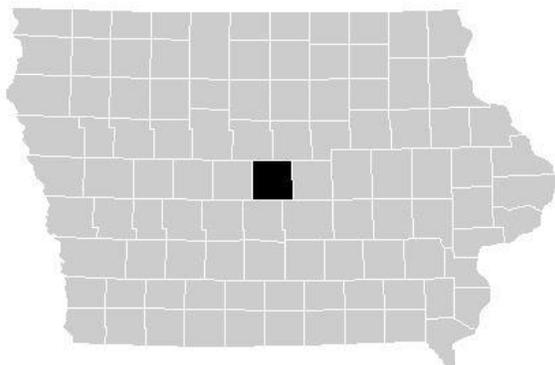


FLOOD INSURANCE STUDY

FEDERAL EMERGENCY MANAGEMENT AGENCY

VOLUME 2 OF 2



STORY COUNTY, IOWA AND INCORPORATED AREAS

| COMMUNITY NAME | NUMBER | COMMUNITY NAME | NUMBER |
|--------------------|--------|---------------------------------------|--------|
| AMES, CITY OF | 190254 | MCCALLSBURG, CITY OF | 190315 |
| CAMBRIDGE, CITY OF | 190255 | NEVADA, CITY OF | 190258 |
| COLLINS, CITY OF | 190719 | ROLAND, CITY OF | 190513 |
| COLO, CITY OF* | 190839 | SLATER, CITY OF | 190659 |
| GILBERT, CITY OF | 190256 | STORY CITY, CITY OF | 190259 |
| HUXLEY, CITY OF | 190597 | STORY COUNTY, UNINCORPORATED AREAS | 190907 |
| KELLEY, CITY OF* | 190748 | ZEARING, CITY OF | 190260 |
| MAXWELL, CITY OF | 190257 | | |

*No Special Flood Hazard Areas Identified

REVISED:
January 15, 2021

FLOOD INSURANCE STUDY NUMBER
19169CV002C

Version Number 2.5.3.0



FEMA

TABLE OF CONTENTS

Volume 1

| | <u>Page</u> |
|---|-------------|
| SECTION 1.0 – INTRODUCTION | 1 |
| 1.1 The National Flood Insurance Program | 1 |
| 1.2 Purpose of this Flood Insurance Study Report | 2 |
| 1.3 Jurisdictions Included in the Flood Insurance Study Project | 2 |
| 1.4 Considerations for using this Flood Insurance Study Report | 6 |
| | |
| SECTION 2.0 – FLOODPLAIN MANAGEMENT APPLICATIONS | 16 |
| 2.1 Floodplain Boundaries | 16 |
| 2.2 Floodways | 22 |
| 2.3 Base Flood Elevations | 23 |
| 2.4 Non-Encroachment Zones | 23 |
| 2.5 Coastal Flood Hazard Areas | 23 |
| 2.5.1 Water Elevations and the Effects of Waves | 23 |
| 2.5.2 Floodplain Boundaries and BFEs for Coastal Areas | 23 |
| 2.5.3 Coastal High Hazard Areas | 24 |
| 2.5.4 Limit of Moderate Wave Action | 24 |
| | |
| SECTION 3.0 – INSURANCE APPLICATIONS | 24 |
| 3.1 National Flood Insurance Program Insurance Zones | 24 |
| | |
| SECTION 4.0 – AREA STUDIED | 25 |
| 4.1 Basin Description | 25 |
| 4.2 Principal Flood Problems | 26 |
| 4.3 Non-Levee Flood Protection Measures | 27 |
| 4.4 Levees | 27 |
| | |
| SECTION 5.0 – ENGINEERING METHODS | 29 |
| 5.1 Hydrologic Analyses | 29 |
| 5.2 Hydraulic Analyses | 37 |
| 5.3 Coastal Analyses | 43 |
| 5.3.1 Total Stillwater Elevations | 43 |
| 5.3.2 Waves | 44 |
| 5.3.3 Coastal Erosion | 44 |
| 5.3.4 Wave Hazard Analyses | 44 |
| 5.4 Alluvial Fan Analyses | 44 |
| | |
| SECTION 6.0 – MAPPING METHODS | 44 |
| 6.1 Vertical and Horizontal Control | 44 |
| 6.2 Base Map | 45 |
| 6.3 Floodplain and Floodway Delineation | 46 |
| 6.4 Coastal Flood Hazard Mapping | 77 |
| 6.5 FIRM Revisions | 77 |
| 6.5.1 Letters of Map Amendment | 77 |

| | | |
|--|---------------------------------------|-----------|
| 6.5.2 | Letters of Map Revision Based on Fill | 77 |
| 6.5.3 | Letters of Map Revision | 78 |
| 6.5.4 | Physical Map Revisions | 78 |
| 6.5.5 | Contracted Restudies | 79 |
| 6.5.6 | Community Map History | 79 |
| SECTION 7.0 – CONTRACTED STUDIES AND COMMUNITY COORDINATION | | 81 |
| 7.1 | Contracted Studies | 81 |
| 7.2 | Community Meetings | 85 |
| SECTION 8.0 – ADDITIONAL INFORMATION | | 88 |
| SECTION 9.0 – BIBLIOGRAPHY AND REFERENCES | | 90 |

Figures

| | <u>Page</u> |
|--|-------------|
| Figure 1: FIRM Index | 8 |
| Figure 2: FIRM Notes to Users | 9 |
| Figure 3: Map Legend for FIRM | 12 |
| Figure 4: Floodway Schematic | 22 |
| Figure 5: Wave Runup Transect Schematic | 23 |
| Figure 6: Coastal Transect Schematic | 24 |
| Figure 7: Frequency Discharge-Drainage Area Curves | 36 |
| Figure 8: 1% Annual Chance Total Stillwater Elevations for Coastal Areas | 44 |
| Figure 9: Transect Location Map | 44 |

Tables

| | <u>Page</u> |
|--|-------------|
| Table 1: Listing of NFIP Jurisdictions | 2 |
| Table 2: Flooding Sources Included in this FIS Report | 18 |
| Table 3: Flood Zone Designations by Community | 24 |
| Table 4: Basin Characteristics | 25 |
| Table 5: Principal Flood Problems | 26 |
| Table 6: Historic Flooding Elevations | 26 |
| Table 7: Non-Levee Flood Protection Measures | 27 |
| Table 8: Levees | 28 |
| Table 9: Summary of Discharges | 31 |
| Table 10: Summary of Non-Coastal Stillwater Elevations | 36 |
| Table 11: Stream Gage Information used to Determine Discharges | 36 |
| Table 12: Summary of Hydroglogic and Hydraulic Analyses | 38 |
| Table 13: Roughness Coefficients | 43 |
| Table 14: Summary of Coastal Analyses | 43 |
| Table 15: Tide Gage Analysis Specifics | 44 |
| Table 16: Coastal Transect Parameters | 44 |

| | |
|---|----|
| Table 17: Summary of Alluvial Fan Analyses | 44 |
| Table 18: Results of Alluvial Fan Analyses | 44 |
| Table 19: Countywide Vertical Datum Conversion | 45 |
| Table 20: Stream-Based Vertical Datum Conversion | 45 |
| Table 21: Base Map Sources | 46 |
| Table 22: Summary of Topographic Elevation Data used in Mapping | 47 |
| Table 23: Floodway Data | 48 |
| Table 24: Flood Hazard and Non-Encroachment Data for Selected Streams | 77 |
| Table 25: Summary of Coastal Transect Mapping Considerations | 77 |
| Table 26: Incorporated Letters of Map Change | 78 |
| Table 27: Community Map History | 80 |
| Table 28: Summary of Contracted Studies Included in this FIS Report | 81 |
| Table 29: Community Meetings | 86 |
| Table 30: Map Repositories | 88 |
| Table 31: Additional Information | 89 |
| Table 32: Bibliography and References | 91 |

Exhibits

| | |
|----------------|--------------|
| Flood Profiles | <u>Panel</u> |
| Ballard Creek | 01-02 P |

Volume 2

Exhibits

| | |
|--------------------------|--------------|
| Flood Profiles | <u>Panel</u> |
| Bear Creek | 03-06 P |
| Clear Creek | 07-08 P |
| College Creek | 09-12 P |
| Fourmile Creek | 13 P |
| Indian Creek | 14-15 P |
| Keigley Creek | 16-17 P |
| Lateral A | 18 P |
| Long Dick Creek | 19-20 P |
| Onion Creek | 21-22 P |
| Rock Creek | 23-24 P |
| Rock Creek Tributary | 25 P |
| Skunk River | 26-33 P |
| South Skunk River | 34 P |
| Squaw Creek | 35-38 P |
| Unnamed Creek | 39 P |
| Unnamed Creek A | 40 P |
| Unnamed Creek B | 41 P |
| Walnut Creek | 42-44 P |
| West Branch Indian Creek | 45-52 P |
| Worle Creek | 53-59 P |

Exhibits

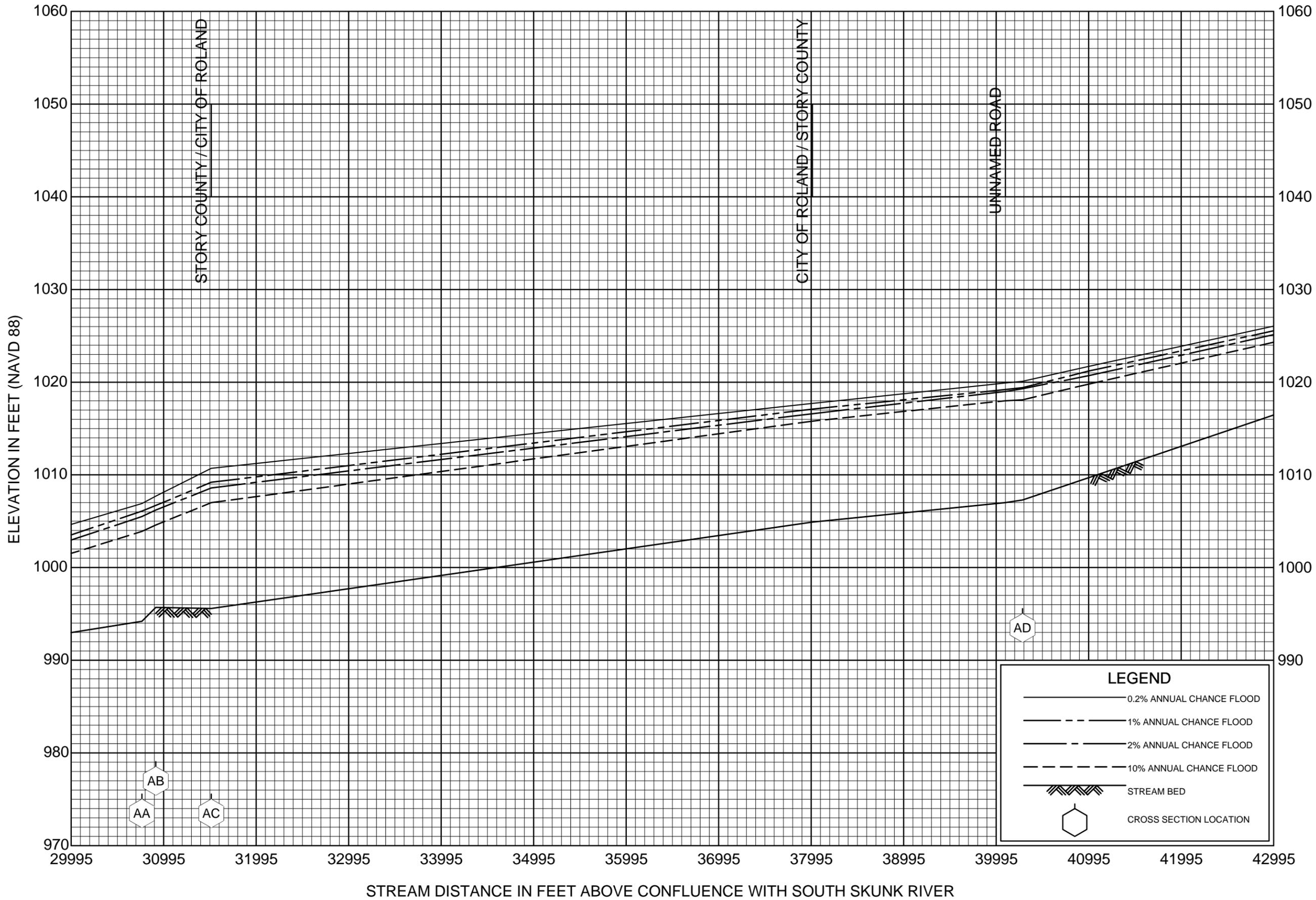
Flood Profiles

Worle Creek Tributary 1
Worle Creek Tributary 2

Panel
60-61 P
62-63 P

Published Separately

Flood Insurance Rate Map (FIRM)



