FLOOD INSURANCE STUDY

TOWN OF JOHNSTON, RHODE ISLAND
PROVIDENCE COUNTY

NOVEMBER 17, 1993

5764

Federal Emergency Management Agency

COMMUNITY NUMBER - 440018

NOTICE TO
FLOOD INSURANCE STUDY USERS

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

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

Initial FIS Effective Date: FIS Report - March 1978 (Flood Insurance Rate Map dated September 1, 1978)

Revised FIS Date: November 17, 1993

TABLE OF CONTENTS

TABLE OF CONTENTS - continued

FLOOD INSURANCE STUDY
TOWN OF JOHNSTON, PROVIDENCE COUNTY, RHODE ISLAND

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study (FIS) revises and updates a previous FIS/Flood Insurance Rate Map (FIRM) for the Town of Johnston, Providence County, Rhode Island. This information will be used by the Town of Johnston to update existing floodplain regulations as part of the Regular Phase of the National Flood Insurance Program (NFIP). The information will also be used by local and regional planners to further promote sound land use and floodplain development.

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.

The hydrologic and hydraulic analyses for the original study were prepared by the Soil Conservation Service (SCS) for the Federal Emergency Management Agency (FEMA), under Inter-Agency Agreement No. IAA-H-9-76. This work was completed in April 1977.

In this revision, the hydrologic and hydraulic analyses for the Pocasset River were prepared by Storch Engineers for FEMA, under Contract No. EMW-89-C-2819. This work was completed in December 1990. The hydrologic and hydraulic analyses for the Woonasquatucket River were prepared by the U.S. Geological Survey (USGS) during the preparation of the FIS for the Town of North Providence under Inter-Agency Agreement No. EMW-89-E-2997, Project No. 5. This work was completed on January 27, 1992.

1.3 Coordination

The purpose of an initial Consultation Coordination Officer's (CCO) meeting is to discuss the scope of the FIS. A final CCO meeting is held to review the results of the study.

For the original study, an initial CCO meeting was held on January 13, 1976, and a final CCO meeting was held on August 1, 1977. Both of these meetings were attended by representatives of the SCS, the town, and FEMA. Of note, the Rhode Island Department of Community Affairs also attended the initial CCO meeting. In addition, an intermediate meeting was held on March 9, 1977, so that the community could review the flood elevations, flood boundaries, and floodway delineations.

For this revised study, an initial CCO meeting was held on June 2, 1988, and a final CCO meeting was held on December 15, 1992. Both of these meetings were attended by representatives of Storch Engineers, the town, and FEMA. On June 9, 1988, meetings were held with the SCS in West Warwick and with the Rhode Island Office of Statewide Planning in Providence, in order to discuss an updated FIS, specifically addressing the limits of flooding along the Pocasset River.

2.0 AREA STUDIED

2.1 Scope of Study

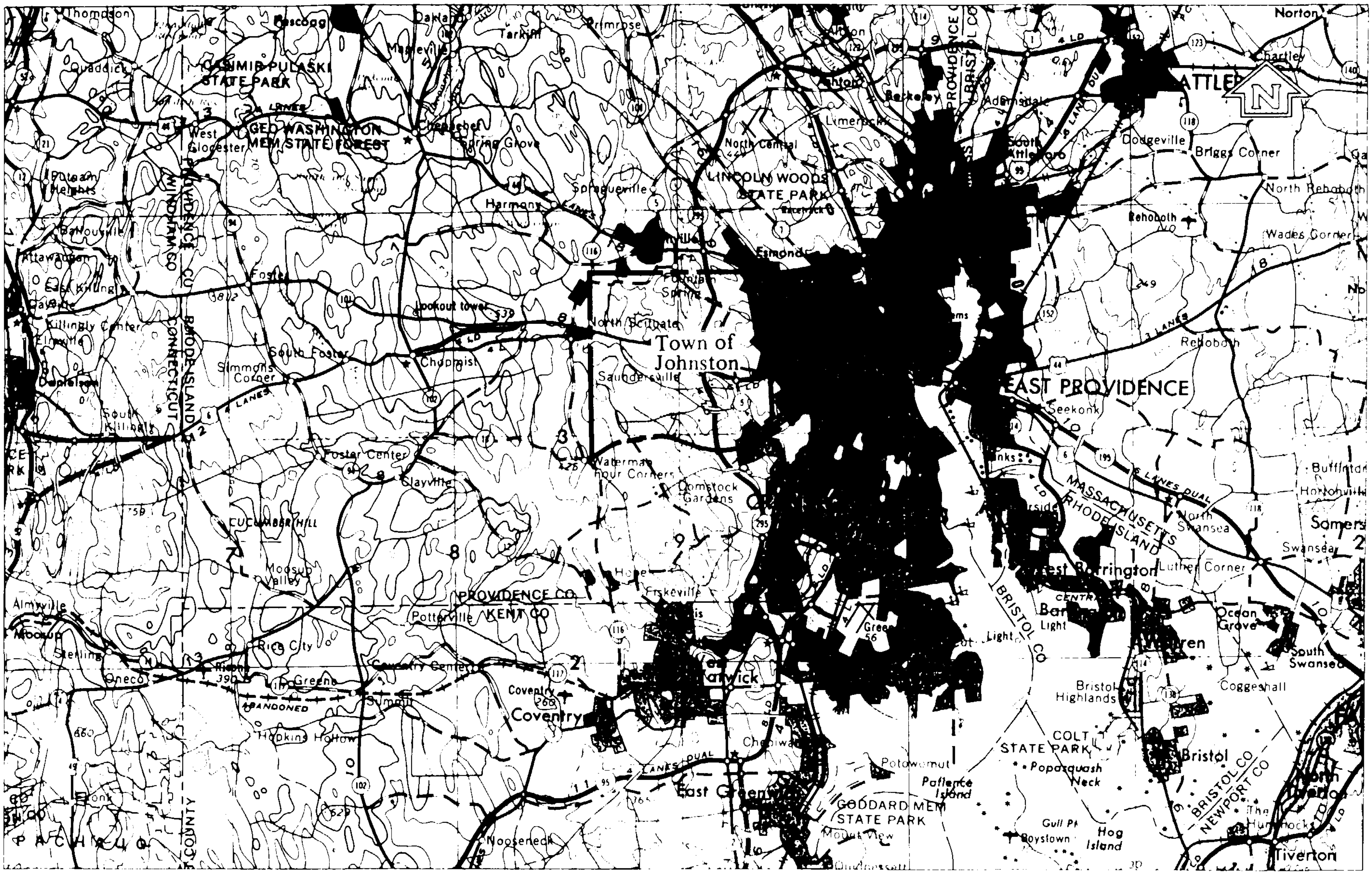
This FIS covers the incorporated area of the Town of Johnston. The area of study is shown on the Vicinity Map (Figure 1).

In the original study, the following streams were studied by detailed methods: the Woonasquatucket River, the Pocasset River, Simmons Brook, Dry Brook, Assapumpset Brook, and South Branch Assapumpset Brook. In this revision, the Pocasset River was restudied from the downstream corporate limits to Belfield Avenue. The Woonasquatucket River was restudied from approximately 0.5 mile downstream of the Ronci Industrial Park Dam to the upstream corporate limits. Limits of detailed study are indicated on the Flood Profiles (Exhibit 1) and on the FIRM (Exhibit 2). The areas studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development and proposed construction.

Dry Brook was studied by approximate methods from Oak Swamp Reservoir to Jillson Reservoir. 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 the Town of Johnston.

2.2 Community Description

The Town of Johnston is located in the center of Providence County in northern Rhode Island. The town is bounded by the Town of



APPROXIMATE SCALE

4 0 4 8 12 MILES

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF JOHNSTON, RI

(PROVIDENCE CO.)

VICINITY MAP

FIGURE 1

Scituate to the west, the Town of Smithfield to the north, the Town of North Providence to the east, and the City of Cranston to the south. The population in the town was 27,130 in 1988. There is commercial development in the floodplains of the Pocasset and Woonasquatucket Rivers. Residential development is present in Dry Brook, Simmons Brook, and Assampumpset Brook floodplains.

The Pocasset River rises in the northern part of the town and flows south into Cranston. Dry Brook and Simmons Brook both flow into the Pocasset River from the west. The Woonasquatucket River rises in North Smithfield and flows through numerous ponds before it forms the eastern border for the Town of Johnston. Assapumpset Brook flows into the Woonasquatucket River from the west.

The topography throughout the town is moderate, with bedrock and well-drained soils in the north and center of town; the southern and western sections contain hardpan soils. There are numerous swamps and small ponds that moderate peak flow rates from the upland areas.

The town is in the prevailing westerly zone, which often includes cyclonic disturbances that cross the country from the west or southwest. The town is also exposed to occasional coastal storms, some of tropical origin, that travel northward along the Atlantic seaboard. In late summer and autumn, the storms occasionally attain hurricane intensity. At times during the winter, the weather is modified by Narragansett Bay and the Atlantic Ocean; thus, major storms may create precipitation in the form of rain rather than snow.

2.3 Principal Flood Problems

Areas adjacent to streams which flow through Johnston are subject to flooding. The most severe flooding is the result of rainfall associated with hurricanes. The events which had the most effect on Johnston occurred in 1944, 1954, 1960, and 1976. Originally the flood of record occurred in March 1968. Since that time, record flows have been recorded in January 1979 and June 1982, at the Cranston gage. Although recent floods show an increase in discharge-frequency, these events have been characterized as a very rare series of low recurrence floods. During a June 2, 1988 Time and Cost meeting for the updated study, representatives from the Town of Johnston, reported principal flooding occurs at roadways and facilities built adjacent to the Pocasset River, between Central Avenue and Plainfield Pike.

2.4 Flood Protection Measures

There are no flood protection measures presently in existence for the town, although floodplain management is highly recommended in these floodprone areas.

3.0 ENGINEERING METHODS

For the flooding sources studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. 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 community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency and peak elevation-frequency relationships for each flooding source studied in detail affecting the community.

For all the detailed studied streams except the Pocasset and Woonasquatucket Rivers, the SCS synthetic rainfall-runoff method was used to obtain the 10-, 50-, 100-, and 500-year peak discharge (Reference 1). The SCS method utilizes: soils and land use information to develop the runoff curve numbers; topography and stream hydraulics from which times of concentration are calculated; rainfall intensity and distribution taken from the weather bureau records (Reference 2). The SCS method has been shown to produce very conservative flowrates when compared to those for gaged streams in the area.

The Pocasset River hydrology was investigated in this revision for flowrate reduction based on existing reports, studies, and gaged data.

For the Woonasquatucket River, the 100-year flood discharge was based on stream gaging records at USGS station No. 01114500 located in Centerdale on the Woonasquatucket River (Reference 3). The 100-year discharge was then extended to the Providence-North Providence corporate limit. The resultant peak discharge of 2,600 cubic feet per second agrees with the FIS for the Town of North Providence (Reference 4).

A summary of the drainage area-peak discharge relationships for the streams studied by detailed methods is shown in Table 1, "Summary of Discharges."

TABLE 1 - SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs)			
		10-YEAR	50-YEAR	100-YEAR	500-YEAR
WOONASQUATUCKET RIVER					
At downstream corporate limits	43.8	*	*	2,600	*
At upstream corporate limits	36.5	*	*	2,170	*
POCASSET RIVER					
At corporate limits	17.29	985	1,816	2,014	3,919
Below Simmons Brook	16.80	985	1,816	2,021	3,929
Above Simmons Brook	10.90	715	1,348	1,386	2,599
Below Dry Brook	9.89	670	1,184	1,278	2,373
Above Dry Brook	6.70	573	990	1,063	1,947
At Interstate Route 195	5.78	496	860	922	1,686
At Interstate Route 6	3.05	262	455	487	913
SIMMONS BROOK					
At cross section A	5.90	740	1,430	1,890	2,980
At Mill Street	4.94	590	1,200	1,600	2,570
At Simmonsville Road	4.32	490	1,060	1,420	2,300
DRY BROOK					
At cross section A	3.19	340	650	820	1,190
At cross section B	3.09	320	610	780	1,130
ASSAPUMPSET BROOK					
At cross section A	2.56	180	350	480	950
At Amento Street	1.50	110	310	400	790
At George Waterman Road	1.47	110	300	390	750
At cross section O	1.38	220	410	490	720
At Sweet Hill Drive	1.28	200	380	450	660

* Data not available

TABLE 1 - SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs)			
		10-YEAR	50-YEAR	100-YEAR	500-YEAR
SOUTH BRANCH ASSAPUMPSET BROOK					
Above confluence with Assapumpset Brook	1.15	150	210	280	550
At Greenville Avenue	1.08	50	190	280	580

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals.

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

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

In the original study, water-surface elevations of floods were computed using the SCS WSP-2 computer program (Reference 5). Water-surface elevations of floods of the selected recurrence intervals were computed using the U.S. Army Corps of Engineers (USACE) HEC-2 step-backwater computer program (Reference 6). Starting water-surface elevations were calculated using the SCS-prepared Flood Hazard Analyses for the Pocasset River (Reference 3). Starting elevations for the Woonasquatucket River were obtained from the FIS for the City of Providence (Reference 7). All other streams used the elevations from their parent streams for the determination of starting water-surface elevations. Flood profiles were drawn showing computed water-surface elevations for floods of the selected recurrence intervals.

Channel roughness factors (Manning's "n") used in the hydraulic computations were chosen by field inspection and engineering judgement. For all streams studied by detailed methods the channel "n" values ranged from 0.025 to 0.050, and the overbank "n" values ranged from 0.035 to 0.100.

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

All elevations are referenced to the National Geodetic Vertical Datum of 1929 (NGVD). Elevation reference marks used in this study are shown on the maps.

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. Therefore, each FIS provides 100-year flood elevations and delineations of the 100- and 500-year floodplain boundaries and 100-year floodway to assist in developing floodplain management measures.

4.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1 percent annual chance (100-year) flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2 percent annual chance (500-year) flood is employed to indicate additional areas of flood risk in the community. For the streams studied in detail, the 100- and 500-year floodplain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using topographic maps at a scale of 1:24,000 with a contour interval of 10 feet (Reference 8).

For the stream studied by approximate methods, the 100-year floodplain boundaries remain unchanged from the delineation shown on the previously printed FIS for the Town of Johnston (Reference 9).

