Special Flood Hazard Evaluation Report

AD-A231 202

Mill Creek

Village of Lowville, Lewis County, New York

Prepared
for the New York State
Department of Environmental Conservation

US Army Corps
of Engineers
Buffalo District

December 1990

UNCLASSIFIED

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This report documents the results of an investigation to determine ~~the~~ potential flooding flood ~~situation~~ along Mill Creek within the village of Lowville, New York. The study reach extends along Mill Creek from the eastern corporate limit, upstream to the western corporate limit, a distance of 6,600 feet. (to pg. 1)

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SPECIAL FLOOD HAZARD EVALUATION REPORT
MILL CREEK
VILLAGE OF LOWVILLE
LEWIS COUNTY, NEW YORK

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INTRODUCTION

This Special Flood Hazard Evaluation Report documents the results of an investigation to determine the potential flood situation along Mill Creek within the village of Lowville, New York. This study was conducted at the request of the New York State Department of Environmental Conservation under the authority of Section 206 of the 1960 Flood Control Act, as amended. The study reach extends along Mill Creek from the eastern (downstream) corporate limit, upstream to the western corporate limit, a distance of 6,600 feet.

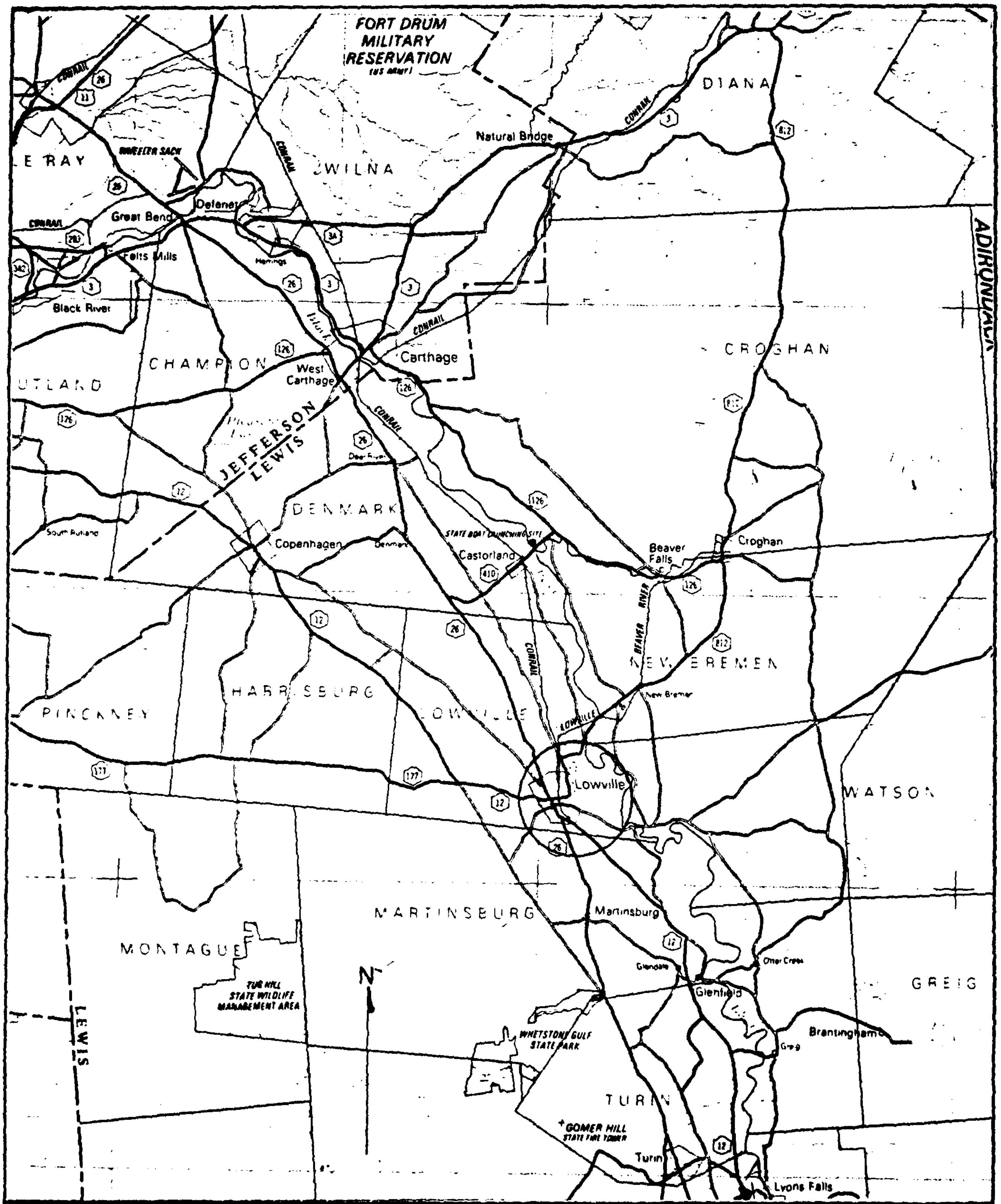
The village of Lowville is located in northern New York State, approximately 20 miles southeast of Watertown and 85 miles northeast of Syracuse. It is within the town of Lowville in Lewis County, 8 miles west of the Adirondack Park State Forest Preserve (see Figure 1). The climate is characterized by long, cold winters. In January, the average mean temperature is 17.6°F, and zero or below is observed on 26 days during the winter. The summer climate is cool, with July temperatures averaging 67.9°F. Average annual snowfall measures 116.0 inches, and average annual precipitation is 38.06 inches (Reference 1).

Mill Creek is an ungaged stream with a total drainage area of 35.61 square miles. It originates in the town of Harrisburg and flows in a southeasterly direction through the town and village of Lowville to its confluence with the Black River. The watershed is characterized by heavily wooded, rolling topography. Surface elevations range from 740 feet at the mouth to a high of about 1,680 feet. The village of Lowville is located near the mouth of Mill Creek, approximately 1.25 miles upstream from its confluence with the Black River.

Knowledge of potential floods and flood hazards is important in (cont) land use planning. This report identifies the 100-year and 500-year flood plain and 100-year floodway for Mill Creek.

affecting drainage from watersheds and

Information developed for the Mill Creek study will be used by local officials to manage future flood plain development. While the report does not provide solutions to flood problems, it does furnish a suitable basis for the adoption of land use controls to guide flood plain development, thereby preventing intensification of the flood loss problem. It will also aid in the development of other flood damage reduction techniques to modify flooding and reduce flood damages. which might be embodied in an overall Flood



VILLAGE OF LOWVILLE, NY

SCALE 1:250,000
5 0 5 MILES

(Lewis County)

VICINITY MAP

FIGURE 1

Plain Management (FPM) program. Other types of studies, such as those of environmental attributes and the current and future land use roles of the flood plain as part of its surroundings, would also profit from this information.

Although Flood Insurance Rate Maps have been developed for the community, approximate analyses were used to delineate an approximate flood plain along Mill Creek. The area was thought to have low development potential at the time the maps were prepared. However, the area now is experiencing residential development pressure resulting from the expansion of the nearby Fort Drum military complex, and more detailed flood plain information is required by local officials to manage this development.

Additional copies of this report can be obtained from the New York State Department of Environmental Conservation until its supply is exhausted, and the National Technical Information Service of the U.S. Department of Commerce, Springfield, Virginia 22161, at the cost of reproducing the report. The Buffalo District Corps of Engineers will provide technical assistance and guidance to planning agencies in the interpretation and use of the hydrologic data obtained for this study.

PRINCIPAL FLOOD PROBLEMS

The greatest potential and frequency for floods within the study area occurs in the early spring when rain combines with snowmelt. Although cool, early spring temperatures are conducive to a slower rate of snow melt, spring floods do occur most years. However, as the stream is ungaged, there are no stream flow records and no accurate record of floods in the village of Lowville.

Because of the large accumulation of snow that falls annually, spring flooding can be expected to occur in the future. Increased development may also contribute to the potential for flooding.

