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NATIONAL DAM SAFETY PROGRAM. VISCHER RRY DAM (NY 170), MOHAWK--ETC(U)
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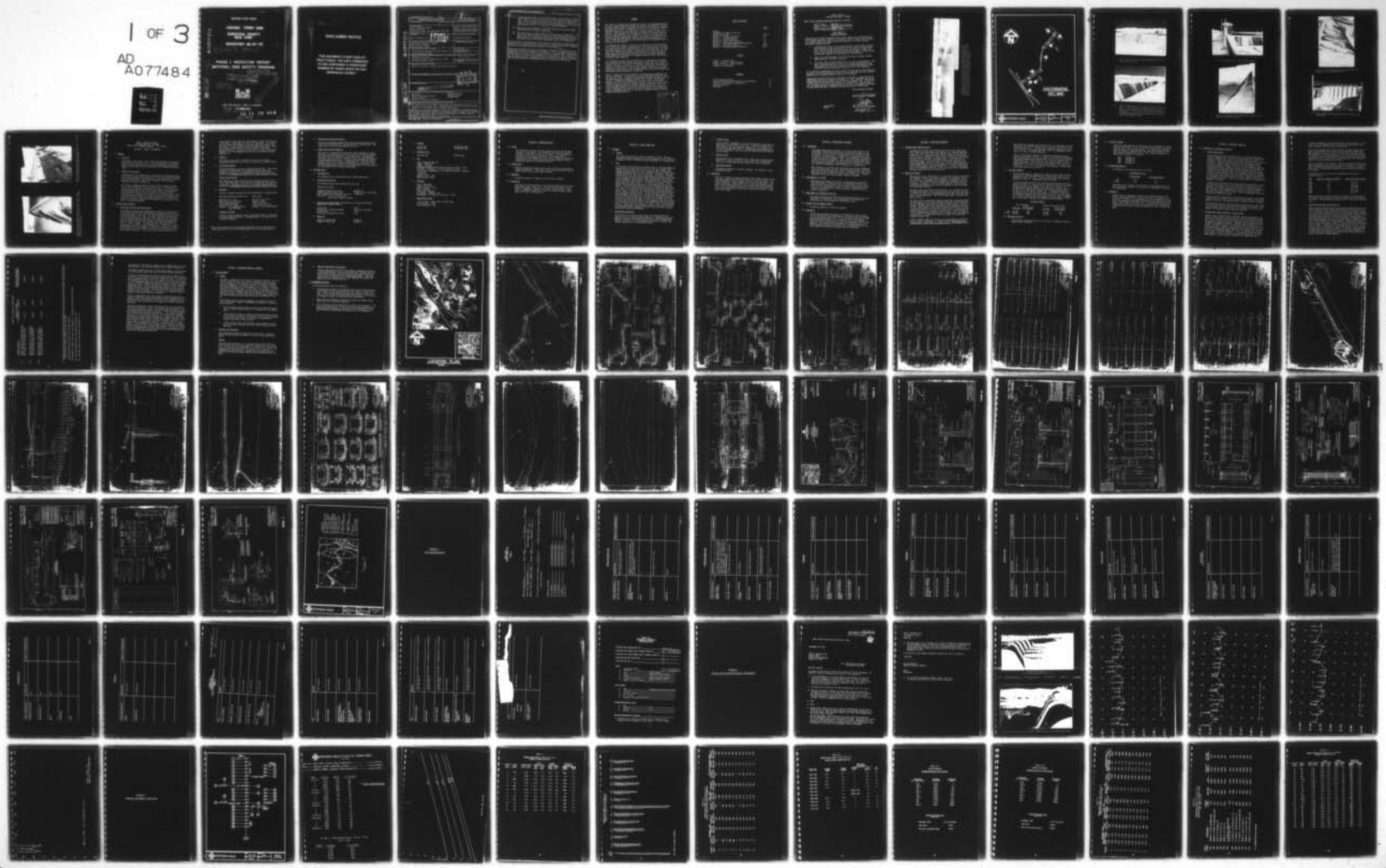

AD A077484

MOHAWK RIVER BASIN

VISCHER FERRY DAM

SARATOGA COUNTY
NEW YORK

INVENTORY NO NY 170

(10) John B. Stetson

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

(6) Vischer Ferry Dam (NY 170), Mohawk River Basin, Saratoga County, New York. Phase I Inspection Report,

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Dam Safety
National Dam Safety Program
Visual Inspection
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Vischer Ferry Dam
Saratoga County
Vischer Ferry

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report provides information and analysis on the physical condition of the dam as of the report date. Information and analysis are based on visual inspection of the dam by the performing organization.

Examination of available documents and a visual inspection of the dam did not reveal conditions which constitute an immediate hazard to human life or property. However, additional studies should be undertaken to further evaluate conditions affecting the dam. —next page

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cont.

(1.) Investigate the extent of the deterioration of the spillway sections and the affect of this deterioration on the stability of this structure. Obtain borings and perform stability analysis on those sections of the spillway which have become deteriorated. Follow up with the necessary repairs as indicated by the investigation.

(2.) Repair the south abutment of the north spillway to prevent further deterioration of the shale foundation.

(3.) The outlet gates on the northern end of the dam are inoperative. The work on the reconstruction of the sluice gates structure which has been awarded for contract by the New York State Department of Transportation should be performed continuously until its completion.

It is therefore recommended that within 3 months of the date of notification of the Owners, the above mentioned investigations be undertaken and that required remedial work be completed within 2 years of notification.

Computations prepared according to the Corps of Engineers' screening criteria, established the spillway capacity at 165,000 cfs. This represents 29% of the Probable Maximum Flood and 58% of the 1/2 Probable Maximum Flood. The PMF and 1/2 PMF flows are 572,00 cfs and 285,000 cfs, respectively. The spillway is not considered seriously inadequate based on the Corps of Engineers' screening criteria since the dam is structurally stable during the 1/2 PMF event.

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I Investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through frequent inspections can unsafe conditions be detected and only through continued care and maintenance can these conditions be prevented or corrected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aide in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

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Name of Dam Vischer Ferry Dam at Lock No. 7, NY170

State Located New York
County Located Saratoga and Schenectady
Stream Mohawk River
Date of Inspection August 1, 1979

ASSESSMENT OF GENERAL CONDITIONS

Examination of available documents and a visual inspection of the dam did not reveal conditions which constitute an immediate hazard to human life or property. However, additional studies should be undertaken to further evaluate conditions affecting the dam.

1. Investigate the extent of the deterioration of the spillway sections and the affect of this deterioration on the stability of this structure. Obtain borings and perform stability analysis on those sections of the spillway which have become deteriorated. Follow up with the necessary repairs as indicated by the investigation.

2. Repair the south abutment of the north spillway to prevent further deterioration of the shale foundation.

3. The outlet gates on the northern end of the dam are inoperative. The work on the reconstruction of the sluice gates structure which has been awarded for contract by the New York State Department of Transportation should be performed continuously until its completion.

It is therefore recommended that within 3 months of the date of notification of the Owners, the above mentioned investigations be undertaken and that required remedial work be completed within 2 years of notification.

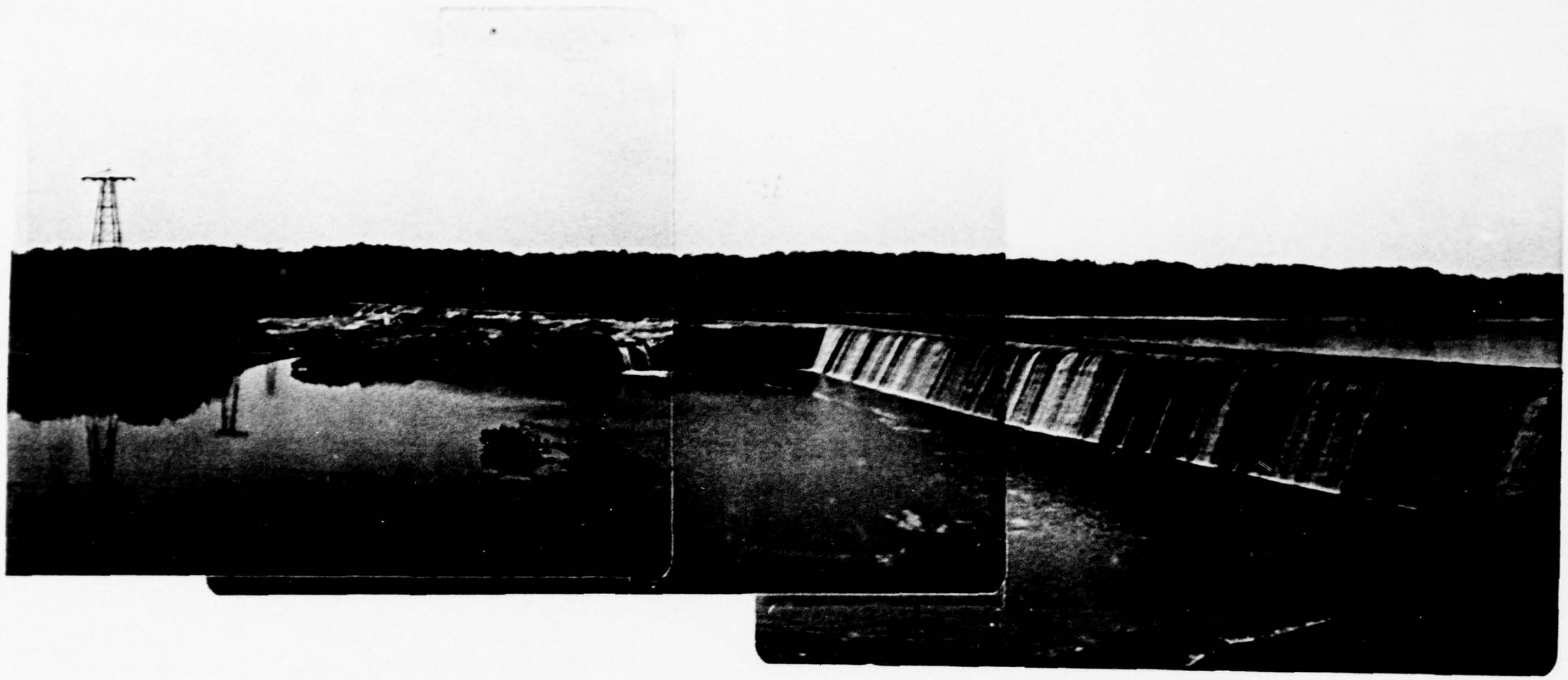
Computations prepared according to the Corps of Engineers' screening criteria, established the spillway capacity at 165,000 cfs. This represents 29% of the Probable Maximum Flood and 58% of the 1/2 Probable Maximum Flood. The PMF and 1/2 PMF flows are 572,00 cfs and 285,000 cfs, respectively. The spillway is not considered seriously inadequate based on the Corps of Engineers' screening criteria since the dam is structurally stable during the 1/2 PMF event.

Dale Engineering Company

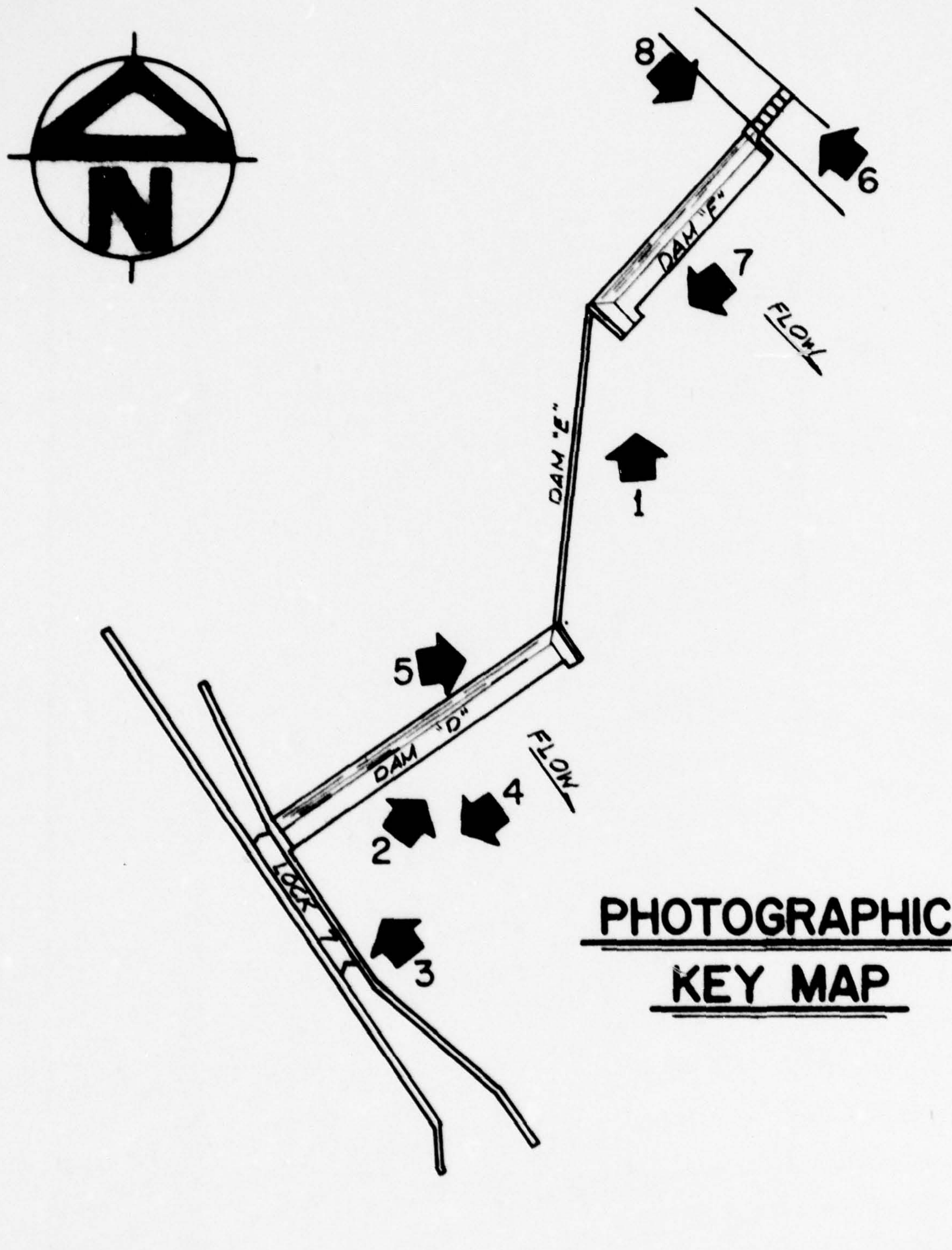
John B. Stetson, President

Approved By: Col. Clark H. Benn
New York District Engineer

Date: 28 Sept 79



Overview of north dam section from hydropower forebay area. The center portion of the dam consists of a rock section which comes up to near the spillway crest. Another section of dam is located on the other side of the rock area. The total length of the dam is approximately 1900 feet.



PHOTOGRAPHIC KEY MAP

STETSON • DALE	DATE 8·30·79	DRAWN JPG	VISCHERS FERRY DAM
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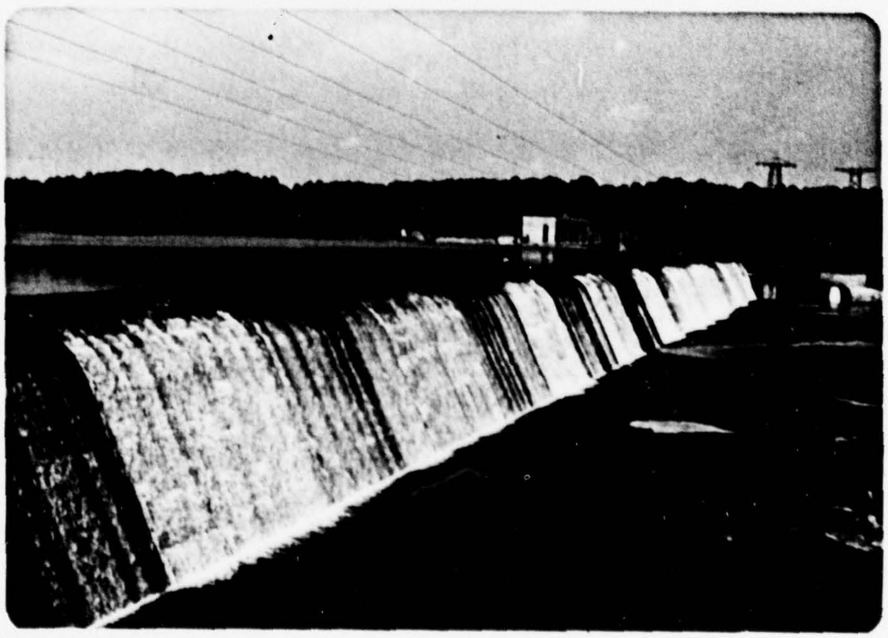
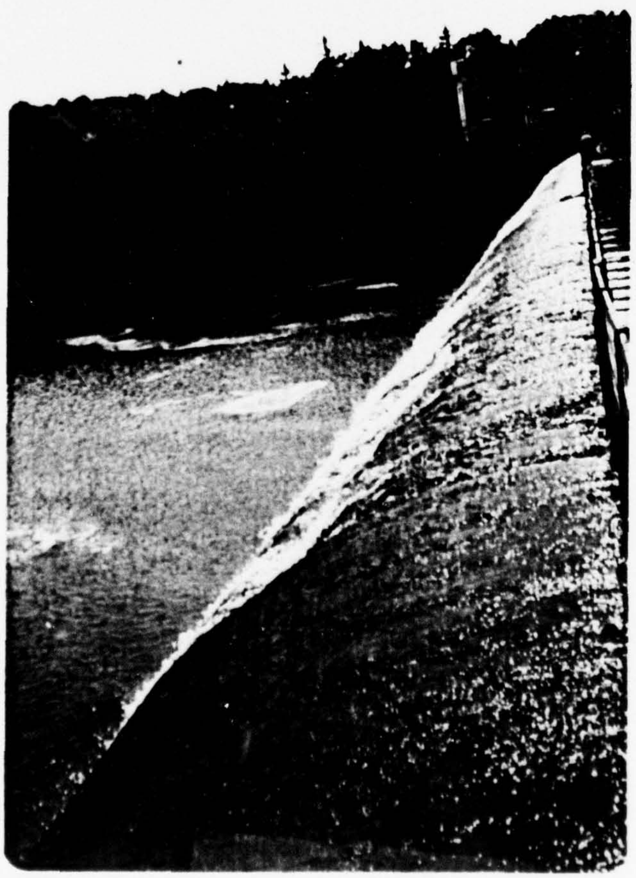
1. View of north dam section and hydropower facility on north shore of river.



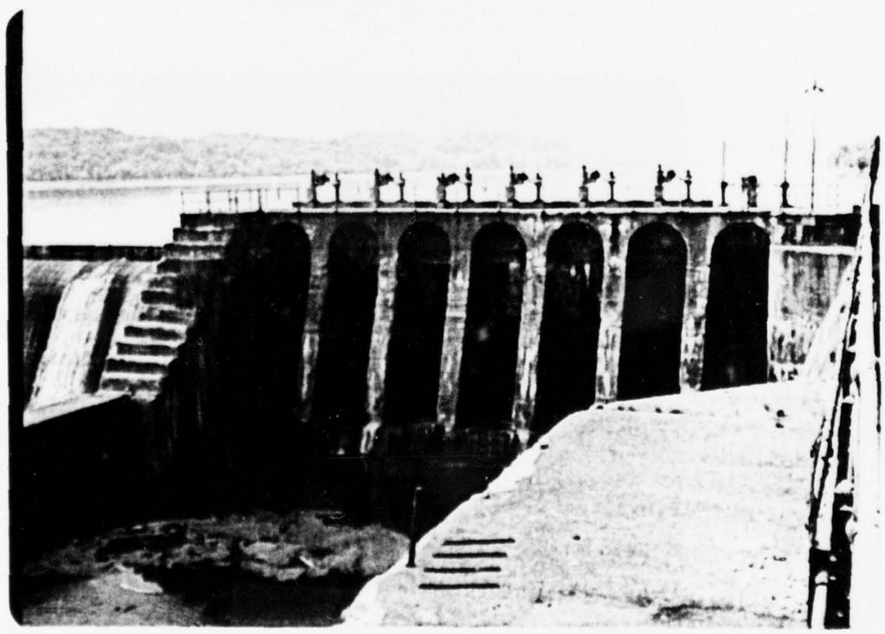
2. View of south dam section across pool area to the north shore. A dam inspector can be seen in the center of picture at the location of severe leakage through the flashboards. In this area, flow across deteriorated horizontal construction joints can be seen as well as flow along monolith joints.

3. Close-up of abutment of dam in south shore.

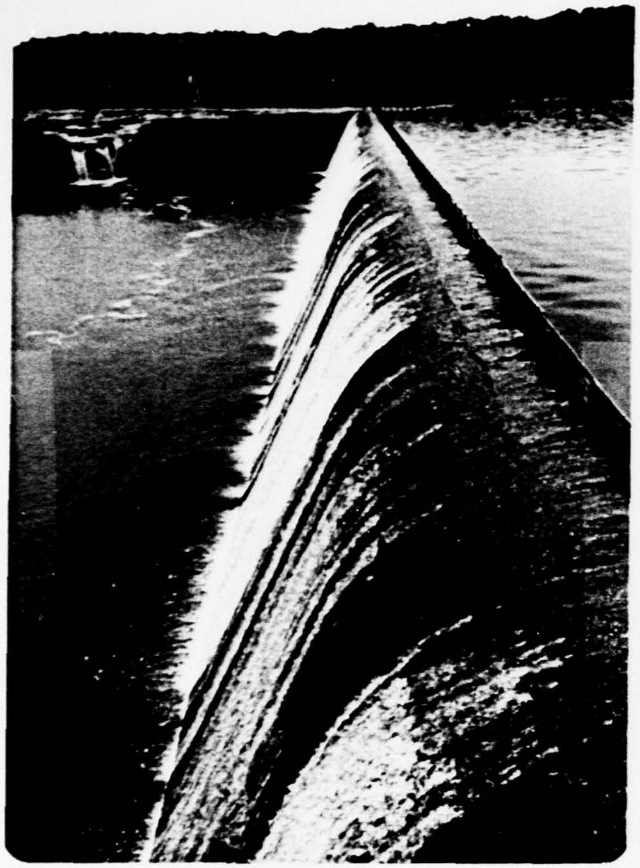


4. Close-up of eroded spillway surface area near the center of the south dam section.

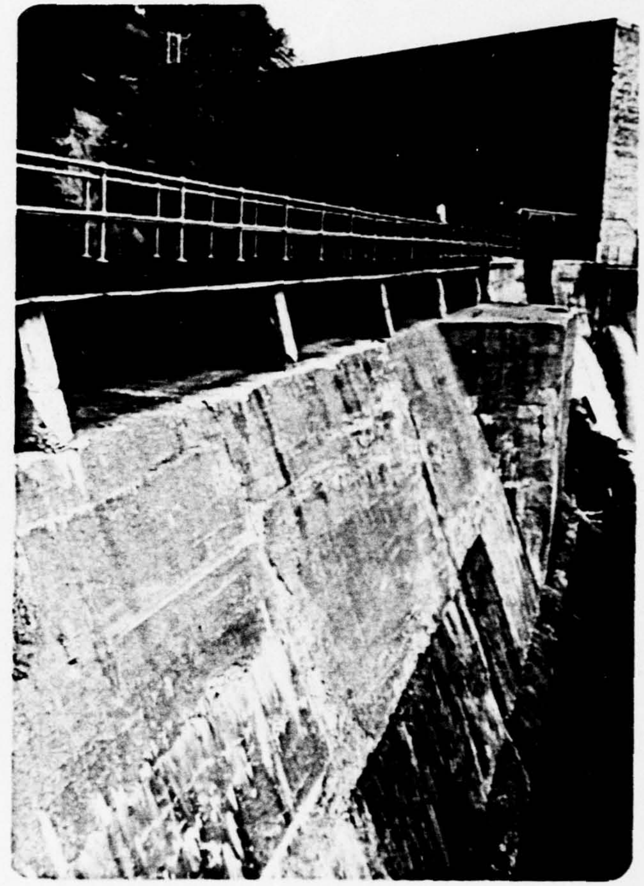
5. Close-up of eroded spillway surface near the north abutment of the south dam section.



6. View of gated spillway system which is currently not operational.



7. Close-up of north dam section spillway. Note flow along monolith joints. This section is not as eroded as the south dam section.



8. View of forebay wall just below abutment area. Notice seepage through construction joint.

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
NAME OF DAM - VISCHER FERRY DAM ID# - NY 170

SECTION 1 - PROJECT INFORMATION

1.1 GENERAL

a. Authority

Authority for this report is provided by the National Dam Inspection Act, Public Law 92-367 of 1972. It has been prepared in accordance with a contract for professional services between Dale Engineering Company and The New York State Department of Environmental Conservation.

b. Purpose of Inspection

The purpose of this inspection is to evaluate the existing condition of the Vischer Ferry Dam and appurtenant structures, owned by the New York State Department of Transportation, and to determine if the dam constitutes a hazard to human life or property and to transmit findings to the State of New York.

This Phase I inspection report does not relieve an Owner or Operator of a dam of the legal duties, obligations or liabilities associated with the ownership or operation of the dam. In addition, due to the limited scope of services for these Phase I investigations, the investigators had to rely upon the data furnished to them. Therefore, this investigation is limited to visual inspection, review of data prepared by others, and simplified hydrologic, hydraulic and structural stability evaluations where appropriate. The investigators do not assume responsibility for defects or deficiencies in the dam or in the data provided.

1.2 DESCRIPTION OF PROJECT

a. Description of Dam and Appurtenances

The Vischer Ferry Dam on the Mohawk River consists of three sections of spillway structure which span between the Barge Canal-Lock No. 7, on the south bank of the river and a power generating station located on the north bank of the river. The total length of the three sections of the spillway is 2,087 feet. The center section of the dam is a low concrete spillway section which is formed at the upstream end of a bedrock island. This section varies from approximately 2 feet to 5 feet in height. The north and the south sections of the dam span the main channels of the Mohawk River. These sections are approximately 33 feet in height. A sluice gate structure is located at the north end of the northerly spillway section adjacent to the power generating station. This sluice gate structure consists of 6 sluice gates, 8 feet wide by 14 feet high and 1 gate 8 feet wide by 12 feet high. These gates are electrically operated. The concrete wall which forms the forebay to the power generating station also functions as a side channel spillway at higher water levels. There are no gates controlling flow into the forebay of the power generating station. The dam is the second in a series of dam which regulate flow in the Mohawk River for use in navigation and power generation.

b. Location

The Vischer's Ferry Dam is located in the Town of Niskayuna, Schenectady County and in the Town of Clifton Park, Saratoga County.

c. Size Classification

The maximum height of the dam is approximately 42 feet. The storage volume of the impoundment is approximately 25,000 acre feet.* Therefore, the dam is in the Intermediate Size Classification as defined by The Recommended Guidelines for Safety Inspection of Dams.

d. Hazard Classification

The Mohawk River flows through the City of Cohoes and the City of Troy. The Mohawk River is also used for navigational and recreational purposes. Therefore, the dam is in the High Hazard Category as defined by The Recommended Guidelines for Safety Inspection of Dams.

e. Ownership

The dam is owned by the New York State Department of Transportation.

Waterway Maintenance Subdivision:

New York State - DOT
Main Office - State Campus
1220 Washington Avenue
Albany, New York 12232
Director - Mr. Joseph Stellato
(518) 457-4420

Region One:

New York State - DOT
Region 1 Office
84 Holland Avenue
Albany, New York 12208
Engineer - Mr. John Hulchanski

f. Purpose of the Dam

The dam is used to regulate flows on the Mohawk River for navigational use and power generation. The Mohawk River is also used for recreational purposes.

*This is the volume of the river channel upstream to the next dam with an assumed depth of 34 feet at the downstream and 14 feet at the upstream end.

g. Design and Construction History

No data was available regarding the design and construction history. Plans for the construction of the dam and lock are dated 1907. The construction of the dam was completed in 1913.

h. Normal Operational Procedures

The facility is operated by the New York State Department of Transportation. The main function of the facility is to provide adequate pool elevations for navigation in the Barge Canal. The secondary function of the facility is to maintain flows for power generation at the power generating station. The gates are manipulated to provide optimum flows to fulfill both of these functions. The gates which presently control flow from the impoundment are inoperative. Plans have been prepared by the New York State Department of Transportation for the rehabilitation of these sluice gates.

1.3 PERTINENT DATA

a. Drainage Area

The drainage area of Vischer Ferry Dam is 3385 square miles.

b. Discharge at Dam Site

No discharge records are available for this site.

Computed discharges:

Ungated spillway, top of dam	165,000 cfs
Ungated spillway, design flood	100,000 cfs Est. from Plans
Gated drawdown thru hydropower facility	4,342 cfs
New gates: 6 @ 14 x 8 feet to be constructed, capacity unknown	

c. Elevation (Feet above MSL) (Elevations are in Barge Canal Datum. Barge Canal = USGS + 0.99 ft.

Top of dam	219.0
Maximum pool - Design discharge	217.0 Est. from Plans
Spillway crest	211.0
Stream bed at centerline of dam	177±

d. Reservoir

Length of maximum pool	54,500 ft
Length of normal pool	54,500 ft

e. Storage

Top of dam	33,500 acre feet
Normal pool	25,100± acre feet

f. Reservoir Area

Spillway pool	1046.8± acre

g. Dam

Type - Concrete, gravity.
Length - 2087± feet
Height - 42± feet
Freeboard between normal reservoir and top of dam - 8 feet
Top width - Spillway - 11.5 ft., Abutment - 18 ft.
Side slopes - Downstream - 2 vertical/1 horizontal, Upstream - vertical
Zoning - N/A
Impervious core - N/A
Grout curtain - N/A

h. Spillway

Type - Ogee crest
Length - 1918.7 ft.
Crest elevation - 211.0
Gates - Ungated
U/S channel - Natural
D/S channel - Natural, rock
Flashboards - 27 inches to elevation - 213.25

i. Regulating Outlets

1 sluice gate - 8 feet wide x 14 feet high
Sill elevation - 190
Lintel elevation - 204

SECTION 2 - ENGINEERING DATA

2.1 DESIGN

The information available for the evaluation of this dam has been included in this report. The information consisting of contract drawings is contained in Figures 2 through 27. No information on the design of this dam was available. The drawings show cross-sections and dimensions of the various structural elements of the dam but do not include information on the properties of the foundations material nor stability analysis.

2.2 CONSTRUCTION

Details regarding the construction of this facility are included in Figures 2 through 27. These figures also include the plans for the rehabilitation of the sluice gate structure.

2.3 OPERATION

No operation manual is known to exist for this structure.

2.4 EVALUATION

The plans for the construction of the facility agree with the visual observations made in the field. The information included in this report is adequate to complete this Phase I investigation. Therefore, no additional research for data is required in order to complete this Phase I investigation.

SECTION 3 - VISUAL INSPECTION

3.1 FINDINGS

a. General

The Vicher Ferry Dam was inspected on August 1, 1979. The Dale Engineering Company Inspection Team was accompanied on the inspection by Walter Elliot of the New York State Department of Transportation.

b. Dam

At the time of the inspection, the water level in the impoundment was approximately 9 inches above the crest of the dam. Wooden flashboards, 27 inches high, were also in place on the spillway crest. Leakage between the bottom of the flashboards and the spillway crest allowed substantial flow over the spillway. Therefore, a detailed observation of the face of the spillway was not possible. In general, the surface of the spillway viewed through the flowing water indicates substantial deterioration along the horizontal and vertical joints throughout the structure. The deterioration is worse on the south section of the dam than it is on the north section. Photographs show areas where substantial surface deterioration was observed. In one area near the center of the northerly spillway section, the crest of the spillway had eroded to a depth of approximately 6 inches. The length of this deteriorated section was approximately 15 feet. Flow across the spillway face prevented observation of any leakage along the joints. The spillway was in proper alignment throughout its length and no evidence of displacement was noted in any of the spillway sections. At the south abutment end of the north dam, on Goat Island, about 10 feet of the original shale contact with the concrete abutment has been removed by erosion, possibly in conjunction with frost action. The impression of the shale originally in contact with the concrete is clearly visible in the abutment concrete. Additional future backward erosion of the shale relative to the abutment could eventually lead to frost action and resulting deterioration behind the abutment.

c. Appurtenant Structures

The concrete on the wall of the forebay to the power generating station is also in a deteriorated condition. A walkway on the power generating station has broken away and fallen into the downstream channel. Lock No. 7 is in good operating condition, although some surface deterioration of the concrete exists.

d. Control Outlet

Outlet from the impoundment is controlled through 7 sluice gates located near the north bank of the river. These sluice gates are in poor condition and are reputedly inoperative at the present time. The New York State Department of Transportation has prepared plans for the replacement of the gates and the rehabilitation of the concrete surfaces.

e. Reservoir Area

The reservoir area is the Mohawk River Channel which extends approximately 10-1/2 miles upstream to a dam in the City of Schenectady. There are no known areas on bank instability along this course.

g. Downstream Channel

The downstream channel is formed in bedrock. No evidence of recent erosion was noted.

3.2 EVALUATION

The visual inspection revealed generally deteriorated surfaces on the spillway structure and the control gates are in need of repair. No major deformation of the alignment of the structure was noted in the visual inspection. Deteriorated shale at the south abutment of the north dam has been displaced and a void remains behind the abutment wall. This area should be repaired by filling with concrete to prevent further deterioration which could effect the structural integrity of the spillway.

SECTION 4 - OPERATIONAL PROCEDURES

4.1 PROCEDURES

The primary operational procedure is to control water levels in the impoundment upstream from the dam for navigational purposes in the Barge Canal. The sluice gates located near the north bank are used to control this water level. Flashboards are installed on the dam and remain in place during the summer. The flashboards are installed in May and removed in December. Flows through the power generating station are also controlled to provide adequate upstream water levels for navigational purposes. The operation of this facility is under the control of the New York State Department of Transportation.

When the water is 2.5 feet above the masonry dam and the flashboards are on the waste gates are open. When the water recedes to 2.5 feet above masonry dam the gates are closed. Flashboards are installed on both dams by May 1 or when the flow is below 5,000 C.F.S. They are removed at the close of the navigable season in December.

4.2 MAINTENANCE OF THE DAM

Maintenance and operation of the dam is controlled by the New York State Department of Transportation. The Department inspects the facility every two years and a report on the condition of the structure is filed at the Central Office in Albany. Maintenance of the structure is scheduled on a priority basis as a result of the bi--annual inspections.

4.3 MAINTENANCE OF OPERATING FACILITIES

The gates controlling the flow into the downstream channel are under the control of the New York State Department of Transportation. These gates are not operational at the present time.

4.4 DESCRIPTION OF WARNING SYSTEMS

No warning system is in effect at present.

4.5 EVALUATION

The dam and appurtenant structures are inspected at regular intervals by the New York State Department of Transportation. Maintenance on the structure has been minimal in recent years as evidence by the deteriorated conditions of the concrete and of the sluice gates. These conditions indicate that, in the past, maintenance has not been adequate. The New York State Department of Transportation has recently awarded a Construction Contract for the rehabilitation of the sluice gates which control discharge from the impoundment.

SECTION 5 - HYDROLOGIC/HYDRAULIC

5.1 DRAINAGE AREA CHARACTERISTICS

The Mohawk River Basin drains 3456 square miles above Cohoes, New York, according to the USGS stream gage which is located downstream of the dam. The river flows south from its source in west-central New York until it reaches the City of Rome, from which it proceeds in a east-southeast direction to Cohoes where it joins the Hudson River. For most of its 156 miles, the Mohawk River is paralleled by the State Barge Canal. Two of the basin's three major reservoirs are used to supplement the flow in the canal. They are Delta Reservoir, on the Mohawk River itself; Hinkley Reservoir, on West Canada Creek; the third impoundment, Schoharie Reservoir, is located on Schoharie Creek in the southern most part of the study area used to supplement the water supply of the City of New York.

5.2 ANALYSIS CRITERIA

The purpose of this investigation is to evaluate the dam and spillway with respect to their flood control potential and adequacy. Where the structure is integrated with hydropower and navigation lock facilities, interrelationships from a hydrologic standpoint have been evaluated. In general, in this screening analysis, control structures and gates used for the latter two purposes are not considered as flood control devices.

Different scenarios of partial dam failures, i.e., monolith failures are beyond the scope of this analysis due to the fact that the dam is a run-of-river facility and the downstream dam break flood wave analysis is multi-dimensional. The initial hazard area is one-half mile below the dam.

The dam's stability and flood discharge capacity is assessed through the evaluation of the Probable Maximum Flood (PMF) for the watershed and the subsequent routing of the flood through the dam's spillway system. The PMF event is that hypothetical flow induced by the most critical combination of precipitation, minimum infiltration loss and concentration run-off of a specific location that is considered reasonably possible for a particular drainage area. Since this dam is in the Intermediate Dam Category and is a High Hazard, the guidelines criteria (Ref. 1) require that the dam be capable of passing the Probable Maximum Flood.

An HEC-1 computer model for the basin was published by the New York District Corps of Engineers in a report entitled Hydrologic Flood Routing Models, Upper Hudson and Mohawk Rivers, dated October, 1976.

The report was reviewed for the purpose of this investigation and the model which was used for preparation of the report was obtained from the New York District. The model was recoded and executed for analysis of the PMF. No changes were made to the unit hydrograph, base flow, loss rate or routing parameters.

The U.S. Army Corps of Engineers' Hydrologic Engineering Center's Computer Program HEC-1 DB was utilized to evaluate the PMF hydrology. The Probable Maximum Precipitation (PMP) was 21.9 inches according to Hydrometeorological Report (HMR #51) for a 24-hour duration, 200 square mile basin. Loss rates used were those applied in the Transferred Agnes Storm and SPF Analysis in the report. One multi-plan analysis (.2, .4, .5, .6, .8, 1.0 PMP) was performed. Rainfall was distributed evenly over the basin.