The 100- and 500-year floodplain boundaries are shown on the FIRM (Exhibit 2). On this map, the 100-year floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A and AE), and the 500-year floodplain boundary corresponds to the boundary of areas of moderate flood hazards. In cases where the 100- and 500-year floodplain boundaries are close together, only the 100-year 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 stream studied by approximate methods, only the 100-year 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 National Flood Insurance Program, a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of the 100-year 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 100-year flood can be carried without substantial increases in flood heights. Minimum federal standards limit such increases to 1.0 foot, provided that hazardous velocities are not produced. The floodways in this study are presented to local agencies as a minimum standard that can be adopted directly or that can be used as a basis for additional floodway studies.

The floodways presented in this study were computed for certain stream segments on the basis of equal conveyance reduction from each side of the floodplain. Floodway widths were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. The results of the floodway computations are tabulated for selected cross sections (Table 2). The computed floodways are shown on the FIRM (Exhibit 2). In cases where the floodway and 100-year floodplain boundaries are either close together or collinear, only the floodway boundary is shown. The floodway for the Woonasquatucket River extends beyond the corporate limits.

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". 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. A portion of the floodway width for certain cross sections extends beyond the corporate limits.

The area between the floodway and 100-year 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 100-year flood

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH[2] (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY (FEET NGVD)	WITH FLOODWAY	INCREASE
Woonasquatucket River								
A	600	305	1,676	4.52	57.9	57.9	58.9	1.0
B	700	78	1,021	7.31	57.9	57.9	58.9	1.0
C	950	164	1,678	4.43	58.4	58.4	59.4	1.0
D	1,050	204	876	8.49	58.5	58.5	59.0	0.5
E	1,800	178	1,838	4.04	60.2	60.2	60.7	0.5
F	3,040	45	597	12.42	65.3	65.3	66.3	1.0
G	3,900	220	1,481	5.00	68.7	68.7	69.7	1.0
H	4,250	267	1,736	4.26	68.8	68.8	69.8	1.0
I	4,884	117	1,279	5.77	68.8	68.8	69.8	1.0
J	5,500	257	1,401	1.86	68.8	68.8	68.8	0.0
K	6,465	74	323	8.05	69.4	69.4	69.4	0.0
L	8,040	156	936	2.78	74.0	74.0	74.3	0.3
M	8,150	465	2,405	1.08	80.7	80.7	81.7	1.0
N	12,565	123	592	4.40	82.1	82.1	82.9	0.8
O	12,761	48	217	11.96	85.1	85.1	85.3	0.2
P	12,850	55	226	11.50	91.5	91.5	91.5	0.0
Q	12,899	89	815	3.19	93.6	93.6	93.6	0.0
R	16,388	49	223	11.66	101.2	101.2	101.3	0.1
S	16,696	182	1,124	2.31	105.1	105.1	106.0	0.9
T	16,761	38	228	11.40	105.1	105.1	106.0	0.9
U	18,136	282	1,200	2.17	111.7	111.7	112.0	0.3
V	19,050	231	1,201	2.16	113.0	113.0	113.3	0.3
W	19,521	306	1,282	2.03	114.6	114.6	115.0	0.4

[1]Feet above corporate limits
[2]This width extends beyond corporate limits

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF JOHNSTON, RI
(PROVIDENCE CO.)

FLOODWAY DATA

WOONASQUATUCKET RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
					(FEET NGVD)			
Pocasset River								
A	3,070	120	757	2.7	78.9	78.9	78.9	0.0
B	4,680	120	1,436	1.4	79.0	79.0	79.4	0.4
C	5,842	120	790	2.6	79.0	79.0	79.7	0.7
D	6,070	43	397	5.1	81.6	81.6	82.5	0.9
E	6,490	120	898	2.3	82.2	82.2	83.0	0.8
F	6,850	200	1,576	0.9	82.3	82.3	83.2	0.9
G	7,080	200	2,037	0.7	82.3	82.3	83.2	0.9
H	7,840	200	1,148	1.2	82.3	82.3	83.2	0.9
I	8,060	192	660	2.1	82.3	82.3	83.2	1.0
J	8,110	220	1,707	0.8	82.4	82.4	83.4	1.0
K	8,214	220	1,650	0.8	82.4	82.4	83.4	1.0
L	8,625	220	1,101	1.3	82.4	82.4	83.3	0.9
M	9,160	146	279	5.0	85.6	85.6	85.6	0.0
N	9,360	42	133	9.6	88.6	88.6	88.6	0.0
O	10,200	114	214	6.0	95.6	95.6	95.6	0.0
P	10,409	100	1,059	1.2	100.4	100.4	100.4	0.0
Q	10,990	100	904	1.4	100.4	100.4	100.5	0.1
R	11,420	150	1,117	1.1	100.4	100.4	100.5	0.1
S	11,740	150	1,175	1.1	100.4	100.4	100.5	0.1
T	12,905	150	757	1.4	100.5	100.5	100.7	0.2
U	13,240	150	659	1.6	102.8	102.8	102.8	0.0
V	13,460	115	411	2.6	103.3	103.3	103.3	0.0
W	14,030	76	150	7.1	107.3	107.3	107.3	0.0
X	14,250	109	428	2.5	111.2	111.2	111.2	0.0
Y	15,035	75	245	4.3	113.4	113.4	113.7	0.3
Z	15,735	95	415	2.6	115.2	115.2	115.8	0.6

[1]Feet above corporate limits

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF JOHNSTON, RI
(PROVIDENCE CO.)

FLOODWAY DATA

POCASSET RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
						(FEET NGVD)		
Pocasset River (continued)								
AA	16,495	500	1,489	0.6	124.2	124.2	124.2	0.0
AB	16,965	150	203	4.5	125.1	125.1	125.2	0.1
AC	17,190	150	432	2.1	125.6	125.6	126.3	0.7
AD	17,273	36	106	8.7	125.7	125.7	126.3	0.6
AE	17,392	38	177	5.2	128.0	128.0	128.0	0.0
AF	18,059	120	608	1.5	136.9	136.9	136.9	0.0
AG	18,924	375	1,465	0.6	137.1	137.1	137.1	0.0
AH	20,714	53	160	5.7	141.5	141.5	141.5	0.0
AI	21,147	39	152	3.2	150.3	150.3	150.3	0.0
AJ	21,796	50	127	3.8	151.2	151.2	151.3	0.1
AK	21,941	96	634	0.8	157.1	157.1	157.5	0.4
AL	22,831	52	104	4.7	157.1	157.1	157.5	0.4
AM	23,086	53	143	3.4	159.3	159.3	159.5	0.2
AN	23,381	54	156	3.1	160.1	160.1	160.5	0.4
AO	23,814	90	187	2.6	161.5	161.5	161.7	0.2
AP	24,214	8	38	12.7	167.1	167.1	167.1	0.0
AQ	24,742	6	100	4.9	181.9	181.9	181.9	0.0
AR	25,266	17	50	9.8	205.2	205.2	205.3	0.1
AS	25,627	5	135	3.6	230.6	230.6	230.6	0.0
AT	26,027	50	525	0.9	230.9	230.9	230.9	0.0
AU	26,707	200	1,279	0.4	230.9	230.9	230.9	0.0
AV	27,907	123	1,126	0.4	254.2	254.2	254.2	0.0
AW	28,472	100	914	0.4	254.2	254.2	254.2	0.0
AX	29,632	200	417	1.2	254.2	254.2	254.3	0.1

[1]Feet above corporate limits

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF JOHNSTON, RI

(PROVIDENCE CO.)

FLOODWAY DATA

POCASSET RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC.)	WITH FLOODWAY (NGVD)	WITHOUT FLOODWAY (NGVD)	DIFFERENCE
SIMMONS BROOK							
A	378	222	1681	1.13	88.0	87.0	1.0
B	611	30	195	9.61	88.8	88.3	0.5
C	693	15	132	14.17	89.4	88.9	0.5
D	981	73	509	3.66	97.9	96.9	1.0
E	1224	55	414	4.49	98.2	97.2	1.0
F	1650	31	186	9.99	100.3	99.3	1.0
G	1950	84	248	7.47	105.7	105.2	0.5
H	2450	43	166	11.11	119.4	118.9	0.5
I	2698	38	158	10.29	129.0	128.5	0.5
J	2950	38	181	8.95	133.0	132.5	0.5
K	3070	38	151	10.67	137.1	136.6	0.5
L	3140	73	448	3.61	147.8	147.3	0.5
M	3300	73	455	3.55	147.9	147.4	0.5
N	3600	27	137	11.76	156.0	155.0	1.0
O	4795	32	174	9.21	166.6	165.6	1.0
P	5845	40	160	9.74	185.6	184.6	1.0
Q	7145	79	287	5.21	204.6	204.1	0.5
R	7980	260	268	5.31	232.0	231.5	0.5
S	8265	218	169	8.39	239.7	239.2	0.5
DRY BROOK							
A	200	136	1050	0.79	104.2	103.2	1.0
B	1040	22	113	7.13	108.1	107.1	1.0
C	1300	45	96	8.36	110.5	110.0	0.5
D	1380	46	89	8.93	115.0	114.5	0.5
E	1570	20	86	9.18	128.2	127.2	1.0
F	1900	14	84	9.34	140.9	139.9	1.0
G	2200	16	74	10.49	145.1	144.1	1.0

[1]FEET ABOVE CONFLUENCE WITH POCASSET RIVER

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF JOHNSTON, RI
(PROVIDENCE CO.)

FLOODWAY DATA

SIMMONS BROOK - DRY BROOK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC.)	WITH FLOODWAY (NGVD)	WITHOUT FLOODWAY (NGVD)	DIFFERENCE
ASSAPUMPSET BROOK							
A	150	44	189	2.55	83.2	82.2	1.0
B	230	30	170	2.83	86.2	85.2	1.0
C	555	83	165	2.92	90.0	89.0	1.0
D	765	100	188	2.56	94.8	93.8	1.0
E	924	35	113	4.26	97.9	96.9	1.0
F	1034	33	142	2.84	98.9	97.9	1.0
G	1085	23	62	6.46	99.3	98.8	0.5
H	1320	22	97	4.13	101.7	100.7	1.0
I	1416	12	51	7.90	102.1	101.6	0.5
J	1563	38	167	2.40	104.0	103.0	1.0
K	1753	155	106	3.78	104.5	104.0	0.5
L	2042	14	46	8.63	119.1	118.6	0.5
M	2627	27	63	6.30	134.7	134.2	0.5
N	2672	29	65	5.70	137.9	137.4	0.5
O	2756	412	1867	0.27	138.8	138.3	0.5
P	4700	25	109	4.26	150.2	149.2	1.0
Q	5150	344	1444	0.20	160.5	160.0	0.5
SOUTH BRANCH ASSAPUMPSET BROOK							
A	30[2]	13	43	6.50	99.3	98.3	1.0
B	372[2]	14	54	5.12	110.9	109.9	1.0
C	548[2]	22	40	6.96	115.8	114.8	1.0
D	960[2]	27	107	2.58	127.4	126.4	1.0
E	1330[2]	30	63	4.40	139.3	138.8	0.5
F	1700[2]	12	33	8.46	165.4	164.4	1.0
G	2156[2]	162	881	0.31	184.5	184.0	0.5

[1]FEET ABOVE CONFLUENCE WITH WOONASQUATUCKET RIVER
[2]FEET ABOVE CONFLUENCE WITH ASSAPUMPSET BROOK

TABLE 2

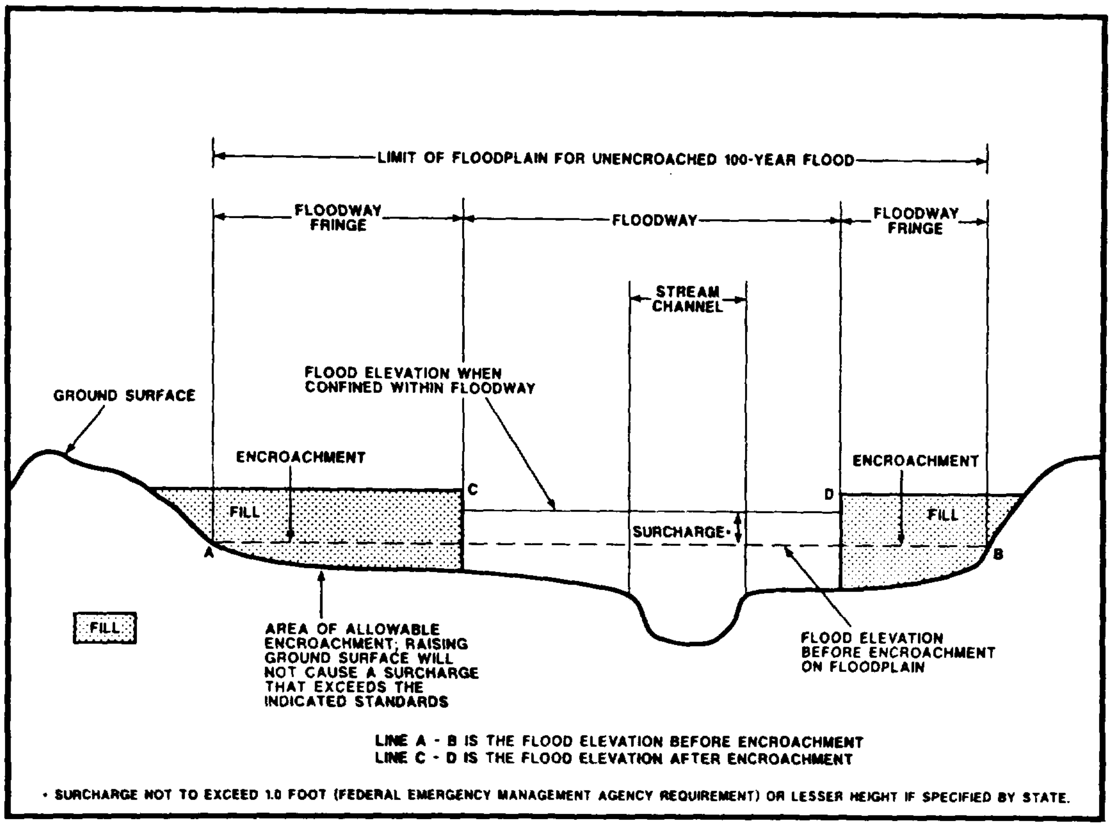
FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF JOHNSTON, RI
(PROVIDENCE CO.)