FLOOD PROFILES

BEAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

STORY COUNTY, IA

STORY COUNTY, IA AND INCORPORATED AREAS



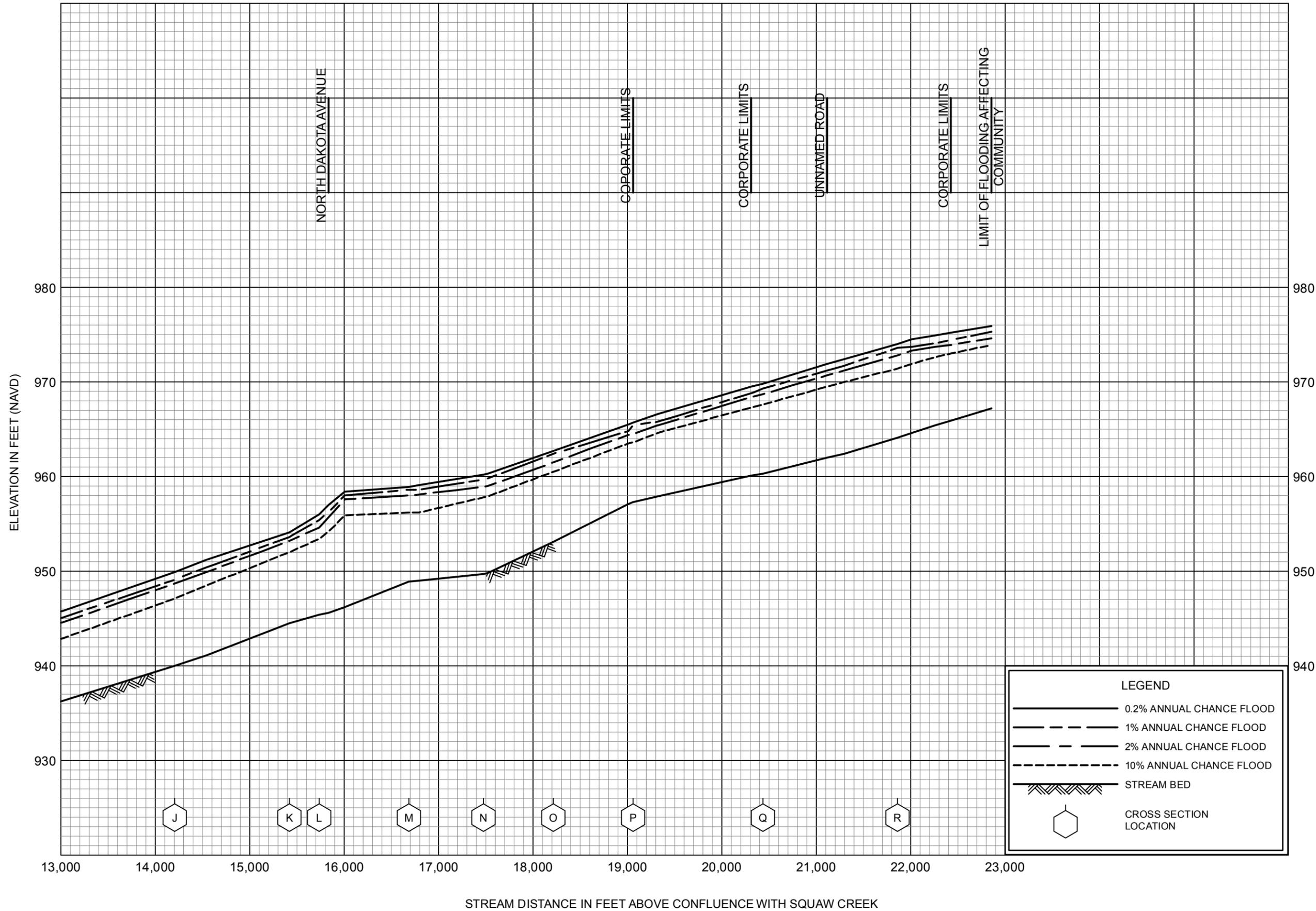
FLOOD PROFILES

CLEAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

STORY COUNTY, IA

STORY COUNTY, IA AND INCORPORATED AREAS



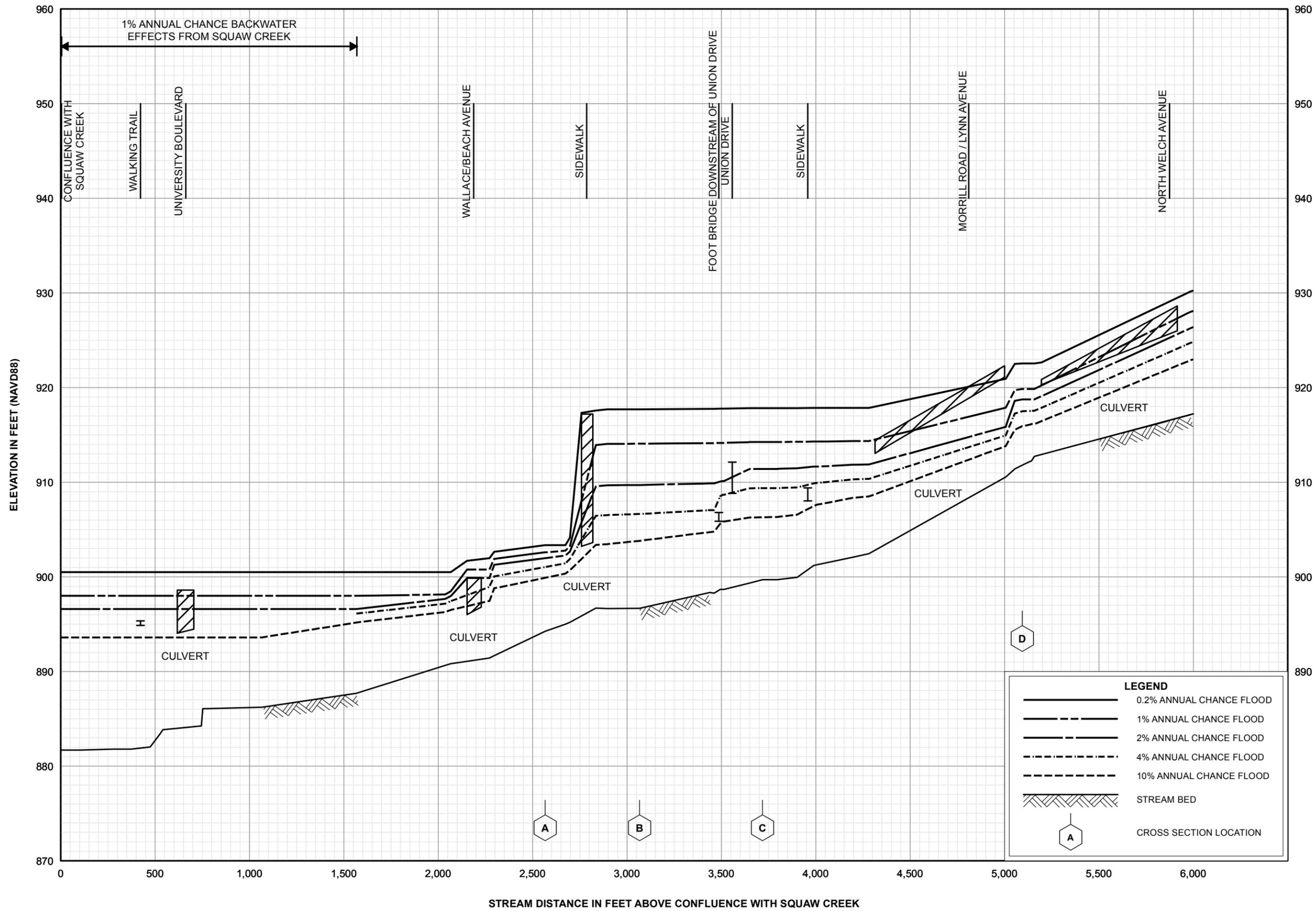
FLOOD PROFILES

CLEAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

STORY COUNTY, IA

STORY COUNTY, IA AND INCORPORATED AREAS



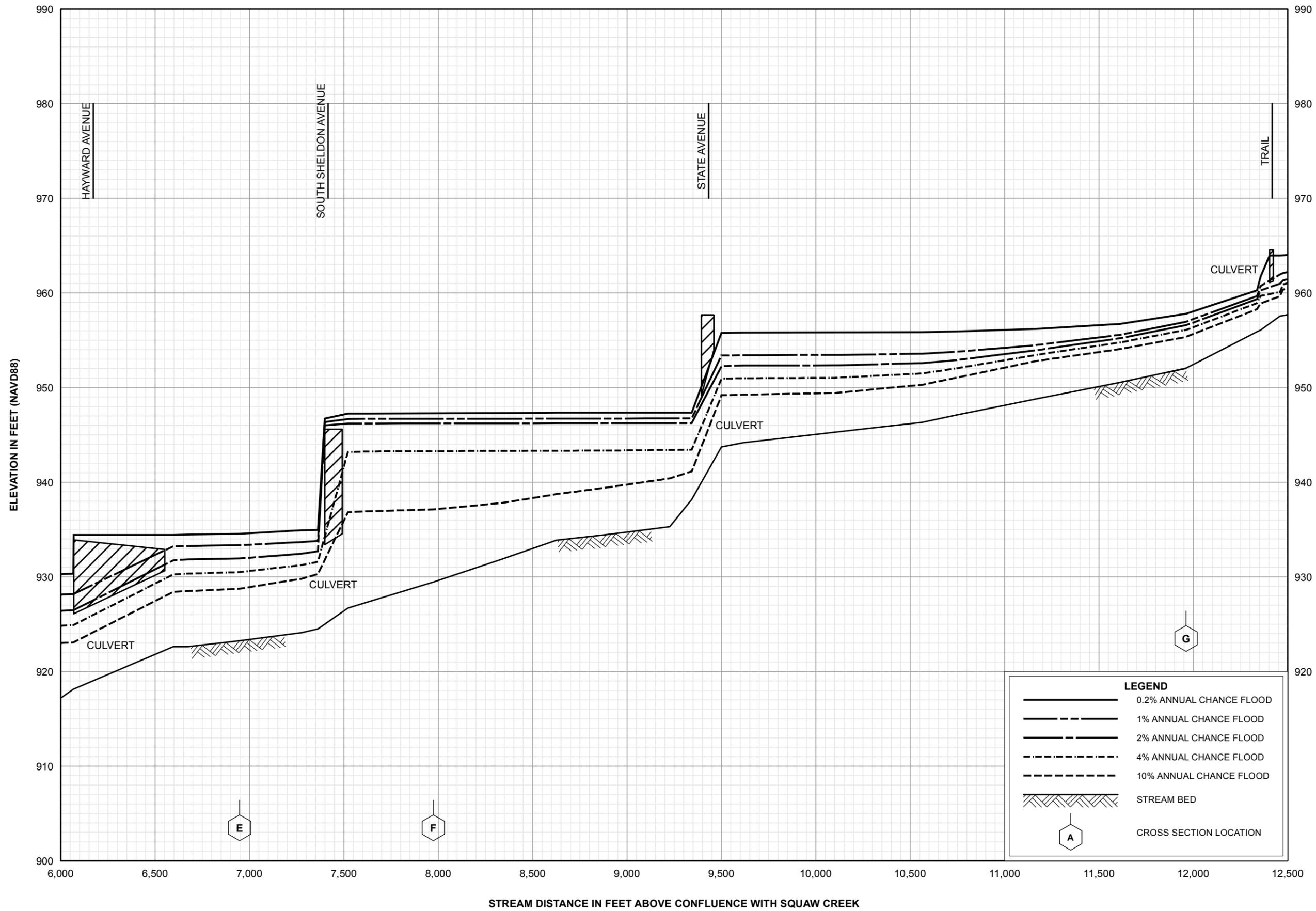
FLOOD PROFILES

COLLEGE CREEK

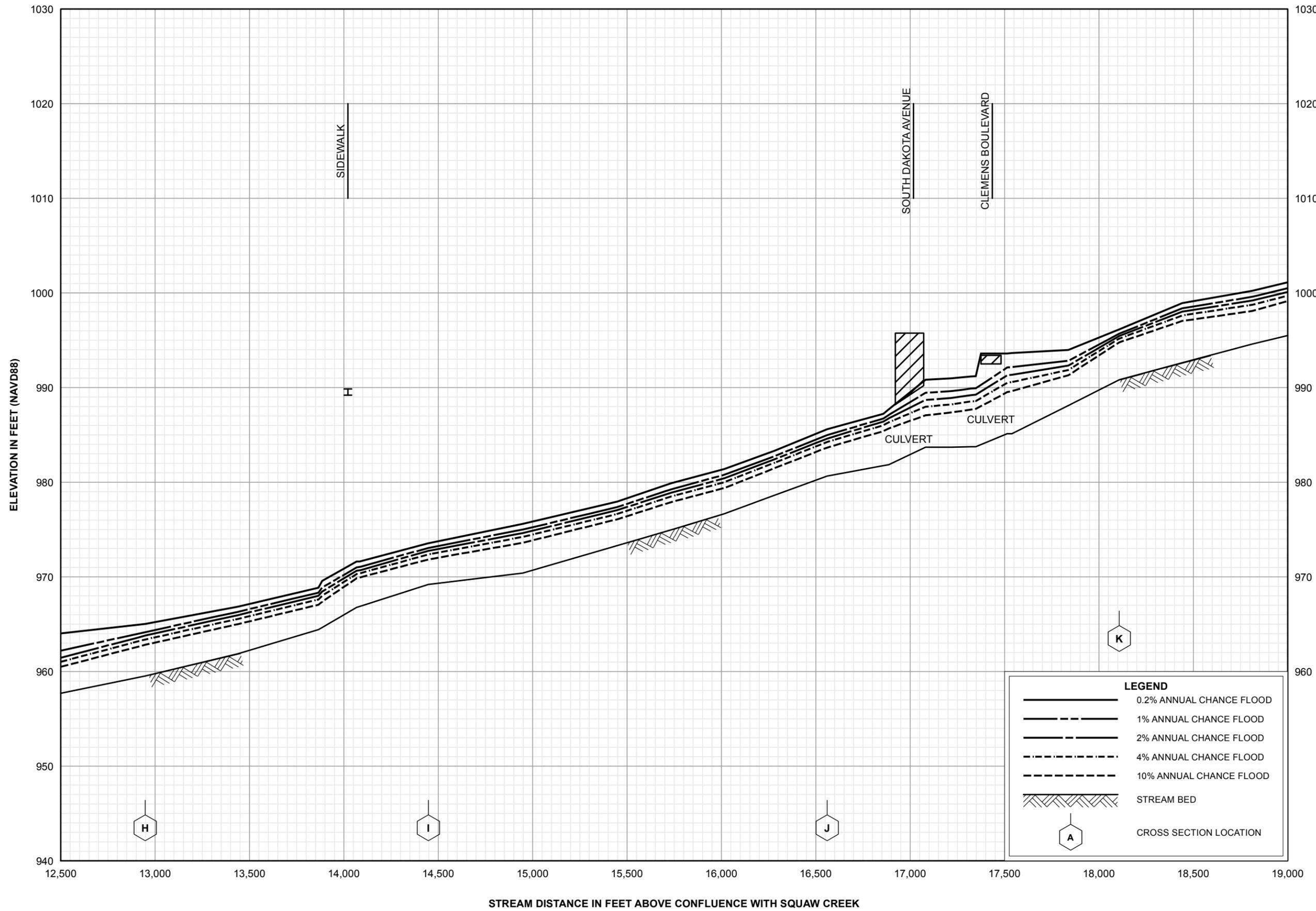
FEDERAL EMERGENCY MANAGEMENT AGENCY

STORY COUNTY, IOWA

AND INCORPORATED AREAS



| LEGEND | |
|--------|--------------------------|
| | 0.2% ANNUAL CHANCE FLOOD |
| | 1% ANNUAL CHANCE FLOOD |
| | 2% ANNUAL CHANCE FLOOD |
| | 4% ANNUAL CHANCE FLOOD |
| | 10% ANNUAL CHANCE FLOOD |
| | STREAM BED |
| | CROSS SECTION LOCATION |

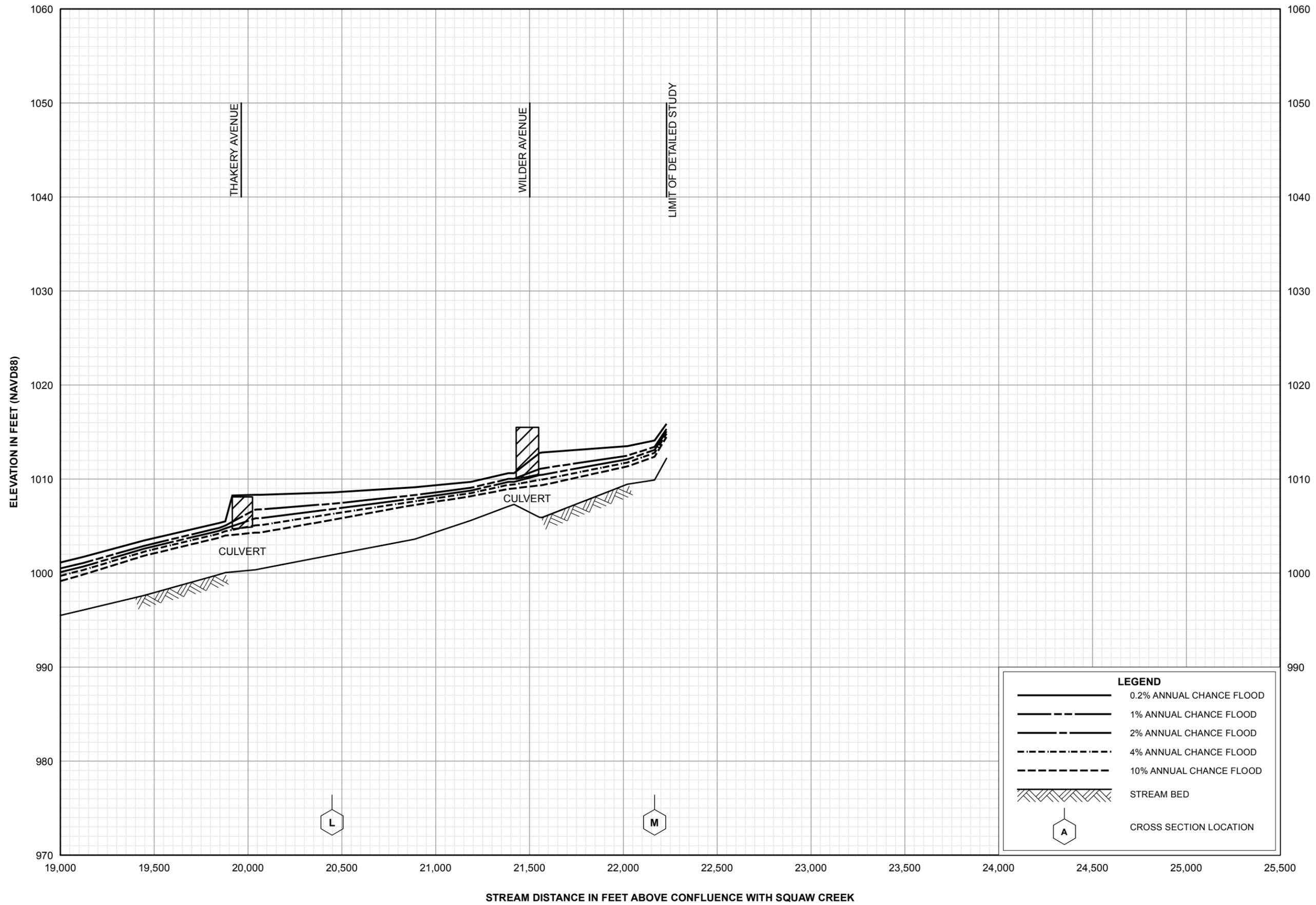


LEGEND

- 0.2% ANNUAL CHANCE FLOOD
- - - 1% ANNUAL CHANCE FLOOD
- · - · 2% ANNUAL CHANCE FLOOD
- · - · 4% ANNUAL CHANCE FLOOD
- · · 10% ANNUAL CHANCE FLOOD
- ▨ STREAM BED
- ⬡ CROSS SECTION LOCATION

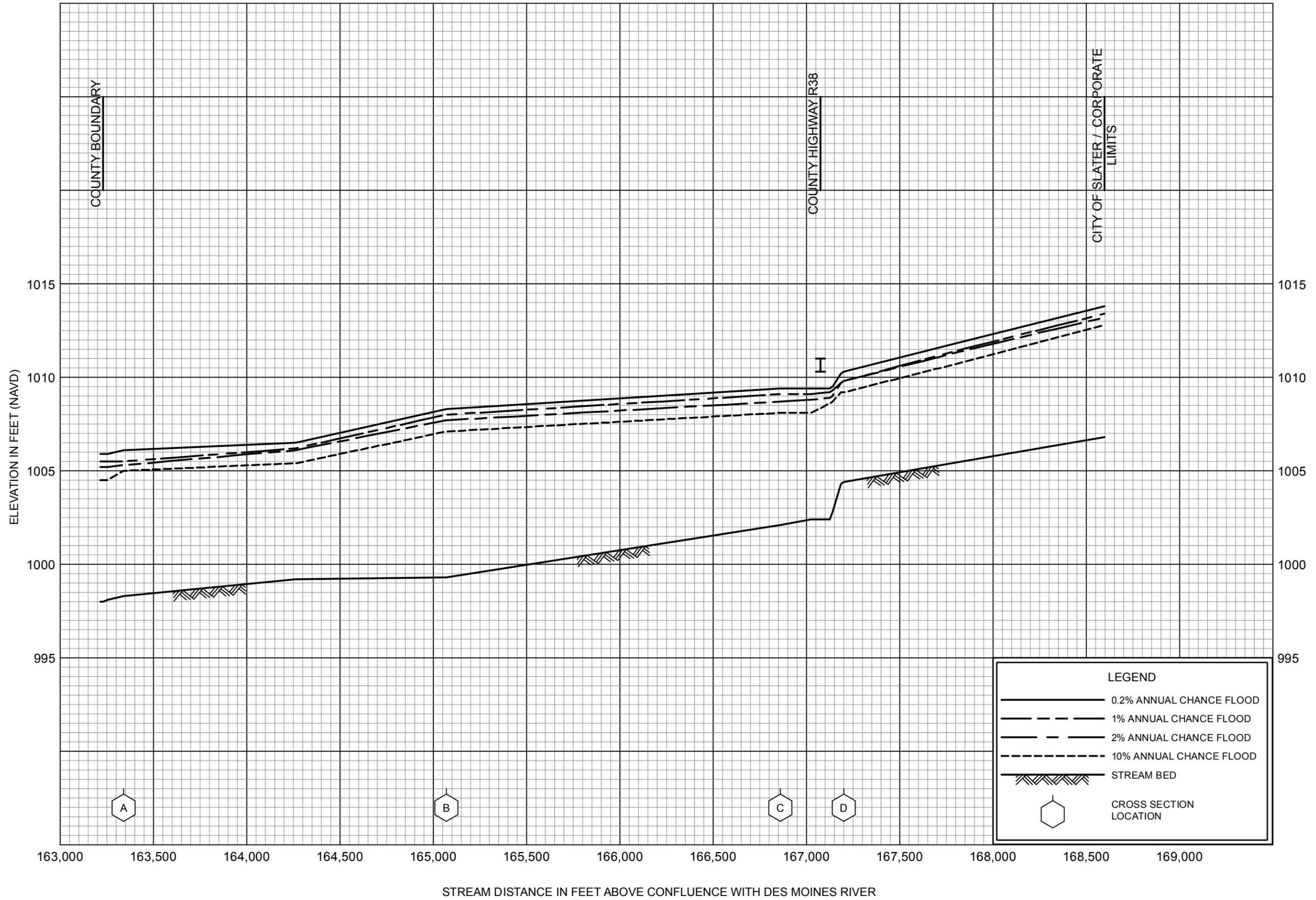
FLOOD PROFILES
COLLEGE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY
STORY COUNTY, IOWA
AND INCORPORATED AREAS



FLOOD PROFILES
COLLEGE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY
STORY COUNTY, IOWA
AND INCORPORATED AREAS



FLOOD PROFILES
FOURMILE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY
STORY COUNTY, IA
STORY COUNTY, IA AND INCORPORATED AREAS



| LEGEND | |
|--------|--------------------------|
| | 0.2% ANNUAL CHANCE FLOOD |
| | 1% ANNUAL CHANCE FLOOD |
| | 2% ANNUAL CHANCE FLOOD |
| | 10% ANNUAL CHANCE FLOOD |
| | STREAM BED |
| | CROSS SECTION LOCATION |

FLOOD PROFILES

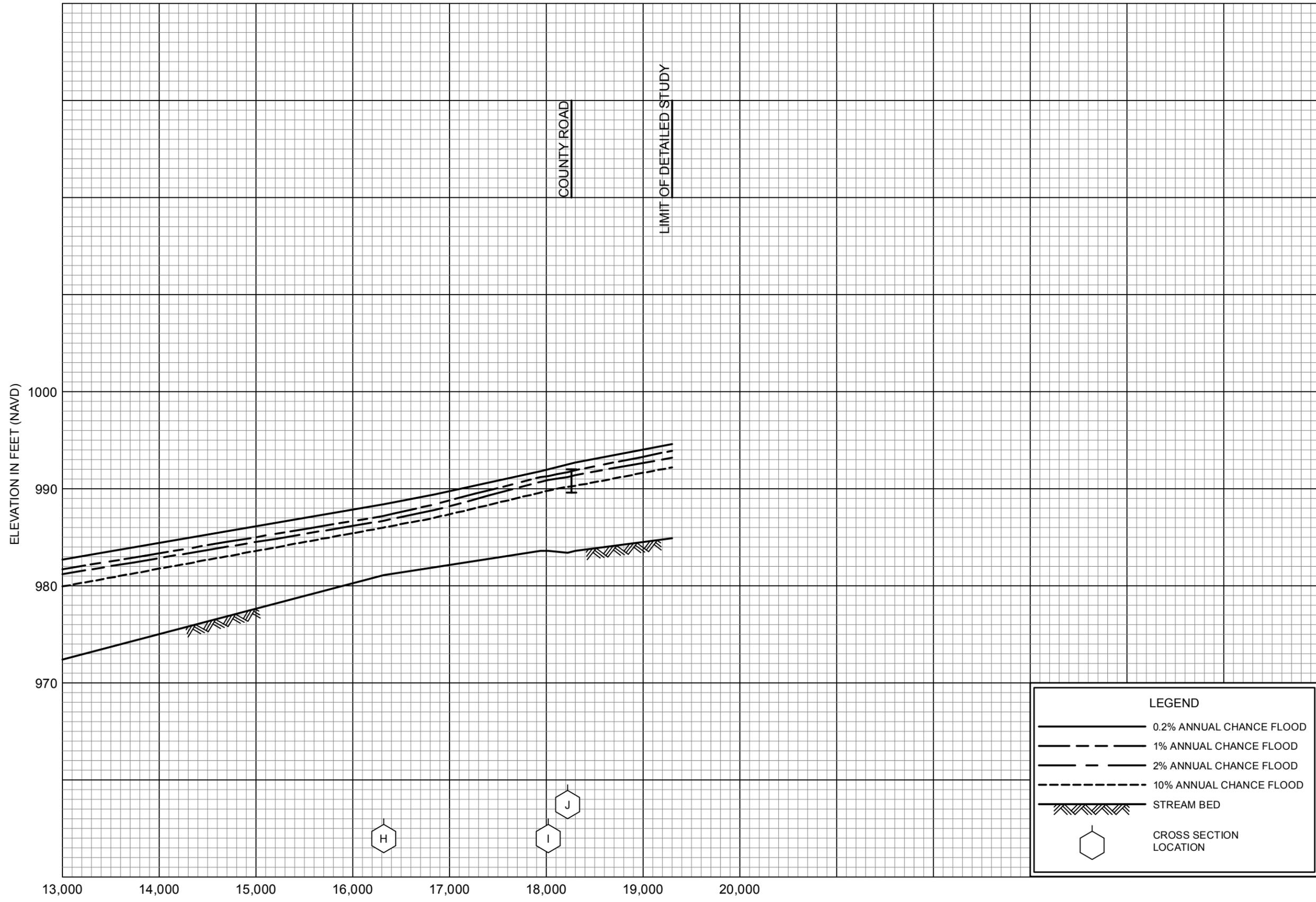
LATERAL A

FEDERAL EMERGENCY MANAGEMENT AGENCY

STORY COUNTY, IA

STROY COUNTY, IA AND INCORPORATED AREAS

STREAM DISTANCE IN FEET ABOVE CONFLUENCE WITH 07080105001051



LEGEND

- 0.2% ANNUAL CHANCE FLOOD
- - - 1% ANNUAL CHANCE FLOOD
- · - 2% ANNUAL CHANCE FLOOD
- · · - 10% ANNUAL CHANCE FLOOD
- ▨ STREAM BED
- ⬡ CROSS SECTION LOCATION