Flood Magnitudes and Their Frequencies

Floods are classified on the basis of their frequency or recurrence interval. A 100-year flood is an event with a magnitude that can be expected to be equaled or exceeded once on the average during any 100-year period. It has a 1.0 percent chance of occurring in any given year. It is important to note that, while on a long-term basis the exceedence averages out to once per 100 years, floods of this magnitude can occur in any given year or even in consecutive years and within any given time interval. For example, there is a greater than 50 percent probability that a 100-year event will occur during a 70-year lifetime. Additionally, a house which is built within the 100-year flood level has about a one-in-four chance of being flooded in a 30-year mortgage life.

Hazards and Damages of Large Floods

The extent of damage caused by any flood depends on the topography of the flooded area, the depth and duration of flooding, the velocity of flow, the rate of rise in water surface elevation, and development of the flood plain. Deep water flowing at a high velocity and carrying floating debris would create conditions hazardous to persons and vehicles which attempt to cross the flood plain. Generally, water 3 or more feet deep which flows at a velocity of 3 or more feet per second could easily sweep an adult off his feet and create definite danger of injury or drowning. As indicated in Table 2, flow velocities of Mill Creek for the 100-year flood significantly exceed 3 feet per second throughout the study reach. Rapidly rising and swiftly flowing floodwater may trap persons in homes that are ultimately destroyed or in vehicles that are ultimately submerged or floated. Since water lines can be ruptured by deposits of debris and by the force of flood waters, there is the possibility of contaminated domestic water supplies. Damaged sanitary sewer lines and sewage treatment plants could result in the pollution of floodwaters and could create health hazards. Isolation of areas by floodwater could create hazards in terms of medical, fire, or law enforcement emergencies.

HYDROLOGIC ANALYSIS

Hydrologic analyses for Mill Creek were carried out to determine the 100- and 500-year peak discharges. The study area for Mill Creek includes 1.2 miles within the village of Lowville and 7.2 miles within the town of Lowville. For this analysis, Mill Creek was divided into eight subreaches and discharges were calculated at the downstream point of each subreach. The 7.2 mile portion of Mill Creek that lies outside the village corporate limits will be discussed in a Special Flood Hazard Evaluation for the town of Lowville, New York.

The method used to determine the 100-year and 500-year discharges was developed by the Hydrologic Engineering Center (HEC) at Davis, California. For this study, the kinematic wave method of HEC-1 was applied to determine runoff and to simulate flood routing (Reference 2). The watershed was divided into 40 subbasins and the following input data were required for each subbasin. For each subbasin, the following input data were required: 1) drainage area, 2) SCS curve number, 3) overland flow length, 4) representative subbasin slope, 5) Manning's "n", 6) channel length, 7) channel slope, 8) channel roughness, 9) channel shape 10) width, and 11) sideslopes. A hypothetical storm was generated to produce the 100-year, 24-hour precipitation. A second hypothetical storm was generated to produce the 500-year, 24-hour precipitation.

Drainage areas were determined by field inspection of the watershed in conjunction with USGS 7.5-minute topographic maps (Reference 3). The values for the drainage areas and the 100- and 500-year peak discharges for each reach located within the village are shown in Table 1.

Table 1 - Summary of Discharges

Location	Drainage Area (sq. mi.)	100-Year Peak Discharge (cfs)	500-Year Peak Discharge (cfs)
Reach 1 - Approximately 400 feet downstream of Village western corporate limit	28.70	2,750	4,600
Reach 2 - Approximately 2,400 feet downstream of Village eastern corporate limit	33.89	3,350	5,700

HYDRAULIC ANALYSIS

Analyses of the hydraulic characteristics of flooding from Mill Creek were carried out to provide estimates of the elevations of floods for the 100- and 500-year flooding events.

Cross-section data for Mill Creek were obtained from a field survey performed in April 1990. Additional elevation data were obtained from USGS topographic maps (Reference 3). All bridges and culverts were surveyed to determine elevation data and structural geometry.

Water surface elevations for Mill Creek were developed using the COE HEC-2 step-backwater computer program (Reference 4). The starting water surface elevation for Mill Creek was determined using the slope area method in the lower reaches just above the confluences with the Black River.

Both backwater and forewater computations were run because of the steep topography of Mill Creek particularly in the upper reaches. Subcritical flow generally exists below E. State Street. The differences between the two runs in the supercritical sections are slight, therefore the result of the "backwater" is presented on the profile.

Locations of the selected cross-sections used in the hydraulic analyses are shown on the Flood Profiles (Plates 1, 2, and 3) and on the Flooded Area Map (Plate 4).

Channel and overbank roughness factors (Manning's "n") used in the hydraulic computations were selected using engineering judgment and were based on field observations of the stream and flood plain areas. The channel "n" values for Mill Creek ranged from .030 to .045, and the overbank "n" values ranged from .040 to .065.

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY (FEET NGVD)	WITH FLOODWAY (FEET NGVD)	INCREASE
A	9,190	110	471	7.1	760.4	760.4	760.4	0.0
B	9,994	90	603	5.6	771.7	771.7	772.5	0.8
C	11,900	67	294	11.4	792.7	792.7	792.6	0.1
D	13,250	78	301	11.1	832.3	832.3	832.3	0.0
E	13,856	71	292	11.5	844.1	844.1	844.1	0.0
F	14,083	126	679	4.9	848.4	848.4	848.4	0.0
G	15,482	78	286	9.6	865.7	865.7	865.7	0.0
H	15,770	58	232	11.8	871.2	871.2	871.2	0.0

1. Distance is measured in feet from confluence with Black River.

TABLE 2

VILLAGE OF LOWVILLE, NEW YORK
LEWIS COUNTY

FLOODWAY DATA

MILL CREEK

The computed 100- and 500-year water surface profiles for Mill Creek are shown on Plates 1-3. The flood plain boundaries are shown on Plate 4. These boundaries were delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using USGS topographic maps and spot elevations obtained during the field surveys. Small areas within the flood plain boundaries may be above the flood elevations, but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

An encroachment floodway was also determined for Mill Creek based on equal conveyance reduction from each side of the flood plain. As per the New York State standard, the maximum increase in stage due to encroachment was limited to 1 foot, provided that hazardous velocities were not produced. Floodway widths were computed at cross sections and varied from 58 to 126 feet. Between cross sections, the floodway boundaries were interpolated. The results of the floodway computations are tabulated for selected cross sections and are shown in Table 2. The computed floodway is also shown on the Flooded Area Map, Plate 4. In cases where the floodway and the 100-year flood plain boundaries are either close together or colinear, only the floodway boundary is shown.

The hydraulic analyses for this study were based on unobstructed flow. The flood elevations shown on the profile are 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). Descriptions of the marks are presented in Table 3.

Table 3 - Elevation Reference Marks

Reference Mark	Elevation (feet NGVD)	Description of Location
RM1	780.13	E. State St. Bridge, chiseled square painted red in top of downstream right (southeast) abutment approximately level with road.
RM2	864.54	NYC RR Bridge, a USGS standard disk stamped "863A1900" in the top of the northwest abutment of the bridge.
RM3	852.89	Cascade St. Bridge, on the top of the "9" of the original chiseled cut "1976" on the upstream left (northwest) abutment of bridge.
RM4	874.09	Cedar St. Bridge, on top of existing original chiseled cut on the upstream left (northwest) abutment of bridge.

UNIFIED FLOOD PLAIN MANAGEMENT

Historically, the alleviation of flood damage has been accomplished almost exclusively by the construction of protective works such as reservoirs, channel improvements, and floodwalls and levees. However, in spite of the billions of dollars that have already been spent for construction of well-designed and efficient flood control works, annual flood damages continue to increase because the number of persons and structures occupying floodprone lands is increasing faster than protective works can be provided.

Recognition of this trend has forced a reassessment of the flood control concept and resulted in the broadened concept of unified flood plain management programs. Legislative and administrative policies frequently cite two approaches: structural and nonstructural, for adjusting to the flood hazard. In this context, "structural" is usually intended to mean adjustments that modify the behavior of floodwaters through the use of measures such as dams and channel work. "Nonstructural" is usually intended to include all other adjustments in the way society acts when occupying or modifying a flood plain (e.g., regulations, floodproofing, insurance, etc.). Both structural and nonstructural tools are used for achieving desired future flood plain conditions. There are three basic strategies which may be applied individually or in combination: (1) modifying the susceptibility to flood damage and disruption, (2) modifying the floods themselves, and (3) modifying (reducing) the adverse impacts of floods on the individual and the community.

