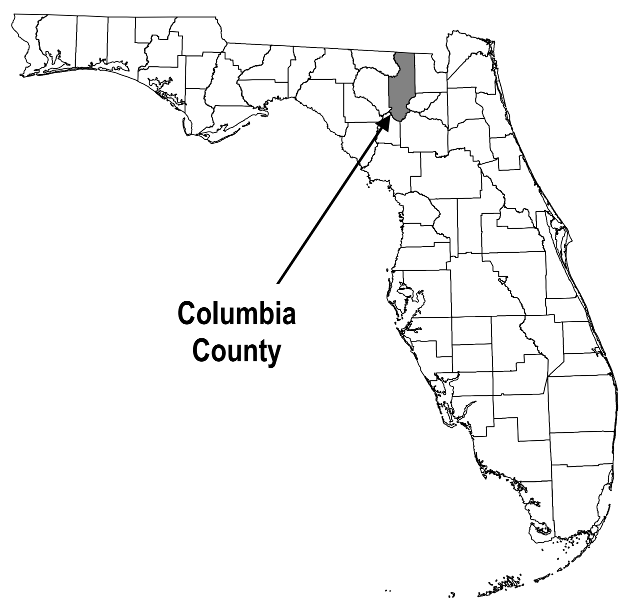
COLUMBIA COUNTY, FLORIDA

AND INCORPORATED AREAS



COMMUNITY NAME	COMMUNITY NUMBER
COLUMBIA COUNTY (UNINCORPORATED AREAS)	120070
FORT WHITE, TOWN OF*	120349
LAKE CITY, CITY OF	120406

*No Special Flood Hazard Areas Identified

Revised November 2, 2018

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER

12023CV000B

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.

Part or all of this FIS may be revised and republished at any time. In addition, part of this FIS may be revised by the Letter of Map Revision process, which does not involve republication or redistribution of the FIS. It is, therefore, the responsibility of the user to consult with community officials and to check the community repository to obtain the most current FIS components.

Initial Countywide FIS Effective Date: February 4, 2009

Revised FIS Effective Date: November 2, 2018 – To add Base Flood Elevations, to change zone designations, to change Special Flood Hazard Areas, to reflect updated topographic information, to update map format, to add roads and road names, to incorporate previously issued Letters of Map Amendment and to update corporate limits.

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<u>EXHIBITS</u>

FLOOD INSURANCE STUDY
COLUMBIA COUNTY, FLORIDA AND INCORPORATED AREAS

1.0 INTRODUCTION

1.1 Purpose of Study

This 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 the geographic area of Columbia County, Florida, including: the City of Lake City and the unincorporated areas of Columbia County (hereinafter referred to collectively as Columbia County).

Please note that on the effective date of this study, the Town of Fort White has no identified Special Flood Hazard Areas (SFHA). This does not preclude future determinations of SFHAs that could be necessitated by changed conditions affecting the community (i.e., annexation of new lands) or the availability of new scientific or technical data about flood hazards.

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 Columbia 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.

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 FIS was prepared to include the unincorporated areas of, and incorporated communities within, Columbia County in a countywide format. Information on the authority and acknowledgments for each jurisdiction included in this countywide FIS, as compiled from their previously printed FIS reports, is shown below.

Columbia County (Unincorporated Areas): the hydrologic and hydraulic analyses from the FIS report dated January 6, 1988, were performed by the U.S. Army Corps of Engineers (USACE), Jacksonville District (the study contractor) for the Federal Emergency Management Agency (FEMA), under Inter-Agency Agreement No. EMW-E-1153, Project Order No. 1. That study was completed in March 1985. Information for Alligator Lake was taken from the FIS for the City of Lake City (FEMA, 1988).

Lake City, City of: the hydrologic and hydraulic analyses from the FIS report dated January 6, 1988, were performed by the U.S. Department of the Interior, Geological Survey, Water Resources Division (the study contractor) for FEMA, under Inter-Agency Agreement No. EMW-85-E-1823. That study was completed in June 1986.

The Town of Fort White does not have a previous FIS report.

For the February 4, 2009 countywide FIS, revised hydrologic and hydraulic analyses were prepared for FEMA by Dewberry & Davis LLC, as a subcontractor to URS Corporation, under contract with the Suwannee River Water Management District (SRWMD), a FEMA Cooperating Technical Partner (CTP). All work was completed in August 2006.

Base map information shown on this FIRM was derived from Florida Department of Transportation aerials produced at a scale of 1:200 from photography dated 2006.

The coordinate system used for the production of the digital FIRM is State Plane in the Florida North projection zone 0903, referenced to the North American Datum of 1983.

<u>Physical Map Revision, Effective November 2, 2018</u>

For this physical map revision (PMR), work was performed by Amec Foster Wheeler Environment & Infrastructure, Inc. (Amec Foster Wheeler) and North Florida Professional Services (NFPS), under contract with SRWMD, as part of the FEMA Risk MAP Projects for the Upper Suwannee Watershed (HUC 03110201) and Santa Fe Watershed (HUC 03110206), respectively. The hydrologic and hydraulic analyses for multiple flooding sources were prepared by Amec Foster Wheeler, as described in the Scope of Study section of this document.

Base map information shown on revised FIRMs was derived from Florida Department of Transportation aerials dated 2010 at a scale of 1:12000.

1.3 Coordination

Consultation Coordination Officer's (CCO) meetings may be held for each jurisdiction in this 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.

For the pre-countywide FIS, a final CCO meeting was held on February 18, 1987, and was attended by representatives of the USACE, the U.S. Department of the Interior, Columbia County, the City of Lake City, and FEMA.

February 4, 2009 Countywide Revision

An initial CCO meeting was held on December 21, 2005, and a final CCO meeting was held on November 30, 2006. These meetings were attended by representatives of the study contractors, the communities, FEMA and the Suwannee River Water Management District.

Physical Map Revision, Effective November 2, 2018

Risk MAP Discovery meetings were held on July 26, 2012 and August 7, 2012, and were attended by representatives from Columbia County, City of Lake City, FEMA, SRWMD, and their study contractors. At these meetings, study request and priorities were received from the communities and documented by SRWMD and their study contractors. Subsequent to those meetings, a combined Flood Risk Review and Risk MAP Resilience Meeting was held on June 23, 2015 for the Upper Suwannee Watershed, a Flood Risk Review Meeting was held on September 11, 2015 for the Santa Fe Watershed, and a Resilience Meeting was held on February 9, 2016 for the Santa Fe Watershed. At those meetings, communities within the watersheds were provided with non-regulatory Risk MAP products and datasets, and were advised on their use in understanding and reducing flood risk. A CCO meeting was held on September 27, 2016, and was attended by representatives from Columbia County, City of Lake City, FEMA, SRWMD, and their study contractors.

2.0 AREA STUDIED

2.1 Scope of Study

This FIS covers the geographic area of Columbia County, Florida.

For the February 4, 2009 countywide FIS, flooding caused by overflow of Alligator Lake, Lake Montgomery, Montgomery Outlet Stream, the Suwannee River, and the Santa Fe River were studied in detail. Cannon Creek, Rose Creek and Ponding Areas 1, 2 and 3a-3e were also studied in detail.

Limits of the detailed study are indicated on the Flood Profiles (Exhibit 1) and on the FIRM (Exhibit 2).

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.

Approximate analyses were used to study those areas having a low development potential or minimal flood hazards. The scope and methods of study were proposed to, and agreed upon by, FEMA and Columbia County.

Physical Map Revision, Effective November 2, 2018

For this PMR, updated analyses were included for the flooding sources shown in Table 1, "Scope of Revision."

TABLE 1 – SCOPE OF REVISION

Flooding Source	Limits of Revised or New Detailed Study
Clay Hole Creek	From approximately 3 miles upstream of Interstate 75 to approximately 2.6 miles downstream of Interstate 75
Deep Creek	From approximately 0.84 miles upstream of US Highway 441 to its confluence with Suwannee River
Falling Creek	From approximately 0.73 miles upstream of Triple Run Road to its confluence with Suwannee River
Falling Creek Tributary	From just upstream of Range Road to its confluence with Falling Creek
Gwen Lake	Drainage area contributing to Gwen Lake
Lake Desoto	Drainage area contributing to Lake Desoto
Lake Harper	Drainage area contributing to Lake Harper
Lake Jeffery	Drainage area contributing to Lake Jeffery
Robinson Creek	From approximately 1.5 miles upstream of US Highway 441 to its confluence with Suwannee River
Unnamed Tributary to Falling Creek Tributary	Drainage area contributing to Unnamed Tributary to Falling Creek Tributary
Watertown Lake	Drainage area contributing to Watertown Lake

2.2 Community Description

Columbia County is located in north-central Florida. It is bordered on the north by Clinch and Echols Counties, Georgia; on the south by Alachua and Gilchrist Counties, Florida; on the east by Baker and Union Counties, Florida; and on the west by Suwannee and Hamilton Counties, Florida.

The county is served by Interstates 10 and 75, CSX Transportation and Norfolk Southern Railway. The 2010 population of Columbia County was reported to be 67,531, an increase of 19.5 percent over the 2000 population of 56,513 (U.S. Department of Commerce, 2010).

Columbia County is located in the Gulf Coastal Lowlands physiographic area with topography ranging from 10 feet to about 120 feet above North American Vertical Datum of 1988 (NAVD 88). There are two soil associations abutting the Suwannee River. The Surrency-Portsmouth Association, which is adjacent to the river except in the vicinity of Robinson Creek, consists of nearly level, very poorly drained sandy soils with loamy subsoils and very poorly drained loamy soils, underlain by sand. The next association landward (and adjacent to the river at Robinson Creek) is the Chipley-Albany-Rutledge. This consists of nearly level to gently sloping, moderately well-drained sandy soils and poorly drained sandy soils over loamy subsoil, and very poorly drained sandy soils (Florida Bureau of Comprehensive Planning, 1975).

The climate of Columbia County is semi-tropical, characterized by long, hot summers and mild winters. The average annual rainfall is 53.7 inches, while the average temperature varies from 55.6 degrees Fahrenheit (°F) in January to 81.1°F in August.

The drainage area of the Suwannee River at the mouth is 9,950 square miles, of which 4,230 square miles are in north-central Florida, and 5,720 square miles are in south-central Georgia. The drainage area of the Santa Fe River, at the mouth, is 1,380 square miles.

2.3 Principal Flood Problems

A number of major floods have occurred on the Suwannee River during the 20th century. The four largest floods at White Springs occurred in October 1947, April 1948, April 1973, April 1984 and June 2012. The respective discharges associated with these floods are 23,700 cubic feet per second (cfs), 28,500 cfs, 38,100 cfs, 26,100 cfs and 28,800 cfs. The estimated return period for floods of these magnitudes are 30, 50, 150, 40 and 50 years, respectively.

The April 1973 flood was the largest flood at the Town of White Springs since 1862 and exceeded the 1948 flood by 3 feet at the White Springs gage. Floodwaters remained over the lowland for 30 days, and for a time several major highways (Interstate 75, U.S. Route 41, and U.S. Route 129) were closed.

Many people were forced to evacuate their homes, and Columbia County was included in the "major disaster area" declared by the President.

During peak stages of the 1948 flood, the Suwannee River was out of its banks from the Gulf of Mexico to north of the Georgia-Florida state line and its width varied from 0.5 to 6 miles. The flooded area comprised almost 500 square miles along the major rivers.

The largest flood known to have occurred on the Santa Fe River in Columbia County was the flood of September 1964. The peak discharge for this flood was 17,000 cfs at the USGS gage near the Town of Fort White and 20,000 cfs at the now non-existent USGS gage at the City of High Springs.

The National Weather Service recorded numerous increased stages along Suwanee River in Columbia County. Actions stages were recorded in September 2004, April 2009, February 2010, July 2013, and March 2014. Flood stages were only recorded once in the 2000s during March 2003. Moderate flood stages were experienced during April 2005 and April 2014. Major flood stages were registered during October 2004, July 2012, and April 2014.

In June 2012, Tropical Storm Debby produced torrential rains across central and north Florida. According to a report published by the National Hurricane Center in January 2013, rainfall totals in excess of 20 inches were observed between Lake City and the Florida-Georgia state border. Several bridges were damaged or completely washed out due to the heavy rains, and over 100 roads in Columbia County, including portions of Interstate 10, U.S. Route 319 and U.S. Route 98 remained closed due to flooding. The USGS gage on the Suwannee River at White Springs recorded a peak discharge of 28,800 cfs, similar to that observed at the gage in April 1948. On the Santa Fe River, a peak discharge of 11,800 cfs was observed at the USGS gage near the Town of Fort White. The Columbia County Sheriff's office estimated that at least 10,000 residents were directly affected by tropical storm Debby and that the cost of damages for infrastructure resulting from the storm likely exceeded $10 million.

2.4 Flood Protection Measures

Flood protection measures do not exist within the study area.

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-, 25-, 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-, 25-, 50-, 100-, and 500-year floods, have a 10-, 4-, 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 exceedance) 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.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for the flooding sources studied in detail affecting the county.

Precountywide Revisions

The hydrologic analyses described in previously printed FIS reports have been compiled and are summarized below.

Analyses of discharge records of all gaged locations on the Suwannee River were used to establish a peak discharge-frequency relationship throughout the river. Flood recurrence frequencies were determined by log-Pearson Type III statistical analysis in accordance with procedures recommended by the U.S. Water Resources Council (Interagency Advisory Committee on Water Data, 1981).

Hydrologic analysis for the Santa Fe River was performed by standard engineering methods. Statistical data from five long-term discharge gages were used to calibrate a hydrologic runoff model. A rainfall-runoff model was developed for the Santa Fe River using the Soil Conservation Service (SCS) option in the HEC-1 computer program (USACE, 1973). Rainfall frequency was developed from U.S. Weather Bureau Technical Paper No. 40 (U.S. Department of Commerce, 1963) and runoff losses were accounted for by SCS curve number techniques. In the vicinity of O'leno State Park, the Santa Fe River flows underground for approximately 4.5 miles. For this portion of the river, the modeling was developed by computing the discharges to reflect the amount of storage available with the remainder considered as overland flow.

Using 17 years of periodic stage observations on Alligator Lake, log-Pearson Type III analysis was performed to determine the peak elevation. The stage data were converted to volumes before the frequency analysis was performed. The 1-percent annual chance volume was then converted back to stage elevation. The maximum elevation observed in the period from 1964 to 1985 was 102.1 feet National Geodetic Vertical Datum of 1929 (NGVD) on September 12, 1964 (Suwannee River Water Management District).

Equations have been developed by Franklin and Losey (USGS, 1984) for estimating the peak discharge frequency from urban streams in the City of Tallahassee, Florida. The area studied in Lake City is similar in soil type and topography to Tallahassee. The discharge computed using these equations is considered the best estimate for Lake City.

A stage volume relation was established from topographic maps for Lake Montgomery. The elevation of the lake on June 5, 1985, was 129.75 feet NGVD. This reading is considered low since the rainfall was below normal for northern Florida during this period; therefore, the average lake elevation was assumed to be 130 feet NGVD. The 1-percent annual chance runoff volume was added to determine the flood elevation of Lake Montgomery. Outflow from the lake begins at 130 feet NGVD; therefore, the peak was reduced to account for the volume lost. The final results indicated a 1-percent annual chance flood elevation for Lake Montgomery of 131.3 feet NGVD with a peak discharge of 60 cfs.

February 4, 2009 Countywide Revision

Information on the methods used to determine peak discharge-frequency relationships for the streams restudied as part of the initial countywide FIS is shown below.

A revised gage analysis was performed at all gage locations on the Santa Fe and Suwannee rivers. Analysis of the results determined that the results were not significantly different from the effective hydrology. In accordance with the Guidelines and Specifications for Flood Hazard Mapping Partners, the revised analysis did not justify revising the effective hydrology.

Cannon Creek was studied in detail using the HEC-HMS hydrologic model (USACE, 2006) with the NRCS Curve Number and TR-55 methodologies. The watershed was divided into 13 subcatchments and flows were routed through the watershed using the Muskingum-Cunge method for channel routing and level pool routing for large backwaters behind structures.

Lake Montgomery Outlet Stream was studied in detail using the HEC-HMS hydrologic model (USACE, 2006) with the NRCS Curve Number and TR-55 methodologies. The watershed was divided into 4 subcatchments and flows were routed through the watershed using the Muskingum-Cunge method for channel routing and level pool routing for large backwaters behind structures.
Lake Montgomery was modeled using level pool routing and storage/elevation relationships were determined through ground survey of the lake area. The stage outflow relationship for the lake was determined using the HEC-RAS model (USACE, 2005) for the Montgomery Outlet Stream which extended as far as the spill crest of the lake.

Rose Creek was studied using regional regression equations to determine the flood flows of this riverine system. Drainage areas were determined using topographic maps at a scale of 1:24,000 with a contour interval of 5 feet (USGS, 1962 and 1963).

For Ponding Areas 1, 2 and 3a – 3e, detailed hydrologic analysis was performed using EPA-SWMM5 (EPA, 2005) and the Horton rainfall-runoff methodology. The Horton method was selected due to the extremely well drained nature of these watersheds. Drainage areas were determined from the 5-foot contour information provided on the USGS topographic maps (USGS, 1962 and 1963).

Physical Map Revision, Effective November 2, 2018

For this revision, hydrologic studies were conducted for riverine Clay Hole Creek, Deep Creek, Falling Creek, Falling Creek Tributary and Robinson Creek basins as well as Lake Desoto, Gwen Lake, Lake Harper, Lake Jeffery, Watertown Lake and Unnamed Tributary to Falling Creek Tributary closed basins.

For Deep Creek, Falling Creek and Robinson Creek, frequency discharges were computed using regression equations obtained from the 1996 USGS study on streams within the Suwannee River Management District (SRWMD). Drainage basins for these studies were delineated using a 5-feet digital elevation model (DEM) derived from LiDAR data collected by SRWMD in January 2011. Percent lake areas within each basin were computed using the USGS National Hydrography Dataset (NHD) Waterbody feature class.

The Falling Creek Tributary and Clay Hole Creek basins was modeled using the Hydrologic Engineering Center's Hydrologic Modeling System (HEC-HMS) version 4.0. Subbasins were delineated using the LiDAR DEM and 2010 aerial imagery provided by the Florida Department of Transportation (FDOT).

The United States Department of Agriculture (USDA) SCS Curve Number method documented in the USDA Natural Resources Conservation Service (NRCS) Technical Release No. 55, Urban Hydrology for Small Watersheds, was used as the loss method. SCS Curve Numbers for subbasins contributing to Falling Creek Tributary and Clay Hole Creek were calculated using soils data obtained from NRCS and 2011 landuse data for Columbia County obtained from SRWMD. The SRWMD landuse categories are defined in accordance with the Florida Land Use, Cover and Forms Classification System (FLUCFCS). The soil types are defined by the NRCS based on the soil's ability to infiltrate. An antecedent soil moisture condition of II (AMC II) was assumed for the studied basins.

The 24-hour 10-percent, 4-percent, 2-percent, and 1-percent annual chance rainfall depths were obtained from intensity-duration-frequency (IDF) curves developed by FDOT based on data from the National Weather Service, published in Technical Memorandum, TP-40, TP-49, and HYDRO-35, for seven rainfall events up to the one-percent annual chance event.

For the purposes of this study, the 24-hour rainfall depth for the 0.2-percent annual chance event was extrapolated using a best-fit curve of the FDOT rainfall depths for lower events. The SCS Type II Florida Modified rainfall distribution was used in this study.

The HEC-HMS models for Falling Creek Tributary and Clay Hole Creek used the Clark Unit Hydrograph method to transform runoff volumes to basin inflow hydrographs. Basin time of concentration was determined using the procedures outlined in the NRCS TR-55 publication and the Drainage Hydrology Handbook published by FDOT in January 2004. The Muskingum-Cunge channel routing method was used for routing runoff from each subbasin to each study area outlet. The geometry of the eight-point cross sections used to represent the channel cross-section at modeled reaches was estimated using a combination of the DEM and survey data. The HEC-HMS models accounted for storage areas using elevation-area curves estimated from the DEM.

For the closed basin areas studied in this revision, namely Lake Desoto, Gwen Lake, Lake Harper, Lake Jeffery, Watertown Lake and Unnamed Tributary to Falling Creek Tributary, Streamline Technologies Interconnected Channel and Pond Routing (ICPR) v.3.1 unsteady flow model was used to estimate discharges and elevations for flood frequencies including the 10-, 4-, 2-, 1-, and 0.2-percent annual chance events.

As with the HMS models, a synthetic (SCS Type II Florida Modified) rainfall time distribution was used to develop the ICPR models. The 24-hour 10-, 4-, 2- and 1-percent annual chance rainfall depths were obtained from the FDOT IDF curves. Closed basin boundaries were delineated using the LiDAR DEM and the 2010 FDOT aerial imagery for Columbia County. The SCS Curve Number Method was used to compute the direct runoff resulting from each of the analyzed frequencies. Basin time of concentration was determined using the procedures outlined in the NRCS TR-55 publication the FDOT Drainage Hydrology Handbook. The SCS Unit Hydrograph method was used to generate the hydrographs resulting from the analyzed storms. A unit hydrograph peak factor of 484 was selected.

A summary of the drainage area-peak discharge relationships for the 10-, 4-, 2-, 1-, and 0.2-percent annual chance events for all the streams studied by detailed methods is shown in Table 2, “Summary of Discharges.”

TABLE 2: SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-PERCENT	4-PERCENT	2-PERCENT	1-PERCENT	0.2-PERCENT
CANNON CREEK						
At Mouth	7.59	1,115	*	1,655	1,960	2,745
At Ward Road	6.64	1,330	*	2,100	2,420	3,215
At Cross Section D	4.78	1,235	*	1,870	2,165	2,855
At Cessna Boulevard	2.95	720	*	1,195	1,420	2,230
Downstream of abandoned embankment just downstream of Route 341	2.52	640	*	1,060	1,265	2,005
At Quail Heights Boulevard	2.03	1,170	*	1,770	2,030	2,620
CLAY HOLE CREEK						
At Approximately 0.7 miles upstream of Duyal Road	42.54	3,080	4,110	4,980	6,190	8,400
Just downstream of the confluence of Cannon Creek	38.28	2,870	3,850	4,670	5,810	7,870
At Approximately 0.8 miles upstream of Interstate 75	28.10	1,770	2,320	2,790	3,460	4,630
At Approximately 1,500 feet upstream of Superior Street	25.18	1,600	2,080	2,470	3,030	4,040
Just upstream of US Highway 441	21.06	990	1,240	1,450	1,790	3,080
DEEP CREEK						
At confluence with Suwannee River	99.0	2,070	3,050	3,930	5,270	7,620
At approximately 1.9 miles upstream of confluence with Suwannee River	97.0	2,020	2,990	3,850	5,160	7,470

*Data not available

TABLE 2: SUMMARY OF DISCHARGES (Cont'd)

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-PERCENT	4-PERCENT	2-PERCENT	1-PERCENT	0.2-PERCENT
DEEP CREEK (cont'd)						
Approximately 0.9 mile upstream of US Highway 441	87.1	1,830	2,710	3,490	4,680	6,790
FALLING CREEK						
At confluence with Suwannee River	56.1	1,800	2,690	3,490	4,720	6,920
Approximately 1.4 mile upstream of Lassie Black Street	54.8	1,760	2,640	3,430	4,640	6,810
Approximately 1,300 feet upstream of County Highway 131	49.1	1,650	2,470	3,220	4,350	6,400
Just upstream of US Highway 441	39.8	1,430	2,150	2,810	3,810	5,630
Approximately 0.7 mile upstream of Triple Run Road	21.1	1,210	1,850	2,440	3,340	5,010
FALLING CREEK TRIBUTARY						
Just upstream of confluence with Falling Creek	12.77	1,510	1,770	1,940	2,210	2,680
Approximately 500 feet upstream of Interstate 10	7.44	1,050	1,330	1,550	1,880	2,450
Just upstream of Tammy Lane	6.55	830	1,030	1,190	1,410	1,800
Just upstream of Double Run Road	6.04	600	730	830	980	1,250
Just upstream of Gum Swamp Road	5.38	410	490	560	650	810
Just upstream of Voss Road	1.58	310	400	460	560	730
Approximately 0.5 mile upstream of Voss Road	1.31	100	120	140	170	210
Just upstream of Range Road	0.67	10	10	10	10	10
MONTGOMERY OUTLET STREAM						
At Inglewood Avenue	1.83	485	*	800	920	1,210
At St. Margaret Road	1.46	325	*	525	615	825
At Grandview Avenue	1.07	145	*	200	270	505
At Alamo Drive	0.58	20	*	35	40	55

*Data not available

TABLE 2: SUMMARY OF DISCHARGES (Cont'd)

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-PERCENT	4-PERCENT	2-PERCENT	1-PERCENT	0.2-PERCENT
ROBINSON CREEK						
At confluence with Suwannee River	34.3	1,660	2,520	3,300	4,490	6,660
Approximately 0.8 mile downstream of Falling Creek Road	32.6	1,600	2,440	3,190	4,350	6,460
Approximately 0.6 mile upstream of County Highway 246	27.5	1,420	2,160	2,840	3,880	5,790
Approximately 0.8 mile downstream of US Highway 441	23.4	1,260	1,930	2,540	3,470	5,190
Approximately 1,000 feet downstream of Triple Run Road	20.0	1,120	1,720	2,270	3,110	4,670
ROSE CREEK						
Approximately 0.6 mile upstream of County Highway 246	27.5	1,420	2,160	2,840	3,880	5,790
At Mouth	35.38	1,290	*	2,550	3,470	5,140
At Interstate 75	28.73	1,090	*	2,180	2,960	4,410
SUWANNEE RIVER						
At U.S. Route 41 near White Springs	2,430	16,700	*	28,000	33,600	49,100
At Georgia-Florida State line	1,872	13,200	*	21,400	25,300	35,500
SANTA FE RIVER						
At mouth	1,380	8,500	*	13,400	16,400	22,200
At USGS gage #02322500 near Ft. White	1,017	9,200	*	13,800	16,700	22,200
At USGS gage #0232200 near High Springs	950	9,300	*	15,800	19,600	29,700
Just downstream of confluence of Olustee Creek	*	17,100	*	26,900	32,800	46,500

*Data not available

The stillwater elevations have been determined for the 10-, 2-, 1-, and 0.2-percent annual chance floods for the flooding sources studied by detailed methods and are summarized in Table 3, "Summary of Stillwater Elevations."

TABLE 3: SUMMARY OF STILLWATER ELEVATIONS

FLOODING SOURCE	ELEVATION (feet NAVD*)				
	10-PERCENT	4-PERCENT	2-PERCENT	1-PERCENT	0.2-PERCENT
ALLIGATOR LAKE					
Along entire shoreline	**	**	**	103.5	**
GWEN LAKE					
GL01 (Gwen Lake)	125.2	125.5	125.7	125.9	126.3
GL02	181.3	181.9	181.9	182.1	182.3
GL03	160.9	164.7	166.1	166.5	166.8
GL04	176.7	176.9	177.0	177.1	177.2
GL05	183.2	183.3	183.3	183.4	183.4
LD01	180.4	180.8	181.1	181.4	182.0
LD02	180.2	180.6	180.8	181.3	182.0
LD06	184.5	185.3	185.8	186.2	186.5
LAKE HARPER					
LH01 (Lake Harper)	101.6	102.0	102.3	102.7	103.5
LH02	101.1	101.4	101.5	101.8	102.2
LH09	106.1	106.3	106.5	106.7	107.1
LH10	106.0	106.3	106.4	106.6	106.9
LH11	174.3	175.1	175.4	175.6	175.7
LAKE HARRIS					
COUNTRY CLUB SOUTH					
PONDS 1 AND 2	96.8	97.6	98.0	98.6	99.5
COUNTRY CLUB NORTH					
PONDS 1 AND 2	99.1	99.8	100.3	100.9	101.7
LAKE HARRIS EAST	99.4	100.1	100.5	101.4	102.4
LAKE HARRIS WEST	99.4	100.1	100.5	101.2	102.3
LAKE JEFFERY					
LJ01 (Lake Jeffery)	133.8	134.0	134.2	134.4	134.8
LJ02	154.7	154.8	154.8	154.9	155.0
LJ04	158.6	158.7	158.7	158.7	158.8
LJ06	158.1	158.1	158.1	158.2	158.2
LJ07	154.8	154.9	154.9	155	155.1
LJ08	141.4	142.0	142.0	142.1	142.2
LJ09	152.3	152.3	152.3	152.4	152.4
LJ10	145.7	145.8	145.9	145.9	146.0
LJ11	146.9	147.1	147.1	147.2	147.4
LJ12	155.5	155.6	155.7	155.7	155.8
LJ13	137.2	137.2	137.3	137.3	137.4
LJ14	130.8	131.4	131.7	132.2	134.3
LJ15	137.9	137.9	138.0	138.2	138.3
LJ17	153.4	153.5	153.5	153.6	153.7
LAKE MONTGOMERY	130.1	**	130.6	130.8	131.3

TABLE 3: SUMMARY OF STILLWATER ELEVATIONS (cont'd)

	ELEVATION (feet NAVD*)				
FLOODING SOURCE	10-PERCENT	4-PERCENT	2-PERCENT	1-PERCENT	0.2-PERCENT
PONDING AREA 1	84.8	**	89.6	91.3	94.3
PONDING AREA 2	91.9	**	93.1	93.6	94.7
PONDING AREA 3a	103.2	**	103.2	103.2	103.3
PONDING AREA 3b	107	**	107.5	107.7	108.1
PONDING AREA 3c	104.1	**	104.2	104.2	104.2
PONDING AREA 3d	103.5	**	104.2	104.5	105.0
PONDING AREA 3e	104.1	**	105	105.3	105.9
WATERTOWN LAKE					
WL01 (Watertown Lake)	177.0	177.1	177.1	177.2	177.3
WL02	183.4	183.8	184.0	184.2	184.7
WL03	190.6	190.9	191.1	191.4	191.8
WL05	181.1	181.4	181.5	181.7	181.9
UNNAMED TRIBUTARY TO FALLING CREEK TRIBUTARY					
A1000	169.8	170.0	170.0	170.0	170.1
A1100	168.9	169.4	169.6	169.8	170.0
A1250	168.8	169.0	169.0	169.1	169.2
A1400	168.5	168.6	168.9	169.3	169.7
A1500	169.2	169.3	169.3	169.4	169.7
A1700	168.8	168.9	169.0	169.1	169.3
A1750	167.6	167.8	167.9	168.0	168.3
A1800	169.9	170.3	170.4	170.6	170.8
B2100	166.8	167.3	167.6	168.0	168.4
B2250	171.1	171.2	171.2	171.2	171.3
B2300	172.5	172.9	173.1	173.1	173.2
B2350	172.8	173.2	173.4	173.4	173.5
B2450	170.4	170.7	170.9	171.2	171.7
B2500	168.8	169.1	169.2	169.5	169.9
B2550	167.0	167.3	167.6	168.0	168.5
B2600	168.0	168.1	168.1	168.2	168.2
B2650	168.2	168.4	168.5	168.7	169.0
B2800	172.8	173.1	173.2	173.4	173.7
B2820	172.8	173.1	173.2	173.4	173.7
B2900	172.8	173.1	173.2	173.4	173.7
B2950	172.8	173.1	173.2	173.4	173.7
C3250	165.8	166.2	166.5	166.9	167.2

*North American Vertical Datum of 1988

**Data not available

3.2 Hydraulic 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 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 were determined from topographic maps and field surveys. All bridges, dams, and culverts were field surveyed to obtain elevation data and structural geometry. All topographic mapping used to determine cross sections are referenced in Section 4.1.