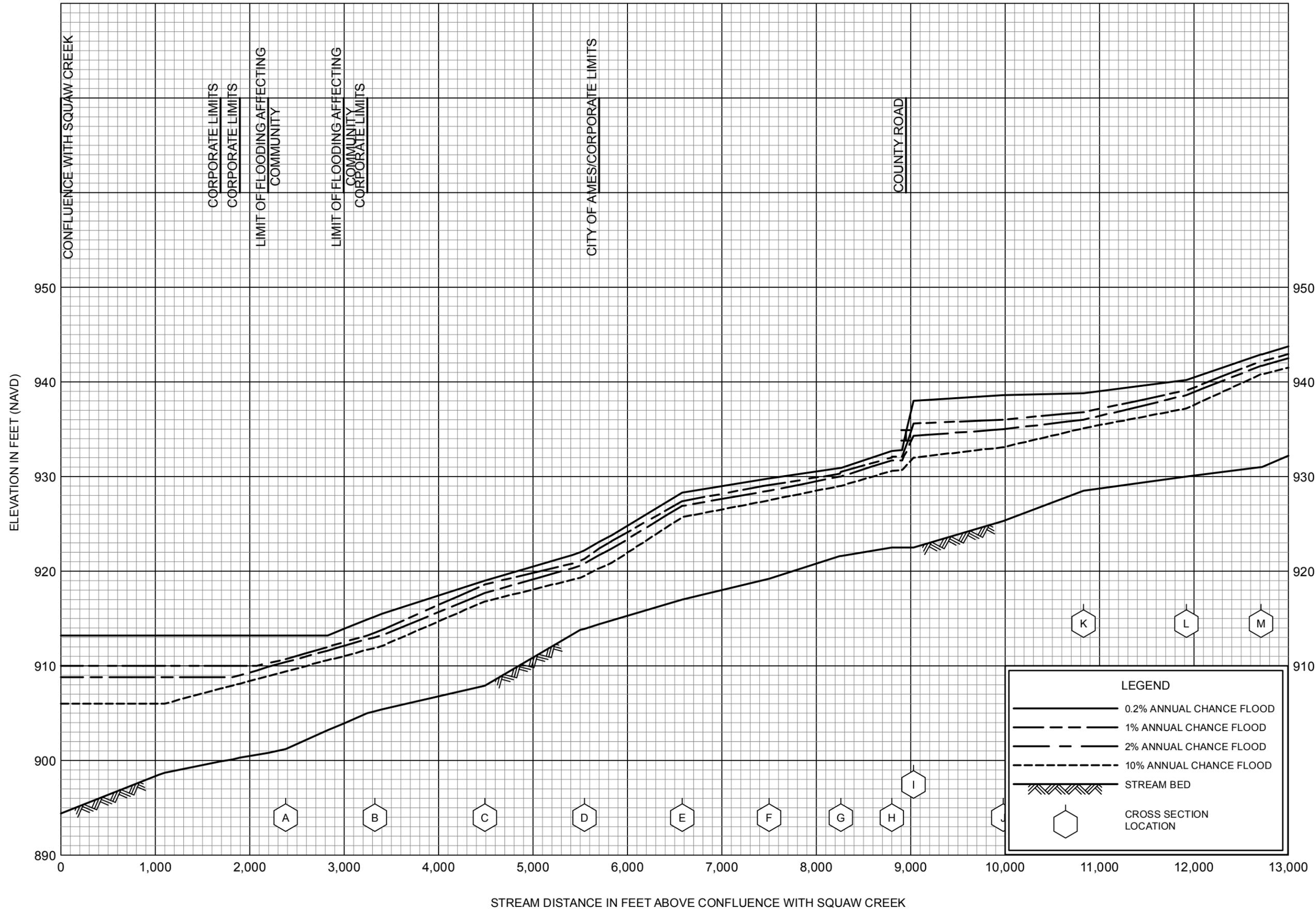
FLOOD PROFILES

LONG DICK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

STORY COUNTY, IA

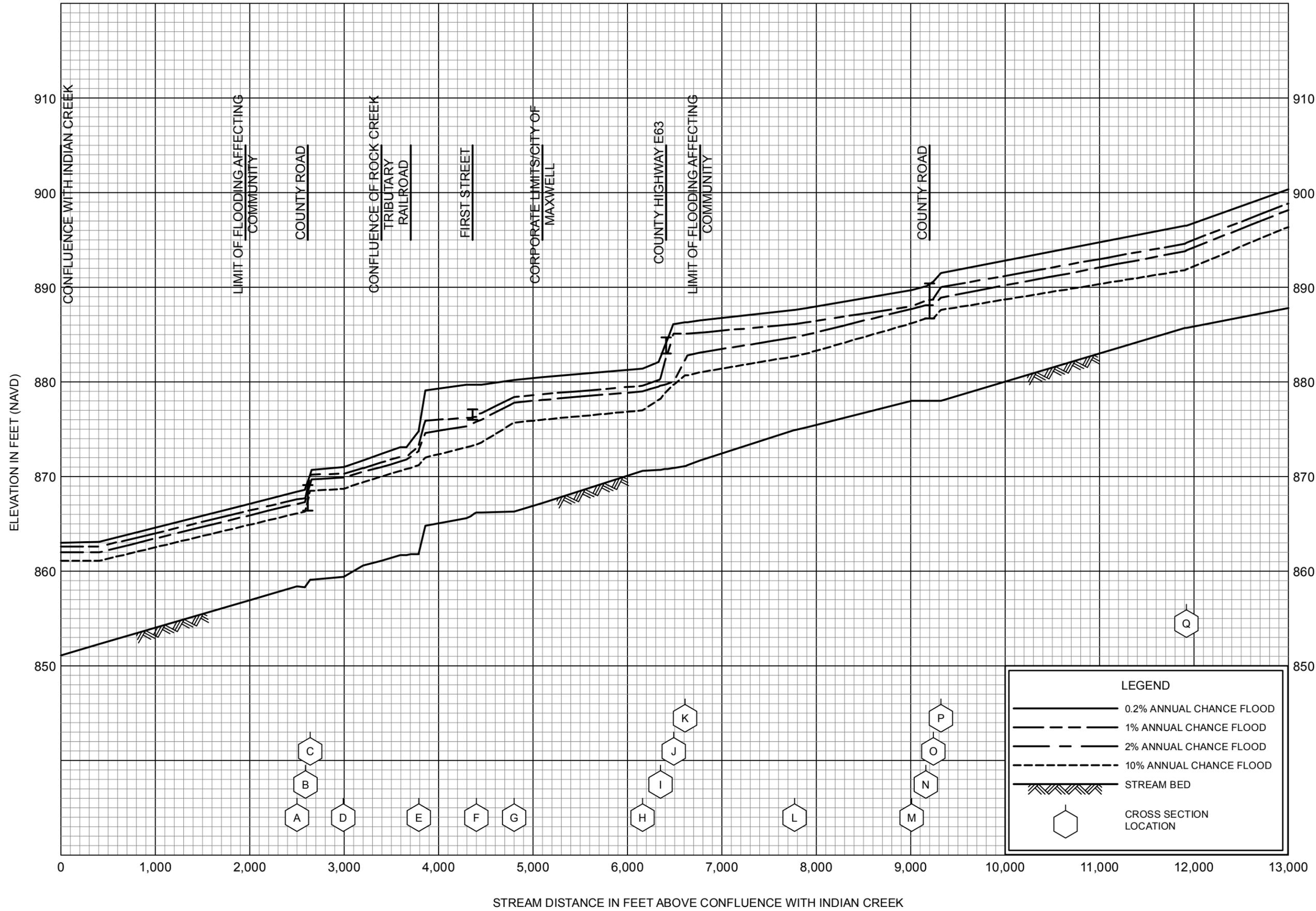
STORY COUNTY, IA AND INCORPORATED AREAS



FLOOD PROFILES

ONION CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY
 STORY COUNTY, IA
 AND INCORPORATED AREAS



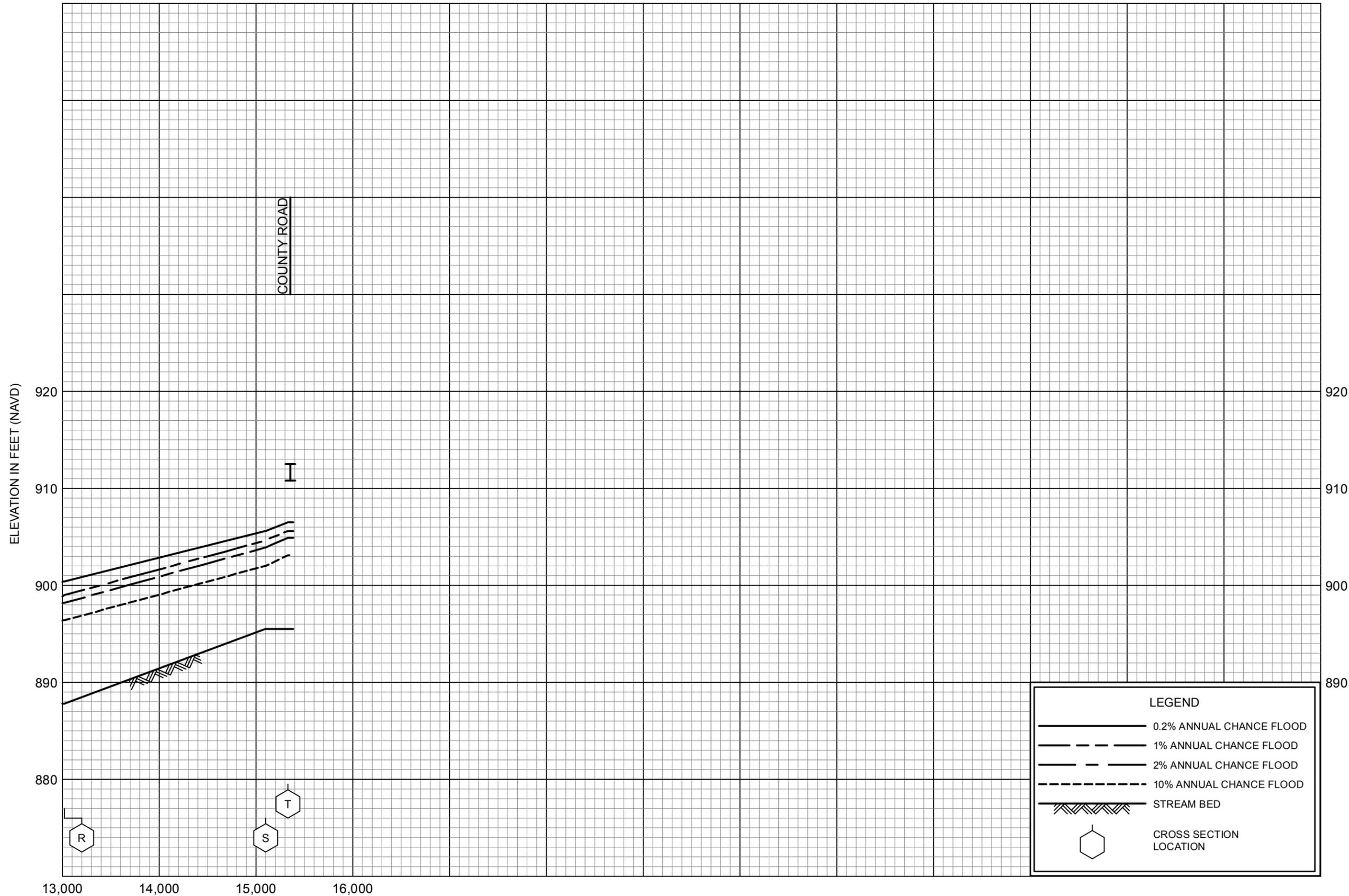
FLOOD PROFILES

ROCK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

STORY COUNTY, IA

AND INCORPORATED AREAS



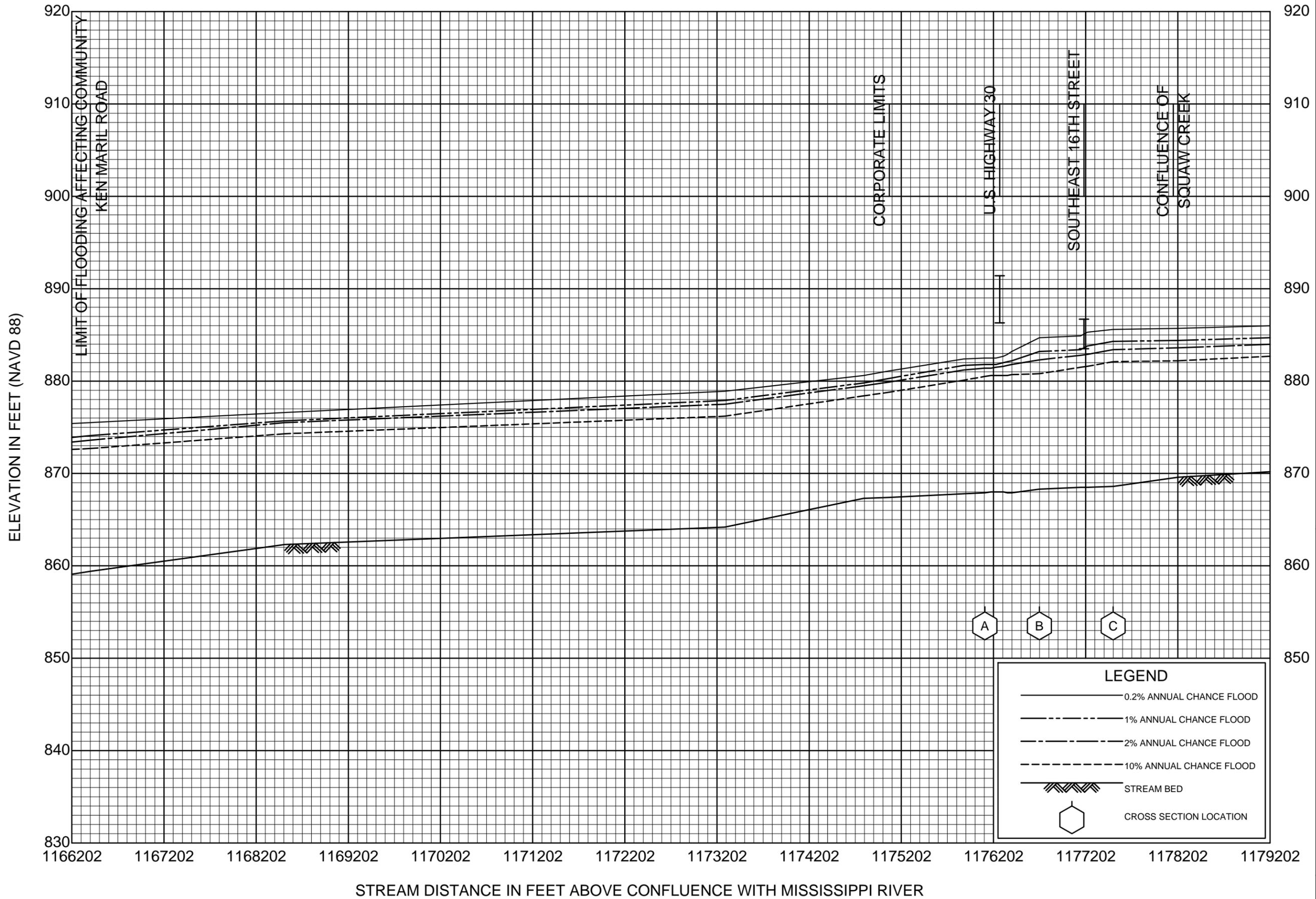
FLOOD PROFILES

ROCK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

STORY COUNTY, IA

AND INCORPORATED AREAS

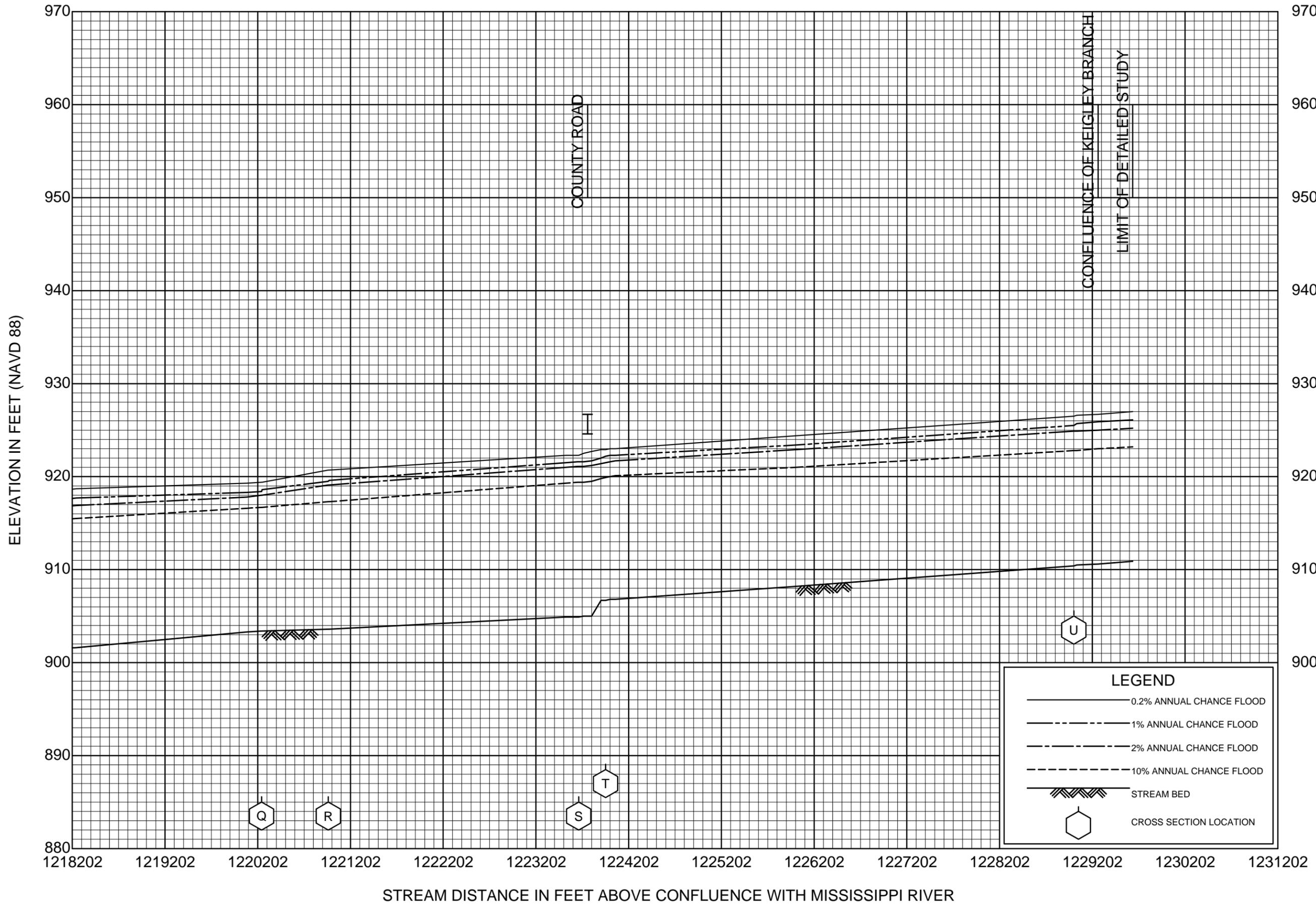


FLOOD PROFILES

SKUNK RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

**STORY COUNTY, IA
AND INCORPORATED AREAS**

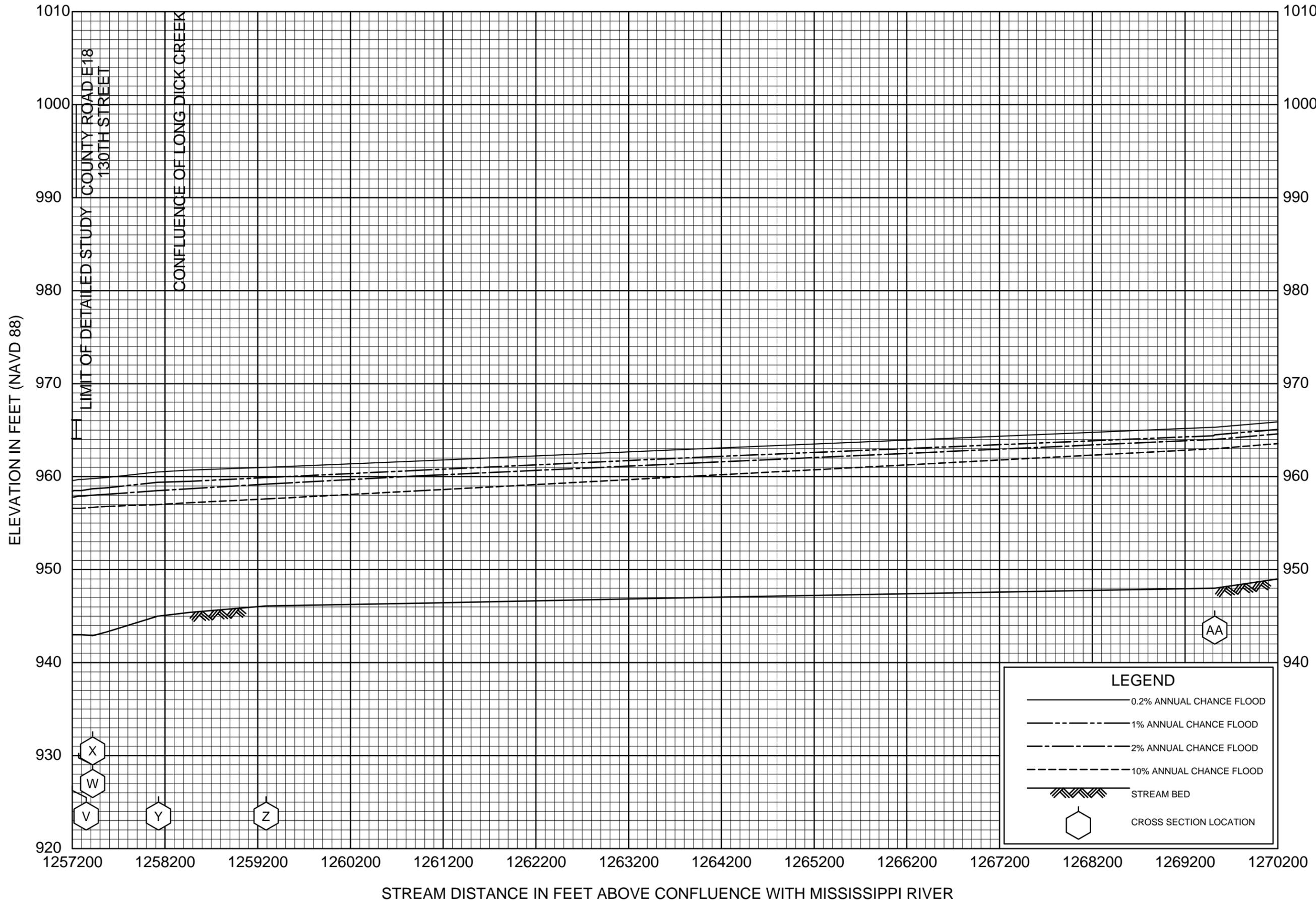


FLOOD PROFILES

SKUNK RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