FLOODWAY DATA

ASSAPUMPSET BROOK - SOUTH BRANCH ASSAPUMPSET BROOK

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 2.



FLOODWAY SCHEMATIC Figure 2

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 100-year floodplains that are determined in the Flood Insurance Study 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 100-year 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 100-year 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 100-year shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average whole-depths derived from the detailed hydraulic analyses are shown within this zone.

Zone A99

Zone A99 is the flood insurance rate zone that corresponds to areas of the 100-year 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.

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 100-year 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 100- and 500-year floodplains. Floodways and the locations of selected cross sections used in the hydraulic analyses and floodway computations are shown where applicable. The FIRM includes flood hazard information that was presented separately on the Flood Boundary and Floodway Map in the previously printed FIS for the Town of Johnston (Reference 9).

7.0 OTHER STUDIES

FISs have been prepared for the Towns of Scituate, Smithfield, and North Providence and the Cities of Providence and Cranston (References 10, 11, 12, 7, and 13).

Because it is based on more up-to-date analyses, this FIS supersedes the previously printed FIS for the Town of Johnston (Reference 9). Please note that this FIS also supersedes the Flood Boundary and Floodway Map for the Town of Johnston, which was published as part of the previously printed FIS. The information on the Flood Boundary and Floodway Map has been added to the FIRM accompanying this FIS.

8.0 LOCATION OF DATA

Information concerning the pertinent data used in preparation of this study can be obtained by contacting FEMA, the Natural and Technological Hazards Division, J. W. McCormack Post Office and Courthouse Building, Room 462, Boston, Massachusetts 02109.

9.0 BIBLIOGRAPHY AND REFERENCES

1. U. S. Department of Agriculture, Soil Conservation Service, Hydrology Branch, Soil Conservation Service National Engineering Handbook, Section 4, Hydrology, Washington, D.C., August 1972.

2. U. S. Department of Commerce, Weather Bureau, Technical Paper No. 40, Rainfall Frequency Atlas of the United States, Washington, D.C., 1961, Revised 1963.

3. Water Resources Council, "Guidelines for Determining Flood Flow Frequency," Bulletin 17, Washington, D. C., March 1976.

4. U. S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Insurance Study, Town of North Providence, Providence County, Rhode Island, Washington, D. C., Flood Insurance Study dated June 1977, Flood Insurance Rate Map dated December 15, 1977.

5. U. S. Department of Agriculture, Soil Conservation Service, Technical Release No. 61, WSP-2 Computer Program, Washington, D. C., May 1976.

6. U. S. Army Corps of Engineers, Hydrologic Engineering Center, HEC-2 Water Surface Profiles, Generalized Computer Program, Davis, California, April 1984.

7. Federal Emergency Management Agency, Flood Insurance Study, City of Providence, Providence County, Rhode Island, Washington, D.C., April 15, 1986. (currently being revised)

8. U. S. Department of the Interior, Geological Survey, 7.5-Minute Series Topographic Maps, Scale 1:24,000, Contour Interval 10 Feet: Providence, RI., 1957 (photorevised 1970).

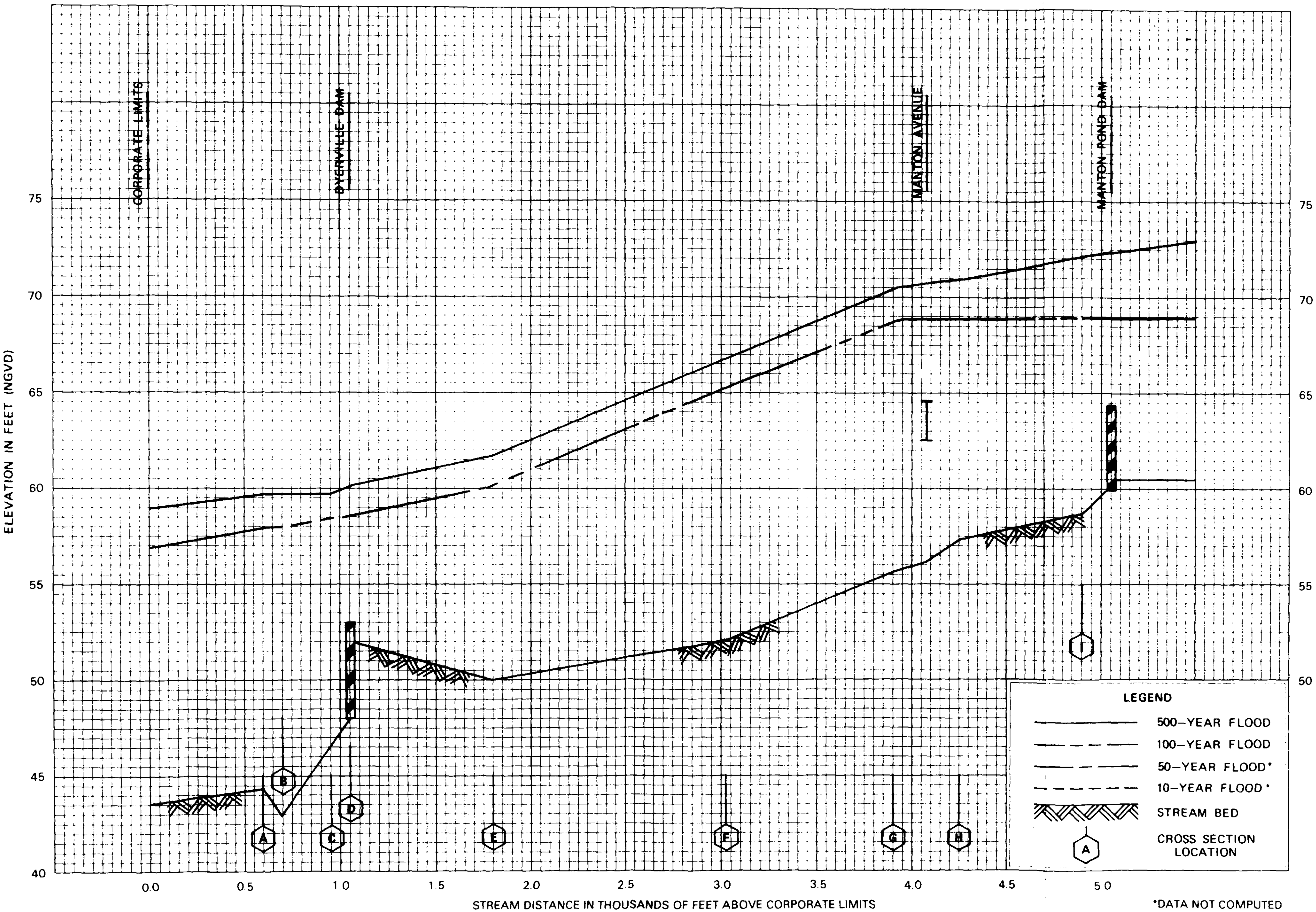
9. U. S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Insurance Study, Town of Johnston, Providence County, Rhode Island, Washington, D.C., March 1978, Flood Insurance Rate Map dated September 1, 1978.

10. Federal Emergency Management Agency, Federal Insurance Administration, Flood Insurance Study, Town of Scituate, Providence County, Rhode Island, Washington, D.C., January 2, 1981.

11. U. S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Insurance Study, Town of Smithfield, Providence County, Rhode Island, Washington, D.C., March 1, 1977.

12. U. S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Insurance Study, Town of North Providence, Providence County, Rhode Island, Washington, D.C., September 30, 1993.

13. Federal Emergency Management Agency, Flood Insurance Study, City of Cranston, Providence County, Rhode Island, Washington, D.C., November 1, 1984.



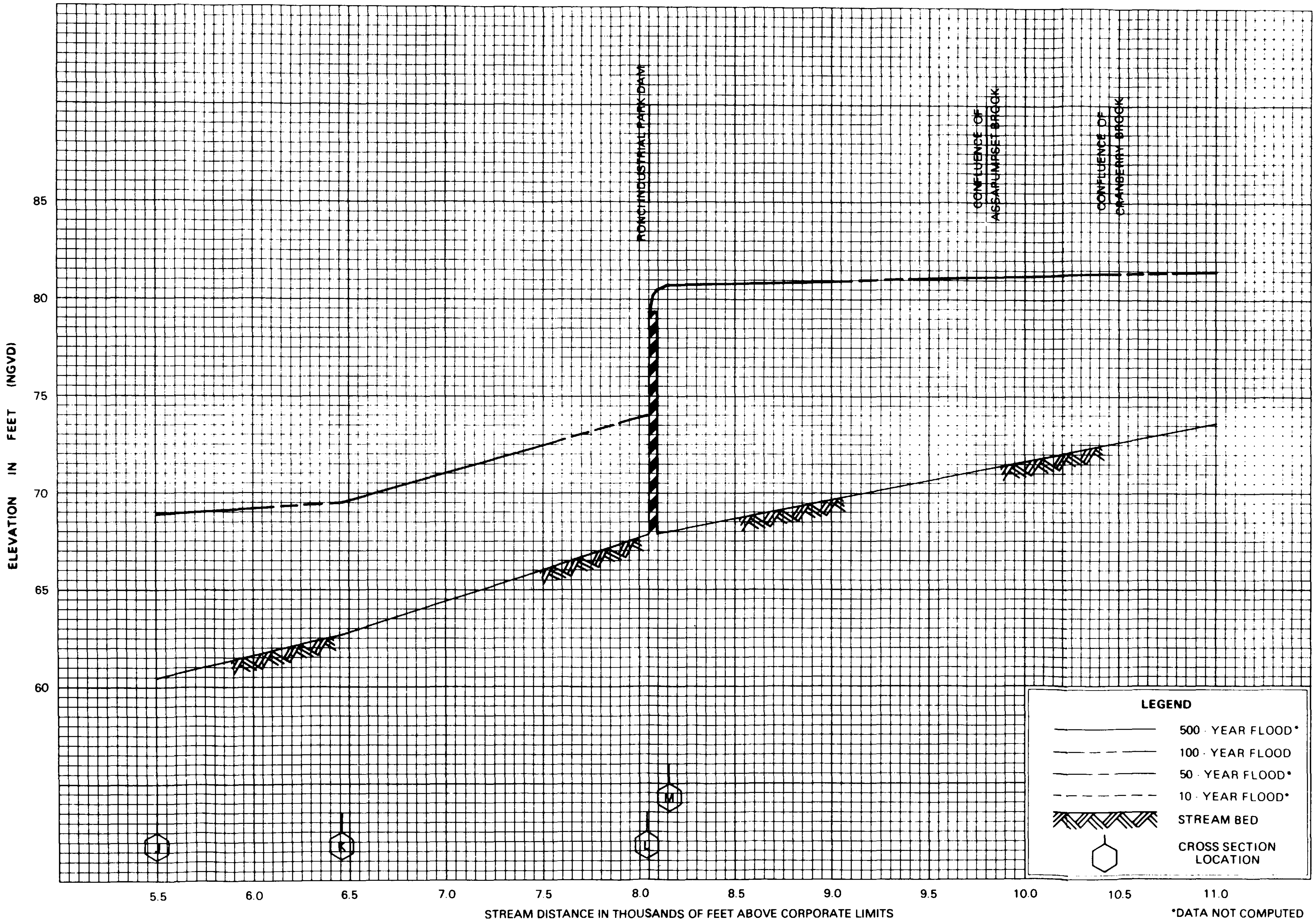
FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF JOHNSTON, RI
(PROVIDENCE CO.)

FLOOD PROFILES

WOONASQUATUCKET RIVER

01P



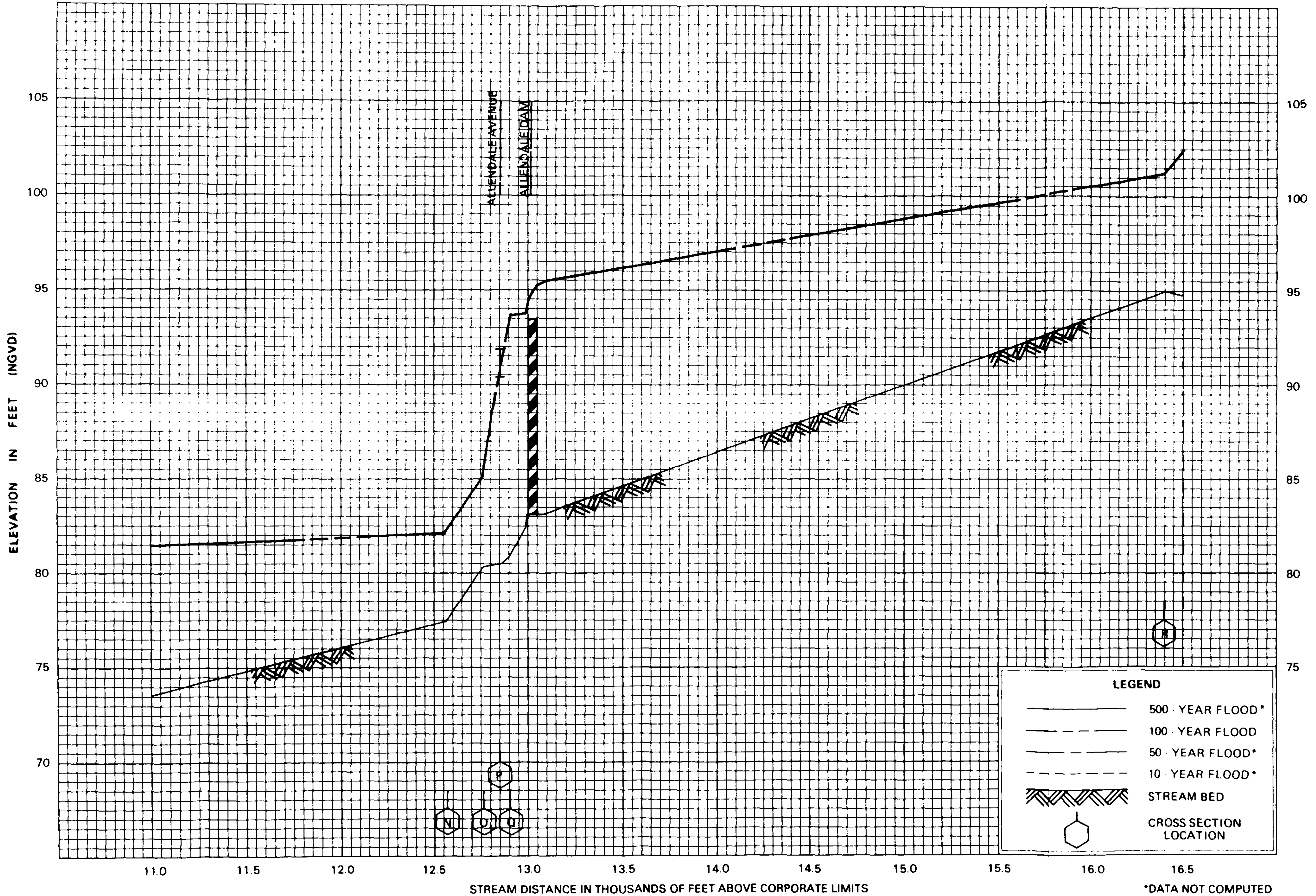
FLOOD PROFILES

WOONASQUATUCKET RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF JOHNSTON, RI
(PROVIDENCE CO.)