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).

The hydraulic analyses for this FIS were based on unobstructed flow. The flood elevations shown on the profiles are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

All 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.

Precountywide Analyses

The hydraulic analyses described in previously printed FIS reports have been compiled and are summarized below.

Cross-section data for the Suwannee River were obtained by aerial survey methods from photography flown for the floodplain areas and by field measurements for the main channel and immediate overbanks (USACE, Stream Cross Sections). All bridges were field surveyed to obtain elevation data and structural geometry. Stream cross sections and bridge geometries for the Santa Fe River were compiled by photogrammetric methods from aerial photography (Southern Resource Mapping, Suwannee River Basin Surveys).

Roughness coefficients (Manning's "n") used in the hydraulic computations for the Suwannee River were determined by analyzing known flood events in the Columbia County reach of the river. The coefficients ranged from 0.045 to 0.050 for the main channel, and 0.2 to 0.48 for the overbanks. Roughness coefficients for the Santa Fe River were determined by analyzing a hydraulic model that was calibrated to reproduce the 1964 flood. The values ranged from 0.035 to 0.100 for the main channel and 0.20 to 0.28 for the overbank. Water-surface profiles of the floods of the selected recurrence intervals were computed using the USACE HEC-2 step-backwater computer program (USACE, 1976). Starting water-surface elevations were computed using the slope/area method. Roughness values for Montgomery Outlet Stream range from 0.025 in the main channel to 0.125 in the floodplain.

The USGS step-backwater computer program (U.S. Department of the Interior, 1976) was used to compute the water-surface elevation for the 1-percent annual chance flood on the Montgomery Outflow Stream. The elevation of Alligator Lake was used at the starting water-surface elevation. The step-backwater program cannot route through culverts, so at each road crossing the computer run was stopped at the downstream side of the road. The water-surface elevation was then transferred to the upstream side of the road using techniques described by Bodhaine and Hulsing (USGS, 1968; USGS, 1967).

February 4, 2009 Countywide FIS

The HEC-2 computer files for the Suwannee River and Santa Fe River were converted to HEC-RAS by the SRWMD prior to this revised analysis. As part of this analysis, the structures in the HEC-RAS model were modified to conform to standard procedures outlined in the HEC-RAS User's Manual (USACE, 2002).

New riverine hydraulic analysis was performed along Cannon Creek, Rose Creek and Montgomery Outlet Stream. Cannon Creek was studied from the confluence with Clay Hole Creek to a point approximately 650 feet upstream of Quail Heights Boulevard. Rose Creek was studied from the confluence with Clay Hole Creek to a point just downstream of Interstate 75, and Montgomery Outlet Stream was studied from Alligator Lake to Lake Montgomery. HEC-RAS version 3.1.3 (HEC, 2005) was used to model the hydraulic characteristics of these streams.

Cross sections and hydraulic structures were ground surveyed and used to build the HEC-RAS models.

New hydraulic analysis was performed for several ponding areas with known flooding problems. These are referred to as Ponding Areas 1, 2 and 3a – 3e. Both hydrologic and hydraulic analyses were performed using EPA-SWMM5 (EPA, 2005). Spills between ponding areas were modeled using weirs for overland spills and closed conduits for culvert structures.

All field surveys were established with vertical control in the NAVD 1988 datum. All of the NGVD 29 elevation data in the input HEC-RAS files for Columbia County from the SRWMD were converted to NAVD 88. Therefore, the input and output of the revised HEC-RAS files now reflect elevations in NAVD 88.

Flood profiles were drawn showing computed water-surface elevations for floods of the selected recurrence intervals.

Physical Map Revision, Effective November 2, 2018

For this revision, riverine studies for Clay Hole Creek, Deep Creek, Falling Creek, and Falling Creek Tributary were performed by detailed methods. Water surface elevations and floodway surcharges were computed through the use of the USACE HEC-RAS version 4.1.0 water-surface computer profiles program. Closed basin studies for Lake Desoto, Gwen Lake, Lake Harper, Lake Jeffery, Watertown Lake and Unnamed Tributary to Falling Creek Tributary were also performed by detailed methods, using Streamline Technologies ICPR v.3.1, Service Pack 8 to estimate flood levels.

For the riverine studies, model geometry was estimated using a combination of the LiDAR DEM and survey data. All structure geometry was based on survey data. In general cross section geometry incorporated survey data for the channel and banks and utilized the DEM data outside of the banks. At cross sections where survey data was not available, the nearest upstream and downstream survey data was used to linearly interpolate the minimum channel elevation.

Model inputs associated with cross sections were estimated using guidance provided in the HEC-RAS Hydraulic Reference Manual. In general, expansion and contraction coefficients were set to 0.3 and 0.1, respectively, at cross sections not associated with structures. At structure cross sections 2, 3, and 4 expansion and contraction coefficients were typically set to 0.5 and 0.3, respectively. In general, ineffective flow areas were placed based on a 1 to 3 expansion and 1 to 1 contraction of the floodplain.

For the closed basin studies performed using ICPR, the model schematic was developed using ArcGIS. Various sources were utilized in developing the schematic including GIS shapefiles of the transportation network, aerial imagery of Columbia County, LiDAR DEM and contours derived from the DEM.

The stage-area relationships for each closed basin were derived from the DEM and aerial imagery provided by FDOT. Starting water surface elevations for each basin were determined from the DEM. Basin connectivity in the model was represented by the use of overtopping weirs, channels and conveyance structures. The cross-section geometry for overtopping weirs and channel cross-sections was derived from the DEM. Conveyance structures were modeled using data obtained from field survey.

The following streams and closed basins were not restudied, but redelineated as a part of this revision by utilizing the profiles and floodway data tables for the riverine studies and stillwater elevation tables for the closed basin studies from the February 4, 2009 revision for Columbia County – Suwannee River, Suwannee River Unnamed Tributary, Rose Creek, Cannon Creek, Alligator Lake, Montgomery Outlet Stream, Ponding Areas 1, 2, 3, 3a, 3b, 3c, 3d, and 3e. The updated LiDAR DEM was used to map these streams and closed basins.

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 results in differences in base flood elevations across 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 new datum values. To compare structure and ground elevations to 1% annual chance flood elevations shown in the FIS and on the FIRM, the subject structure and ground elevation must be referenced to the new datum values.

As noted above, the elevations shown in the FIS report and on the FIRM for Dixie County and Incorporated Areas 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 +0.84. 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 the FIS to NGVD 29 should apply the stated conversion factor 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 additional information regarding the conversion between NGVD and NAVD, visit the NGS website at www.ngs.noaa.gov, or contact the NGS at the following address:

Vertical Network Branch, N/CG13
National Geodetic Survey, NOAA
Silver Spring Metro Center 3
1315 East-West Highway
Silver Spring, Maryland 20910
(301) 713-3191

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 report provides 1-percent-annual-chance floodplain data, which may include a combination of the following: 10-, 2-, 1-, and 0.2-percent-annual-chance flood elevations; delineations of the 1- and 0.2-percent-annual-chance floodplains; and a 1-percent-annual-chance floodway. This information is presented on the FIRM and in many components of the FIS report, including Flood Profiles, Floodway Data tables, and Summary of Stillwater Elevation tables. Users should reference the data presented in the FIS report 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-percent annual chance (100-year) flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2-percent annual chance (500-year) flood is employed to indicate additional areas of flood risk in the county. For the streams studied in detail, the 100- and 500-year floodplain boundaries have been delineated using the flood elevations determined at each cross section.

For studies performed as part of the precountywide analyses, between cross sections, the boundaries were interpolated using topographic maps at a scale of 1:12,000 with a contour interval of 2 feet (USACE, Stream Cross Sections); and at a scale of 1:24,000, with a contour interval of 5 feet (USGS, 1962 and 1963).

February 4, 2009 Countywide FIS

For the initial countywide FIS, between cross sections, the boundaries were interpolated using topographic maps at a scale of 1:24,000 with a contour interval of 5 feet (USGS, 1962 and 1963).

For the flooding sources studied by approximate methods, the boundaries of the 1- percent annual chance floodplains were delineated using topographic maps taken from the previously printed FIS reports, FHBMs, and/or FIRMs for all of the incorporated and unincorporated jurisdictions within Columbia County.

Physical Map Revision, Effective November 2, 2018

For this revision, between cross sections, the floodplain boundaries were interpolated using the LiDAR-derived DEM. This DEM was also utilized to plot floodplains for closed basin studies using the flood elevations in each basin.
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 and AE), 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.

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 base flood can be carried without substantial increases in flood heights. Minimum Federal standards limit such increases to 1 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.

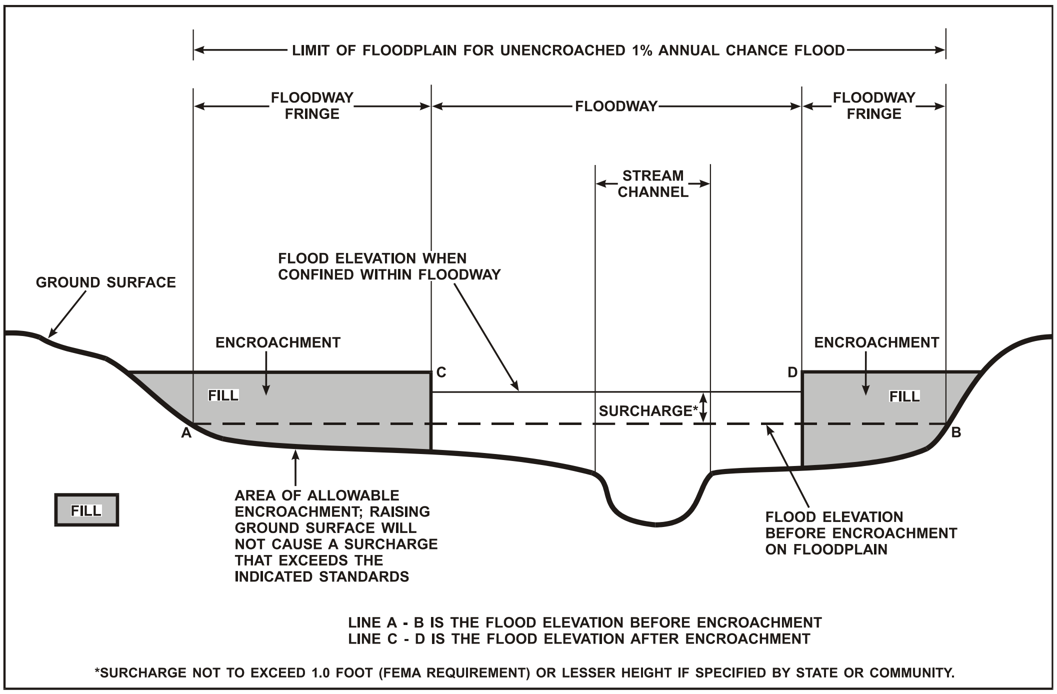
The floodways presented in this study were computed for certain stream segments on the basis of equal-conveyance reduction from each side of the floodplain. Floodway widths were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. The results of the floodway computations are tabulated for selected cross sections (see Table 4, Floodway Data). The computed floodways are shown on the FIRM (Exhibit 2). In cases where the floodway and 1-percent-annual-chance floodplain boundaries are either close together or collinear, only the floodway boundary is shown.

Portions of the flood widths for the Santa Fe and Suwannee Rivers 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 4, "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.

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 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



FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
CANNON CREEK								
A	443	300	956	2.1	70.3[2]	69.5	70.4	0.9
B	898	115	369	5.3	70.3[2]	69.7	70.6	0.9
C	1,466	317	829	2.4	70.7	70.7	71.6	0.9
D	1,831	223	707	2.8	73.5	73.5	73.8	0.3
E	2,167	260	1,015	1.9	73.9	73.8	74.4	0.6
F	3,005	281	1,358	1.5	75.2	75.2	76.0	0.8
G	3,715	240	2,164	0.9	75.3	75.3	76.1	0.8
H	6,012	66	628	3.1	77.3	77.3	77.9	0.6
I	7,446	113	446	5.4	79.6	79.6	80.0	0.4
J	9,794	54	372	6.5	84.5	84.5	84.6	0.1
K	11,162	254	665	3.6	89.4	89.4	89.9	0.5
L	12,292	194	681	3.6	92.9	92.9	93.8	0.9
M	13,470	126	522	4.2	96.3	96.3	97.1	0.8
N	14,507	137	845	2.6	98.4	98.4	99.2	0.8
O	16,365	150	427	5.1	103.2	103.2	103.7	0.5
P	17,328	244	732	3.0	108.0	108.0	108.6	0.6
Q	17,623	244	541	4.0	110.1	110.1	110.3	0.2
R	19,046	199	527	4.1	113.5	113.5	114.0	0.5
S	20,867	207	323	4.4	120.1	120.1	120.4	0.3
T	21,298	127	595	2.4	126.2	126.2	127.0	0.8
U	21,614	1,366	5,974	0.2	131.2	131.2	131.3	0.1
V	22,266	667	1,714	0.9	131.2	131.2	131.3	0.1
W	24,496	200	672	3.0	134.3	134.3	135.0	0.7
X	25,153	200	729	2.8	135.9	135.9	136.3	0.4

[1]Feet above confluence with Clay Hole Creek
[2]Elevations computed considering backwater effects from Suwannee River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL
AND INCORPORATED AREAS

FLOODWAY DATA

CANNON CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
CLAY HOLE CREEK								
A	4,286	490	3,304	1.9	56.4	56.4	57.3	0.9
B	5,508	199	2,901	2.1	57.8	57.8	58.7	0.9
C	7,919	203	1,790	3.5	61.8	61.8	62.6	0.8
D	9,806	323	4,539	1.3	65.9	65.9	66.8	0.9
E	14,357	345	2,704	2.2	68.4	68.4	69.4	1.0
F	17,322	412	3,245	1.1	71.9	71.9	72.8	0.9
G	20,057	224	2,758	1.3	81.1	81.1	81.6	0.5
H	25,108	707	6,977	0.4	82.3	82.3	82.9	0.6
I	30,682	318	1,573	1.1	87.1	87.1	87.9	0.8
J	32,102	147	627	2.9	88.7	88.7	89.2	0.5

[1]Feet above Dyal Road

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL
AND INCORPORATED AREAS

FLOODWAY DATA

CLAY HOLE CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
DEEP CREEK								
A	5,527	544	2,558	2.0	93.5[2]	87.0	87.7	0.7
B	10,068	366	2,902	2.0	93.5[2]	90.8	91.6	0.8
C	14,571	453	2,913	1.8	93.5[2]	93.4	94.3	0.9
D	19,523	541	4,484	1.2	95.7	95.7	96.5	0.8
E	28,215	483	2,798	2.0	101.0	101.0	101.4	0.4
FALLING CREEK								
A	7,957	459	2,801	1.7	89.4[2]	85.9	86.2	0.3
B	12,800	551	2,545	1.8	89.8	89.8	90.3	0.5
C	18,857	560	3,073	1.5	95.6	95.6	96.0	0.4
D	24,859	397	2,353	2.0	100.1	100.1	100.5	0.4
E	32,484	497	3,883	1.1	102.7	102.7	103.5	0.8
F	41,121	705	6,740	0.7	105.9	105.9	106.5	0.6
G	48,412	994	3,713	1.0	113.0	113.0	113.9	0.9
H	56,508	327	1,809	2.1	125.1	125.1	125.4	0.3
I	66,248	580	3,698	1.0	133.5	133.5	134.3	0.8
J	75,347	1,325	4,902	0.7	135.0	135.0	135.9	0.9

[1]Feet above confluence with Suwannee River
[2]Elevations computed considering backwater effects from Suwannee River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL
AND INCORPORATED AREAS

FLOODWAY DATA

DEEP CREEK - FALLING CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
FALLING CREEK TRIBUTARY								
A	2,185	384	1,266	0.6	134.8	134.8	135.3	0.5
B	3,798	172	386	1.7	136.2	136.2	136.4	0.2
C	4,819	1,035	1,361	0.5	138.5	138.5	138.5	0.0
D	6,460	1,459	2,034	0.9	141.2	141.2	141.2	0.0
E	9,068	293	835	1.7	146.3	146.3	147.1	0.8
F	10,675	104	472	3.0	151.0	151.0	151.6	0.6
G	11,775	244	1,055	1.3	154.4	154.4	155.2	0.8
H	14,385	82	315	3.1	159.0	159.0	159.8	0.8
I	16,515	120	661	1.5	162.8	162.8	163.7	0.9
J	19,286	561	2,091	0.3	165.1	165.1	165.7	0.6
K	25,952	1,276	1,005	0.6	166.8	166.8	166.9	0.1
L	27,622	116	391	1.4	172.1	172.1	172.3	0.2
M	29,284	69	110	1.6	174.3	174.3	175.0	0.7
N	31,242	283	357	0.0	177.3	177.3	178.0	0.7
O	32,938	30	66	0.2	177.3	177.3	178.0	0.7

[1]Feet above confluence with Falling Creek

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL
AND INCORPORATED AREAS

FLOODWAY DATA

FALLING CREEK TRIBUTARY

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
MONTGOMERY OUTLET STREAM								
A	907[1]	75	221	4.2	103.5[3]	100.1	100.9	0.8
B	1,667[1]	90	276	3.3	104.5	104.5	105.2	0.7
C	1,817[1]	91	420	2.2	109.7	109.7	109.7	0.0
D	2,692[1]	60	233	4.4	110.9	110.9	111.5	0.6
E	3,591[1]	100	348	1.8	116.0	116.0	116.6	0.6
F	3,877[1]	121	366	1.7	116.1	116.1	116.8	0.7
G	4,396[1]	24	118	5.2	117.2	117.2	117.9	0.7
H	5,146[1]	45	158	3.9	121.1	121.1	121.7	0.6
I	5,576[1]	17	89	3.0	123.1	123.1	123.4	0.3
J	6,165[1]	723	3,164	0.0	124.7	124.7	124.8	0.1
K	6,986[1]	20	32	1.4	124.8	124.8	124.8	0.0
L	7,447[1]	15	17	2.5	127.7	127.7	127.7	0.0
M	8,143[1]	65	58	0.7	130.6	130.6	130.6	0.0
ROBINSON CREEK								
A	4,920[2]	399	2,487	1.8	90.6[4]	85.8	86.2	0.4
B	11,086[2]	532	1,893	2.3	91.2	91.2	91.4	0.2
C	16,548[2]	578	4,044	1.1	97.1	97.1	97.5	0.4
D	21,904[2]	446	3,018	1.3	100.9	100.9	101.5	0.6
E	26,286[2]	465	3,336	1.2	105.5	105.5	105.8	0.3
F	30,537[2]	517	2,812	1.4	108.2	108.2	108.7	0.5
G	38,467[2]	405	2,513	1.2	115.1	115.1	115.7	0.6
H	44,649[2]	1,234	3,811	0.8	118.3	118.3	118.9	0.6

[1]Feet above confluence with Alligator Lake
[2]Feet above confluence with Suwannee River
[3]Elevations computed considering backwater effects from Alligator Lake
[3]Elevations computed considering backwater effects from Suwannee River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL
AND INCORPORATED AREAS

FLOODWAY DATA

MONTGOMERY OUTLET STREAM - ROBINSON CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
ROSE CREEK								
A	1,344	333	1,511	2.3	49.9	49.9	50.8	0.9
B	4,377	308	1,649	2.1	57.5	57.5	58.3	0.8
C	4,842	233	1,502	2.3	59.0	59.0	59.5	0.5
D	8,070	199	1,117	3.1	64.9	64.9	65.5	0.6
E	10,291	264	1,507	2.0	69.2	69.2	70.1	0.9
F	10,590	293	1,797	1.7	69.5	69.5	70.5	1.0
G	14,159	328	1,489	2.0	73.7	73.7	74.5	0.8
H	14,412	328	1,531	1.9	74.3	74.3	74.6	0.3
I	15,681	271	1,240	2.4	76.1	76.1	76.9	0.8
J	16,993	234	1,206	2.5	79.0	79.0	79.9	0.9
K	17,497	240	1,259	2.4	79.1	79.1	80.0	0.9
L	18,631	133	882	3.4	81.7	81.7	82.6	0.9
M	20,750	274	2,037	1.5	84.7	84.7	85.7	1.0
N	21,179	158	1,283	2.3	85.2	85.2	86.1	0.9
O	21,397	158	1,538	1.9	88.2	88.2	88.9	0.7
P	21,896	159	1,670	1.8	88.2	88.2	89.0	0.8

[1]Feet above confluence with Clay Hole Creek

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL
AND INCORPORATED AREAS

FLOODWAY DATA

ROSE CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH[2] (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY (FEET NGVD)	WITH FLOODWAY (FEET NGVD)	INCREASE (FEET)
SANTA FE RIVER								
A	7.64	1,694/728	23,965	0.7	33.8	33.8	34.8	1.0
B	8.43	2,099/1,260	25,132	0.7	34.0	34.0	35.0	1.0
C	10.06	1,217/5,50	17,908	0.9	34.5	34.5	35.5	1.0
D	11.30	1,615/604	28,519	0.6	34.8	34.8	35.8	1.0
E	13.03	1,832/864	28,188	0.6	35.2	35.2	36.2	1.0
F	14.08	1,883/642	25,502	0.6	35.5	35.5	36.5	1.0
G	15.08	1,643/361	22,407	0.7	35.9	35.9	36.8	0.9
H	16.53	1,668/965	23,330	0.7	36.6	36.6	37.5	0.9
I	17.78	1,615/1,122	21,455	0.8	37.2	37.2	38.2	1.0
J	18.49	1,587/1,179	18,323	0.9	37.6	37.6	38.6	1.0
K	19.62	1,224/323	18,240	0.9	38.2	38.2	39.2	1.0
L	20.44	1,368/302	19,267	1.0	38.6	38.6	39.6	1.0
M	21.59	541/367	7,946	2.5	39.6	39.6	40.5	0.9
N	22.24	524/348	6,489	3.0	40.6	40.6	41.5	0.9
O	23.14	741/639	7,772	2.5	42.0	42.0	42.9	0.9
P	23.82	491/172	7,448	2.6	43.4	43.4	44.4	1.0
Q	24.15	539/195	5,980	3.3	43.8	43.8	44.8	1.0
R	25.19	550/161	6,796	2.9	46.5	46.5	47.3	0.8
S	26.52	3,100/156	30,598	0.7	47.3	47.3	48.3	1.0
T	27.68	2,448/2,173	27,617	0.8	47.9	47.9	48.8	0.9
U	28.94	4,740/4,294	29,891	0.8	49.0	49.0	49.9	0.9
V	30.42	6,705/2,154	37,442	0.7	50.7	50.7	51.4	0.7
W	32.18	2,115/1,129	27,858	0.9	52.2	52.2	53.0	0.8
X	33.09	2,322/1,743	30,800	0.8	53.1	53.1	54.1	1.0
Y	33.85	4,222/1,303	50,494	0.5	53.7	53.7	54.7	1.0
Z	35.57	5,589/255	43,347	0.8	54.6	54.6	55.5	0.9
AA	37.98	2,490/2,341	36,149	0.9	55.9	55.9	56.7	0.8
AB	39.02	622/538	9,525	3.4	56.4	56.4	57.3	0.9
AC	39.81	1,753/121	28,891	1.1	57.7	57.7	58.6	0.9

[1]Miles above confluence with Suwannee River
[2]Width/Width within county boundary

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL
AND INCORPORATED AREAS

FLOODWAY DATA

SANTA FE RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH[2] (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
SUWANNEE RIVER								
A	166.3	4,168/177	58,902	0.6	85.0	85.0	86.8	1.0
B	166.9	4,905/161	82,272	0.4	85.2	85.2	87.0	1.0
C	168.2	7,177/6,736	118,621	0.3	85.4	85.4	86.4	1.0
D	169.4	4,401/2,918	65,101	0.5	85.8	85.8	86.8	1.0
E	169.8	2,528/47	34,603	1.0	86.0	86.0	87.0	1.0
F	170.1	3,335/1,861	40,196	0.8	86.4	86.4	87.2	1.0
G	171.1	3,463/2,976	45,834	0.7	87.2	87.2	88.2	1.0
H	172.4	4,592/3,575	52,773	0.6	88.2	88.2	89.9	0.9
I	173.9	3,378/3,143	53,982	0.6	89.1	89.1	90.9	1.0
J	174.7	2,279/1,399	31,981	1.0	89.7	89.7	91.5	1.0
K	176.2	3,097/1,327	36,929	0.9	90.5	90.5	92.3	1.0
L	177.7	1,542/540	27,258	1.2	91.9	91.9	93.7	1.0
M	178.9	3,314/46	47,537	0.7	92.7	92.7	94.5	1.0
N	180.5	2,937/1,823	39,890	0.8	93.5	93.5	95.2	1.0
O	182.1	3,267/578	39,912	0.8	94.5	94.5	96.3	1.0
P	183.6	2,314/1,243	33,602	0.9	95.5	95.5	97.2	1.0
Q	184.5	3,736/2,211	50,181	0.6	96.0	96.0	97.7	1.0

[1]Miles above mouth
[2]Width/Width within county boundary

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL
AND INCORPORATED AREAS

FLOODWAY DATA

SUWANNEE RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH[2] (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
SUWANNEE RIVER (continued)								
R	186.5	3,860/3,822	48,155	0.6	97.1	97.1	98.2	1.1
S	188.3	4,556/1,638	53,554	0.6	97.7	97.7	98.8	1.1
T	190.4	3,334/1,139	41,355	0.7	99.0	99.0	100.1	1.0
U	192.4	3,758/3,080	49,120	0.6	100.2	100.2	101.2	1.0
V	193.9	4,180/3,109	53,611	0.5	100.9	100.9	101.9	1.0
W	195.7	2,932/1,973	36,328	0.8	101.6	101.6	102.6	1.0
X	196.4	2,378/147	31,414	0.9	102.3	102.3	103.3	1.0
Y	198.1	3,239/3,035	31,289	0.9	103.2	103.2	104.2	1.1
Z	199.5	2,175/1,458	26,624	1.0	104.2	104.2	105.2	1.0
AA	200.7	2,966/771	47,435	0.6	104.8	104.8	105.8	1.0
AB	202.6	3,077/85	41,851	0.7	105.4	105.4	106.4	1.0
AC	204.0	4,020/129	47,038	0.6	106.0	106.0	107.0	1.1
AD	205.3	2,339/987	34,081	0.8	106.9	106.9	107.9	1.0
AE	206.4	2,667/815	40,781	0.7	107.4	107.4	108.4	1.0

[1]Miles above mouth
[2]Width/Width within county boundary

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL
AND INCORPORATED AREAS

FLOODWAY DATA

SUWANNEE RIVER

5.0 INSURANCE APPLICATION

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 rate zone that corresponds to the 1-percent-annual-chance floodplains that are determined in the FIS report by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no base (1-percent-annual-chance) flood elevations (BFEs) 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 report by detailed methods. 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 rate zone that corresponds to 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 rate zone that corresponds to 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

Zone AR is the flood insurance risk zone that corresponds to an area of special flood hazard formerly protected from the base 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 BFEs 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 BFEs 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 BFEs 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, 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 (sq. mi.), and areas protected from the base flood by levees. No BFEs 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-percent-annual-chance floodplains that were studied by detailed methods, shows selected whole-foot BFEs or average depths. Insurance agents use 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 and shown where applicable.

The current FIRM presents flooding information for the entire geographic area of Columbia County. Previously, separate Flood Hazard Boundary Maps and/or FIRMs were prepared for each identified flood-prone incorporated community and the unincorporated areas of the county. This countywide FIRM also includes flood hazard information that was presented separately on Flood Boundary and Floodway Maps (FBFMs), where applicable. Historical data relating to the pre-countywide FIRMs prepared for each community, are presented in Table 5, "Community Map History."

