FLOOD INSURANCE STUDY

MONROE COUNTY, INDIANA
AND INCORPORATED AREAS

COMMUNITY NAME	COMMUNITY NUMBER
BLOOMINGTON, CITY OF	180169
ELLETTSVILLE, TOWN OF	180170
MONROE COUNTY (UNINCORPORATED AREAS)	180444
STINESVILLE, TOWN OF	180348

EFFECTIVE:

December 17, 2010

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER
18105CV000A

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) report may not contain all data available within the Community Map Repository. Please contact the Community Map Repository for any additional data.

The Federal Emergency Management Agency (FEMA) may revise and republish part or all of this FIS report at any time. In addition, FEMA may 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 panels for this community contain information that was previously shown separately on the corresponding Flood Boundary and Floodway Map panels (e.g., floodways, cross sections). In addition, former flood hazard zone designations have been changed as follows:

Old Zone:	New Zone:
A1 through A30	AE
B	X
C	X

Initial Countywide FIS Effective Date: December 17, 2010

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FLOOD INSURANCE STUDY

MONROE COUNTY, INDIANA AND INCORPORATED AREAS

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study (FIS) revises and supersedes the FIS reports and Flood Insurance Rate Maps (FIRMs) in the geographic area of Monroe County, Indiana, including the City of Bloomington, the Towns of Ellettsville, and Stinesville the unincorporated areas of Monroe County (hereinafter referred to collectively as Monroe County), and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study has developed flood risk data for various areas of the community that will be used to establish actuarial flood insurance rates and to assist the community in its efforts to promote sound floodplain management. This information will also be used by Monroe County to update existing floodplain regulations as part of the Regular Phase of the National Flood Insurance Program (NFIP), and 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.

The Digital Flood Insurance Rate Map (DFIRM) and FIS report for this countywide study have been produced in digital format. Flood hazard information was converted to meet the Federal Emergency Management Agency (FEMA) DFIRM database specifications and Geographic Information System (GIS) format requirements. The flood hazard information was created and is provided in a digital format so that it can be incorporated into local GIS and be accessed more easily by the community.

1.2 Authority and Acknowledgments

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

Information of the authority and acknowledgements for each of the new studies and previously printed FIS reports and Flood Insurance Rate Maps (FIRMs) for communities within Monroe County was compiled and is shown below:

Monroe County (Unincorporated Areas): The hydrologic and hydraulic analyses for Jacks Defeat Creek and the Unnamed Tributary Jacks Defeat Creek were prepared by the U.S. Geological Survey (USGS), Water Resources Division, for the Federal Emergency Management Agency (FEMA), under Inter-Agency Agreement No. EMW – 90 – E - 3266. This work was completed in July 1, 1992.

City of Bloomington: The hydrologic and hydraulic analyses for the June 1991 FIS were performed by the U.S. Geological Survey (USGS), as part of the Limited Map Maintenance Program, under Inter-Agency Agreement No. EMW – 87-E-254B, Project order No. 2B. The Federal Emergency Management Agency (FEMA) reviewed and accepted these data for purposes of this revision.

New Studies: The hydrologic and hydraulic analyses for detailed stream reaches of Monroe County were performed by United Consulting Engineers & Architects, on behalf of the Indiana Department of Natural Resources, under Indiana Public Works Project Number E400201B. The Indiana Department of Natural Resources managed the production of this study as part of their Cooperating Technical Partner agreement with the Federal Emergency Management Agency dated April 29, 2004, which was defined by the Indiana DNR Mapping Activity Statement 05-10 dated June 23, 2005 and funded under agreement number EMC-2005-GR-7022.

Redelineation of the previously effective flood hazard information for this FIS report, correction to the North American Vertical Datum of 1988, and conversion of the unincorporated and incorporated areas of Monroe County into the Countywide format was performed by United Consulting Engineers & Architects, on behalf of the Indiana Department of Natural Resources, under Indiana Public Works Project Number E400201B and by the City of Bloomington. The Indiana Department of Natural Resources managed the production of this study as part of their Cooperating Technical Partner agreement with the Federal Emergency Management Agency dated April 29, 2004, which was defined by the Indiana DNR Mapping Activity Statement 05-10 dated June 23, 2005 and funded under agreement number EMC-2005-GR-7022.

1.3 Coordination

The purpose of an initial Consultation Coordinated Officer's (CCOs) meeting is to discuss the scope of the FIS. A final CCO meeting is held to review the results of the study. The dates of the initial and final CCO meetings held for the previously effective FIS reports covering the geographic area of Monroe County, Indiana are shown in Table 1. The initial and final CCO meetings were attended by the study contractor, FEMA (or the Federal Insurance Administration), the Indiana Department of Natural Resources (IDNR), and the affected communities.

Table 1: CCO Meeting Dates for Pre-Countywide FIS

Community Name	Initial CCO Date	Final CCO Date
Monroe County (Unincorporated Areas)	November 1989	May 19, 1994
City of Bloomington	*	June 1, 1976

*Date not available

For this countywide FIS, an initial CCO meeting was held on February 24, 2005, and was attended by FEMA, IDNR, Baker Engineering, and representatives from the City of Bloomington, the Town of Ellettsville, and Monroe County.

The results of the countywide study were reviewed at the final CCO meeting held on September 3, 2008, and attended by representatives of FEMA, IDNR and officials of incorporated areas of Monroe County. All problems raised at that meeting have been addressed.

2.0 AREA STUDIED

2.1 Scope of Study

This FIS covers the geographic area of Monroe County, Indiana, including the incorporated communities listed in Section 1.1.

All FIRM panels for Monroe County have been revised, updated, and republished in countywide format as a part of this FIS. The FIRM panel index, provided as Exhibit 2, illustrates the revised FIRM panel layout.

All or portions of the following streams were studied by approximate methods: Jacks Defeat Creek, Unnamed Tributary Jacks Defeat Creek, Beanblossom Creek, Honey

Creek, North Fork Salt Creek, Lake Lemon, Monroe Reservoir, Indian Creek, Little Indian Creek, Big Creek, McCormicks Creek, White River, Bryant Creek, Shuffle Creek, Wolf Creek, Buck Creek, Lazy Creek, East Fork, Richland Creek, Little Richland Creek, Muddy Fork, Brummett Creek, Baby Creek, Clear Creek, Ramp Creek, Tributary Two, Saddle Creek, and other unnamed tributaries. Flooding caused by the overflow of the Jordan River upstream from the campus of Indiana University was also studied by approximate methods.

For the county-wide study, Clear Creek, Jackson Creek and Jacks Defeat Creek were studied by detailed methods. The previous detailed study through the City of Bloomington were redelineated based on topography provided by the City.

This study incorporates new detailed studies performed for and approved by IDNR. For detailed stream reaches that were studied in previous FIS reports, flood hazard areas were redelineated using updated and revised topographic mapping.

This FIS update also incorporates the determination of letters issued by FEMA resulting in map changes (Letters of Map Change, or LOMC). Letters of Map Revisions (LOMRs) have been issued for Monroe County. Letters of Map Amendments (LOMAs) incorporated into this study are summarized in the Summary of Map Actions (SOMAs) included in the Technical Support Data Notebook (TSDN) associated with this FIS update. Copies of the TSDN may be obtained from the Community Map Repository.

The stream previously known as "Tributary One" in the Monroe County (Unincorporated Areas) FIS dated August 2, 1995, has been renamed for this FIS as "Unnamed Tributary Jacks Defeat Creek"

Table 2: Incorporated Letters of Map Change

Flooding Source	Community and Project ID	Date Issued	Type
Sinking Creek	180169/96-05-337P	May 4, 1998	LOMR
Tributary One (UNT Jacks Defeat Creek)	180444/98-05-047R	May 1, 1998	LOMR

Table 3: Streams Studied by Detailed Methods

Beanblossom Creek
Cascade Creek
Cave Creek
Clear Creek
East Branch Jackson Creek
East Fork Jackson Creek
Griffy Creek
Jacks Defeat Creek
Jackson Creek
Sinking Creek
Stout Creek
Unnamed Tributary to Jacks Defeat Creek
West Branch Clear Creek
West Branch Jackson Creek
West Branch Sinking Creek
West Fork Clear Creek

Table 4: Scope of Study

Stream	Limits of Detailed Study
Clear Creek	Louisville and Nashville RR to Church Rd.
Jackson Creek	Fairfax Road to Second Street
Jacks Defeat Creek	Mouth to State Road 46
Stream	Limits of Redelineation Study
Beanblossom Creek	Mouth to Old SR 37
Cave Creek	Gifford Road to Matthews Road
Griffy Creek	Mouth to Griffy Creek Dam
Jackson Creek	Mouth to Second Street
West Branch Jackson Creek	Mouth to Covenanter Dr.
East Branch Jackson Creek	Mouth to Moores Pike
Muddy Fork	Mouth to End of Study
Sinking Creek	Mouth to Third Street
Stout Creek	Mell Curry Road to Woodyard Road
UNT to Cave Creek	Mouth to Third St.
UNT to Clear Creek (Trib 19)	Mouth to u/s of Sunburg Lane
UNT to Clear Creek (Trib 22)	Mouth to Third St.
UNT to Griffy Creek (Trib 2)	Mouth to SR 46
East Fork Jackson Creek	Mouth to Moores Pike
UNT to Sinking Creek	Mouth to Illinois Central RR

2.2 Community Description

Monroe County is located in south central Indiana. It is bordered on the north by Monroe County, on the south by Lawrence County, on the west by Brown and Jackson Counties, and on the east by Owen and Greene Counties.

According to US Census Data from the year 2000, the population of Bloomington was 69,291. The entire county of Monroe had a population size of 120,563, and the Town of Ellettsville had a population of 5,078. The town of Stinesville population in year 2000 was 194.

The climate in Monroe County is characteristically temperate continental, and temperatures range from hot and humid in the summertime to cold during the winter season. According to the National Oceanic and Atmospheric Administration (NOAA), average daily temperatures for Clinton County range from 84.2 ºF in the summer to 31 ºF in the winter. For the period of record between 1971 and 2000, the average annual precipitation was approximately 44.9 inches.

Bloomington is located in the Highland Rim section of the Interior Low Plateau Province. Rocks of the Highland Rim Section are mainly early and middle Mississippian in age. Bloomington is located on the Mitchell Sinkhole plain. Specifically, most of the area is hilly and severely dissected by streams with narrow, steeply-sloped streambeds flowing through narrow, moderately steep-sided valleys. The western part of the study area is characterized by its Karst Topography. Sinkholes swallow holes, sinking Creeks, and dry beds of abandoned surface streams are the more common features of the Karst plain. Surface drainage has largely disintegrated and has been diverted to subsurface routes.

2.3 Principal Flood Problems

Major flooding in Monreo County primarily occurs along the Beanblossom Creek, Jackson Creek, Clear Creek and their tributaries. Major floods principally occur during the winter and spring months, but can occur during any season. Generally, two types of storm events cause flooding. During the winter and spring, storms of moderate intensity and long duration, coupled with frozen ground, cause flooding to occur. During the summer, thunderstorms which have high intensities and relatively short durations can cause floods. Localized flood problems in the incorporated areas are summarized below:

Bloomington, City of:	Potential flooding due to Clear Creek, Jackson Creek, Beanblossom Creek and their tributaries
Ellettsville, Town of:	Potential flooding due to Jacks Defeat Creek.
Stinesville, Town of:	Potential flooding due to Jacks Defeat Creek.

2.4 Flood Protection Measures

There are no dikes, or flood-levee systems in the study area of Bloomington, nor are any planned. Similarly, Monroe County has no known measures of flood protection. Lake Monroe is a Flood Control Reservoir built by the Army Corps of Engineers, although the major flood control benefit is downstream of Monroe County. The two water-supply reservoir dams, Lake Lemon Dam on Beanblossom Creek (7 miles upstream from the study area) and Griffy Creek Dam (upstream of Dunn Street), were not designed for flood control.

3.0 ENGINEERING METHODS

For the flooding sources studied by detailed methods in Monroe County, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude that 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 that equals or exceeds the 1-percent- annual-chance flood in any 50-year period is approximately 40 percent (4 in 10); 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 community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analysis

Hydrologic analyses were carried out to establish peak discharge-frequency relationships for each flooding source studied by detailed methods affecting Monroe County. Table 5 contains a summary of peak discharges for the 10-, 2-, 1-, and 0.2-percent annual chance floods, where applicable, for each flooding source studied in detail in Monroe County. Peak discharges in the table were compiled from previously effective FIS reports for Monroe County and incorporated areas.

Table 5. Summary of Discharges

Flooding Source And Location	Drainage Area (Square Miles)	Peak Discharge (cfs) 10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
BEANBLOSSOM CREEK					
River mile 14.95	145.20	11,000	15,600	22,500	32,200
River mile 17.88	112.40	10,000	14,200	20,000	28,900
River mile 20.62	101.00	9,500	13,500	18,700	27,500
CASCADE CREEK					
Confluence with Griffy Creek	3.09	1,800	2,350	3,130	5,100
River mile 0.75	2.46	1,550	2,000	2,750	4,450
River mile 1.58	0.94	900	1,150	1,580	2,550
CAVE CREEK					
At mouth	3.38	*	*	2,650	*
Downstream of SR 48	0.57	*	*	720	*

Table 5. Summary of Discharges (Continued)

Flooding Source And Location	Drainage Area (Square Miles)	Peak Discharge (cfs) 10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
CLEAR CREEK					
River mile 13.80	27.69	6,200	10,300	13,000	18,400
River mile 14.68	15.45	4,400	7,400	8,900	13,100
River mile 15.36	8.32	3,100	5,200	6,600	9,300
River mile 17.92	4.95	2,300	3,900	4,900	7,000
River mile 18.24	3.21	1,800	3,100	3,850	5,500
EAST BRANCH JACKSON CREEK					
Confluence with Jackson Creek	0.72	800	1,350	1,650	2,400
EAST FORK JACKSON CREEK					
Confluence with Jackson Creek	2.53	1,600	2,700	3,350	4,800
River mile 1.20	1.67	1,300	2,100	2,650	3,800
River mile 3.08	0.34	500	800	1,000	1,400
GRIFFY CREEK					
River mile 0.16	14.00	4,100	5,600	7,500	12,100
River mile 2.43	8.70	3,200	4,250	5,650	9,300
River mile 2.88	8.17	3,050	4,050	5,450	8,900
JACKS DEFEAT CREEK					
At mouth	21.7	*	*	10,500	14,500
At Red Hill Road	16.5	*	*	8,300	11,500
At Main Street Ellettsville	9.96	*	*	6,200	8,600
At State Route 26	8.44	*	*	5,530	7,900
Upstream of confluence Of UNT Jacks Defeat Creek	4.70	*	*	3,740	5,360
Unnamed tributary south Of Wolcott Road	1.66	*	*	1,870	2,700
JACKSON CREEK					
Confluence with Clear Creek	10.81	3,600	6,000	7,600	10,700
River mile 1.99	7.21	2,900	4,900	6,100	8,600
River mile 4.75	1.85	1,400	2,300	2,850	4,000
River mile 5.38	0.85	900	1,500	1,825	2,800
SINKING CREEK					
At mouth	2.63	2,750	*	*	*
Just downstream of State Route 48	0.55	310	*	*	*

Table 5. Summary of Discharges (Continued)

Flooding Source And Location	Drainage Area (Square Miles)	Peak Discharge (cfs) 10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
STOUT CREEK					
River mile 0.10	7.90	3,000	4,000	5,350	8,900
River mile 2.10	4.90	2,300	3,000	4,050	6,600
River mile 2.95	4.10	2,100	2,700	3,700	6,000
UNNAMED TRIBUTARY JACKS DEFEAT CREEK					
At confluence with Jacks Defeat Creek	1.82	*	*	1,960	2,880
At Union Valley Road	0.48	*	*	800	1,180
Downstream of Deer Park Road	0.25	*	*	450	660
WEST BRANCH CLEAR CREEK					
Confluence with Clear Creek	1.30	1,150	1,900	2,350	3,400
River mile 1.21	0.63	750	1,250	1,550	2,200
WEST FORK CLEAR CREEK					
Confluence with Clear Creek	4.87	2,200	3,700	4,650	6,600
River mile 2.96	0.95	950	1,600	1,950	2,800
WEST BRANCH JACKSON CREEK					
Confluence with Jackson Creek	0.40	600	1,000	1,200	1,700
WEST BRANCH SINKING CREEK					
At mouth	.71	*	*	1,100	*
Downstream of Gifford Road	.30	*	*	620	*
WEST FORK CLEAR CREEK					
Confluence with Clear Creek	4.87	2,200	3,700	4,650	6,600
River mile 2.96	0.95	950	1,600	1,950	2,800

*Data not available

3.2 Hydraulic Analysis

Analyses of the hydraulic characteristics of flooding from the sources 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 Flood Insurance Rate Map (FIRM) represent rounded whole-foot elevations and may not exactly reflect the elevations shown on the Flood Profiles or in the Floodway Data table in the FIS

report. Flood elevations shown on the FIRM are primarily intended for flood insurance rating purposes. For construction and/or floodplain management purposes, users are cautioned to use the flood elevation data presented in this FIS report in conjunction with the data shown on the FIRM.

Cross sections for the backwater analyses were obtained from a variety of sources including: physical survey data, IDNR contour mapping, USGS topographic mapping and local contour mapping.

Precountywide Analyses

The starting water-surface elevation for Jacks Defeat Creek was calculated using the slope-conveyance option of WSPRO. Slope was calculated from a USGS topographic map (Reference 3). Normal depth was used upstream of the state Route 46 bridge after numerous attempts to model the bridge produced water-surface elevations below normal depth at the approach section, which should be in backwater from the bridge. A one-dimensional model was not capable of computing a satisfactory elevation upstream of the bridge due to a narrow approach reach, high velocities, bridge skew, and intersecting roadway with weir flow. Therefore, the more conservative water-surface elevation of the normal depth computations was used instead of a bridge-backwater computation.

There is also a tributary entering Jacks Defeat Creek just upstream of the state Route 46 Bridge. The discharge value at the starting cross sections was based on the drainage area that includes this tributary, in order to account for any backwater effects. The discharge value coded for the second cross section represents the decrease in drainage area upstream of the tributary.

Starting water-surface elevation for the Unnnamed Tributary Jacks Defeat Creek was developed from backwater computation at Jacks Defeat Creek.

The starting water-surface elevation for Tributary Two was computed using the slope-conveyance option of WSPRO. Approximate flood elevations on Tributary Two were determined based on the calculated flow capacity of the culvert and road overflow at state route 46, field surveyed cross sections constructed from the topographic map (Reference 3). Inundation limits were drawn based on the WSPRO elevations and the topographic map.

Channel and overbank roughness factors (Manning's "n" values) used in the hydraulic computations were chosen by engineering judgment and were based on field observations of the stream and floodplain areas. Channel and overbank roughness factors used in the detailed studies are summarized by stream in Table 6.

Approximate flood elevations on the Jordan River above Indiana Avenue were determined based on the calculated flow capacity of the culvert and road overflow at Indiana Avenue.

The Jordan River below Indiana Avenue is completely confined by a storm sewer which can not carry the 1-percent annual chance flood discharge. This area, then, is subject to shallow flooding with an average depth of one more foot, based on information from the city planning office. A number of intersections have flooded to greater than one foot depth when storm sewer inlets have been plugged and/or the main sewer lines were flowing to capacity. This overland flooding is generally confined to the streets and sidewalk. Flooding is from local runoff and the limits of shallow flooding are not delineated on the maps due to scale limitations.

Water-surface elevations were computed for the 1-percent annual chance flood surface using the WSPRO step-backwater computer program (Reference 10). Cave Creek and Sinking Creek terminate in sinkholes leading to a complex system of caverns or subterranean channels. The 1-percent annual chance flood elevations at the terminal sinkholes were estimated utilizing data from Daniel Knuth's study (Reference 11) and rainfall frequency curves for Indiana published by the Indiana Department of Natural Resources. The starting water-surface elevation for Stout Creek was obtained from the original Flood Insurance Study for the City of Bloomington. The starting water-surface elevations for Cave Creek, Sinking Creek and West Branch Sinking Creek were computed using the slope-area method. The boundaries for the floodplains of the studied streams were delineated using topographic maps at a scale of 1:2400 with a contour interval of 4 feet (Reference 10).

Countywide Analyses

Analyses of the hydraulic characteristics of flooding from the sources 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 Flood Insurance Rate Map (FIRM) represent rounded whole-foot elevations and may not exactly reflect the elevations shown on the Flood Profiles or in the Floodway Data table in the FIS report. Flood elevations shown on the FIRM are primarily intended for flood insurance rating purposes. For construction and/or floodplain management purposes, users are cautioned to us the flood elevation data presented in this FIS report in conjunction with the data shown on the FIRM.

Cross sections for the backwater analyses were obtained from a variety of sources including: physical survey data, IDNR contour mapping, USGS topographic mapping and local contour mapping.

Water-surface elevations for floods of the selected recurrence intervals were computed through use of the USACE HEC-RAS step-backwater computer program. For the new approximate study reaches, the USACE HEC-RAS program was used.

Flood profiles were prepared for all streams studied by detailed methods and show computed water-surface elevations to an accuracy of 0.5 feet for floods of the selected recurrence intervals. For this countywide FIS, flood profiles and approved LOMRs have been consolidated into continuous stream reaches and adjusted to reflect the current

vertical datum as described in Section 3.3. New profiles have been prepared for the new detailed studies.

Channel and overbank roughness factors (Manning's "n" values) used in the hydraulic computations were chosen by engineering judgment and were based on field observations of the stream and floodplain areas. Channel and overbank roughness factors used in the detailed studies are summarized by stream in Table 6.

Table 6. Channel and Overbank Roughness Factors

	Roughness Coefficients	
Stream	Main Channel	Overbanks
Beanblossom Creek	.03-.055	.045-.085
Cascade Creek	.07	.05-.100
Cave Creek	.03-.05	.06-.08
Clear Creek	.04	.07-.12
East Branch Jackson Creek	.040-.060	.035-.080
East Fork Jackson Creek	.035-.050	.035-.060
Griffy Creek	.03-.065	.04-.10
Jacks Defeat Creek	.032-.065	.028-.085
Jackson Creek	.04	.041-.10
Sinking Creek	.025-.02	.035-.08
Stout Creek	.06-.075	.035-.12
Unnamed Tributary to Jacks Defeat Creek	035-.065	.035-.100
West Branch Clear Creek	.035-.070	.035-.070
West Branch Jackson Creek	.04-.08	.04-.100
West Branch Sinking Creek	.025-.02	.035-.08
West Fork Clear Creek	.030-.055	.035-.090

he hydraulic analyses for this study were based on unobstructed flow. The flood elevations shown on the Flood Profiles (Exhibit 1) are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

3.3 Vertical Datum

All FIS reports 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 FIS reports and FIRMs was the National Geodetic Vertical Datum of 1929 (NGVD29). With the finalization of the North American Vertical Datum of 1988 (NAVD88), many FIS reports and FIRMs are being prepared using NAVD88 as the referenced vertical datum.

All flood elevations shown in this FIS report and on the FIRM are referenced to NAVD88. Structure and ground elevations in the community must, therefore, be referenced to NAVD88. It is important to note that adjacent communities may be referenced to NGVD29. This may result in differences in Base Flood Elevations (BFEs) across the corporate limits between the communities.

In this revision, a vertical datum conversion of -0.38 was calculated at the centroid of the county and used to convert all elevations in Monroe County from NGVD29 to NAVD88 using the National Geodetic Survey's VERTCON online utility (VERTCON, 2005).

(NGVD29 – 0.38 = NAVD88)

For more information on NAVD88, see the FEMA publication entitled Converting the National Flood Insurance Program to the North American Vertical Datum of 1988 (FEMA, June 1992), or contact the Vertical Network Branch, National Geodetic Survey, Coast and Geodetic Survey, National Oceanic and Atmospheric Administration, Rockville, Maryland 20910 (Internet address http://www.ngs.noaa.gov).

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 the FIS report and FIRM for this community. Interested individuals may contact FEMA to access these data.

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. Therefore, each FIS provides 1-percent-annual-chance flood elevations and delineations of the 1- and 0.2-percent-annual-chance floodplain boundaries and 1-percent-annual-chance floodway to assist communities in developing floodplain management measures. This information is presented on the FIRM and in many components of the FIS report, including Flood Profiles, and the Floodway Data table. Users should reference the data presented in the FIS report as well as additional information that may be available at the local 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-percent-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 community. For each stream studied by detailed methods, 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 topographic maps provided by Terre Haute. This topographic mapping has a 2-contour interval and was derived from an aerial survey performed in 2005.

The 1- and 0.2-percent-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, AE, V, and VE); and the 0.2-percent-annual-chance floodplain boundary corresponds to the boundary of areas of moderate flood hazards. In cases where the 1- and 0.2-percent-annual-chance floodplain boundaries are close together, only the 1-percent-annual-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-percent-annual chance floodplain boundary is shown on the FIRM (Exhibit 2).

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-percent-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 study 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.

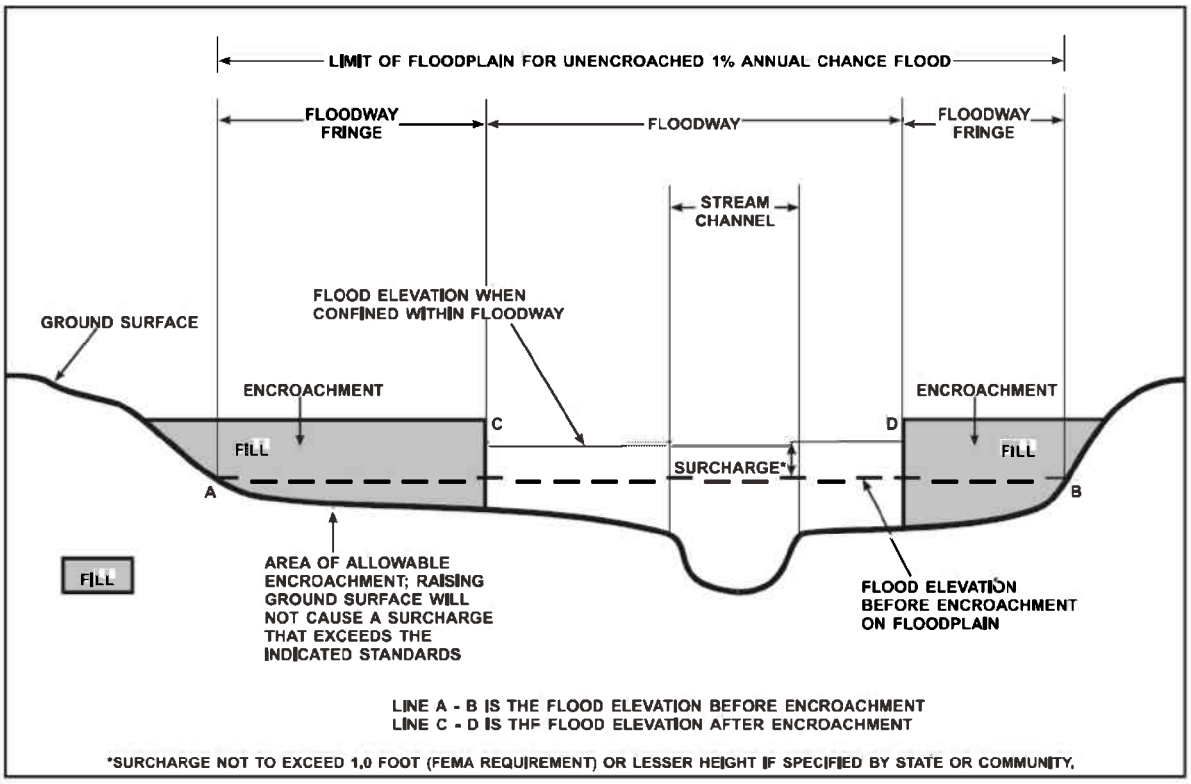
The State of Indiana, however, per Indiana Code IC 14-28-1 and Indiana Administrative Code 312 IAC 10, has designated that encroachment in the floodplain is limited to that which will cause no significant increase in flood height. As a result, floodways for this study are delineated based on a flood surcharge of less than 0.15 feet. The floodways in this study were approved by the IDNR, and 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 floodway presented in this FIS report and on the FIRM was 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 have been tabulated for selected cross sections (Table 7). In cases where the floodway

and 1-percent-annual-chance floodplain boundaries are either close together or collinear, only the floodway boundary has been shown.

