FLOOD INSURANCE STUDY

GRANT PARISH, LOUISIANA
AND INCORPORATED AREAS

COMMUNITY NAME	COMMUNITY NUMBER
COLFAX, TOWN OF	220077
CREOLA, VILLAGE OF	220079
DRY PRONG, VILLAGE OF[1]	220280
GEORGETOWN, VILLAGE OF	220288
GRANT PARISH (UNINCORPORATED AREAS)	220076
MONTGOMERY, TOWN OF	220256
POLLOCK, TOWN OF	220305

[1]No Special Flood Hazard Areas Identified

PRELIMINARY

July 31, 2014

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER
22043CV000A

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.

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

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

ATTENTION: On FIRM panels 0080, 0085, 0090, 0095, 0125, 0150, 0175, 0235, 0255, 0260, 0270, 0280, 0285, 0290, 0295, 0325, 0405, 0410, 0415, 0420, 0430, 0440, and 0445, the Red River levee system has not been demonstrated by the community or levee owner(s) to meet the requirements of Section 65.10 of the NFIP regulations in 44 CFR as it relates to the levee's capacity to provide 1% annual chance flood protection. The subject areas are identified on FIRM panels (with notes and bounding lines) and in the FIS report as potential areas of flood hazard data changes based on further review.

FEMA has updated levee analysis and mapping protocols. Until such time as FEMA is able to initiate a new flood risk project to apply the new protocols, the flood hazard information on the aforementioned FIRM panel(s) that are affected by the Red River levee system is being added as a snapshot of the prior effective information presented on the FIRMs and FIS reports dated May 4, 1982 for the Town of Montgomery and November 16, 1995 for Grant Parish and the Town of Colfax. As indicated above, it is expected that affected flood hazard data within the subject area could be significantly revised. This may result in floodplain boundary changes, 1% annual chance flood elevation changes, and/or changes to flood hazard zone designations.

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

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

Initial Parishwide FIS Effective Date:

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FLOOD INSURANCE STUDY
GRANT PARISH, LOUISIANA AND INCORPORATED AREAS

1.0 INTRODUCTION

1.1 Purpose of Study

This parishwide 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 Grant Parish, Louisiana, including the Town of Colfax, the Village of Creola, the Village of Dry Prong, the Village of Georgetown, the Town of Montgomery, the Town of Pollock, and the unincorporated areas of Grant Parish (hereinafter referred to collectively as Grant Parish) and 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 Parish that will be used to establish actuarial flood insurance rates. This information will also be used by Grant Parish to update existing floodplain regulations as part of the Regular Phase of the National Flood Insurance Program (NFIP), and will also be used by local and regional planners to further promote sound land use and floodplain development. Minimum floodplain management requirements for participation in the NFIP are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

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

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

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

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

1.2 Authority and Acknowledgments

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

This FIS was prepared to include the communities within Grant Parish in a parishwide format. Information on the authority and acknowledgments for each jurisdiction included in this parishwide FIS, as compiled from their previously printed FIS reports, is shown below.

Grant Parish (Unincorporated Areas):	The hydrologic and hydraulic analyses for the FIS report dated November 16, 1995 study were performed by Owen and White, Inc., for the Federal Emergency Management Agency (FEMA), under Contract No. EMW-C-3359. This study was completed on June 30, 1993.
Colfax, Town of:	The hydrologic and hydraulic analyses for the FIS report dated March 1979 were performed by the U.S. Army Corps of Engineers (USACE), New Orleans District, for the Federal Insurance Administration (FIS), under Interagency Agreement No. IAA-H-7-76, Project Order No. 9. This work, which was completed in December 1977, covered all significant flooding sources in the Town of Colfax. The hydrologic and hydraulic analyses for FIS report dated November 16, 1995 were performed by Owen and White, Inc., for the Federal Emergency Management Agency (FEMA), under Contract No. EMW-C-3359. This study was completed on June 25, 1993.

There is no previous FIS or FIRM for the and Village of Creola and Village of Georgetown, and no previous FIS for the Town of Montgomery and the Town of Pollock; therefore, the previous authority and acknowledgment information for these communities is not included in this FIS.

Parishwide Analyses

The approximate hydrologic and hydraulic analyses for this first-time parishwide study were performed by Risk Assessment, Mapping, and Planning Partners (RAMPP), for the Federal Emergency Management Agency (FEMA) under Contract No. HSFEHQ-09-D-0369, Task Order HSFE06-10-J0002. This work was completed on February 25, 2011.

Base map information shown on this FIRM was derived from multiple sources. Base map files were provided in digital format by Louisiana Oil Spill Coordinator (LOSCO), Louisiana Department of Transportation and Development (LDOTD), U.S. Geological Survey (USGS), U.S. Census Bureau, and RAMPP.

The projection used in the production of this FIRM is Louisiana State Plane North FIPS Zone 1701 (Feet). The horizontal datum is North American Datum of 1983 (NAD 83). Differences in the datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdictional boundaries. These differences do not affect the accuracy of this FIRM.

1.3 Coordination

Consultation Coordination Officer's (CCO) meetings may be held for each jurisdiction in this parishwide 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 the previous FIS reports for Grant Parish and the incorporated communities within its boundaries are shown in Table 1, "Initial and Final CCO Meetings" (FEMA, February 25, 2011)

TABLE 1 - INITIAL AND FINAL CCO MEETINGS

Community	Initial CCO Date	Intermediate CCO Date	Final CCO Date
Grant Parish (Unincorporated Areas)	April 1975	*	August 11, 1978
	June 27, 1990	*	December 13, 1994
Colfax, Town of	April 1975	*	August 11, 1978
	June 27, 1990	*	December 13, 1994

*No date available

The initial CCO meetings were held with representatives from FEMA or the FIA, USACE, the communities, and the study contractors to explain the nature and purpose of FIS reports, and to identify the streams to be studied by detailed

methods. The final CCO meetings were held with representatives from FEMA or the FIA, the communities, and the study contractors to review the results of the studies.

For this parishwide FIS, the initial CCO meeting was held on February 25, 2011. This meeting was attended by representatives from the Town of Colfax, Grant Parish, the State of Louisiana, FEMA, and RAMPP.

2.0 AREA STUDIED

2.1 Scope of Study

This FIS covers the geographic area of Grant Parish, Louisiana. Portions of the Kisatchie National Forest are located within the detailed study area.

Floods caused by backwater from Bayou Rigolette system, which consists of the Bayou Rigolette, Sugarhouse Bayou and Bayou Grappe, and floods caused by the Red River were studied in detail.

Detailed riverine flooding was studied on Bayou Rogolette, Bayou Darrow, Sugarhouse Bayou, Bayou Grappe, Corfeine Bayou, Flagon Bayou, and Clear Creek.

The Bayou Rigolette analysis begins at the Rapides Parish line and continues upstream for 23 miles to Lake Iatt. Approximately 4 miles of this stream is called Walden Bayou.

The Bayou Darrow analysis is impacted by Bayou Rigolette. The two streams share a common floodplain throughout the length of Bayou Darrow.

The Sugarhouse Bayou analysis begins at its confluence with Bayou Rigolette and continues upstream for 5 miles. At the confluence with Bayou Valentine, about 1,700 feet downstream of State Highway 158, Sugarhouse Bayou becomes Bayou Grappe.

The Bayou Grappe analysis begins at its confluence with Sugarhouse Bayou and continues upstream for 3.8 miles to its confluence with Corfeine Bayou.

The Corfeine Bayou analysis begins at its confluence with Bayou Grappe and meanders upstream for 5.3 miles to U.S. Highway 71 north of the community of Aloha.

The Flagon Bayou analysis begins at the Rapides Parish line and continues upstream for 9.6 miles to State Highway 8 near the community of Bentley.

The Clear Creek analysis begins at its confluence with Little River and continues upstream for 14.5 miles to U.S. Highway 165. The first few miles of this reach were not studied in detail since they are entirely Little River backwater.

Floods caused by the Little River were studied in detail as part of the original U.S. Department of Housing and Urban Development, Flood Hazard Boundary Map (FHBM) H-01-42, June 17, 1977. This information appears on the current effective FIRM dated November 16, 1995. No further information was available, so the FIRM served as the source for the water surface elevation.

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

No Letters of Map Revision (LOMRs) have been completed for the Parish.

2.2 Community Description

Grant Parish is located in central Louisiana and consists of an area of 664 square miles. It is bordered by Rapides, Natchitoches, Winn, and LaSalle Parishes. Its southerly boundary is at a distance of approximately 10 miles from the City of Alexandria. From the Town of Colfax, which is the seat of the parish, to Baton Rouge, the state capital, the distance is approximately 135 miles. Based on the 1990 census, Grant Parish has a total population in the unincorporated areas of 17,526, a population density of 26.4 people per square mile (U.S. Census Bureau, August 2009). Over 80 percent of the parish population is in unincorporated areas. Incorporated communities include the Towns of Colfax, Montgomery, and Pollock, and the Villages of Creola, Dry Prong and Georgetown.

According to the U.S. Census Bureau, Grant Parish had a population of 18,696 in 2000. The 2010 population was 22,309, representing a 19.3% change from 2000 to 2010 (U.S. Census Bureau, June, 2014). Grant Parish has a total land area of 663.29 square miles.

Although Grant Parish is considered a hill parish with 90 percent of its area being classified as hill land, its alluvial lands are more extensively populated. The land is drained by the Red River and its tributaries on the west, and by Little River and its tributaries on the east. The alluvial valley of the Red River contains extensive agricultural development.

Approximately half of Grant Parish is located in the Red River Basin. The eastern half of Grant Parish is located in the Ouachita Basin. This area consists primarily of hill lands, although some lowlands exist at the eastern edge of the parish along Little River. The area is densely forested, with substantial acreage within the Kisatchie National Forest. Only small areas are suitable for farming.

Grant Parish has a semitropical climate and enjoys a complete seasonal cycle with pleasant spring and fall seasons. Winter months are usually mild, with cold spells of short duration, and the summer months are quite warm. The average annual

temperature for Grant Parish is 68 degrees, with a January average of 49 degrees and a July average of 81 degrees. Winters are short, with occasional temperatures below freezing. The average monthly precipitation is 4.19 inches. Since 1887, the average annual rainfall has been 56 inches, with a historical range from 36 inches to 88 inches. 1991 reached a near record with 87.4 inches.

The topography in Grant Parish ranges from 250 feet National Geodetic Vertical Datum (NGVD) near the Winn Parish-Grant Parish line in the north, to 80 feet NGVD in the floodplain of Bayou Rigolette near the Grant Parish-Rapides Parish line in the south.

The Red River, running along the west flank, and the Little River, running along the east flank, constitute a system of collectors which drain flows from all the streams in Grant Parish.

2.3 Principal Flood Problems

The past history of flooding on streams within Grant Parish indicates that flooding may occur during any season of the year. The majority of major floods occur during spring and fall rains associated with frontal systems moving through the parish. Rainfall during these summer months is usually isolated thunder showers and tropical storm activity.

Flooding in Grant Parish results primarily from intense rainfall over the drainage basin. Some flooding can be experienced as a result of high water on the Red River, but for the most part the Red River levee system protects the parish from high water along the Red River.

The many interconnecting, meandering streams and bayous, typical of the alluvial valley of the Red River, have in the past been inadequate in providing drainage of water, causing overbank flooding. The principal streams that drain the Colfax area are Bayou Rigolette, Sugarhouse Bayou, and Bayou Grappe. In some reaches, these channels have constricted sections and are clogged with vegetation, further hindering drainage.

An examination of stage and discharge records on streams in the Colfax area indicate that in major floods, floodwaters collect and pond in the area upstream of the confluence of Bayou Rigolette and Sugarhouse Bayou, into Lake Iatt and the valley of Iatt Creek. Lake Iatt, completed in 1956 as a recreation project, exerts little regulatory influence on flood flows of Bayou Rigolette.

Prior to 1956, the principal cause for flooding in the parish was overflow from the Red River. A project to levee the Red River and provide floodgate outlets was completed. The resulting “sump area” was heavily forested. However, this land was subsequently cleared for agriculture so the interior stream could no longer transport the flow. Shallow flooding in the Aloha-Rigolette area now occurs every 2 to 3 years.

In addition to backwater flooding, Colfax is also subject to flooding by heavy localized rainfall. The entire town is poorly drained, but the area lying between the

Kansas City Railroad tracks and the Red River levee experiences more serious problems. Drainage from this area is limited by the railroad embankment, which has a grade several feet above natural ground. A field inspection of the area revealed that in some locations, inlets to the storm drains are higher than natural grade. This causes ponding of rainfall until such time that the water level exceeds the inlet elevation or seeks another path out of that particular catchment area.

Flooding along Clear Creek is also a common event. The stream has a wide, low-lying floodplain. However, the area is so densely vegetated that the transmission of flood waters is impeded.

Major flooding is known to have occurred in Grant Parish in 1945, 1953, 1966, 1968, 1973, 1974, 1975, 1976, and 1979. No recurrence intervals or estimate of damages are available for past floods.

2.4 Flood Protection Measures

Flooding from Red River is controlled by a federal levee system. In 1941, a project, "Grant Parish Below Colfax," provided protection from Red River flooding between the Town of Colfax and the mouth of Bayou Darrow.

The project "Aloha-Rigolette Area, Louisiana" (USACE, 1991), was authorized under the Flood Control Act of 1941, and incorporated into the project "Red River below Denison Dam, Oklahoma, Texas, Arkansas, and Louisiana" by the Flood Control Act of July 24, 1946. The project included enlargement of the existing levee on the left descending bank of the Red River between mile 151 and mile 141 and construction of a new levee downstream of this point to the hills north of Pineville, Louisiana, opposite mile 124 (river mile cir. 1938). The project provided levees, clearing and snagging, diversion channels, and a gated flood-control structure. These projects combine to provide nearly complete protection from Red River flooding and improve drainage within the levee.

Another plan has been implemented to provide further relief to the Aloha-Rigolette area. This plan transfers a substantial amount of floodwater from Bayou Rigolette to Bayou Darrow through Sam's Bayou. Bayou Darrow was widened and a floodgated control structure was constructed on the Red River (USACE, 2002).

Bayou Rigolette was enlarged and a floodgate was installed on the confluence with the Red River.

The project was completed in June 1956. The project serves to protect the area from direct overflow and backwater flooding by the Red River, and provides as improved outlet for flood flows originating within the tributary watershed. During periods when the Red River is high, the floodgate is closed and tributary runoff ponded in a natural sump, to be evacuated when the Red River stages recede.

Despite the beneficial effect of the existing project, nearly all of Colfax in the vicinity of the Bayou Rigolette system remains subject to backwater flooding to some degree.

In the Town of Colfax some drainage improvements have been made. These improvements are generally limited to enlargement of ditches and drainage culverts. However, these improvements exert little affect when the primary source of flooding is backwater from the Bayou Rigolette system.

A unique flood protection measure practiced in Colfax for the area between the railroad tracks and the Red River levee is blocking the drainage culverts that pass beneath the railroad tracks in an attempt to prevent the influx of backwater from the Bayou Rigolette system. When flooding on the Bayou Rigolette system threatens, the culverts are blocked on the upstream side with sandbags and a pumper truck from the fire department is used to relieve any rainfall that might accumulate. This procedure is far from being failsafe and was not considered in the hydraulic and hydrologic analyses.

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

3.0 ENGINEERING METHODS

For the flooding sources studied in detail in the Parish, 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 exceedance) in any 50-year period is approximately 40 percent (4 in 10), and, for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the Parish at the time of completion of this FIS. Maps and flood elevations will be amended periodically to reflect future changes.

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

3.1 Hydrologic Analyses

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

The hydrology for the Red River was taken from a USACE design memorandum (USACE, March 1974).

A gaging station on Red River located at Alexandria, Louisiana, about 35 miles downstream from Colfax, was the principal source of data for defining a discharge-frequency relationship for the river. Values of the 10-, 50-, 100-, and 500-year peak discharges were obtained from a Log-Pearson Type III distribution (Water Resources Council, December 1967) of annual peak flow data based on 43 years of record (1928-1970) at Alexandria and related to Colfax as discussed in Section 3.2.

An automatic stage recorder maintained by the USACE and located about 2 miles east of Colfax on Bayou Rigolette was the principal source of data for defining a stage-frequency relationship for this bayou.

For the Bayou Rigolette system, a unit hydrograph and routing procedure was used. A Clark Unit Hydrograph was developed utilizing time of concentration (TC) and storage coefficients (R) values determined for subbasins by an Espey Huston equation (Espey Huston, Inc., Development of Hydrologic Methodology). Loss rates of 1.0 inch initial and 0.05 inch per hour uniform for woodlands or 0.5 inch initial and 0.02 inch uniform for agricultural lowlands were deducted from rainfall obtained through technical papers (U.S. Department of Commerce, Technical Paper No. 40, Technical Paper No. 49, and Technical Memorandum NWS Hydro-35). The rainfall and unit hydrographs were routed and combined using the Modified Puls Method of the HEC-1 program (USACE, September 1981). Volume-discharge relationships based on topographical features were computed using the USACE HEC-2 program (USACE, September 1988).

For Bayou Rigolette, discharges are significantly influenced by Iatt Lake reservoir. This facility reduces discharges at the upstream limit of the detailed analysis area from 26,100 cubic feet per second (cfs) to 5,500 cfs and extends to time to peak by two days. In addition, parallel streams such as Sam's Bayou and Bayou Darrow transmit significant flows at various reaches.

Sugarhouse Bayou, Bayou Grappe, and Corfeine Bayou all have extensive storage areas. The analysis included a diversion of discharge into these areas using the Split Flow routine of HEC-2 (USACE, September 1988). Reservoir routing procedures were used to analyze return flow.

Hydrologic analyses information is not available for Little River that was studied in detail.

Peak discharge-drainage area relationships for the streams studied by detailed methods are shown in Table 2, "Summary of Discharges".

TABLE 2 - SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-PERCENT-ANNUAL-CHANCE	2-PERCENT-ANNUAL-CHANCE	1-PERCENT-ANNUAL-CHANCE	0.2-PERCENT-ANNUAL-CHANCE
Bayou Grappe					
Upstream of Sugarhouse Bayou	19.2	N/A	N/A	950	N/A
Downstream of Corfeine Bayou	11.0	N/A	N/A	780	N/A
Bayou Rigolette					
At Louisiana Highway 492	317	N/A	N/A	13,800	N/A
Downstream of Sugarhouse Bayou	270	N/A	N/A	5,500	N/A
Downstream of Iatt Lake	238	N/A	N/A	5,500	N/A
Clear Creek					
Upstream of Hardwater Lake	20.8	N/A	N/A	10,200	N/A
At Walker Ferry Road	13.8	N/A	N/A	9,100	N/A
At Clear Creek Road	9.2	N/A	N/A	6,610	N/A
At Barron Road	5.2	N/A	N/A	3,900	N/A
At U.S. Highway 165	1.1	N/A	N/A	1,080	N/A
Corfeine Bayou					
Upstream of Bayou Grappe	2.6	N/A	N/A	270	N/A
At U.S. Highway 71	0.8	N/A	N/A	180	N/A
Flagon Bayou					
At Flagon Creek Road	14.3	N/A	N/A	6,424	N/A
At Airport Road	8.4	N/A	N/A	4,600	N/A
At State Highway 8	1.7	N/A	N/A	1,430	N/A
Red River					
Station 140.5[1]	66,810.2	142,500	204,000	248,600	348,960

TABLE 2 - SUMMARY OF DISCHARGES

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
Sugarhouse Bayou					
Upstream of confluence with Bayou Rigolette	24.6	N/A	N/A	1,160	N/A
Downstream of Bayou Grappe	19.2	N/A	N/A	950	N/A

[1]Miles above mouth

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for the flooding sources studied in Approximate A zones affecting the Parish.