Modify Susceptibility to Flood Damage and Disruption

The strategy to modify susceptibility to flood damage and disruption consists of actions to avoid dangerous, economically undesirable, or unwise use of the flood plain. Responsibility for implementing such actions rests largely with the non-Federal sector and primarily at the local level of government.

These actions include restrictions in the mode and the time of occupancy; in the ways and means of access; in the pattern, density, and elevation of structures and in the character of their materials (structural strength, absorptiveness, solubility, corrodibility); in the shape and type of buildings and in their contents; and in the appurtenant facilities and landscaping of the grounds. The strategy may also necessitate changes in the interdependencies between flood plains and surrounding areas not subject to flooding, especially interdependencies regarding utilities and commerce. Implementing mechanisms for these actions include land use regulations, development and redevelopment policies, floodproofing, disaster preparedness and response plans, and flood forecasting and warning systems.

Different tools may be more suitable for developed or underdeveloped flood plains or to urban or rural areas. The information contained in this report is particularly useful for the preparation of flood plain regulations.

a. Flood Plain Regulations.

Flood plain regulations apply to the full range of ordinances and other means designed to control land use and construction within floodprone areas. The term encompasses zoning ordinances, subdivision regulations, building and housing codes, encroachment line statutes, open area regulations, and other similar methods of management which affect the use and development of floodprone areas.

Flood plain land use management does not prohibit use of floodprone areas; to the contrary, flood plain land use management seeks the best use of flood plain lands. The flooded area map and the water surface profile contained in this report can be used to guide development in the flood plain. The elevations shown on the profile should be used to determine flood heights because they are more accurate than the outlines of flooded areas. It is recommended that development in areas susceptible to frequent flooding adhere to the principles expressed in Executive Order 11988 - Flood Plain Management, whose objective is to ". . . avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of flood plains . . . whenever there is a practicable alternative." Accordingly, development in areas susceptible to frequent flooding should consist of construction which has a low damage potential such as parking areas and golf courses. High value construction such as buildings, should be located outside the flood plain to the fullest extent possible. In instances where no practicable alternative exists, the land should be elevated to minimize damages. If it is uneconomical to elevate the land in these areas, means of floodproofing the structure should be given careful consideration.

b. Development Zones.

A flood plain consists of two zones. The first zone is the designated "floodway" or that cross sectional area required for carrying or discharging the anticipated flood waters with a maximum 1-foot increase in flood level (New York State standard). Velocities are the greatest and most damaging in the floodway. Regulations essentially maintain the flow-conveying capability of the floodway to minimize inundation of additional adjacent areas. Uses which are acceptable for floodways include parks, parking areas, open spaces, etc.

The second zone of the flood plain is termed the "floodway fringe" or restrictive zone, in which inundation might occur but where depths and velocities are generally low. Although not recommended if practicable alternatives exist, such areas can be developed provided structures are placed high enough or floodproofed to be reasonably free from flood damage during the 100-year flood. Typical relationships between the floodway and floodway fringe are shown in Figure 2. The floodway for Mill Creek has been plotted on the Flooded Area Map, Plate 4.

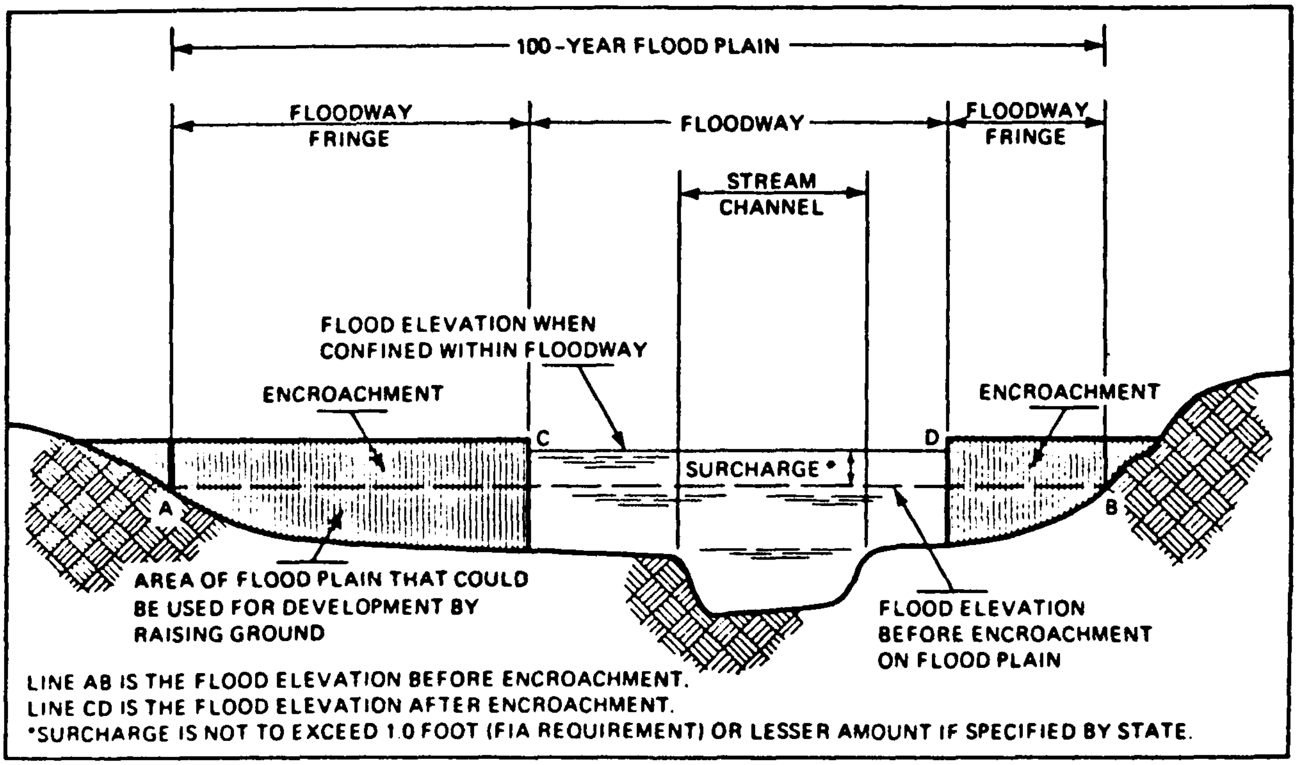


Figure 2 - Floodway Schematic

c. Formulation of Flood Plain Regulations

Formulation of flood plain regulations in a simplified sense involves selecting the type and degree of control to be exercised for each specific flood plain. In principle, the form of the regulations is not as important as a maintained adequacy of control. The degree of control normally varies with the flood hazard as measured by depth of inundation, velocity of flow, frequency of flooding, and the need for available land. Considerable planning and research is required for the proper formulation of flood plain regulations. Where formulation of flood plain regulations is envisioned to require a lengthy period of time during which development is likely to occur, temporary regulations should be adopted to be amended later as necessary.

Modify Flooding

The traditional strategy of modifying floods through the construction of dams, dikes, levees and floodwalls, channel alterations, high flow diversions and spillways, and land treatment measures has repeatedly demonstrated its effectiveness for protecting property and saving lives, and it will continue to be a strategy of flood plain management. However, in the future, reliance solely upon a flood modification strategy is neither possible nor desirable. Although the large capital investment required by flood modifying tools has been provided largely by the Federal Government, sufficient funds from Federal sources have not been and are not likely to be available to meet all situations for which flood modifying measures would be both effective and economically feasible. Another consideration is that the cost of maintaining and operating flood control structures falls upon local governments.

Flood modifications acting alone leave a residual flood loss potential and can encourage an unwarranted sense of security leading to inappropriate use of lands in the areas that are directly protected or in adjacent areas. For this reason, measures to modify possible floods should usually be accompanied by measures to modify the susceptibility to flood damage, particularly by land use regulations.

Modify the Impact of Flooding on Individuals and the Community

A third strategy for mitigating flood losses consists of actions designed to assist individuals and communities in their preparatory, survival, and recovery responses to floods. Tools include information dissemination and education, arrangements for spreading the costs of the loss over time, purposeful transfer of some of the individual's loss to the community by reducing taxes in flood prone areas, and the purchase of Federally subsidized flood insurance.

The distinction between a reasonable and unreasonable transfer of costs from the individual to the community can also be regulated and is a key to effective flood plain management.