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 water-surface elevation of the 1-percent-annual-chance flood 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



FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-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
Beanblossom Creek								
A	14.95	4466	9554	2.4	579.7	579.7	579.7	0.0
B	15.39	3954	8615	2.5	581.4	581.4	581.4	0.0
C	16.38	3430	7099	2.8	583.2	583.2	583.2	0.0
D	16.92	4825	9000	1.3	583.6	583.6	583.6	0.0
E	17.58	5442	4860	2.5	584.1	584.1	584.1	0.0
F	17.65	4488	5120	2.3	584.2	584.2	584.2	0.0
G	18.03	4521	3480	3.0	586.5	586.5	586.5	0.0
H	18.12	4448	6640	1.6	586.8	586.8	586.8	0.0
I	18.46	4575	8790	1.2	587.1	587.1	587.1	0.0
J	19.17	4268	11,200	1.7	588.4	588.4	588.4	0.0
K	19.64	892	5457	3.7	591.5	591.5	591.5	0.0
L	20.05	2161	12,535	1.6	593.3	593.3	593.3	0.0
M	20.62	2849	16,403	1.1	594.7	594.7	594.7	0.0
N	21.05	1161	8109	2.3	595.9	595.9	595.9	0.0
O	21.41	1972	6881	2.7	597.0	597.0	597.0	0.0

[1]Miles above confluence with West Fork White River

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN AND INCORPORATED AREAS

FLOODWAY DATA

BEANBLOSSOM CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-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
Cascade Creek								
A	0.10	470	1210	2.6	592.1	592.1	592.1	0.0
B	0.22	491	359	8.6	596.1	596.1	596.1	0.0
C	0.42	404	1510	2.0	600.2	600.2	600.2	0.0
D	0.62	363	464	6.1	605.9	605.9	605.9	0.0
E	0.69	389	646	4.3	610.7	610.7	610.7	0.0
F	0.75	352	481	5.7	613.4	613.4	613.4	0.0
G	0.78	337	416	6.6	616.1	616.1	616.1	0.0
H	0.82	297	781	3.5	618.7	618.7	618.7	0.0
I	1.00	123	331	7.9	627.1	627.1	627.1	0.0
J	1.08	125	552	5.5	633.4	633.4	633.4	0.0
K	1.18	56	249	10.0	639.2	639.2	639.2	0.0
L	1.32	67	335	7.2	659.2	659.2	659.2	0.0
M	1.48	62	195	8.4	675.1	675.1	675.1	0.0
N	1.52	200	533	3.0	683.1	683.1	683.1	0.0
O	1.58	17	143	11.0	687.5	687.5	687.5	0.0

[1]Miles above confluence with Griffy Creek

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN AND INCORPORATED AREAS

FLOODWAY DATA

CASCADE CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-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
Cave Creek								
A	7500	97	383	3.9	810.8	810.8	810.8	0.0
B	9100	253	879	1.3	820.8	820.8	820.8	0.0
C	10,175	226	286	4.6	824.4	824.4	824.4	0.0
D	11,560	228	281	2.9	833.8	833.8	833.8	0.0

[1]Feet above confluence with Cave Creek sinkhole

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN AND INCORPORATED AREAS

FLOODWAY DATA

CAVE CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-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
Clear Creek								
A	72,020	265	2063	6.3	616.1	616.1	616.2	0.1
B	72,882	535	4901	2.7	619.9	619.9	620.0	0.1
C	73,130	525	2942	5.3	619.2	619.2	619.3	0.1
D	73,465	523	3969	5.9	620.8	620.8	620.9	0.1
E	73,898	548	4260	4.7	622.4	622.4	622.5	0.1
F	74,831	693	2177	7.6	624.1	624.1	624.1	0.0
G	75,225	395	2944	4.4	627.6	627.6	627.7	0.1
H	75,559	358	4060	3.2	630.7	630.7	630.7	0.1
I	76,259	426	4820	2.7	631.9	631.9	631.9	0.0
J	77,203	436	3911	3.3	632.4	632.4	632.5	0.0
K	77,970	514	3445	3.8	633.2	633.2	633.3	0.1
L	78,441	476	2209	5.9	633.8	633.8	633.8	0.0
M	78,890	399	3455	2.6	635.9	635.9	635.9	0.0
N	79,142	430	4557	2.0	641.8	641.8	641.9	0.1
O	79,828	344	3810	2.3	642.1	642.1	642.3	0.1
P	80,585	271	2009	4.4	642.5	642.5	642.7	0.1
Q	80,887	292	1786	5.0	643.1	643.1	643.2	0.1
R	81,390	383	1772	5.0	644.5	644.5	644.6	0.1
S	81,728	442	1847	4.8	647.6	647.6	647.7	0.1
T	82,521	556	830	8.0	648.0	648.0	648.0	0.0
U	82,732	559	2948	2.2	652.6	652.6	652.6	0.0
V	83,630	521	801	8.2	654.2	654.2	654.2	0.0
W	84,211	595	2377	2.8	659.2	659.2	659.2	0.0
X	84,422	659	3360	2.0	660.6	660.6	660.6	0.0
Y	84,844	675	1085	6.1	661.7	661.7	661.7	0.0
Z	84,950	842	1117	5.9	664.4	664.4	664.4	0.0

[1]Feet above confluence with East Fork White River

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN AND INCORPORATED AREAS

FLOODWAY DATA

CLEAR CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-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
Clear Creek (Continued)								
AA	85,372	674	1533	4.3	665.2	665.2	665.2	0.0
AB	87,009	629	2169	3.0	670.8	670.8	670.8	0.0
AC	87,220	612	3086	2.0	672.2	672.2	672.2	0.0
AD	87,748	512	2371	2.7	672.4	672.4	672.4	0.0
AE	88,804	53	539	11.7	673.1	673.1	673.1	0.0
AF	89,702	140	1177	5.4	680.1	680.1	680.1	0.0
AG	91,444	453	578	10.9	683.2	683.2	683.2	0.0
AH	92,236	435	1820	3.1	689.3	689.3	689.3	0.0
AI	92,870	714	1684	3.2	692.5	692.5	692.5	0.0
AJ	93,081	581	3622	1.5	695.3	695.3	695.3	0.0
AK	94,084	599	1024	1.5	700.3	700.3	700.3	0.0
AL	96,038	672	1994	2.5	708.0	708.0	708.0	0.0
AM	96,355	710	1667	2.9	710.6	710.6	710.6	0.0
AN	96,619	717	1520	3.2	711.4	711.4	711.4	0.0
AO	97,094	872	939	5.2	714.6	714.6	714.6	0.0
AP	97,939	544	2479	1.6	718.2	718.2	718.2	0.0
AQ	98,255	602	1694	2.3	718.4	718.4	718.4	0.0
AR	98,467	767	1943	2.0	718.9	718.9	718.9	0.0
AS	99,259	682	1069	3.6	721.1	721.1	721.1	0.0
AT	99,470	735	3270	1.2	724.2	724.2	724.2	0.0
AU	99,734	782	1002	3.8	724.3	724.3	724.3	0.0
AV	100,051	700	1672	2.3	726.2	726.2	726.2	0.0
AW	100,156	635	676	5.7	726.2	726.2	726.2	0.0
AX	100,420	456	863	4.5	727.5	727.5	727.5	0.0
AY	100,684	396	1505	2.6	729.0	729.0	729.0	0.0
AZ	100,895	531	1578	2.4	729.7	729.7	729.7	0.0
BA	101,371	551	1138	3.4	731.0	731.0	731.0	0.0

[1]Feet above confluence with East Fork White River

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN AND INCORPORATED AREAS

FLOODWAY DATA

CLEAR CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-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
East Branch Jackson Creek								
A	422	315	582	2.8	739.4	737.6[2]	737.6[2]	0.0
B	845	56	200	8.2	741.1	741.1	741.1	0.0
C	1267	100	310	5.3	747.6	747.6	747.6	0.0
D	1901	168	275	6.0	753.2	753.2	753.2	0.0
E	2746	273	362	4.1	762.0	762.0	762.0	0.0
F	2904	235	229	7.2	764.5	764.5	764.5	0.0
G	3115	174	336	4.9	767.5	767.5	767.5	0.0
H	3326	163	334	4.9	769.2	769.2	769.2	0.0
I	3749	50	215	7.0	775.0	775.0	775.0	0.0

[1]Feet above confluence with Jackson Creek
[2]Elevation without considering backwater effect from Jackson Creek

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN AND INCORPORATED AREAS

FLOODWAY DATA

EAST BRANCH JACKSON CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-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
East Fork Jackson Creek								
A	53	336	1237	2.7	673.0	673.0	673.0	0.0
B	1637	119	390	8.6	681.3	681.3	681.3	0.0
C	1848	411	2936	1.1	689.4	689.4	689.4	0.0
D	3749	223	336	8.6	698.5	698.5	698.5	0.0
E	6072	230	501	5.3	718.6	718.6	718.6	0.0
F	7498	286	317	8.4	730.6	730.6	730.6	0.0
G	8395	430	534	5.0	738.4	738.4	738.4	0.0
H	9557	258	296	6.4	748.7	748.7	748.7	0.0
I	9768	277	1495	1.3	753.2	753.2	753.2	0.0
J	10824	166	276	6.9	756.8	756.8	756.8	0.0
K	12936	207	311	6.1	777.8	777.8	777.8	0.0
L	13675	264	375	5.1	784.5	784.5	784.5	0.0
M	13886	431	735	2.6	787.9	787.9	787.9	0.0
N	14678	253	414	2.8	792.8	792.8	792.8	0.0
O	16262	180	187	5.4	807.0	807.0	807.0	0.0
P	17741	183	222	4.5	817.7	817.7	817.7	0.0
Q	17952	128	362	2.8	822.2	822.2	822.2	0.0

[1]Feet above confluence with Jackson Creek

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN AND INCORPORATED AREAS

FLOODWAY DATA

EAST FORK JACKSON CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-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
Griffy Creek								
A	0.20	1699	4660	1.6	585.3	585.3	585.3	0.0
B	0.86	1513	3940	1.9	585.8	585.8	585.8	0.0
C	1.59	975	3550	2.0	586.6	586.6	586.6	0.0
D	1.80	1074	2560	2.7	587.0	587.0	587.0	0.0
E	1.85	977	2130	3.3	588.1	588.1	588.1	0.0
F	2.12	1225	2160	3.2	589.3	589.3	589.3	0.0
G	2.59	1307	4350	1.3	596.8	596.8	596.8	0.0
H	2.68	781	3100	1.8	598.6	598.6	598.6	0.0
I	2.82	856	4150	1.3	598.7	598.7	598.7	0.0
J	2.90	778	2090	2.6	601.8	601.8	601.8	0.0

[1]Miles above confluence with Beanblossom Creek

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN AND INCORPORATED AREAS

FLOODWAY DATA

GRIFFY CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-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
Jacks Defeat Creek								
A	1923	840	3859	2.7	564.1	564.1	564.2	0.1
B	2798	500	3690	2.9	564.8	564.8	564.9	0.1
C	3608	316	2488	4.2	565.7	565.7	565.8	0.1
D	4387	493	3159	3.3	567.3	567.3	567.3	0.0
E	5398	320	2242	4.7	568.6	568.6	568.7	0.1
F	5879	377	2159	4.9	569.2	569.2	569.3	0.1
G	6283	336	1948	5.4	569.8	569.8	569.8	0.0
H	6800	493	2504	4.2	570.7	570.7	570.7	0.0
I	8228	405	2297	4.6	573.9	573.9	574.0	0.1
J	8929	295	3766	2.8	584.2	584.2	584.2	0.0
K	9630	316	2928	3.6	585.1	585.1	585.2	0.1
L	10,310	142	953	11.0	584.6	584.6	584.7	0.1
M	11,698	193	2196	4.8	594.4	594.4	594.4	0.0
N	12,817	140	1570	6.7	595.6	595.6	595.7	0.1
O	13,397	116	1144	9.2	596.3	596.3	596.3	0.0
P	13,850	123	1236	8.5	597.6	597.6	597.6	0.0
Q	14,736	350	4891	2.2	607.1	607.1	607.2	0.1
R	15,168	310	3292	3.2	607.2	607.2	607.2	0.0
S	16,800	660	3071	3.4	609.3	609.3	609.3	0.0
T	17,324	340	2229	4.7	610.2	610.2	610.3	0.1
U	17,883	250	1505	7.0	612.0	612.0	612.0	0.0
V	18,469	283	1590	6.6	615.7	615.7	615.8	0.1
W	18,918	266	1620	6.5	617.8	617.8	617.9	0.1
X	19,529	310	1877	5.6	622.4	622.4	622.4	0.0
Y	20,330	417	2103	5.0	624.3	624.3	624.4	0.1
Z	21,700	555	4260	2.5	631.7	631.7	631.8	0.1

[1]Feet above confluence with Beanblossom Creek

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN AND INCORPORATED AREAS

FLOODWAY DATA

JACKS DEFEAT CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-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
Jacks Defeat Creek								
AA	22,553	413	2033	5.2	632.1	632.1	632.2	0.1
AB	23,268	210	1089	7.6	633.8	633.8	633.8	0.0
AC	24,076	125	944	8.8	638.9	638.9	639.0	0.1
AD	24,544	92	787	10.5	641.5	641.5	641.5	0.0
AE	24,932	449	3485	2.4	644.4	644.4	644.5	0.1
AF	25,732	456	2744	3.0	645.0	645.0	645.1	0.1
AG	26,706	308	1524	5.4	646.7	646.7	646.8	0.1
AH	27,328	248	1429	5.8	649.1	649.1	649.2	0.1
AI	28,190	379	2349	3.5	652.0	652.0	652.1	0.1
AJ	28,960	379	1936	4.3	653.5	653.5	653.6	0.1
AK	29,734	489	2558	3.3	655.3	655.3	655.4	0.1
AL	30,526	447	1873	4.4	656.8	656.8	656.9	0.1
AM	31,229	445	1890	4.4	660.0	660.0	660.0	0.1
AN	32,007	461	1593	5.2	662.7	662.7	662.8	0.1
AO	33,326	555	2624	3.2	666.9	666.9	667.0	0.1
AP	34,367	630	2494	3.3	668.5	668.5	668.5	0.0
AQ	34,899	540	1761	4.7	669.5	669.5	669.6	0.1
AR	35,690	395	1804	4.6	675.4	675.4	675.4	0.0
AS	36,417	665	1808	4.6	678.5	678.5	678.6	0.1
AT	36,970	605	3133	2.6	679.6	679.6	679.6	0.0
AU	37,892	404	2198	3.8	680.8	680.8	680.9	0.1
AV	38,648	390	3299	2.5	685.4	685.4	685.4	0.0
AW	39,164	495	3286	1.9	685.5	685.5	685.6	0.1
AX	41,334	515	1903	3.3	689.7	689.7	689.8	0.1
AY	43,407	293	1049	5.9	698.1	698.1	698.2	0.1
AZ	44,132	339	991	6.3	701.3	701.3	701.3	0.0

[1]Feet above confluence with Beanblossom Creek

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN AND INCORPORATED AREAS

FLOODWAY DATA

JACKS DEFEAT CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-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
Jacks Defeat Creek								
BA	44,655	178	647	7.3	702.6	702.6	702.7	0.1
BB	45,310	213	935	5.0	706.8	706.8	706.9	0.1
BC	45,790	96	400	9.4	708.7	708.7	708.8	0.1
BD	45,936	114	663	5.6	711.2	711.2	711.2	0.0
BE	47,255	315	707	5.3	716.3	716.3	716.4	0.1
BF	48,374	231	809	4.6	722.2	722.2	722.3	0.1
BG	49,753	282	715	4.9	727.6	727.6	727.7	0.1
BH	51,261	225	524	6.2	735.4	735.4	735.4	0.0
BI	51,337	310	891	3.6	736.6	736.6	736.6	0.0
BJ	52,507	298	530	5.6	741.2	741.2	741.2	0.0
BK	53,954	176	556	4.8	749.5	749.5	749.5	0.0
BL	54,709	320	578	4.7	752.4	752.4	752.5	0.1
BM	54,774	357	593	4.6	753.2	753.2	753.3	0.1
BN	55,331	178	526	3.6	757.2	757.2	757.3	0.1
BO	55,856	430	1127	1.7	759.0	759.0	759.1	0.1
BP	55,942	458	405	4.6	760.4	760.4	760.5	0.1
BQ	55,988	462	1448	1.3	763.2	763.2	763.2	0.0
BR	56,053	180	855	2.2	763.2	763.2	763.2	0.0
BS	56,303	209	713	2.6	763.4	763.4	763.4	0.0
BT	56,653	186	495	3.6	764.0	764.0	764.1	0.1
BU	56,687	252	744	2.4	764.2	764.2	764.3	0.1
BV	57,387	149	288	5.6	767.9	767.9	768.0	0.1

[1]Feet above confluence with Beanblossom Creek

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN AND INCORPORATED AREAS

FLOODWAY DATA

JACKS DEFEAT CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-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
Jackson Creek								
A	1793	179	851	8.9	635.9	635.4[2]	635.5[2]	0.1
B	2678	359	2640	2.9	642.8	642.8	642.8	0.0
C	3238	391	2458	3.0	643.2	643.2	643.3	0.1
D	3928	247	1001	7.4	644.7	644.7	644.8	0.1
E	4493	292	1687	4.2	647.1	647.1	647.2	0.1
F	5398	401	1386	5.1	649.1	649.1	649.3	0.1
G	5733	514	2052	3.4	650.3	650.3	650.4	0.1
H	6028	492	2911	2.4	653.9	653.9	653.9	0.0
I	6118	482	2936	2.4	654.0	654.0	654.0	0.0
J	6993	521	1996	3.5	654.9	654.9	654.9	0.0
K	7533	240	848	7.6	656.1	656.1	656.1	0.0
L	8103	260	1280	5.0	658.9	658.9	659.1	0.1
M	8543	227	1065	6.0	660.5	660.5	660.6	0.1
N	8968	152	954	6.7	661.9	661.9	662.0	0.1
O	9488	387	1500	4.3	663.9	663.9	664.0	0.0
P	10223	401	1270	5.0	666.8	666.8	666.9	0.1
Q	11383	262	1318	4.9	672.2	672.2	672.3	0.1
R	11693	264	1253	4.9	673.7	673.7	673.8	0.1
S	12408	218	829	5.8	676.1	676.1	676.2	0.1
T	12858	170	610	7.9	679.0	679.0	679.0	0.0
U	13008	225	1448	3.3	683.0	683.0	683.1	0.1
V	13393	200	966	5.0	683.3	683.3	683.5	0.1
W	13723	307	1216	4.0	684.3	684.3	684.5	0.1
X	14233	424	1243	3.9	685.8	685.8	685.9	0.1
Y	14773	352	1079	4.5	688.1	688.1	688.2	0.0
Z	15523	486	1860	2.6	690.4	690.4	690.5	0.1

[1]Feet above confluence with Clear Creek
[2] Elevation without considering backwater effect from Clear Creek

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN AND INCORPORATED AREAS

FLOODWAY DATA

JACKSON CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-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
Jackson Creek								
AA	15952	350	789	6.1	691.0	691.0	691.1	0.1
AB	16053	405	966	5.0	692.0	692.0	692.2	0.1
AC	16571	520	1583	3.0	694.8	694.8	694.8	0.0
AD	16936	250	764	6.3	696.1	696.1	696.1	0.1
AE	17446	245	1008	4.8	700.4	700.4	700.5	0.1
AF	18226	320	1647	2.9	703.1	703.1	703.1	0.1
AG	18656	228	1032	4.7	703.9	703.9	704.1	0.1
AH	18981	233	771	6.2	705.7	705.7	705.7	0.1
AI	19367	446	1649	2.9	708.5	708.5	708.5	0.0
AJ	19535	505	2540	1.9	710.8	710.8	710.8	0.0
AK	19899	220	1175	4.1	711.1	711.1	711.1	0.0
AL	20354	219	894	5.4	712.1	712.1	712.2	0.1
AM	20824	298	1104	4.4	714.0	714.0	714.1	0.1
AN	21150	325	1248	3.9	715.4	715.4	715.6	0.1
AO	21682	256	705	6.8	718.4	718.4	718.5	0.1
AP	22492	140	649	7.4	724.5	724.5	724.6	0.1
AQ	23092	100	567	8.5	728.1	728.1	728.2	0.1
AR	23747	130	994	4.9	731.6	731.6	731.8	0.1
AS	24617	155	957	5.0	734.3	734.3	734.4	0.1
AT	25072	490	2691	1.8	739.4	739.4	739.5	0.1
AU	26073	170	588	6.3	740.2	740.2	740.2	0.0
AV	26393	135	400	7.1	742.3	742.3	742.4	0.1
AW	26693	80	396	7.2	746.6	746.6	746.6	0.0
AX	27510	69	273	10.2	751.6	751.6	751.7	0.1
AY	28030	85	351	7.9	757.2	757.2	757.2	0.0
AZ	28215	62	250	11.1	759.1	759.1	759.1	0.0

[1]Feet above confluence with Clear Creek

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN AND INCORPORATED AREAS

FLOODWAY DATA

JACKSON CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-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
Jackson Creek								
BA	28525	235	718	3.9	764.1	764.1	764.1	0.0
BB	28867	119	665	4.2	764.6	764.6	764.6	0.0
BC	29006	125	506	5.5	768.6	768.6	768.7	0.1
BD	29328	82	276	10.1	769.8	769.8	769.8	0.0
BE	29508	185	444	6.3	772.4	772.4	772.5	0.1

[1]Feet above confluence with Clear Creek

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN AND INCORPORATED AREAS

FLOODWAY DATA

JACKSON CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-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
Sinking Creek								
A	6525	513	801	2.5	827.0	827.0	827.0	0.0
B	7300	473	1354	1.2	831.8	831.8	831.8	0.0
C	8275	478	394	4.1	834.3	834.3	834.3	0.0
D	9330	711	1772	0.8	842.1	842.1	842.1	0.0
E	10,700	276	628	1.7	842.8	842.8	842.8	0.0
F	12,000	353	422	2.5	847.3	847.3	847.3	0.0

[1]Feet above confluence with Sinking Creek sinkhole

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN AND INCORPORATED AREAS

FLOODWAY DATA

SINKING CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-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
Stout Creek								
A	5650	909	2520	2.0	581.6	581.6	581.6	0.0
B	7498	527	1080	4.5	584.7	584.7	584.7	0.0
C	9398	443	1510	3.1	592.0	592.0	592.0	0.0
D	11088	444	925	4.4	600.0	600.0	600.0	0.0
E	12197	369	941	4.2	609.8	609.8	609.8	0.0
F	12672	358	1190	3.3	612.5	612.5	612.5	0.0
G	13570	258	545	7.1	620.3	620.3	620.3	0.0
H	14150	185	821	4.7	628.5	628.5	628.5	0.0
I	14731	148	426	8.9	636.8	636.8	636.8	0.0
J	15575	172	788	4.7	648.4	648.4	648.4	0.0
K	16025	165	585	6.2	653.4	653.4	653.4	0.0
L	19190	62	520	6.2	697.4	697.4	697.4	0.0
M	20500	340	724	4.0	708.2	708.2	708.2	0.0
N	21090	409	453	5.1	712.9	712.9	712.9	0.0
O	23560	228	484	2.5	733.2	733.2	733.2	0.0
P	24750	323	264	4.2	746.5	746.5	746.5	0.0
Q	25430	293	286	3.5	755.2	755.2	755.2	0.0

[1]Feet above confluence with Beanblossom Creek

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN AND INCORPORATED AREAS

FLOODWAY DATA

STOUT CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-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
Unnamed Tributary Jacks Defeat Creek								
A	232	1156	5652	0.3	710.6	710.6	710.6	0.0
B	1429	135	380	5.2	712.7	712.7	712.7	0.0
C	2076	66	266	6.8	718.7	718.7	718.8	0.1
D	3030	233	497	3.1	726.2	726.2	726.2	0.0
E	3464	116	271	4.6	729.4	729.4	729.5	0.1
F	3665	175	368	3.4	732.7	732.7	732.7	0.0
G	4204	210	339	3.7	734.9	734.9	735.0	0.1
H	4259	115	264	4.7	736.0	736.0	736.1	0.1
I	4645	250	369	3.2	738.3	738.3	738.4	0.1
J	4700	203	434	2.7	739.4	739.4	739.5	0.1
K	5178	200	317	3.8	741.2	741.2	741.3	0.1
L	5868	100	190	5.7	748.1	748.1	748.1	0.0
M	6470	124	285	2.8	753.7	753.7	753.8	0.1
N	6578	183	927	0.9	758.1	758.1	758.2	0.1
O	6883	186	395	2.0	758.3	758.3	758.4	0.1
P	6950	128	407	2.0	759.7	759.7	759.8	0.1
Q	7446	147	260	2.6	762.2	762.2	762.3	0.1
R	7926	90	102	5.3	768.8	768.8	768.8	0.0
S	8642	48	106	5.1	776.4	776.4	776.5	0.1
T	8690	60	153	3.5	776.9	776.9	777.0	0.1
U	8842	96	96	4.7	778.5	778.5	778.6	0.1

[1]Feet above confluence with Jacks Defeat Creek

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN AND INCORPORATED AREAS

FLOODWAY DATA

UNNAMED TRIBUTARY JACKS DEFEAT CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-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
West Branch Clear Creek								
A	0.12	700	812	2.9	717.0	717.0	717.0	0.0
B	0.14	521	948	2.5	718.2	718.2	718.2	0.0
C	0.17	312	711	3.0	719.9	719.9	719.9	0.0
D	0.26	267	601	3.9	721.3	721.3	721.3	0.0
E	0.29	498	1461	1.6	723.6	723.6	723.6	0.0
F	0.33	502	388	6.1	723.9	723.9	723.9	0.0
G	0.42	552	422	5.6	728.1	728.1	728.1	0.0
H	0.44	410	864	2.7	728.9	728.9	728.9	0.0
I	0.50	151	596	3.9	729.4	729.4	729.4	0.0
J	0.59	157	759	3.1	737.5	737.5	737.5	0.0
K	0.77	344	489	4.1	739.8	739.8	739.8	0.0
L	0.86	191	341	5.9	741.5	741.5	741.5	0.0
M	0.96	313	549	3.6	748.7	748.7	748.7	0.0
N	1.04	363	705	2.8	751.5	751.5	751.5	0.0
O	1.17	460	942	2.1	758.7	758.7	758.7	0.0
P	1.24	516	1046	1.5	767.6	767.6	767.6	0.0
Q	1.26	429	1115	1.4	768.4	768.4	768.4	0.0
R	1.34	248	911	1.7	768.5	768.5	768.5	0.0
S	1.42	170	366	4.2	773.5	773.5	773.5	0.0
T	1.47	138	239	6.5	776.6	776.6	776.6	0.0

[1]Miles above confluence with Clear Creek

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN AND INCORPORATED AREAS

FLOODWAY DATA

WEST BRANCH CLEAR CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-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
West Branch Jackson Creek								
A	0.04[1]	205	546	2.2	739.2	737.7[3]	737.7[3]	0.0
B	0.13[1]	139	149	8.1	743.5	743.5	743.5	0.0
C	0.24[1]	174	352	3.4	753.4	753.4	753.4	0.0
D	0.34[1]	220	227	5.3	764.2	764.2	764.2	0.0
E	0.37[1]	222	450	2.7	767.9	767.9	767.9	0.0
F	0.43[1]	154	153	6.0	769.9	769.9	769.9	0.0
G	0.47[1]	328	129	0.7	777.1	777.1	777.1	0.0
H	0.58[1]	169	154	6.0	783.0	783.0	783.0	0.0
I	0.62[1]	51	507	1.8	785.0	785.0	785.0	0.0
J	0.73[1]	175	138	6.7	791.5	791.5	791.5	0.0
K	0.77[1]	211	327	2.8	795.8	795.8	795.8	0.0
West Branch Sinking Creek								
A	2520[2]	222	245	3.6	821.9	821.9	821.9	0.0
B	3260[2]	177	331	2.6	825.1	825.1	825.1	0.0

[1]Miles above confluence with Jackson Creek
[2]Feet above confluence with Sinking Creek
[3]Elevations without considering backwater effect from Jackson Creek

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN AND INCORPORATED AREAS

FLOODWAY DATA

WEST BRANCH JACKSON CREEK – WEST BRANCH SINKING CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-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
West Fork Clear Creek								
A	0.12	238	1237	3.8	648.4	648.4	648.4	0.0
B	0.43	450	755	6.2	656.7	656.7	656.7	0.0
C	0.47	707	3167	1.5	661.6	661.6	661.6	0.0
D	0.68	469	861	5.4	663.9	663.9	663.9	0.0
E	0.74	529	1989	2.3	667.3	667.3	667.3	0.0
F	0.88	435	1015	4.6	668.4	668.4	668.4	0.0
G	0.92	474	2420	1.9	670.9	670.9	670.9	0.0
H	1.13	324	594	7.8	674.4	674.4	674.4	0.0
I	1.17	869	2134	2.2	678.5	678.5	678.5	0.0
J	1.45	377	953	4.9	679.0	679.0	679.0	0.0
K	1.70	469	868	5.4	689.0	689.0	689.0	0.0
L	1.73	572	3760	1.2	694.2	694.2	694.2	0.0
M	1.95	526	1569	2.2	697.7	697.7	697.7	0.0
N	2.18	550	821	4.1	701.0	701.0	701.0	0.0
O	2.20	801	926	3.7	706.9	706.9	706.9	0.0
P	2.43	413	650	4.5	711.6	711.6	711.6	0.0
Q	2.47	532	1813	1.6	713.4	713.4	713.4	0.0
R	2.60	265	314	9.2	715.4	715.4	715.4	0.0
S	2.70	388	846	3.4	718.9	718.9	718.9	0.0
T	2.94	411	775	3.0	727.0	727.0	727.0	0.0
U	2.98	367	904	2.2	728.5	728.5	728.5	0.0
V	3.00	345	200	9.8	736.9	736.9	736.9	0.0

[1]Miles above confluence with Clear Creek

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN AND INCORPORATED AREAS

FLOODWAY DATA

WEST FORK CLEAR CREEK

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. These zones are as follows:

Zone A

Zone A is the flood insurance risk 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 BFEs or base flood depths are shown within this zone.

Zone AE

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

Zone AH

Zone AH is the flood insurance risk 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 BFEs derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AO

Zone AO is the flood insurance risk 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 base flood depths derived from the detailed hydraulic analyses are shown within this zone.

Zone AR

Zone AR is the flood insurance risk zone that corresponds to an 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 risk 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 BFEs or depths are shown within this zone.

Zone V

Zone V is the flood insurance risk 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 BFEs are shown within this zone.

Zone VE

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

Zone X

Zone X is the flood insurance risk zone that corresponds to areas outside the 0.2-percent-annual-chance floodplain, areas within the 0.2-percent-annual-chance floodplain, and 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 BFEs or base flood depths are shown within this zone.

Zone X (Future Base Flood)

Zone X (Future Base Flood) is the flood insurance risk zone that corresponds to the 1-percent-annual-chance floodplains that are determined based on future-conditions hydrology. No BFEs or base flood depths are shown within this zone.

Zone D

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

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISIONS DATE	FIRM EFFECTIVE DATE	FIRM REVISIONS DATE
Bloomington, City of	June 21, 1974	None	June 15, 1978	June 17, 1991
Ellettsville, Town of	June 14, 1974	April 9, 1976	July 18, 1985	October 4, 1994
Monroe County (Unincorporated Areas)	March 6, 1981	None	April 1, 1988	August 2, 1995
Stinesville, Town of	December 17, 2010	None	December 17, 2010	NA

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN AND INCORPORATED AREAS

COMMUNITY MAP HISTORY

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 risk zones as described in Section 5.0 and, in the 1-percent-annual-chance floodplains that were studied by detailed methods, shows selected whole-foot BFEs or average depths. Insurance agents use the zones and BFEs 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-percent-annual-chance floodplains, floodways, and the locations of selected cross sections used in the hydraulic analyses and floodway computations.

The current FIRM presents flooding information for the entire geographic area of Monroe County. Previously, separate FIRMs were prepared for each identified flood prone incorporated community and for the unincorporated areas of the county. Historical data relating to the maps prepared for each community are presented in Table 8.

7.0 OTHER STUDIES

This FIS report either supersedes or is compatible with all previous studies on streams studied in this report and should be considered authoritative for purposes of the NFIP.

8.0 LOCATION OF DATA

Information concerning the pertinent data used in the preparation of this study can be obtained by contacting the Flood Insurance and Mitigation Division, Federal Emergency Management Agency, Region V, 536 S. Clark Street, 6th Floor, Chicago, IL 60605

9.0 BIBLIOGRAPHY AND REFERENCES

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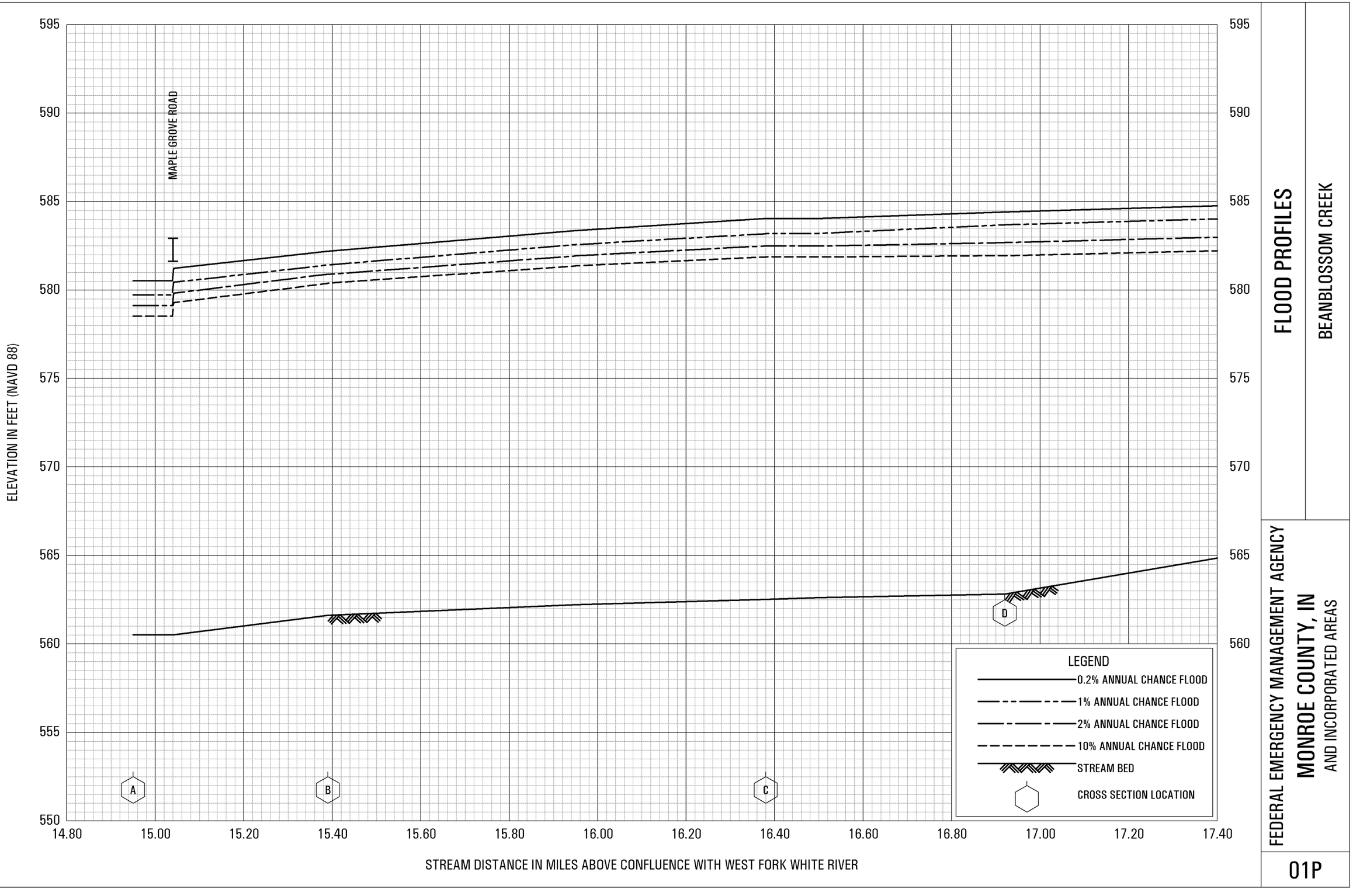
10. U.S. Department of Transportation, Federal Highway Administration, Report No. FHWA/RD-86/108, Bridge Waterways Analysis Model: Research Report, J.O. Shearman, W.H. Kirby, V.R. Snyder, and H.N. Flippo, July 1986.
11. Knuth, Daniel J., Karst Hydrology in Urban Planning, Bloomington, Indiana: Doctoral Thesis, Indiana University, 1975.



