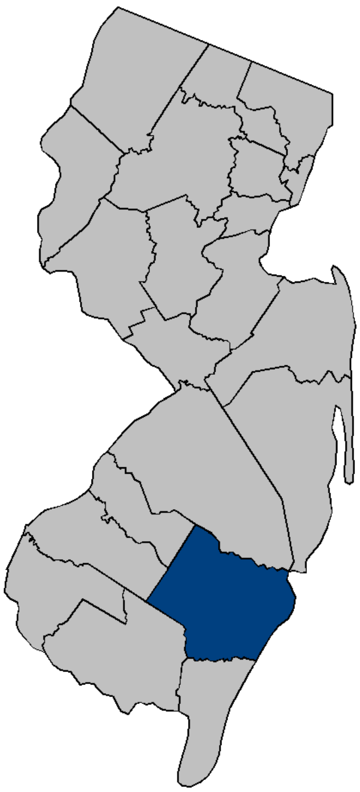
FLOOD INSURANCE STUDY

FEDERAL EMERGENCY MANAGEMENT AGENCY

VOLUME 1 OF 1



ATLANTIC COUNTY, NEW JERSEY (ALL JURISDICTIONS)

COMMUNITY NAME	COMMUNITY NUMBER
ABSECON, CITY OF	340001
ATLANTIC CITY, CITY OF	345278
BRIGANTINE, CITY OF	345286
BUENA, BOROUGH OF	340004
BUENA VISTA, TOWNSHIP OF	340525
CORBIN CITY, CITY OF	340005
EGG HARBOR CITY, CITY OF	340006
EGG HARBOR, TOWNSHIP OF	340007
ESTELL MANOR, CITY OF	340573
FOLSOM, BOROUGH OF	340568
GALLOWAY, TOWNSHIP OF	340008
HAMILTON, TOWNSHIP OF	340009
HAMMONTON, TOWN OF	340010
LINWOOD, CITY OF	340011
LONGPORT, BOROUGH OF	345302
MARGATE CITY, CITY OF	345304
MULLICA, TOWNSHIP OF	340517
NORTHFIELD, CITY OF	340014
PLEASANTVILLE, CITY OF	340015
PORT REPUBLIC, CITY OF	340016
SOMERS POINT, CITY OF	340017
VENTNOR CITY, CITY OF	345326
WEYMOUTH, TOWNSHIP OF	340536

FEMA

Preliminary: May 30, 2014

FLOOD INSURANCE STUDY NUMBER
34001CV000A
Version Number 2.1.1.1

NOTICE TO
FLOOD INSURANCE STUDY USERS

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

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

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

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

Initial Countywide FIS Effective Date:

Revised Countywide FIS Date:

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FLOOD INSURANCE STUDY
ATLANTIC COUNTY, NEW JERSEY (ALL JURISDICTIONS)

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 Atlantic County, New Jersey, including: the Cities of Absecon, Atlantic City, Brigantine, Corbin City, Egg Harbor City, Estell Manor, Linwood, Margate City, Northfield, Pleasantville, Port Republic, Somers Point, and Ventnor City; the Boroughs of Buena, Folsom, and Longport; the Town of Hammonton; and the Townships of Buena Vista, Egg Harbor, Galloway, Hamilton, Mullica, and Weymouth (hereinafter referred to collectively as Atlantic County).

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 Atlantic 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 Title 44 of the Code of Federal Regulations (CFR), Section 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 all jurisdictions within Atlantic 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.

Absecon, City of:	The hydrologic analyses from the FIS report were prepared by the U.S. Army Corps of Engineers (USACE), Philadelphia District, for the Federal Emergency Management Agency (FEMA), under Inter-Agency Agreement No. EMW-96-IA-0195. That work was completed in August 1997. The coastal analysis for

Absecon Bay was prepared by Dewberry & Davis for FEMA. That work was completed in December 1997.

Atlantic City, City of:	The wave height analysis from the FIS report was prepared by Dewberry & Davis for FEMA, under Contract No. EMW-C-0543. That work was completed in August 1982.
Brigantine, City of:	The wave height analysis for the FIS report was prepared by Dewberry & Davis for FEMA, under Contract No. EMW-C-0543. That work was completed in September 1982.
Corbin City, City of:	The hydrologic and hydraulic analyses from the FIS report were prepared by Gannett, Fleming, Corddry, and Carpenter, Inc., for the State of New Jersey Department of Environmental Protection (NJDEP), Division of Water Resources, for the Federal Insurance Administration (FIA), under Contract No. H-4546. That work was completed in April 1980.
Egg Harbor City, City of:	The hydrologic and hydraulic analyses from the FIS report were prepared by Gannett, Fleming, Corddry and Carpenter, Inc., for the NJDEP, Division of Water Resources, for FEMA, under Contract No. H-4546. That work was completed in April 1980.
Egg Harbor, Township of:	The hydrologic and hydraulic analyses from the FIS report dated August 16, 1982, were prepared by T & M Associates for FEMA under Contract No. H-4807. That work was completed in August 1981.
Estell Manor, City of:	The hydrologic and hydraulic analyses from the FIS report for the South River were taken from the FISs for the Township of Hamilton and the Township of Upper, Cape May County, New Jersey (FEMA, 1983). The hydrologic and hydraulic analyses for the Tuckahoe River were taken from the FIS for the Township of Maurice River, Cumberland County, New Jersey (U.S. Department of Housing and Urban Development, 1976). The hydrologic and hydraulic analyses for the Great Egg Harbor River were taken from the FIS for the Township of Egg Harbor (FEMA, 1983). This information

was compiled and incorporated by the USACE, Philadelphia District, for FEMA under Inter-Agency Agreement Number EMW-2000-IA-0192, Project Order Number 2000-2. That work was completed in March 2001.

Folsom, Borough of:	The hydrologic and hydraulic analyses from the FIS report were prepared by Gannett, Fleming, Corddry, and Carpenter, Inc., for the NJDEP, Division of Water Resources, for FEMA, under Contract No. H-4546. That work was completed in April 1980.
Galloway, Township of:	The hydrologic and hydraulic analyses from the FIS report were prepared by T & M Associates for FEMA under Contract No. H-4807. That work was completed in August 1981.
Hamilton, Township of:	The hydrologic and hydraulic analyses from the FIS report were prepared by the USACE, Philadelphia District, for the FIA, under Inter-Agency Agreement Nos. IAA-H-15-72, IAA-H-19-74, and IAA-H-16-75, Project Order Numbers 13, 18, and 22, respectively.
Hammonton, Town of:	The hydrologic and hydraulic analyses from the FIS report were prepared by Gannett, Fleming, Corddry, and Carpenter, Inc., for the NJDEP, Division of Water Resources, for FEMA, under Contract No. H-4546. That work was completed in April 1980.
Linwood, City of:	The hydrologic and hydraulic analyses from the FIS report were prepared by T & M Associates for FEMA under Contract No. H-4807. That work was completed in August 1981.
Longport, Borough of:	The wave height analysis from the FIS report was prepared by Dewberry & Davis for FEMA under Contract No. EMW-C-0543. That work was completed in September 1982.
Margate City, City of:	The wave height analysis from the FIS report was prepared by Dewberry & Davis for FEMA under Contract No. EMW-C-0543. That work was completed in September 1982.
Mullica, Township of:	The hydrologic and hydraulic analyses from the FIS were prepared by Gannett, Fleming,

	Corddry, and Carpenter, Inc., for the NJDEP, Division of Water Resources, for FEMA, under Contract No. H-4546. That work was completed in April 1980.
Northfield, City of:	The hydrologic and hydraulic analyses from the FIS report were prepared by T & M Associates for FEMA under Contract No. H-4807. That work was completed in August 1981.
Pleasantville, City of:	The hydrologic and hydraulic analyses from the FIS report were prepared by T & M Associates for FEMA under Contract No. H-4807. That work was completed in August 1980.
Port Republic, City of:	The hydrologic and hydraulic analyses from the FIS report were prepared by T & M Associates for FEMA under Contract No. H-4807. That work was completed in August 1981.
Somers Point, City of:	The hydrologic and hydraulic analyses from the FIS report were prepared by T & M Associates for FEMA under Contract No. H-4807. That work was completed in August 1980.
Ventnor City, City of:	The wave height analysis from the FIS report dated March 15, 1983, was prepared by Dewberry & Davis for FEMA under Contract No. EMW-C-0543. That work was completed in September 1982.
Weymouth, Township of:	The hydrologic and hydraulic analyses from the FIS report dated, for the Great Egg Harbor River Reach 1 and South River Reach 2, were taken from the FIS for the Township of Hamilton. The hydrologic and hydraulic analyses for the Tuckahoe River were taken from the FIS for the Township of Maurice River, Cumberland County, New Jersey (U.S. Department of Housing and Urban Development, 1976). This information was compiled and incorporated by the USACE, Philadelphia District, for FEMA, under Inter-Agency Agreement No. EMW-96-IA-0288, Project Order Number 99-2. This work was completed in August 2000.

The authority and acknowledgments for the Borough of Buena and the Township of Buena Vista are not available because no FIS reports were ever published for those communities.

For the [*date*] countywide FIS, updated coastal storm surge and wave height analyses have been performed for the entirety of the shoreline within Atlantic County. In addition, floodplains for all riverine flooding sources studied by detailed methods in the county have been redelineated using updated topographic data provided to FEMA by USGS and NJDEP. Flood hazard areas previously assessed by approximate methods were reanalyzed throughout the county, with results mapped using the updated topographic data mentioned above. This work was performed by RAMPP, a joint venture of Dewberry & Davis LLC, URS Group Inc., and ESP Associates for FEMA. This work was completed in May 2013.

Base map information for this FIRM was developed from high-resolution orthophotography provided by the State of New Jersey. This information was derived from digital orthophotos produced at a scale of 1:2,400 with a 1-foot pixel resolution from photography dated 2012.

The projection used for the production of this FIRM is New Jersey State Plane (FIPS 2900) zone. The horizontal datum was NAD 83, GRS80 spheroid. Differences in the datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent counties may result in slight positional differences in map features at the county boundaries. These differences do not affect the accuracy of information shown on the FIRM.

1.3 Coordination

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

The dates of the initial and final CCO meetings held for FISs prior to the [*date*] FIS the jurisdictions within Atlantic County are shown in Table 1, "Initial and Final CCO Meetings."

TABLE 1 – INITIAL AND FINAL CCO MEETINGS

Community	Initial CCO Date	Final CCO Date
Absecon, City of	November 19, 1997[1]	June 10, 1998
Atlantic City, City of	*	*
Brigantine, City of	*	*
Corbin City, City of	June 2, 1977	November 10, 1980
Egg Harbor, City of	June 3, 1977	August 13, 1981
Egg Harbor, Township of	May 19, 1978	March 25, 1982
Estell Manor, City of	November 20, 2001[1]	July 10, 2002
Folsom, Borough of	June 1977	January 26, 1981
Galloway, Township of	May 19, 1978	May 25, 1982
Hamilton, Township of	*	October 29, 1975
Hammonton, Town of	June 1977	January 26, 1981
Linwood, City of	June 11, 1978	February 25, 1982
Longport, Borough of	*	*
Margate City, City of	*	*
Mullica, Township of	June 1977	March 2, 1981
Northfield, City of	June 11, 1978	February 25, 1982
Pleasantville, City of	June 18, 1979	February 11, 1982
Port Republic, City of	May 19, 1978	August 24, 1982
Somers Point, City of	June 11, 1978	January 7, 1982
Ventnor, City of	*	*
Weymouth, Township of	March 1, 2001[1]	January 24, 2002

[1]Notified by letter
*Data not available

Initial CCO meetings for the [*date*] FIS were held on November 9, 2010, with representatives of the NJDEP, FEMA, RAMPP, and local officials. Flood Risk Review Meetings were held on November 13, 2013.

2.0 AREA STUDIED

2.1 Scope of Study

This FIS covers the geographic area of Atlantic County, New Jersey.

All or portions of the flooding sources listed in Table 2, "Flooding Sources Studied by Detailed Methods," were studied by detailed methods. Limits of detailed study are indicated on the Flood Profiles (Exhibit 1) and on the FIRM (Exhibit 2).

TABLE 2 – FLOODING SOURCES STUDIED BY DETAILED METHODS

Atlantic Ocean	Little Meadow Run
Babcock Creek	Maple Run
Cedar Brook	Mattix Run
Clarks Mill Stream	Mill Branch
Cordery Creek	Morses Mill Stream
Doughty Creek	Mullica River
English Creek	North Branch Absecon Creek
Gravelly Run	Patcong Creek
Great Egg Harbor River Reach 1	South River Reach 1
Great Egg Harbor River Reach 2	South River Reach 2
Great Egg Harbor River Reach 2 Tributary	Tributary to Atlantic City Reservoir
Hospitality Branch	Tuckahoe River
Lakes Creek	Union Creek
Landing Creek Reach 1	Union Creek Tributary
Landing Creek Reach 2	

Table 3, "Stream Name Changes," lists streams that have names in this countywide FIS other than those used in the previously printed FISs for the communities in which they are located.

TABLE 3 – STREAM NAME CHANGES

Community	Old Name	New Name
Buena Vista, Township of	South River	South River Reach 2
Egg Harbor City, City of	Landing Creek	Landing Creek Reach 2
Estell Manor, City of	South River	South River Reach 1
	South River	South River Reach 2
Folsom, Borough of	Great Egg Harbor River	Great Egg Harbor River Reach 2
	Great Egg Harbor River Tributary	Great Egg Harbor River Reach 2 Tributary
Galloway, Township of	Landing Creek	Landing Creek Reach 1
Galloway, Township of	North Branch	North Branch Absecon Creek
Hamilton, Township of	Great Egg Harbor River	Great Egg Harbor River Reach 1
Hamilton, Township of	South River	South River Reach 2
Weymouth, Township of	South River	South River Reach 2

Riverine flooding sources throughout the county have been studied by detailed methods at different times and, prior to this countywide FIS, often on a community-by-community basis. Table 4, "Model Dates for Riverine Flooding Sources" represents the hydraulic modeling dates for the detailed study flooding sources in the county.

TABLE 4 – MODEL DATES FOR RIVERINE FLOODING SOURCES

STREAM NAME	COMMUNITY	MOST RECENT MODEL DATE
Babcock Creek	Township of Hamilton	September 1976
Cedar Brook	Town of Hammonton	April 1980
Clarks Mill Stream	City of Port Republic	August 1981
Cordery Creek	Township of Galloway	August 1981
Doughty Creek	Township of Galloway	August 1981
English Creek	Township of Egg Harbor	August 1981
Gravelly Run	Township of Hamilton	September 1976
Great Egg Harbor River Reach 1	Township of Hamilton	April 1980
Great Egg Harbor River Reach 2	Borough of Folsom	April 1980
Great Egg Harbor River Reach 2 Tributary	Borough of Folsom	April 1980
Hospitality Branch	Borough of Folsom	April 1980
Lakes Creek	Township of Egg Harbor	August 1981
Landing Creek Reach 2	City of Egg Harbor City	April 1980
Little Meadow Run	Township of Egg Harbor	August 1981
Maple Run	Township of Egg Harbor, City of Northfield	August 1981
Mattix Run	Township of Galloway	August 1981
Mill Branch	Township of Egg Harbor	August 1981
Morses Mill Stream	City of Port Republic	August 1981
Mullica River	Township of Mullica	April 1980
North Branch Abescon Creek	Township of Egg Harbor, Township of Galloway	August 1981
Patcong Creek	Township of Egg Harbor, City of Linwood, City of Northfield	August 1981
South River Reach 2	Township of Hamilton, Township of Weymouth	September 1976
Tributary to Atlantic City Reservoir	Township of Galloway	August 1981
Tuckahoe River	City of Estell Manor, Township of Weymouth	November 1976
Union Creek	City of Egg Harbor City	April 1980
Union Creek Tributary	City of Egg Harbor City	April 1980

For the [*date*] countywide FIS, updated coastal storm surge and wave height analyses have been performed for the entirety of the shoreline within Atlantic County.

The areas studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development and proposed construction.

All or portions of numerous flooding sources in the county were studied by approximate methods. Approximate analyses were used to study those areas having a low development potential or minimal flood hazards.

2.2 Community Description

Atlantic County is located in the southern part of New Jersey. It is bordered to the north by Burlington, Camden, Gloucester, and Ocean Counties; to the west by Cumberland County; to the south by Cape May County; and to the east by the Atlantic Ocean. The county seat is Mays Landing. The county is bounded to the north by the Mullica River; to the south by Great Egg Harbor River (which is part of the National Wild and Scenic Rivers system) and the Tuckahoe River; and to the east by the Atlantic Ocean.

Atlantic County was officially created in 1837, formed from the eastern portion of Gloucester County. Historically the home of the Leni-Lenape Native American people, the first European settlement occurred in 1679, with many early settlers working in mills, brickyards, or the shipbuilding industry. Today the county's principal industries consist of tourism services, agriculture, engineering services, shipbuilding, pharmaceutical research and promotion, and fine china production (Atlantic County, New Jersey Official Government Website, 2014). According to the U.S. Census Bureau, the population for Atlantic County was 274,549 in 2010 (U.S. Census Bureau), with a land area of 555.70 square miles (U.S. Census Bureau 2010).

Atlantic County lies entirely within the Atlantic Coastal Plain, which extends along the east coast of the U.S. from Massachusetts to Florida. The Coastal Plan consists of unconsolidated sands, silts, clays, and marls with the Cohansey and Kirkwood sand formations being prevalent in the area.

The Coastal Plain sediments in this region are underlain by gneiss and schists. This basement complex slopes toward the Atlantic Ocean from a depth of about 1,100 feet in New Egypt to over 5,000 feet at the Atlantic Ocean (U.S. Department of the Interior, 1971; New Jersey Department of Environmental Protection, 1977). The bedrock formations were worn to a peneplain which slopes toward the Atlantic Ocean and were subsequently warped so that the Coastal Plain is depressed to the southeast. This resulted in the deposition of eroded material from the northern mountains.

Southern New Jersey has a relatively mild climate, due to the influence of the Atlantic Ocean and the Gulf Stream, which results in longer summers and milder winters than areas further inland. The average temperature is 40.3 degrees Fahrenheit (°F) in January and 85.8°F in July (Atlantic County, New Jersey Official Government Website). Average annual precipitation is approximately 41.1 inches. Storm-related floods are often a result of tropical cyclones moving up the Atlantic coast.

2.3 Principal Flood Problems

Past history of flooding in Atlantic County demonstrates that flooding can occur during any season of the year. Most serious tidal flooding problems are attributed to hurricanes, which occur during the late summer and early autumn. In addition to heavy precipitation, hurricanes produce high tides and strong waves, which can result in severe damage to coastal areas. Although extratropical cyclones, referred to as northeasters, can develop at almost any time of the year, they are more likely to occur during the winter and spring. Thunderstorms are a common occurrence during the summer months..

Hurricanes and major storms have produced significant flooding conditions on the southern New Jersey coast in 1933, 1944, 1950, 1953, 1960, 1962, 1971, 1976, 1992, 2011 and 2012.

<u>September 14, 1944</u>

The Great Atlantic Hurricane of 1944 struck the entire shoreline of New Jersey with wind velocities ranging from 90 mph at Atlantic City to over 100 mph in New York City. During the passage of this storm, many communities reported extremely high tides.

<u>November 25, 1950</u>

The Great Appalachian Storm of November 1950 caused severe flood occurred on Thanksgiving Day. This strong northeaster struck the entire shoreline of New Jersey with gale force winds and more than 3 inches of rainfall.

<u>March 6-8, 1962</u>

This northeaster, also known as The Ash Wednesday Storm, was one of the most memorable storms to strike the Atlantic County shoreline in recent years. This storm struck the entire coastline of New Jersey with gale force winds, extremely high tides and heavy precipitation in the form of wet snow. Generating winds of 70 mph, this northeaster remained in the study area for 60 hours. The unusually long duration coincided with five successive high spring tides. Along the river front, many docks were under water for several days. Severe flooding conditions, not only in the study area but along the entire coastline of New Jersey, resulted from the high storm water, waves and gale force winds.

The outstanding feature of the storm was the series of five successive high tides and destructive waves generated by gale force winds. The storm surge covered most of Absecon Island. Floodwaters reached a depth of 5 feet over the streets of the northeastern section of Atlantic City, necessitating evacuation of residents. On the island, approximately 11,750 dwellings and 729 commercial establishments, including boardwalks, sustained damage from flooding and wave action. Three persons lost their lives in Atlantic City as a direct result of the storm (USACE, 1963). The storm of March 1962 produced water levels of 6.6 feet NAVD88 at Lewes, Delaware, and 6.2 feet NAVD88 at Reedy Point, Delaware. At Atlantic City, the tide gauge indicated a maximum ocean tidal stage of 5.8 feet NAVD88. In August, 1976, heavy and moderate coastal flooding resulted in structural damages and moderate coastal erosion.

August 26-28, 1971

A heavy frontal storm in combination with Tropical Storm Doria produced the greatest flooding in the area. This storm caused the President to declare New Jersey a National Disaster Area. An extensive high water mark survey was conducted jointly by the State of New Jersey and the USGS following Doria. These data are on file with the Division of Water Resources.

The August 1971 flood resulted from heavy antecedent rainfall in the morning and afternoon of August 27 followed by precipitation associated with the passage of Tropical Storm Doria across New Jersey in the evening of August 27 and early-morning hours of August 28. On August 26-28, 1971, intense thunderstorm activity followed by the passage of Tropical Storm Doria brought heavy precipitation to south-central, central, and northeast New Jersey for 32 hours. Total storm rainfall amounts during a 32-hour period ranged from about 3 to over 11 inches across New Jersey. Storm runoff increased rapidly to peak flows greater than previously experienced prior to August 1971 recorded at 47 stream gaging stations in New Jersey.

August 1991

Heavy surf from Hurricane Bob in August 1991 caused significant beach damage and the death of several surfers, caught in tide rip currents.

September 22, 1992

Tropical Storm Danielle dropped light rain fall across much of New Jersey. The southwest portion of the state experienced over 3 inches of rain. The storm washed out miles of beaches along the coastline.

December 11, 1992

Northeaster struck the New Jersey shoreline with winds reaching 90 miles per hour. Boardwalks were torn up and flooding occurred from along the Atlantic coastline.

September 1993

Damage to coastal structures and extensive beach erosion were the result of the effects of Hurricane Isabel, in September 1993.

Winter storms, though more frequent than hurricanes, are less likely to generate large surges; the storm of March 1962 produced tides to 7.2 feet and the 1950 storm, with a slightly larger surge, occurred at low water. Storm histories over this region have been outlined and analyzed in some detail in a similar flood insurance report by the National Oceanic and Atmospheric Administration and by a tide frequency analysis (U.S. Department of Housing and Urban Development, 1970; U.S. Department of Commerce, 1970). Storm histories were obtained from a tropical cyclone analysis, records of the U.S. Weather Bureau, and from the USACE (U.S. Department of Commerce, 1965; U.S. Department of Commerce, 1961; USACE, 1963).

Special consideration was given to storms which caused damages to the area in recent years, including Hurricane Floyd in 1999, Hurricane Irene in 2011, and Hurricane Sandy in 2012 (FEMA, 2013).

Hurricane Floyd originally made landfall in Cape Fear, North Carolina as a Category 2 hurricane on September 16, 1999. The storm crossed over North Carolina and southeastern Virginia, before briefly entered the western Atlantic Ocean. The storm reached New Jersey on September 17, 1999. Record breaking flooding was recorded throughout the State of New Jersey. The Raritan River basin experienced record floods of up to 4.5 ft. higher than any previous record flood crest. The areas of Bound Brook and Manville were especially hit hard. A Federal Emergency Declaration was issued on September 17, 1999. Overall damage estimates for Hurricane Floyd, in the State of New Jersey are estimated around $250 million.

Having earlier been downgraded to an extra-tropical storm, Hurricane Irene came ashore in Little Egg Inlet in Southern New Jersey; on August 28, 2011. In anticipation of the storm Governor Chris Christy declared a state of emergency of August 25th, with President Obama reaffirming the declaration on August 27th. Mandatory evacuations were ordered throughout the Ocean County Barrier Islands. Wind Speeds were recorded at 75 mph and rain totals reached over 10 inches in many parts of the state. Overall damage estimates, for the State of New Jersey, came to over $1 billion; with over 200,000 homes and buildings being damaged.

Hurricane Sandy came ashore as an immense tropical storm in Brigantine, New Jersey, on October 29, 2012. Sandy dropped heavy rain on the area; almost a foot in some areas. Wind gust were recorded at 90 mph. A full moon made the high tides 20 percent higher than normal and amplified the storm surge. The New Jersey shore suffered the most damage. Some barrier island communities suffered severe "wash over" including the creation of two temporary inlets. NOAA's gage #8534720 at Atlantic City, NJ; the high water mark (which is considered as a stillwater elevation without waves) was 8.76 ft. NAVD88 at 11:42 PM on October 29, 2012 and NOAA's gage #8531680 at Sandy Hook, NJ; the high water mark (which is considered as a stillwater elevation without waves) was 9.21 ft NAVD88 at 6:00 PM on October 29, 2012. Seaside communities were damaged and destroyed up and down the coastline. Initial reports suggest that well over 24,000 homes and businesses were damaged or destroyed by the storm. Governor Chris Christy declared a state of emergency on October 31. Hurricane Sandy is estimated to cost the State of New Jersey over $36 billion.

In the City of Absecon, eastern portions are affected by tidal flooding directly from Absecon Bay, while inland sections of the city are subject to tidal flooding through Absecon Creek, Ingersolls Branch, and Conovers Creek.

Gaging stations located at Atlantic City give an accurate record of past flooding on Absecon Island since 1911. There are some periods where data was not obtained at the Atlantic City gage and three rather long periods to note include October 1938 to January 1951, October 1951 to January 1959, and November 1978 to July 1985. The highest recorded water level at Atlantic City was 6.4 feet NAVD88, recorded during the December 1992 Northeaster. Other high water levels occurred during storms on November 10, 1932, September 14, 1944, November 1, 1947, November

24, 1950, October 23, 1953, March 6-7, 1962, and September 12, 1960 (U.S. Department of the Interior, 1962). Large floods in the study area occurred during the storms of 1933, 1944, 1950, 1953, 1960, and 1962, with the worst of these storms occurring in September 1944, November 1950, and March 1962 (USACE, 1968). The high surge and tide level during the September 1944 hurricane was reported at 9 feet above mean low water. This hurricane caused one of the highest known water levels and severe damages along the Atlantic coast of New Jersey.

The Mullica River is subject to tidal flooding due to backwater from Great Bay. Since it is primarily swampy and uninhabited, the danger from flooding is minimal. A flood recorded at the Mullica River gaging station located near Batsto, New Jersey, was in 1975 and corresponded to an 18-year flood.

The severe floods of record for the Great Egg Harbor River in Atlantic County occurred in August 1933, September 1938, 1940, and 1960. Other large floods on the Great Egg Harbor River occurred in August 1958, August 1967, April 1970, and April 15-18, 2007. In addition to fluvial flooding, the Great Egg Harbor River below the dam at Mays Landing is subject to tidal flooding due to high tides and surge events from the Atlantic Ocean through Great Egg Harbor Bay.

Cedar Brook is a tributary to Nescochague Creek which flows through the Town of Hammonton and empties into the Mullica River approximately 2.5 miles upstream of USGS gage No. 01409400. Stream flow data has been recorded at this site since 1958 and floods have occurred in the Mullica River basin in 1958, 1967, 1970, and 1975. The 1975 flooding shows a high recorded discharge and corresponds to an 18-year recurrence interval at this site.

Most of the flooding in the City of Pleasantville is due to tidal flooding from Lakes Bay and Absecon Bay. In addition, flooding occurs during extreme weather conditions along Conovers Creek located in the northern portion of the community.

Within the City of Somers Point, localized flooding is experienced during high tides in the area of the marina on Bay Avenue.

In the Township of Weymouth, streams and their tributaries have considerable swampland along their banks. The majority of the central region of the township is drained by Stephen Creek and its tributaries.

2.4 Flood Protection Measures

The only flood protection measure in the City of Absecon is a dike at the lower end of the Atlantic City Reservoir.

There is an earthen embankment in the Tuckahoe Wildlife Management Area within the City of Corbin City. However, this embankment would not prevent inundation by the 1-percent-annual-chance flood.

For the City of Egg Harbor City, there are no known structural flood protection devices in either the Landing Creek or Union Creek drainage basins. Some channelization on Landing Creek, located downstream from Duerer Street, is evident and was taken into consideration in the hydraulic analysis performed for this study.

In the Borough of Folsom, the dams which impound water to form Cushman, Braddock, and Cains Mill Lakes act to lessen the peak flood discharges downstream. This effect was considered in the hydrologic analysis for Hospitality Branch.

There are no other known structural flood protection measures in place in Atlantic County.

3.0 ENGINEERING METHODS

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

3.1 Riverine Hydrologic Analyses

Prior to the [*date*], FIS the following hydrologic analyses were carried out to establish peak discharge-frequency relationships for each flooding source studied by detailed or limited detailed methods in the county. With the exceptions of the Borough of Buena and the Township of Buena Vista all other communities have a previously printed FIS report. The hydrologic analyses described in those reports have been compiled and are summarized below.

For Cedar Brook, Clarks Mill Stream, Cordery Creek, Doughty Creek, English Creek, Great Egg Harbor River Reach 2 Tributary, Hospitality Branch, Lakes Creek, Landing Creek Reach 2, Little Meadow Run, Maple Run, Mattix Run, Mill Branch, Morses Mill Stream, North Branch Absecon Creek, Patcong Creek, Tributary to Atlantic City Reservoir, Union Creek, and Union Creek Tributary, flood discharges were computed by applying methods presented in USGS Special Report 38 (State of New Jersey, 1974). This method of estimating flood-peak magnitudes was developed through a regression analysis considering flood frequency relationships for 103 gaging stations in New Jersey, and was determined using the log-Pearson Type III method of statistical analysis (Water Resources Council, 1976). The method relates basin characteristics such as drainage area, slope, storage, and impervious cover to peak discharge for various frequencies through empirical equations.

Recorded flood flow frequency data for Great Egg Harbor River Reach 2 within the Borough of Folsom were based on a statistical analysis of discharge records covering a 51-year period at the Folsom gaging station (No. 01411000), operated by the USGS. The gage was also used for the reach of the Great Egg Harbor River Reach 1 within Hamilton Township, South River Reach 2, Gravelly Run, and Babcock Creek. This analysis followed the standard log-Pearson Type III method, as outlined by the Water Resources Council (Water Resources Council, 1976) at Folsom, New Jersey.

The flood flow frequency discharges for the Mullica River were based upon a statistical analysis of discharge records covering a 19-year period at gage No. 01409400 on the Mullica River near Batsto. The standard log-Pearson Type III distribution was applied to the data (Water Resources Council, 1976). The discharge information at the gage was transferred to the study area by applying the equation:

$$Q1/A2 = (A1/A2)^{0.5}$$

which relates drainage area (A) to discharge (Q).

The hydrologic analysis of the Tuckahoe River consisted of historic hydrograph reconstitution using the HEC-1 computer model (USACE, 1973) and by a routing and combining process. Unit hydrographs were then developed. Hypothetical storms were generated, and resultant discharge hydrographs were developed to estimate runoff events at selected recurrence intervals. An alternative approach, which consisted of an extension of the regional frequency analysis (USACE, 1974), was also investigated. The results were compared and evaluated and final estimates of discharges for the 10-, 2-, and 1-percent-annual-chance floods were adopted (USACE, 1976). The peak flows of the 0.2-percent-annual-chance flood were obtained by extrapolating the discharge-frequency curves developed from peak flows of the more frequent flood events.

For the [*date*] countywide FIS, no detailed riverine analysis was performed.

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

TABLE 5 – SUMMARY OF DISCHARGES

		PEAK DISCHARGES (cfs)			
FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	10-PERCENT ANNUAL CHANCE	2-PERCENT ANNUAL CHANCE	1-PERCENT ANNUAL CHANCE	0.2-PERCENT ANNUAL CHANCE
BABCOCK CREEK					
Confluence with Great Egg Harbor River Reach 1	18	3,600	7,000	9,600	11,800
CEDAR BROOK					
Wharton State Forest boundary	3.87	313	552	701	1,180
Liberty Street	1.76	203	364	466	790

TABLE 5 – SUMMARY OF DISCHARGES – continued

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-PERCENT ANNUAL CHANCE	2-PERCENT ANNUAL CHANCE	1-PERCENT ANNUAL CHANCE	0.2-PERCENT ANNUAL CHANCE
CLARKS MILL STREAM					
Upstream of Pitney Road	18.59	577	971	1,192	1,928
Upstream of confluence of Morses Mill Stream	8.34	341	594	742	1,206
CORDERY CREEK					
Upstream of U.S. Route 9	1.50	80	147	187	309
DOUGHTY CREEK					
Upstream of Creek Road	3.40	220	388	489	801
ENGLISH CREEK					
At the Zion Road crossing	4.46	216	383	478	774
GREAT EGG HARBOR RIVER REACH 1					
At U.S. Highway 40	228	1,394	2,016	3,324	5,192
Upstream of State Route 54	56.3	595	1,030	1,270	2,010
At upstream corporate limit of Borough of Folsom	51.79	563	976	1,205	1,880
GREAT EGG HARBOR RIVER TRIBUTARY					
At confluence with Great Egg Harbor River	3.0	71	129	161	270
HOSPITALITY BRANCH					
Upstream of CONRAIL bridge	44.53	1,036	1,715	2,089	3,350
At upstream corporate limit of Borough of Folsom	25.98	620	1,039	1,272	2,000
LAKES CREEK					
At the crossing of State Route 559	2.97	177	309	388	621
LANDING CREEK REACH 2					
At downstream corporate limit of City of Egg Harbor	9.14	322	557	691	1,120
At upstream corporate limit of City of Egg Harbor	3.77	125	228	290	490

TABLE 5 – SUMMARY OF DISCHARGES – continued

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-PERCENT ANNUAL CHANCE	2-PERCENT ANNUAL CHANCE	1-PERCENT ANNUAL CHANCE	0.2-PERCENT ANNUAL CHANCE
LITTLE MEADOW RUN					
Upstream of the confluence with Mill Branch	2.87	190	331	415	666
MAPLE RUN					
Upstream of the confluence of Mill Branch	4.72	240	409	504	784
MATTIX RUN					
At access road	6.40	153	271	339	546
MILL BRANCH					
Upstream of the confluence of Maple Run	12.22	411	702	867	1,364
Upstream of the confluence of Little Meadow Run	9.34	297	512	634	1,002
Upstream of the confluence of Cedar Branch	5.12	160	281	350	559
MORSES MILL STREAM					
Upstream of the confluence with Clarks Mill Stream	8.00	193	327	409	666
MULLICA RIVER					
At Pleasant Mills Bridge	124.76	1,790	2,980	3,585	5,300
NORTH BRANCH ABSECON CREEK					
Upstream of the spillway at Mill Road	15.10	539	923	1,146	1,833
Upstream of the confluence with South Branch Absecon Creek	5.48	428	738	926	1,509
Downstream of the confluence with South Branch Absecon Creek	4.21	428	738	926	1,509
PATCONG CREEK					
Upstream of the Central Avenue spillway	21.49	796	1,308	1,609	2,479
At the Zion Road crossing	17.14	586	978	1,197	1,847
SOUTH RIVER REACH 2					
At Walkers Forge Avenue	25	436	838	1,039	1,622

TABLE 5 – SUMMARY OF DISCHARGES – continued

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	10-PERCENT ANNUAL CHANCE	2-PERCENT ANNUAL CHANCE	1-PERCENT ANNUAL CHANCE	0.2-PERCENT ANNUAL CHANCE
TRIBUTARY TO ATLANTIC CITY RESERVOIR					
At upstream of corporate limit of Township of Galloway	1.55	122	223	280	465
TUCKAHOE RIVER					
At Cumberland Avenue	8	160	360	500	1,100
UNION CREEK					
At confluence with Landing Creek	3.91	204	356	445	710
At upstream corporate limit of City of Egg Harbor	1.16	96	115	224	380
UNION CREEK TRIBUTARY					
At confluence with Union Creek	1.20	133	236	300	500
At upstream corporate limit of City of Egg Harbor	0.76	73	134	172	295

3.2 Riverine 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.

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.

Prior to the [date], FIS with the exceptions of the Borough of Buena Vista and Township of Buena Vista all other communities have a previously printed FIS report. The hydraulic analyses described in those reports have been compiled and are summarized below.

Water-surface profiles for floods of the selected recurrence intervals for Babcock Creek, Clarks Mill Stream, Cordery Creek, Doughty Creek, English Creek, Gravelly Run, Great Egg Harbor River Reach 1, Great Egg Harbor River Reach 2, Great Egg Harbor River Tributary, Hospitality Branch, Lakes Creek, Landing Creek Reach 2, Little Meadow Run, Maple Run, Mattix Run, Mill Branch, Morses Mill Stream, Mullica River, North Branch Absecon Creek, Patcong Creek, South River Reach 2, Tributary to Atlantic City Reservoir, Tuckahoe River, Union Creek, and Union Creek Tributary were computed through use of the USACE HEC-2 step-backwater computer program (USACE, 1982).

Composite cross sections for the backwater analyses of Cedar Brook, Great Egg Harbor River Reach 1, Great Egg Harbor River Reach 2, Great Egg Harbor River Tributary, Hospitality Branch, Landing Creek Reach 2, Mullica River, Union Creek, and Union Creek Tributary were obtained from aerial photographs, and the below-water sections were obtained by field measurement (Geod Aerial Survey, Inc., 1977).

Starting water-surface elevations for Babcock Creek, Gravelly Run, and South River Reach 2 were obtained from the backwater analysis for the Great Egg Harbor River.

Starting water-surface elevations for Cedar Brook, Hospitality Branch and Landing Creek Reach 2 were calculated assuming critical depth approximately 2,000 feet downstream of the beginning of detailed study to allow a normal backwater profile to develop.

Starting water-surface elevations for Clarks Mill Stream, Cordery Creek, English Creek, Lakes Creek, and Mattix Run were taken from the mean annual tide which is equivalent to the 2-year tide elevation of 4.7 feet (NGVD29).

Starting water-surface elevations for Doughty Creek, North Branch Absecon Creek, and Patcong Creek were taken from a spillway rating curve.

Starting water-surface elevations for the reach of the Great Egg Harbor River Reach 2 within the Borough of Folsom were obtained from USGS gage and rating table data at Folsom.

Starting water-surface elevations for the reach of the Great Egg Harbor River Reach 1 within the Township of Hamilton were determined from tidal gage information.

Starting water-surface elevations for the Great Egg Harbor River Tributary were based on critical depth assuming non-coincidental flooding conditions; however, the elevations from the main river were plotted at the confluence.

Starting water-surface elevations for Little Meadow Run, Maple Run, and Mill Branch were taken from the backwater analysis for Patcong Creek.

Starting water-surface elevations for Morses Mill Stream were taken from the backwater analysis on Clarks Mill Stream.

Starting water-surface elevations for the Mullica River were assumed at channel-full conditions by assuming non-coincidental riverine and tidal flooding.

Starting water-surface elevations for Tributary to Atlantic City Reservoir were determined using the slope/area method.

Starting water-surface elevations for the Tuckahoe River were obtained using critical depth downstream of the Township of Maurice River boundary.

Starting water-surface elevations for Union Creek and Union Creek Tributary were computed assuming normal depths and non-coincidental flooding.

For the [*date*] countywide FIS, no detailed riverine analysis was performed.

***Approximate* (A) "A Zones":** This category is assigned where "unnumbered" A Zones are shown on the effective maps, but the anticipated level of development does not warrant the collection of field survey; or where communities have requested an approximate study where there was currently no study at all. The desktop analysis approach to be applied to approximate studies is defined in Appendix C, Section 4.3 of FEMA's *Guidelines and Specifications for Flood Hazard Mapping Partners*. The level of effort includes orthophoto collection, Light Detection and Ranging (LiDAR) and stream breakline collection, use of engineering drawing plans and DOT studies (where appropriate and available), nomination of flow rates, and the development of HEC-RAS hydraulic models.

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

Roughness factors (Manning's "n") used in the hydraulic computations were chosen by engineering judgment and were based on field observations of the streams and floodplain areas. Roughness factors for all streams studied by detailed methods are shown in Table 6, "Manning's "n" Values."

TABLE 6 – MANNING'S "n" VALUES

Stream	Channel "n"	Overbank "n"
Babcock Creek	0.015 - 0.045	0.015 - 0.12
Cedar Brook	0.030 - 0.090	0.046 - 0.100
Clarks Mill Stream	0.030 - 0.045	0.040 - 0.100
Cordery Creek	0.025 - 0.035	0.050 - 0.150
Doughty Creek	0.04	0.060 - 0.100
English Creek	0.020 - 0.040	0.050 - 0.150
Gravelly Run	0.015 - 0.045	0.015 - 0.12
Great Egg Harbor River Reach 2	0.045 - 0.060	0.06 - 0.12
Great Egg Harbor River Tributary	0.06 - 0.07	0.08 - 0.11
Hospitality Branch	0.03 - 0.055	0.035 - 0.085
Lakes Creek	0.030 - 0.080	0.070 - 0.150
Landing Creek Reach 2	0.040 - 0.060	0.050 - 0.120
Little Meadow Run	0.020 - 0.040	0.040 - 0.150
Maple Run	0.030 - 0.040	0.080 - 0.150
Mattix Run	0.035 - 0.050	0.050 - 0.100
Mill Branch	0.020 - 0.040	0.030 - 0.150
Morses Mill Stream	0.025 - 0.035	0.080 - 0.150

TABLE 6 – MANNING'S "n" VALUES – continued

Stream	Channel “n”	Overbank “n”
Mullica River	0.039 - 0.051	0.049 - 0.064
North Branch Absecon Creek	0.030 - 0.045	0.060 - 0.100
Patcong Creek	0.030 - 0.500	0.050 - 0.100
South River Reach 2	0.02 - 0.05	0.02 - 0.12
Tributary to Atlantic City Reservoir	0.025 - 0.030	0.050 - 0.100
Tuckahoe River	0.05	0.12 - 0.13
Union Creek	0.040 - 0.060	0.060 - 0.120
Union Creek Tributary	0.047 - 0.055	0.070 - 0.090

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

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

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

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

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

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

3.3 Coastal Analysis

Prior to the [*date*] countywide FIS, each jurisdiction within Atlantic County, with the exceptions of the Borough of Buena and the Township of Buena Vista has a previously printed FIS report. Note that these analyses are now superseded by the revised coastal hydrodynamic analysis discussed in this section.

For the [*date*] countywide FIS, a coastal analysis considering storm characteristics and the shoreline and bathymetric characteristics of the flooding sources studied was carried out to provide estimates of flood elevations for the selected recurrence intervals along the shoreline. Users of the FIRM should be aware that coastal flood elevations are provided in Table 7, "Transect Data Table" in this report. If the elevation on the FIRM is higher than the elevation shown in this table, a wave height, wave runup, and/or wave setup component likely exists, in which case the higher elevation should be used for construction and/or floodplain management purposes. The coastal study for the New Jersey Atlantic Ocean coast was conducted for FEMA by RAMPP under contract HSFEHQ-09-D-0369 task order HSFE02-09-J-0001.