02P



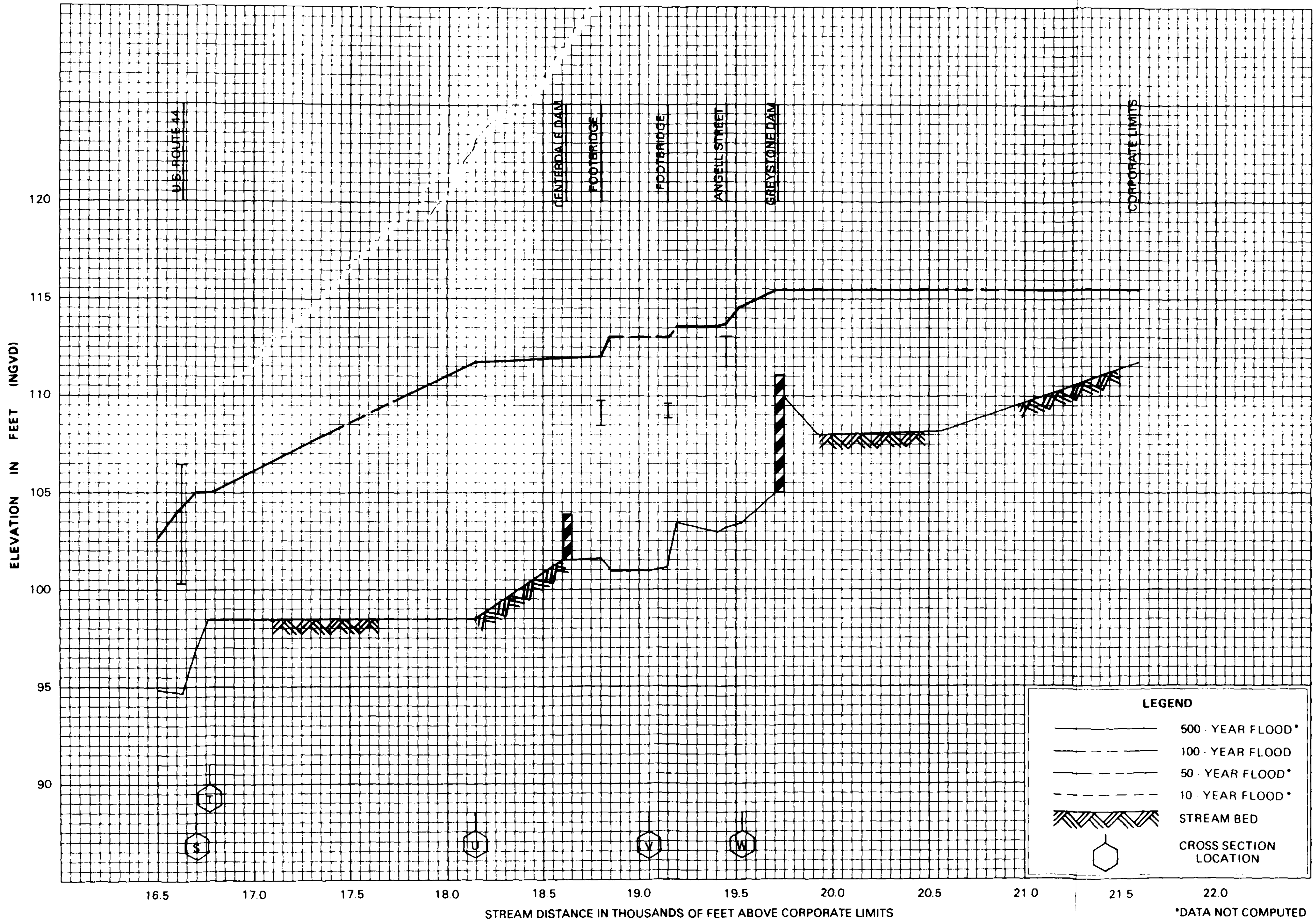
FLOOD PROFILES

WOONASQUATUCKET RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF JOHNSTON, RI
(PROVIDENCE CO.)

03P



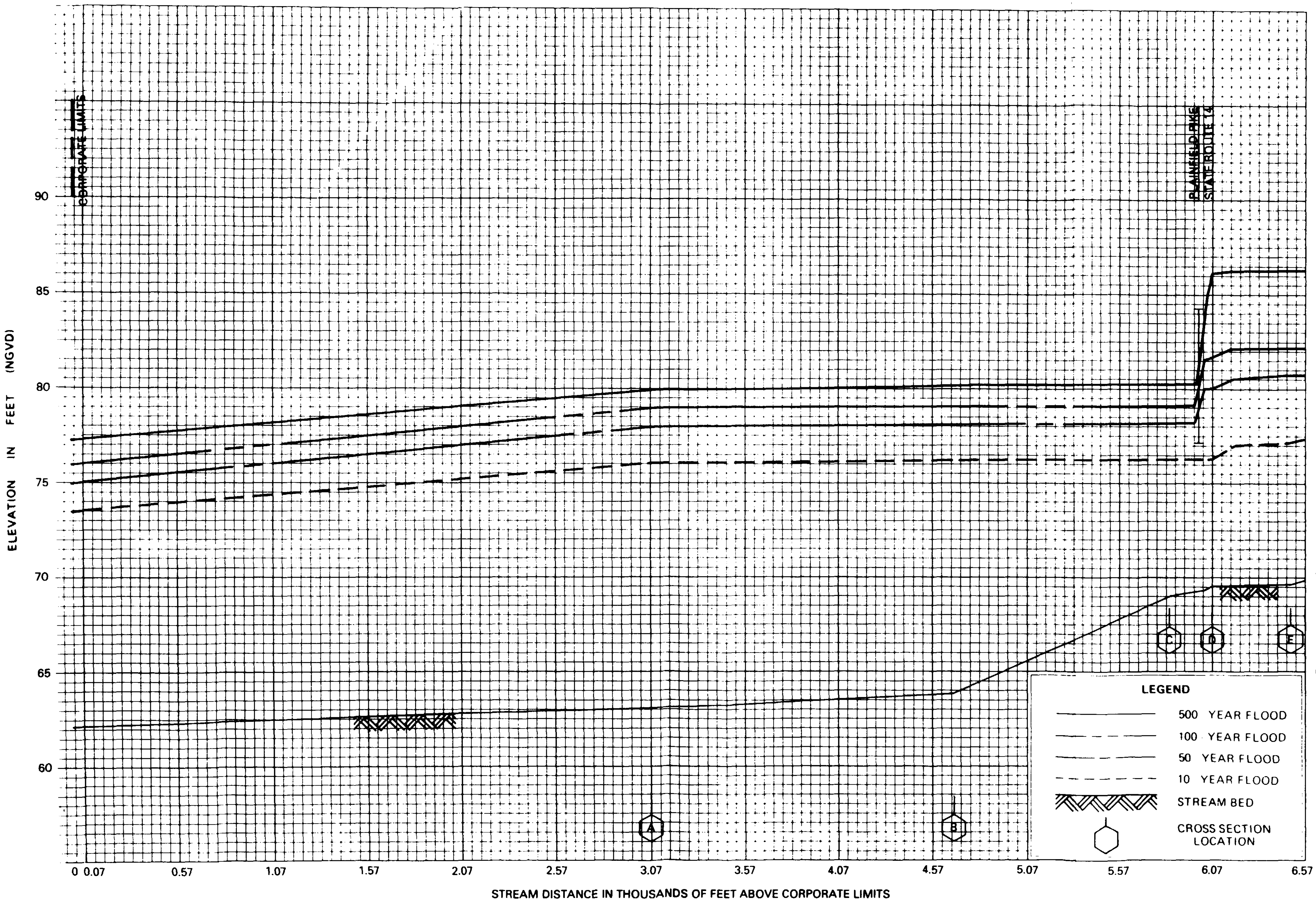
FLOOD PROFILES

WOONASQUATUCKET RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF JOHNSTON, RI
(PROVIDENCE CO.)

04P



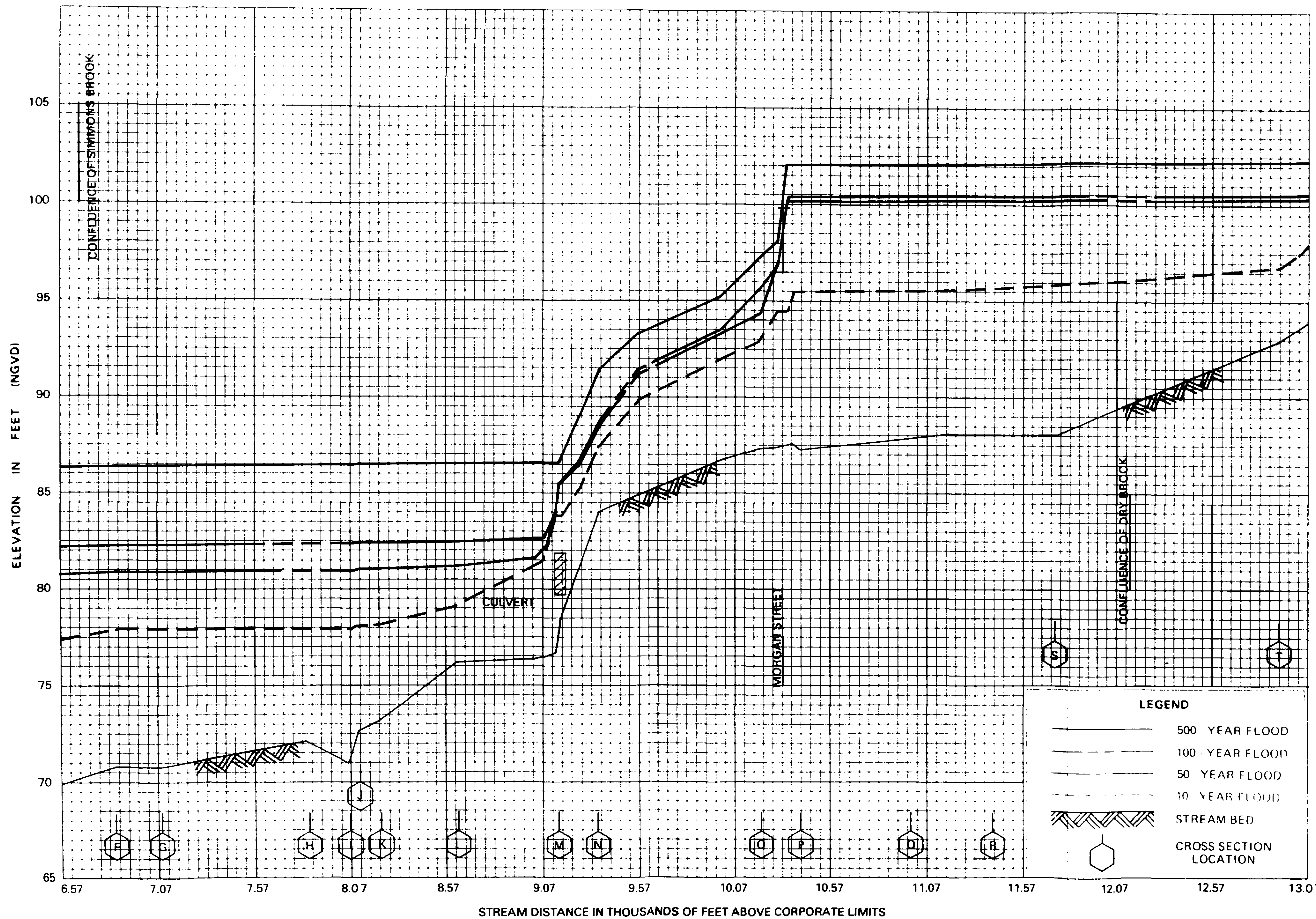
FLOOD PROFILES

POCASSET RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF JOHNSTON, RI
(PROVIDENCE CO.)

