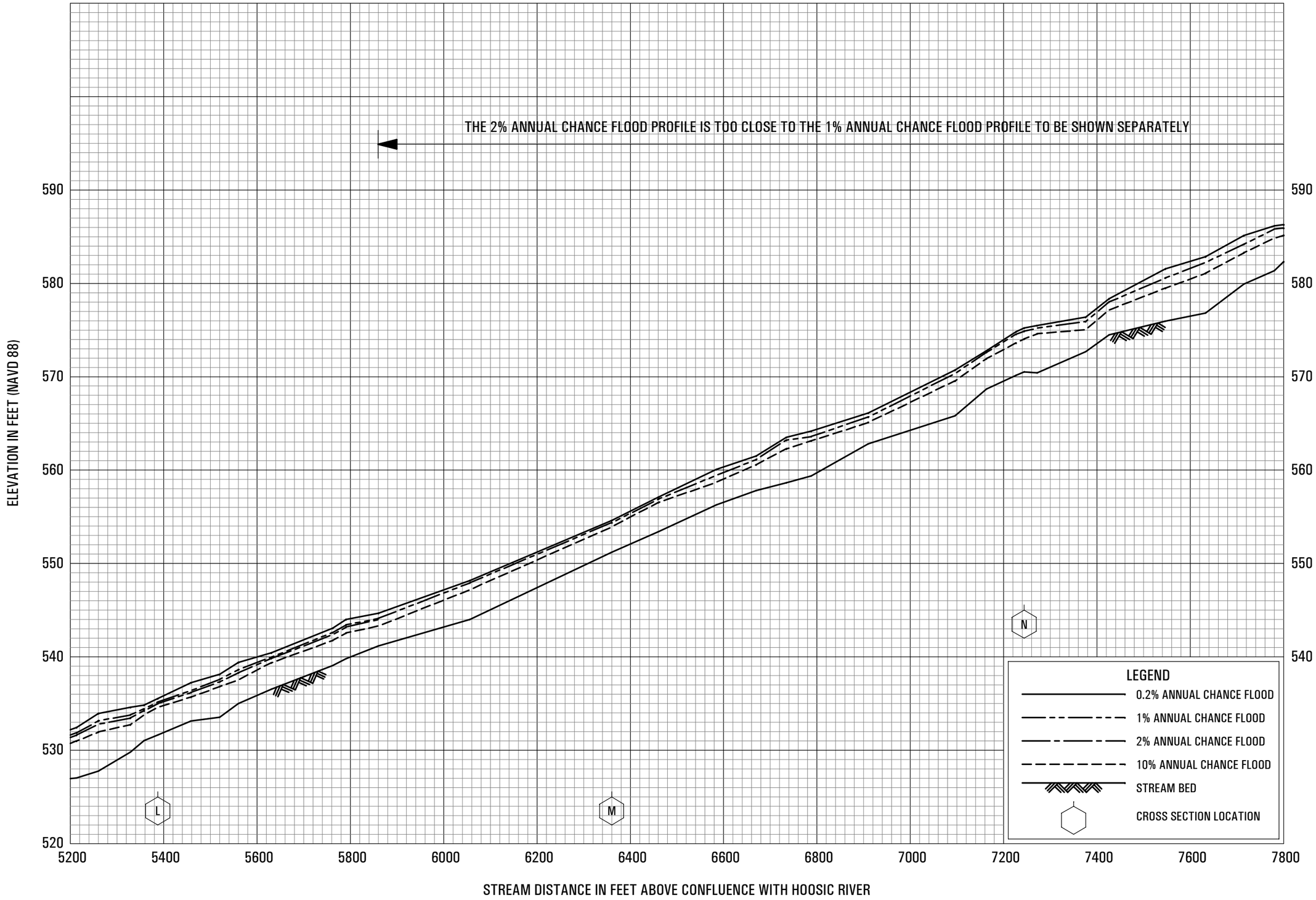
RENSSELAER COUNTY, NY

(ALL JURISDICTIONS)