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISIONS DATE	FIRM EFFECTIVE DATE	FIRM REVISIONS DATE
Columbia County (Unincorporated Areas)	January 20, 1978	None	January 6, 1988	N/A
Lake City, City of	October 29, 1976	January11, 1980 October 2, 1981	January 6, 1988	N/A
Fort White, Town of [1,2]	N/A	N/A	N/A	N/A

[1] No Special Flood Hazard Areas Identified
[2] This community does not have map history prior to the first countywide mapping.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL AND INCORPORATED AREAS

COMMUNITY MAP HISTORY

7.0 OTHER STUDIES

Information pertaining to revised and unrevised flood hazards for each jurisdiction within Columbia County has been compiled into this FIS. Therefore, this FIS supersedes all previously printed FIS Reports, FHBMs, FBFMs, and FIRMs for all of the incorporated and unincorporated jurisdictions within Columbia County.

This study is referenced to the new vertical datum of NAVD 88 and therefore does not match Flood Insurance Studies of adjacent counties that are referenced to NGVD 29. However, this is a datum change only, and does not affect actual levels.

8.0 LOCATION OF DATA

Information concerning the pertinent data used in the preparation of this FIS can be obtained by contacting FEMA, Federal Insurance and Mitigation Division, Koger Center - Rutgers Building, 3003 Chamblee Tucker Road, Atlanta, Georgia 30341.

9.0 BIBLIOGRAPHY AND REFERENCES

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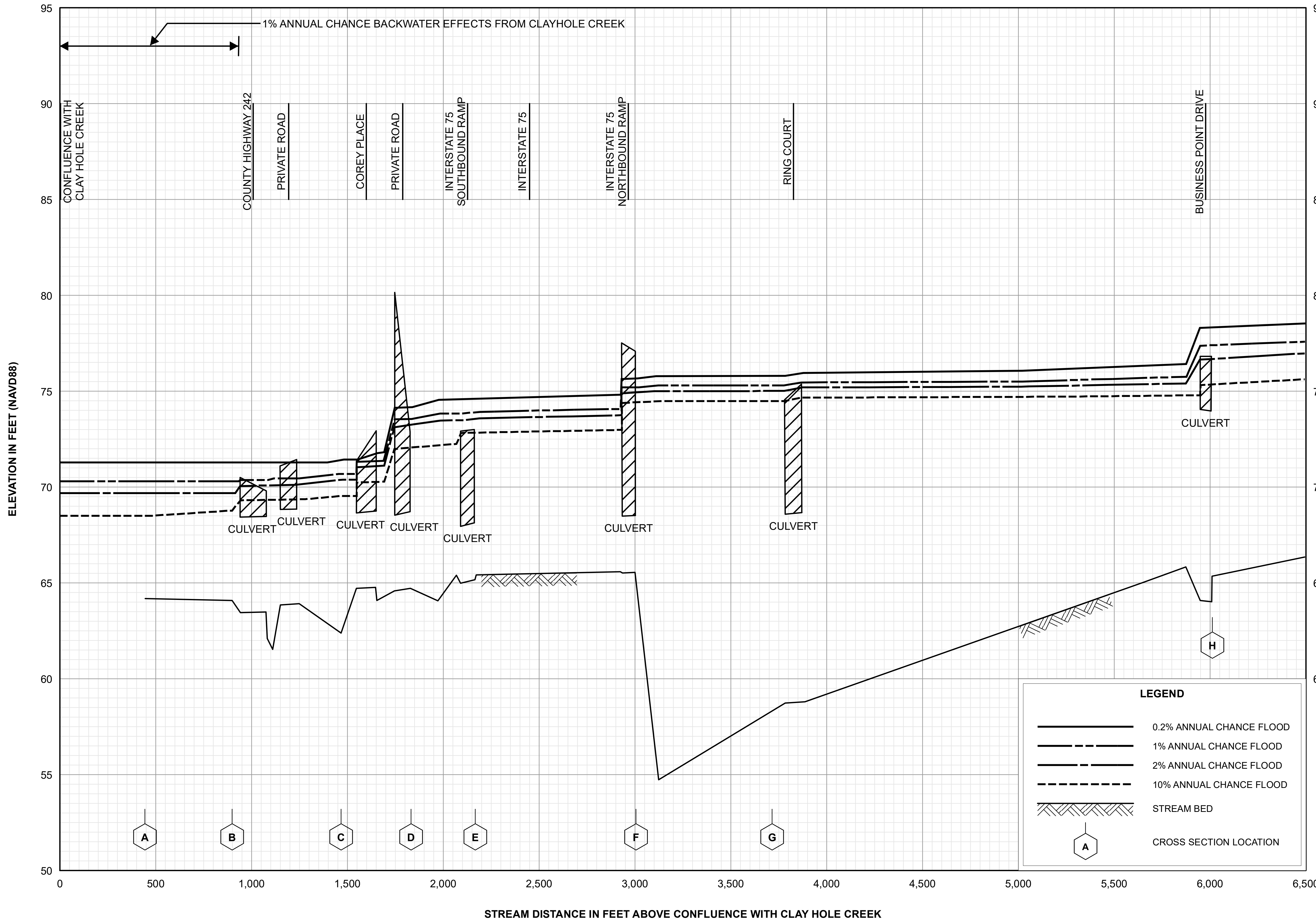


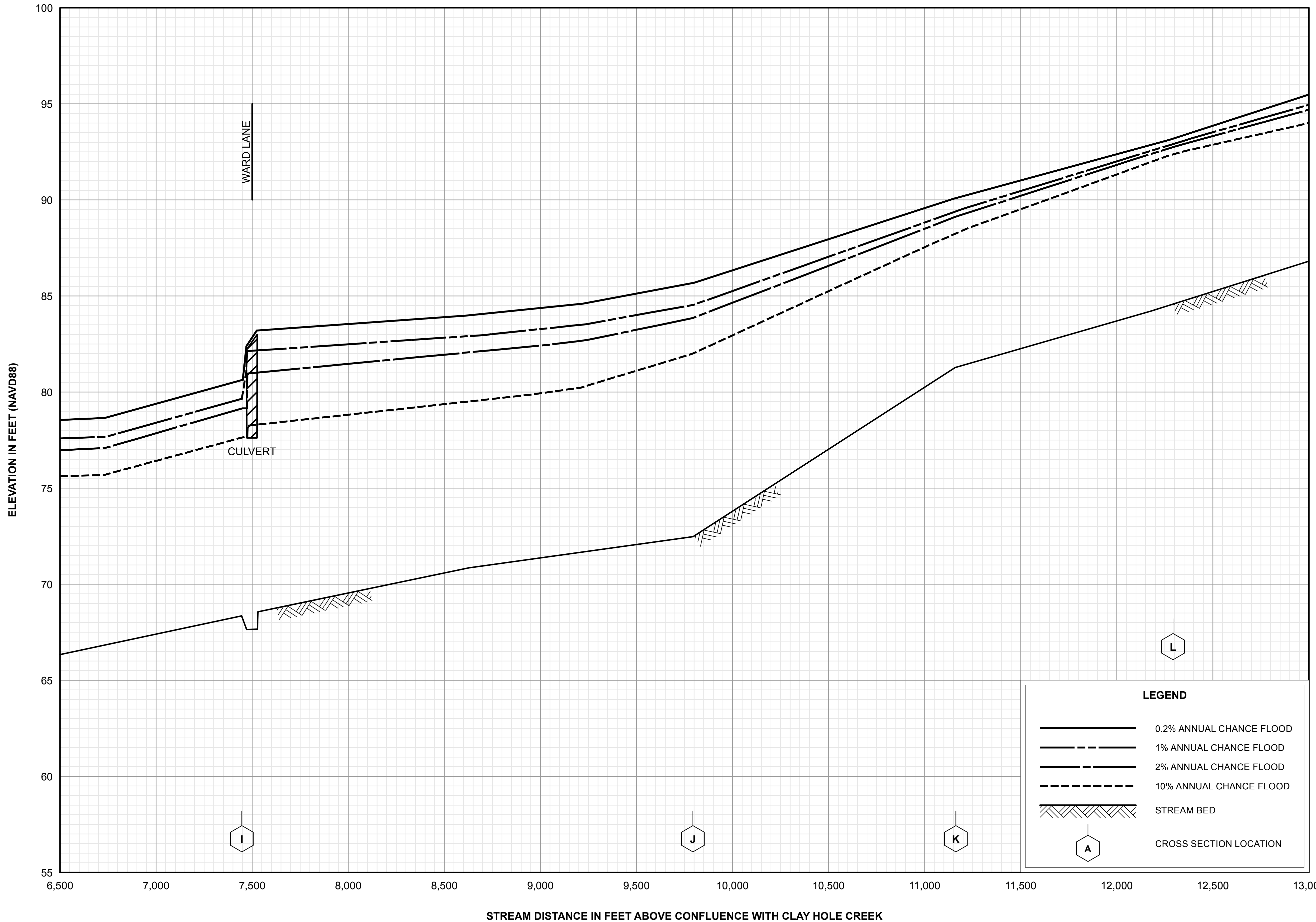
FLOOD PROFILES

CANNON CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL
AND INCORPORATED AREAS

01P



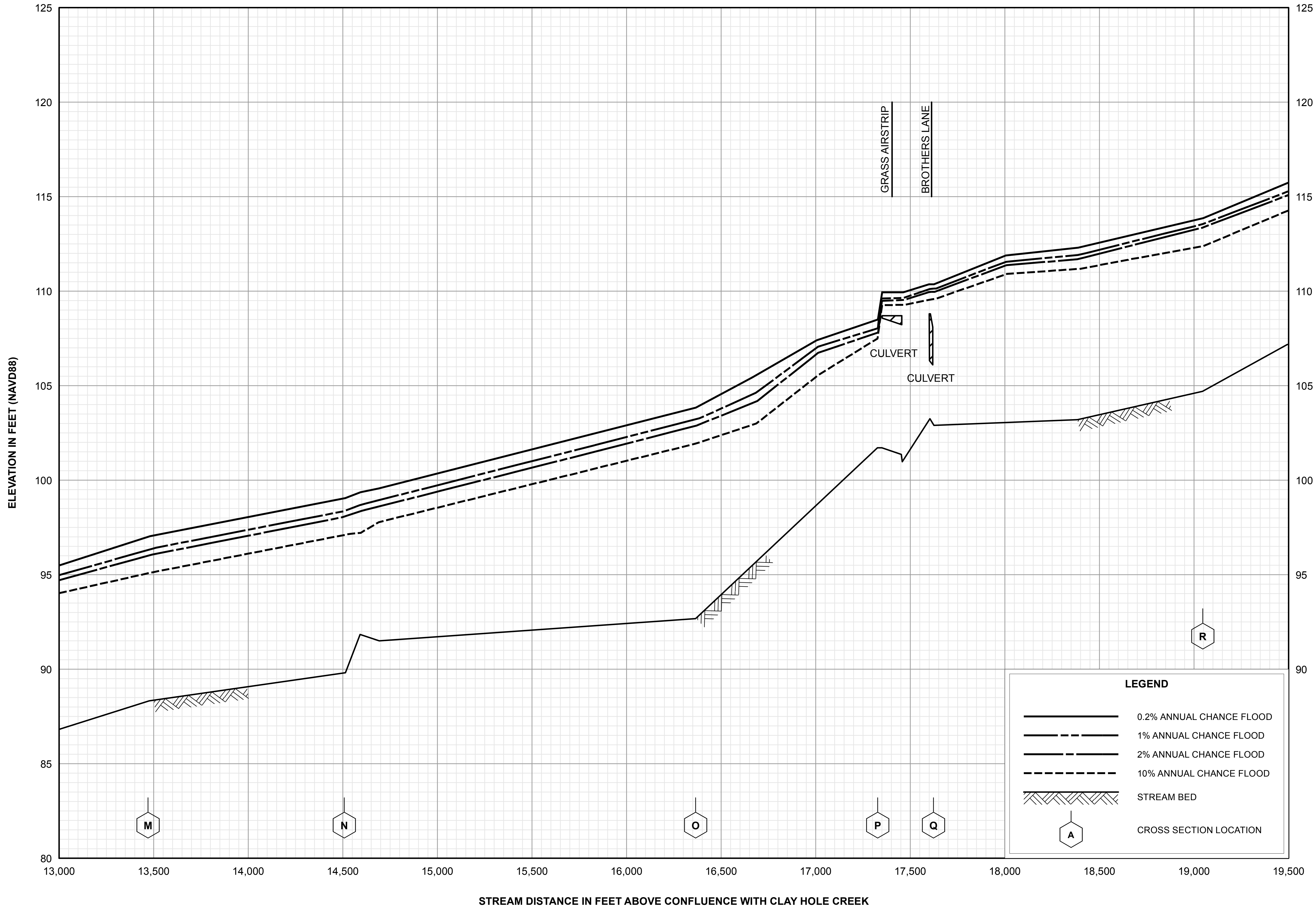
FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL
AND INCORPORATED AREAS

FLOOD PROFILES

CANNON CREEK

02P



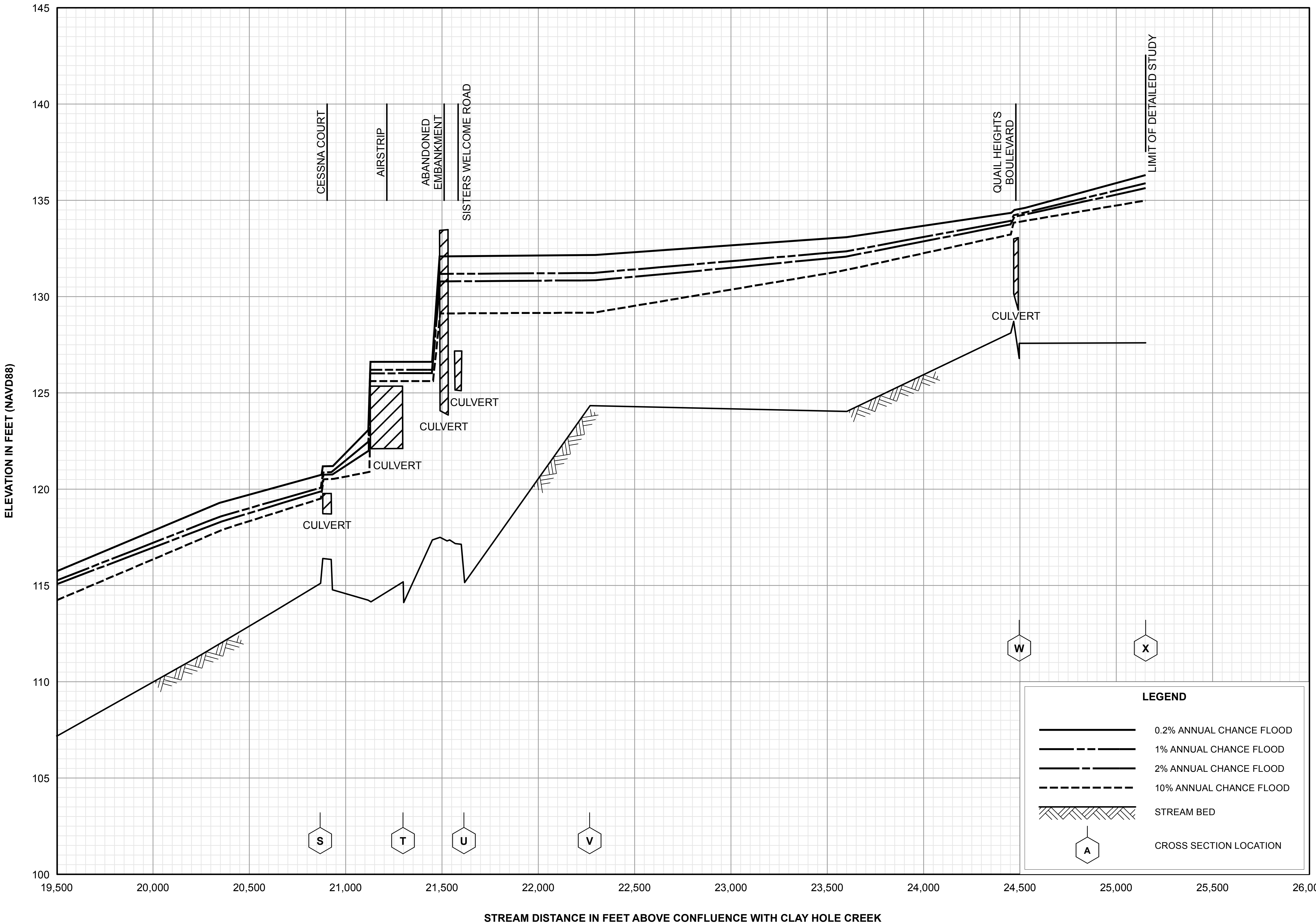
FLOOD PROFILES

CANNON CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL
AND INCORPORATED AREAS

03P



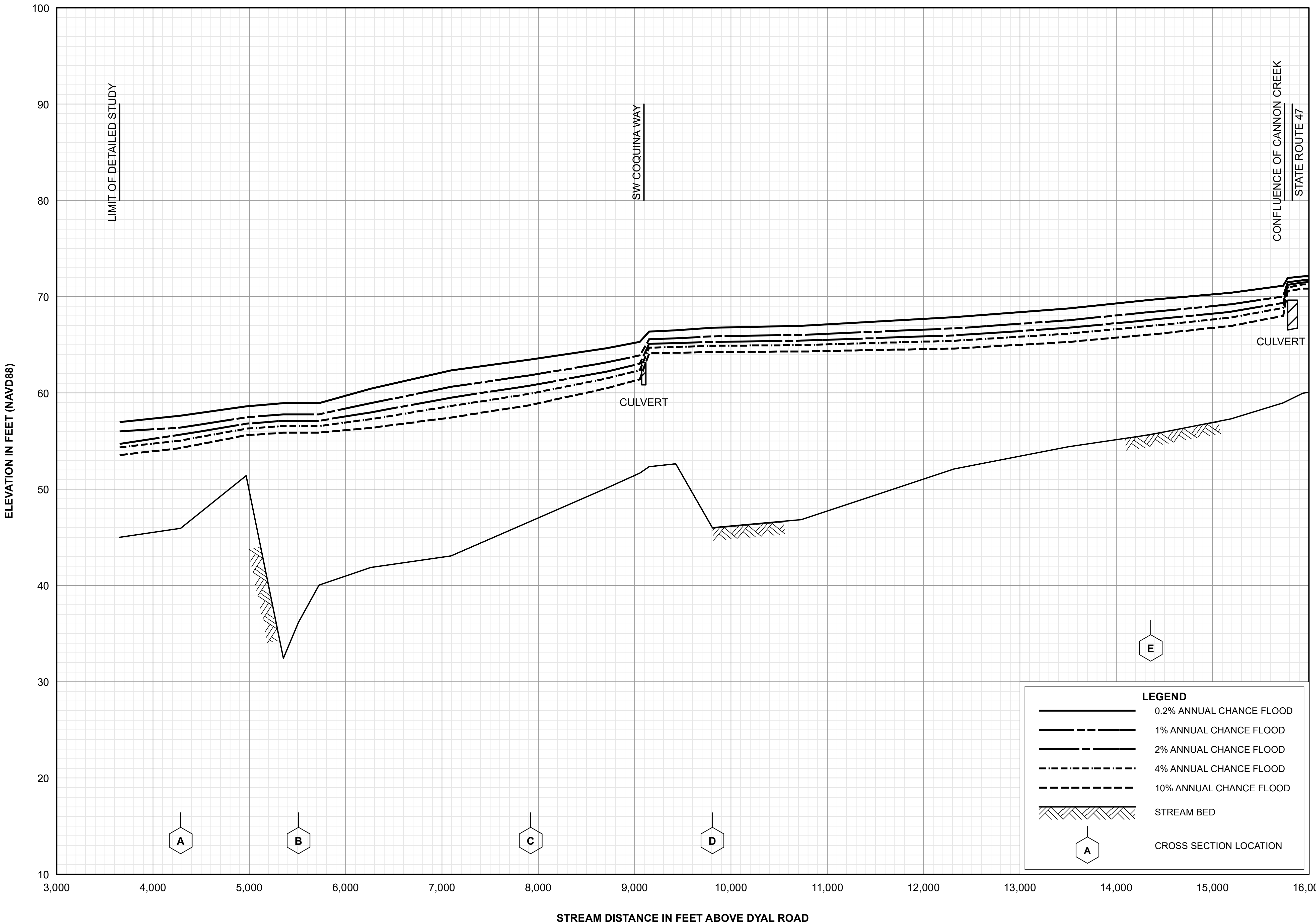
FLOOD PROFILES

CANNON CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL

AND INCORPORATED AREAS



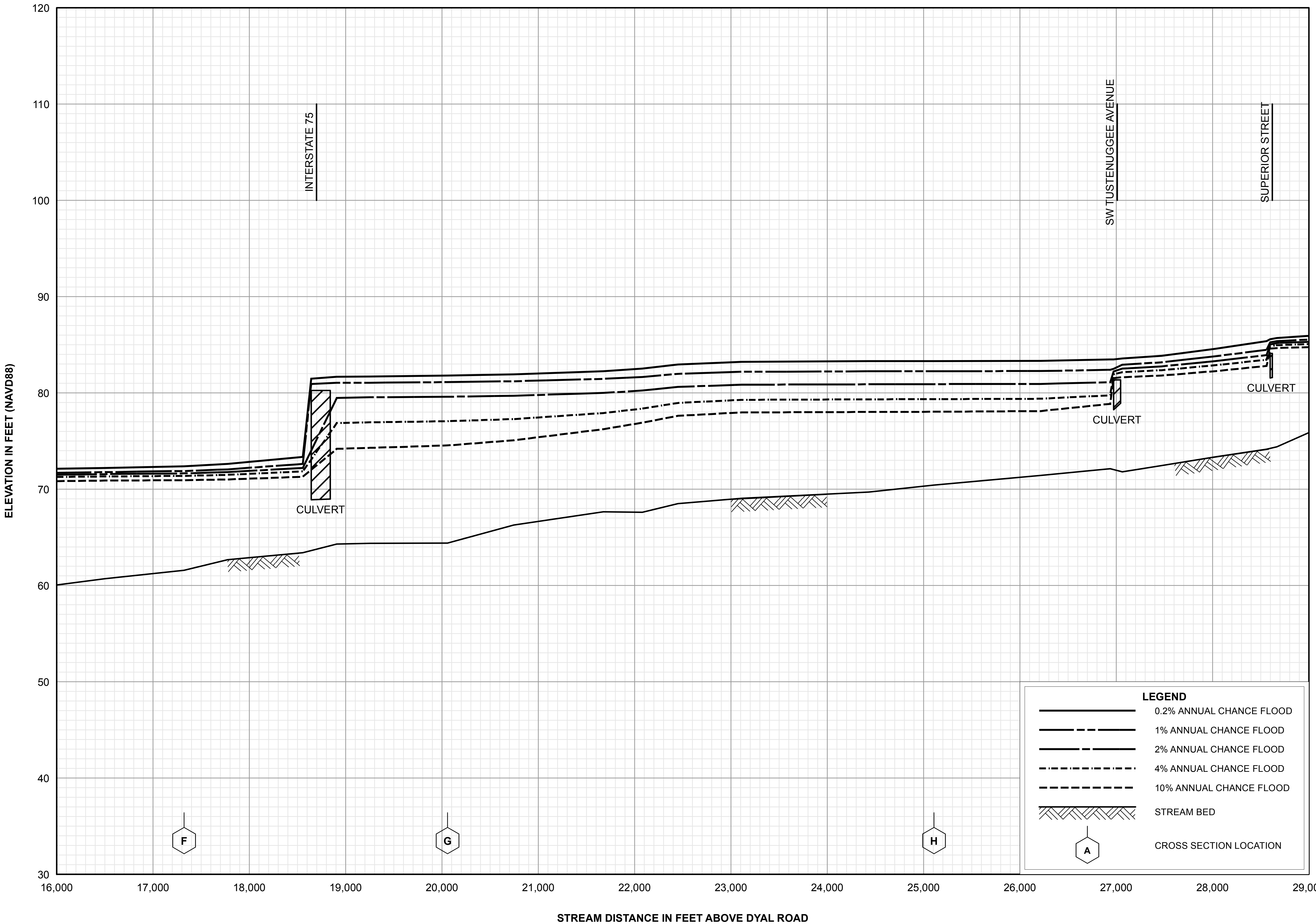
FLOOD PROFILES

CLAY HOLE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL

AND INCORPORATED AREAS



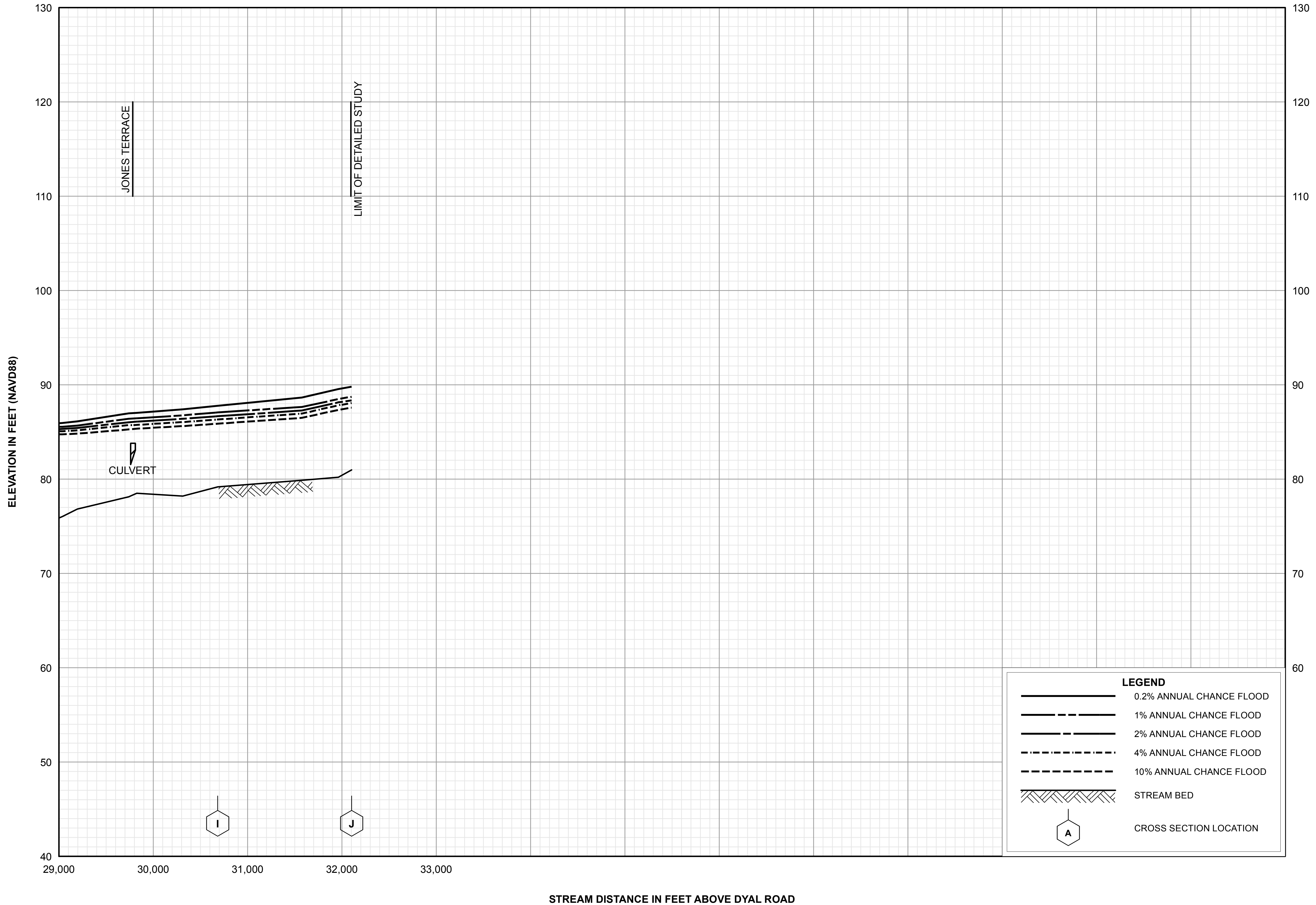
FLOOD PROFILES

CLAY HOLE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL
AND INCORPORATED AREAS