STORY COUNTY, IA
AND INCORPORATED AREAS

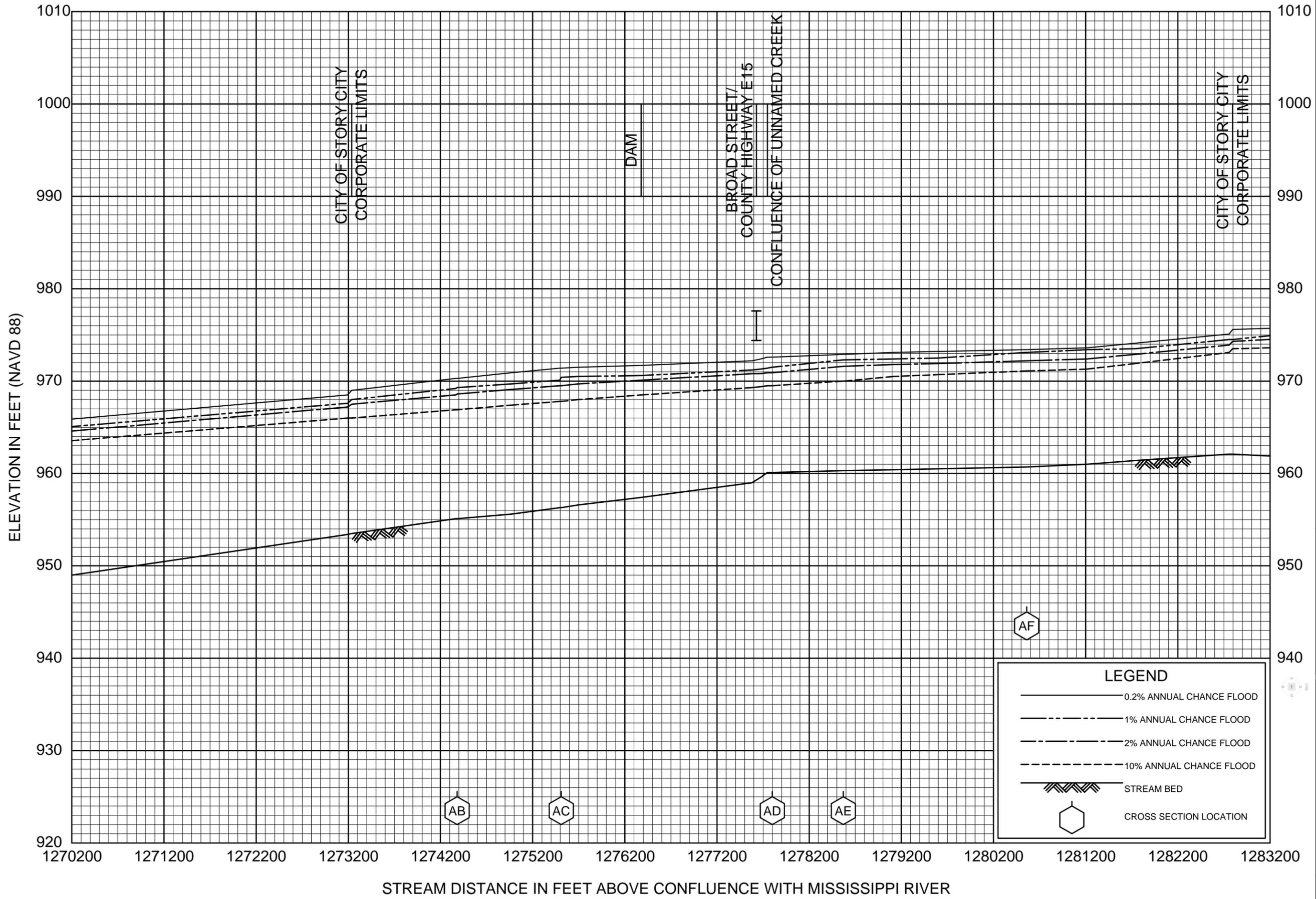


FLOOD PROFILES

SKUNK RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

**STORY COUNTY, IA
AND INCORPORATED AREAS**

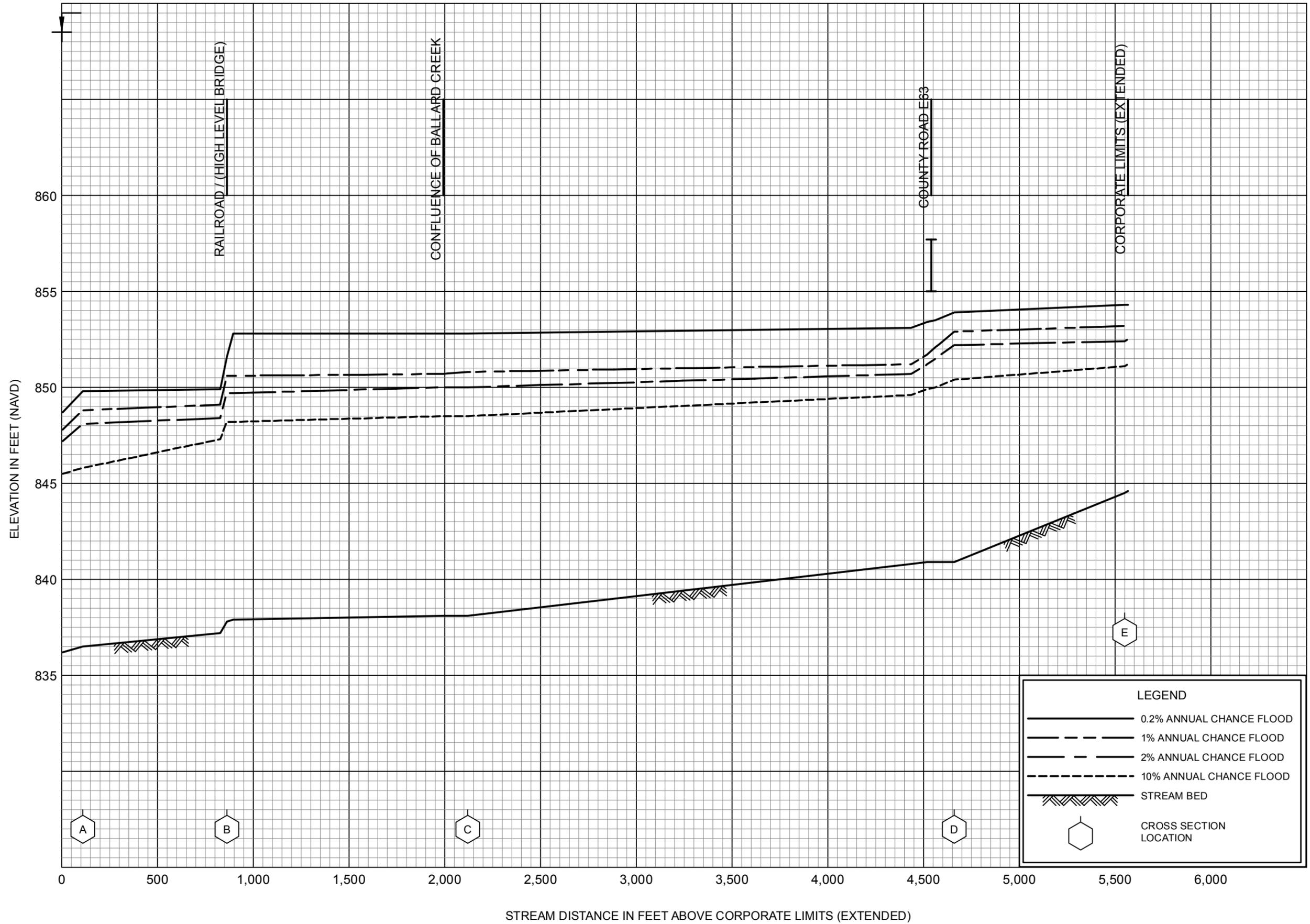


FLOOD PROFILES

SKUNK RIVER

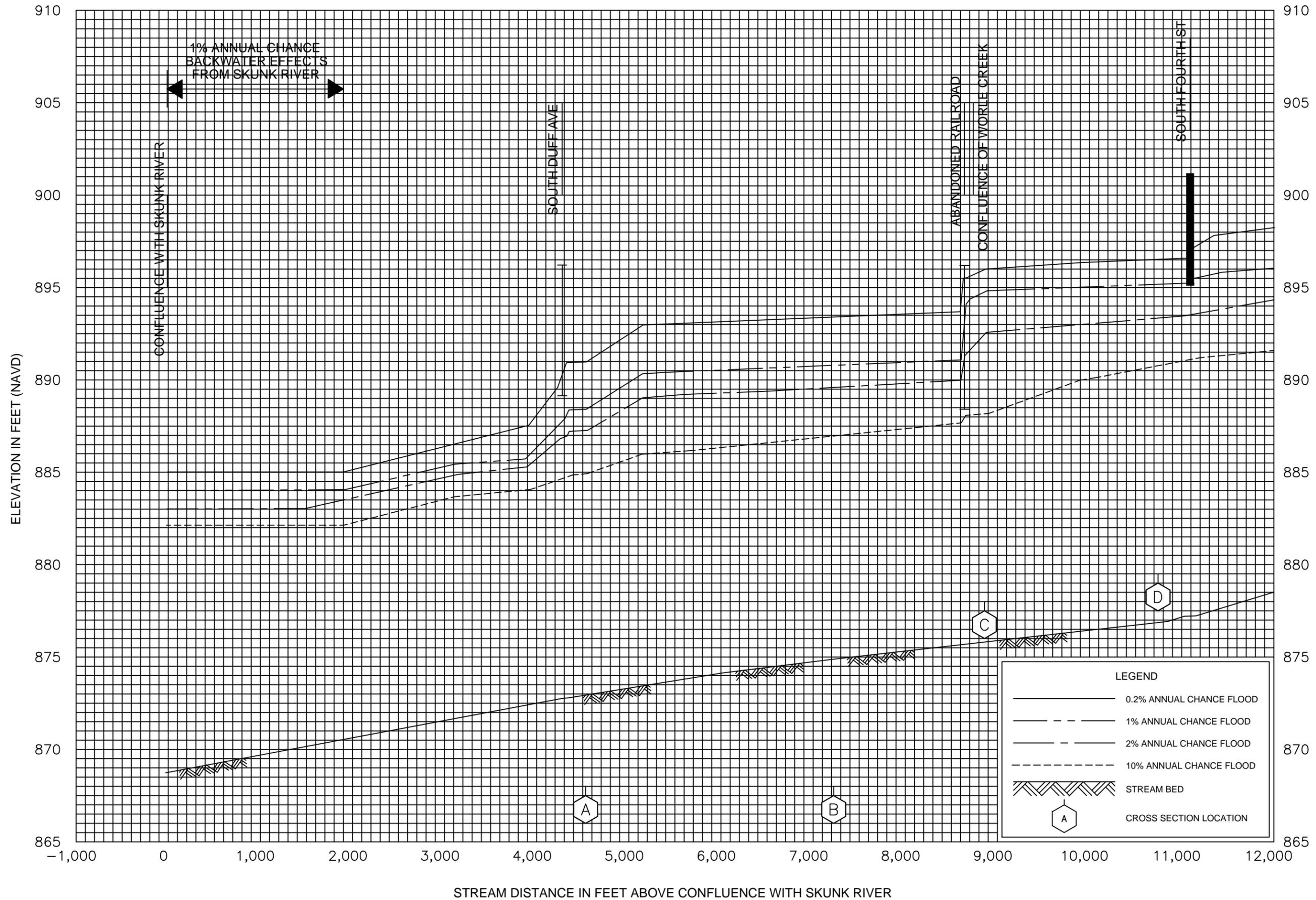
FEDERAL EMERGENCY MANAGEMENT AGENCY
STORY COUNTY, IA
 AND INCORPORATED AREAS

32P



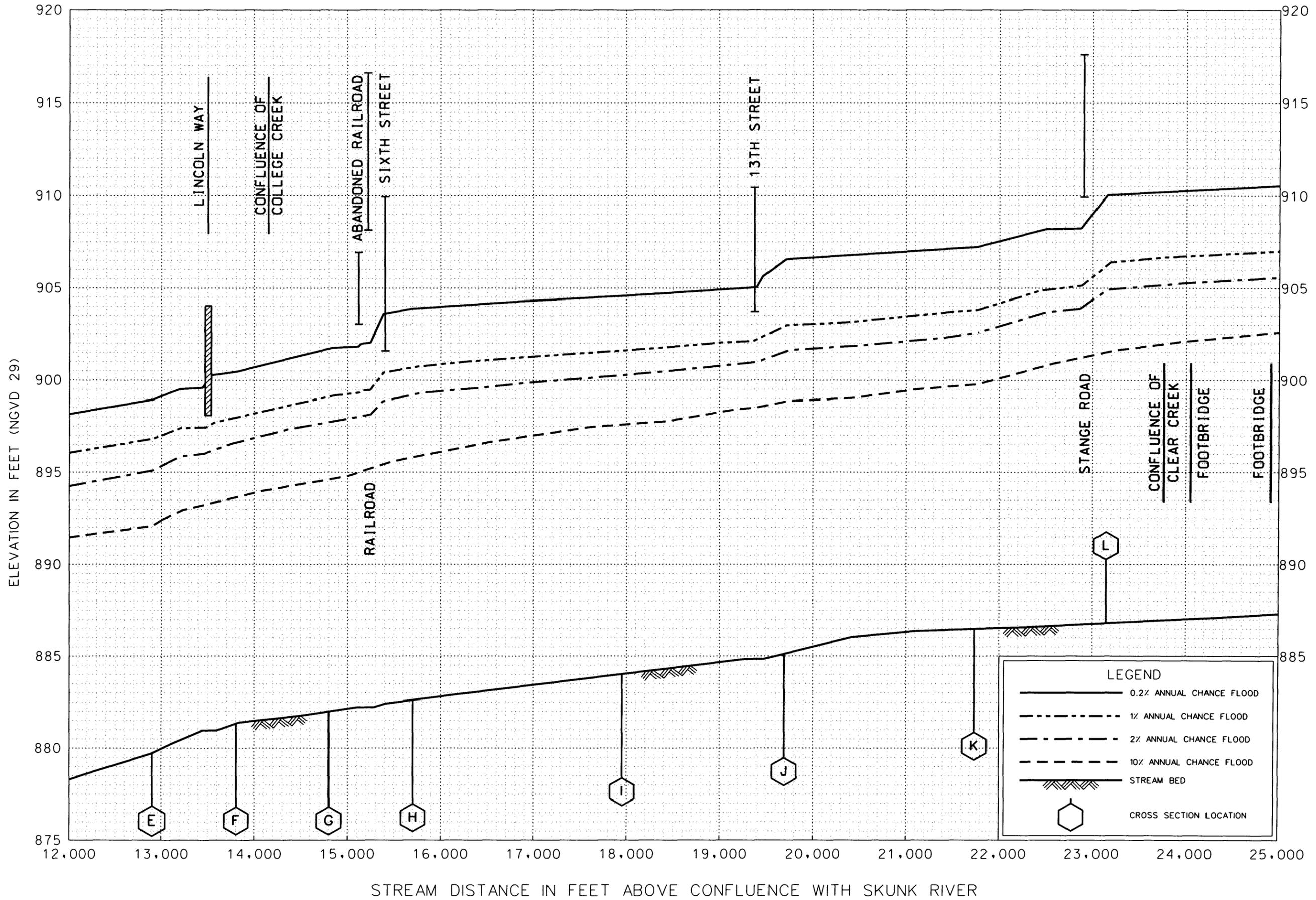
FLOOD PROFILES
SOUTH SKUNK RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY
STORY COUNTY, IA
STORY COUNTY, IA AND INCORPORATED AREAS



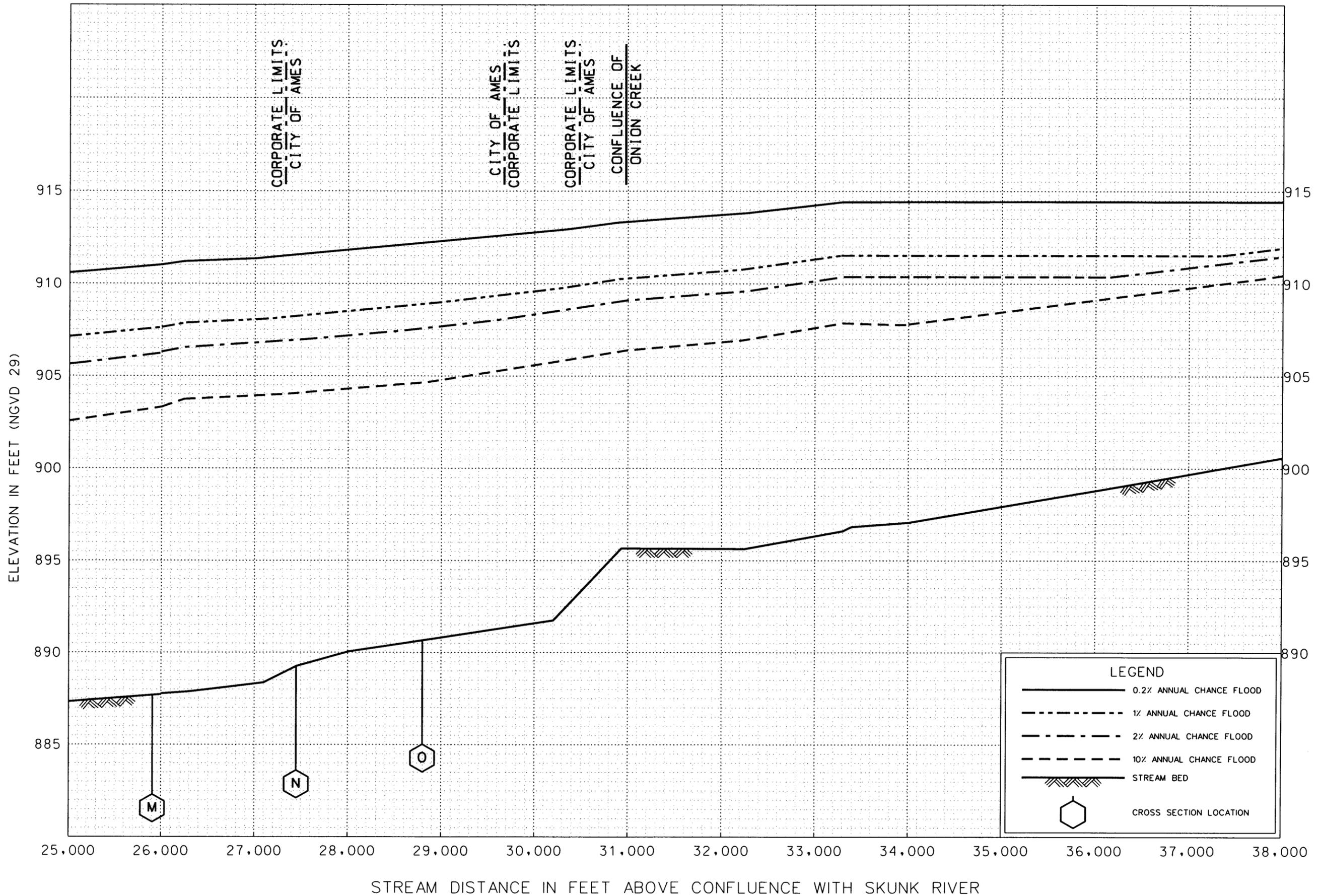
FLOOD PROFILES
SQUAW CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY
STORY COUNTY, IA
AND INCORPORATED AREAS



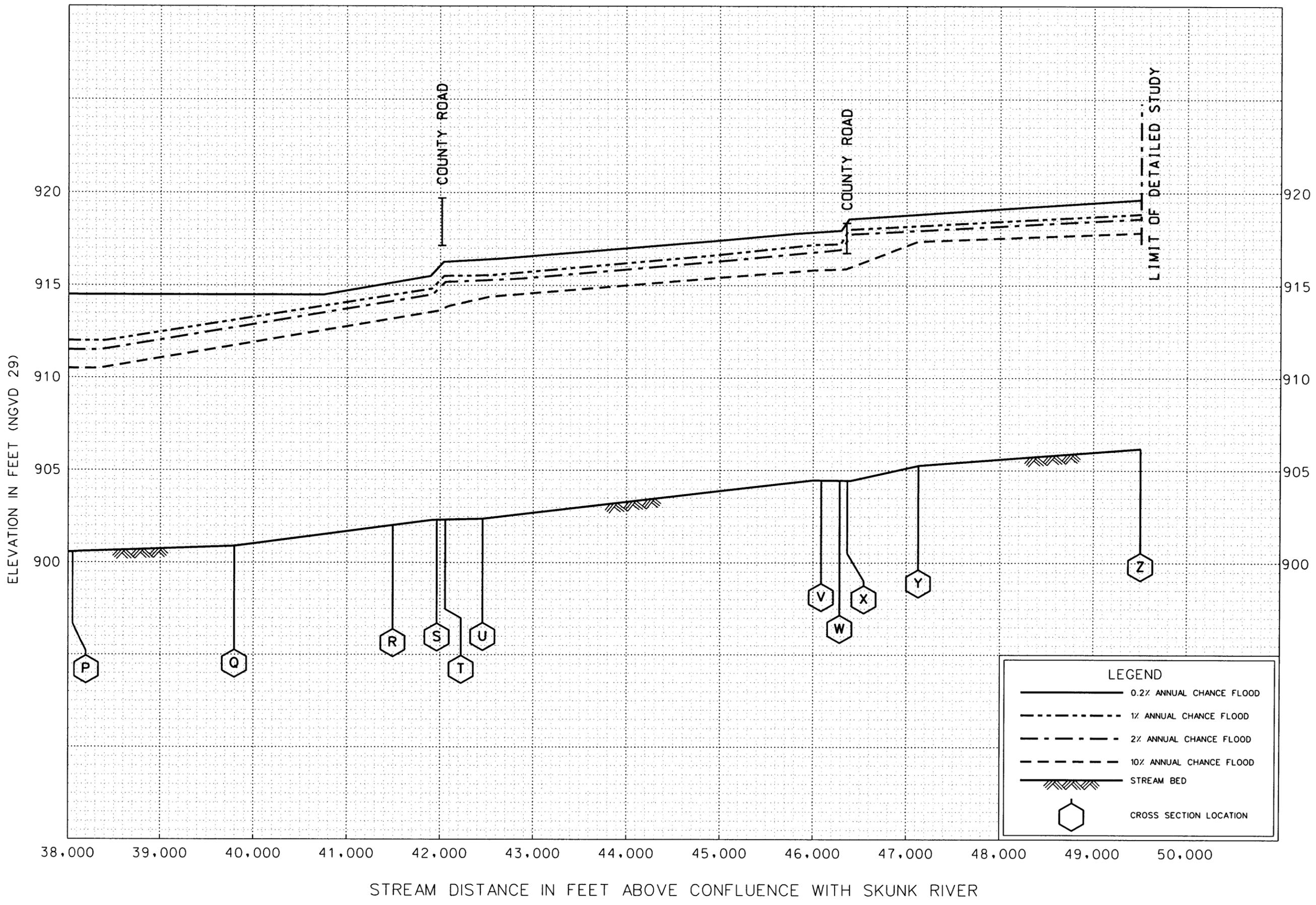
FLOOD PROFILES
SQUAW CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY
STORY COUNTY, IOWA
AND INCORPORATED AREAS