The regional storm surge modeling system includes the Advanced Circulation Model for Oceanic, Coastal and Estuarine Waters (ADCIRC) for simulation of 2-dimensional hydrodynamics. ADCIRC was dynamically coupled to the unstructured numerical wave model Simulating Waves Nearshore (unSWAN) to calculate the contribution of waves to total storm surge (RAMPP, 2013). The resulting model system is typically referred to as SWAN+ADCIRC. A seamless modeling grid was developed to support the storm surge modeling efforts. The modeling system validation consisted of a comprehensive tidal calibration followed by a validation using carefully reconstructed wind and pressure fields for six major flood events affecting the region: the 1938 hurricane, the Great Atlantic Hurricane of 1944, Hurricane Donna, Hurricane Gloria, and two extra-tropical storms, from 1984 and 1992. Model skill was assessed by quantitative comparison of model output to wind, wave, water level and high water mark observations. The model was then used to simulate 30 historical extra-tropical storms and 159 synthetic hurricanes to create a synthetic water elevation record from which the 10-, 2-, 1-, and 0.2-percent annual chance of exceedence elevations were determined.

Wave setup is the increase in mean water level above the still water level due to momentum transfer to the water column by waves that are breaking or otherwise dissipating their energy (Dean et al., 2005). For the New York and New Jersey surge study, wave setup was determined directly from the SWAN+ADCIRC model. The total stillwater elevation, which includes wave setup, was then used for the erosion and overland wave modeling.

3.4 Wave Height Analysis

The wave height analysis was carried out to provide estimates of the elevations of floods of the selected recurrence intervals along the shoreline of the Atlantic Ocean and inland bays.

The destructiveness of high stillwater elevations due to coastal flooding may be increased by wind-induced waves which contribute to increased water levels and whose size and velocity may damage structures directly. The height of a wave is dependent upon wind speed and its duration, depth of water, and length of fetch. The wave crest elevation is the sum of the stillwater elevation and the portion of the wave height above the stillwater elevation.

The wave crest analysis was conducted according to the methodology developed by the National Academy of Sciences (NAS) and adopted by FEMA as a standard component of coastal FISs (NAS, 1977). The required computations for the analysis were performed using the Wave Height Analysis for Flood Insurance Studies (WHAFIS) computer program (FEMA, January 1981). Wave heights were computed along transects which were located perpendicular to the average mean shoreline. The transects were located with consideration given to the physical and cultural characteristics of the land so that they would closely represent conditions in their locality. Transects were spaced close together in areas of complex topography and dense development. In areas having more uniform characteristics, the transects were spaced at larger intervals. It was also necessary to locate transects in areas where unique flooding existed and in areas where computed wave heights varied significantly between adjacent transects.

Transects represent the locations where the overland wave height analysis was modeled and are placed with consideration given to topography, land use, shoreline features and orientation, and the available fetch distance. Each transect was placed to capture the dominant wave direction, typically perpendicular to the shoreline and extended inland to a point where coastal flooding ceased. Along each transect, wave heights were computed considering the combined effects of changes in ground elevation, obstructions, and wind contributions. Transects were placed along the shoreline along all sources of primary flooding in the county, as illustrated on the FIRMs and in the “Transect Location Map” provided in Figure 1. Transects also represent locations visited during field reconnaissance to assist in parameterizing obstructions and observing shore protection features.

Starting wave conditions (offshore) were derived from the two-dimensional SWAN+ADCIRC model developed for Delaware Bay. Wave heights were then computed across transects defined for coastal areas of Atlantic County.

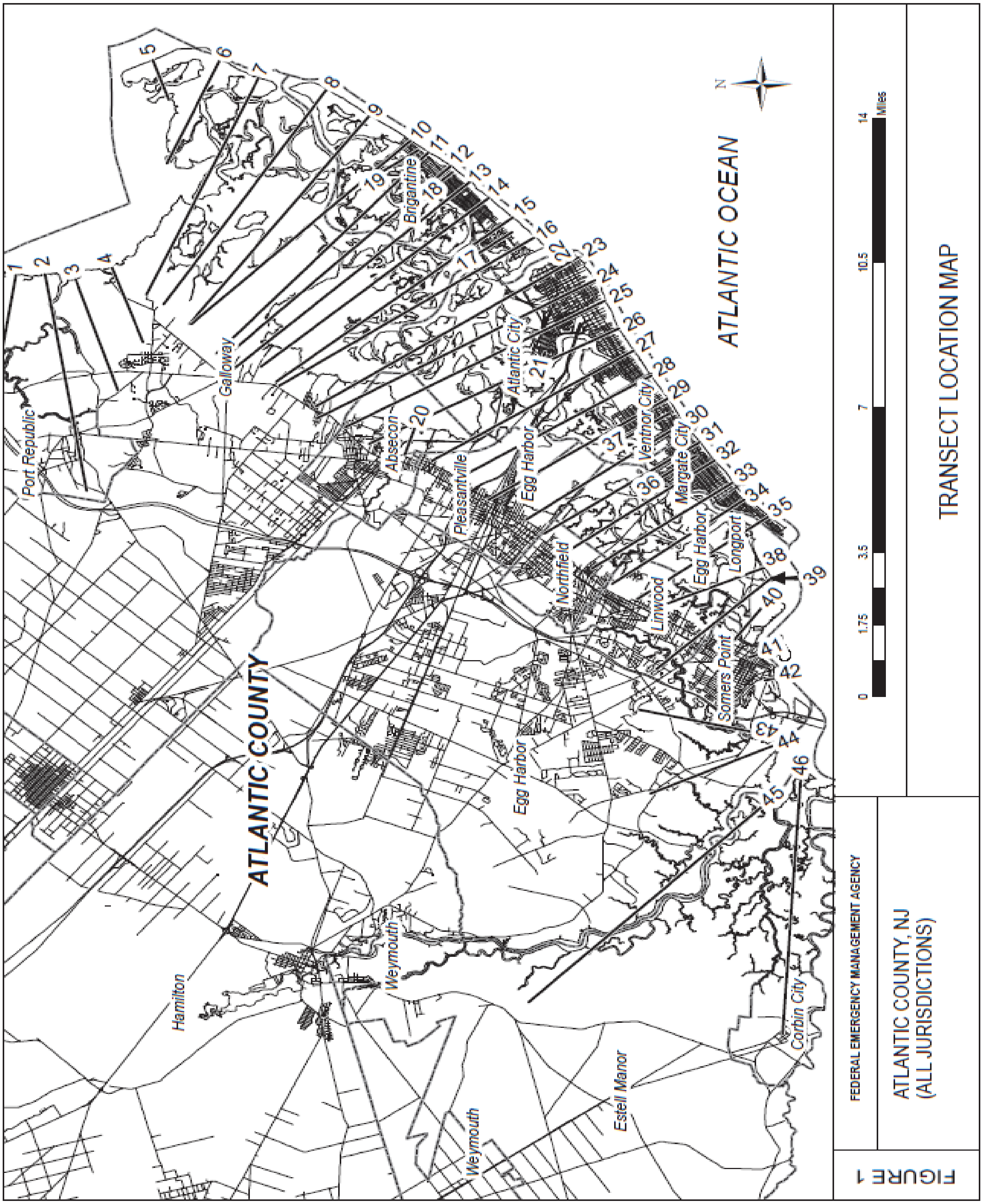

FIGURE 1 – TRANSECT LOCATION MAP

Coastal flooding in the county affects the Cities of Absecon, Atlantic City, Brigantine City, Corbin City, Egg Harbor City, Estell Manor, Linwood, Longport, Margate, Pleasantville, Port Republic, Somers Point, and Ventnor City; and

Townships of Egg Harbor, Galloway, Hamilton, Mullica, and Weymouth. Along the Atlantic Ocean, most of the shoreline is sandy with a variable height sand dune and characterized by high-density residential areas. The bay sides of the barrier islands are a mix of low lying marsh, armored shoreline and residential areas. The inland shoreline is primarily low-lying with a mix of residential areas and marsh.

The tidal surge in the Atlantic Ocean affects approximately 20 miles of Atlantic County coastline, and that entire length was modeled for overland wave hazards. The fetch length across the back bays varies from approximately 0.5 to 6 miles.

The coastal analysis for this revision involved transect layout, field reconnaissance, erosion analysis, and overland wave modeling including wave height and wave run-up analysis.

Erosion was modeled at transects where a dune was identified; this included most of the Atlantic Ocean shoreline. A review of the geology and shoreline type in Atlantic County supported using FEMA's standard erosion methodology for primary frontal dunes, referred to as the "540 rule" (FEMA, 2007). This methodology first evaluates the dune's cross-sectional profile to determine whether the dune has a reservoir of material that is greater or less than 540 square feet. If the reservoir is greater than 540 square feet, the "retreat" erosion method is employed and approximately 540 square feet of the dune is eroded using a standardized eroded profile, as specified in FEMA's Atlantic Ocean and Gulf of Mexico Coastal Guidelines Update (2007a). If the reservoir is less than 540 square feet, the "remove" erosion method is employed where the dune is removed for subsequent analysis, again using a standard eroded profile. The storm surge study provided the return period stillwater elevations required for erosion analysis. Each cross-shore transect was analyzed for erosion, when applicable.

The methodology for analyzing the effects of wave heights associated with coastal storm surge flooding is described in a report prepared by the NAS (NAS, 1977). This method is based on three major concepts. First, depth-limited waves in shallow water reach maximum breaking height that is equal to 0.78 times the stillwater depth. The wave crest is 70 percent of the total wave height above the stillwater level. The second major concept is that wave height may be diminished by dissipation of energy due to the presence of obstructions, such as sand dunes, dikes and seawalls, buildings and vegetation. The amount of energy dissipation is a function of the physical characteristics of the obstruction and is determined by procedures prescribed in NAS Report. The third major concept is that wave height can be regenerated in open fetch areas due to the transfer of wind energy to the water. This added energy is related to fetch length and depth.

Simulations of inland wave propagation were conducted using FEMA's WHAFIS model Version 4.0 (FEMA, 2007b). WHAFIS is a one-dimensional model that was applied to each transect in the study area. The model uses the total stillwater and starting wave information extracted from the coupled wave and storm surge model. In Table 7, "Transect Data," the 10-, 2-, 1-, and 0.2-percent annual chance stillwater elevations for each transect are provided along with the starting wave height and period. Simulations of wave transformations were then conducted with WHAFIS taking into account the storm-induced erosion and overland features of each transect. The model outputs the combined flood elevation from the total SWEL and wave height along each cross-shore transect allowing for the establishment of base flood elevations (BFEs) and flood zones from the shoreline to points inland within the study area. Wave heights were calculated to the nearest 0.1 foot, and BFEs were determined at whole-foot increments along the transects.

Wave runup is defined as the maximum vertical extent of wave uprush on a beach or structure. FEMA's Atlantic Ocean and Gulf of Mexico Coastal Guidelines Update (2007a) require the 2-percent wave runup level be computed for the coastal feature being evaluated (cliff, coastal bluff, dune, or structure). The 2-percent runup level is the elevation exceeded by 2-percent of incoming waves affecting the shoreline during the 1-percent-annual-chance flood event. Each transect defined within the study area was evaluated for the applicability of wave runup, and if necessary, the appropriate runup methodology was selected and applied to each transect. Runup elevations were then compared to WHAFIS results to determine the dominant process affecting BFEs and associated flood hazard levels. Based on wave runup rates, wave overtopping was computed following the FEMA Guidelines and Specifications.

Controlling wave heights, which are used to determine BFEs for the one-percent annual chance event and are output from the WHAFIS model, range from 3.2 feet to 7.6 feet at the shoreline. The corresponding wave crest elevation output from WHAFIS at the shoreline varies from 10.5 feet NAVD to 15.2 feet NAVD. The dune along the coast serves to reduce wave height transmitted inland, but the large areas of low-lying marshes which are inundated by the tidal surge allow regeneration of the waves as they proceed inland. In general, the relatively shallow depth of water in the marshes along with the energy dissipating effects of vegetation allows only minor regeneration of the waves.

Areas of coastline subject to significant wave attack are referred to as coastal high hazard areas. The USACE has established the 3-foot breaking wave as the criterion for identifying the limit of coastal high hazard areas (USACE, 1975). The 3-foot wave has been determined the minimum size wave capable of causing major damage to conventional wood frame of brick veneer structures. The one exception to the 3-foot wave criteria is where a primary frontal dune exists. The limit of the coastal high hazard area then becomes the landward toe of the primary frontal dune or where a 3-foot or greater breaking wave exists, whichever is most landward. The coastal high hazard zone is depicted on the FIRMs as Zone VE, where the delineated flood hazard includes wave heights equal to or greater than 3 feet. Zone AE is depicted on the FIRMs where the delineated flood hazard includes wave heights less than 3 feet. A depiction of how the Zones VE and AE are mapped is shown in Figure 2 "Transect Schematic."

Post-storm field visits and laboratory tests have confirmed that wave heights as small as 1.5 feet can cause significant damage to structures when designed without consideration to the coastal hazards. Additional flood hazards associated with coastal waves include floating debris, high velocity flow, erosion, and scour which can cause damage to Zone AE-type construction in these coastal areas. To help community officials and property owners recognize this increased potential for damage due to wave action in the AE zone, FEMA issued guidance in December 2008 on identifying and mapping the 1.5-foot wave height line, referred to as the Limit of Moderate Wave Action (LiMWA). While FEMA does not impose floodplain management requirements based on the LiMWA, the LiMWA is provided to help communicate the higher risk that exists in that area. Consequently, it is important to be aware of the area between this inland limit and the Zone VE boundary as it still poses a high risk, though not as high of a risk as Zone VE (see Figure 2).

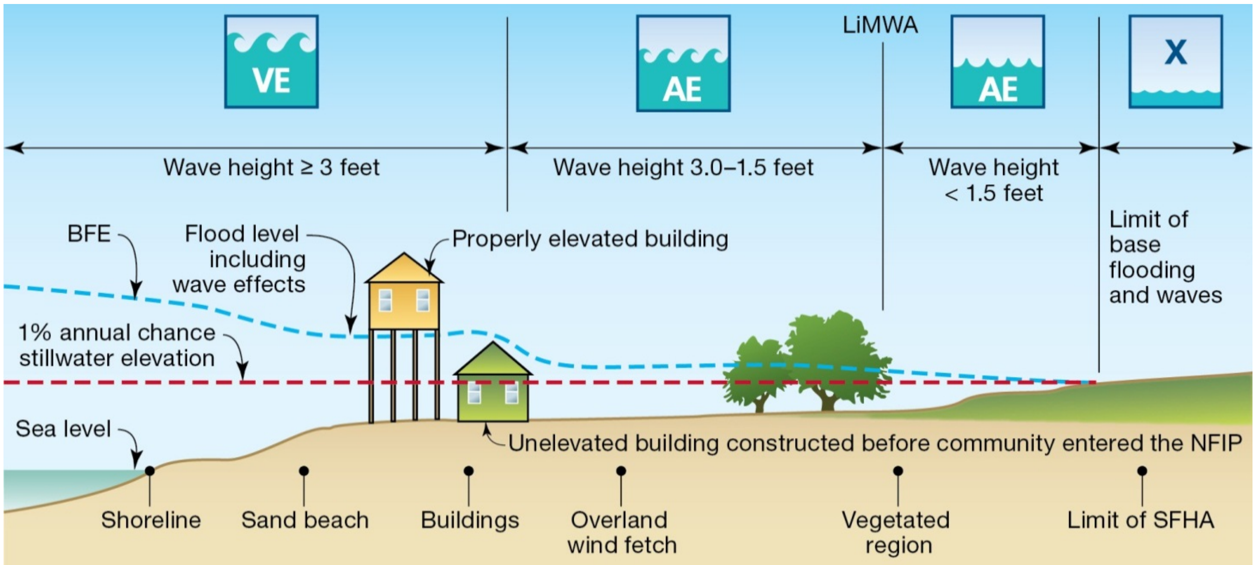

FIGURE 2 – TRANSECT SCHEMATIC

Between transects, elevations were interpolated using topographic maps, land-use and land cover data, and engineering judgment to determine the aerial extent of flooding. The results of the overland wave height and runup calculations are accurate until local topography, vegetation, or cultural development within the community undergoes major changes. The transect data table, Table 7**,** provides the 10-, 2-, 1- and 0.2-percent-annual-chance stillwater elevations and the starting wave conditions for each transect.

TABLE 7 – TRANSECT DATA

Flood Source	Transect		Starting Wave Conditions for the 1% Annual Chance		Starting Stillwater Elevations[1] (ft NAVD88) Range of Stillwater Elevations[2] (ft NAVD88)			
	Number	Coordinates	Significant Wave Height	Peak Wave Period	10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Great Bay	1	N 39.533689 W 74.411923	3.91	3.88	6.3 5.8 - 8.9	8.5 7.8 - 9.3	9.3 8.7 - 9.6	11.2 10.9 - 12.1
Great Bay	2	N 39.524840 W 74.411996	3.97	3.81	6.3 6 - 8.4	8.4 7.9 - 8.8	9.3 9.1 - 9.8	11.1 11.0 - 11.7
Great Bay	3	N 39.515647 W 74.414657	4.00	3.73	6.4 6.4 - 7.9	8.5 8.1 - 8.7	9.3 9.1 - 9.6	11 10.9 - 11.3
Great Bay	4	N 39.504736 W 74.408760	3.56	3.61	6.4 6.4 - 6.7	8.4 8.4 - 8.7	9.2 9.2 - 9.4	10.9 10.8 - 10.9
Atlantic Ocean	5	N 39.489948 W 74.316144	6.53	12.90	6.6 6.1 - 6.6	8.6 7.9 - 8.6	9.4 8.5 - 9.4	11.6 10.0 - 11.6
Great Bay	6	N 39.469505 W 74.316442	7.89	13.26	6.9 6.1 - 6.9	8.9 8 - 8.9	9.7 8.6 - 9.7	12.2 10.0 - 12.2
Atlantic Ocean	7	N 39.457988 W 74.325378	9.12	12.79	7.0 6.2 - 7.4	9.0 8.0 – 9.0	9.8 8.5 - 9.8	12.4 10.0 - 12.4
Atlantic Ocean	8	N 39.437518 W 74.331367	11.52	13.32	7.0 6.1 – 7.0	8.6 7.9 - 8.7	9.5 8.4 - 9.5	12.2 9.7 - 12.2
Atlantic Ocean	9	N 39.424774 W 74.343753	10.12	13.38	6.7 6.2 - 8.3	8.5 8.0 - 8.8	9.3 8.6 - 9.4	12.1 9.9 - 12.1
Atlantic Ocean	10	N 39.412555 W 74.355625	10.27	12.74	6.6 5.9 - 8.3	8.6 8.0 - 8.8	9.5 8.6 - 9.5	12.4 10.0 - 12.4
Atlantic Ocean	11	N 39.407162 W 74.360900	9.98	12.59	6.5 6.2 - 7.4	8.5 8.0 - 8.9	9.5 8.6 - 9.8	12.4 10.0 - 12.5
Atlantic Ocean	12	N 39.400549 W 74.367513	10.04	12.67	6.4 6.2 - 7.3	8.4 8.0 - 8.9	9.4 8.6 - 9.8	12.3 10.0 - 12.5
Atlantic Ocean	13	N 39.394843 W 74.374633	9.56	12.45	6.3 6.2 - 7.6	8.4 8.0 - 8.9	9.3 8.7 - 9.9	12.4 10.0 - 12.8
Atlantic Ocean	14	N 39.389310 W 74.382285	9.82	13.18	6.4 6.1 - 8	8.4 8.0 - 8.8	9.3 8.7 - 9.7	12.4 10.0 - 12.9
Atlantic Ocean	15	N 39.382313 W 74.391421	10.15	12.47	6.3 6.2 - 8.2	8.4 8.0 - 8.8	9.3 8.6 - 9.8	12.4 10.0 - 13.2
Atlantic Ocean	16	N 39.375635 W 74.400483	10.48	12.55	6.3 6.2 - 8.3	8.4 8.0 – 9.0	9.3 8.7 - 10.1	12.3 10.1 - 13.2
St. Georges Thorofare Bay	17	N 39.393014 W 74.407307	2.04	2.59	6.2 6.2 - 7.3	8.1 7.8 - 8.9	8.7 8.4 - 10.1	10.0 9.9 - 13.3
Bonita Tideway Bay	18	N 39.404299 W 74.374859	2.74	2.78	6.2	8.0	8.7 8.6 - 8.8	10.0 10 - 12
Somers Bay	19	N 39.422161 W 74.369806	2.11	2.33	6.2 6.2 - 6.7	8.0 8.0 - 8.5	8.7 8.6 - 9.3	10.0 10.0 – 12.0

[1]Stillwater elevations include the contribution from wave setup.

[2]For transects with a constant stillwater elevation, only one number is provided to represent both the starting value and the range.

TABLE 7 – TRANSECT DATA – continued

Flood Source	Transect		Starting Wave Conditions for the 1% Annual Chance		Starting Stillwater Elevations[1] (ft NAVD88) Range of Stillwater Elevations[2] (ft NAVD88)			
	Number	Coordinates	Significant Wave Height	Peak Wave Period	10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Absecon Bay	20	N 39.414139 W 74.485538	3.40	3.60	6.7 6.7 - 7.1	8.9 8.9 - 9	9.6 9.6 - 9.8	11.2 11.2 - 11.8
Beach Thorofare	21	N 39.374725 W 74.456150	2.36	2.87	6.3	8.2 8.0 - 8.2	8.9 8.6 - 8.9	10.2 9.8 - 10.2
Atlantic Ocean	22	N 39.367197 W 74.410462	6.35	15.21	6.3 6.3 - 6.8	8.3 8.3 - 8.6	9.2 9.2 - 9.3	11.9 11.9 - 12.2
Atlantic Ocean	23	N 39.362872 W 74.410334	10.40	12.92	6.4 6.2 - 7.1	8.4 7.8 - 8.9	9.3 8.7 - 9.8	12.4 10.2 - 12.6
Atlantic Ocean	24	N 39.357568 W 74.420479	10.62	12.60	6.3 5.4 – 8.0	8.3 7.7 - 8.9	9.2 8.6 - 9.8	12.5 10.3 - 12.9
Atlantic Ocean	25	N 39.355139 W 74.430117	10.31	12.99	6.6 6.2 - 8.1	8.4 7.7 - 9	9.3 8.6 - 10.1	12.8 10.3 - 13.3
Atlantic Ocean	26	N 39.351182 W 74.442808	10.39	13.35	6.6 5.9 - 8.2	8.5 7.8 - 9.2	9.3 8.5 - 10.4	12.9 10 - 13.6
Atlantic Ocean	27	N 39.346907 W 74.452940	10.43	13.01	6.4 5.8 - 7.9	8.4 7.7 - 9.3	9.4 8.4 - 10.5	12.9 9.9 - 13.8
Atlantic Ocean	28	N 39.341837 W 74.464620	10.96	13.59	6.3 5.6 - 6.8	8.4 7.6 - 9.2	9.3 8.2 – 10.0	12.9 9.6 - 13.5
Atlantic Ocean	29	N 39.337061 W 74.474988	11.20	13.52	6.4 5.7 - 8.2	8.4 7.5 - 9.5	9.3 8.2 - 10.7	13.0 9.6 - 13.5
Atlantic Ocean	30	N 39.332316 W 74.486057	11.51	13.56	6.4 5.7 - 8.1	8.5 7.4 - 8.6	9.4 8.2 - 9.5	13.0 9.6 - 13.3
Atlantic Ocean	31	N 39.327744 W 74.495049	11.63	13.50	6.4 5.7 - 7	8.5 7.6 - 9	9.4 8.2 - 10.1	13.0 9.8 - 13.3
Atlantic Ocean	32	N 39.323496 W 74.503720	11.77	13.39	6.4 5.7 - 8.1	8.5 7.5 - 8.8	9.5 8.2 - 9.8	13.1 9.6 - 13.4
Atlantic Ocean	33	N 39.318167 W 74.513746	11.52	13.34	6.4 5.8 - 6.9	8.5 7.6 - 9.2	9.5 8.2 - 10.4	13.1 9.8 - 13.6
Atlantic Ocean	34	N 39.313967 W 74.520862	11.60	13.04	6.5 5.8 - 8.1	8.5 7.7 - 8.8	9.5 8.3 - 9.9	13.1 10.0 - 13.5
Atlantic Ocean	35	N 39.307577 W 74.529390	10.10	12.59	6.4 5.6 - 7.3	8.5 7.7 - 8.6	9.4 8.4 - 9.5	12.9 10.2 - 12.9
Lakes Bay	36	N 39.340502 W 74.511123	2.01	2.58	5.8 5.7 - 7.2	7.6 7.6 - 8.4	8.3 8.2 - 9.5	9.8 9.6 - 12.7
Lakes Bay	37	N 39.350192 W 74.492420	2.59	2.62	5.6 5.6 - 8.1	7.5 7.5 - 8.5	8.2 8.2 - 9.6	9.7 9.6 - 13.3
Atlantic Ocean	38	N 39.309408 W 74.552552	4.32	11.66	6.4 6.1 - 6.9	8.4 7.9 - 8.4	9.3 8.5 - 9.3	12.3 10.2 - 12.3
Atlantic Ocean	39	N 39.307286 W 74.557129	4.37	11.93	6.4 3.7 - 7.3	8.3 7.0 - 8.4	9.1 7.6 - 9.1	11.7 8.9 - 11.7

[1]Stillwater elevations include the contribution from wave setup.

[2]For transects with a constant stillwater elevation, only one number is provided to represent both the starting value and the range.

TABLE 7 – TRANSECT DATA – continued

Flood Source	Transect		Starting Wave Conditions for the 1% Annual Chance		Starting Stillwater Elevations[1] (ft NAVD88) Range of Stillwater Elevations[2] (ft NAVD88)			
	Number	Coordinates	Significant Wave Height	Peak Wave Period	10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Atlantic Ocean	40	N 39.307277 W 74.565152	3.90	12.06	6.4 6.2 - 6.4	8.3 8.0 - 8.3	9.1 8.7 - 9.1	11.7 10.7 - 11.7
Great Egg Harbor Bay	41	N 39.311537 W 74.591341	2.76	2.64	6.4 6 - 7.3	7.9 7.8 - 7.9	8.6 8.4 - 8.6	10.6 10.4 - 10.7
Great Egg Harbor Bay	42	N 39.307142 W 74.602702	2.88	2.51	6.1 6 - 6.2	7.8 7.6 - 7.8	8.5 8.3 - 8.5	10.2 9.9 - 10.2
Great Egg Harbor Bay	43	N 39.313892 W 74.626759	2.13	2.40	6 5.8 - 6.4	7.6 7.1 - 7.6	8.2 7.8 - 8.2	9.6 9.3 - 9.6
Great Egg Harbor Bay	44	N 39.307517 W 74.632662	2.39	2.56	6.1 5.6 - 7.3	7.7 6.9 - 7.7	8.3 7.6 - 8.3	9.6 8.7 - 9.6
Great Egg Harbor Bay	45	N 39.311592 W 74.659586	2.21	2.66	6.1 4.7 - 6.8	7.6 7.1 - 7.6	8.2 7.7 - 8.2	9.5 8.9 - 10.3
Great Egg Harbor Bay	46	N 39.300308 W 74.648186	2.72	2.69	6.1 5.7 - 6.1	7.7 7.4 - 7.8	8.3 7.9 - 8.4	9.6 9.0 - 9.6

[1]Stillwater elevations include the contribution from wave setup.

[2]For transects with a constant stillwater elevation, only one number is provided to represent both the starting value and the range.

3.5 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 (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 across the corporate limits between the communities.

Prior versions of the FIS report and FIRM were referenced to NGVD29. When a datum conversion is effected for an FIS report and FIRM, the Flood Profiles, and base flood elevations (BFEs) reflect the new datum values. To compare structure and ground elevations to 1-percent annual chance flood elevations shown in the FIS and on the FIRM, the subject structure and ground elevations must be referenced to the new datum values.

As noted above, the elevations shown in the [*date*] FIS report and on the FIRM for Atlantic County are referenced to NAVD88. Ground, structure, and flood elevations may be compared and/or referenced to NGVD29 by applying a standard conversion factor. The conversion factor to NGVD29 is +1.247. 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 who wish to convert the elevations in this FIS to NGVD29 should apply the stated conversion factor(s) to elevations shown on the Flood Profiles and supporting data tables in the FIS report, which are shown at a minimum to the nearest 0.1 foot.

NGVD29 = NAVD88 +1.247

For more information on NAVD88, see Converting the National Flood Insurance Program to the North American Vertical Datum of 1988, FEMA Publication FIA-20/June 1992, or contact the Spatial Reference System Division, National Geodetic Survey, NOAA, Silver Spring Metro Center, 1315 East-West Highway, Silver Spring, Maryland 20910 (Internet address http://www.ngs.noaa.gov).

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

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

4.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1-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 county. For the streams studied in detail, the 1- and 0.2-percent annual chance floodplain boundaries have been delineated using the flood elevations determined at each cross section.

For the [*date*] countywide FIS, LiDAR data were provided in classified American Society of Photogrammetry and Remote Sensing (ASPRS) LiDAR data exchange format (LAS) files for Atlantic County. Data were uploaded into Environmental Systems Research Institute, Inc. (ESRI) file geodatabases (FGDBs) as multi-point feature classes with elevation attributes based on Class 2 bare earth points. An ESRI Terrain dataset was generated and spatially constrained to the data extent for the county.

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.

In areas where a wave height analysis was performed, the A, AE, V and VE zones were divided into whole-foot elevation zones based on the average wave crest elevation in that zone. Where the map scale did not permit delineating zones at 1 foot intervals, larger increments were used.

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 FIS are presented to local agencies as minimum standards that can be adopted directly or that can be used as a basis for additional floodway studies. However, the State of New Jersey has established criteria limiting the increase in flood heights to 0.2 foot. Thus, floodways having no more than a 0.2-foot surcharge have been delineated for this study.

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

Portions of the floodway for the Mullica River extend beyond the county boundary.

No floodways were computed for Babcock Creek, Gravelly Run, South River Reach 2, Tuckahoe River, and the reach of Great Egg Harbor River within the Township of Hamilton.

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

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

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Cedar Brook								
A	102	713	1,116	0.6	58.8	58.8	59.0	0.2
B	757	325	442	1.6	59.7	59.7	59.9	0.2
C	1,660	220	531	1.3	61.2	61.2	61.4	0.2
D	2,285	215	635	1.1	61.6	61.6	61.8	0.2
E	2,460	323	585	1.2	62.6	62.6	62.7	0.1
F	3,665	415	1,422	0.5	64.7	64.7	64.8	0.1
G	4,502	276	456	1.4	64.8	64.8	64.9	0.1
H	5,800	204	590	1.1	66.9	66.9	67.1	0.2
I	5,995	234	661	1.0	67.3	67.3	67.5	0.2
J	6,790	218	675	1.0	67.6	67.6	67.8	0.2
K	7,600	161	347	1.6	69.9	69.9	70.0	0.1
L	8,200	179	773	0.7	71.3	71.3	71.4	0.1
M	8,465	122	446	1.3	71.3	71.3	71.4	0.1
N	8,670	149	351	1.6	71.9	71.9	72.1	0.2
O	8,875	113	258	2.2	72.0	72.0	72.2	0.2
P	9,300	102	498	1.1	72.3	72.3	72.5	0.2
Q	9,860	83	211	2.7	73.2	73.2	73.4	0.2
R	9,950	163	941	0.6	73.7	73.7	73.9	0.2
S	11,255	104	420	1.3	73.8	73.8	74.0	0.2
T	11,322	150	629	0.9	74.5	74.5	74.7	0.2
U	11,805	120	206	2.7	74.8	74.8	74.9	0.1
V	11,850	116	237	2.4	75.2	75.2	75.3	0.1
W	12,615	11	63	8.4	76.3	76.3	76.4	0.1
X	13,055	109	166	3.2	81.0	81.0	81.0	0.0

[1] Feet above Wharton State Forest boundary

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ
(ALL JURISDICTIONS)

FLOODWAY DATA

CEDAR BROOK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Cedar Brook (continued)								
Y	13,155[1]	163	654	0.8	81.2	81.2	81.2	0.0
Z	13,815[1]	169	681	0.8	81.3	81.3	81.3	0.0
AA	14,417[1]	300	827	0.6	81.3	81.3	81.3	0.0
Clarks Mill Stream								
A	88[2]	1,074	11,175	0.1**	*	10.2**	10.4**	0.2**
B	1,468[2]	927	6,506	0.2**	*	10.2**	10.4**	0.2**
C	2,443[2]	469	2,214	0.3	10.3	10.3	10.4	0.1
D	3,623[2]	410	1,376	0.5	12.3	12.3	12.3	0.0
E	4,101[2]	491	2,512	0.3	15.1	15.1	15.1	0.0
F	5,213[2]	187	767	1.0	15.1	15.1	15.1	0.0
Cordery Creek								
A	5,405[3]	112	321	0.6**	*	8.1**	8.3**	0.2**
B	5,510[3]	97	318	0.6**	*	9.4**	9.5**	0.1**
C	5,970[3]	117	587	0.3	10.7	10.7	10.7	0.0
D	6,685[3]	215	598	0.3	10.7	10.7	10.7	0.0
E	7,970[3]	20	43	4.3	11.4	11.4	11.5	0.1
Doughty Creek								
A	5,570[3]	585	4,397	0.1**	*	8.9**	9.1**	0.2**
B	7,620[3]	403	1,867	0.3	13.3	13.3	13.3	0.0
C	8,275[3]	414	2,037	0.2	13.3	13.3	13.3	0.0

[1] Feet above Wharton State Forest boundary
[2] Feet above Mill Street
[3] Feet above confluence with Reeds Bay

*Data superseded by updated coastal analysis
**Coastal flooding effects control NFIP regulatory Base Flood Elevations in this area. Riverine floodway data are provided for the purpose of a no-rise analysis in accordance with floodway determinations for development within the SFHA.

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ
(ALL JURISDICTIONS)

FLOODWAY DATA

CEDAR BROOK – CLARKS MILL STREAM – CORDERY CREEK – DOUGHTY CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
English Creek								
A	14,598[1]	217	877	0.5	10.0	10.0	10.1	0.1
B	15,108[1]	483	1,860	0.3	10.0	10.0	10.2	0.2
C	15,833[1]	420	1380	0.3	10.0	10.0	10.2	0.2
D	16,608[1]	139	298	1.6	10.0	10.0	10.2	0.2
E	17,798[1]	194	221	2.2	11.6	11.6	11.8	0.2
F	18,590[1]	329	1,033	0.5	14.8	14.8	15.0	0.2
G	19,218[1]	267	812	0.6	14.9	14.9	15.1	0.2
H	19,868[1]	69	102	4.7	16.5	16.5	16.5	0.0
I	21,208[1]	327	411	1.2	20.8	20.8	21.0	0.2
J	22,023[1]	67	121	3.9	23.7	23.7	23.8	0.1
K	22,618[1]	86	207	2.3	25.9	25.9	26.1	0.2
Great Egg Harbor River Reach 2								
A	45[2]	59	279	4.6	60.8	60.8	70.0	0.2
B	945[2]	52	505	0.8	62.2	62.2	62.4	0.2
C	2,145[2]	46	348	3.7	63.4	63.4	63.6	0.2
D	3,205[2]	236	742	1.7	64.0	64.0	64.2	0.2
E	5,110[2]	608	1,212	1.0	67.0	67.0	67.2	0.2
F	7,130[2]	573	1,718	0.7	68.7	68.7	68.9	0.2
G	8,350[2]	900	4,283	0.3	69.0	69.0	69.2	0.2
H	9,970[2]	588	2,151	0.6	69.2	69.2	69.3	0.1
I	11,180[2]	613	1,330	0.9	70.0	70.0	70.2	0.2

[1] Feet above confluence with Great Egg Harbor Bay
[2] Feet above centerline of State Route 54

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ
(ALL JURISDICTIONS)

FLOODWAY DATA

ENGLISH CREEK – GREAT EGG HARBOR RIVER REACH 2

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Great Egg Harbor River Reach 2 Tributary								
A	1,320[1]	124	251	0.6	70.0	70.0	70.2	0.2
Hospitality Branch								
A	185[2]	204	994	2.1	61.3	61.3	61.5	0.2
B	1,005[2]	881	4,592	0.3	61.6	61.6	61.7	0.1
C	2,420[2]	407	700	1.9	61.6	61.6	61.7	0.1
D	4,330[2]	843	3,906	0.3	70.0	70.0	70.0	0.0
E	5,420[2]	*	2,089	0.6	70.0	70.0	70.0	0.0
F	7,030[2]	*	3,393	0.4	70.0	70.0	70.0	0.0
G	8,115[2]	*	7,462	0.2	72.2	72.2	72.3	0.1
H	9,160[2]	*	1,195	1.1	72.3	72.3	72.5	0.2
Lakes Creek								
A	17,645	23	63	6.1***	**	7.0***	7.2***	0.2***
B	18,635	80	172	2.3	11.4	11.4	11.6	0.2

[1] Feet above confluence with Great Egg Harbor River Reach 2
[2] Feet above centerline of Railroad
[3] Feet above confluence with Great Egg Harbor Bay

*Floodway coincident with channel banks
**Data superseded by updated coastal analysis
***Coastal flooding effects control NFIP regulatory Base Flood Elevations in this area. Riverine floodway data are provided for the purpose of a no-rise analysis in accordance with floodway determinations for development within the SFHA.

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ
(ALL JURISDICTIONS)

FLOODWAY DATA

GREAT EGG HARBOR RIVER REACH 2 TRIBUTARY – HOSPITALITY BRANCH – LAKES CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Landing Creek Reach 2								
A	0[1]	47	130	5.3	23.5	23.5	23.5	0.0
B	1,820[1]	287	901	0.7	26.6	26.6	26.6	0.0
C	2,760[1]	224	427	1.6	27.6	27.6	27.6	0.0
D	3,100[1]	74	341	1.1	29.1	29.1	29.2	0.1
E	3,940[1]	134	320	1.2	29.3	29.3	29.4	0.1
F	5,040[1]	452	856	0.4	30.6	30.6	30.8	0.2
G	6,000[1]	232	360	1.1	31.3	31.3	31.5	0.2
H	7,090[1]	310	321	1.1	32.4	32.4	32.6	0.2
I	8,400[1]	22	85	4.0	33.6	33.6	33.7	0.1
J	8,830[1]	42	112	3.0	34.9	34.9	35.0	0.1
K	9,600[1]	102	122	2.5	36.3	36.3	36.4	0.1
L	10,400[1]	158	423	0.7	39.5	39.5	39.5	0.0
M	11,065[1]	93	192	1.6	39.8	39.8	39.8	0.0
N	11,580[1]	159	759	0.4	41.8	41.8	41.8	0.0
O	11,970[1]	128	295	1.0	41.8	41.8	41.8	0.0
P	12,760[1]	217	422	0.7	42.3	42.3	42.4	0.1
Q	13,640[1]	244	953	0.3	42.3	42.3	42.5	0.2
Little Meadow Run								
A	875[2]	188	934	0.4	14.3	14.3	14.3	0.0
B	1,508[2]	229	982	0.4	16.6	16.6	16.7	0.1
C	2,700[2]	139	320	1.3	16.7	16.7	16.8	0.1
D	3,461[2]	240	561	0.7	19.7	19.7	19.9	0.2
E	4,325[2]	160	395	1.1	19.9	19.9	20.1	0.2
F	5,030[2]	97	152	2.7	20.5	20.5	20.6	0.1
G	6,140[2]	85	214	1.9	22.7	22.7	22.7	0.0
H	7,340[2]	51	105	4.0	24.7	24.7	24.8	0.1
I	8,395[2]	66	174	2.4	26.6	26.6	26.7	0.1

[1] Feet above confluence with Limit of Detailed Study approximately 3,020 feet downstream of Philadelphia Avenue
[2] Feet above confluence with Mill Branch

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ (ALL JURISDICTIONS)

FLOODWAY DATA

LANDING CREEK REACH 2 – LITTLE MEADOW RUN

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Little Meadow Run								
J	8,950[1]	70	156	2.7	27.4	27.4	27.5	0.1
K	9,740[1]	101	126	3.3	30.0	30.0	30.1	0.1
L	9,890[1]	187	692	0.6	30.7	30.7	30.8	0.1
M	10,650[1]	208	221	1.9	30.8	30.8	30.9	0.2
N	10,686[1]	210	285	1.5	31.6	31.6	31.7	0.1
Maple Run								
A	1,795[2]	121	395	1.3	10.5	10.5	10.7	0.2
B	1,927[2]	183	833	0.6	12.8	12.8	13.0	0.2
C	2,715[2]	143	545	0.9	12.9	12.9	13.1	0.2
D	3,650[2]	85	333	1.5	13.1	13.1	13.3	0.2
Mattix Run								
A	7,047[3]	54	211	1.6**	*	8.6**	8.6**	0.0**
B	7,120[3]	757	2,610	0.1	12.0	12.0	12.0	0.0
C	8,540[3]	722	1,984	0.2	12.0	12.0	12.0	0.0
D	8,952[3]	684	2,878	0.1	14.1	14.1	14.2	0.1
E	9,950[3]	193	245	1.4	14.1	14.1	14.2	0.1
F	10,760[3]	295	700	0.5	16.7	16.7	16.9	0.2
G	11,240[3]	320	954	0.4	16.8	16.8	17.0	0.2
H	11,454[3]	203	401	0.8	17.4	17.4	17.6	0.2
I	12,070[3]	610	2,745	0.1	19.3	19.3	19.4	0.1
J	12,780[3]	245	199	1.7	19.3	19.3	19.4	0.1
K	14,200[3]	76	136	2.5	20.5	20.5	20.6	0.1
L	16,330[3]	815	818	0.4	23.0	23.0	23.1	0.1
M	17,205[3]	1,265	4,321	0.1	27.6	27.6	27.6	0.0

[1] Feet above confluence with Mill Branch
[2] Feet above confluence with Patcong Creek and Mill Branch
[3] Feet above confluence with Nacote Creek

*Data superseded by updated coastal analysis
**Coastal flooding effects control NFIP regulatory Base Flood Elevations in this area. Riverine floodway data are provided for the purpose of a no-rise analysis in accordance with floodway determinations for development within the SFHA.