06P



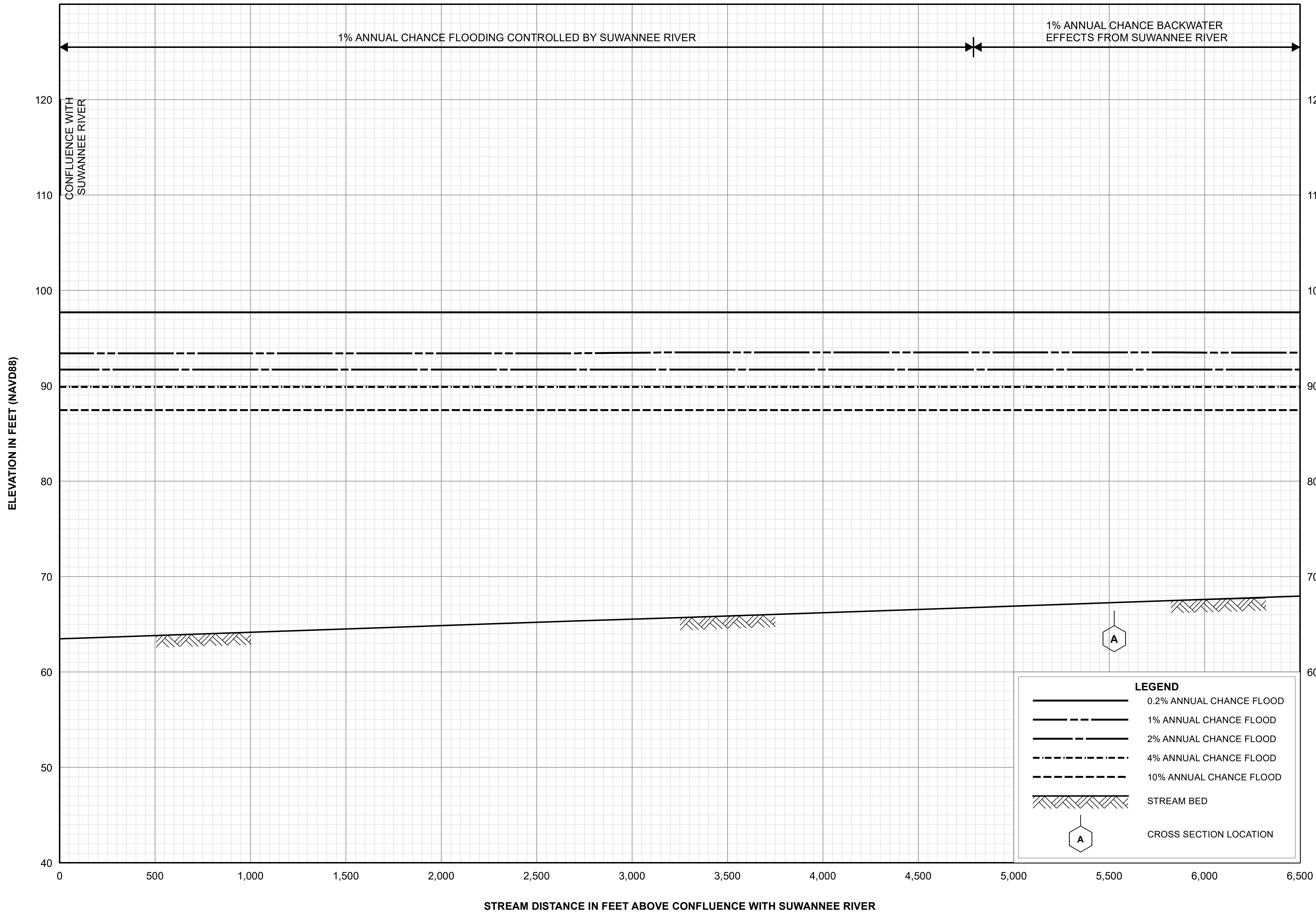
FLOOD PROFILES

CLAY HOLE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL
AND INCORPORATED AREAS

07P



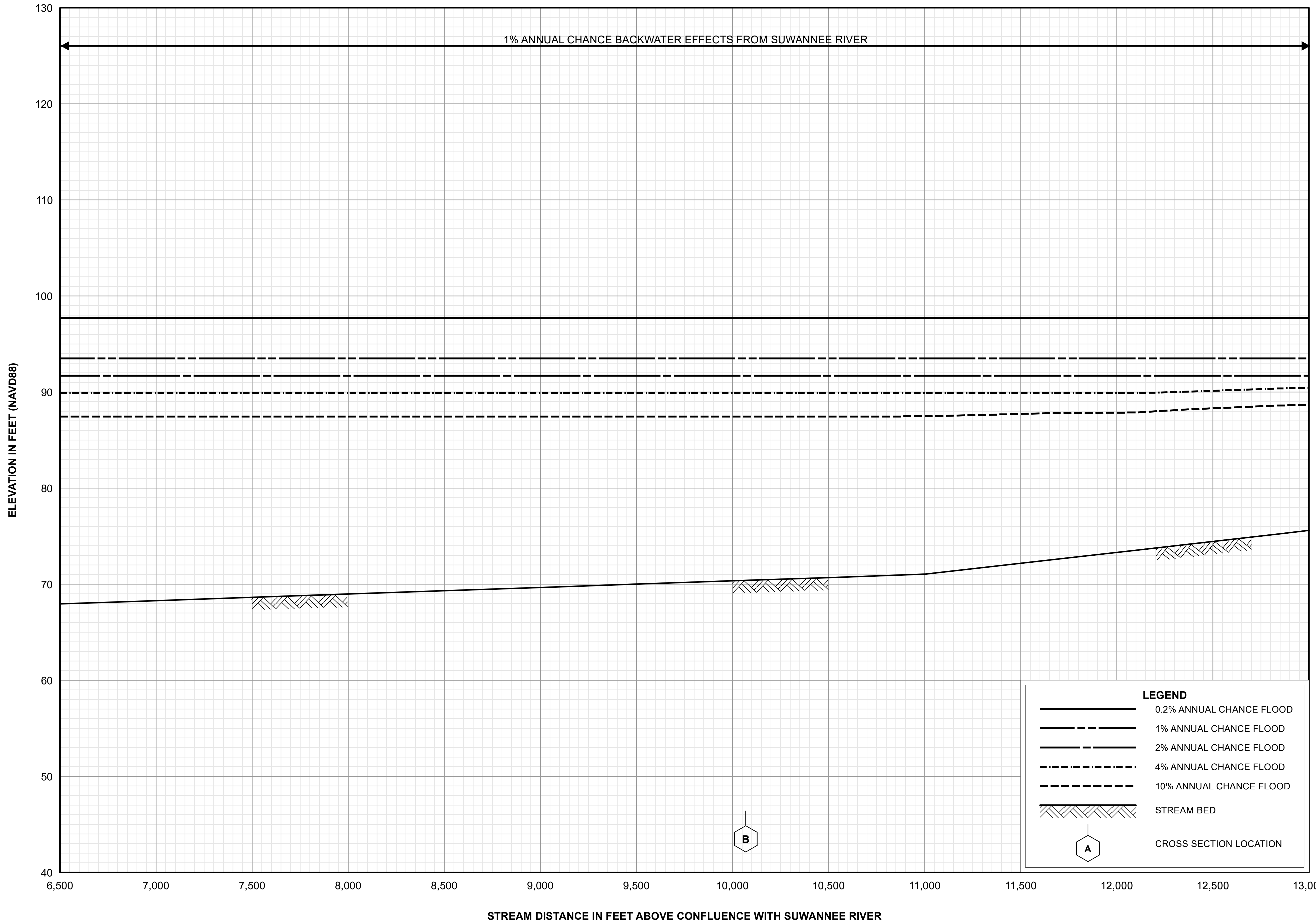
FLOOD PROFILES

DEEP CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL
AND INCORPORATED AREAS

08P



FLOOD PROFILES

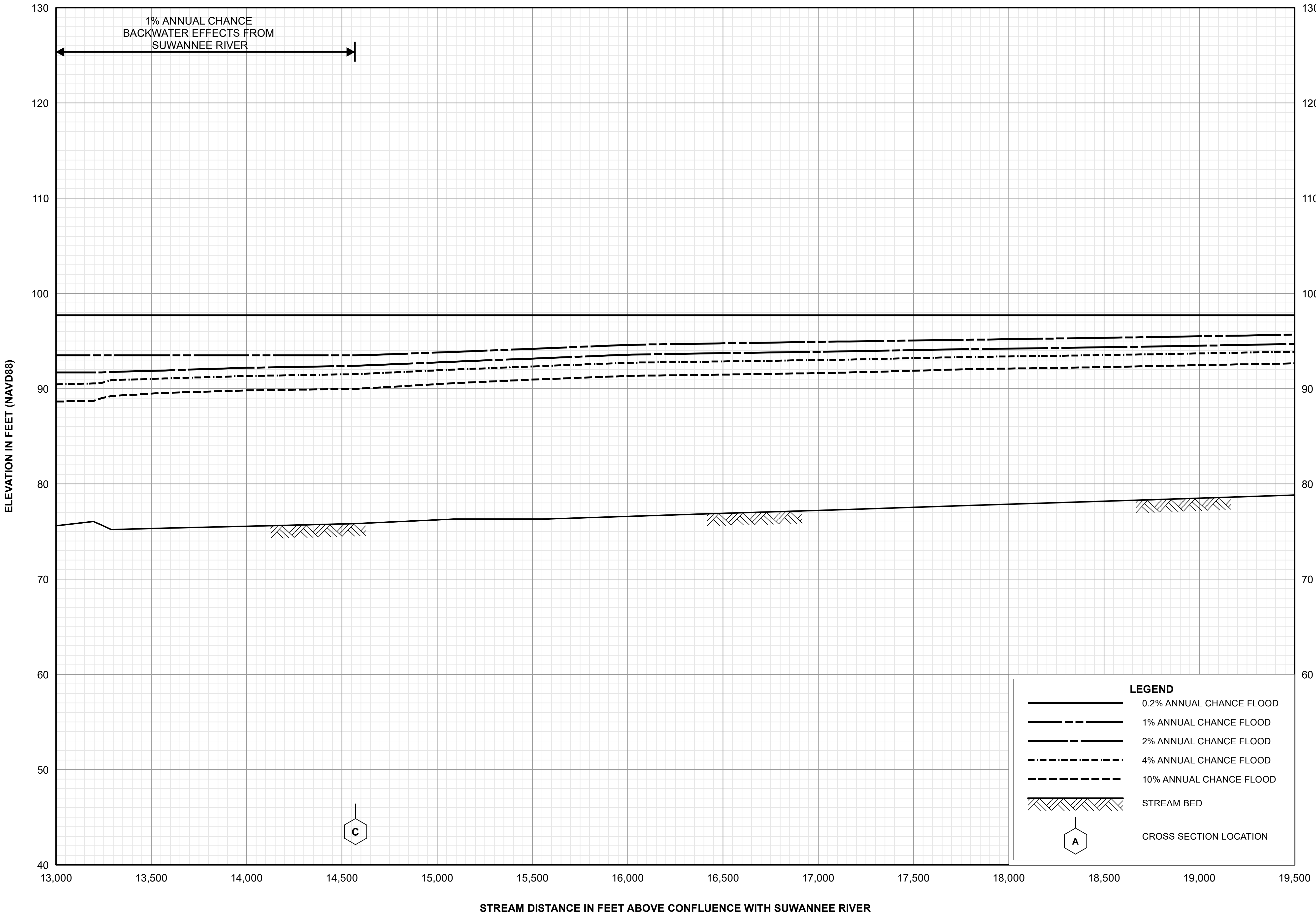
DEEP CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL

AND INCORPORATED AREAS

09P

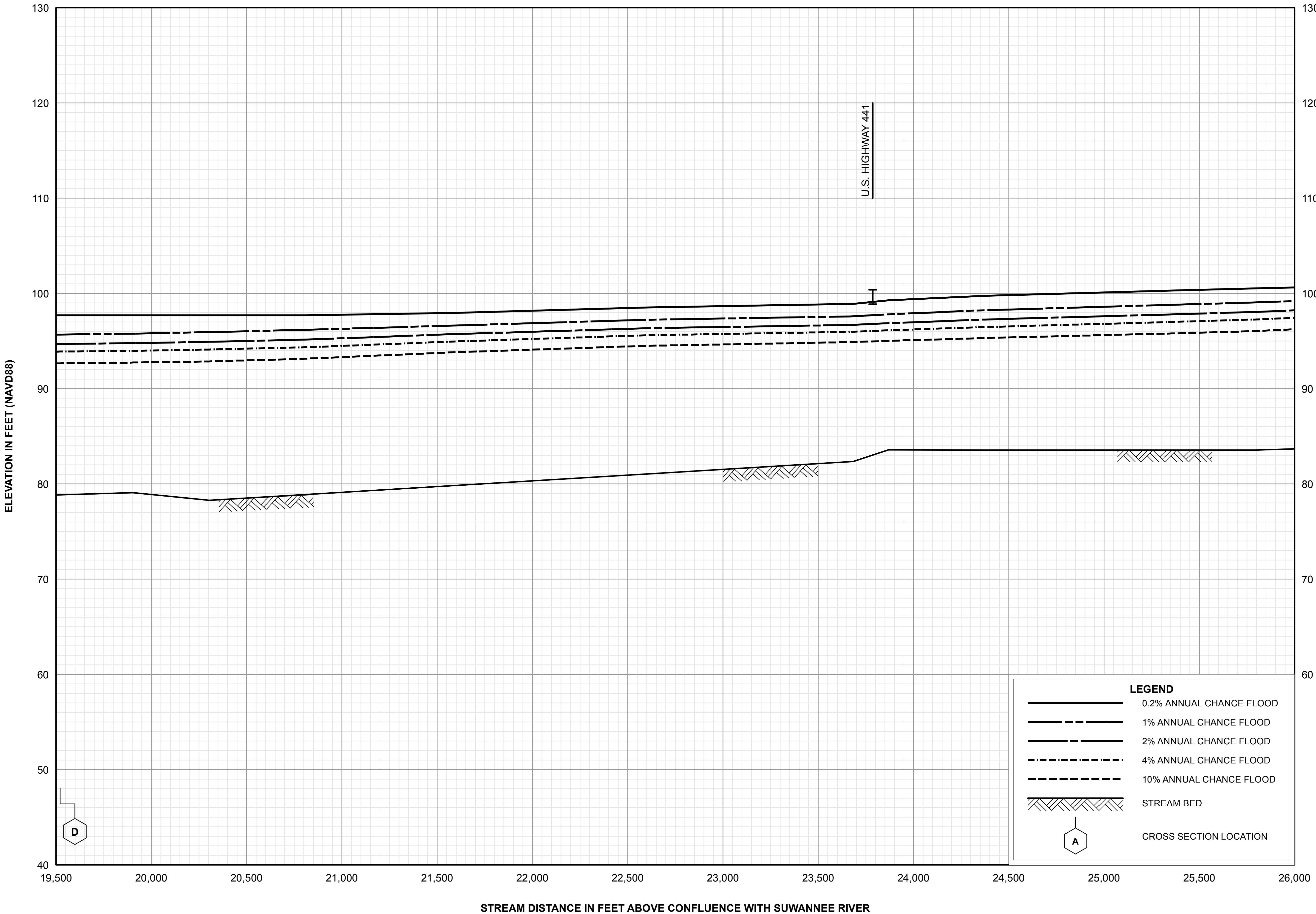


FLOOD PROFILES

DEEP CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL
AND INCORPORATED AREAS

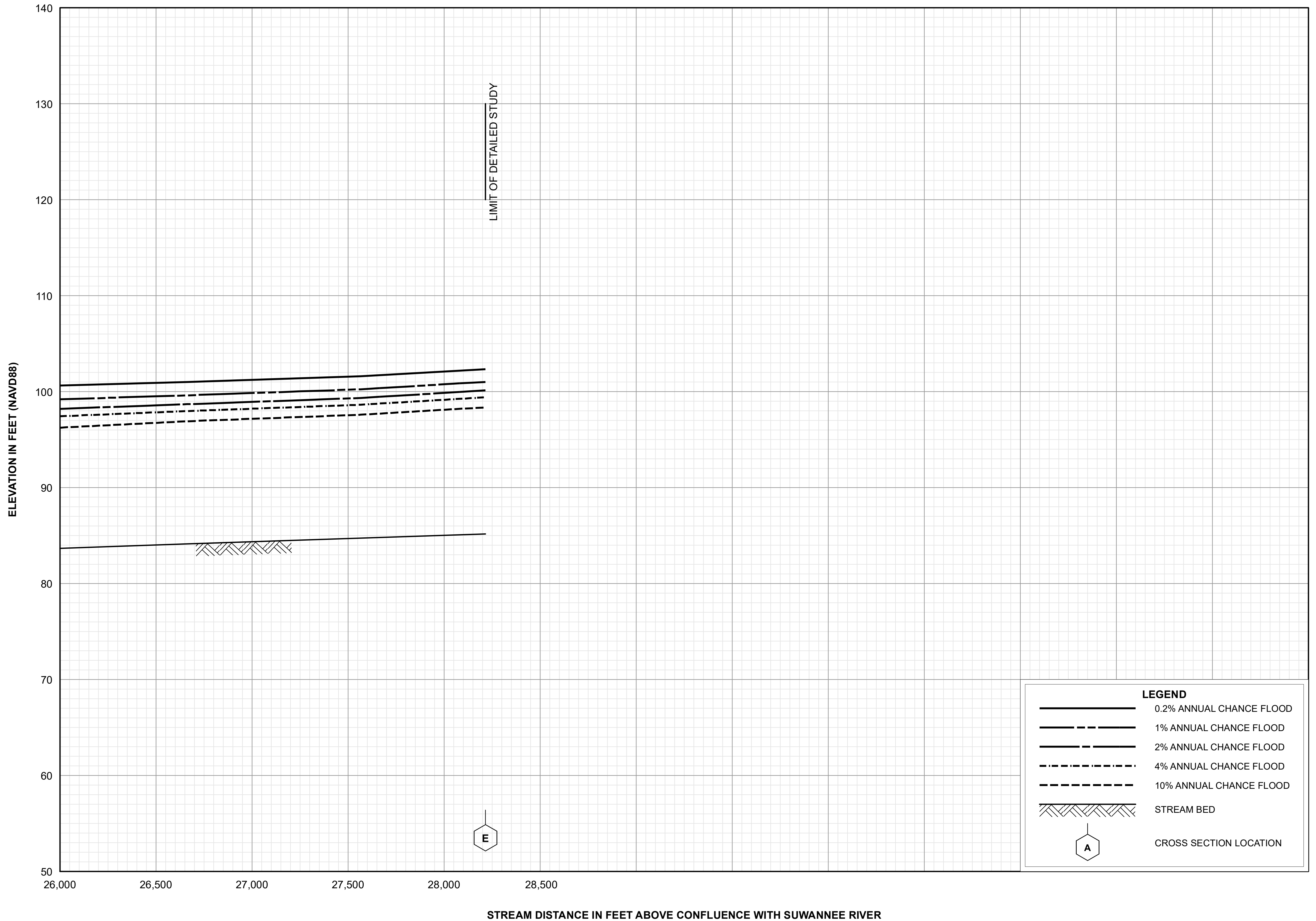


FLOOD PROFILES

DEEP CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL
AND INCORPORATED AREAS



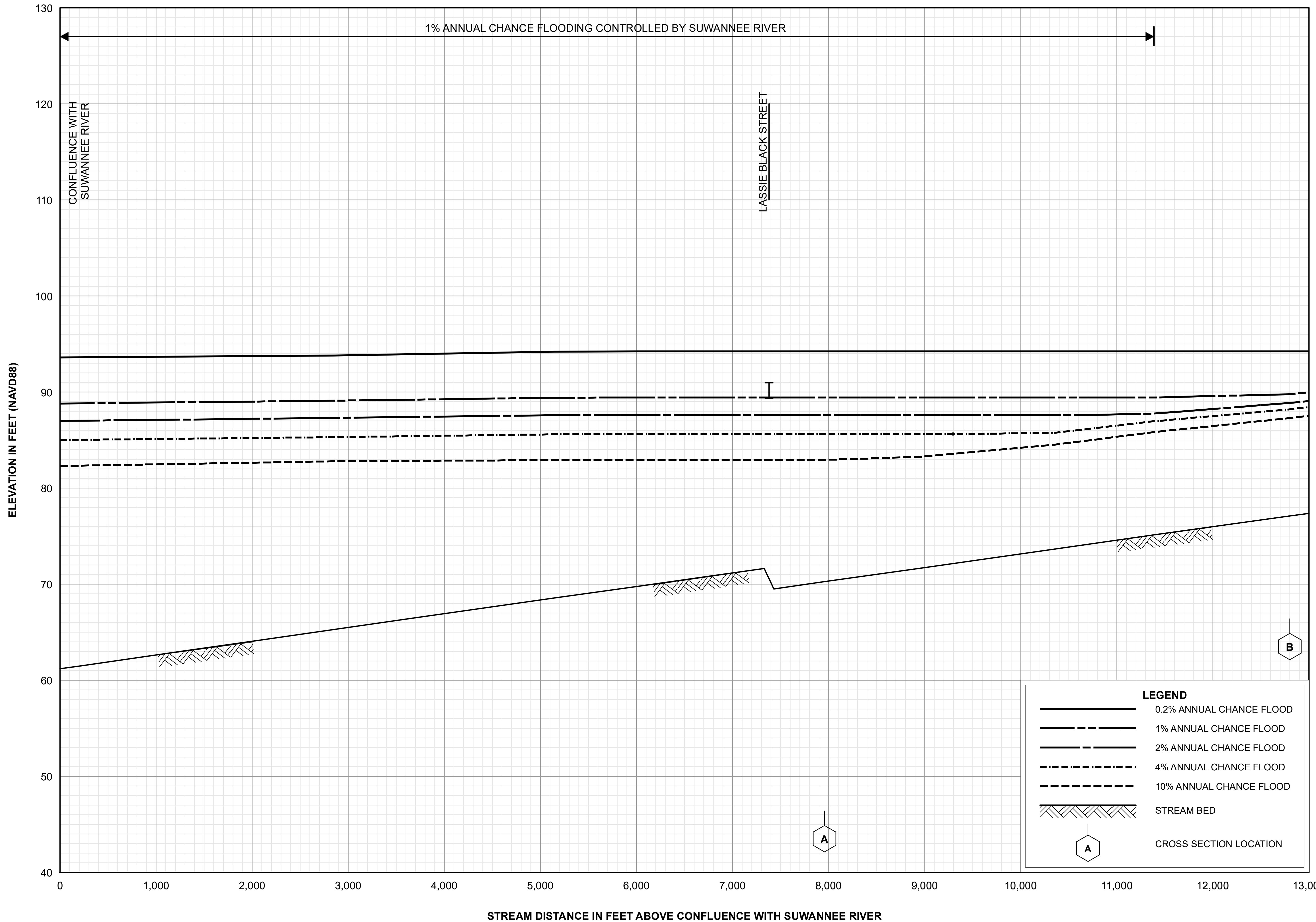
FLOOD PROFILES

DEEP CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL
AND INCORPORATED AREAS

12P



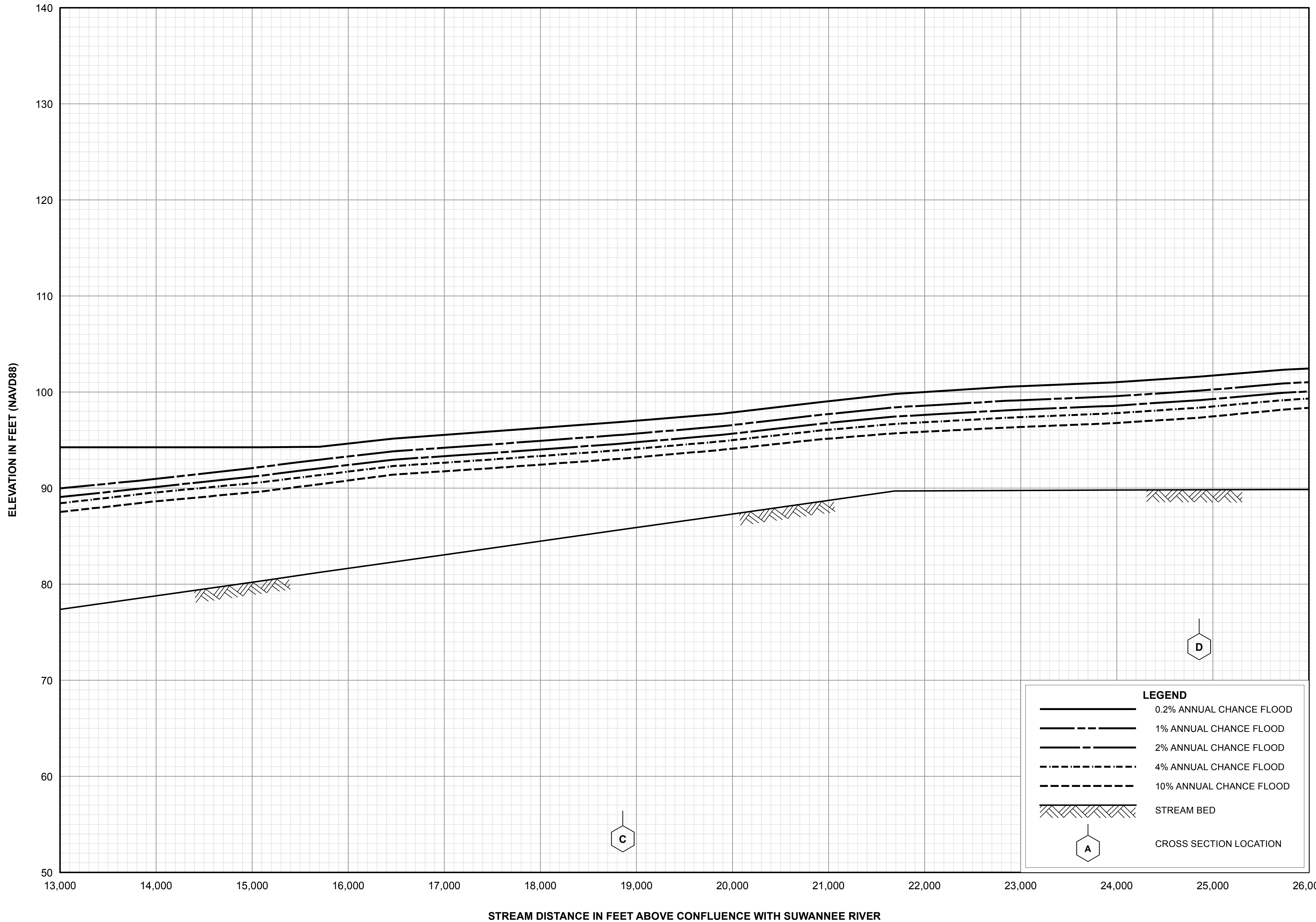
FLOOD PROFILES

FALLING CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL
AND INCORPORATED AREAS

13P



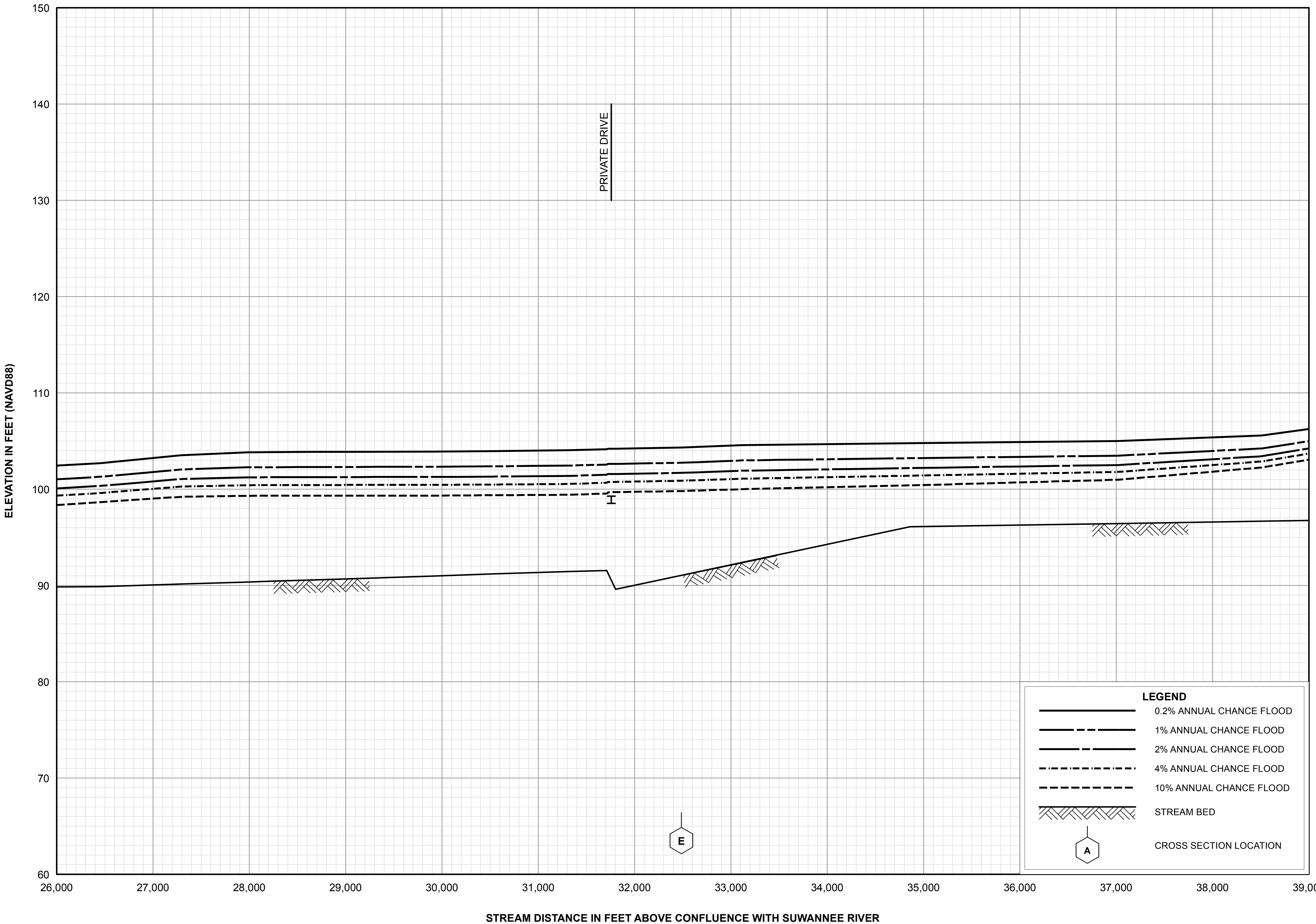
FLOOD PROFILES

FALLING CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL

AND INCORPORATED AREAS



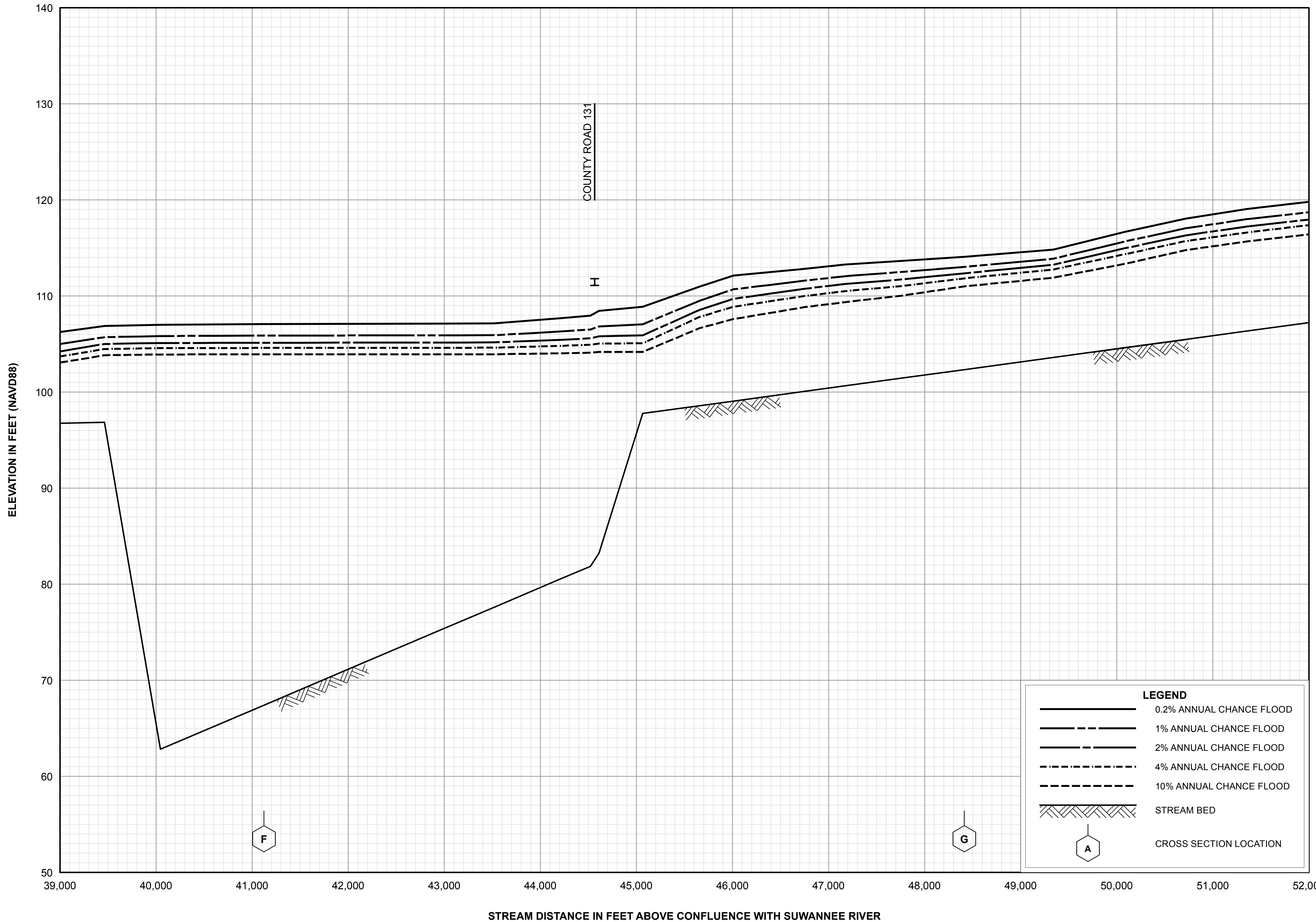
FLOOD PROFILES

FALLING CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL
AND INCORPORATED AREAS