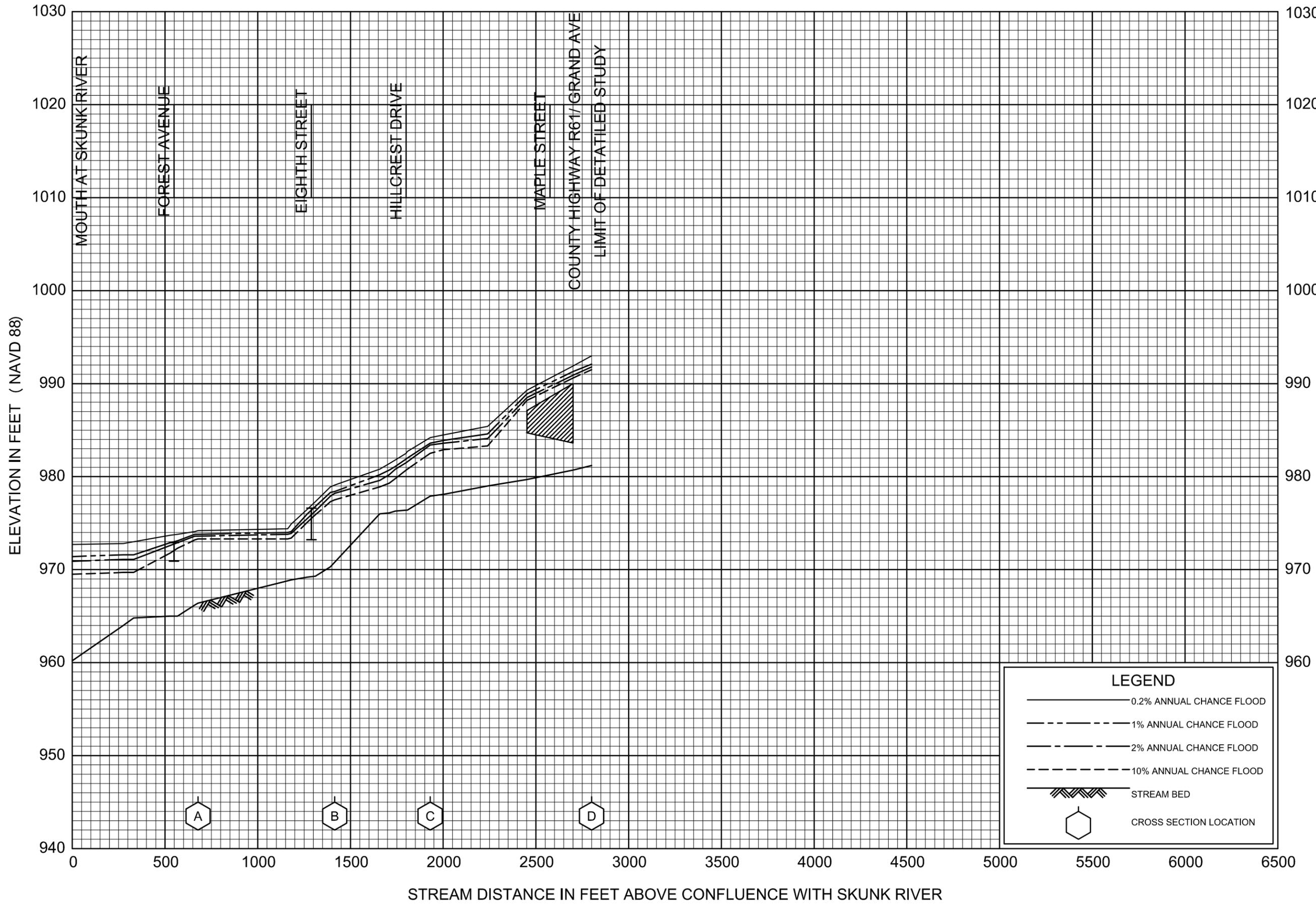
FLOOD PROFILES
SQUAW CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY
STORY COUNTY, IOWA
AND INCORPORATED AREAS



FLOOD PROFILES
SQUAW CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY
STORY COUNTY, IOWA
AND INCORPORATED AREAS



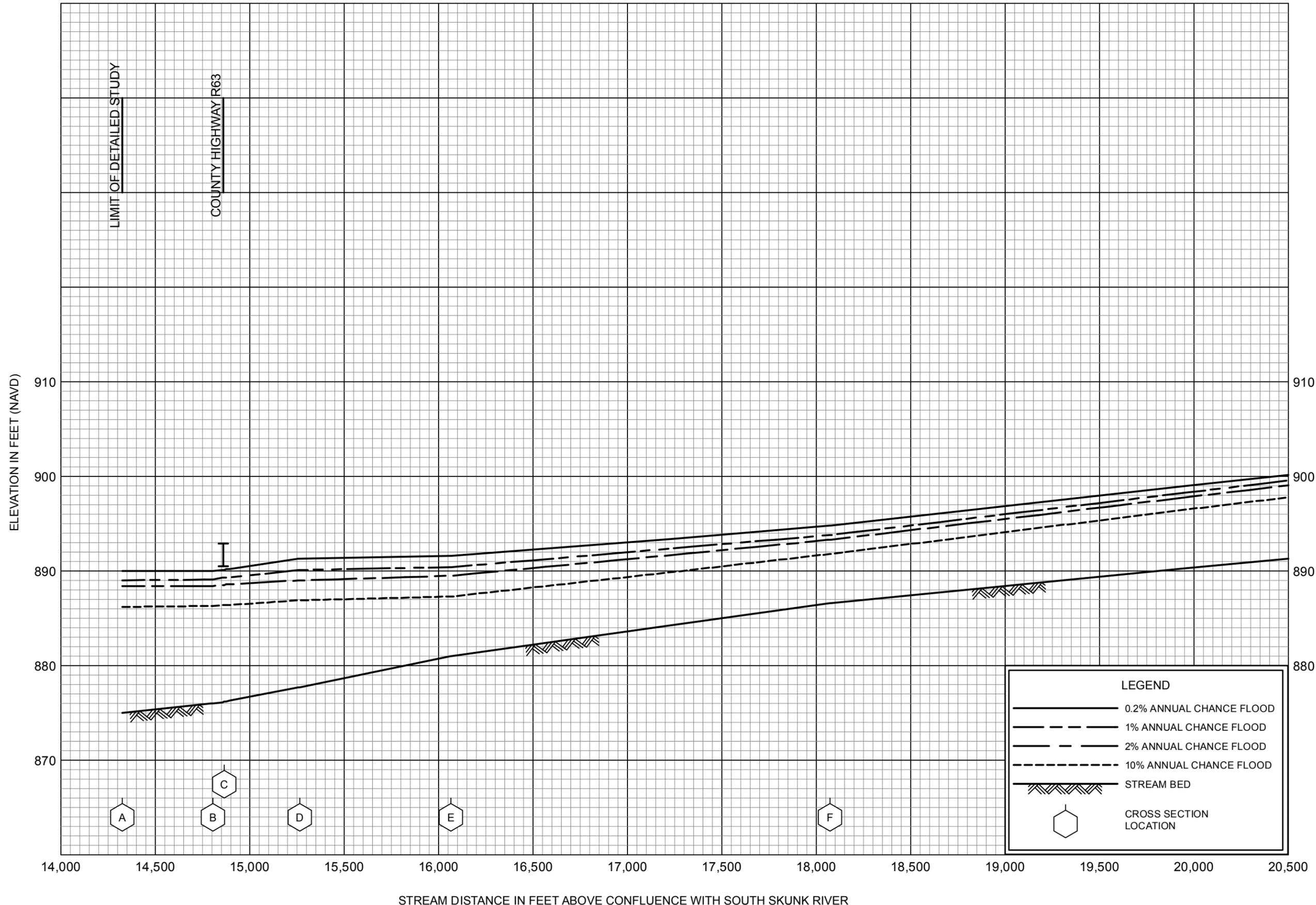
FLOOD PROFILES

UNNAMED CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

STORY COUNTY, IA

STORY COUNTY, IA AND INCORPORATED AREAS



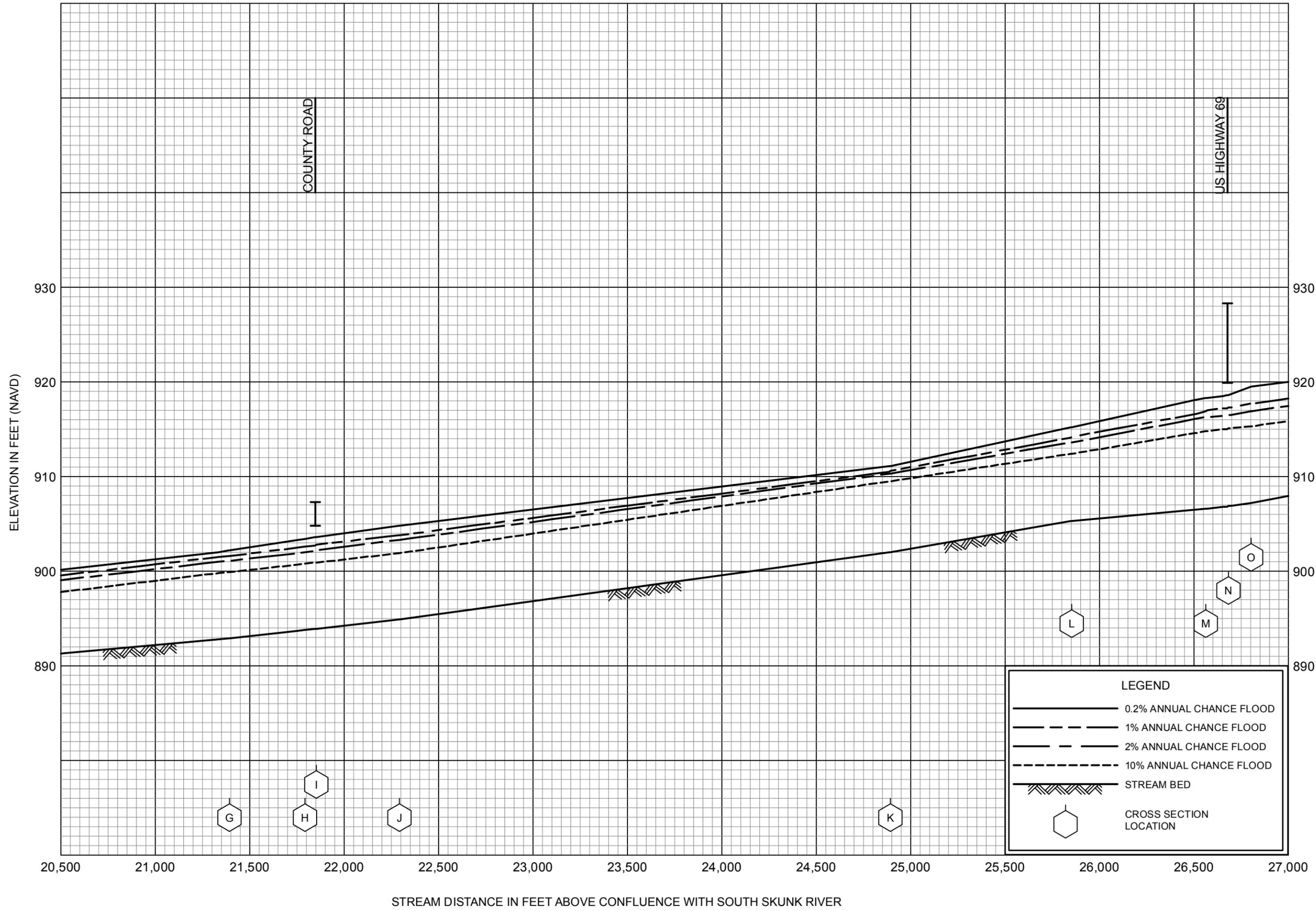
FLOOD PROFILES

WALNUT CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

STORY COUNTY, IA

AND INCORPORATED AREAS



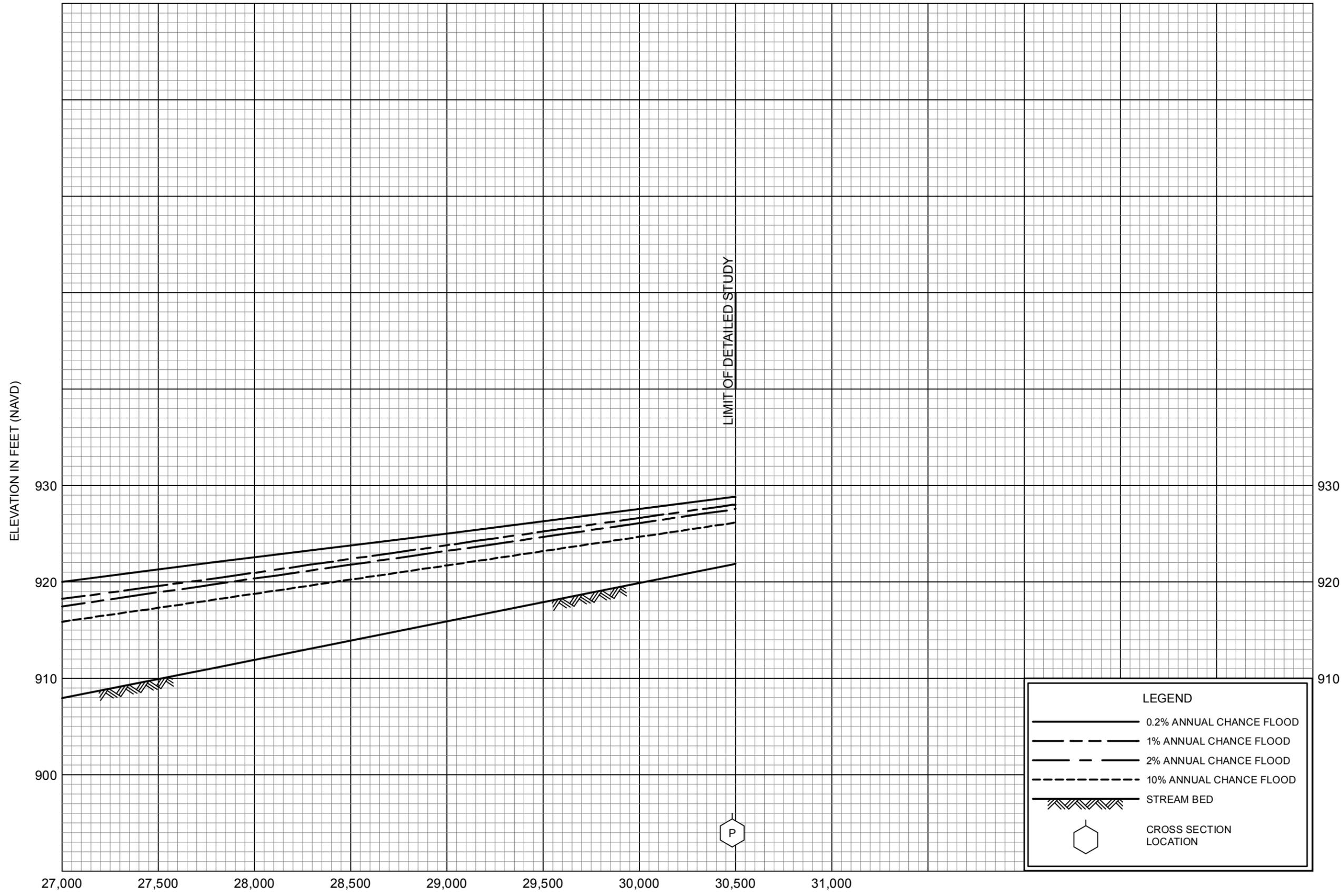
FLOOD PROFILES

WALNUT CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

STORY COUNTY, IA

AND INCORPORATED AREAS



ELEVATION IN FEET (NAVD)

STREAM DISTANCE IN FEET ABOVE CONFLUENCE WITH SOUTH SKUNK RIVER

LEGEND

- 0.2% ANNUAL CHANCE FLOOD
- - - 1% ANNUAL CHANCE FLOOD
- · - 2% ANNUAL CHANCE FLOOD
- · · 10% ANNUAL CHANCE FLOOD
- (with hatching) STREAM BED
- ⬡ (with 'P') CROSS SECTION LOCATION

LIMIT OF DETAILED STUDY

FLOOD PROFILES

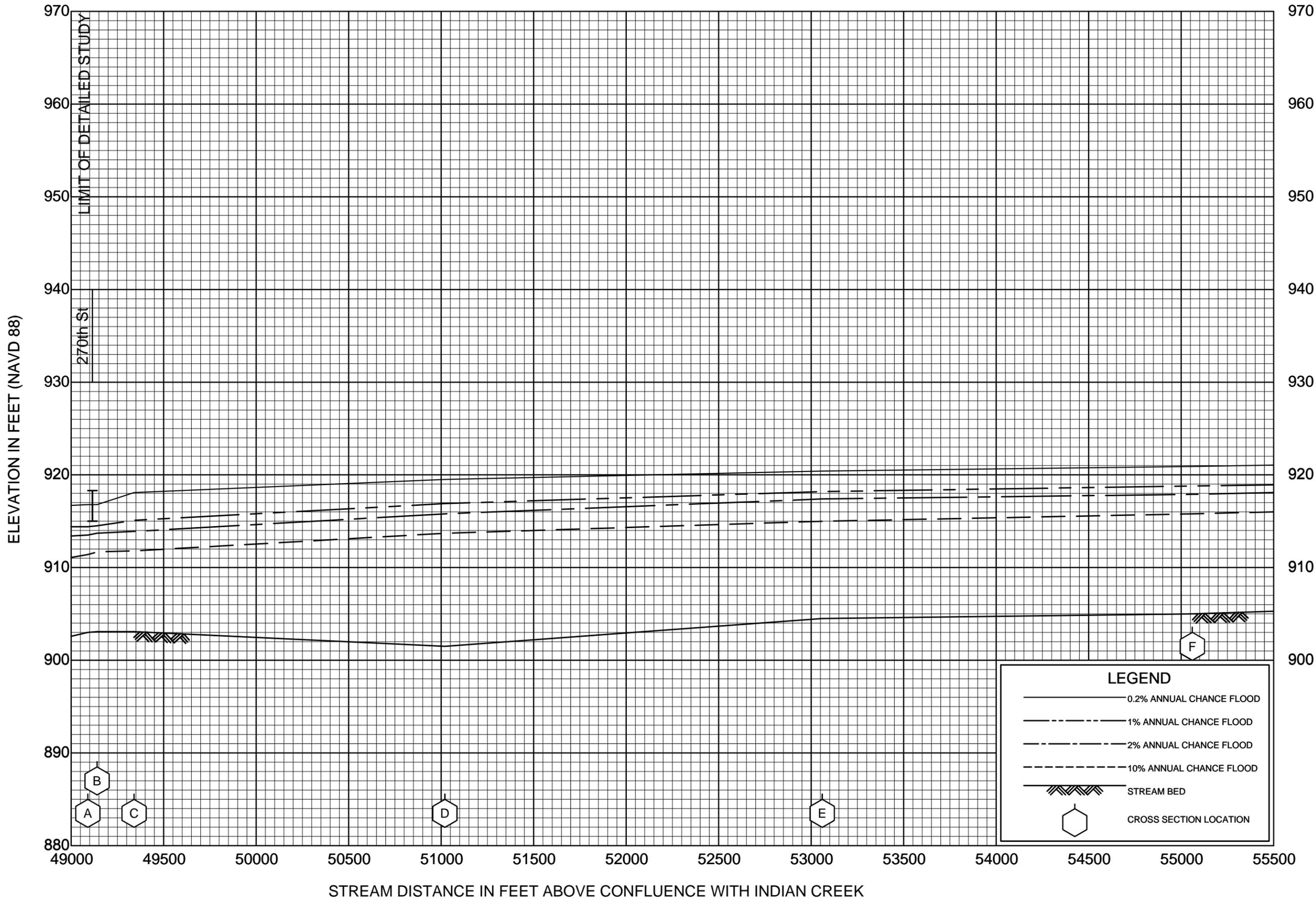
WALNUT CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