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ
(ALL JURISDICTIONS)

FLOODWAY DATA

LITTLE MEADOW RUN – MAPLE RUN – MATTIX RUN

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Mattix Run (continued)								
N	17,890[1]	1,139	3,141	0.1	27.6	27.6	27.6	0.0
O	19,250[1]	350	736	0.5	27.6	27.6	27.6	0.0
P	20,580[1]	200	225	1.5	28.0	28.0	28.0	0.0
Mill Branch								
A	1,830[2]	258	788	1.1	10.5	10.5	10.7	0.2
B	3,415[2]	90	653	1.3	15.7	15.7	15.7	0.0
C	3,670[2]	398	2,445	0.2	15.7	15.7	15.7	0.0
D	4,750[2]	356	2,162	0.3	15.7	15.7	15.7	0.0
E	6,230[2]	490	1,309	0.4	15.7	15.7	15.7	0.0
F	7,160[2]	420	703	0.8	15.8	15.8	15.8	0.0
G	8,410[2]	240	393	1.5	16.3	16.3	16.5	0.2
H	9,165[2]	74	127	4.5	17.9	17.9	17.9	0.0
I	10,265[2]	748	964	0.6	19.0	19.0	19.0	0.0
J	11,924[2]	110	738	0.8	23.5	23.5	23.6	0.1
K	13,050[2]	270	936	0.6	23.5	23.5	23.6	0.1
L	13,740[2]	343	683	0.8	23.6	23.6	23.7	0.1
M	14,450[2]	141	247	1.5	24.0	24.0	24.1	0.1
N	15,207[2]	67	200	1.8	25.1	25.1	25.2	0.1
O	16,290[2]	36	110	3.3	25.8	25.8	26.0	0.2
P	16,890[2]	32	96	3.8	26.6	26.6	26.8	0.2
Q	17,760[2]	92	207	1.8	27.7	27.7	27.9	0.2
R	18,350[2]	39	88	4.2	28.5	28.5	28.7	0.2

[1]Feet above confluence with Nacote Creek
[2] Feet above confluence with Patcong Creek and Maple Run

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ
(ALL JURISDICTIONS)

FLOODWAY DATA

MATTIX RUN – MILL BRANCH

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Morses Mill Stream								
A	355[1]	1,100	5,084	0.1**	*	10.2**	10.4**	0.2**
B	1,840[1]	455	1,849	0.2	10.2	10.2	10.4	0.2
C	2,935[1]	240	510	0.8	10.5	10.5	10.7	0.2
D	3,640[1]	262	152	2.7	10.8	10.8	11.0	0.2
Mullica River								
A	17,445[2]	330	2,195	2.3**	*	-0.9**	-0.7**	0.2**
B	19,120[2]	400	2,650	1.9**	*	-0.4**	-0.2**	0.2**
C	20,265[2]	536	3,327	1.5**	*	-0.1**	0.1**	0.2**
D	21,780[2]	570	3,293	1.5**	*	0.1**	0.2**	0.1**
E	24,260[2]	700	4,789	1.0**	*	0.4**	0.5**	0.1**
F	26,190[2]	846	4,803	1.0**	*	0.5**	0.6**	0.1**
G	28,450[2]	736	4,886	1.0**	*	0.6**	0.7**	0.1**
H	29,980[2]	844	5,048	0.9**	*	0.7**	0.8**	0.1**
I	31,620[2]	438	1,903	2.5**	*	0.9**	1.0**	0.1**
J	33,960[2]	745	2,951	1.6**	*	1.8**	1.9**	0.1**
K	35,300[2]	431	1,816	2.6**	*	2.3**	2.4**	0.1**
L	38,360[2]	459	2,486	1.9**	*	3.9**	4.0**	0.1**
M	40,655[2]	1,577	4,428	1.1**	*	4.4**	4.5**	0.1**
N	42,740[2]	432	2,435	1.9**	*	4.7**	4.9**	0.2**
O	44,360[2]	238	1,769	2.2**	*	5.3**	5.5**	0.2**
P	46,710[2]	184	1,589	2.4**	*	5.9**	6.1**	0.2**
Q	48,520[2]	433	1,742	2.2**	*	6.6**	6.8**	0.2**
R	50,960[2]	136	1,576	2.5**	*	7.3**	7.5**	0.2**
S	51,380[2]	337	1,274	3.0**	*	7.4**	7.6**	0.2**
T	52,910[2]	223	1,414	2.7**	*	8.2**	8.4**	0.2**
U	54,250[2]	321	1,582	2.3**	*	9.1**	9.3**	0.2**
V	55,110[2]	245	1,675	2.1**	*	9.5**	9.7**	0.2**

[1] Feet above confluence with Clarks Mill Stream
[2] Feet above confluence with Great Bay

*Data superseded by updated coastal analysis
**Coastal flooding effects control NFIP regulatory Base Flood Elevations in this area. Riverine floodway data are provided for the purpose of a no-rise analysis in accordance with floodway determinations for development within the SFHA.

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ
(ALL JURISDICTIONS)

FLOODWAY DATA

MORSES MILL STREAM – MULLICA RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
North Branch Absecon Creek								
A	21,875[1]	1,010	7,621	0.2	13.1	13.1	13.3	0.2
B	27,226[1]	705	4,512	0.2	19.6	19.6	19.6	0.0
C	28,255[1]	639	3,718	0.2	19.6	19.6	19.6	0.0
D	28,830[1]	618	2,723	0.3	19.7	19.7	19.7	0.0
E	29,430[1]	530	1,999	0.5	19.7	19.7	19.7	0.0
F	30,310[1]	185	361	2.6	19.7	19.7	19.7	0.0
G	30,615[1]	470	4,248	0.2	28.4	28.4	28.4	0.0
H	31,880[1]	576	3,082	0.3	28.4	28.4	28.4	0.0
I	32,585[1]	722	3,474	0.3	28.4	28.4	28.4	0.0
J	33,433[1]	277	1,027	0.9	30.5	30.5	30.5	0.0
K	34,115[1]	209	611	1.5	30.8	30.8	30.8	0.0
L	35,490[1]	307	534	1.7	35.3	35.3	35.5	0.2
M	36,070[1]	208	527	1.8	36.6	36.6	36.8	0.2
N	37,000[1]	97	273	3.4	38.6	38.6	38.8	0.2
Patcong Creek								
A	36,600[2]	540	5,628	0.3	10.3	10.3	10.5	0.2
B	39,390[2]	366	2,125	0.8	10.3	10.3	10.5	0.2
C	39,490[2]	273	2,256	0.7	10.3	10.3	10.5	0.2
D	40,220[2]	564	2,652	0.5	10.3	10.3	10.5	0.2
E	40,900[2]	642	2,539	0.5	10.4	10.4	10.6	0.2
F	41,615[2]	618	2,480	0.5	10.5	10.5	10.7	0.2

[1] Feet above confluence with Absecon Bay

[2] Feet above confluence with Great Egg Harbor Bay

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ
(ALL JURISDICTIONS)

FLOODWAY DATA

NORTH BRANCH ABSECON CREEK– PATCONG CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Tributary to Atlantic City Reservoir								
A	2,900[1]	45	96	2.9	14.2	14.2	14.4	0.2
B	3,575[1]	46	96	2.9	15.6	15.6	15.8	0.2
C	4,880[1]	42	104	2.7	19.5	19.5	19.7	0.2
D	5,135[1]	33	116	2.4	21.8	21.8	21.8	0.0
E	5,562[1]	71	225	1.2	25.1	25.1	25.3	0.2
F	6,360[1]	36	91	3.1	25.6	25.6	25.8	0.2
G	7,050[1]	58	148	1.9	27.0	27.0	27.2	0.2
Union Creek								
A	840[2]	95	305	1.5	29.4	29.4	29.6	0.2
B	1,490[2]	250	589	0.8	31.2	31.2	31.4	0.2
C	3,090[2]	369	703	0.6	32.2	32.2	32.4	0.2
D	4,690[2]	176	339	1.2	34.1	34.1	34.3	0.2
E	5,765[2]	140	274	1.4	38.1	38.1	38.2	0.1
F	6,465[2]	126	274	1.4	39.8	39.8	39.9	0.1
G	7,235[2]	179	477	0.8	42.2	42.2	42.3	0.1
H	7,630[2]	126	378	1.0	42.6	42.6	42.7	0.1
I	8,260[2]	154	532	0.7	45.2	45.2	45.4	0.2
J	8,750[2]	161	689	0.5	45.5	45.5	45.7	0.2
K	9,260[2]	150	259	0.9	45.8	45.8	46.0	0.2
L	9,940[2]	102	157	1.4	49.0	49.0	49.2	0.2
M	10,200[2]	143	383	0.6	49.3	49.3	49.5	0.2
N	10,815[2]	127	278	0.8	49.5	49.5	49.7	0.2

[1] Feet above confluence with North Branch Absecon Creek

[2] Feet above confluence with Landing Creek Reach 2

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ
(ALL JURISDICTIONS)

FLOODWAY DATA

TRIBUTARY TO ATLANTIC CITY RESERVOIR – UNION CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Union Creek Tributary								
A	180	74	204	1.5	45.7	45.7	45.7	0.0
B	610	61	203	1.5	47.5	47.5	47.6	0.1
C	1,130	49	141	2.1	49.1	49.1	49.2	0.1
D	2,040	64	207	1.2	52.1	52.1	52.3	0.2
E	2,900	74	168	1.0	54.5	54.5	54.7	0.2

[1] Feet above confluence with Union Creek

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ (ALL JURISDICTIONS)

FLOODWAY DATA

UNION CREEK TRIBUTARY

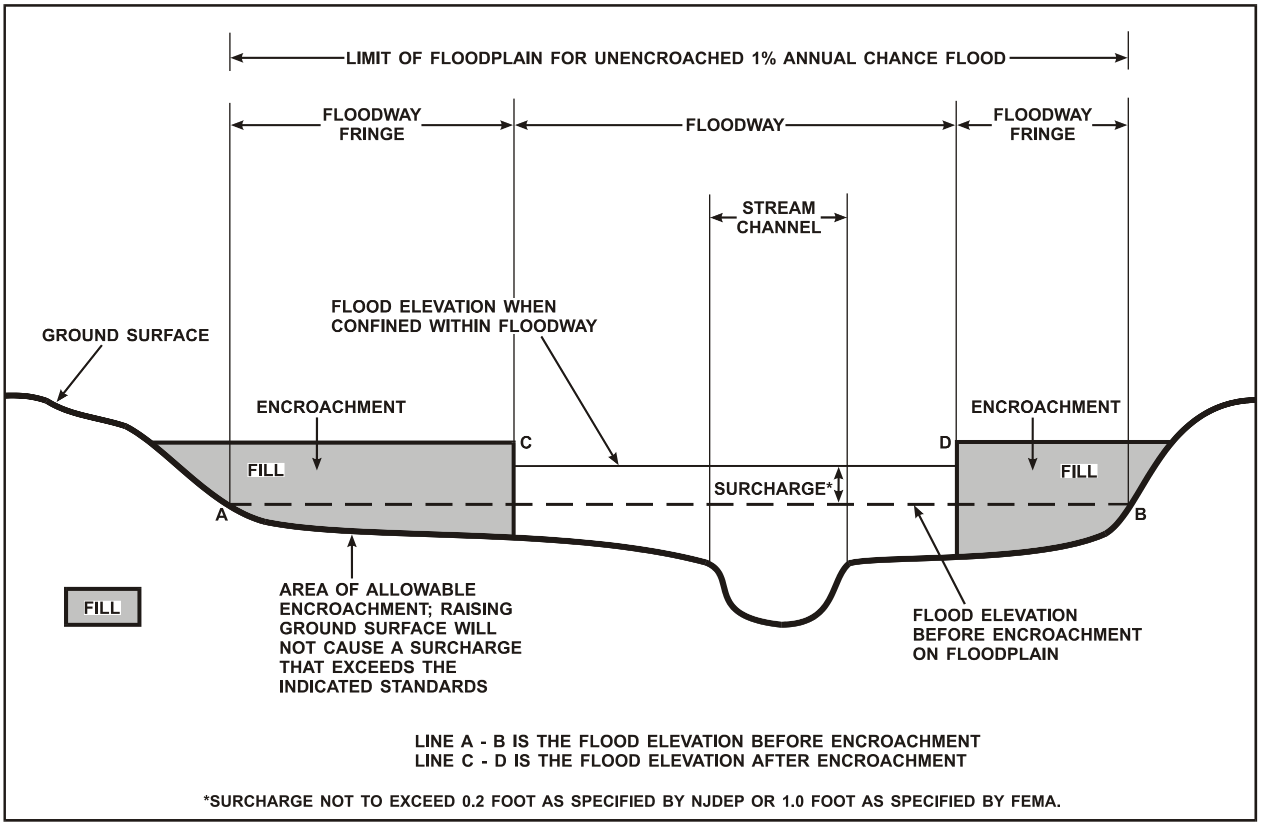

FIGURE 3 – FLOODWAY SCHEMATIC

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 0.2 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 3 “Floodway Schematic”.

5.0 INSURANCE APPLICATIONS

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

Zone A

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

Zone AE

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

Zone AH

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

Zone AO

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

Zone AR

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

Zone A99

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

Zone V

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

Zone VE

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

Zone X

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

Zone D

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

6.0 FLOOD INSURANCE RATE MAP

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

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

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

The current FIRM presents flooding information for the entire geographic area of Atlantic County. Previously, separate Flood Hazard Boundary Maps (FHBMs) and/or FIRMs were prepared for each identified flood-prone jurisdiction within 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 maps prepared for each community, prior to the [*date*] FIS, are presented in Table 9, "Community Map History."

7.0 OTHER STUDIES

FISs and FIRMs have been prepared for Gloucester County, New Jersey (All Jurisdictions) (FEMA 2010), Camden County, New Jersey (All Jurisdictions) (FEMA 2009), Ocean County, New Jersey (All Jurisdictions) (FEMA 2006), FISs and FIRMs are currently in production for Burlington County, New Jersey (All Jurisdictions), Cumberland County, New Jersey (All Jurisdictions) and Cape May County, New Jersey (All Jurisdictions.)

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISIONS DATE	FIRM EFFECTIVE DATE	FIRM REVISIONS DATE
Absecon, City of	June 28, 1974	None	March 5, 1976	April 23, 1976 August 23, 1999
Atlantic City, City of	June 18, 1971	None	June 18, 1971	July 1, 1974 November 21, 1975 January 9, 1976 January 23, 1979 August 15, 1983 February 1, 1985
Brigantine, City of	May 15, 1970	None	June 18, 1971	July 1, 1974 January 28, 1977 September 15 1983 July 15, 1992
Buena, Borough of	June 28, 1974	June 4, 1976	March 4, 1983	
Buena Vista, Township of	December 20, 1974	June 18, 1976	June 22, 1979	
Corbin City, City of	December 6, 1974	None	September 30, 1981	
Egg Harbor City, City of	July 26, 1974	June 25, 1976	August 2, 1982	
Egg Harbor, Township of	September 6, 1974	June 25, 1976	February 16, 1983	
Estell Manor, City of	December 13, 1974	July 30, 1976	November 3, 1978	July 2, 2003
Folsom, Borough of	January 31, 1975	None	January 6, 1982	
Galloway, Township of	January 3, 1975	April 30, 1976	May 2, 1983	July 15, 1992 June 30, 1999

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NEW JERSEY
(ALL JURISDICTIONS)

COMMUNITY MAP HISTORY

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISIONS DATE	FIRM EFFECTIVE DATE	FIRM REVISIONS DATE
Hamilton, Township of	July 26, 1974	None	March 15, 1977	
Hammonton, Town of	May 31, 1974	September 24, 1976 April 28, 1978	January 6, 1982	
Linwood, City of	March 29, 1974	February 13, 1976	January 19, 1983	
Longport, Borough of	August 12, 1970	None	July 1, 1974	August 22, 1975 August 15, 1983
Margate City, City of	June 18, 1971	None	July 1, 1974	February 13, 1976 October 18, 1983
Mullica, Township of	November 1, 1974	July 30, 1976 May 5, 1978	March 1, 1982	
Northfield, City of	June 28, 1974	March 19, 1976	November 2, 1979	January 19, 1983
Pleasantville, City of	May 31, 1974	June 11, 1976	January 19, 1983	
Port Republic, City of	August 23, 1974	July 16, 1976	July 5, 1983	July 15, 1992
Somers Point, City of	January 9, 1974	April 1, 1977	November 17, 1982	
Ventnor City, City of	June 18, 1971	None	June 18, 1971	July 1, 1974 December 26, 1975 September 15, 1983
Weymouth, Township of	December 20, 1974	July 2, 1976	August 10, 1979	January 16, 2003

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NEW JERSEY
(ALL JURISDICTIONS)

COMMUNITY MAP HISTORY

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

8.0 LOCATION OF DATA

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

9.0 BIBLIOGRAPHY AND REFERENCES

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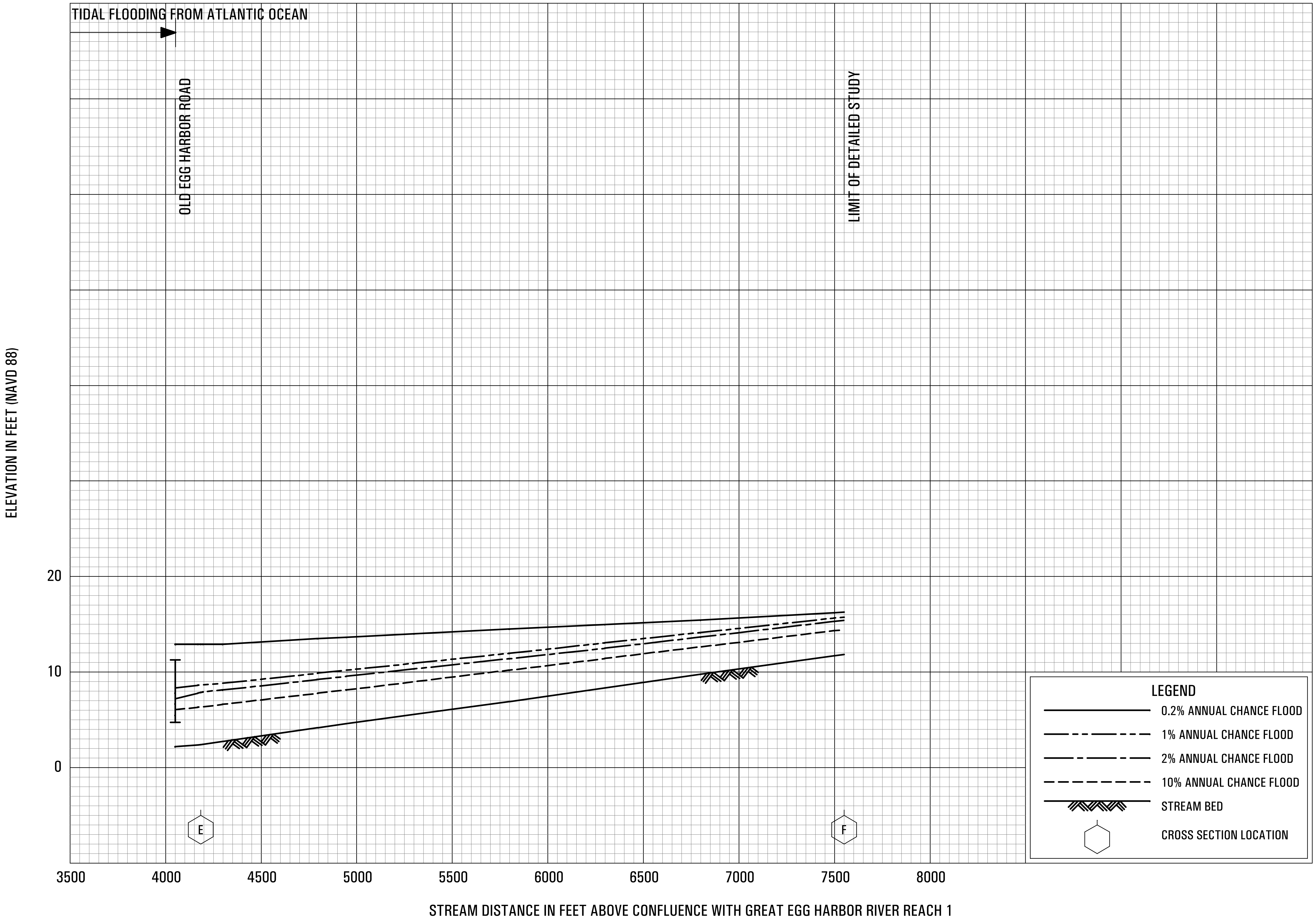


FLOOD PROFILES

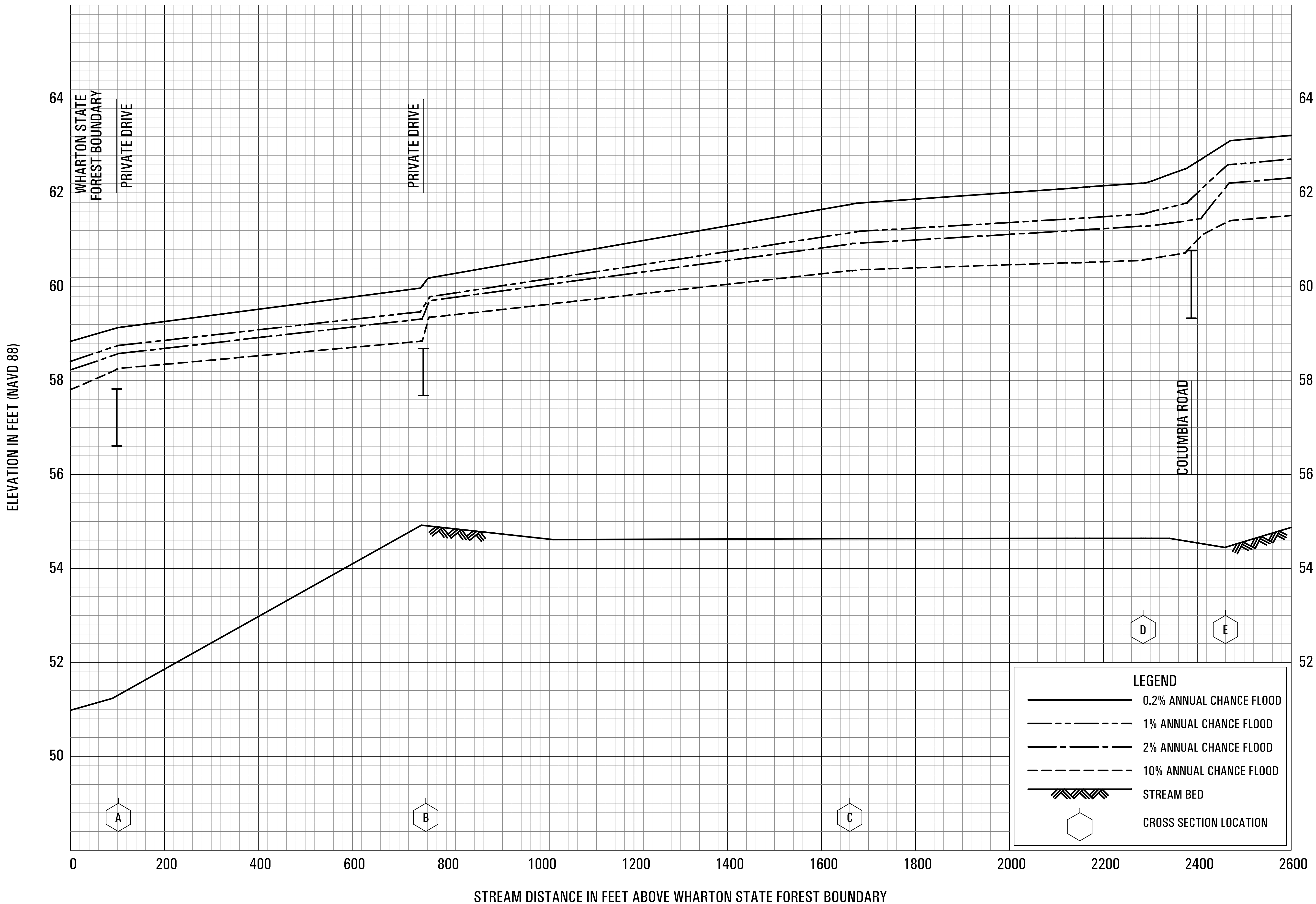
BABCOCK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)

01P



FLOOD PROFILES

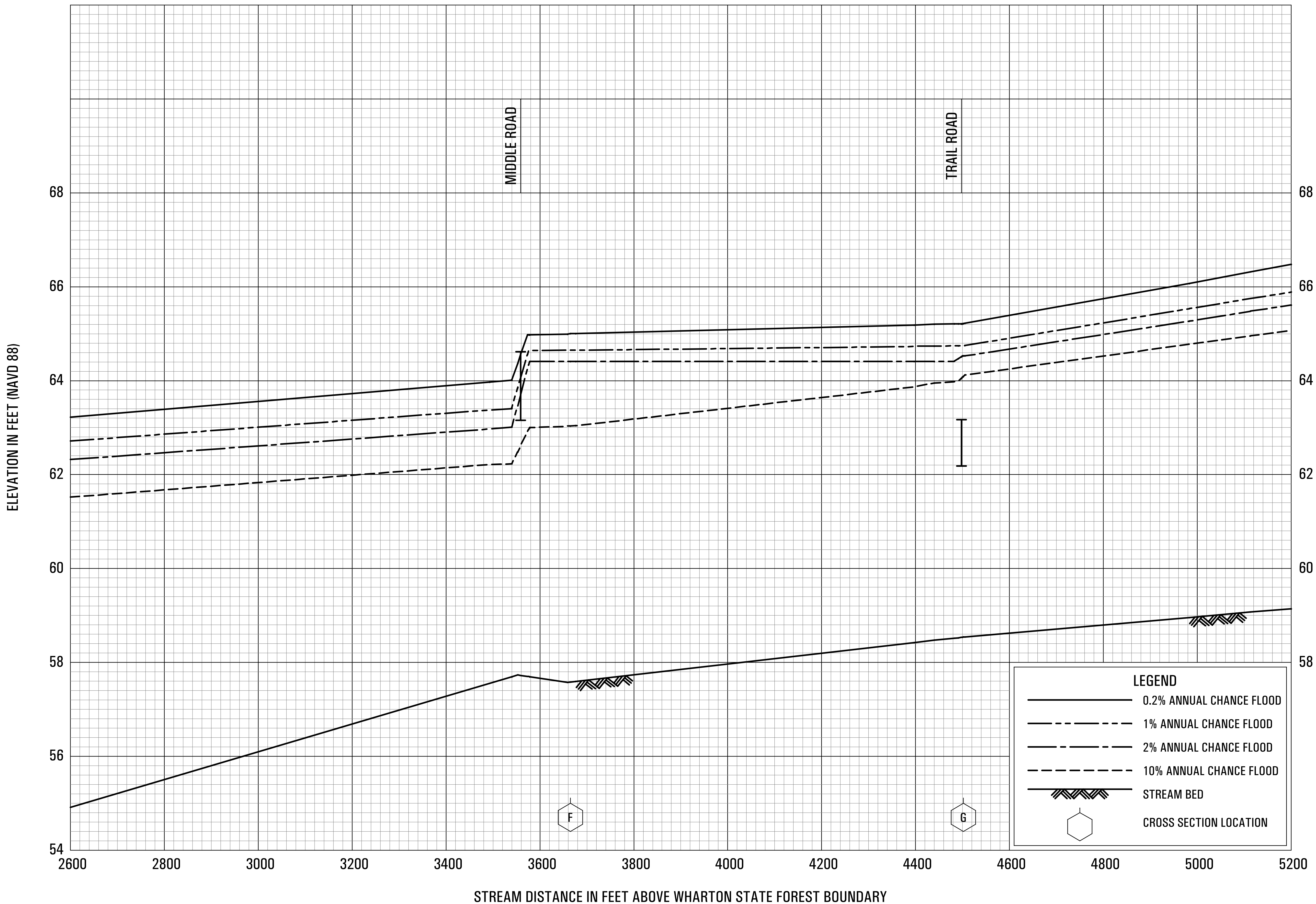
CEDAR BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)

02P



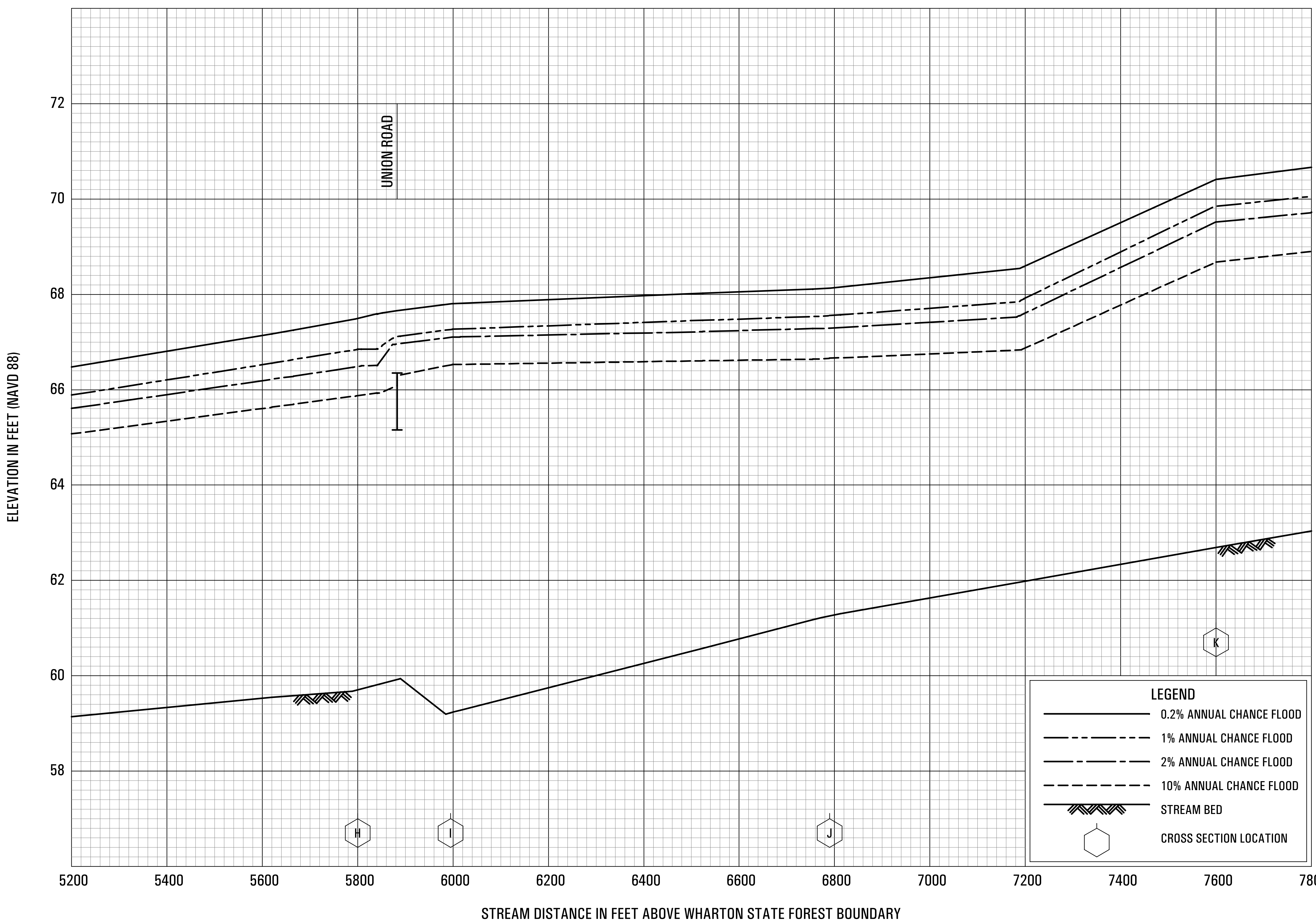
FLOOD PROFILES

CEDAR BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)



FLOOD PROFILES

CEDAR BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)

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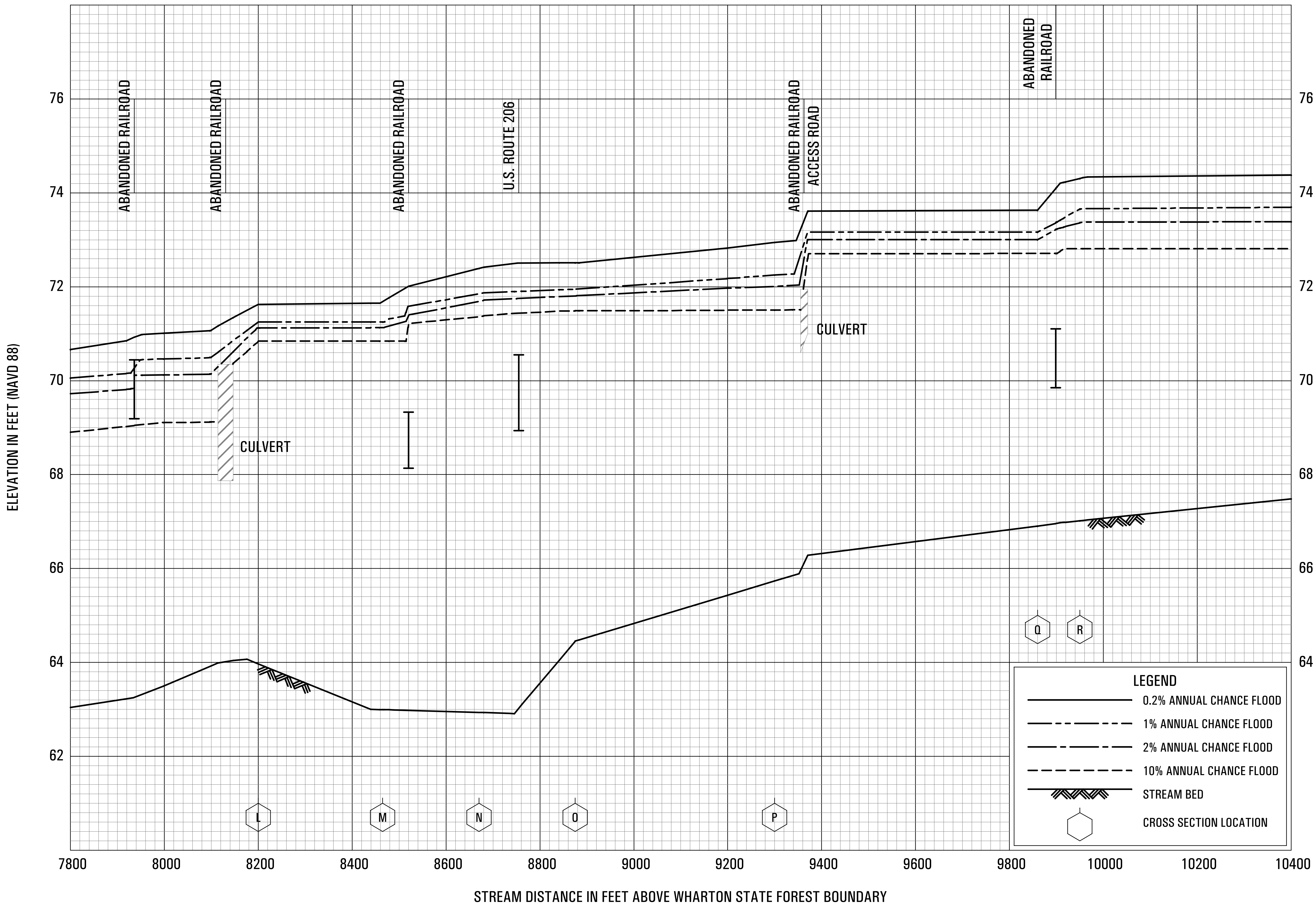


FLOOD PROFILES

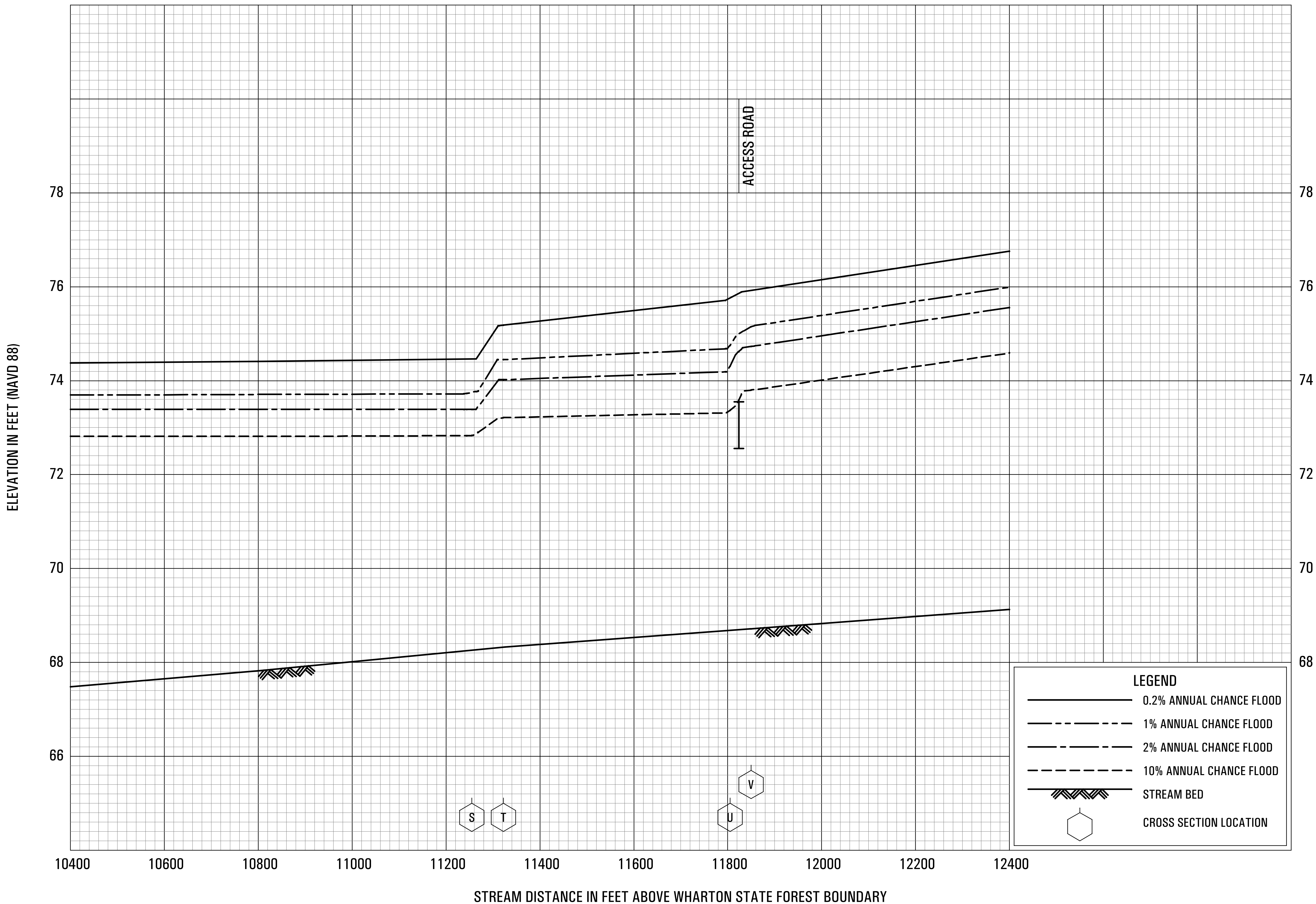
CEDAR BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)

05P



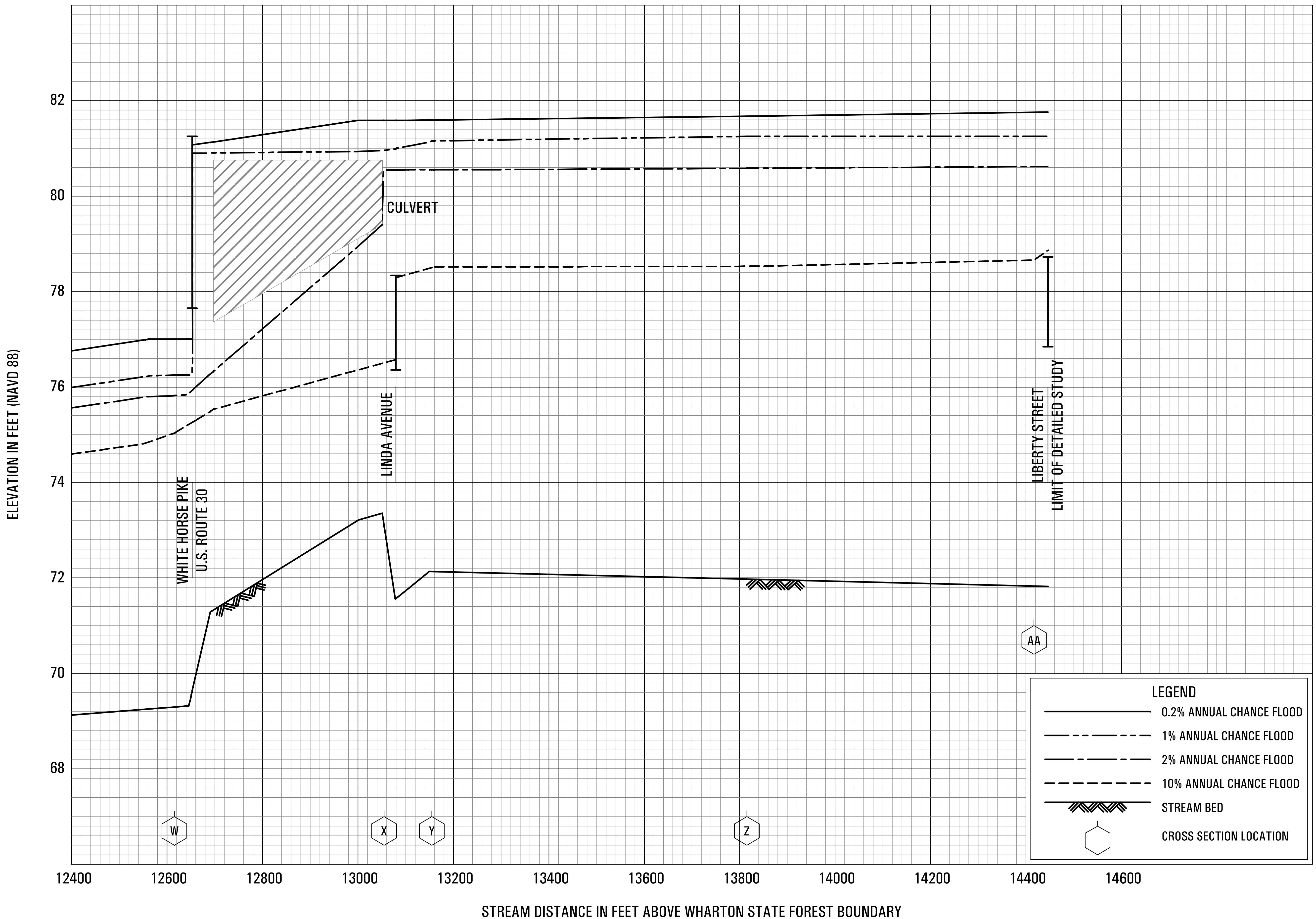
FLOOD PROFILES

CEDAR BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)



FLOOD PROFILES

CEDAR BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)