There are only four streams in the study area that have usable USGS stream gage data. Due to the limited number of gages and reservoirs on the stream reaches being studied, the discharges for all ungaged streams were computed using the USGS Regression Equations for Louisiana, the National Flood Frequency Program - Methods of Estimating Flood Magnitudes and Frequency in Rural Areas in Louisiana, 2001 (USGS, 2001). Weighted discharges obtained from a PEAKFQ analysis, for all the gaged streams (USGS, 2006). Peak flood discharges were calculated for the 1- percent annual-chance storm event.

3.2 Hydraulic Analyses

All streams with approximate floodplains on the effective maps were restudied using new topographic data. This process also developed floodplains for most previously unstudied streams draining areas greater than one square mile. For these streams, water surface elevations for the 1-percent annual-chance floods were computed using HEC-RAS Version 4.0. For the stream cross sections, elevation data from LiDAR points was used to create a terrain model of Grant Parish. The elevation data was obtained from "Atlas: The Louisiana Statewide GIS" LSU CADGIS Research Laboratory, Baton Rouge, LA, 2007 (http://atlas.lsu.edu). Structure information was not included in the approximate models for this study. The river channels and banks were reviewed using aerial imagery and topographic data, and representative Manning's n values were selected using engineering judgment. The known Water Surface Elevation (WSEL) option was used as the starting condition for all the streams that flow into a stream or lake with existing BFEs on effective maps. Normal depth was used as the

starting condition for all other streams. Floodplains for the studied streams were delineated using the terrain model.

Hydraulic information was taken directly from the historic FIS for each community in Grant Parish for which they were available.

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

Much of the hydraulic analysis of the Red River was taken from the USACE, New Orleans District working papers on hydrology (USACE, March, 1974). Cross section data for the Red River were obtained from the most recent hydrographic survey.

Roughness coefficients (Manning's "n") for the Red River were developed by calibration of the backwater profile model, which consisted of adjusting the Manning's "n" values until observed stages and slopes of historic flood profiles could be reproduced. To compute the 10-, 2-, and 1-percent-annual-chance flood events flow from the peak discharge-frequency curve was input to the HEC-2 step backwater program (USACE, October 1973). The peak discharge-frequency curve was extrapolated to obtain the 0.2-percent-annual-chance flood flow. Extrapolation of the stage-discharge relationship indicted that the levee system would be overtopped by several feet of water for this event at Colfax. Furthermore, data indicated that overtopping of the levee system would be imminent along various other reaches of the Red River (the Red River project design flood has a recurrence frequency of once per 100 years). Numerous hydraulic variables would be associated with levee overtopping. Also, the scope and impact of flood-fighting procedures connected with such a rare event would be difficult to project. Consequently, a detailed analysis of the 0.2-percent-annual-chance flood event within the study area was considered impractical. Therefore, with the knowledge that overtopping of the levee system result in undetermined depths of flooding in the study area, the 0.2-percent-annual-chance flood profile along the study reach was included in this report only for display purposes.

The analysis of flooding from the Bayou Rigolette system principally involves the frequency analysis of the annual peak stage data on Bayou Rigolette east of Colfax. From this analysis it was determined that for floods of a 10-percent-annual-chance frequency and greater, the Town of Colfax is subject to backwater flooding from Bayou Rigolette. This is further supported by interviews with local citizens and review of data taken intermittently on Bayou Grappe approximately 5 miles upstream of the confluence with Sugarhouse Bayou and Valentine Bayou. In this 5-mile reach, when flood stages are equal or greater than the 10-year event, there is only a few tenths of a foot of slope between the two points.

As an example, to illustrate the flooding situation described above, in the flood of 1968 the stage on Bayou Rigolette east of Colfax was 90.74 feet NGVD (associated with a discharge of 3,520 cubic feet per second), the stage at Bayou Grappe 5 miles upstream was 90.78 feet NGVD.

The main channels of the Bayou Rigolette system are well outside the corporate limits and flooding within the community is backwater. Because the Kansas City Southern Railroad crosses the study area above natural grade, analysis of the effect of the railroad embankment on drainage was studied to determine the elevation of water entering storage between the railroad embankment and the Red River levee. The analysis was made to study the effects of the 1-, 24-, and 48-hour duration storms over this area. The results of this analysis indicate that the volumes of water generated in these small urban areas (0.5 square miles or less) are not sufficient to raise elevations higher than those associated with the backwater effect from the Bayou Rigolette system.

Hydraulic information is not available for Little River that was studied in detail.

Cross section data for channels and bridges were obtained from field surveys. Elevation data for overbank areas were obtained from spot elevations and contours from photomaps developed specifically for this analysis. Contour intervals ranged from 2 to 10 feet depending on density of vegetation and gradient.

Water-surface elevation of floods of the selected recurrence intervals were computed through the use of the USACE HEC-2 step-backwater computer program (USACE, September 1988).

Channel roughness factors (Manning's "n") used in the hydraulic computations were based on field observations, engineering judgment, and photography of cross sections. The "n" values for the channels and overbank areas are as shown:

TABLE 3 - MANNING'S "n" VALUES

Stream	Channel "n"	Overbank "n"
Bayou Grappe	0.130 – 0.120	0.060 – 0.200
Bayou Rigolette	0.050 – 0.060	0.080 – 0.200
Clear Creek	0.100-0.150	0.080-0.200
Corfeine Bayou	0.120	0.150
Flagon Bayou	0.030-0.100	0.100-0.220
Red River	0.03	0.12
Sugarhouse Bayou	0.050	0.120 – 0.200

For Bayou Rigolette, the initial starting water-surface elevation was based on a stage frequency analysis of 36 years of annual high water marks at a gaging station on Bayou Rigolette in Rapides Parish.

For Sugarhouse Bayou, the initial starting water-surface elevation was the calculated water-surface elevation on Bayou Rigolette at the time of peak discharge on Sugarhouse Bayou.

For Bayou Grappe, the initial starting water-surface elevation was coincident with the ending water-surface elevation on Sugarhouse Bayou, since this is an extension of that stream.

For Corfeine Bayou, the initial starting water-surface elevation was coincident with the calculated water-surface elevation on Bayou Grappe at this confluence.

For Flagon Bayou and Clear Creek, the initial water-surface elevation was based on the slope-area method.

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway was computed (Section 4.2), selected cross section location are also shown on the Flood Insurance Rate Map (Exhibit 2).

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

There is no new detail studied data for this parishwide study.

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

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

- Stability A: Monuments of the most reliable nature, expected to hold position/elevation well (e.g., mounted in bedrock)

- Stability B: Monuments which generally hold their position/elevation well (e.g., concrete bridge abutment)

- Stability C: Monuments which may be affected by surface ground movements (e.g., concrete monument below frost line)

- Stability D: Mark of questionable or unknown vertical stability (e.g., concrete monument above frost line, or steel witness post)

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

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

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

3.3 Vertical Datum

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

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

As noted above, the elevations shown in the FIS report and on the FIRM for Grant Parish are referenced to NAVD 88. Ground, structure, and flood elevations may be compared and/or referenced to NGVD 29 by applying a standard conversion factor to the NAVD 88 values. The conversion factor to NAVD 88 is -0.01. The BFEs shown on the FIRM represent whole-foot rounded values. For example, a BFE of 102.4 will appear as 102 on the FIRM and 102.6 will appear as 103. Therefore users that wish to convert the elevations in this FIS to NGVD 29 should apply the stated conversion factor 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.

$$\text{NAVD 88} + 0.01 = \text{NGVD 29}$$

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

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. To assist in this endeavor, each FIS provides 1-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 Parish.

Floodplain mapping for Grant Parish, Louisiana including the Town of Colfax, and the unincorporated areas of Grant Parish, consists of redelineating 1-, and 0.2-percent annual chance floodplains for Bayou Grappe, Bayou Rigolette, Clear Creek, Corfeine Bayou, Flagon Bayou, and Sugarhouse Bayou, utilizing effective data and new terrain information obtained from Louisiana State University's Atlas website (located at http://atlas.lsu.edu/central). In addition Little River floodplain mapping within the unincorporated areas of Grant Parish, LA was redelineated using the effective FIRM dated November 16, 1995. Only the 1-percent annual chance floodplain was available from this source. No further information was available, so the FIRM served as the source for the water surface elevation.

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, AO and AE), and the 0.2-percent annual chance floodplain boundary corresponds to the boundary of areas of moderate flood hazards. In cases where the 1- and 0.2-percent annual chance floodplain boundaries are close together, only the 1-percent annual chance floodplain boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

For the streams studied by approximate methods, only the 1-percent annual chance floodplain boundary is shown on the FIRM (Exhibit 2).

Within this jurisdiction there are one or more levees that have not been demonstrated by the community or levee owner(s) to meet the requirements of 44 CFR Part 65.10 of the NFIP regulations as it relates to the levee's capacity to provide 1% annual chance flood protection. As such, the floodplain boundaries in

this area are subject to change. Please refer to the Notice to Flood Insurance Study Users page at the front of this FIS report for more information on how this may affect the floodplain boundaries shown on this FIRM.

4.2 Floodways

Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard. For purposes of the NFIP, a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of the 1-percent annual chance floodplain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the 1-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.

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 2). The computed floodways are shown on the FIRM (Exhibit 2). In cases where the floodway and 1-percent annual chance floodplain boundaries are close together or collinear, only the floodway boundary is shown. Water surface elevations shown in Table 2 for Clear Creek were computed without consideration of backwater effects from Little River.

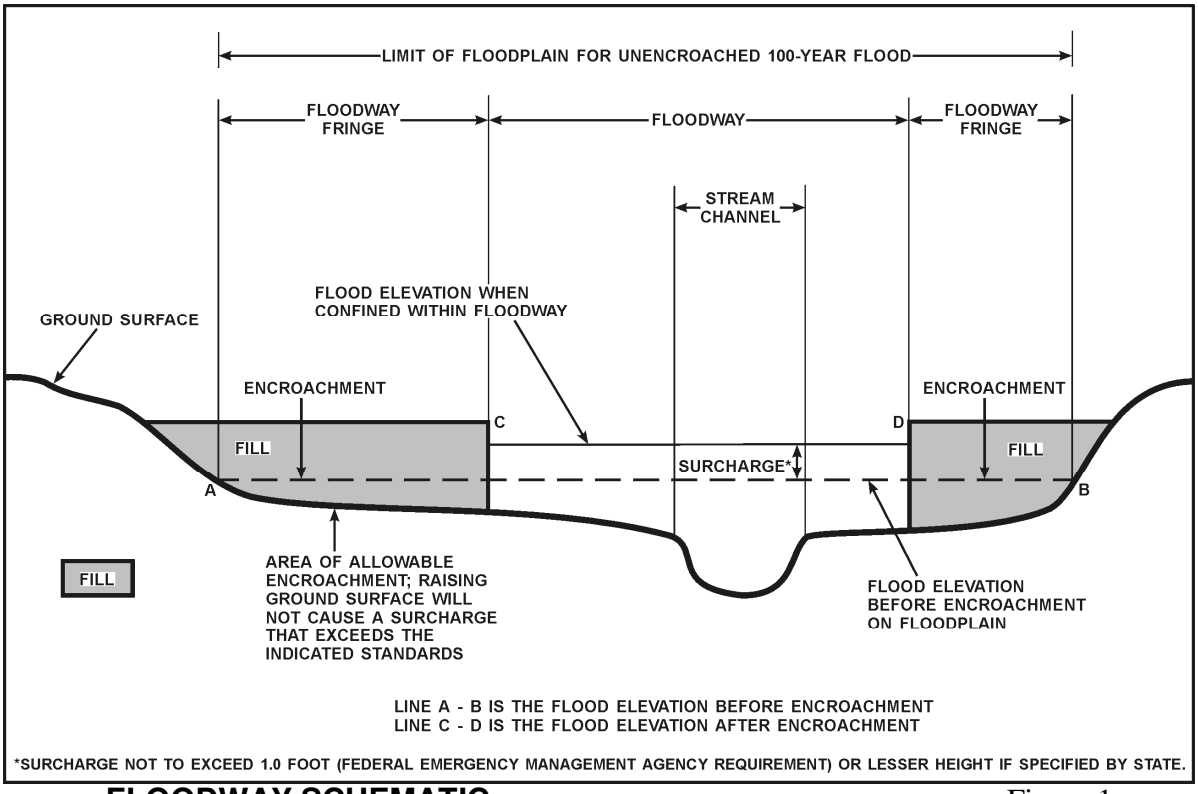
Floodways were computed for Clear Creek and Flagon Bayou. No floodways were computed for Bayou Grappe, Bayou Rigolette, Corfeine Bayou, or Sugarhouse Bayou. The flows from Bayou Rigolette commingle with flows or parallel streams for a major portion of the study reach; therefore, the concept of floodway does not apply. Due to the extensive flow transfer to and from storage areas, floodways are not appropriate for Sugarhouse Bayou, Bayou Grappe, and Corfeine Bayou. In the Town of Colfax, due to significant sharing of conveyance with parallel streams, a floodway for Bayou Rigolette is not practical. Due to the extensive flow transfer to and from storage areas, floodways are not appropriate for Sugarhouse Bayou and Bayou Grappe.

The flooding from the Red River is located in areas outside of the levee; therefore, there was no floodway computed for this river.

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 2, "Floodway Data." To reduce the risk of property damage in areas where the stream velocities are high, the community may wish to restrict development in areas outside the floodway.

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



FLOODWAY SCHEMATIC Figure 1

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
Clear Creek								
A	10,600	930	7,354	1.4	60.0	52.9[2]	53.9[2]	1.0
B	14,000	1,050	8,746	1.2	60.0	57.7[2]	58.6[2]	0.9
C	16,400	1,350	8,843	1.1	60.0	59.5[2]	60.4[2]	0.9
D	20,110	950	7,304	1.4	64.0	64.0	64.9	0.9
E	23,800	650	6,859	1.5	70.3	70.3	71.3	1.0
F	26,450	840	8,664	1.2	73.9	73.9	74.5	0.6
G	31,280	1,200	9,606	1.0	75.2	75.2	76.0	0.8
H	33,700	1,150	8,270	1.1	76.6	76.6	77.6	1.0
I	38,280	950	8,029	1.2	83.7	83.7	84.7	1.0
J	38,800	1,150	9,056	1.0	84.1	84.1	85.0	0.9
K	41,400	1,050	8,621	1.1	85.5	85.5	86.4	0.9
L	44,030	1,000	7,277	1.1	90.2	90.2	91.2	1.0
M	48,350	750	5,635	1.3	96.3	96.3	97.1	0.8
N	50,950	750	5,214	1.4	100.4	100.4	101.4	1.0
O	55,592	550	4,181	1.6	108.3	108.3	109.3	1.0
P	58,580	450	2,994	1.3	113.4	113.4	114.3	0.9
Q	61,220	400	2,683	1.4	119.2	119.2	120.1	0.9
R	66,240	400	2,848	1.3	129.4	129.4	130.0	0.6
S	70,040	325	1,851	1.0	135.3	135.3	136.2	0.9
T	72,880	120	518	3.0	144.3	144.3	145.2	0.9
U	74,800	100	605	2.2	152.8	152.8	153.6	0.8
V	76,470	54	359	3.0	159.8	159.8	160.5	0.7

[1]Feet Above Confluence with Little River
[2]Water-Surface Elevation Computed Without Consideration of Backwater Effects from Little River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT PARISH, LA
AND INCORPORATED AREAS

FLOODWAY DATA

CLEAR 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
Flagon Bayou								
A	158,000	1,100	5,922	1.1	151.2	151.2	151.9	0.7
B	160,860	1,100	6,388	1.0	154.5	154.5	154.9	0.4
C	164,680	1,100	6,995	0.9	157.5	157.5	158.3	0.8
D	167,310	1,250	8,028	0.8	159.0	159.0	160.0	1.0
E	170,040	1,300	6,437	1.0	161.9	161.9	162.7	0.8
F	172,750	1,450	7,508	0.8	164.6	164.6	165.4	0.8
G	176,130	1,250	7,649	0.8	166.8	166.8	167.6	0.8
H	179,910	1,375	6,385	0.8	168.8	168.8	169.7	0.9
I	182,940	1,300	5,530	0.8	171.6	171.6	172.5	0.9
J	185,680	1,200	5,915	0.8	174.8	174.8	175.5	0.7
K	188,250	700	2,891	0.9	177.8	177.8	178.8	1.0
L	189,980	600	3,013	0.9	179.4	179.4	180.3	0.9
M	193,720	700	3,059	0.8	183.3	183.3	184.1	0.8
N	197,340	650	3,020	0.8	186.5	186.5	187.4	0.9
O	199,510	75	681	3.3	190.0	190.0	191.0	1.0
P	203,360	245	1,212	1.2	196.0	196.0	196.9	0.9
Q	205,970	245	1,395	1.0	199.0	199.0	199.9	0.9

[1]Feet Above Mouth

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT PARISH, LA
AND INCORPORATED AREAS

FLOODWAY DATA

FLAGON BAYOU

5.0 INSURANCE APPLICATIONS

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

Zone A

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

Zone AE

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

Zone 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 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.

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 Grant Parish. Previously, separate Flood Hazard Boundary Maps (FHBMs) and/or FIRMs were prepared for each incorporated community with identified flood hazard areas and the unincorporated areas of the Parish. Historical map dates relating to pre-parishwide maps prepared for each community, are presented in Table 5, "Community Map History."

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

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISION DATE(S)	FLOOD INSURANCE RATE MAP EFFECTIVE DATE	FLOOD INSURANCE RATE MAP REVISION DATE(S)
Creola, Village of [1,2]	June 17,1977	None	March 1,1987	November 16, 1995
Colfax, Town of	June 28, 1974	November 14, 1975	September 5, 1979	November 16, 1995
Dry Prong, Village of [2,3]	N/A	N/A	N/A	
Georgetown, Village of [2]	N/A	N/A	N/A	
Grant Parish (Unincorporated Areas)	June 17,1977	None	March 1,1987	November 16, 1995
Montgomery, Town of	September 19, 1975	None	May 4, 1982	
Pollock, Town of	August 15, 1975	None	May 25, 1982	

[1]Dates for this community were taken from Grant Parish

[2]This community did not have a FIRM prior to the first parish-wide FIRM for Grant Parish

[3]No Special Flood Hazard Areas Identified

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT PARISH, LA

AND INCORPORATED AREAS

COMMUNITY MAP HISTORY

7.0 OTHER STUDIES

Information pertaining to revised and unrevised flood hazards for each jurisdiction within Grant Parish has been compiled into this FIS. Therefore, this FIS supersedes all previously printed FIS Reports, FHBMs, Flood Boundary and Floodway Maps (FBFMs), and FIRMs for all of the incorporated and unincorporated jurisdictions within Grant Parish.