15P



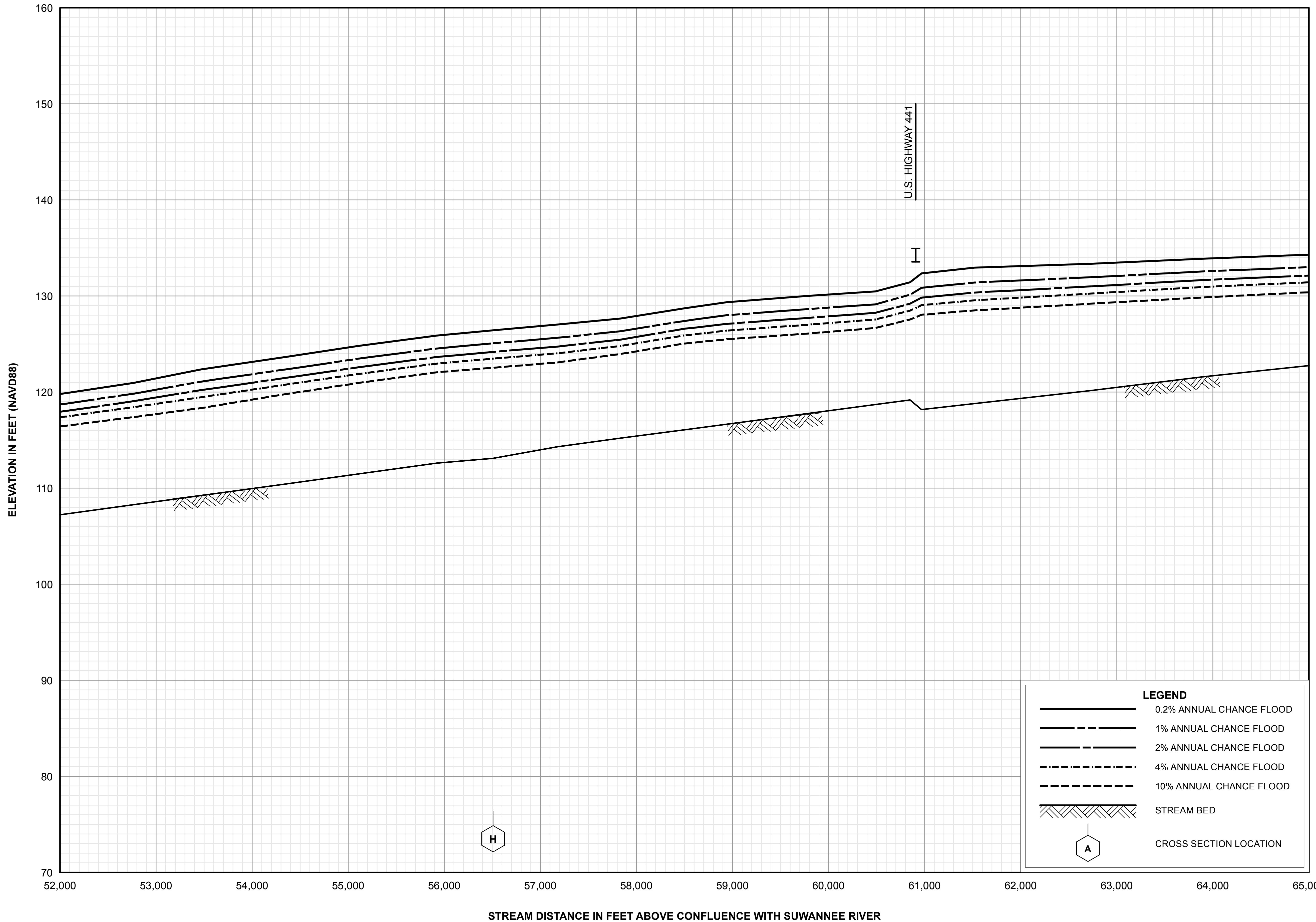
FLOOD PROFILES

FALLING CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL

AND INCORPORATED AREAS

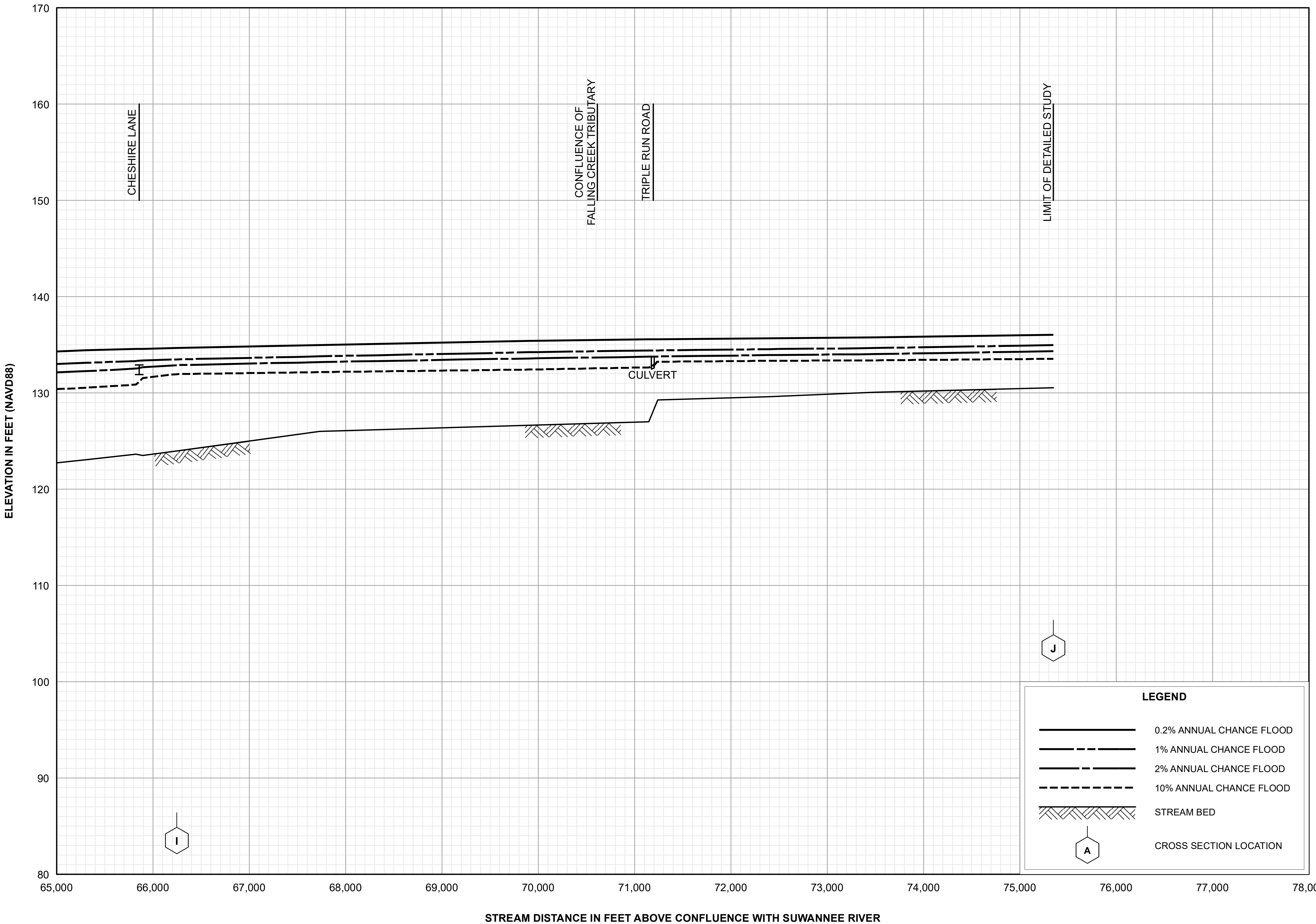


FLOOD PROFILES

FALLING CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL
AND INCORPORATED AREAS

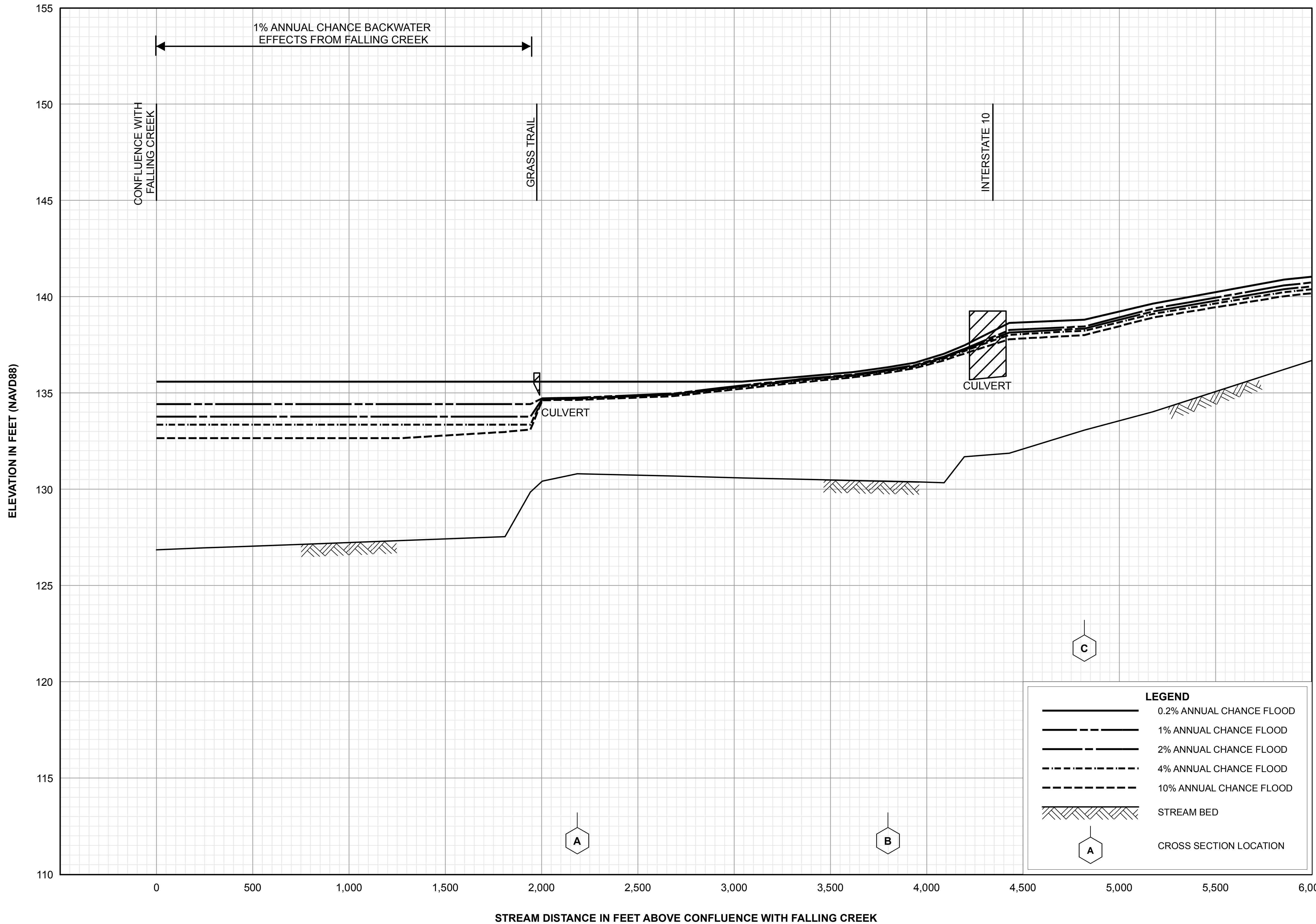


FLOOD PROFILES

FALLING CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL
AND INCORPORATED AREAS