CONCLUSION

This report presents local flood hazard information for Mill Creek in the village of Lowville, New York. The U.S. Army Corps of Engineers, Buffalo District, will provide interpretation in the application of the data contained in this report, particularly as to its use in developing effective flood plain regulations. Requests should be coordinated with the New York State Department of Environmental Conservation.

GLOSSARY

BACKWATER	The resulting high water surface in a given stream due to a downstream obstruction or high stages in an intersecting stream.
BASE FLOOD	A flood which has an average return interval in the order of once in 100 years, although the flood may occur in any year. It is based on statistical analysis of streamflow records available for the watershed and analysis of rainfall and runoff characteristics in the general region of the watershed. It is commonly referred to as the "100-year flood."
DISCHARGE	The quantity of flow in a stream at any given time, usually measured in cubic feet per second (cfs).
FLOOD	An overflow of lands not normally covered by water. Floods have two essential characteristics: The inundation of land is temporary and the lands are adjacent to and inundated by overflow from a river, stream, ocean, lake, or other body of standing water. Normally a "flood" is considered as any temporary rise in streamflow or stage, but not the ponding of surface water, that results in significant adverse effects in the vicinity. Adverse effects may include damages from overflow of land areas, temporary backwater effects in sewers and local drainage channels, creation of unsanitary conditions or other unfavorable situations by deposition of materials in stream channels during flood recessions, and rise of groundwater coincident with increased streamflow.
FLOOD CREST	The maximum stage or elevation reached by floodwaters at a given location.
FLOOD FREQUENCY	A statistical expression of the percent chance of exceeding a discharge of a given magnitude in any given year. For example, a <u>100-year flood</u> has a magnitude expected to be exceeded on the average of once every hundred years. Such a <u>flood</u> has a 1 percent chance of being exceeded in any given year. Often used interchangeably with <u>RECURRENCE INTERVAL</u>.

FLOOD PLAIN	The areas adjoining a river, stream, watercourse, ocean, lake, or other body of standing water that have been or may be covered by floodwater.
FLOOD PROFILE	A graph showing the relationship of water surface elevation to location; the latter generally expressed as distance upstream from a known point along the approximate centerline of a stream of water that flows in an open channel. It is generally drawn to show surface elevation for the crest of a specific flood, but may be prepared for conditions at a given time or stage.
FLOOD STAGE	The stage or elevation at which overflow of the natural banks of a stream or body of water begins in the reach or area in which the elevation is measured.
FLOODWAY	The channel of a watercourse and those portions of the adjoining flood plain required to provide for the passage of the selected flood (normally the 100-year flood) with an insignificant increase in the flood levels above that of natural conditions. As used in the National Flood Insurance Program, floodways must be large enough to pass the 100-year flood without causing an increase in elevation of more than a specified amount (1 foot in most areas).
RECURRENCE INTERVAL	A statistical expression of the average time between floods exceeding a given magnitude (see FLOOD FREQUENCY).

REFERENCES

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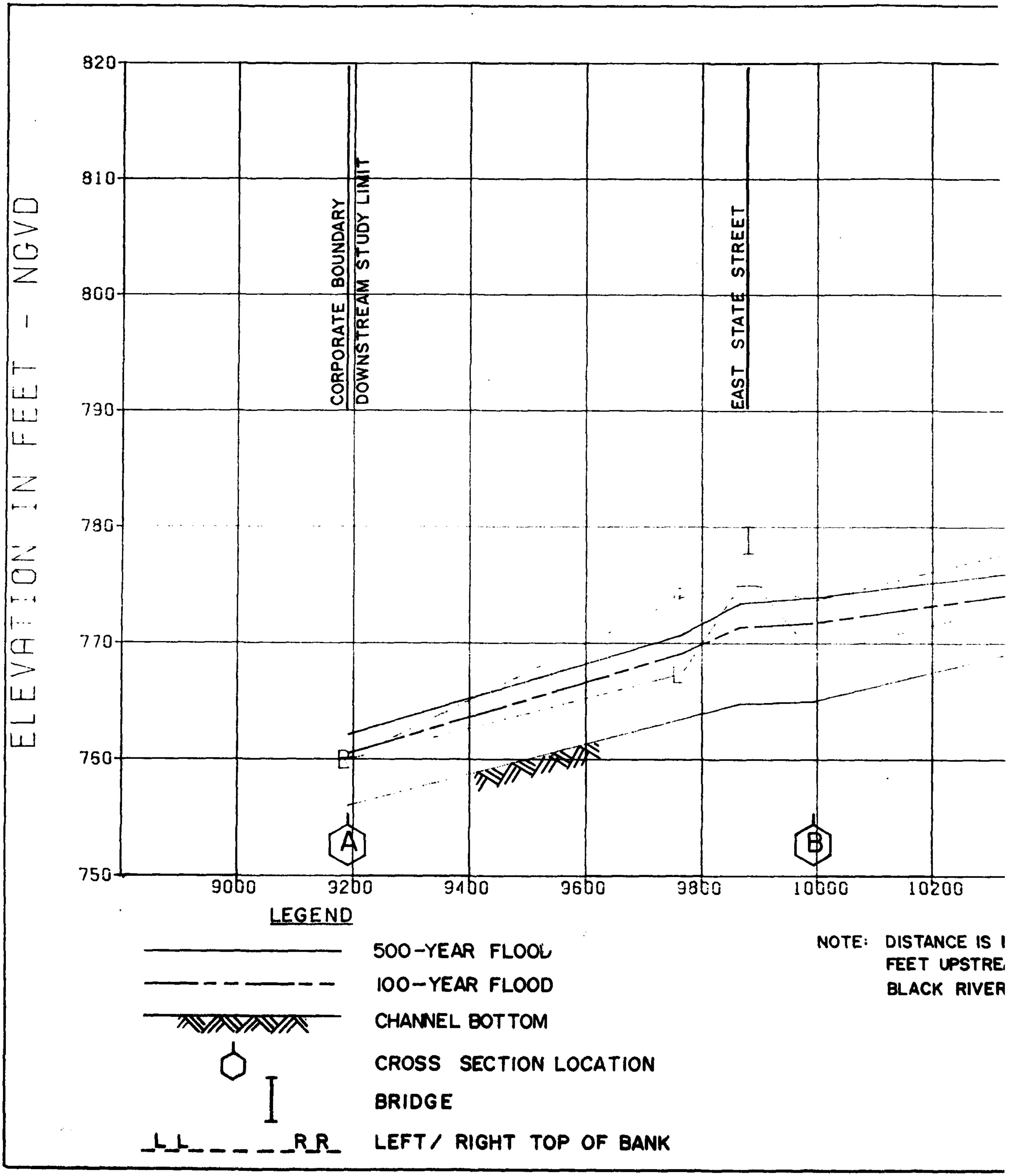
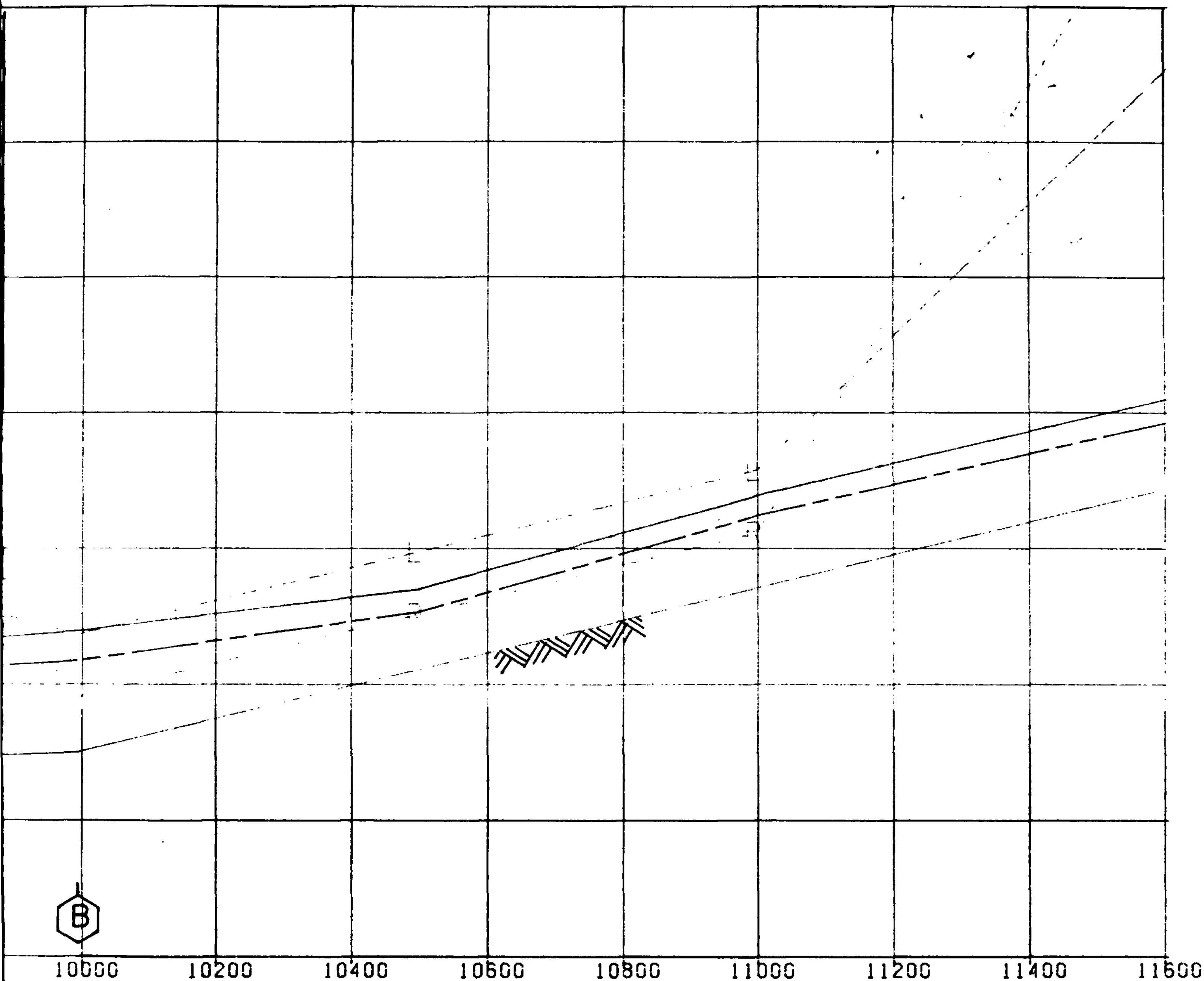
4. U.S. Army Corps of Engineers, Hydrologic Engineering Center, HEC- 2 Water Surface Profiles Generalized Computer Program, Davis, California, 1974.