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, Federal Regional Center, 800 North Loop 288, Denton, Texas 76201-3698.

9.0 BIBLIOGRAPHY AND REFERENCES

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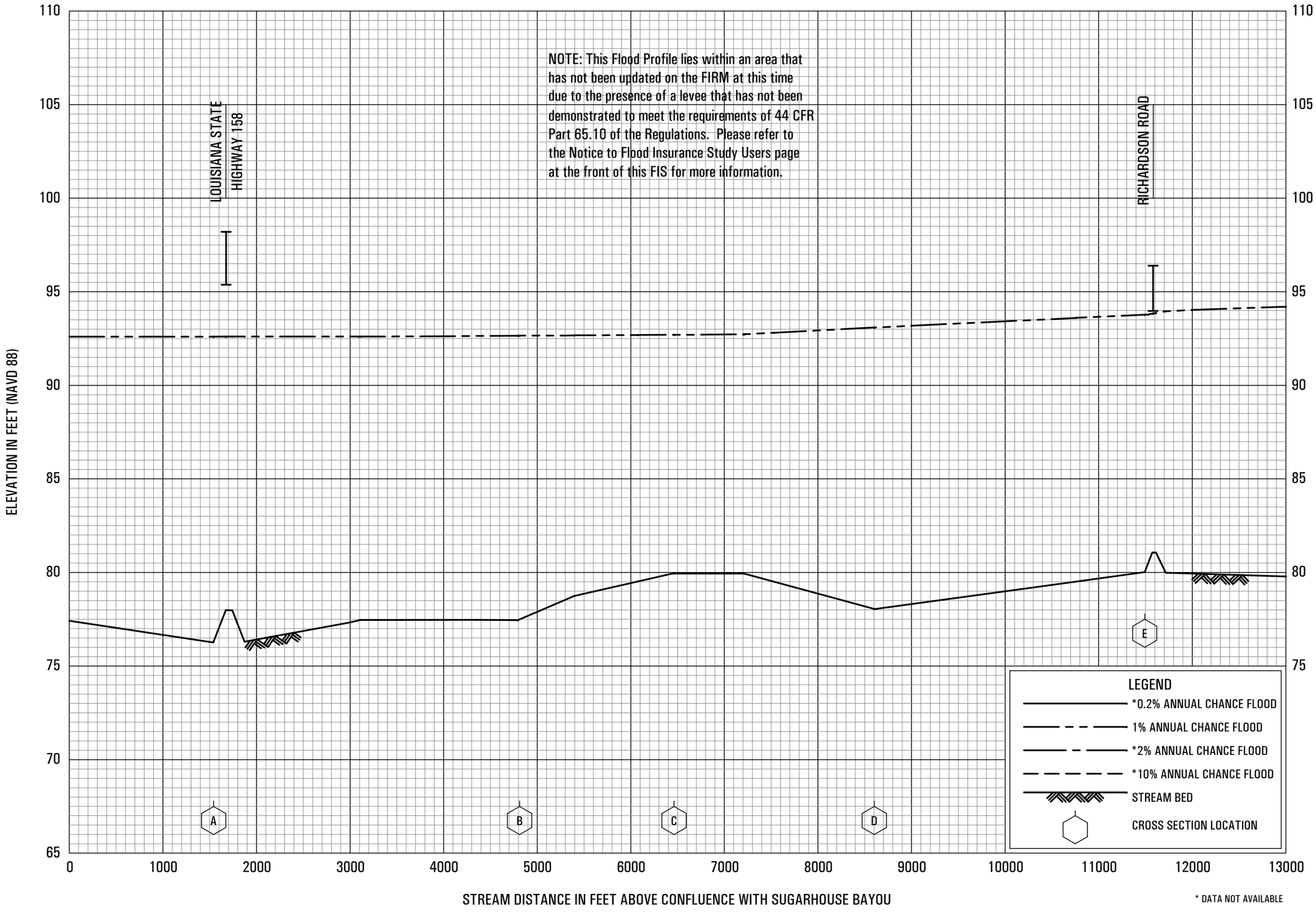