5.3 SPILLWAY CAPACITY

The spillway system is composed of a 1230 foot crest shaped spillway section plus a 690 foot trapezoided spillway section with an estimated design head of 6 feet. Discharge coefficients were computed between 3.3 and 4.15. Submergence was not checked.

At the top of dam elevation, the overflow spillway capacity was computed at 165,000 cfs. Two sources of information were used to assess flood magnitudes on the Mohawk in the vicinity of the dam. The aforementioned computer model and the USGS gage at Cohoes, New York. The PMF and 1/2 PMF values computed from the computer model were 572,000 cfs and 285,000 cfs respectively. A frequency analysis of the gage which was obtained from the New York District of the Corps of Engineers indicates that the 500 year flood has a peak of 198,000 cfs. Plotting and extending the frequency analysis results suggests that the PMF and 1/2 PMF may be 300,000 cfs and 225,000 cfs.

SPILLWAY CAPACITY

	HEC-1 DB Model		Frequency Analysis of Gage	
	Discharge	Capacity as % of Discharge	Discharge	Capacity as % of Discharge
PMF	572,000	29%	300,000	55%
1/2 PMF	285,000	58%	225,000	71%

5.4 RESERVOIR CAPACITY

The reservoir storage capacity at top of dam is estimated at approximately 33,500 acre feet.

5.5 FLOODS OF RECORD

Floods have been measured at USGS gaging station 01357500 at Cohoes, New York since 1918. No events have been recorded which are greater than the top of dam spillway capacity. Four floods have occurred equal or greater in magnitude than the high water elevation of 217 feet shown on Contract No. 14 Plans. That elevation equates to a design flood capacity of 100,000 cfs.

1964	143,000 cfs
1936	130,000 cfs
1938	102,000 cfs
1956	100,000 cfs

5.6 OVERTOPPING ANALYSIS

Overtopping of the dam would occur as follows:

	OVERTOPPING IN FEET	
	HEC-DB Model	Frequency Analysis
PMF	10.0	4.0
1/2 PMF	3.5	2.0

According to this analysis, the dam would be overtopped by the 1/2 PMF using either procedure for developing the hydrologic and hydraulic information.

5.7 EVALUATION

The spillway is inadequate to pass the 1/2 Probable Maximum Flood without overtopping the dam. Based on the Corps of Engineers' criteria, the spillway is not considered seriously inadequate since the stability computations performed in Section 6 have indicated that the dam is stable under the 1/2 PMF event. The hydrologic analysis performed in this report indicates that the dam would be overtopped by a flood event with a return interval probability of once in every 300 years.

SECTION 6 - STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

a. Visual Observations

Vischer Ferry Dam, extending generally in a north-south direction across the Mohawk River, consists of two separate main dam/spillway sections connected by a lesser dam/spillway structure which is founded on a rock outcropping island (Goat Island) near the middle of the river. Observations indicate all three dam segments retain structural stability with no indication of displacement or other structural movement. However, the facility was inspected under conditions where limited spillway flow was occurring, and the physical condition of the concrete comprising the structures was not fully visible for detailed evaluation. It was evident that surface deterioration of the concrete in the dam's downstream faces has occurred. The more significant deterioration consists of spalling and erosion at the numerous vertical construction joints. Because of the spillway overflow condition, it could not be determined if through-the-dam seepage is occurring.

A generating station with sluice gate structure and forebay is located on the north bank of the river and marks the northerly limit of the dam. The concrete in the gate structure is experiencing some deterioration. What apparently was a section of concrete walkway for the river-side of the generating station has separated from the building and dropped into the river. There is no apparent structural affect on the station building.

On Goat Island, the rock shale at the downstream side of the abutment structure for the northerly dam section has experienced a significant degree of erosion. The abutment remains essentially intact, however.

The Barge Canal lock for the area exists on the southerly bank of the river, and the lock wall forms the south abutment for the dam. Some surface deterioration has occurred in the concrete lock wall but no affects of structural significance were observed.

b. Geology and Seismic Stability - Vischer Ferry

Vischer Ferry is located within the Hudson Valley lowland which is a section of the Valley and Ridge Province. Both the dam and spillway are sited on bedrock of the Canajoharie Shale of Late Ordovician Age. The rock unit consists mainly of a grayish to black shale with some interbeds of graywacke sandstone. Although some very tight folds are present the general strike of the bedding is N30E to N40E with a dip close to vertical. Bedding is nearly parallel to the orientation of the northern dam and within 20 degrees of the southern dam. Two sets of joints are displayed, N40W with a dip of 25 degrees N, and N60-70 W with a dip of 80 to 85 degrees S. Joint spacing is from 18 inches to 36 inches. Strike of the joints are within 10 degrees of being perpendicular to the north dam orientation; the N40W joint set is within 5 degrees of being perpendicular to the south dam. Its low angle of dip (25 degrees N) and close spacing would readily permit frost loosening of blocks from the outcroping.

At the south abutment end of the north dam, on Goat Island, about 10 feet of the original shale contact with the concrete abutment has been removed by erosion, possibly in conjunction with frost action. The impression of the shale originally in contact with the concrete is clearly visible in the abutment concrete. Additional future backward erosion of the shale relative to the abutment could eventually lead to frost action behind the abutment.

Faults are present in the region. A minor fault whose orientation is about N7 degrees E cuts across the dam site according to the Geologic Map of New York State (See Geologic Map 1). The area is located within Zone 2 of the Seismic Probability Map but does have potential of a Zone 3.

Information on some of the larger earthquakes for the area is tabulated below:

Date	Intensity - Modified Mercalli	Location Relative to Dam
1845	VI	22 mi SSE
1907	IV	8 mi W
1916	IV-V	10 mi NW
1916	V	35 mi NNE
1931	VII	42 mi N
1955	V	12 mi NNE
1958	IV	10 mi S

Many earthquakes of lesser intensity are known to have occurred in the region, according the the records of the New York State Geological Survey. Two of these were located about 2 miles west of the dam site.

c. Data Review and Stability Evaluation

Design drawings available for review show cross-sections for the various structural elements comprising the dam facility but do not include information on the properties of the dam and foundation materials, nor stability analysis. As part of the present study, stability evaluations have been performed for the dam/spillway sections. Actual properties of the dam's construction materials and foundations were not determined as part of this study; where information on properties were necessary for computations but lacking, assumptions felt to be practical were made. These stability computations assumed a dam cross-section based on dimensions indicated by the plans included in this report. The analysis also assumed the dam section to be a monolith possessing necessary internal resistance to shear and bending occurring as a result of loading. It should be considered that in areas where deterioration has occurred the section dimensions would be less than indicated by the plans, with some adverse effect on the structural strength expected.

RESULTS OF STABILITY COMPUTATIONS

	Loading Condition	Factor of Safety* Overturning	Factor of Safety* Sliding**	Location of Resultant Passing through Base***
(I)	Water elevation at normal operating level, uplift on base plus 7.5 kip per lineal foot ice load acting.	1.4+(1)	6.1+(1)	0.36b(1)
(II)	Water elevations at 1/2 PMF levels, uplift acting on base as computed for normal operating conditions.	1.34+(2)	4.4+(2)	0.33b(2)
(III)	Water elevations at PMF levels, uplift acting on base as computed for normal operating conditions.	1.31+(2)	4.1+(2)	0.33b(2)

*These factors of safety indicate the ratio of moments causing overturning to those moments resisting, and the ratio of forces causing sliding to those resisting.

**As determined applying the friction-shear method.

***Indicated in terms of the dam's base dimension, b, measured from the toe of the dam.

(1) Not considering affects of passive resistance at toe

(2) Includes affects of some passive resistance at toe

The results of the stability computations are summarized in the preceeding table. The stability analyses are included in Appendix D.

The analysis indicate the dam is stable when subject to forces possible during normal operations, and the 1/2 PMF and PMF conditions.

Critical to the analysis and resulting indication of stability are the items of uplift water pressures acting on the base of the dam and relative permeabilities of the site's foundation rock. For the "normal operating conditions" case, the analysis uplift force was based on a full headwater hydrostatic pressure acting on the dam's upstream corner and a full tailwater hydrostatic pressure acting at the dam's downstream corner. Uplift pressures were assumed to vary linearly between the dam's upstream and downstream corner, and act upon 100 percent of the dam's base. The resulting uplift force represents a condition that is significant in arriving at the computed factors of safety for the normal operations condition.

Uplift as computed for the normal operating condition was also assigned for the flood conditions studied, it being assumed that uplift pressures would not increase significantly over a relatively short flood stage time period because of expected low foundation rock permeability.

Though the computations indicate the dam facility will be stable for the loading conditions studied, the analyses have been based on having dam sections which possess structural integrity related to sound and undeteriorated construction materials. Field inspection observations indicate that concrete deterioration is occurring at numerous locations in the various dam sections. For assurance of stability, maintenance and repair need be undertaken to rehabilitate the structural concrete comprising the spillway and abutment strutures. Areas where erosion of rock close to any dam or abutment section has occurred should be protected by means of a concrete overlay or other method. The maintenance/repair program should include an inspection with the reservoir level slightly below spillway elevation to detect possible through-the-dam and under-dam seepage. An inspection should also be performed with a lowered reservoir to evaluate the physical condition of the dams upstream face.

SECTION 7 - ASSESSMENT/REMEDIAL MEASURES

7.1 DAM ASSESSMENT

a. Safety

The Phase I inspection of the Vischer Ferry Dam at Lock No. 7 did not indicate conditions which constitute an immediate hazard to human life or property. The sluice gate structure controlling discharge from the impoundment is presently inoperative. However, contracts have been awarded for the reconstruction of this facility. Although the dam will be topped by the 1/2 PMF event, the spillway is not considered seriously inadequate since the stability computations indicate that the dam is stable under the 1/2 PMF event. The structural stability analysis indicates that the dam remains stable under all of the loading conditions prescribed by the Corp of Engineers' criteria.

The following specific safety assessments are based on the Phase I visual examination, analysis of hydrology and hydraulics, and structural stability:

1. The sluice gate structure which controls flow from the impoundment is severely deteriorated and is inoperative at the present time.

2. The spillway structure has experienced substantial deterioration of the concrete surfaces. One section of the northerly spillway structure has deteriorated to the depth of approximately 6 inches at the crest of the spillway.

3. A shale strata at the south abutment of the northerly spillway section has been displaced and a void remains behind the abutment wall.

b. Adequacy of Information

The information available is adequate for this Phase I inspection. Design and construction information is limited to the construction plans.

c. Urgency

The sluice gate structure is in a serverely deteriorated condition. Indications are that the sluice gates are inoperative at the present time. The New York State Department of Transportation indicates that a contract has been awarded for the repair of this structure. It is recommended that the structural investigative work begin within 3 months of notification and the remedial work be completed within two years.

d. Need for Additional Investigation

Further investigations should be undertaken to determine the extent of the deterioration of the spillway structures. Borings should be obtained and structural stability analysis performed on those sections of the spillway which have become deteriorated. A continued deterioration of concrete section could substantially affect the stability of the spillway section.

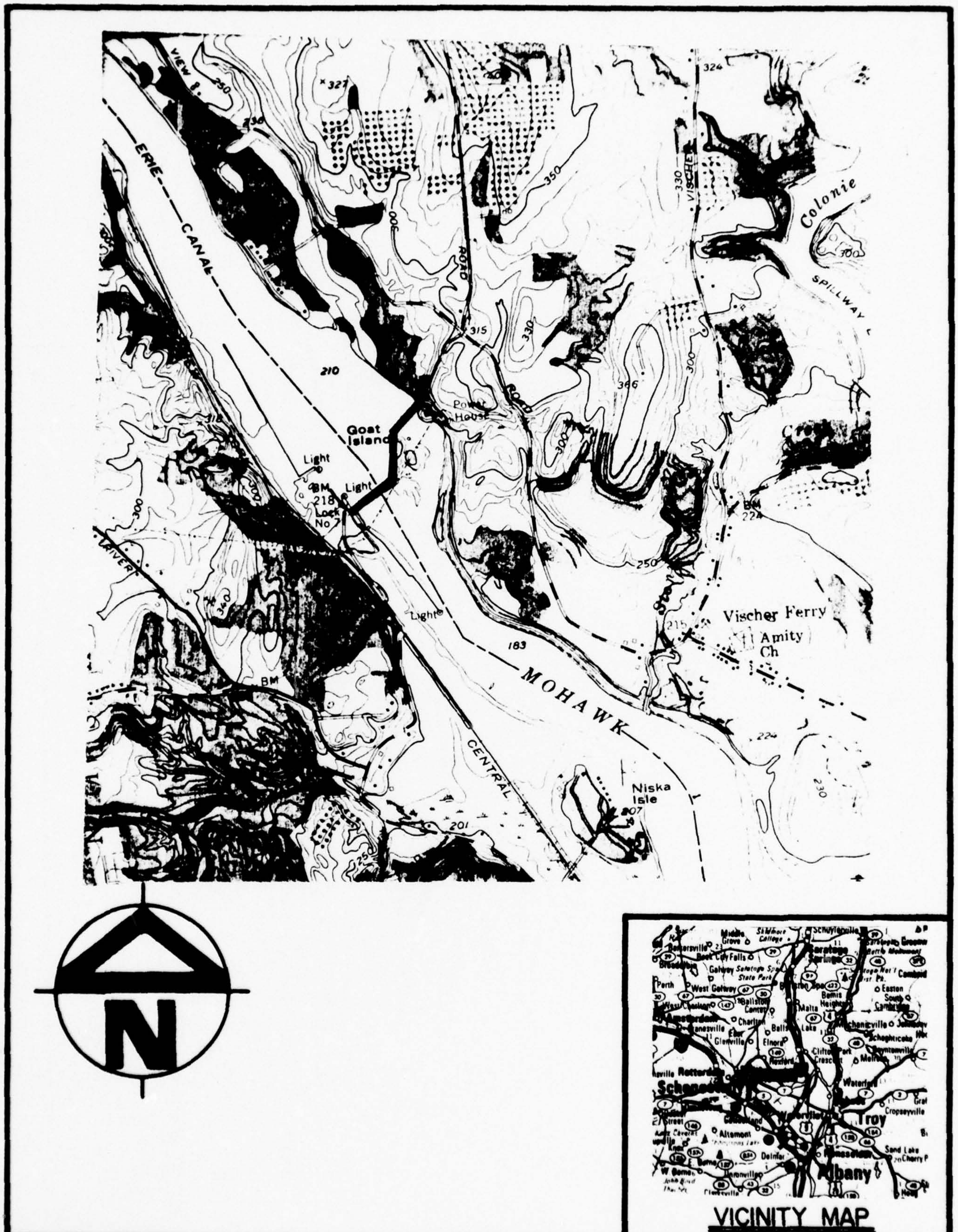
7.2 RECOMMENDED MEASURES

The following steps should be undertaken:

1. Investigate the extent of the deterioration of the spillway sections and the affect of this deterioration on the stability of this structure. Obtain borings and perform stability analysis on those sections of the spillway which have become deteriorated. Follow up with the necessary repairs as indicated by the investigation.

2. Repair the south abutment of the north spillway to prevent further deterioration of the shale foundation.

3. The outlet gates on the northern end of the dam are inoperative. The work on the reconstruction of the sluice gates structure which has been awarded for contract by the New York State Department of Transportation should be performed continuously until its completion.



LOCATION PLAN

FIGURE 1

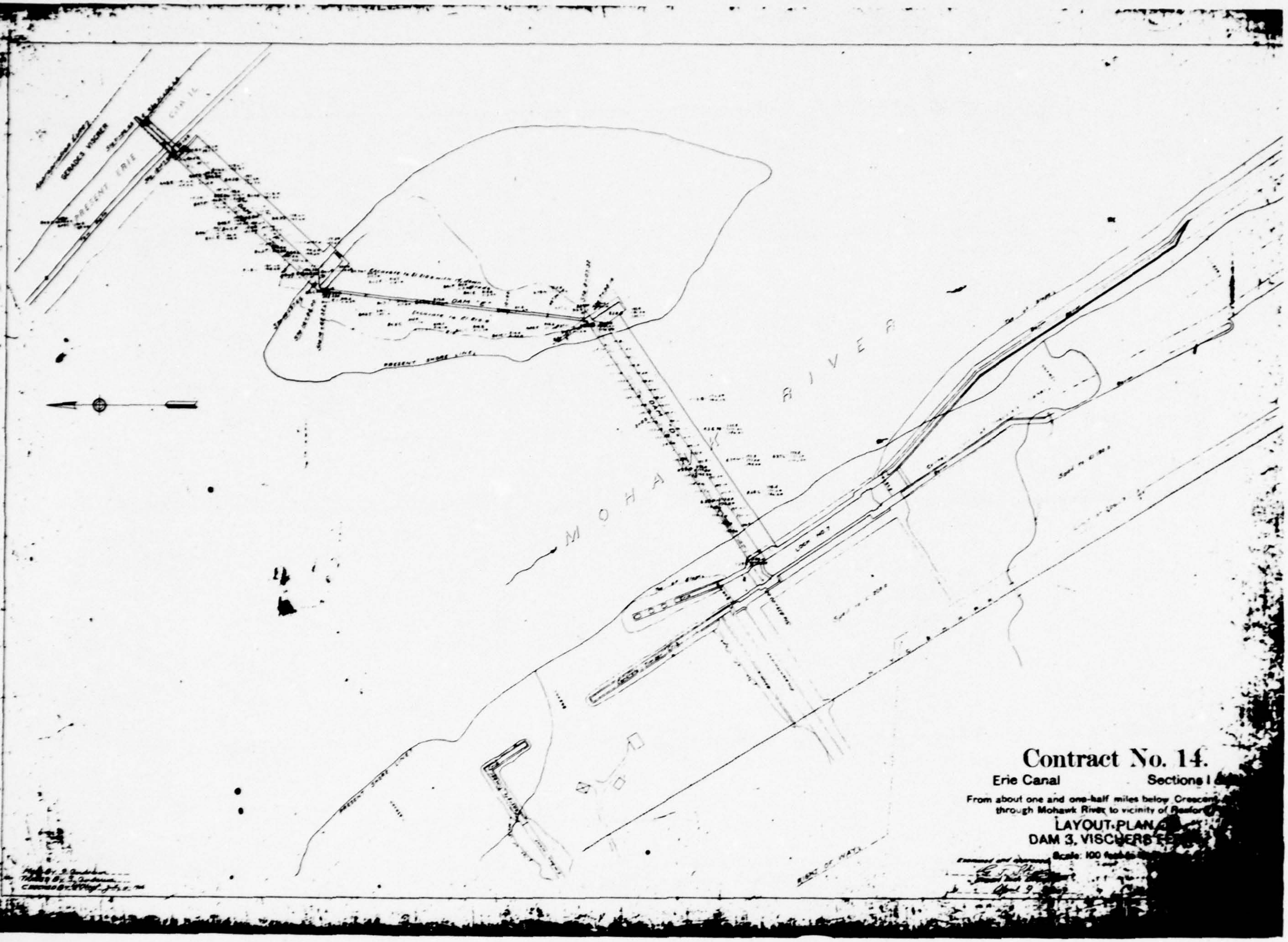

Contract No. 14.
Erie Canal
Sections I
From about one and one-half miles below Crescent
through Mohawk River to vicinity of
LAYOUT PLAN
DAM 3, VISCHERS
MOHAWK RIVER
PRESENT ERIE
PRESENT SHORE LINE
RIGHT OF WAY

FIGURE 2

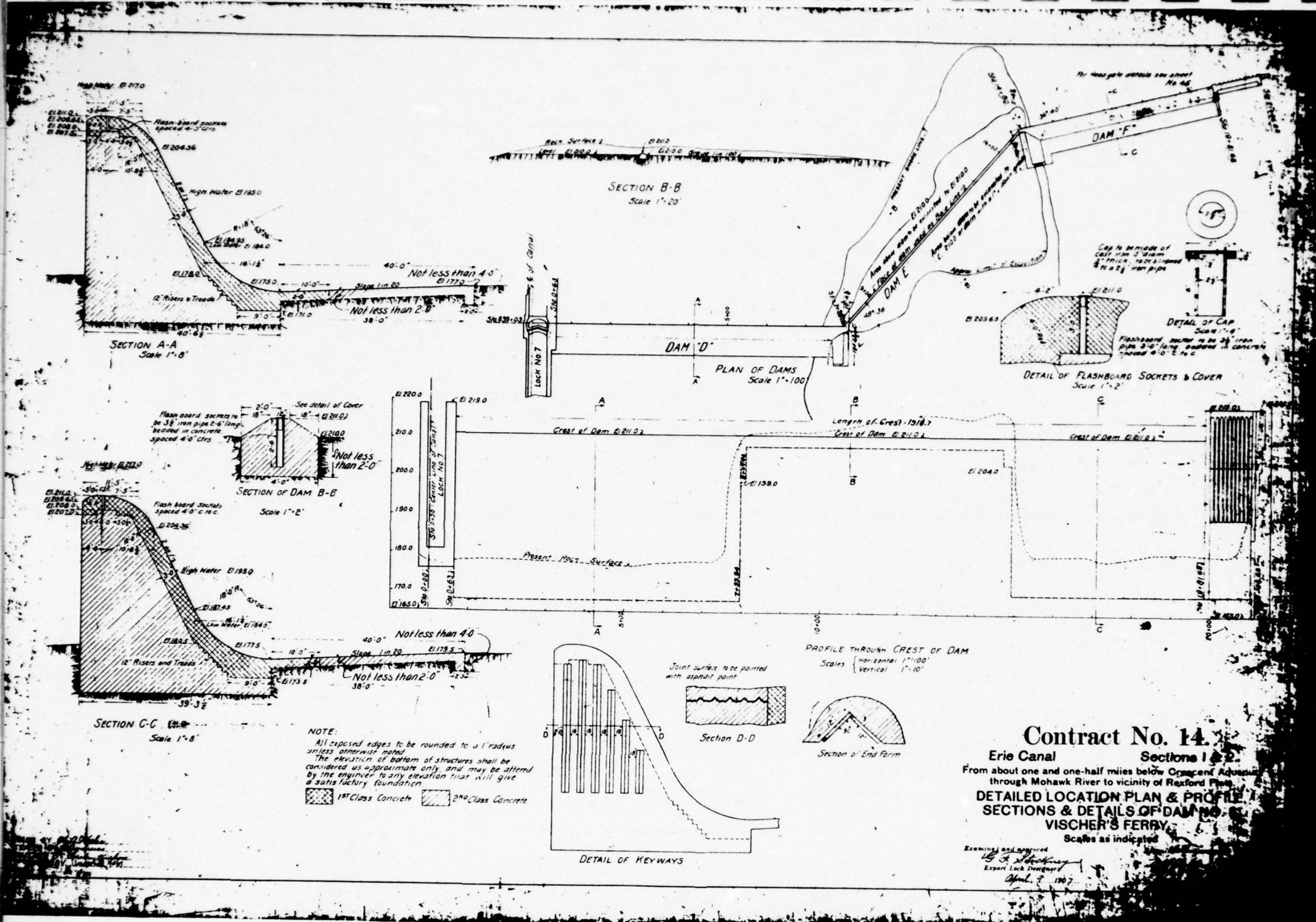
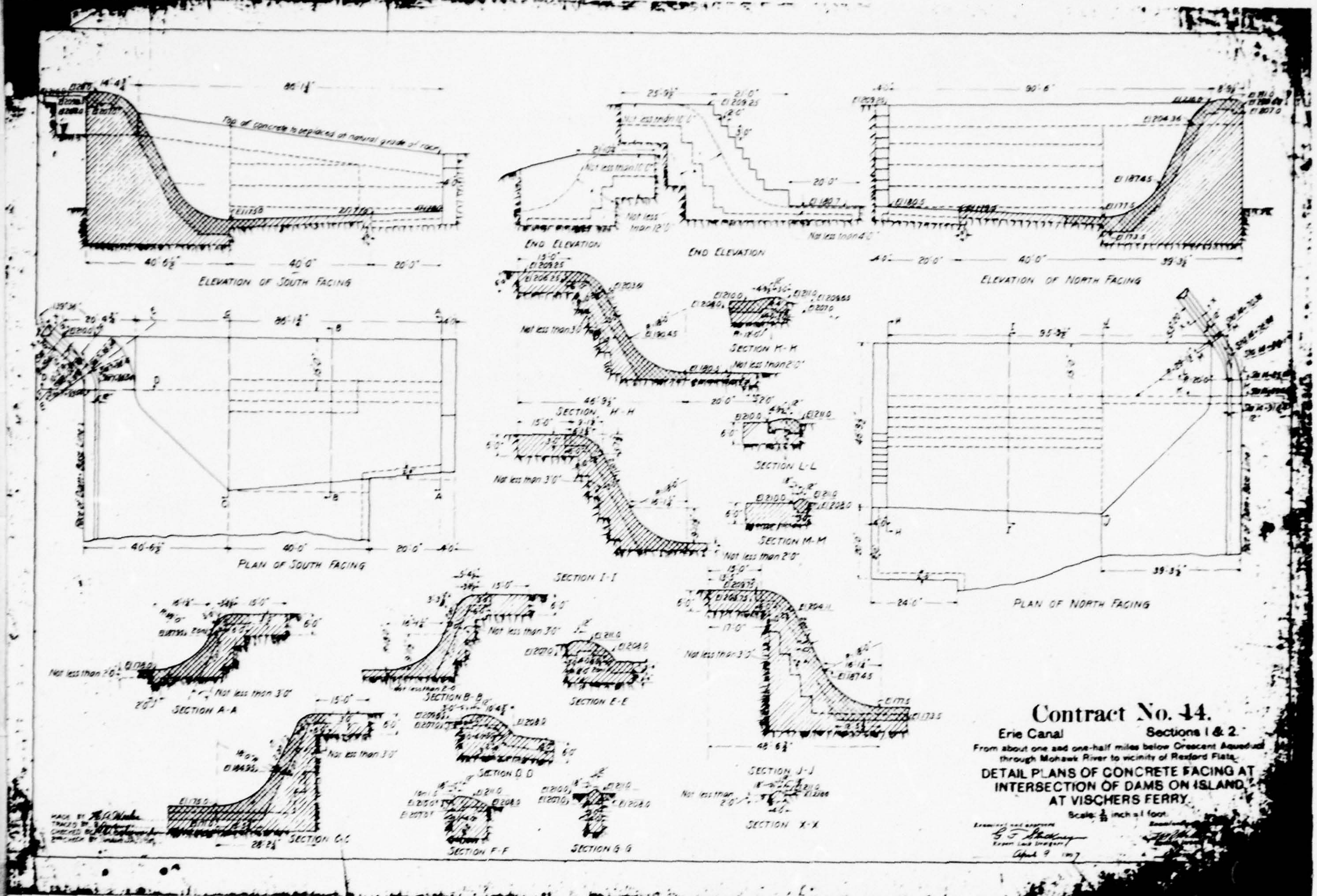
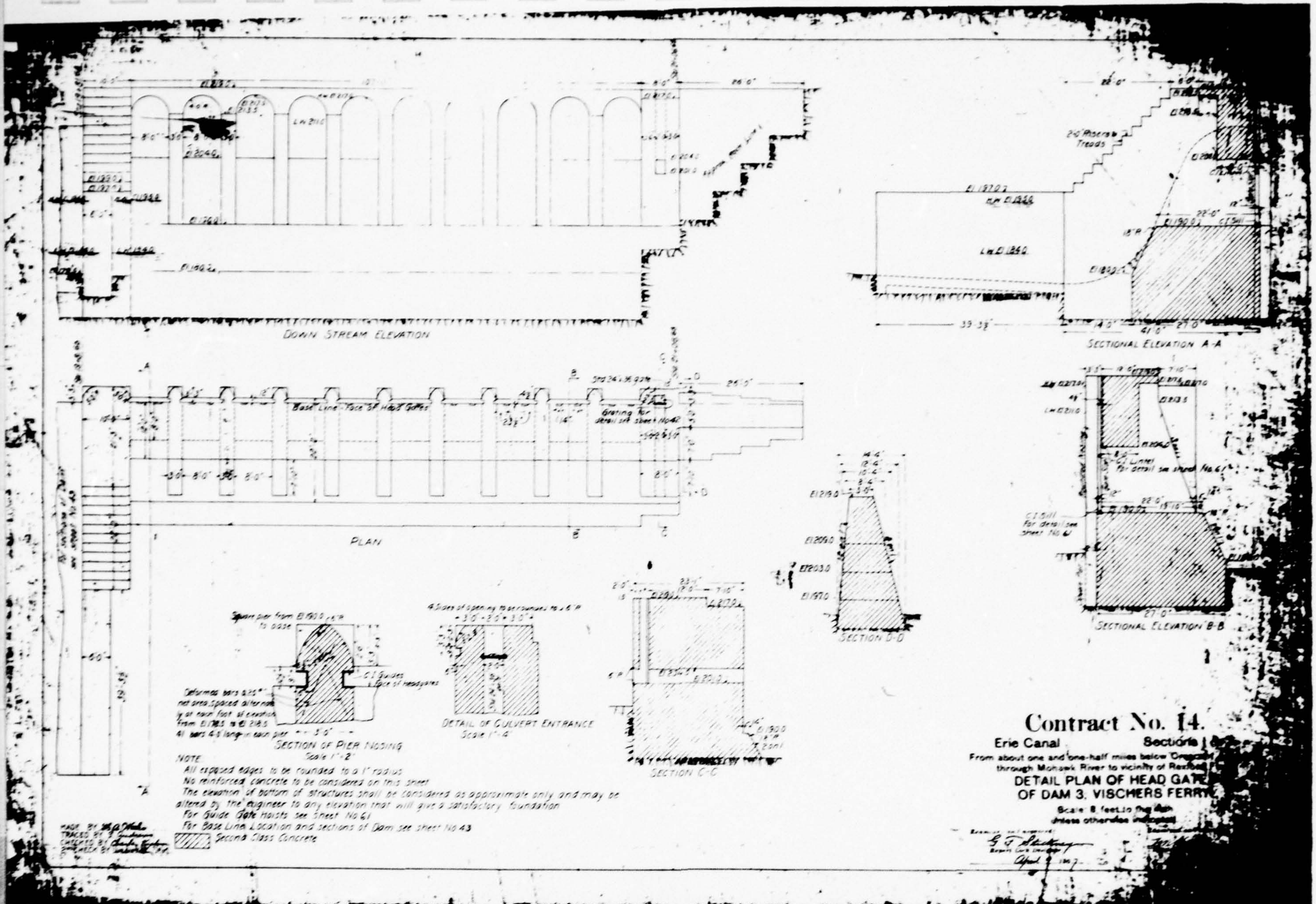

Contract No. 14.
Erie Canal
Sections 1 & 2.
From about one and one-half miles below Crescent Aqueduct through Mohawk River to vicinity of Rexford Flats
DETAILED LOCATION PLAN & PROFILE
SECTIONS & DETAILS OF DAM NO. 6
VISCHER'S FERRY
Scales as indicated
Examined and approved
Expert Lock Designer
April 7 1907
SECTION A-A
Scale 1"=8'
SECTION B-B
Scale 1"=20'
SECTION C-C
Scale 1"=8'
SECTION OF DAM B-B
Scale 1"=2'
PLAN OF DAMS
Scale 1"=100'
DAM "D"
DAM "E"
DAM "F"
Lock No 7
High Water El 195.0
Low Water El 184.0
12" Risers and Treads
Slope 1 in 20
Not less than 4'-0"
Not less than 2'-0"
Flash board sockets spaced 4'-0" c to c
Length of Crest - 1918.7
Crest of Dam El 211.0
Present Rock Surface
PROFILE THROUGH CREST OF DAM
Scales Horizontal 1"=100' Vertical 1"=10'
DETAIL OF FLASHBOARD SOCKETS & COVER
Scale 1"=2'
DETAIL OF CAP
Scale 1"=4"
DETAIL OF KEYWAYS
Section D-D
Joint surface to be painted with asphalt paint
Section of End Form
NOTE:
All exposed edges to be rounded to a 1" radius unless otherwise noted
The elevation of bottom of structures shall be considered as approximate only, and may be altered by the engineer to any elevation that will give a satisfactory foundation.
1st Class Concrete
2nd Class Concrete

FIGURE 3



Elevation of South Facing
Plan of South Facing
End Elevation
End Elevation
Elevation of North Facing
Plan of North Facing
Section H-H
Section I-I
Section K-K
Section L-L
Section M-M
Section A-A
Section B-B
Section C-C
Section D-D
Section E-E
Section F-F
Section G-G
Section J-J
Section X-X
Top of concrete to be placed at natural grade of rock
Contract No. 44.
Erie Canal
Sections 1 & 2.
From about one and one-half miles below Crescent Aqueduct through Mohawk River to vicinity of Rexford Flats.
DETAIL PLANS OF CONCRETE FACING AT INTERSECTION OF DAMS ON ISLAND AT VISCHERS FERRY.