ELEVATION IN FEET - NGVD
820
810
800
790
780
770
760
750
9000
9200
9400
9600
9800
10000
10200
CORPORATE BOUNDARY
DOWNSTREAM STUDY LIMIT
EAST STATE STREET
A
B
LEGEND
500-YEAR FLOOD
100-YEAR FLOOD
CHANNEL BOTTOM
CROSS SECTION LOCATION
BRIDGE
L L R R
LEFT/ RIGHT TOP OF BANK
NOTE: DISTANCE IS I
FEET UPSTRE
BLACK RIVER



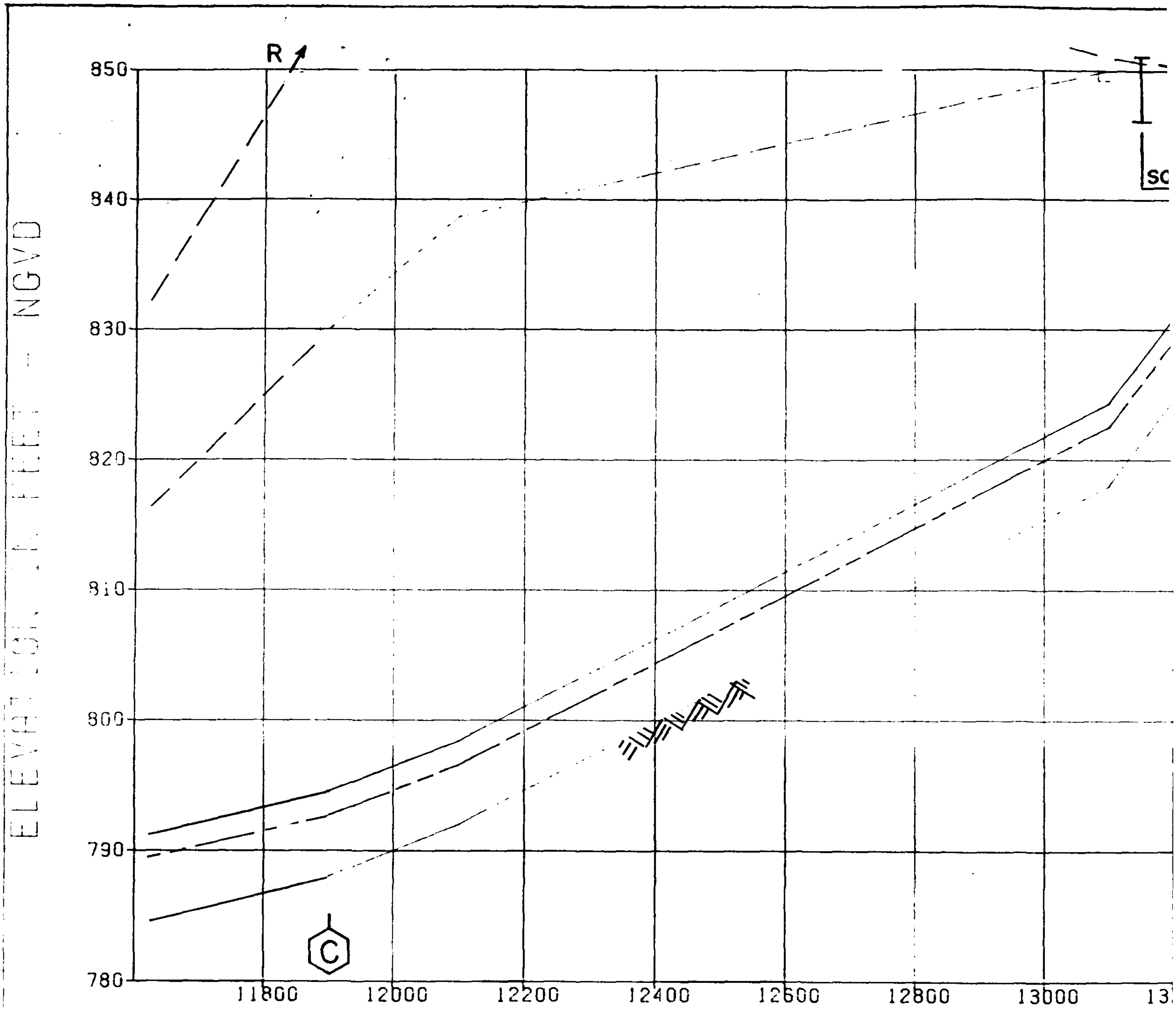
NOTE: DISTANCE IS MEASURED IN FEET UPSTREAM FROM THE BLACK RIVER.