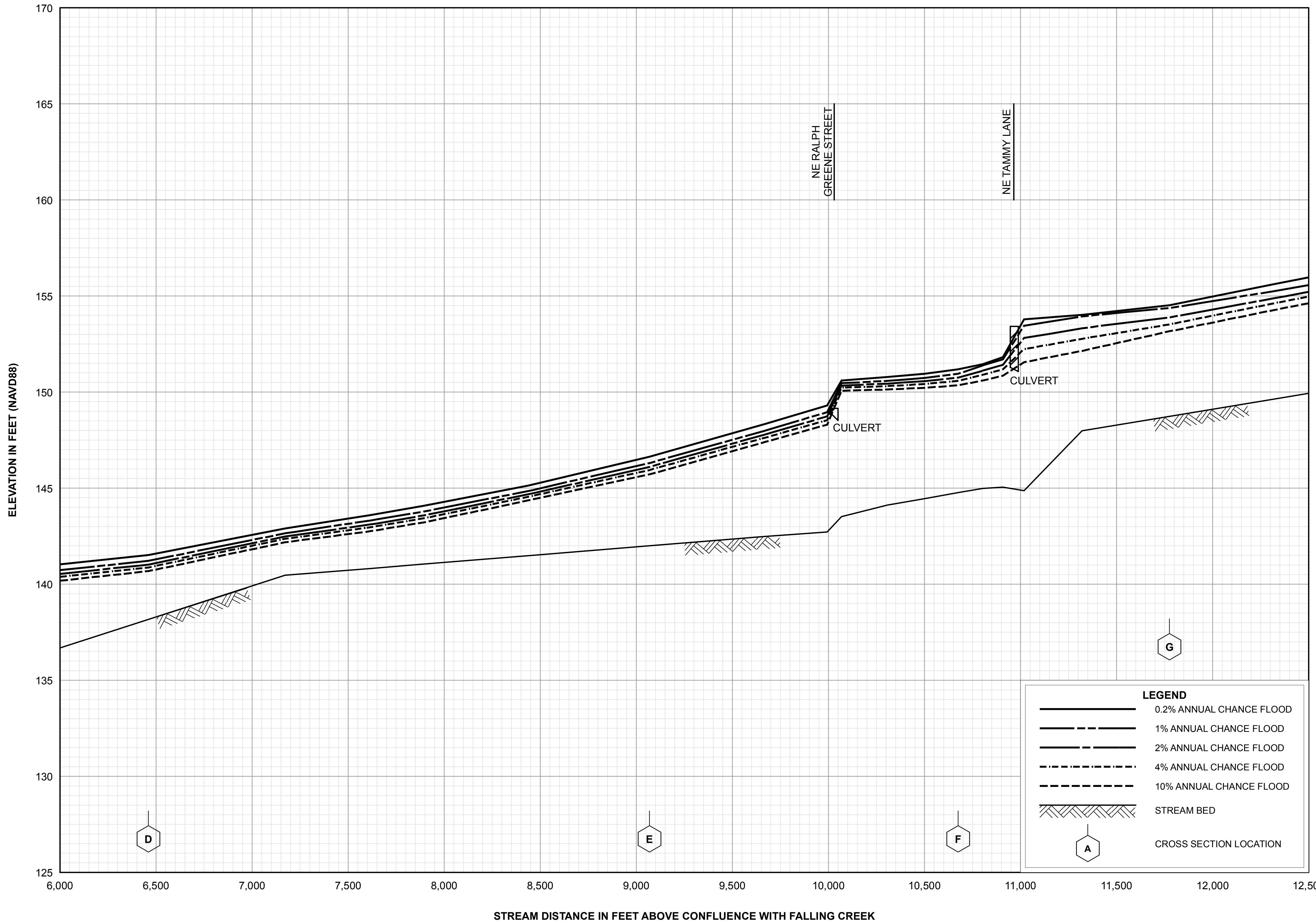
FLOOD PROFILES

FALLING CREEK TRIBUTARY

FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL

AND INCORPORATED AREAS



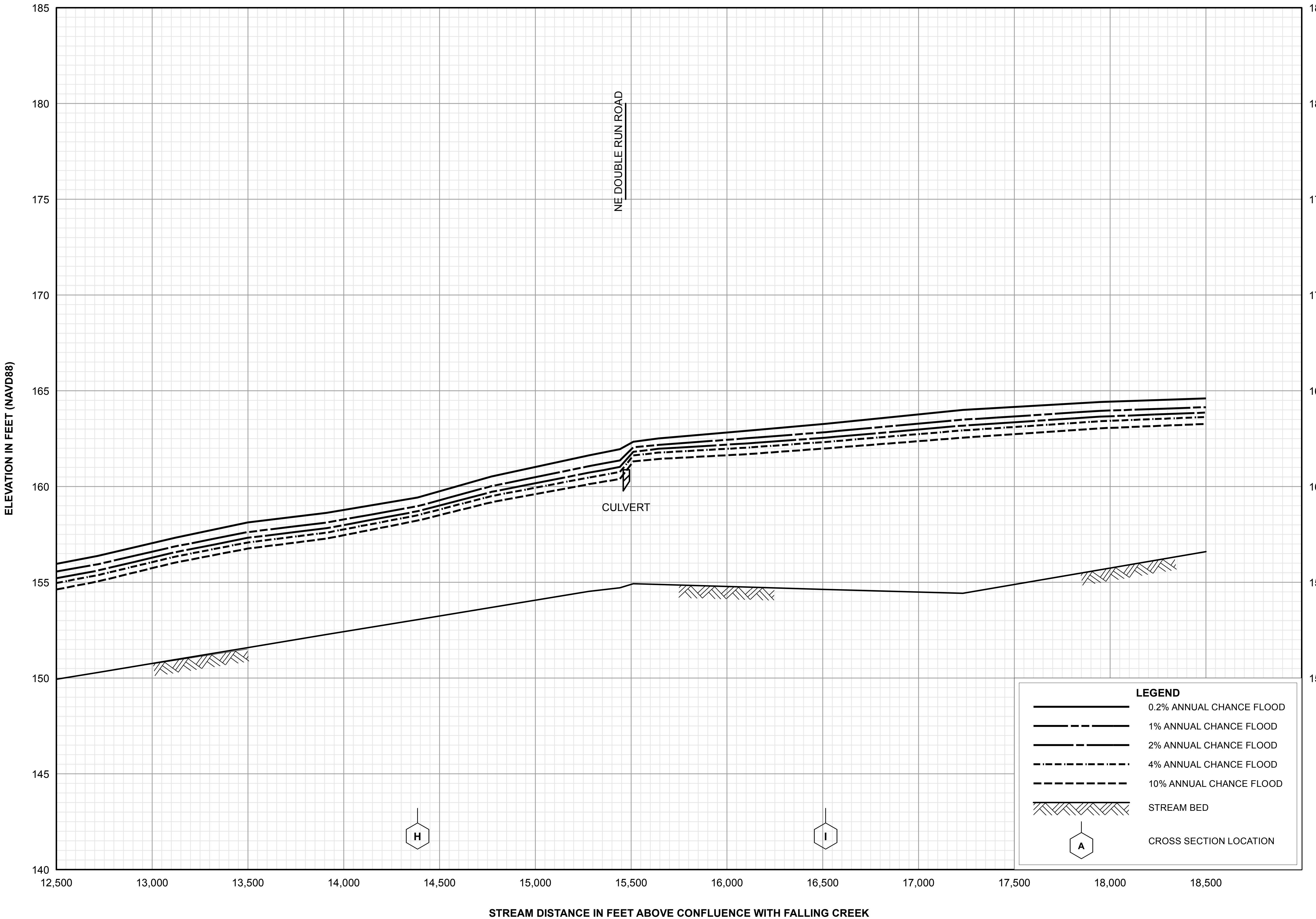
FLOOD PROFILES

FALLING CREEK TRIBUTARY

FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL

AND INCORPORATED AREAS

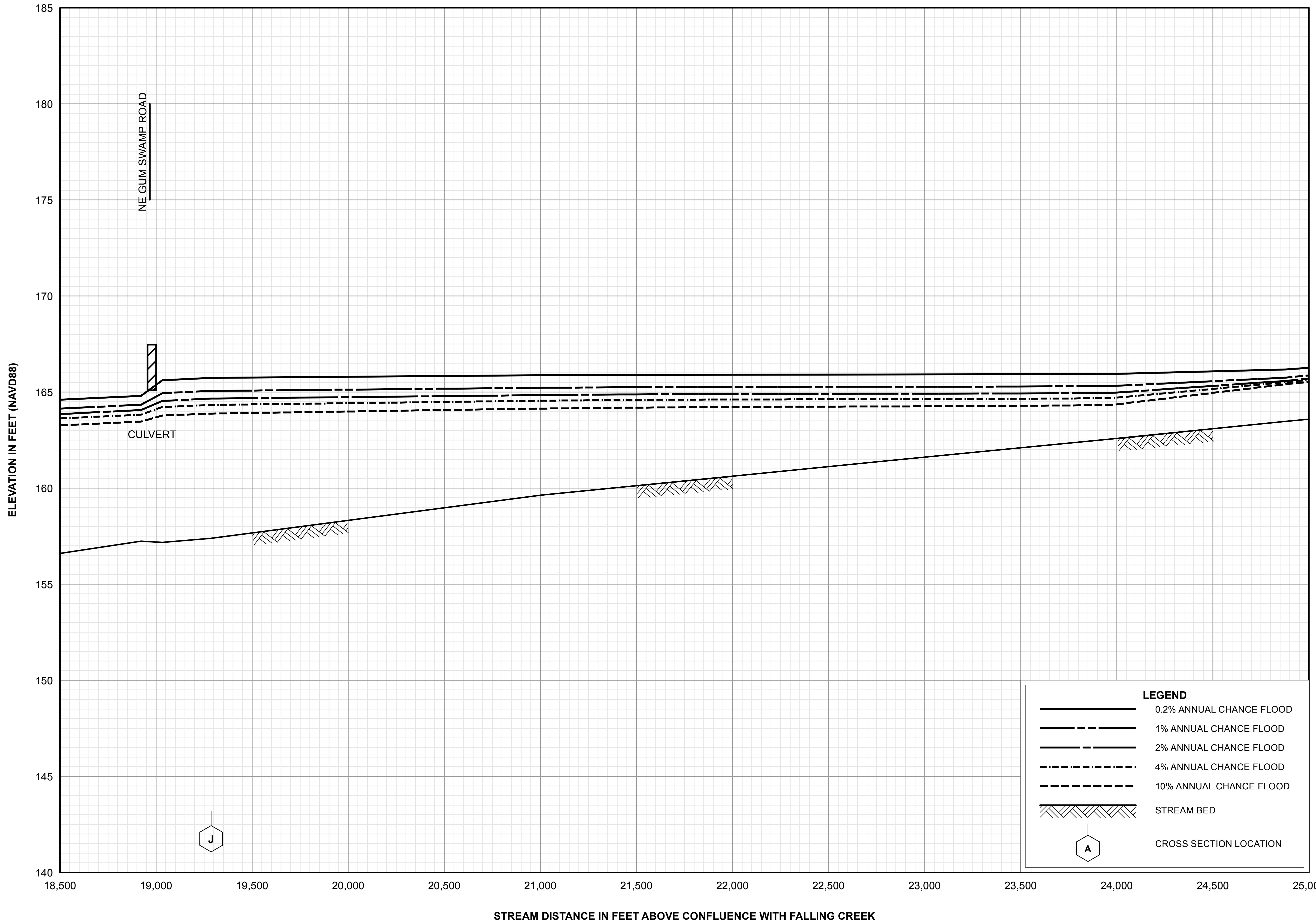


FLOOD PROFILES

FALLING CREEK TRIBUTARY

FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL
AND INCORPORATED AREAS



FLOOD PROFILES

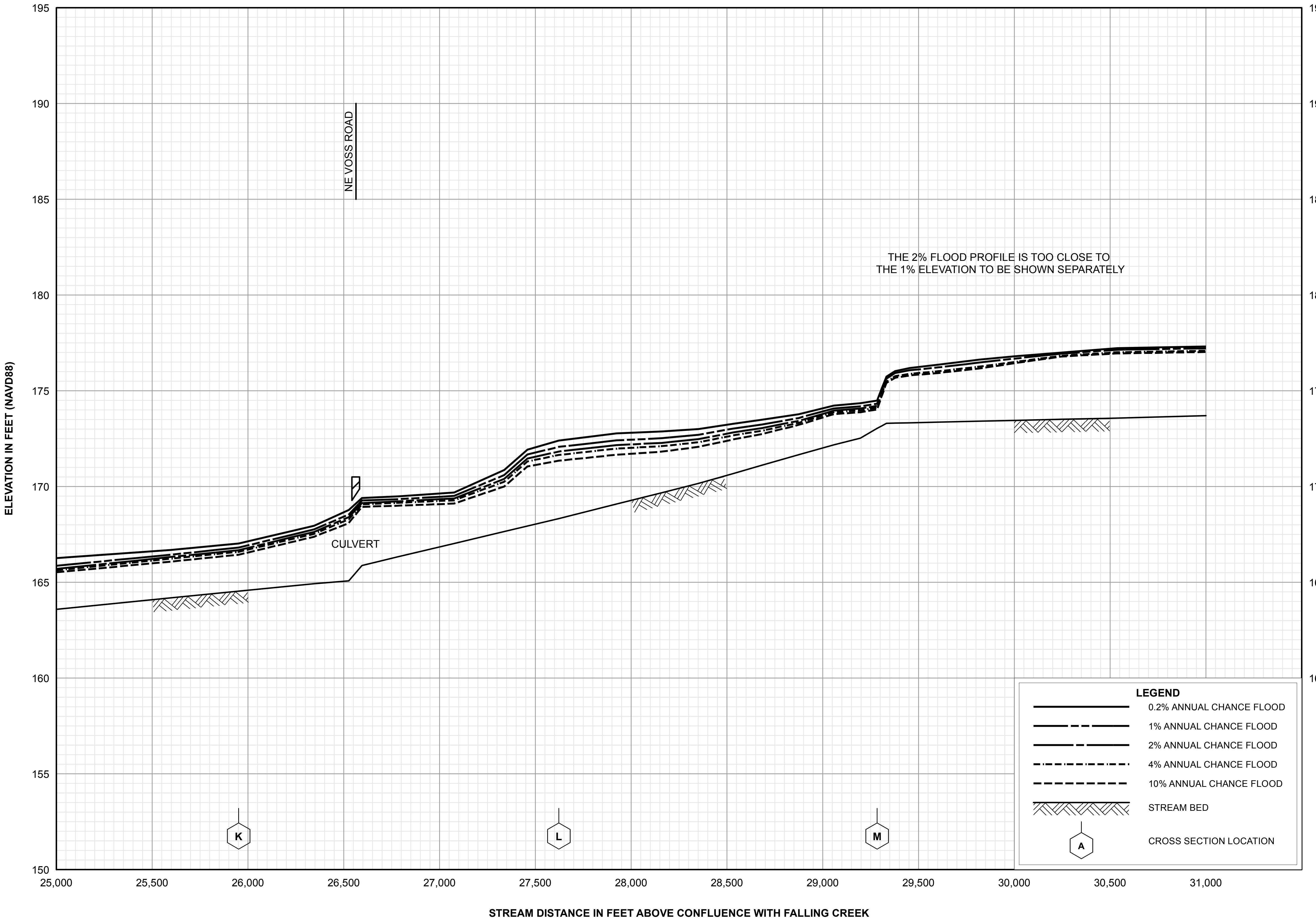
FALLING CREEK TRIBUTARY

FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL

AND INCORPORATED AREAS

22P

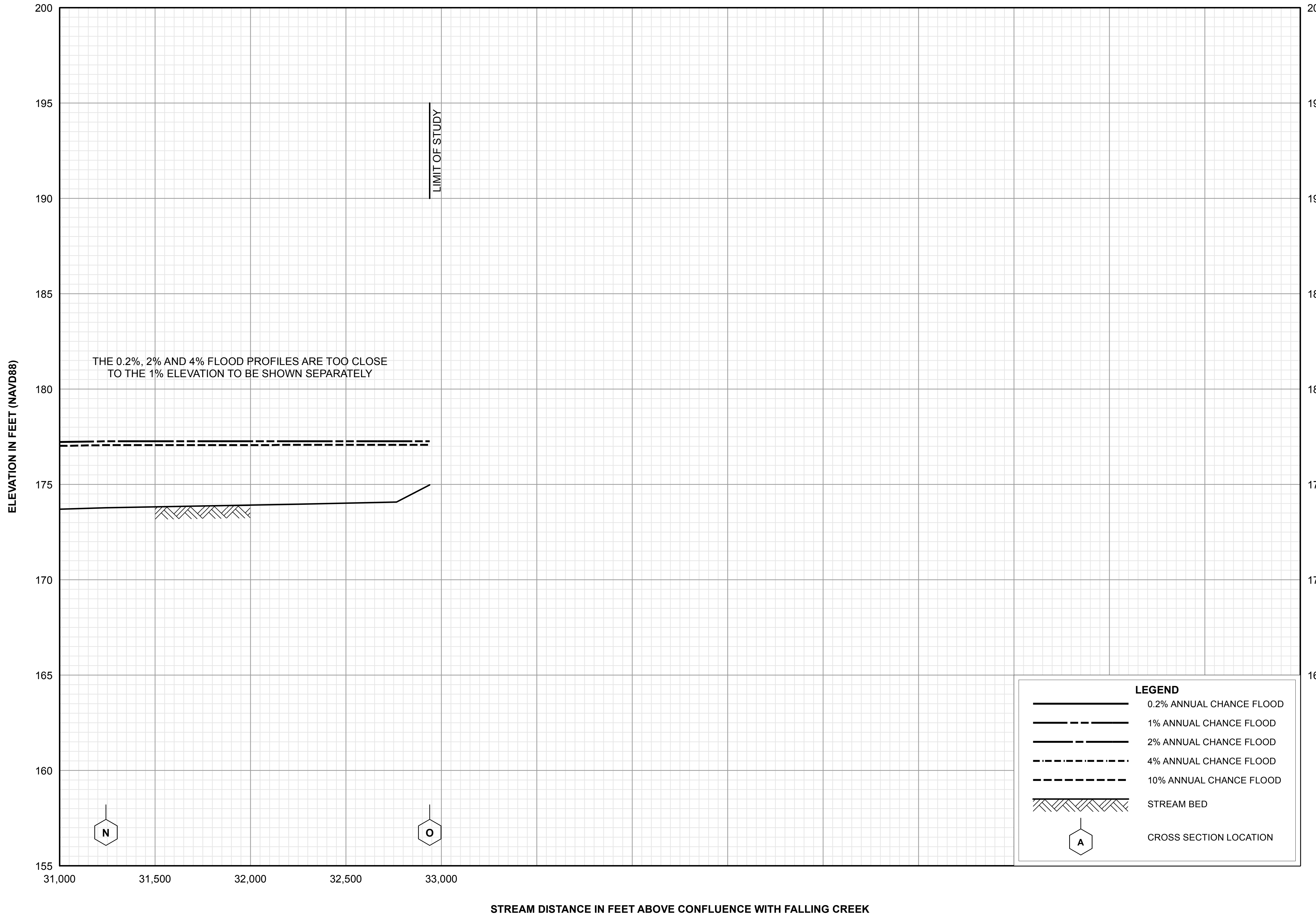


FLOOD PROFILES

FALLING CREEK TRIBUTARY

FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL
AND INCORPORATED AREAS

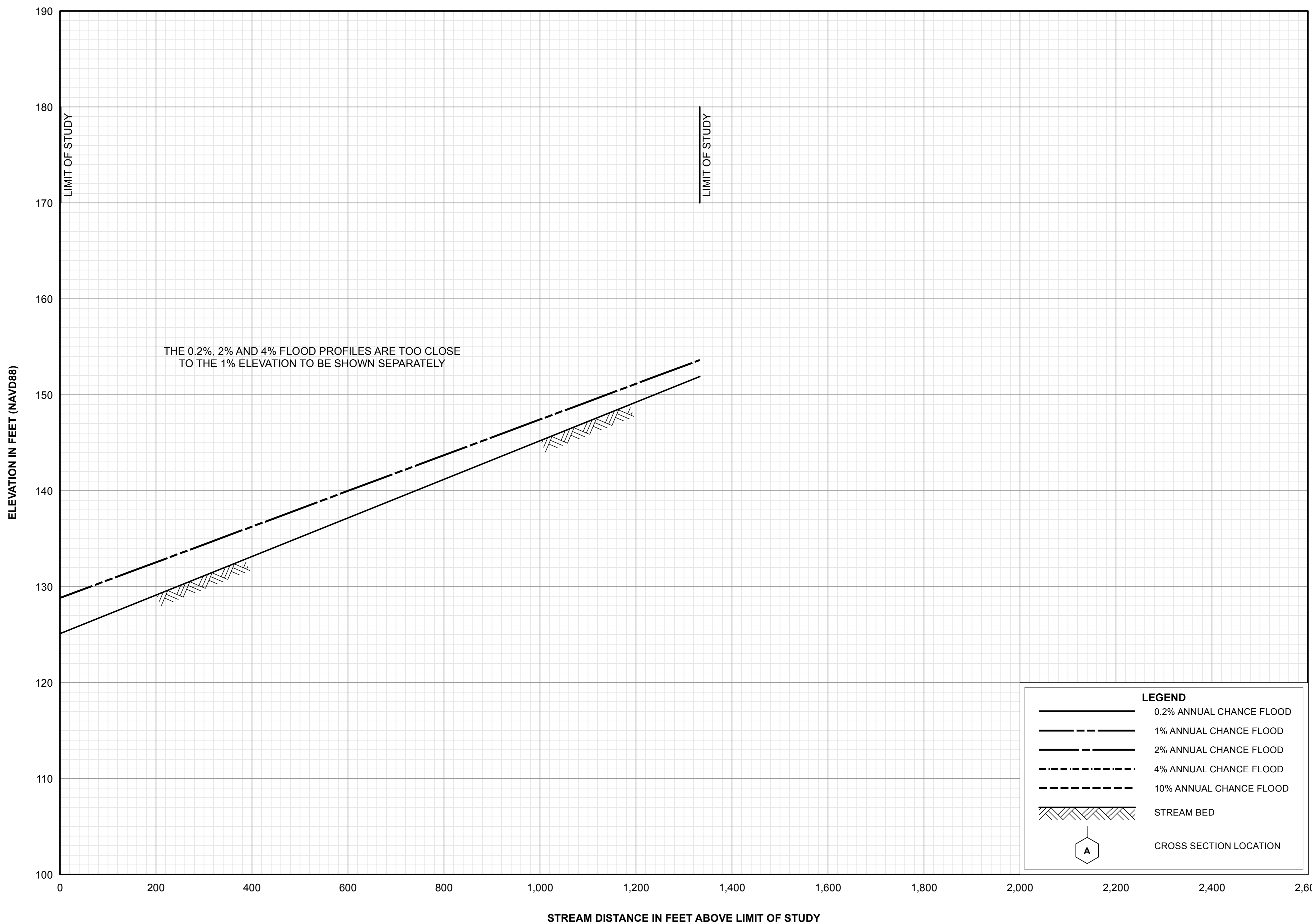


FLOOD PROFILES

FALLING CREEK TRIBUTARY

FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL
AND INCORPORATED AREAS

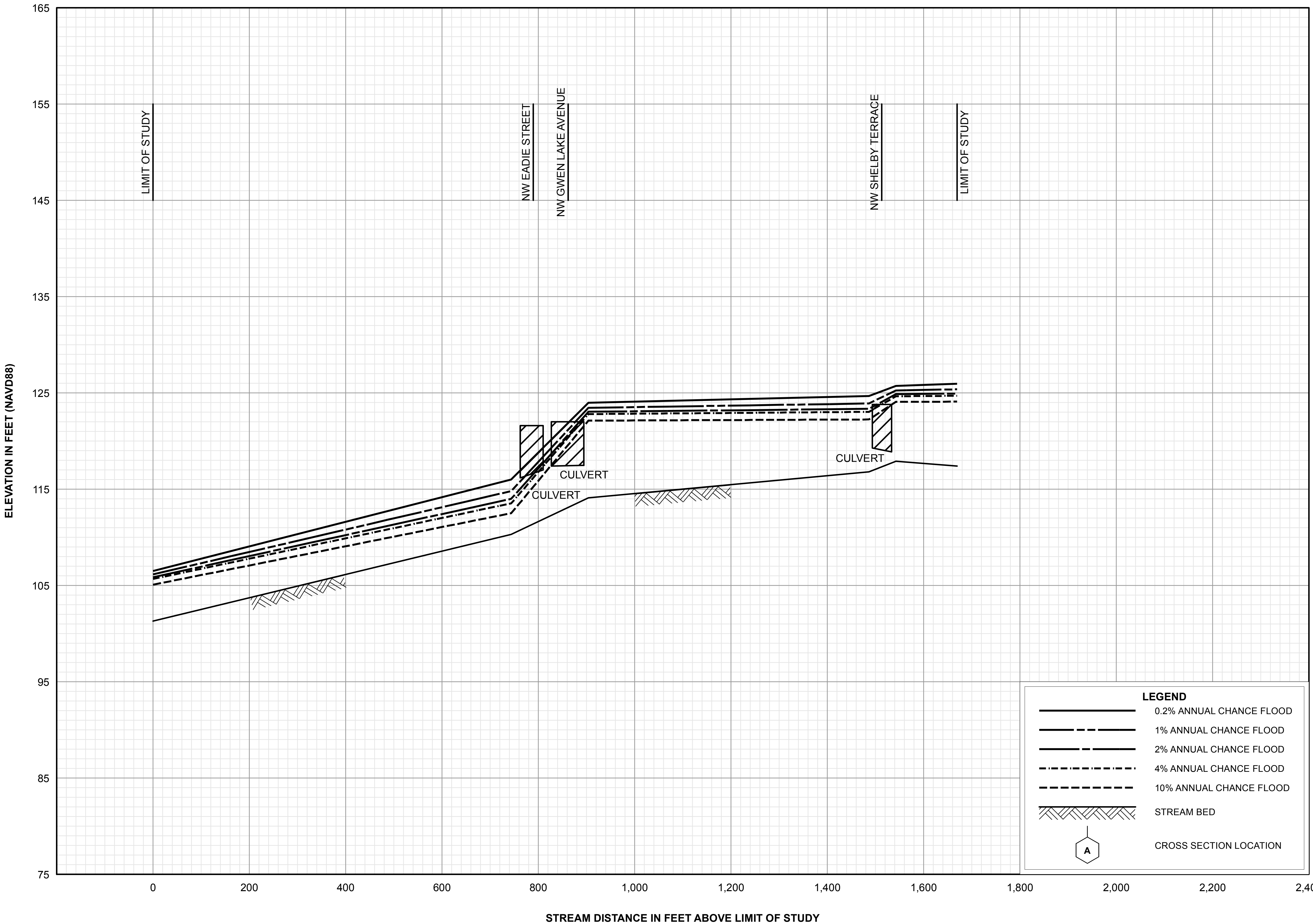


FLOOD PROFILES

LINK FROM GL01 TO GL04

FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL
AND INCORPORATED AREAS



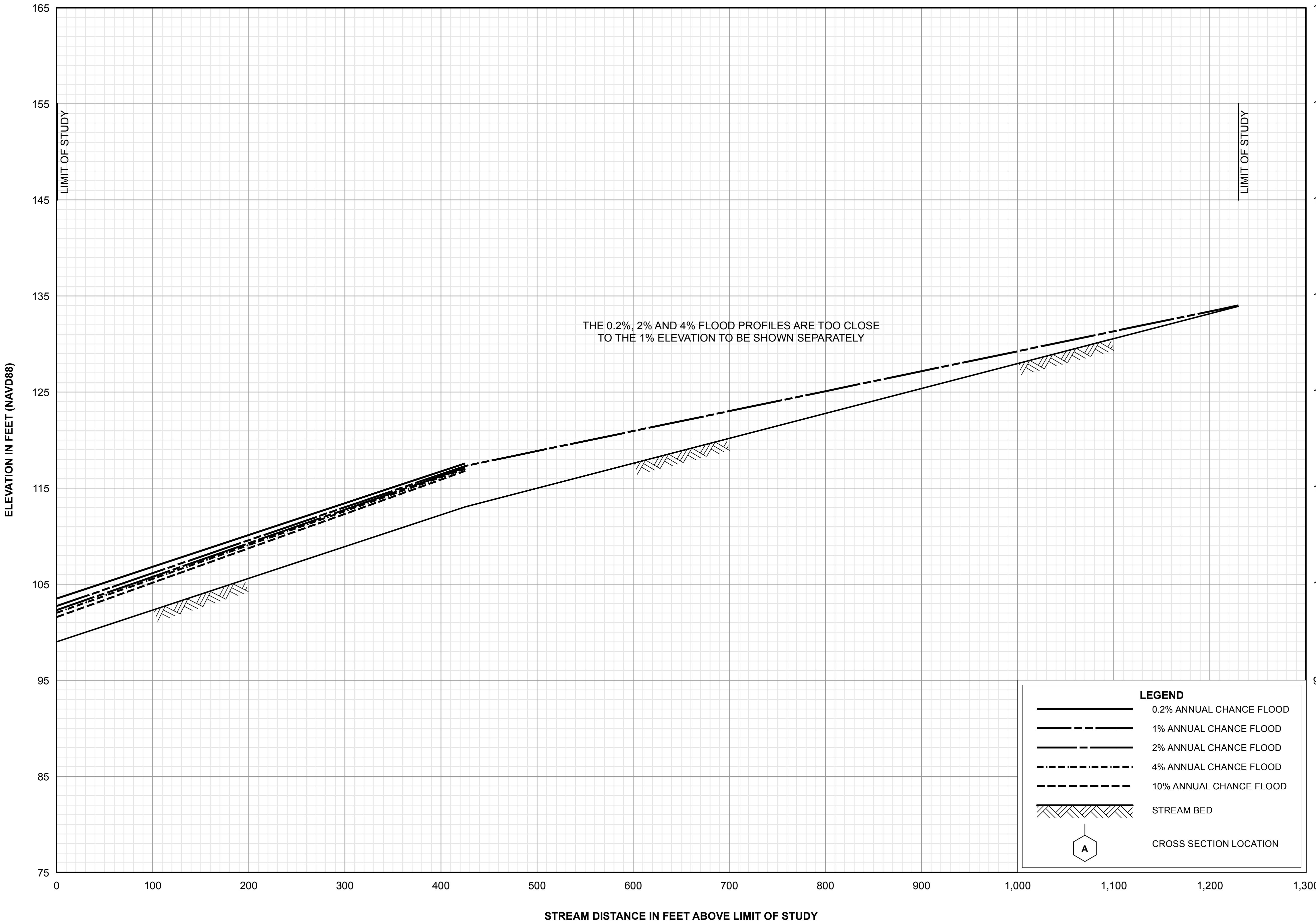
FLOOD PROFILES

LINK FROM LH01 TO GL01

FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL

AND INCORPORATED AREAS

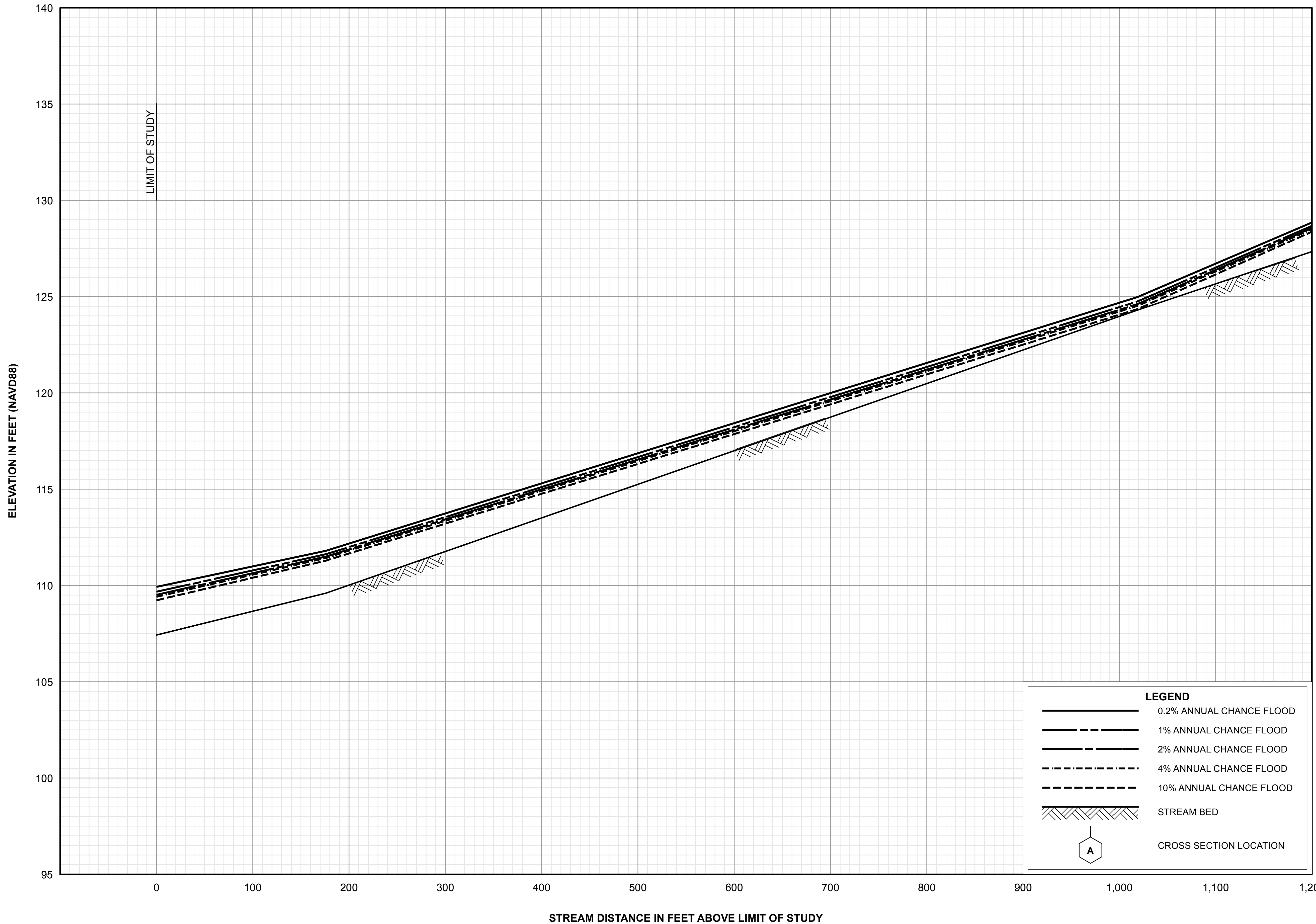


FLOOD PROFILES

LINK FROM LH01 TO LH15

FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL
AND INCORPORATED AREAS

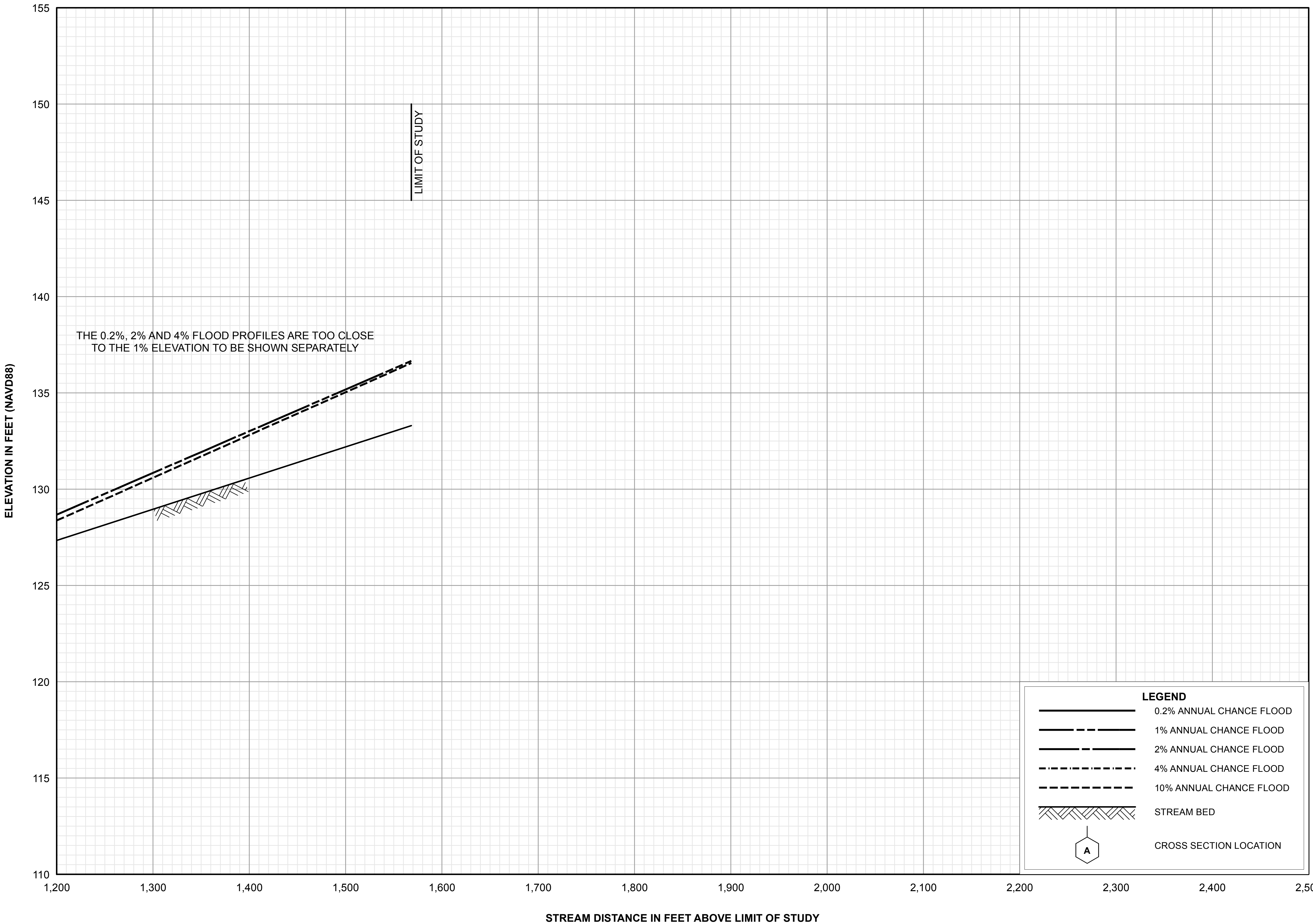


FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL
AND INCORPORATED AREAS