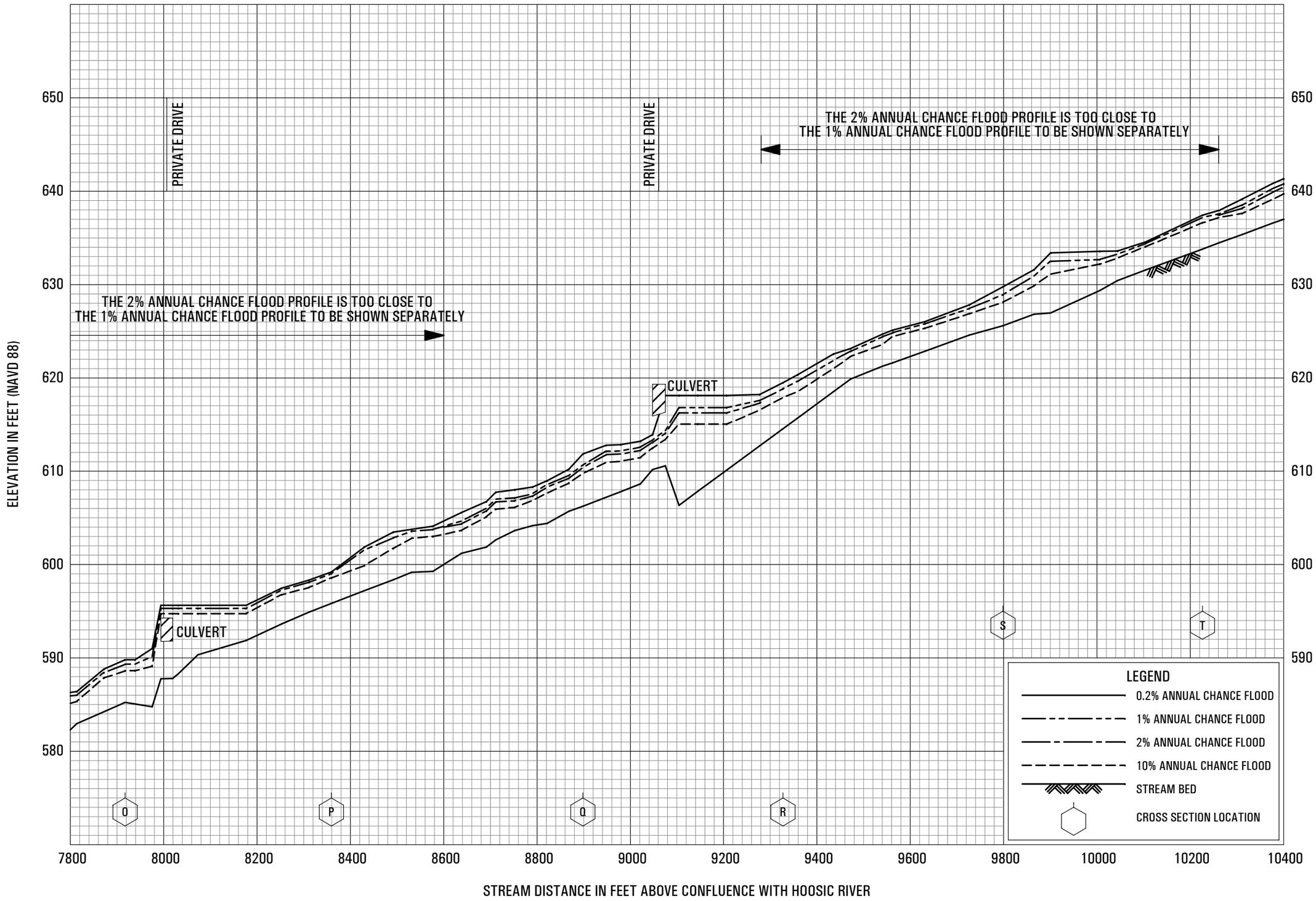
FLOOD PROFILES

WOODS BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

RENSSELAER COUNTY, NY

(ALL JURISDICTIONS)