FLOOD PROFILES

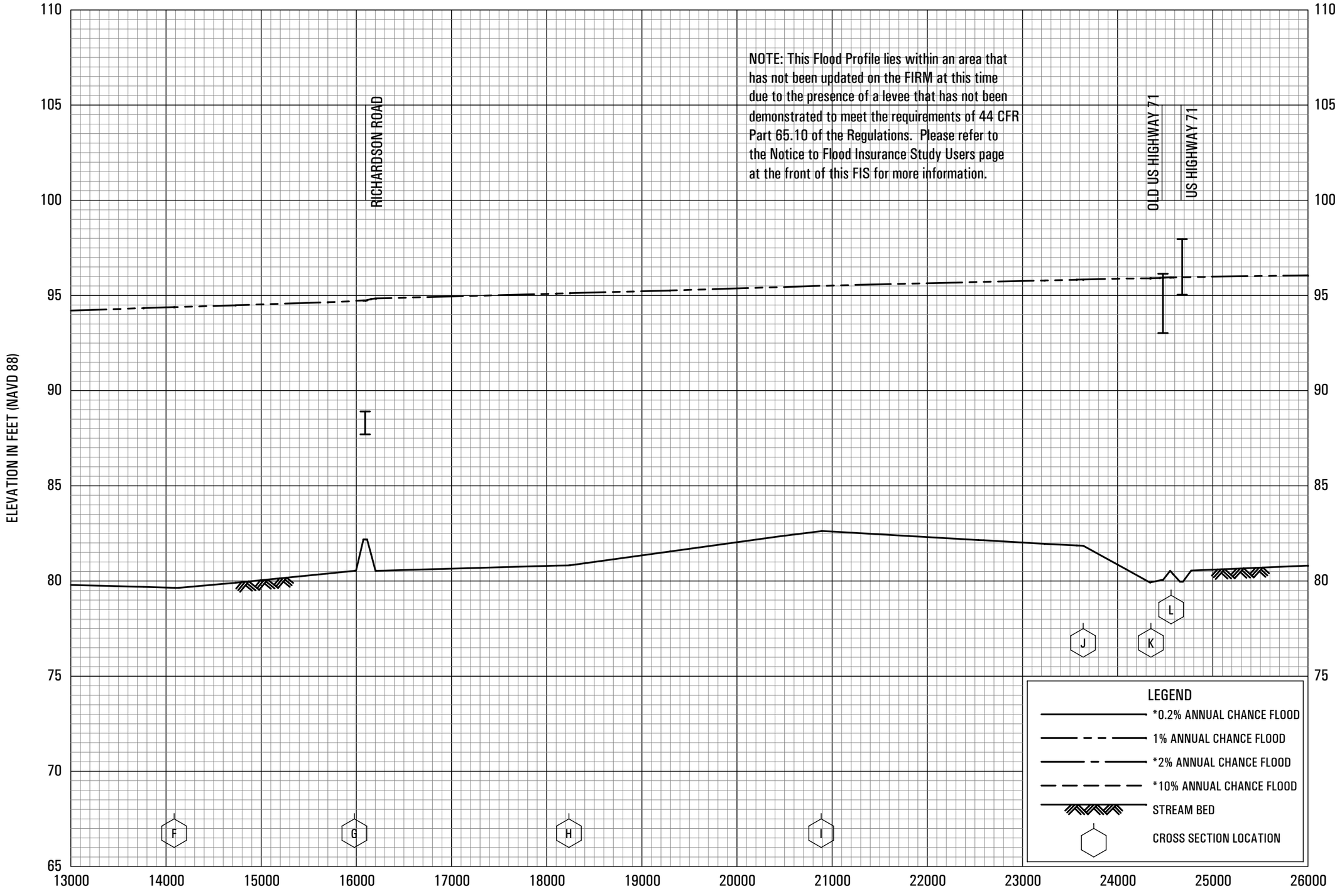
BAYOU GRAPPE

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT PARISH, LA

AND INCORPORATED AREAS

01P



FLOOD PROFILES

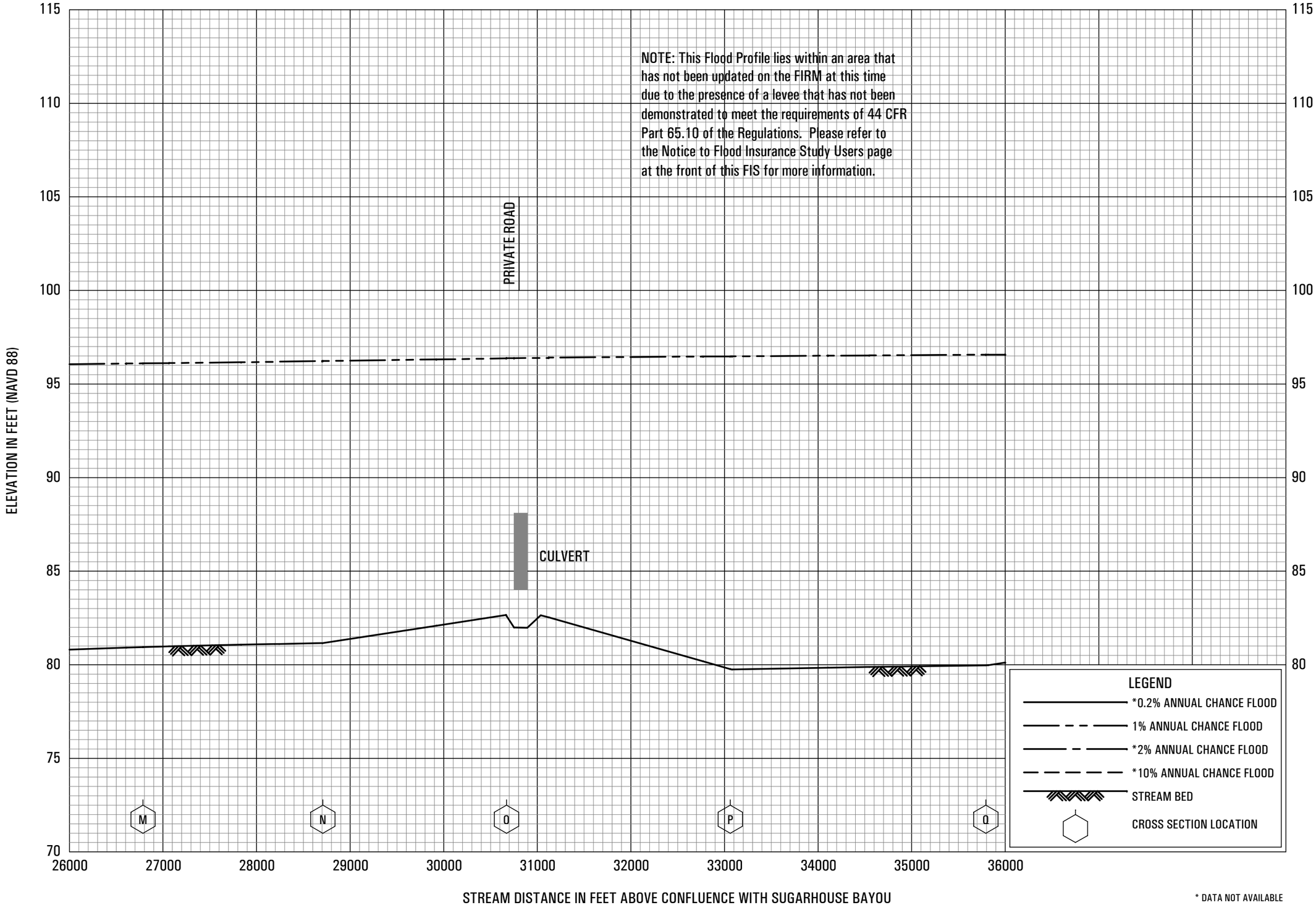
BAYOU GRAPPE

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT PARISH, LA

AND INCORPORATED AREAS

02P



FLOOD PROFILES

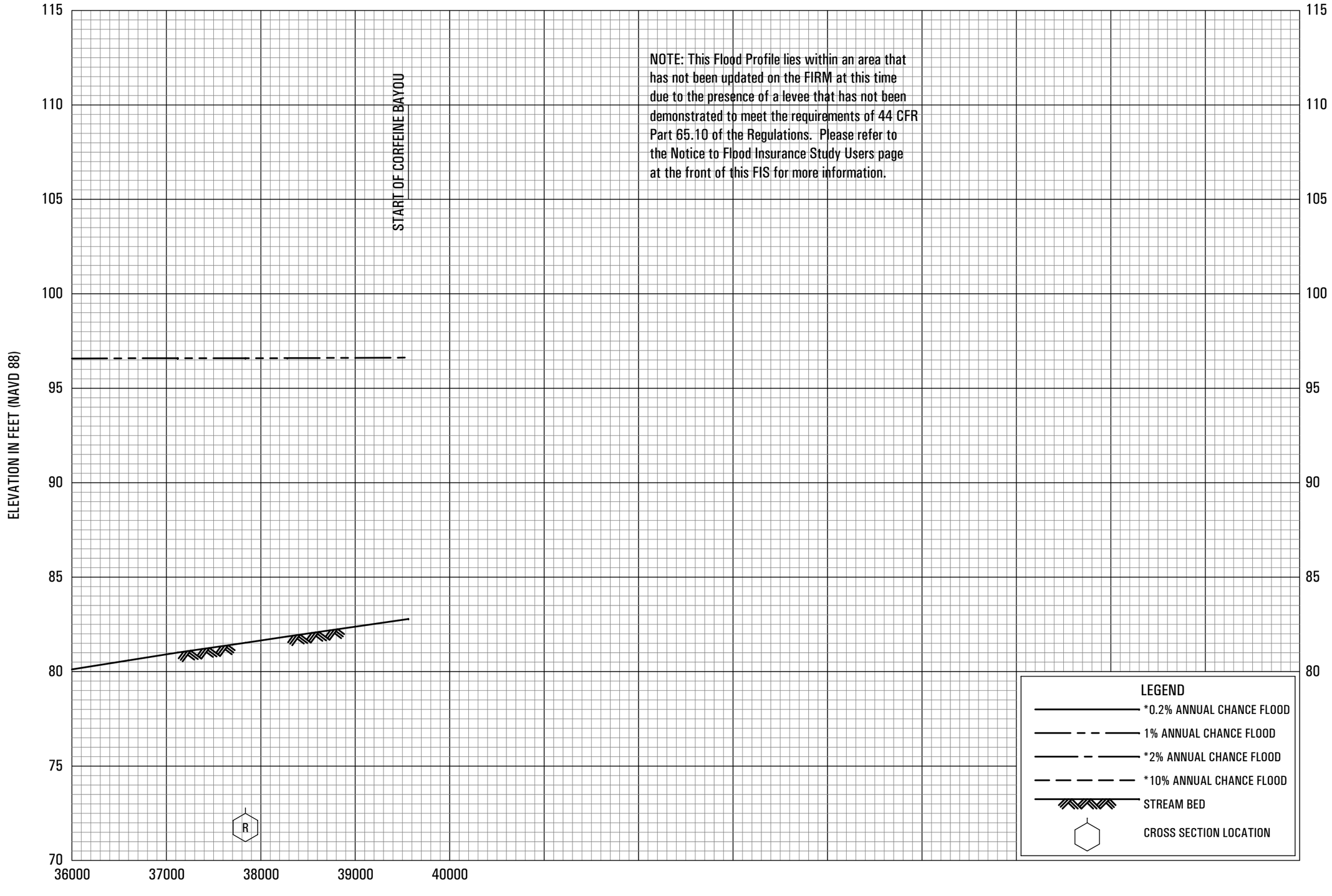
BAYOU GRAPPE

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT PARISH, LA

AND INCORPORATED AREAS

03P



FLOOD PROFILES

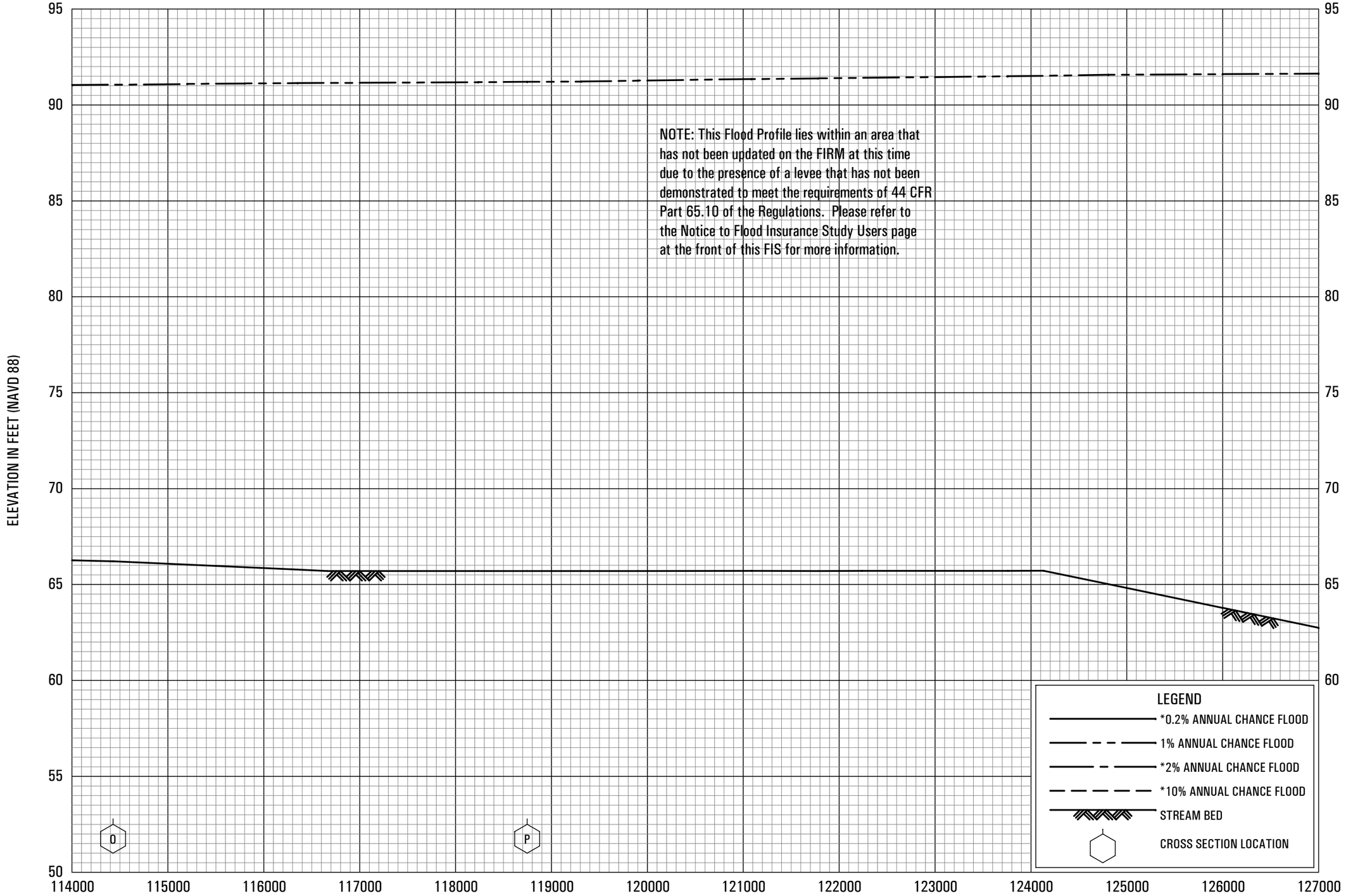
BAYOU GRAPPE

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT PARISH, LA

AND INCORPORATED AREAS

04P



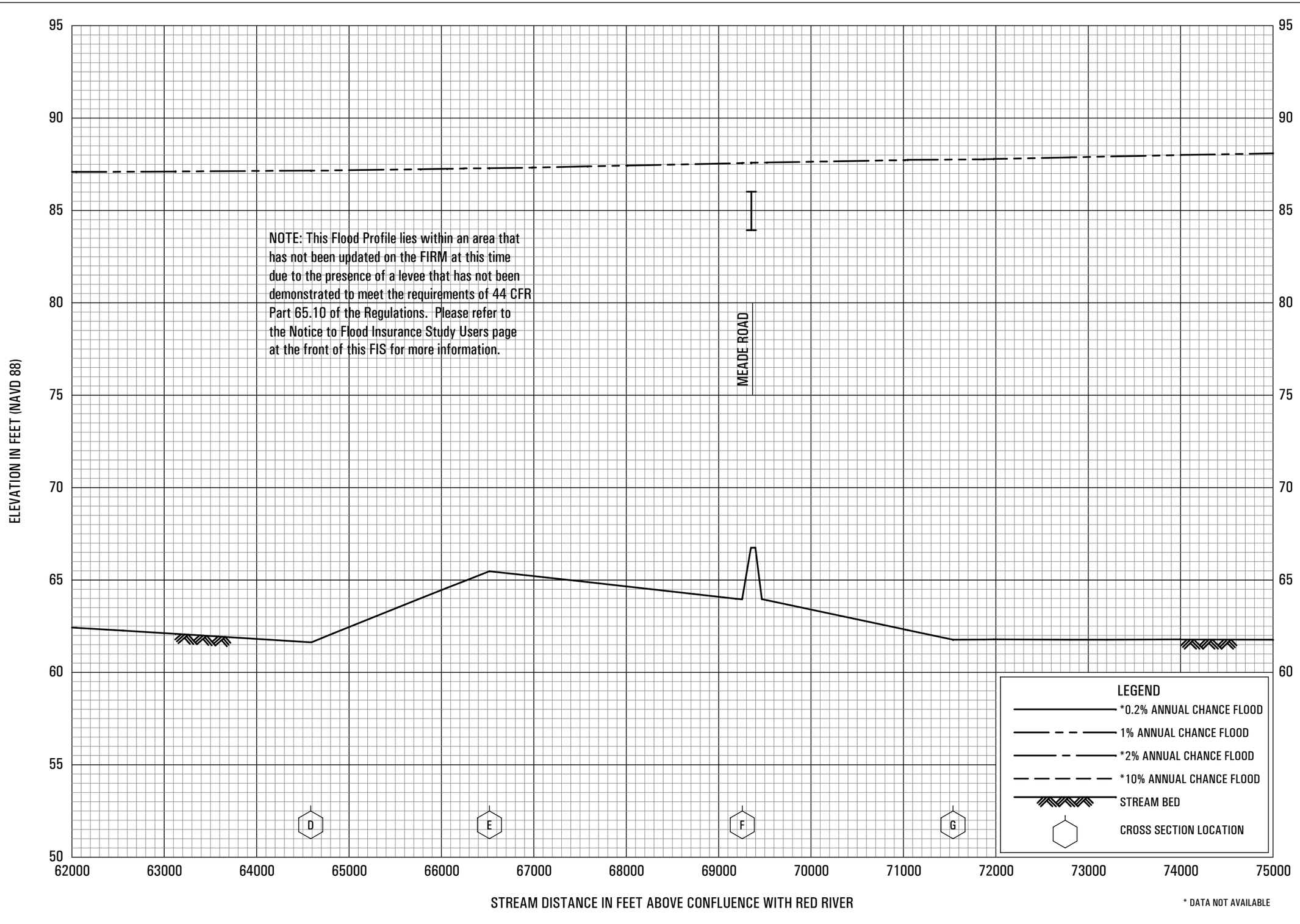
FLOOD PROFILES

BAYOU RIGOLETTE

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT PARISH, LA

AND INCORPORATED AREAS



FLOOD PROFILES

BAYOU RIGOLETTE

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT PARISH, LA

AND INCORPORATED AREAS

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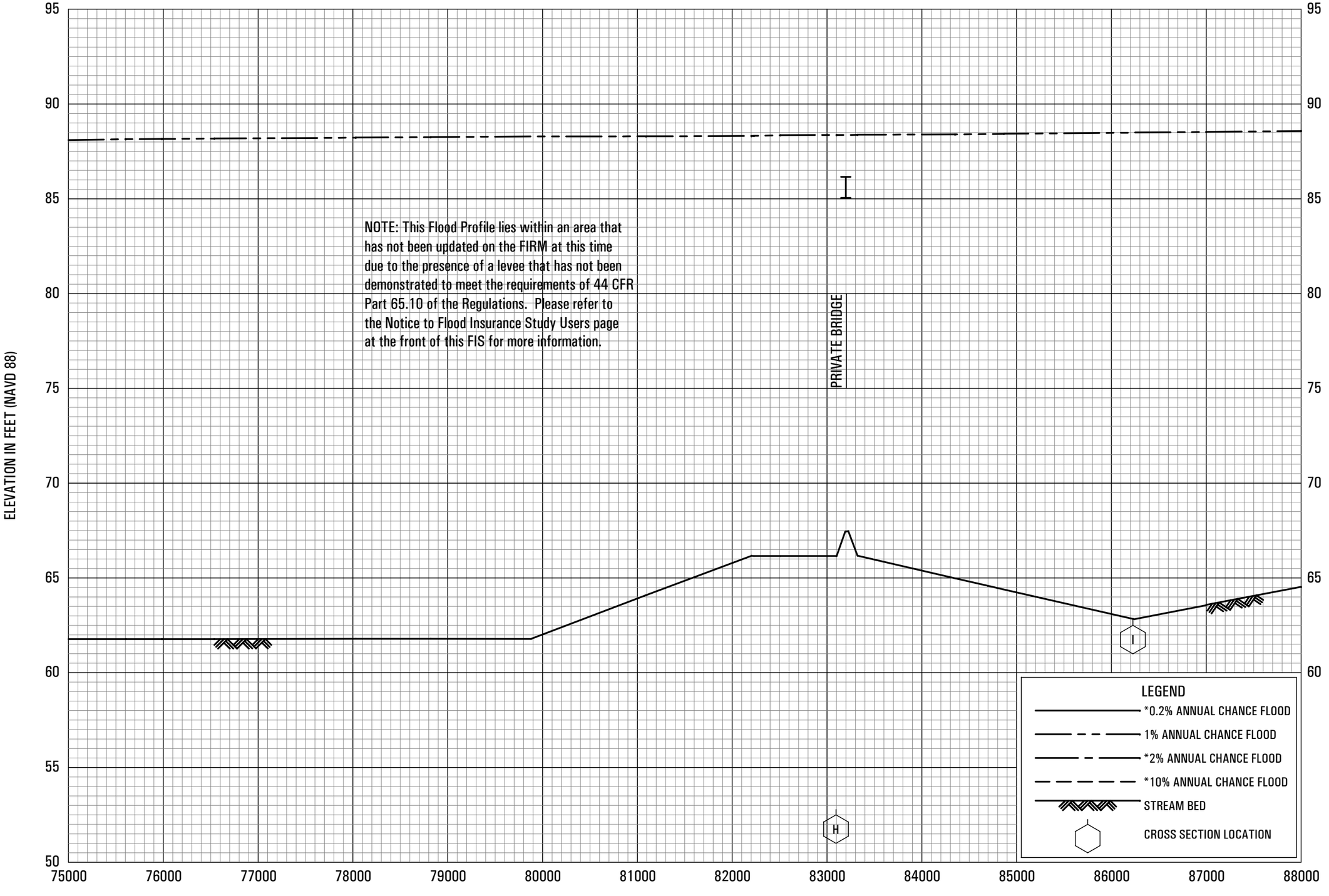