FLOOD PROFILES

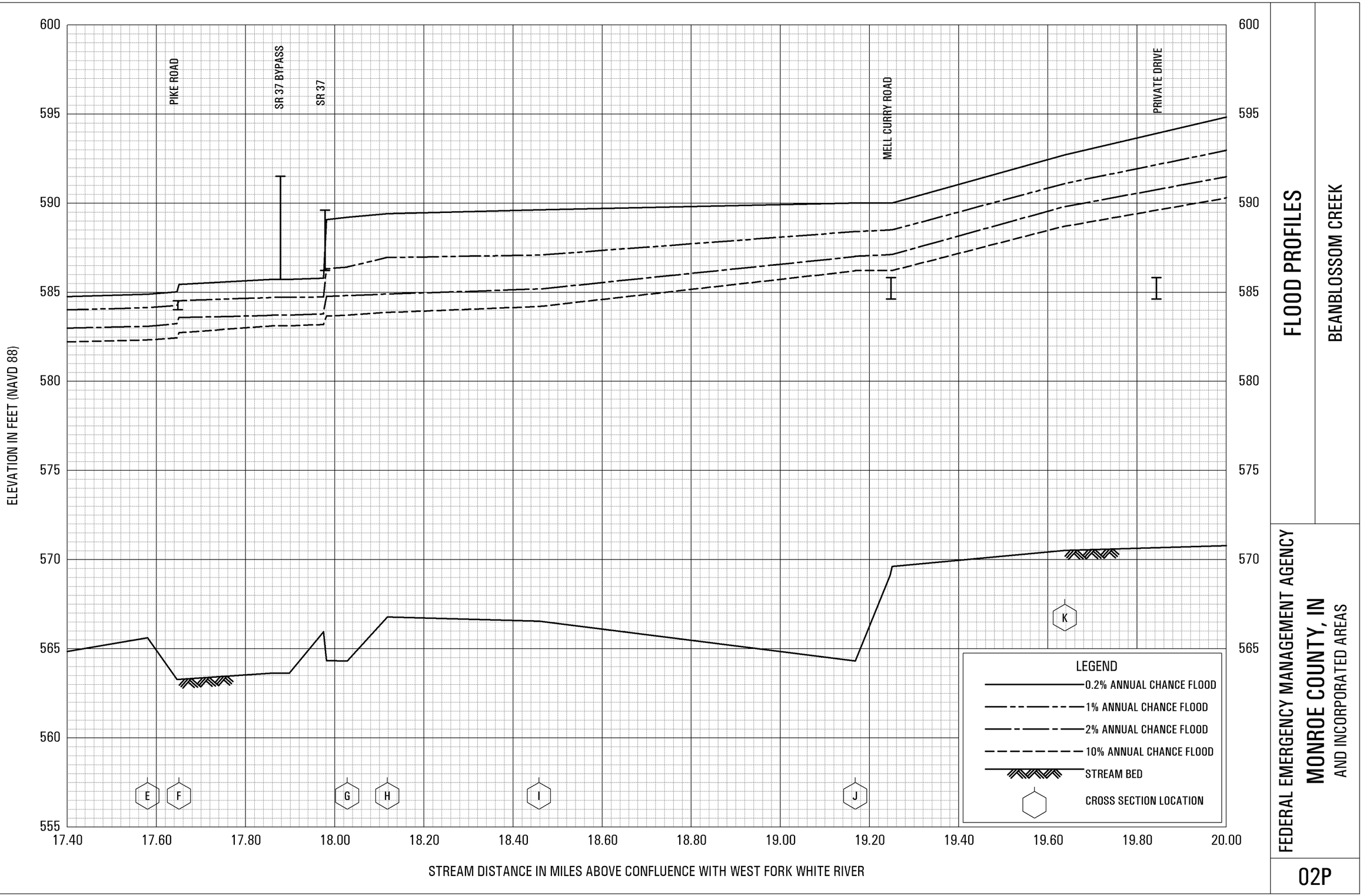
BEANBLOSSOM CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN

AND INCORPORATED AREAS

01P



FLOOD PROFILES

BEANBLOSSOM CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN

AND INCORPORATED AREAS

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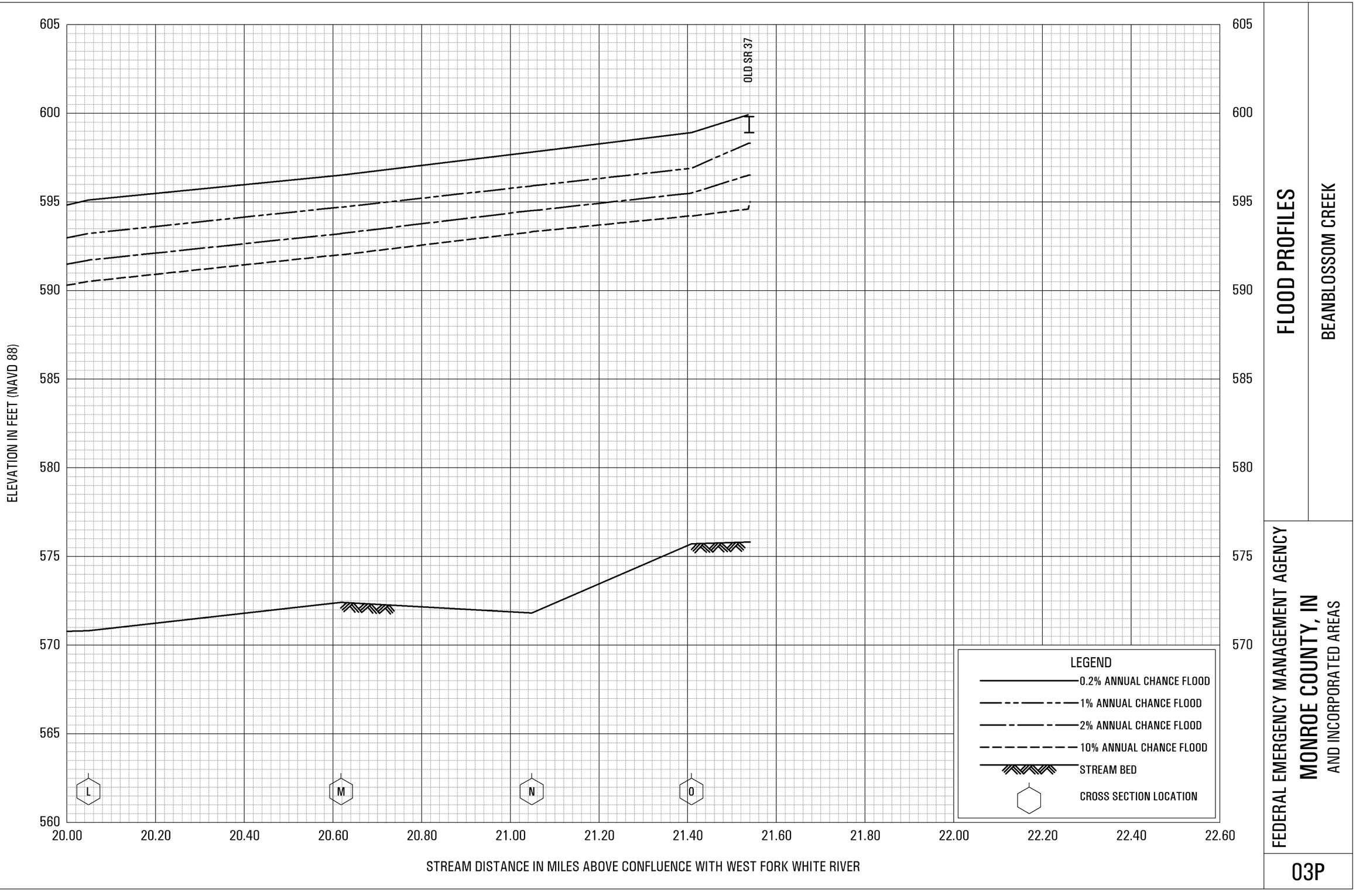


FLOOD PROFILES

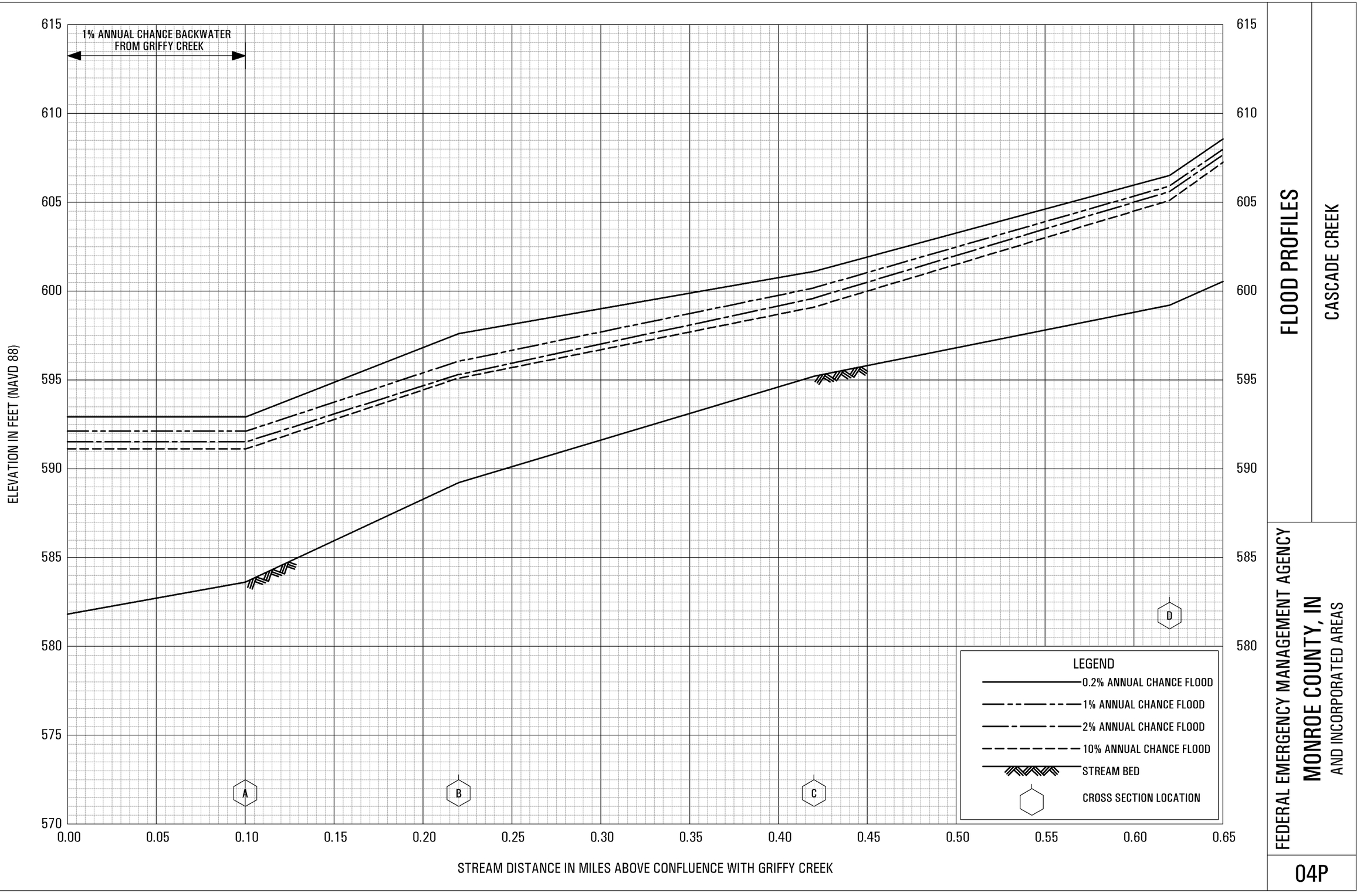
BEANBLOSSOM CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN

AND INCORPORATED AREAS

03P



FLOOD PROFILES

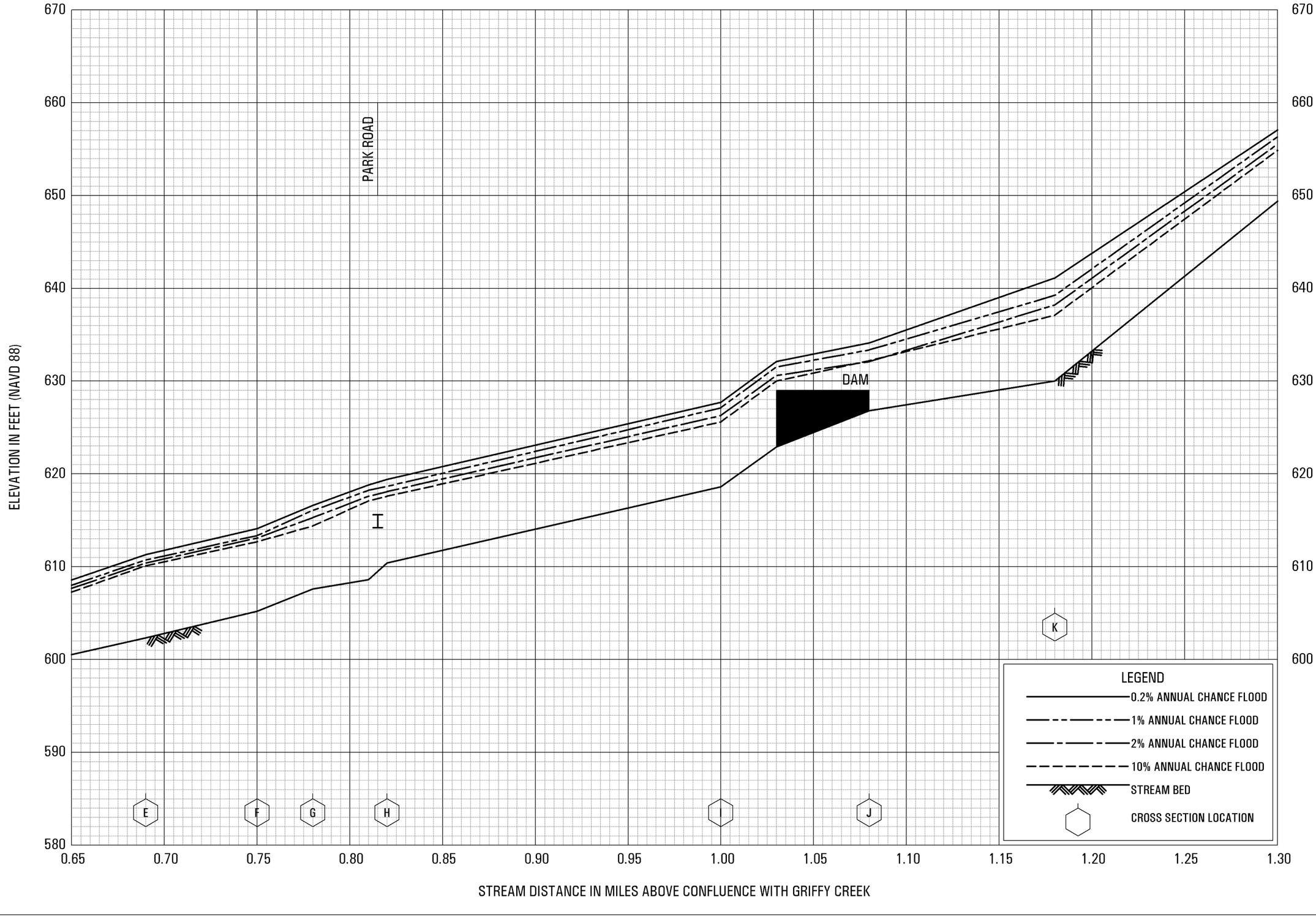
CASCADE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN

AND INCORPORATED AREAS

04P



FLOOD PROFILES

CASCADE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN

AND INCORPORATED AREAS

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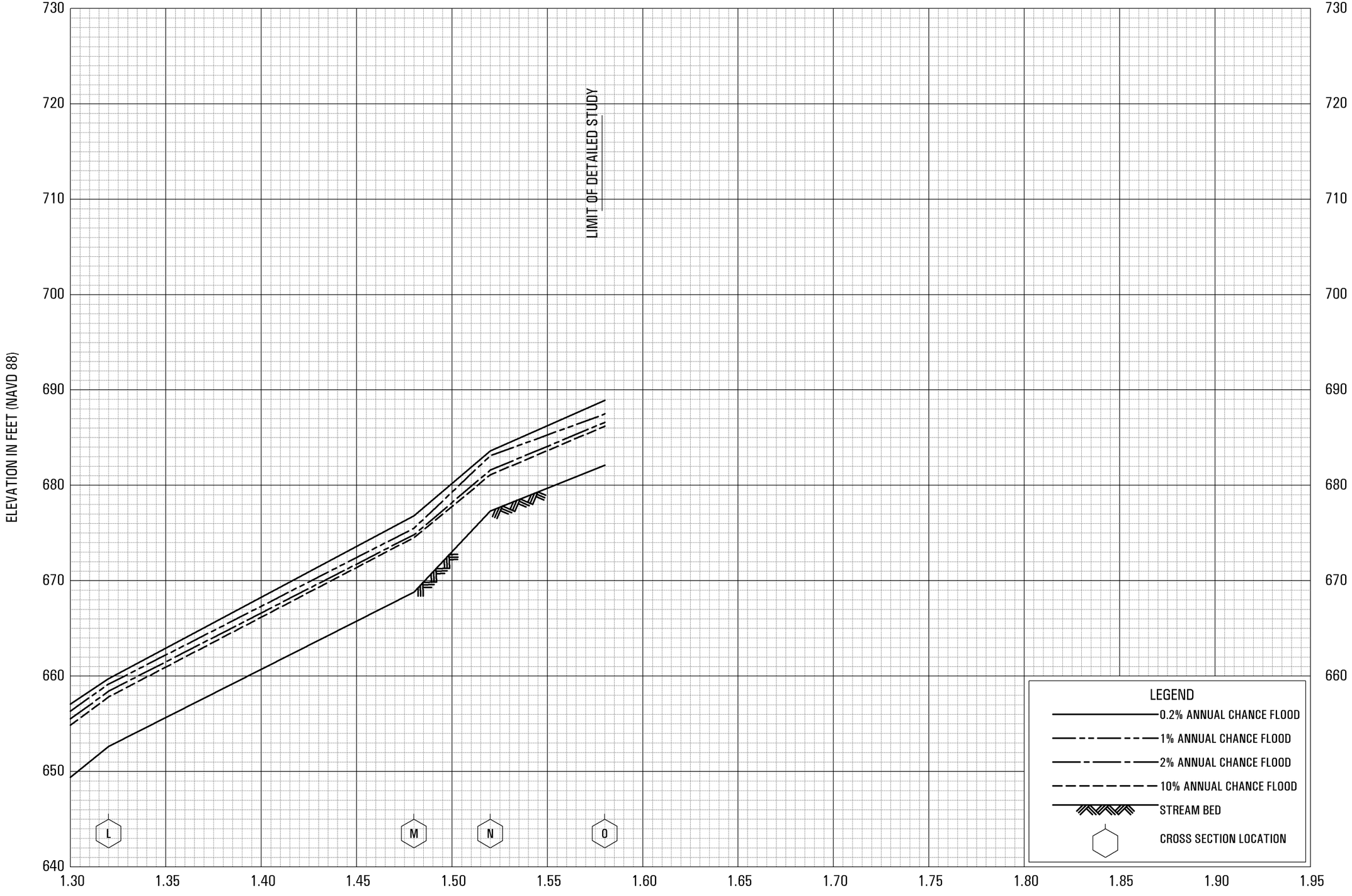

FLOOD PROFILES

CASCADE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN

AND INCORPORATED AREAS

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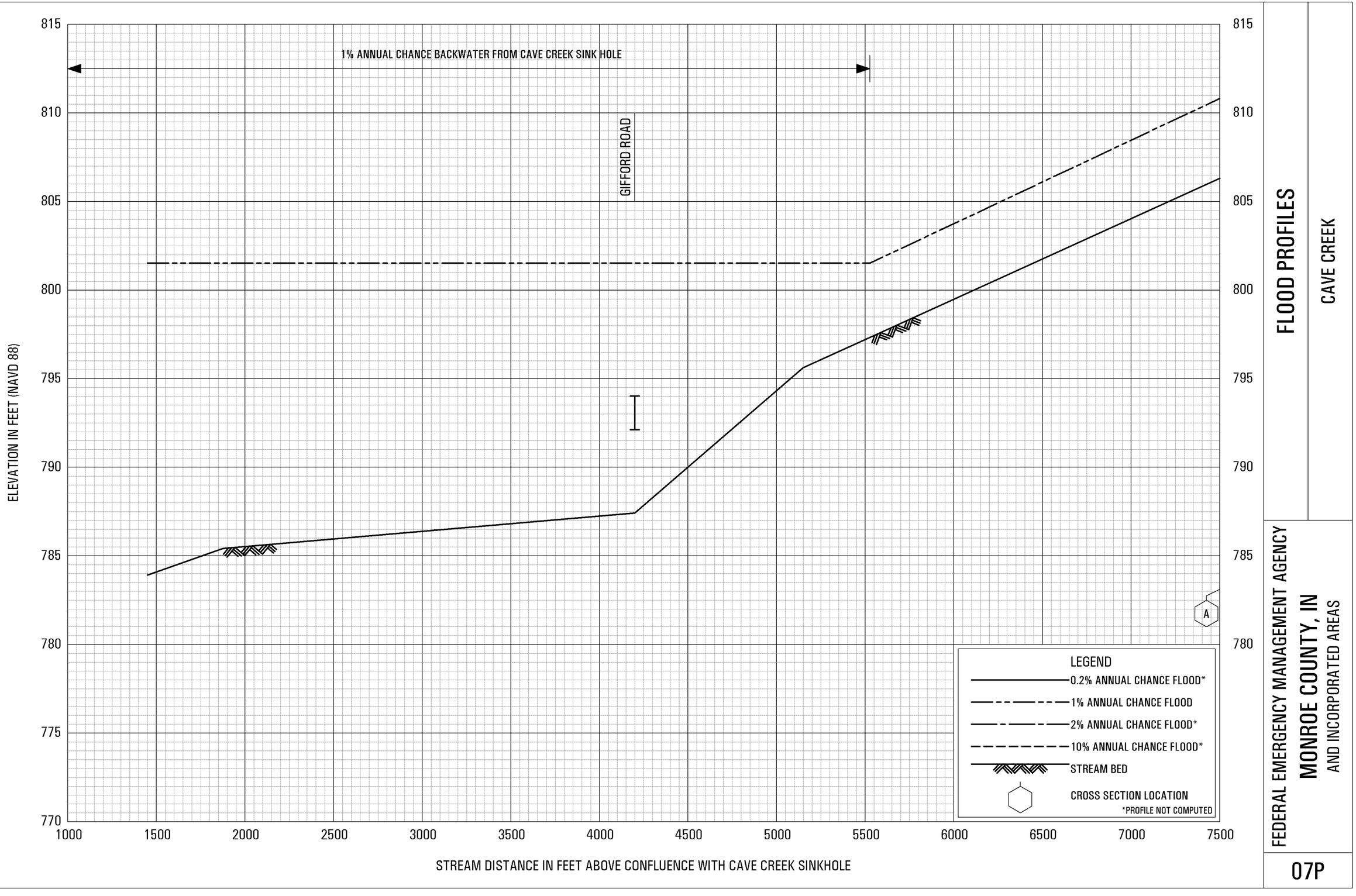

FLOOD PROFILES

CAVE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN

AND INCORPORATED AREAS

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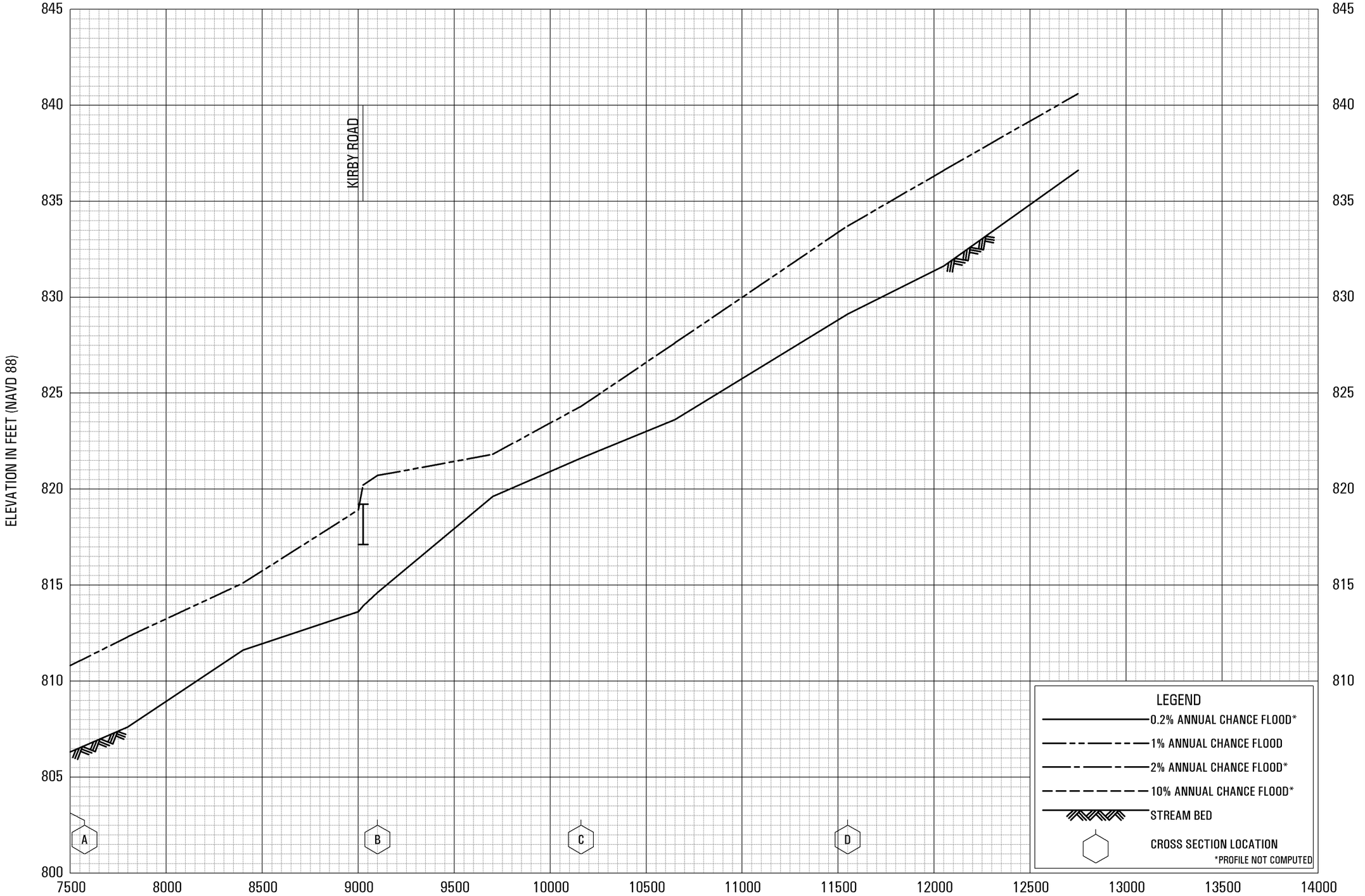


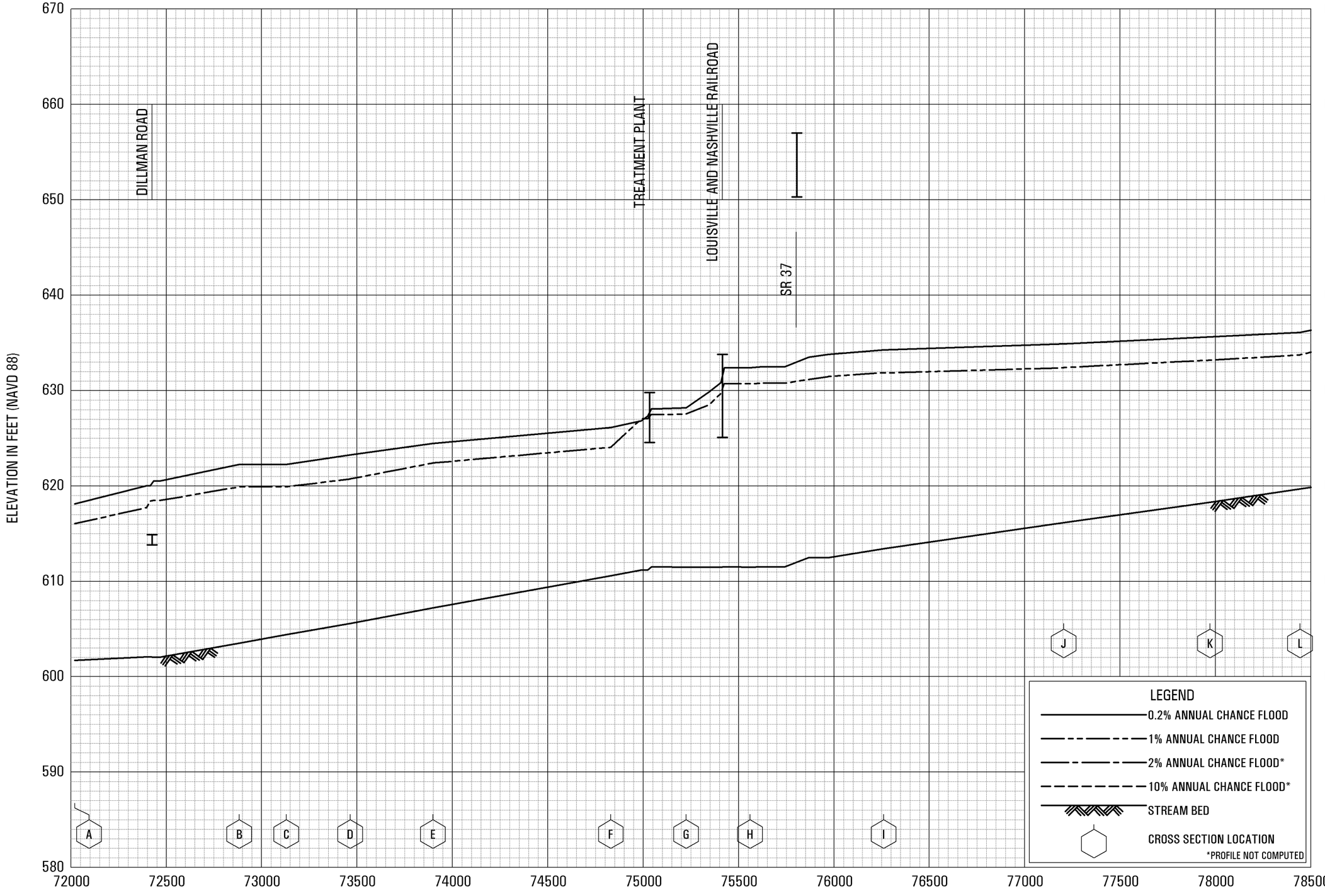
FLOOD PROFILES

CAVE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN

AND INCORPORATED AREAS



FLOOD PROFILES

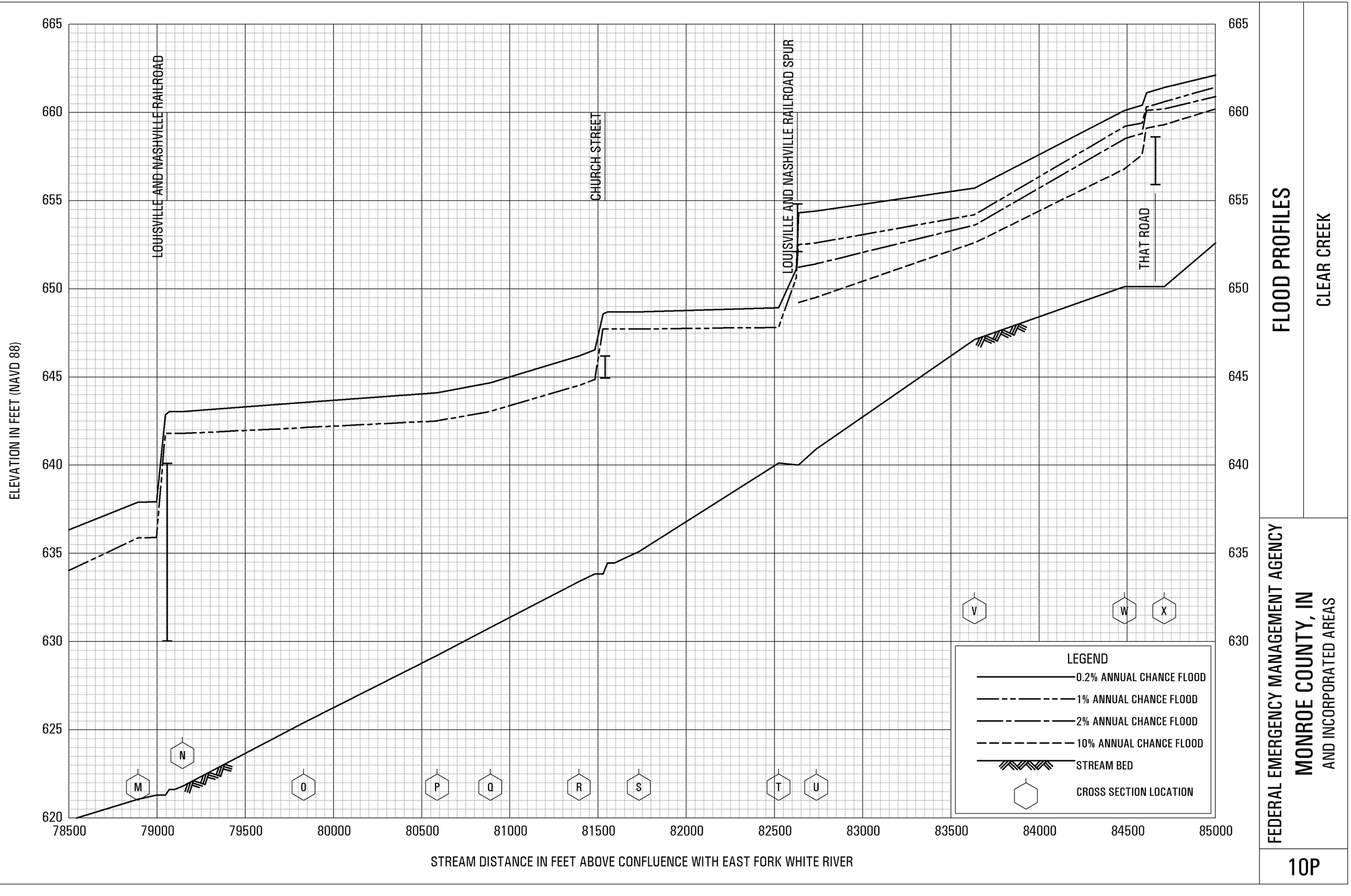
CLEAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN

AND INCORPORATED AREAS

09P



FLOOD PROFILES

CLEAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN

AND INCORPORATED AREAS

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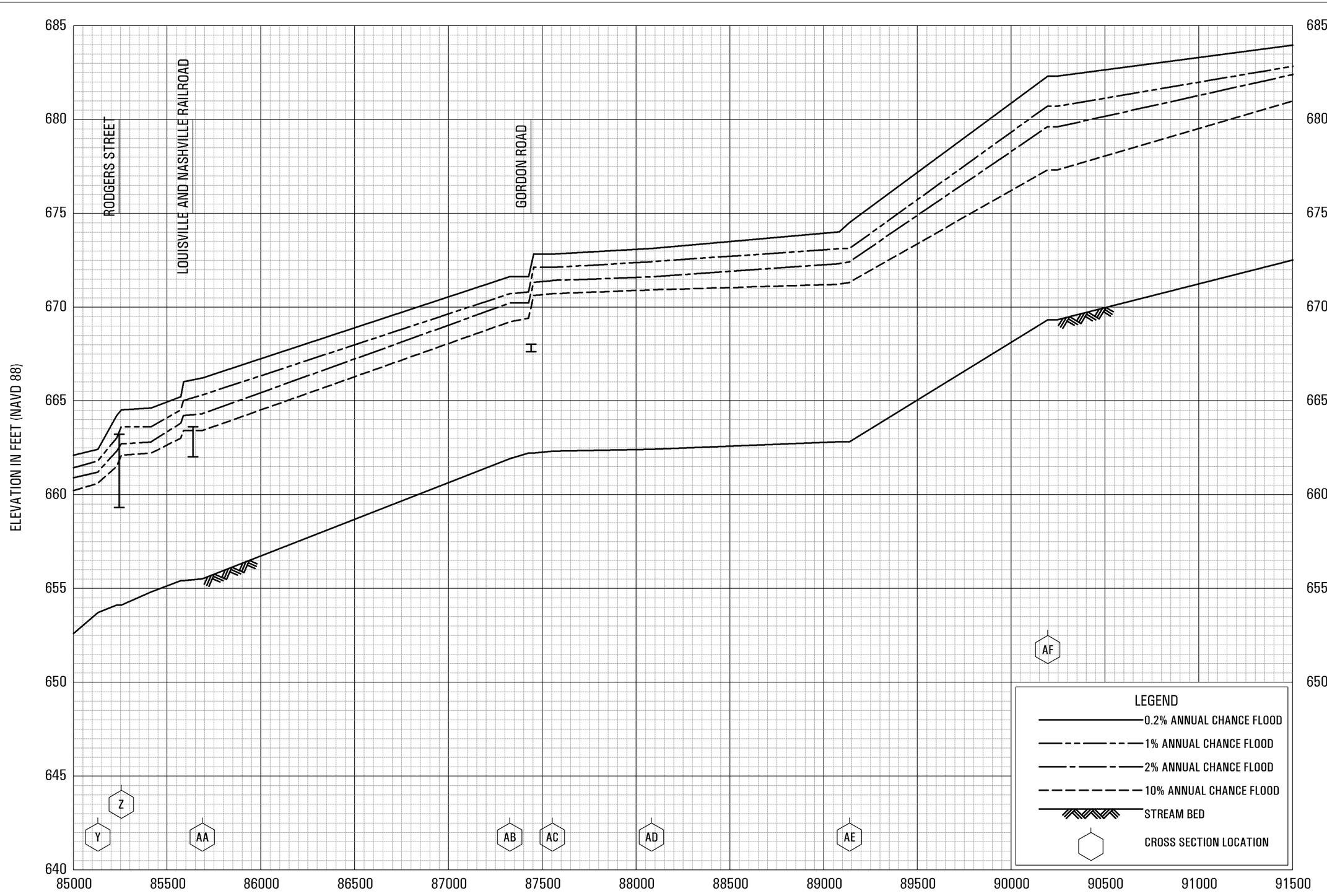

FLOOD PROFILES

CLEAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN

AND INCORPORATED AREAS

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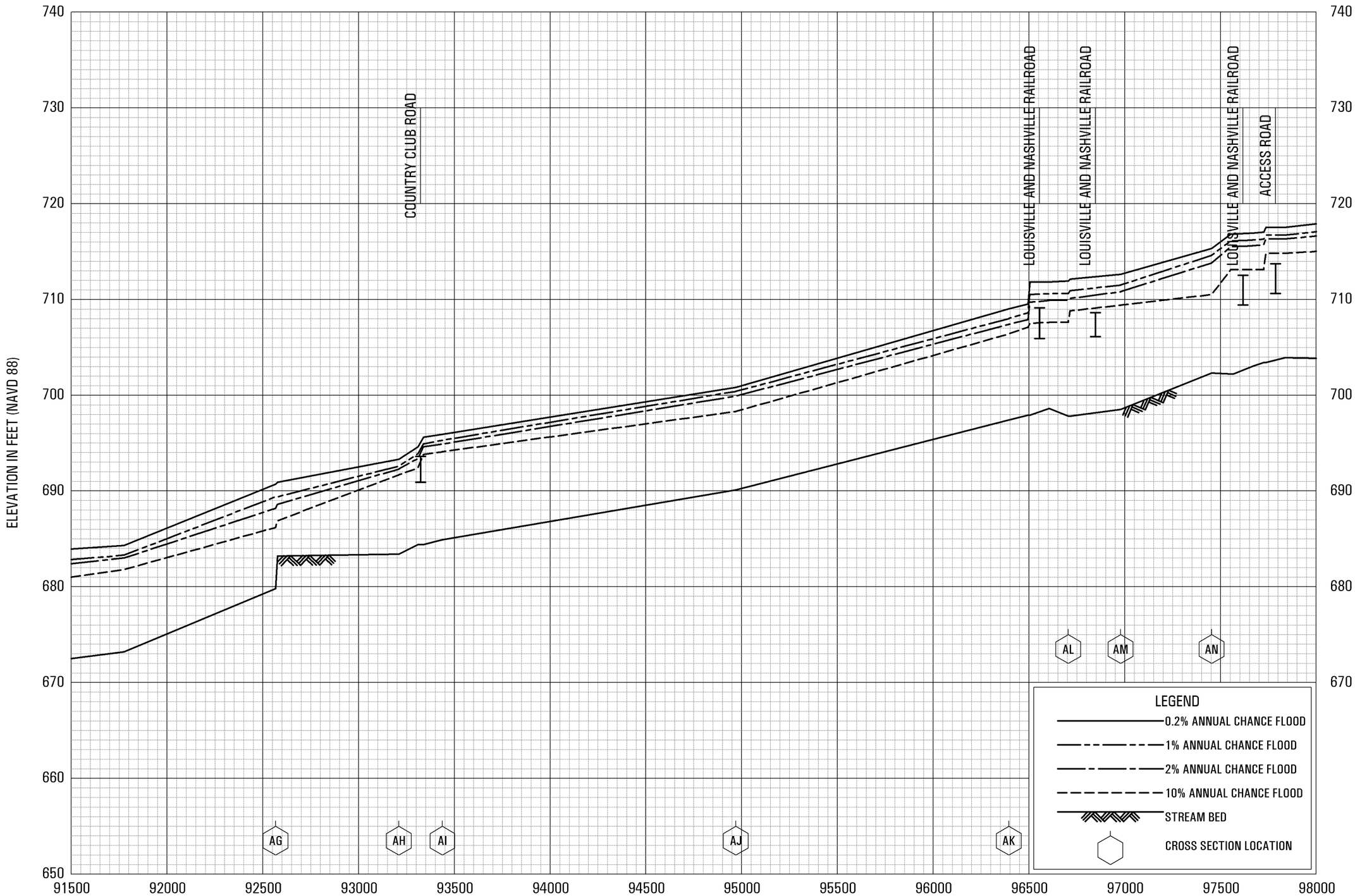


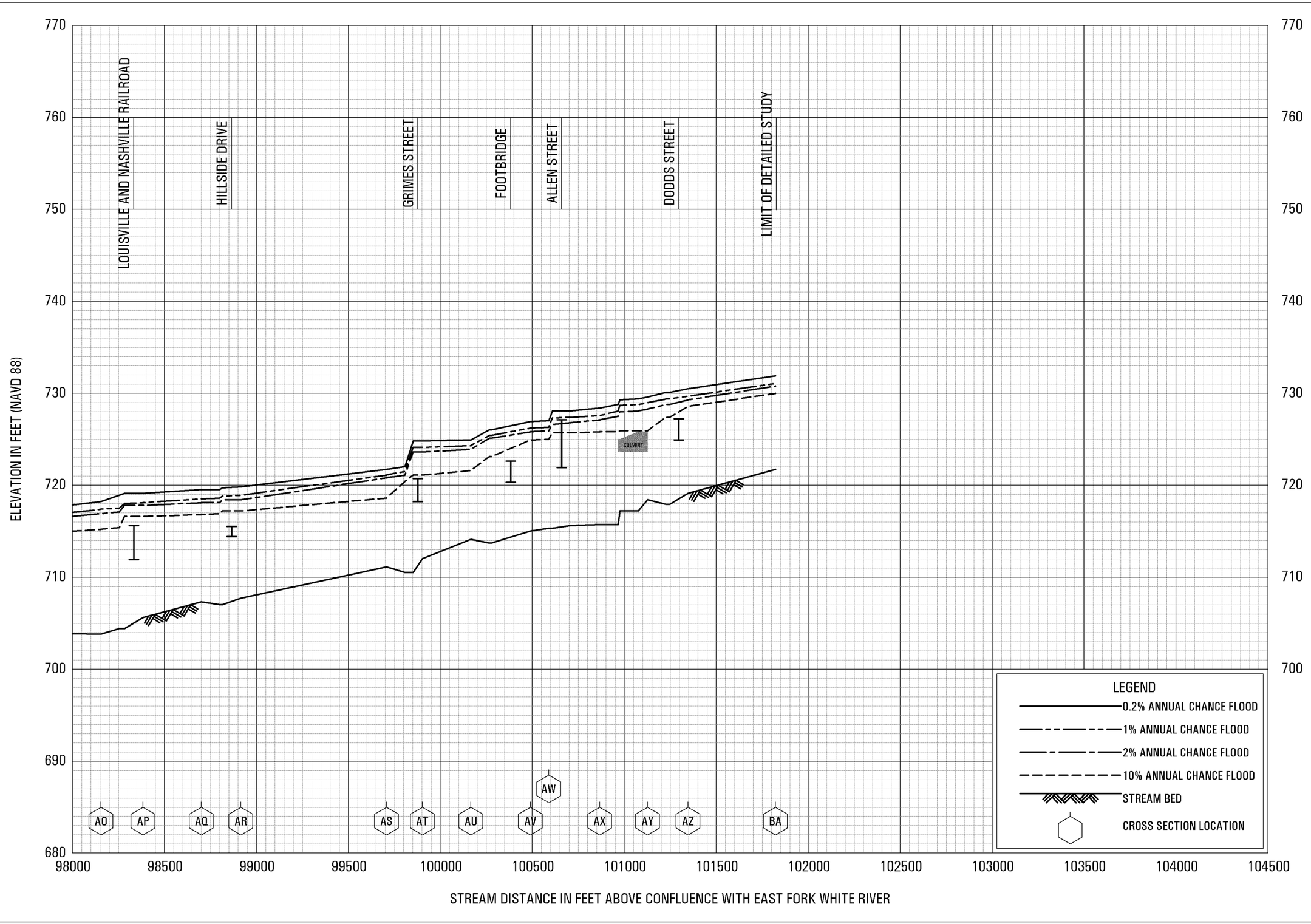
FLOOD PROFILES

CLEAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN

AND INCORPORATED AREAS



FLOOD PROFILES

CLEAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN

AND INCORPORATED AREAS

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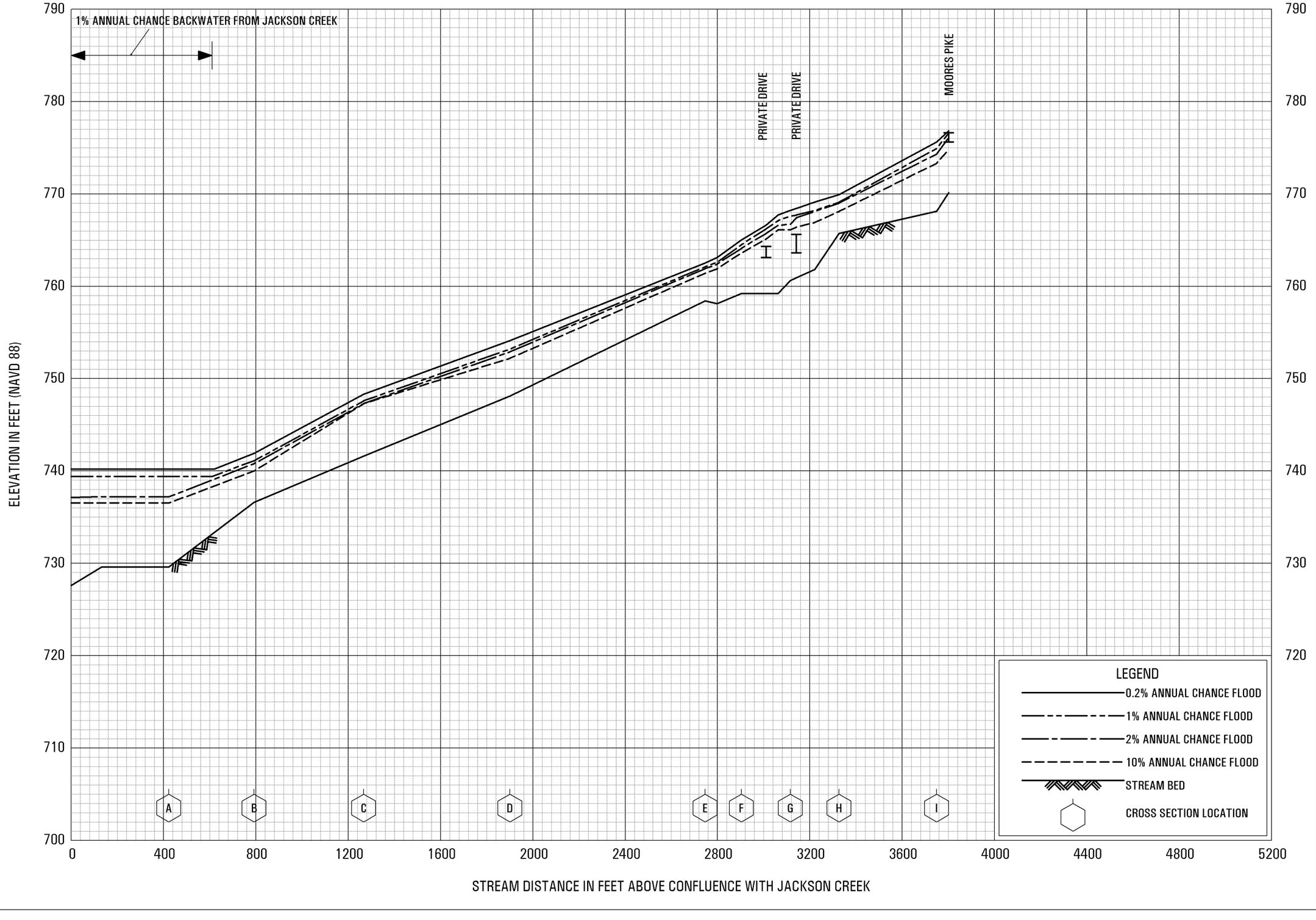


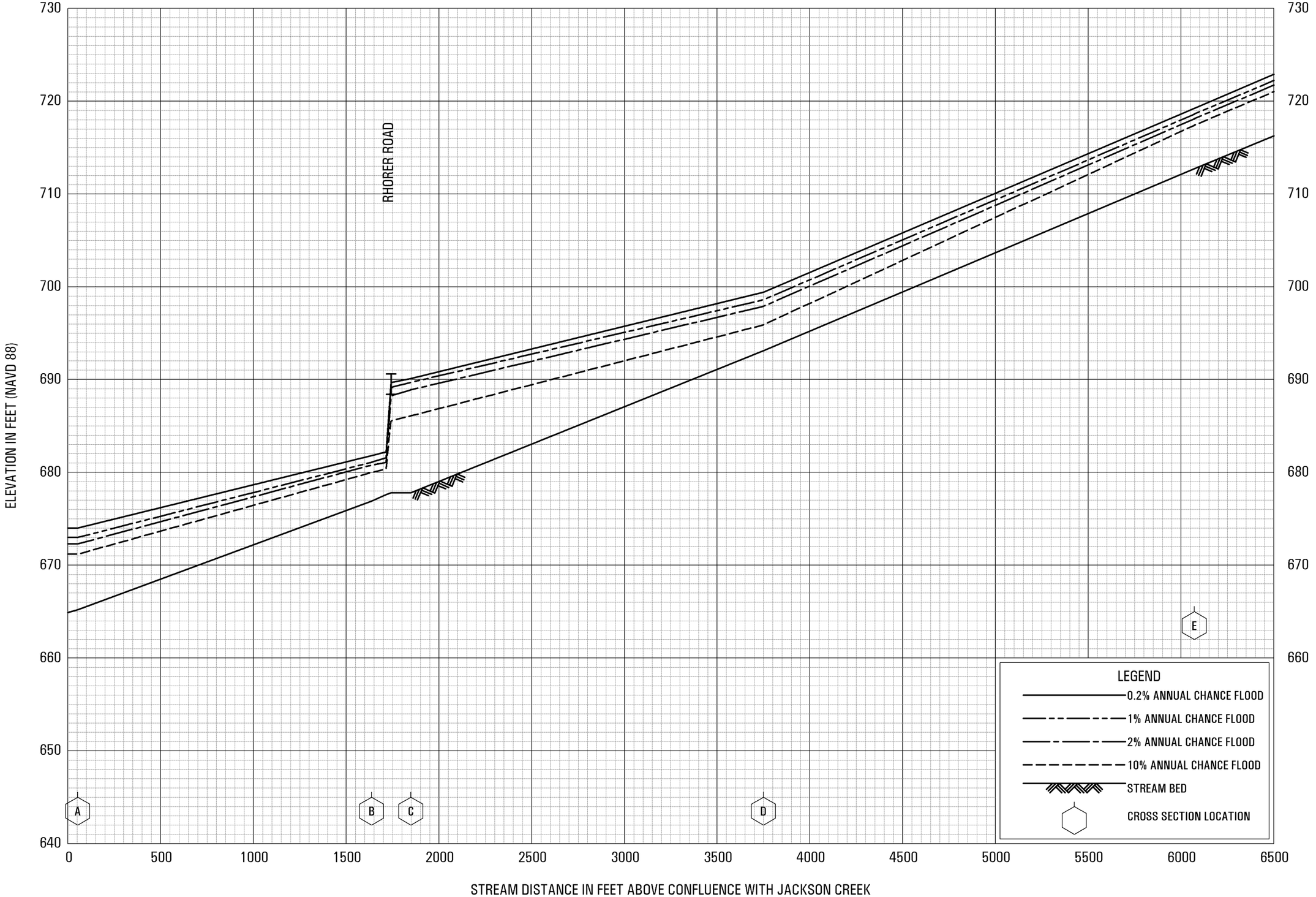
FLOOD PROFILES

EAST BRANCH JACKSON CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN

AND INCORPORATED AREAS



FLOOD PROFILES

EAST FORK JACKSON CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN

AND INCORPORATED AREAS

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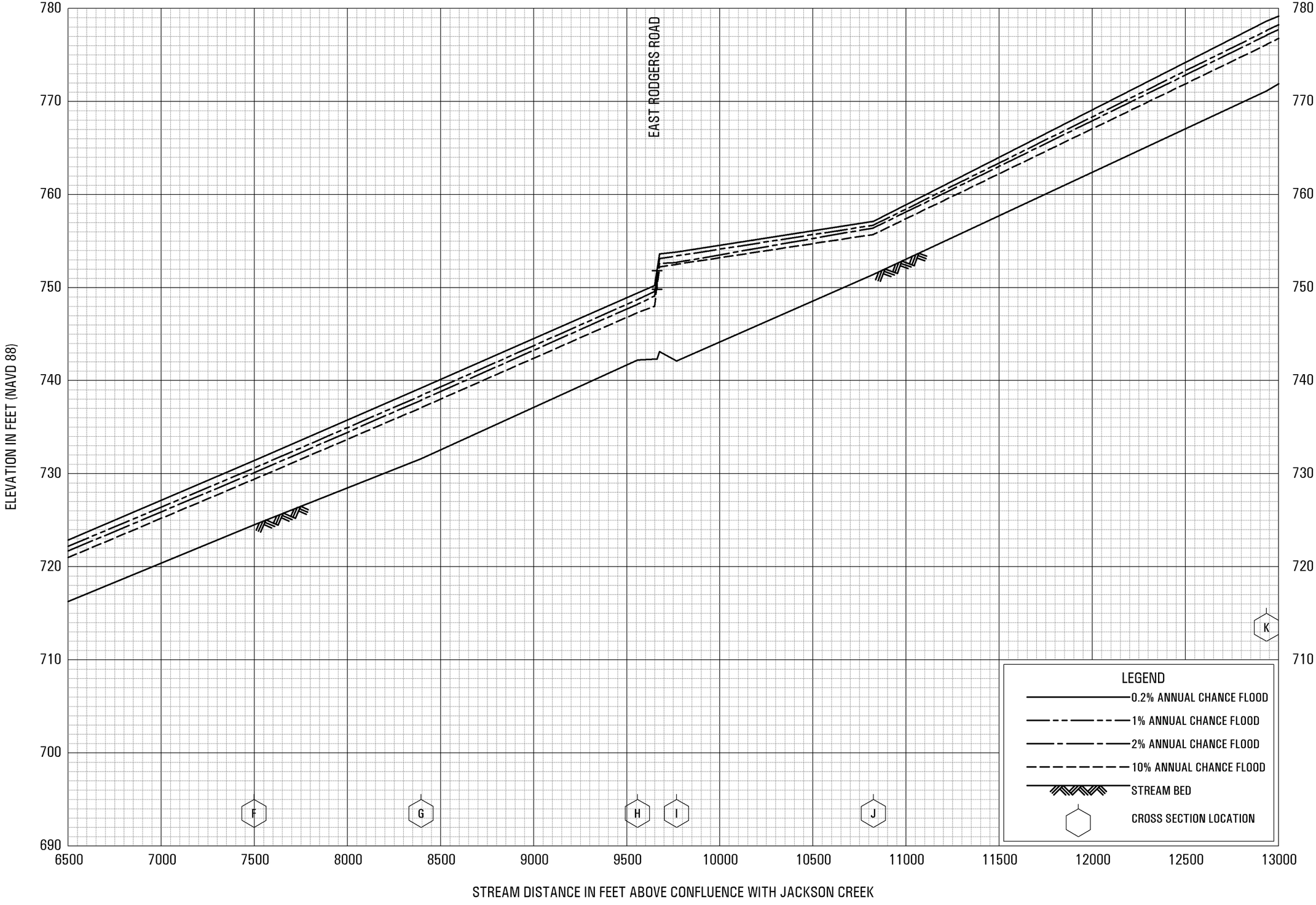


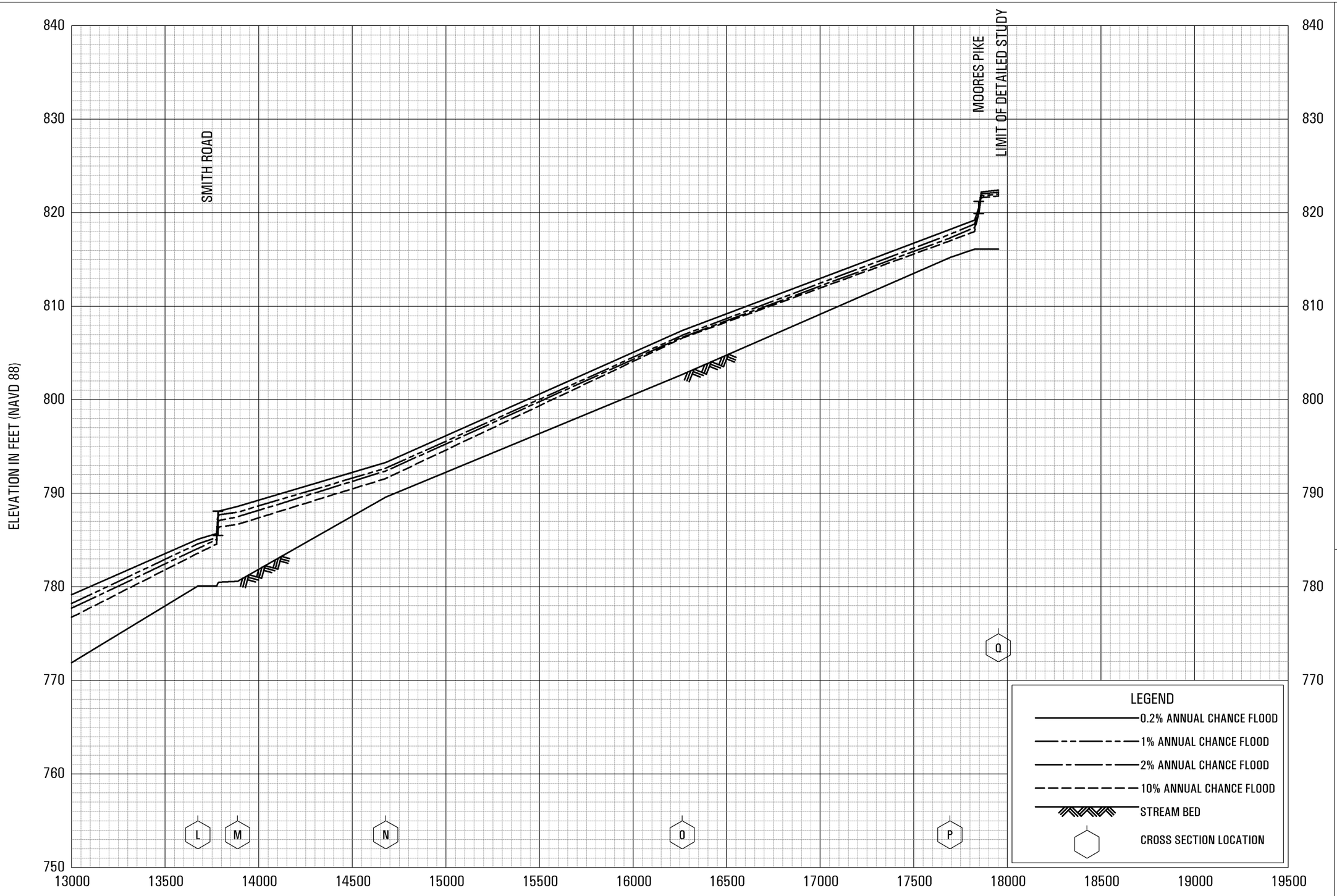
FLOOD PROFILES

EAST FORK JACKSON CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN

AND INCORPORATED AREAS



FLOOD PROFILES

EAST FORK JACKSON CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN

AND INCORPORATED AREAS

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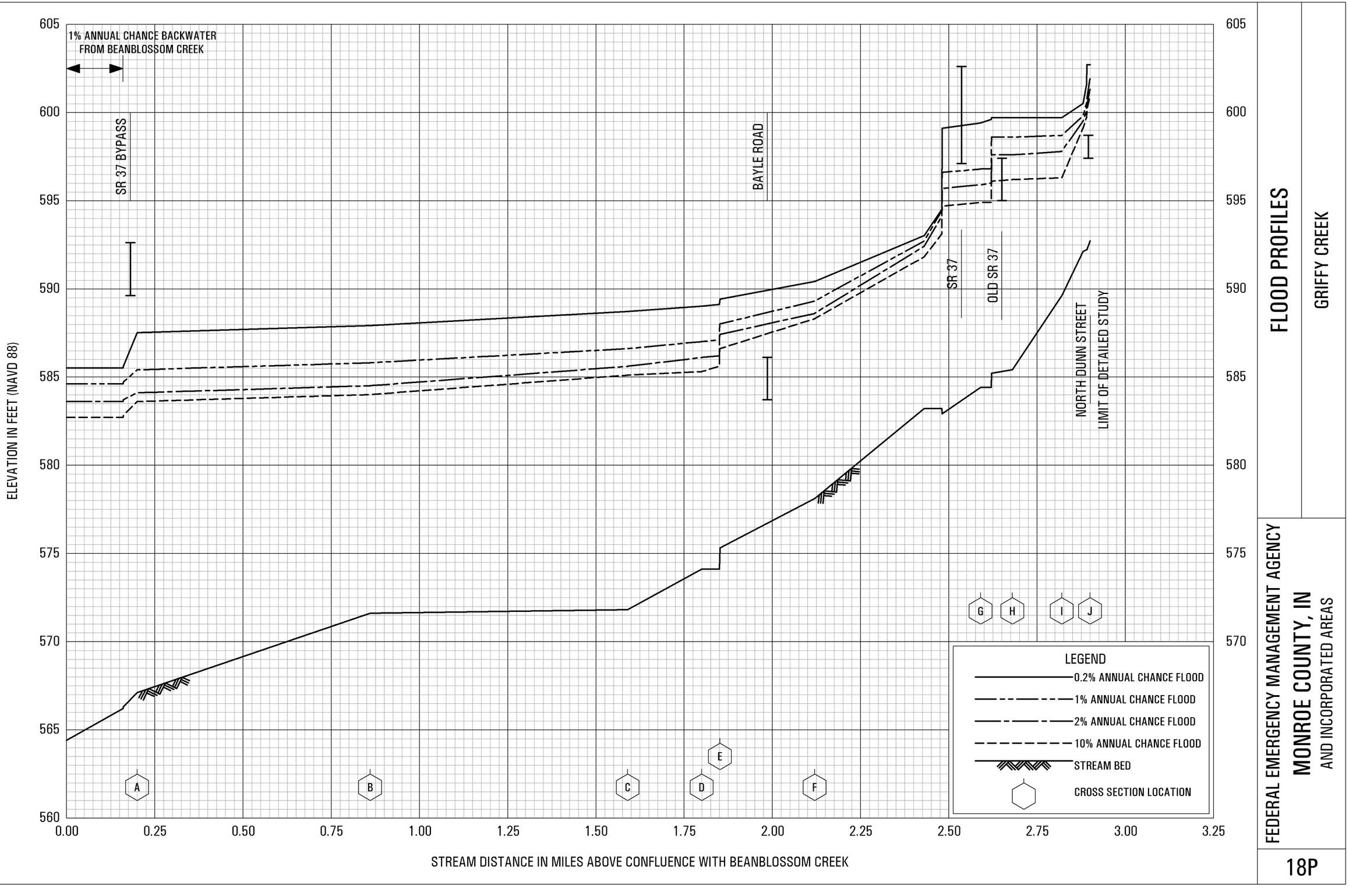