05P



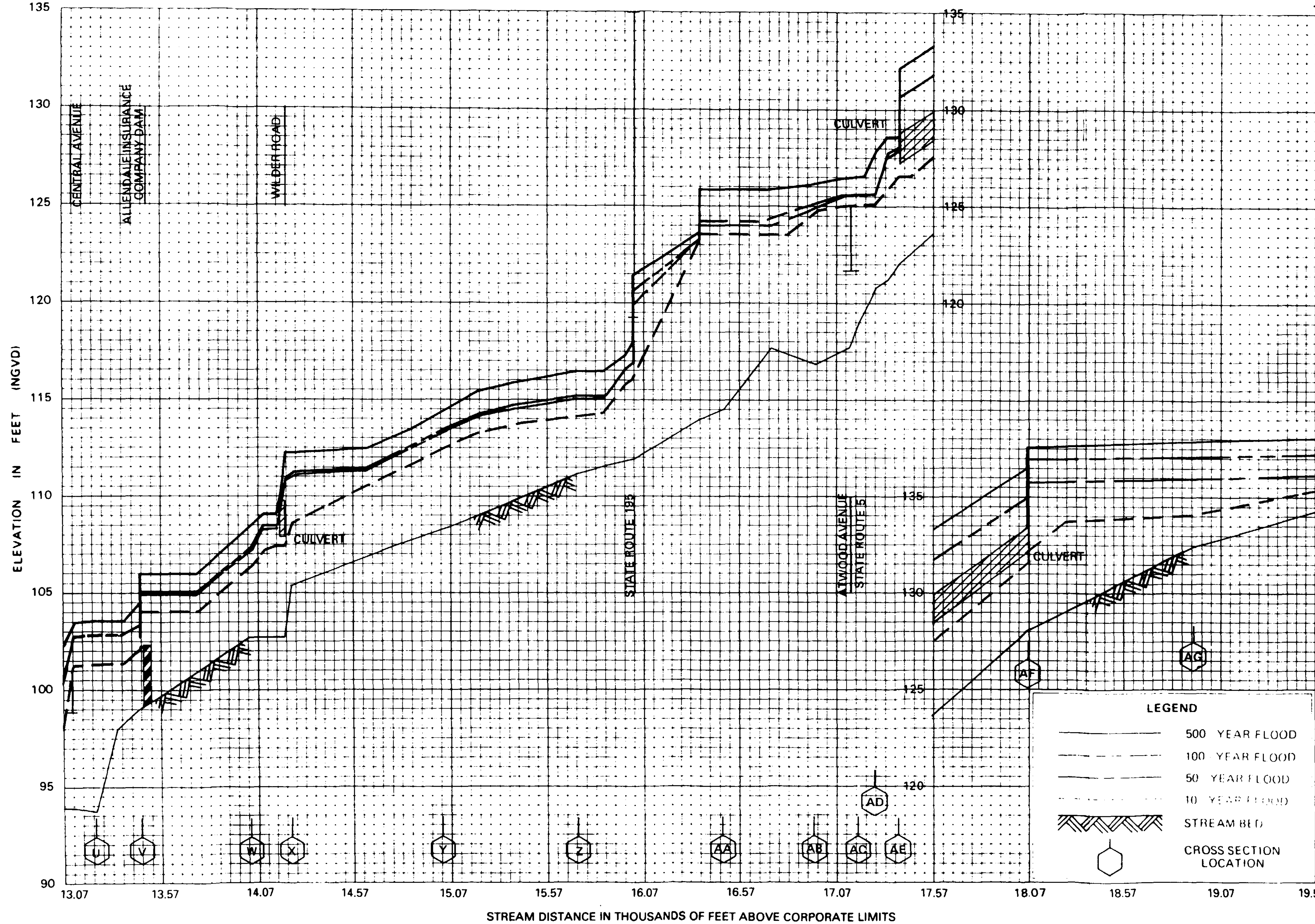
FLOOD PROFILES

POCASSET RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF JOHNSTON, RI (PROVIDENCE CO.)

06P



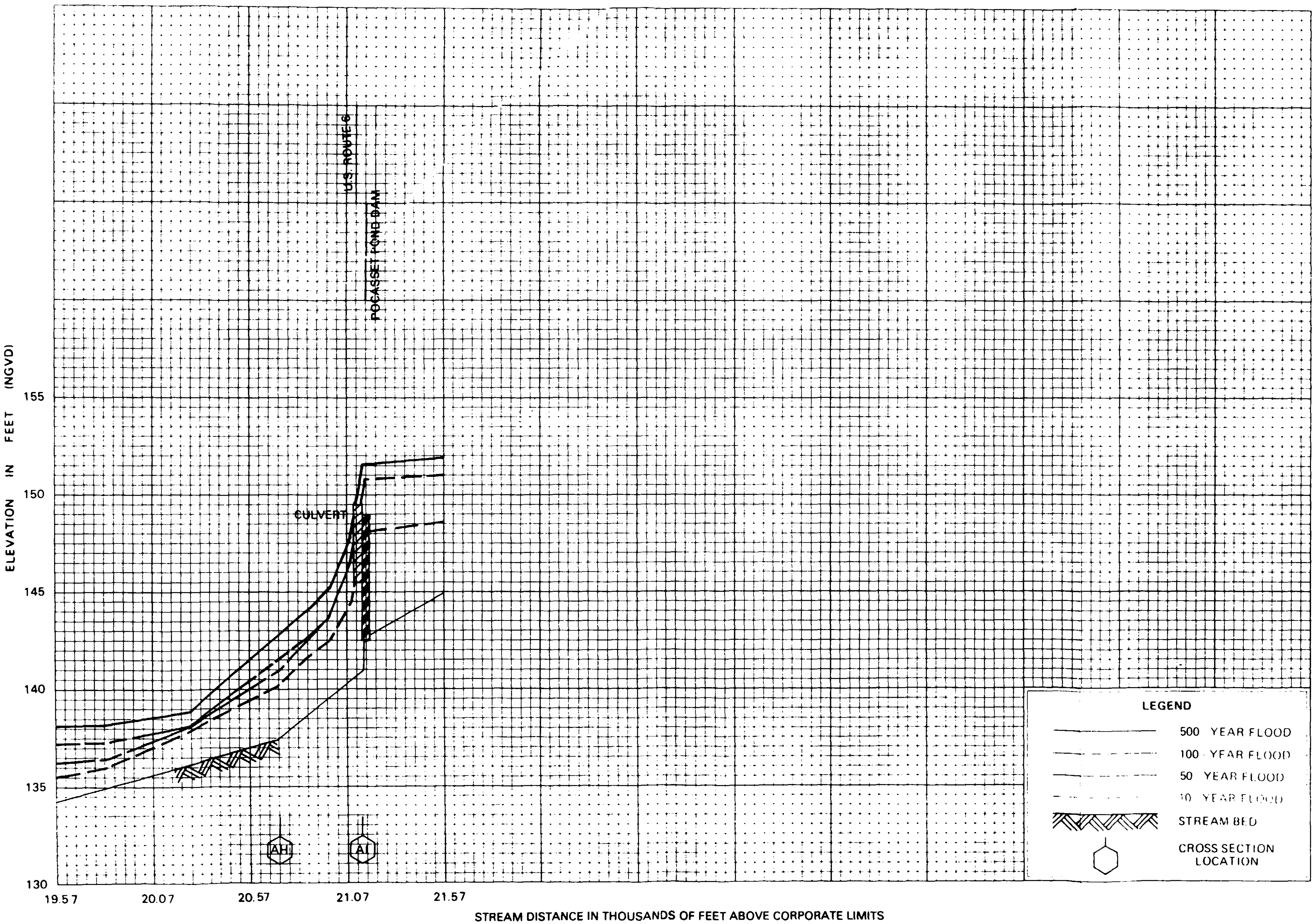
FLOOD PROFILES

POCASSET RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF JOHNSTON, RI
(PROVIDENCE CO.)

07P



FLOOD PROFILES

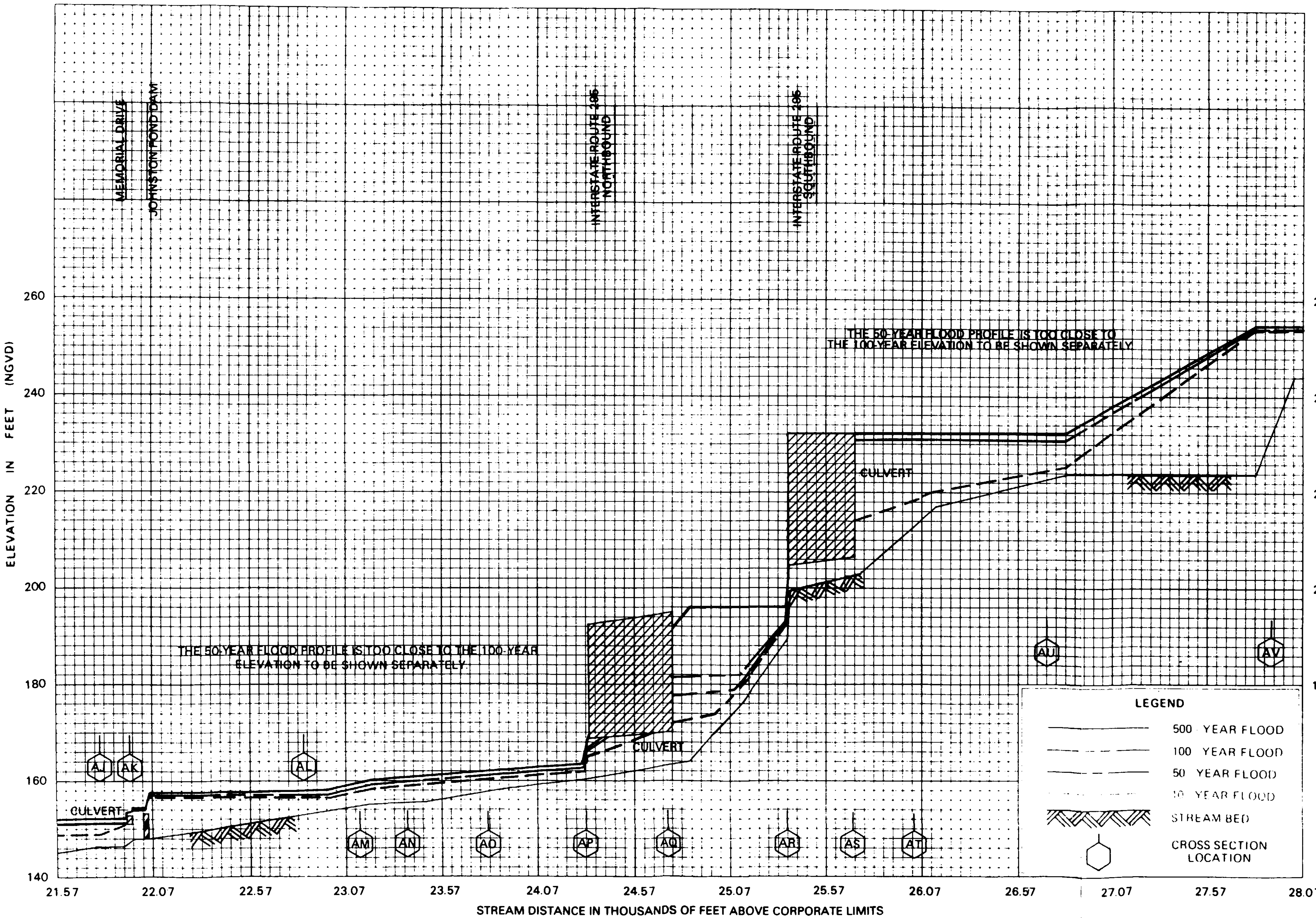
POCASSET RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF JOHNSTON, RI

(PROVIDENCE CO.)

08P



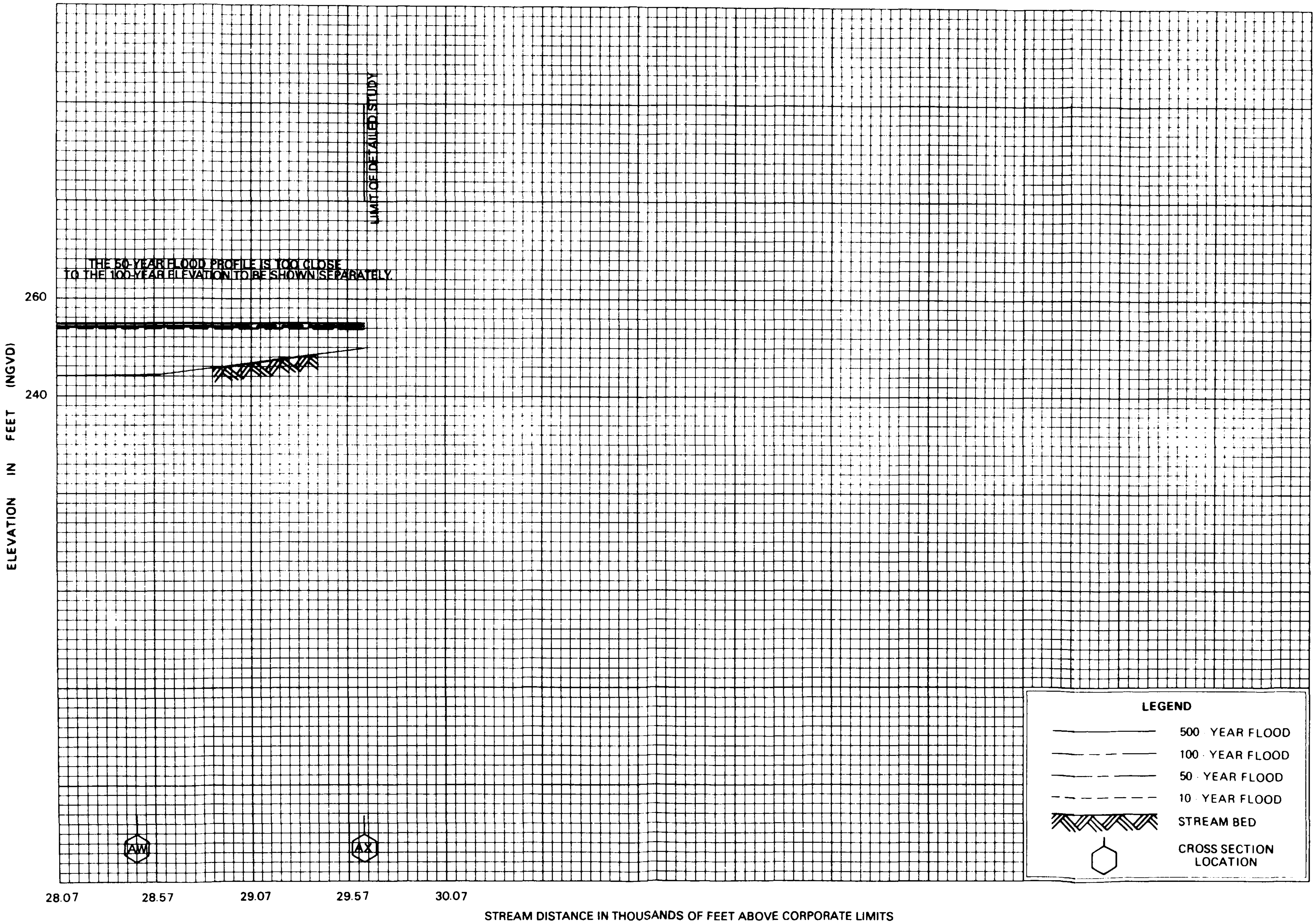
FLOOD PROFILES

POCASSET RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF JOHNSTON, RI
(PROVIDENCE CO.)