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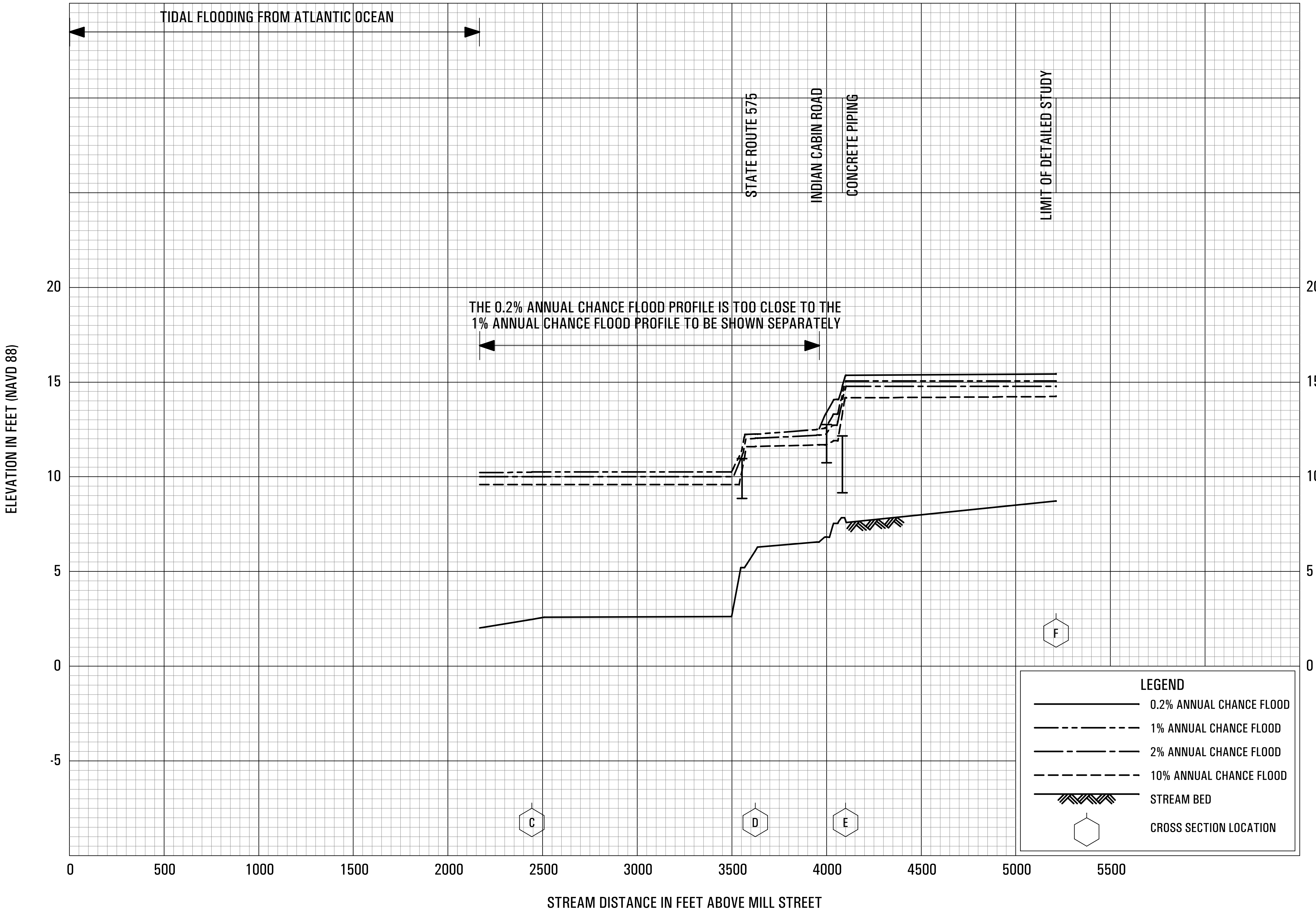


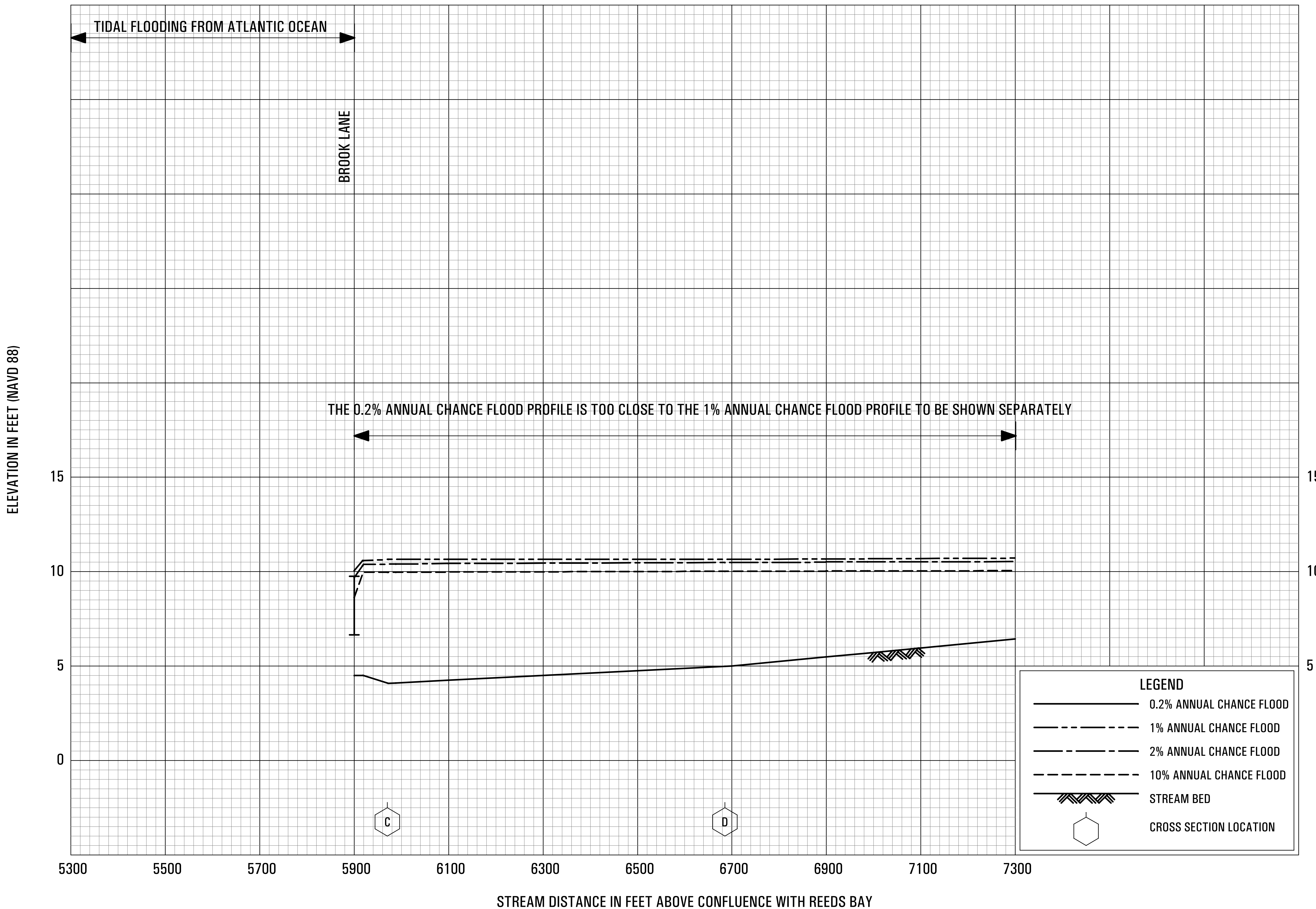
FLOOD PROFILES

CLARKS MILL STREAM

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)



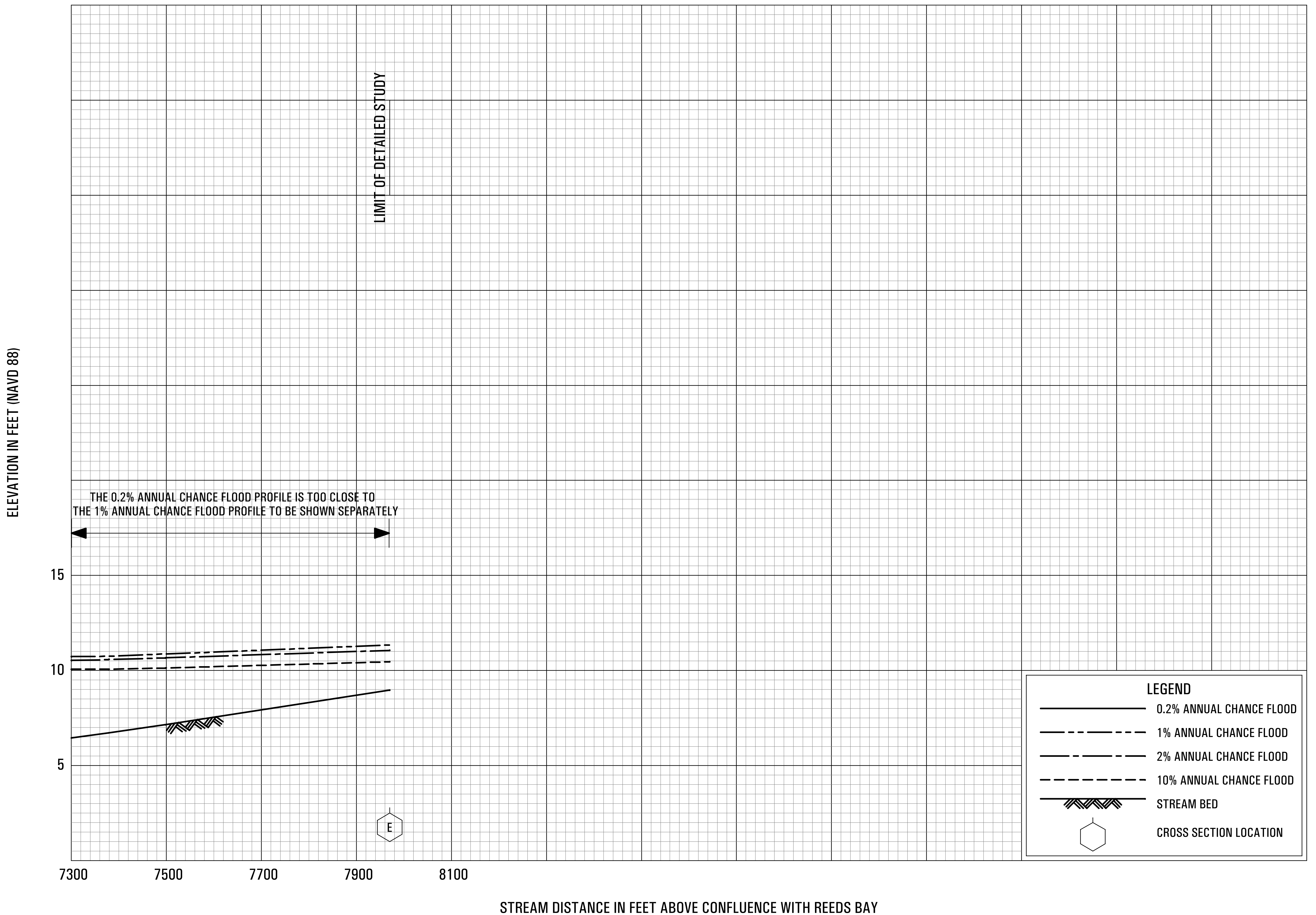
FLOOD PROFILES

CORDERY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)



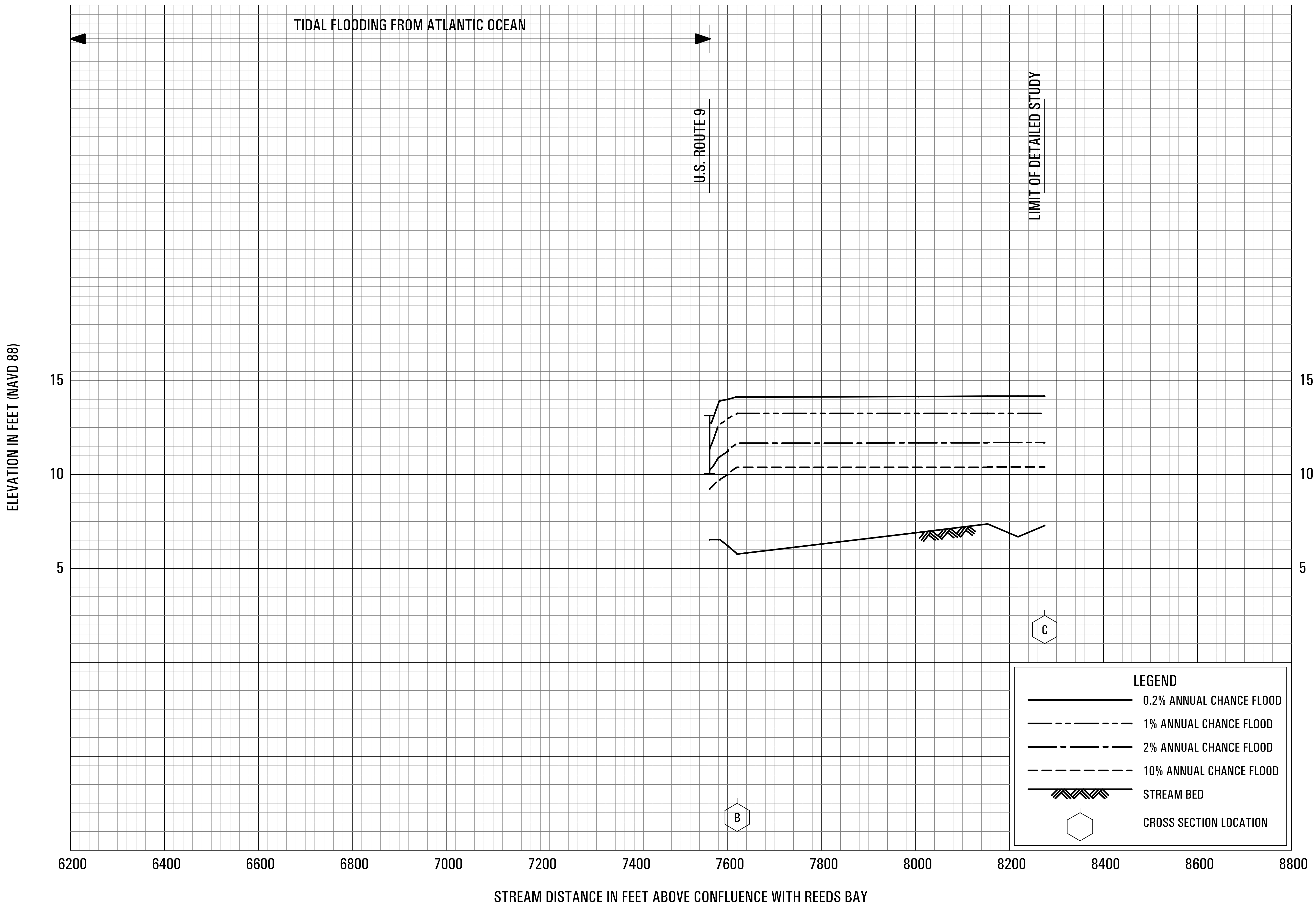
FLOOD PROFILES

CORDERY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)



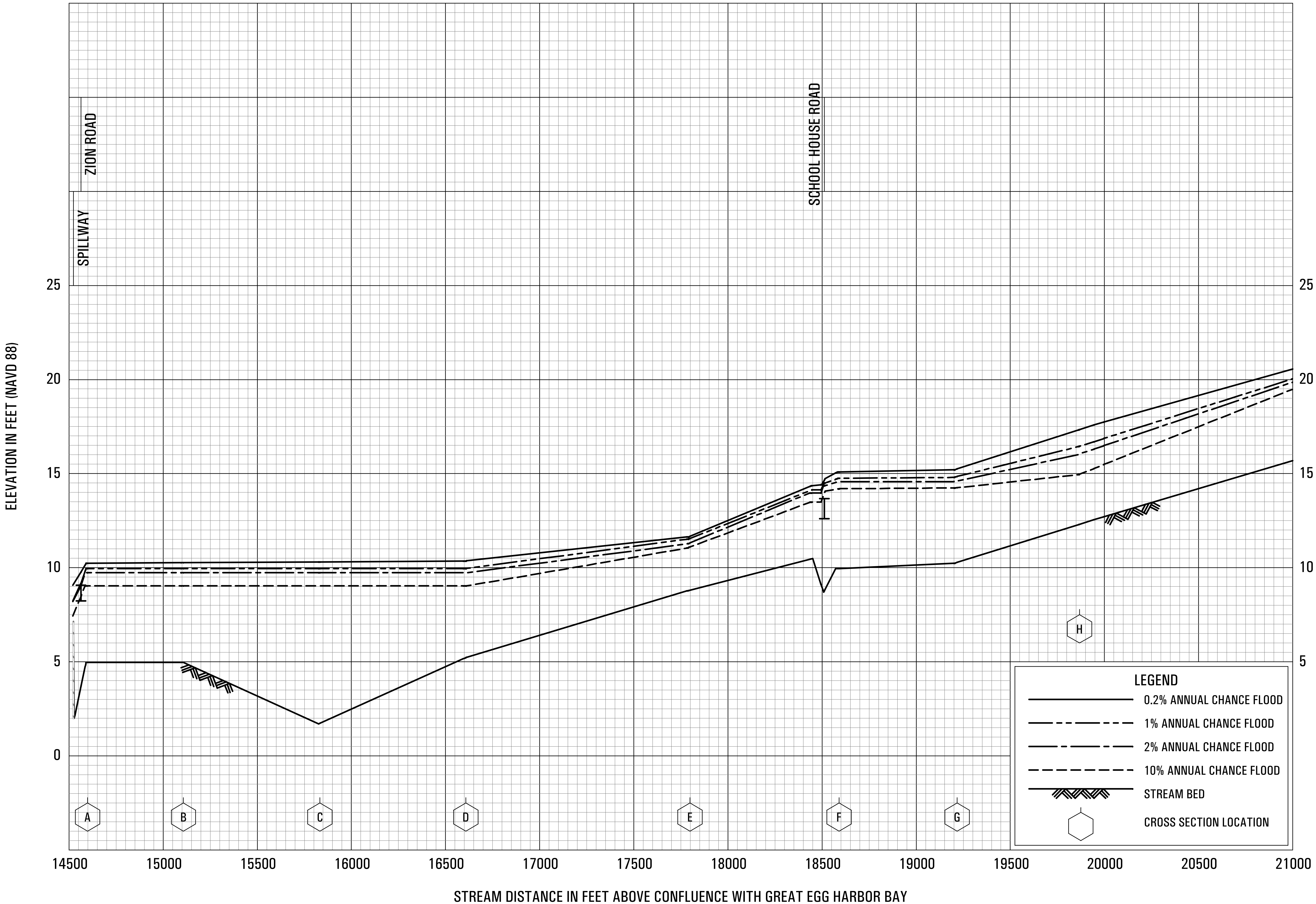
FLOOD PROFILES

DOUGHTY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)



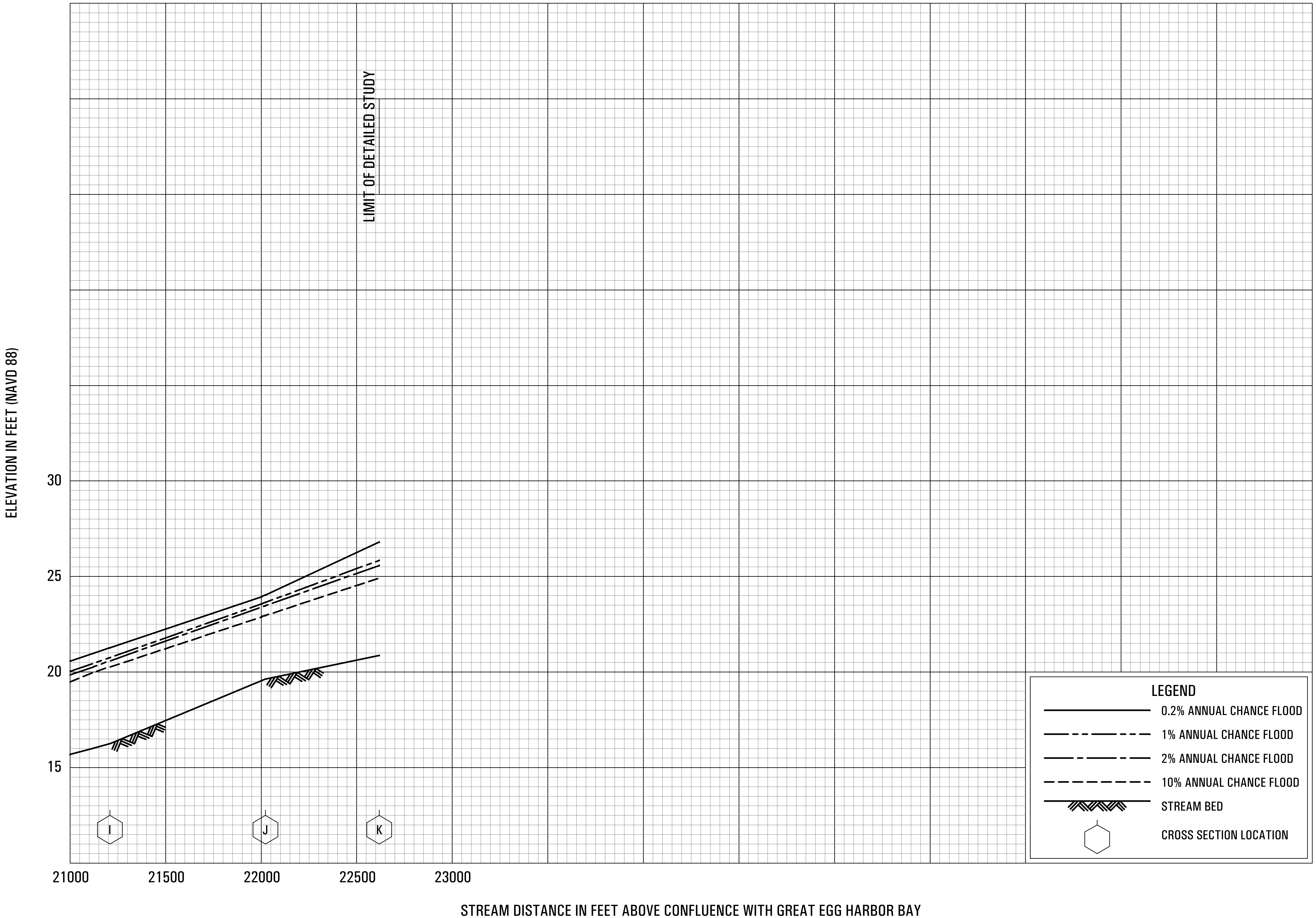
FLOOD PROFILES

ENGLISH CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)



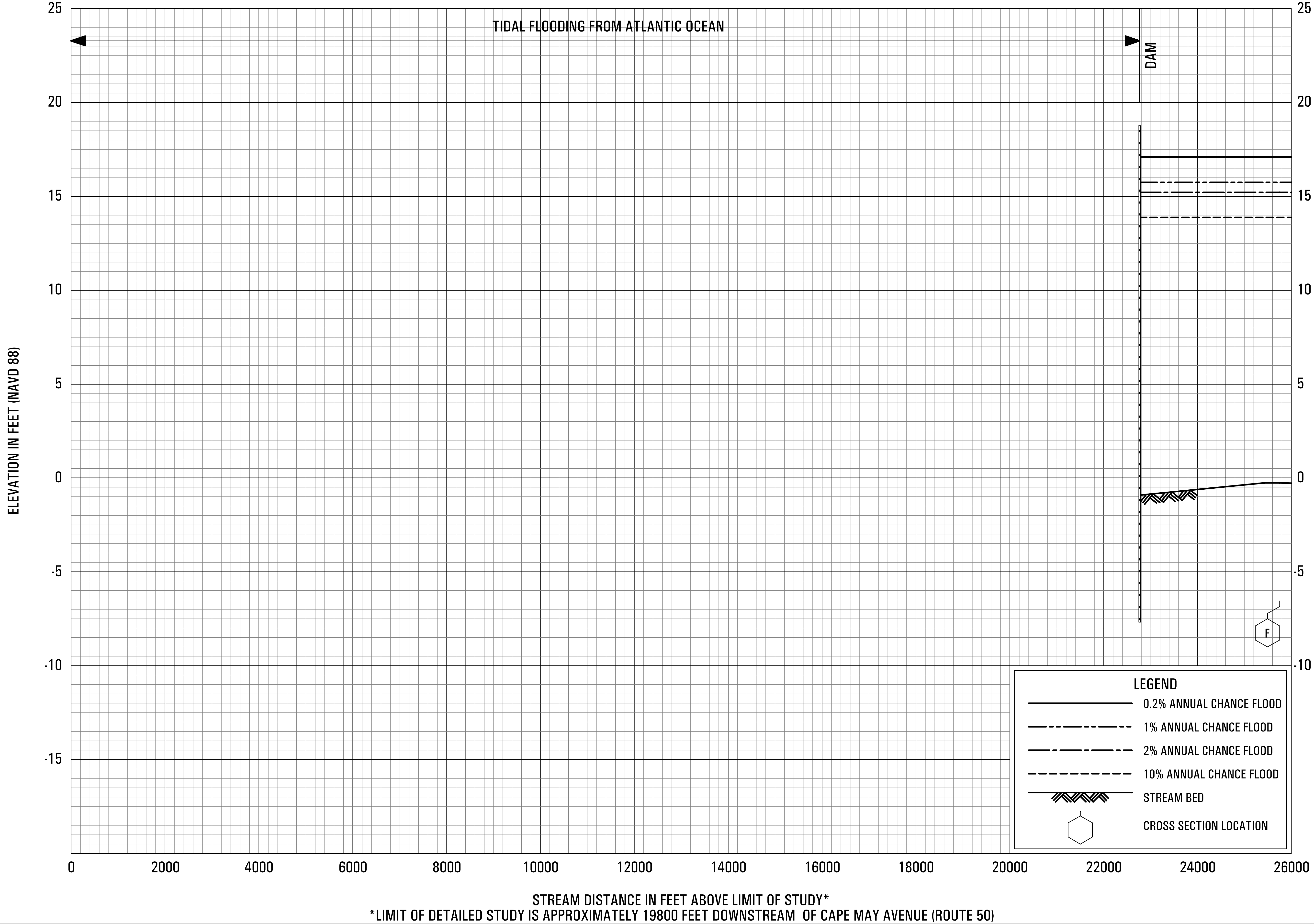
FLOOD PROFILES

ENGLISH CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)



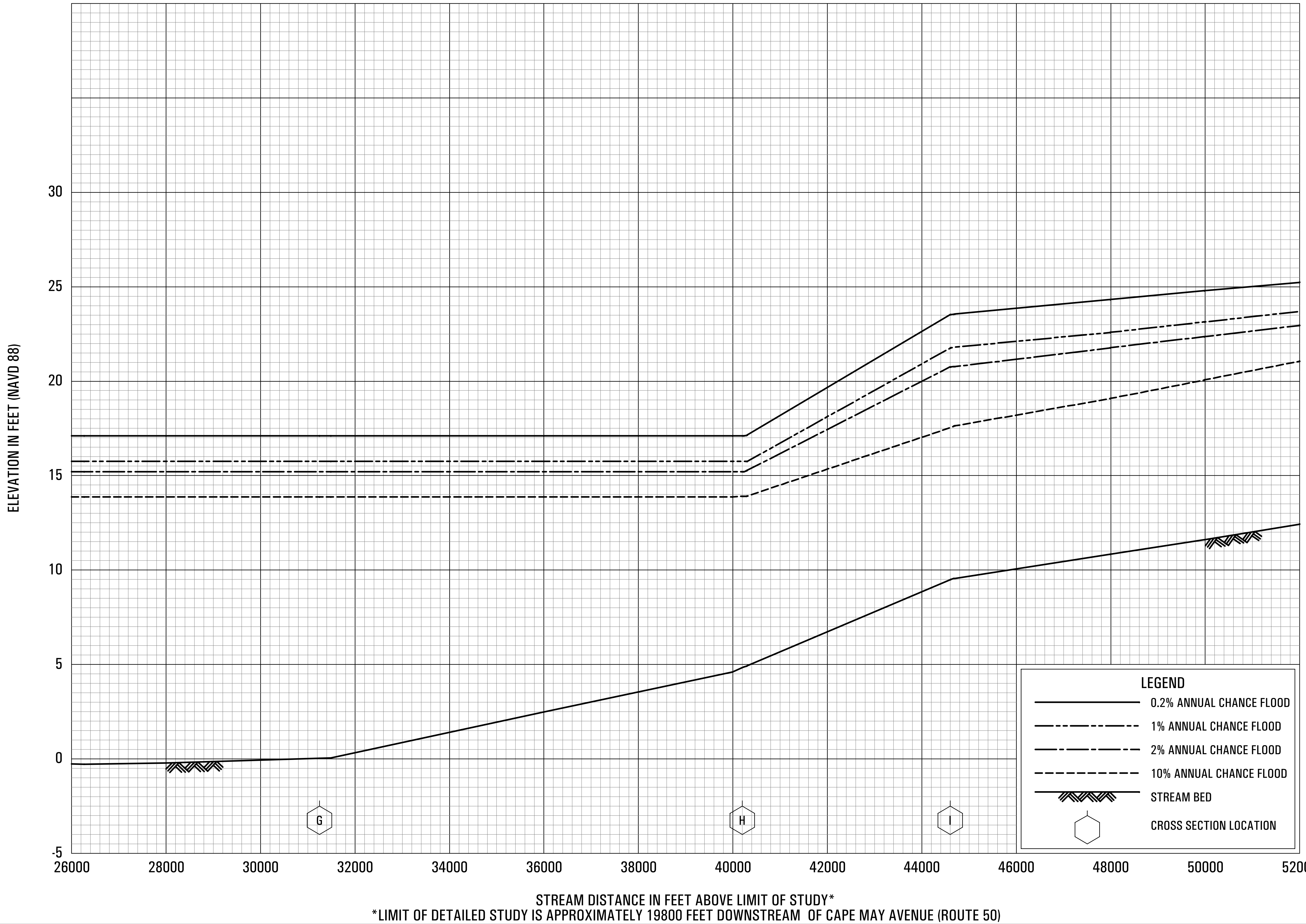
FLOOD PROFILES

GREAT EGG HARBOR RIVER REACH 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)



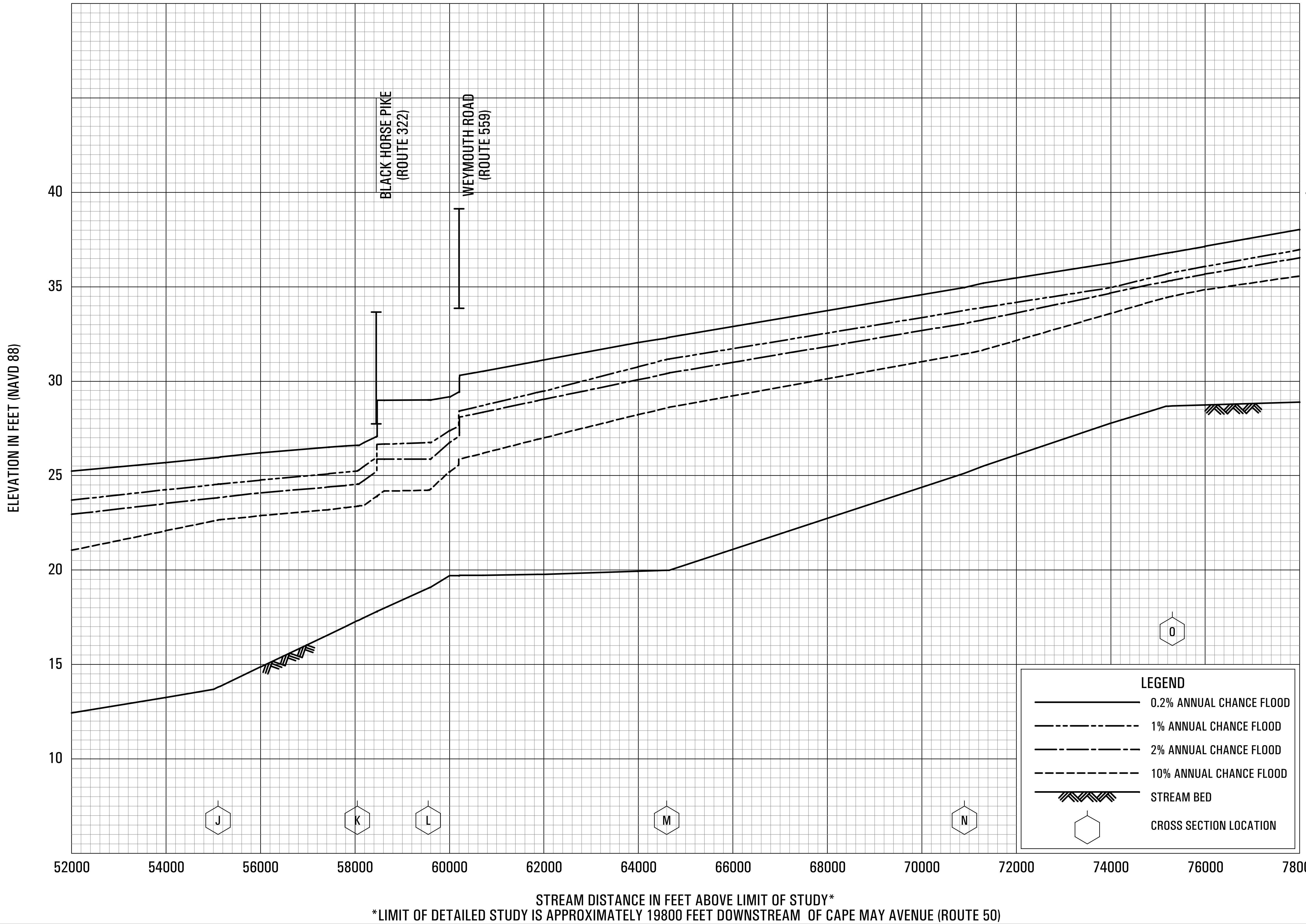
FLOOD PROFILES

GREAT EGG HARBOR RIVER REACH 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)



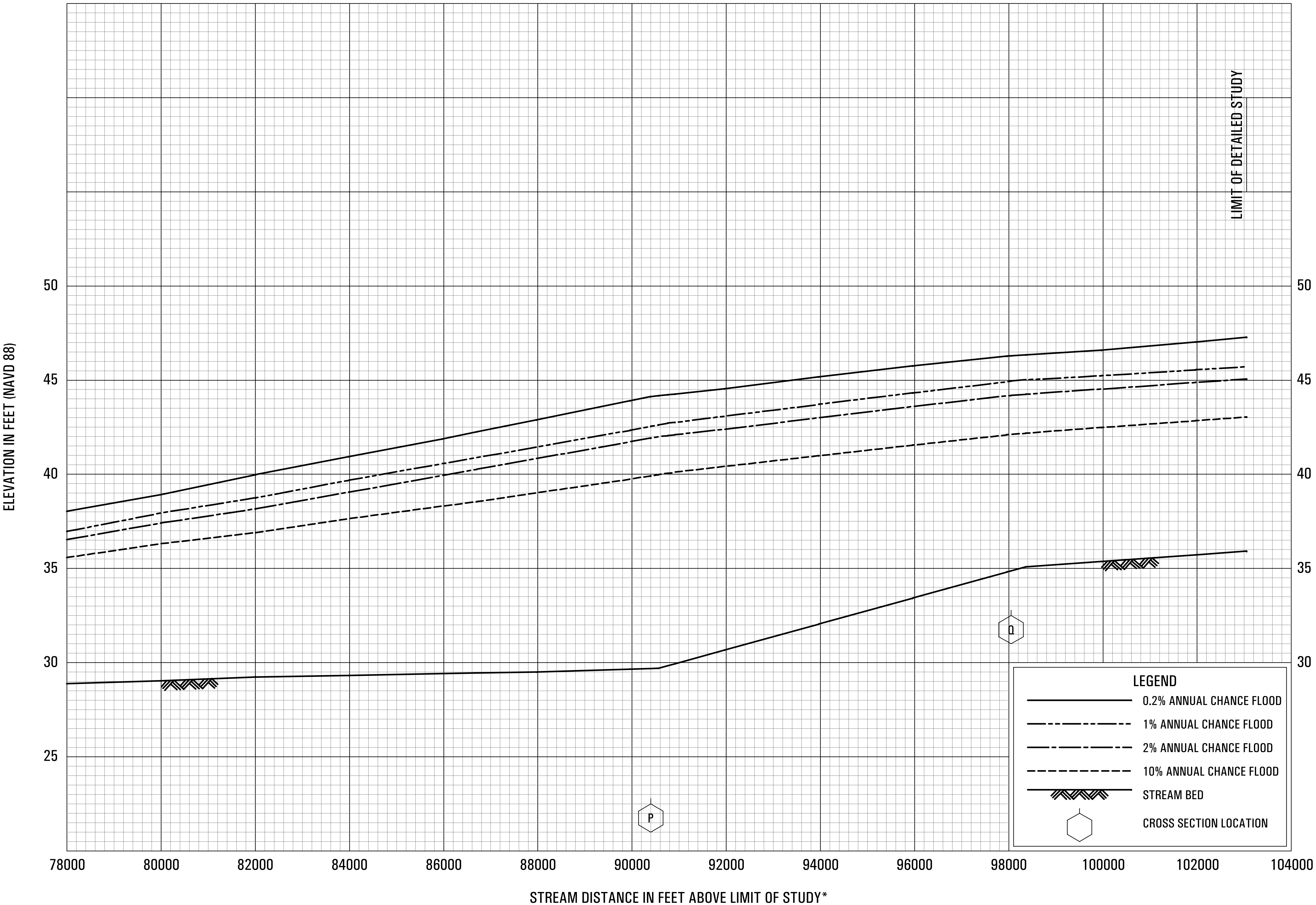
FLOOD PROFILES

GREAT EGG HARBOR RIVER REACH 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)



*LIMIT OF DETAILED STUDY IS APPROXIMATELY 19800 FEET DOWNSTREAM OF CAPE MAY AVENUE (ROUTE 50)

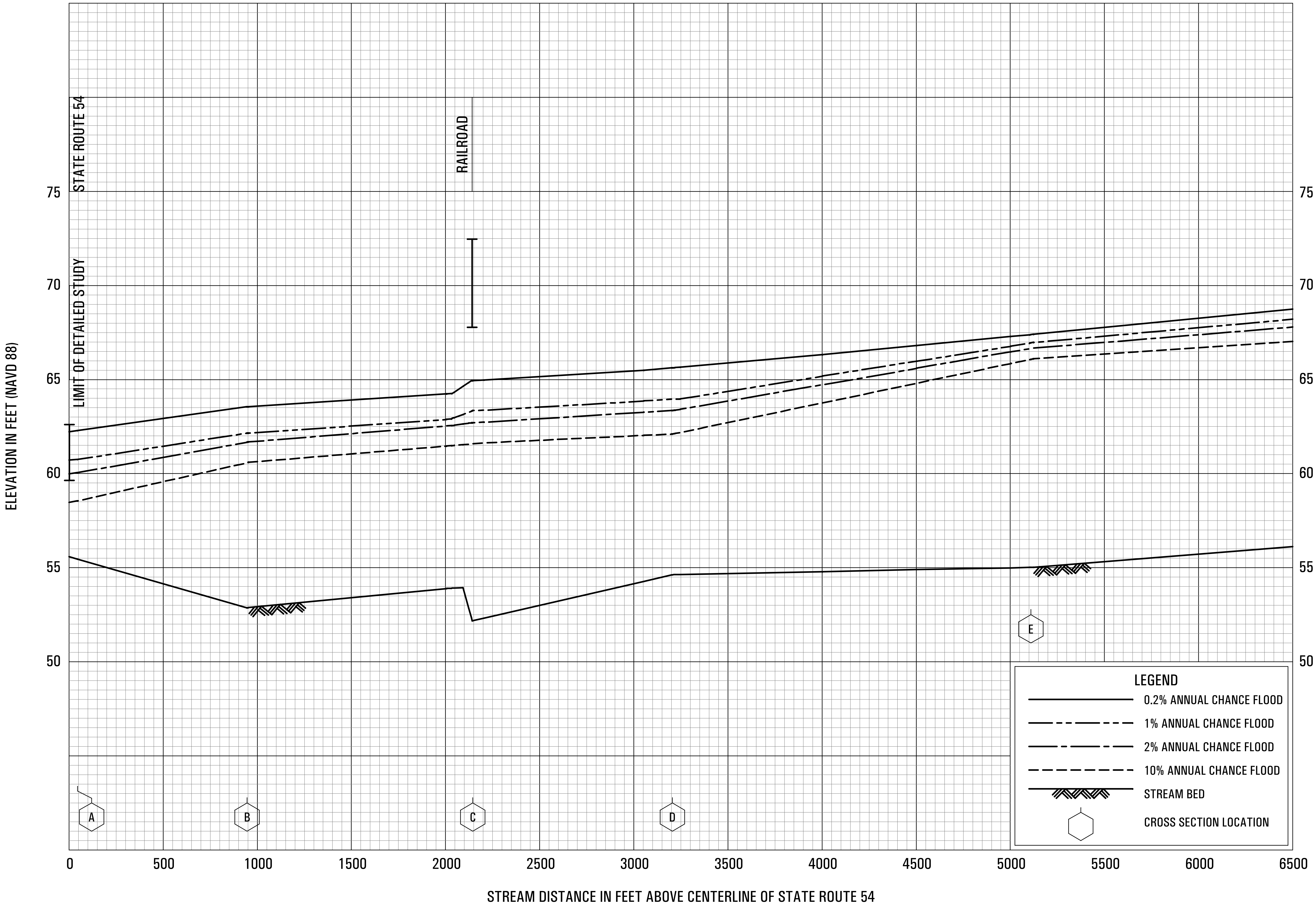
FLOOD PROFILES

GREAT EGG HARBOR RIVER REACH 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)



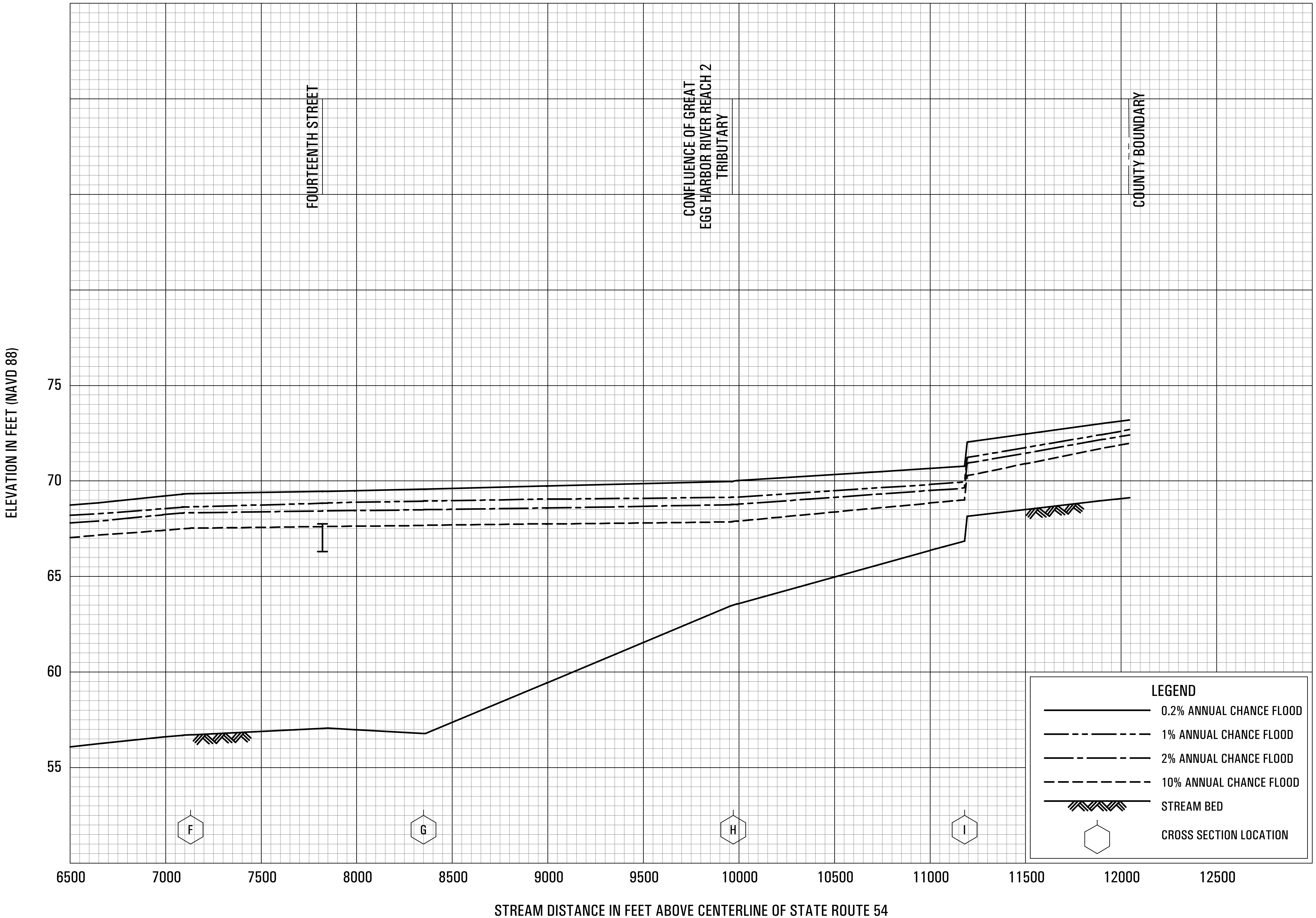
FLOOD PROFILES

GREAT EGG HARBOR RIVER REACH 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)