U.S. Army Engineer District, Buffalo
SPECIAL FLOOD HAZARD EVALUATION

FLOOD PROFILE
MILL CREEK
VILLAGE OF LOWVILLE, NEW YORK

PLATE I

DEC. 1990



LEGEND

500-YEAR FLOOD

100-YEAR FLOOD

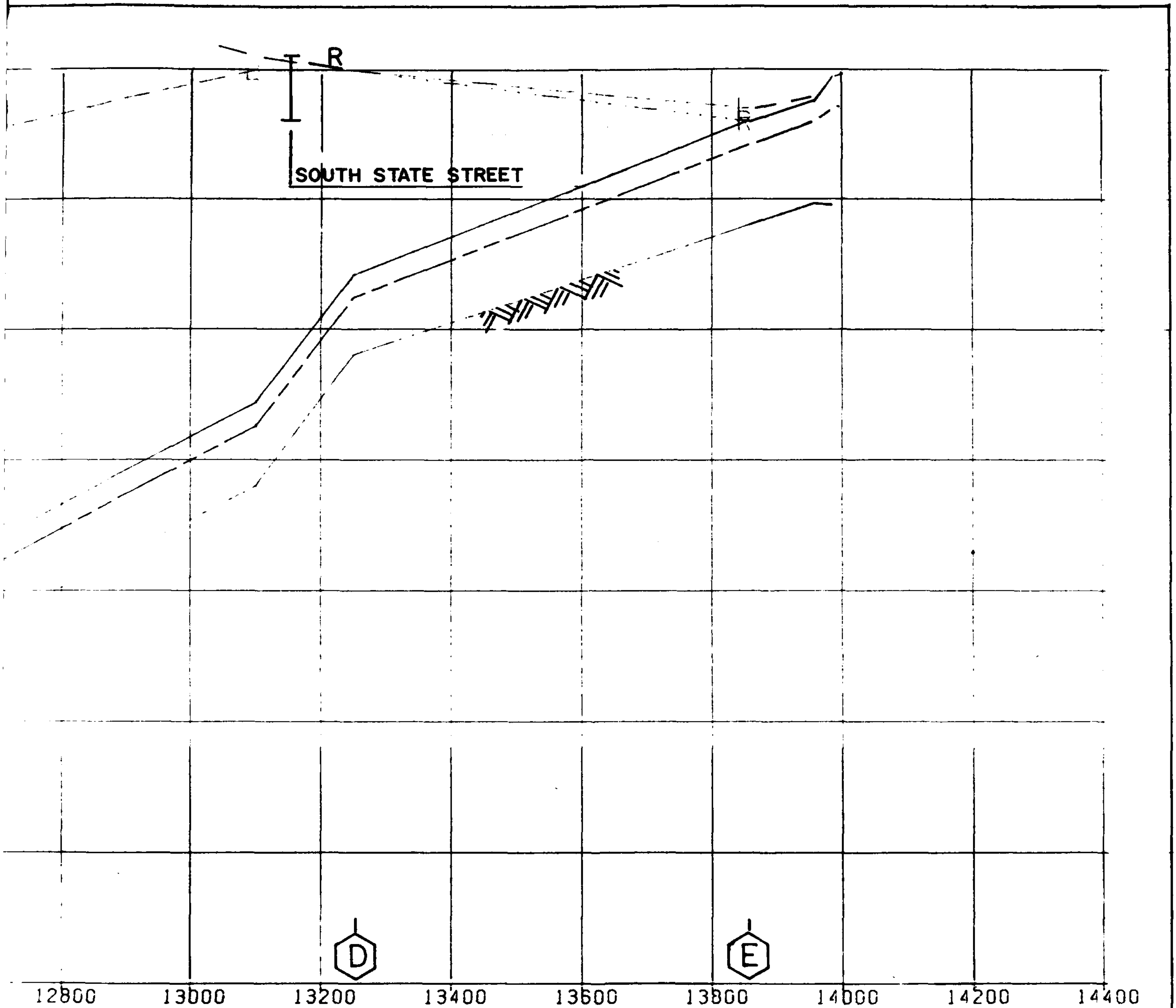
CHANNEL BOTTOM

CROSS SECTION LOCATION

BRIDGE

L L _ _ _ _ R R LEFT / RIGHT TOP OF BANK

NOTE: DISTANCE IS MEAS
FEET UPSTREAM
BLACK RIVER.

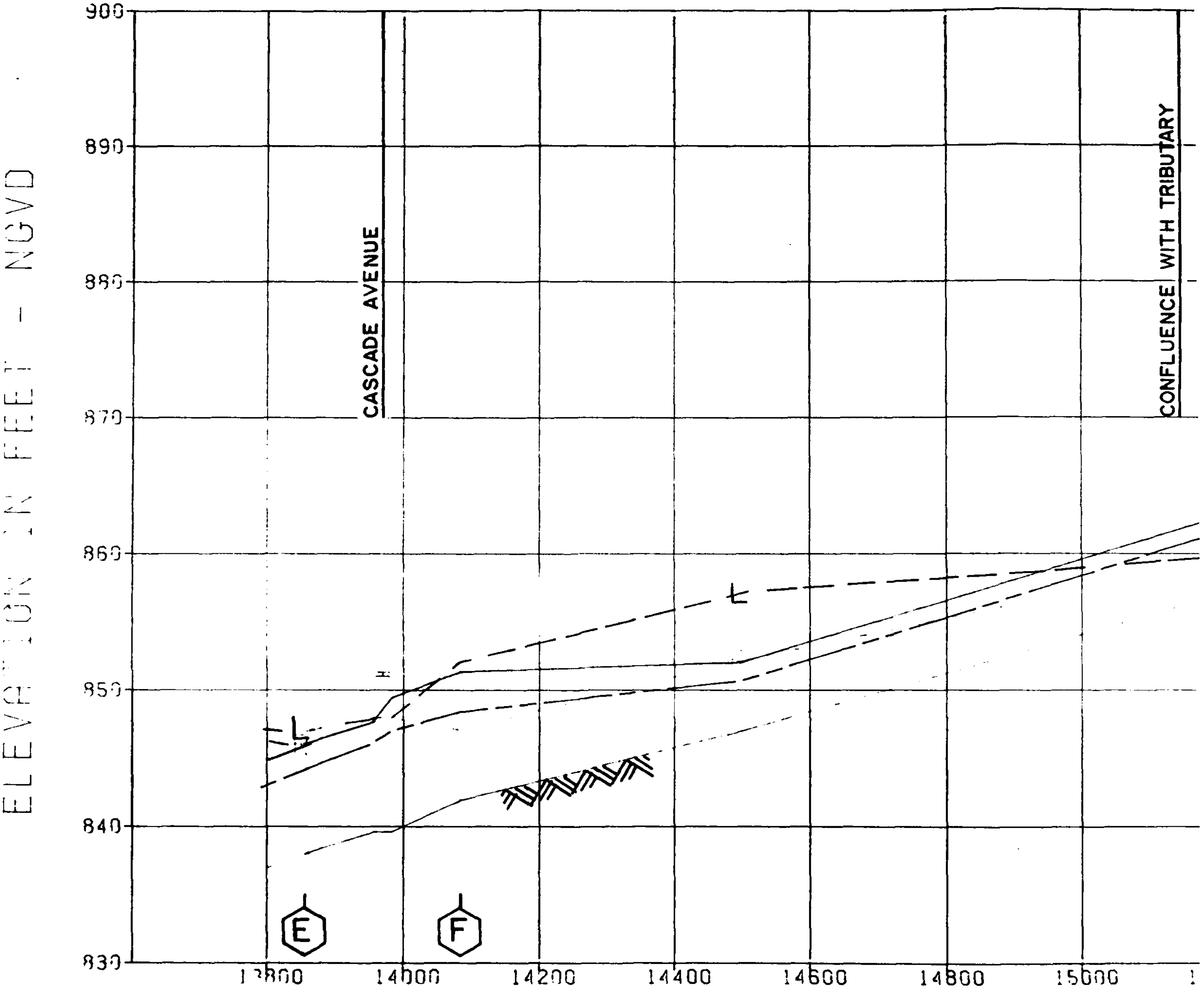


NOTE: DISTANCE IS MEASURED IN FEET UPSTREAM FROM THE BLACK RIVER.