09P



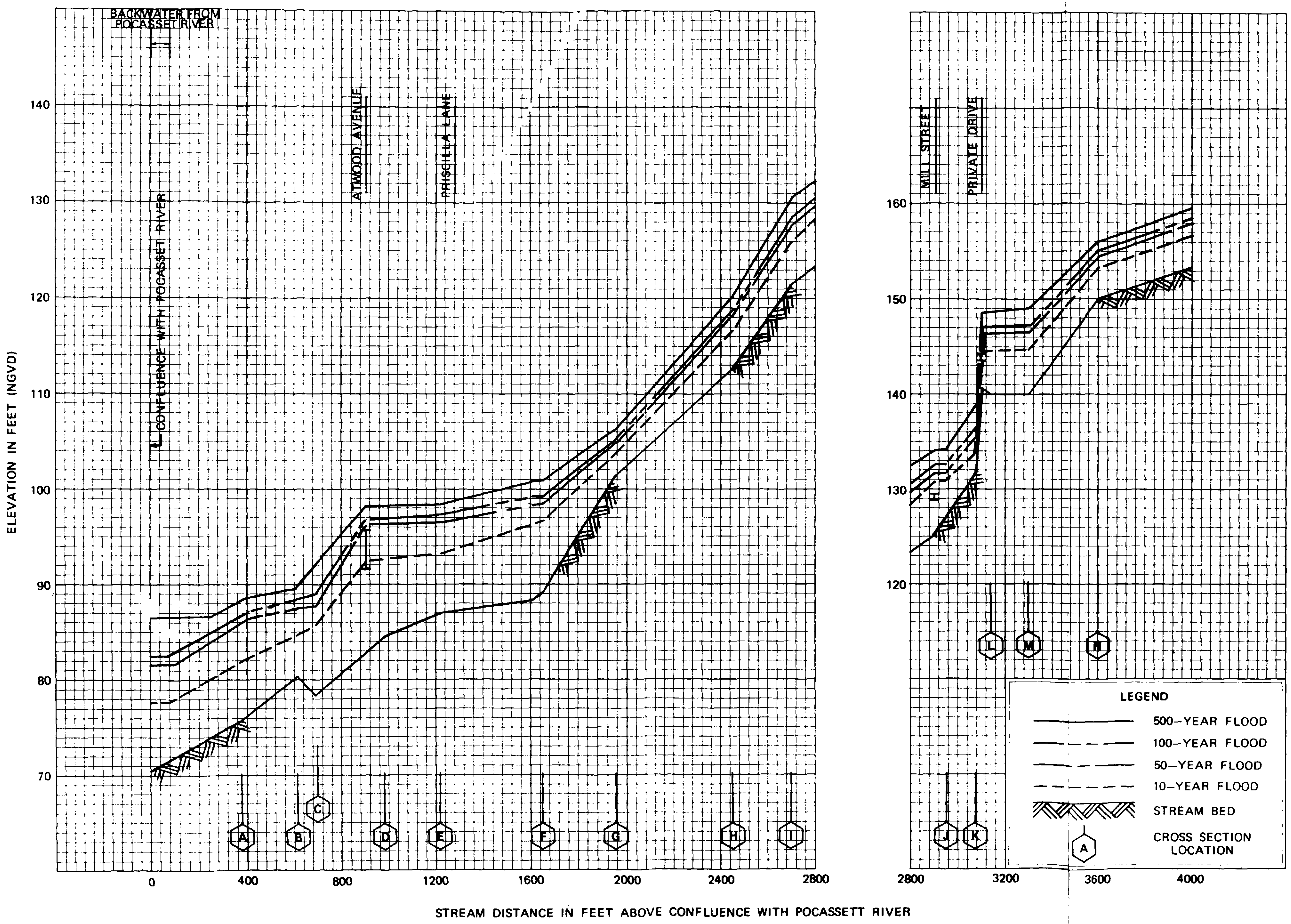
FLOOD PROFILES

POCASSET RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF JOHNSTON, RI
(PROVIDENCE CO.)

10P



FLOOD PROFILES

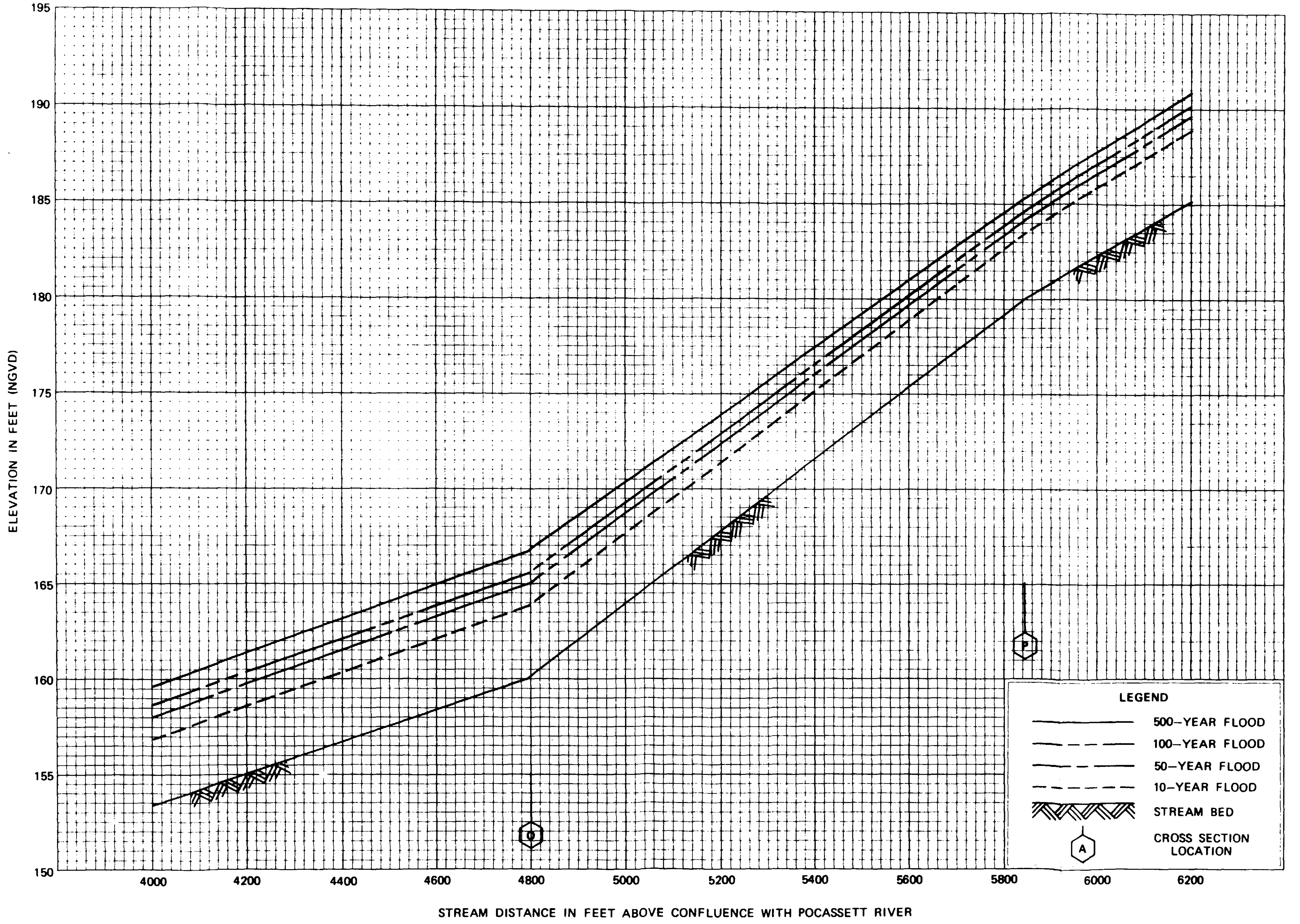
SIMMONS BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF JOHNSTON, RI

(PROVIDENCE CO.)

11P

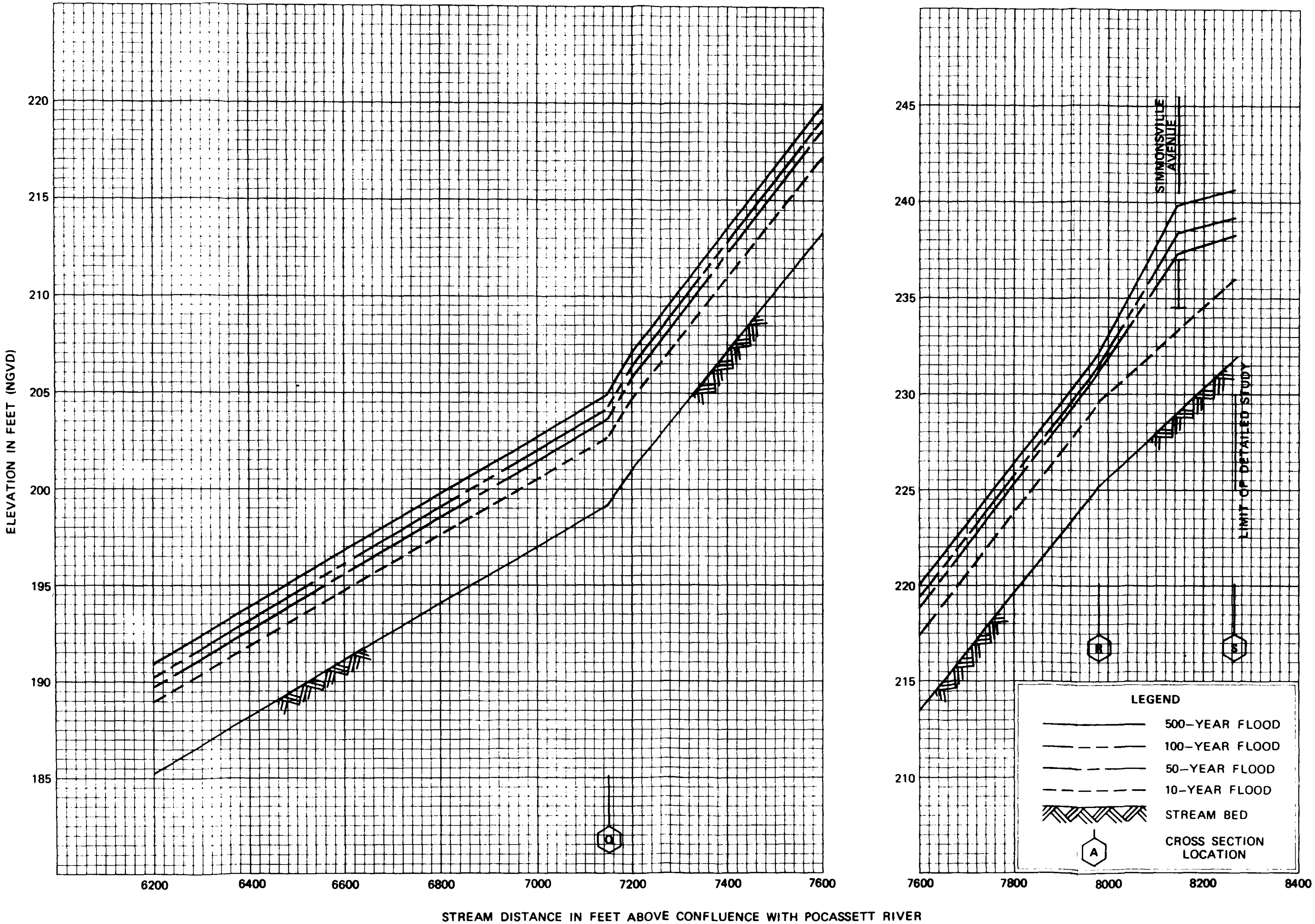


FLOOD PROFILES

SIMMONS BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF JOHNSTON, RI
(PROVIDENCE CO.)



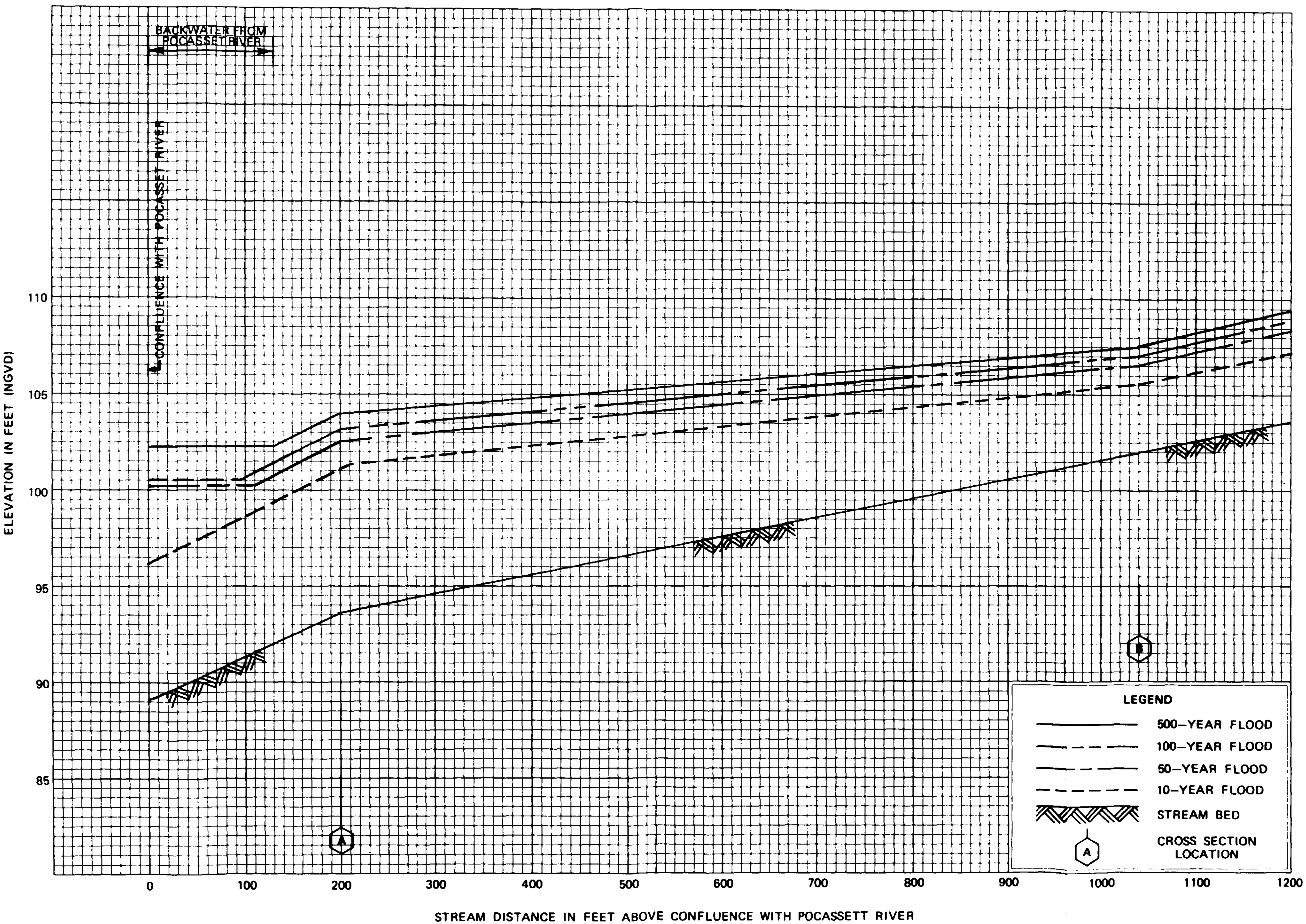
FLOOD PROFILES

SIMMONS BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF JOHNSTON, RI
(PROVIDENCE CO.)