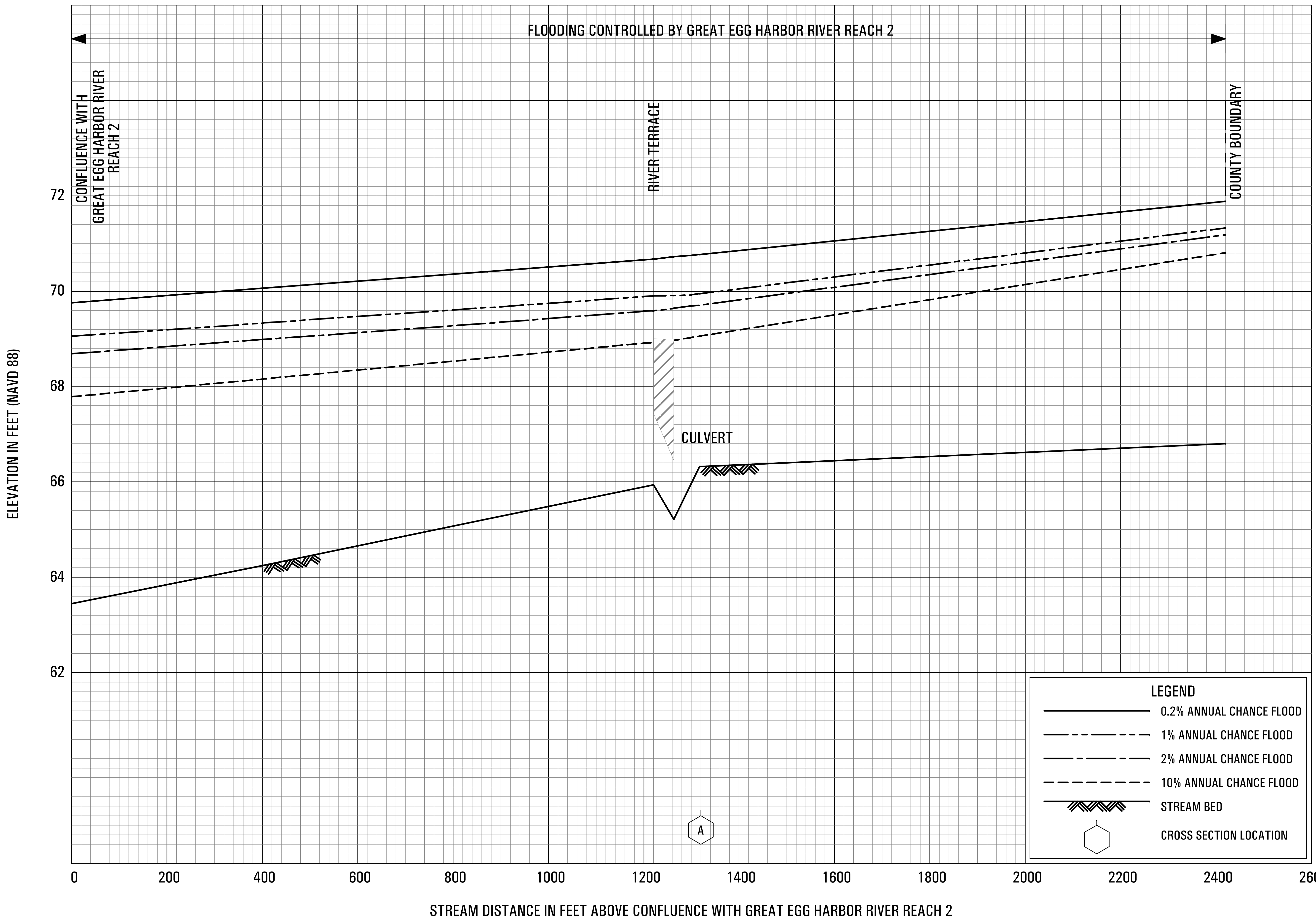
FLOOD PROFILES

GREAT EGG HARBOR RIVER REACH 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)



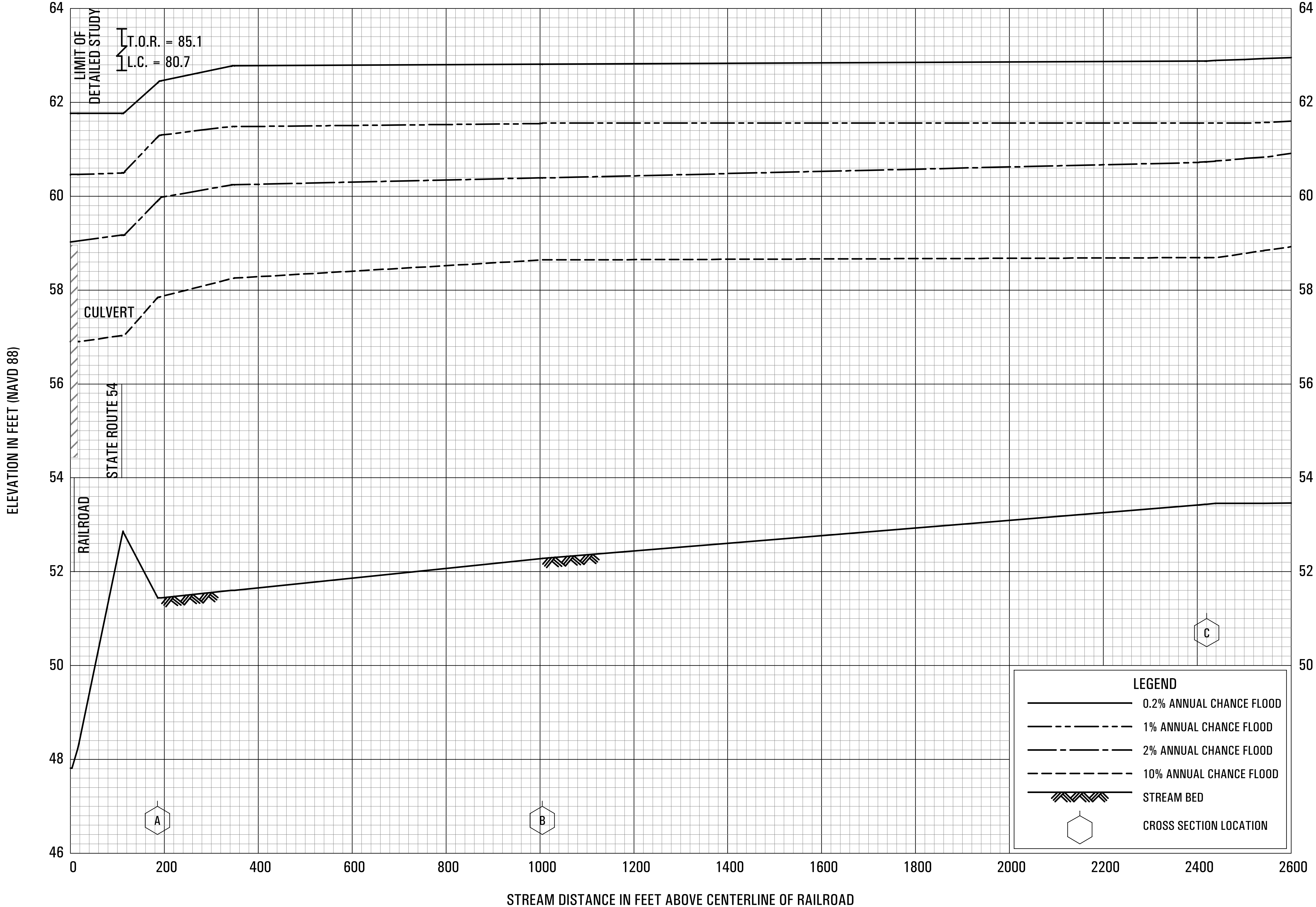
FLOOD PROFILES

GREAT EGG HARBOR RIVER REACH 2 TRIBUTARY

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)

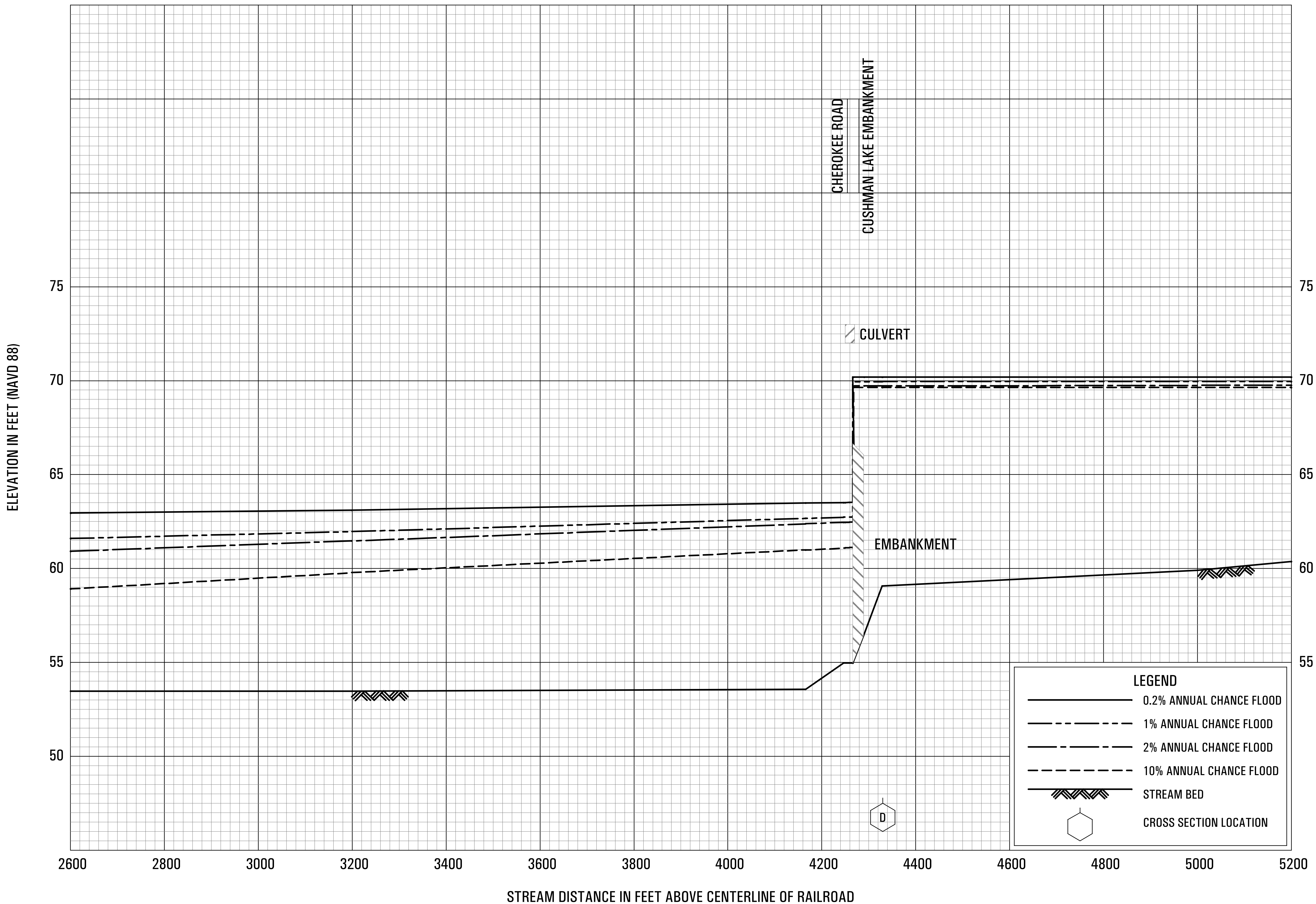


FLOOD PROFILES

HOSPITALITY BRANCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ
(ALL JURISDICTIONS)



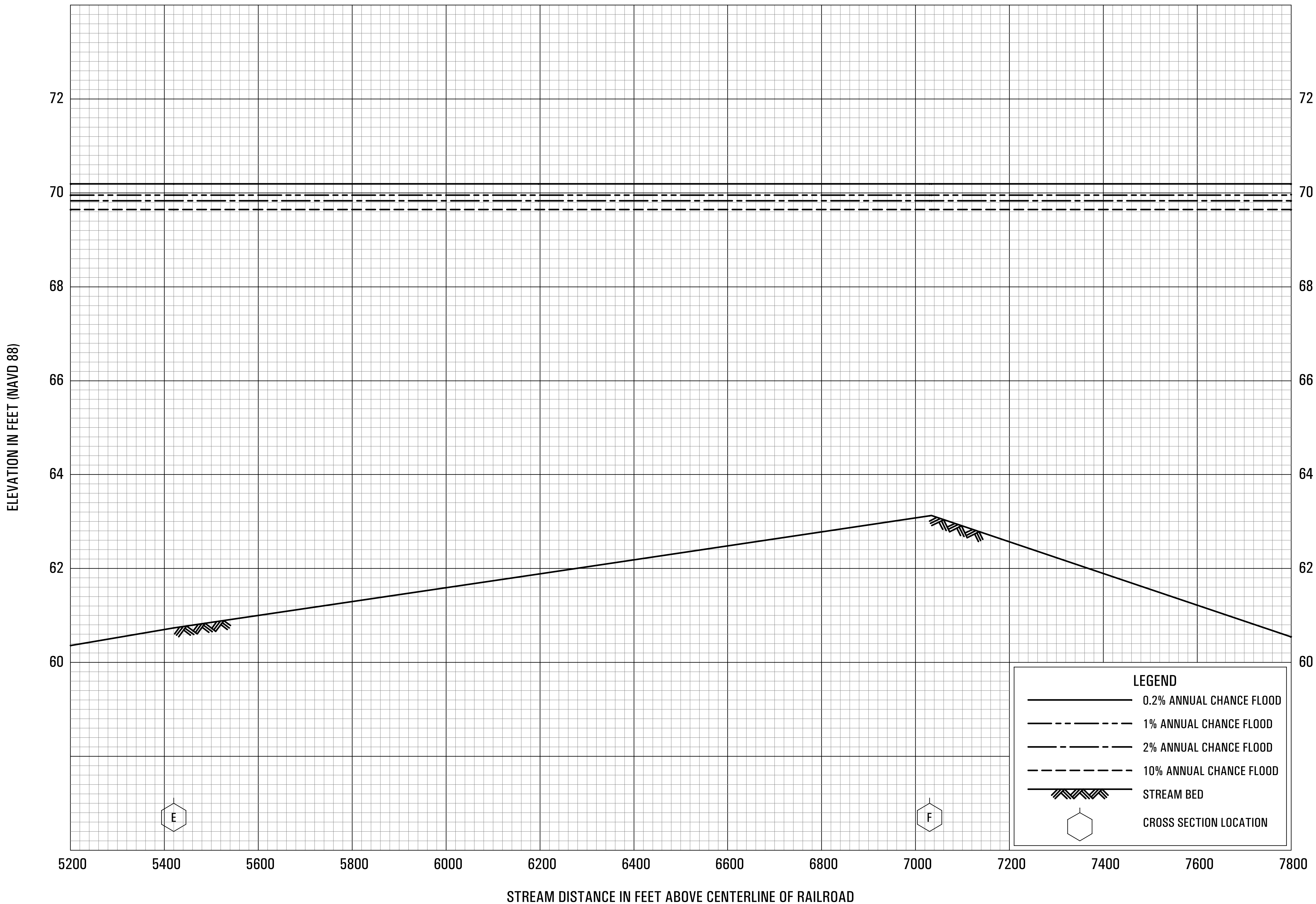
FLOOD PROFILES

HOSPITALITY BRANCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)



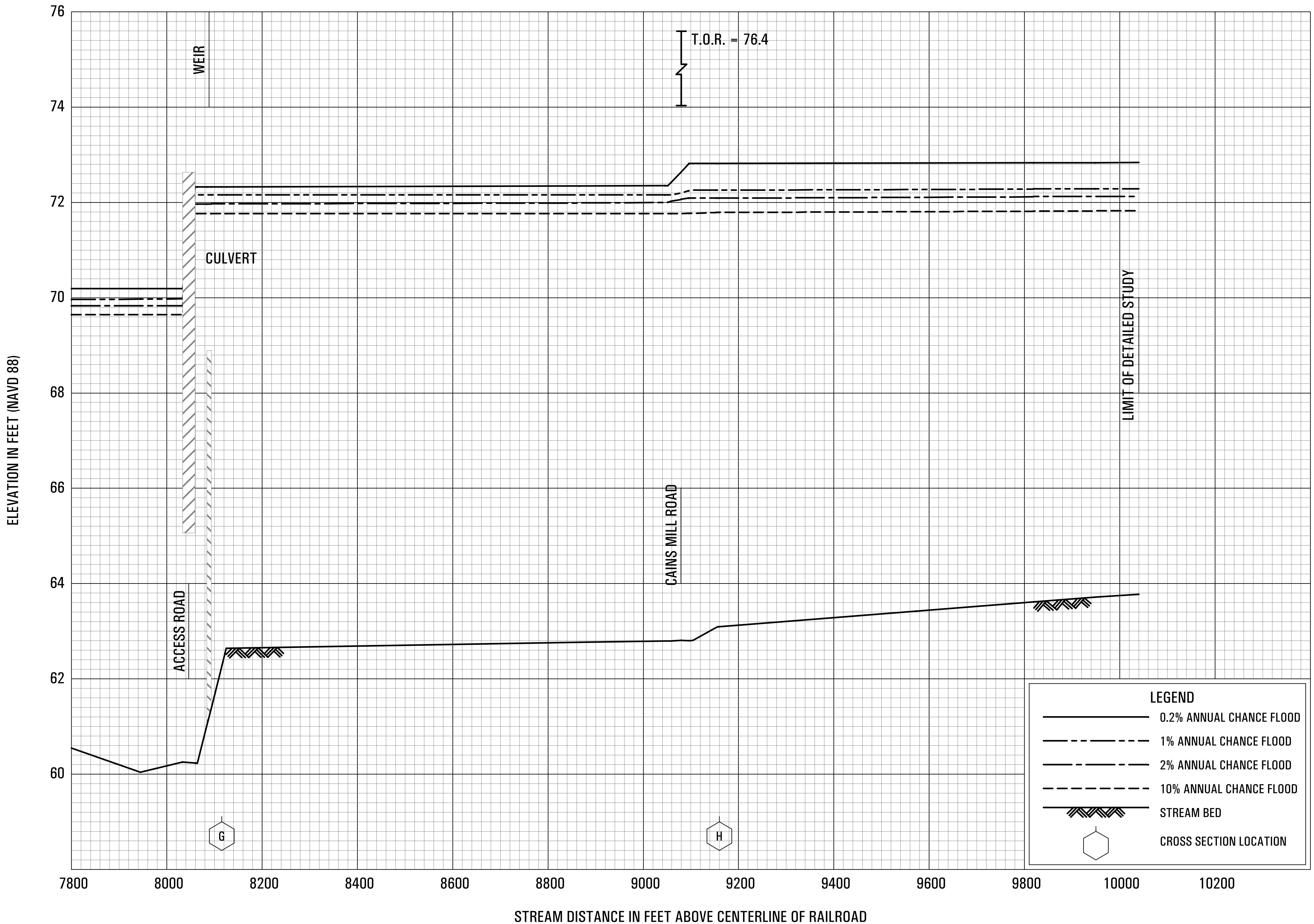
FLOOD PROFILES

HOSPITALITY BRANCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)



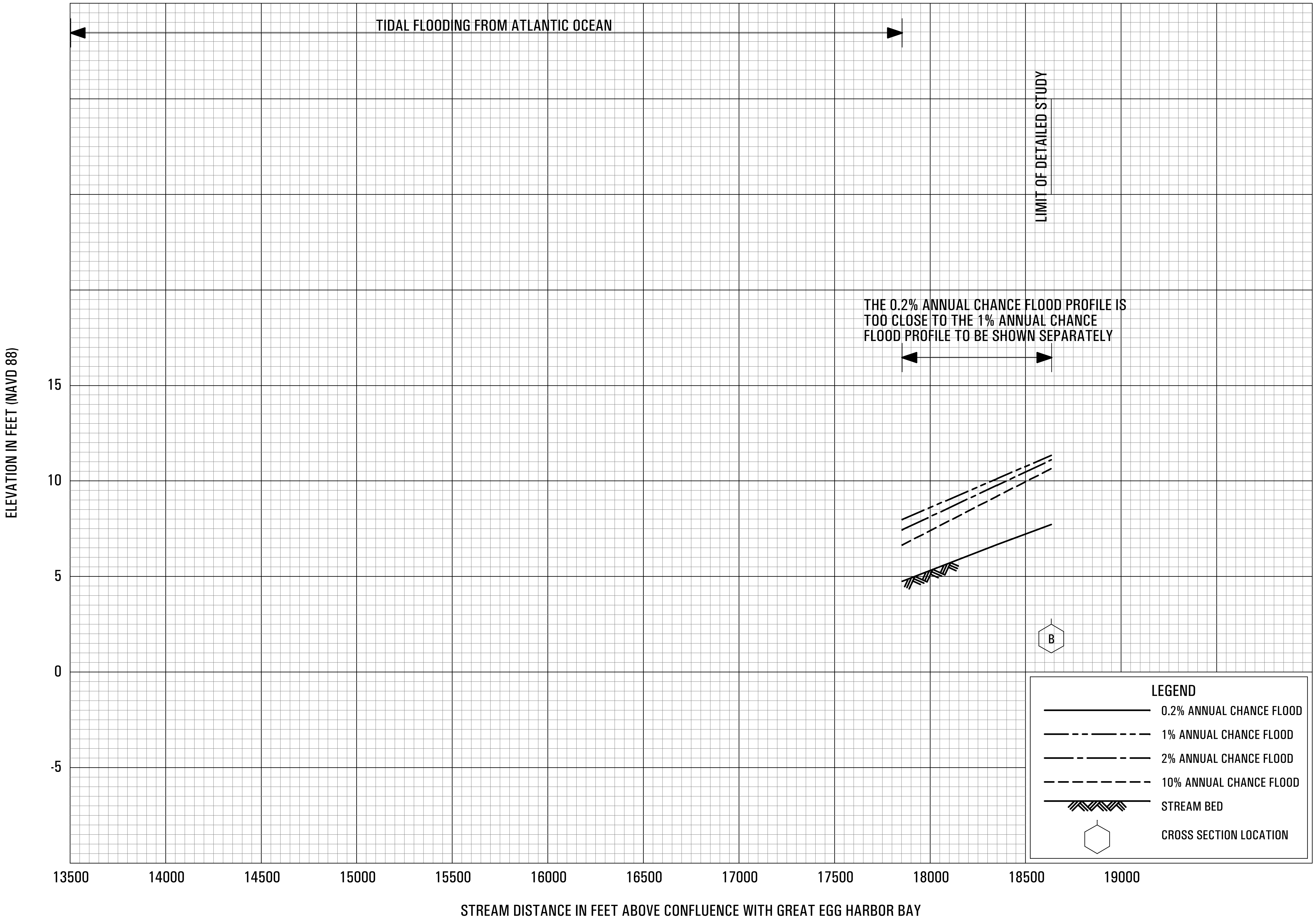
FLOOD PROFILES

HOSPITALITY BRANCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)



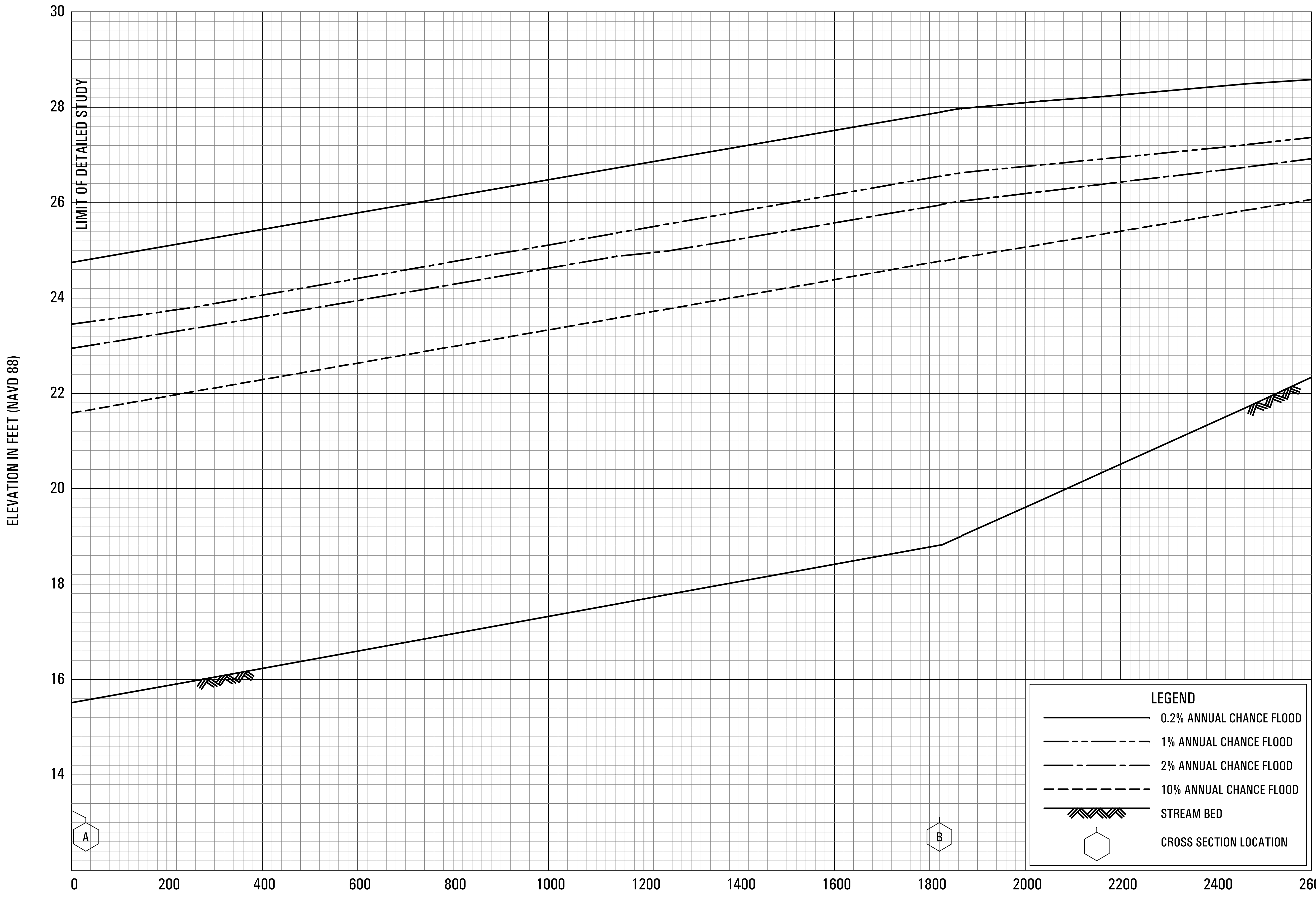
FLOOD PROFILES

LAKES CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)



* LIMIT OF DETAILED STUDY IS APPROXIMATELY 3020 FEET DOWNSTREAM OF PHILADELPHIA AVENUE

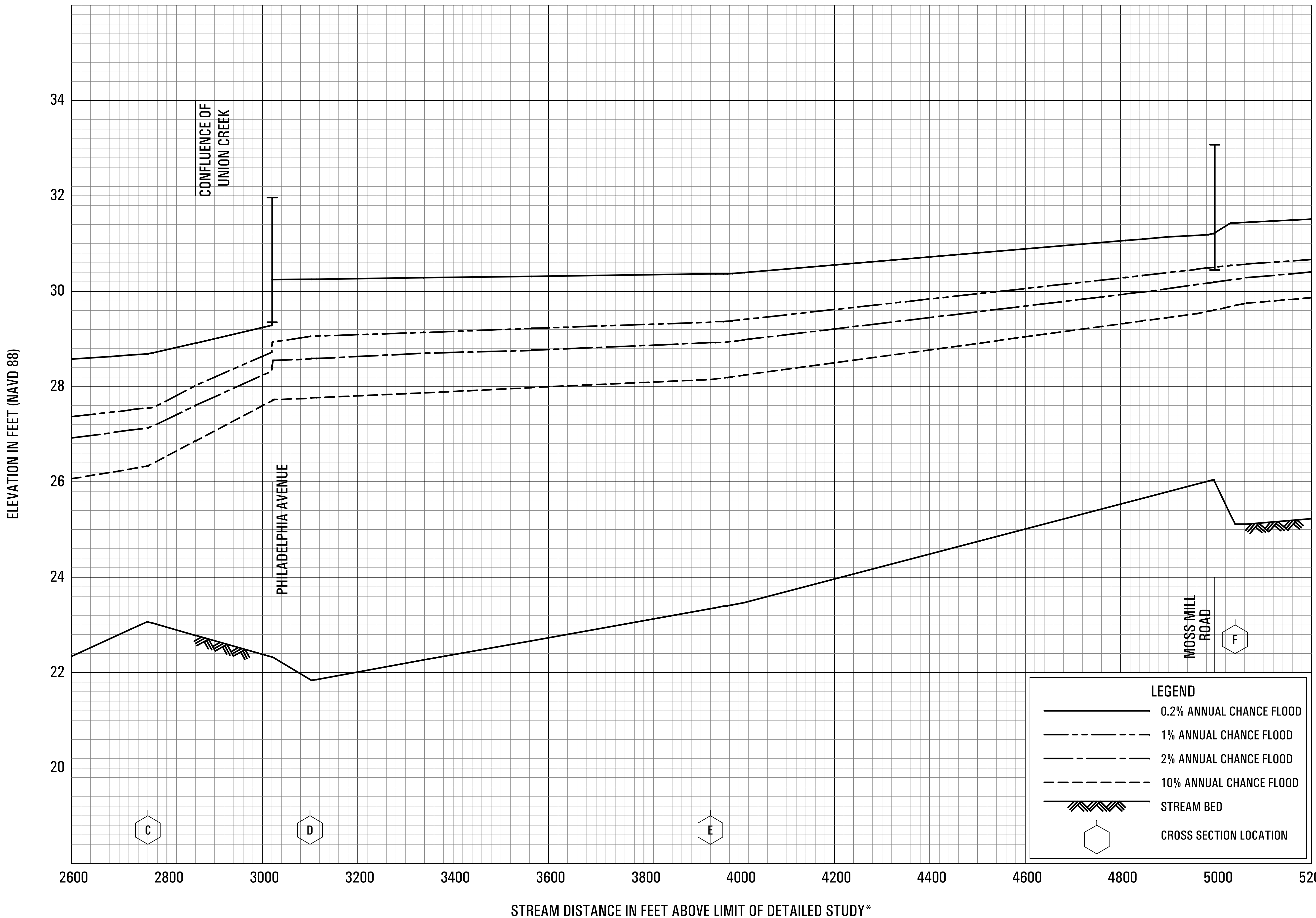
FLOOD PROFILES

LANDING CREEK REACH 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)



* LIMIT OF DETAILED STUDY IS APPROXIMATELY 3020 FEET DOWNSTREAM OF PHILADELPHIA AVENUE

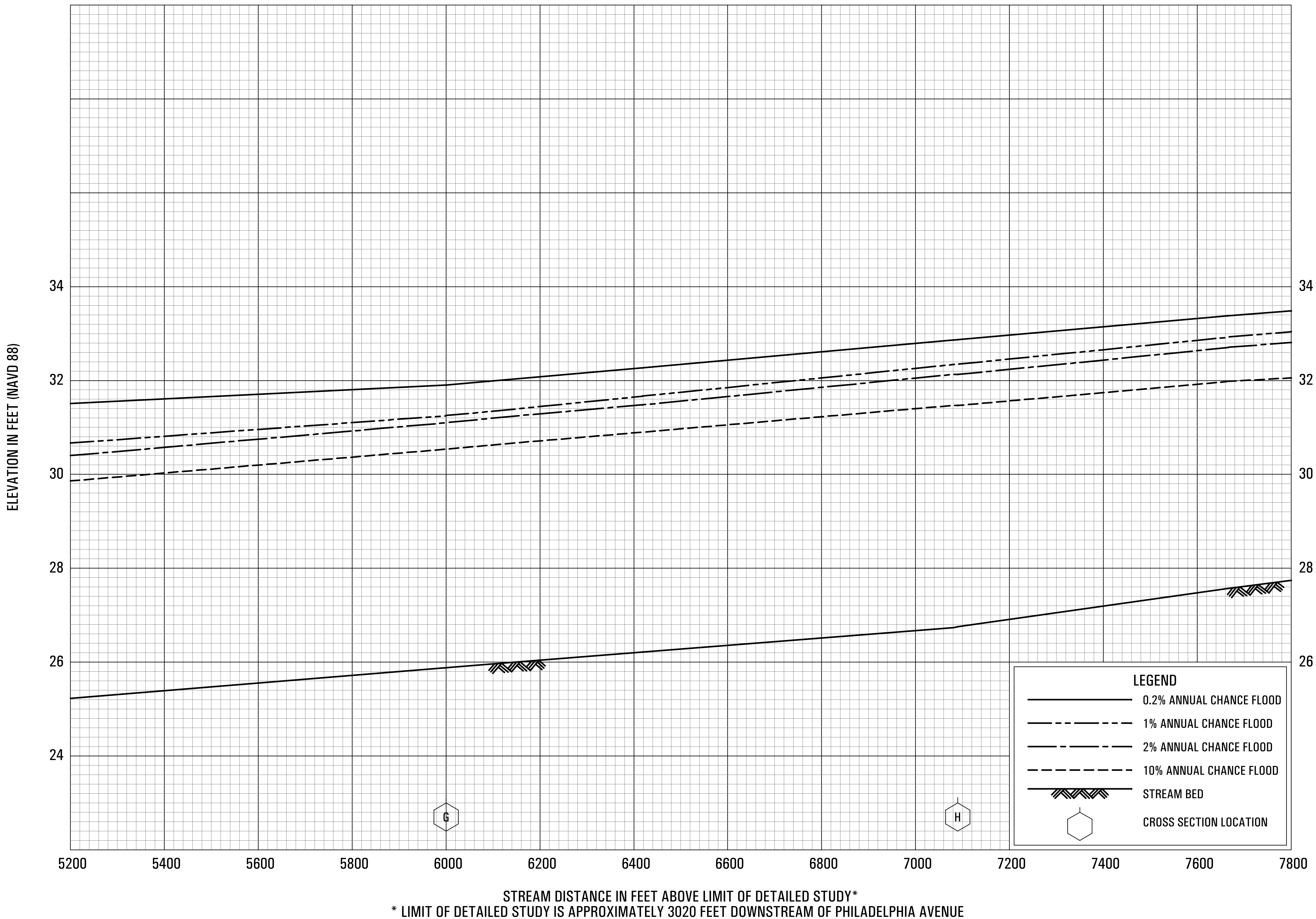
FLOOD PROFILES

LANDING CREEK REACH 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)



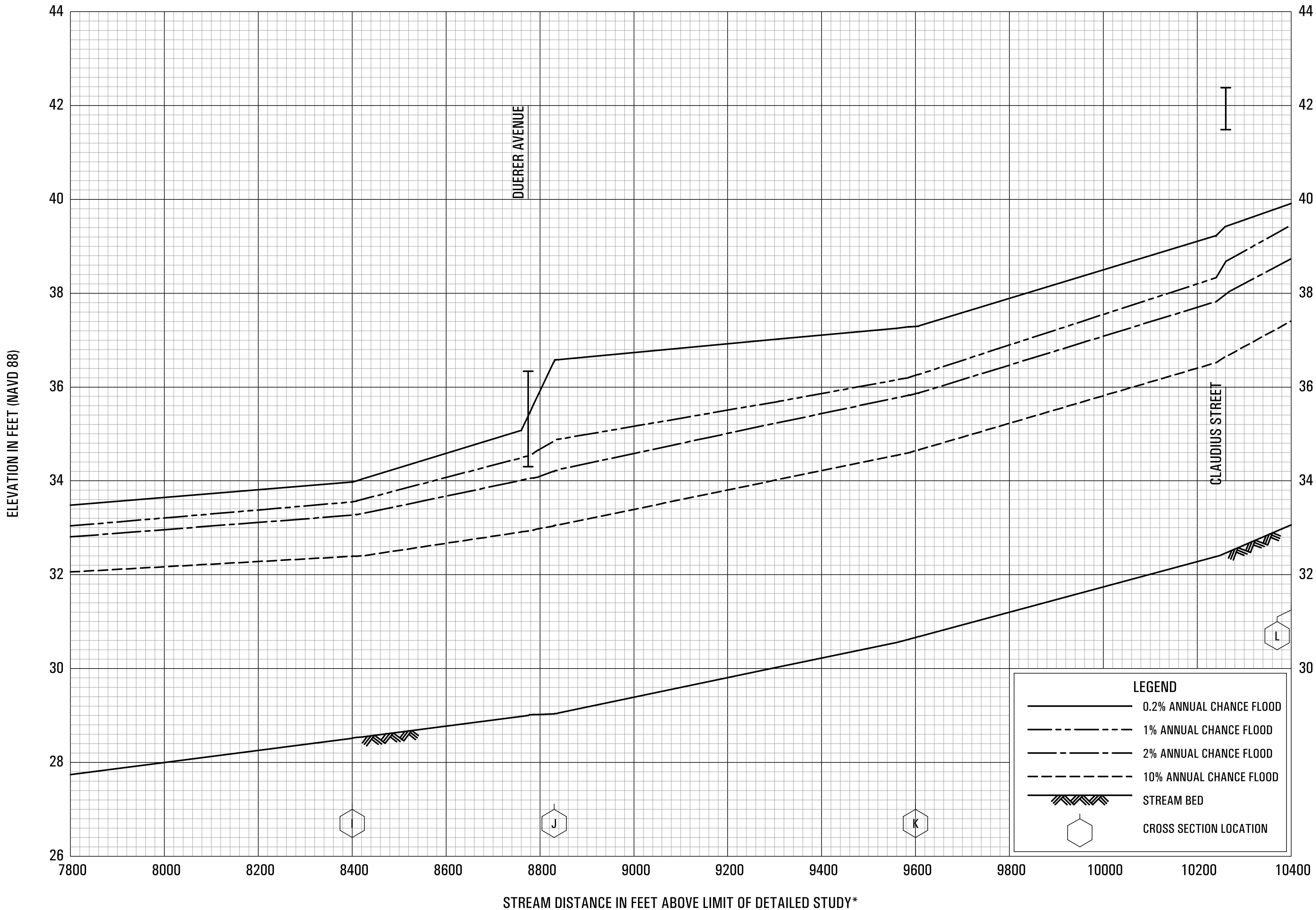
FLOOD PROFILES

LANDING CREEK REACH 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)



* LIMIT OF DETAILED STUDY IS APPROXIMATELY 3020 FEET DOWNSTREAM OF PHILADELPHIA AVENUE

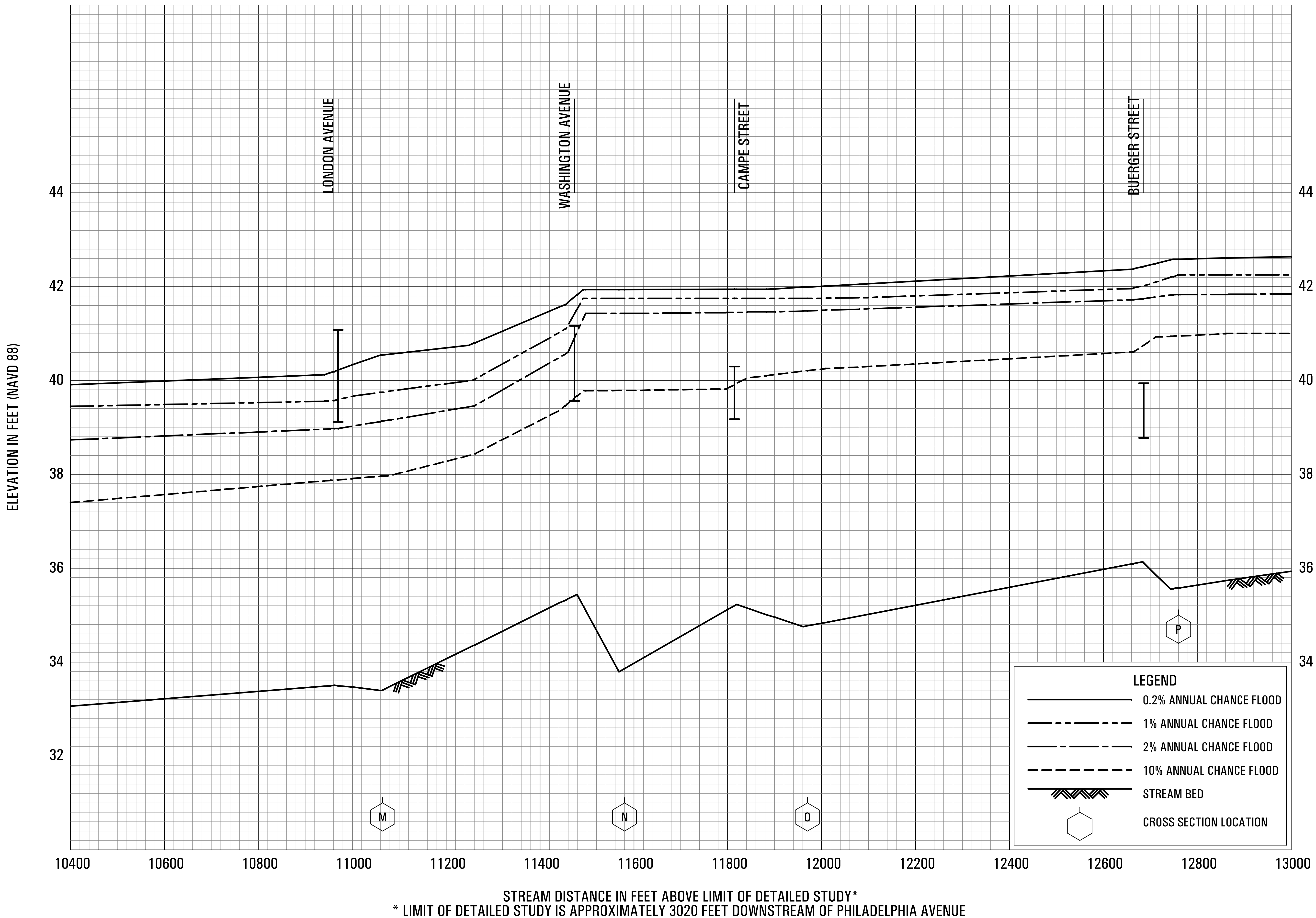
FLOOD PROFILES

LANDING CREEK REACH 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)