FIGURE 4



DOWN STREAM ELEVATION
PLAN
SECTIONAL ELEVATION A-A
SECTIONAL ELEVATION B-B
SECTION C-C
SECTION D-D
SECTION OF PIER NOSING
Scale 1"=2'
DETAIL OF CULVERT ENTRANCE
Scale 1"=4'
Base Line - Face of Head Gates
2'-0" Risers & Treads
NOTE
All exposed edges to be rounded to a 1" radius
No reinforced concrete to be considered on this sheet
The elevation of bottom of structures shall be considered as approximate only and may be altered by the engineer to any elevation that will give a satisfactory foundation
For Guide Gate Hoists see Sheet No 61
For Base Line Location and sections of Dam see sheet No 43
Second Class Concrete
Contract No. 14.
Erie Canal
DETAIL PLAN OF HEAD GATE
OF DAM 3, VISCHERS FERRY

FIGURE 5

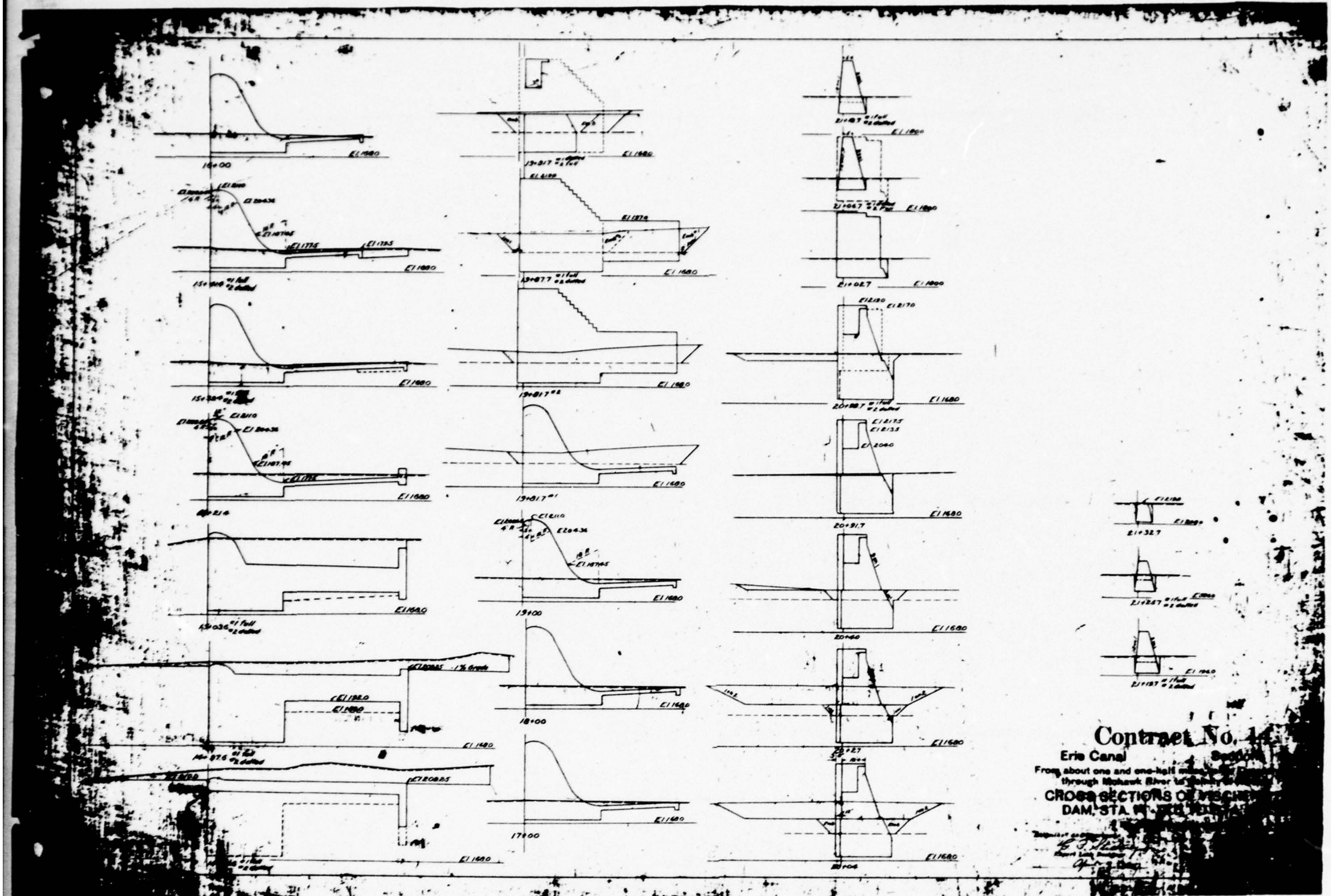


FIGURE 6

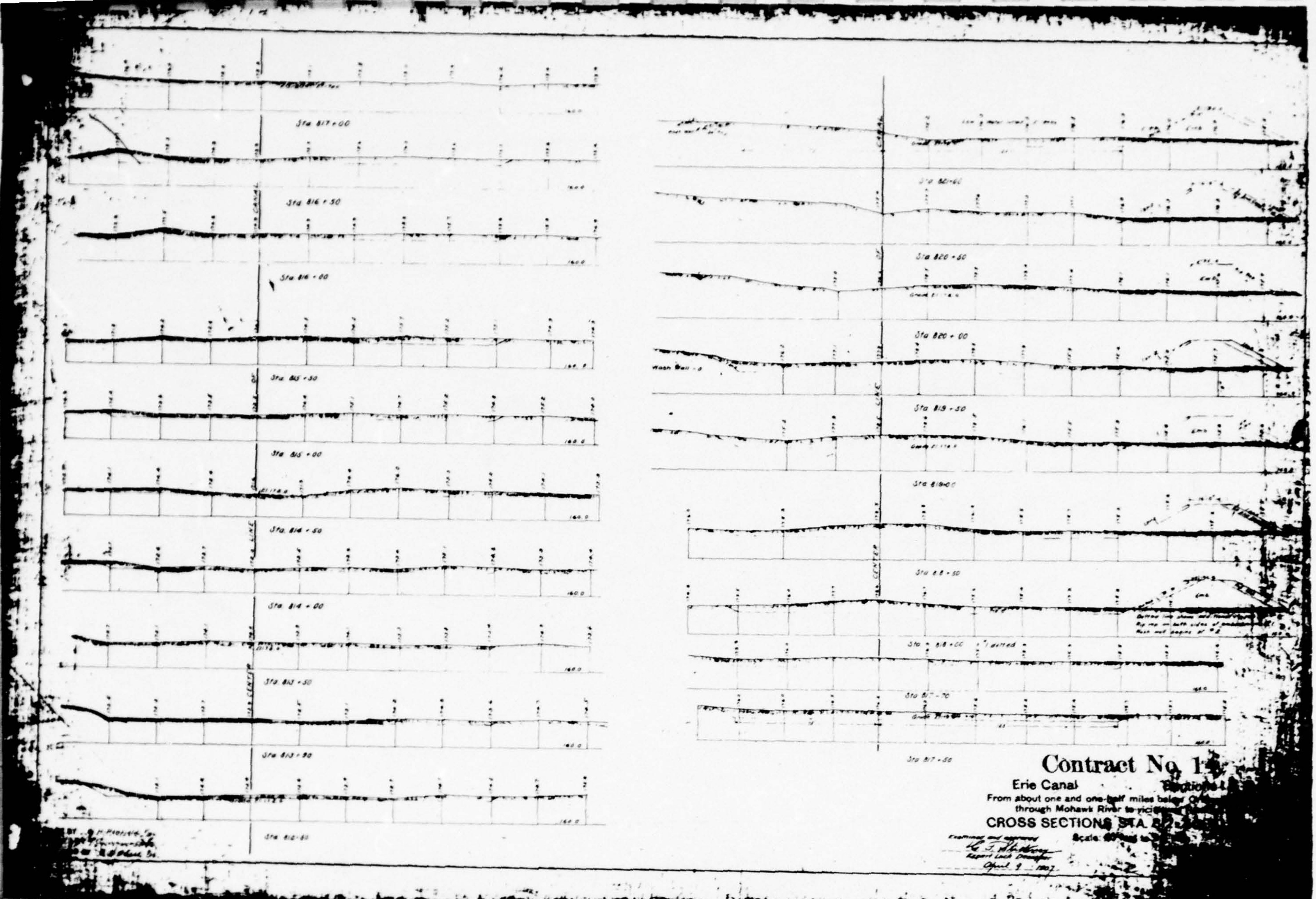

Sta 817+00
Sta 816+50
Sta 816+00
Sta 815+50
Sta 815+00
Sta 814+50
Sta 814+00
Sta 813+50
Sta 812+50
Sta 821+00
Sta 820+50
Sta 820+00
Sta 819+50
Sta 819+00
Sta 818+50
Sta 818+00
Sta 817+70
Sta 817+50
Contract No. 1
Erie Canal
From about one and one-half miles below
through Mohawk River
CROSS SECTIONS STA.
Scale:

FIGURE 7

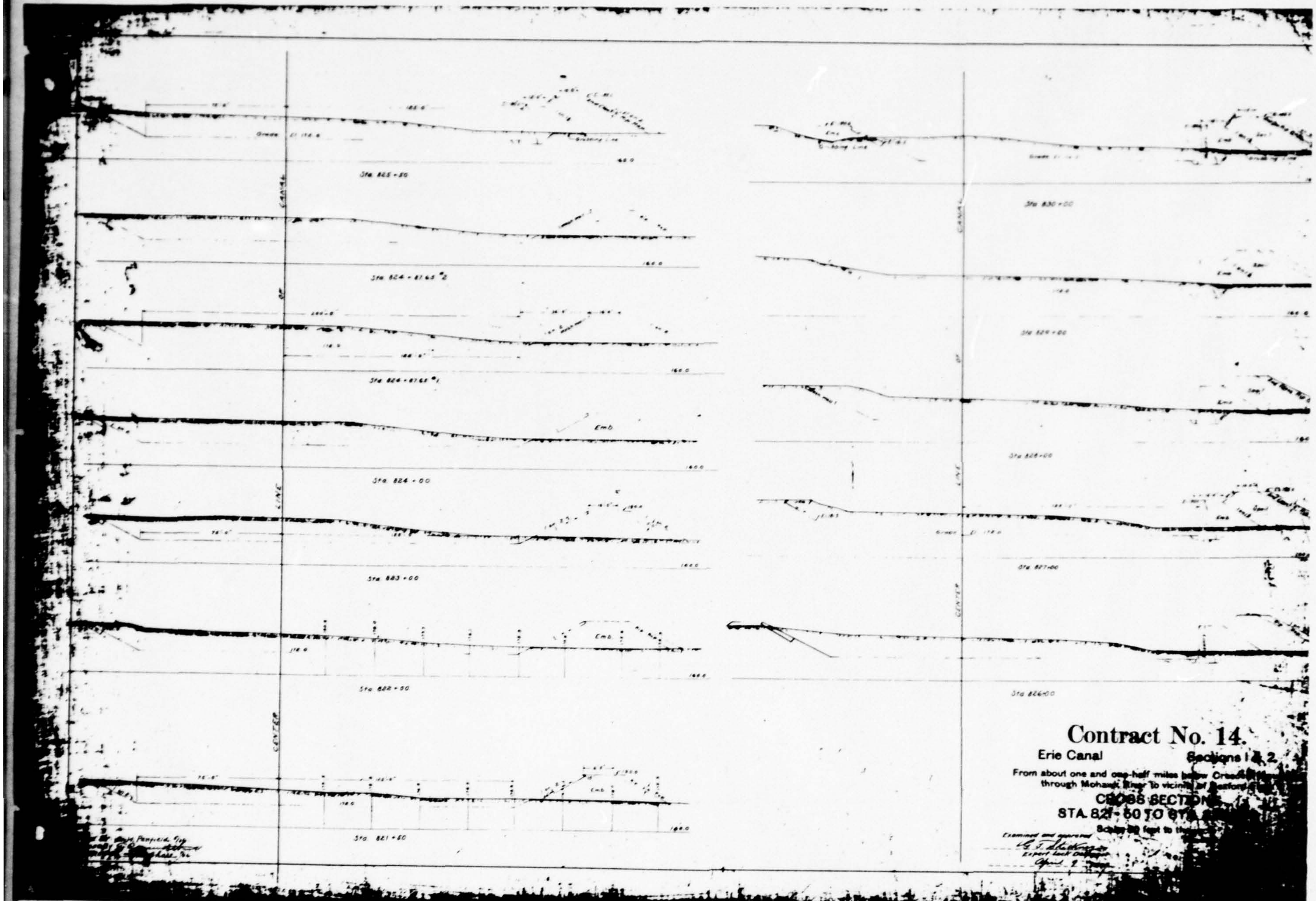

Contract No. 14.
Erie Canal
CENTER LINE OF CANAL
Sta 825+50
Sta 824+87.65 #2
Sta 824+87.65 #1
Sta 824+00
Sta 823+00
Sta 822+00
Sta 821+50
Sta 830+00
Sta 829+00
Sta 828+00
Sta 827+00
Sta 826+00
Emb

FIGURE 8

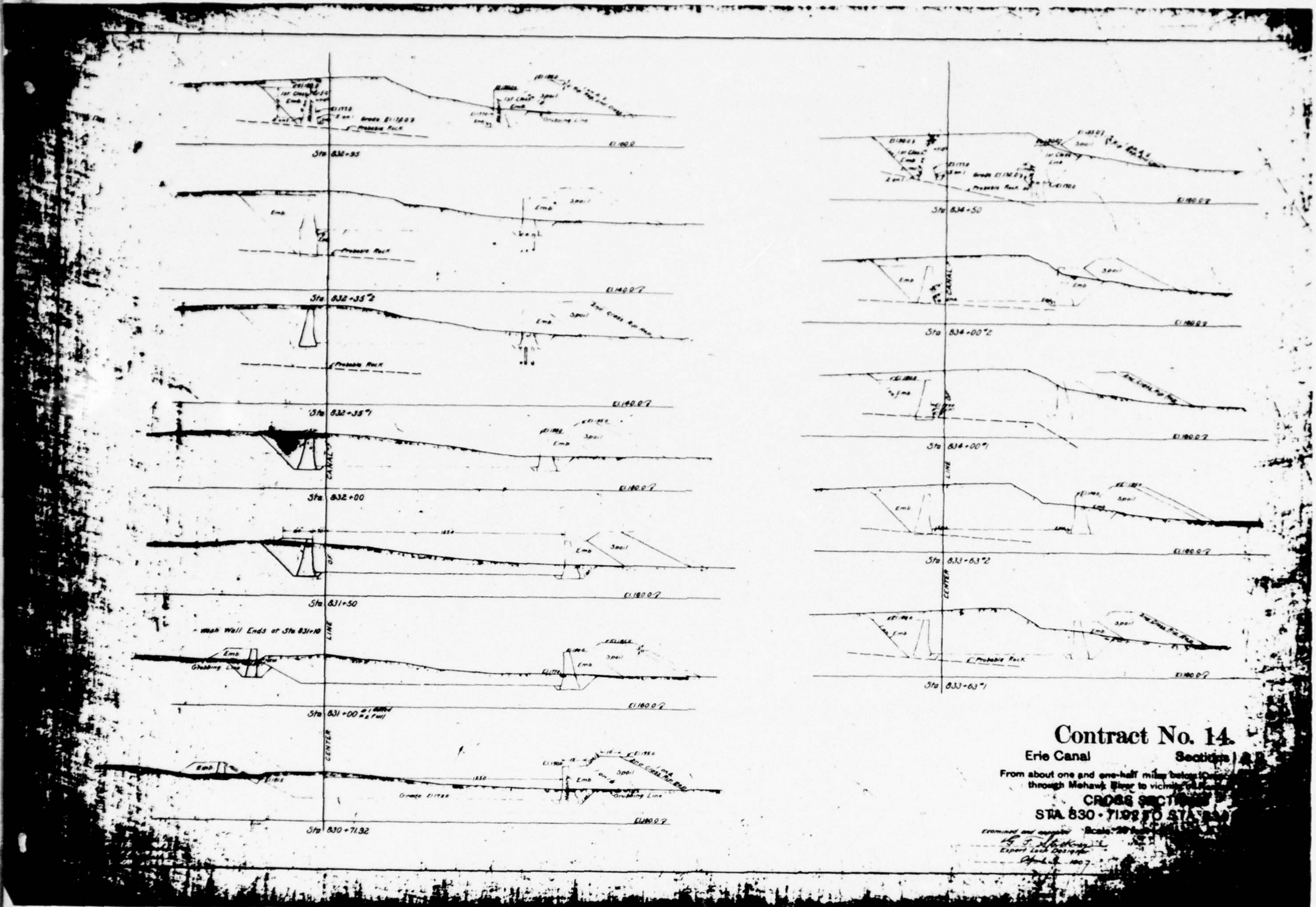

Sta 832+95
Sta 832+35 ^2
Sta 832+35 ^1
Sta 832+00
Sta 831+50
Sta 831+00
Sta 830+71.32
Sta 834+50
Sta 834+00 ^2
Sta 834+00 ^1
Sta 833+63 ^2
Sta 833+63 ^1
Probable Rock
Grubbing Line
Wash Wall Ends at Sta 831+10
Emb
Spoil
CENTER LINE OF CANAL
Contract No. 14.
Erie Canal
CROSS SECTIONS
STA. 830 + 71.32 TO STA

FIGURE 9

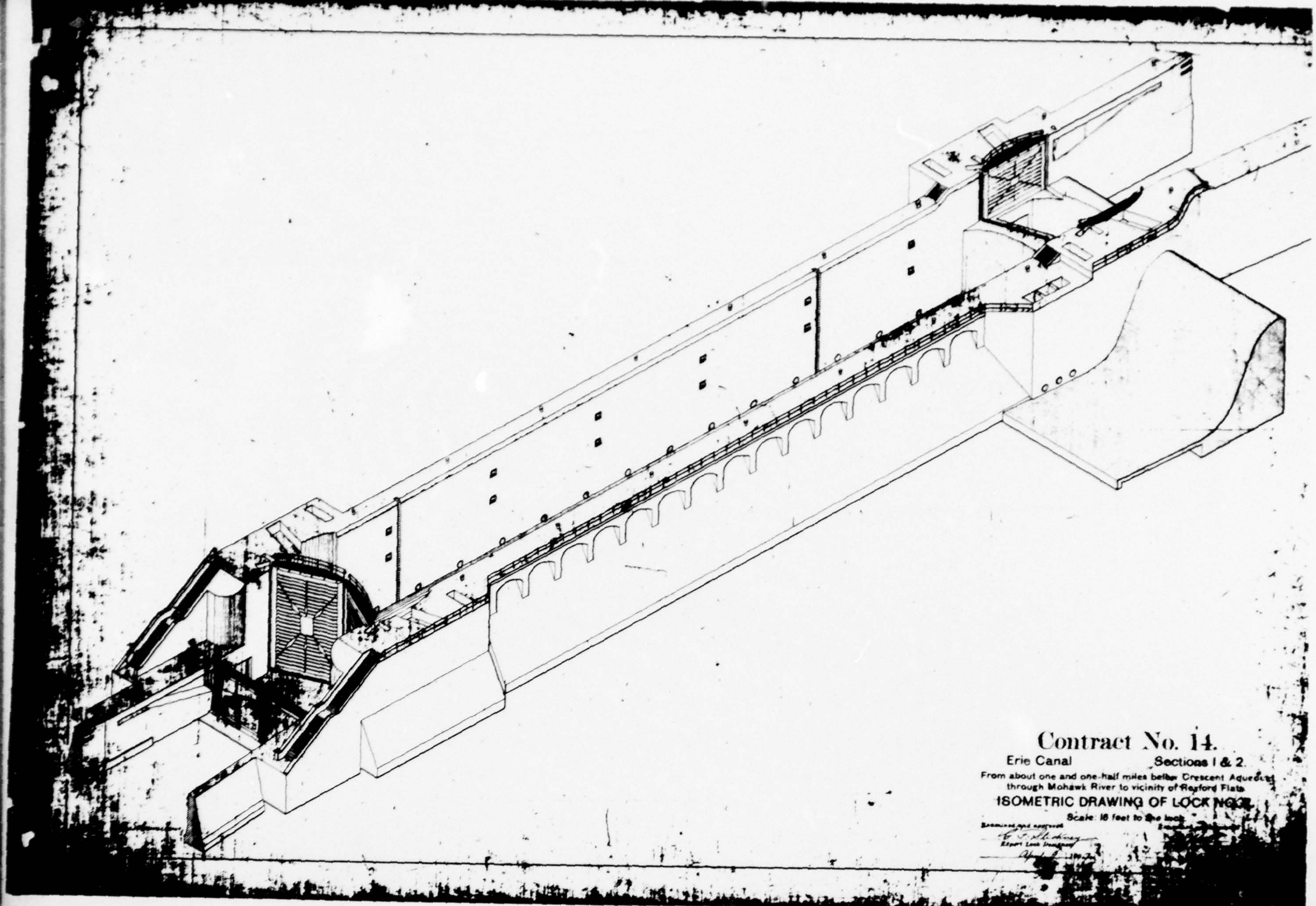
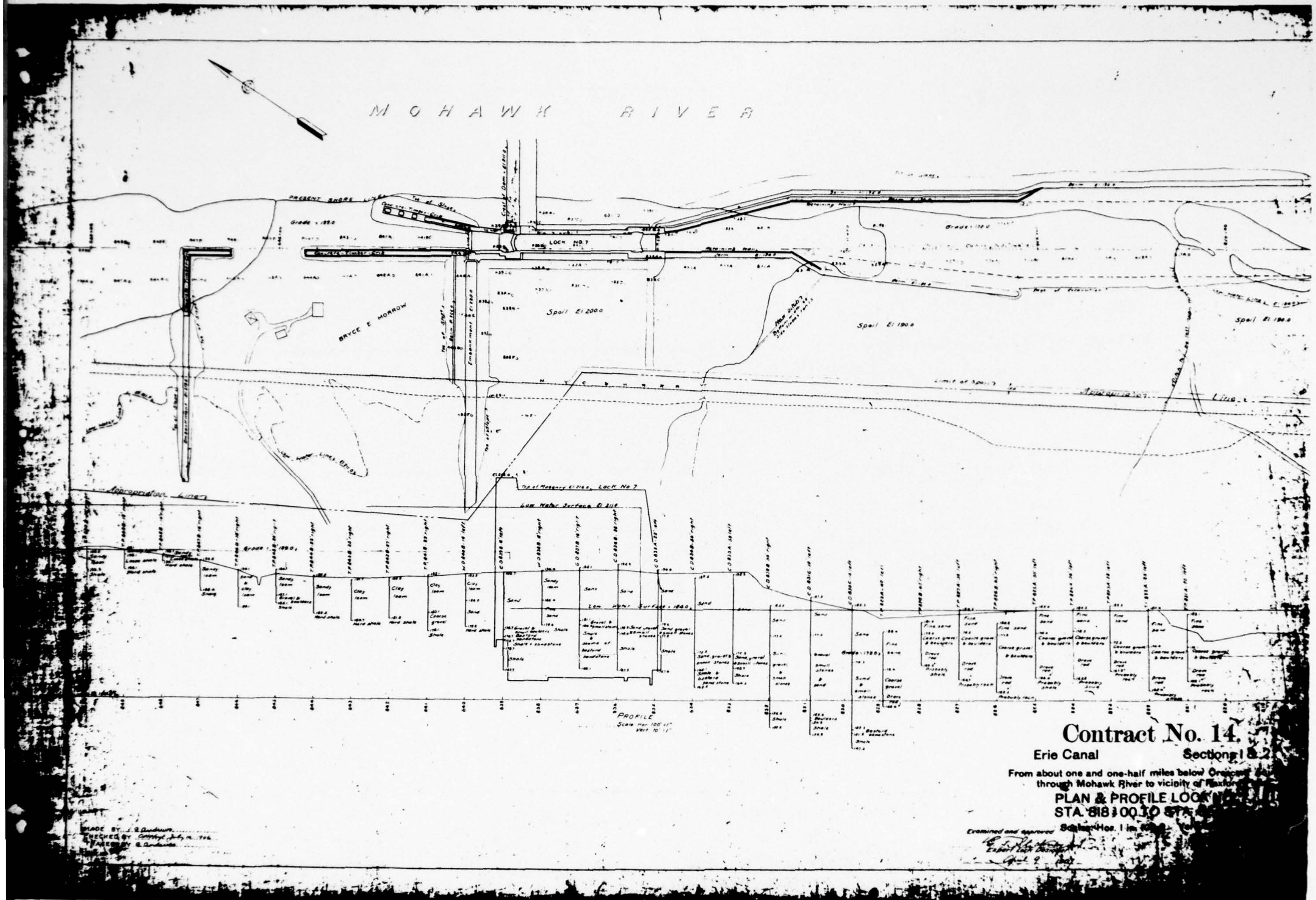
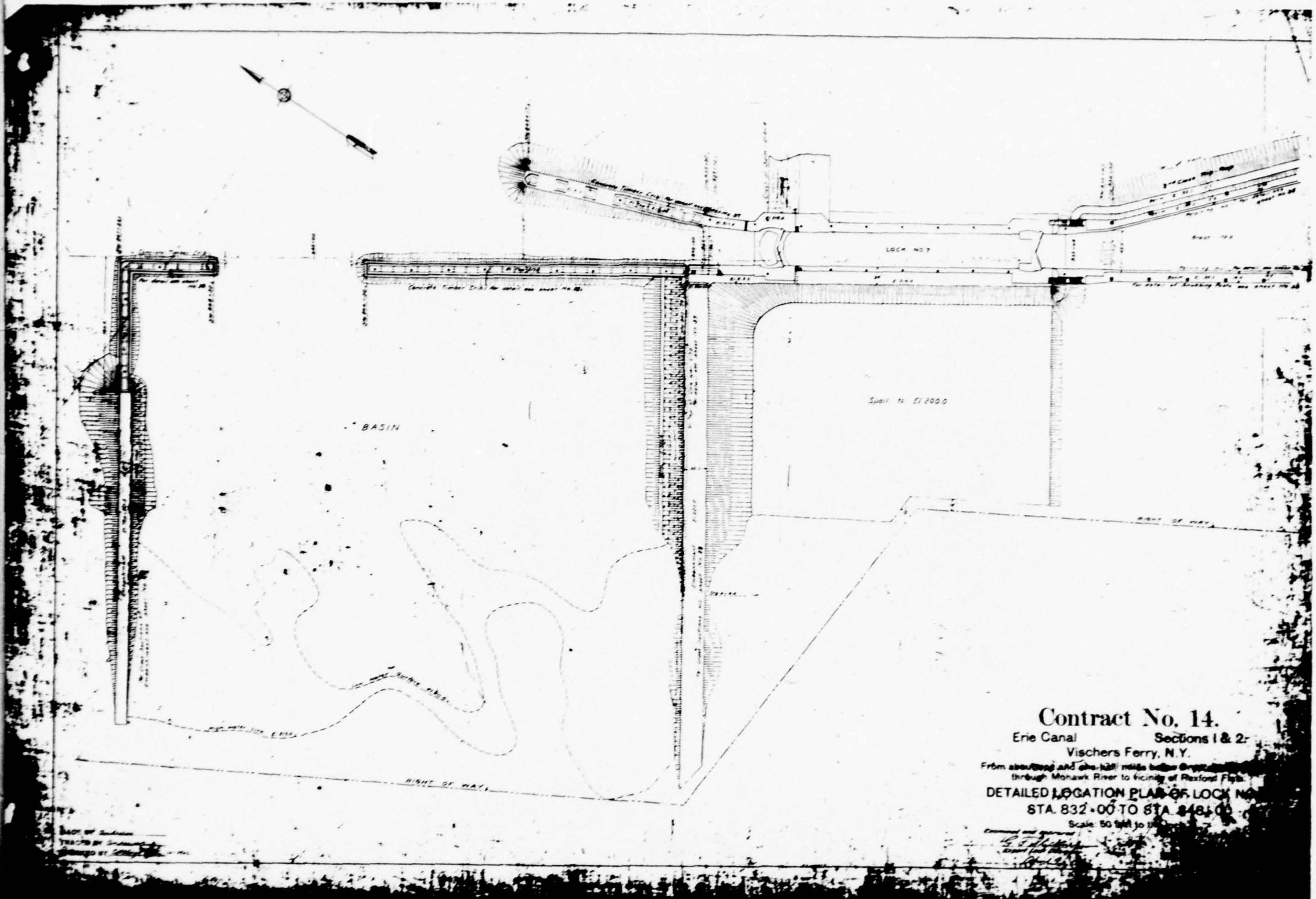

Contract No. 14.
Erie Canal
Sections I & 2.
From about one and one-half miles below Crescent
through Mohawk River to vicinity of
ISOMETRIC DRAWING OF LOCK
Scale: 16 feet to

FIGURE 10



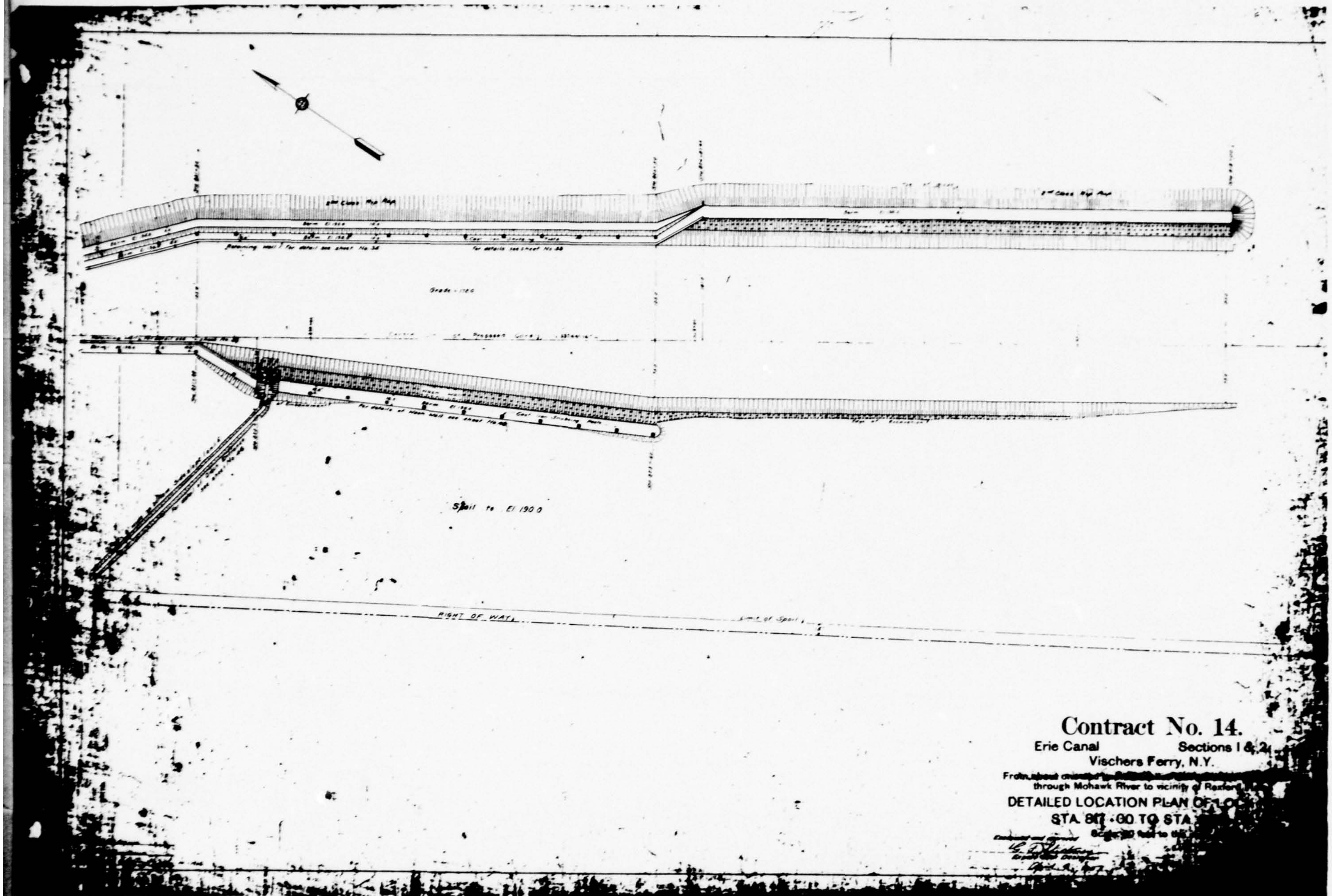
MOHAWK RIVER
PRESENT SHORE LINE
LOCK NO. 7
BRYCE E. MORROW
Spoil El 200.0
Spoil El 190.0
Spoil El 190.0
Appropriation Line
Limit of Spoil
Low Water Surface El 211.0
PROFILE
Contract No. 14.
Erie Canal
Sections 1 & 2
From about one and one-half miles below
through Mohawk River to vicinity of
PLAN & PROFILE LOCK
STA. 818+00 TO
Examined and approved

FIGURE 11



LOCK NO 7
BASIN
Spoil to El 200.0
RIGHT OF WAY
Contract No. 14.
Erie Canal
Sections 1 & 2
Vischers Ferry, N.Y.
through Mohawk River to vicinity of Rexford Flats
STA. 832+00 TO STA. 848+00

FIGURE 12



Grade
Spoil to El 190.0
RIGHT OF WAY
Limit of Spoil
Contract No. 14.
Erie Canal
Sections 1 & 2
Vischers Ferry, N.Y.
through Mohawk River to vicinity of Rexford
DETAILED LOCATION PLAN OF LO
STA. 8
+00 TO STA

FIGURE 13

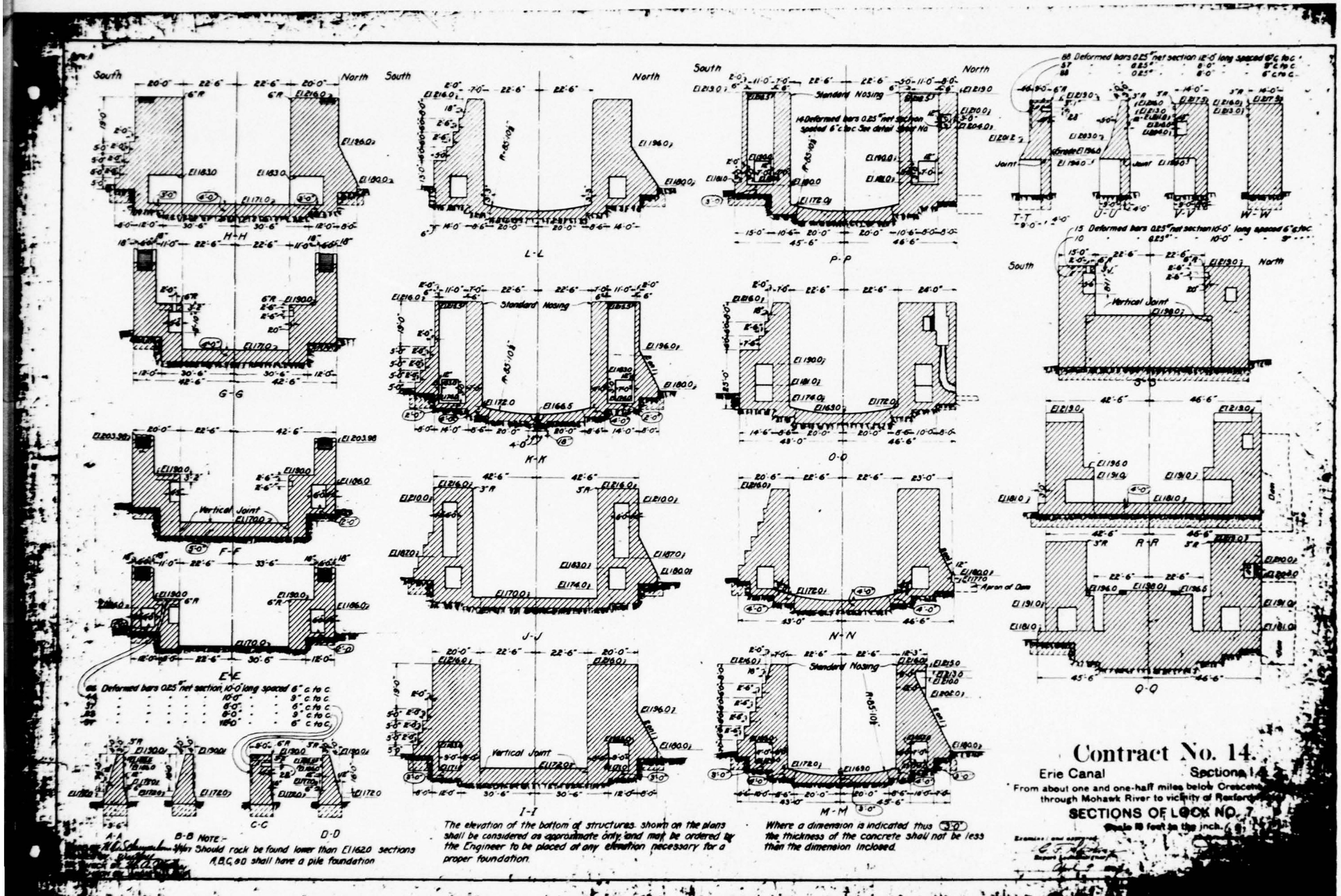
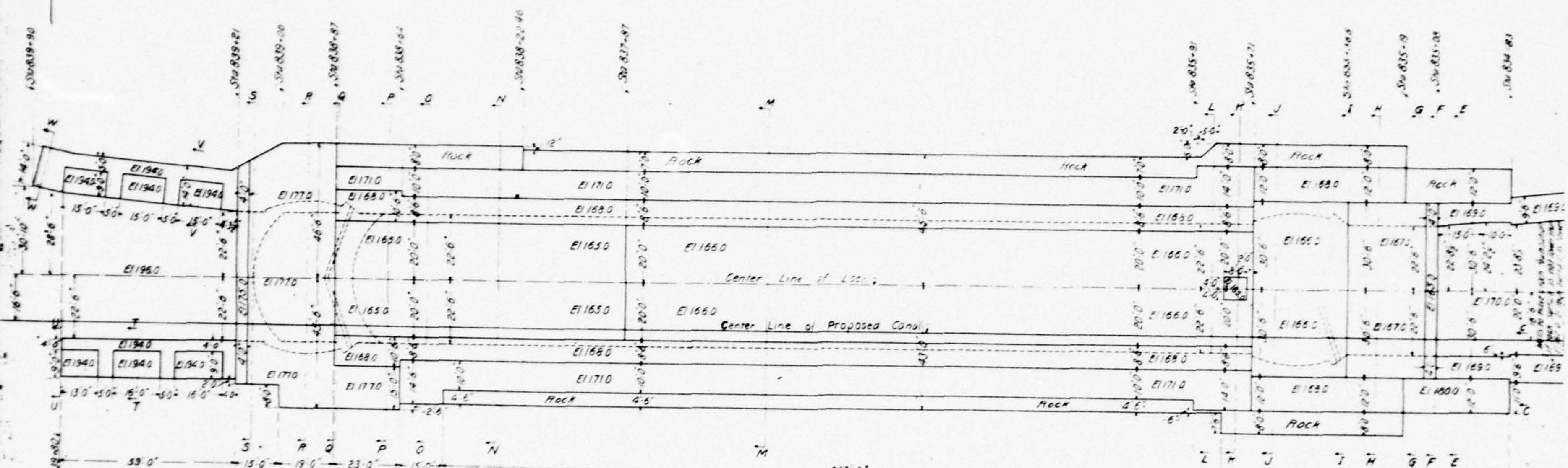

Contract No. 14.
Erie Canal
Sections
From about one and one-half miles below Crescent through Mohawk River to vicinity of Rexford
SECTIONS OF LOCK NO. 7
Scale 10 feet to the inch.
The elevation of the bottom of structures shown on the plans shall be considered as approximate only, and may be ordered by the Engineer to be placed at any elevation necessary for a proper foundation.
Where a dimension is indicated thus 3'-0" the thickness of the concrete shall not be less than the dimension inclosed.
NOTE:- Should rock be found lower than El.162.0 sections A,B,C, & D shall have a pile foundation
South
North
H-H
G-G
F-F
E-E
A-A
B-B
C-C
D-D
L-L
K-K
J-J
I-I
P-P
O-O
N-N
M-M
T-T
U-U
V-V
W-W
S-S
R-R
Q-Q
Standard Nosing
Vertical Joint
Apron of Dam

FIGURE 14



NOTE
The elevations of the bottom of the structure shown on the plan shall be considered as approximate only, and may be ordered by the Engineer to be placed at any elevation lower than the one shown necessary for a proper foundation.

Contract No. 14.

Erie Canal — **Sections 1 & 2.**

From about one and one-half miles below Crescent Aqueduct through Mohawk River to vicinity of Rexford Flats

FOUNDATION PLAN OF LOCK NO. 7

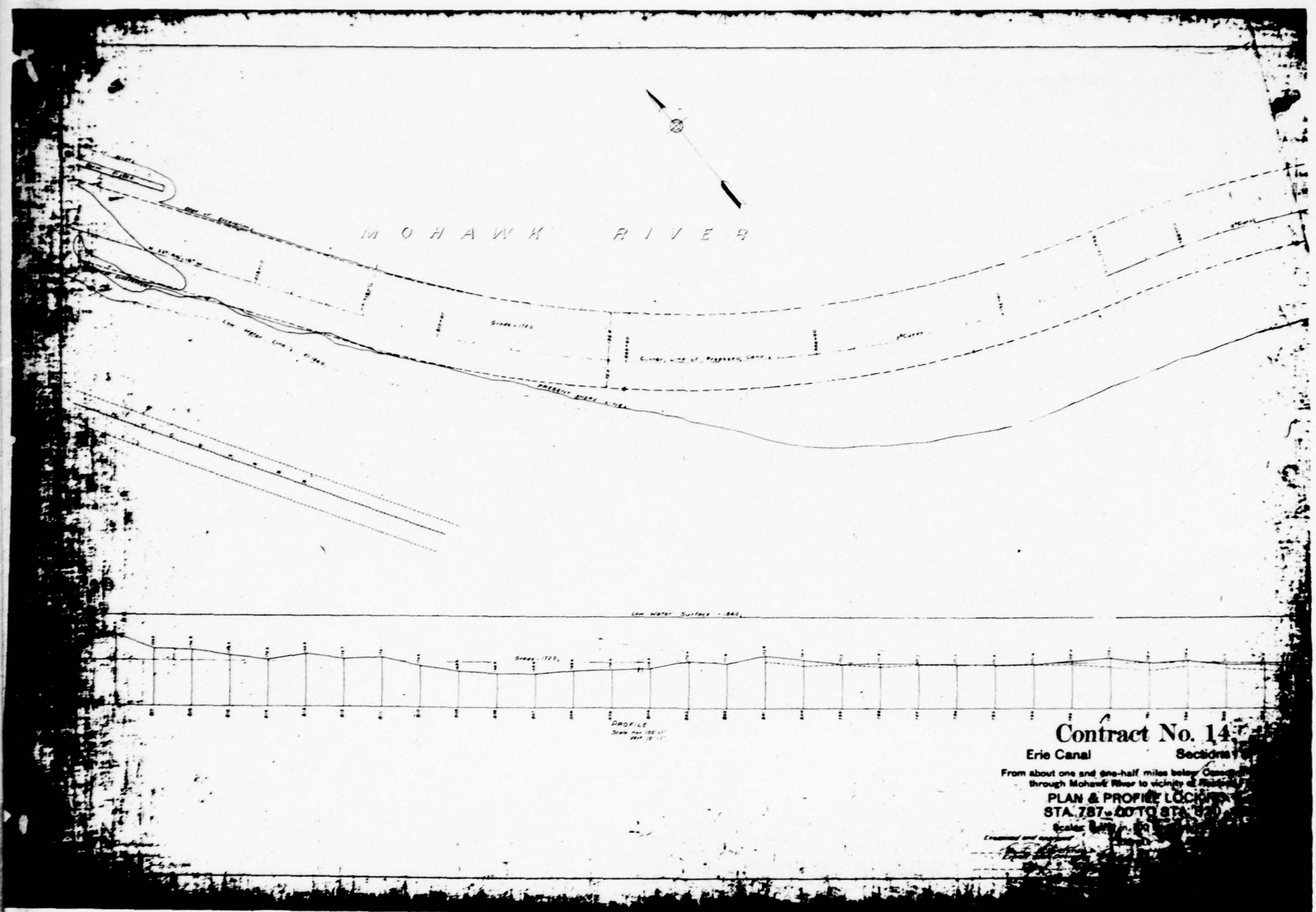
Scale 16 feet to the inch.