FLOOD PROFILES

GRIFFY CREEK

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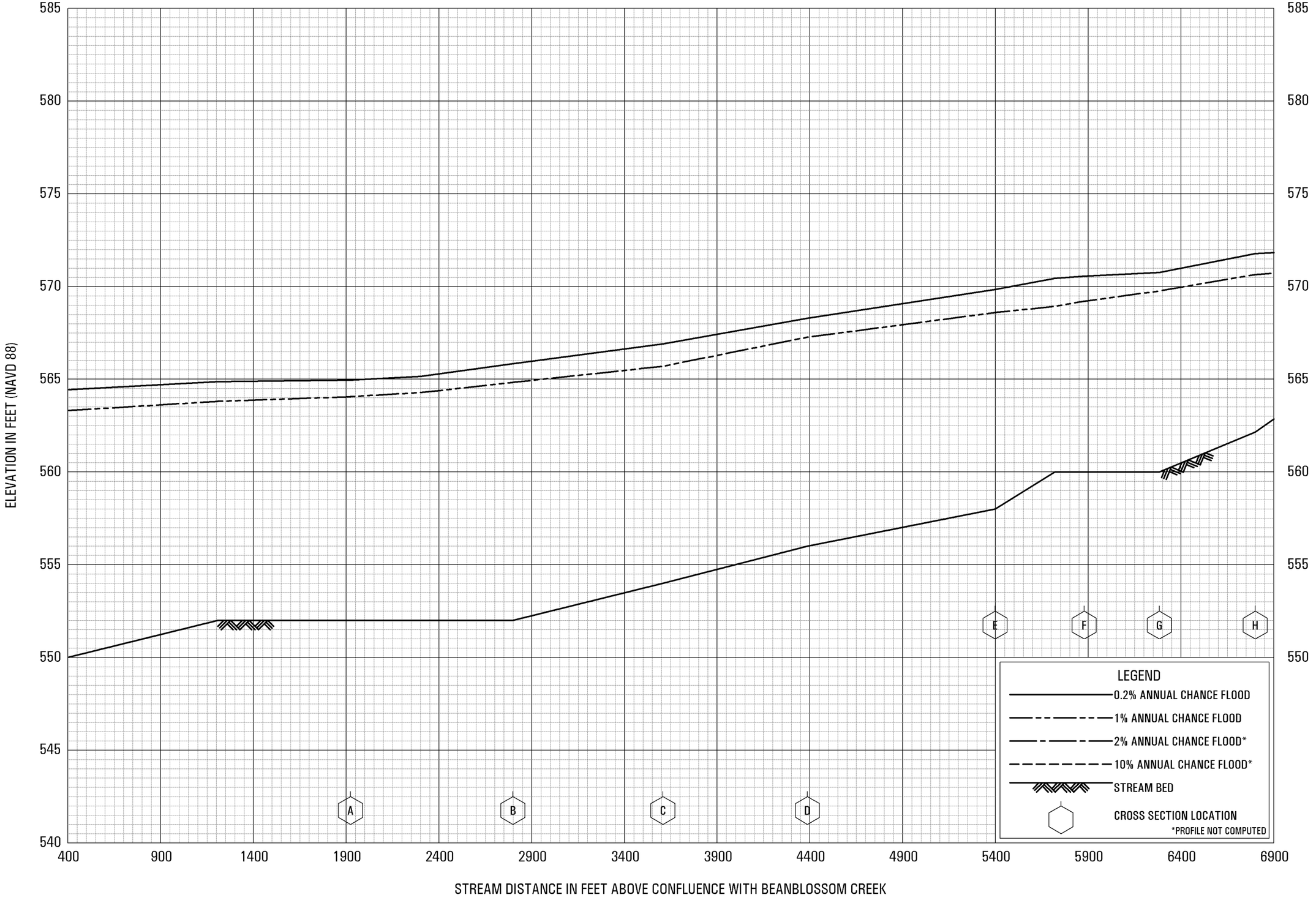


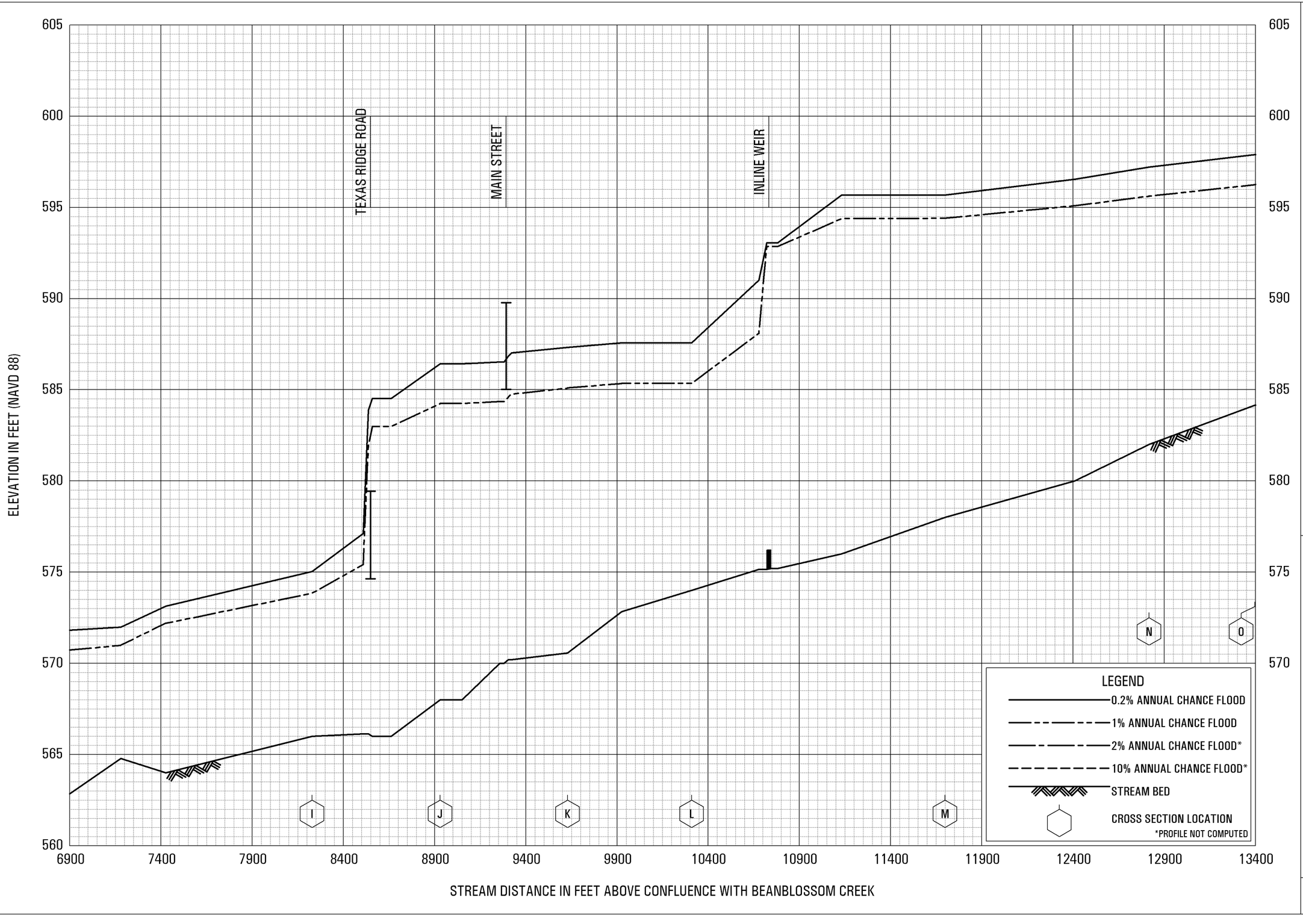
FLOOD PROFILES

JACKS DEFEAT CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN

AND INCORPORATED AREAS



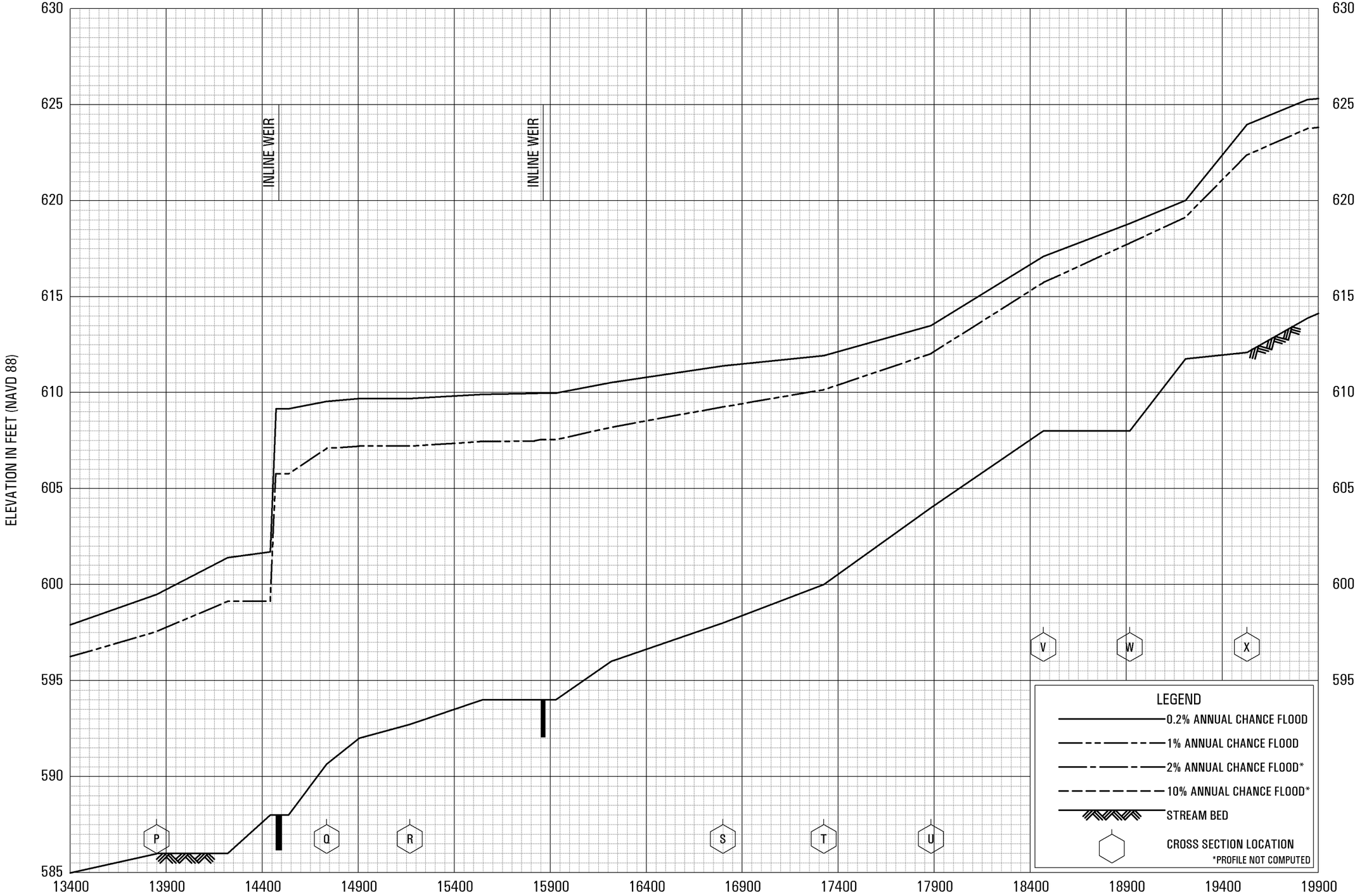
FLOOD PROFILES

JACKS DEFEAT CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN

AND INCORPORATED AREAS



FLOOD PROFILES

JACKS DEFEAT CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN

AND INCORPORATED AREAS

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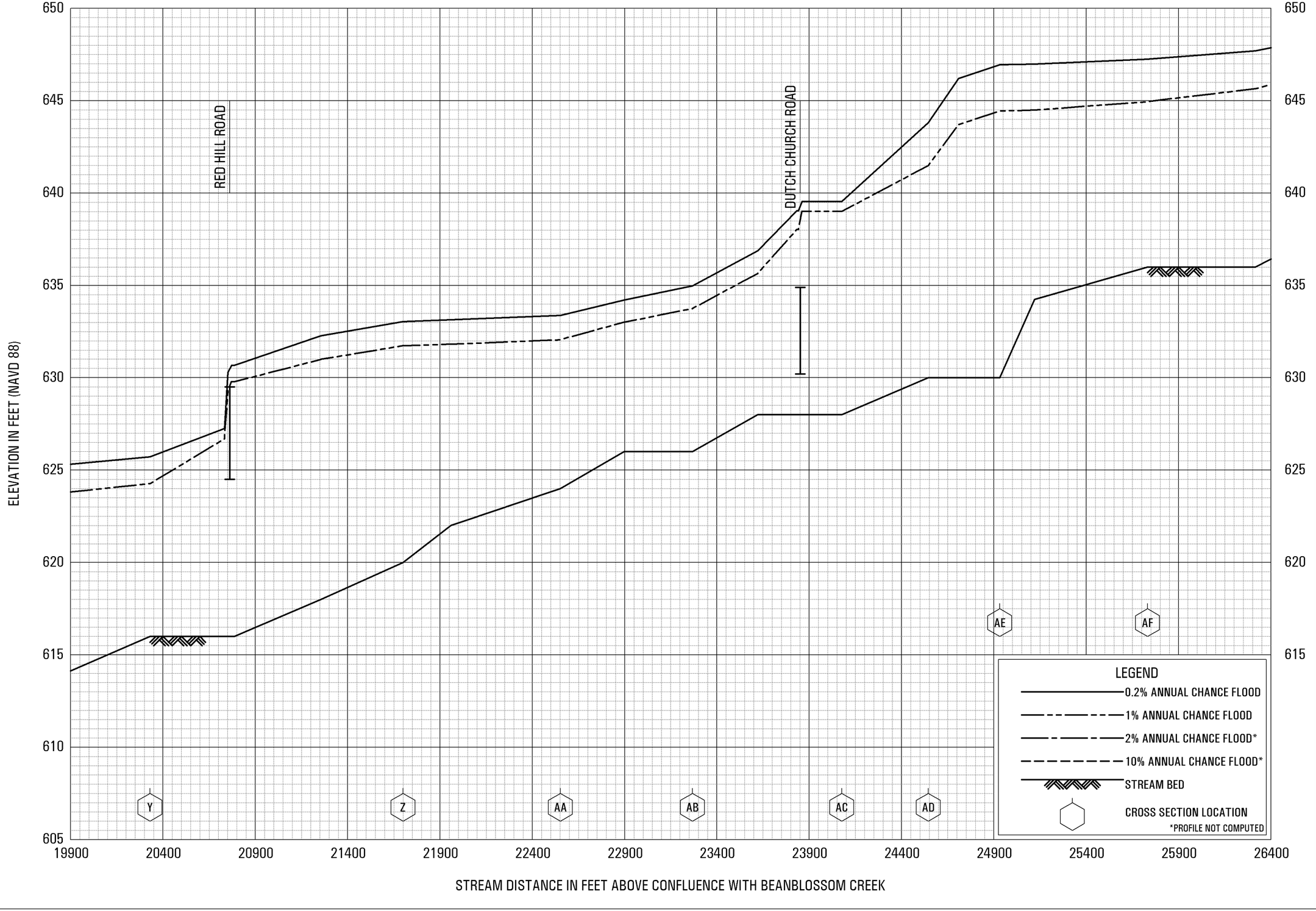

FLOOD PROFILES

JACKS DEFEAT CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN

AND INCORPORATED AREAS

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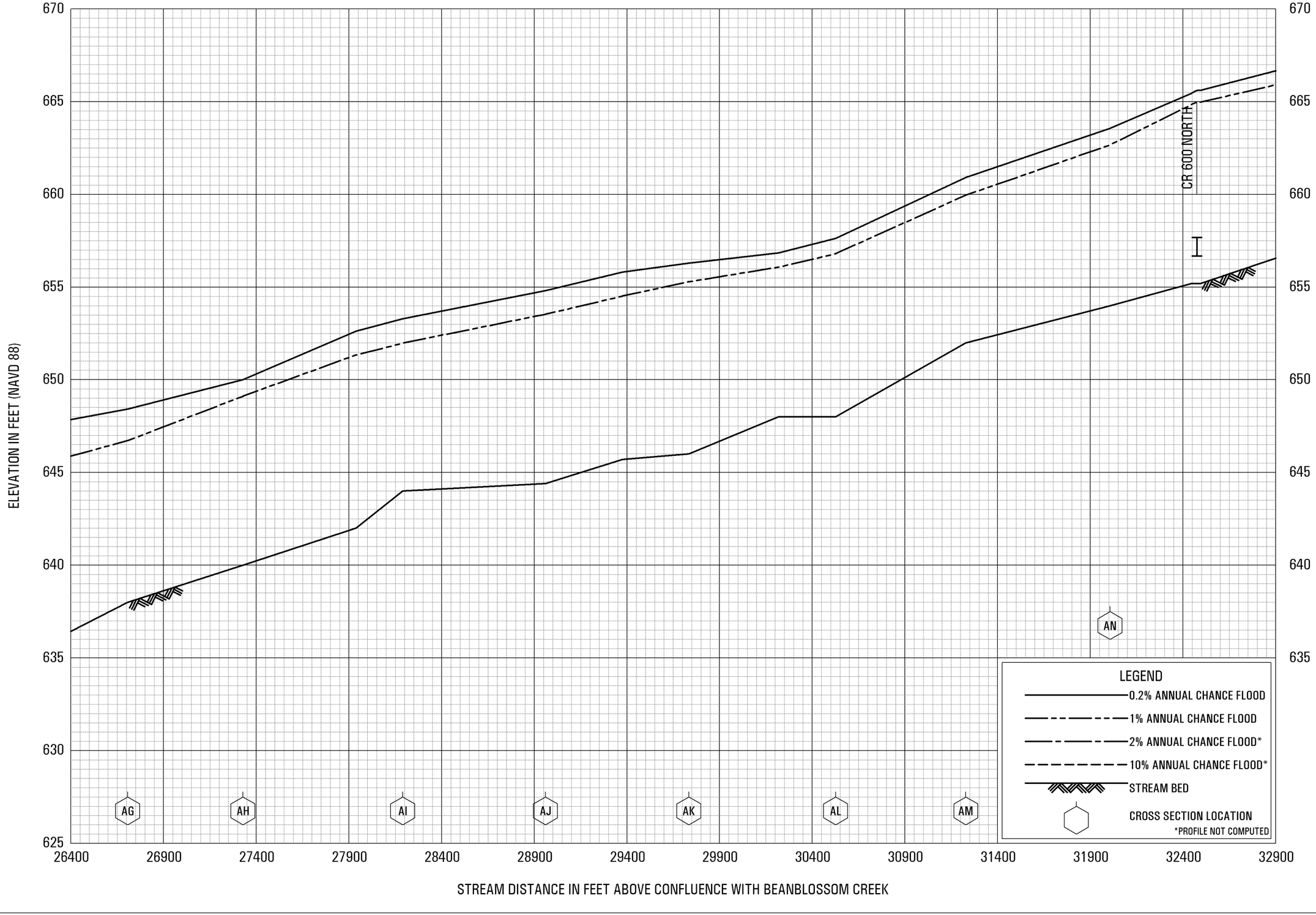