STORY COUNTY, IA

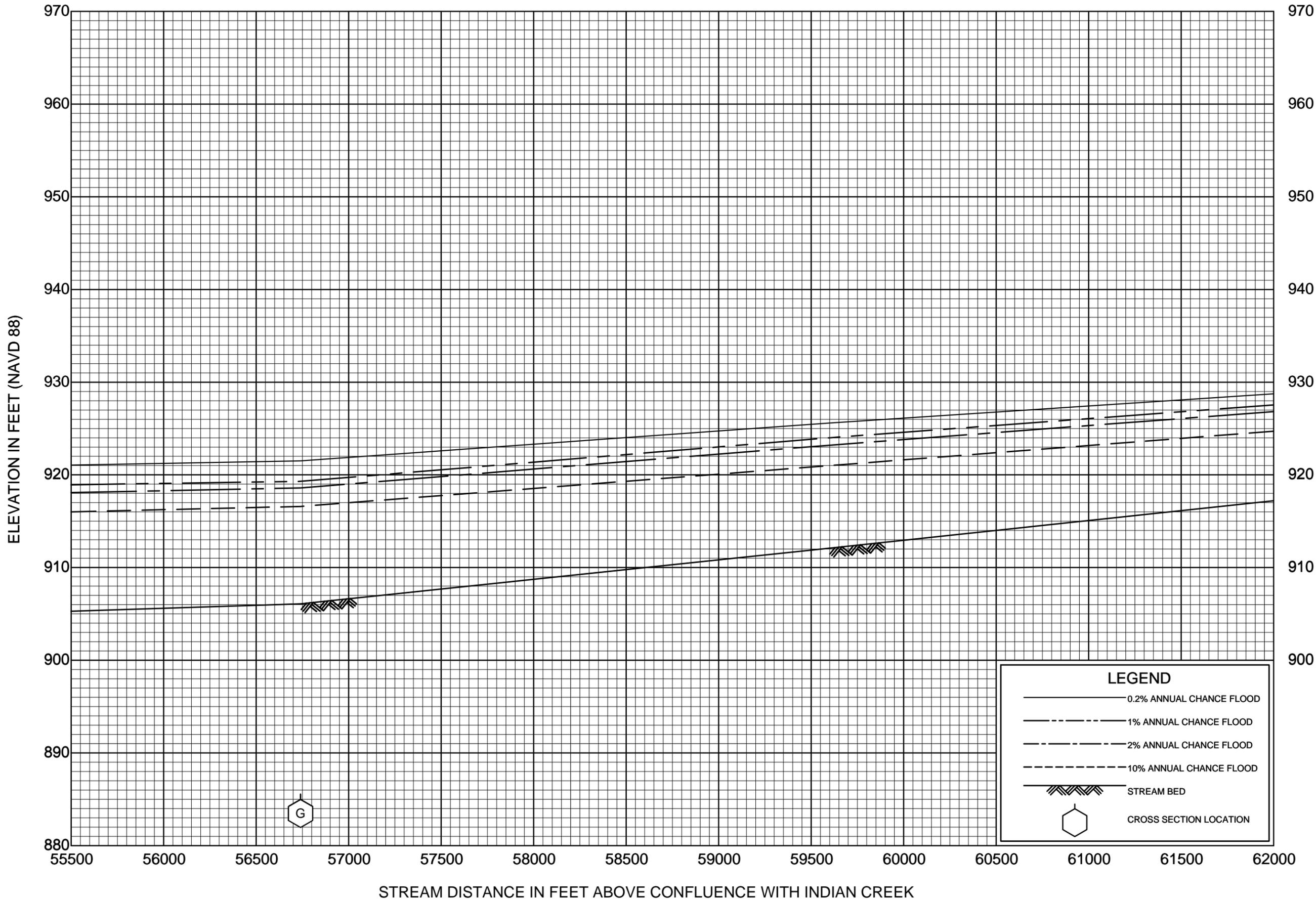
AND INCORPORATED AREAS

44P



FLOOD PROFILES
WEST BRANCH INDIAN CREEK

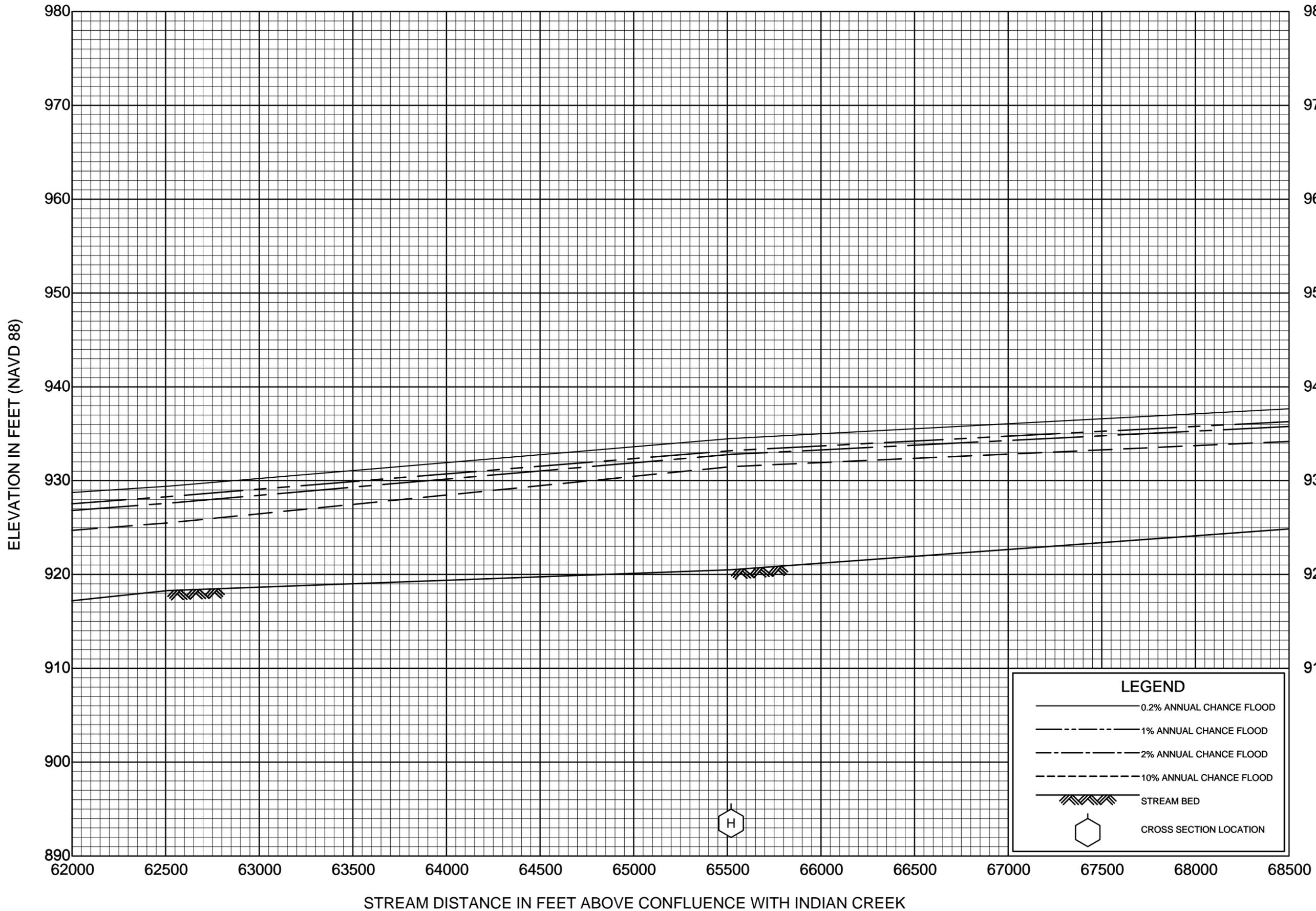
FEDERAL EMERGENCY MANAGEMENT AGENCY
STORY COUNTY, IA
STORY COUNTY, IA AND INCORPORATED AREAS



FLOOD PROFILES
WEST BRANCH INDIAN CREEK

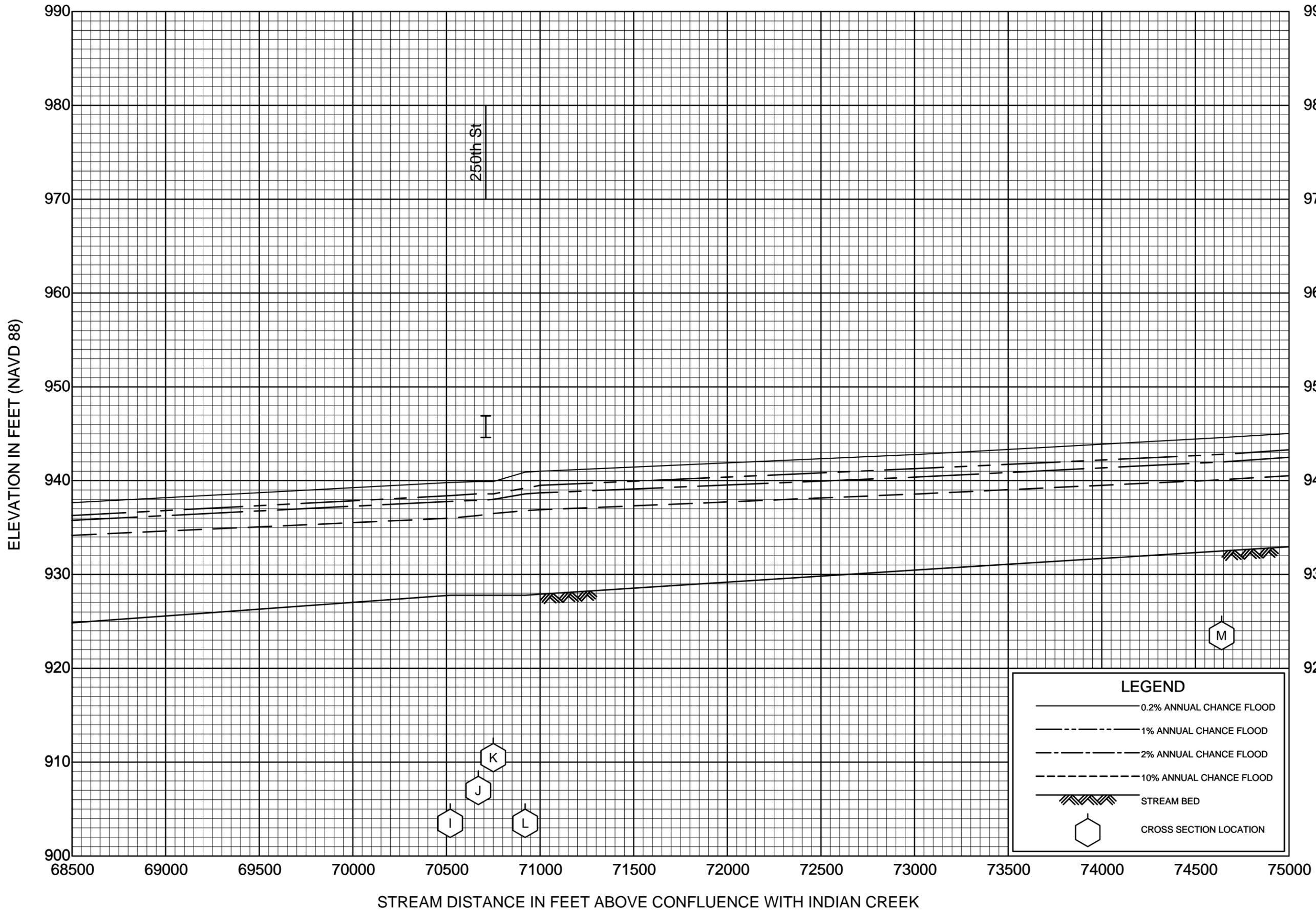
FEDERAL EMERGENCY MANAGEMENT AGENCY
STORY COUNTY, IA
STORY COUNTY, IA AND INCORPORATED AREAS

46P



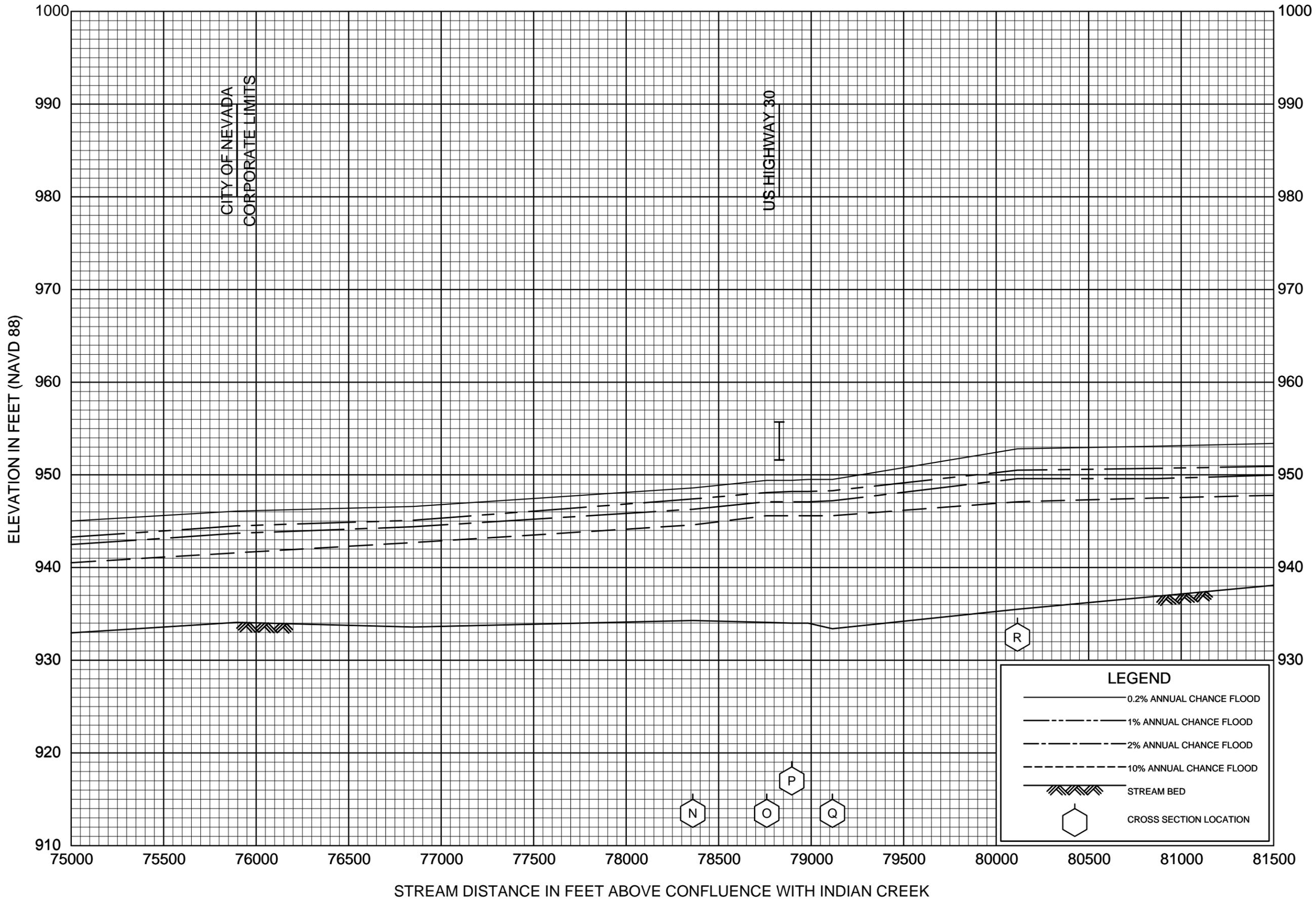
FLOOD PROFILES
WEST BRANCH INDIAN CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY
STORY COUNTY, IA
STORY COUNTY, IA AND INCORPORATED AREAS



FLOOD PROFILES
WEST BRANCH INDIAN CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY
STORY COUNTY, IA
STORY COUNTY, IA AND INCORPORATED AREAS