FLOOD PROFILES

LINK FROM LH09



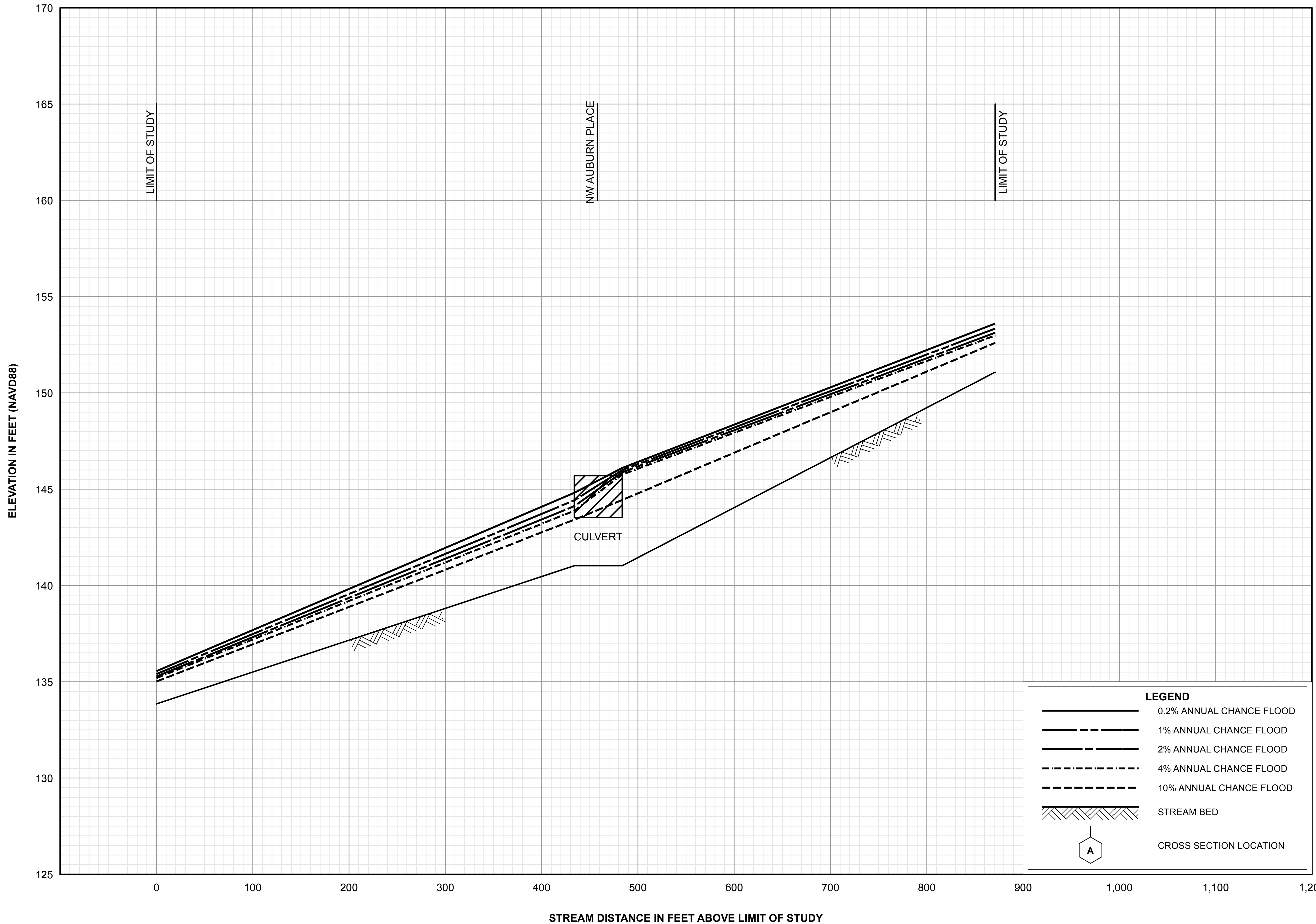
FLOOD PROFILES

LINK FROM LH09

FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL

AND INCORPORATED AREAS



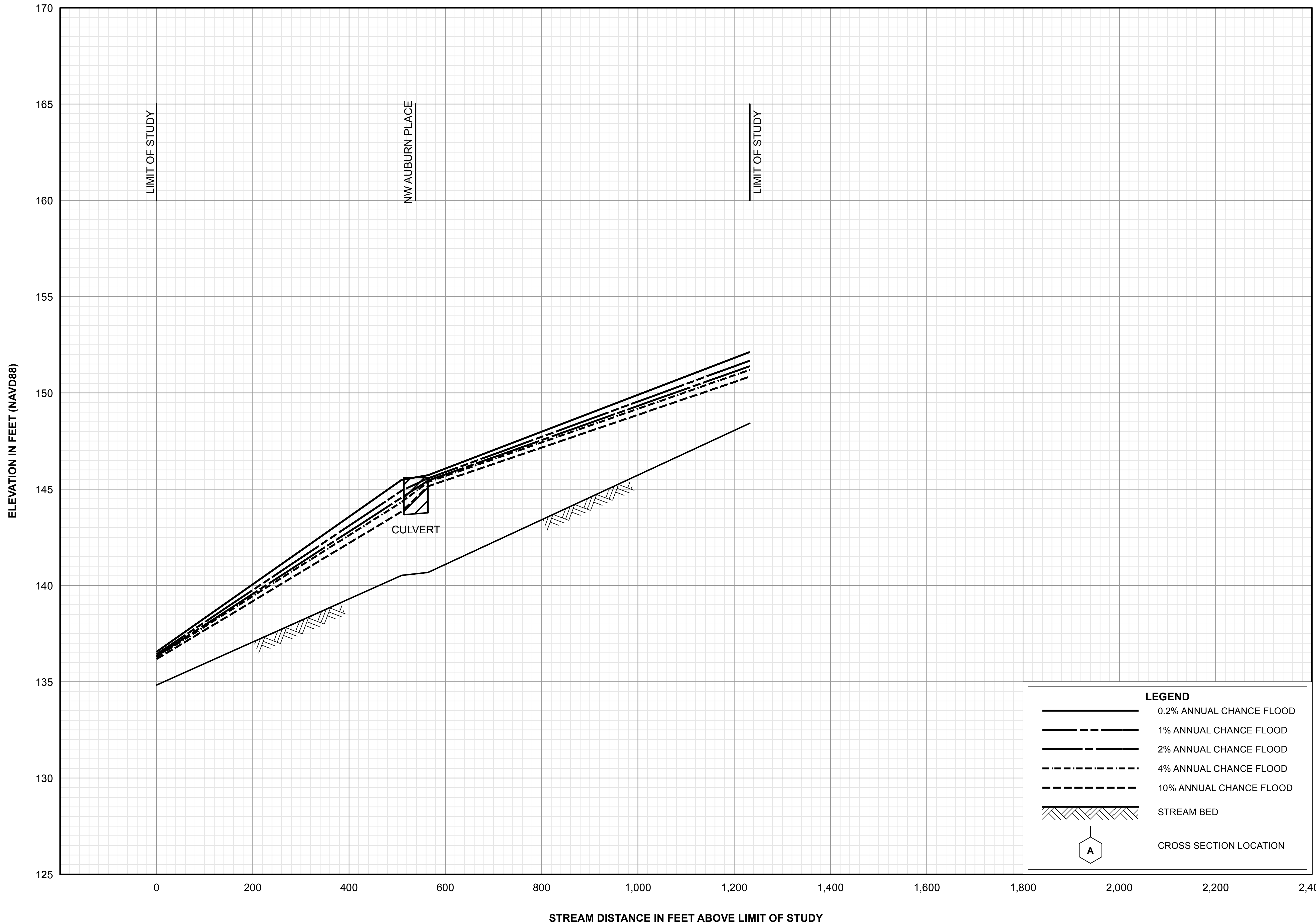
FLOOD PROFILES

LINK FROM LJ01 TO LJ12

FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL

AND INCORPORATED AREAS



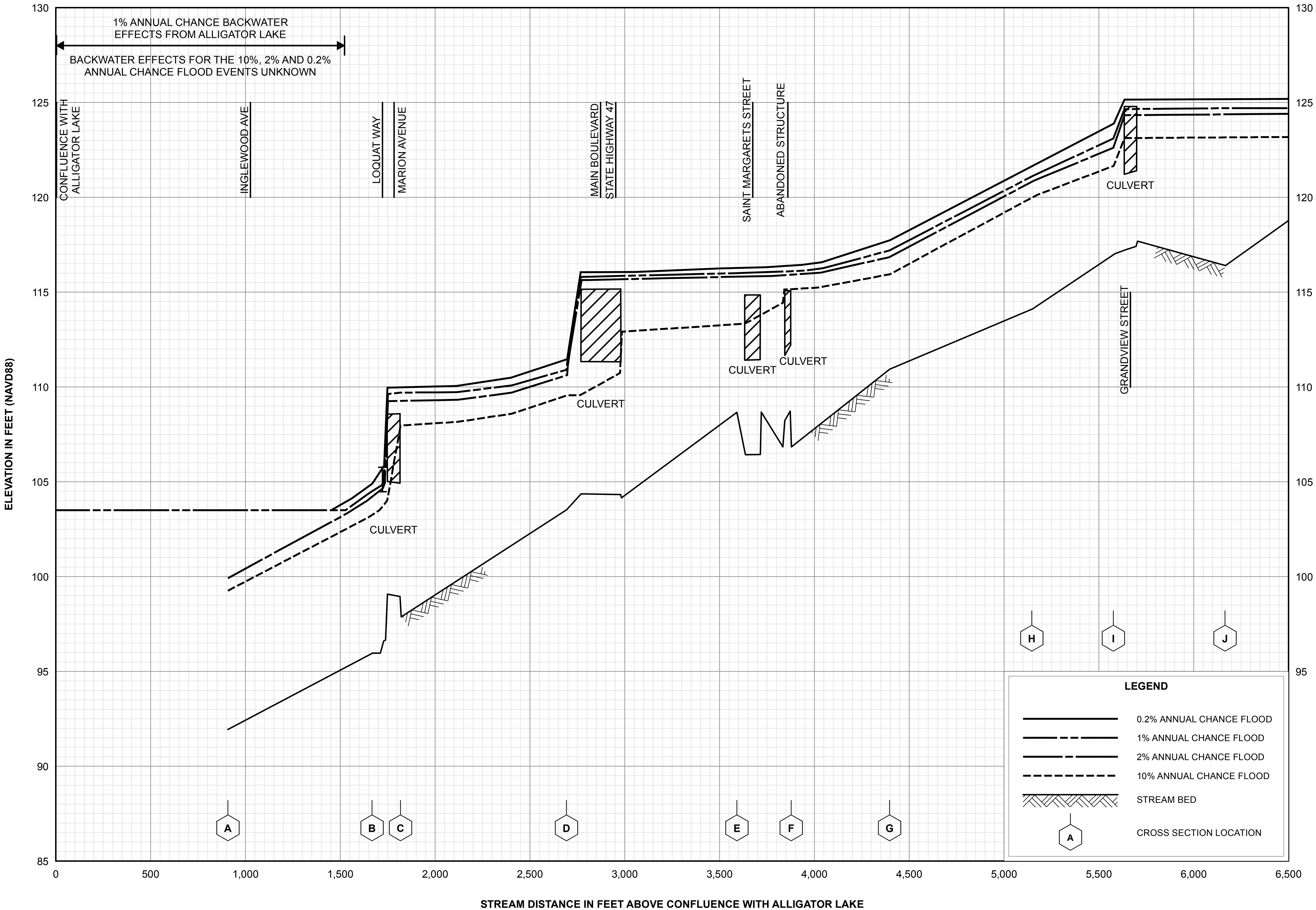
FLOOD PROFILES

LINK FROM LJ01 TO LJ17

FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL
AND INCORPORATED AREAS

31P



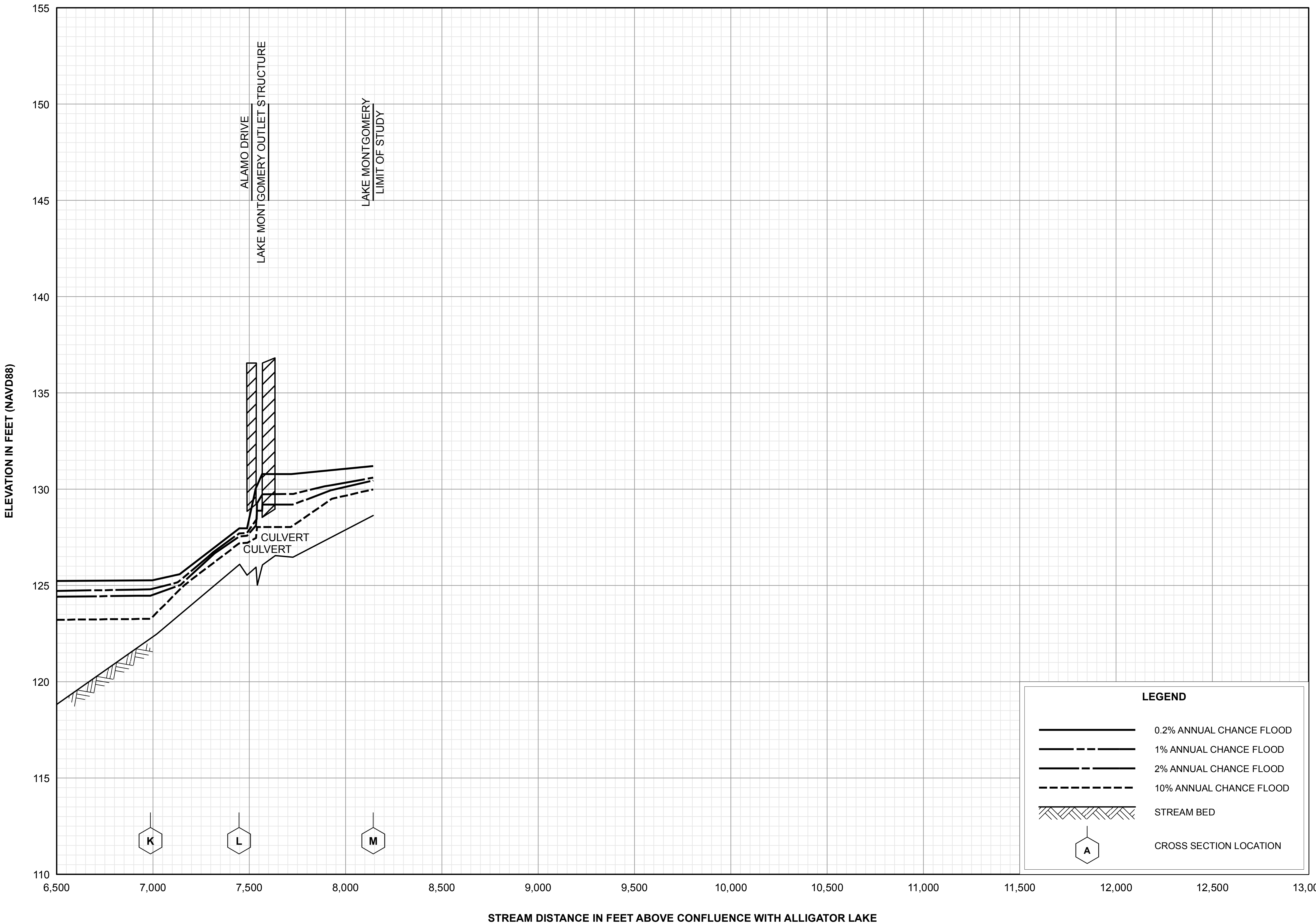
FLOOD PROFILES

MONTGOMERY OUTLET STREAM

FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL

AND INCORPORATED AREAS

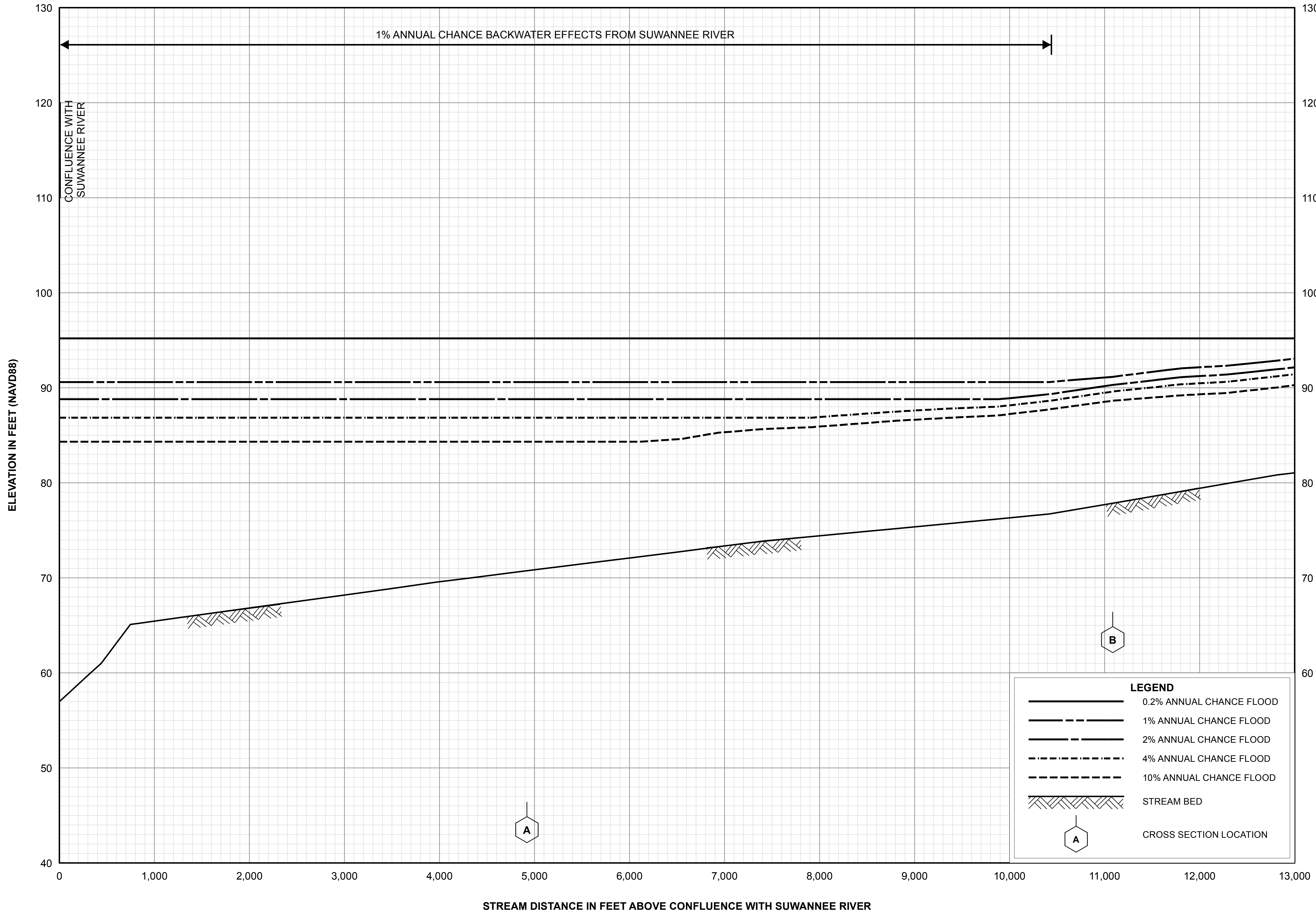


FLOOD PROFILES

MONTGOMERY OUTLET STREAM

FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL
AND INCORPORATED AREAS

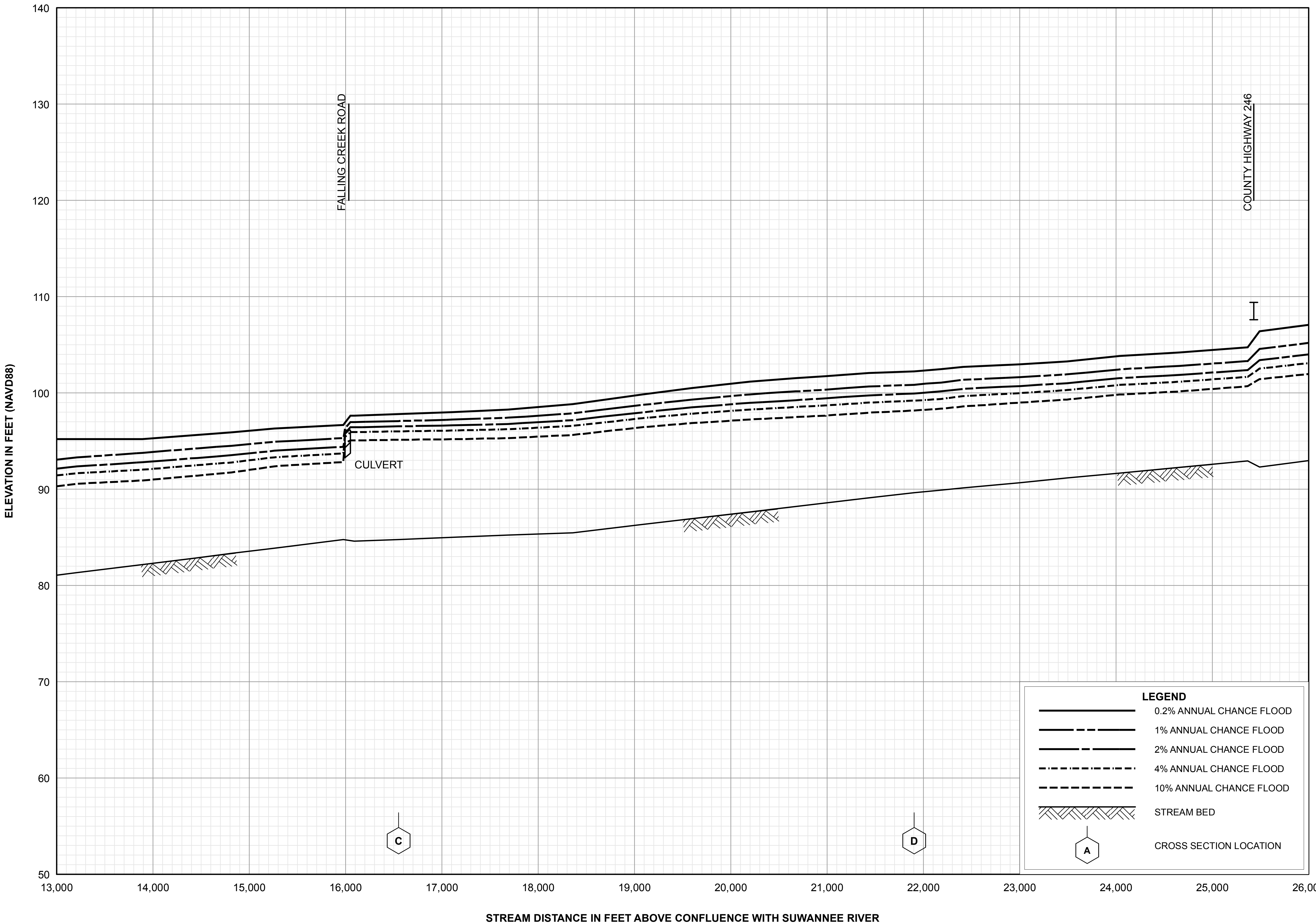


FLOOD PROFILES

ROBINSON CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL
AND INCORPORATED AREAS

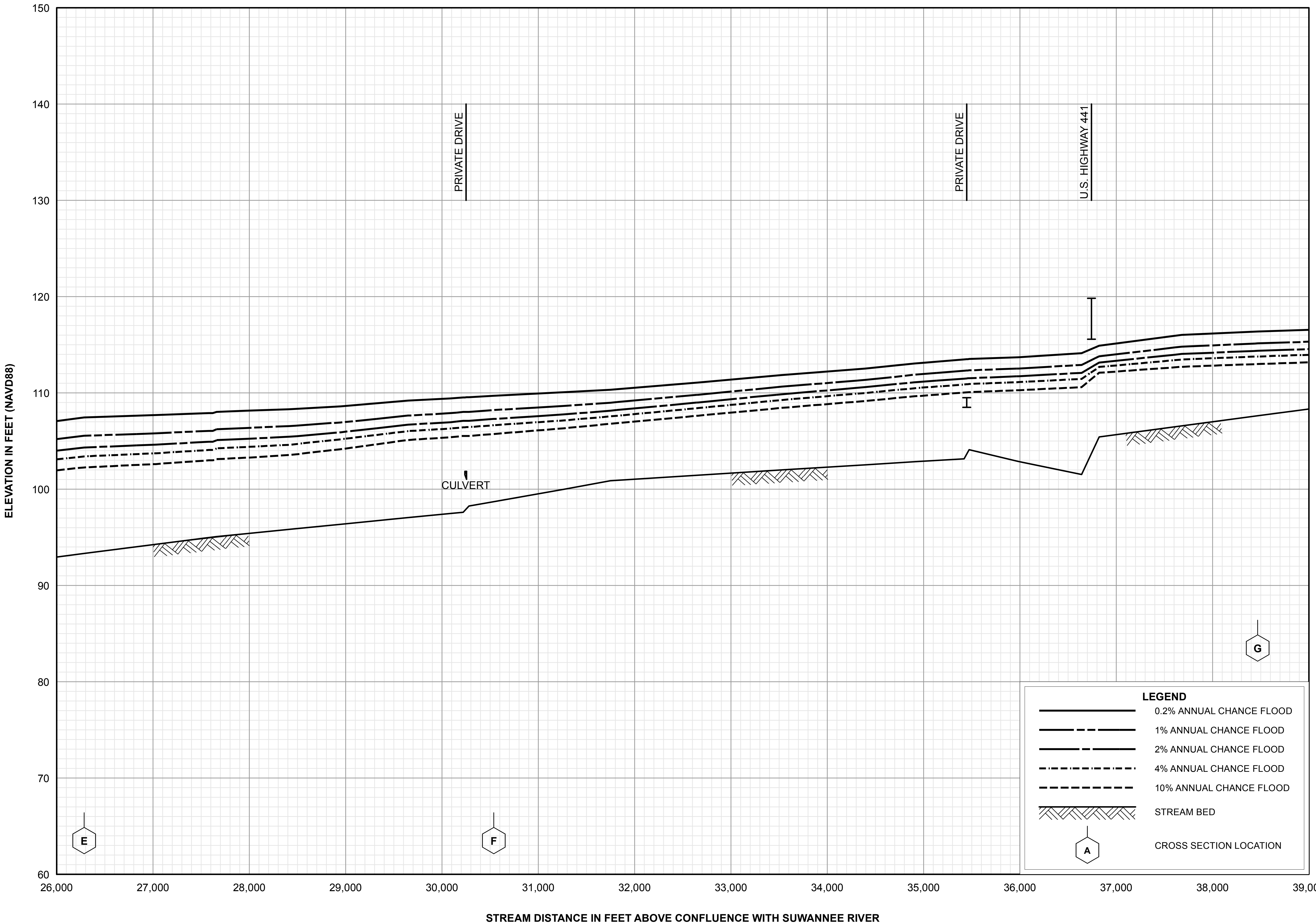


FLOOD PROFILES

ROBINSON CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL
AND INCORPORATED AREAS

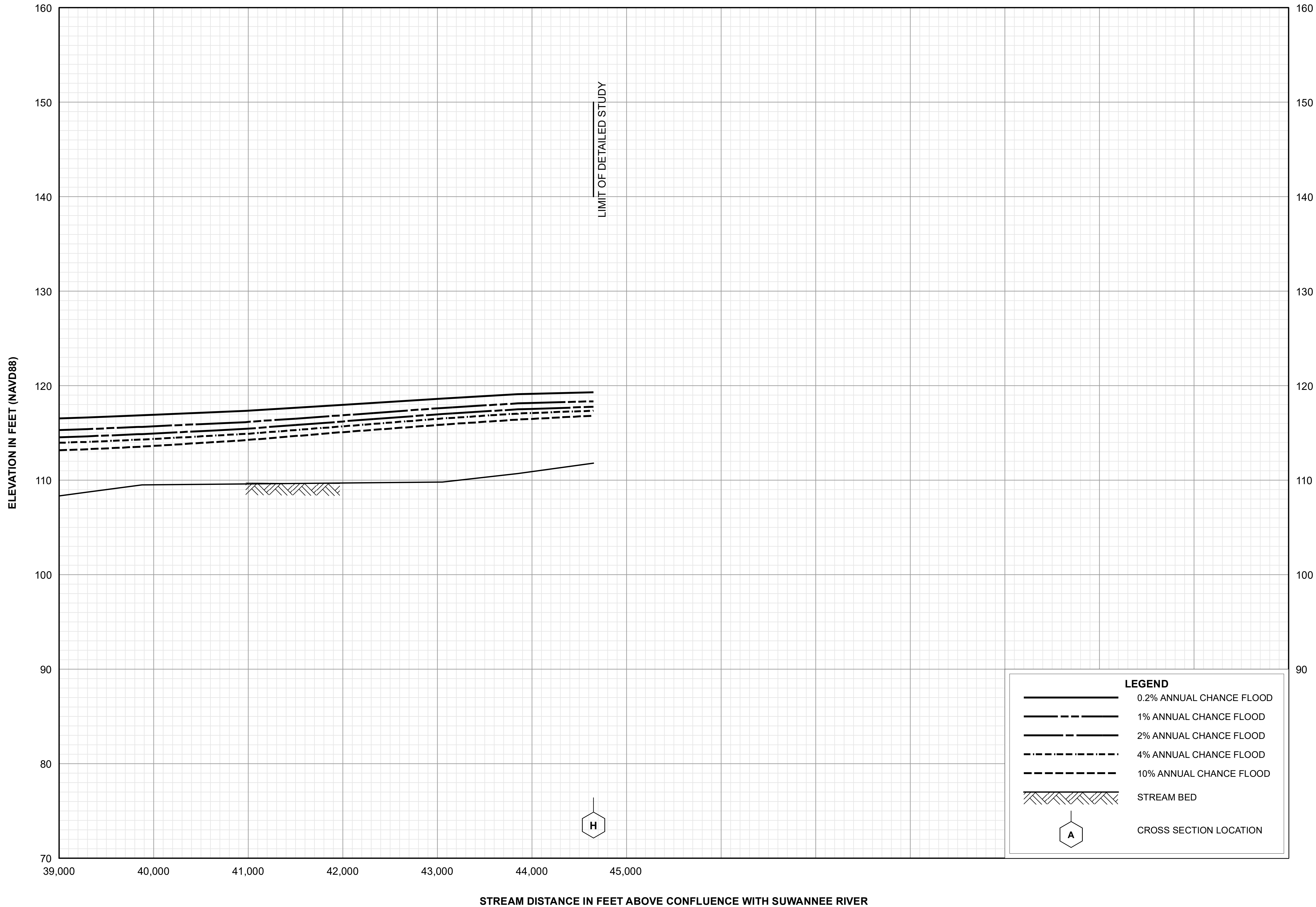


FLOOD PROFILES

ROBINSON CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL
AND INCORPORATED AREAS



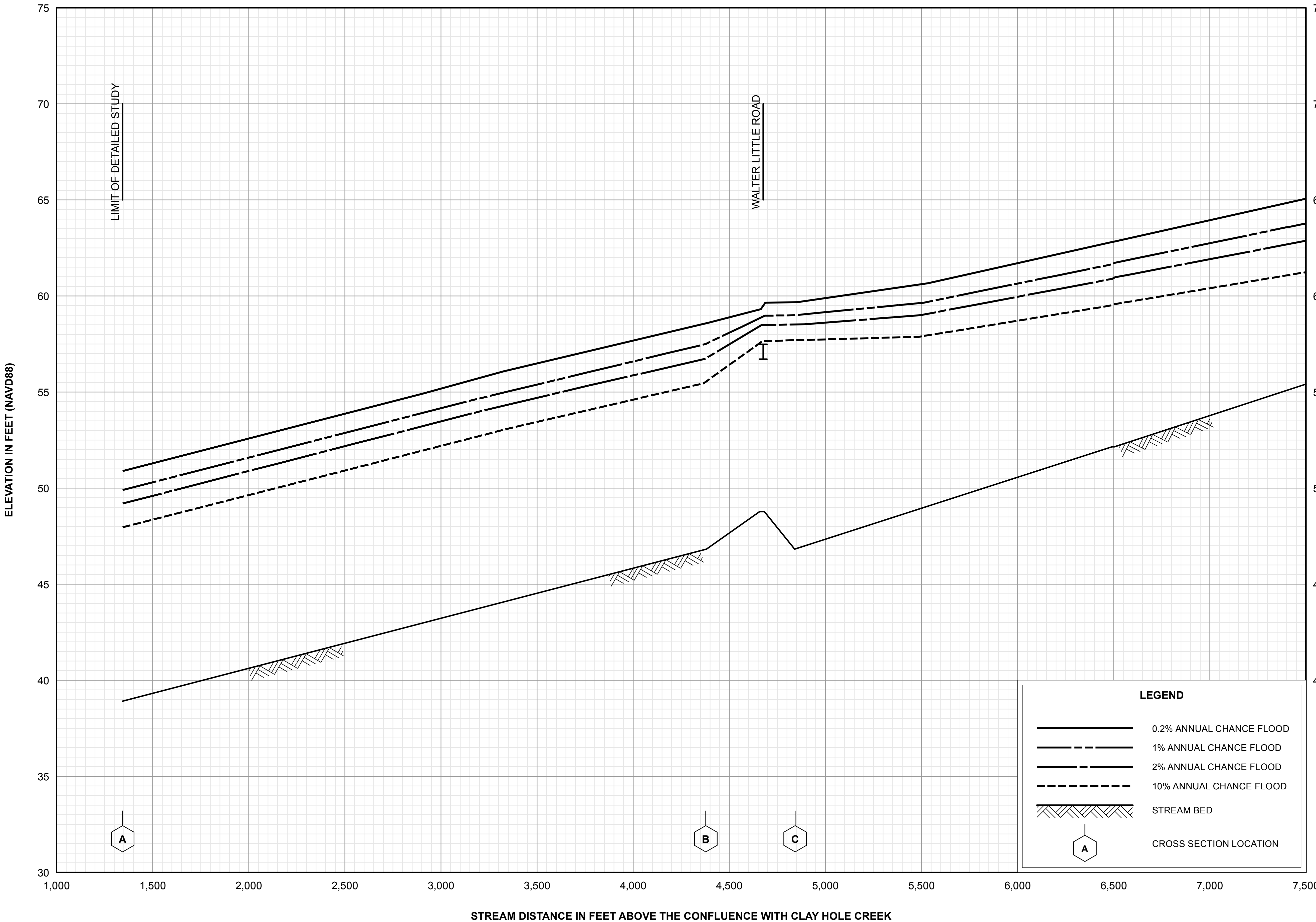
FLOOD PROFILES

ROBINSON CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL

AND INCORPORATED AREAS

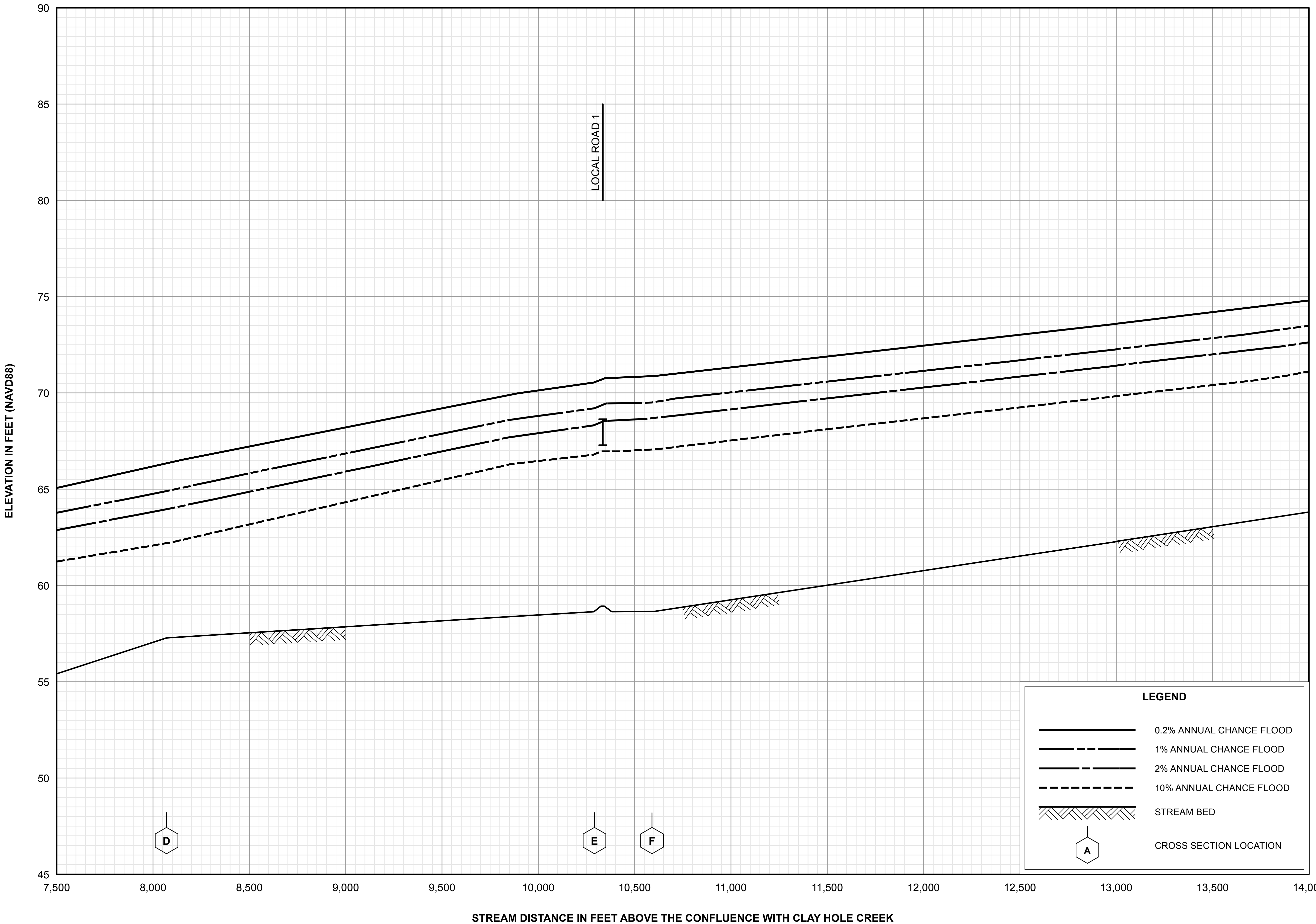


FLOOD PROFILES

ROSE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL
AND INCORPORATED AREAS