Made by H. C. Schumacher 3/4/07.
Traced by S. Quinn
Checked by
2nd Check by

Examined and approved
C. J. Stickney
Expert Lock Designer
April 9 1907

Examined and approved
Special Deputy
April 9

FIGURE 15



MOHAWK RIVER
Center Line of Proposed Canal
Present Shore Line
Low Water Line
Low Water Surface 184.0
PROFILE
Contract No. 14
Erie Canal
From about one and one-half miles below
through Mohawk River to vicinity of
PLAN & PROFILE LOCKING
STA. 787+00 TO STA.

FIGURE 16

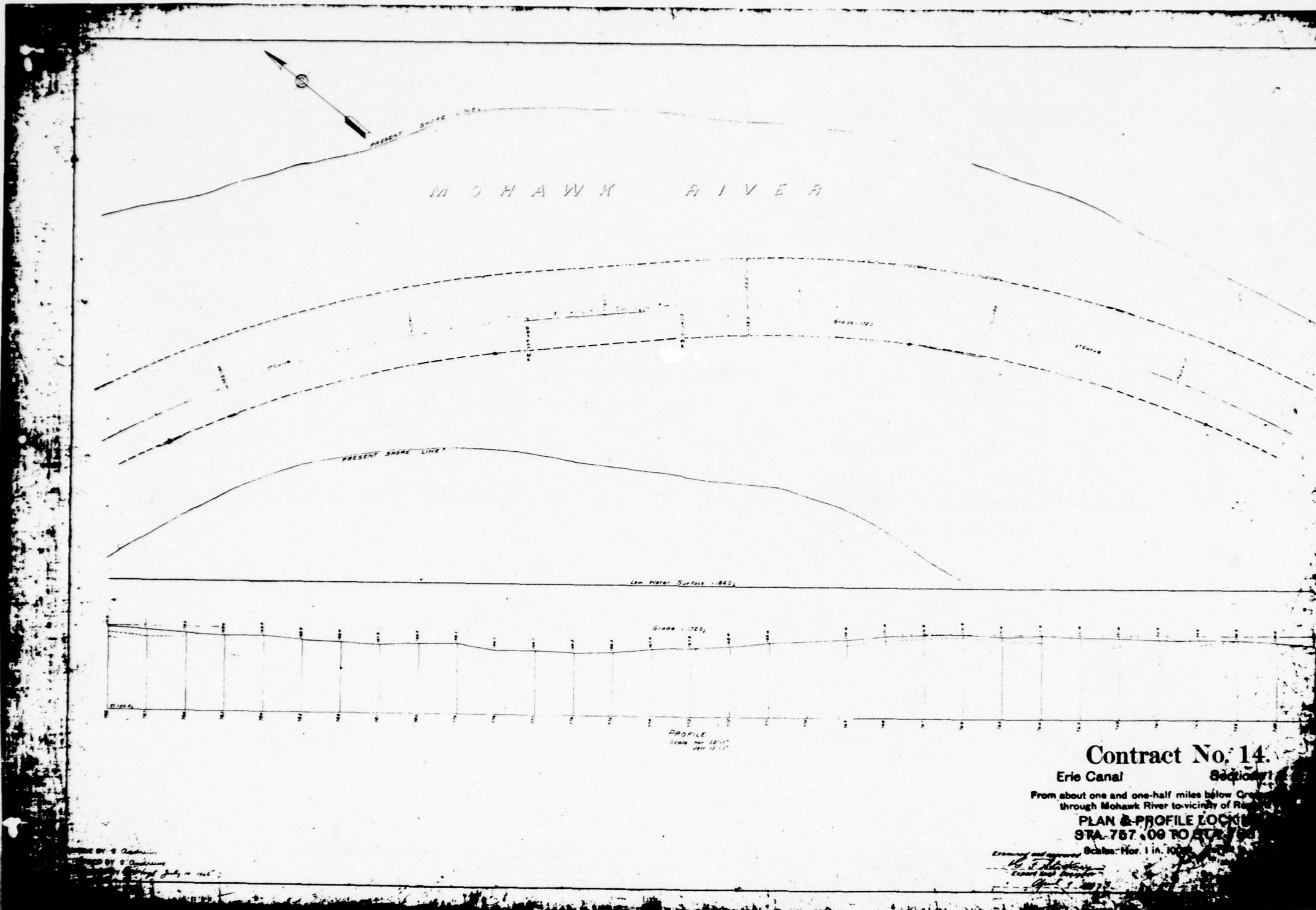

MOHAWK RIVER
PRESENT SHORE LINE
Low Water Surface
PROFILE
Contract No. 14.
Erie Canal
From about one and one-half miles below
through Mohawk River to vicinity of
PLAN & PROFILE LOCK
Examined and approved

FIGURE 17

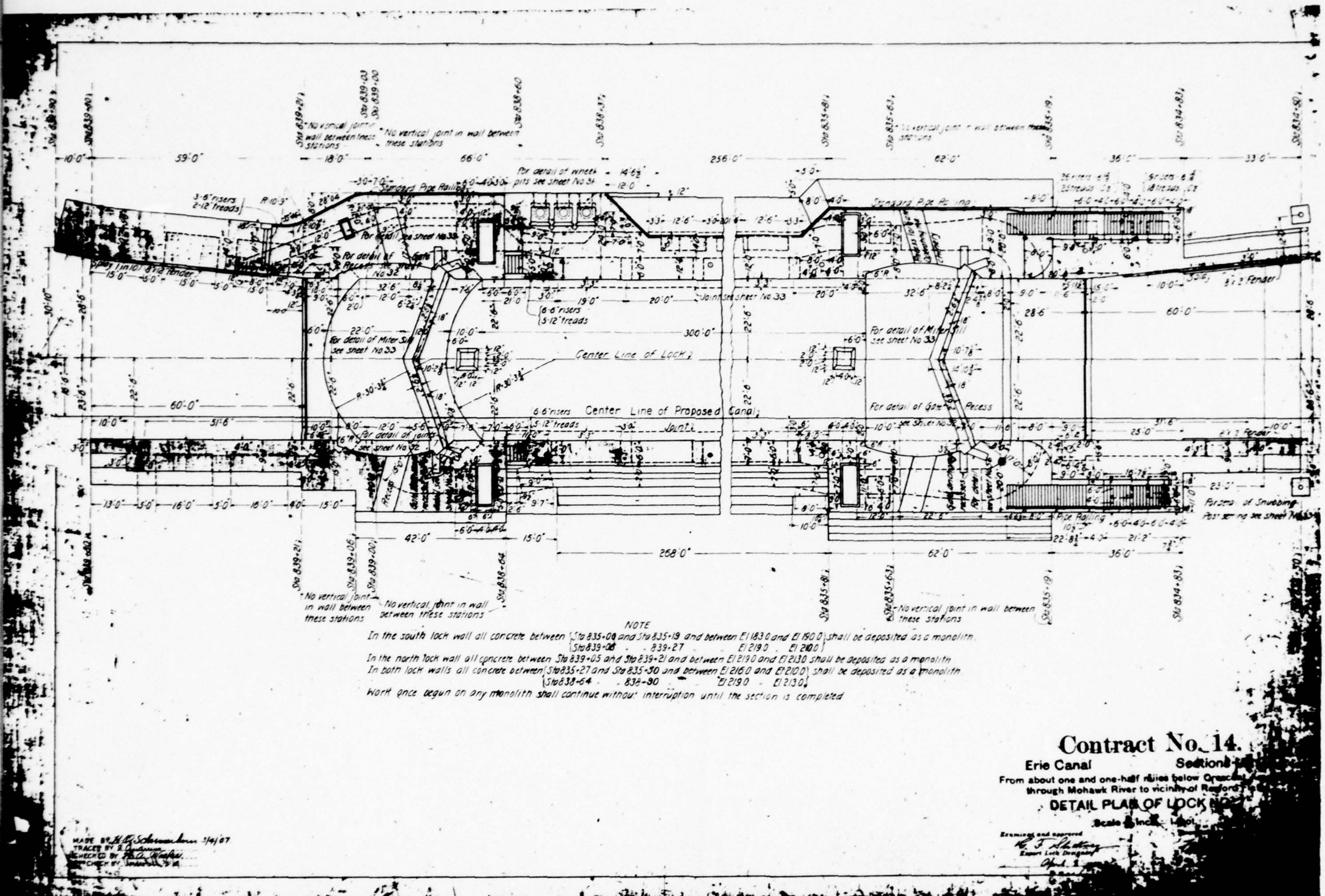

Center Line of Lock
Center Line of Proposed Canal
Standard Pipe Railing
NOTE
In the south lock wall all concrete between Sta 835+00 and Sta 835+19 and between El 183.0 and El 190.0 shall be deposited as a monolith.
Sta 839+08 . 839+27 . El 219.0 . El 210.0
In the north lock wall all concrete between Sta 839+05 and Sta 839+21 and between El 219.0 and El 213.0 shall be deposited as a monolith
In both lock walls all concrete between Sta 835+27 and Sta 835+50 and between El 216.0 and El 210.0 shall be deposited as a monolith
Sta 838+64 . 838+90 . El 219.0 . El 213.0
Work once begun on any monolith shall continue without interruption until the section is completed
Contract No. 14.
Erie Canal
From about one and one-half miles below Crescent through Mohawk River to vicinity of Rexford
DETAIL PLAN OF LOCK
Examined and approved

FIGURE 18

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
DESIGN AND CONSTRUCTION DIVISION

CHAPTER 542 LAWS OF 1939

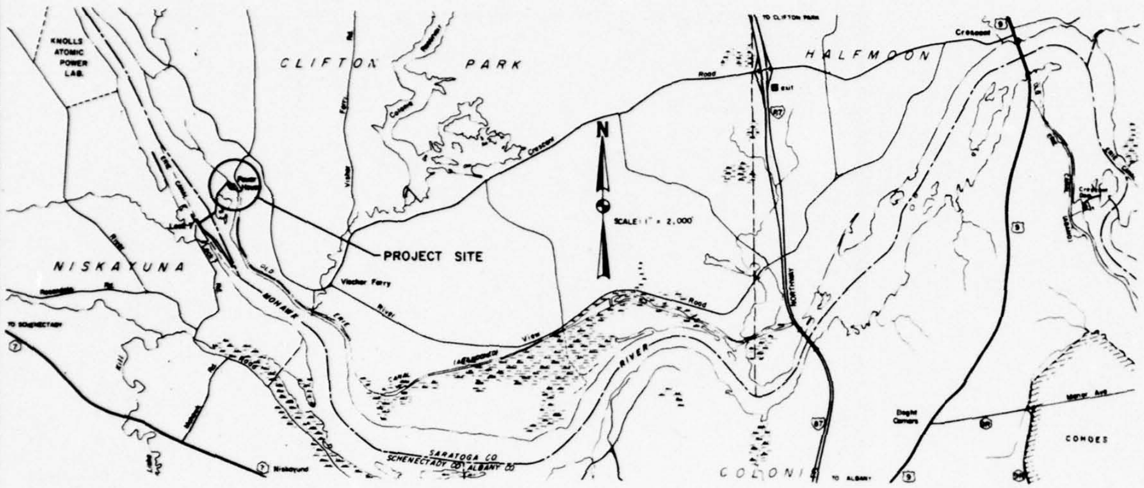
CONTRACT D96133
(Canal Reference No. M 79-1)
REHABILITATION OF DAM 3 AT VISCHER FERRY
TOWN OF CLIFTON PARK
SARATOGA COUNTY
SHEETS 1 THRU 9 INCLUSIVE
SCALES AS INDICATED

NEW GATES

	STATE		SHEET NO.	TOTAL SHEETS
1	N.Y.		1	9

REHABILITATION OF DAM 3 AT VISCHER FERRY, SARATOGA COUNTY

TYPE OF CONSTRUCTION



78 MOHAWK
NY 170

VISCHER FERRY DAM

RECOMMENDED BY 3/3/75
REGIONAL CONSTRUCTION ENGINEER DATE

RECOMMENDED BY 3/5/7
REGIONAL WATERWAYS MAINT ENGINEER DATE

PREPARED PURSUANT TO THE CANAL LAW AND RECOMMENDED BY
REGIONAL DIRECTOR DATE

APPROVED 19
JOSEPH R. STELLATO DIRECTOR WATERWAYS MAINT

TITLE.	SHEET		
STATE OF NEW YORK DEPARTMENT OF TRANSPORTATION			
DRAWING No. 1	MAP SCALE 1" = 2,000	DATE 12-78	REGION ONE

FIGURE 19

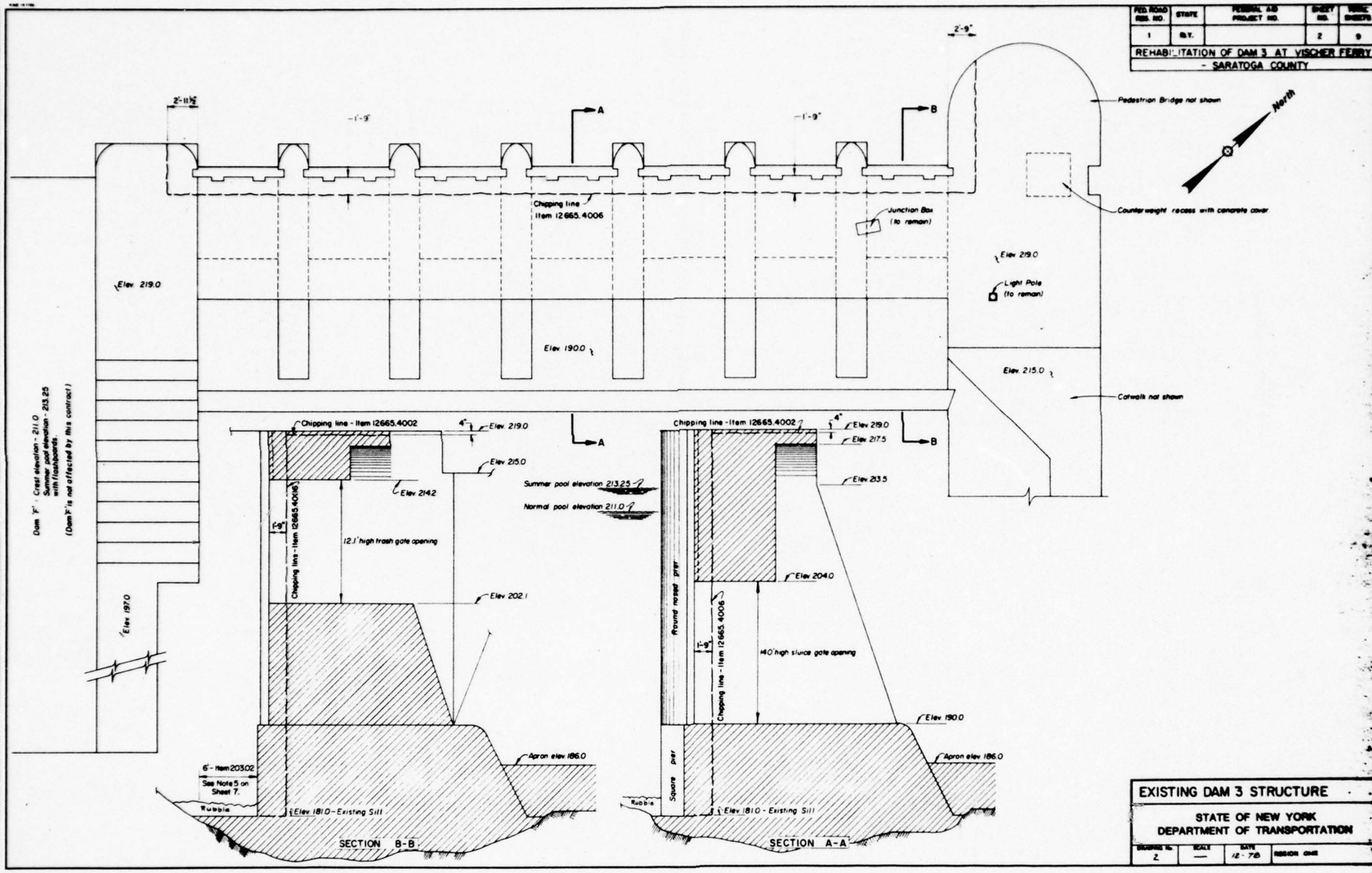

REHABILITATION OF DAM 3 AT VISCHER FERRY
- SARATOGA COUNTY
Pedestrian Bridge not shown
North
Counterweight recess with concrete cover
Junction Box (to remain)
Light Pole (to remain)
Elev 219.0
Elev 215.0
Catwalk not shown
Elev 190.0
Chipping line Item 12665.4006
Elev 197.0
Dam 'F' : Crest elevation - 211.0
Summer pool elevation - 213.25
with flashboards.
(Dam 'F' is not affected by this contract)
Chipping line - Item 12665.4002
Elev 214.2
12.1' high trash gate opening
Elev 202.1
Summer pool elevation 213.25
Normal pool elevation 211.0
Elev 217.5
Elev 213.5
Elev 204.0
14.0' high sluice gate opening
Round nosed pier
Square pier
Elev 190.0
Apron elev 186.0
6' - Item 203.02
See Note 5 on Sheet 7.
Rubble
Elev 181.0 - Existing Sill
SECTION B-B
SECTION A-A
EXISTING DAM 3 STRUCTURE
STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
12-78

FIGURE 20

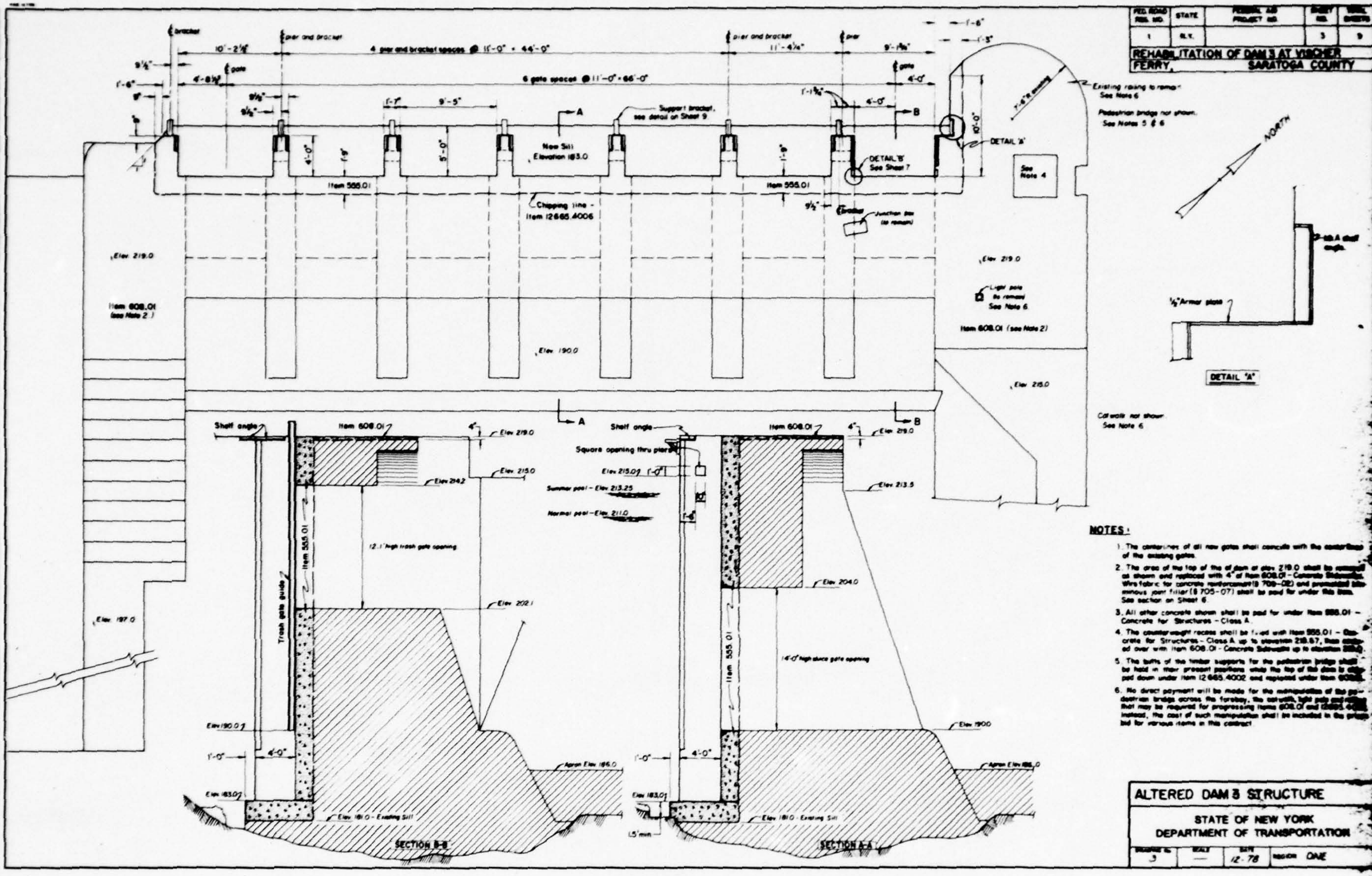
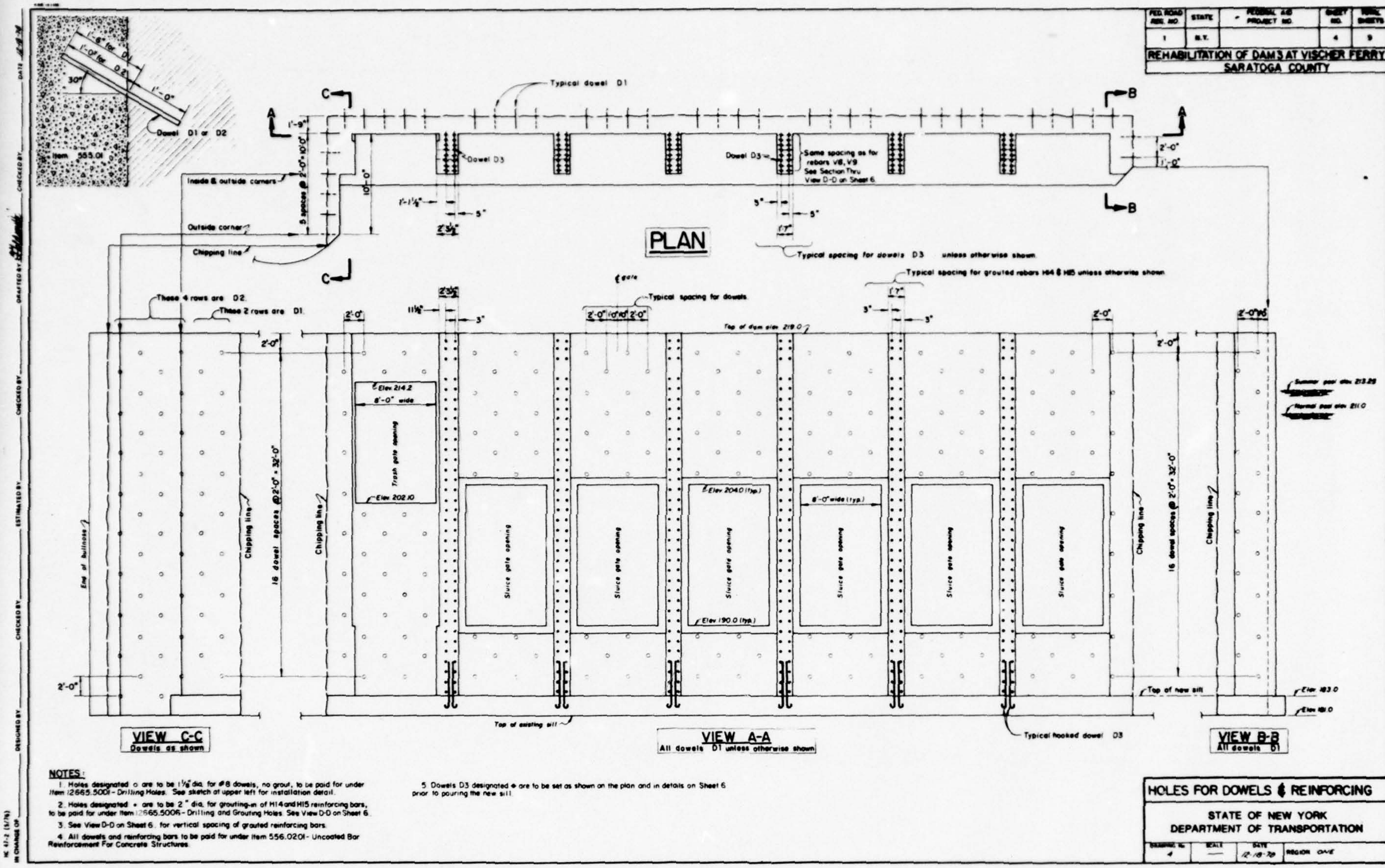
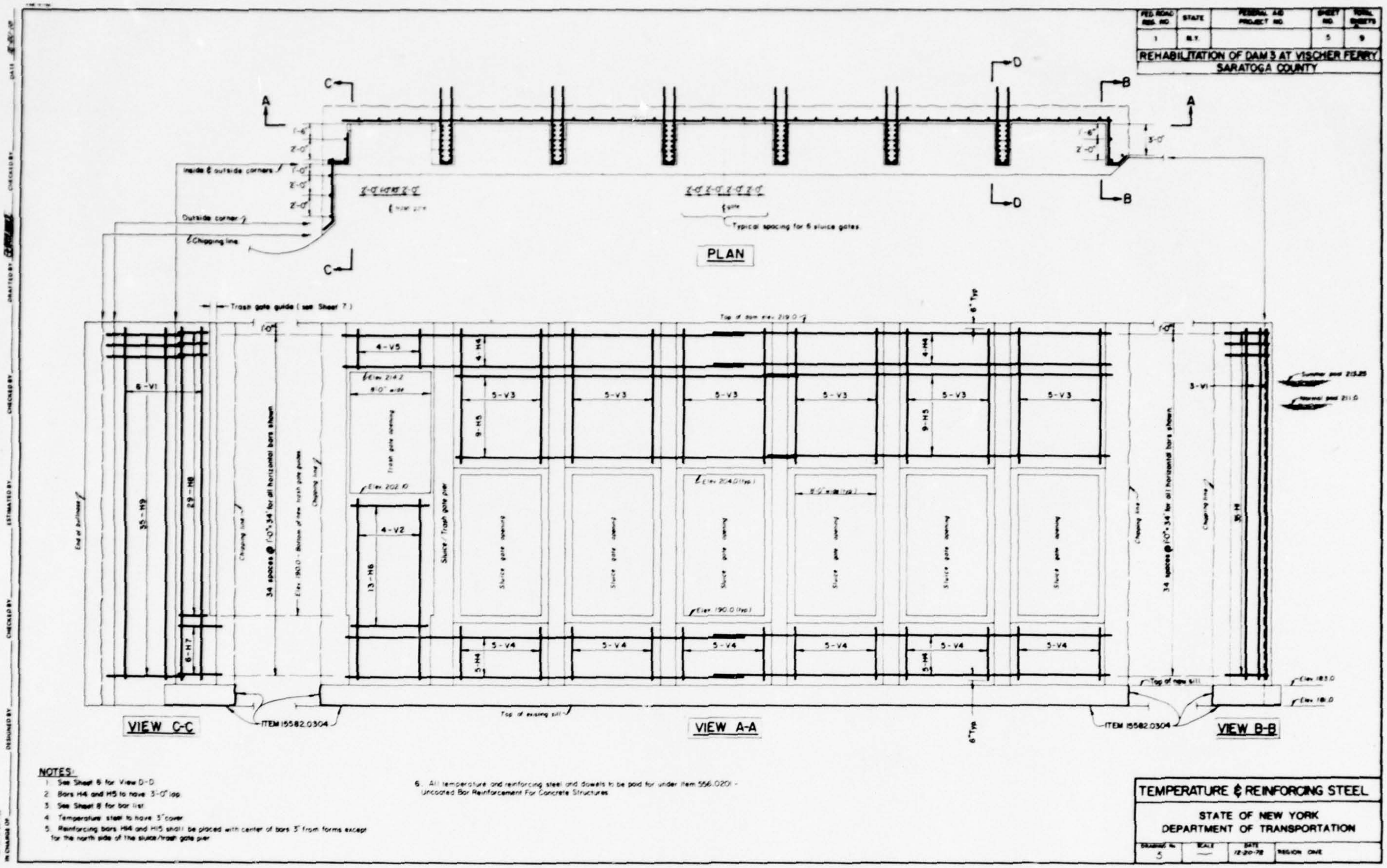

REHABILITATION OF DAM 3 AT VISCHER FERRY, SARATOGA COUNTY
ALTERED DAM 3 STRUCTURE
STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
12-78
REGION ONE
4 pier and bracket spaces @ 15'-0" = 44'-0"
6 gate spaces @ 11'-0" = 66'-0"
New Sill Elevation 183.0
Support bracket, see detail on Sheet 9
DETAIL 'A'
DETAIL 'B' See Sheet 7
Item 555.01
Chipping line - Item 12665.4006
Elev 219.0
Item 608.01 (see Note 2)
Elev 190.0
Elev 197.0
Elev 215.0
Existing railing to remain See Note 6
Pedestrian bridge not shown. See Notes 5 & 6
NORTH
See Note 4
Light pole to remain See Note 6
Catwalk not shown See Note 6
1/2" Armor plate
Shelf angle
Trash gate guide
12.1' high trash gate opening
14'-0" high sluice gate opening
Square opening thru piers
Summer pool - Elev 213.25
Normal pool - Elev 211.0
Elev 181.0 - Existing Sill
Apron Elev 186.0
SECTION B-B
SECTION A-A
NOTES:
1. The centerlines of all new gates shall coincide with the centerlines of the existing gates.
3. All other concrete shown shall be paid for under Item 555.01 - Concrete for Structures - Class A.

FIGURE 21



REHABILITATION OF DAM 3 AT VISCHER FERRY
SARATOGA COUNTY
FED. ROAD REG. NO. 1
STATE N.Y.
SHEET NO. 4
TOTAL SHEETS 9
PLAN
Typical dowel D1
Dowel D1 or D2
Item 555.01
1'-6" for D1
1'-0" for D2
30°
1'-0"
Dowel D3
Same spacing as for rebars V8, V9 See Section Thru View D-D on Sheet 6
Inside & outside corners
Outside corner
Chipping line
5 spaces @ 2'-0" = 10'-0"
10'-0"
Typical spacing for dowels D3 unless otherwise shown
Typical spacing for grouted rebars H14 & H15 unless otherwise shown
Typical spacing for dowels
These 4 rows are D2
These 2 rows are D1
Top of dam elev. 219.0
Elev 214.2
8'-0" wide
Trash gate opening
Elev 202.10
Sluice gate opening
Elev 204.0 (typ.)
Elev 190.0 (typ.)
8'-0" wide (typ.)
16 dowel spaces @ 2'-0" = 32'-0"
End of buttress
Top of existing sill
Top of new sill
Typical hooked dowel D3
Summer pool elev. 213.25
Normal pool elev. 211.0
Elev 183.0
Elev 181.0
VIEW C-C
Dowels as shown
VIEW A-A
All dowels D1 unless otherwise shown
VIEW B-B
All dowels D1
NOTES:
1. Holes designated ○ are to be 1⅛" dia. for #8 dowels, no grout, to be paid for under Item 12665.5001 - Drilling Holes. See sketch at upper left for installation detail.
2. Holes designated ● are to be 2" dia. for grouting-in of H14 and H15 reinforcing bars, to be paid for under Item 12665.5006 - Drilling and Grouting Holes. See View D-D on Sheet 6.
3. See View D-D on Sheet 6, for vertical spacing of grouted reinforcing bars.
4. All dowels and reinforcing bars to be paid for under Item 556.0201 - Uncoated Bar Reinforcement For Concrete Structures.
5. Dowels D3 designated ⊕ are to be set as shown on the plan and in details on Sheet 6 prior to pouring the new sill.
HOLES FOR DOWELS & REINFORCING
STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
DRAWING No. 4
DATE 12-18-78
REGION ONE

FIGURE 22



REHABILITATION OF DAM 3 AT VISCHER FERRY
SARATOGA COUNTY
PLAN
Typical spacing for 6 sluice gates
Inside & outside corners
Outside corner
Chipping line
Trash gate guide (see Sheet 7)
Top of dam elev. 219.0
34 spaces @ 1'-0" = 34' for all horizontal bars shown
Trash gate opening
Sluice / Trash gate pier
Sluice gate opening
Top of new sill
Top of existing sill
ITEM 15582.0304
VIEW C-C
VIEW A-A
VIEW B-B
NOTES:
1. See Sheet 6 for View D-D.
2. Bars H4 and H5 to have 3'-0" lap.
3. See Sheet 8 for bar list.
4. Temperature steel to have 3" cover.
5. Reinforcing bars H4 and H5 shall be placed with center of bars 3" from forms except for the north side of the sluice/trash gate pier.
6. All temperature and reinforcing steel and dowels to be paid for under item 556.0201 - Uncoated Bar Reinforcement For Concrete Structures.
TEMPERATURE & REINFORCING STEEL
STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
12-20-78
REGION ONE