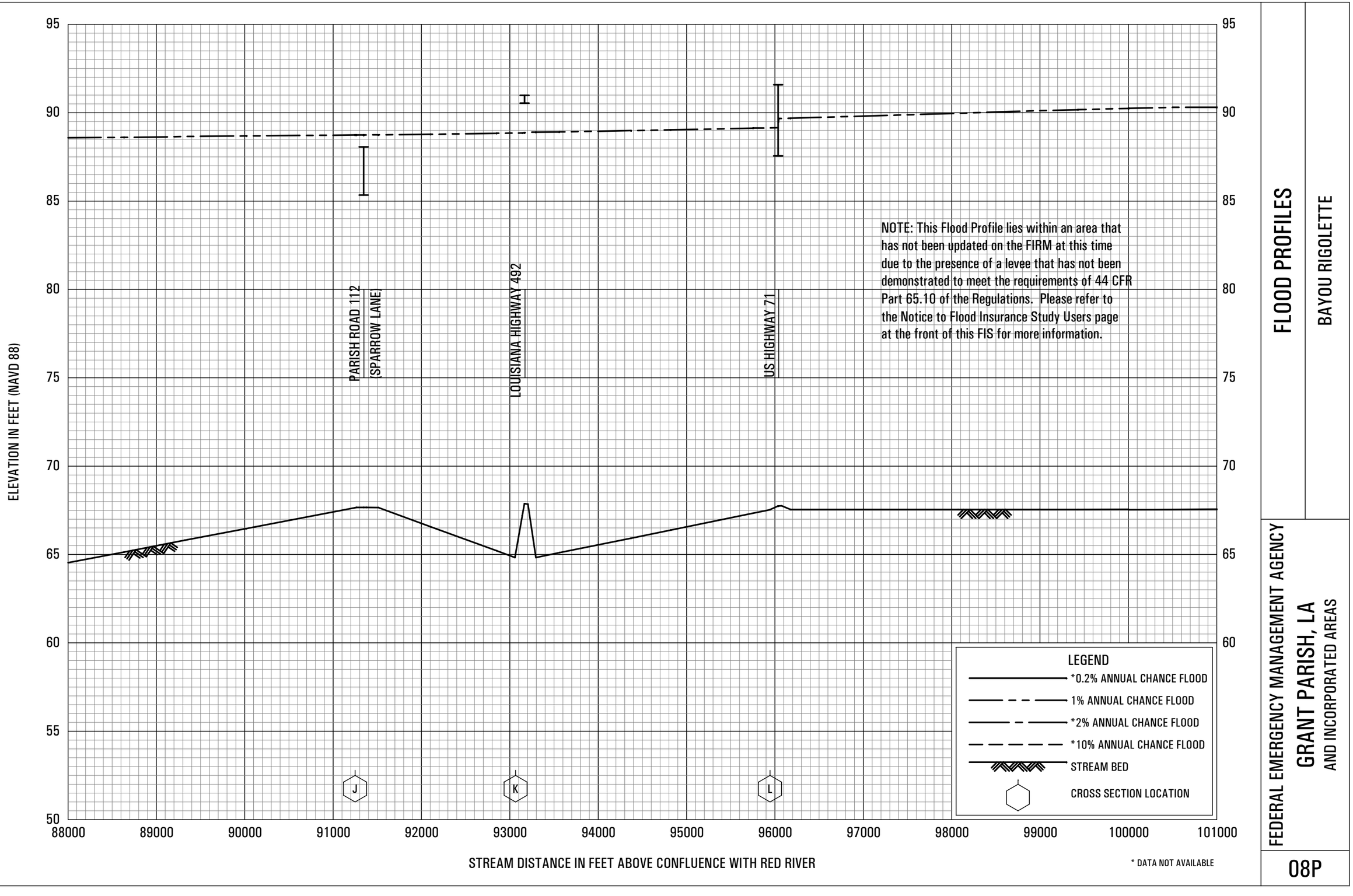
FLOOD PROFILES

BAYOU RIGOLETTE

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT PARISH, LA

AND INCORPORATED AREAS



FLOOD PROFILES

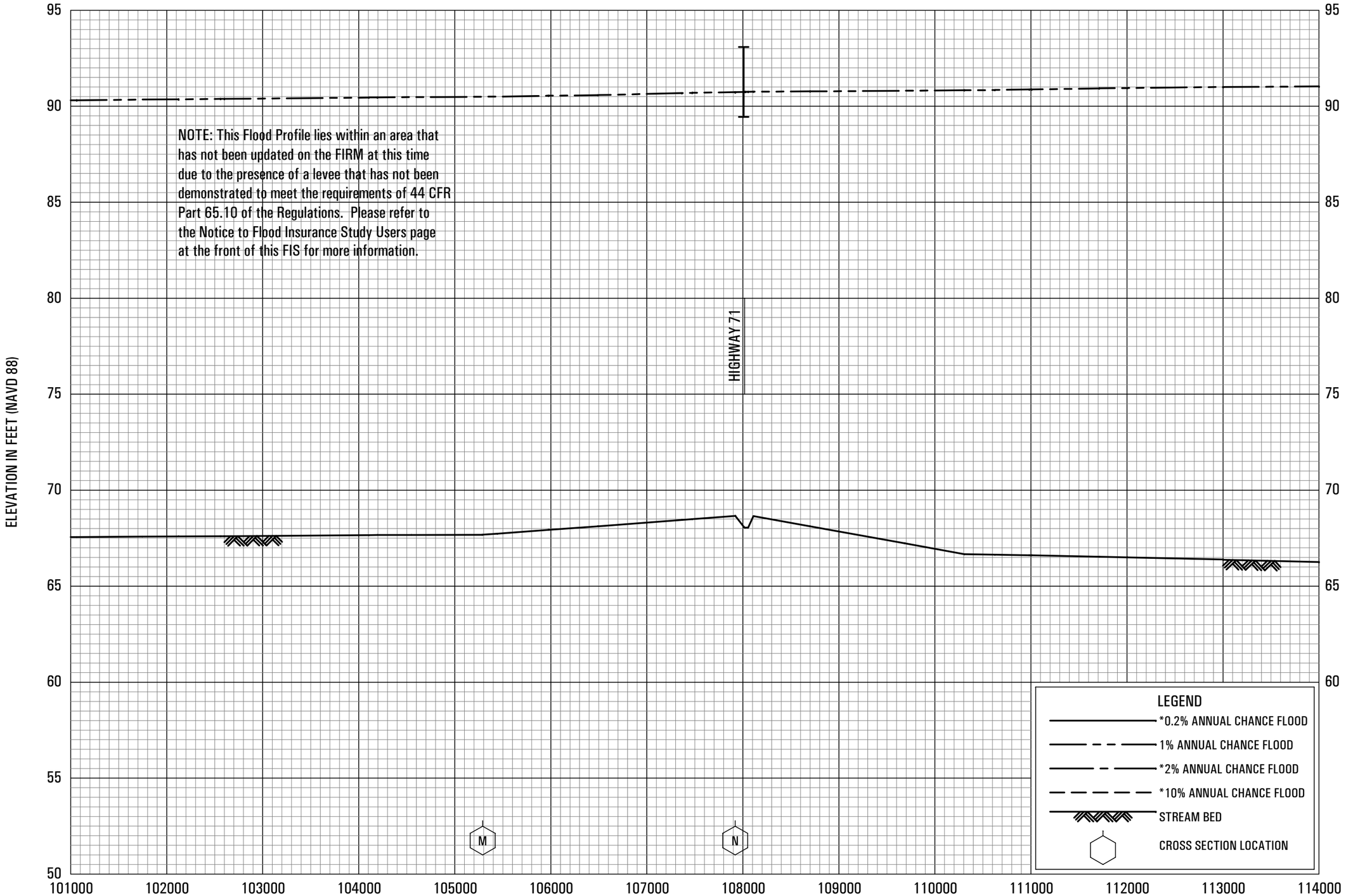
BAYOU RIGOLETTE

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT PARISH, LA

AND INCORPORATED AREAS

08P



FLOOD PROFILES

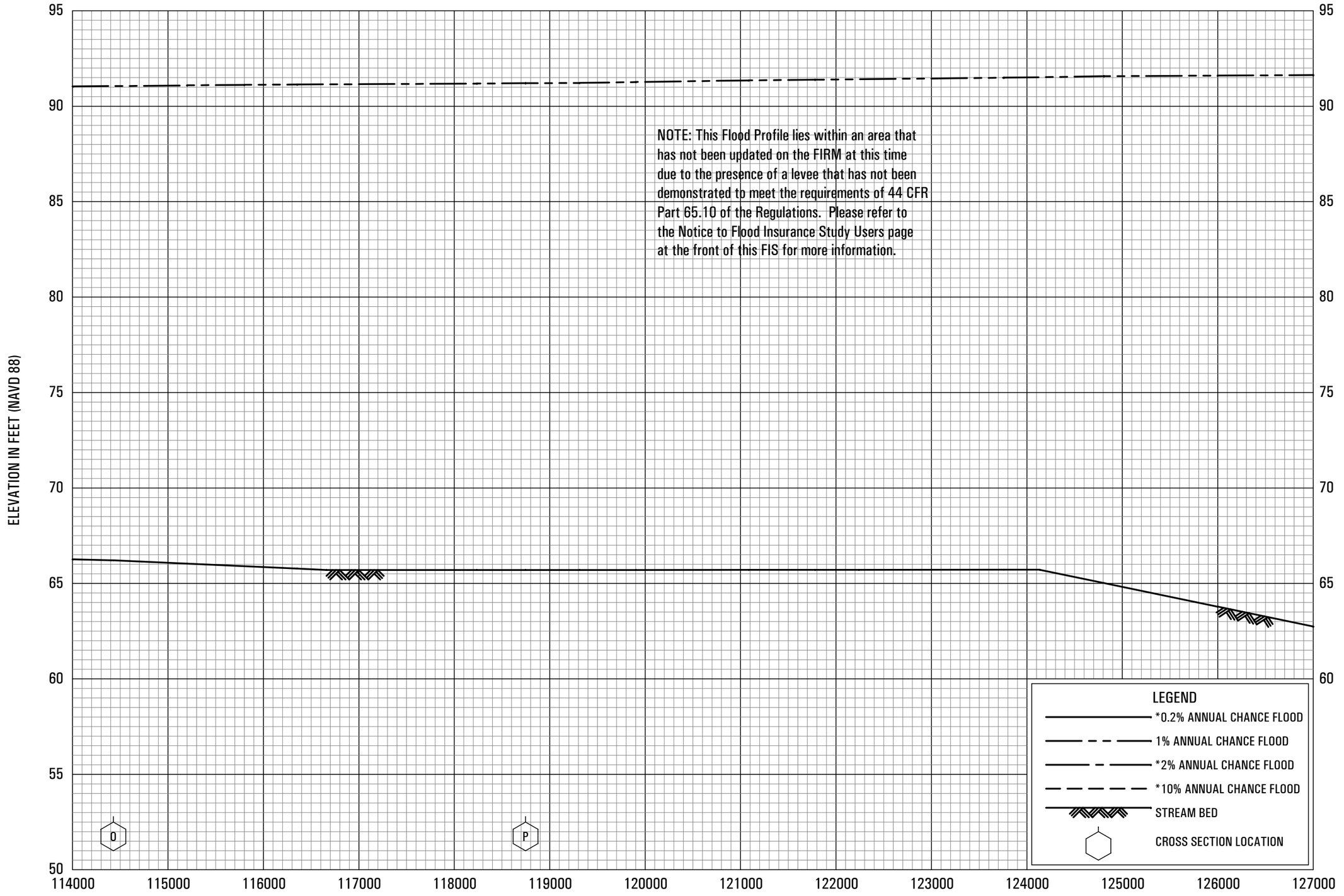
BAYOU RIGOLETTE

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT PARISH, LA

AND INCORPORATED AREAS

09P



FLOOD PROFILES

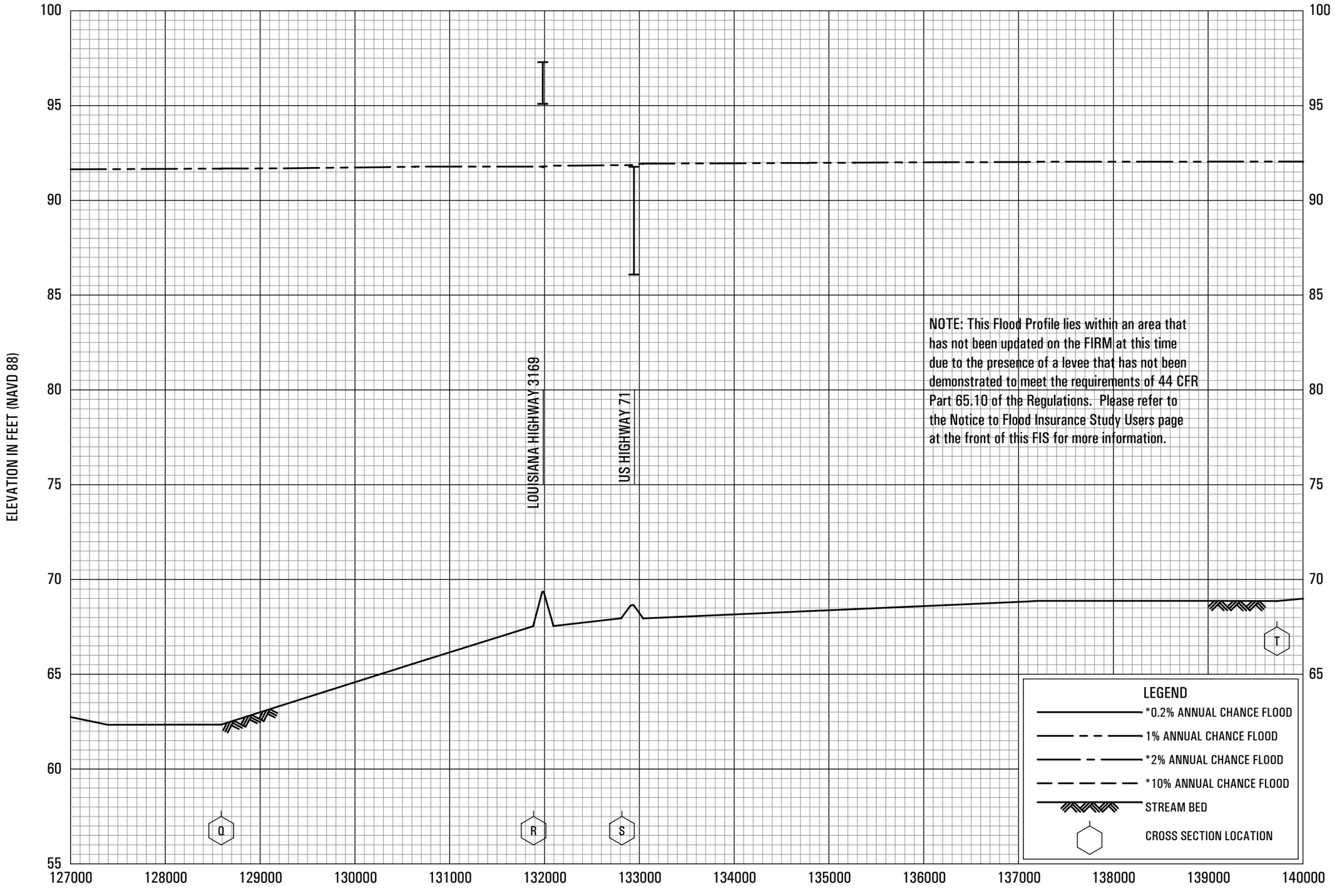
BAYOU RIGOLETTE

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT PARISH, LA

AND INCORPORATED AREAS

10P



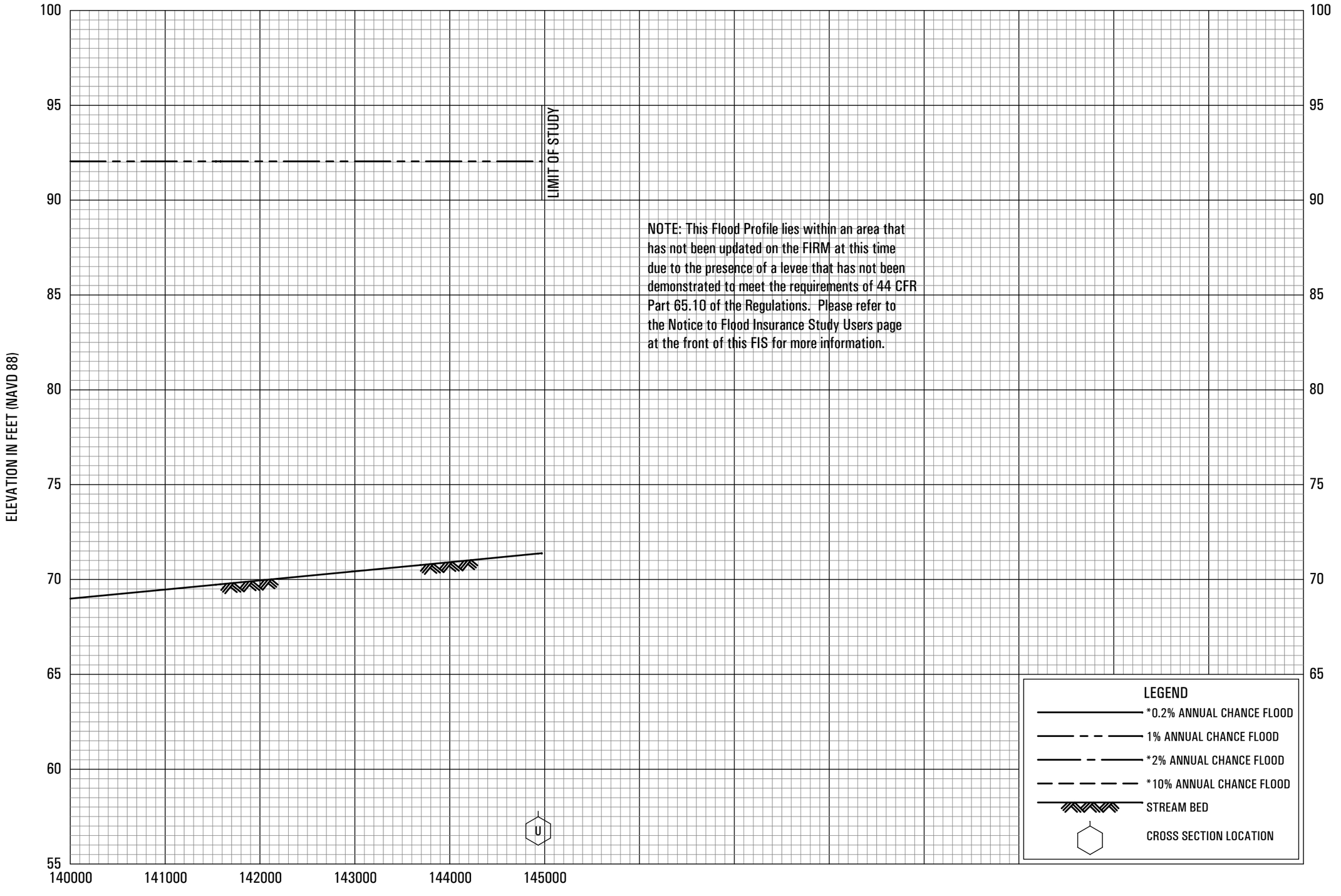
FLOOD PROFILES

BAYOU RIGOLETTE

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT PARISH, LA

AND INCORPORATED AREAS



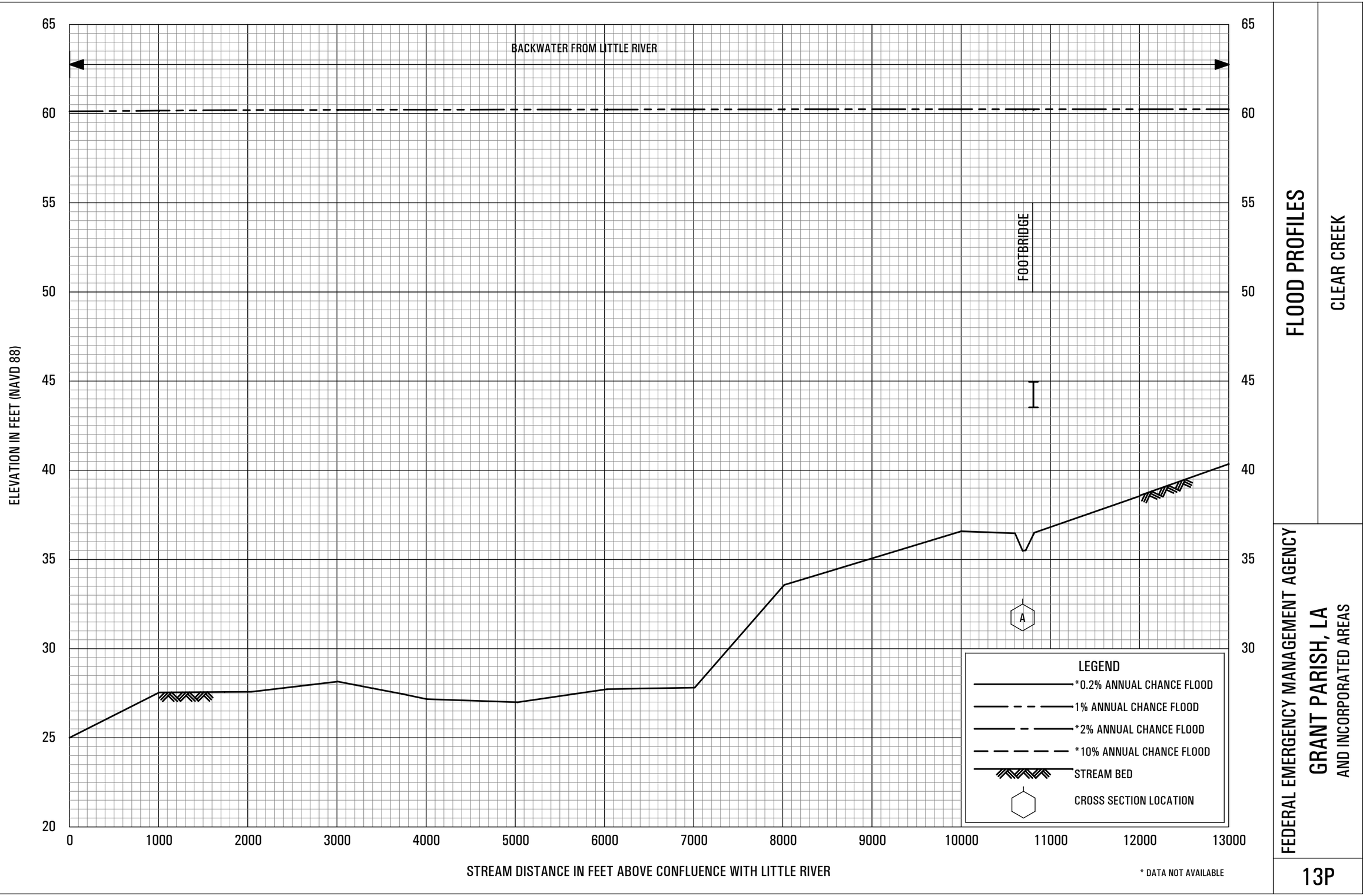
FLOOD PROFILES

BAYOU RIGOLETTE

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT PARISH, LA

AND INCORPORATED AREAS



FLOOD PROFILES

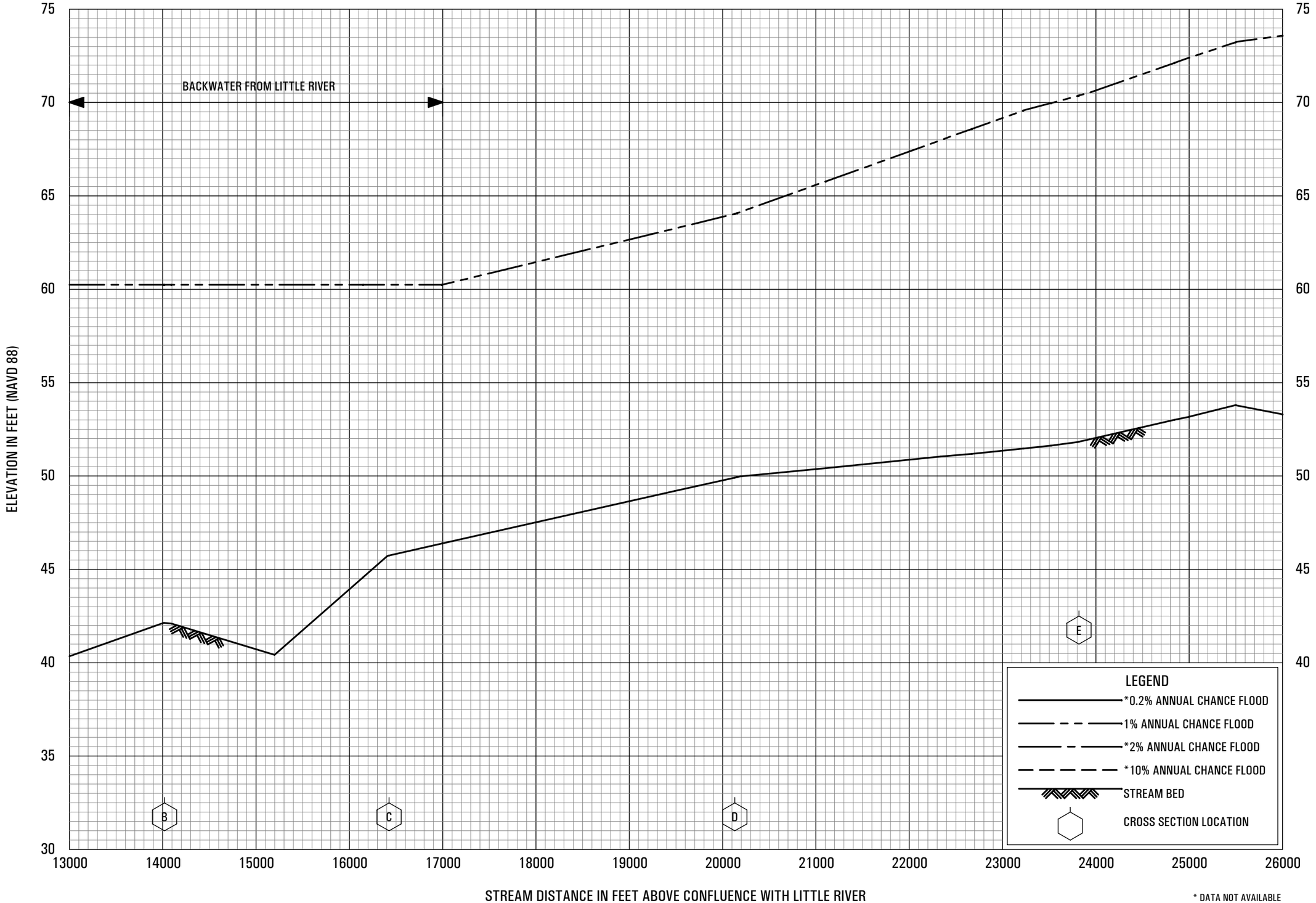
CLEAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT PARISH, LA