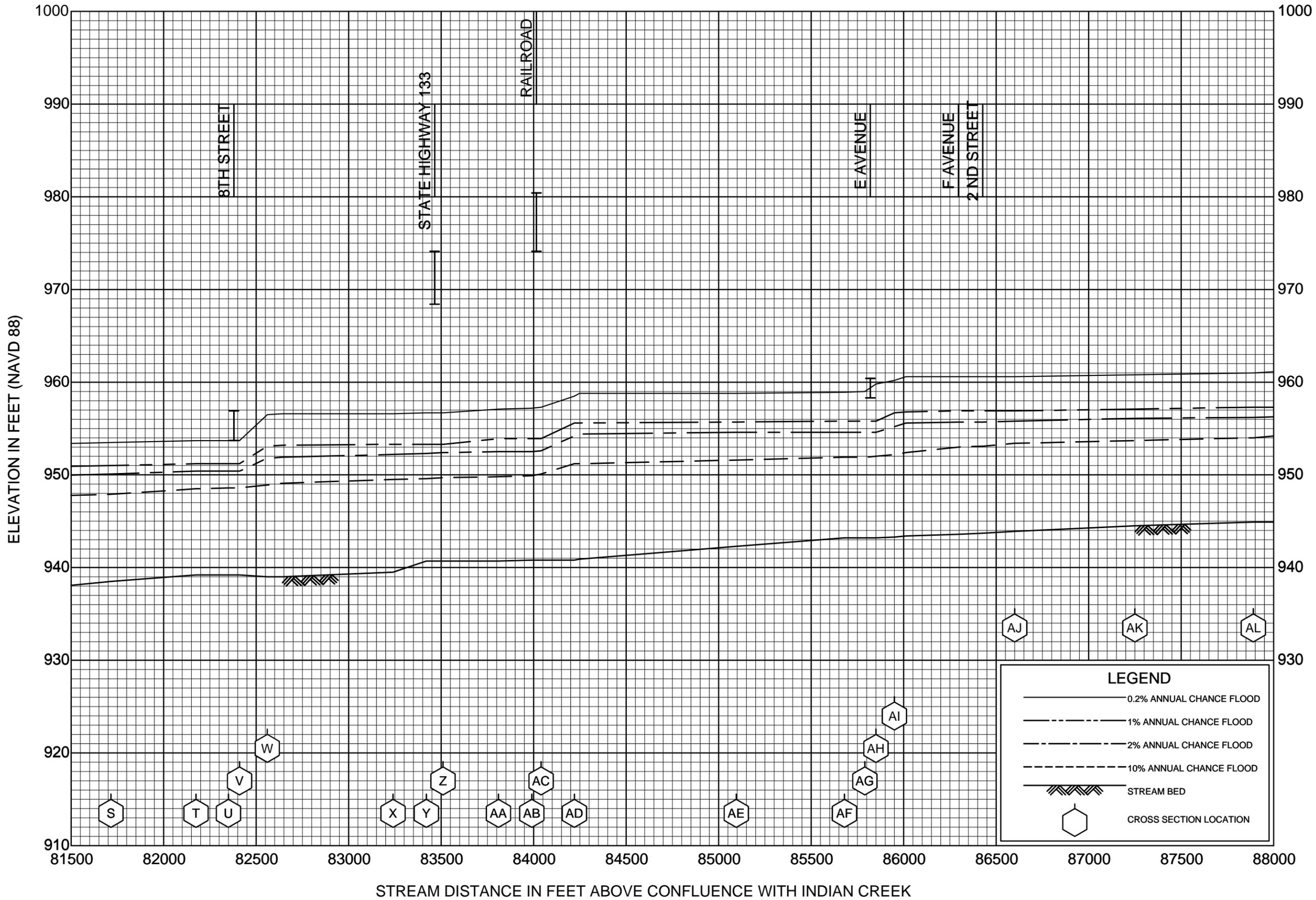
FLOOD PROFILES

WEST BRANCH INDIAN CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

STORY COUNTY, IA

STORY COUNTY, IA AND INCORPORATED AREAS



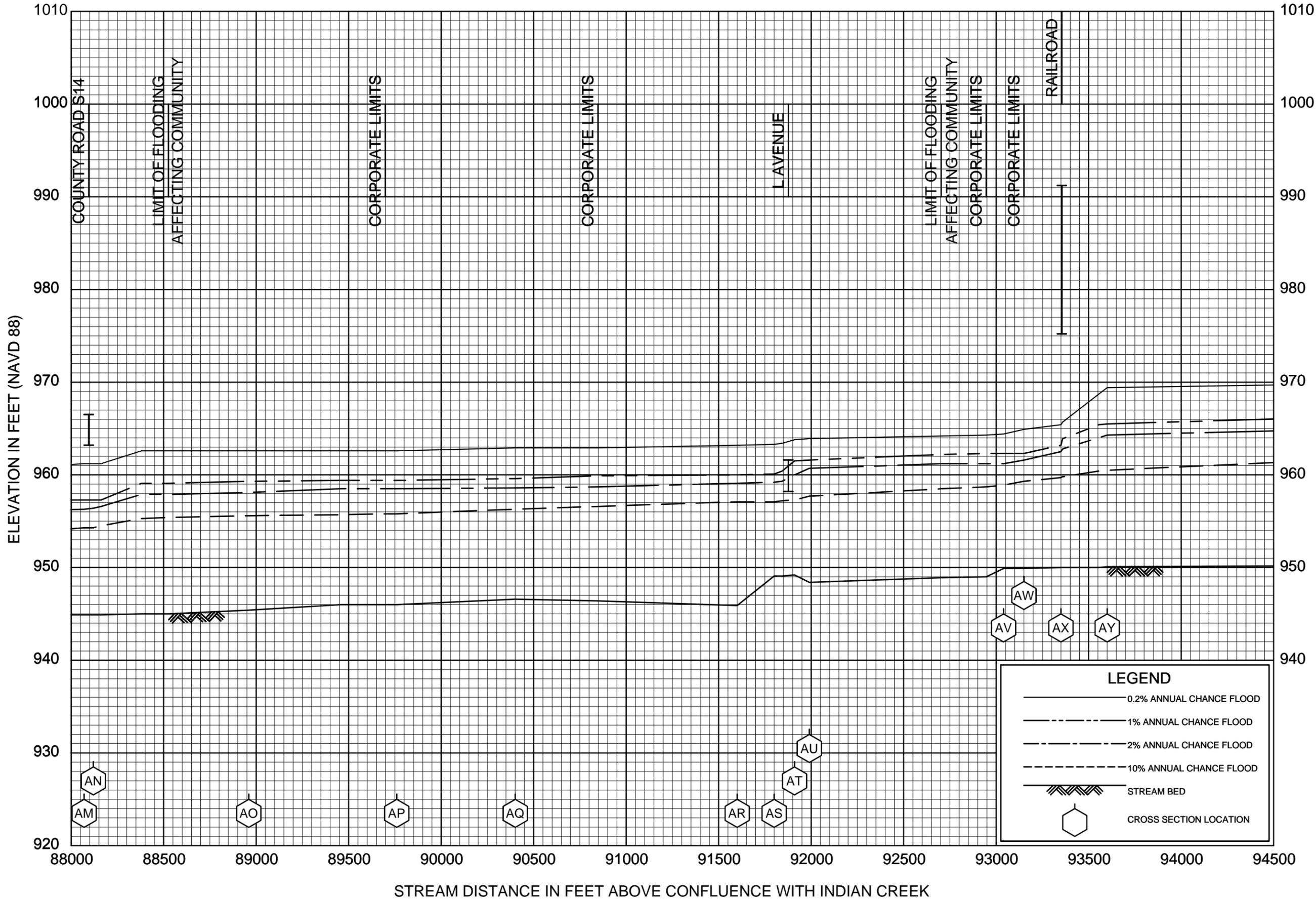
FLOOD PROFILES

WEST BRANCH INDIAN CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

STORY COUNTY, IA

STORY COUNTY, IA AND INCORPORATED AREAS



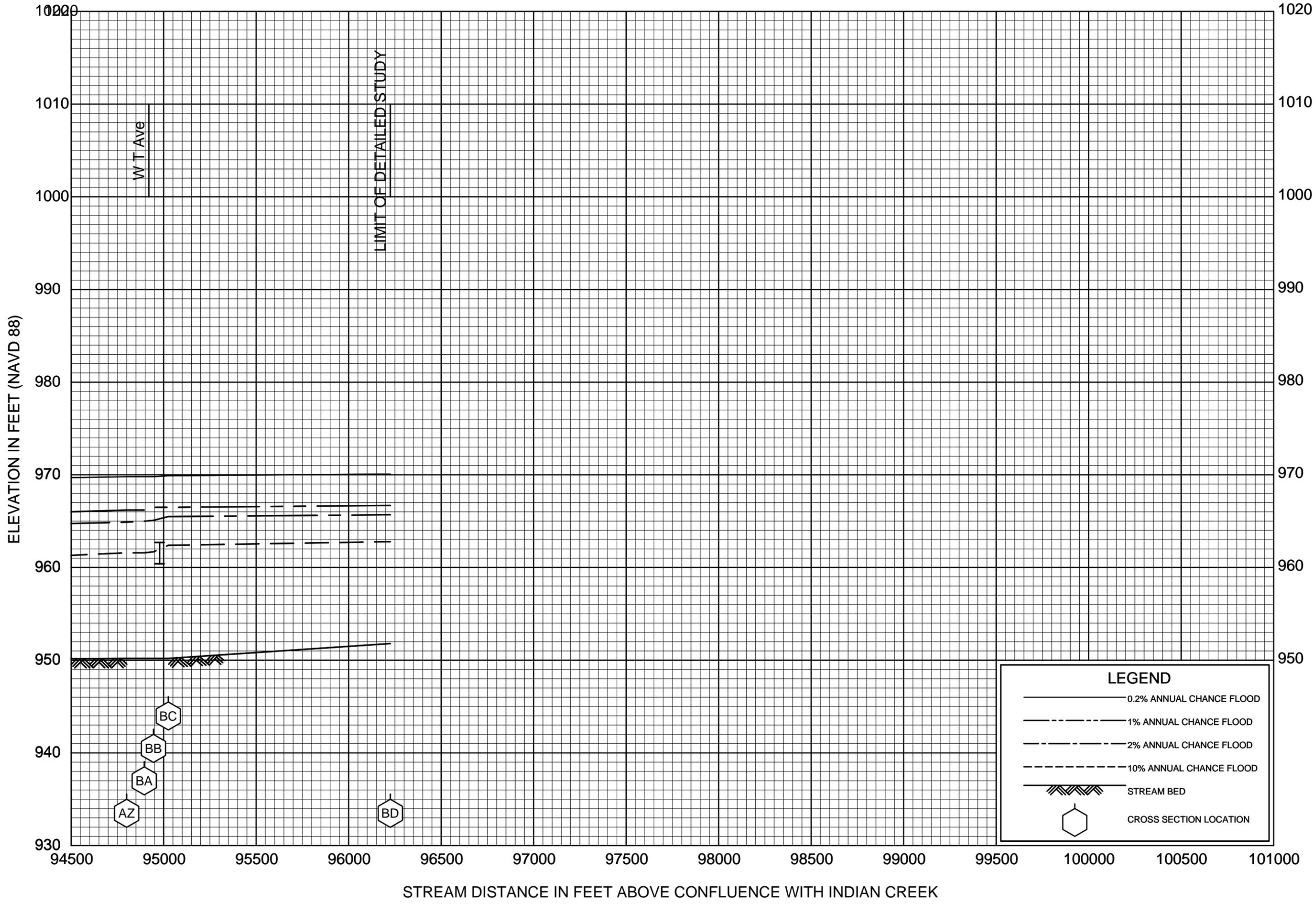
FLOOD PROFILES

WEST BRANCH INDIAN CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

STORY COUNTY, IA

STORY COUNTY, IA AND INCORPORATED AREAS



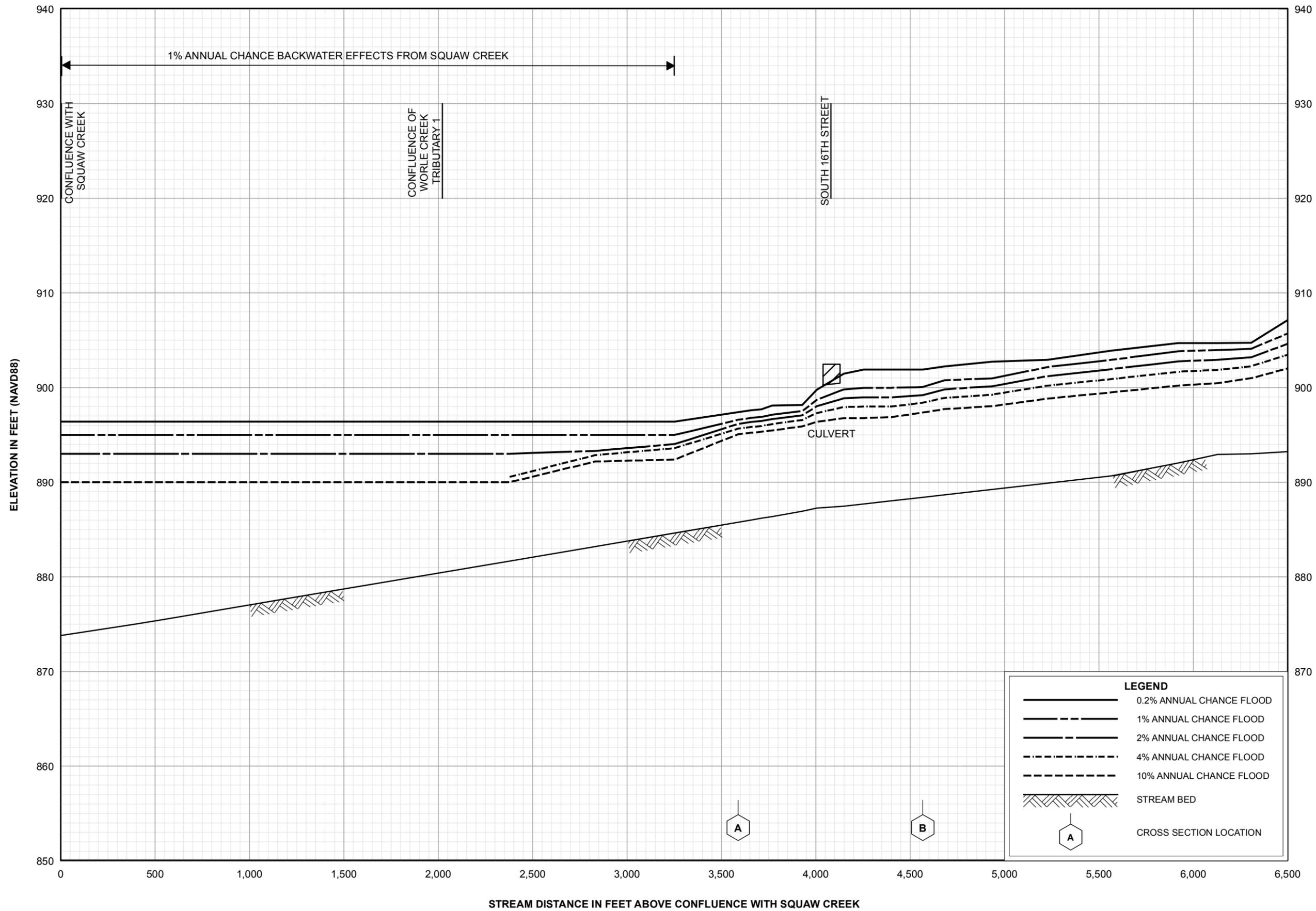
FLOOD PROFILES

WEST BRANCH INDIAN CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

STORY COUNTY, IA

STORY COUNTY, IA AND INCORPORATED AREAS



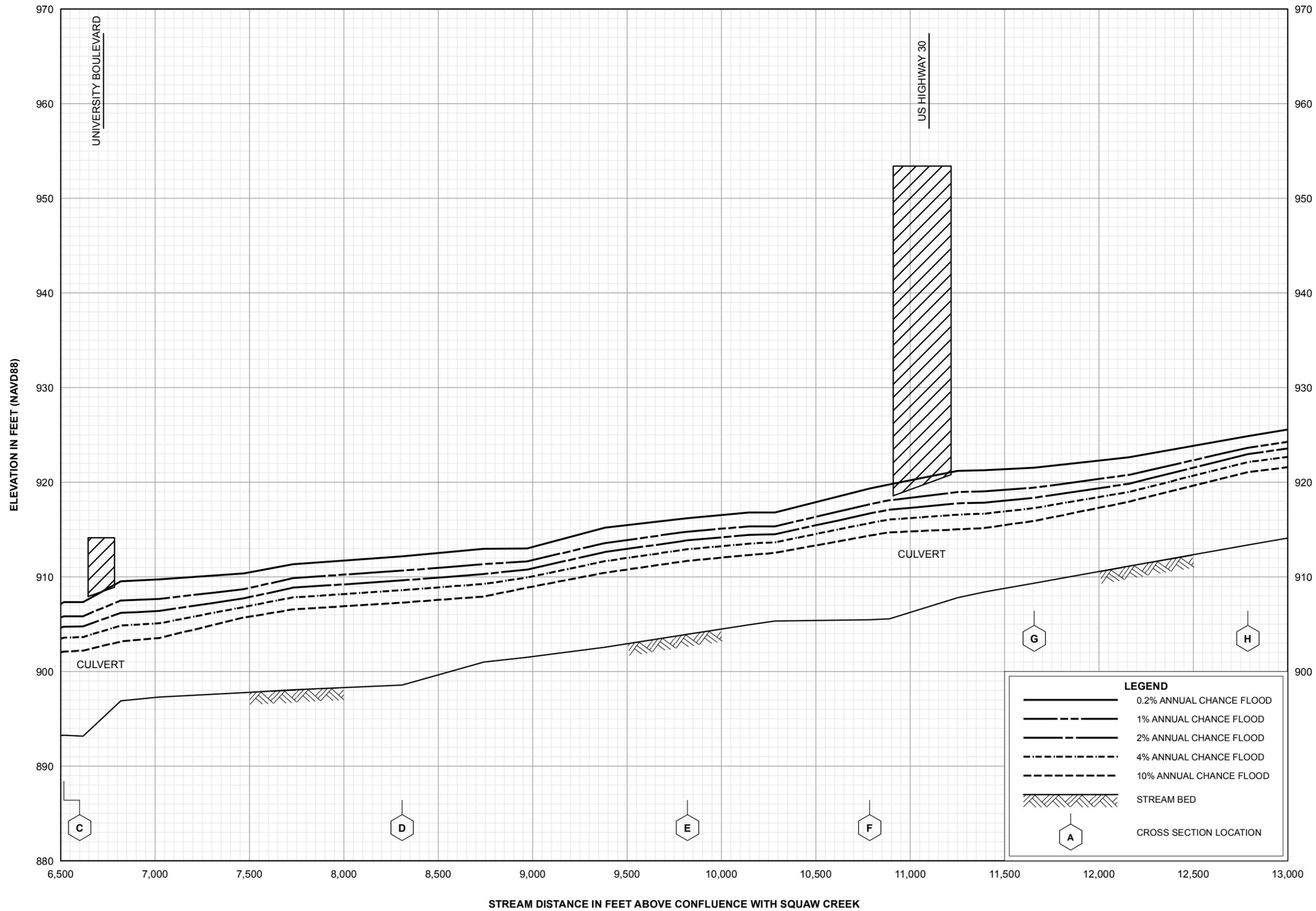
FLOOD PROFILES

WORLE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

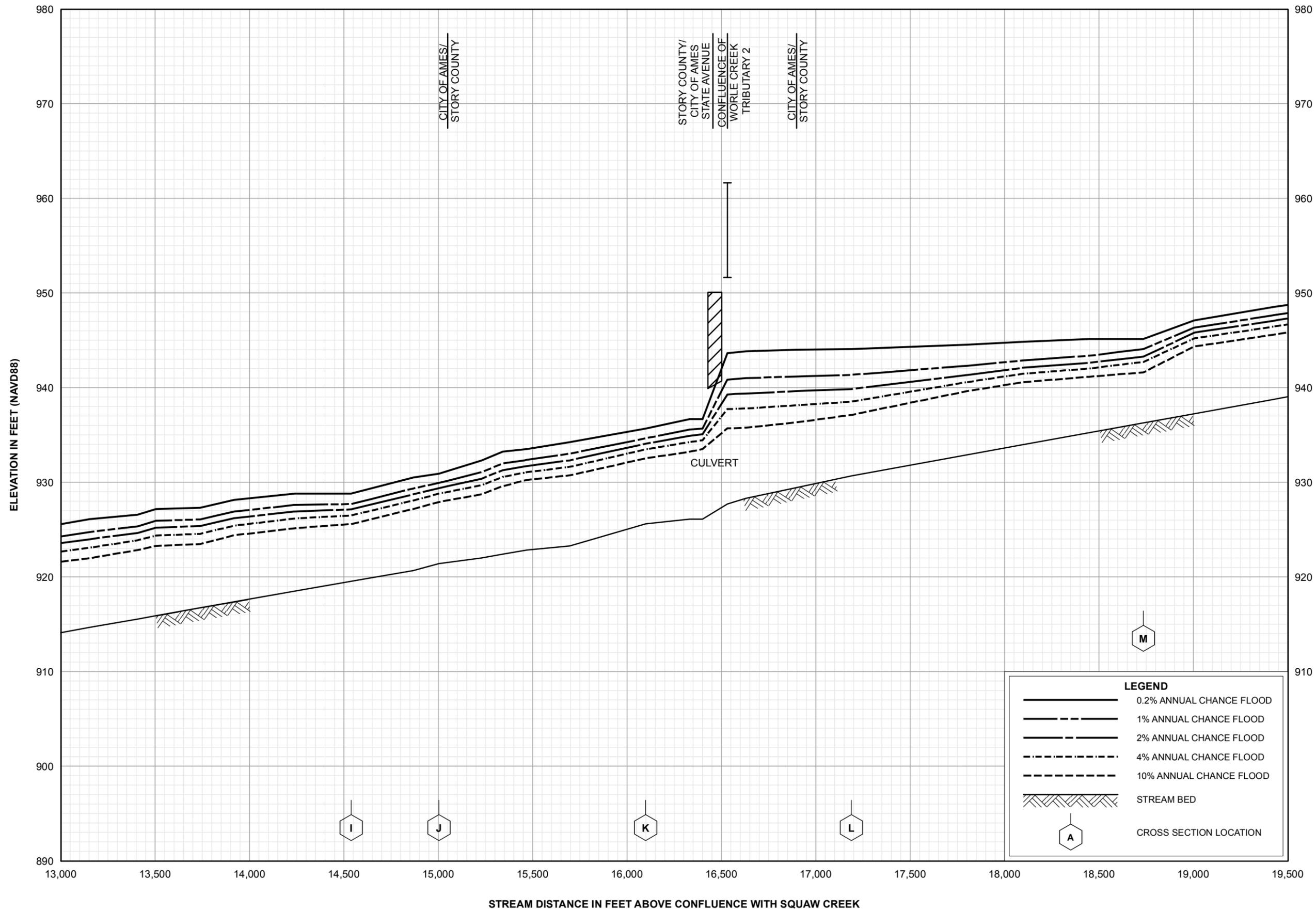
STORY COUNTY, IOWA

AND INCORPORATED AREAS



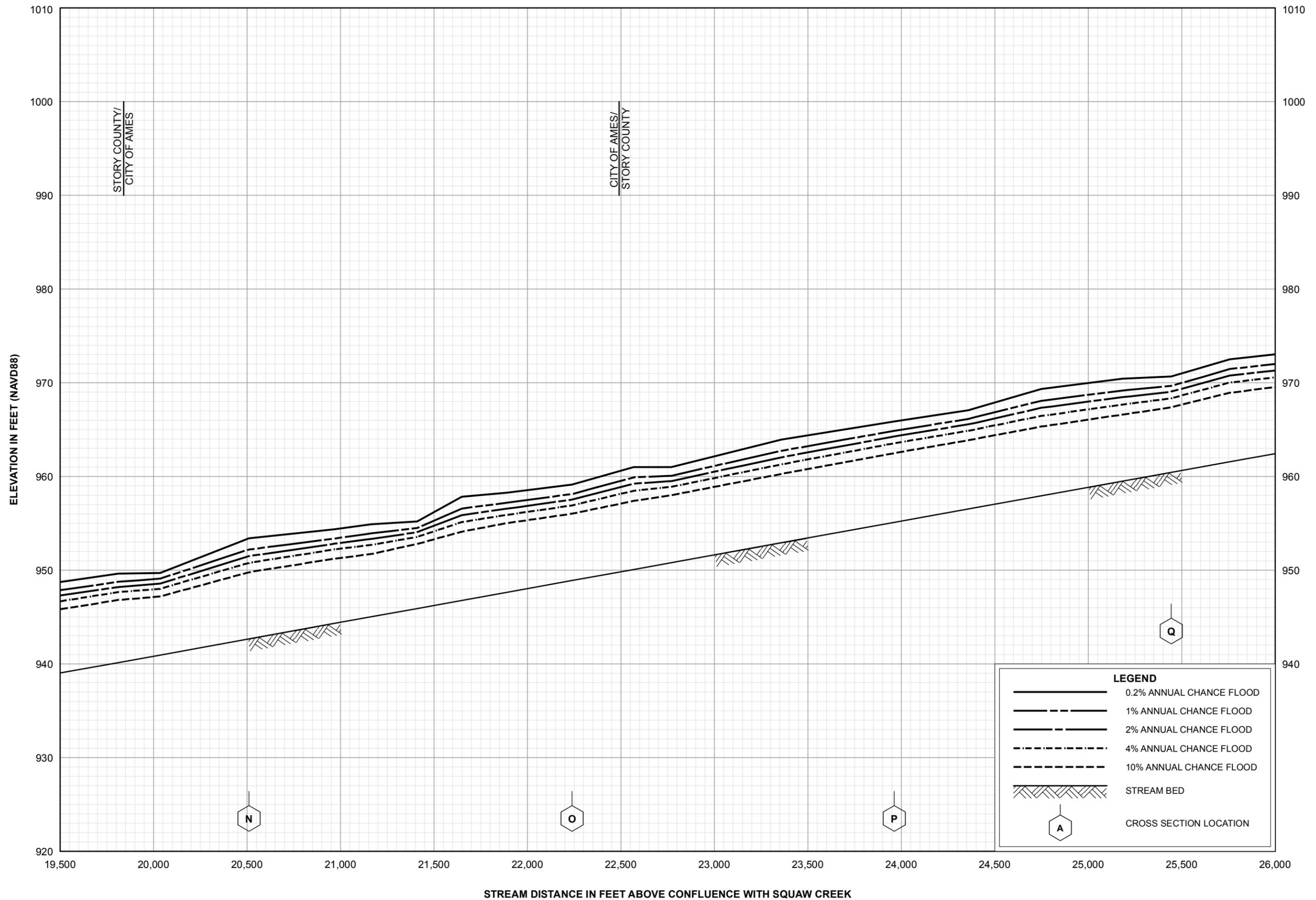
FLOOD PROFILES
WORLE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY
STORY COUNTY, IOWA
AND INCORPORATED AREAS