U.S. Army Engineer District, Buffalo
SPECIAL FLOOD HAZARD EVALUATION

FLOOD PROFILE
MILL CREEK
VILLAGE OF LOWVILLE, NEW YORK

PLATE 2 DEC. 1990



LEGEND

500-YEAR FLOOD

100-YEAR FLOOD

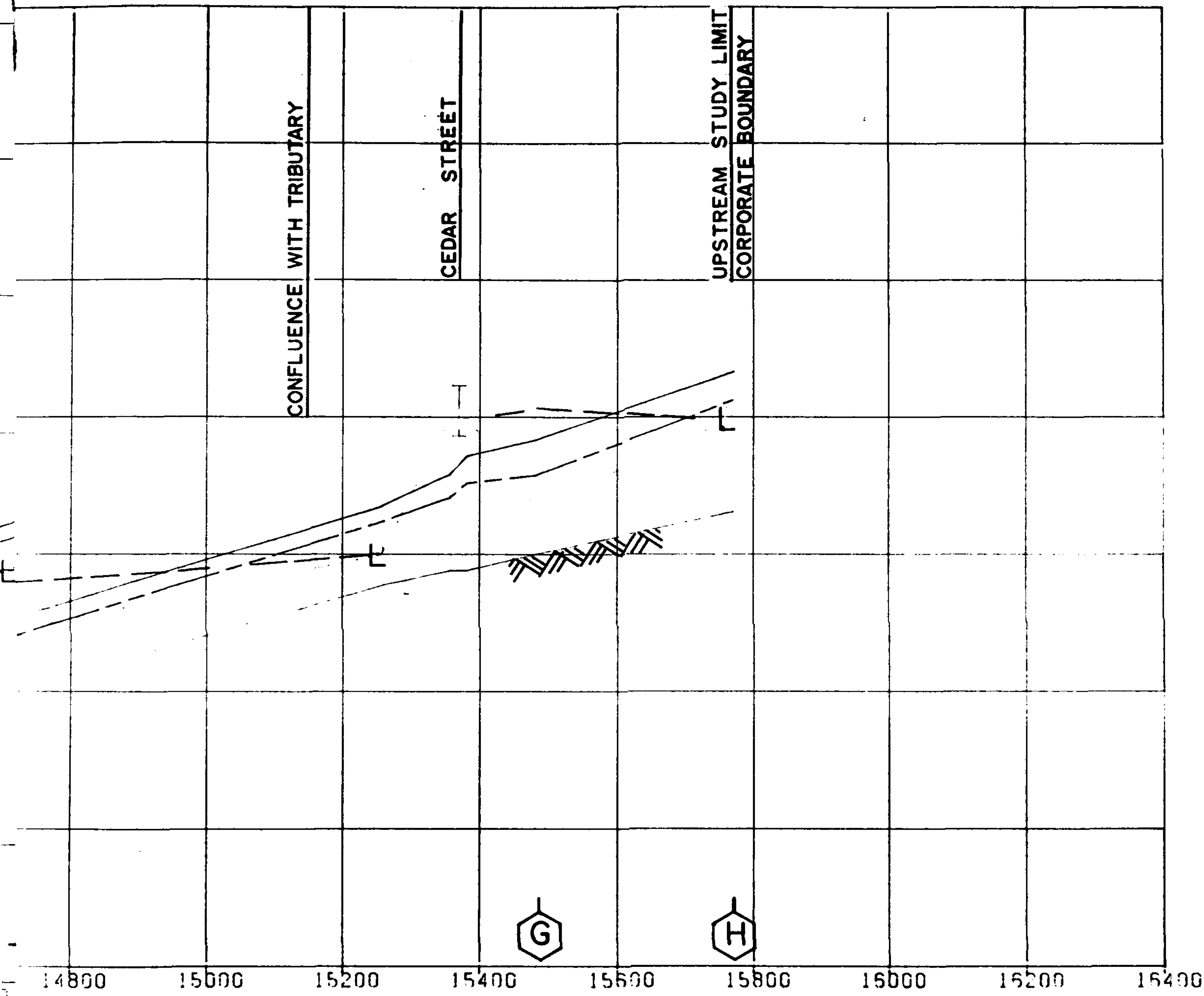
CHANNEL BOTTOM

CROSS SECTION LOCATION

BRIDGE

L L R R LEFT / RIGHT TOP OF BANK

NOTE: DISTANCE IS MEA
FEET UPSTREAM
BLACK RIVER.

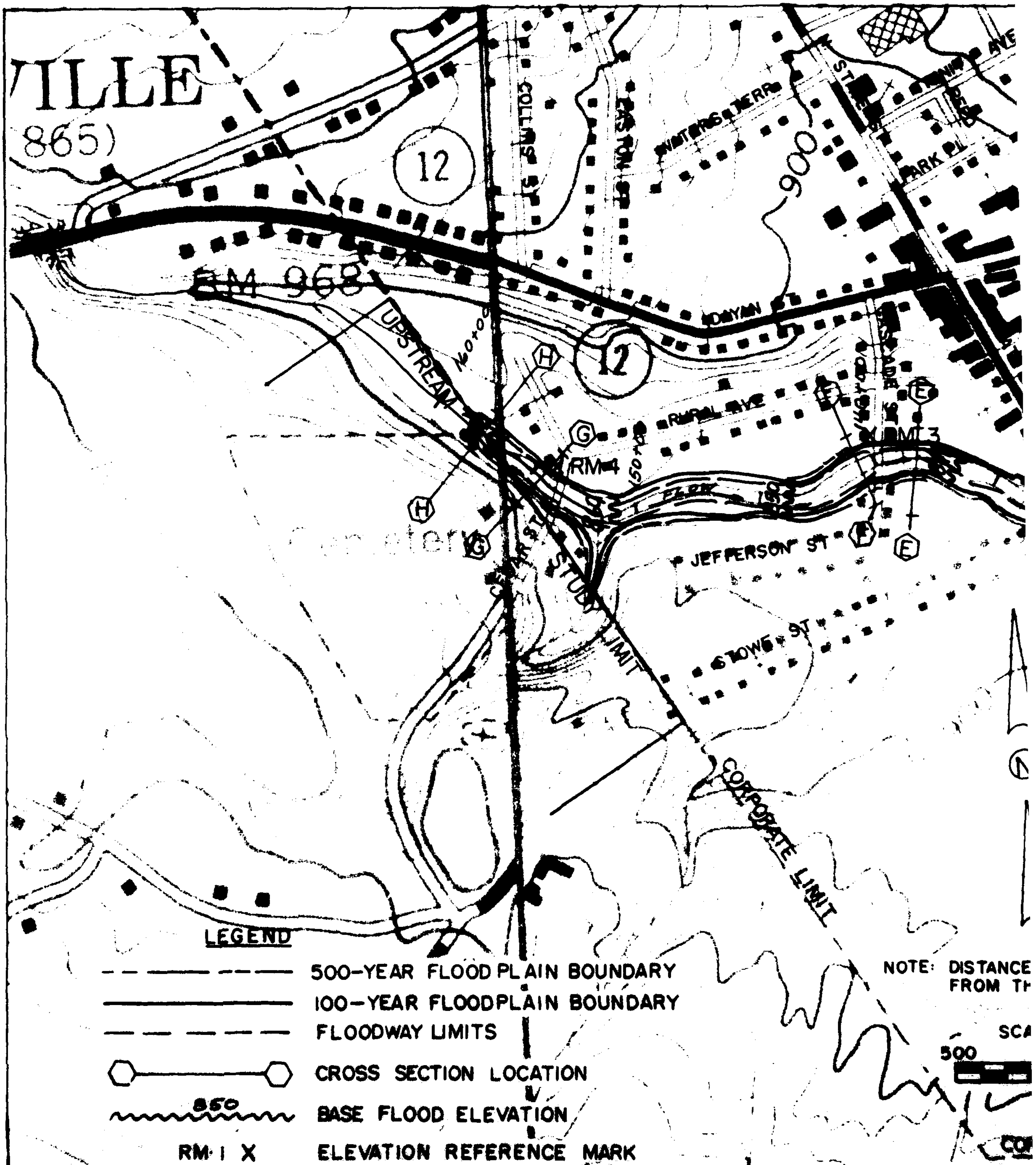


NOTE: DISTANCE IS MEASURED IN FEET UPSTREAM FROM THE BLACK RIVER.