AND INCORPORATED AREAS

13P



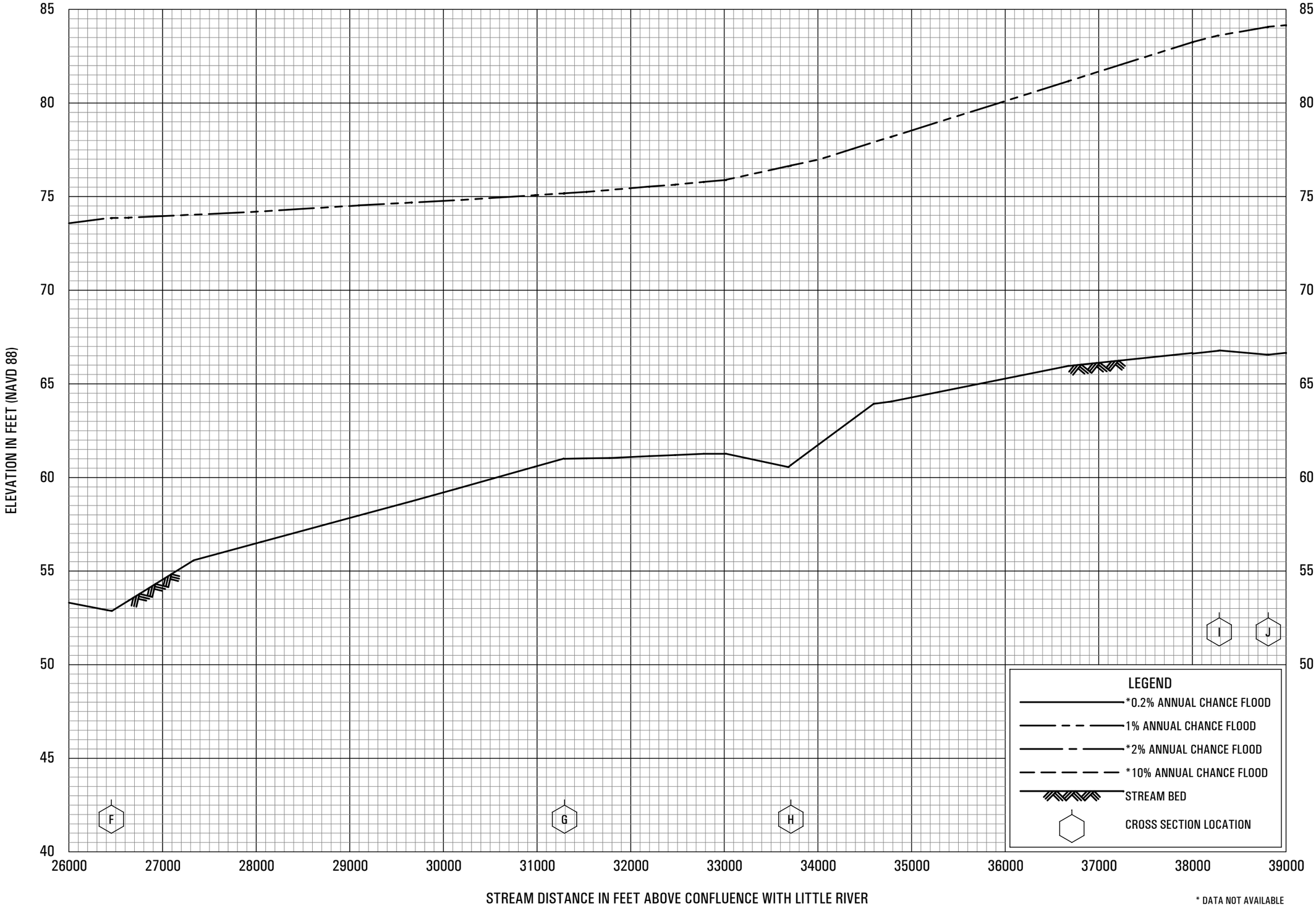
FLOOD PROFILES

CLEAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT PARISH, LA

AND INCORPORATED AREAS



FLOOD PROFILES

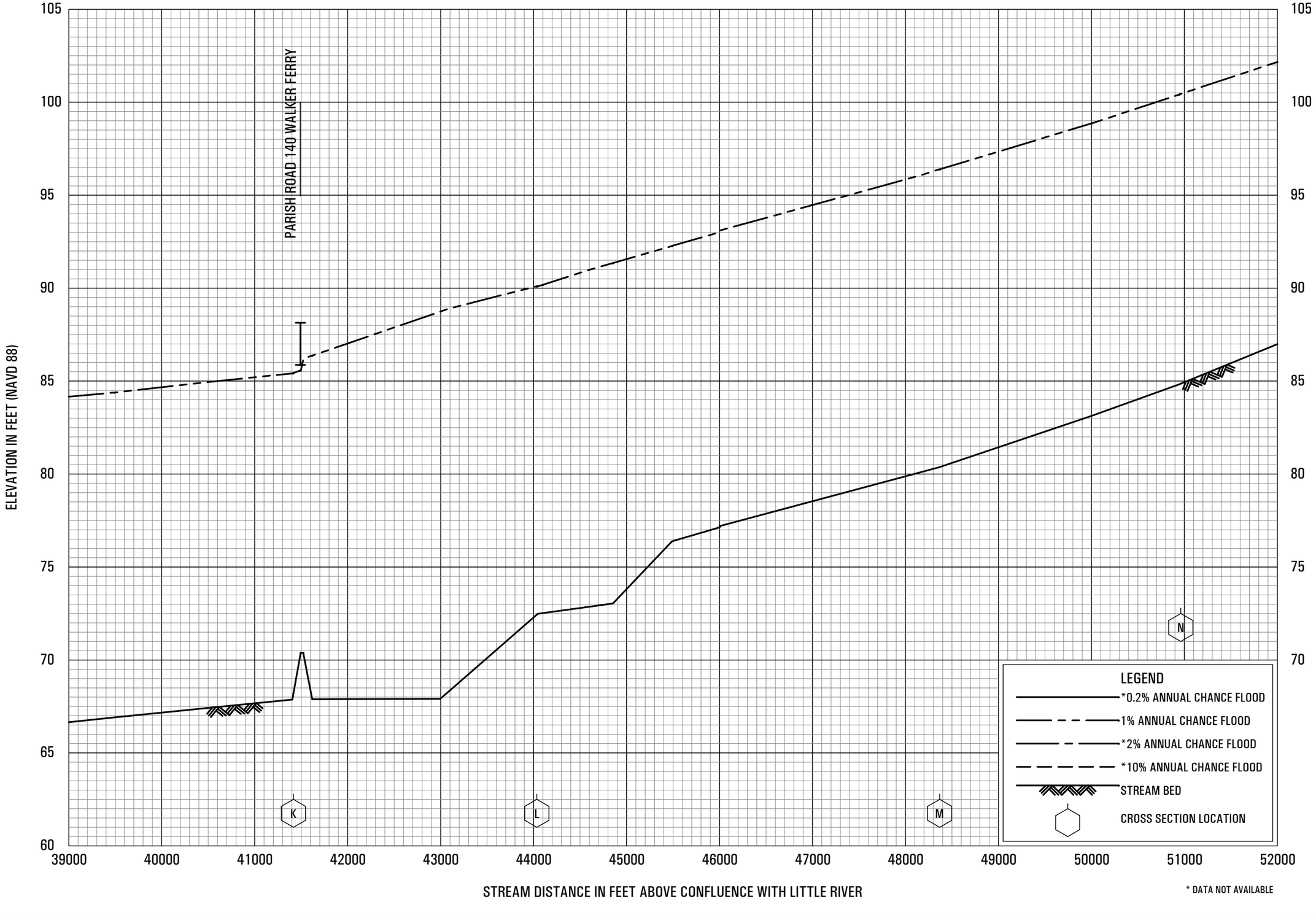
CLEAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT PARISH, LA

AND INCORPORATED AREAS

15P



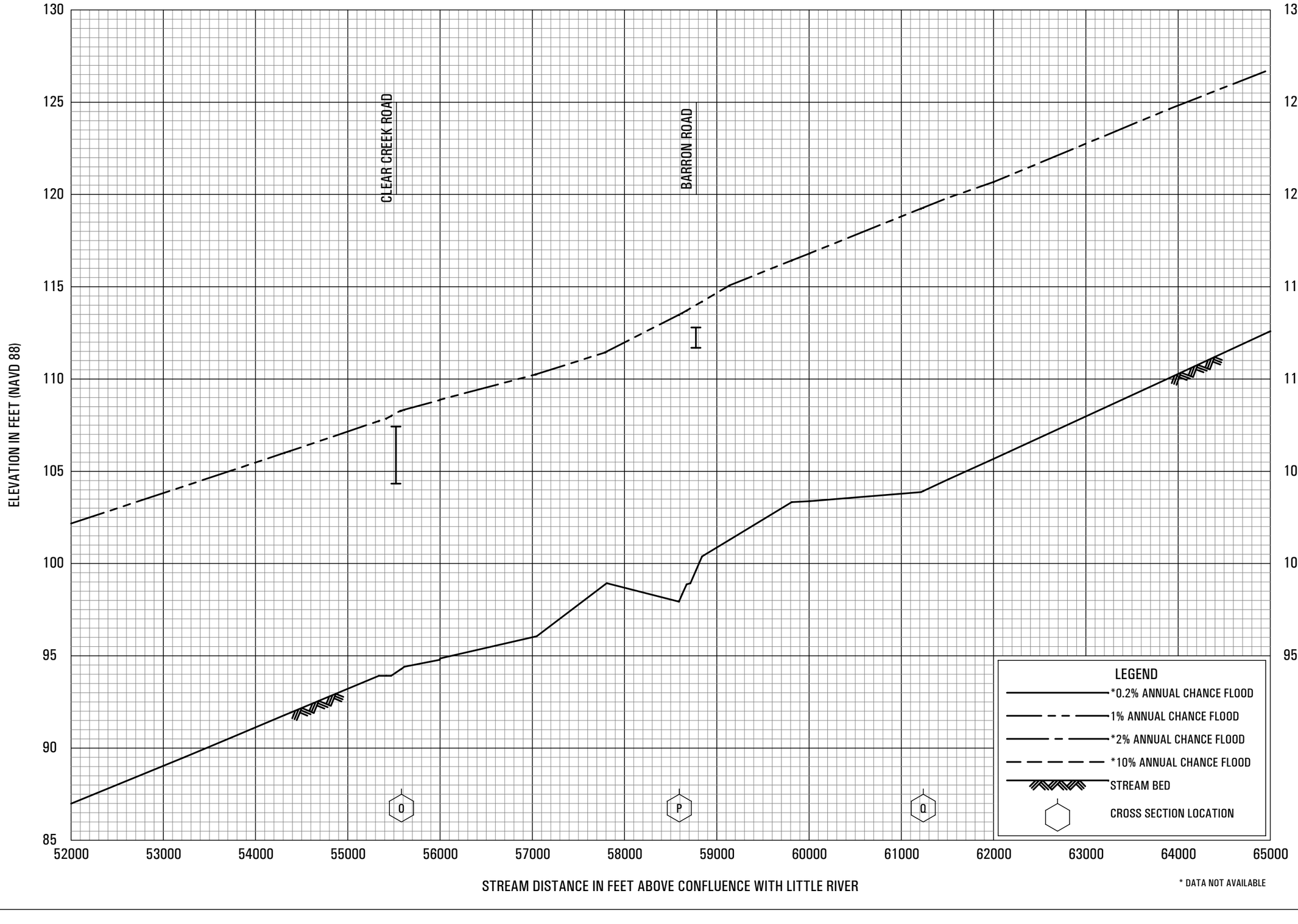
FLOOD PROFILES

CLEAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT PARISH, LA

AND INCORPORATED AREAS



FLOOD PROFILES

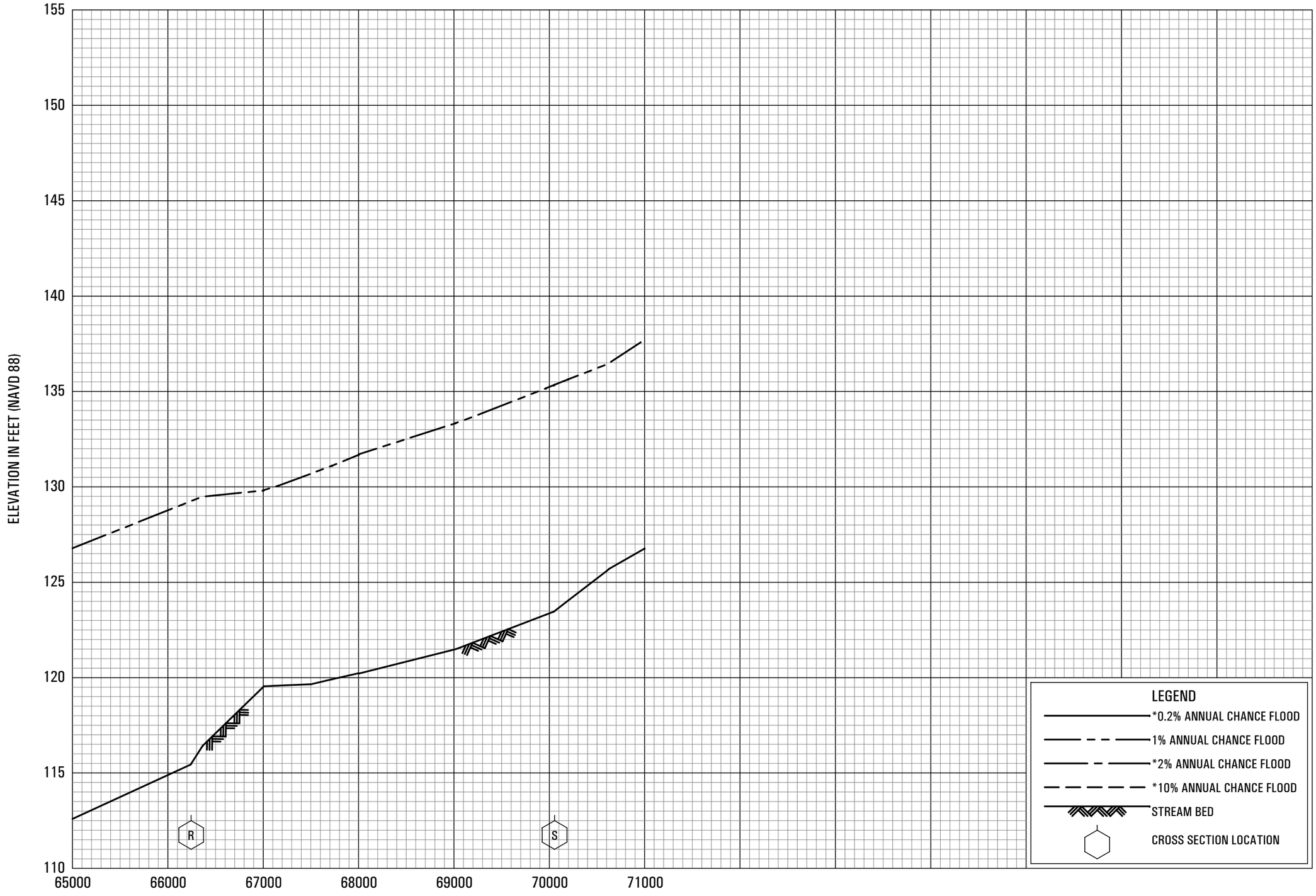
CLEAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT PARISH, LA