FLOOD PROFILES

WOODS BROOK

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RENSSELAER COUNTY, NY

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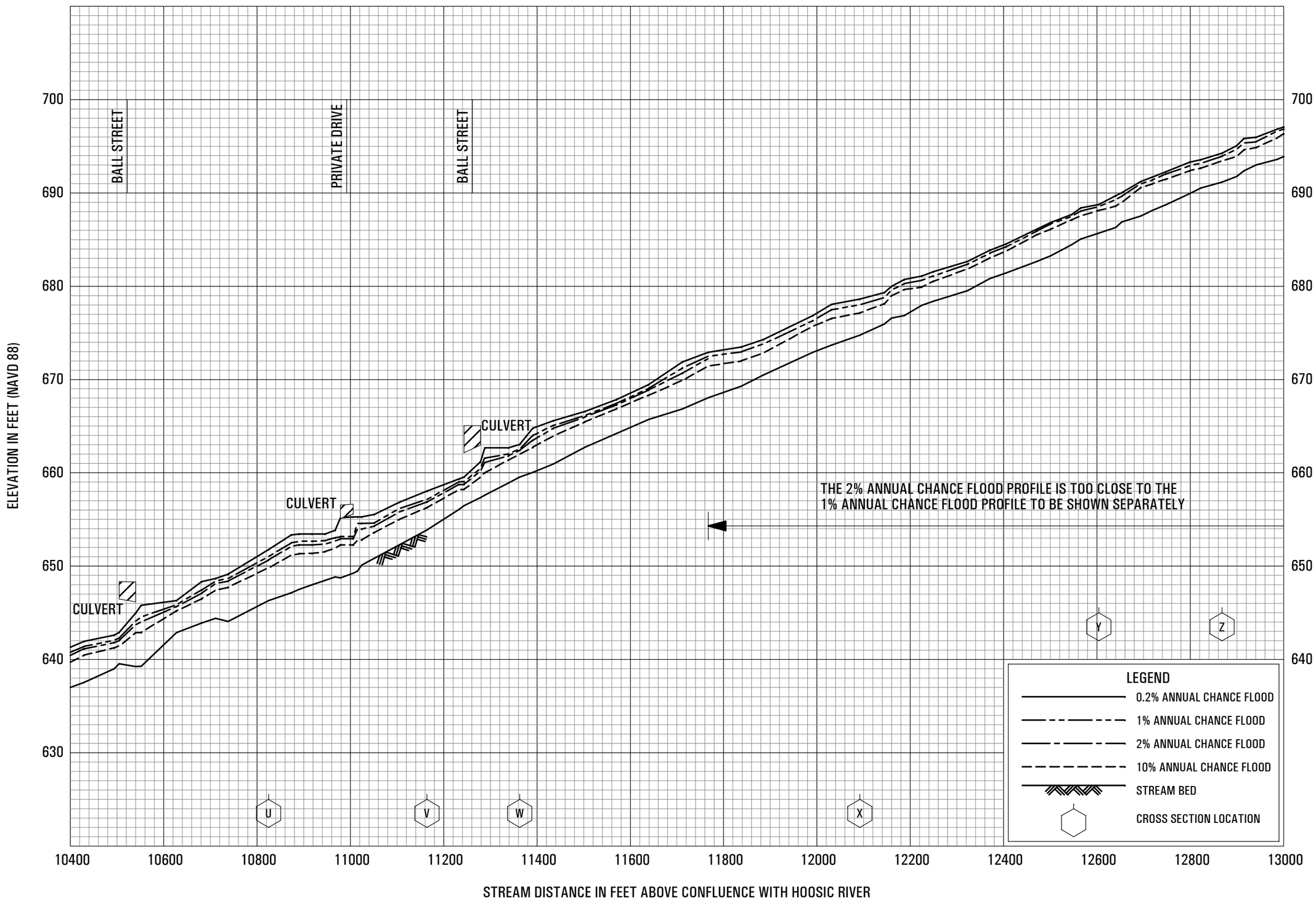