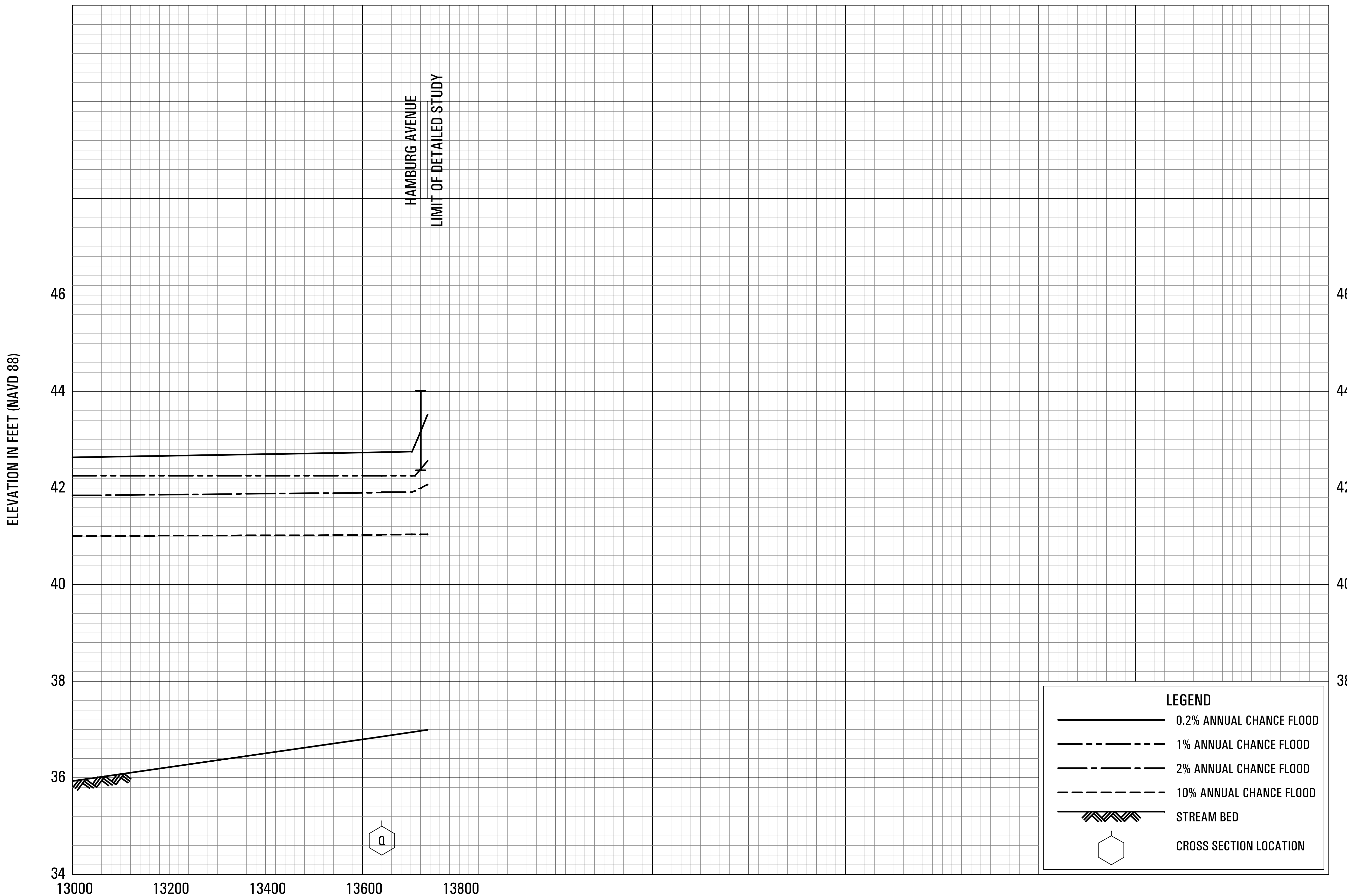
FLOOD PROFILES

LANDING CREEK REACH 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)



STREAM DISTANCE IN FEET ABOVE LIMIT OF DETAILED STUDY*

* LIMIT OF DETAILED STUDY IS APPROXIMATELY 3020 FEET DOWNSTREAM OF PHILADELPHIA AVENUE

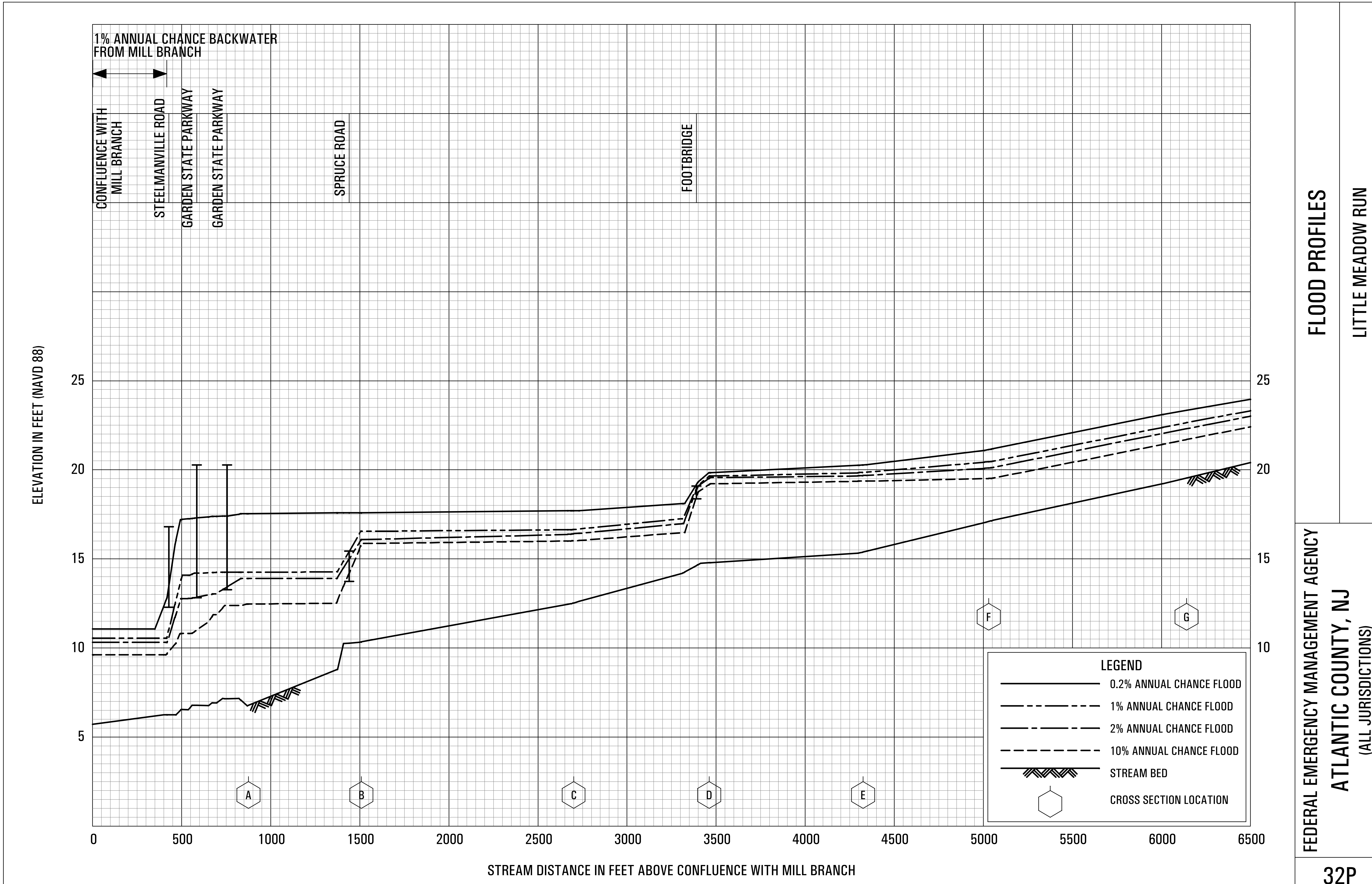
FLOOD PROFILES

LANDING CREEK REACH 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

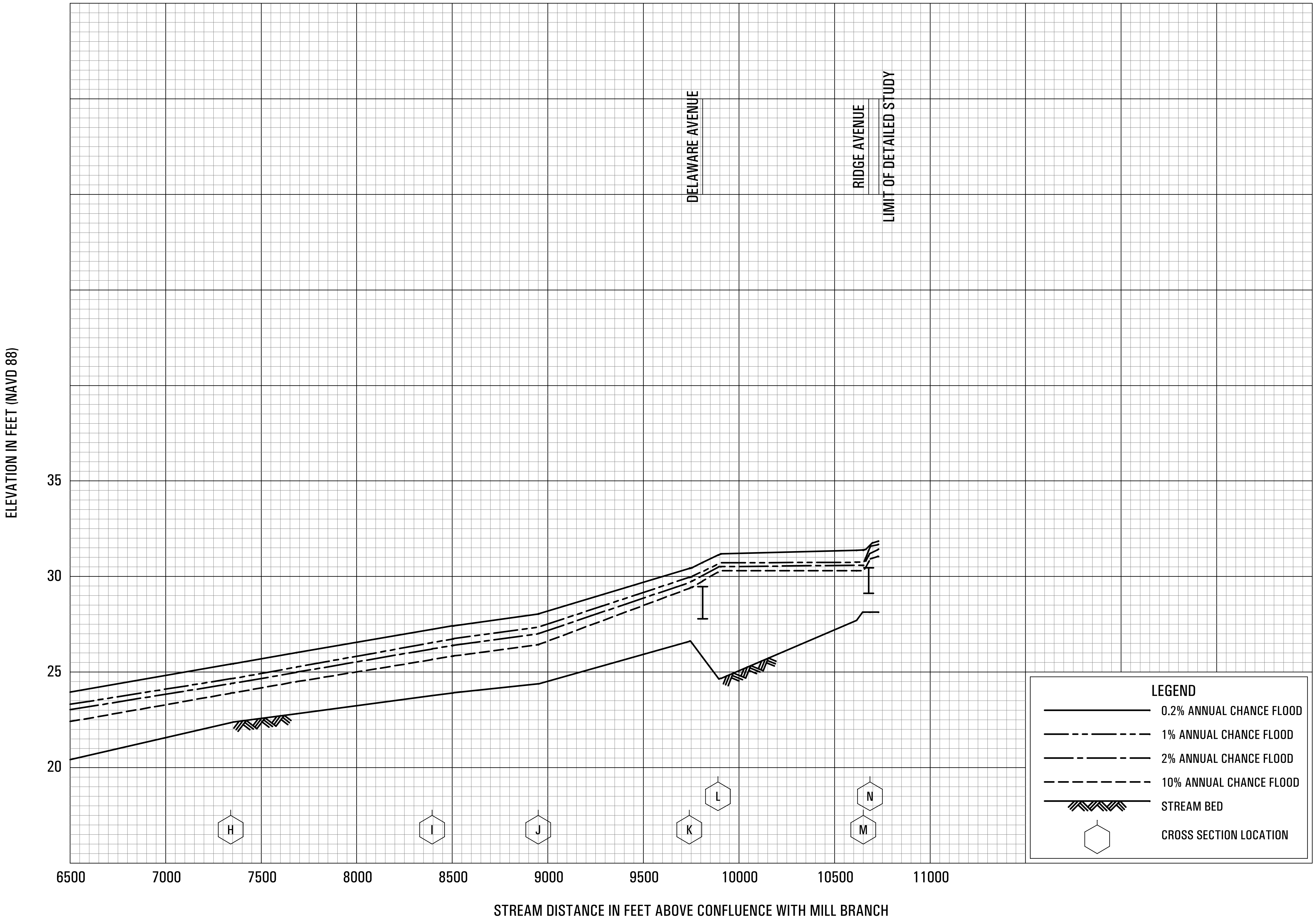
ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)



1% ANNUAL CHANCE BACKWATER FROM MILL BRANCH
CONFLUENCE WITH MILL BRANCH
STEELMANVILLE ROAD
GARDEN STATE PARKWAY
GARDEN STATE PARKWAY
SPRUCE ROAD
FOOTBRIDGE
ELEVATION IN FEET (NAVD 88)
25
20
15
10
5
A
B
C
D
E
F
G
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
6500
STREAM DISTANCE IN FEET ABOVE CONFLUENCE WITH MILL BRANCH
LEGEND
0.2% ANNUAL CHANCE FLOOD
1% ANNUAL CHANCE FLOOD
2% ANNUAL CHANCE FLOOD
10% ANNUAL CHANCE FLOOD
STREAM BED
CROSS SECTION LOCATION
FLOOD PROFILES
LITTLE MEADOW RUN
FEDERAL EMERGENCY MANAGEMENT AGENCY
ATLANTIC COUNTY, NJ
(ALL JURISDICTIONS)

32P



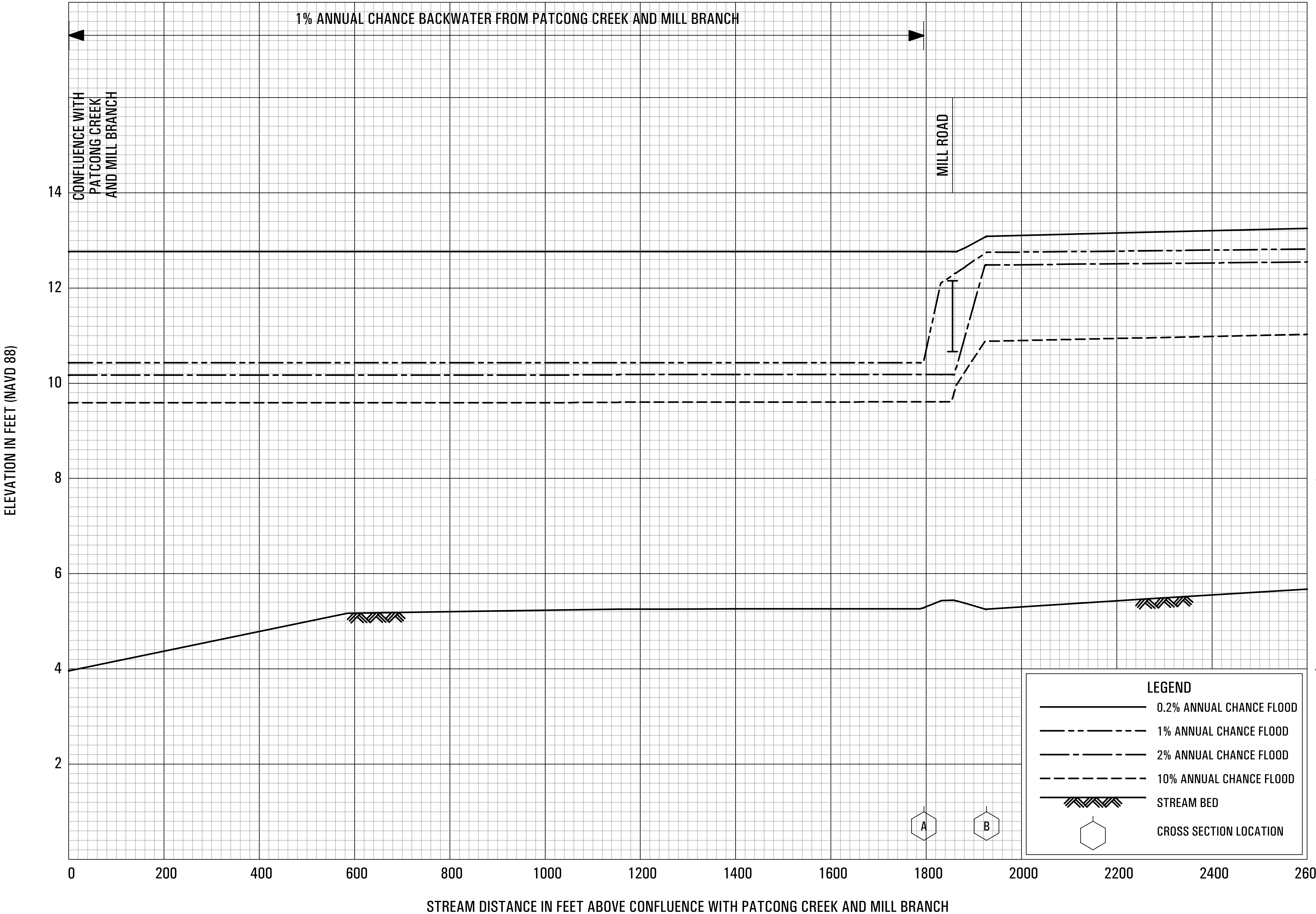
FLOOD PROFILES

LITTLE MEADOW RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)



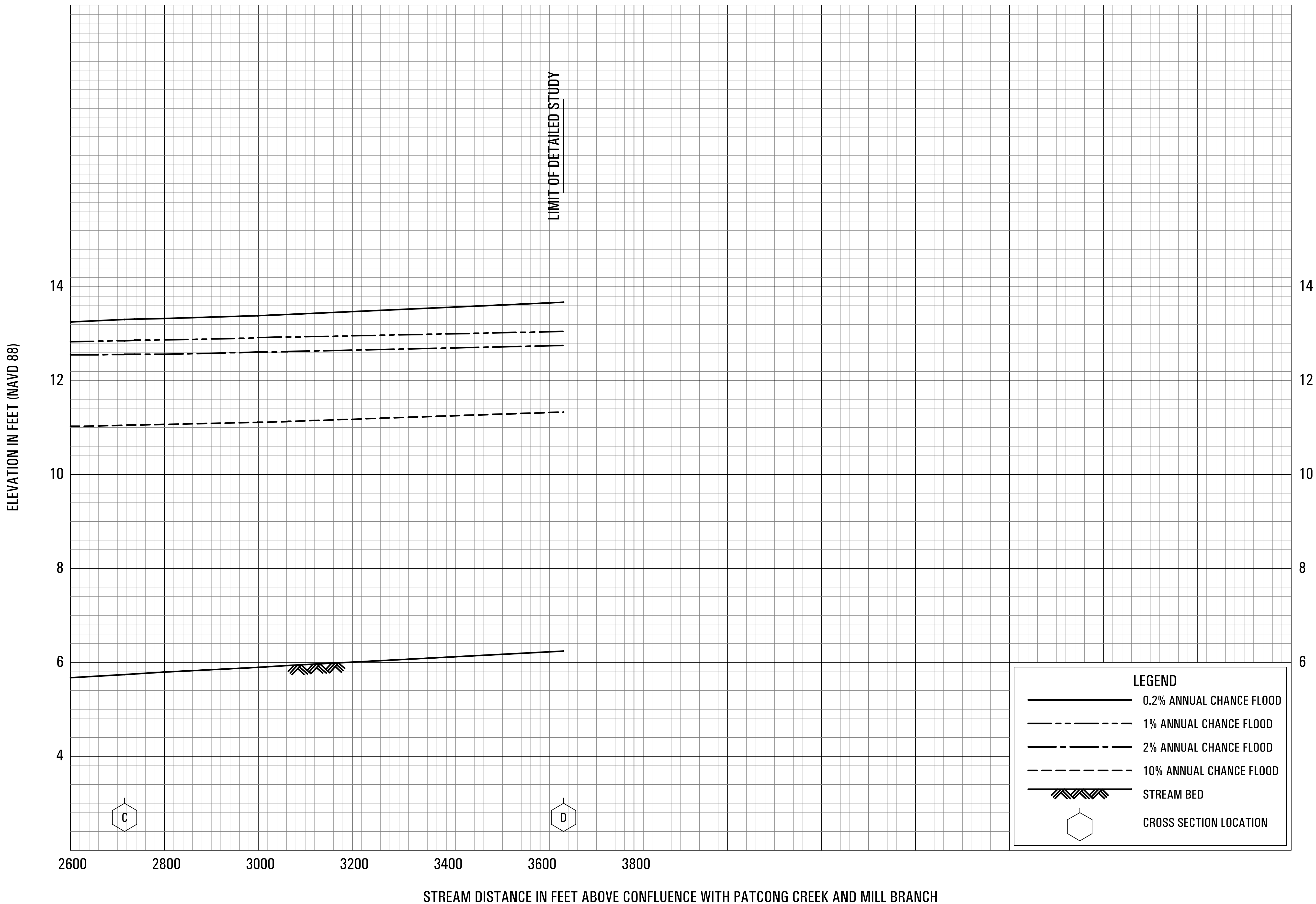
FLOOD PROFILES

MAPLE RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)



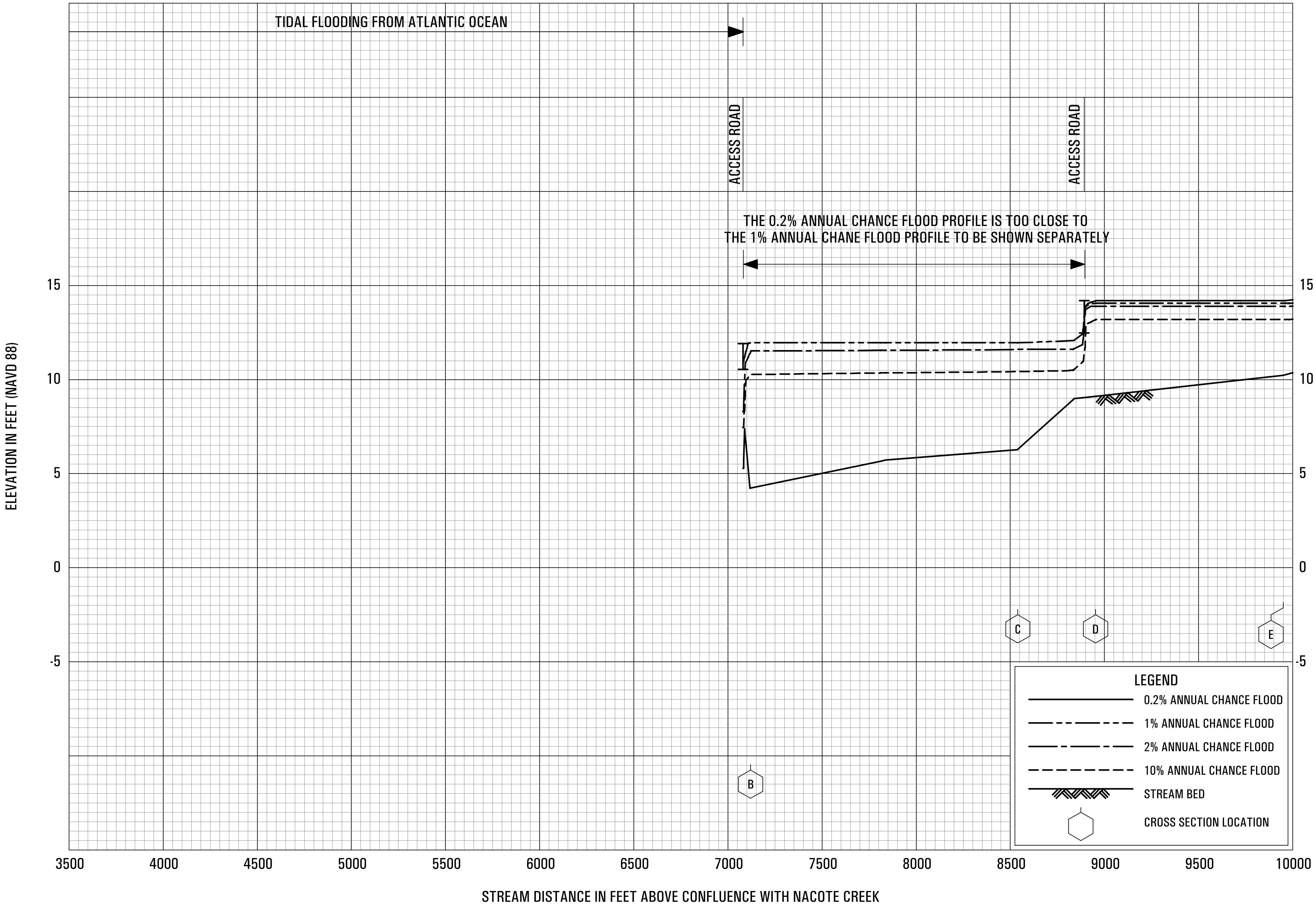
FLOOD PROFILES

MAPLE RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)



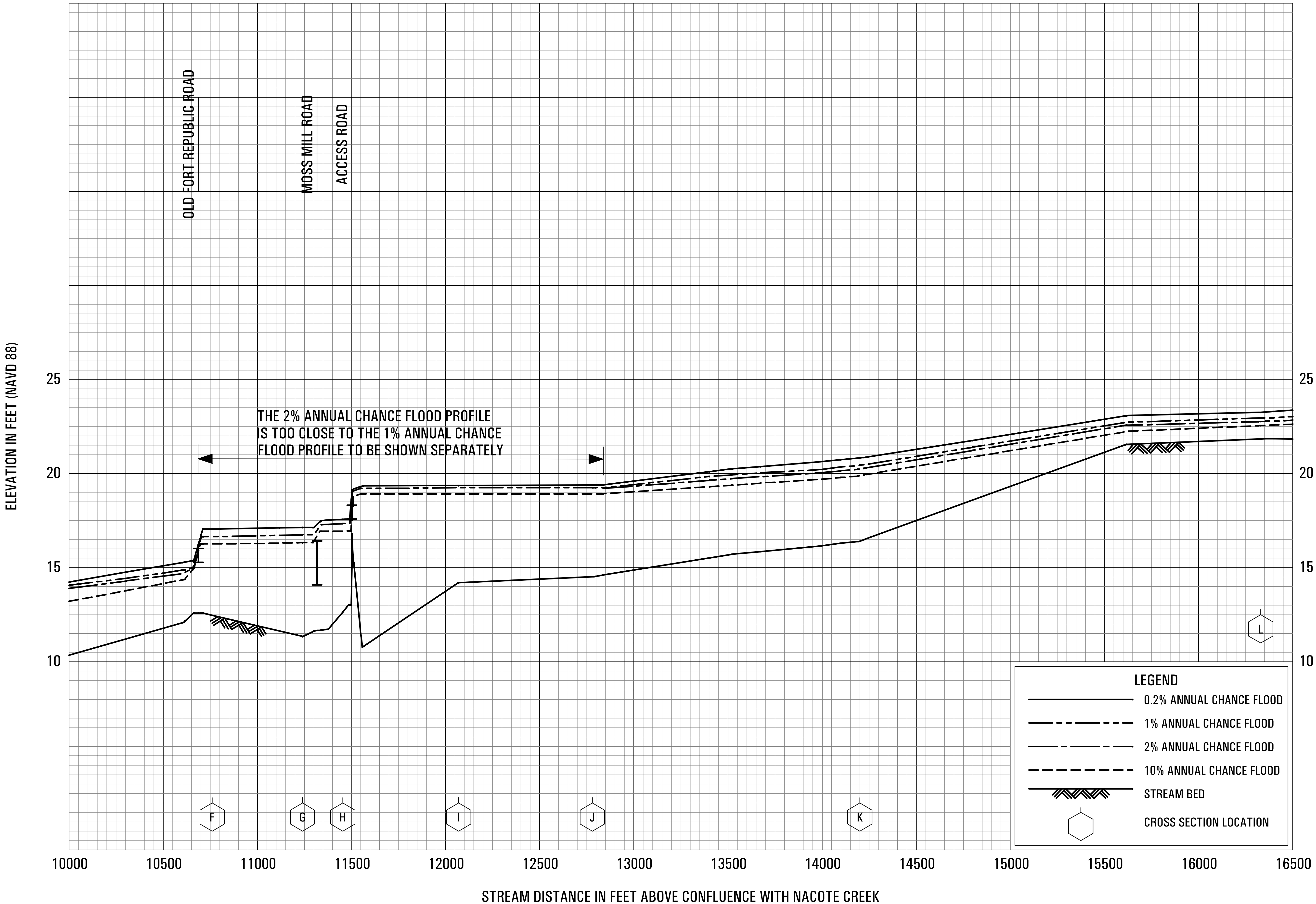
FLOOD PROFILES

MATTIX RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)



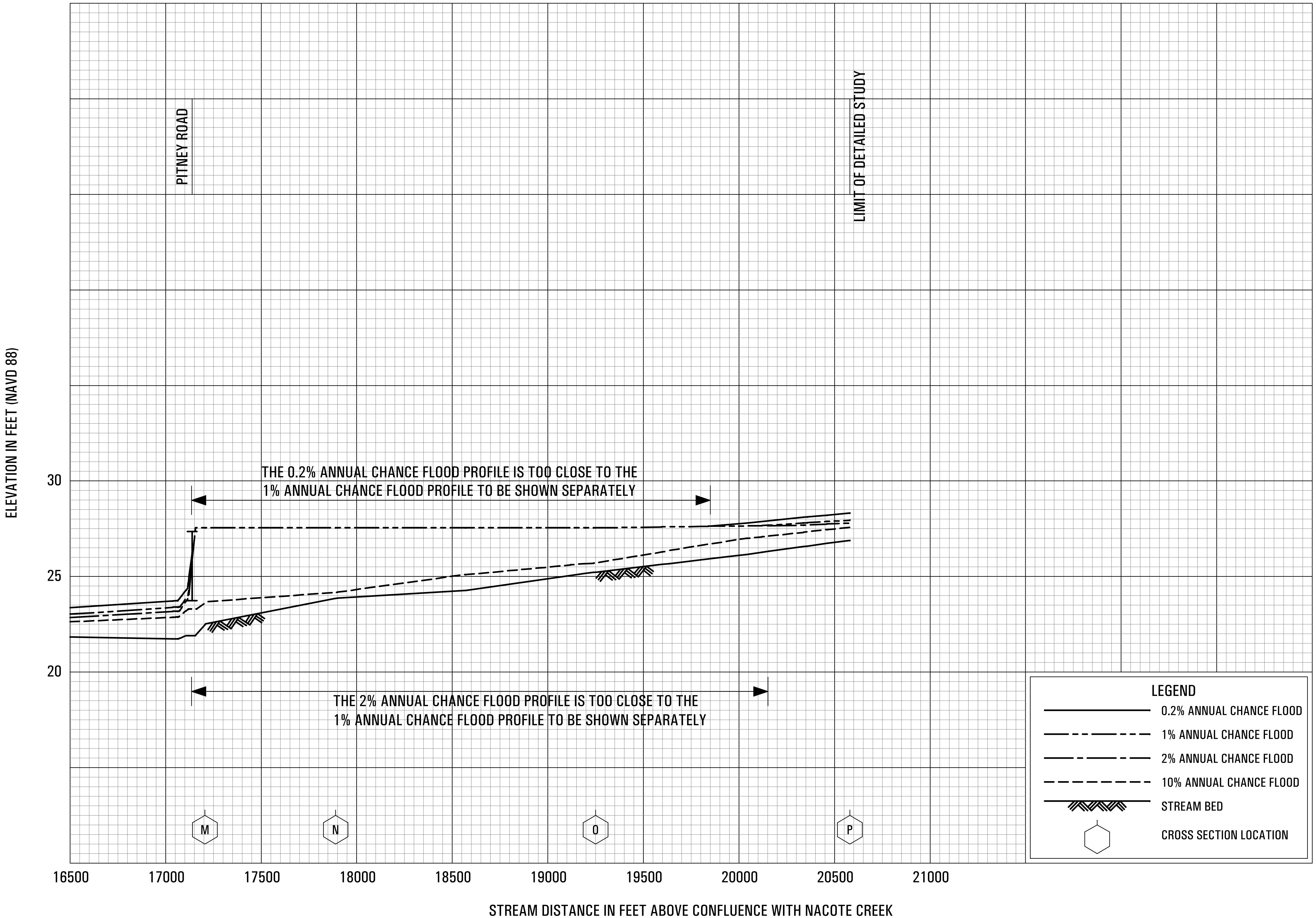
FLOOD PROFILES

MATTIX RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)



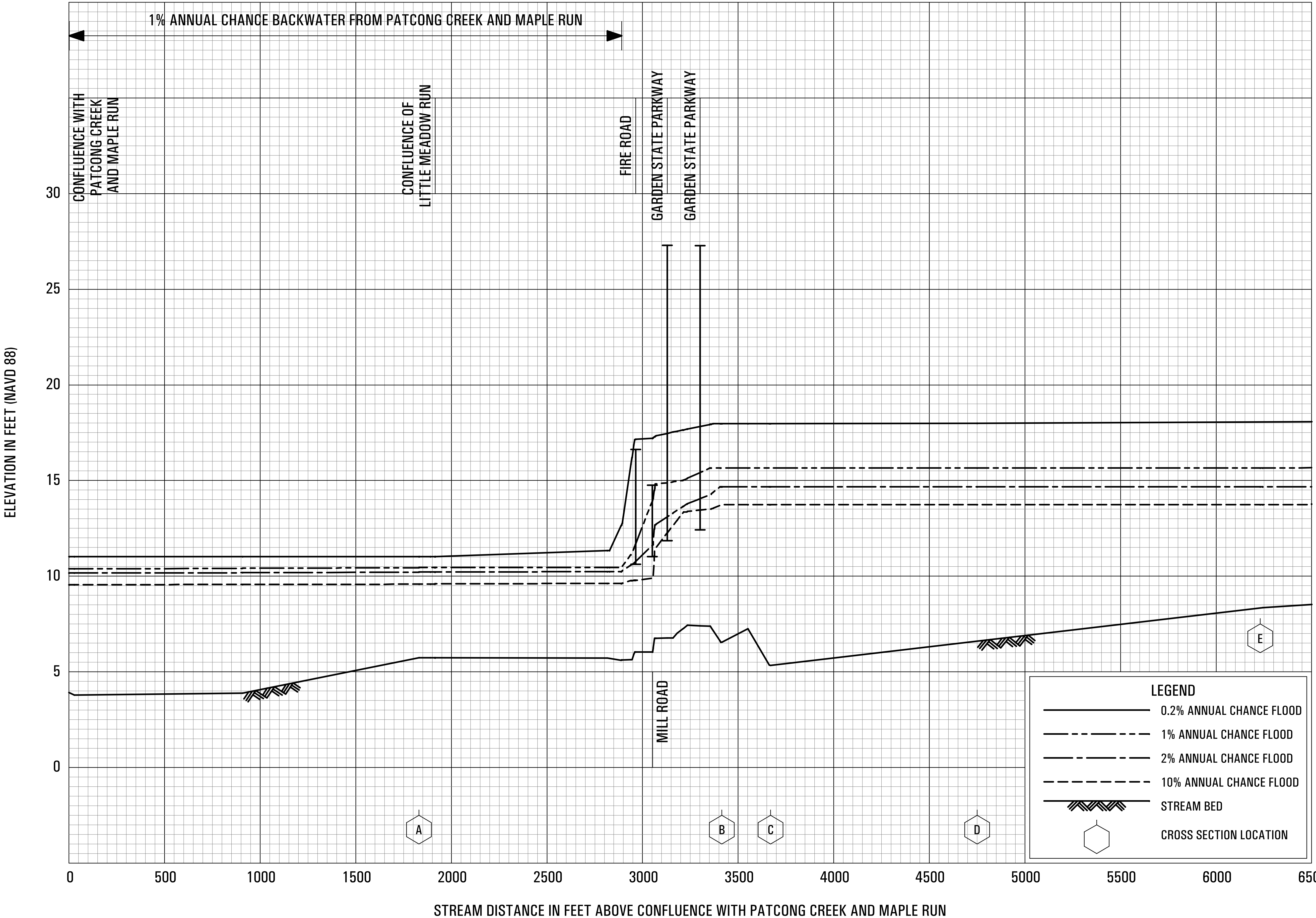
FLOOD PROFILES

MATTIX RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)



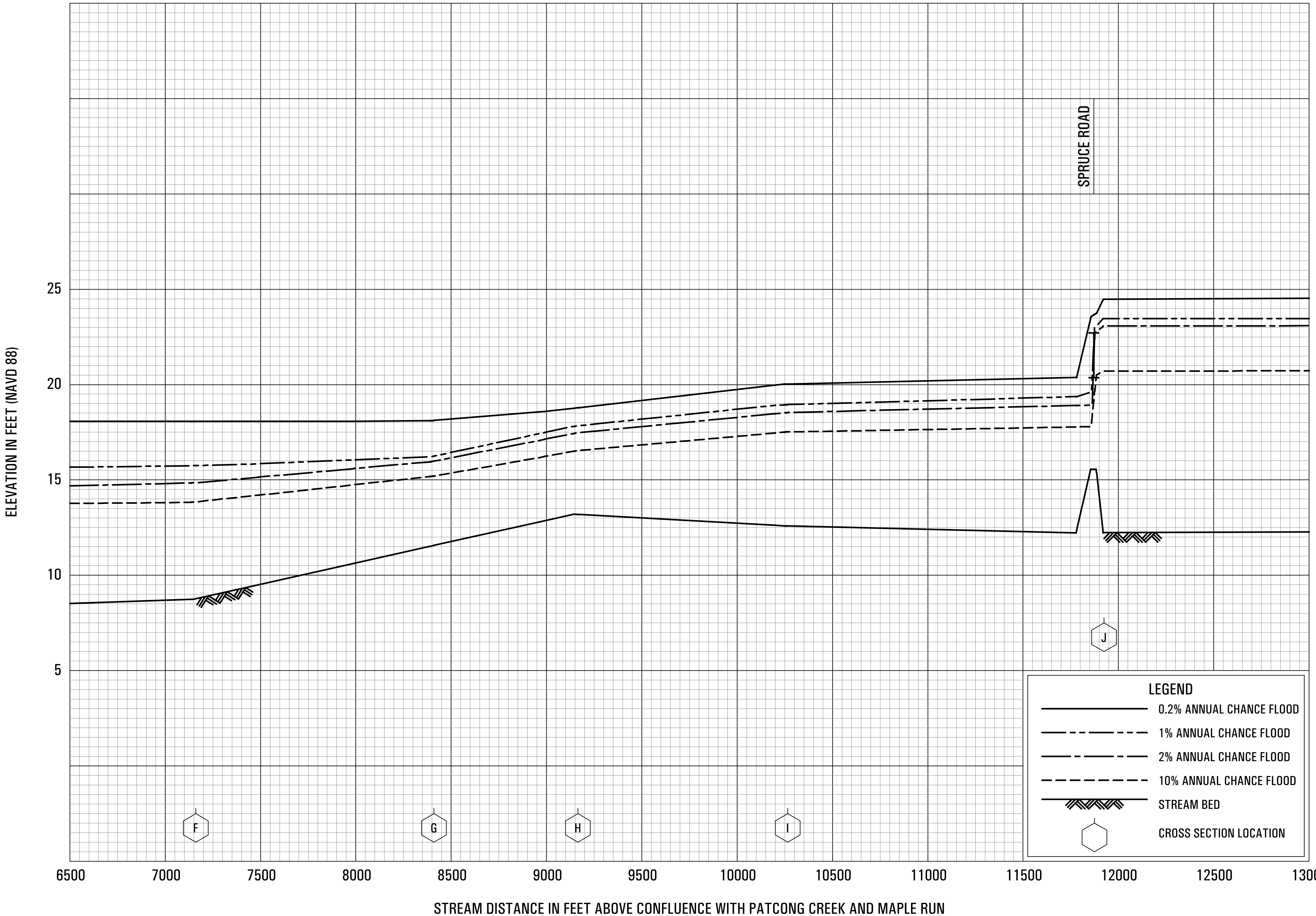
FLOOD PROFILES

MILL BRANCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)



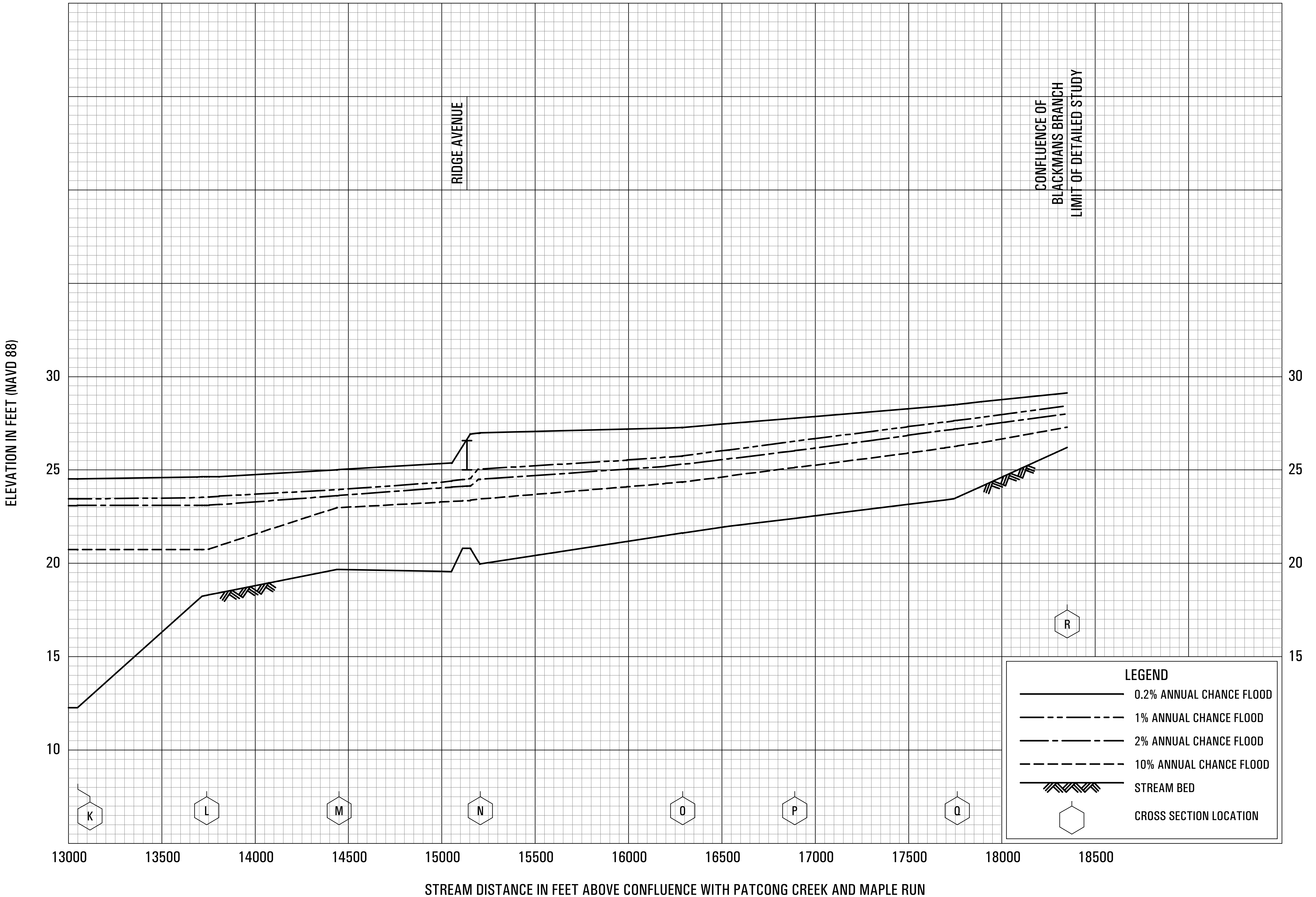
FLOOD PROFILES

MILL BRANCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)