AND INCORPORATED AREAS

17P



* DATA NOT AVAILABLE

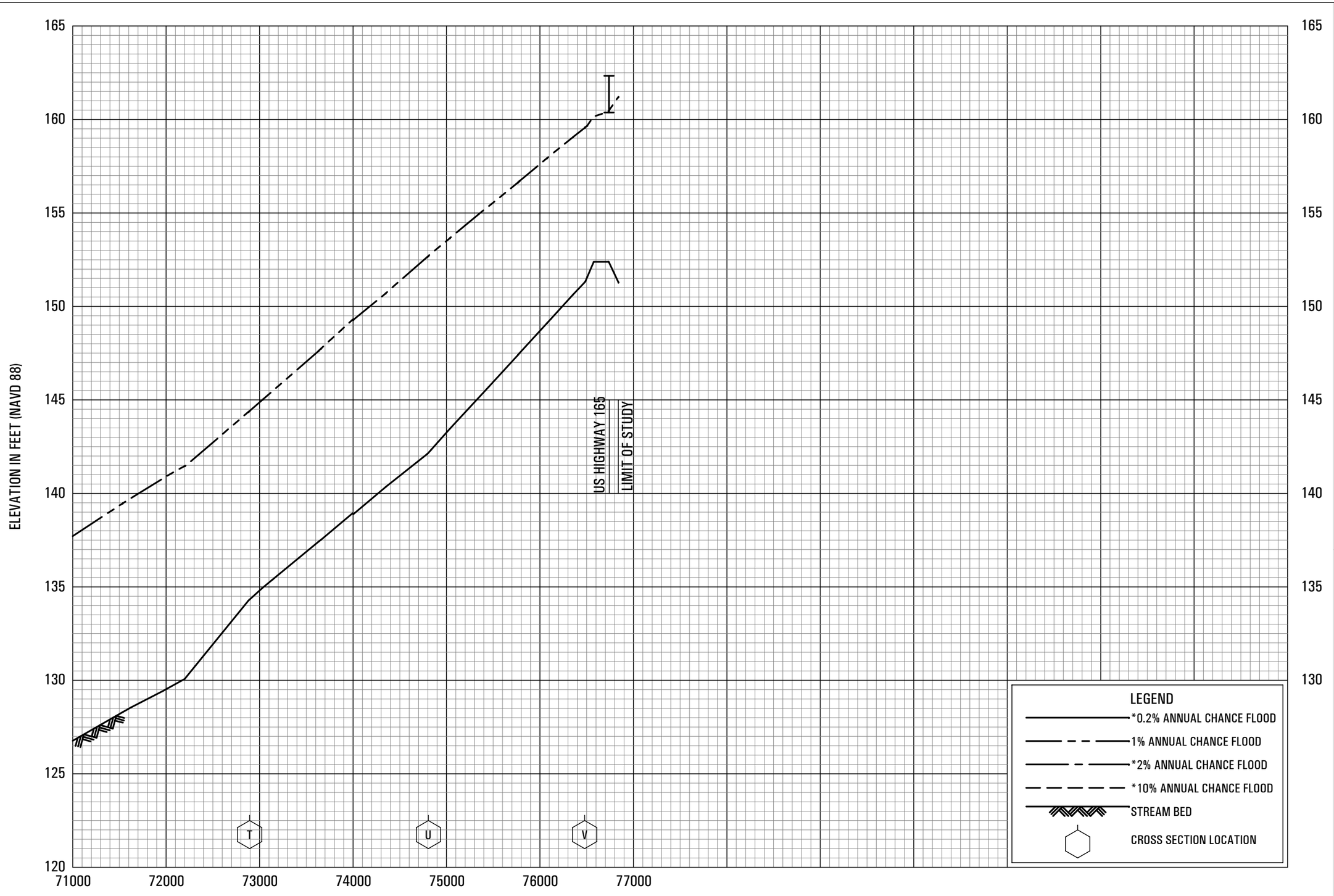
FLOOD PROFILES

CLEAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT PARISH, LA

AND INCORPORATED AREAS



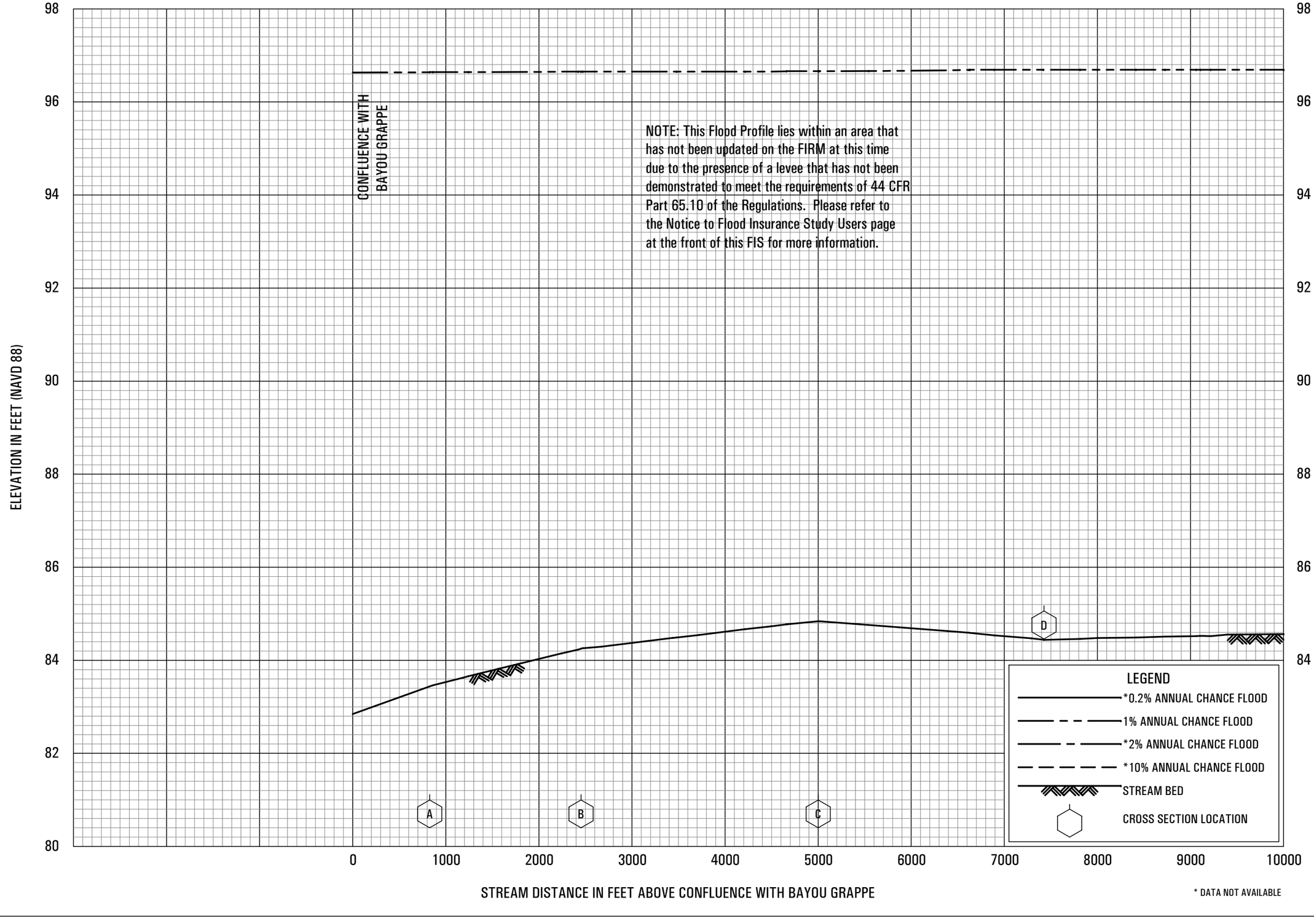
FLOOD PROFILES

CLEAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT PARISH, LA

AND INCORPORATED AREAS



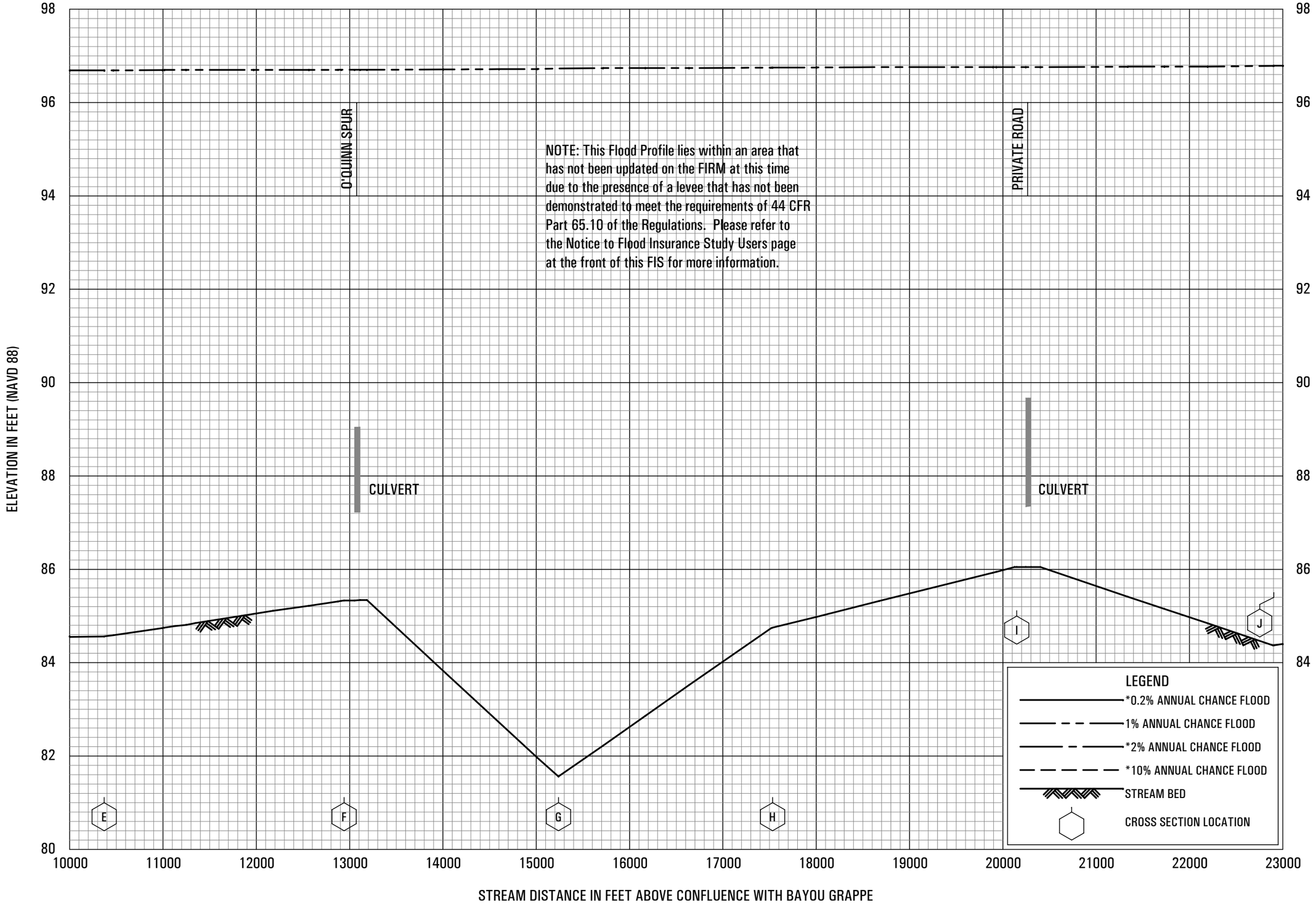
FLOOD PROFILES

CORFEINE BAYOU

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT PARISH, LA

AND INCORPORATED AREAS



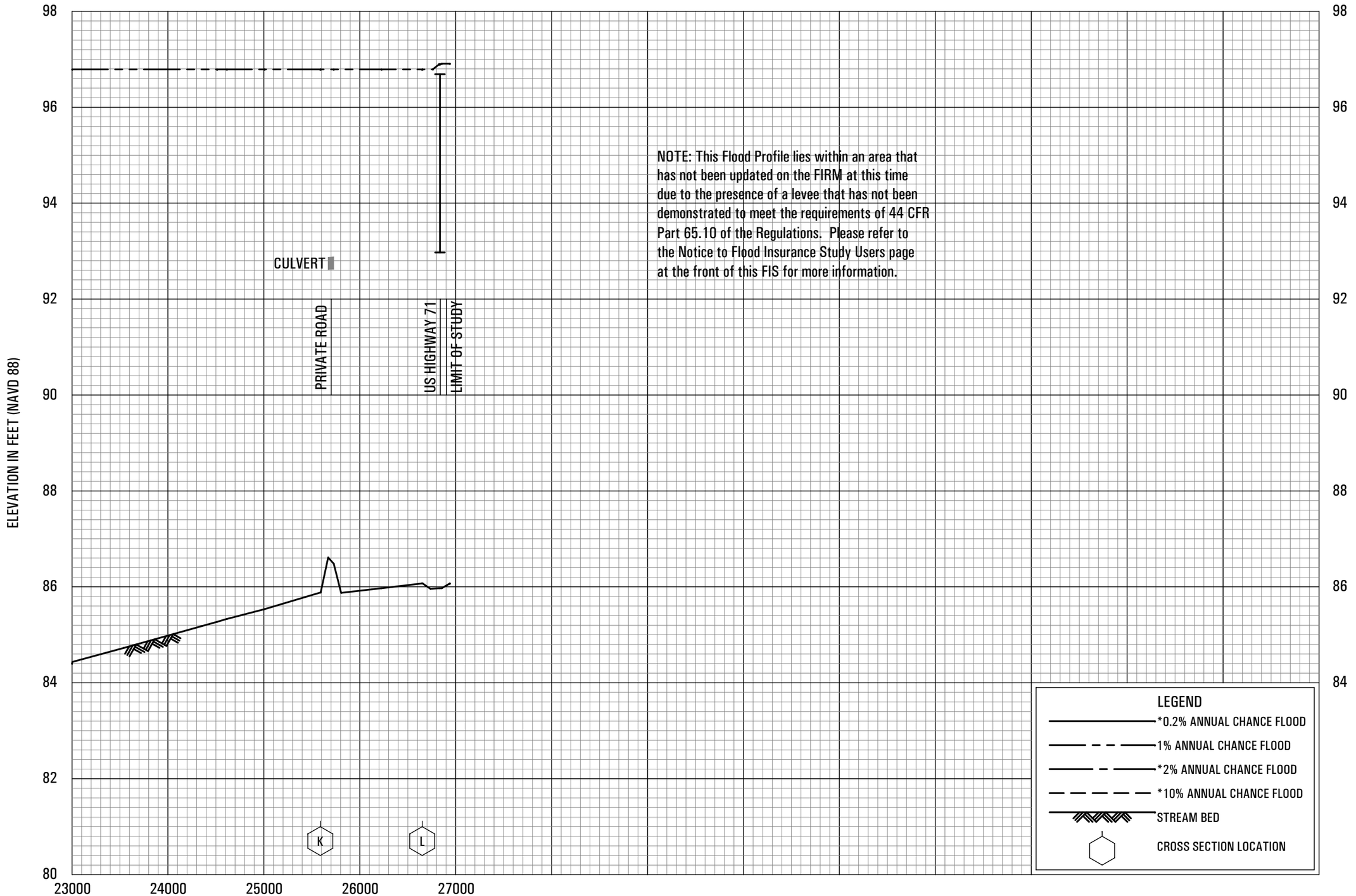
FLOOD PROFILES

CORFEINE BAYOU

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT PARISH, LA

AND INCORPORATED AREAS



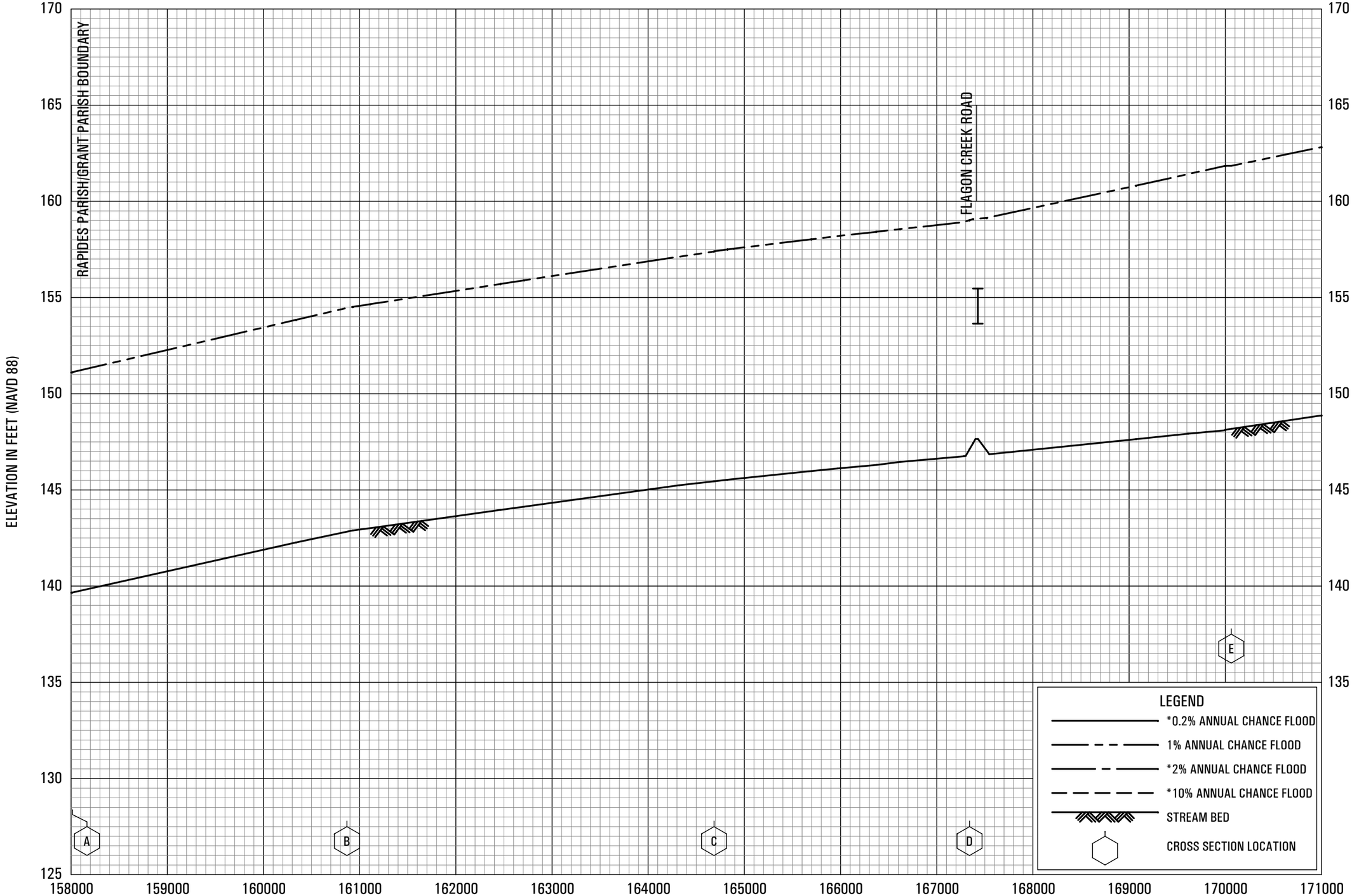
FLOOD PROFILES

CORFEINE BAYOU

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT PARISH, LA

AND INCORPORATED AREAS



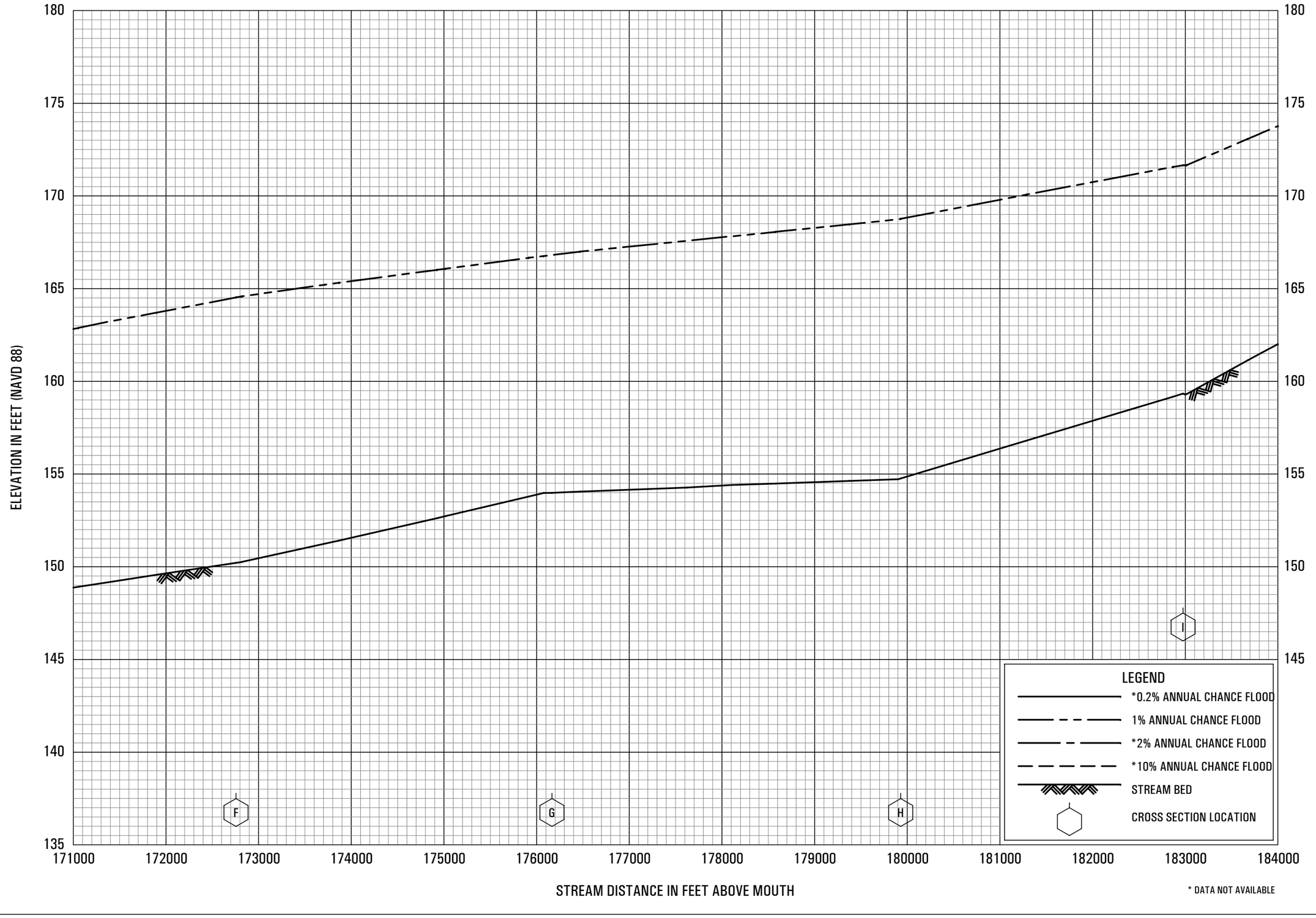
FLOOD PROFILES

FLAGON BAYOU

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT PARISH, LA

AND INCORPORATED AREAS