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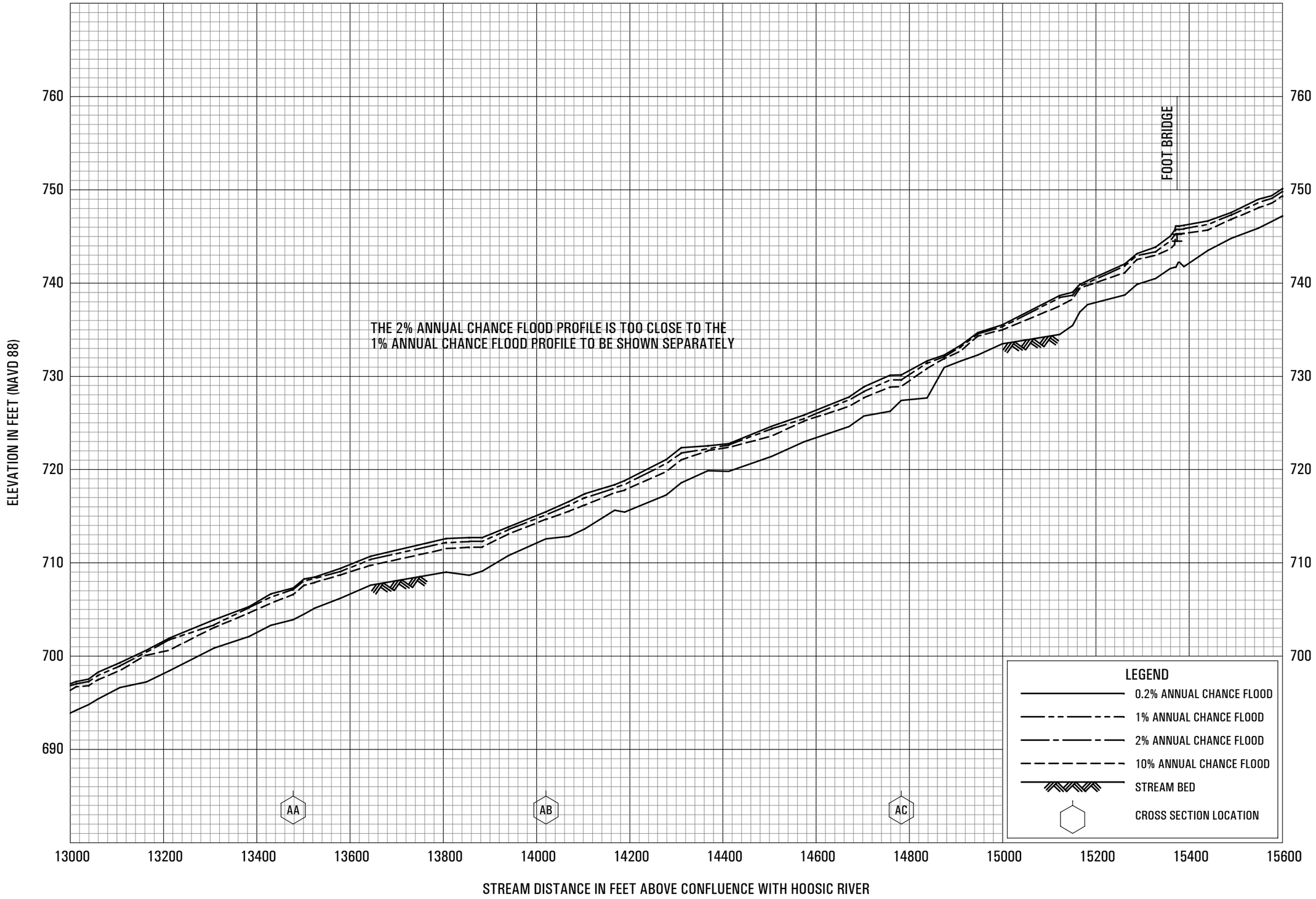