FLOOD PROFILES

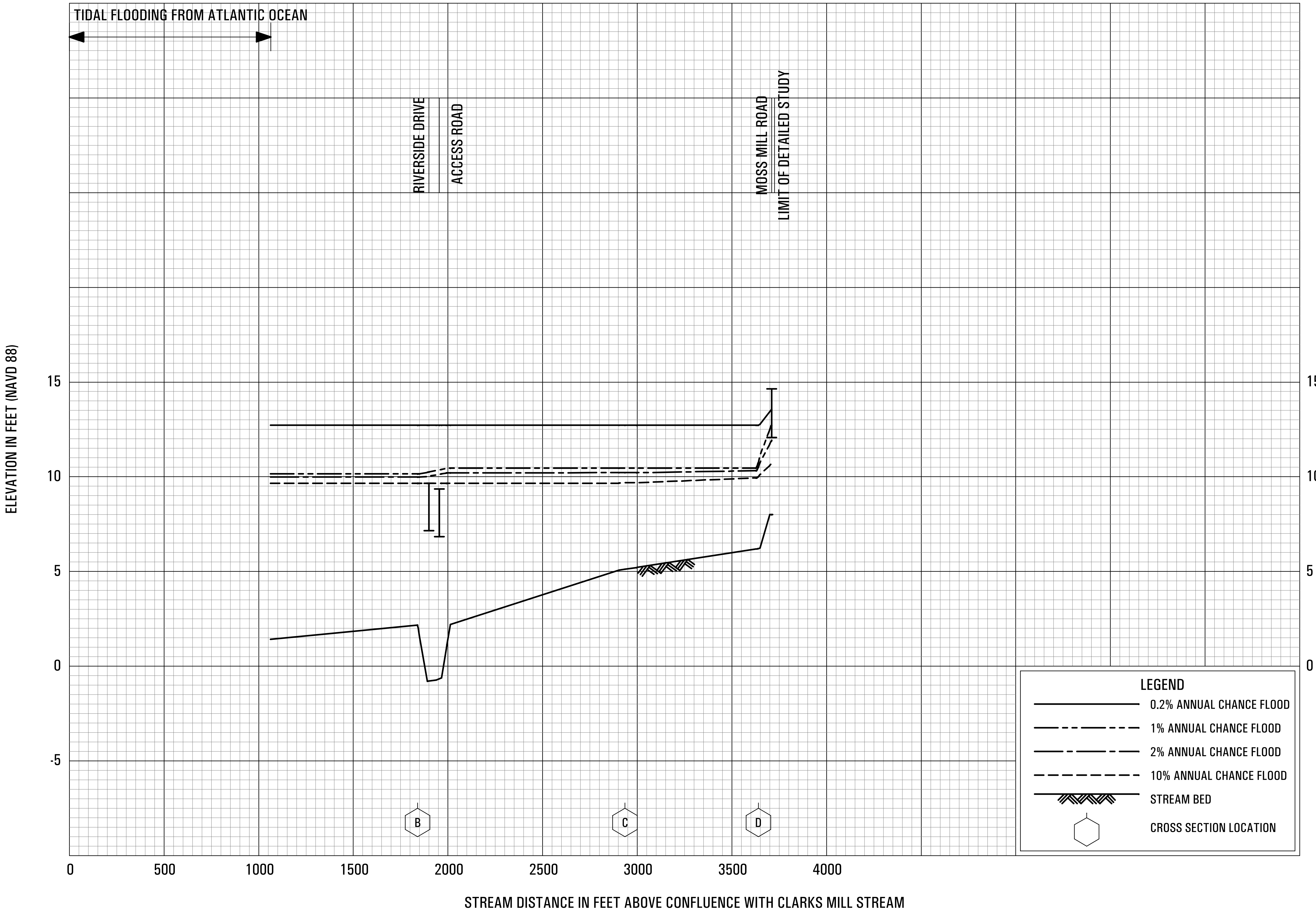
MILL BRANCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)

41P



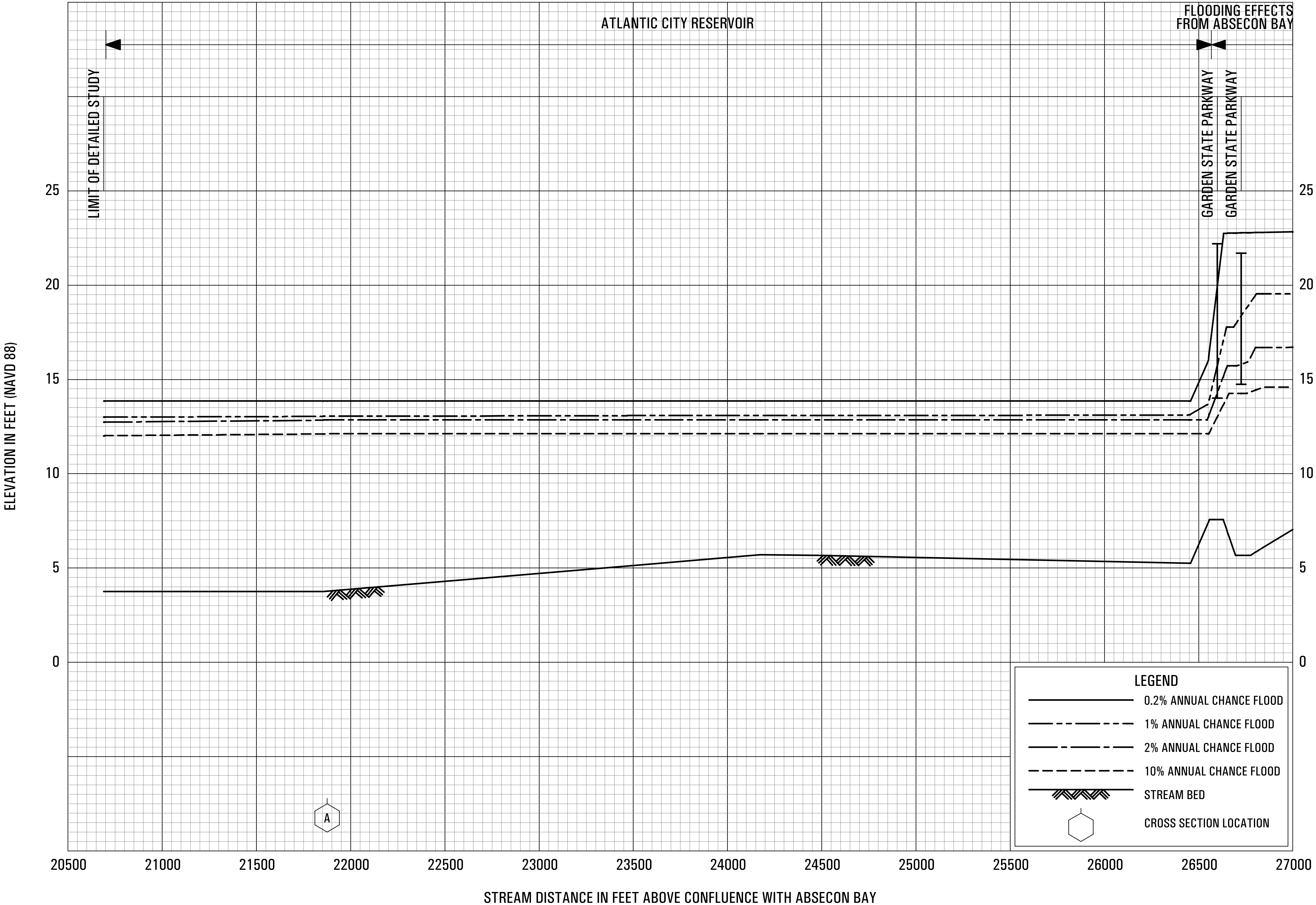
FLOOD PROFILES

MORSES MILL STREAM

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)



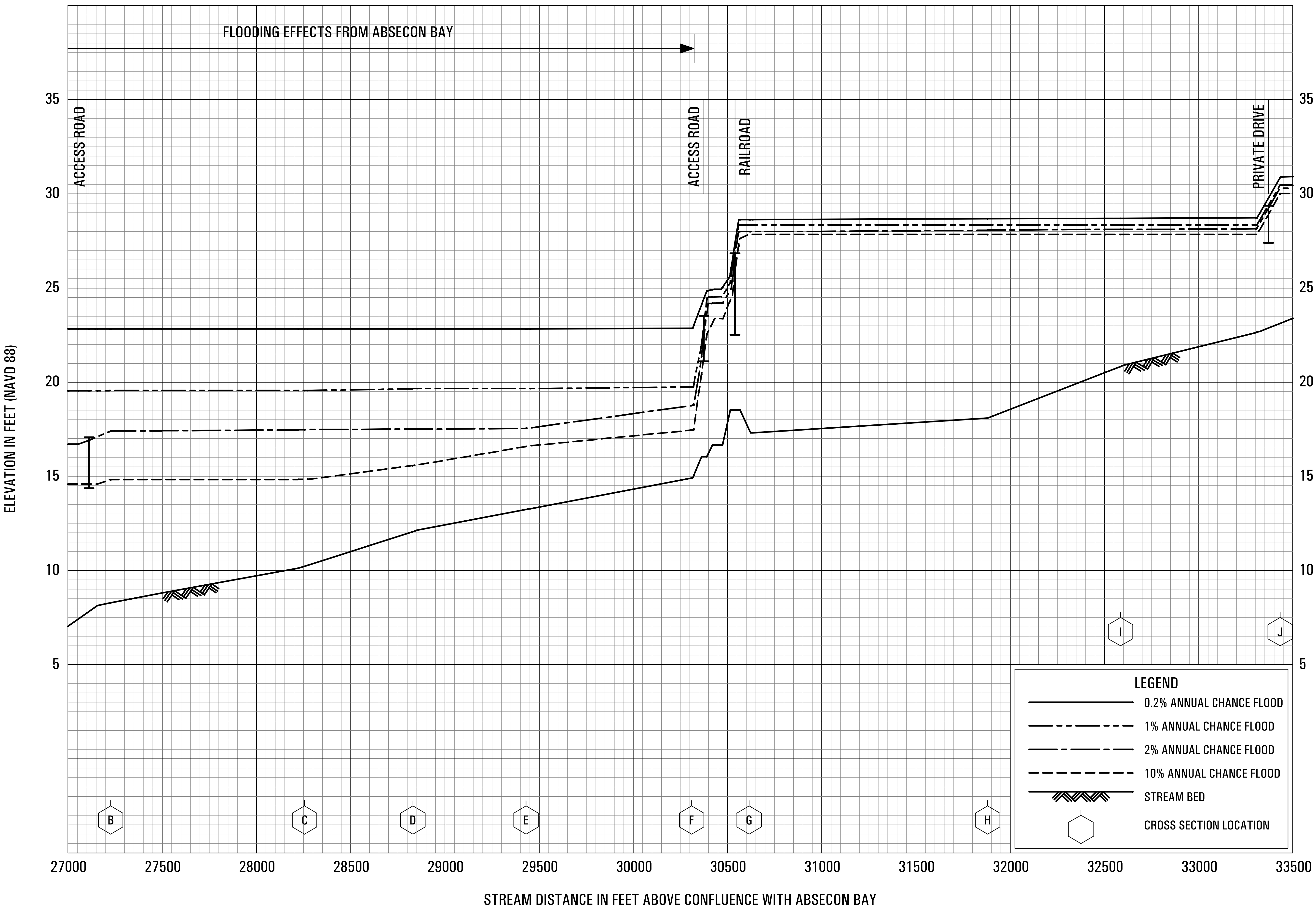
FLOOD PROFILES

NORTH BRANCH ABSECON CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)



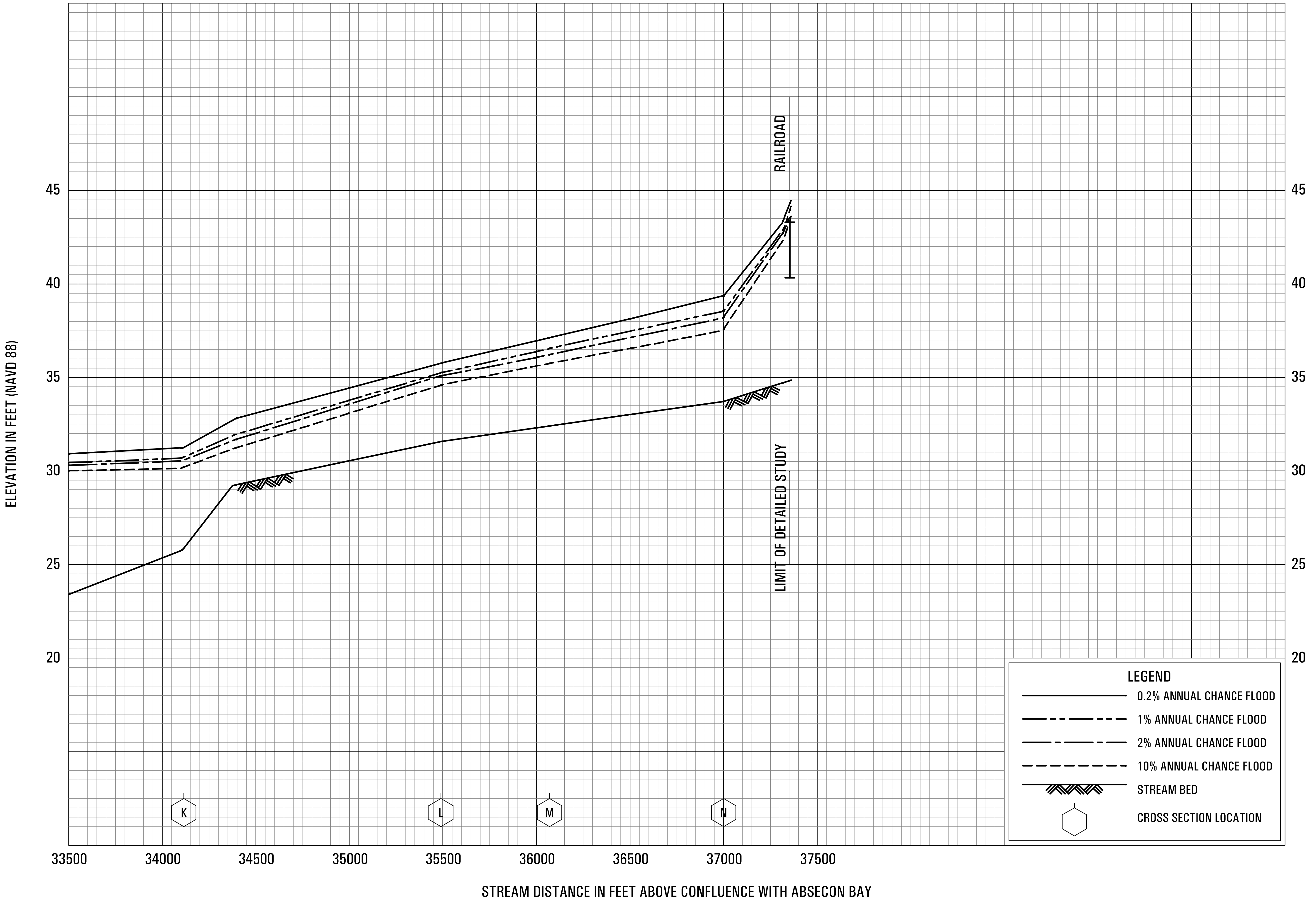
FLOOD PROFILES

NORTH BRANCH ABSECON CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)



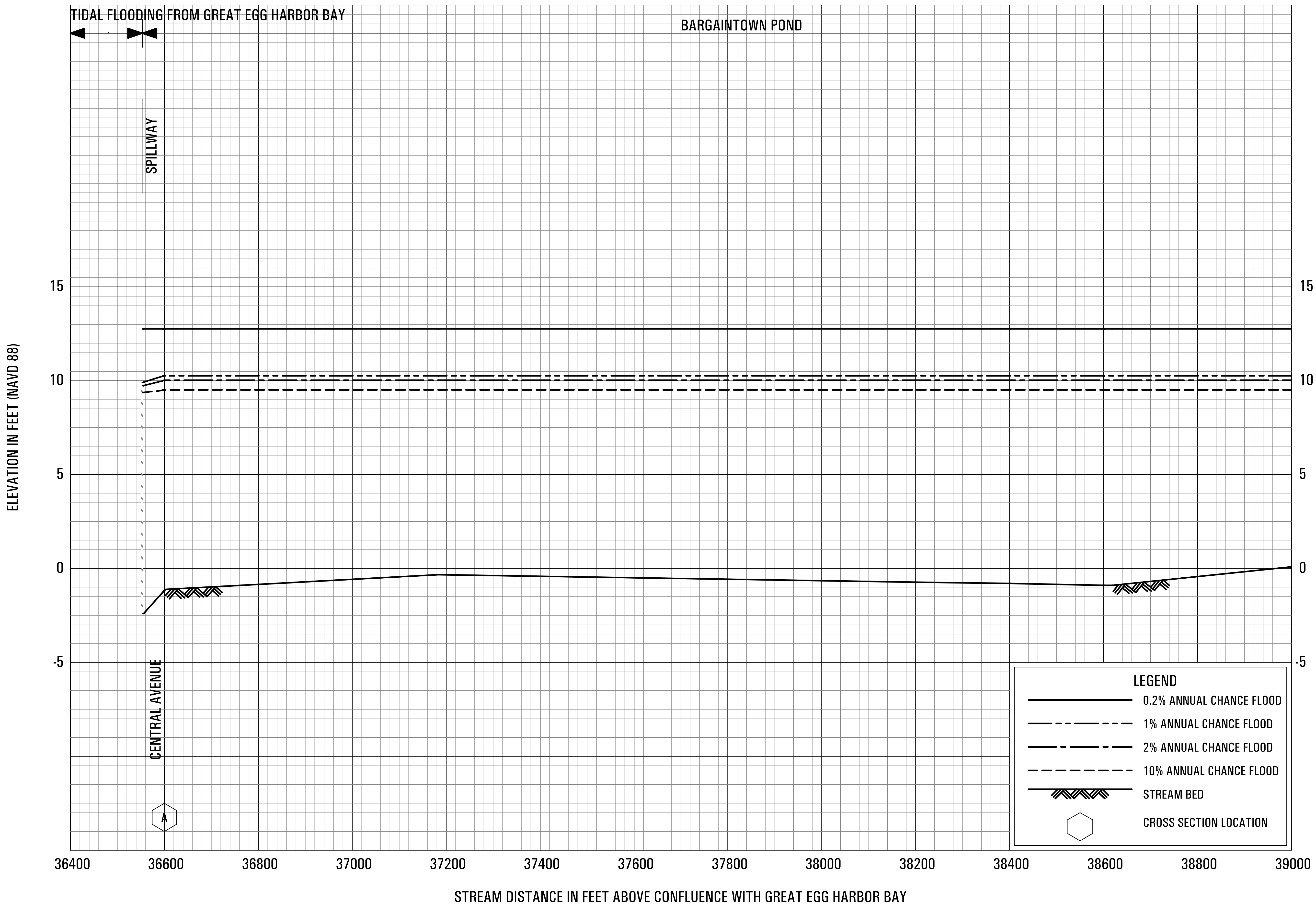
FLOOD PROFILES

NORTH BRANCH ABSECON CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)



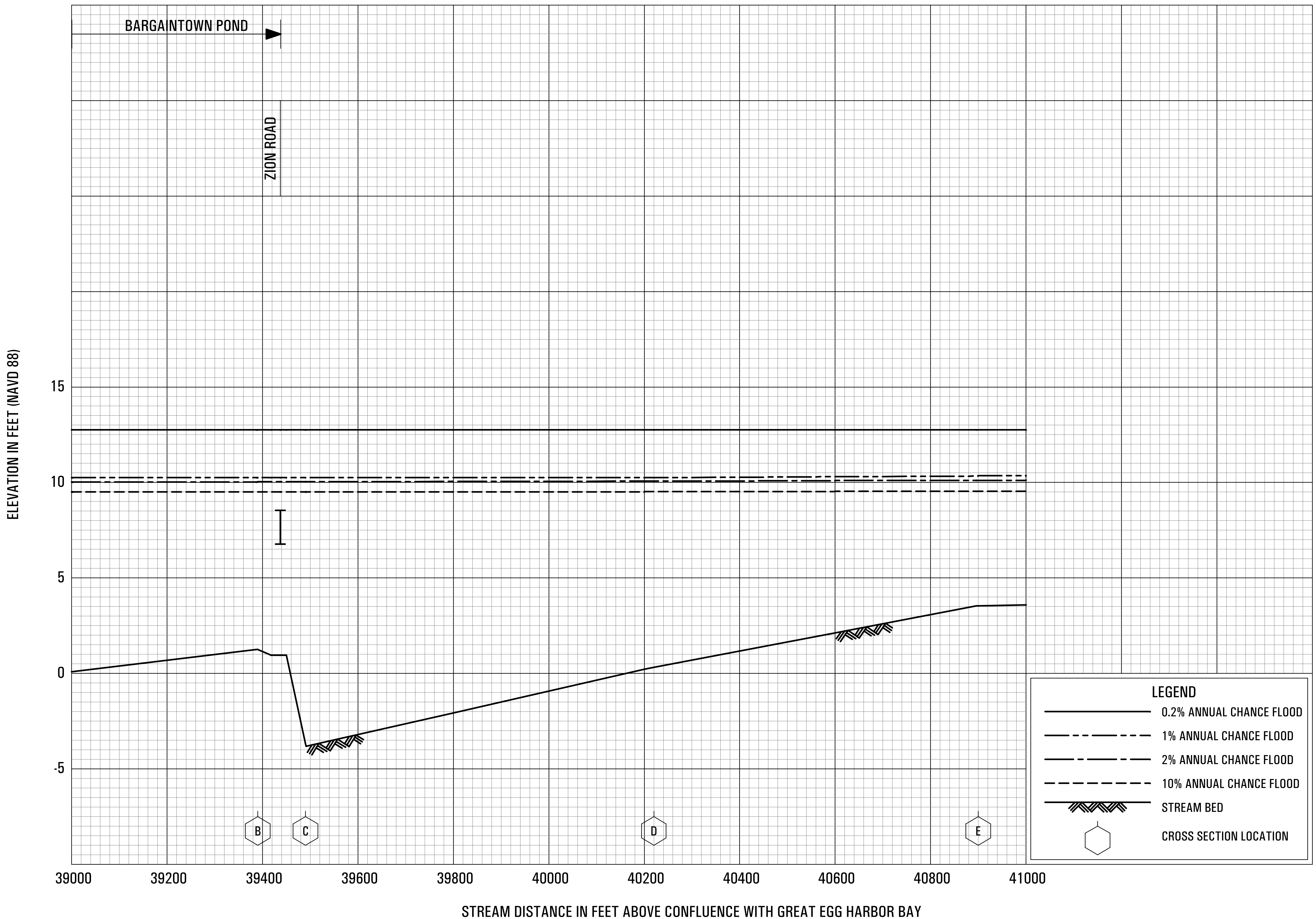
FLOOD PROFILES

PATCONG CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)



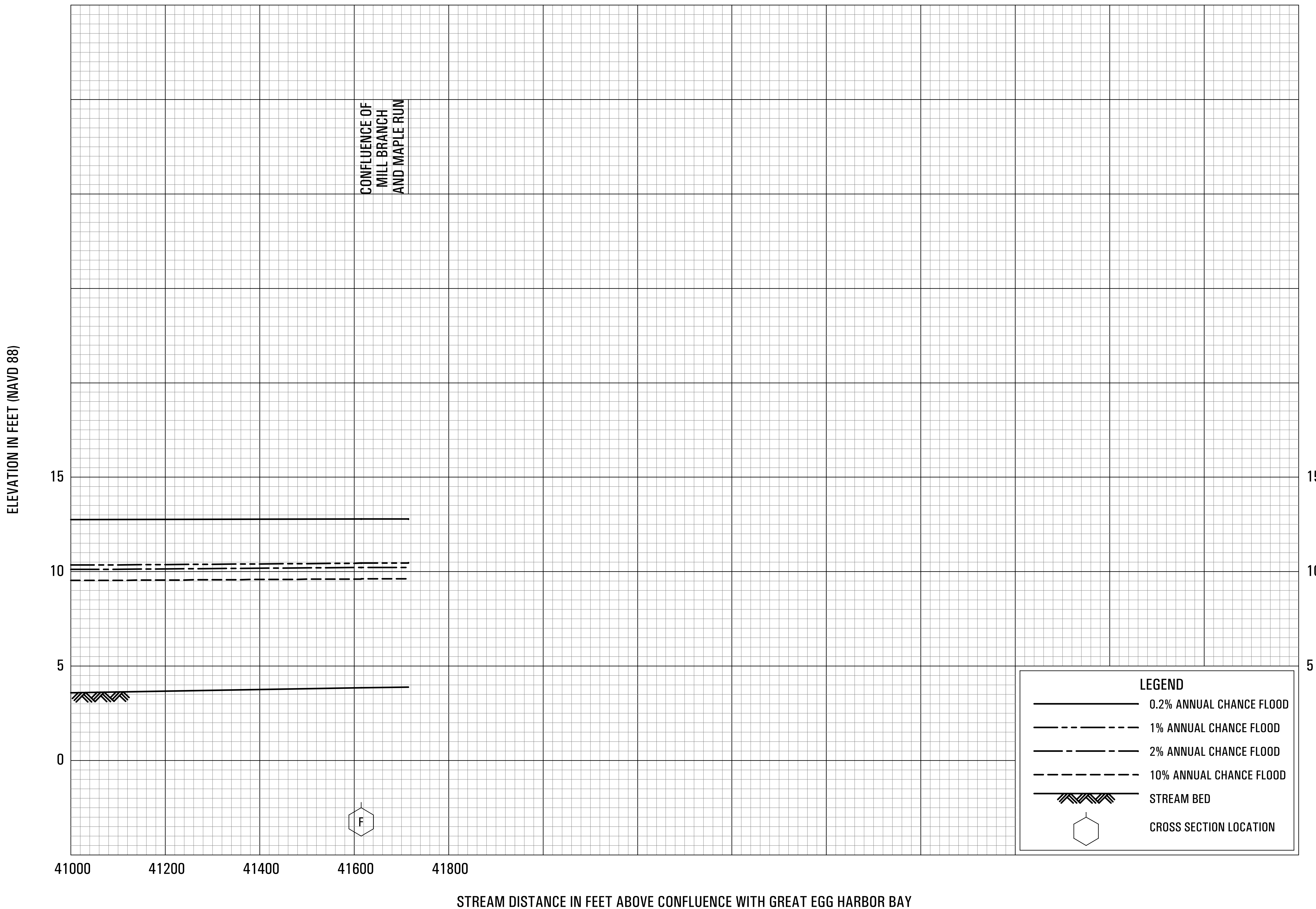
FLOOD PROFILES

PATCONG CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)



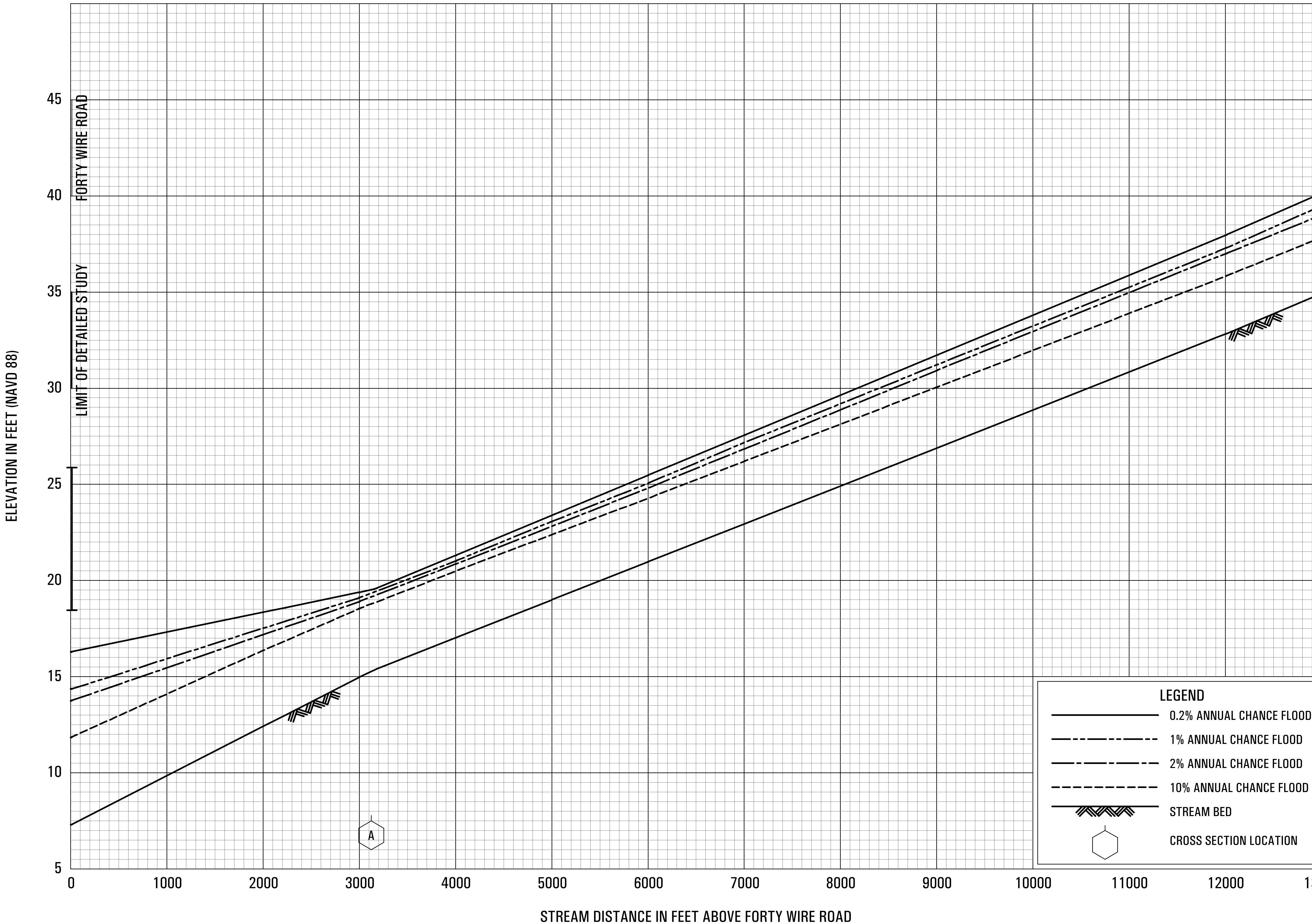
FLOOD PROFILES

PATCONG CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)



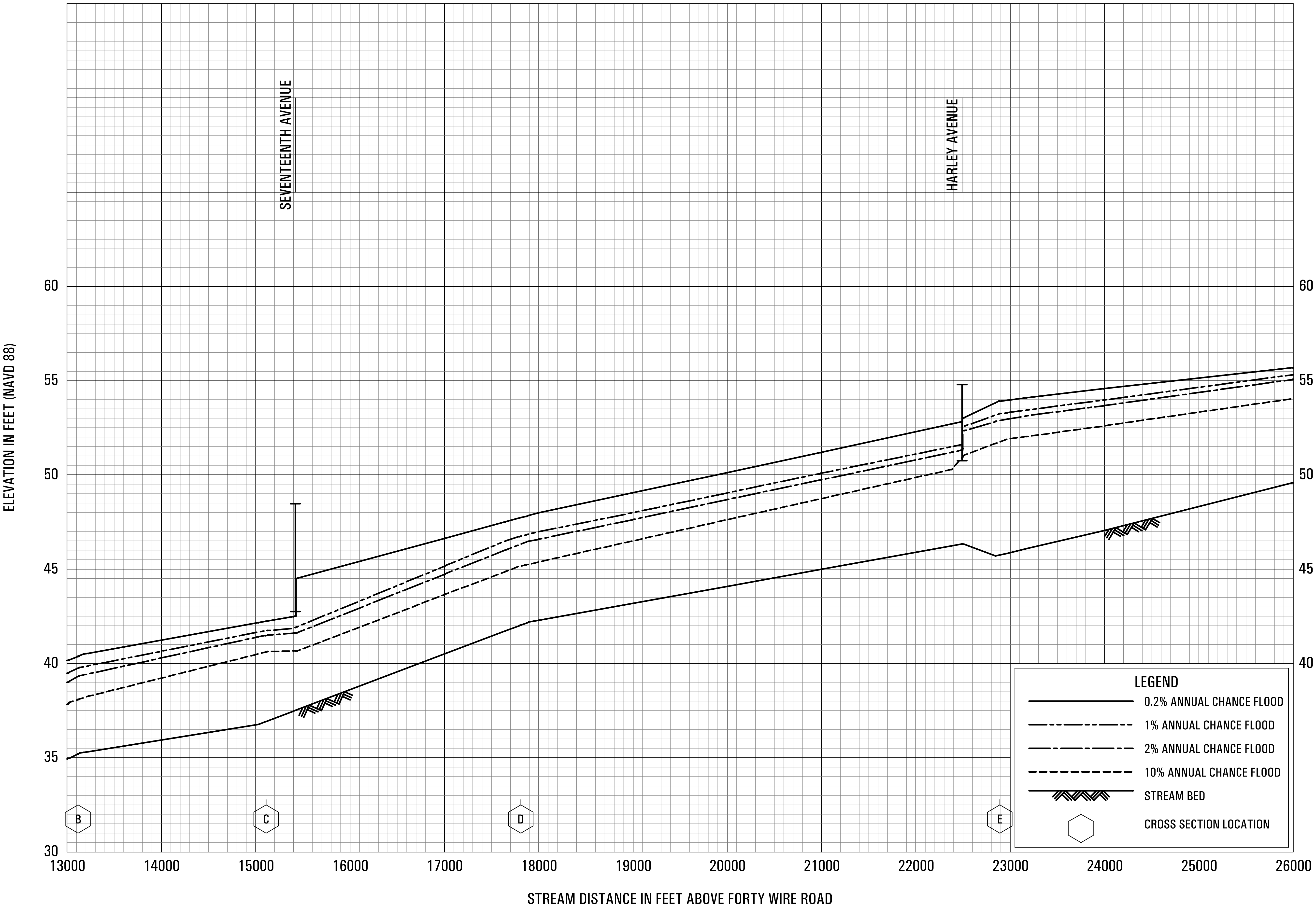
FLOOD PROFILES

SOUTH RIVER REACH 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)



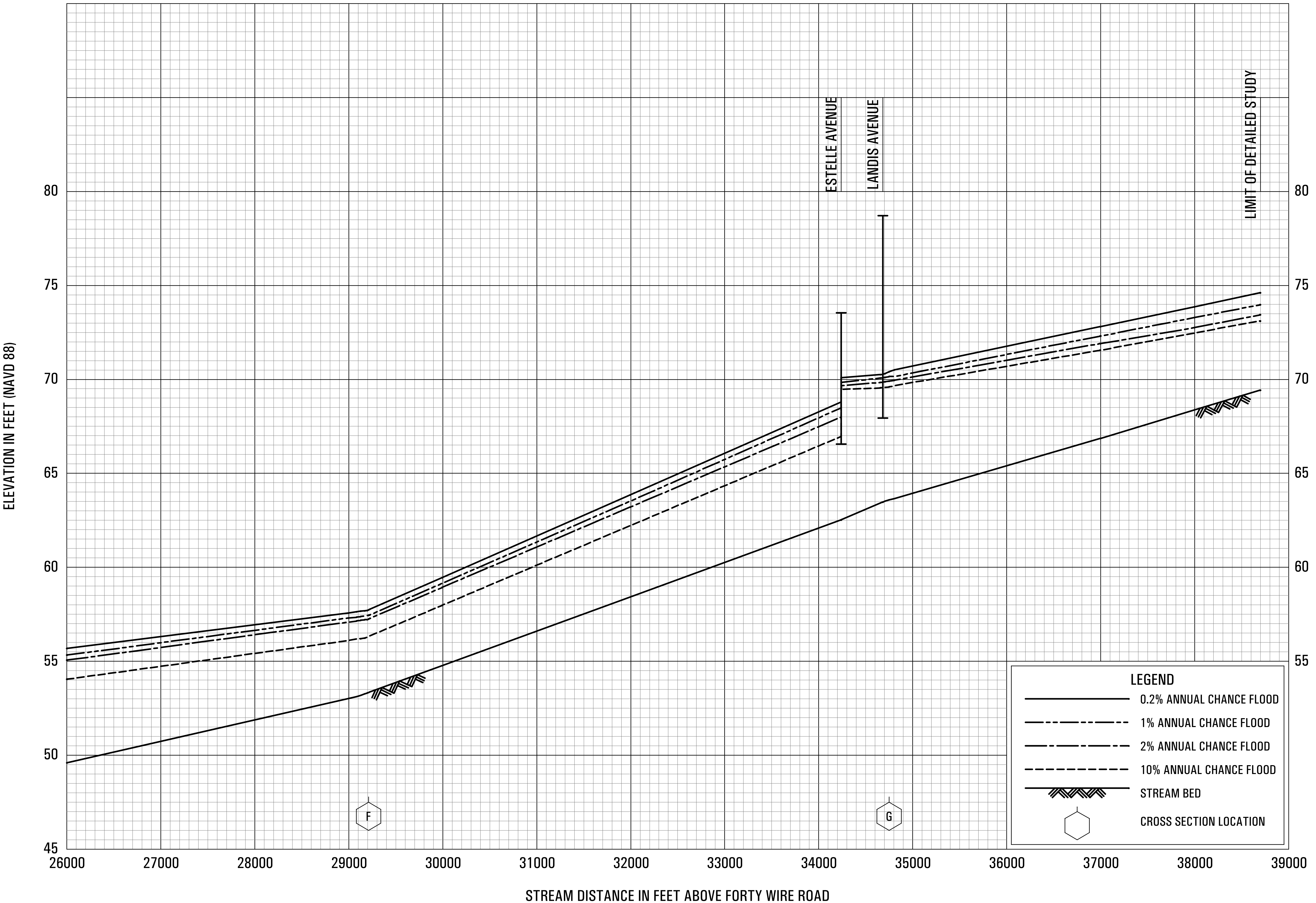
FLOOD PROFILES

SOUTH RIVER REACH 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)



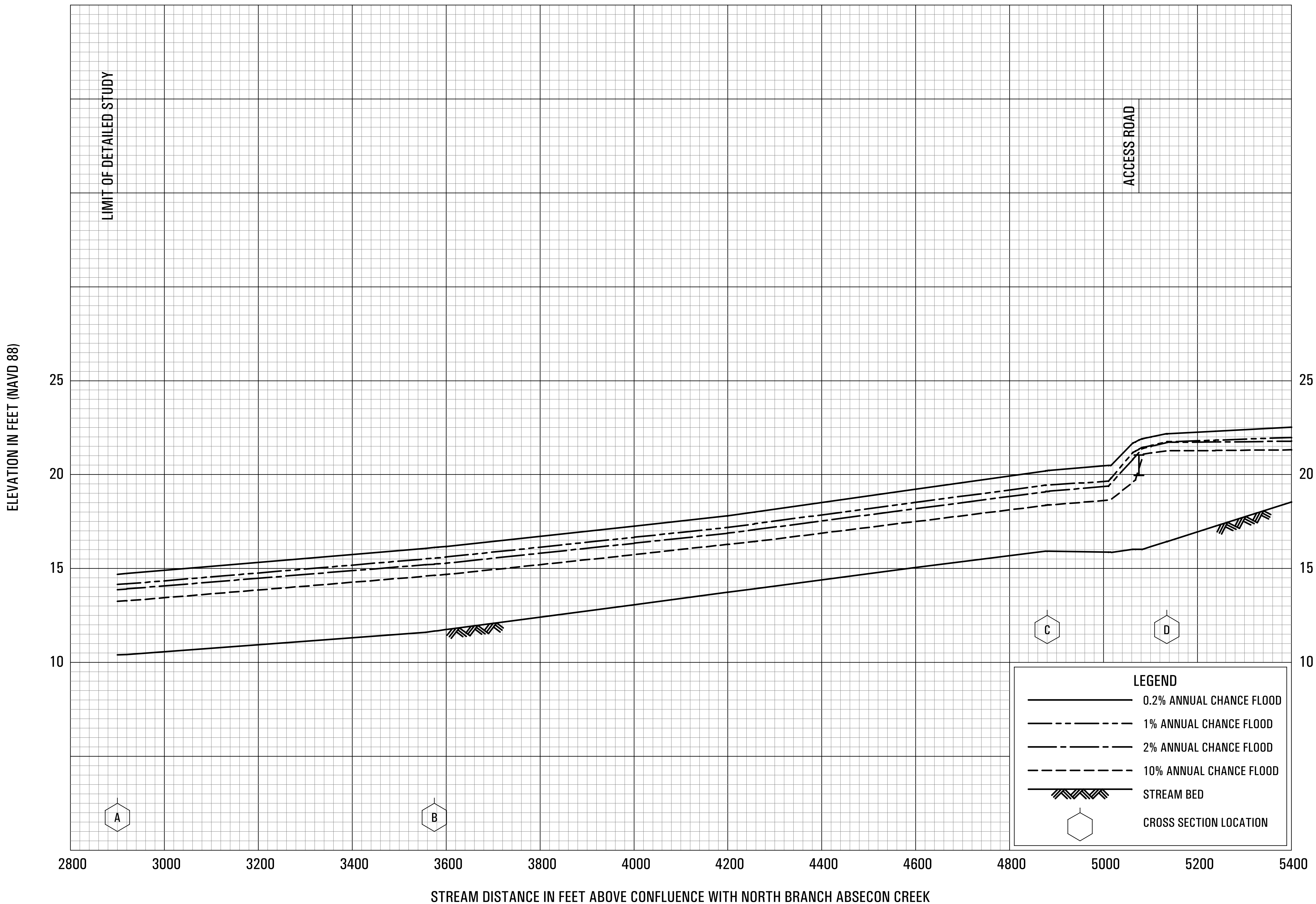
FLOOD PROFILES

SOUTH RIVER REACH 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)



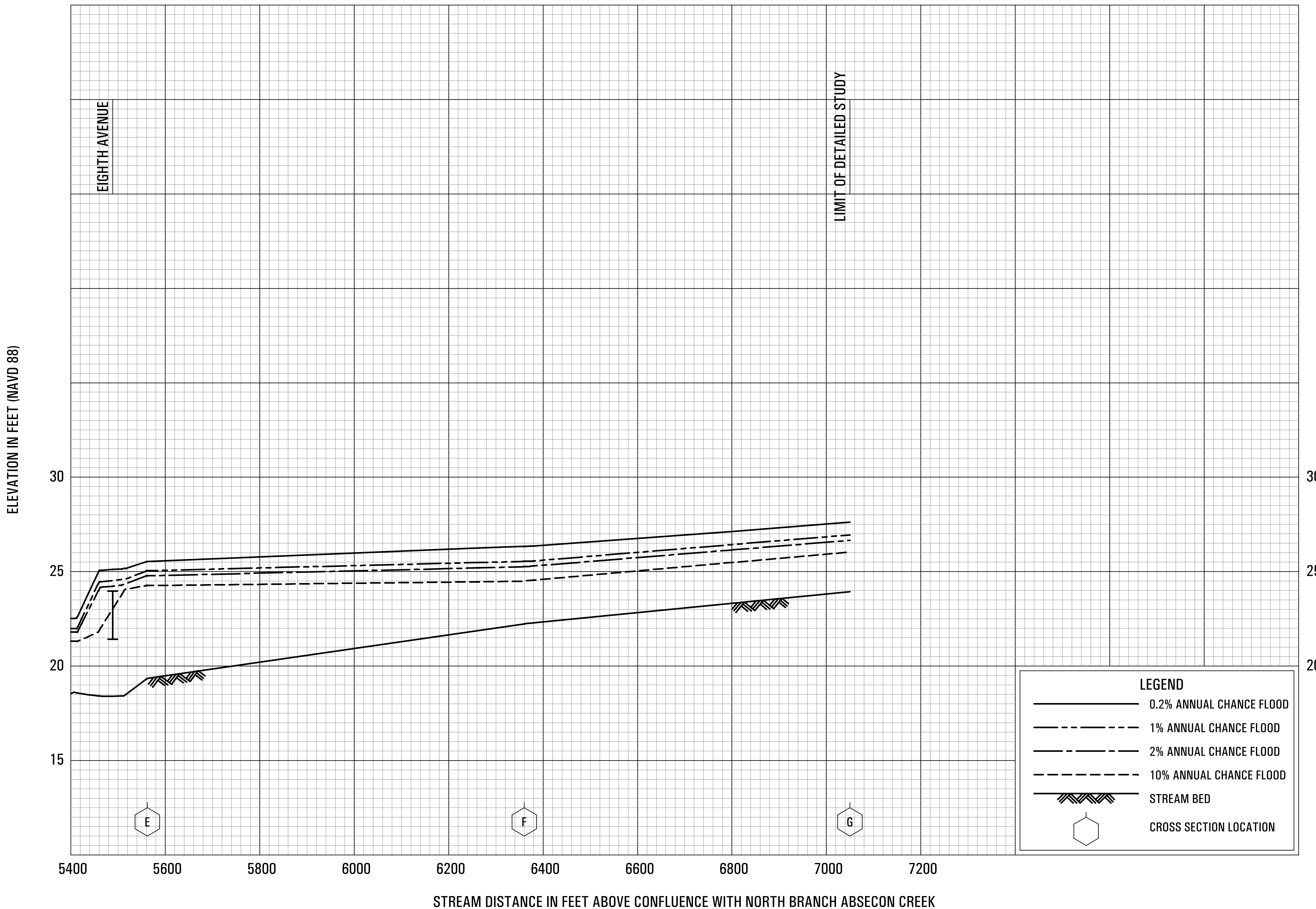
FLOOD PROFILES

TRIBUTARY TO ATLANTIC CITY RESERVOIR

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)