13P



FLOOD PROFILES

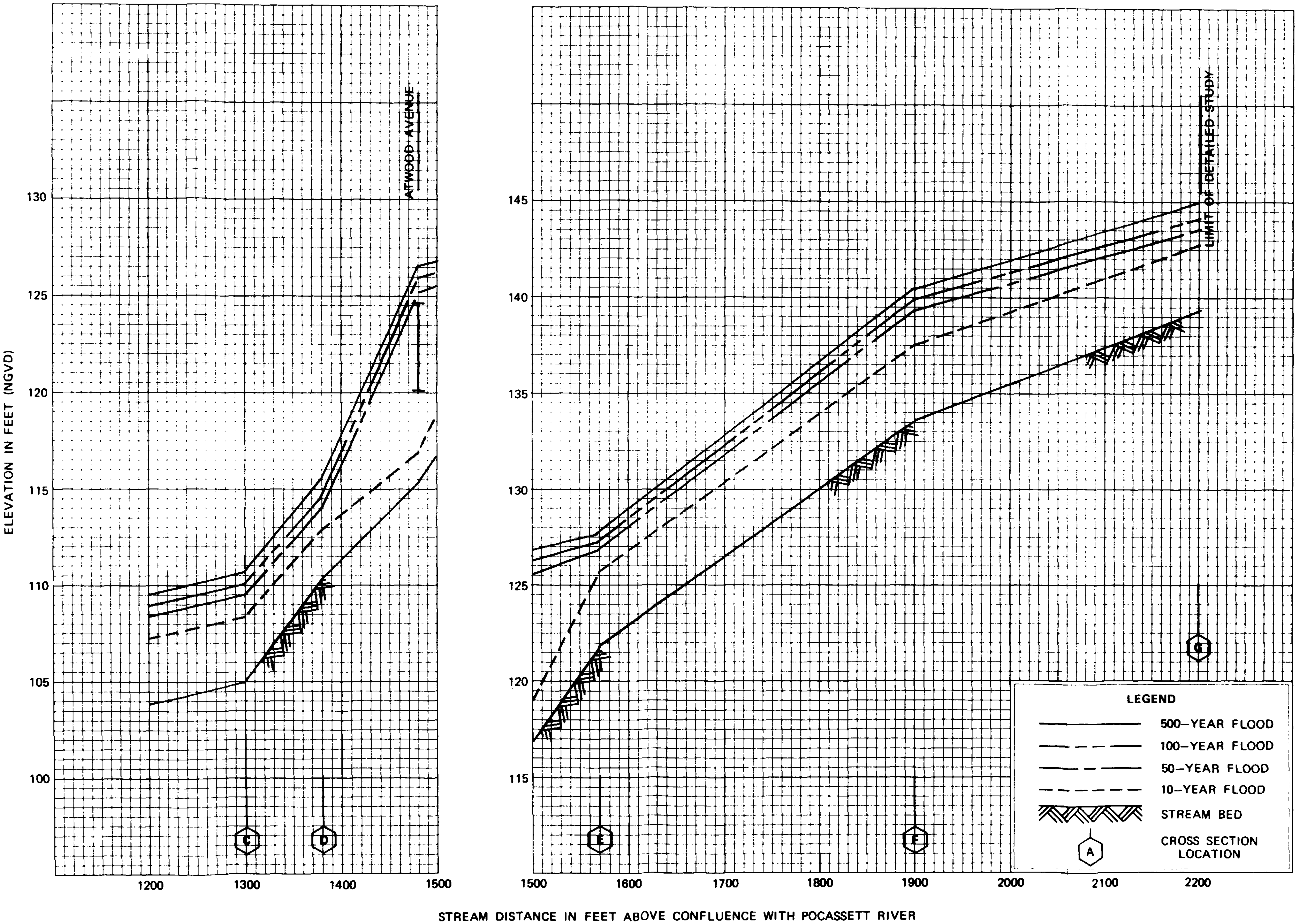
DRY BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF JOHNSTON, RI

(PROVIDENCE CO.)

14P

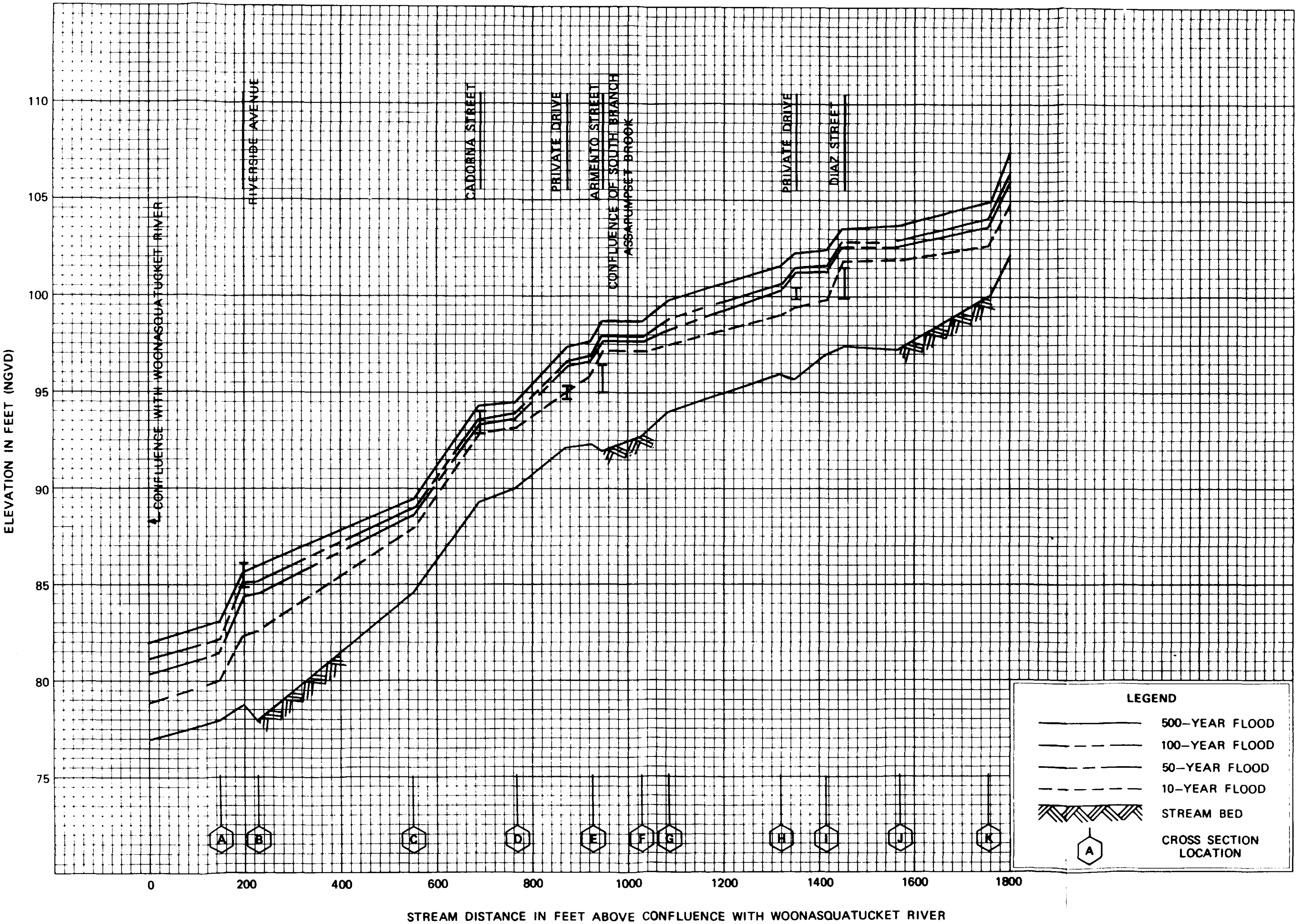


FLOOD PROFILES

DRY BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF JOHNSTON, RI
(PROVIDENCE CO.)



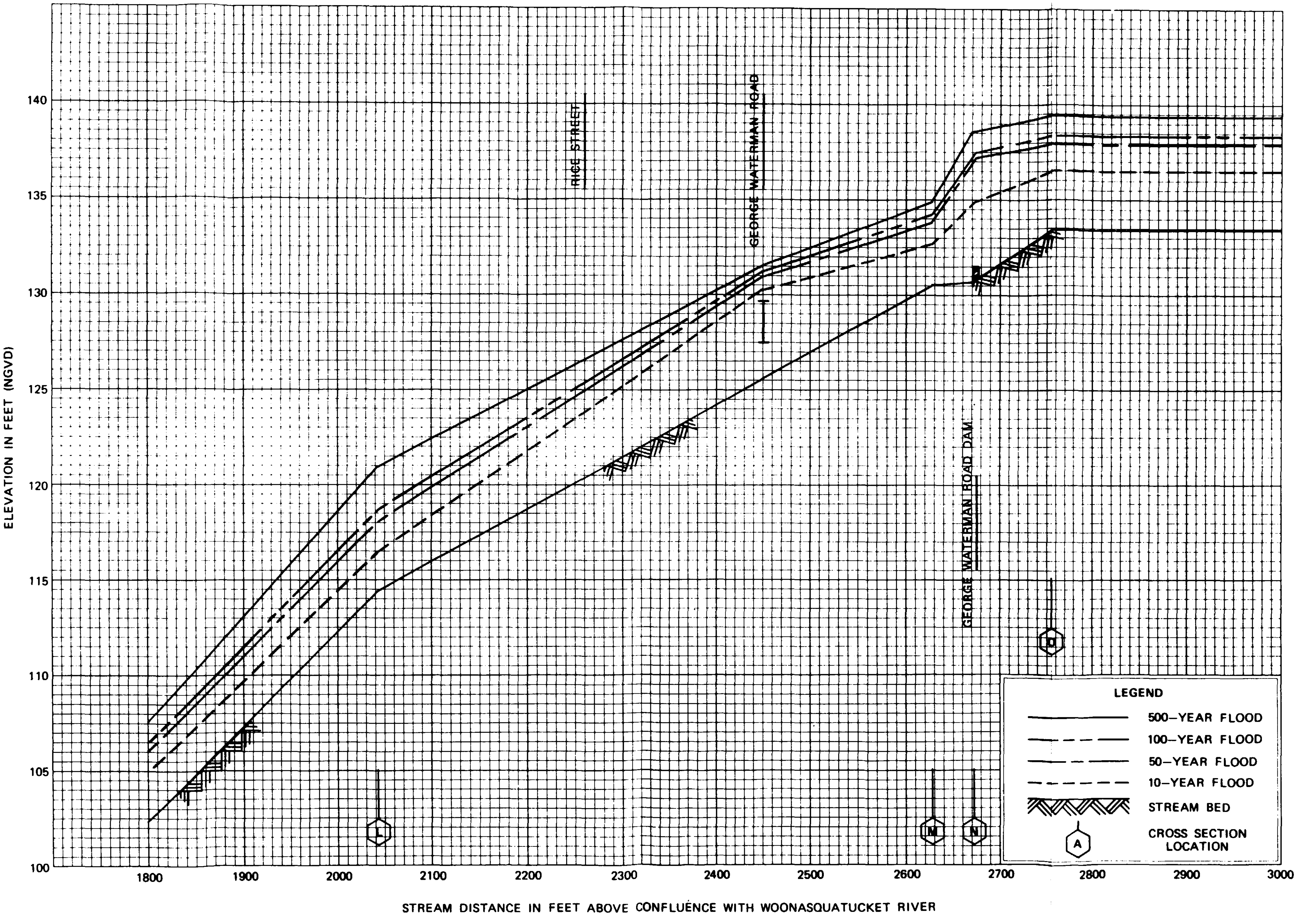
FLOOD PROFILES

ASSAPUMPSET BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF JOHNSTON, RI
(PROVIDENCE CO.)