FIGURE 23

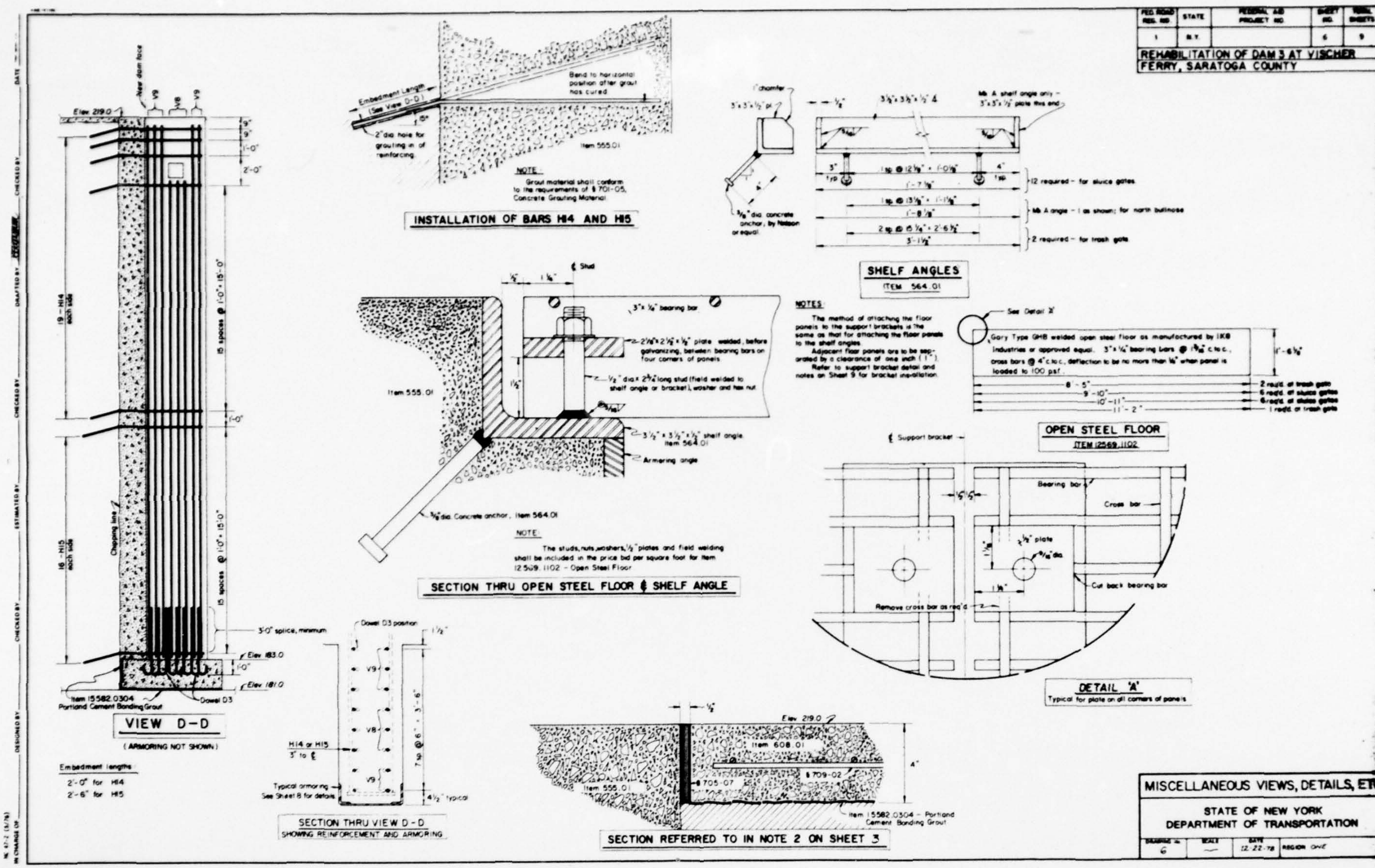
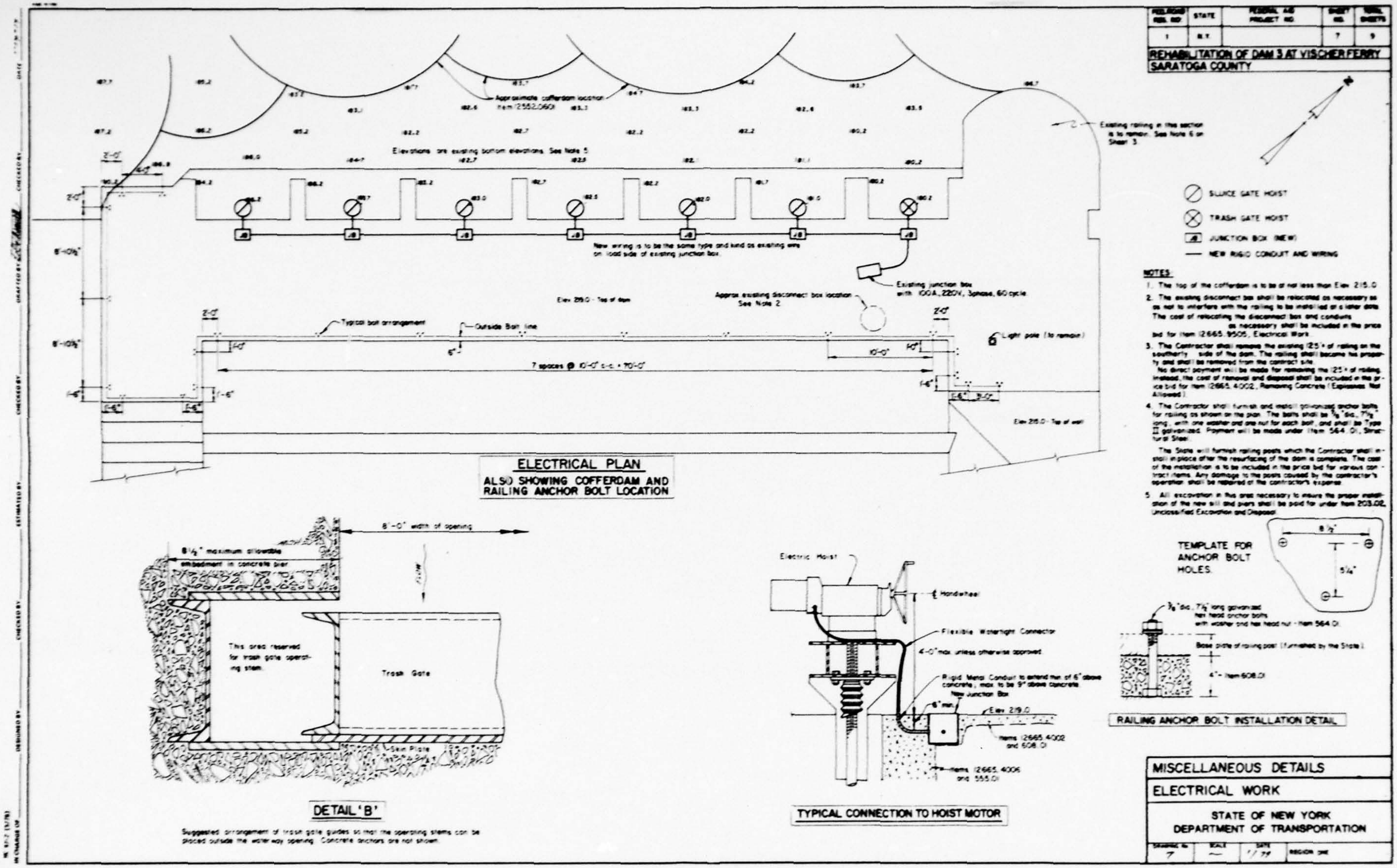

REHABILITATION OF DAM 3 AT VISCHER FERRY, SARATOGA COUNTY
VIEW D-D
(ARMORING NOT SHOWN)
Embedment lengths
2'-0" for H14
2'-6" for H15
Item 15582.0304 Portland Cement Bonding Grout
INSTALLATION OF BARS H14 AND H15
NOTE: Grout material shall conform to the requirements of § 701-05, Concrete Grouting Material.
Bend to horizontal position after grout has cured
2" dia. hole for grouting in of reinforcing
Item 555.01
SHELF ANGLES
ITEM 564.01
12 required - for sluice gates
2 required - for trash gate
SECTION THRU OPEN STEEL FLOOR & SHELF ANGLE
NOTE: The studs, nuts, washers, 1/2" plates and field welding shall be included in the price bid per square foot for Item 12569.1102 - Open Steel Floor
NOTES: The method of attaching the floor panels to the support brackets is the same as that for attaching the floor panels to the shelf angles. Adjacent floor panels are to be separated by a clearance of one inch (1"). Refer to support bracket detail and notes on Sheet 9 for bracket installation.
OPEN STEEL FLOOR
ITEM 12569.1102
Gary Type GHB welded open steel floor as manufactured by IKG Industries or approved equal. Deflection to be no more than 1/4" when panel is loaded to 100 psf.
DETAIL 'A'
Typical for plate on all corners of panels
SECTION THRU VIEW D-D
SHOWING REINFORCEMENT AND ARMORING
SECTION REFERRED TO IN NOTE 2 ON SHEET 3
MISCELLANEOUS VIEWS, DETAILS, ETC
STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

FIGURE 24



REHABILITATION OF DAM 3 AT VISCHER FERRY
SARATOGA COUNTY
SLUICE GATE HOIST
TRASH GATE HOIST
JUNCTION BOX (NEW)
NEW RIGID CONDUIT AND WIRING
NOTES:
ELECTRICAL PLAN
ALSO SHOWING COFFERDAM AND RAILING ANCHOR BOLT LOCATION
Elevations are existing bottom elevations. See Note 5
Approximate cofferdam location
Typical bolt arrangement
Outside Bolt line
7 spaces @ 10'-0" c-c = 70'-0"
Existing junction box with 100A, 220V, 3phase, 60 cycle
Light pole (to remain)
Elev 215.0 - Top of wall
8'-0" width of opening
Trash Gate
This area reserved for trash gate operating stem
DETAIL 'B'
Suggested arrangement of trash gate guides so that the operating stems can be placed outside the water way opening. Concrete anchors are not shown.
Electric Hoist
Handwheel
Flexible Watertight Connector
TYPICAL CONNECTION TO HOIST MOTOR
TEMPLATE FOR ANCHOR BOLT HOLES
RAILING ANCHOR BOLT INSTALLATION DETAIL
MISCELLANEOUS DETAILS
ELECTRICAL WORK
STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

FIGURE 25

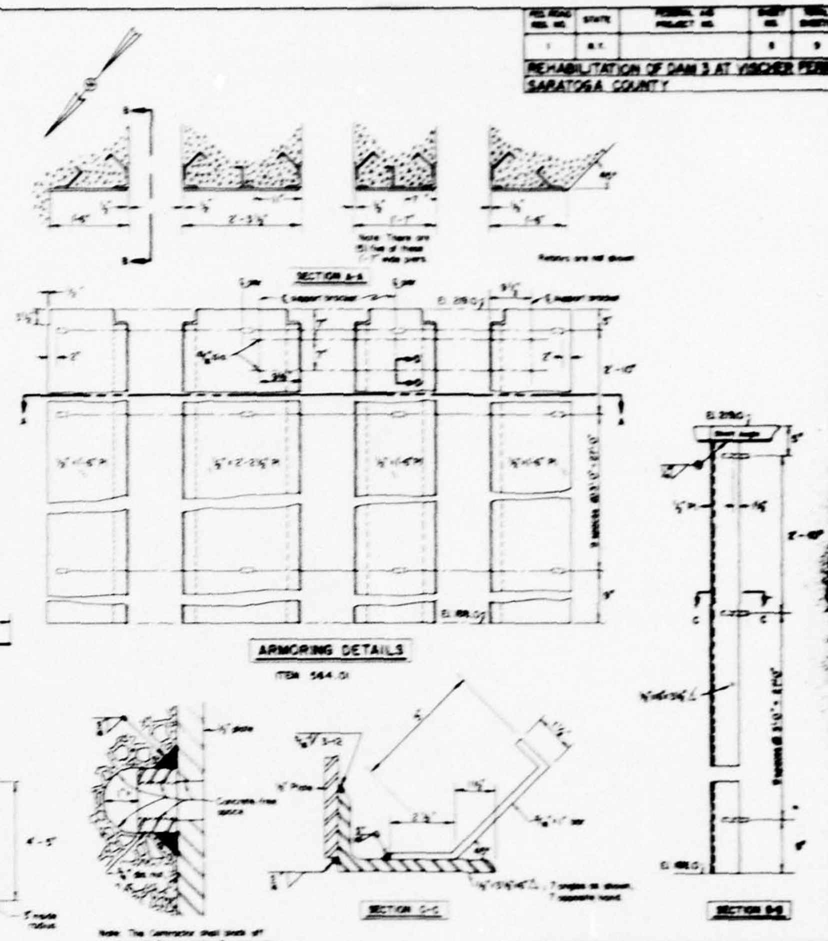
FED. ROAD REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.		8	9

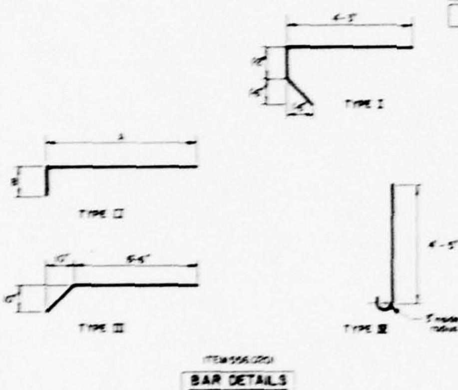
REHABILITATION OF DAM 3 AT VISCHER FERRY
SARATOGA COUNTY

QUANTITY ESTIMATE

BAR LIST

	MARK	NO.	LENGTH	TYPE	A	B	SIZE
TEMPERATURE STEEL	V1	9	35'-0"	ST			#5
	V2	4	18'-0"	ST			#5
	V3	30	13'-6"	ST			#5
	V4	30	5'-6"	ST			#5
	V5	4	4'-0"	ST			#5
REINFORCING STEEL	V8	36	31'-6"	ST			#8
	V9	60	35'-5"	ST			#8
TEMPERATURE STEEL	H1	35	7'-6"	I			#5
	H4	18	38'-4"	ST			#5
	H5	18	34'-0"	ST			#5
	H6	13	8'-0"	ST			#5
	H7	6	6'-0"	II	4'-5"	1'-9"	#5
	H8	29	4'-7"	II	2'-10"	1'-9"	#5
	H9	35	7'-8"	III			#5
REINFORCING STEEL	H14	228	8'-6"	II	7'-6"	1'-0"	#6
	H15	192	9'-2"	II	8'-0"	1'-2"	#7
DOWELS	D1	193	2'-6"	ST			#8
	D2	36	2'-0"	ST			#8
	D3	36	5'-8"	IV			#8





ARMORING DETAIL
BAR LIST AND BAR DETAILS
QUANTITY ESTIMATE

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

FIGURE 26

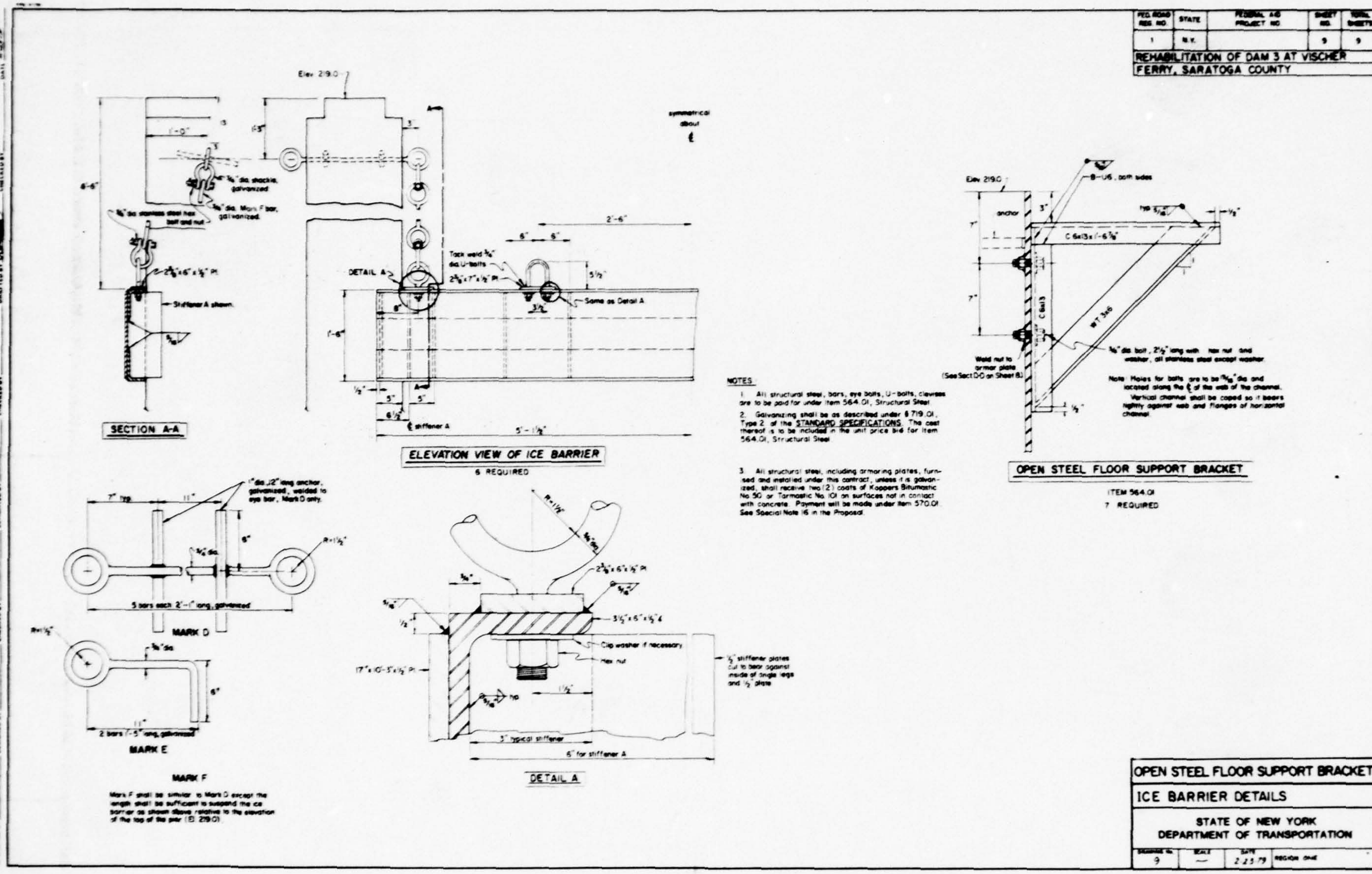
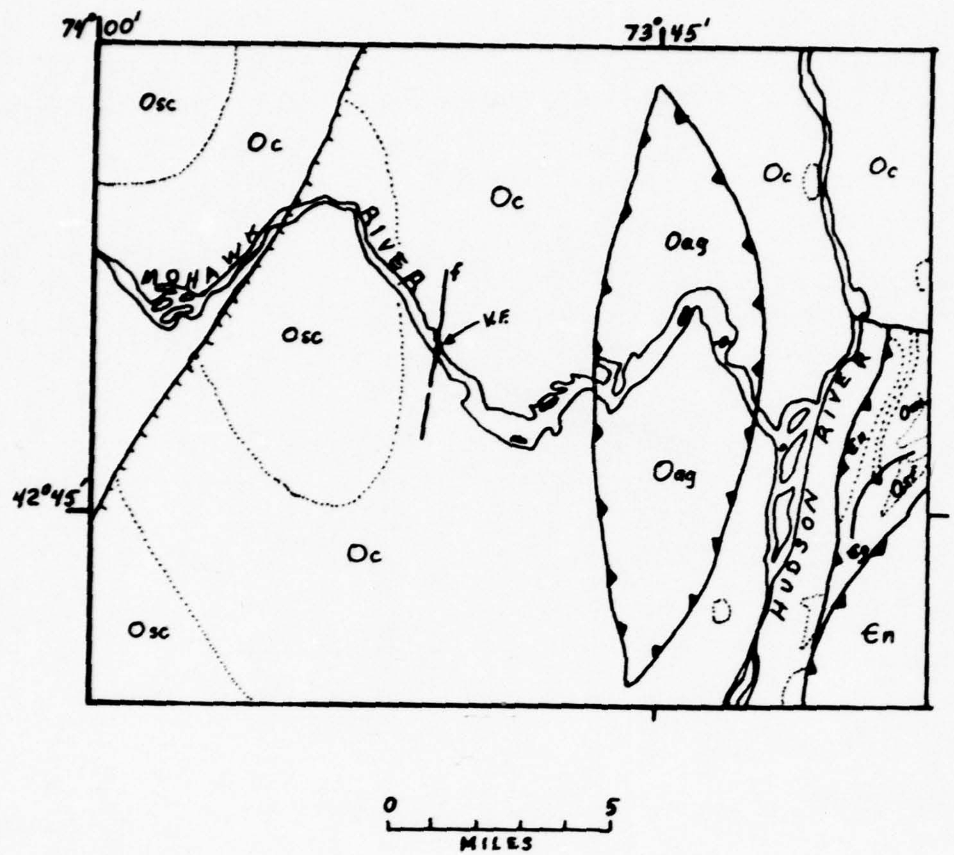

REHABILITATION OF DAM 3 AT VISCHER FERRY, SARATOGA COUNTY
SECTION A-A
ELEVATION VIEW OF ICE BARRIER
6 REQUIRED
DETAIL A
MARK D
MARK E
MARK F
Mark F shall be similar to Mark D except the length shall be sufficient to suspend the ice barrier as shown above relative to the elevation of the top of the pier (El. 219.0).
NOTES:
1. All structural steel, bars, eye bolts, U-bolts, clevises are to be paid for under Item 564.01, Structural Steel.
2. Galvanizing shall be as described under § 719.01, Type 2 of the STANDARD SPECIFICATIONS. The cost thereof is to be included in the unit price bid for Item 564.01, Structural Steel.
3. All structural steel, including armoring plates, furnised and installed under this contract, unless it is galvanized, shall receive two (2) coats of Koppers Bitumastic No. 50 or Tarmastic No. 101 on surfaces not in contact with concrete. Payment will be made under Item 570.01. See Special Note 16 in the Proposal.
OPEN STEEL FLOOR SUPPORT BRACKET
ITEM 564.01
7 REQUIRED
Note: Holes for bolts are to be 15/16" dia. and located along the ℄ of the web of the channel. Vertical channel shall be coped so it bears tightly against web and flanges of horizontal channel.
OPEN STEEL FLOOR SUPPORT BRACKET
ICE BARRIER DETAILS
STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
2-23-79
REGION ONE

FIGURE 27



LEGEND

Osc - Schenectady Formation
Oag - Austin Glen Formation
Oc - Canajoharie Shale
On - Normanskill Shale
Omi - Mount Merino Formation
Osf - Stuyvesant Falls Fm.
Єg - Germantown Fm.
Єn - Nassau Formation

Thrust Plate
Teeth on overthrust block

Normal Fault
Hachures on downthrown side

Fault line

Formation Contact

V.F. - Vischer Ferry Dam

STETSON • DALE

DATE 8·21·79	DRAWN HM
JOB 2305	APP'D

FIGURE 28

GEOLOGIC MAP

APPENDIX A

FIELD INSPECTION REPORT

CHECK LIST
VISUAL INSPECTION

PHASE 1

Name Dam Vischer Ferry County Albany State New York ID # NY170

Type of Dam Concrete Gravity Hazard Category High

Date(s) Inspection August 1, 1979 Weather Sunny Temperature 90

Pool Elevation at Time of Inspection 211.80* M.S.L. Tailwater at Time of Inspection 184.50*

* Barge Canal Datum

Inspection Personnel:

N. F. Dunlevy	Dale Engineering Company	
F. W. Byszewski	Dale Engineering Company	
D. F. McCarthy	Dale Engineering Company	
H. Muskatt	Dale Engineering Company	
Walter Elliot	New York State Department of Transportation	

Neal F. Dunlevy Recorder

CONCRETE/MASONRY DAMS

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
ANY NOTICEABLE SEEPAGE	None observed since considerable flow over spillway was occurring.	
STRUCTURE TO ABUTMENT/EMBANKMENT JUNCTIONS	Abutment on north side is hydropower forebay wall, on south side is lock wall. Both walls have surface deterioration, but no major cracks.	
DRAINS	----	
WATER PASSAGES	Open passage in forebay area.	
FOUNDATION	Bedrock.	

CONCRETE/MASONRY DAMS

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SURFACE CRACKS CONCRETE SURFACES	The surface of the spillway is significantly eroded. Most areas have eroded less than 6 inches. The top of the crest has eroded so that leakage occurs below flashboards. Some construction joints provide leakage.	
STRUCTURAL CRACKING	No structural cracks were observed.	
VERTICAL & HORIZONTAL ALIGNMENT	Good alignment.	
MONOLITH JOINTS	Some leakage through joints.	
CONSTRUCTION JOINTS	Surface erosion is greater along horizontal construction joints.	
STAFF GAGE OF RECORDER	At lock.	

EMBANKMENT

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SURFACE CRACKS	N/A	
UNUSUAL MOVEMENT OR CRACKING AT OR BEYOND THE TOE	N/A	
SLOUGHING OR EROSION OF EMBANKMENT AND ABUTMENT SLOPES	N/A	
VERTICAL AND HORIZONTAL ALINEMENT OF THE CREST	N/A	
RIPRAP FAILURES	N/A	

EMBANKMENT

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
JUNCTION OF EMBANKMENT AND ABUTMENT, SPILLWAY AND DAM	N/A	
ANY NOTICEABLE SEEPAGE	N/A	
STAFF GAGE AND RECORDER	N/A	
DRAINS	N/A	

UNGATED SPILLWAY

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONCRETE WEIR	See sheets 2 and 3.	
APPROACH CHANNEL	Width of river.	
DISCHARGE CHANNEL	Width of river.	
BRIDGE AND PIERS	None.	

GATED SPILLWAY

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONCRETE SILL	Gated spillway not operable. Awaiting repairs.	
APPROACH CHANNEL	North bank of river.	
DISCHARGE CHANNEL	North side of river adjacent to powerhouse	
BRIDGE AND PIERS	None.	
GATES AND OPERATION EQUIPMENT	Electrically operated gates.	

OUTLET WORKS
THROUGH POWERHOUSE

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CRACKING AND SPALLING OF CONCRETE SURFACES IN OUTLET CONDUIT	---	
INTAKE STRUCTURE	---	
OUTLET STRUCTURE	---	
OUTLET CHANNEL	---	
EMERGENCY GATE	---	

DOWNSTREAM CHANNEL

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONDITION (OBSTRUCTIONS, DEBRIS, ETC.)	Unobstructed, no debris.	
SLOPES	Not a problem.	
APPROXIMATE NO. OF HOMES AND POPULATION	Crescent dam is 10 miles downstream. A significant number of residential and commercial structures adjacent to river. This reach of river is highly used for recreational purposes such as boating.	

INSTRUMENTATION

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
MONUMENTATION/SURVEYS	None	
OBSERVATION WELLS	None	
WEIRS	None	
PIEZOMETERS	None	
OTHER		

RESERVOIR

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SLOPES	Not well sloped.	
SEDIMENTATION	No observation.	

CHECK LIST
ENGINEERING DATA
DESIGN, CONSTRUCTION, OPERATION
PHASE 1

NAME OF DAM Vischer Ferry

ID # 170

ITEM	REMARKS
AS-BUILT DRAWINGS	See this report
REGIONAL VICINITY MAP	See this report
CONSTRUCTION HISTORY	See this report
TYPICAL SECTIONS OF DAM	See this report
OUTLETS - PLAN - DETAILS - CONSTRAINTS - DISCHARGE RATINGS	See this report
RAINFALL/RESERVOIR RECORDS	---

ITEM	REMARKS
DESIGN REPORTS	None available
GEOLOGY REPORTS	None available
DESIGN COMPUTATIONS HYDROLOGY & HYDRAULICS DAM STABILITY SEEPAGE STUDIES	None available
MATERIALS INVESTIGATIONS BORING RECORDS LABORATORY FIELD	None available
POST-CONSTRUCTION SURVEYS OF DAM	None available
BORROW SOURCES	---

ITEM	REMARKS
MONITORING SYSTEMS	See New York State Department of Transportation for information and this report.
MODIFICATIONS	See New York State Department of Transportation for information and this report.
HIGH POOL RECORDS	See New York State Department of Transportation for information and this report.
POST CONSTRUCTION ENGINEERING STUDIES AND REPORTS	None available.
PRIOR ACCIDENTS OR FAILURE OF DAM DESCRIPTION REPORTS	No data available.
MAINTENANCE OPERATION: RECORDS	See New York State Department of Enviromental Conservation for information and this report.

ITEM	
SPILLWAY PLAN SECTIONS DETAILS	See this report.
OPERATING EQUIPMENT PLANS & DETAILS	See this report.

CHECK LIST
HYDROLOGIC & HYDRAULIC
ENGINEERING DATA

DRAINAGE AREA CHARACTERISTICS: 2285 sq. mi.

ELEVATION TOP NORMAL POOL (STORAGE CAPACITY): 213.33 w/flashboards* / 211 w/o flashboards

ELEVATION TOP FLOOD CONTROL POOL (STORAGE CAPACITY): 211

ELEVATION MAXIMUM DESIGN POOL: 211

ELEVATION TOP DAM: 219

CREST:

a. Elevation (Barge Canal Datum) 213.33 w/flashboards* / 211 w/o flashboards
b. Type Crest shaped.
c. Width See plan in this report.
d. Length 1900 total both sections.
e. Location Spillover Entire width of river
f. Number and Type of Gates ---

OUTLET WORKS:

a. Type Through hydrostation and locks.
b. Location
c. Entrance Inverts
d. Exit Inverts
e. Emergency Draindown Facilities

HYDROMETEOROLOGICAL GATES:

a. Type ---
b. Location ---
c. Records ---

MAXIMUM NON-DAMAGING DISCHARGE: ---

* Flashboards are removed in December and are replaced in May. Typically they are designed to fail under 1 - 2 feet of head.

APPENDIX B

PREVIOUS INSPECTION REPORTS/RELEVANT CORRESPONDENCE

NEW YORK STATE
DEPARTMENT OF TRANSPORTATION
William C. Hennessy, Commissioner

Region 1 Office: 84 Holland Avenue, Albany, New York 12208

September 13, 1979

Neal F. Dunlevy, P.E.
Stetson Dale
Bankers Trust Building
Utica, NY 13501

Re: Information on Crescent and Vischer Ferry Dam

Dear Mr. Dunlevy:

In answer to your letter of August 29, 1979, we offer the following. The responses listed are numbered in the order of your questions.

1. In the 1909 Report of the State Engineer and Surveyor, we found the enclosed photographs of the dam construction. We didn't find any narrative information on construction of the dams. Our records indi- date the dam at Vischer Ferry was completed in 1913; the dam at Crescent was completed in 1912.

2. At normal pool elevation, both dams discharge 4342 C.F.S. (2 units)

3. Enclosed find graphs showing the Annual Mean High Water Elevations of Guage 137 which is of the upper end of Lock 7Erie (1916 to present) Mr. Elliott said that the only time that he saw the water over the Crescent Powerhouse forebay walls was in March 1968. (7 ft. over crest of dam). We have no gauging station at this location.

4. None

5. None

6. Crescent Dam - When water is 2.0 feet above masonry dam and the flash- boards are on the dam the taintor gate is open 9.0 feet, provided no ice is in the river. When the water recedes to 1.0 feet above masonry dam, the taintor gate is closed.

   Vischer Ferry Dam - When the water is 2.5 feet above the masonry dam and the flashboards are on the waste gates are open. When the water recedes to 2.5 feet above masonry dam the gates are closed. Flashboards are in- stalled on both dams by May 1 or when the flow is below 5,000 C.F.S. They are removed at the close of the navigable season in December.

Neal F. Dunlevy, P.E.
September 13, 1979
Page Two

7. Attached find a set of contract plans (Contract D95985) and specifications for the rehabilitation of including concrete replacement, installation of sluice gates and trash gate and other miscellaneous work to dam 3 at Vischer Ferry Dam - (Canal reference No. M79-1) Contract letting date is September 13, 1979.

If we can be of any further assistance, please feel free to contact us.

Sincerely,

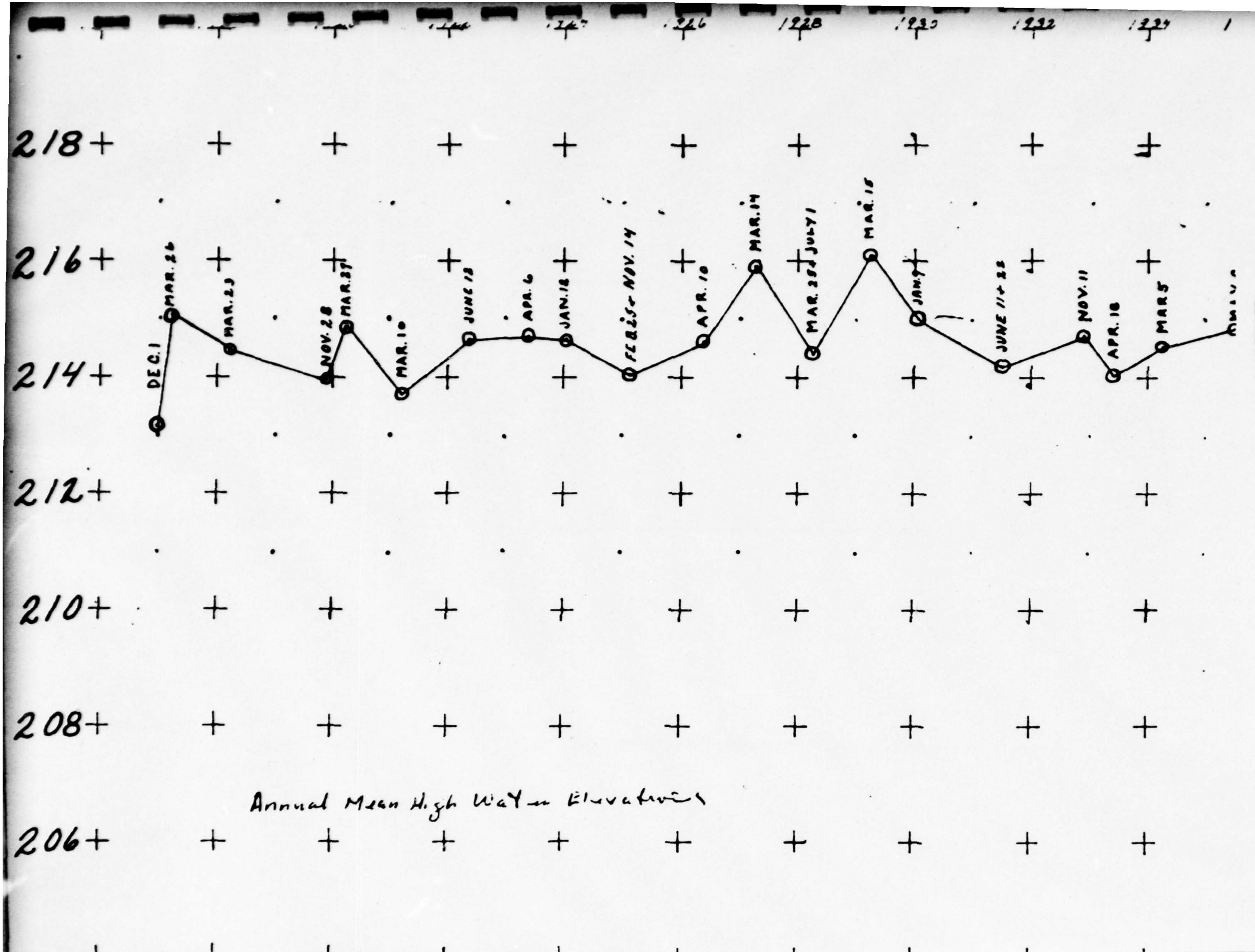
John Hulchanski
Regional Waterways Engineer

JH:jm
Attachment

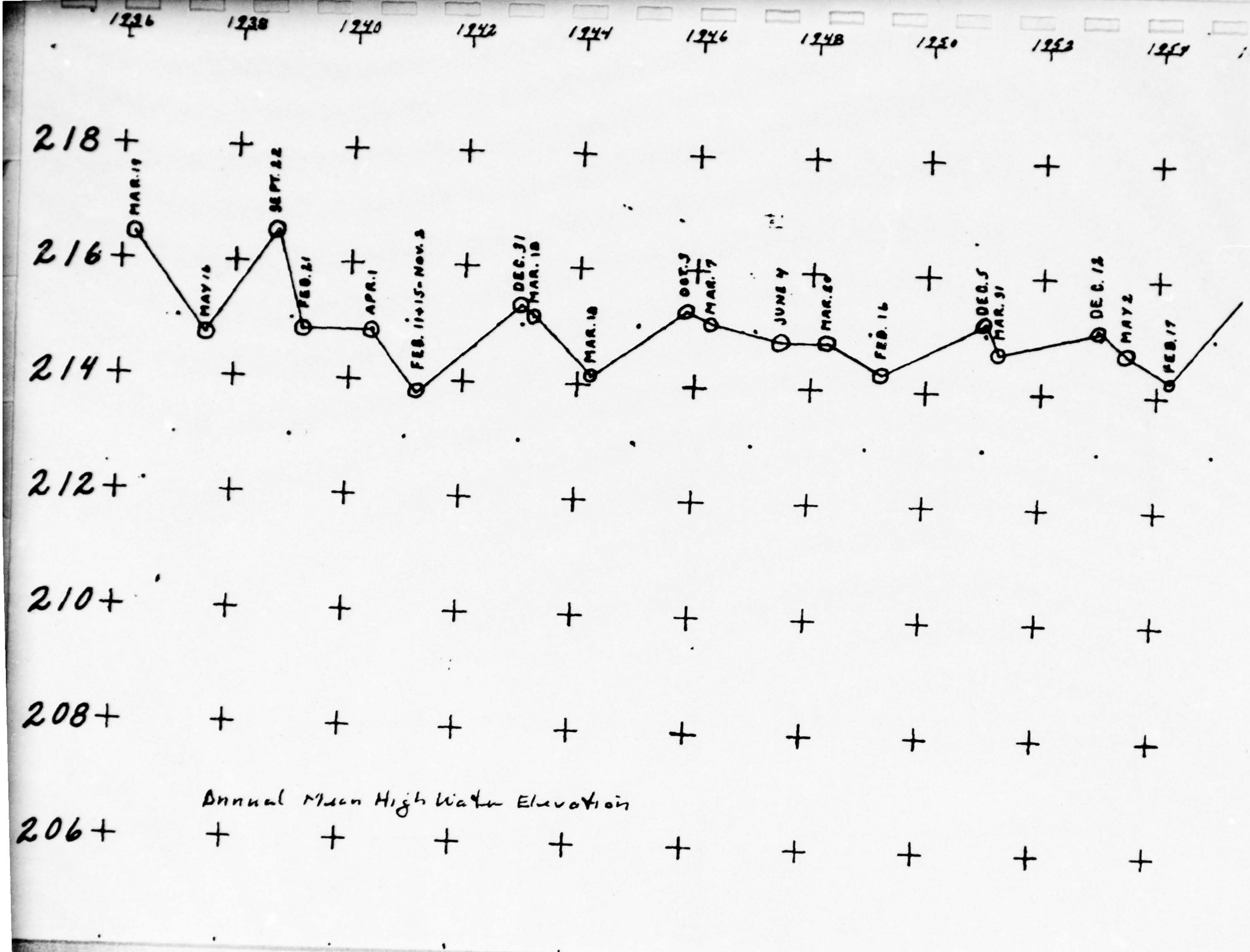
cc: J. R. Stellato, Waterways Subdiv., Bldg. 5, Rm. 216
W. Elliott, Superintendent, Hydroelectric Powerplants

Barge Canal, Contract No. 14.
View of the eastern portion of the dam near Crescent.