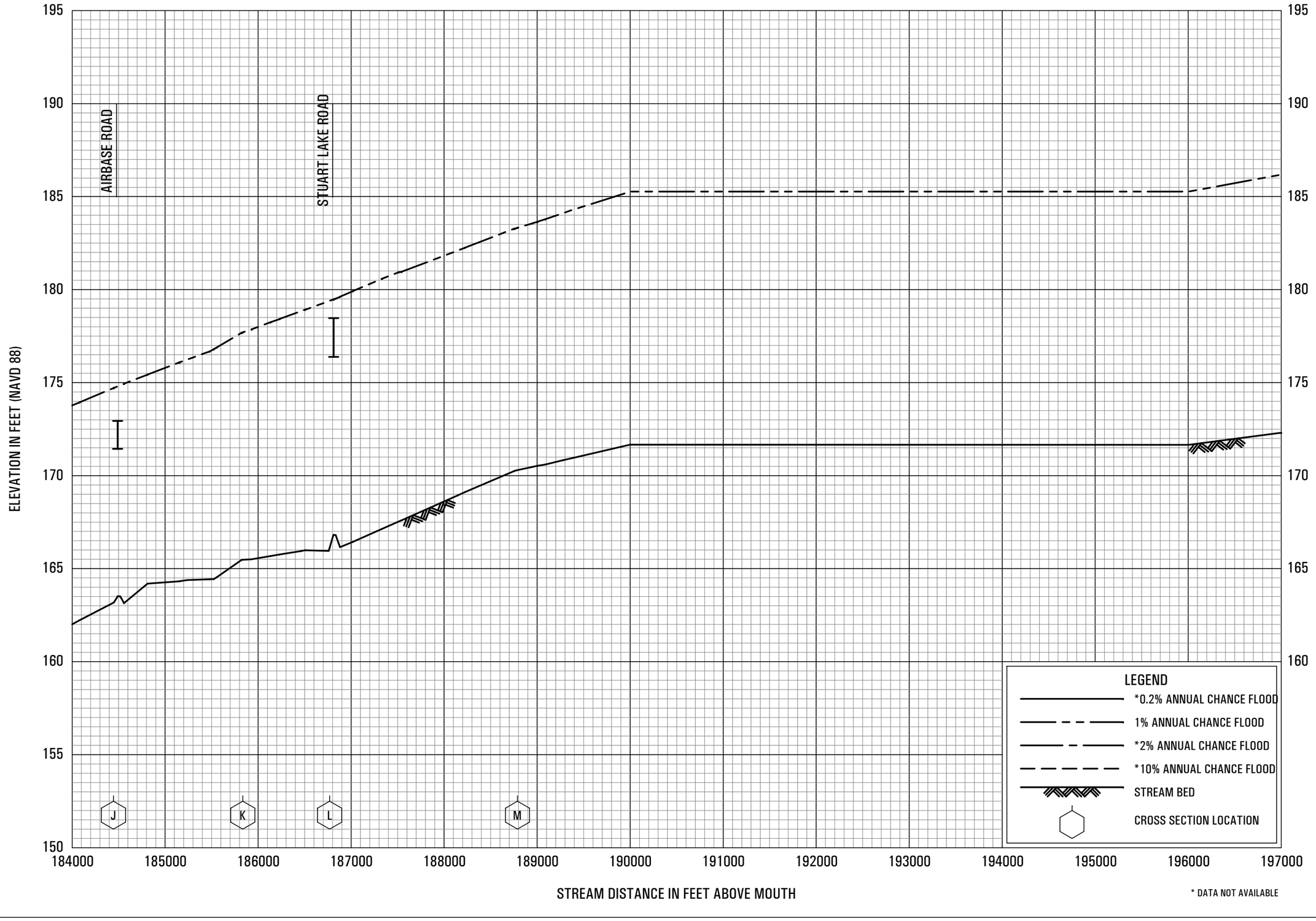
FLOOD PROFILES

FLAGON BAYOU

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT PARISH, LA

AND INCORPORATED AREAS



* DATA NOT AVAILABLE

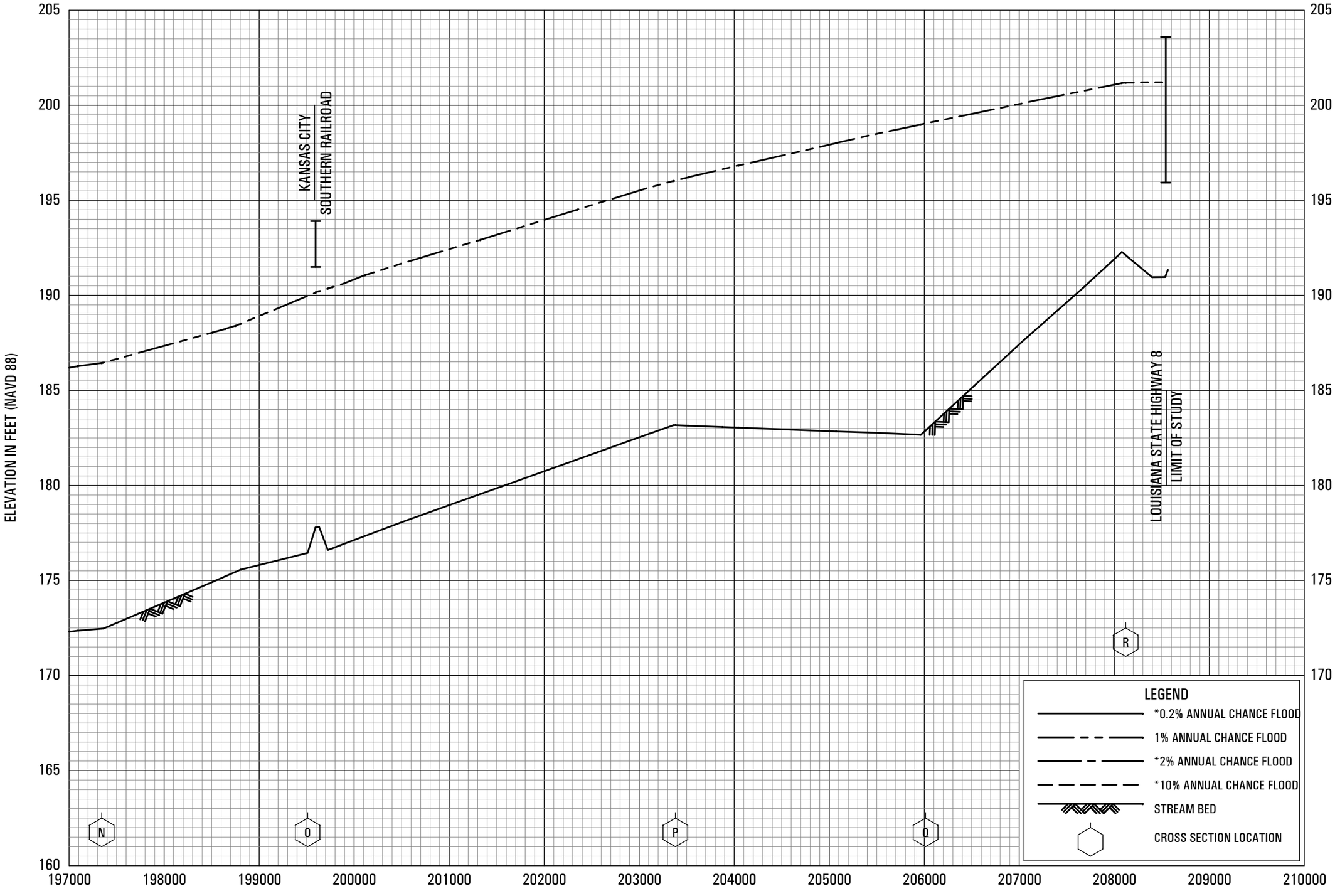
FLOOD PROFILES

FLAGON BAYOU

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT PARISH, LA

AND INCORPORATED AREAS



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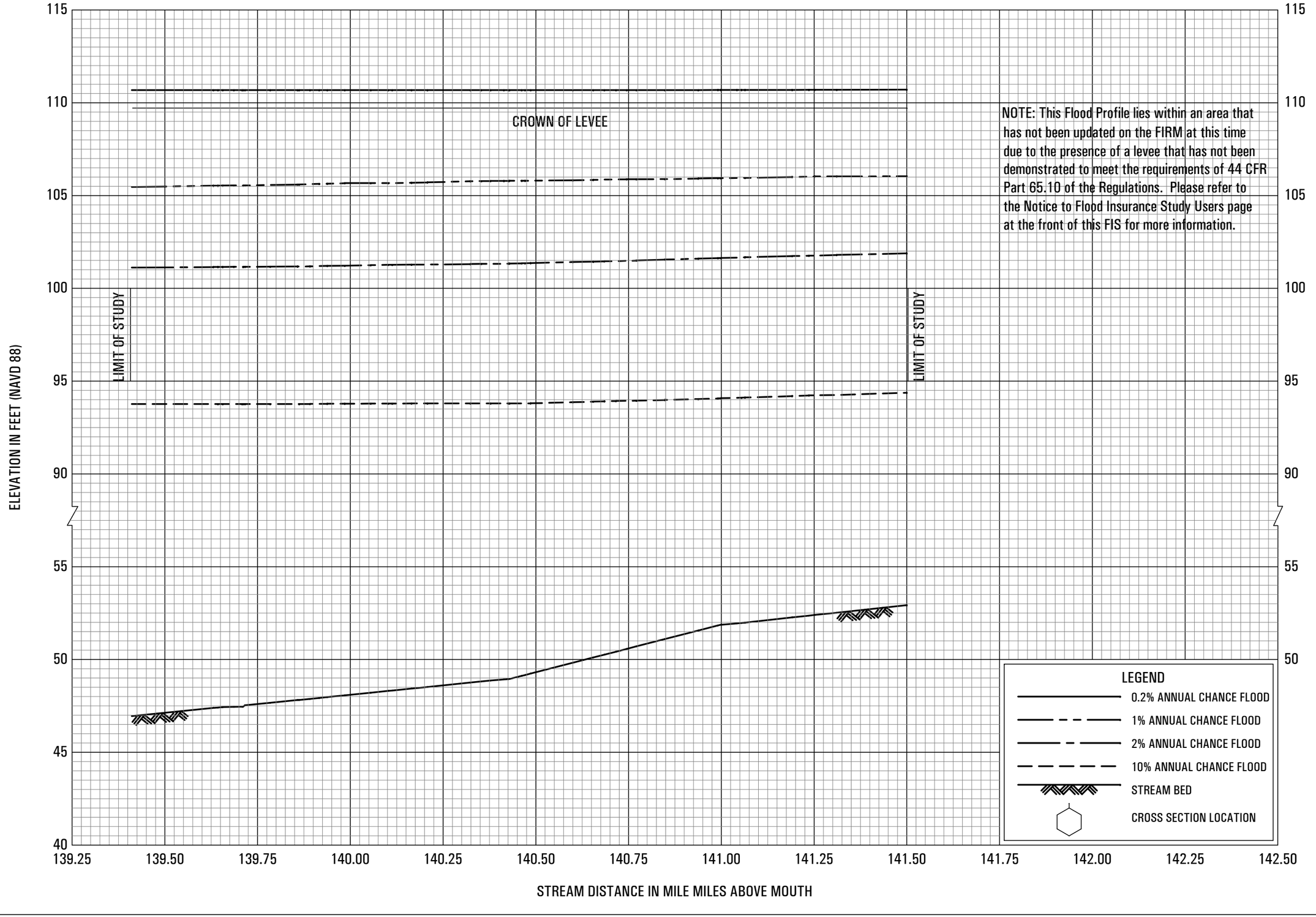
FLOOD PROFILES

FLAGON BAYOU

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT PARISH, LA

AND INCORPORATED AREAS



FLOOD PROFILES

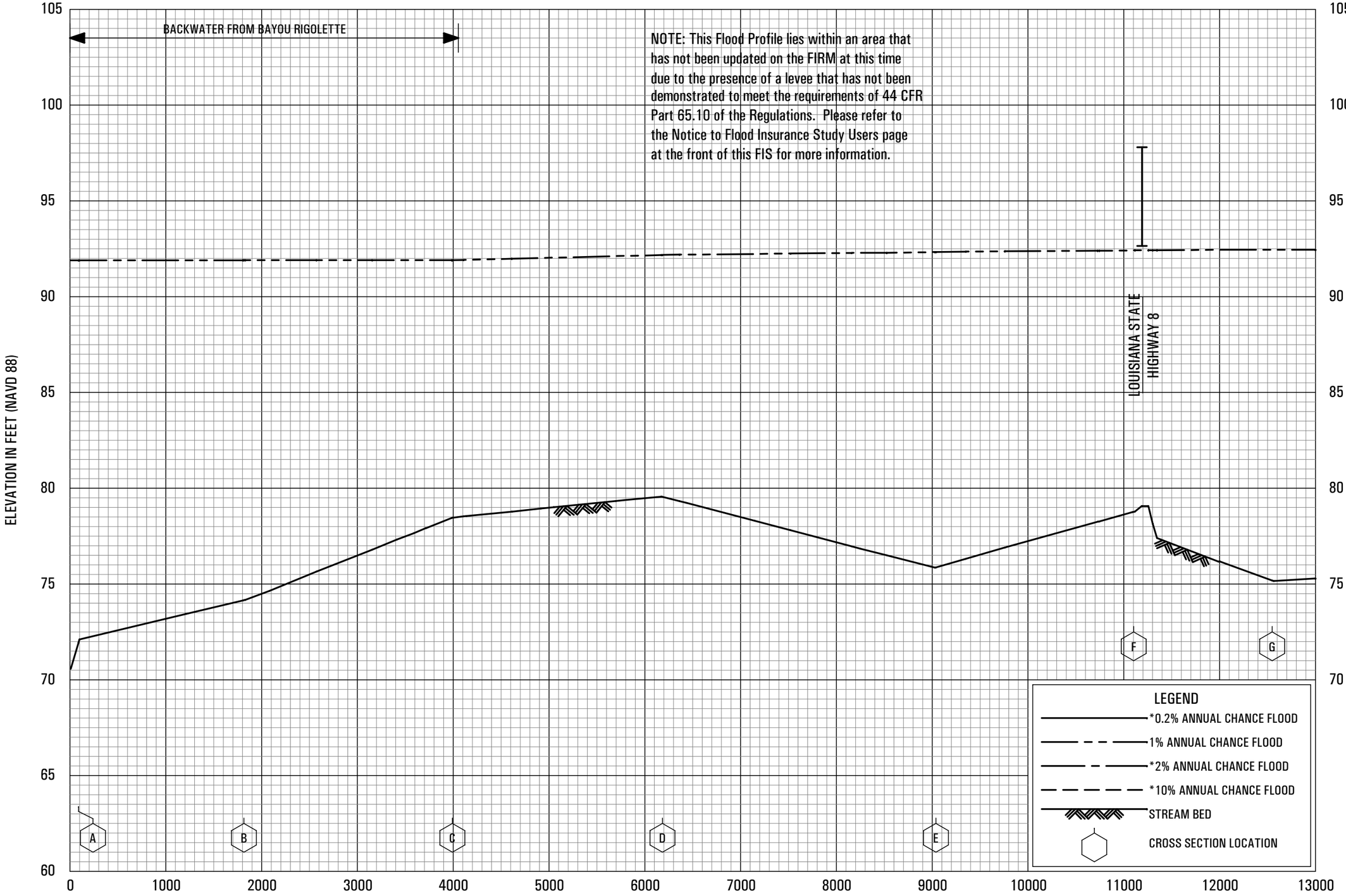
RED RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT PARISH, LOUISIANA

AND INCORPORATED AREAS

27P



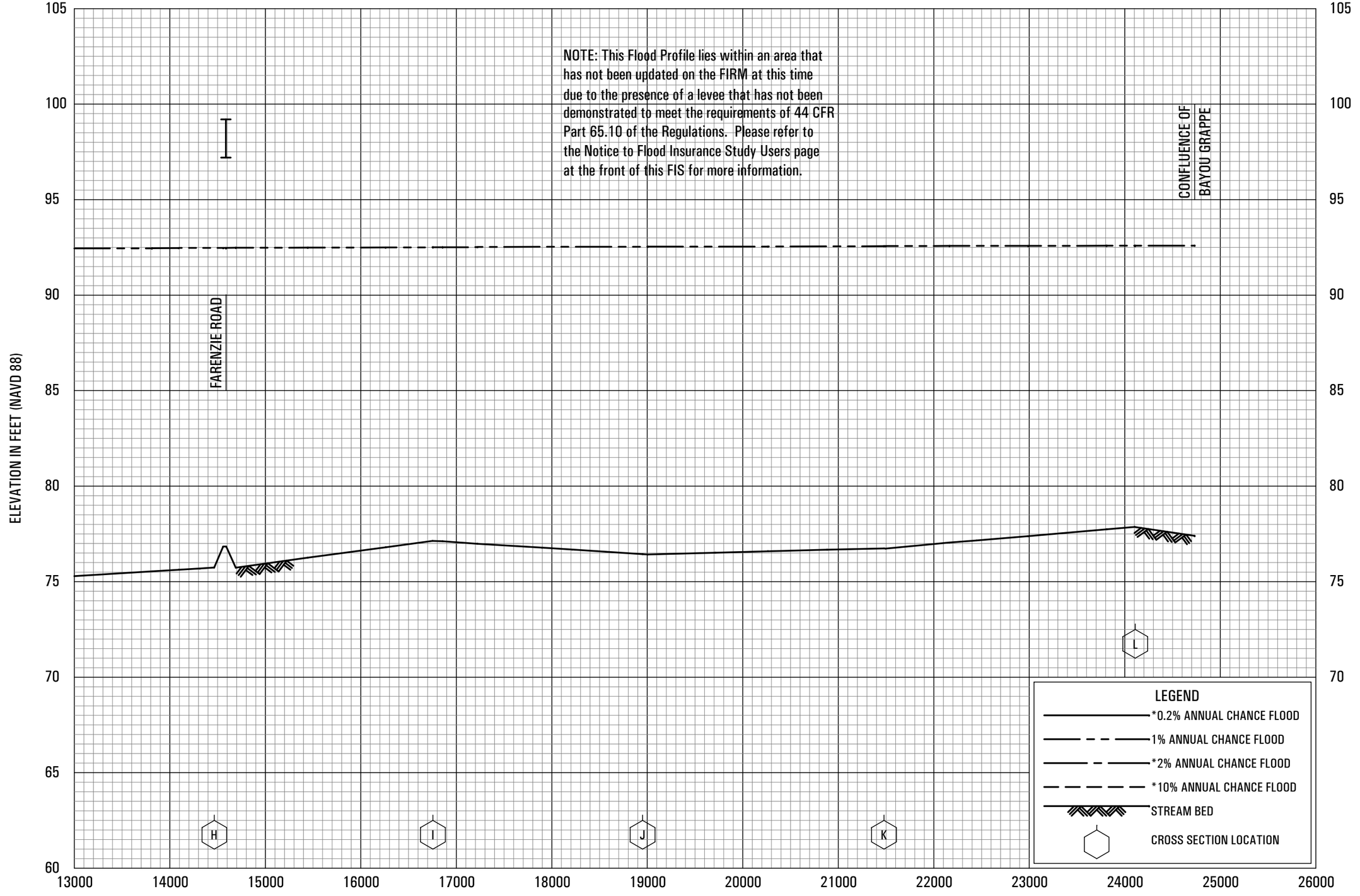
FLOOD PROFILES

SUGARHOUSE BAYOU

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT PARISH, LA

AND INCORPORATED AREAS



FLOOD PROFILES

SUGARHOUSE BAYOU

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT PARISH, LA

AND INCORPORATED AREAS