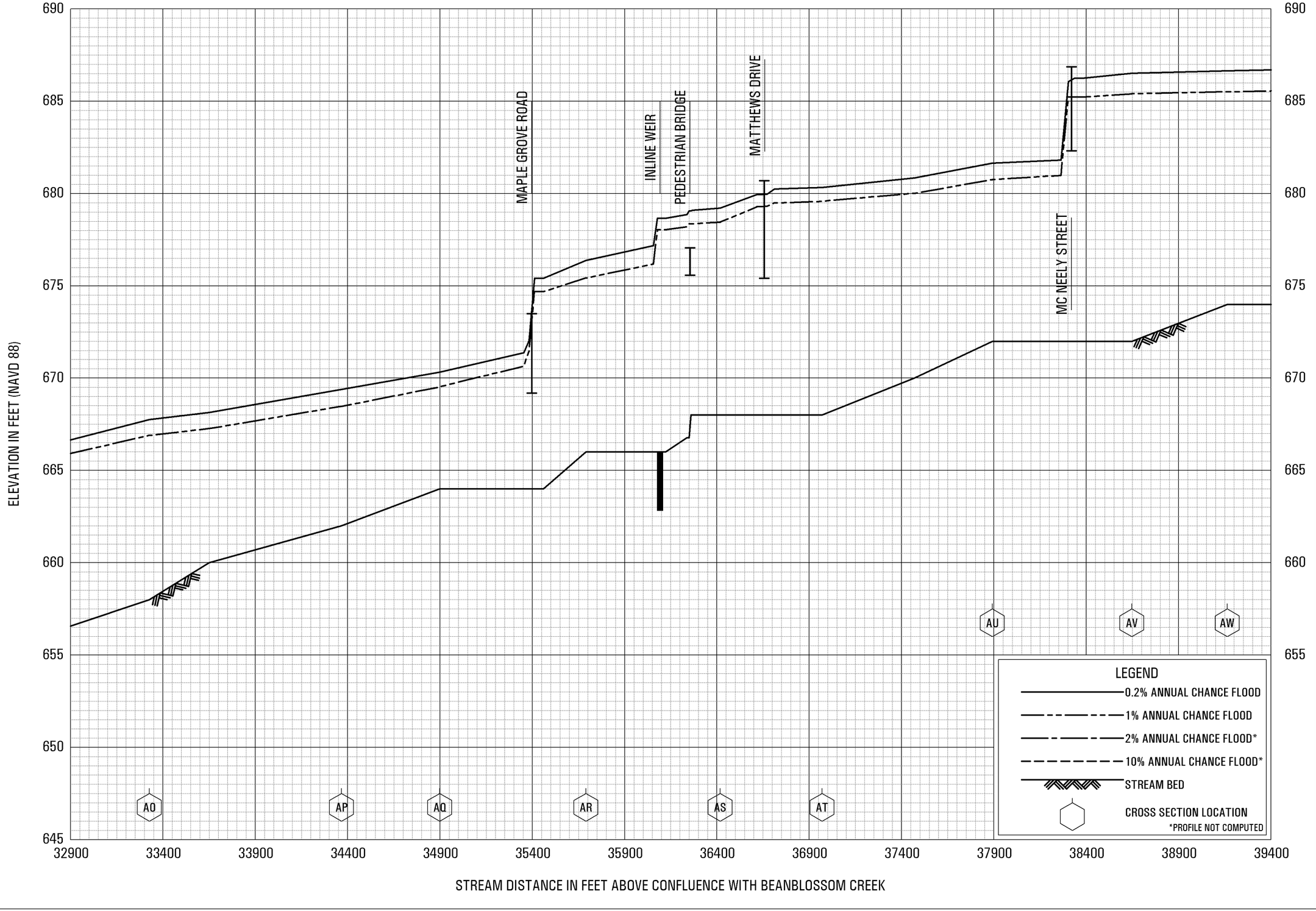
FLOOD PROFILES

JACKS DEFEAT CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN

AND INCORPORATED AREAS



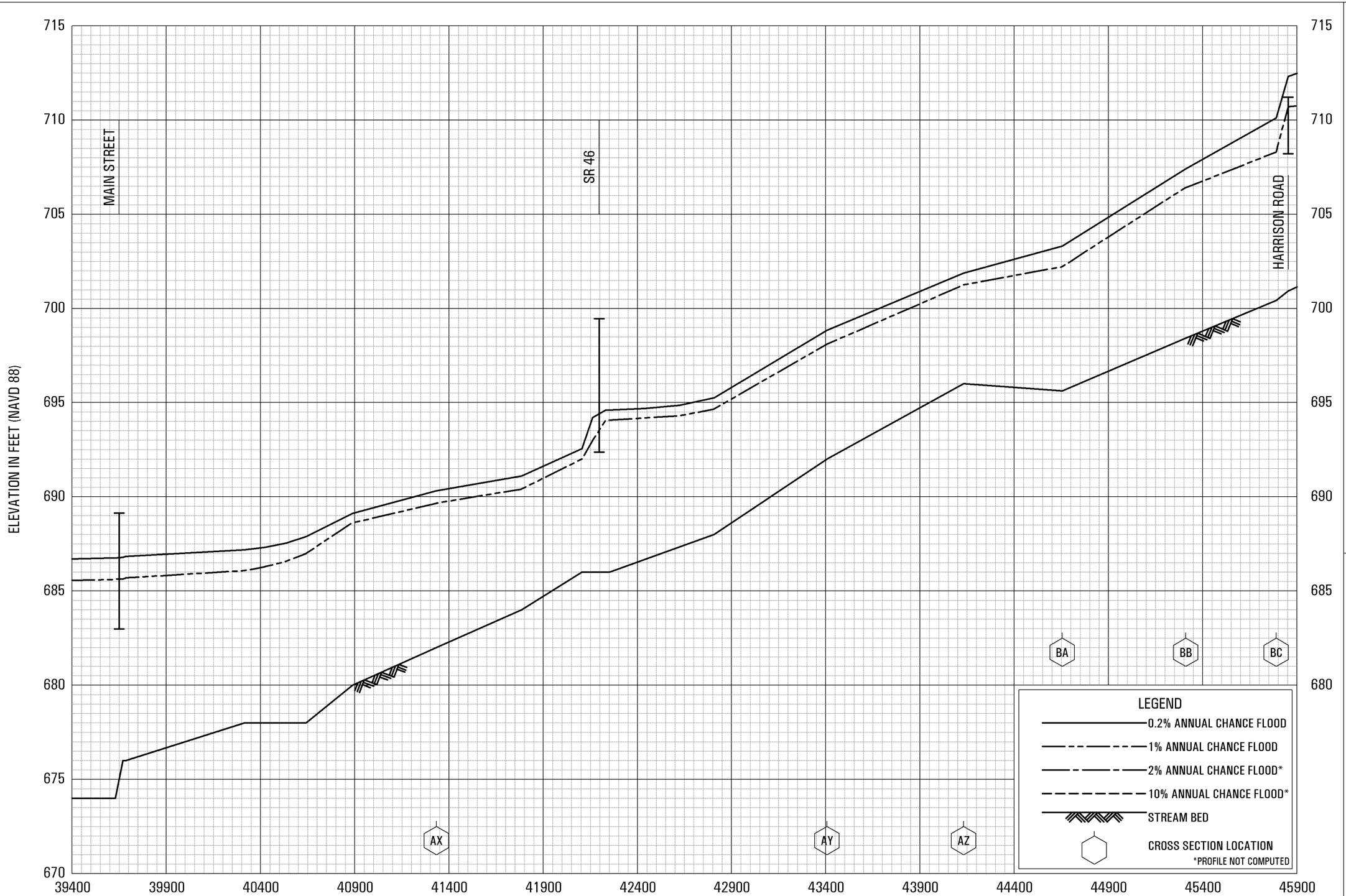
FLOOD PROFILES

JACKS DEFEAT CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN

AND INCORPORATED AREAS



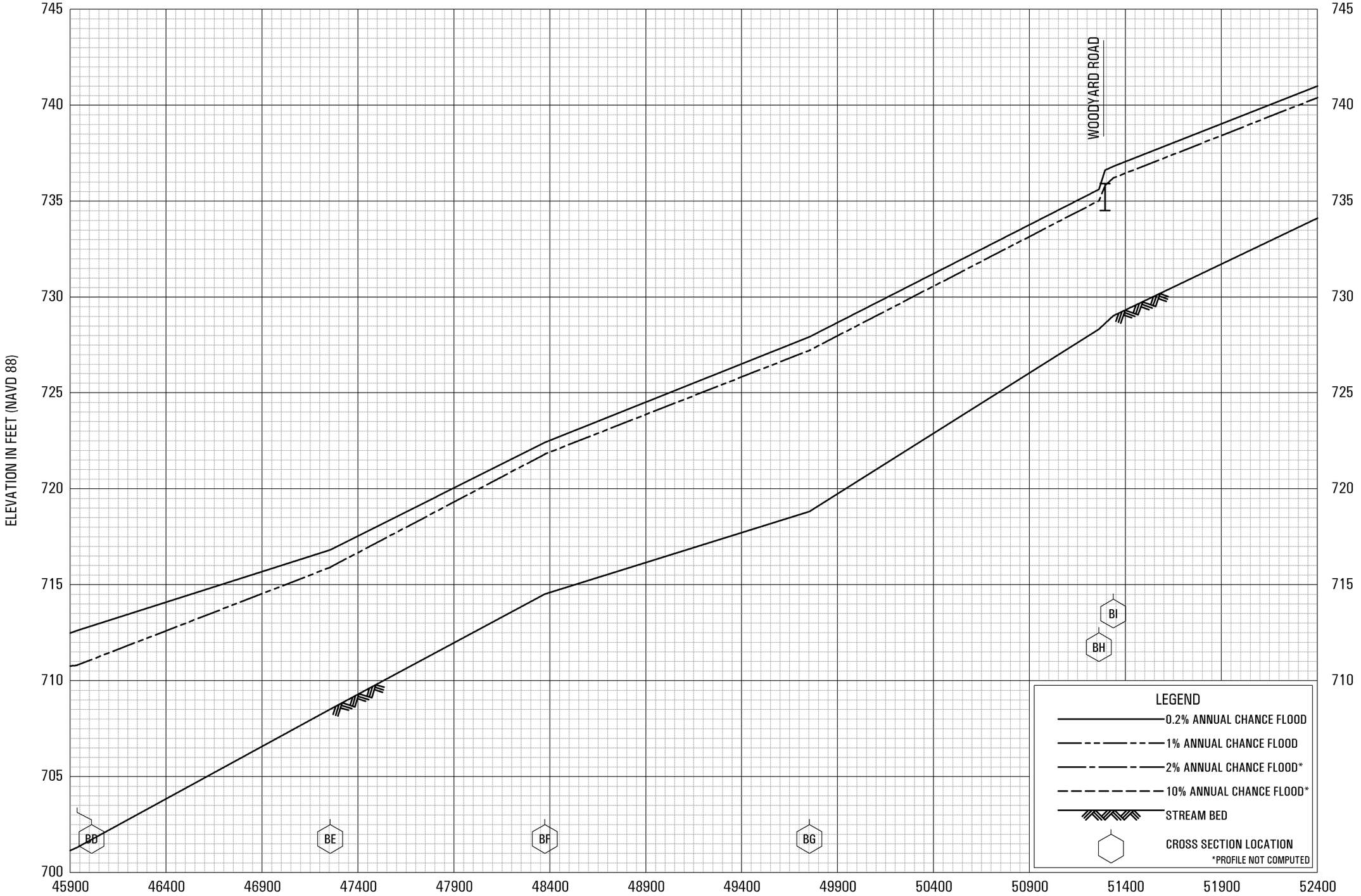
FLOOD PROFILES

JACKS DEFEAT CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN

AND INCORPORATED AREAS



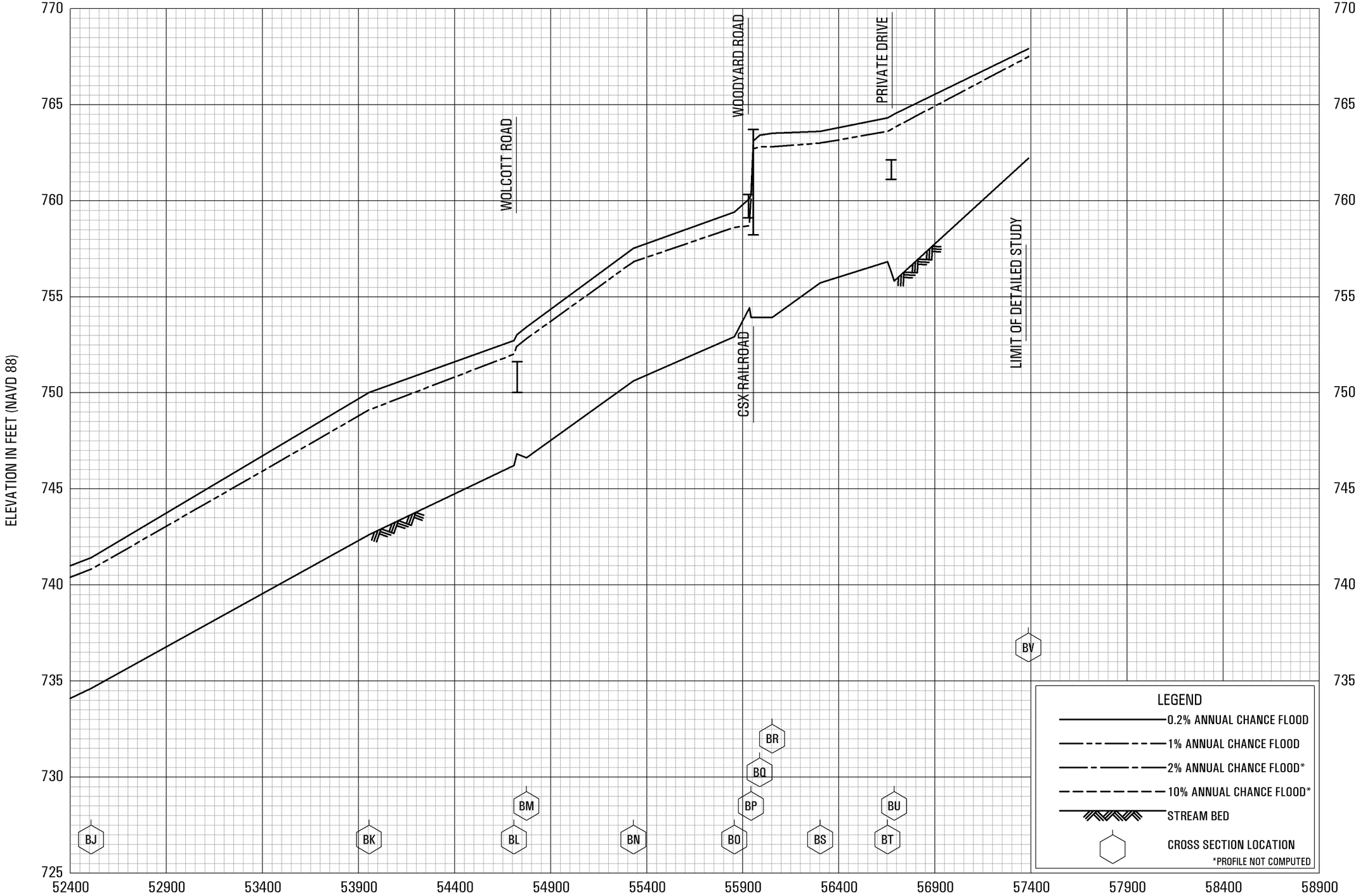
FLOOD PROFILES

JACKS DEFEAT CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN

AND INCORPORATED AREAS



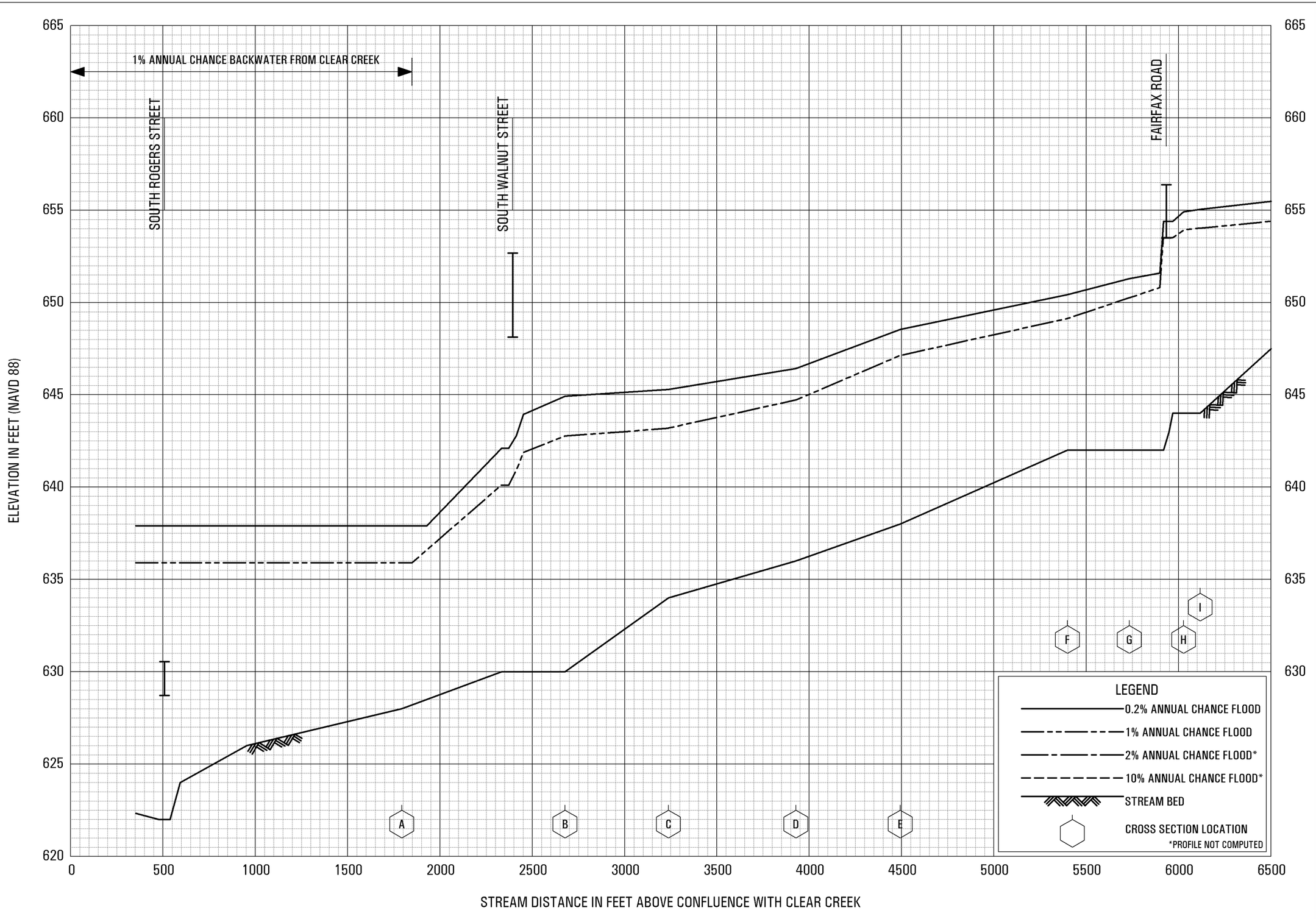
FLOOD PROFILES

JACKS DEFEAT CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN

AND INCORPORATED AREAS



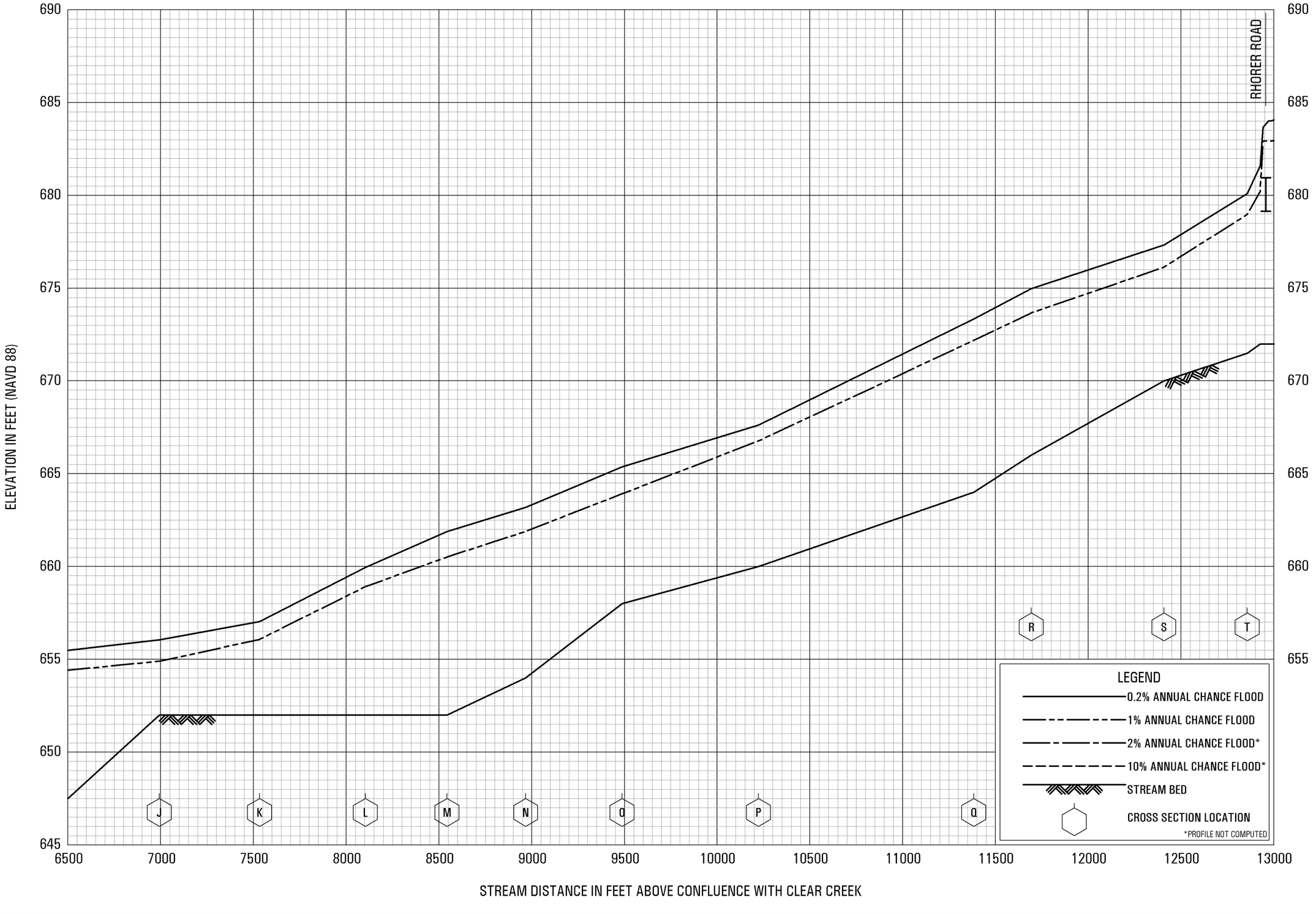
FLOOD PROFILES

JACKSON CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN

AND INCORPORATED AREAS



FLOOD PROFILES

JACKSON CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN

AND INCORPORATED AREAS

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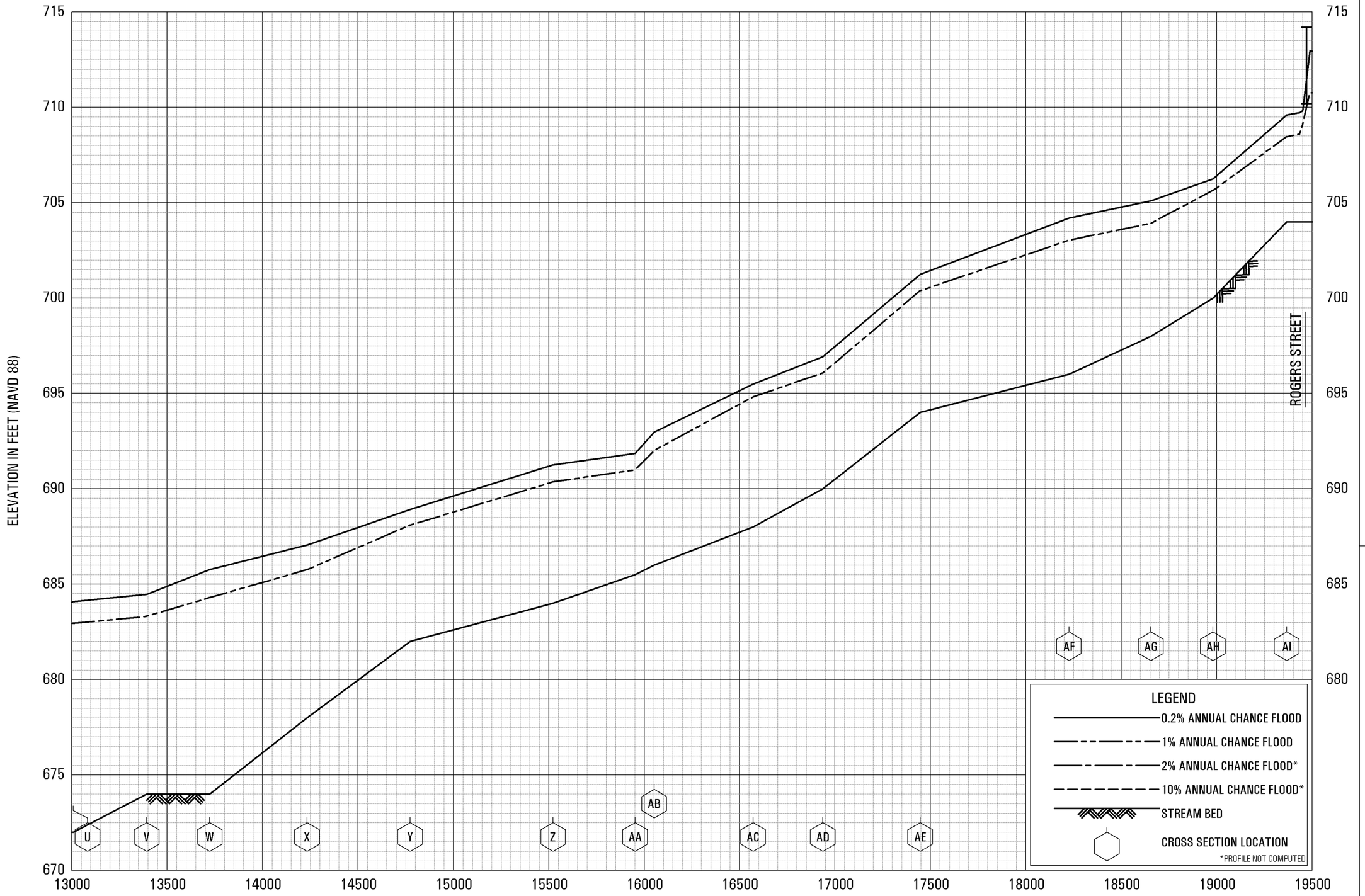


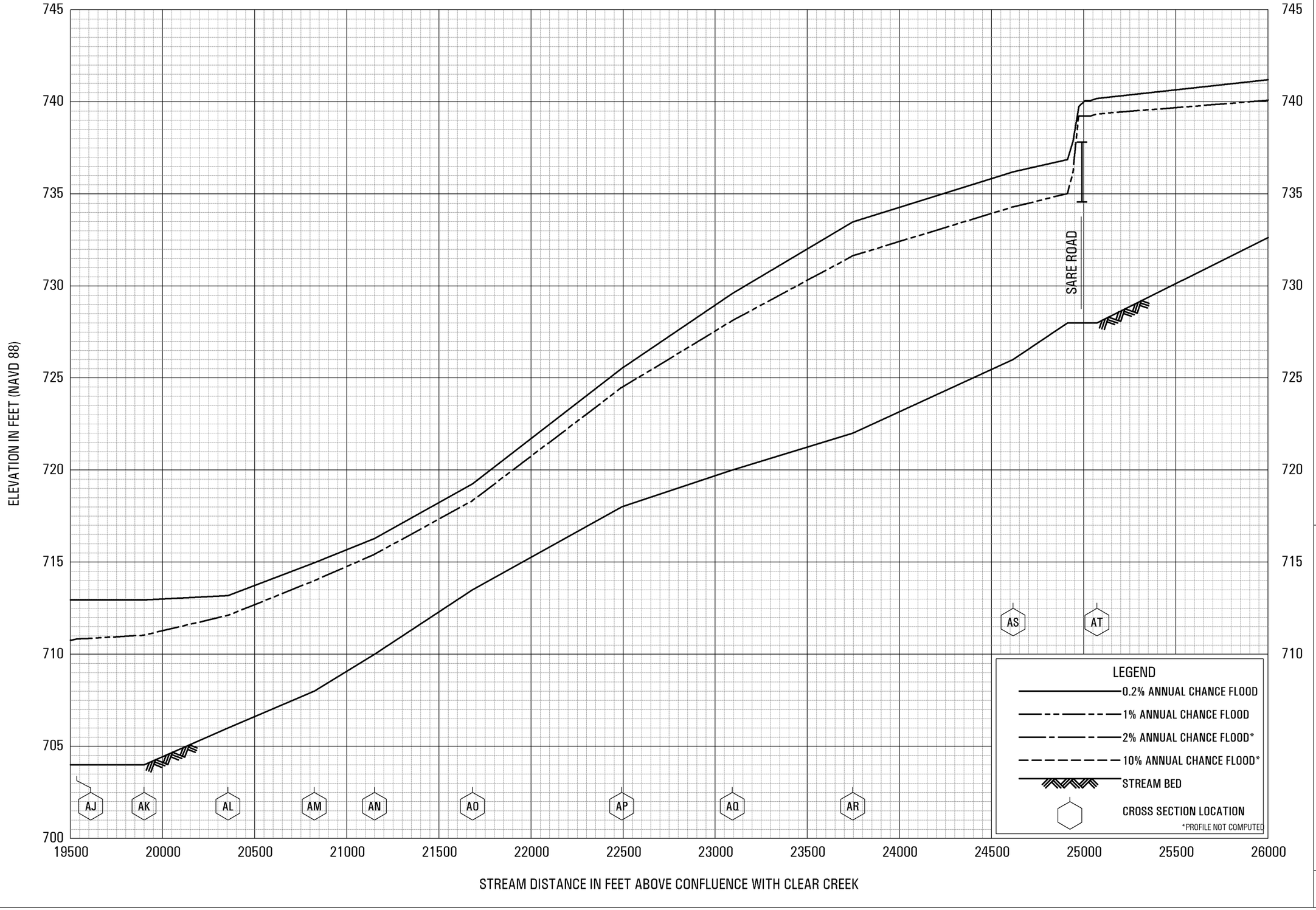
FLOOD PROFILES

JACKSON CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN

AND INCORPORATED AREAS



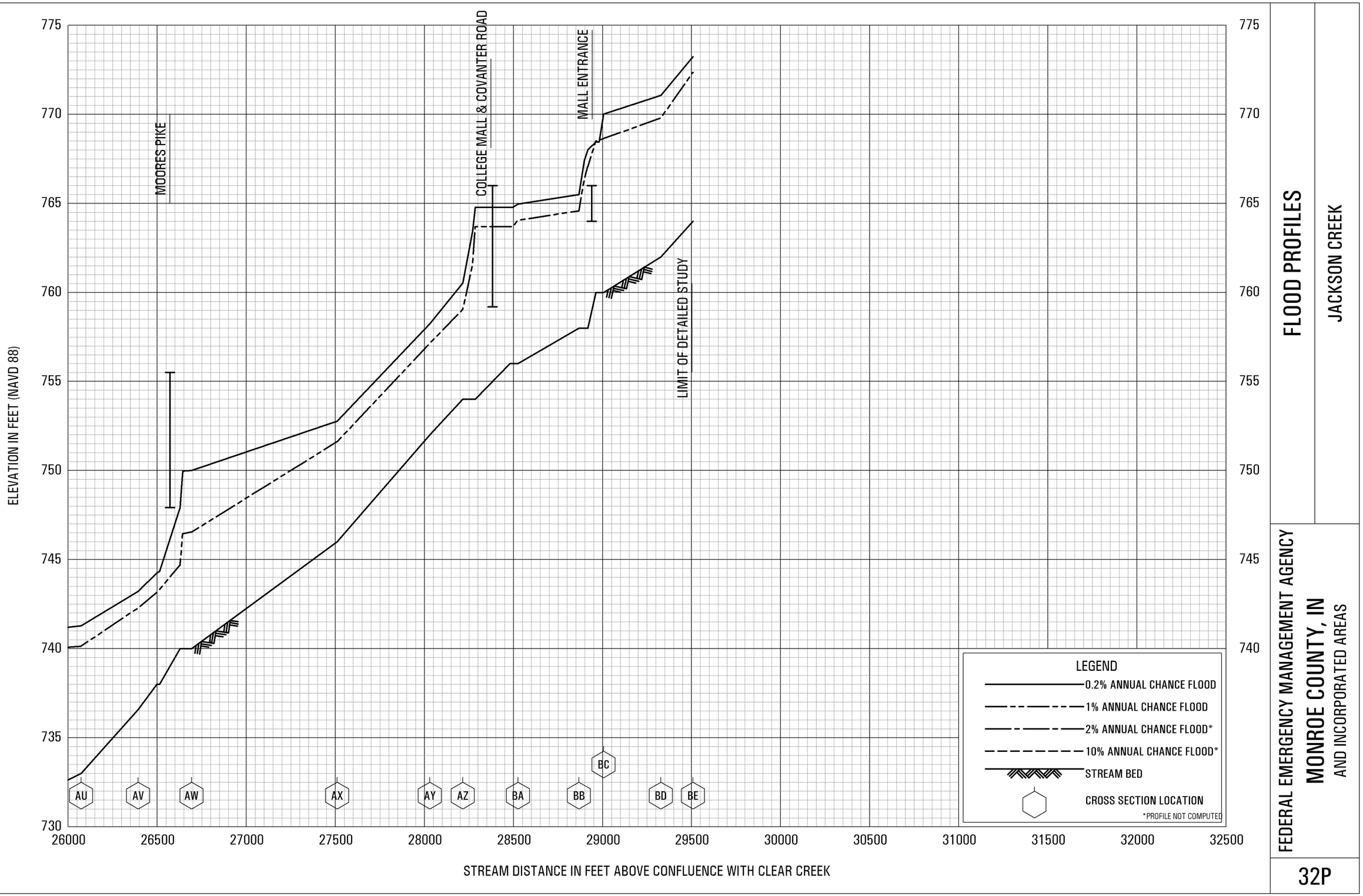
FLOOD PROFILES

JACKSON CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN

AND INCORPORATED AREAS



FLOOD PROFILES

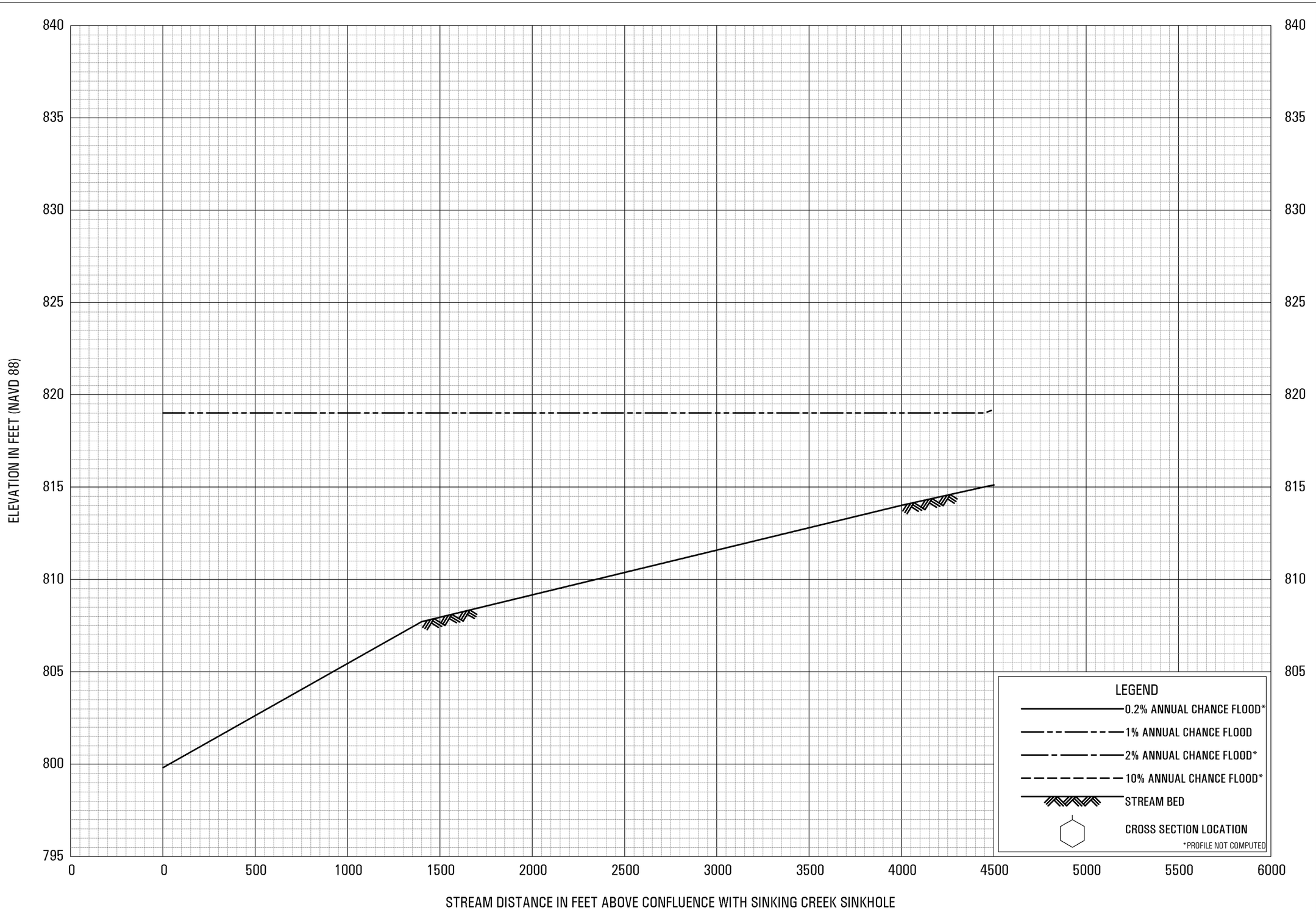
JACKSON CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN

AND INCORPORATED AREAS

32P



FLOOD PROFILES

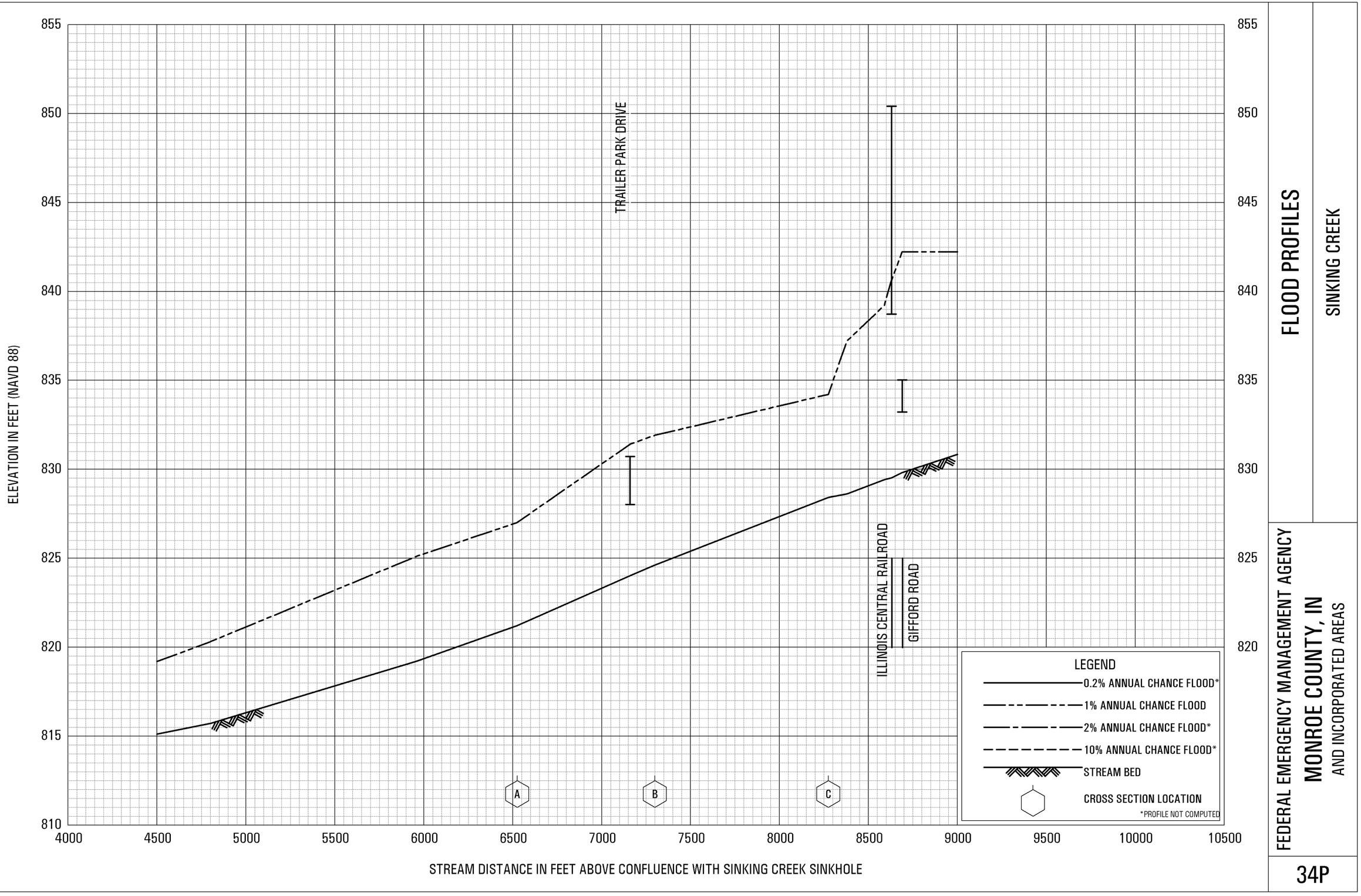
SINKING CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN

AND INCORPORATED AREAS

33P



FLOOD PROFILES

SINKING CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN

AND INCORPORATED AREAS

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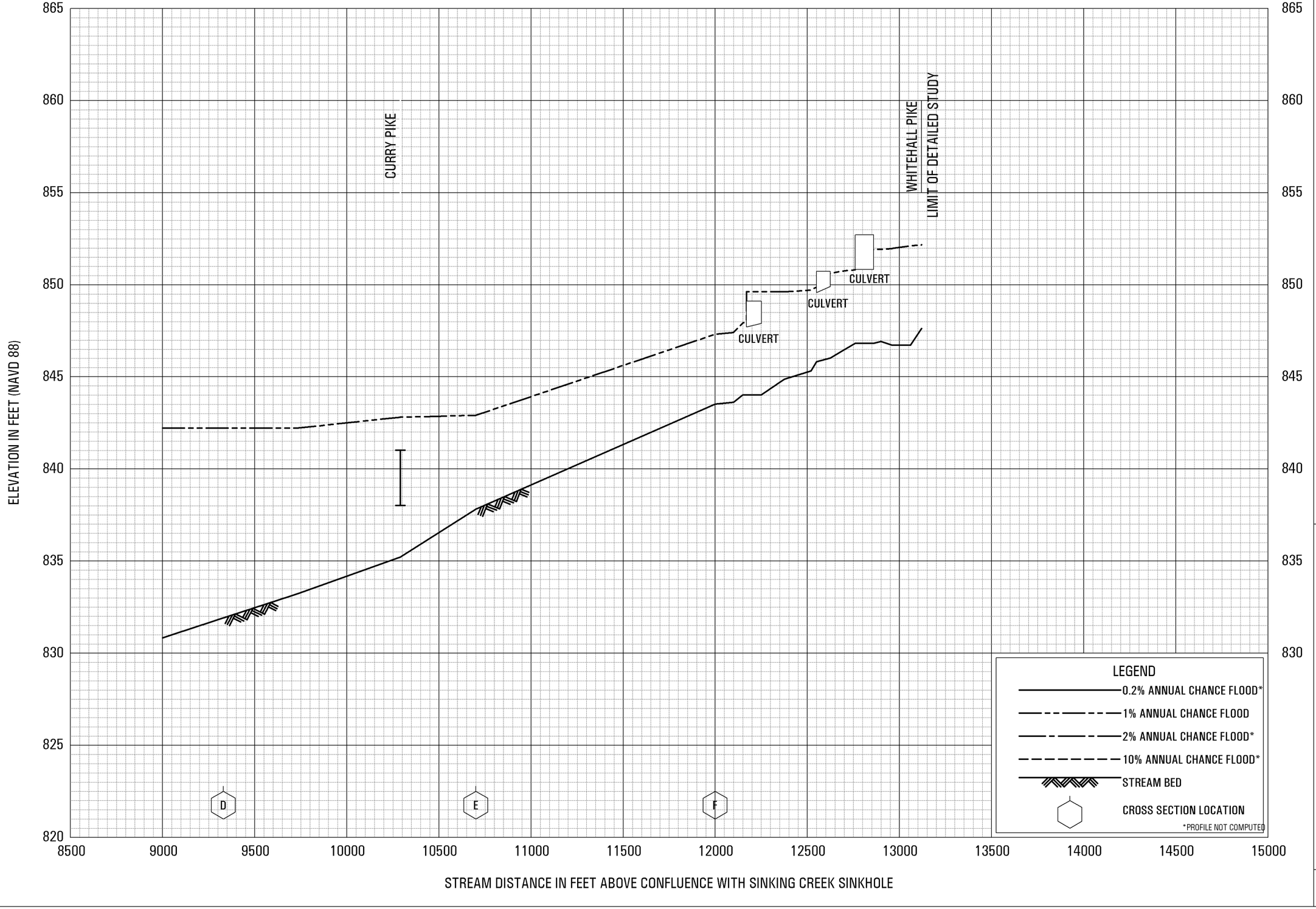