16P

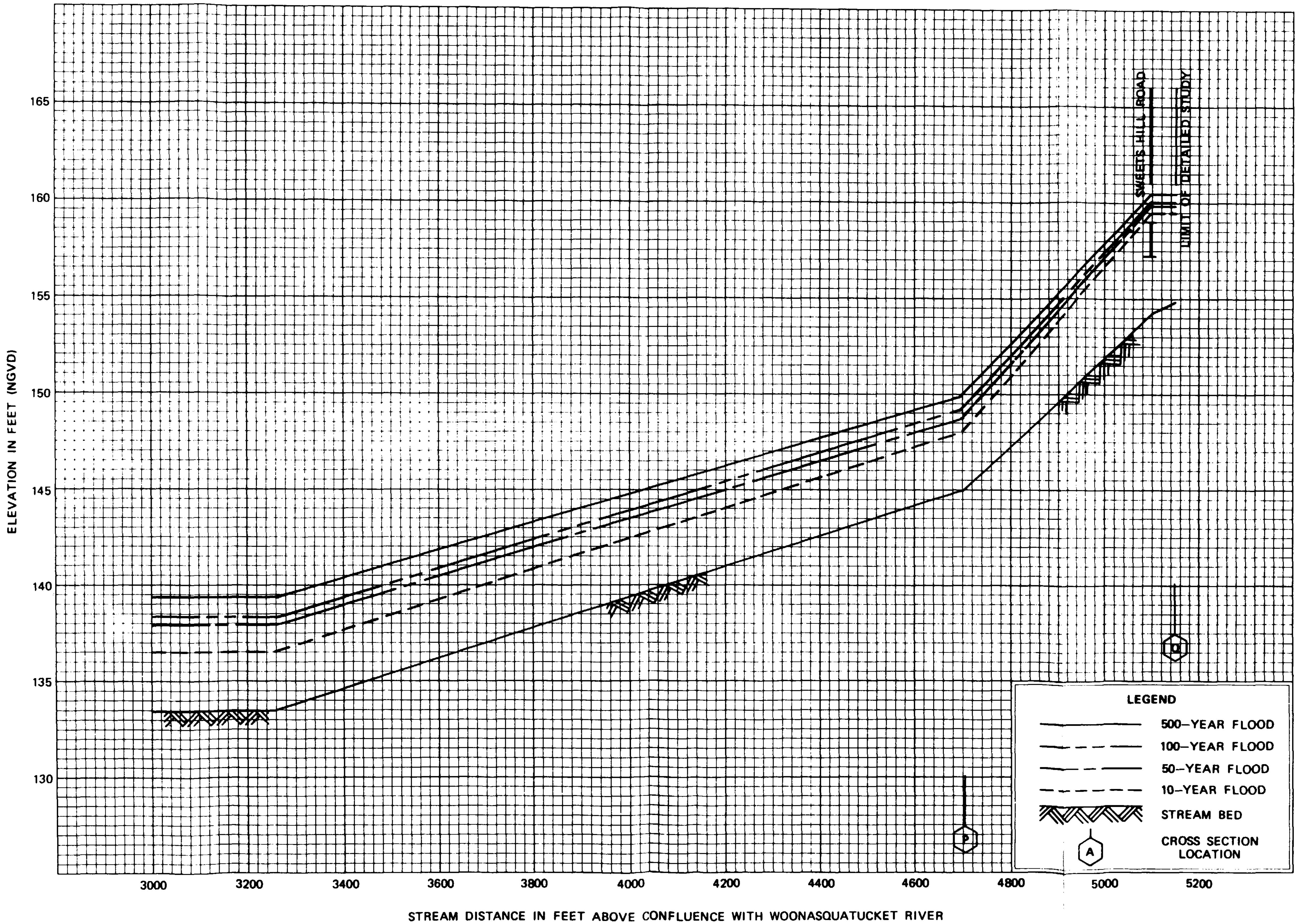


FLOOD PROFILES

ASSAPUMPSET BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF JOHNSTON, RI
(PROVIDENCE CO.)

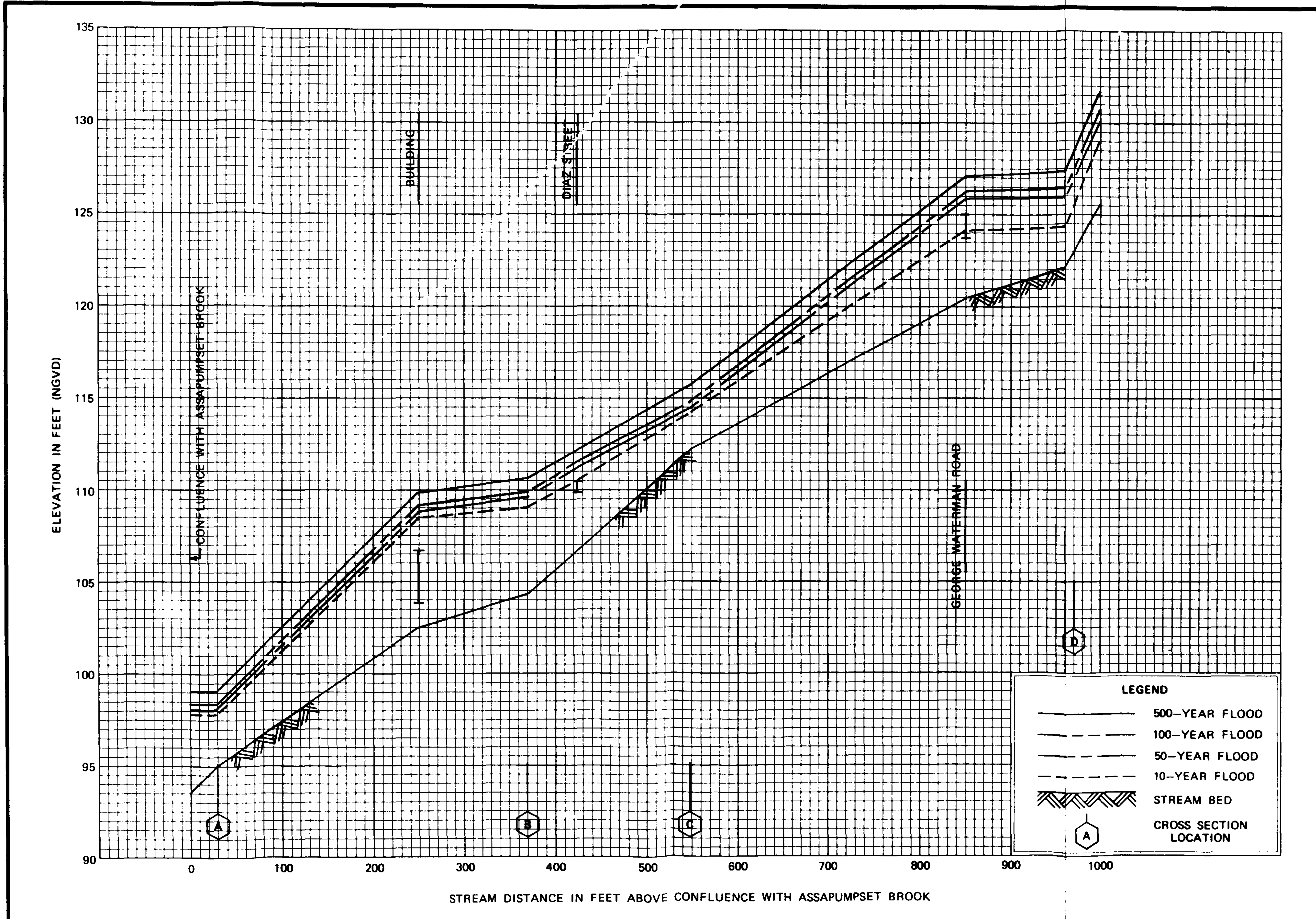


FLOOD PROFILES

ASSAPUMPSET BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF JOHNSTON, RI
(PROVIDENCE CO.)



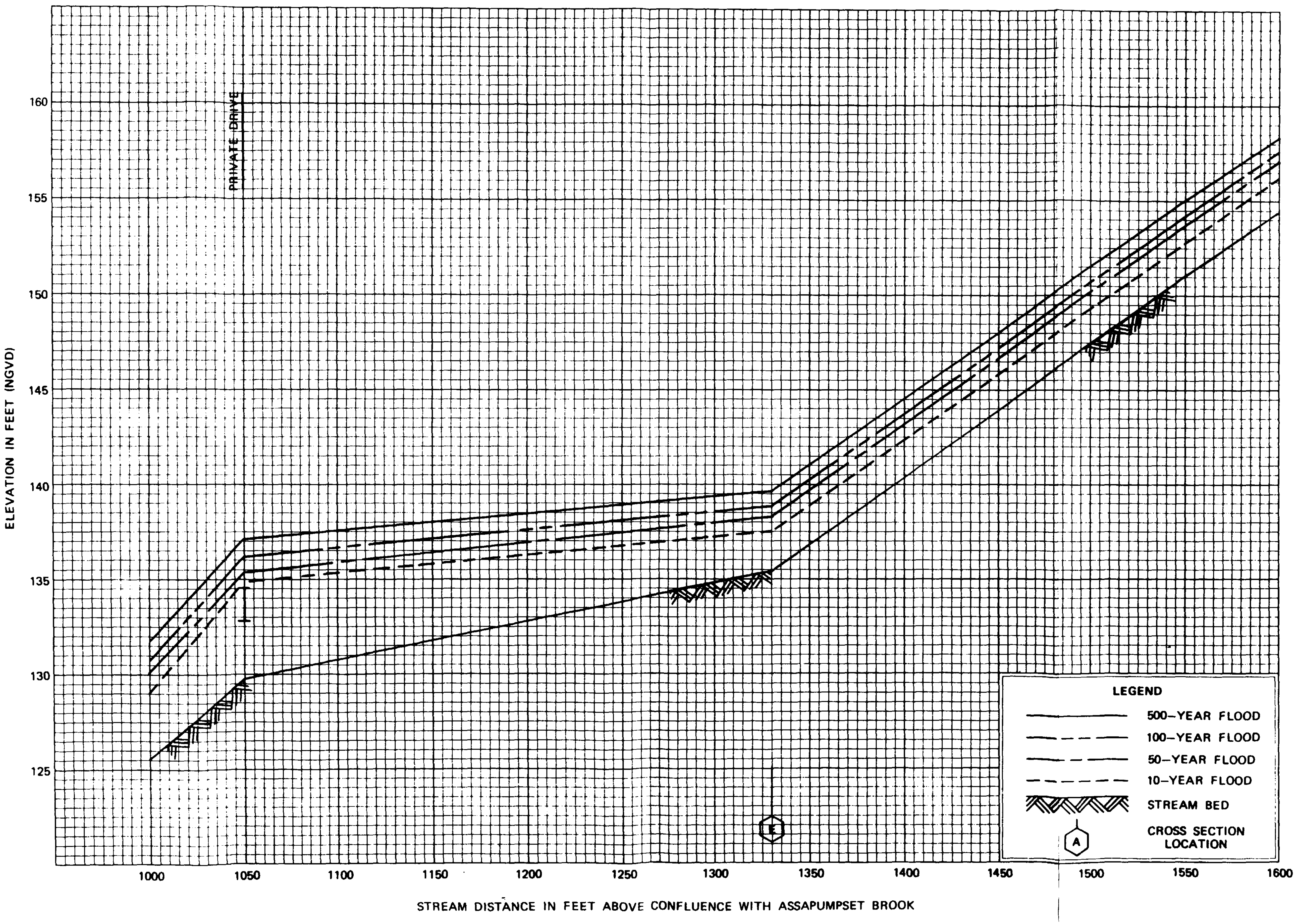
FLOOD PROFILES

SOUTH BRANCH ASSAPUMPSET BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF JOHNSTON, RI

(PROVIDENCE CO.)



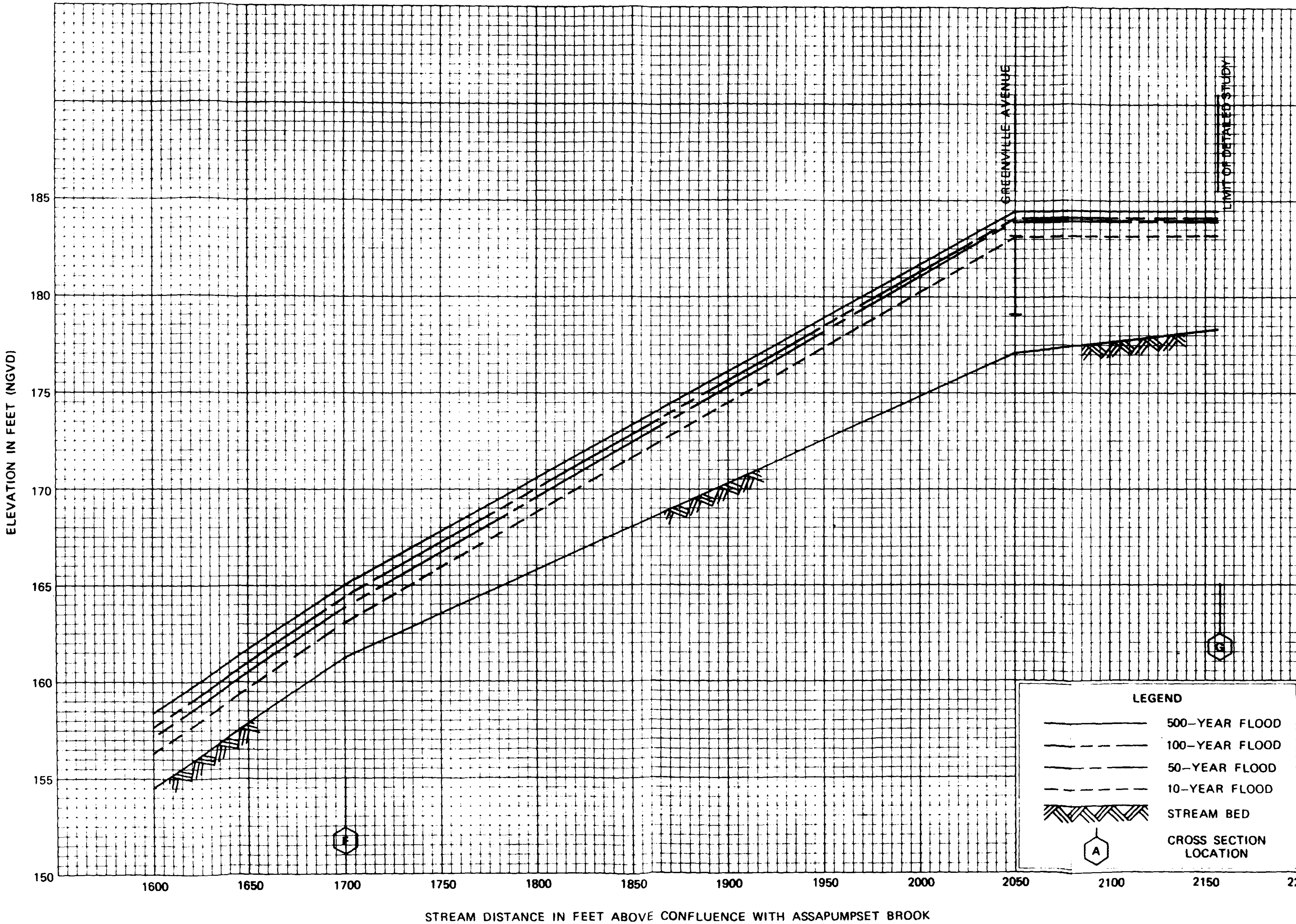
FLOOD PROFILES

SOUTH BRANCH ASSAPUMPSET BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF JOHNSTON, RI

(PROVIDENCE CO.)



FLOOD PROFILES

SOUTH BRANCH ASSAPUMPSET BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF JOHNSTON, RI

(PROVIDENCE CO.)