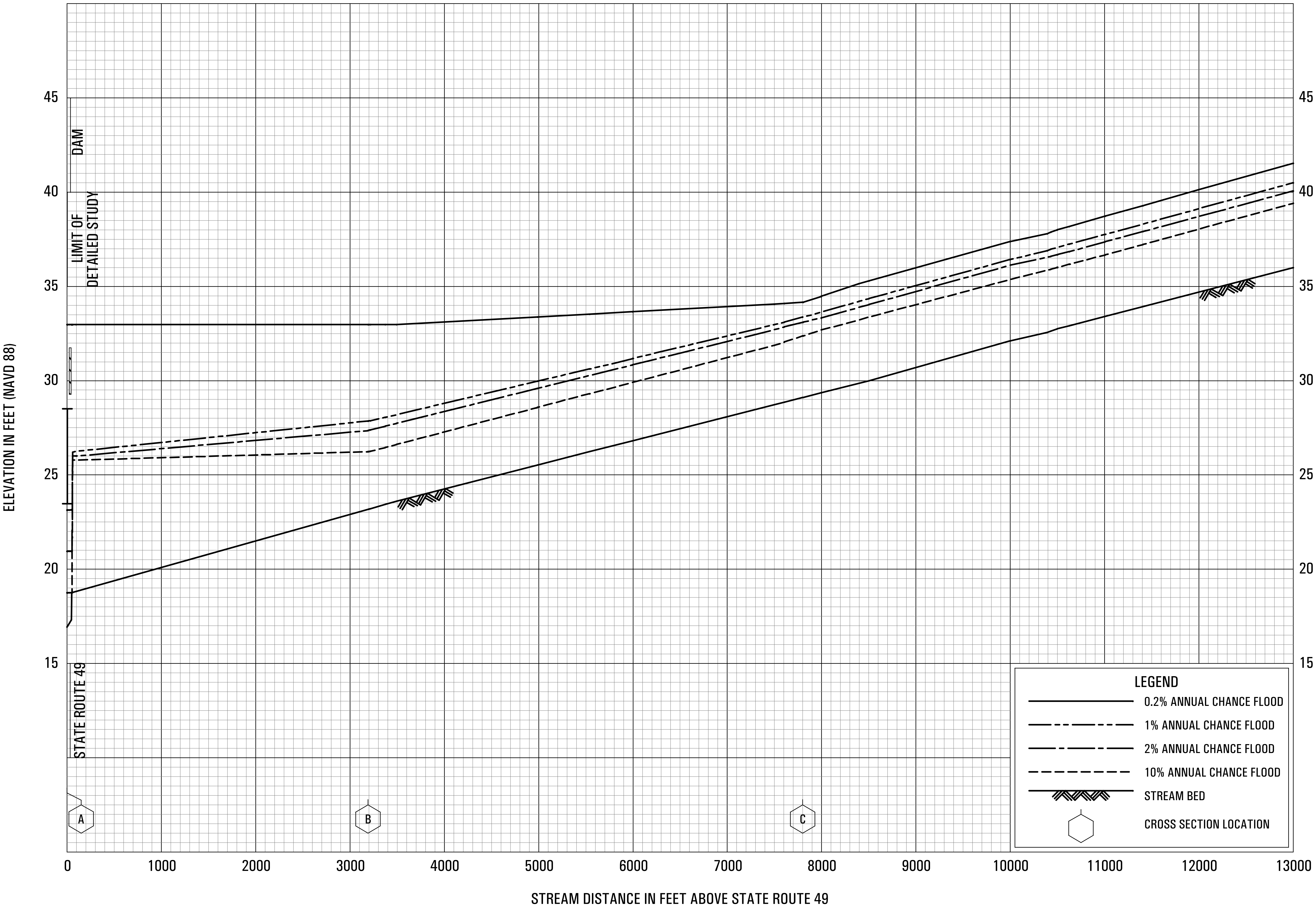
FLOOD PROFILES

TRIBUTARY TO ATLANTIC CITY RESERVOIR

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)



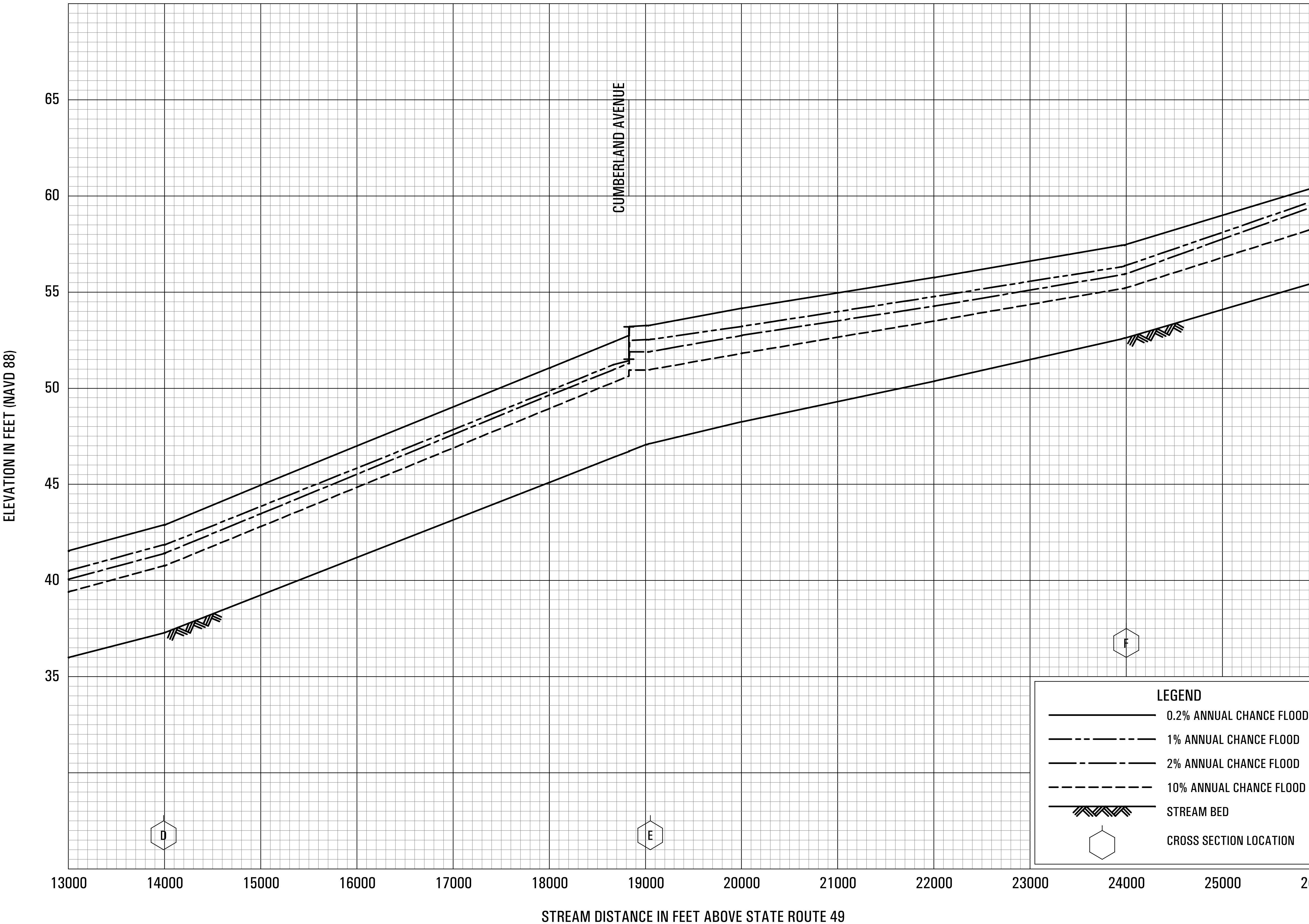
FLOOD PROFILES

TUCKAHOE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)



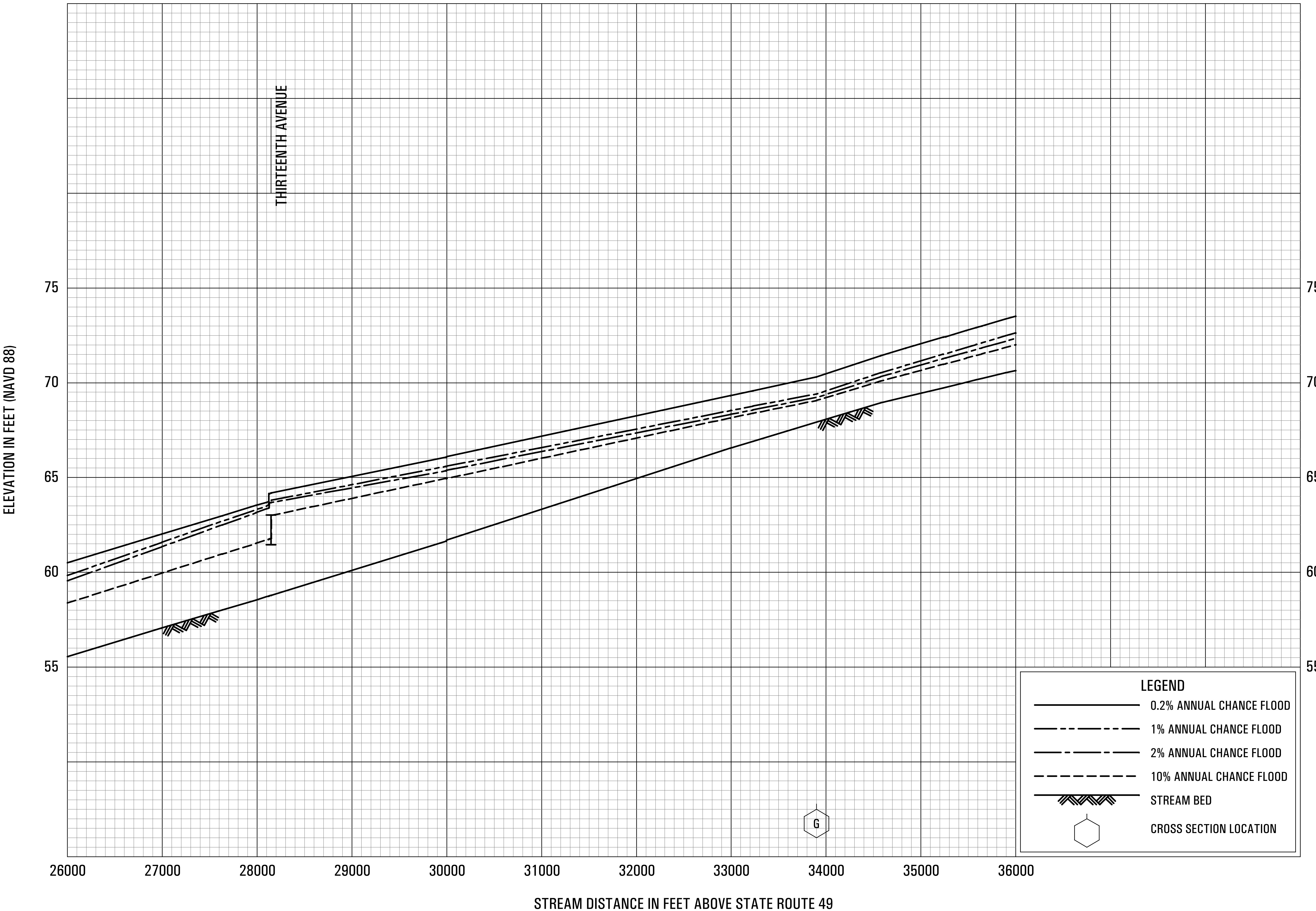
FLOOD PROFILES

TUCKAHOE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)



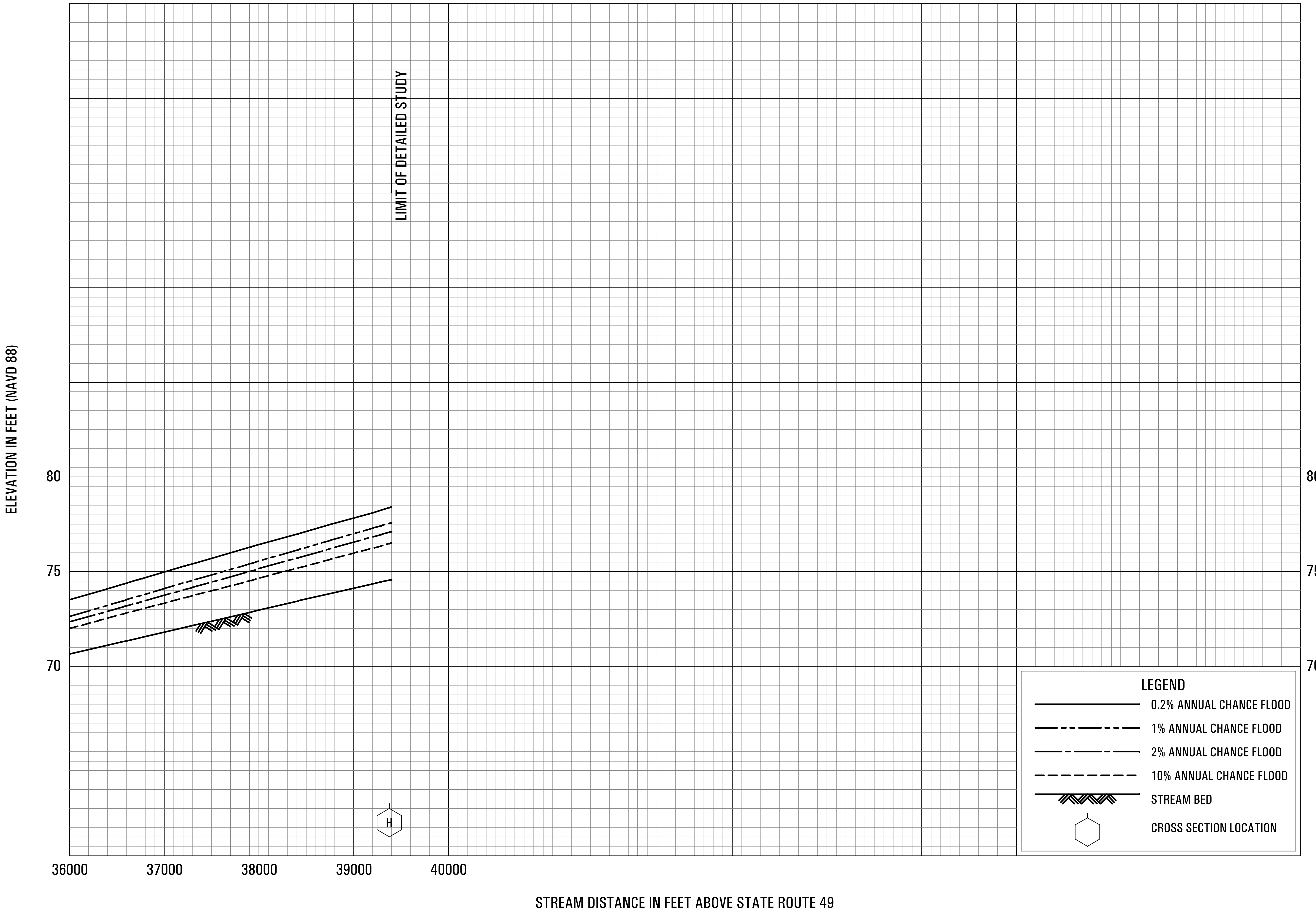
FLOOD PROFILES

TUCKAHOE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)



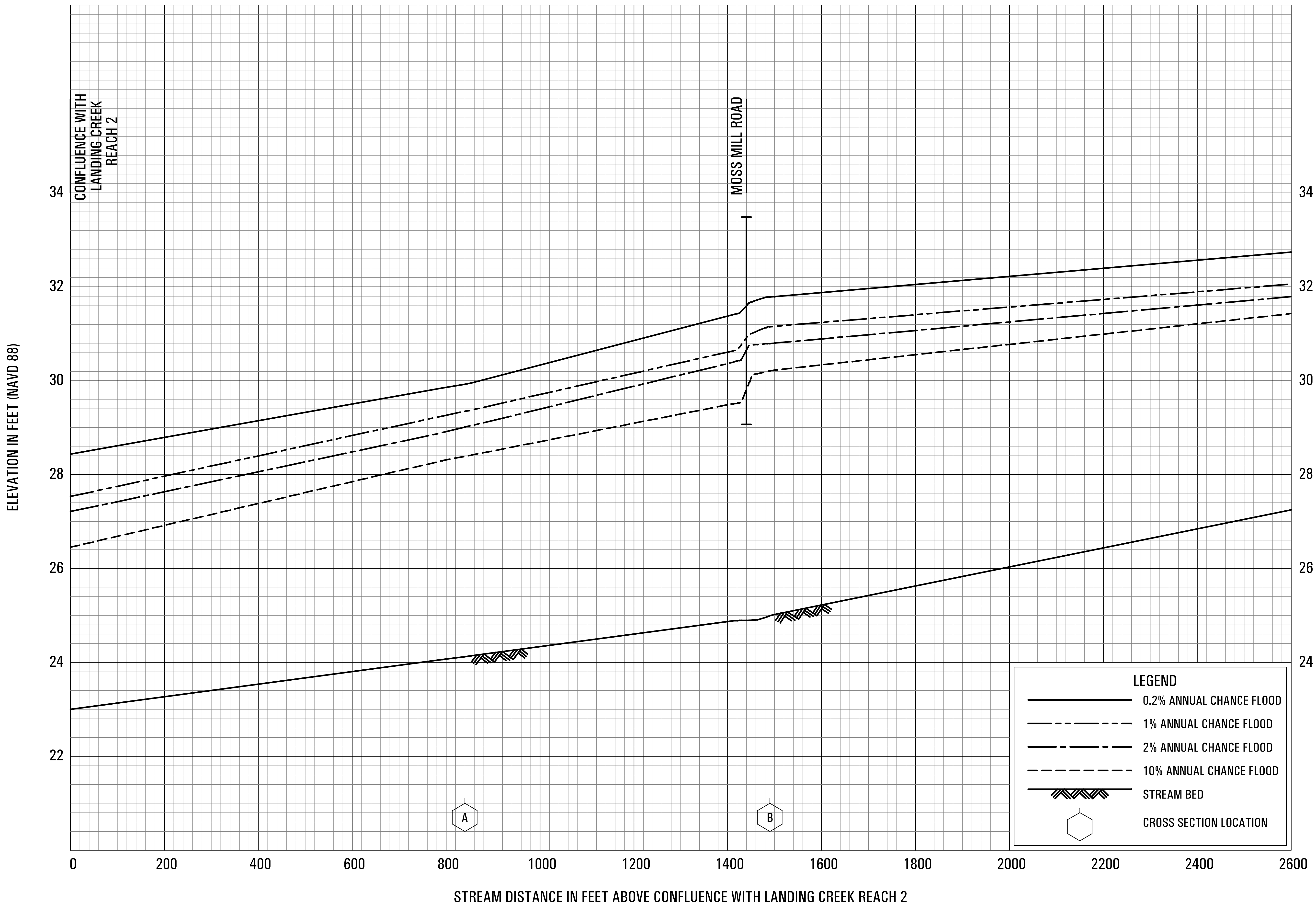
FLOOD PROFILES

TUCKAHOE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)



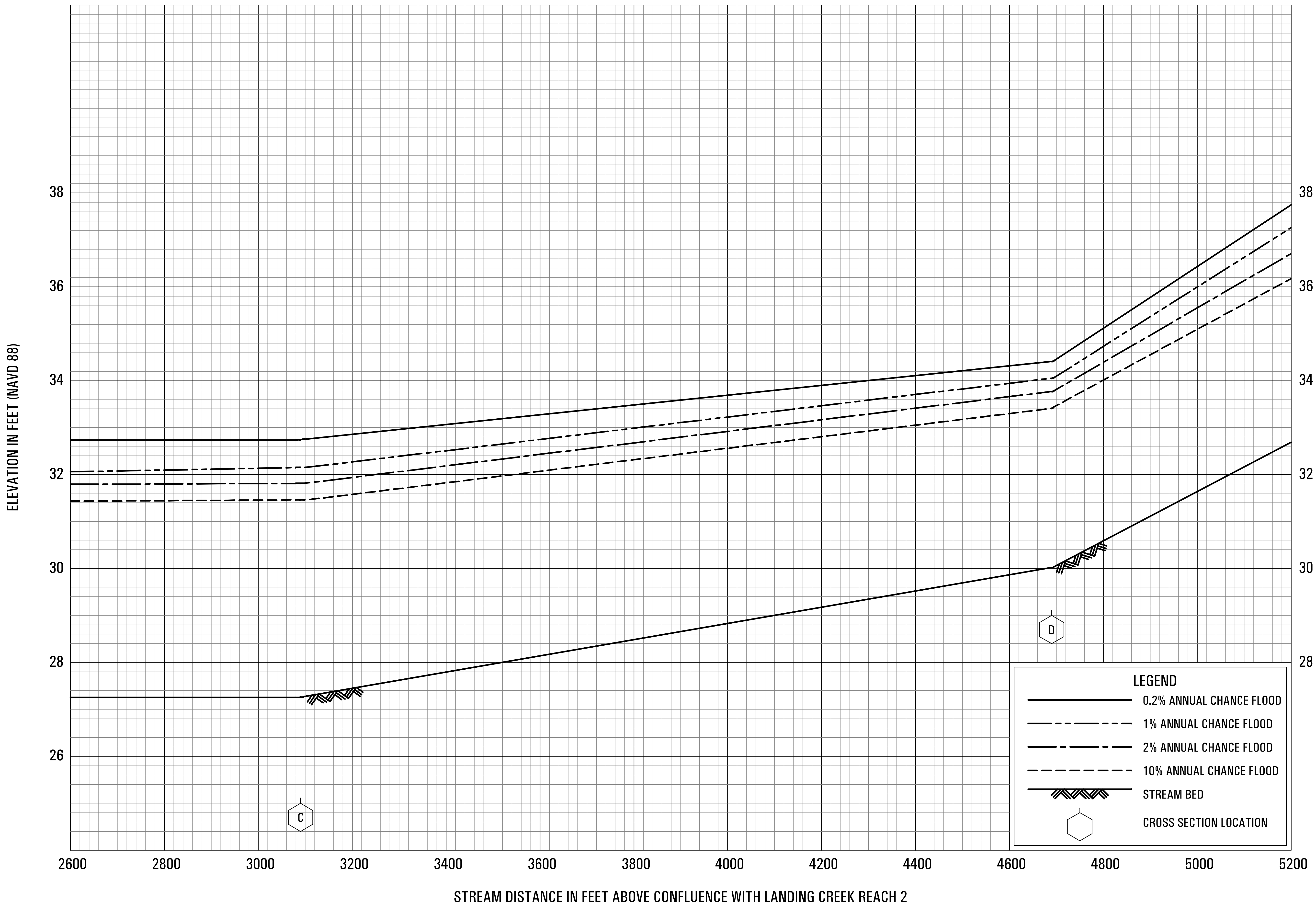
FLOOD PROFILES

UNION CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)



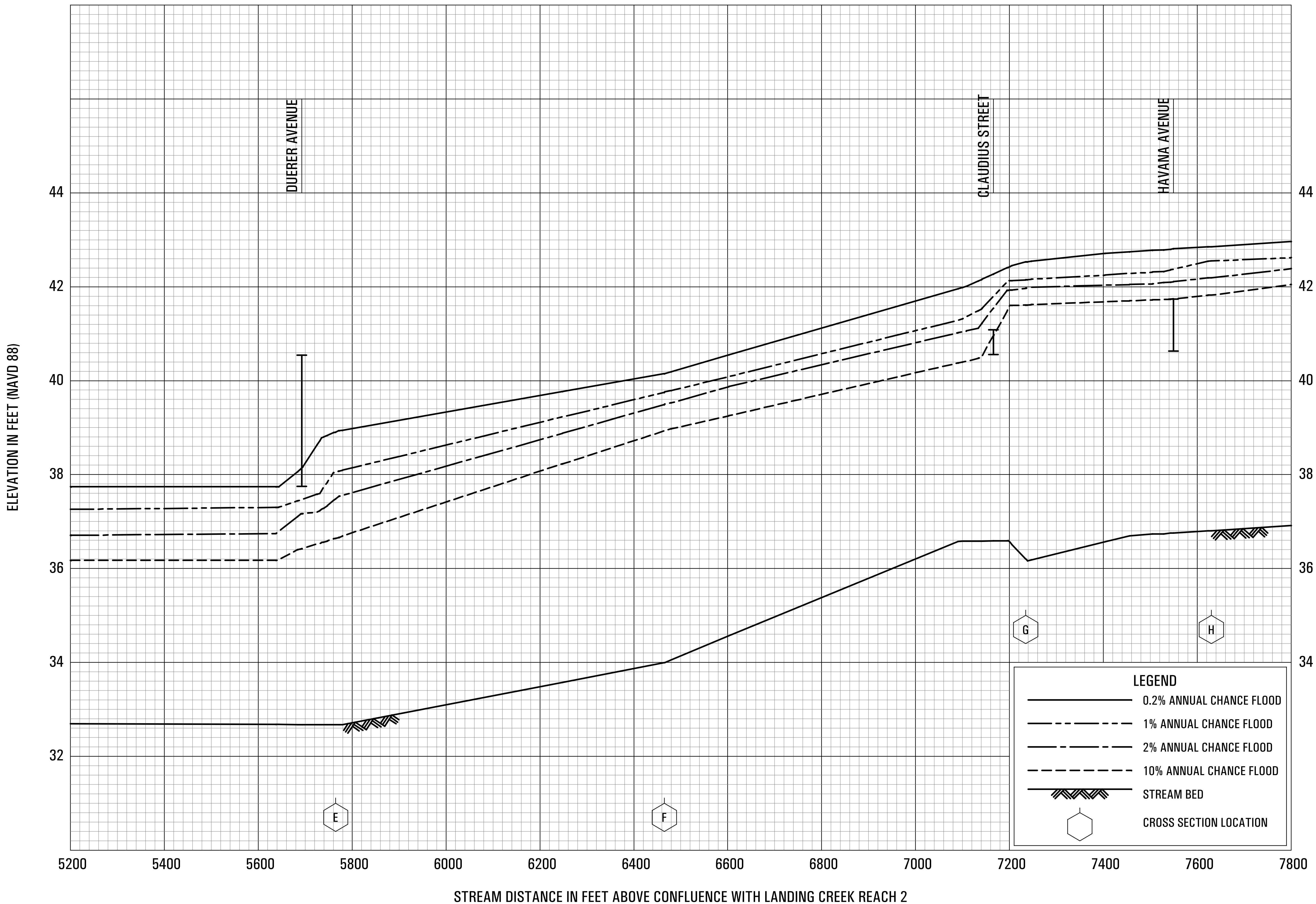
FLOOD PROFILES

UNION CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)



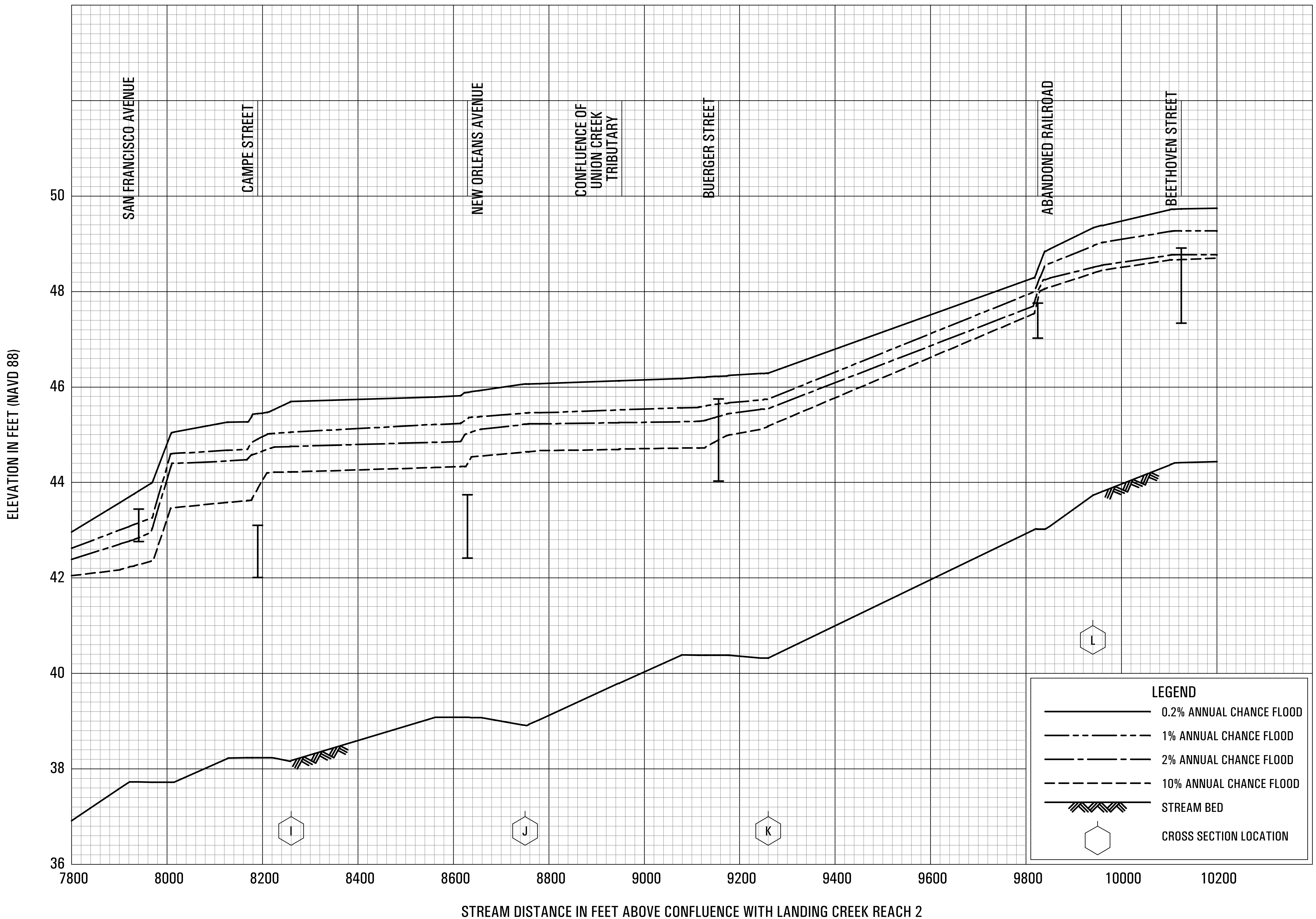
FLOOD PROFILES

UNION CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)



FLOOD PROFILES

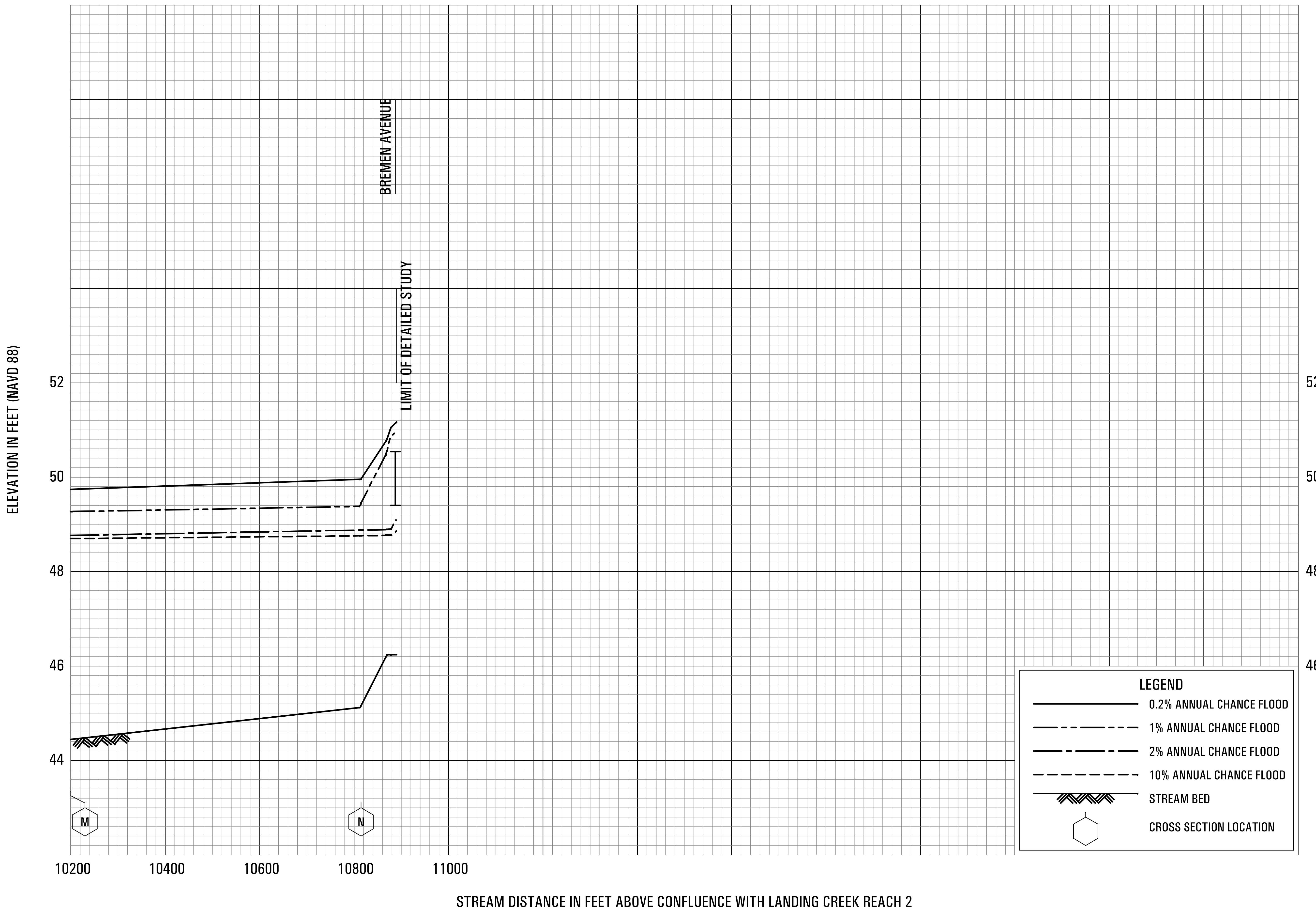
UNION CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)

61P



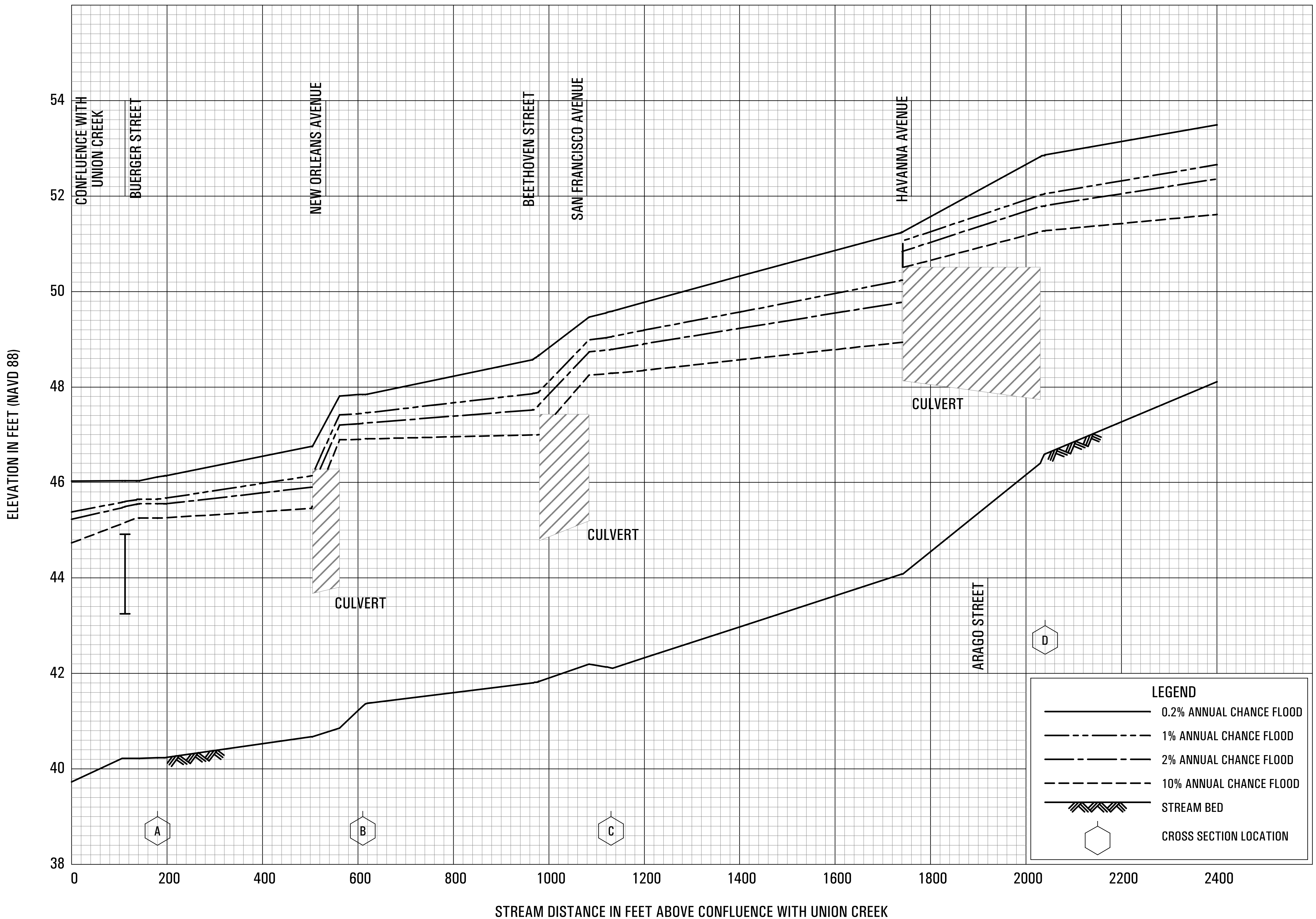
FLOOD PROFILES

UNION CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)



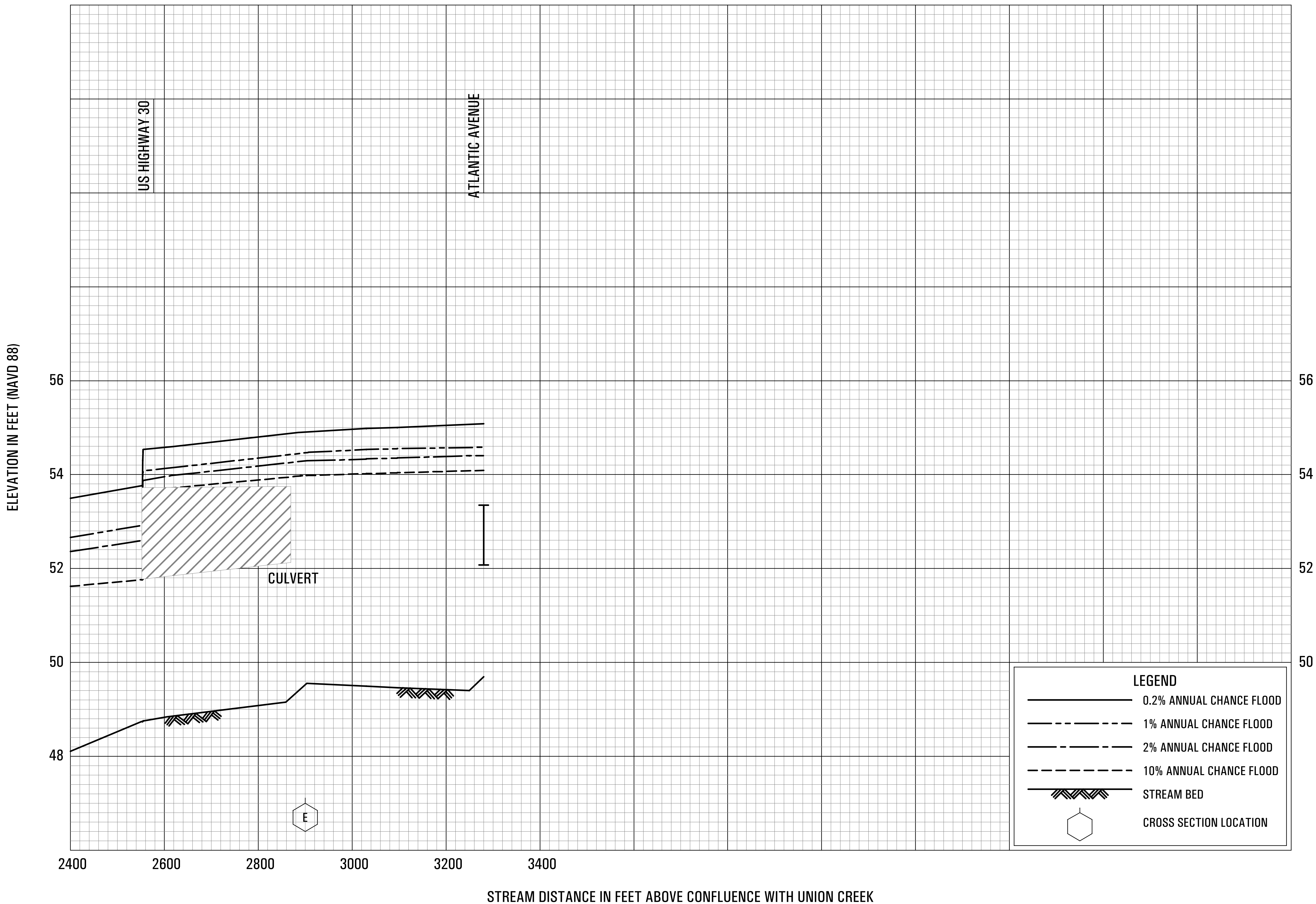
FLOOD PROFILES

UNION CREEK TRIBUTARY

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)



FLOOD PROFILES

UNION CREEK TRIBUTARY

FEDERAL EMERGENCY MANAGEMENT AGENCY

ATLANTIC COUNTY, NJ

(ALL JURISDICTIONS)