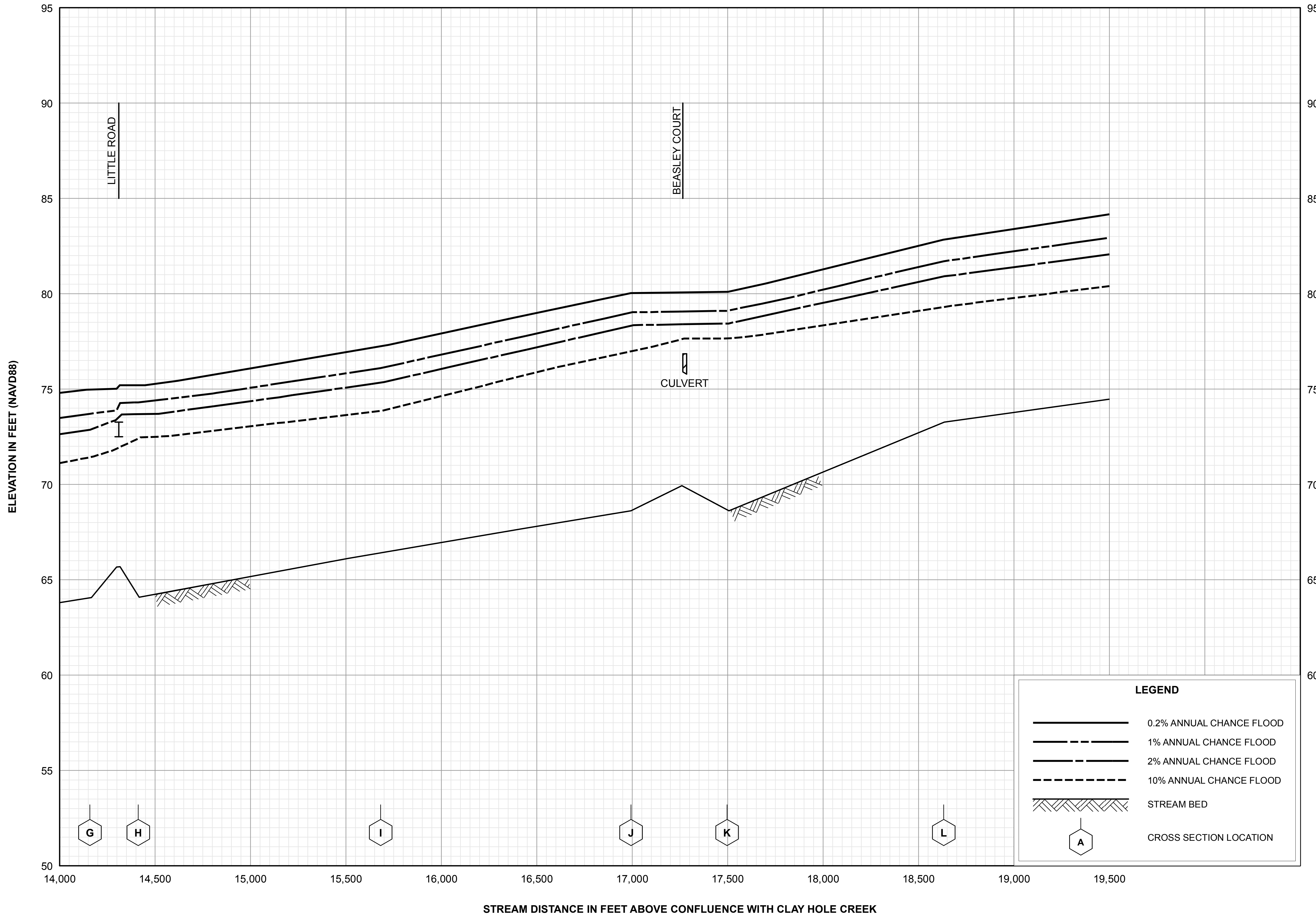


FLOOD PROFILES

ROSE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL
AND INCORPORATED AREAS

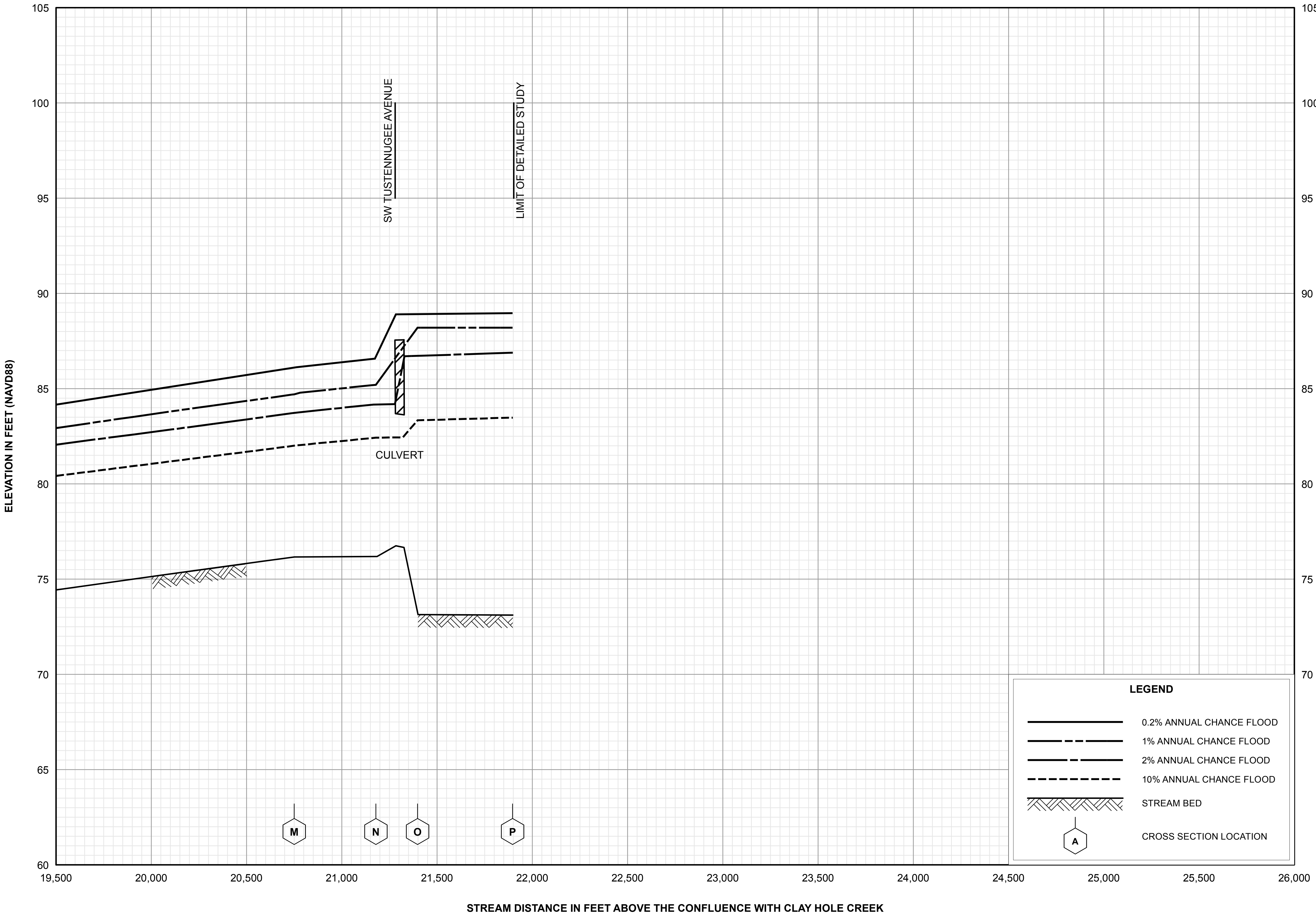


FLOOD PROFILES

ROSE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL
AND INCORPORATED AREAS

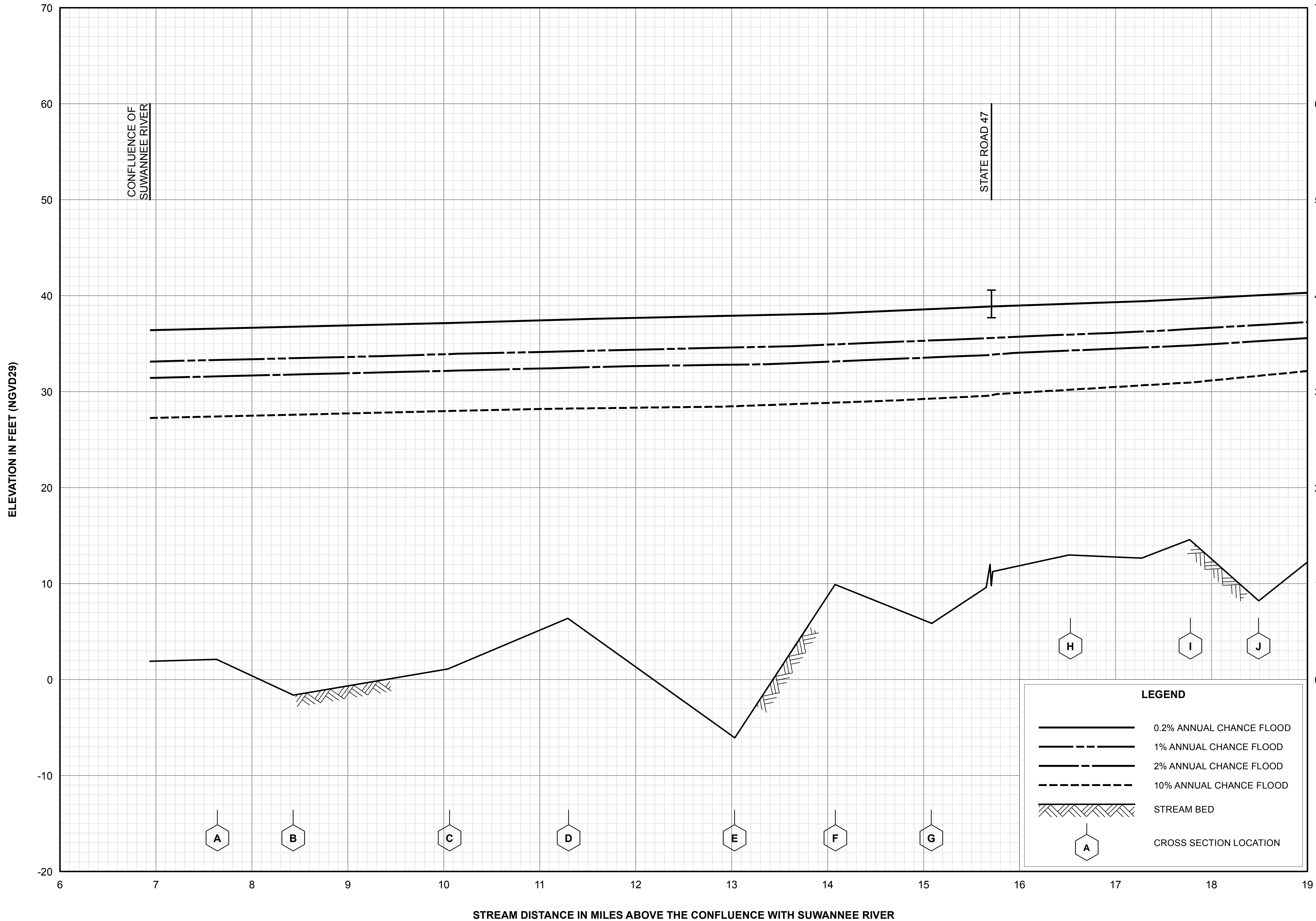


FLOOD PROFILES

ROSE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL
AND INCORPORATED AREAS



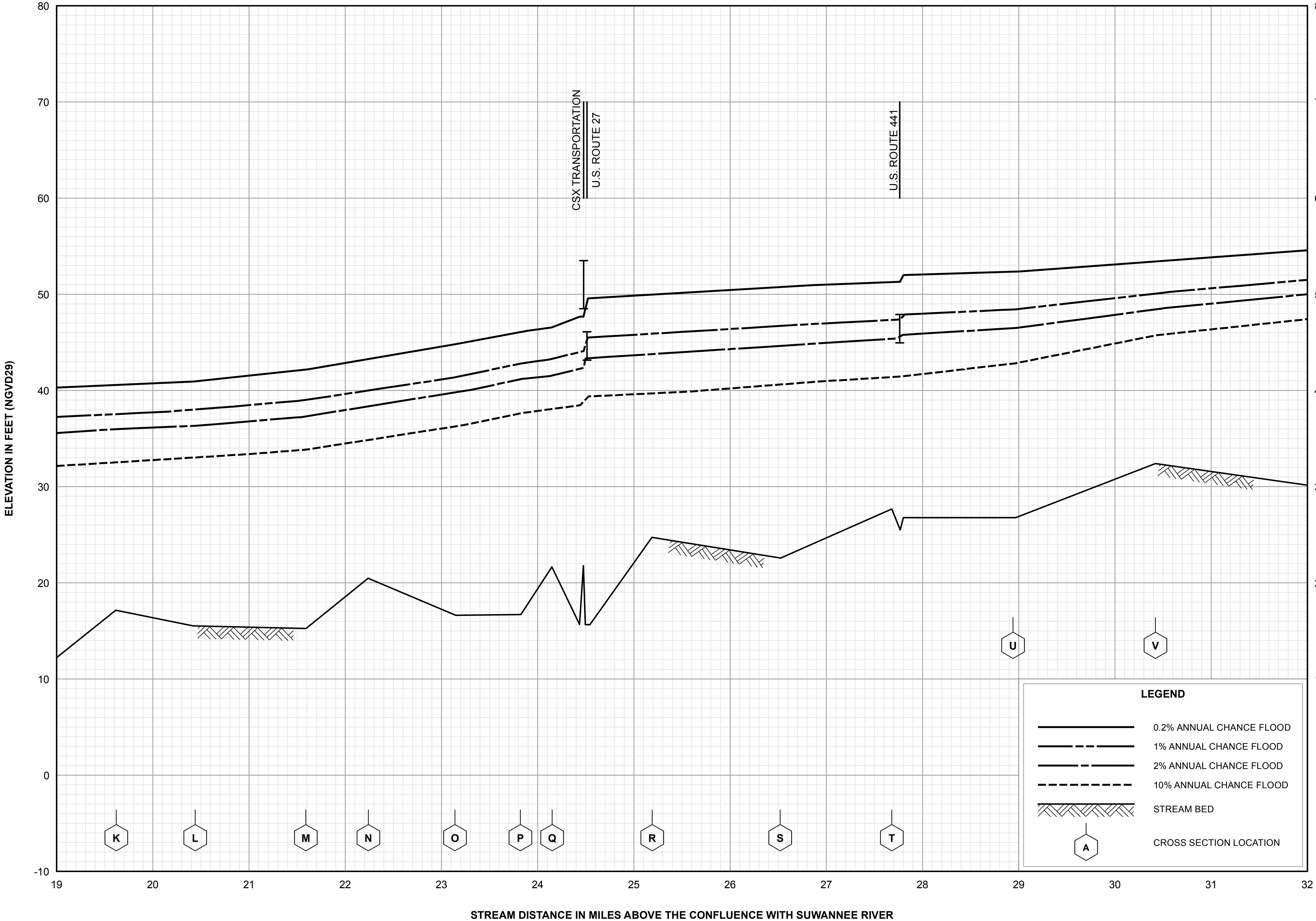
FLOOD PROFILES

SANTA FE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL
AND INCORPORATED AREAS

42P



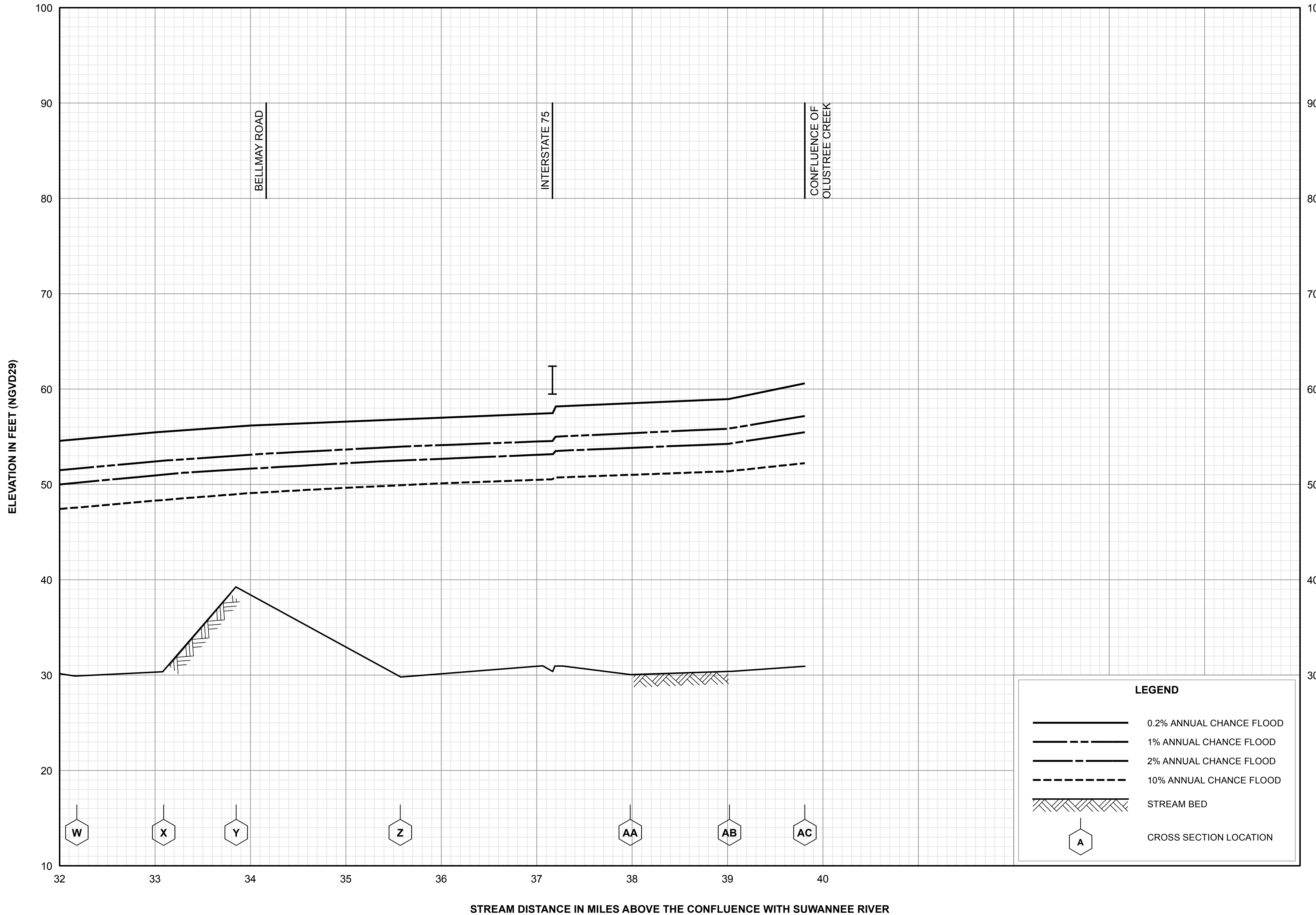
FLOOD PROFILES

SANTA FE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL
AND INCORPORATED AREAS

43P

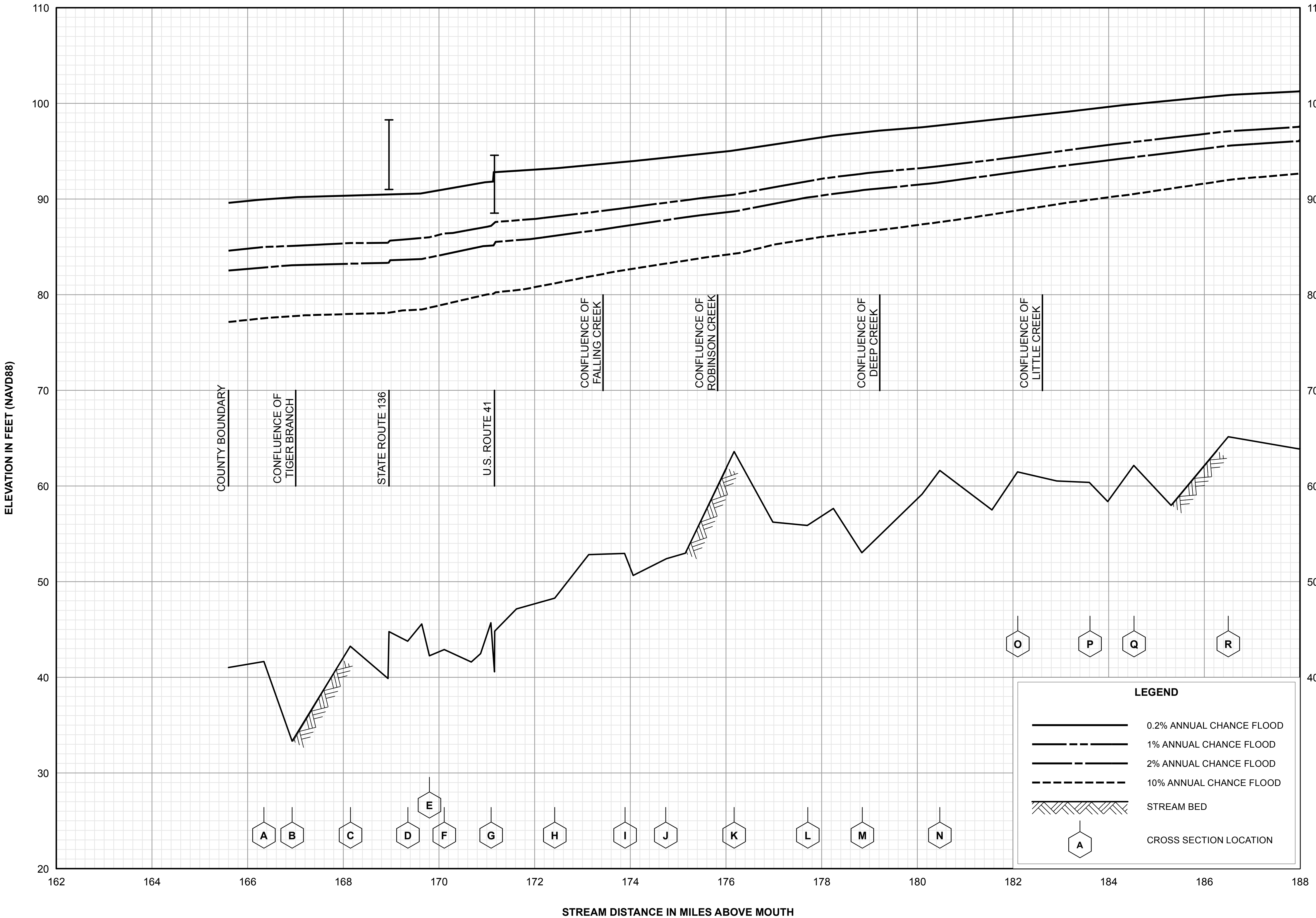


FLOOD PROFILES

SANTA FE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL
AND INCORPORATED AREAS

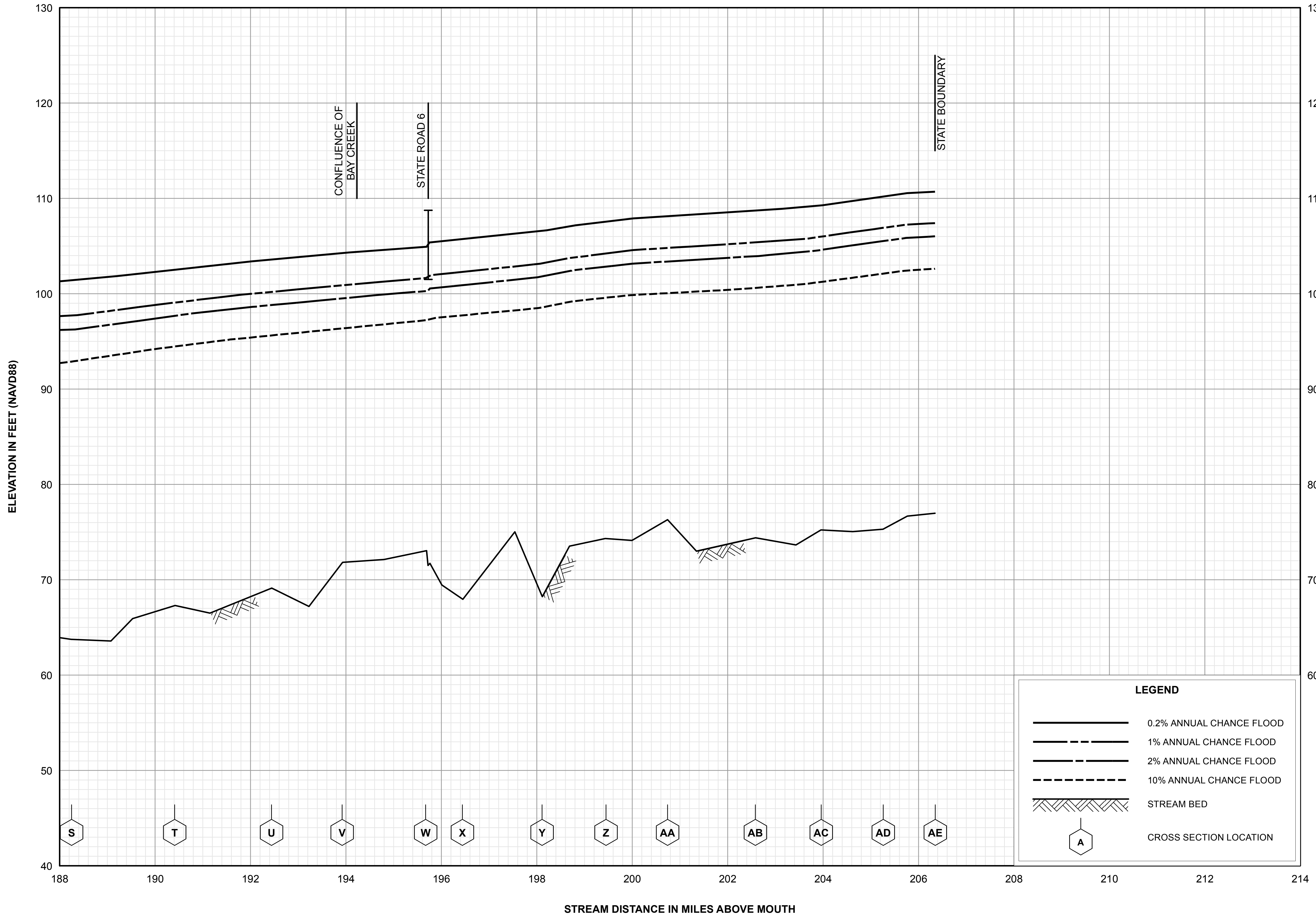


FLOOD PROFILES

SUWANNEE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL
AND INCORPORATED AREAS



FLOOD PROFILES

SUWANNEE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

COLUMBIA COUNTY, FL

AND INCORPORATED AREAS

46P