U.S. Army Engineer District, Buffalo
SPECIAL FLOOD HAZARD EVALUATION

FLOOD PROFILE
MILL CREEK
VILLAGE OF LOWVILLE, NEW YORK

PLATE 3 DEC. 1990



VILLE
865)
12
COLLINS ST
EASTON ST
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900
PARK PL
AVE
BM 968
UPSTREAM
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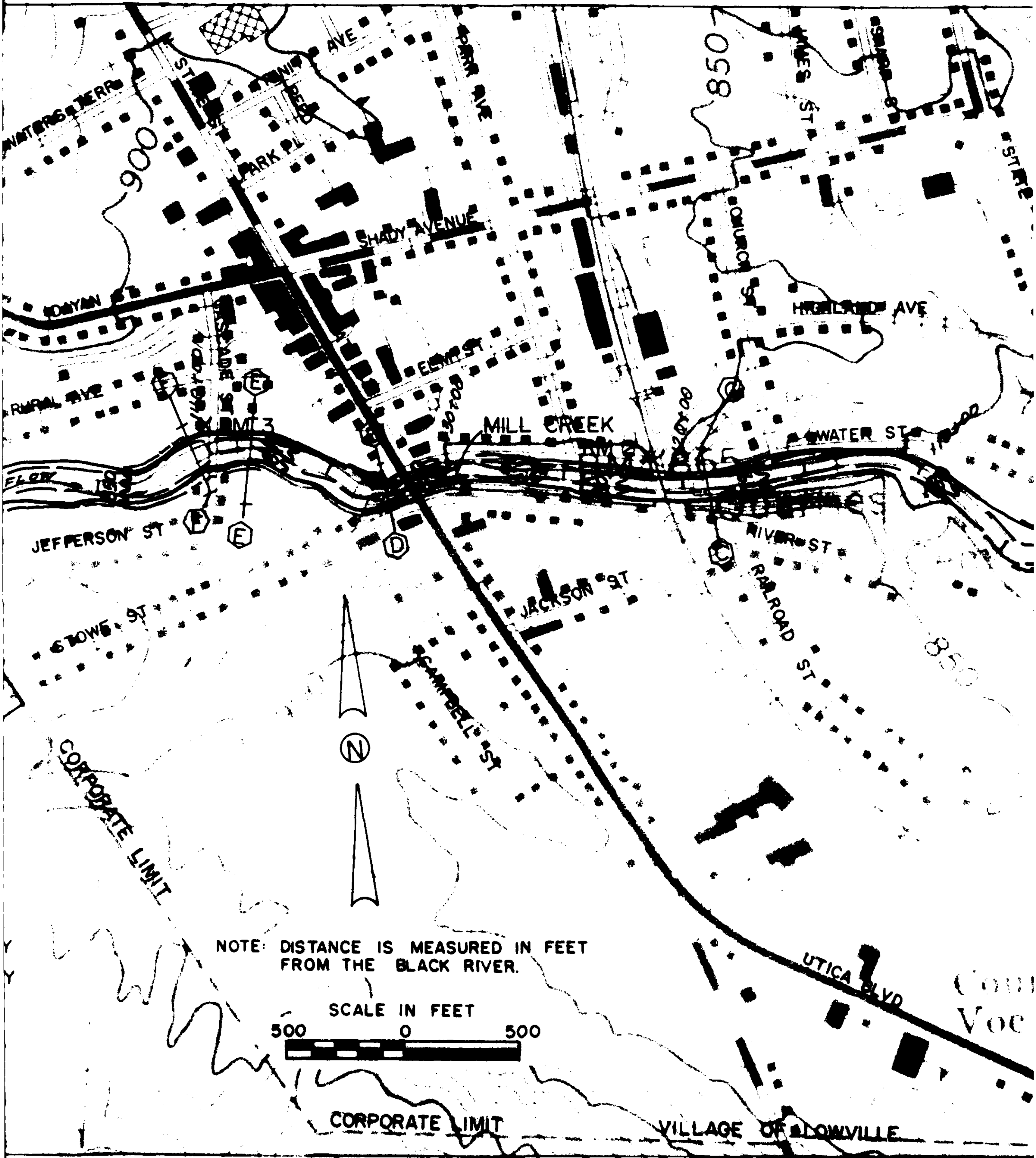
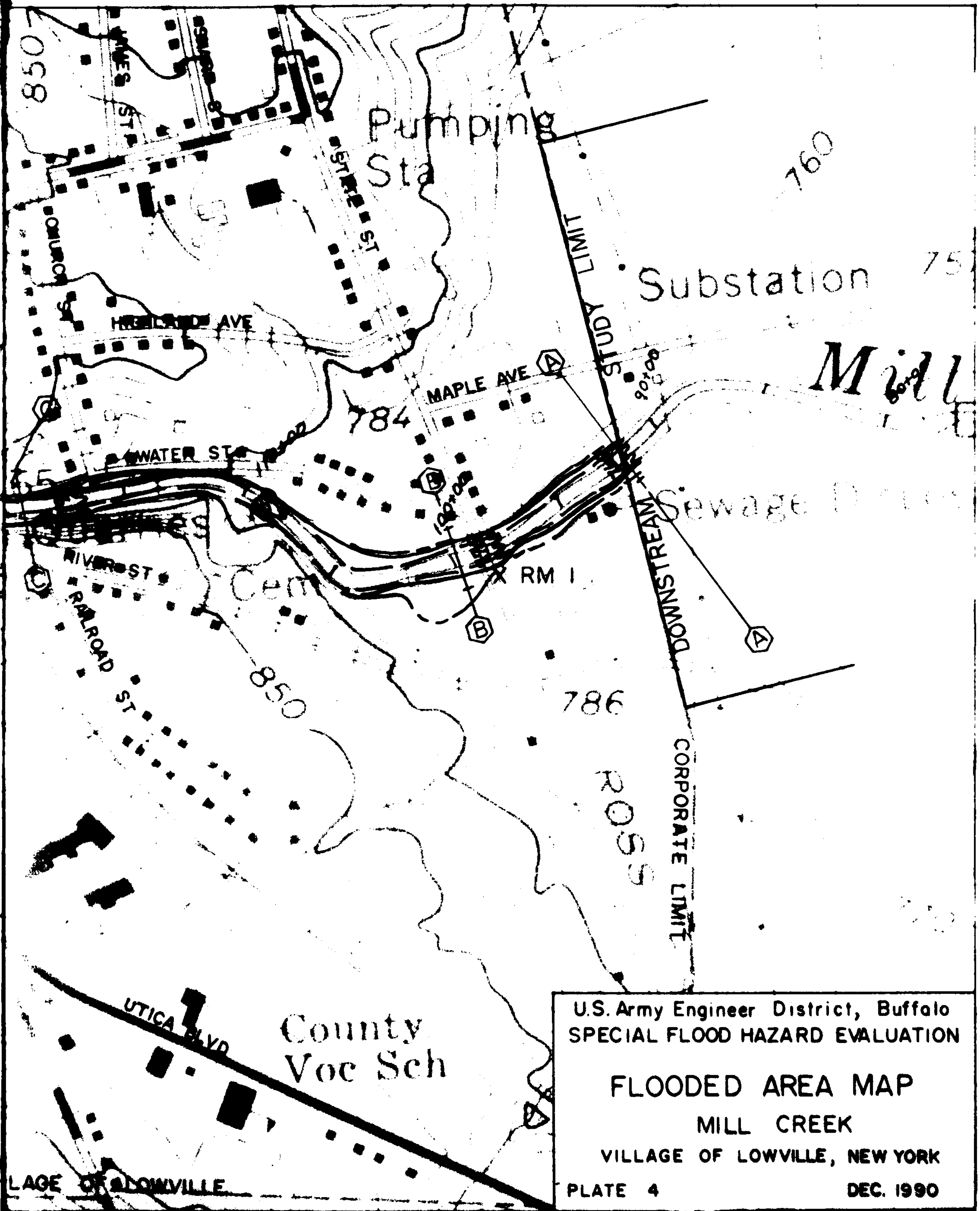
DYAN ST
RURAL AVE
RM 4
RM 3
JEFFERSON ST
STOWE ST
CORPORATE LIMIT
LEGEND
500-YEAR FLOOD PLAIN BOUNDARY
100-YEAR FLOODPLAIN BOUNDARY
FLOODWAY LIMITS
CROSS SECTION LOCATION
850
BASE FLOOD ELEVATION
RM·1 X
ELEVATION REFERENCE MARK
NOTE: DISTANCE
FROM TH
SCA
500



WATERS TERR
PARK AVE
PARK PL
900
850
SHADY AVENUE
DAYAN ST
RURAL AVE
ELM ST
MILL CREEK
WATER ST
CHURCH ST
HIGHLAND AVE
JEFFERSON ST
RIVER ST
JACKSON ST
STOWE ST
CAMPBELL ST
RAILROAD ST
CORPORATE LIMIT
NOTE: DISTANCE IS MEASURED IN FEET FROM THE BLACK RIVER.
SCALE IN FEET
500 0 500
UTICA BLVD
CORPORATE LIMIT
VILLAGE OF LOWVILLE



U.S. Army Engineer District, Buffalo
SPECIAL FLOOD HAZARD EVALUATION

FLOODED AREA MAP
MILL CREEK
VILLAGE OF LOWVILLE, NEW YORK

PLATE 4 DEC. 1990