**FLOOD PROFILES
WORLE CREEK**

FEDERAL EMERGENCY MANAGEMENT AGENCY
**STORY COUNTY, IOWA
AND INCORPORATED AREAS**

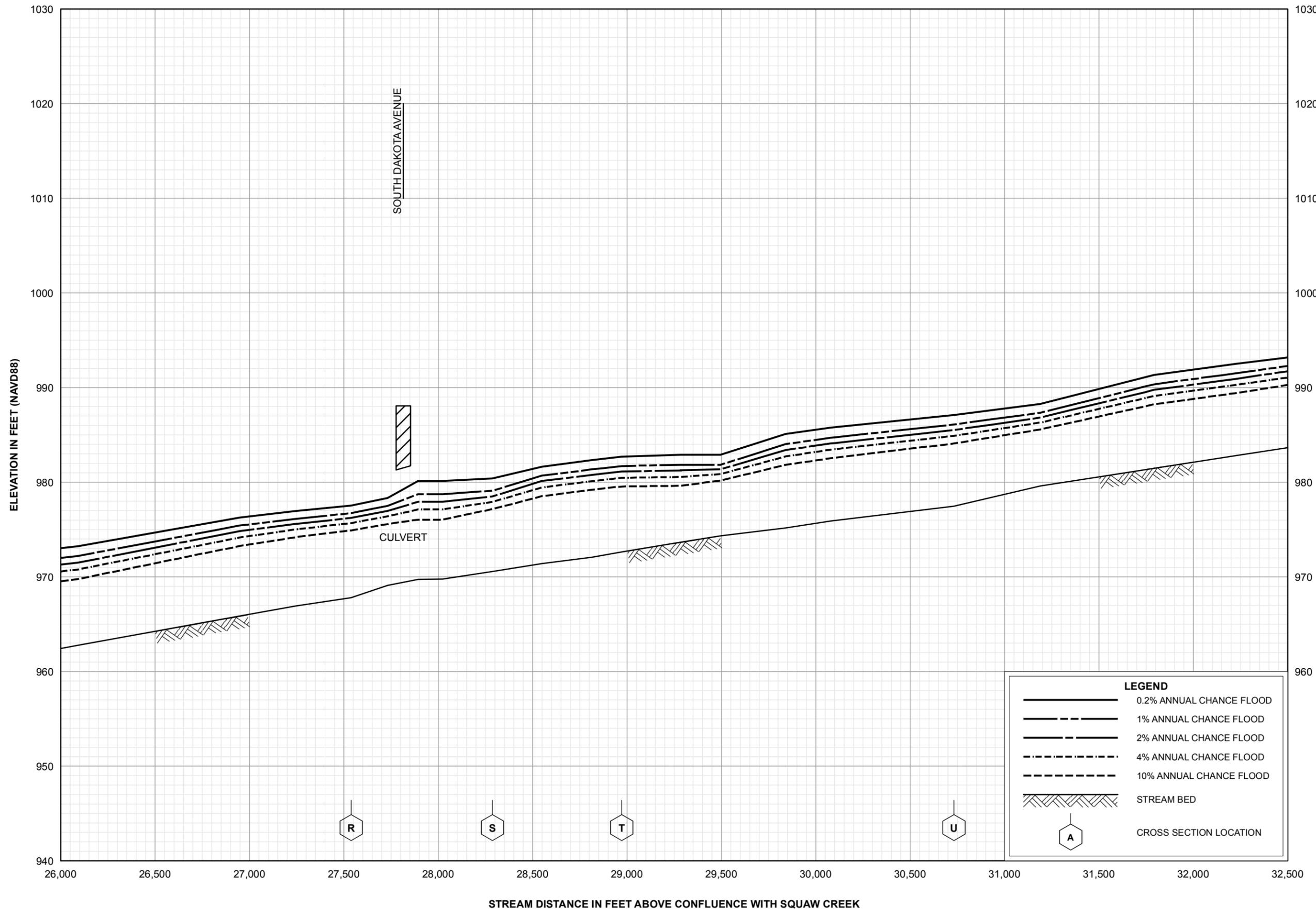


FLOOD PROFILES

WORLE CREEK

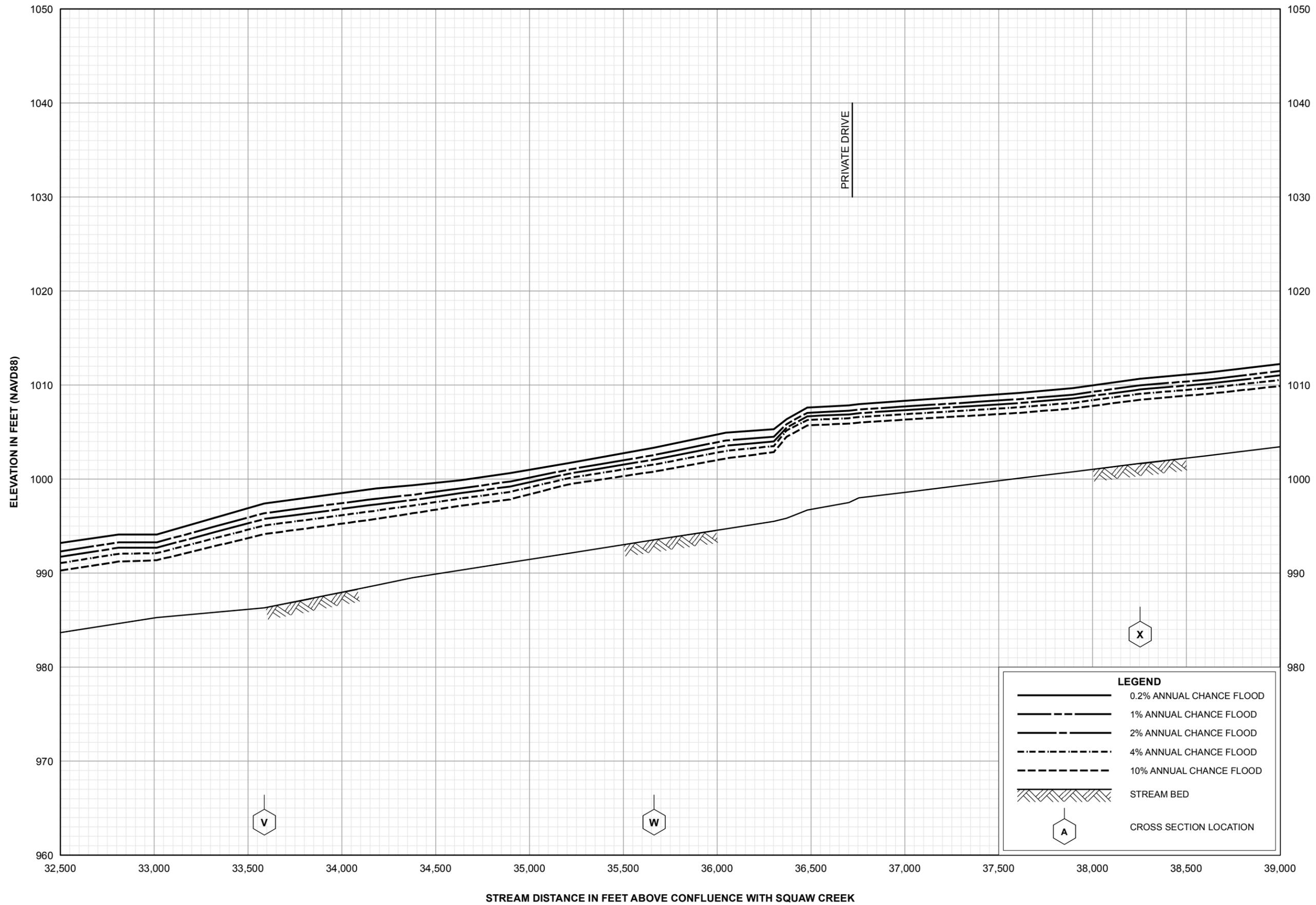
FEDERAL EMERGENCY MANAGEMENT AGENCY

**STORY COUNTY, IOWA
AND INCORPORATED AREAS**



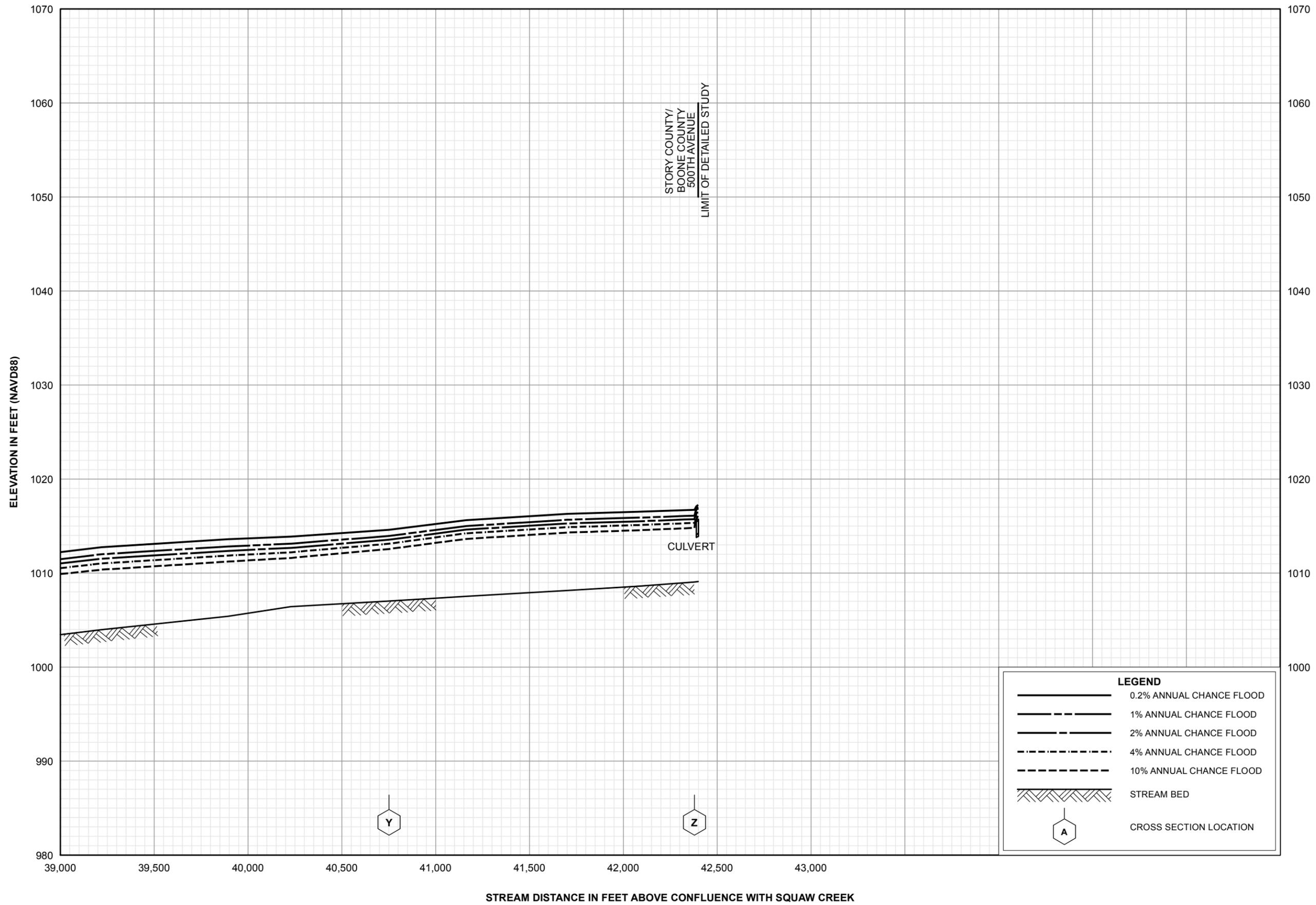
FLOOD PROFILES
WORLE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY
STORY COUNTY, IOWA
AND INCORPORATED AREAS



**FLOOD PROFILES
WORLE CREEK**

FEDERAL EMERGENCY MANAGEMENT AGENCY
**STORY COUNTY, IOWA
AND INCORPORATED AREAS**

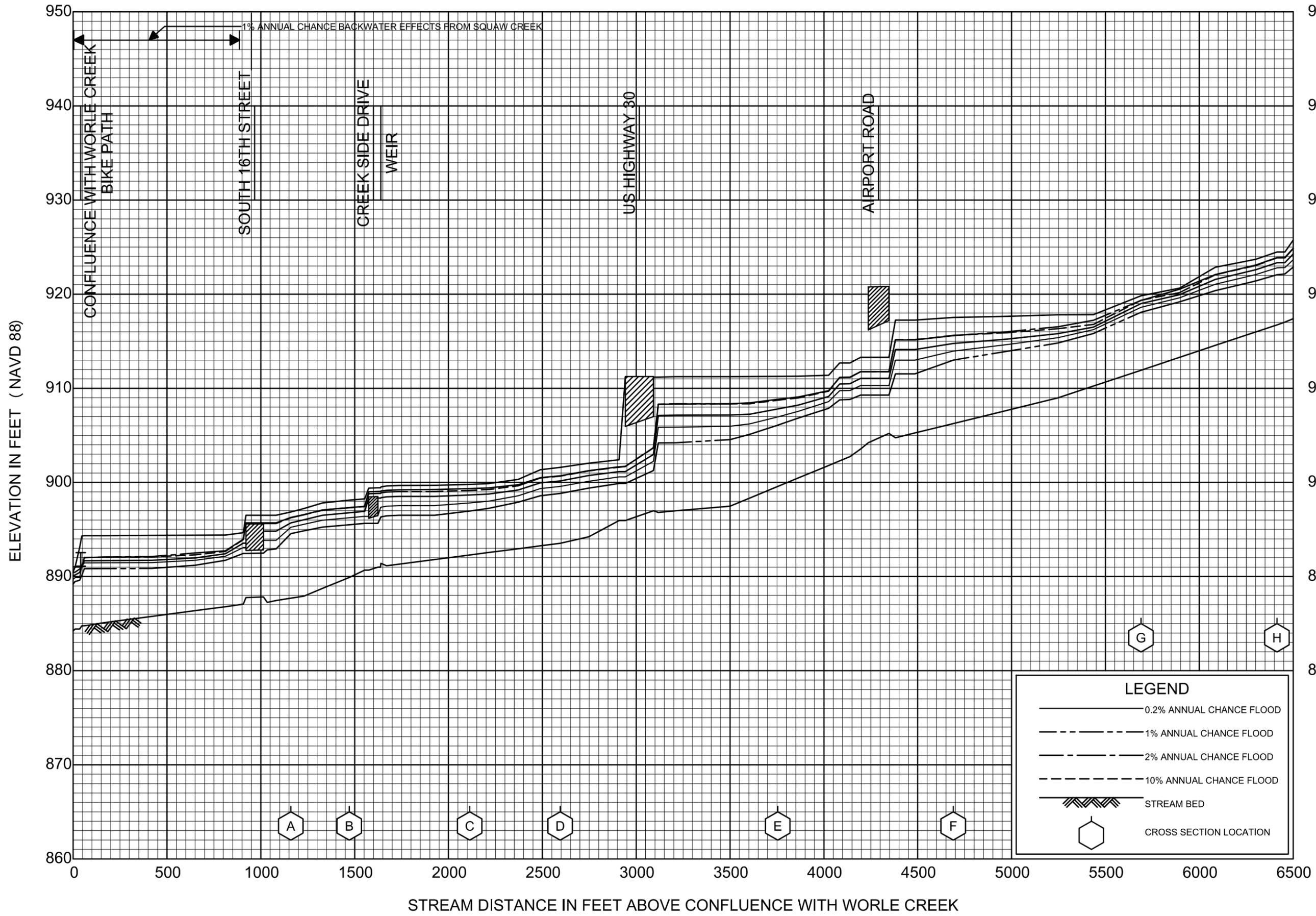


FLOOD PROFILES

WORLE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

**STORY COUNTY, IOWA
AND INCORPORATED AREAS**



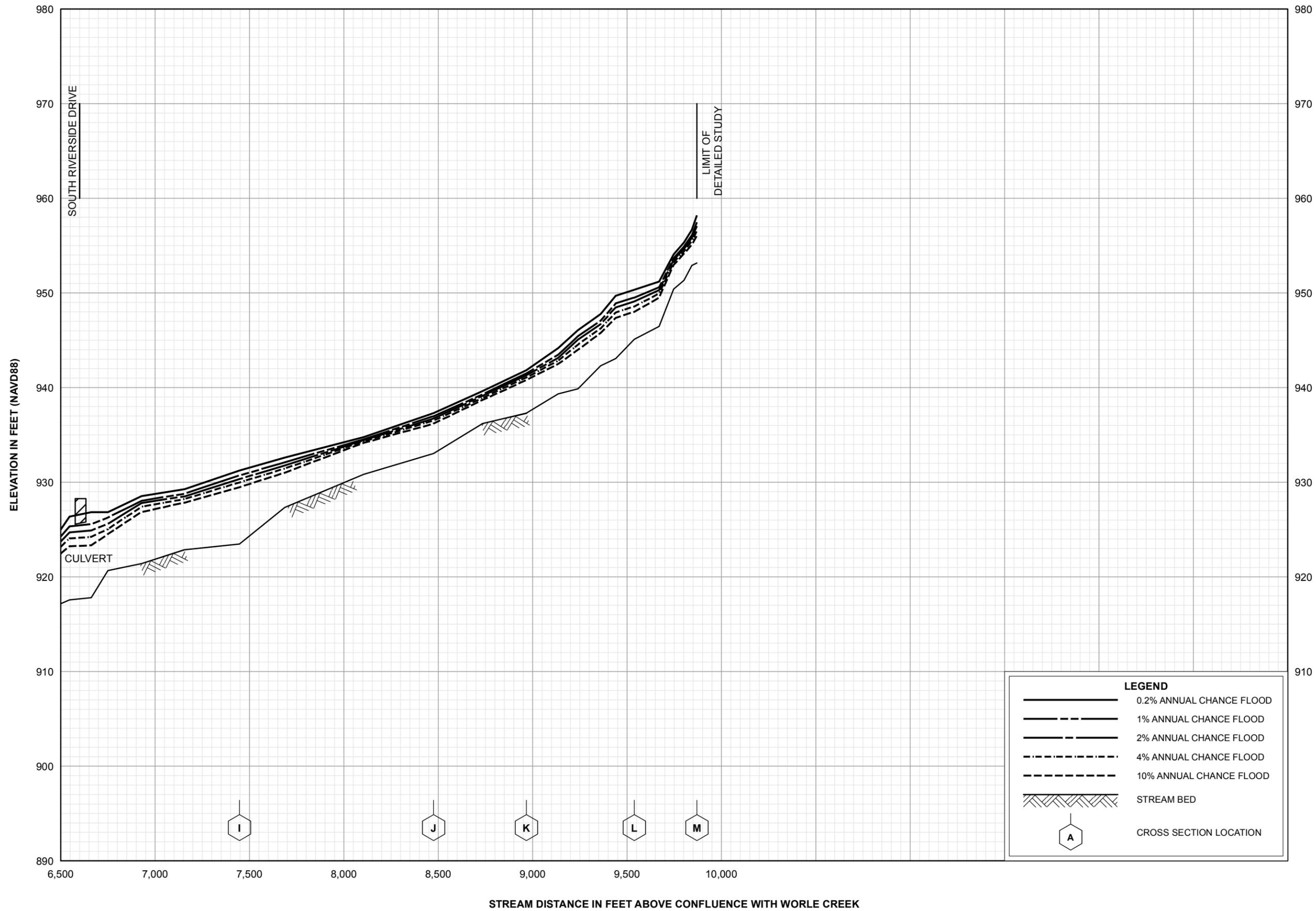
FLOOD PROFILES

WORLE CREEK TRIBUTARY 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

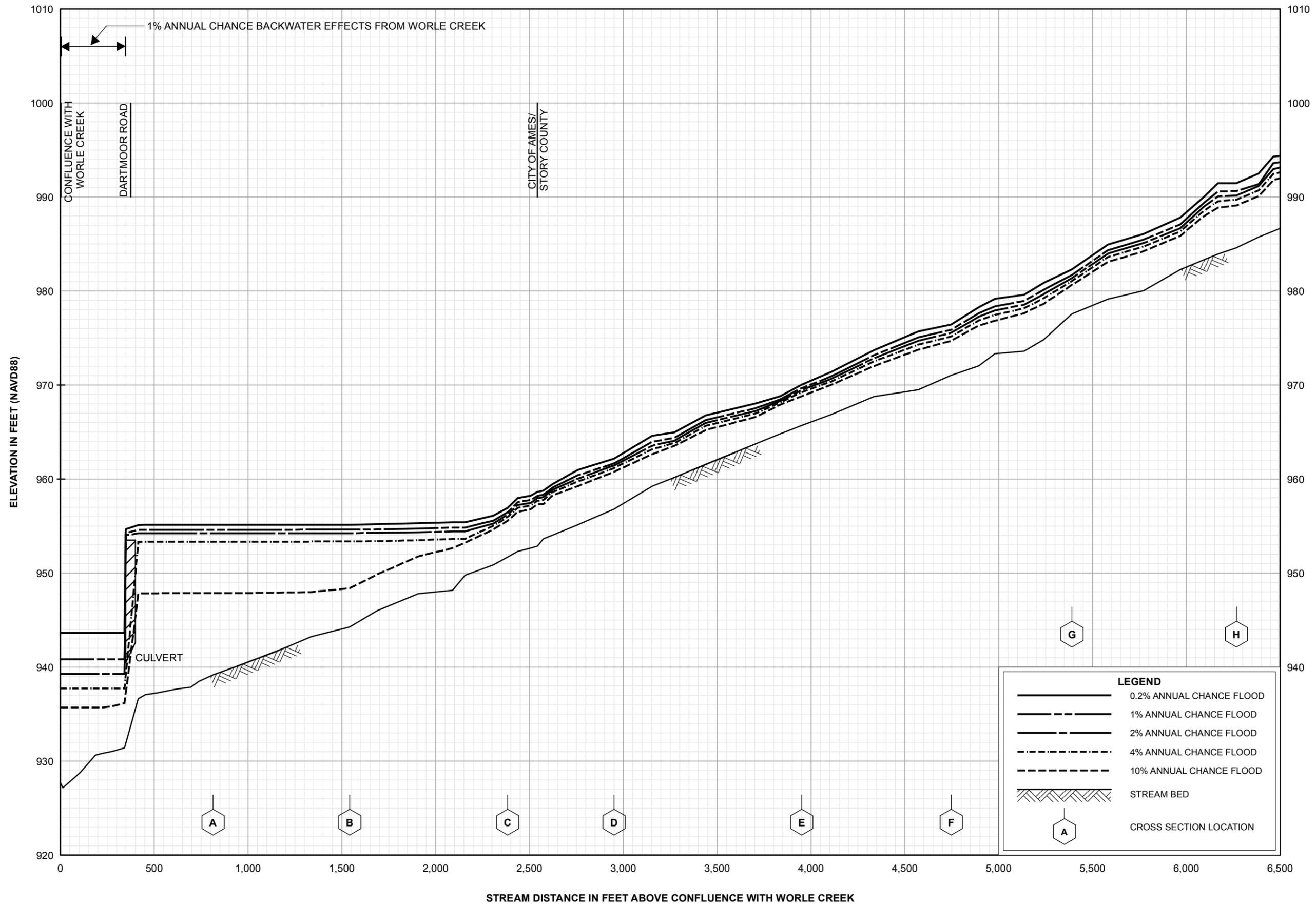
STORY COUNTY, IA

STORY COUNTY, IA AND INCORPORATED AREAS



LEGEND

- 0.2% ANNUAL CHANCE FLOOD
- - - 1% ANNUAL CHANCE FLOOD
- · - · 2% ANNUAL CHANCE FLOOD
- · · · 4% ANNUAL CHANCE FLOOD
- · - · 10% ANNUAL CHANCE FLOOD
- ▨ STREAM BED
- ⬡ A CROSS SECTION LOCATION

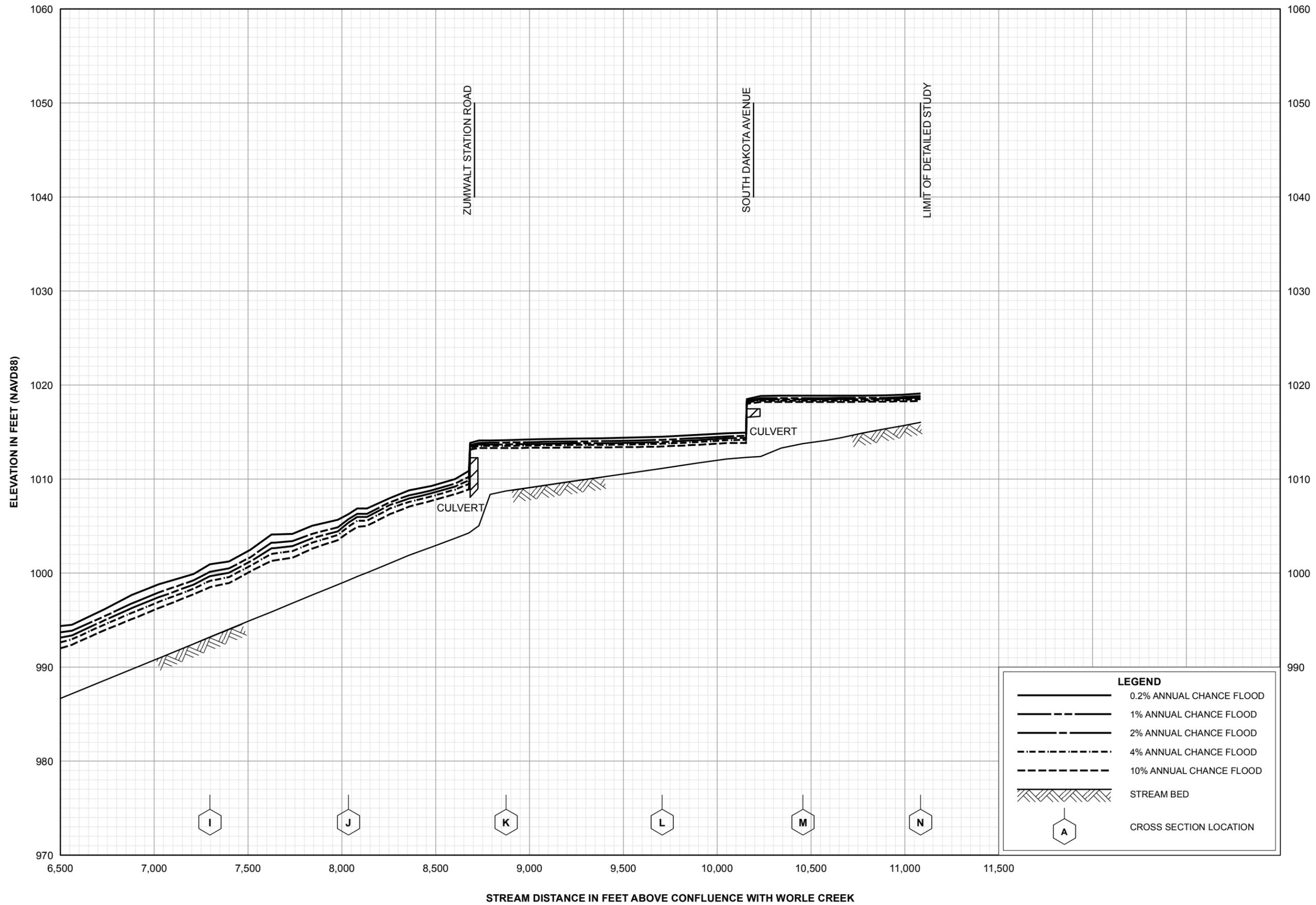


FLOOD PROFILES

WORLE CREEK TRIBUTARY 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

STORY COUNTY, IOWA
AND INCORPORATED AREAS



LEGEND

- 0.2% ANNUAL CHANCE FLOOD
- - - 1% ANNUAL CHANCE FLOOD
- · - 2% ANNUAL CHANCE FLOOD
- · - · 4% ANNUAL CHANCE FLOOD
- · - - - 10% ANNUAL CHANCE FLOOD
- ▨ STREAM BED
- ⬡ A CROSS SECTION LOCATION

FLOOD PROFILES

WORLE CREEK TRIBUTARY 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

**STORY COUNTY, IOWA
AND INCORPORATED AREAS**