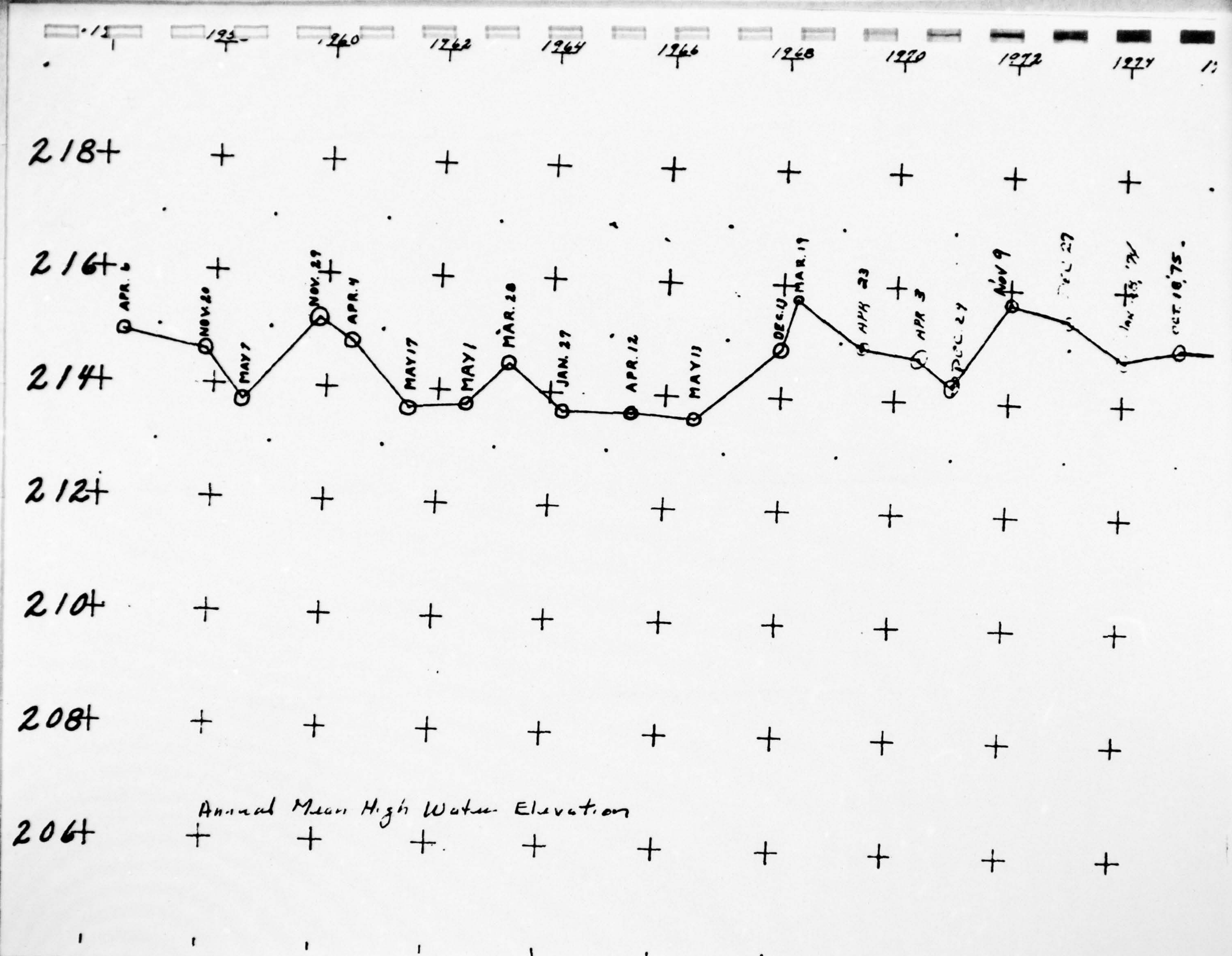
Barge Canal, Contract No. 14.
View at Vischer's Ferry, showing alternate completed sections of western portion of dam and lock under construction.



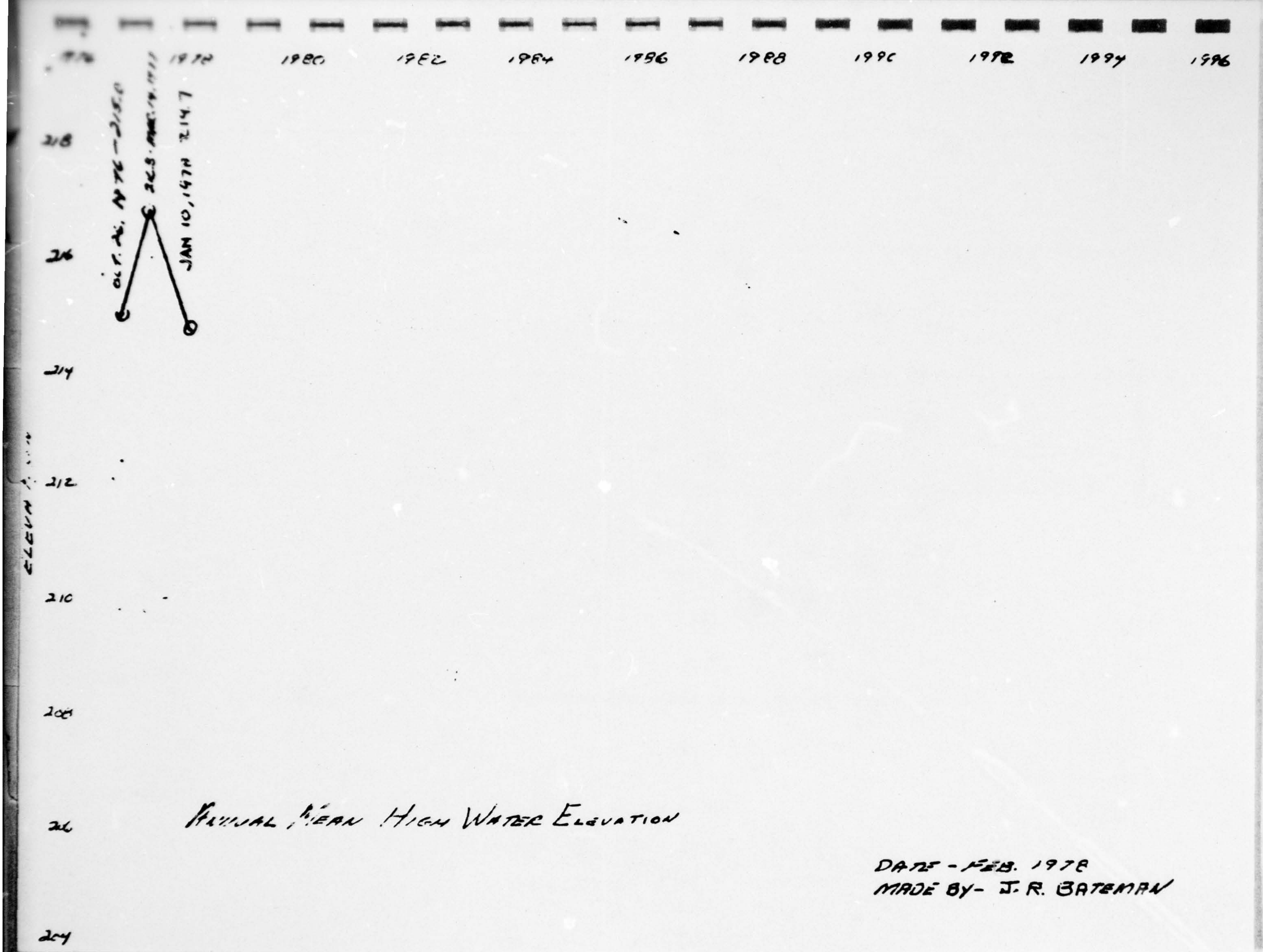
Annual Mean High Water Elevations
218
216
214
212
210
208
206
1926
1928
1930
1932
1934
DEC. 1
MAR. 26
MAR. 23
NOV. 28
MAR. 27
MAR. 10
JUNE 13
APR. 6
JAN. 18
FEB. 25 + NOV. 14
APR. 10
MAR. 14
MAR. 25 + JULY 1
MAR. 15
JUNE 11 + 23
NOV. 11
APR. 18
MAR. 5



1936
1938
1940
1942
1944
1946
1948
1950
1952
1954
218
216
214
212
210
208
206
MAR.19
MAY 16
SEPT.22
FEB.21
APR.1
FEB. 11+15-NOV.2
DEC.31
MAR.18
MAR.18
OCT.3
MAR.7
JUNE 4
MAR.20
FEB.16
DEC.5
MAR.31
DEC.12
MAY 2
FEB.17
Annual Mean High Water Elevation

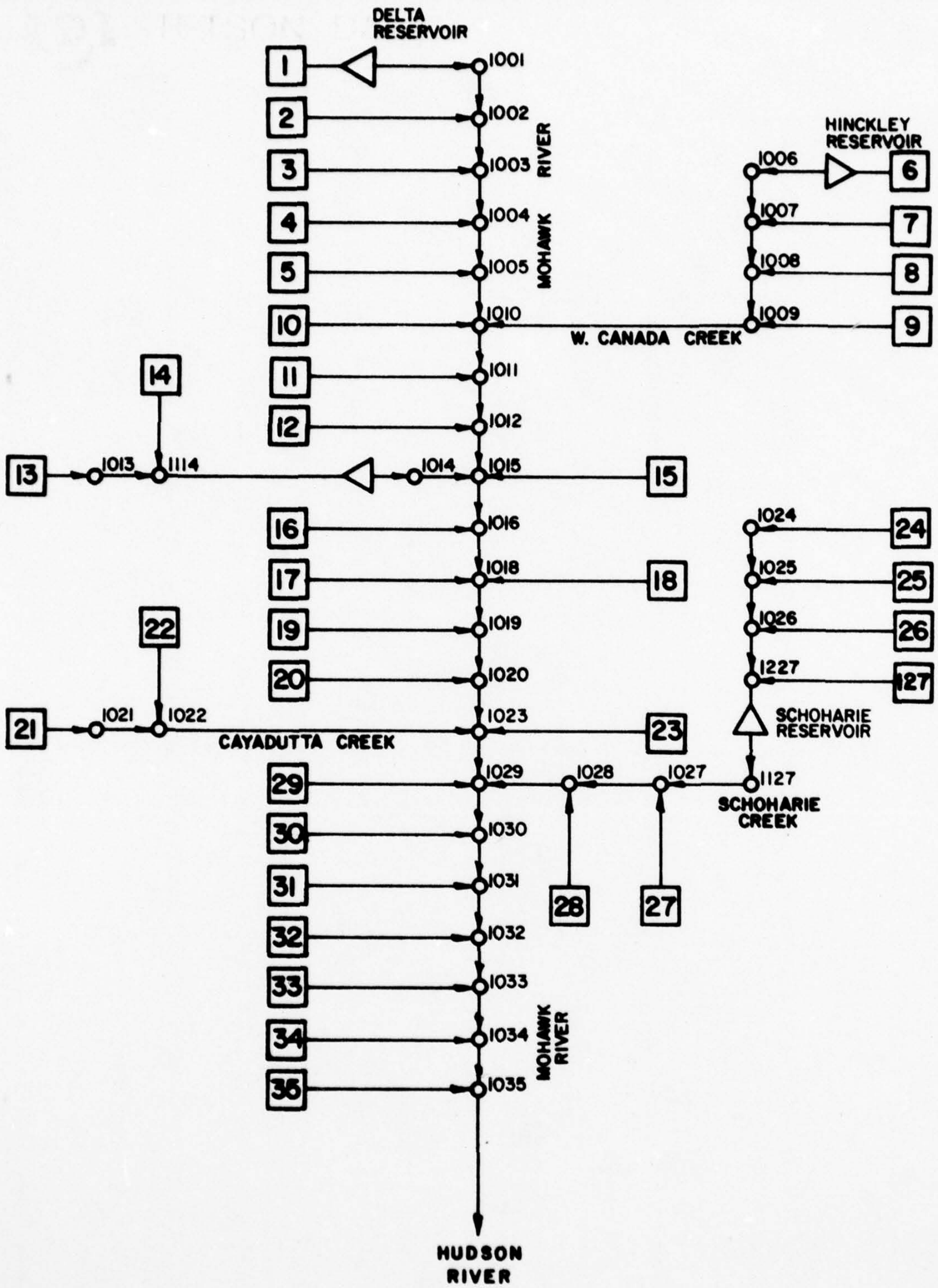


218
216
214
212
210
208
206
1960
1962
1964
1966
1968
1970
1972
1974
APR.
NOV.20
MAY 7
NOV.29
APR.4
MAY 17
MAY 1
MAR.28
JAN.27
APR.12
MAY 13
DEC.13
MAR.19
APR 23
APR 3
DEC 27
NOV 9
OCT. 18,'75.
Annual Mean High Water Elevation


1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
218
216
214
212
210
208
206
204
JAN 10,1978 214.7
ANNUAL MEAN HIGH WATER ELEVATION
DATE - FEB. 1978
MADE BY- J. R. BATEMAN

APPENDIX C

HYDROLOGIC AND HYDRAULIC COMPUTATIONS



STETSON · DALE	DATE 8·1·79	DRAWN JPG	NODAL SYSTEM
	JOB 2305	APP'D	

STETSON • DALE BANKERS TRUST BUILDING UTICA • NEW YORK • 13501 TEL 315-797-5800 **DESIGN BRIEF**

PROJECT NAME NEW YORK STATE DAM INSPECTION DATE 7.31.79

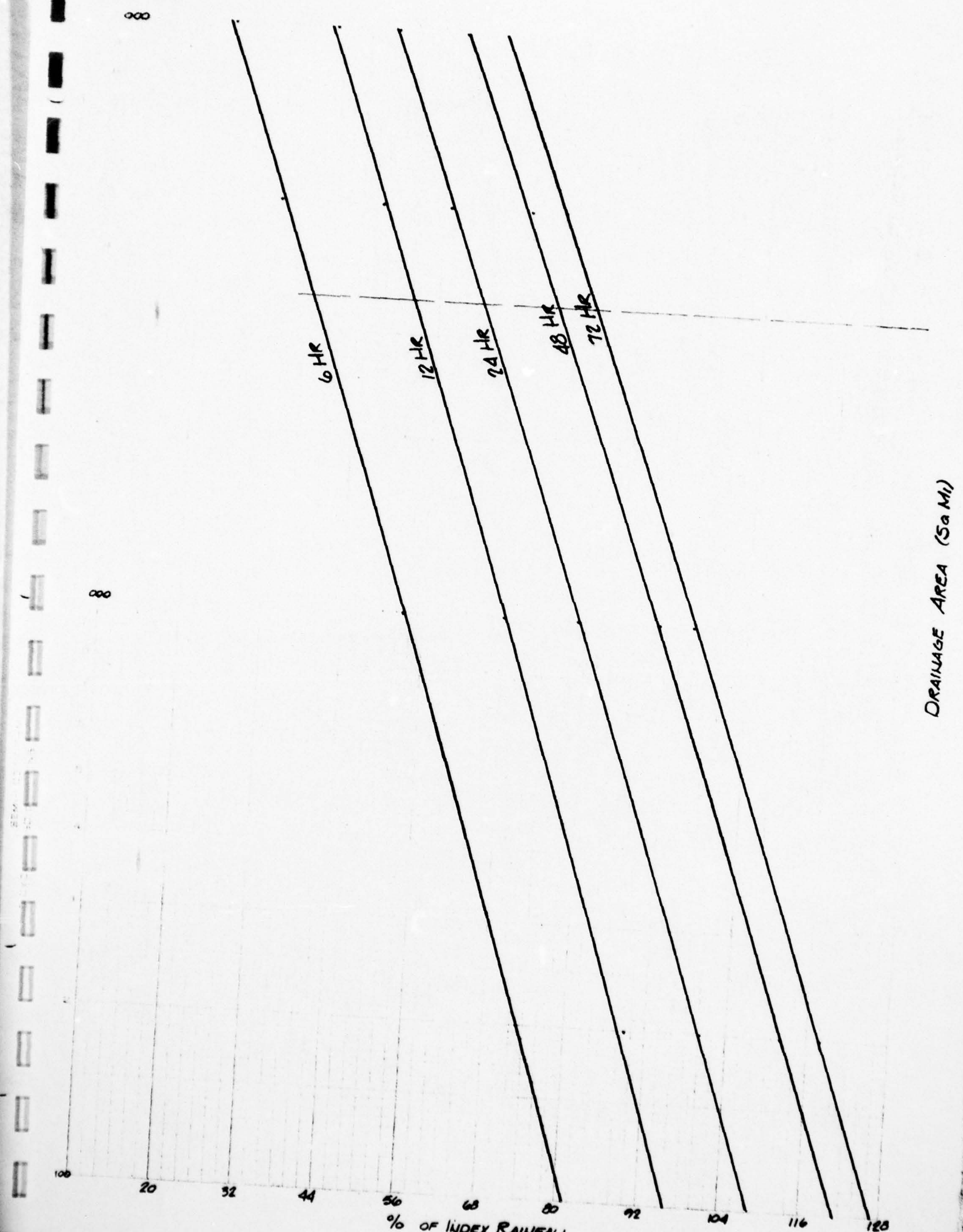
SUBJECT MOHAWK RIVER DRAINAGE BASIN PROJECT NO. 2305

DEPTH - AREA - DURATION RELATIONSHIP * DRAWN BY JPG

AREA	DURATION	DEPTH	% OF INDEX	
200 SQ MI	6 HR	16.0	73	
↓	12 HR	19.4	89	
	24 HR	21.9	100	← PMF INDEX RAINFALL
	48 HR	24.5	112	
200 SQ MI	72 HR	25.9	118	
1000 SQ MI	6 HR	11.5	53	
↓	12 HR	14.8	68	
	24 HR	17.3	79	
	48 HR	20.0	91	
1000 SQ MI	72 HR	21.0	96	
5000 SQ MI	6 HR	7.0	32	
↓	12 HR	10.3	47	
	24 HR	12.5	57	
	48 HR	15.1	69	
5000 SQ MI	72 HR	16.3	74	
10000 SQ MI	6 HR	5.3	24	
↓	12 HR	8.6	39	
	24 HR	10.5	48	
	48 HR	12.8	58	
10000 SQ MI	72 HR	14.0	64	

* FROM HYDROMETEOROLOGICAL REPORT Nº 51
SEPT 1976

PMF	DURATION	% OF INDEX
	6 HR	37.5
	12 HR	52.0
	24 HR	62.5
	48 HR	73.5
	72 HR	79.0



6 HR
12 HR
24 HR
48 HR
72 HR
DRAINAGE AREA (SQ MI)
100
20
32
44
56
68
80
92
104
116
128
% OF INDEX RAINFALL

Table 6.1

MOHAWK BASIN ABOVE LITTLE FALLS, N.Y.
SUBBASIN CHARACTERISTICS

Subbasin No.	Area (mi^2)	Storage Area (% + 1.0)	Clark Coefficients TC (hr)	Clark Coefficients R (hr)	Snyder Coefficients LAG (hr)	Snyder Coefficients CP (-)	Recession Parameters QRCSN (cfs)	Recession Parameters RTIOR (-)
1	150	1.02	15.0	7.3	12.3	.75	1900	1.3
2	7	1.00	7.0	4.5	5.9	.69	50	1.3
3	289	1.04	17.6	8.2	14.4	.76	4100	1.3
4	93	1.06	13.4	7.0	11.2	.74	1100	1.3
5	158	1.17	15.7	8.2	13.2	.75	2100	1.3
6	375	2.32	22.6	15.9	20.0	.68	5700	1.3
7	7	1.13	7.1	4.9	6.1	.66	50	1.3
8	53	1.03	11.6	6.2	9.7	.73	550	1.3
9	121	1.01	14.2	7.0	11.6	.75	1450	1.3
10	45	1.10	11.3	6.4	9.5	.72	500	1.3
11	27	1.03	9.8	5.6	8.2	.71	280	1.3
12	23	1.04	9.5	5.5	8.0	.72	250	1.3

MOHAWK BASIN ABOVE LITTLE FALLS, N.Y.
SUBBASIN 3-HOUR UNIT HYDROGRAPHS

Time (hrs)	1	2	3	4	5	6	7	8	9	10	11	12
3	698	152	953	527	623	478	136	409	632	354	291	266
6	2435	427	3354	1833	2192	1746	394	1407	2198	1217	970	877
9	4449	439	6314	3244	4083	3448	425	2325	3950	1995	1449	1275
12	5771	245	8818	3966	5474	5312	257	2474	4969	2075	1260	1061
15	5762	122	9963	3513	5782	6966	137	1850	4646	1530	772	625
18	4483	61	9342	2445	4838	8020	73	1134	3395	950	447	359
21	2953	30	7241	1580	3406	8365	39	695	2197	590	259	206
24	1945	15	4999	1021	2349	7813	21	426	1422	366	150	118
27	1281	7	3452	660	1620	6642	11	261	920	227	87	68
30	844		2383	426	1118	5495	6	160	595	141	50	39
33	556		1645	276	771	4547		98	385	88	29	22
36	366		1136	178	532	3762		60	249	54	17	13
39	241		784	115	367	3113		37	161	34		
42	159		541	74	253	2575		23	104	21		
45	105		374	48	175	2131			68			
48	69		258		120	1763						
51			178		83	1459						
54			123		57	1207						
57						999						
60						826						
63						684						
66						566						
69						468						
72						387						
75						320						
78						265						
81						219						
84						181						
87						150						
90						124						
93						103						
96						85						
99						70						

All flows in cfs/unit rainfall.

Table 6.3

MOHAWK BASIN ABOVE LITTLE FALLS, N.Y.

INITIAL FLOW AND INFILTRATION PARAMETERS

Subbasin No.	December, 1948 Initial Flow (cfs)	December, 1948 Initial Loss (in)	December, 1948 Constant Loss (in/hr)	June, 1972 Initial Flow (cfs)	June, 1972 Initial Loss (in)	June, 1972 Constant Loss (in/hr)	SPF and Transposed Agnes Initial Flow (cfs)	SPF and Transposed Agnes Initial Loss (in)	SPF and Transposed Agnes Constant Loss (in/hr
1	90	.50	.045	250	0.25	.045	250	1.0	.075
2	7	.50	.045	7	2.00	.075	7	2.0	.075
3	200	.50	.040	540	2.00	.125	540	2.0	.125
4	50	.50	.040	140	2.00	.125	140	2.0	.125
5	100	.50	.040	265	2.00	.100	265	2.0	.100
6	280	.25	.055	725	0.10	.040	725	1.0	.075
7	7	.25	.045	7	0.10	.020	7	1.0	.075
8	25	.25	.045	72	0.10	.040	72	1.0	.075
9	70	.25	.045	190	0.10	.045	190	1.0	.075
10	20	.20	.045	60	0.35	.075	60	2.0	.075
11	10	.10	.040	32	0.30	.050	32	1.0	.075
12	10	.10	.040	27	0.30	.050	27	1.0	.075

Table 6.4

MOHAWK BASIN ABOVE LITTLE FALLS, N.Y.

ROUTING REACH CHARACTERISTICS

Reach No.	Length (mi)	Slope (ft/mi)	Muskingum Parameters NSTEPS (-)	K (hrs.)	X (-)
1001-1002	5.2	8.7	1	1.0	.3
1002-1003	7.8	2.1	2	1.4	.3
1003-1004	5.2	2.1	1	2.0	.2
1004-1005	13.1	2.1	2	2.4	.2
1005-1010	3.9	2.1	1	1.5	.2
1006-1007		**	DUMMY LINK	**	
1007-1008		**	DUMMY LINK	**	
1008-1009	23.1	11.9	4	1.1	.3
1009-1010	4.4	14.1	1	0.7	.3
1010-1011	5.7	2.1	1	2.1	.2
1011-1012	4.6	2.1	1	1.7	.2

Table 6.5

DELTA RESERVOIR

Storage-Discharge Relationship

Elevation (ft. above MSL)	Storage (acre-ft)	Discharge (cfs)
550	62330	0
550.5	64170	337
551	65540	954
551.5	66920	1753
552	68750	2698
552.5	69900	3771
553	71500	4957
555	76770	10666
561.8	94617	30000

Initial Storage Level (acre-ft)

December 1948	(not simulated)
June 1972	64170
SPF and Transposed Agnes	62330

Table 6.6

HINCKLEY RESERVOIR

Storage-Discharge Relationship

Elevation (ft. above MSL)	Storage (acre-ft)	Discharge (cfs)
1225	157900	0
1225.5	161100	474
1226	164540	1340
1226.5	167750	2462
1227	170960	3790
1227.5	174400	5297
1230	190670	14982
1239	211515	50000

Initial Storage Level (acre-ft)

December 1948	(not simulated)
June 1972	157900
SPF and Transposed Agnes	157900

Table 6.7

MOHAWK BASIN ABOVE LITTLE FALLS, N.Y.
SUBBASIN RAINFALL AND PEAK FLOWS

Subbasin	December, 1948 Rainfall (in) Total	December, 1948 Rainfall (in) Excess	December, 1948 Peak Flow (cfs)	June, 1972 Rainfall (in) Total	June, 1972 Rainfall (in) Excess	June, 1972 Peak Flow (cfs)	SPF Rainfall (in) Total	SPF Peak Flow (cfs)	Transposed Agnes Rainfall (in) Total	Transposed Agnes Rainfall (in) Excess	Transposed Agnes Peak Flow (cfs)
1	3.69	1.51	5866	4.14	2.50	10796	12.0	47388	11.3	8.1	30707
2	3.55	1.46	351	3.99	1.77	634	13.5	8259	10.7	5.7	1095
3	3.38	1.03	5125	3.94	1.28	10536	11.4	69424	10.7	3.9	25050
4	3.62	1.37	2651	4.17	1.46	4670	12.4	30463	10.7	3.9	9068
5	3.62	1.44	4373	3.76	1.33	6029	12.0	44203	11.9	7.6	30068
6	5.42	2.40	9767	4.07	2.40	13693	11.2	63107	14.0	10.7	69847
7	4.96	2.47	475	2.53	1.82	572	13.5	4023	12.7	9.5	2227
8	4.34	2.19	3132	2.57	1.26	2627	12.8	21441	12.4	9.2	13350
9	4.41	1.95	4417	3.59	1.83	5471	12.2	40602	13.3	10.0	30669
10	3.28	1.05	1171	3.28	0.87	1266	12.9	18330	12.6	8.9	11482
11	3.55	1.40	889	2.40	1.14	628	13.2	12558	13.3	10.2	8152
12	3.72	1.60	809	2.28	1.24	601	13.3	10996	13.7	10.6	7269

Table 6.8

MOHAWK BASIN ABOVE LITTLE FALLS, N.Y.

SIMULATED PEAK FLOWS AT CONTROL POINTS
(All Flows in cfs)

Control Point	Description	December 1948	June 1972	SPF	Transposed Agnes	Drainage Area (mi^2)
1001	Mohawk R. at Delta Dam, USGS 3360	651 R	6335 R	28630	21819	150
1002	Mohawk R. at Rome, NY above Barge Canal	869	6549	28733	22539	157
1003	Mohawk R. at Oriskany, NY	5720	17016	83307	47381	446
1004	Mohawk R. at Utica, NY	8317	20029	96011	54269	539
1005	Mohawk R. at Ilion, NY	12254	22693	112525	66034	697
1006	W. Canada Cr. below Hinckley Reservoir, USGS 3440	300 R	6600	35759	45461	375
1007	W. Canada Cr. at Trenton Falls, NY	775	6648	35759	45511	382
1008	W. Canada Cr. below Cincinnati Cr.	3848	7114	36264	46977	435
1009	W. Canada Cr. at Kast Bridge, USGS 3460	8054	9408	58143	58538	556
1010	Mohawk R. below W. Canada Cr.	16903	31438	151042	125403	1298
1011	Mohawk R. at Little Falls, NY	17258	31204	150221	125863	1325
1012	Mohawk R. at Little Falls, USGS 3470	17413	31132	149572	126143	1348

R = Assumed Regulated Discharge

Table 6.11

MOHAWK RIVER, LITTLE FALLS, N.Y. TO MOUTH
SUBBASIN CHARACTERISTICS

Subbasin No.	Area (mi^2)	Storage Area (% + 1.0)	Clark Coefficients TC (hr)	Clark Coefficients R (hr)	Snyder Coefficients LAG (hr)	Snyder Coefficients CP (-)	Recession Parameters QRCSN (cfs)	Recession Parameters RTIOR (-)
13	261	1.01	17.1	7.9	14.0	.77	3650	1.3
14	30	1.01	10.0	5.6	8.3	.71	320	1.3
15	35	1.03	10.5	5.9	8.9	.73	400	1.3
16	151	3.25	18.6	17.9	17.4	.59	3500	1.3
17	59.2	1.01	11.9	6.3	10.0	.74	600	1.3
18	13.1	1.08	8.2	5.2	7.0	.69	100	1.3
19	72	1.00	12.4	6.4	10.3	.74	700	1.3
20	55	1.05	11.8	6.4	9.9	.74	550	1.3
21	12.7	1.39	8.6	6.3	7.4	.65	120	1.3
22	23	1.12	9.6	5.9	8.2	.70	250	1.3
23	84	1.07	13.1	6.9	11.1	.74	870	1.3
24	39.3	1.18	11.1	6.6	9.4	.70	420	1.3
25	186.5	1.14	16.2	8.2	13.4	.74	2500	1.3
26	10.2	1.00	7.7	4.7	6.3	.69	70	1.3
127	78	1.09	13.0	6.9	10.9	.74	800	1.3
27	491	1.19	20.8	9.9	17.2	.76	6800	1.3
28	78	1.02	12.8	6.6	10.5	.74	800	1.3
29	87	1.03	13.1	6.8	11.0	.75	920	1.3
30	103	1.90	15.6	11.1	13.8	.67	1150	1.3
31	28	1.06	10.0	5.8	8.3	.71	300	1.3
32	32	2.14	11.7	10.2	10.4	.61	350	1.3
33	38	1.02	10.7	5.9	9.0	.73	400	1.3
34	108	1.39	14.8	8.8	12.6	.71	1250	1.3
35	33	1.07	10.4	6.0	8.9	.73	370	1.3

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NATIONAL DAM SAFETY PROGRAM. VISCHER RRY DAM (NY 170), MOHAWK--ETC(U)
SEP 79 J B STETSON DACW-51-79-C0001

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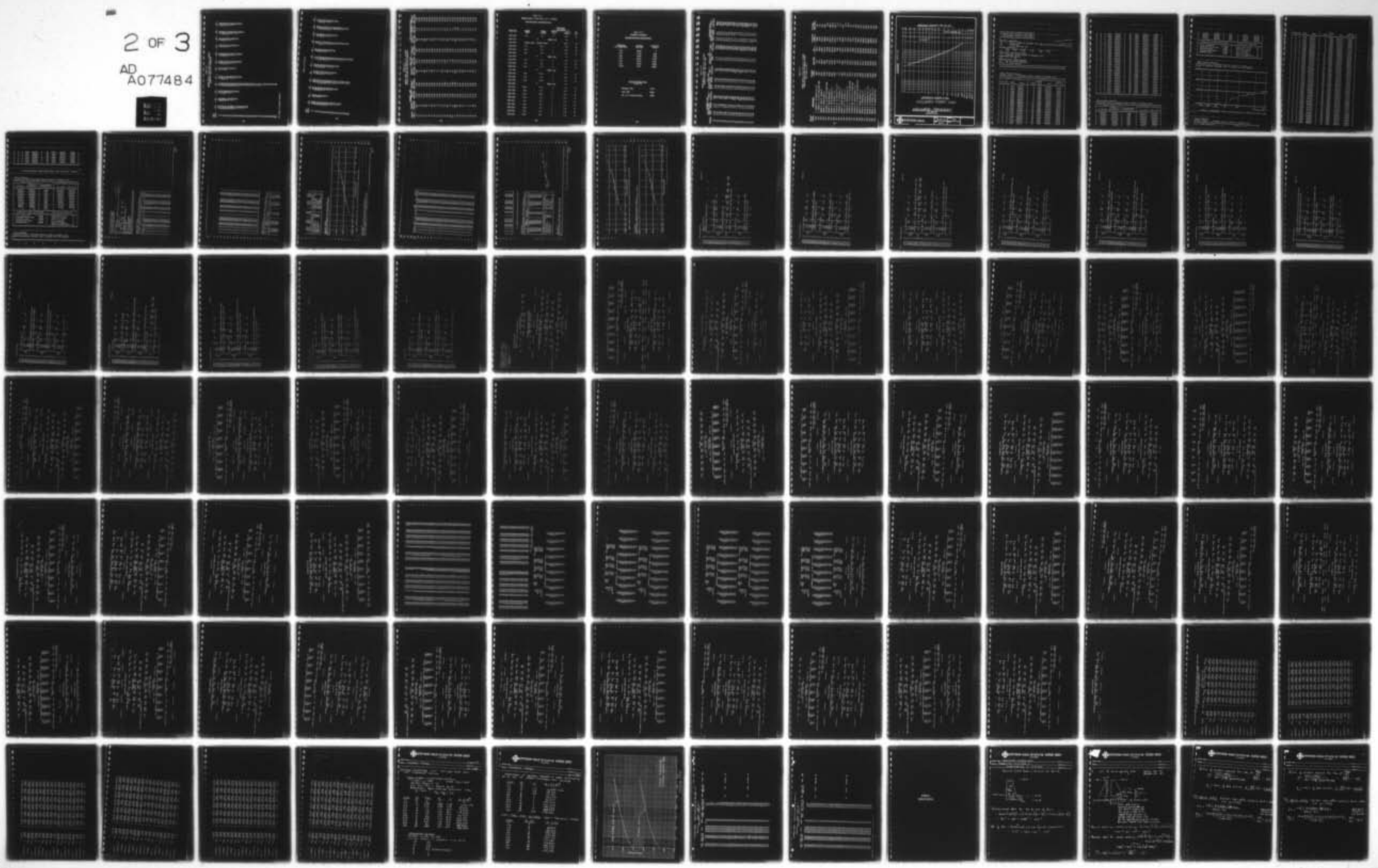


Table 6.12

MOHAWK BASIN, LITTLE FALLS, N.Y. TO MOUTH
SUBBASIN 3-HOUR UNIT HYDROGRAPHS

Time (hrs)	13	14	15	16	17	18	19	20	21	22	23	24
3	933	313	332	231	442	195	492	409	152	249	496	309
6	3275	1047	1124	847	1520	610	1696	1410	494	827	1723	1065
9	6134	1585	1752	1684	2536	771	2893	2350	676	1226	3026	1739
12	8443	1408	1644	2535	2767	554	3313	2550	540	1055	3645	1786
15	9333	881	1089	3156	2113	306	2660	1944	333	648	3151	1310
18	8411	511	645	3395	1296	170	1679	1204	205	384	2144	827
21	6264	296	382	3168	795	94	1042	746	127	227	1380	522
24	4260	172	226	2697	488	52	647	462	78	135	889	329
27	2898	100	134	2280	299	29	402	286	48	80	572	208
30	1971	58	79	1928	183	16	249	177	30	47	368	131
33	1341	33	47	1630	113	9	155	110	18	28	237	83
36	912	19	28	1378	69		96	68	11	17	153	52
39	620		17	1165	42		60	42	7		98	33
42	422			985	26		37	26			63	21
45	287			833							41	
48	195			704								
51	133			595								
54	90			503								
57				425								
60				360								
63				304								
66				257								
69				217								
72				184								
75				155								
78				131								
81				111								
84				94								
87				79								
90				67								
93				57								
96				48								
99				41								
102				34								
105				29								

All flows in cfs/unit rainfall.