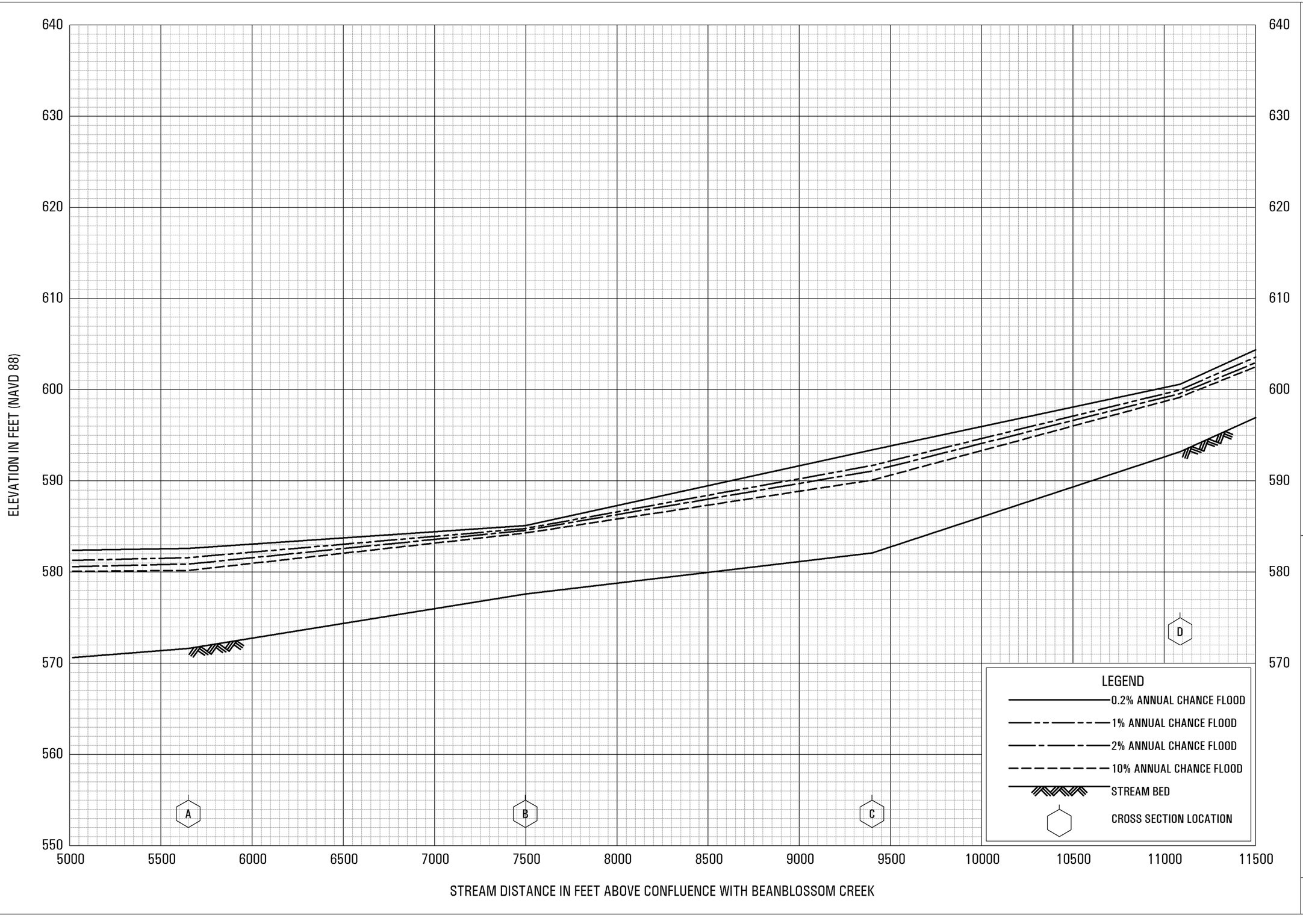
FLOOD PROFILES

SINKING CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN

AND INCORPORATED AREAS



FLOOD PROFILES

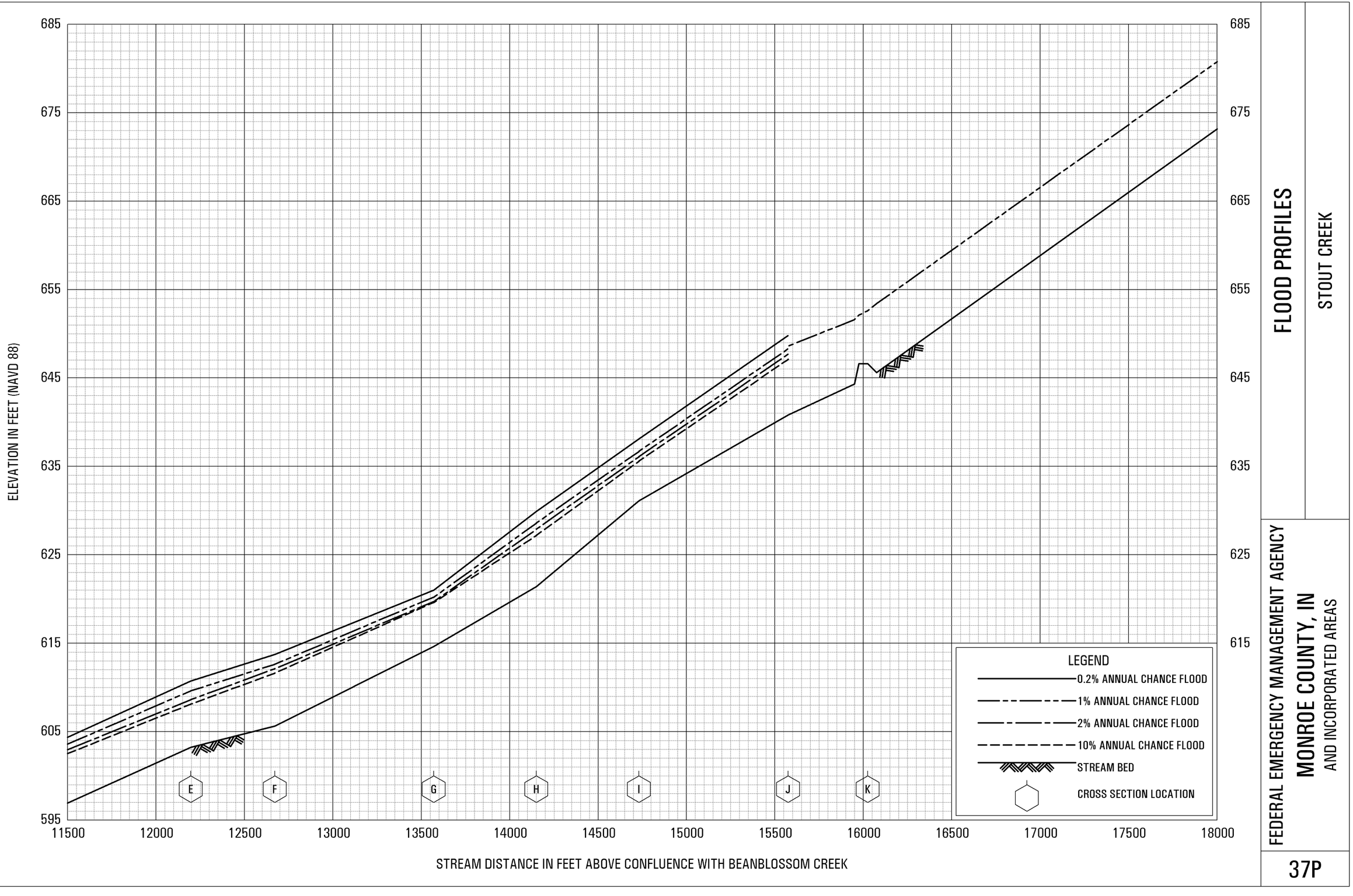
STOUT CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN

AND INCORPORATED AREAS

36P



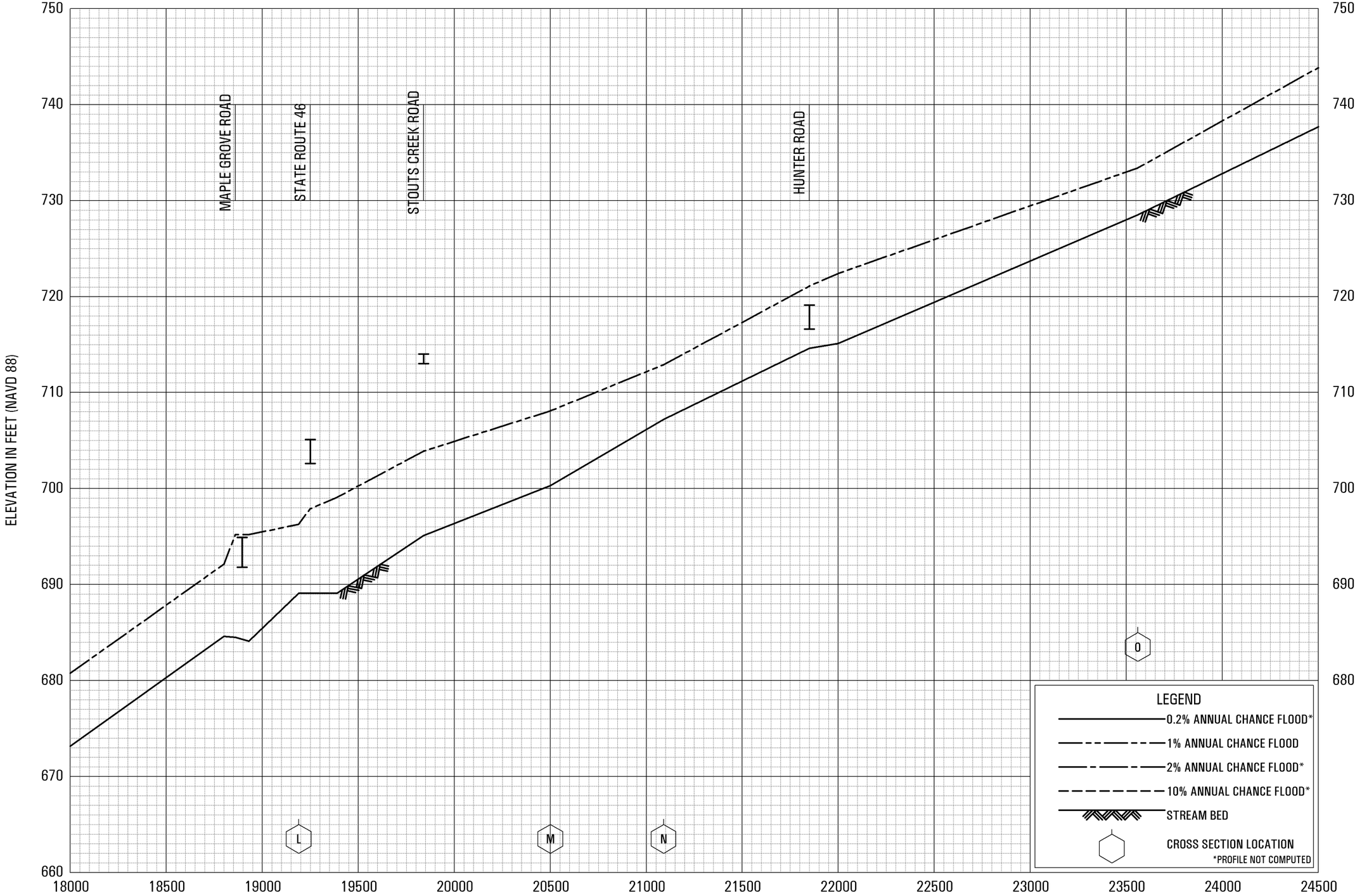
FLOOD PROFILES

STOUT CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN

AND INCORPORATED AREAS



FLOOD PROFILES

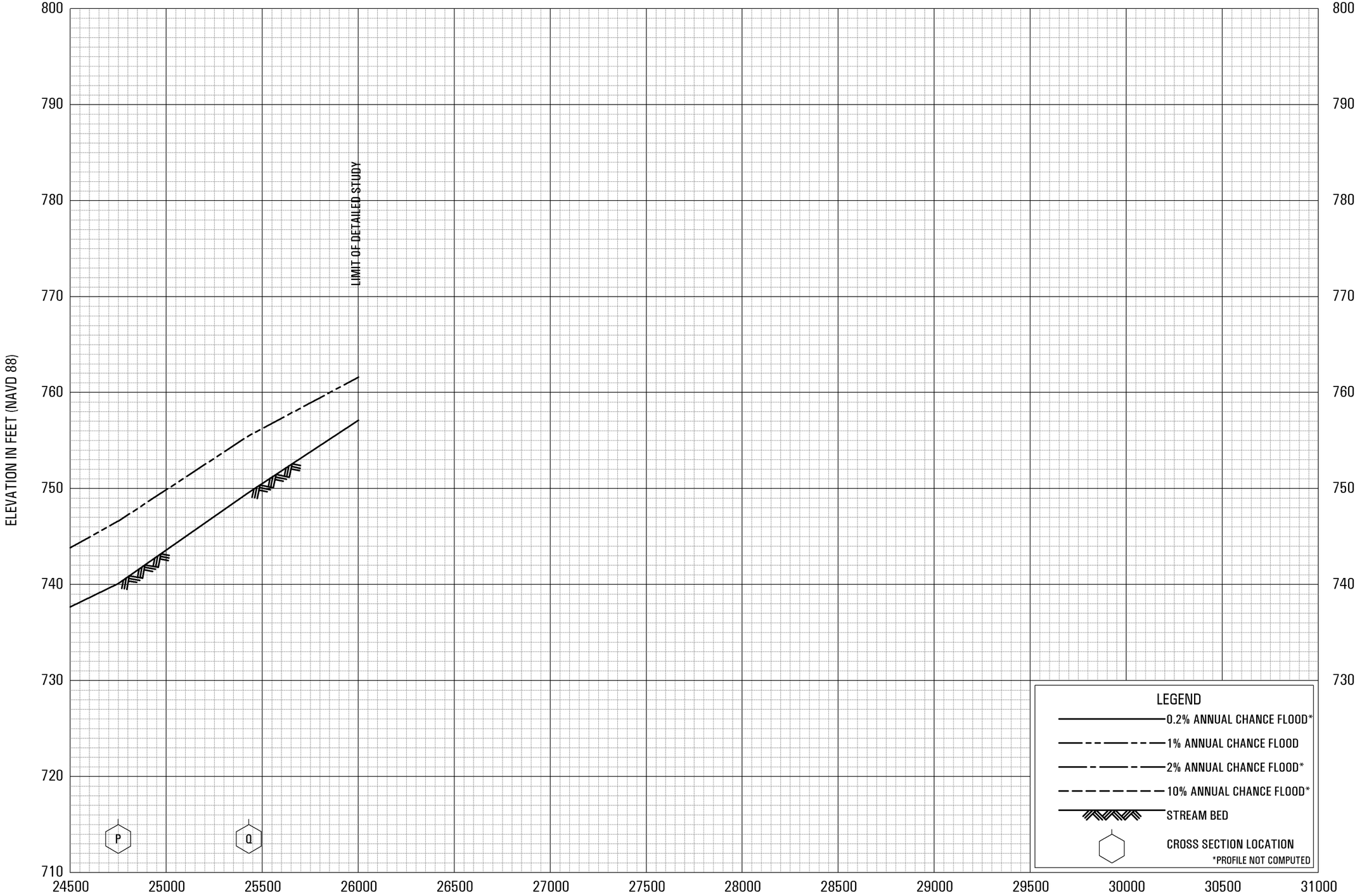
STOUT CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN

AND INCORPORATED AREAS

38P



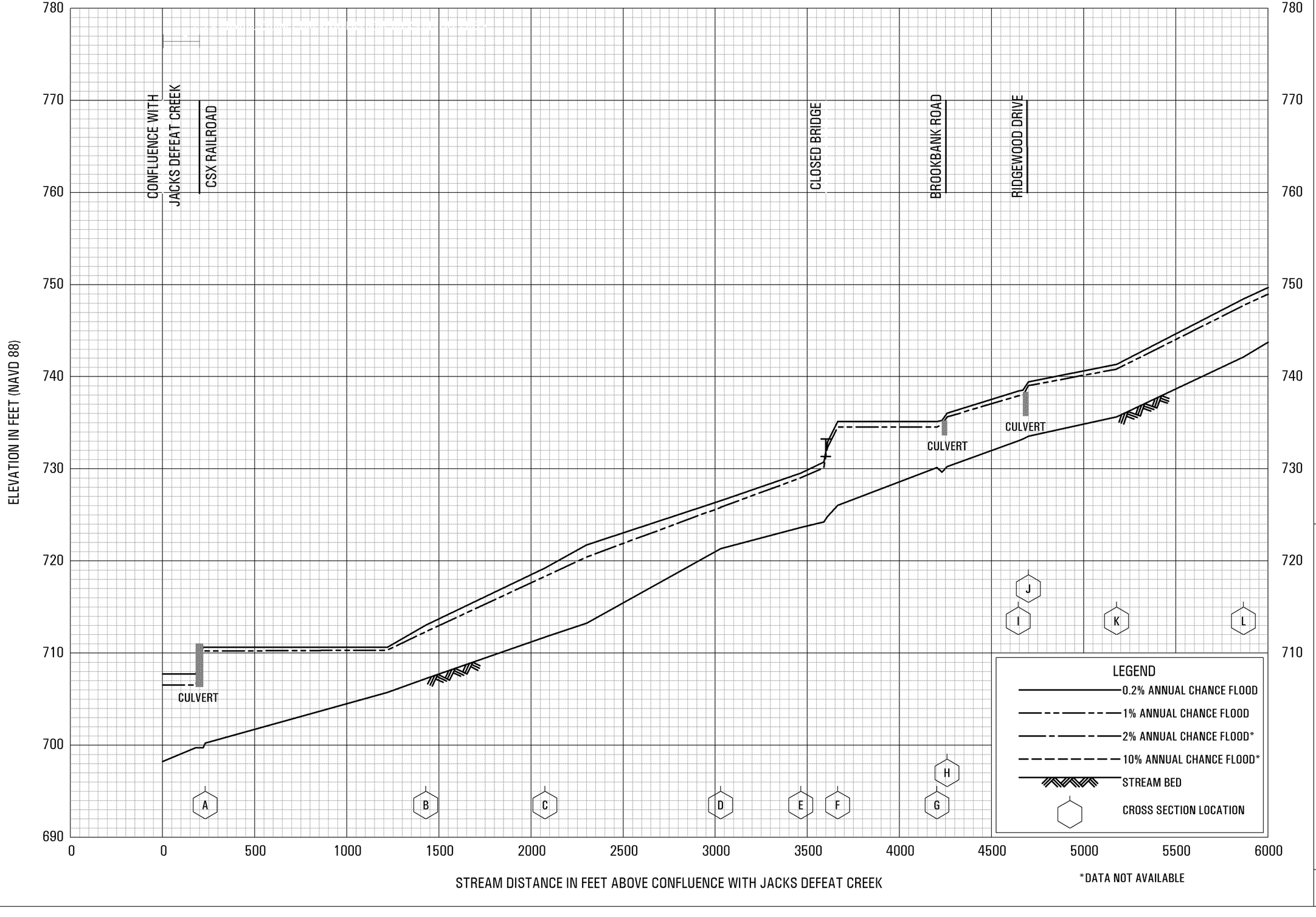
FLOOD PROFILES

STOUT CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN

AND INCORPORATED AREAS



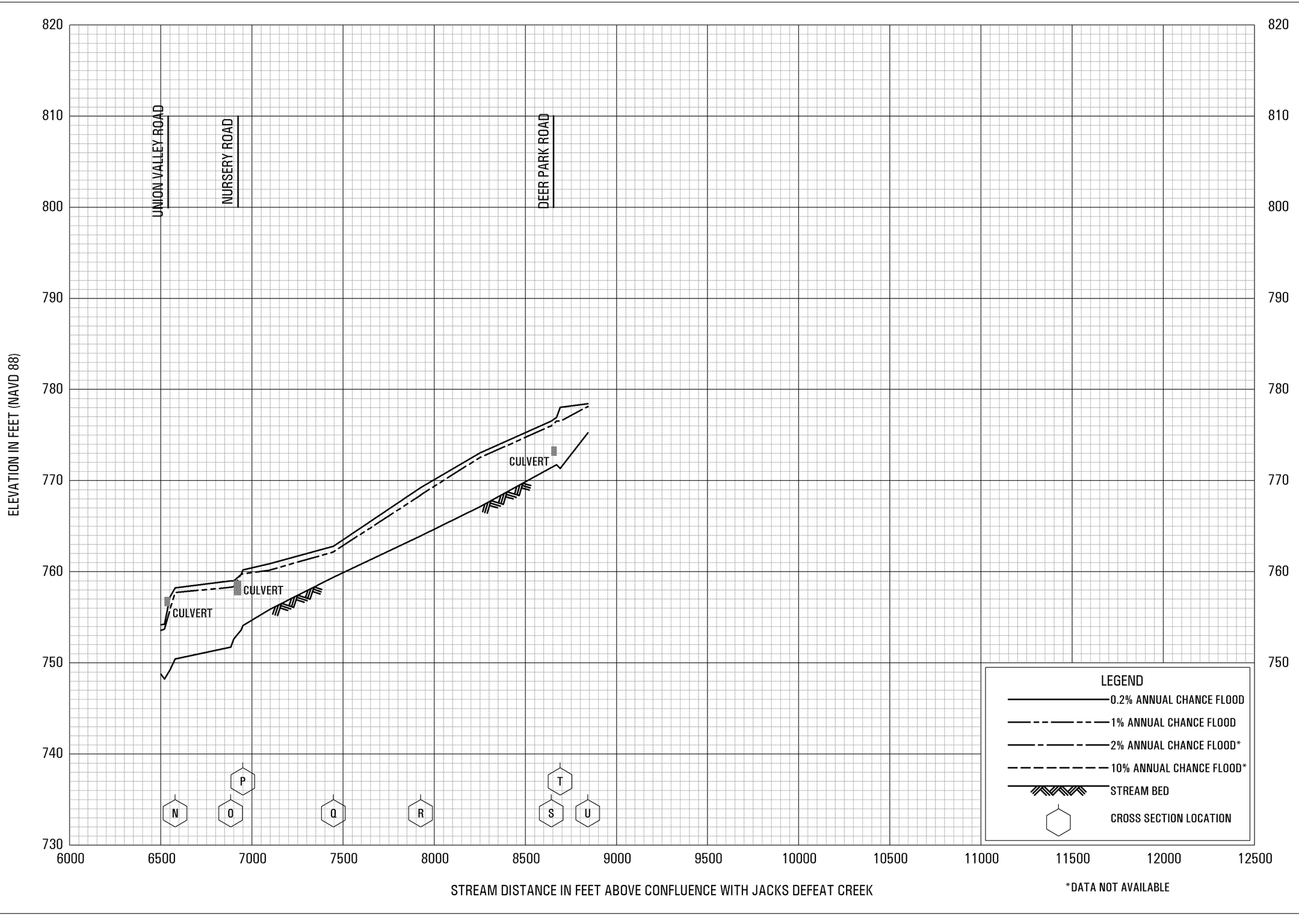
FLOOD PROFILES

UNNAMED TRIBUTARY TO JACKS DEFEAT CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN

AND INCORPORATED AREAS



FLOOD PROFILES

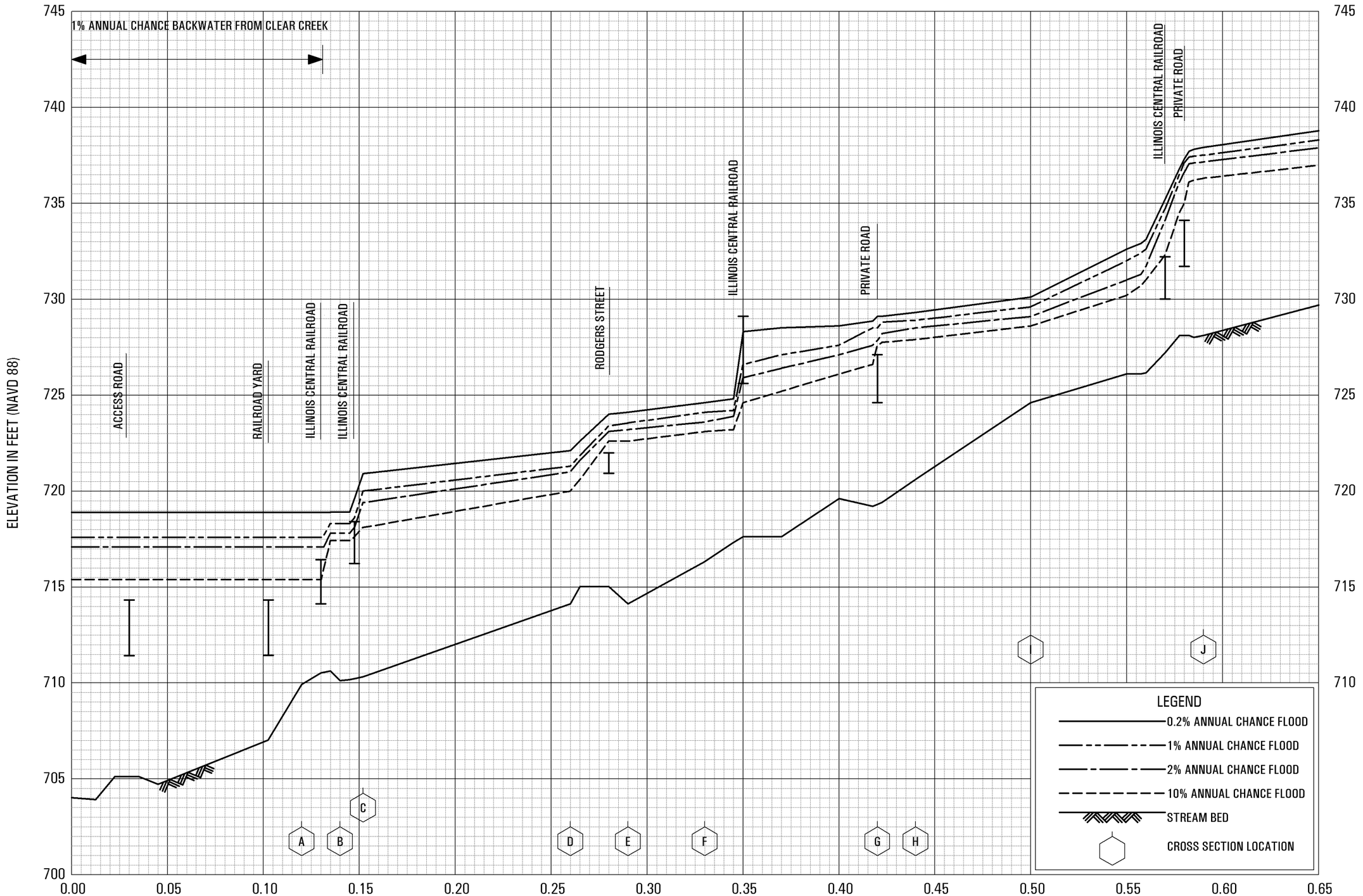
UNNAMED TRIBUTARY TO JACKS DEFEAT CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN

AND INCORPORATED AREAS

41P



FLOOD PROFILES

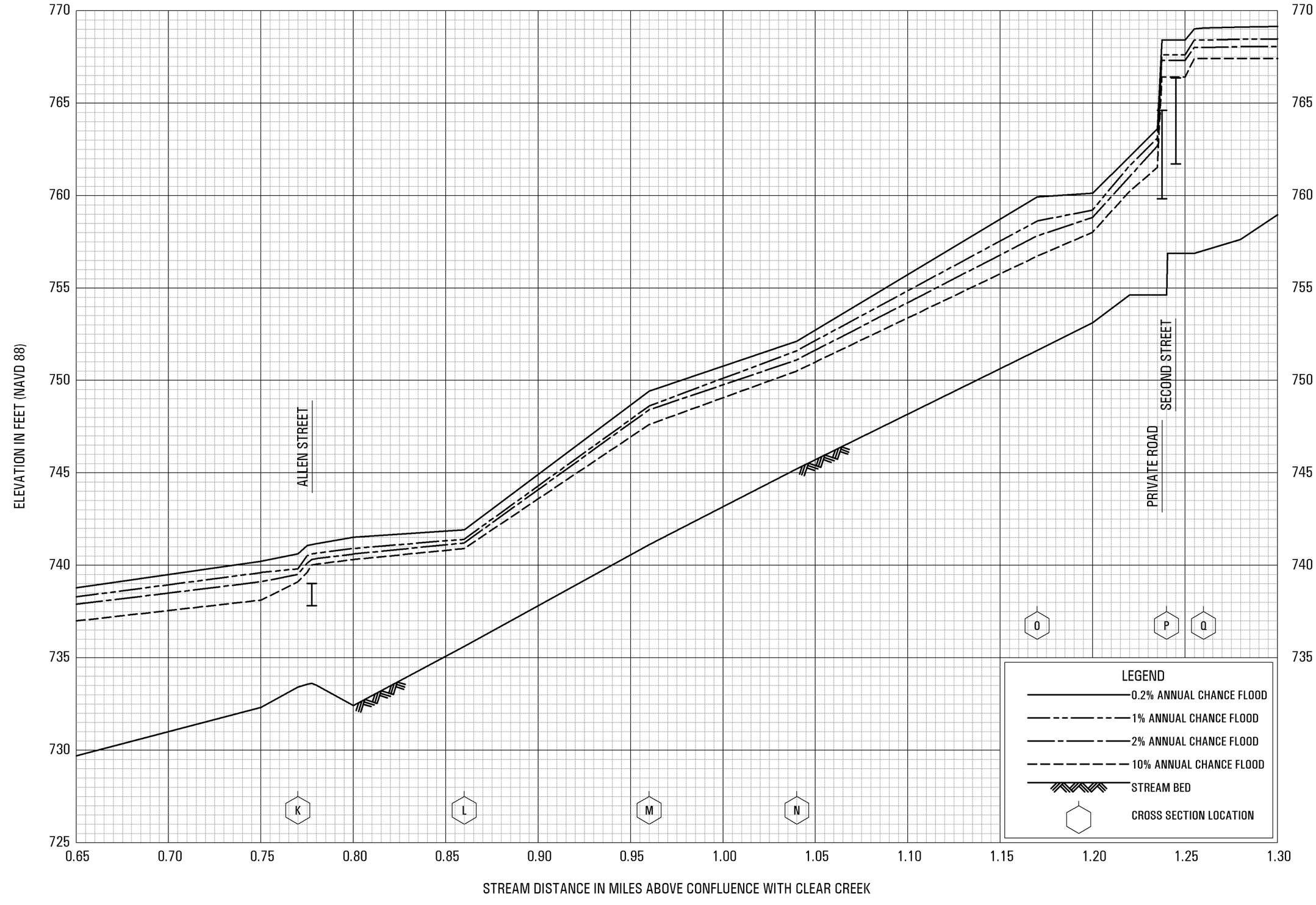
WEST BRANCH CLEAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN

AND INCORPORATED AREAS

42P



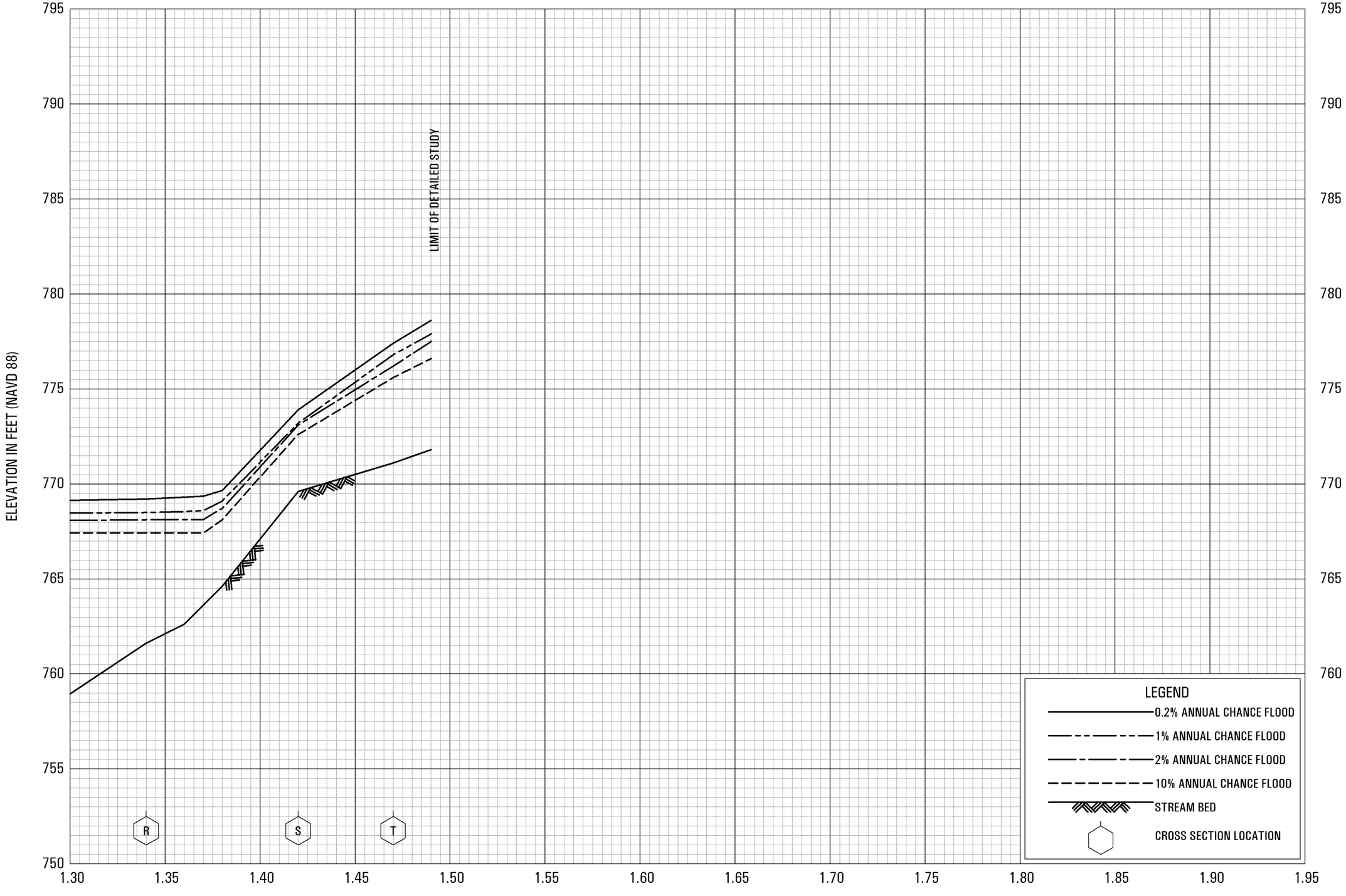
FLOOD PROFILES

WEST BRANCH CLEAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN

AND INCORPORATED AREAS



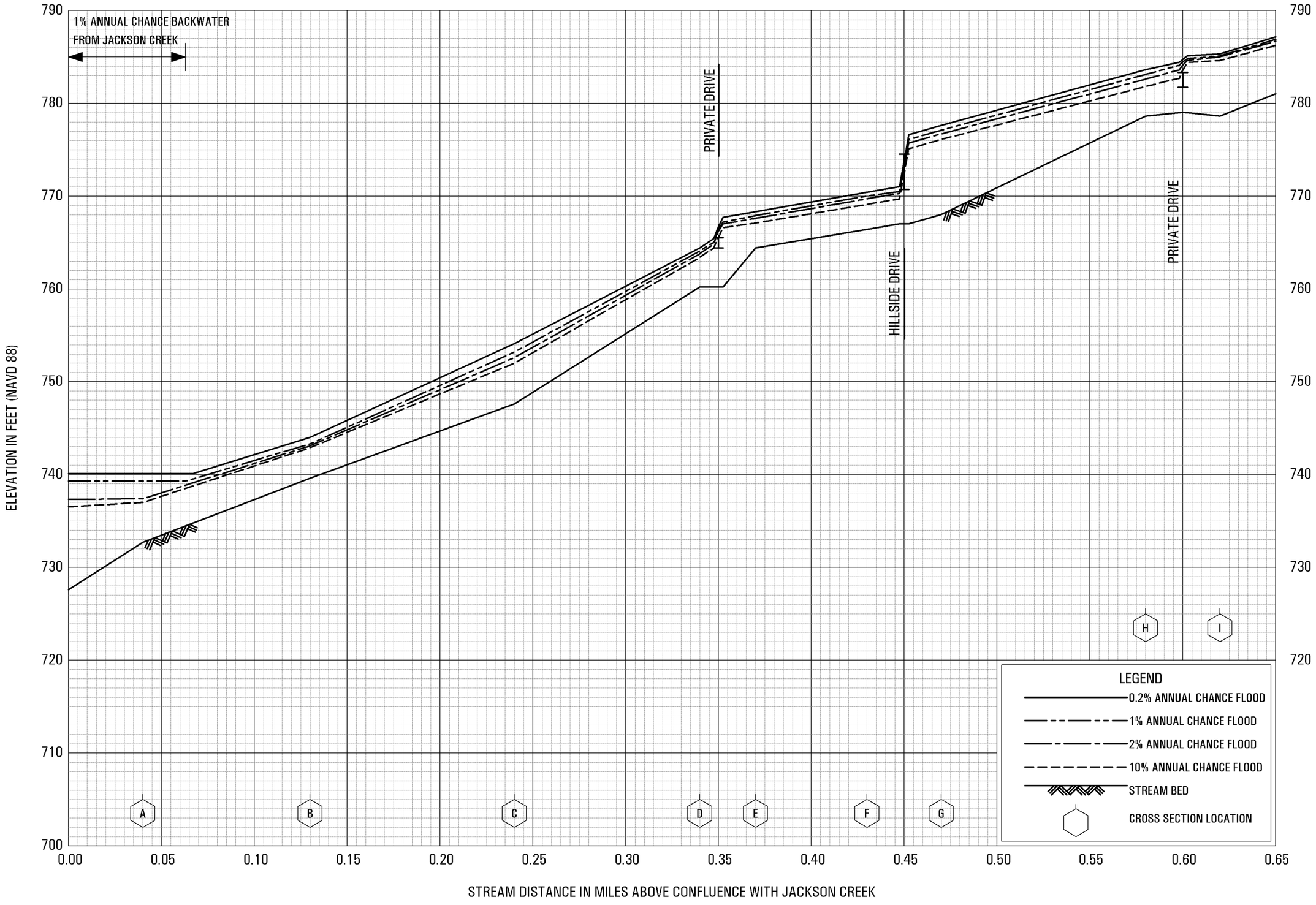
FLOOD PROFILES

WEST BRANCH CLEAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN

AND INCORPORATED AREAS



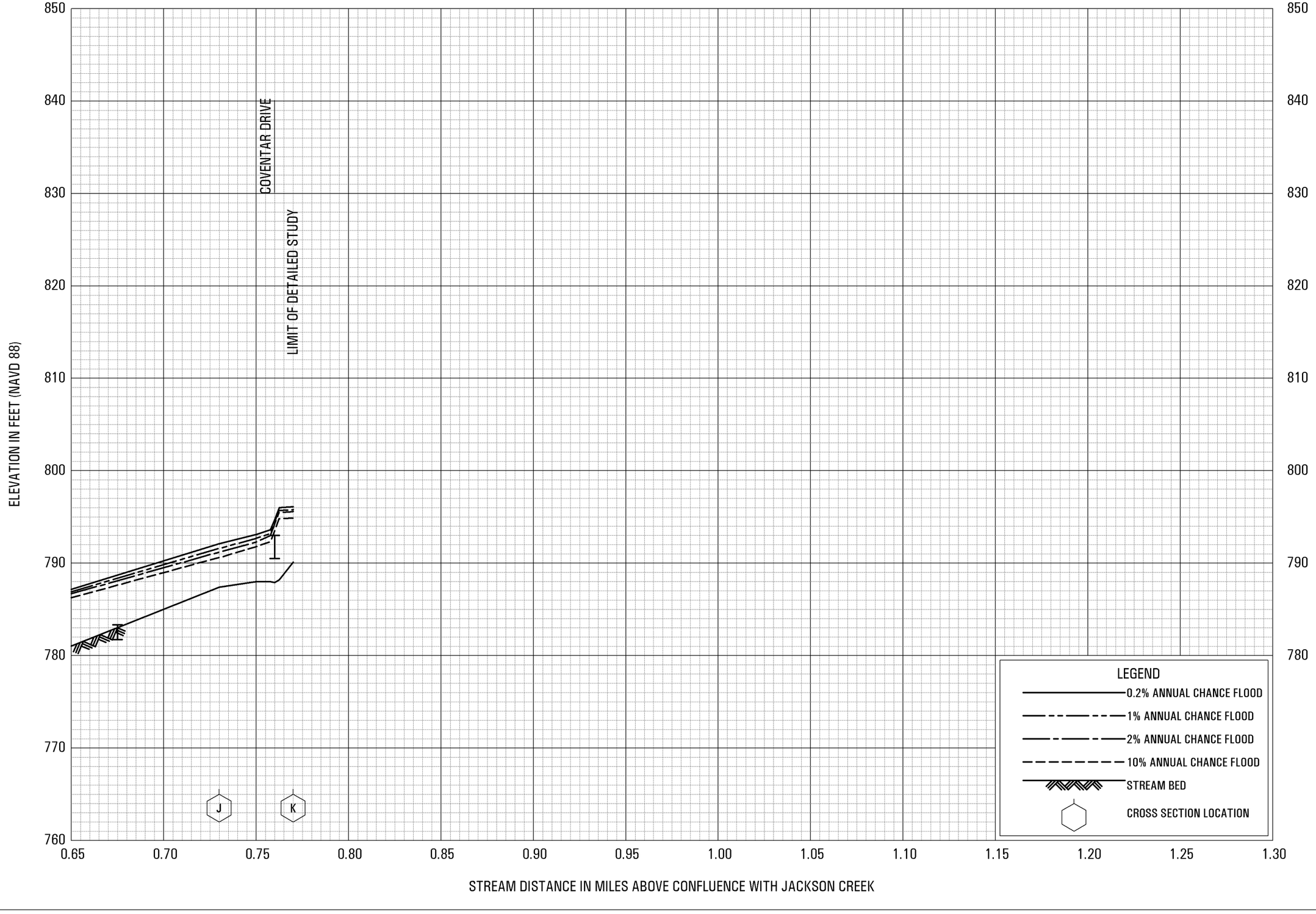
FLOOD PROFILES

WEST BRANCH JACKSON CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN

AND INCORPORATED AREAS



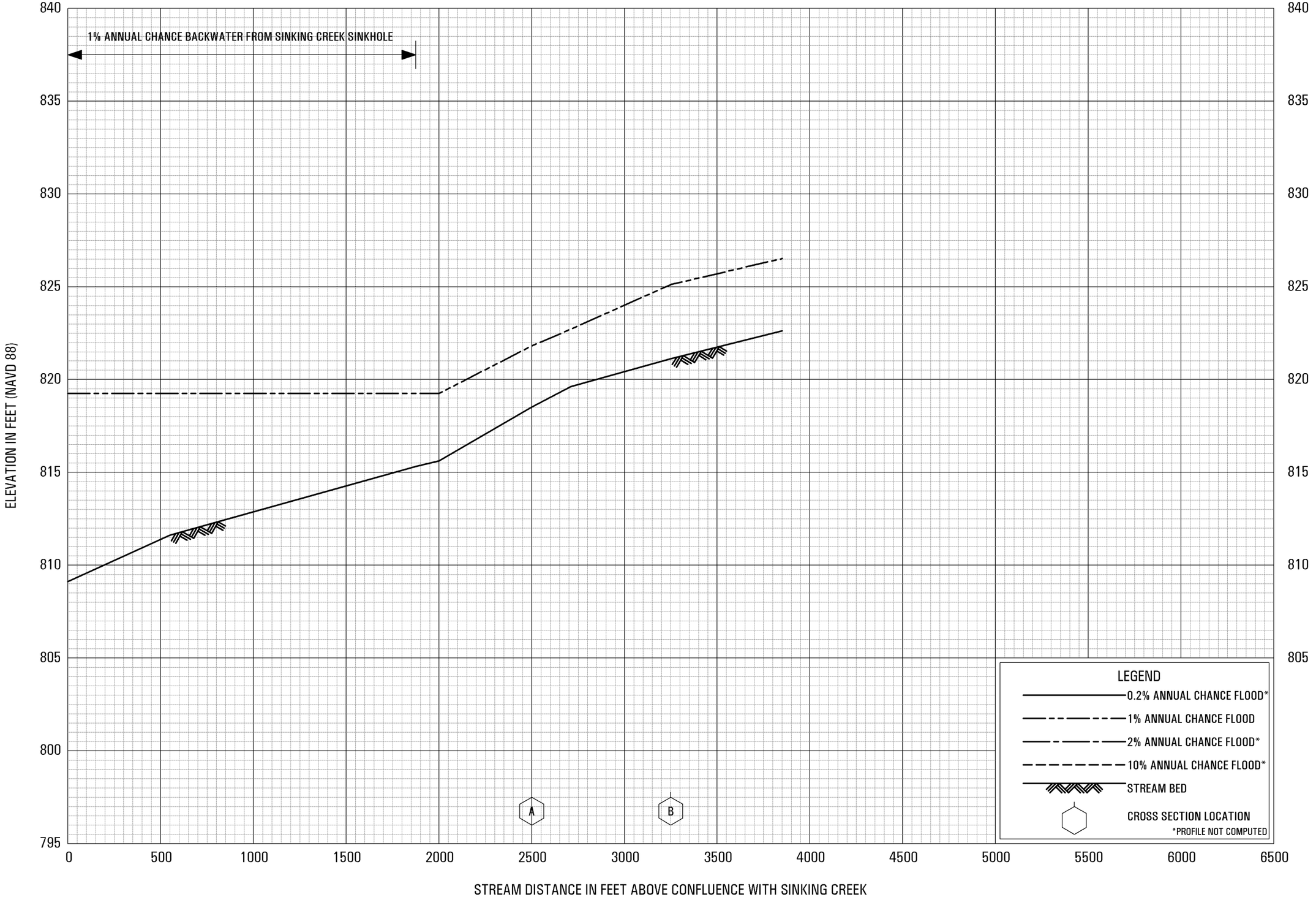
FLOOD PROFILES

WEST BRANCH JACKSON CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN

AND INCORPORATED AREAS



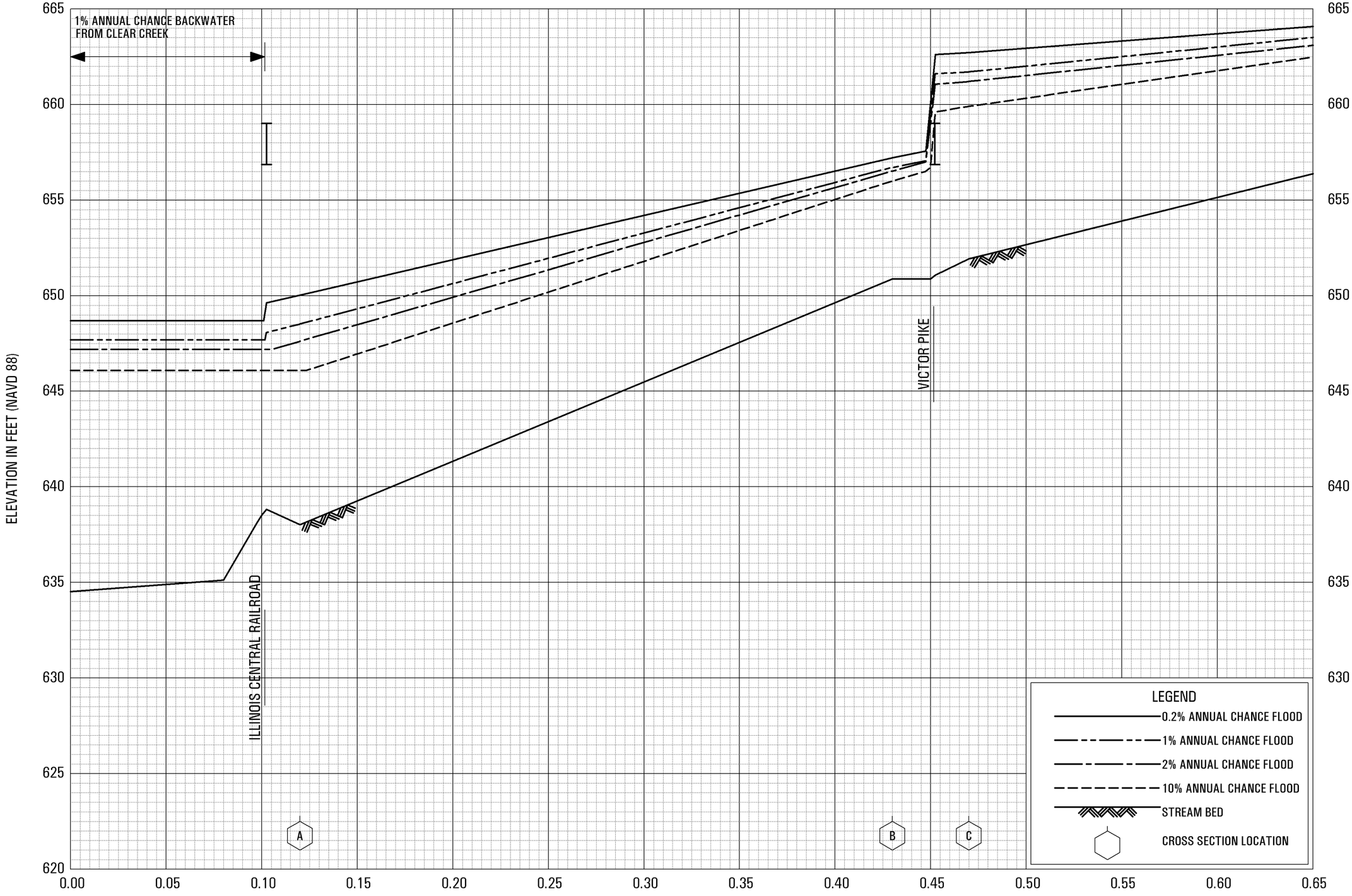
FLOOD PROFILES

WEST BRANCH SINKING CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN

AND UNINCORPORATED AREAS



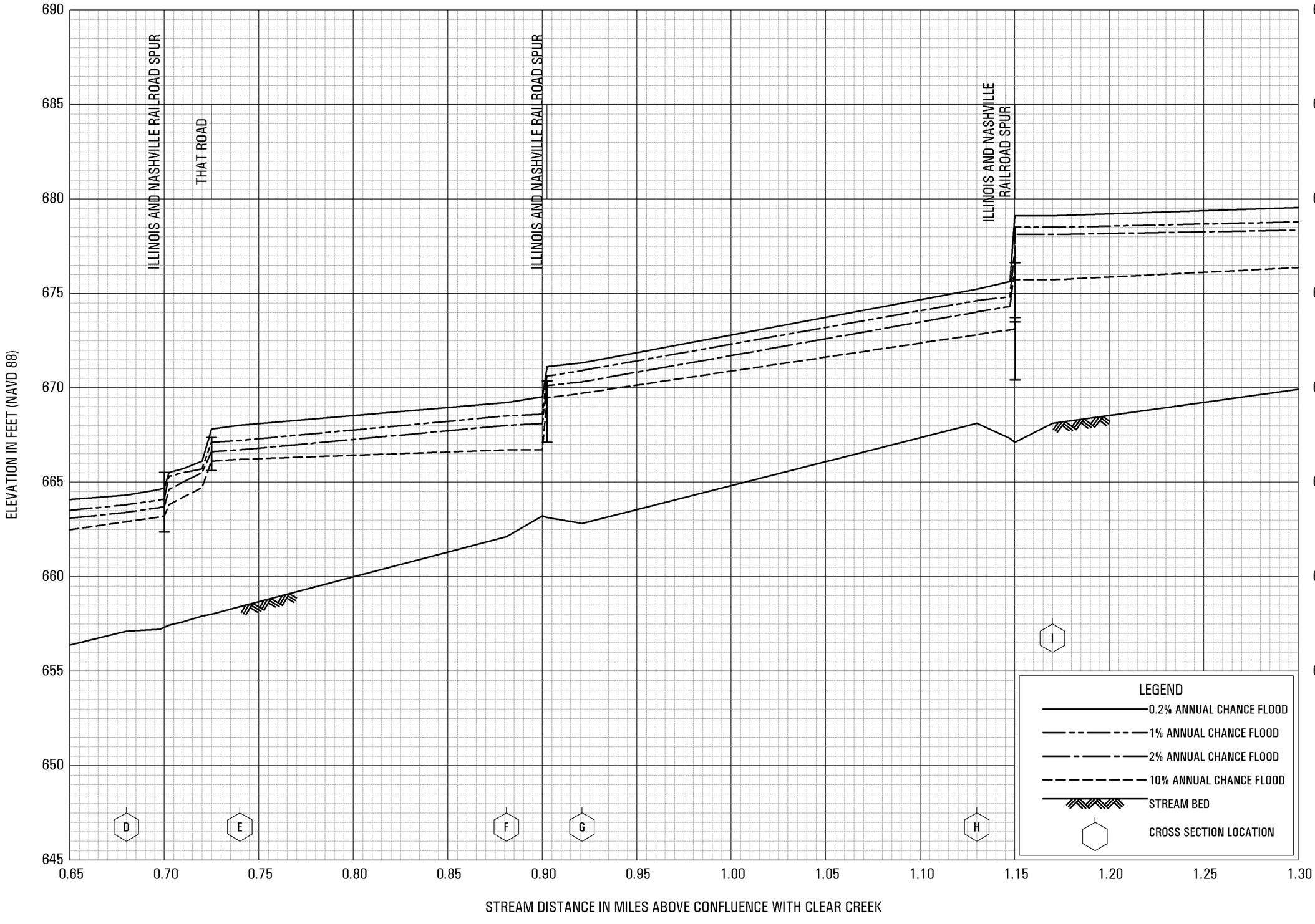
FLOOD PROFILES

WEST FORK CLEAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN

AND INCORPORATED AREAS



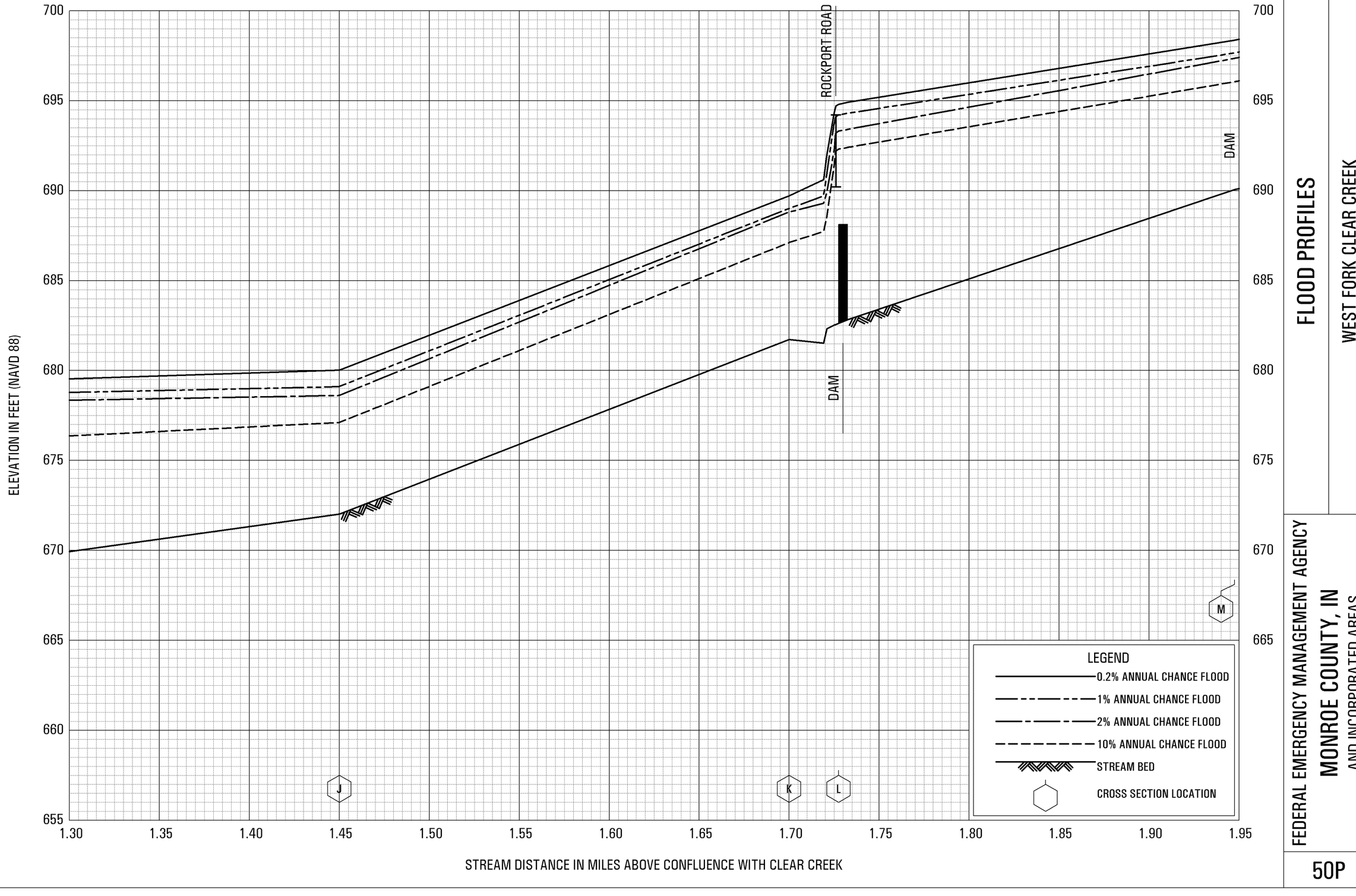
FLOOD PROFILES

WEST FORK CLEAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN

AND INCORPORATED AREAS



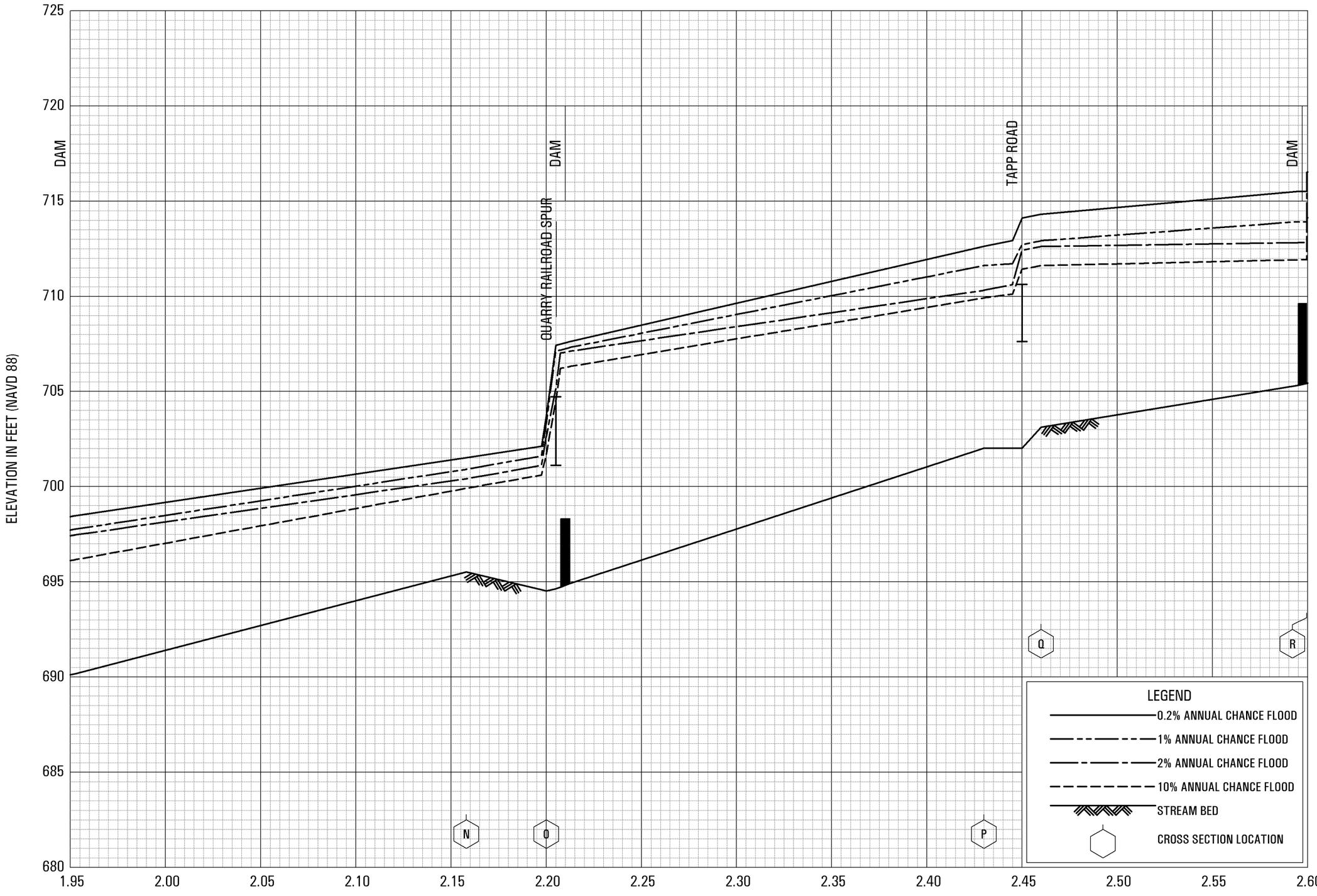
FLOOD PROFILES

WEST FORK CLEAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN

AND INCORPORATED AREAS



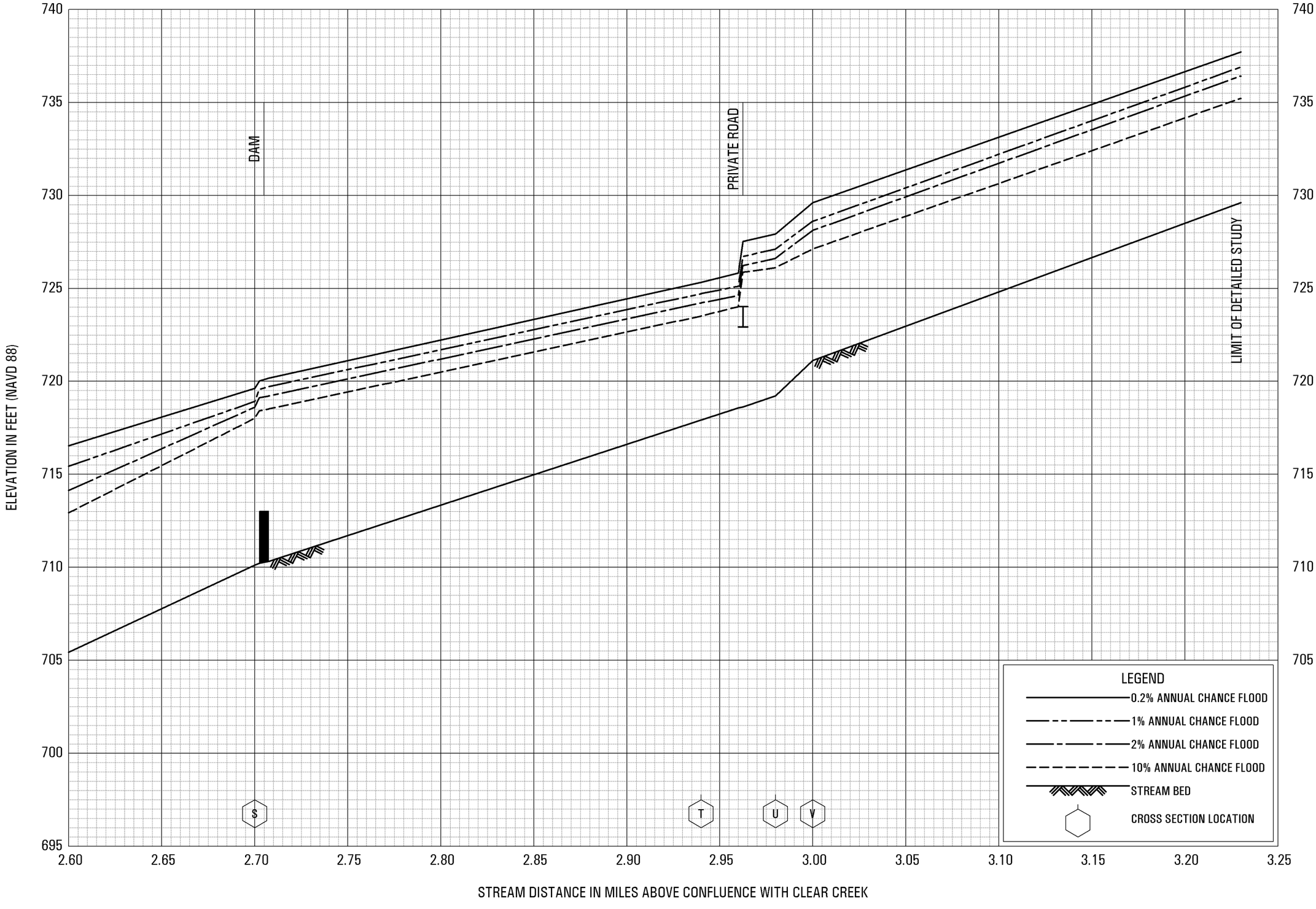
FLOOD PROFILES

WEST FORK CLEAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN

AND INCORPORATED AREAS



FLOOD PROFILES

WEST FORK CLEAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONROE COUNTY, IN

AND INCORPORATED AREAS