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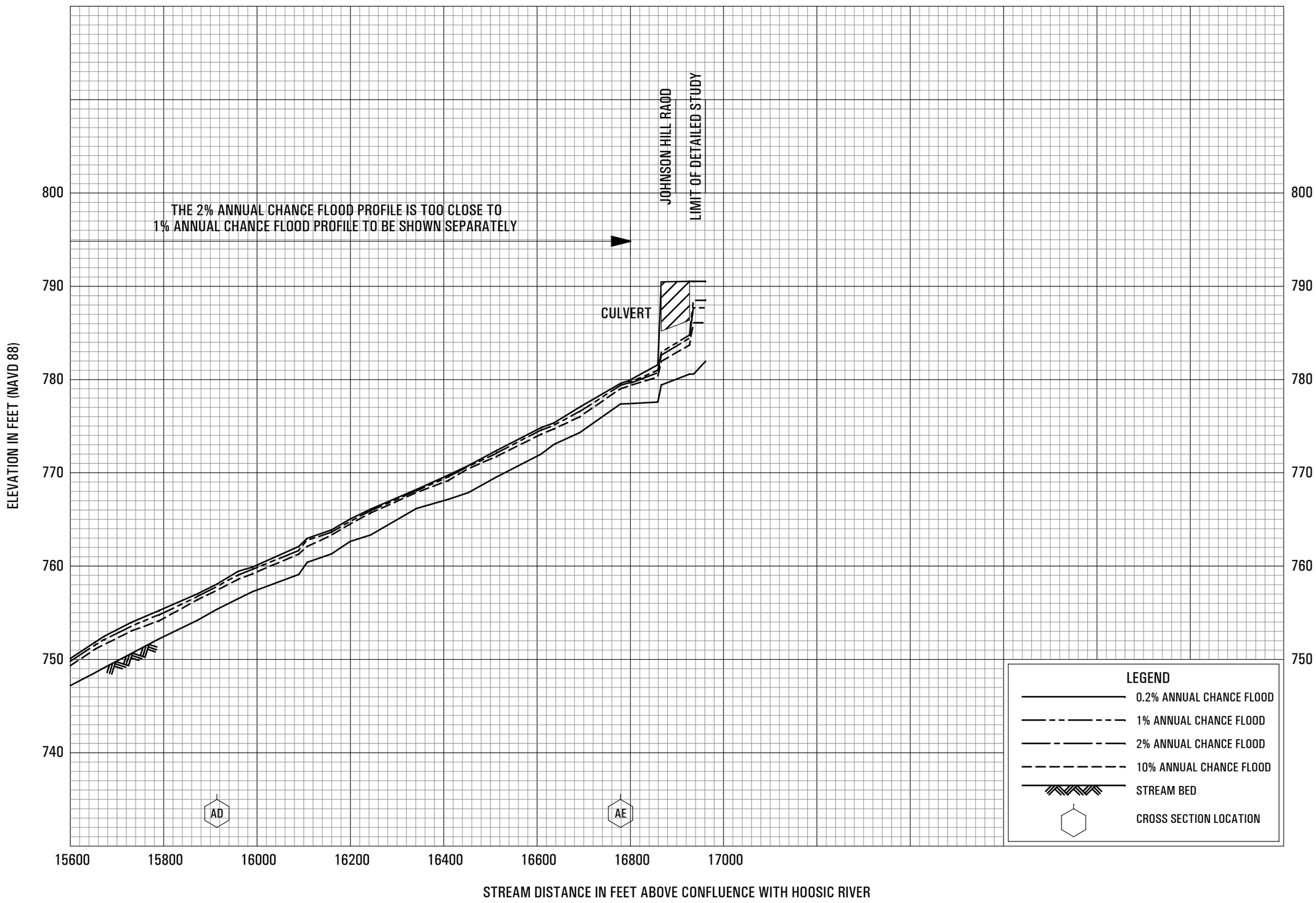

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