Table 6.12 (Cont'd)

Time (hrs)	25	26	127	27	28	29	30	31	32	33	34	35
3	695	183	469	1080	502	525	313	289	162	350	434	311
6	2446	548	1630	3848	1735	1820	1124	967	579	1187	1535	1053
9	4579	629	2850	7363	2998	3185	2148	1465	1013	1869	2851	1641
12	6221	401	3405	10879	3513	3821	2967	1304	1177	1789	3771	1539
15	6721	208	2906	13431	2912	3280	3259	821	1013	1208	3855	1023
18	5814	108	1958	14333	1895	2209	2898	483	753	718	3125	613
21	4204	56	1262	13446	1192	1405	2239	284	560	426	2223	367
24	2907	29	814	10867	750	894	1708	167	416	253	1576	220
27	2010	15	524	7999	472	569	1302	98	309	150	1117	132
30	1389	8	338	5889	297	362	993	58	230	89	792	79
33	961		218	4335	187	230	758	34	171	53	562	47
36	664		140	3191	118	147	578	20	127	32	398	28
39	459		91	2349	74	93	441		94	19	282	17
42	317		58	1729	47	59	336		70		200	
45	219		38	1273		38	256		52		142	
48	152			937			195		39		101	
51	105			690			149		29		71	
54	73			508			114		21		51	
57				374			87		16		36	
60				275			66		12			
63				203			50					
66				149			38					
69							29					

Table 6.13
MOHAWK RIVER, LITTLE FALLS, N.Y. TO MOUTH
INITIAL FLOW AND INFILTRATION PARAMETERS

Subbasin No.	December, 1948			June, 1972			SPF and Transposed Agnes		
	Initial Flow (cfs)	Initial Loss (in)	Constant Loss (in/hr)	Initial Flow (cfs)	Initial Loss (in)	Constant Loss (in/hr)	Initial Flow (cfs)	Initial Loss (in)	Constant Loss (in/hr
13	180	0.10	0.04	480	0.10	0.02	480	1.0	0.075
14	12	0.10	0.04	37	0.10	0.02	37	1.0	0.075
15	15	0.10	0.04	44	0.10	0.02	44	1.0	0.075
16	90	0.40	0.04	250	0.50	0.05	250	1.0	0.075
17	29	0.40	0.04	82	0.50	0.05	82	1.0	0.075
18	8	0.40	0.04	14	0.50	0.05	14	1.0	0.075
19	36	0.40	0.04	103	0.50	0.05	103	1.0	0.075
20	26	0.40	0.04	75	0.50	0.05	75	1.0	0.075
21	8	0.40	0.05	13	1.30	0.05	13	1.3	0.075
22	10	0.40	0.05	27	1.30	0.05	27	1.3	0.075
23	44	0.40	0.05	125	1.00	0.03	125	1.0	0.075
24	13	0.50	0.055	51	2.00	0.03	51	2.0	0.075
25	120	0.50	0.05	320	2.00	0.013	320	2.0	0.075
26	8	0.50	0.05	10	1.50	0.05	10	1.5	0.075
127	42	0.50	0.055	115	1.50	0.05	115	1.5	0.075
27	380	0.50	0.055	1010	1.25	0.01	1010	1.25	0.075
28	40	0.50	0.05	115	1.25	0.01	115	1.25	0.075
29	46	0.50	0.04	132	1.10	0.04	132	1.1	0.075
30	57	0.10	0.05	160	0.70	0.05	160	1.0	0.075
31	11	0.10	0.05	34	0.70	0.05	34	1.0	0.075
32	13	0.10	0.05	40	0.25	0.04	40	1.0	0.075
33	17	0.10	0.05	49	0.25	0.04	49	1.0	0.075
34	60	0.10	0.05	170	0.25	0.04	170	1.0	0.075
35	13	0.10	0.05	41	0.25	0.04	41	1.0	0.075

Table 6.14

MOHAWK RIVER, LITTLE FALLS, N.Y. TO MOUTH

ROUTING REACH CHARACTERISTICS

Reach No.	Length (mi)	Slope (ft/mi)	Muskingum Parameters NSTEPS (-)	K (hrs.)	X (-)
1012-1015	2.3	2.1	1	0.9	.2
1013-1114		**	DUMMY LINK	**	
1114-1014	(Kyser and E. Canada Lakes)		1	14.0	.0
1014-1015	1.4	14.3	1	1.0	.2
1015-1016	6.6	2.1	1	2.5	.2
1016-1018	2.5	2.1	1	1.0	.2
1017-1018		**	DUMMY LINK	**	
1018-1019	3.3	2.1	1	1.2	.2
1019-1020	3.1	2.1	1	1.2	.2
1020-1023	8.3	2.1	2	1.6	.2
1021-1022		**	DUMMY LINK	**	
1022-1023	8.5	41.5	1	1.4	.3
1023-1029	5.5	2.1	1	2.5	.2
1024-1025	12.2	27.9	1	1.3	.3
1025-1026		**	DUMMY LINK	**	
1127-1027	33.0	11.8	4	1.4	.3
1027-1028	6.6	9.1	1	1.2	.2
1028-1029	15.2	15.3	1	2.1	.2
1029-1030	5.6	2.1	1	2.1	.2
1030-1031	3.4	2.1	1	1.3	.2
1031-1032	5.6	2.1	1	2.1	.2
1032-1033	8.0	2.1	2	1.5	.2
1033-1034	9.5	2.1	2	1.8	.2
1034-1035	10.2	13.1	1	1.5	.2

Table 6.15

SCHOHARIE RESERVOIR

Storage-Discharge Relationship

Elevation (ft. above MSL)	Storage (acre-ft)	Discharge (cfs)
1130	60660	0
1131	61750	3480
1132	62840	9890
1133	63920	18160
1134	65010	27960
1135	66100	39080
1139.6	71091	90000

	Initial Storage Level (acre-ft)
December 1948	15530
June 1972	60660
SPF and Transposed Agnes	60660

Table 6.16

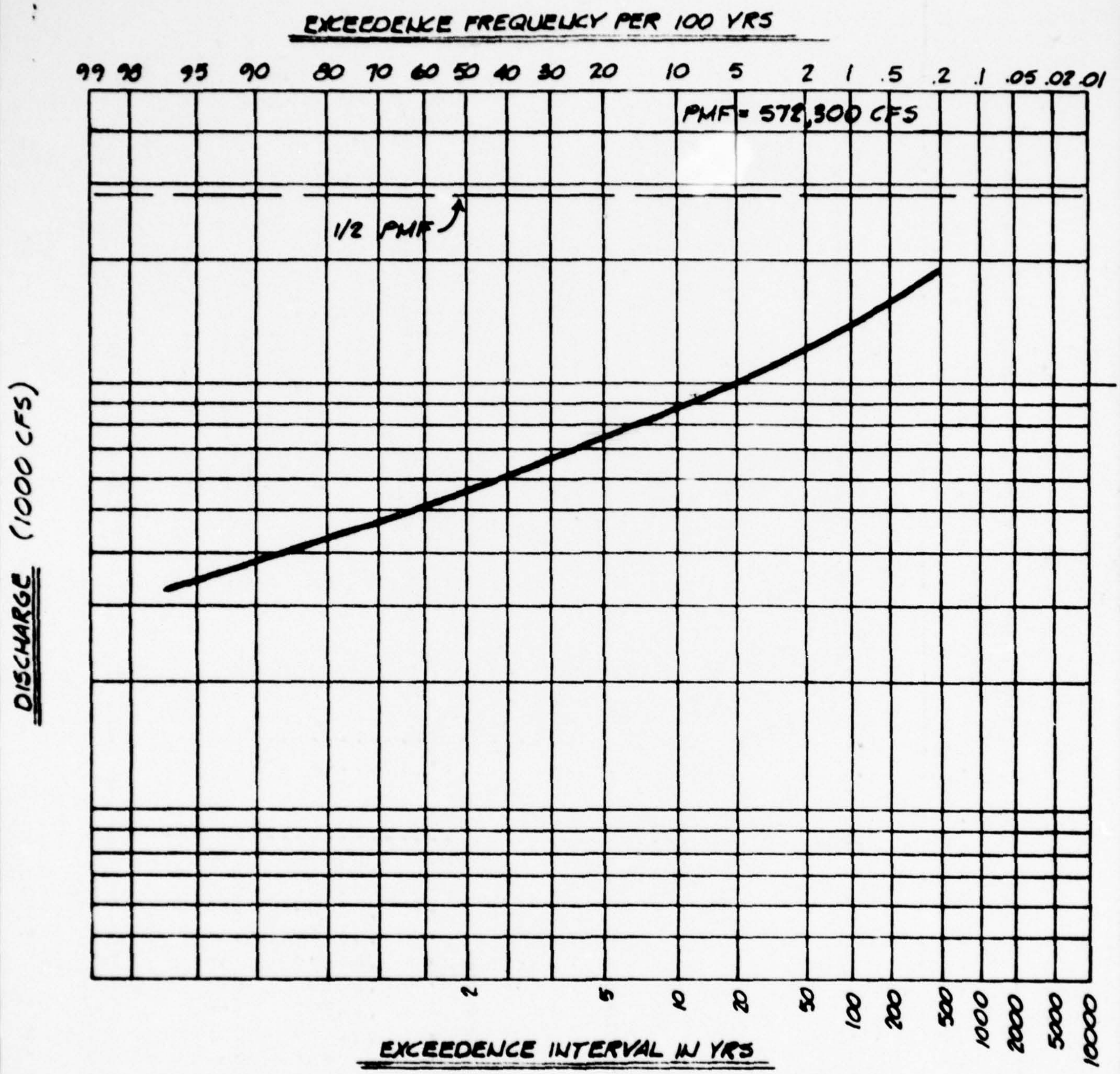
MOHAWK BASIN, LITTLE FALLS, N.Y. TO MOUTH
SUBBASIN RAINFALL AND PEAK FLOWS

	December, 1948			June, 1972			SPF		Transposed Agnes		
	Rainfall (in)		Peak	Rainfall (in)		Peak	Rainfall (in)	Peak	Rainfall (in)		Peak
Subbasin	Total	Excess	Flow (cfs)	Total	Excess	Flow (cfs)	Total	Flow (cfs)	Total	Excess	Flow (cfs)
13	4.53	2.24	8000	2.52	1.65	8711	11.5	70974	13.9	10.7	68095
14	3.76	2.14	1435	2.03	1.59	850	13.1	13765	14.0	10.8	9576
15	3.43	1.17	953	1.69	1.27	756	13.1	15449	13.6	10.5	10565
16	4.34	1.83	3731	2.76	1.48	1810	12.0	27889	14.0	10.8	27973
17	3.98	1.56	2165	2.56	1.45	1490	12.7	23618	14.3	11.2	18047
18	4.07	1.58	429	2.90	1.78	510	13.4	6875	15.3	12.2	4895
19	4.53	2.04	3611	2.67	1.58	1955	12.6	27614	13.9	10.7	20949
20	4.40	2.13	2498	2.43	1.24	1096	12.8	21927	13.2	10.0	15206
21	5.19	2.11	511	3.36	1.68	366	13.4	5981	11.6	8.6	3973
22	5.12	2.05	957	3.36	1.69	679	13.3	10655	11.9	8.9	7538
23	4.54	1.60	3364	2.68	1.39	1500	12.5	30114	13.1	10.0	22043
24	6.03	2.97	2469	7.16	4.59	2740	13.0	15973	11.0	7.4	9154
25	5.92	3.07	10185	6.18	3.99	16152	11.8	52595	11.1	7.0	29251
26	4.46	1.76	505	3.85	1.73	446	13.4	5747	11.1	7.2	2076
127	4.46	1.40	2589	3.89	1.78	2573	12.5	28157	10.7	6.8	12464
27	4.48	1.40	12611	3.08	1.57	6670	10.9	103558	12.0	8.1	81426
28	4.47	2.01	3832	2.63	1.44	1412	12.5	29052	14.8	11.5	23896
29	5.24	3.01	6098	2.40	1.03	1173	12.4	31436	12.9	9.9	28406
30	5.76	3.17	6387	2.88	1.51	2202	12.3	27188	11.4	8.5	22887
31	5.59	3.03	2090	2.64	1.28	791	13.2	12756	11.1	8.2	8521
32	5.24	2.68	1864	2.31	0.61	426	13.1	10381	10.8	8.2	7702
33	5.24	2.68	2576	2.27	0.58	518	13.0	16684	10.5	8.0	11416
34	5.40	2.84	6716	2.39	0.60	1175	12.3	32452	8.4	5.9	19529
35	5.85	3.46	3170	1.59	0.54	404	13.1	14498	6.8	4.1	4479

Table 6.17

MOHAWK RIVER, LITTLE FALLS, N.Y. TO MOUTH
SIMULATED PEAK FLOWS AT CONTROL POINTS
(All Flows in cfs)

Control Point	Description	December 1948	June 1972	SPF	Transposed Agnes	Drainage Area (mi^2)
1013	E. Canada Cr. at Dolgeville, N.Y.	8000	8711	70974	68095	261
1014	E. Canada Cr. at East Creek,USGS 3480	6907	5615	46206	52369	291
1015	Mohawk R. below E. Canada Cr	23401	36010	183761	176014	1674
1016	Mohawk R. Below Caroga Cr.	25026	36651	194176	196968	1825
1017	Otsquago Cr. at Fort Plain,USGS 3490	2156	1490	23618	18047	59.2
1018	Mohawk R. Below Otsquago Cr.	26324	37158	195199	203707	1897.3
1019	Mohawk R. Below Canajoharie Cr.	29087	37673	196138	212635	1969.3
1020	Mohawk R. at Sprakers, N.Y.	30862	37899	196354	218553	2024.3
1021	Cayadutta Cr. at Gloversville, N.Y.	511	366	5981	3973	12.7
1022	Cayadutta Cr. at Johnstown, N.Y.	1467	1045	16289	11498	35.7
1023	Mohawk R. Below Cayadutta Cr.	33528	38595	195513	229900	2144
1024	Batavia Kill at Windham, N.Y.	2469	2740	15973	9154	39.3
1025	Schoharie Cr. Below Batavia Kill	12391	18784	64462	37654	225.8
1026	Schoharie Cr. at Prattsville,USGS 3500	12664	19025	66414	39513	236
1127	Schoharie Res. Outflow at Gilboa Dam	2073	21070	87488	51789	314
1027	Schoharie Cr. Below Cobleskill Cr.	12661	26334	173316	131666	805
1028	Schoharie Cr. at Burtonsville,USGS 3515	15359	26797	180196	149922	883
1029	Mohawk R. below Schoharie Cr.	54800	64118	293924	379254	3114
1030	Mohawk R. at Amsterdam, N.Y.	60953	64116	297861	395809	3217
1031	Mohawk R. at Cranesville, N.Y.	62612	64026	297090	397365	3245
1032	Mohawk R. at Rotterdam Jct., N.Y.	63986	63525	295736	398075	3277
1033	Mohawk R. at Schenectady, N.Y.	65146	63339	293535	396922	3315
1034	Mohawk R. at Vischer Ferry, N.Y.	69566	63320	291113	397577	3423
1035	Mohawk R. at Cohoes.USGS 3575	70486	63291	290206	397659	3456



VISCHER'S FERRY DAM

DISCHARGE - FREQUENCY CURVE

STETSON • DALE	DATE 8·23·79	DRAWN JPG	
	JOB 2305	APP'D	

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1***********************************
 * FLOOD FLOW FREQUENCY ANALYSIS *
 * PRELIMINARY ------- JUNE 1976 *
 ***********************************
0
0**TITLE CARD(S)**
 TT         MOHAWK RIVER AT COHOES, N.Y.
 TT         1918-1975
 TT         D.A.= 3456 SQ. MI.
0**JOB CARD(S)**
      IPPC    ISKFX  IPROUT     IFMT     IWYR    IUNIT
 J1     2       1       0         1        0        1
0**STATION IDENTIFICATION**
 ID    01357500 MOHAWK RIVER AT COHOES, N.Y.
0**GENERALIZED SKEW**
 GS               .70
0**SYSTEMATIC FLOOD PEAKS**
 QR     58 QR CARDS SUPPLIED
0**END OF INPUT DATA**
 ED ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
    ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
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PRELIMINARY RESULTS

-ANNUAL PEAKS - 01357500 MOHAWK RIVER AT COHOES, N.Y.

DATA ANALYZED				ORDERED DATA			
MON	DAY	YEAR	FLOW	RANK	WATER YEAR	FLOW	MEDIAN PLOT POS
0	0	1918	45400.	1	1964	143000.	.0120
0	0	1919	35000.	2	1936	130000.	.0291
0	0	1920	64500.	3	1938	102000.	.0462
0	0	1921	47100.	4	1956	100000.	.0634
0	0	1922	56400.	5	1949	86300.	.0805
0	0	1923	58300.	6	1960	83300.	.0976
0	0	1924	71500.	7	1948	82700.	.1147
0	0	1925	57500.	8	1974	80900.	.1318
0	0	1926	52600.	9	1951	77300.	.1490
0	0	1927	54800.	10	1975	74200.	.1661
0	0	1928	54800.	11	1950	72800.	.1832
0	0	1929	72000.	12	1929	72000.	.2003
0	0	1930	38500.	13	1961	71900.	.2175
0	0	1931	33000.	14	1924	71500.	.2346
0	0	1932	41000.	15	1920	64500.	.2517
0	0	1933	47600.	16	1959	64400.	.2688
0	0	1934	45200.	17	1943	63900.	.2860
0	0	1935	61100.	18	1940	63000.	.3031
0	0	1936	130000.	19	1962	61900.	.3202
0	0	1937	48900.	20	1963	61600.	.3373
0	0	1938	102000.	21	1935	61100.	.3545
0	0	1939	51000.	22	1952	60800.	.3716
0	0	1940	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

*	0	0	1941	49100.	*	24	1946	58300.	.4058	*
*	0	0	1942	47200.	*	25	1923	58300.	.4229	*
*	0	0	1943	63900.	*	26	1972	58100.	.4401	*
*	0	0	1944	46000.	*	27	1925	57500.	.4572	*
*	0	0	1945	47500.	*	28	1954	56800.	.4743	*
*	0	0	1946	58300.	*	29	1922	56400.	.4914	*
*	0	0	1947	51300.	*	30	1970	56400.	.5086	*
*	0	0	1948	82700.	*	31	1968	55800.	.5257	*
*	0	0	1949	86300.	*	32	1973	55800.	.5428	*
*	0	0	1950	72800.	*	33	1928	54800.	.5599	*
*	0	0	1951	77300.	*	34	1927	54800.	.5771	*
*	0	0	1952	60800.	*	35	1926	52600.	.5942	*
*	0	0	1953	59000.	*	36	1955	51500.	.6113	*
*	0	0	1954	56800.	*	37	1947	51300.	.6284	*
*	0	0	1955	51500.	*	38	1939	51000.	.6455	*
*	0	0	1956	100000.	*	39	1941	49100.	.6627	*
*	0	0	1957	23000.	*	40	1937	48900.	.6798	*
*	0	0	1958	39700.	*	41	1933	47600.	.6969	*
*	0	0	1959	64400.	*	42	1945	47500.	.7140	*
*	0	0	1960	85300.	*	43	1942	47200.	.7312	*
*	0	0	1961	71900.	*	44	1921	47100.	.7483	*
*	0	0	1962	61900.	*	45	1944	46000.	.7654	*
*	0	0	1963	61600.	*	46	1918	45400.	.7825	*
*	0	0	1964	143000.	*	47	1934	45200.	.7997	*
*	0	0	1965	27800.	*	48	1969	42300.	.8168	*
*	0	0	1966	32700.	*	49	1932	41000.	.8339	*
*	0	0	1967	24600.	*	50	1971	40600.	.8510	*
*	0	0	1968	55800.	*	51	1958	39700.	.8682	*
*	0	0	1969	42300.	*	52	1930	38500.	.8853	*
*	0	0	1970	56400.	*	53	1919	35000.	.9024	*
*	0	0	1971	40600.	*	54	1931	33000.	.9195	*
*	0	0	1972	58100.	*	55	1966	32700.	.9366	*
*	0	0	1973	55800.	*	56	1965	27800.	.9538	*
*	0	0	1974	60900.	*	57	1967	24600.	.9709	*
*	0	0	1975	74200.	*	58	1957	23000.	.9880	*

PRELIMINARY RESULTS

-FREQUENCY CURVE- 01357500 MOHAWK RIVER AT COHOES, N.Y.

........PEAK FLOWS........				...CONFIDENCE LIMITS...	
	EXPECTED		EXCEEDANCE		
COMPUTED	PROBABILITY		PROBABILITY	.05 LIMIT	.95 LIMIT
182000.	196000.		.002	230000.	153000.
157000.	166000.		.005	193000.	135000.
140000.	146000.		.010	169000.	121000.
124000.	127000.		.020	146000.	109000.
108000.	110000.		.040	125000.	96500.
88600.	89600.		.100	99700.	80600.
74300.	74700.		.200	81800.	68500.
54500.	54500.		.500	58800.	50400.

```
*    41300.       41100.   *     .800     *     44900.      37400.  *
*    36200.       35900.   *     .900     *     39700.      32300.  *
*    32600.       32300.   *     .950     *     36100.      28700.  *
*    27300.       26700.   *     .990     *     30800.      23400.  *
***********************************************************************
*   FREQUENCY CURVE STATISTICS    *     STATISTICS BASED ON          *
*---------------------------------*----------------------------------*
*  MEAN LOGARITHM          4.7464  *   SYSTEMATIC DATA        58     *
*  STANDARD DEVIATION       .1528  *   HISTORIC EVENTS         0     *
*  COMPUTED SKEW            .0256  *   HIGH OUTLIERS           0     *
*  GENERALIZED SKEW         .7000  *   LOW OUTLIERS            0     *
*  ADOPTED SKEW             .4000  *   ZERO OR MISSING         0     *
*                                  *   TOTAL PERIOD,YEARS     58     *
***********************************************************************


 PRELIMINARY RESULTS
-FREQUENCY PLOT - 01357500 MOHAWK RIVER AT COHOES, N.Y.
BASED ON COMPUTED VALUES, FLOW IN CUBIC FEET PER SECOND
Q
200000-----------------------------------------------------------------
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100000-----------------------------------------------------------------
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      .      .      .       .           .               .         .
      .      .      .       .           .               .     OOOOXO
 50000------------------------------------------------------OOOOOOO-----
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      .      .      .       .           . O OO O X        .         .
      .      .      .       .           X                 .         .
      .      .      .       .     X O  O .                .         .
      .      .      X       .    O      .                 .         .
      .      .      .       O           .                 .         .
      .      .      . O     .           .                 .         .
 20000-----------------------------------------------------------------
    .999   .997    .99     .97         .90              .70       .50
                                                          EXCEEDANCE P

      LEGEND - O=OBSERVED VALUE, H=HIGH OUTLIER OR HISTORIC VALUE, L=L
R


 FINAL RESULTS
-ANNUAL PEAKS    - 01357500 MOHAWK RIVER AT COHOES, N.Y.
***********************************************************************
*......DATA ANALYZED.......*.........      ORDERED DATA              *
```

MON	DAY	YEAR	FLOW	RANK	WATER YEAR	FLOW	MEDIAN PLOT POS
0	0	1918	45400.	1	1964	143000.	.0120
0	0	1919	35000.	2	1936	130000.	.0291
0	0	1920	64500.	3	1938	102000.	.0462
0	0	1921	47100.	4	1956	100000.	.0634
0	0	1922	56400.	5	1949	86300.	.0805
0	0	1923	58300.	6	1960	83300.	.0976
0	0	1924	71500.	7	1948	82700.	.1147
0	0	1925	57500.	8	1974	80900.	.1318
0	0	1926	52600.	9	1951	77300.	.1490
0	0	1927	54800.	10	1975	74200.	.1661
0	0	1928	54800.	11	1950	72800.	.1832
0	0	1929	72000.	12	1929	72000.	.2003
0	0	1930	38500.	13	1961	71900.	.2175
0	0	1931	33000.	14	1924	71500.	.2346
0	0	1932	41000.	15	1920	64500.	.2517
0	0	1933	47600.	16	1959	64400.	.2688
0	0	1934	45200.	17	1943	63900.	.2860
0	0	1935	61100.	18	1940	63000.	.3031
0	0	1936	130000.	19	1962	61900.	.3202
0	0	1937	48900.	20	1963	61600.	.3373
0	0	1938	102000.	21	1935	61100.	.3545
0	0	1939	51000.	22	1952	60800.	.3716
0	0	1940	63000.	23	1953	59000.	.3887
0	0	1941	49100.	24	1946	58300.	.4058
0	0	1942	47200.	25	1923	58300.	.4229
0	0	1943	63900.	26	1972	58100.	.4401
0	0	1944	46000.	27	1925	57500.	.4572
0	0	1945	47500.	28	1954	56800.	.4743
0	0	1946	58300.	29	1922	56400.	.4914
0	0	1947	51300.	30	1970	56400.	.5086
0	0	1948	82700.	31	1968	55800.	.5257
0	0	1949	86300.	32	1973	55800.	.5428
0	0	1950	72800.	33	1928	54800.	.5599
0	0	1951	77300.	34	1927	54800.	.5771
0	0	1952	60800.	35	1926	52600.	.5942
0	0	1953	59000.	36	1955	51500.	.6113
0	0	1954	56800.	37	1947	51300.	.6284
0	0	1955	51500.	38	1939	51000.	.6455
0	0	1956	100000.	39	1941	49100.	.6627
0	0	1957	23000.	40	1937	48900.	.6798
0	0	1958	39700.	41	1933	47600.	.6969
0	0	1959	64400.	42	1945	47500.	.7140
0	0	1960	83300.	43	1942	47200.	.7312
0	0	1961	71900.	44	1921	47100.	.7483
0	0	1962	61900.	45	1944	46000.	.7654
0	0	1963	61600.	46	1918	45400.	.7825
0	0	1964	143000.	47	1934	45200.	.7997
0	0	1965	27800.	48	1969	42300.	.8168
0	0	1966	32700.	49	1932	41000.	.8339
0	0	1967	24600.	50	1971	40600.	.8510
0	0	1968	55800.	51	1958	39700.	.8682

*	0	0	1969	42300.	*	52	1930	38500.	.8853	*
*	0	0	1970	56400.	*	53	1919	35000.	.9024	*
*	0	0	1971	40600.	*	54	1931	33000.	.9195	*
*	0	0	1972	58100.	*	55	1966	32700.	.9366	*
*	0	0	1973	55800.	*	56	1965	27800.	.9538	*
*	0	0	1974	80900.	*	57	1967	24600.	.9709	*
*	0	0	1975	74200.	*	58	1957	23000.	.9880	*

1 LOW OUTLIER(S) IDENTIFIED BELOW TEST VALUE OF 23470.4

FINAL RESULTS
-FREQUENCY CURVE- 01357500 MOHAWK RIVER AT COHOES, N.Y.

PEAK FLOWS COMPUTED	PEAK FLOWS EXPECTED PROBABILITY	EXCEEDANCE PROBABILITY	CONFIDENCE LIMITS .05 LIMIT	CONFIDENCE LIMITS .95 LIMIT
181000.	196000.	.002	227000.	153000.
156000.	165000.	.005	191000.	134000.
139000.	145000.	.010	166000.	121000.
122000.	126000.	.020	144000.	108000.
107000.	109000.	.040	123000.	95900.
87900.	88800.	.100	98200.	80500.
73900.	74200.	.200	80900.	68400.
54700.	54700.	.500	58800.	50800.
41800.	41800.	.800	45300.	38000.
36600.	36500.	.900	40100.	32800.
32800.	32500.	.950	36300.	28900.
0.	0.	.990	0.	0.

FREQUENCY CURVE STATISTICS		STATISTICS BASED ON	
MEAN LOGARITHM	4.7531	SYSTEMATIC DATA	57
STANDARD DEVIATION	.1452	HISTORIC EVENTS	0
COMPUTED SKEW	.2299	HIGH OUTLIERS	0
GENERALIZED SKEW	.7000	LOW OUTLIERS	1
ADOPTED SKEW	.5000	ZERO OR MISSING	0
		TOTAL PERIOD,YEARS	58

FINAL RESULTS
-FREQUENCY PLOT - 01357500 MOHAWK RIVER AT COHOES, N.Y.
BASED ON COMPUTED VALUES, FLOW IN CUBIC FEET PER SECOND

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0
200000-------------------------------------------------------------
     :      :        :          :            :                 :        :
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1*********************************
 * FLOOD FLOW FREQUENCY ANALYSIS *
 * PRELIMINARY ------- JUNE 1976 *
 *********************************
0
0**TITLE CARD(S)**
  TT       MOHAWK RIVER AT COHOES, N.Y.
  TT       1918-1975
  TT       D.A.= 3456 SQ. MI.
0**JOB CARD(S)**
       IPPC   ISKEW  IPHOUT    IFMT     I-YR    IUNIT
  J1     2      1       0        1        0        1
0**STATION IDENTIFICATION**
  ID   01357500 MOHAWK RIVER AT COHOES, N.Y.
0**GENERALIZED SKEW**
  GS          .70
0**SYSTEMATIC FLOOD PEAKS**
  DW     58 WR CARDS SUPPLIED
0**END OF INPUT DATA**
  ED ***********************************************************
  ***********************************************************
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PRELIMINARY RESULTS
*ANNUAL PEAKS = 01357500 MOHAWK RIVER AT COHOES, N.Y.

DATA ANALYZED				ORDERED DATA			
MON	DAY	YEAR	FLOW	RANK	WATER YEAR	FLOW	MEDIAN PLOT-POS
0	0	1918	45400.	1	1964	145000.	.0120
0	0	1919	35000.	2	1936	130000.	.0291
0	0	1920	64500.	3	1938	102000.	.0462
0	0	1921	67100.	4	1956	100000.	.0634
0	0	1922	56400.	5	1949	86300.	.0805
0	0	1923	58300.	6	1960	83300.	.0976
0	0	1924	71500.	7	1948	82700.	.1147
0	0	1925	57500.	8	1974	80900.	.1318
0	0	1926	52600.	9	1951	77300.	.1490
0	0	1927	54600.	10	1975	74200.	.1661
0	0	1928	58800.	11	1950	72800.	.1832
0	0	1929	72000.	12	1929	72000.	.2003
0	0	1930	30500.	13	1961	71900.	.2175
0	0	1931	33000.	14	1924	71500.	.2346
0	0	1932	41000.	15	1920	64500.	.2517
0	0	1933	47600.	16	1959	64400.	.2688
0	0	1934	45200.	17	1943	63900.	.2860
0	0	1935	61100.	18	1940	63000.	.3031
0	0	1936	130000.	19	1962	61900.	.3202
0	0	1937	48900.	20	1963	61600.	.3373
0	0	1938	102000.	21	1935	61100.	.3545
0	0	1939	51000.	22	1952	60800.	.3716
0	0	1940	63000.	23	1953	59000.	.3887

M8

0	0	1941	49100.	24	1940	58300.	.4058
0	0	1942	47200.	25	1923	58300.	.4229
0	0	1943	63900.	26	1972	58100.	.4401
0	0	1944	46000.	27	1925	57500.	.4572
0	0	1945	47500.	28	1954	56800.	.4743
0	0	1946	58300.	29	1922	56400.	.4914
0	0	1947	51300.	30	1970	56400.	.5086
0	0	1948	62700.	31	1968	55800.	.5257
0	0	1949	86300.	32	1973	55600.	.5428
0	0	1950	72800.	33	1928	54600.	.5599
0	0	1951	77300.	34	1927	54500.	.5771
0	0	1952	60600.	35	1926	52600.	.5942
0	0	1953	59000.	36	1955	51500.	.6113
0	0	1954	56800.	37	1947	51300.	.6284
0	0	1955	51500.	38	1939	51000.	.6455
0	0	1956	100000.	39	1941	49100.	.6627
0	0	1957	23000.	40	1937	48900.	.6798
0	0	1958	39700.	41	1933	47600.	.6969
0	0	1959	64400.	42	1945	47500.	.7140
0	0	1960	65300.	43	1942	47200.	.7312
0	0	1961	71900.	44	1921	47100.	.7483
0	0	1962	61900.	45	1944	46000.	.7654
0	0	1963	61600.	46	1918	45400.	.7825
0	0	1964	143000.	47	1934	45200.	.7997
0	0	1965	27800.	48	1969	42300.	.8168
0	0	1966	32700.	49	1932	41000.	.8339
0	0	1967	24600.	50	1971	40600.	.8510
0	0	1968	55800.	51	1958	39700.	.8682
0	0	1969	42300.	52	1930	38500.	.8853
0	0	1970	56400.	53	1919	35000.	.9024
0	0	1971	40600.	54	1931	33000.	.9195
0	0	1972	58100.	55	1966	32700.	.9366
0	0	1973	55800.	56	1965	27800.	.9539
0	0	1974	80900.	57	1967	24600.	.9709
0	0	1975	74200.	58	1957	23000.	.9880

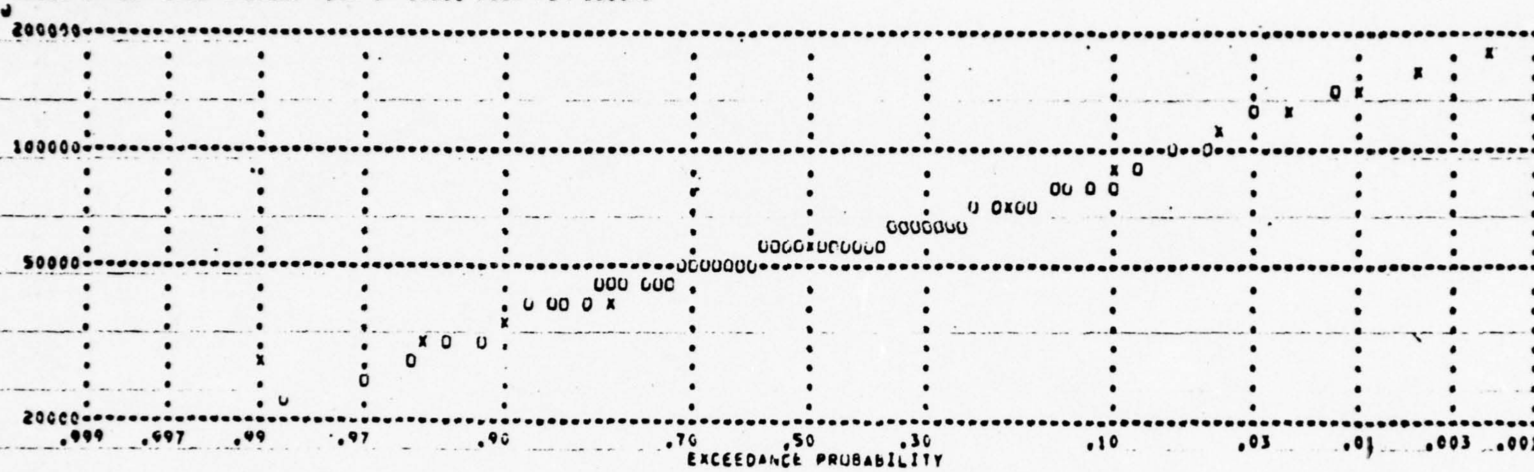
PRELIMINARY RESULTS
-FREQUENCY CURVE- 01357500 MOHAWK RIVER AT COHOES, N.Y.

PEAK FLOWS			CONFIDENCE LIMITS	
COMPUTED	EXPECTED PROBABILITY	EXCEEDANCE PROBABILITY	.05 LIMIT	.95 LIMIT
182000.	190000.	.002	230000.	153000.
157000.	160000.	.005	193000.	135000.
140000.	146000.	.010	169000.	121000.
124000.	127000.	.020	146000.	109000.
104000.	110000.	.040	125000.	96500.
86600.	89000.	.100	99700.	83600.
74300.	74700.	.200	81300.	66500.
54500.	54500.	.500	58800.	50400.

41300.	41100.	.800	44900.	37400.
36200.	35900.	.900	39700.	32300.
32600.	32300.	.950	36100.	28700.
27300.	26700.	.990	30800.	23400.

FREQUENCY CURVE STATISTICS		STATISTICS BASED ON	
MEAN LOGARITHM	4.7469	SYSTEMATIC DATA	58
STANDARD DEVIATION	.1528	HISTORIC EVENTS	0
COMPUTED SKEW	.0256	HIGH OUTLIERS	0
GENERALIZED SKEW	.7000	LOW OUTLIERS	0
ADOPTED SKEW	.4000	ZERO OR MISSING	0
		TOTAL PERIOD, YEARS	58

PRELIMINARY RESULTS
-FREQUENCY PLOT - 01357500 MOHAWK RIVER AT COHOES, N.Y.
BASED ON COMPUTED VALUES. FLOW IN CUBIC FEET PER SECOND



LEGEND - O=OBSERVED VALUE, H=HIGH OUTLIER OR HISTORIC VALUE, L=LOW OUTLIER, X=COMPUTED CURVE

FINAL RESULTS
-ANNUAL PEAKS - 01357500 MOHAWK RIVER AT COHOES, N.Y.

......DATA ANALYZED...................ORDERED DATA...........*

M8

MON	DAY	YEAR	FLOW	RANK	WATER YEAR	FLOW	MEDIAN PLOT POS
0	0	1918	45400.	1	1964	143000.	.0120
0	0	1919	35000.	2	1936	130000.	.0291
0	0	1920	64500.	3	1938	102000.	.0462
0	0	1921	47100.	4	1956	100000.	.0634
0	0	1922	56400.	5	1949	86300.	.0805
0	0	1923	58300.	6	1960	83300.	.0976
0	0	1924	71500.	7	1948	82700.	.1147
0	0	1925	57500.	8	1974	80900.	.1318
0	0	1926	52600.	9	1951	77300.	.1490
0	0	1927	54500.	10	1975	74200.	.1661
0	0	1928	54800.	11	1950	72800.	.1832
0	0	1929	72000.	12	1929	72000.	.2003
0	0	1930	38500.	13	1961	71900.	.2175
0	0	1931	53000.	14	1924	71500.	.2346
0	0	1932	41000.	15	1920	64500.	.2517
0	0	1933	47600.	16	1959	64400.	.2688
0	0	1934	45200.	17	1943	63900.	.2860
0	0	1935	61100.	18	1940	63000.	.3031
0	0	1936	130000.	19	1962	61900.	.3202
0	0	1937	48900.	20	1963	61600.	.3373
0	0	1938	102000.	21	1935	61100.	.3545
0	0	1939	51000.	22	1952	60800.	.3716
0	0	1940	63000.	23	1953	59000.	.3887
0	0	1941	49100.	24	1946	58300.	.4058
0	0	1942	47200.	25	1923	58300.	.4229
0	0	1943	63900.	26	1972	58100.	.4401
0	0	1944	46000.	27	1925	57500.	.4572
0	0	1945	47500.	28	1954	56800.	.4743
0	0	1946	58300.	29	1922	56400.	.4914
0	0	1947	51300.	30	1970	56400.	.5086
0	0	1948	82700.	31	1968	55800.	.5257
0	0	1949	86300.	32	1973	55800.	.5428
0	0	1950	72800.	33	1928	54800.	.5599
0	0	1951	77300.	34	1927	54500.	.5771
0	0	1952	60800.	35	1926	52600.	.5942
0	0	1953	59000.	36	1955	51500.	.6113
0	0	1954	56800.	37	1947	51300.	.6284
0	0	1955	51500.	38	1939	51000.	.6455
0	0	1956	100000.	39	1941	49100.	.6627
0	0	1957	23000.	40	1937	48900.	.6798
0	0	1958	39700.	41	1933	47600.	.6969
0	0	1959	64400.	42	1945	47500.	.7140
0	0	1960	83300.	43	1942	47200.	.7312
0	0	1961	71900.	44	1921	47100.	.7483
0	0	1962	61900.	45	1944	46000.	.7654
0	0	1963	61600.	46	1918	45400.	.7825
0	0	1964	143000.	47	1934	45200.	.7997
0	0	1965	27500.	48	1969	42300.	.8168
0	0	1966	32700.	49	1932	41000.	.8339
0	0	1967	24600.	50	1971	40000.	.8510
0	0	1968	55800.	51	1958	39700.	.8682

0	0	1969	42300.		52	1930	38500.	.8853
0	0	1970	56400.		53	1919	35000.	.9024
0	0	1971	40600.		54	1931	33000.	.9195
0	0	1972	50100.		55	1966	32700.	.9366
0	0	1973	55600.		56	1965	27800.	.9538
0	0	1974	80900.		57	1967	24600.	.9709
0	0	1975	74200.		58	1957	23000.	.9880

1 LOW OUTLIER(S) IDENTIFIED BELOW TEST VALUE OF 23470.0 ✓

FINAL RESULTS
-FREQUENCY CURVE- 01357500 MOHAWK RIVER AT COHOES, N.Y.

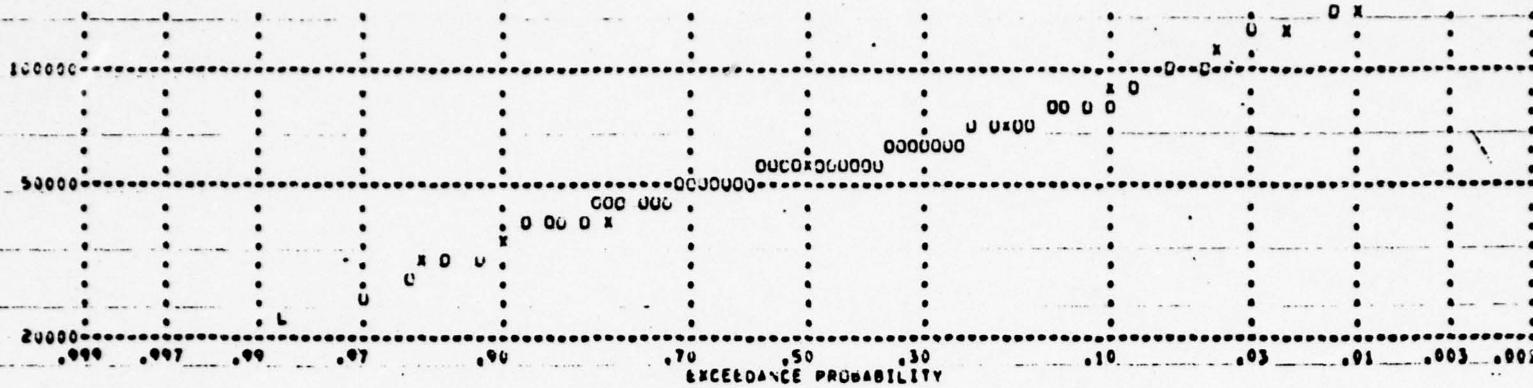
PEAK FLOWS COMPUTED	PEAK FLOWS EXPECTED PROBABILITY	EXCEEDANCE PROBABILITY	CONFIDENCE LIMITS .05 LIMIT	CONFIDENCE LIMITS .95 LIMIT
181000.	196000.	.002	227000.	153000.
156000.	165000.	.005	191000.	134000.
139000.	145000.	.010	166000.	121000.
122000.	126000.	.020	144000.	108000.
107000.	109000.	.040	123000.	95900.
87900.	88800. ✓	.100	98200.	80300.
73900.	74200. ✓	.200	80400.	66400.
54700.	54700. ✓	.500	58800.	50600.
41600.	41800. ✓	.800	45300.	38000.
36000.	36500. ✓	.900	40100.	32800.
32800.	32500. ✓	.950	36300.	28900.
0.	0.	.990	0.	0.

FREQUENCY CURVE STATISTICS		STATISTICS BASED ON	
MEAN LOGARITHM	4.7531	SYSTEMATIC DATA	57
STANDARD DEVIATION	.1452	HISTORIC EVENTS	0
COMPUTED SKEW	.2299	HIGH OUTLIERS	0
GENERALIZED SKEW	.7000	LOW OUTLIERS	1
ADOPTED SKEW	.5000	ZERO OR MISSING	0
		TOTAL PERIOD,YEARS	58

M/S ... = 4.75 - .75 ... 3456 = 2.10 (2.65)

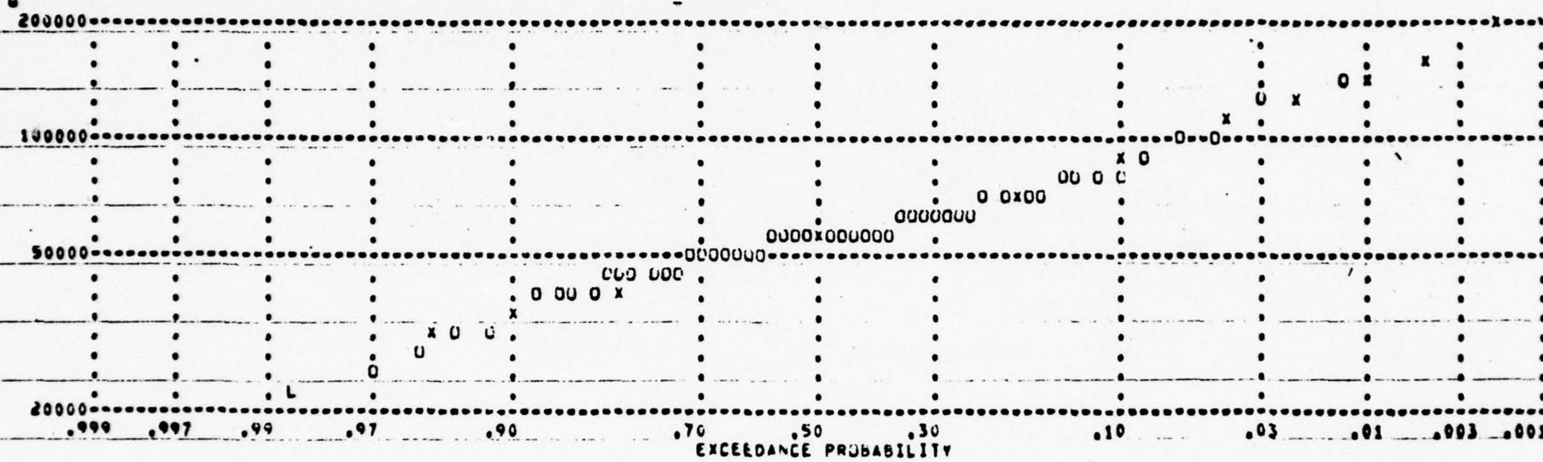
FINAL RESULTS
-FREQUENCY PLOT - 01357500 MOHAWK RIVER AT COHOES, N.Y.
BASED ON COMPUTED VALUES, FLOW IN CUBIC FEET PER SECOND
0
200000 x x

MB



LEGEND - O=OBSERVED VALUE, H=HIGH OUTLIER OR HISTORIC VALUE, L=LOW OUTLIER, X=COMPUTED CURVE

FINAL RESULTS
*FREQUENCY PLOT - 01357500 MOHAWK RIVER AT COHOES, N.Y.
BASED ON EXPECTED PROBABILITY ADJUSTMENT, FLOW IN CUBIC FEET PER SECOND



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(0001)  A1       MOHAWK RIVER BASIN
(0002)  A2       HEC-1DB
(0003)  A3       HYDROLOGIC MODEL (CLARK COEFFICIENT)
(0004)  E    150       1       0       0       0       0       0       0       4
(0005)  E1     5
(0006)  J      1       6       1
(0007)  J1    .2      .4      .5      .6      .8     1.0
(0008)  K      0       1       0       0       0       0       1
(0009)  K1       1 SUB AREA-1 ABOVE DELTA RESERVOIR RUNOFF
(0010)  M      1       0     150       0    3456       0       0       0       1
(0011)  P      0    21.9    37.5    52.0    62.5    73.5    79.0
(0012)  T   .075     1.0     1.0
(0013)  V  14.97    7.29
(0014)  X    250    1900     1.3
(0015)  K      1    1001       0       0       0       0       1
(0016)  K1       2 ROUTE OVER DELTA DAM (USGS 3360)
(0017)  Y      0       0       0       1       1
(0018)  Y1     1       0       0       0       0       0   62330
(0019)  Y2 38500   50190   62330   64170   65540   66920   68750   69900   71500   76770
(0020)  Y3     0       0       0     337     954    1753    2698    3771    4957   10666
(0021)  K      1    1022       0       0       0       0       1
(0022)  K1       3 CHANNEL ROUTE - MOHAWK RIVER TO ROME ABOVE BARGE CANAL
(0023)  Y      0       0       0       0       1
(0024)  Y1     1       0       0       1      .3
(0025)  K      0       2       0       0       0       0       1
(0026)  K1       4 SUB AREA-2 RUNOFF
(0027)  M      1       0       7       0    3456       0       0       0       1
(0028)  P      0    21.9    37.5    52.0    62.5    73.5    79.0
(0029)  T   .075     2.0     1.0
(0030)  V   6.95    4.47
(0031)  X      7      50     1.3
(0032)  K      2    1002       0       0       0       0       1
(0033)  K1       5 COMBINING 2 HYDROGRAPHS FOR MOHAWK RIVER AT ROME
(0034)  K      1    1003       0       0       0       0       1
(0035)  K1       6 CHANNEL ROUTE - MOHAWK RIVER TO ORISKANY
(0036)  Y      0       0       0       0       1
(0037)  Y1     2       0       0    1.45     0.3
(0038)  K      0       3       0       0       0       0       1
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(0039)  K1       7 SUB AREA-3 RUNOFF
(0040)  M      1       0     269       0    3456       0       0       0       1
(0041)  F      0    21.9    37.5    52.0    62.5    73.5    79.0
(0042)  T   .125     2.0     1.0
(0043)  V  17.65    8.19
(0044)  X    540    4100     1.3
(0045)  K      2    1003       0       0       0       0       1
(0046)  K1       8 COMBINE 2 HYDROGRAPHS FOR MOHAWK RIVER AT ORISKANY
(0047)  K      1    1004       0       0       0       0       1
(0048)  K1       9 CHANNEL ROUTE - MOHAWK RIVER TO UTICA
(0049)  Y      0       0       0       0       1
(0050)  Y1     1       0       0       2      .2
(0051)  K      0       4       0       0       0       0       1
(0052)  K1      10 SUB AREA-4 RUNOFF
(0053)  M      1       0      93       0    3456       0       0       0       1
(0054)  F      0    21.9    37.5    52.0    62.5    73.5    79.0
(0055)  T   .125     2.0     1.0
(0056)  V  13.44    6.98
(0057)  X    140    1100     1.3
(0058)  K      2    1004       0       0       0       0       1
(0059)  K1      11 COMBINE 2 HYDROGRAPHS FROM MOHAWK RIVER AT UTICA
(0060)  K      1    1005       0       0       0       0       1
(0061)  K1      12 CHANNEL ROUTE - MOHAWK RIVER TO ILION
(0062)  Y      0       0       0       0       1
(0063)  Y1     2       0       0    2.45      .2
(0064)  K      0       5       0       0       0       0       1
(0065)  K1      13 SUB AREA-5 RUNOFF
(0066)  M      1       0     158    3456       0       0       0       0       1
(0067)  P      0    21.9    37.5    52.0    62.5    73.5    79.0
(0068)  T    .10    2.00     1.0
(0069)  V  15.69    8.17
(0070)  X    265    2100     1.3
(0071)  K      2    1005       0       0       0       0       1
(0072)  K1      14 COMBINE 2 HYDROGRAPHS FOR MOHAWK RIVER AT ILION
(0073)  K      1    1010       0       0       0       0       1
(0074)  K1      15 CHANNEL ROUTE - MOHAWK RIVER BELOW W. CANADA CREEK
(0075)  Y      0       0       0       0       1
(0076)  Y1     1       0       0     1.5      .2
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(0077)  K       0       6       0       0       0       0       1
(0078)  K1          16 SUB AREA-6 RUNOFF
(0079)  M       1       0     375       0    3456       0       0       0       1
(0080)  P       0    21.9    37.5    52.0    62.5    73.5    79.0
(0081)  T    .075     1.0     1.0
(0082)  V   22.55   15.88
(0083)  X     725    5700     1.3
(0084)  K       1    1006       0       0       0       0       1
(0085)  K1          17 CHANNEL ROUTE - W. CANADA CREEK BELOW HINCKLEY RESERVOIR (USGS 3440)
(0086)  Y       0       0       0       1       1
(0087)  Y1      1       0       0       0       0       0  157900
(0088)  Y2  53170   86400  129710  157900  161100  164540  167750  170960  174400  190670
(0089)  Y3      0       0       0       0     474    1340    2462    3790    5297   14982
(0090)  K       0       7       0       0       0       0       1
(0091)  K1          18 SUB AREA-7 RUNOFF
(0092)  M       1       0       7       0    3456       0       0       0       1
(0093)  P       0    21.9    37.5    52.0    62.5    73.5    79.0
(0094)  T    .075     1.0     1.0
(0095)  V    7.12    4.91
(0096)  X       7      50     1.3
(0097)  K       2    1007       0       0       0       0       1
(0098)  K1          19 COMBINE 2 HYDROGRAPHS FOR W. CANADA CREEK AT TRENTON
(0099)  K       0       8       0       0       0       0       1
(0100)  K1          20 SUB AREA-8 RUNOFF
(0101)  M       1       0      53       0    3456       0       0       0       1
(0102)  P       0    21.9    37.5    52.0    62.5    73.5    79.0
(0103)  T    .075     1.0     1.0
(0104)  V   11.42    6.25
(0105)  X      72     550     1.3
(0106)  K       2    1008       0       0       0       0       1
(0107)  K1          21 COMBINE 2 HYDROGRAPHS FOR W. CANADA CREEK BELOW CINNCINNATI CREEK
(0108)  K       1    1009       0       0       0       0       1
(0109)  K1          22 CHANNEL ROUTE - W. CANADA CREEK TO KAST BRIDGE (USGS 3460)
(0110)  Y       0       0       0       0       1
(0111)  Y1      4       0       0    1.08      .3
(0112)  K       0       9       0       0       0       0       1
(0113)  K1          23 SUB AREA-9 RUNOFF
(0114)  M       1       0     121       0    3456       0       0       0       1
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(0115)  F       0     21.9     37.5     52.0     62.5     73.5     79.0
(0116)  T    .075      1.0      1.0
(0117)  V   14.17      7.0
(0118)  X     190     1450      1.3
(0119)  K       2     1009        0        0        0        0        1
(0120)  K1         24 COMBINE 2 HYDROGRAPHS FOR W. CANADA CREEK AT KAST BRIDGE (USGS 3460)
(0121)  K       1     1010        0        0        0        0        1
(0122)  K1         25 CHANNEL ROUTE - W. CANADA CREEK TO MOHAWK RIVER
(0123)  Y       0        0        0        0        1
(0124)  Y1      1        0        0     0.72       .3
(0125)  K       0       10        0        0        0        0        1
(0126)  K1         26 SUB AREA-10 RUNOFF
(0127)  M       1        0       45        0     3456        0        0        0        1
(0128)  F       0     21.9     37.5     52.0     62.5     73.5     79.0
(0129)  T    .075      2.0      1.0
(0130)  V   11.33     6.41
(0131)  X      60      500      1.3
(0132)  K       3     1010        0        0        0        0        1
(0133)  K1         27 COMBINE 3 HYDROGRAPHS AT MOHAWK RIVER BELOW W. CANADA CREEK
(0134)  K       1     1011        0        0        0        0        1
(0135)  K1         28 CHANNEL ROUTE - MOHAWK RIVER AT LITTLE FALLS
(0136)  Y       0        0        0        0        1
(0137)  Y1      1        0        0      2.1       .2
(0138)  K       0       11        0        0        0        0        1
(0139)  K1         29 SUB AREA-11 RUNOFF
(0140)  M       1        0       27        0     3456        0        0        0        1
(0141)  F       0     21.9     37.5     52.0     62.5     73.5     79.0
(0142)  T    .075      1.0      1.0
(0143)  V    9.83     5.63
(0144)  X      32      280      1.3
(0145)  K       2     1011        0        0        0        0        1
(0146)  K1         30 COMBINE 2 HYDROGRAPHS AT MOHAWK RIVER IN LITTLE FALLS
(0147)  K       1     1012        0        0        0        0        1
(0148)  K1         31 CHANNEL ROUTE - MOHAWK RIVER AT LITTLE FALLS (USGS 3470)
(0149)  Y       0        0        0        0        1
(0150)  Y1      1        0        0      1.7       .2
(0151)  K       0       12        0        0        0        0        1
(0152)  K1         32 SUB AREA-12 RUNOFF
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(0153)  M        1       0      23       0    3456       0       0       0       1
(0154)  F        0    21.9    37.5    52.0    62.5    73.5    79.0
(0155)  T     .075     1.0     1.0
(0156)  V     9.46    5.54
(0157)  X       27     250     1.3
(0158)  K        2    1012       0       0       0       0       1
(0159)  K1          33 COMBINE 2 HYDROGRAPHS AT MOHAWK RIVER IN LITTLE FALLS (USGS 3470)
(0160)  K        1    1015       0       0       0       0       1
(0161)  K1          34 CHANNEL ROUTE - MOHAWK RIVER BELOW E. CANADA CREEK
(0162)  Y        0       0       0       0       1
(0163)  Y1       1       0       0      .9      .2
(0164)  K        0      13       0       0       0       0       1
(0165)  K1          35 SUB AREA-13 RUNOFF
(0166)  M        1       0     261       0    3456       0       0       0       1
(0167)  F        0    29.1    37.5    52.0    62.5    73.5    79.0
(0168)  T     .075     1.0     1.0
(0169)  V    17.09    7.68
(0170)  X      480    3650     1.3
(0171)  K        0      14       0       0       0       0       1
(0172)  K1          36 SUB AREA-14 RUNOFF
(0173)  M        1       0      30       0    3456       0       0       0       1
(0174)  F        0    21.9    37.5    52.0    62.5    73.5    79.0
(0175)  T     .075     1.0     1.0
(0176)  V    10.04    5.64
(0177)  X       37     320     1.3
(0178)  K        2    1014       0       0       0       0       1
(0179)  K1          37 COMBINE 2 HYDROGRAPHS AT E. CANADA CREEK AT EAST CREEK (USGS 3480)
(0180)  K        1    1014       0       0       0       0       1
(0181)  K1          38 CHANNEL ROUTE - E. CANADA CREEK TO EAST CREEK (USGS 3480)
(0182)  Y        0       0       0       0       1
(0183)  Y1       1       0       0      14       0
(0184)  K        1    1015       0       0       0       0       1
(0185)  K1          39 CHANNEL ROUTE - MOHAWK RIVER BELOW E. CANADA CREEK
(0186)  Y        0       0       0       0       1
(0187)  Y1       1       0       0     1.0      .2
(0188)  K        0      15       0       0       0       0       1
(0189)  K1          40 SUB AREA-15 RUNOFF
(0190)  M        1       0      37       0    3456       0       0       0       1
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(0191)  P      0    21.9    37.5    52.0    62.5    73.5    79.0
(0192)  T   .075     1.0     1.0
(0193)  V  10.4[illegible]    5.86
(0194)  X     44     400     1.3
(0195)  K      3    1015       0       0       0       0       1
(0196)  K1       41 COMBINE 3 HYDROGRAPHS AT MOHAWK RIVER BELOW E. CANADA CREEK
(0197)  K      1    1016       0       0       0       0       1
(0198)  K1       42 CHANNEL ROUTE - MOHAWK RIVER BELOW CAROGA CREEK
(0199)  Y      0       0       0       0       1
(0200)  Y1     1       0       0     2.5      .2
(0201)  K      0      16       0       0       0       0       1
(0202)  K1       43 SUB AREA-16 RUNOFF
(0203)  M      1       0     151       0    3456       0       0       0       1
(0204)  P      0    21.9    37.5    52.0    62.5    73.5    79.0
(0205)  T   .075     1.0     1.0
(0206)  V  18.56   17.91
(0207)  X    250    3500     1.3
(0208)  K      2    1016       0       0       0       0       1
(0209)  K1       44 COMBINE 2 HYDROGRAPHS AT MOHAWK RIVER BELOW CAROGA CREEK
(0210)  K      1    1018       0       0       0       0       1
(0211)  K1       45 CHANNEL ROUTE - MOHAWK RIVER BELOW OTSQUAGO CREEK
(0212)  Y      0       0       0       0       1
(0213)  Y1     1       0       0     1.0      .2
(0214)  K      0      17       0       0       0       0       1
(0215)  K1       46 SUB AREA-17 RUNOFF
(0216)  M      1       0    59.2       0    3456       0       0       0       1
(0217)  P      0    21.9    37.5    52.0    62.5    73.5    79.0
(0218)  T   .075     1.0     1.0
(0219)  V  11.[illegible]    6.26
(0220)  X     82     600     1.3
(0221)  K      0      18       0       0       0       0       1
(0222)  K1       47 SUB-AREA-18 RUNOFF
(0223)  M      1       0    13.1       0    3456       0       0       0       1
(0224)  P      0    21.9    37.5    52.0    62.5    73.5    79.0
(0225)  T   .075     1.0     1.0
(0226)  V   8.25    5.22
(0227)  X     14     100     1.3
(0228)  K      3    1018       0       0       0       0       1
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(0229)  K1        48 COMBINE 3 HYDROGRAPHS AT MOHAWK RIVER BELOW OTSQUAGO CREEK
(0230)  K      1    1019       0       0       0       0       1
(0231)  K1        49 CHANNEL ROUTE-MOHAWK RIVER BELOW CANAJOHARIE  CREEK
(0232)  Y      0       0       0       0       1
(0233)  Y1     1       0       0     1.2      .2
(0234)  K      0      19       0       0       0       0       1
(0235)  K1        50 SUB AREA - 19 RUNOFF
(0236)  M      1       0      72       0    3456       0       0       0       1
(0237)  F      0    21.9    37.5    52.0    62.5    73.5    79.0
(0238)  T   .075     1.0     1.0
(0239)  V  12.44    6.41
(0240)  X    103     700     1.3
(0241)  K      2    1019       0       0       0       0       1
(0242)  K1        51 COMBINE 2 HYDROGRAPHS AT MOHAWK RIVER BELOW CANAJOHARIE CREEK
(0243)  K      1    1020       0       0       0       0       1
(0244)  K1        52 CHANNEL ROUTE - MOHAWK RIVER AT SPRAKERS
(0245)  Y      0       0       0       0       1
(0246)  Y1     1       0       0     1.2      .2
(0247)  K      0      20       0       0       0       0       1
(0248)  K1        53 SUB AREA-20 RUNOFF
(0249)  M      1       0      55       0    3456       0       0       0       1
(0250)  F      0    21.9    37.5    52.0    62.5    73.5    79.0
(0251)  T   .075     1.0     1.0
(0252)  V  11.78    6.38
(0253)  X     75     550     1.3
(0254)  K      2    1020       0       0       0       0       1
(0255)  K1        54 COMBINE 2 HYDROGRAPHS AT MOHAWK RIVER AT SPRAKERS
(0256)  K      1    1023       0       0       0       0       1
(0257)  K1        55 CHANNEL ROUTE - MOHAWK RIVER BELOW CAYADUTTA CREEK
(0258)  Y      0       0       0       0       1
(0259)  Y1     2       0       0    1.55      .2
(0260)  K      0      21       0       0       0       0       1
(0261)  K1        56 SUB AREA-21   RUNOFF
(0262)  M      1       0    12.7       0    3456       0       0       0       1
(0263)  F      0    21.9    37.5    52.0    62.5    73.5    79.0
(0264)  T   .075     1.3     1.0
(0265)  V   8.61    6.32
(0266)  X     13     120     1.3
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(0267)   K       0      22       0       0       0       0       1
(0268)   K1        57 SUB AREA-22  RUNOFF
(0269)   M       1       0      23       0    3456       0       0       0       1
(0270)   P       0    21.9    37.5    52.0    62.5    73.5    79.0
(0271)   T    .075     1.5     1.0
(0272)   V    9.61    5.86
(0273)   X      27     250     1.3
(0274)   K       2    1022       0       0       0       0       1
(0275)   K1        58 COMBINE 2 HYDROGRAPHS AT CAYADUTTA CREEK AT JOHNSTOWN
(0276)   K       1    1023       0       0       0       0       1
(0277)   K1        59 CHANNEL ROUTE - MOHAWK RIVER BELOW CAYADUTTA CREEEK
(0278)   Y       0       0       0       0       1
(0279)   Y1      1       0       0     1.4      .3
(0280)   K       0      23       0       0       0       1
(0281)   K1        60 SUB AREA-23  RUNOFF
(0282)   M       1       0      24       0    3456       0       0       0       1
(0283)   P       0    21.9    37.5    52.0    62.5    73.5    79.0
(0284)   T    .075     1.0     1.0
(0285)   V   13.14    6.92
(0286)   X     125     870     1.3
(0287)   K       3    1023       0       0       0       0       1
(0288)   K1        61  COMBINE 3 HYDROGRAPHS AT MOHAWK RIVER BELOW CAYADUTTA CREEK
(0289)   K       1    1029       0       0       0       0       1
(0290)   K1        62 CHANNEL ROUTE - MOHAWK RIVER BELOW SCHOHARIE CREEK
(0291)   Y       0       0       0       0       1
(0292)   Y1      1       0       0     2.5      .2
(0293)   K       0      24       0       0       0       0       1
(0294)   K1        63 SUB AREA-24  RUNOFF
(0295)   M       1       0    39.3       0    3456       0       0       0       1
(0296)   P       0    21.9    37.5    52.0    62.5    73.5    79.0
(0297)   T    .075    2.00     1.0
(0298)   V   11.12    6.63
(0299)   X      51     420     1.3
(0300)   K       1    1025       0       0       0       0       1
(0301)   K1        64 CHANNEL ROUTE - BATAVIA KILL AT WINDHAM
(0302)   Y       0       0       0       0       1
(0303)   Y1      1       0       0     1.3      .3
(0304)   K       0      25       0       0       0       0       1
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(0305)  K1      65 SUB AREA-25
(0306)  M      1       0   186.5       0    3465       0       0       0       1
(0307)  F      0    21.9    37.5    52.0    62.5    73.5    79.0
(0308)  T   .075     2.0     1.0
(0309)  V  16.24    8.22
(0310)  X    320    2500     1.3
(0311)  K      2    1025       0       0       0       0       1
(0312)  K1      66 COMBINE HYDROGRAPHS AT BATAVIA KILL AT WINDHAM
(0313)  K      0      26       0       0       0       0       1
(0314)  K1      67 SUB AREA-26
(0315)  M      1       0    10.2       0    3456       0       0       0       1
(0316)  F      0    21.9    37.5    52.0    62.5    73.5    79.0
(0317)  T   .075     1.5     1.0
(0318)  V   7.65    4.73
(0319)  X     10      70     1.3
(0320)  K      2    1026       0       0       0       0       1
(0321)  K1      68 COMBINE 2 HYDROGRAPHS AT SCHOHARIE CREEK AT PRATTSVILLE (USGS 3500)
(0322)  K      0     127       0       0       0       0       1
(0323)  K1      69 SUB AREA-127   RUNOFF
(0324)  M      1       0      78       0    3456       0       0       0       1
(0325)  F      0    21.9    37.5    52.0    62.5    73.5    79.0
(0326)  T   .075     1.5     1.0
(0327)  V  12.94    6.94
(0328)  X    115     800     1.3
(0329)  K      2   10127       0       0       0       0       1
(0330)  K1      70 COMBINE 2 HYDROGRAPHS AT SCHOHARIE RESERVOIR AT GILBOA DAM
(0331)  K      1   10127       0       0       0       0       1
(0332)  K1      70(A) ROUTE OVER GILBOA DAM
(0333)  Y      0       0       0       1       1
(0334)  Y1     1       0       0       0       0       0   60660
(0335)  Y2 15530   30880   49120   55260   60660   61750   62840   63920   65010   66100
(0336)  Y3     0       0       0       0       0    3480    9890   18160   27960   39080
(0337)  K      1    1027       0       0       0       0       1
(0338)  K1      71 CHANNEL ROUTE - SCHOHARIE CREEK BELOW COBLESKILL CREEK
(0339)  Y      0       0       0       0       1
(0340)  Y1     4       0       0     1.4      .3
(0341)  K      0      27       0       0       0       0       1
(0342)  K1      72 SUB AREA-27  RUNOFF
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(0343)  M      1      0    491      0   3456      0      0      0      1
(0344)  F      0   21.9   37.5   52.0   62.5   73.5   79.0
(0345)  T   .075   1.25   1.00
(0346)  V  20.79   9.87
(0347)  X   1010   6800    1.3
(0348)  K      2   1027      0      0      0      0      1
(0349)  K1      73 COMBINE 2 HYDROGRAPHS AT SCHOHARIE CREEK BELOW COBLESKILL CREEK
(0350)  K      1   1028      0      0      0      0      1
(0351)  K1      74 CHANNEL ROUTE - SCHOHARIE CREEK AT BURTONSVILLE (USGS 3515)
(0352)  Y      0      0      0      0      1
(0353)  Y1     1      0      0    1.2     .2
(0354)  K      0     28      0      0      0      0      1
(0355)  K1      75 SUB AREA - 28  RUNOFF
(0356)  M      1      0     78      0   3456      0      0      0      1
(0357)  F      0   21.9   37.5   52.0   62.5   73.5   79.0
(0358)  T   .075   1.25    1.0
(0359)  V  12.75   6.59
(0360)  X    115    800    1.3
(0361)  K      2   1028      0      0      0      0      1
(0362)  K1      76  COMBINE 2 HYDROGRAPHS AT SCHOHARIE CREEK AT BURTONSVILLE (USGS 3515)
(0363)  K      1   1029      0      0      0      0      1
(0364)  K1      77 CHANNEL ROUTE - MOHAWK RIVER BELOW SCHOHARIE CREEK
(0365)  Y      0      0      0      0      1
(0366)  Y1     1      0      0    2.1     .2
(0367)  K      0     29      0      0      0      0      1
(0368)  K1      78  SUB AREA - 29  RUNOFF
(0369)  M      1      0     87      0   3456      0      0      0      1
(0370)  F      0   21.9   37.5   52.0   62.5   73.5   79.0
(0371)  T   .075    1.1    1.0
(0372)  V  13.13   6.75
(0373)  X    132    920    1.3
(0374)  K      3   1029      0      0      0      0      1
(0375)  K1      79 COMBINE 3 HYDROGRAPHS AT MOHAWK RIVER BELOW SCHOHARIE CREEK
(0376)  K      1   1030      0      0      0      0      1
(0377)  K1      80 CHANNEL ROUTE - MOHAWK RIVER AT AMSTERDAM
(0378)  Y      0      0      0      0      1
(0379)  Y1     1      0      0    2.1     .2
(0380)  K      0     30      0      0      0      0      1
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(0381)  K1      81 SUB AREA-30  RUNOFF
(0382)  M     1       0     103       0    3456       0       0       0       1
(0383)  P     0    21.9    37.5    52.0    62.5    73.5    79.0
(0384)  T  .075     1.0     1.0
(0385)  V 15.61   11.14
(0386)  X   100    1150     1.3
(0387)  K     2    1030       0       0       0       0       1
(0388)  K1      82 COMBINE 2  HYDROGRAPHS AT MOHAWK RIVER AT AMSTERDAM
(0389)  K     1    1031       0       0       0       0       1
(0390)  K1      83 CHANNEL ROUTE - MOHAWK RIVER AT CRANESVILLE
(0391)  Y     0       0       0       0       1
(0392)  Y1    1       0       0     1.3      .2
(0393)  K     0      31       0       0       0       0       1
(0394)  K1      84 SUB AREA-31  RUNOFF
(0395)  M     1       0      28       0    3456       0       0       0       1
(0396)  P     0    21.9    37.5    52.0    62.5    73.5    79.0
(0397)  T  .075     1.0     1.0
(0398)  V 9.5[illegible]    5.79
(0399)  X [illegible]     100     1.3
(0400)  K     2    1031       0       0       0       0       1
(0401)  K1      85 COMBINE 2 HYDROGRAPHS AT MOHAWK RIVER AT CRANESVILLE
(0402)  K     1    1032       0       0       0       1
(0403)  K1      86 CHANNEL ROUTE - MOHAWK RIVER AT ROTTERDAM JUNCTION
(0404)  Y     0       0       0       0       1
(0405)  Y1    1       0       0     2.1      .2
(0406)  K     0      32       0       0       0       0       1
(0407)  K1      87 SUB AREA-32  RUNOFF
(0408)  M     1       0      32       0    3456       0       0       0       1
(0409)  P     0    21.9    37.5    52.0    62.5    73.5    79.0
(0410)  T  .075     1.0     1.0
(0411)  V 11.[illegible]   10.19
(0412)  X [illegible]     350     1.3
(0413)  K     2    1032       0       0       0       0       1
(0414)  K1      88 COMBINE 2 HYDROGRAPHS AT MOHAWK RIVER AT ROTTERDAM JUNCTION
(0415)  K     1    1033       0       0       0       0       1
(0416)  K1      89 CHANNEL ROUTE - MOHAWK RIVER AT SCHENECTADY
(0417)  Y     0       0       0       0       1
(0418)  Y1    0       0       0     1.5      .2
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(0419)  K       0     33      0      0      0      0      1
(0420)  K1       90 SUB AREA-33  RUNOFF
(0421)  M       1      0     38      0   3456      0      0      0      1
(0422)  P       0   21.9   37.5   52.0   62.5   73.5   79.0
(0423)  T    .075    1.0    1.0
(0424)  V   10.67   5.89
(0425)  X      49    400    1.3
(0426)  K       2   1033      0      0      0      0      1
(0427)  K1       91 COMBINE 2 HYDROGRAPHS AT MOHAWK RIVER AT SCHENECTADY
(0428)  K       1   1034      0      0      0      0      1
(0429)  K1       92 CHANNEL ROUTE - VISCHERS FERRY
(0430)  Y       0      0      0      0      1
(0431)  Y1      2      0      0    1.0     .2
(0432)  K       0     34      0      0      0      0      1
(0433)  K1       93 SUB AREA-34 RUNOFF
(0434)  M       1      0    108      0   3456      0      0      0      1
(0435)  P       0   21.9   37.5   52.0   62.5   73.5   79.0
(0436)  T    .075    1.0    1.0
(0437)  V   14.85   8.81
(0438)  X     170   1250    1.3
(0439)  K       2     34      0      0      0      0      1
(0440)  K1       94 COMBINE 2 HYDROGRAPHS AT MOHAWK RIVER AT VISCHERS FERRY
(0441)  K       1   1035      0      0      0      0      1
(0442)  K1       95 CHANNEL ROUTE -MOHAWK RIVER AT COHOES  (USGS 3575)
(0443)  Y       0      0      0      0      1
(0444)  Y1      1      0      0    1.5     .2
(0445)  K       0     35      0      0      0      0      1
(0446)  K1       96 SUB AREA-35  RUNOFF
(0447)  M       1      0     33      0   3454      0      0      0      1
(0448)  P       0   21.9   37.5   52.0   62.5   73.5   79.0
(0449)  T    .075    1.0    1.0
(0450)  V   10.42   5.98
(0451)  X      41    370    1.3
(0452)  K       2   1035      0      0      0      0      1
(0453)  K1       97 COMBINE 2 HYDROGRAPHS AT MOHAWK RIVER AT COHOES (USGS 3575)
(0454)  K      99
(0455)  A
(0456)  A
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************************************
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION        JULY 1978
  LAST MODIFICATION  26 FEB 79
************************************

RUN  DATE?FRI, AUG 10 1979
     TIME?11:48:04

                              MOHAWK RIVER BASIN
                              HEC-1DB
                              HYDROLOGIC MODEL (CLARK COEFFICIENT)

                                                JOB SPECIFICATION
                         NQ     NHR     NMIN    IDAY     IHR    IMIN   METRC    IPLT    IPRT   NSTAN
                        150       1        0       0       0       0       0       0       4       0
                                                JOPER     NWT   LROPT   TRACE
                                                   5       0       0       0

                                         MULTI-PLAN ANALYSES TO BE PERFORMED
                                              NPLAN= 1 NRTIO= 6 LRTIO= 1
                            RTIOS=   0.20    0.40    0.50    0.60    0.80    1.00

                  **********         **********         **********         **********         **********

                                             SUB-AREA RUNOFF COMPUTATION

                             1 SUB AREA-1 ABOVE DELTA RESERVOIR RUNOFF
                                     ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                                         1       0       0       0       0       0       1       0       0

                                                 HYDROGRAPH DATA
                         IHYDG    IUHG   TAREA    SNAP   TRSDA   TRSPC   RATIO   ISNOW   ISAME   LOCAL
                             1       0  150.00    0.00 3456.00    0.00   0.000       0       1       0

                                                   PRECIP DATA
                                 SPFE     PMS      R6     R12     R24     R48     R72     R96
                                 0.00   21.90   37.50   52.00   62.50   73.50   79.00    0.00
TRSPC COMPUTED BY THE PROGRAM IS 0.929

                                                    LOSS DATA
                   LROPT   STRKR   DLTKR   RTIOL   ERAIN   STRKS   RTIOK   STRTL   CNSTL   ALSMX   RTIMP
                       0    0.07    1.00    1.00    0.00    0.00    1.00    0.00    0.00    0.00    0.00

                                                UNIT HYDROGRAPH DATA
                                           TC= 14.97     R=  7.29     NTA=  0

                                                  RECESSION DATA
                                       STRTQ=  250.00    QRCSN= 1900.00    RTIOR= 1.30
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UNIT HYDROGRAPH 47 END-OF-PERIOD ORDINATES, LAG=  12.33 HOURS, CP= 0.75  VOL= 1.00
   152.      561.     1125.     1765.     2446.     3147.     3850.     4552.     5158.     5606.
  5859.     6045.     6050.     5904.     5565.     4996.     4355.     3796.     3306.     2884.
  2513.     2191.     1910.     1664.     1451.     1265.     1102.      961.      837.      730.
   636.      555.      483.      421.      367.      320.      279.      243.      212.      185.
   161.      140.      122.      107.       93.       81.       71.

     0                                      END-OF-PERIOD FLOW
MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS   COMP Q      MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS    COMP Q

                                                                        SUM  16.07  12.00   4.07  1214552.
                                                                           ( 408.)( 305.)( 103.)(34392.25)

          **********         **********         **********         **********         **********

                                          HYDROGRAPH ROUTING

                 2 ROUTE OVER DELTA DAM (USGS 3360)
                        ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                         1001       1       0       0       0       0       1       0       0
                                          ROUTING DATA
                 QLOSS  CLOSS     AVG    IRES   ISAME    IOPT    IPMP            LSTR
                   0.0  0.000    0.00       1       1       0       0               0

                        NSTPS   NSTDL     LAG   AMSKK       X     TSK   STORA  ISPRAT
                            1       0       0   0.000   0.000   0.000  62330.       0

STORAGE   38500.00   50190.00   62330.00   64170.00   65540.00   66920.00   68750.00   69900.00   71500.00

OUTFLOW       0.00       0.00       0.00     337.00     954.00    1753.00    2698.00    3771.00    4957.00

          **********         **********         **********         **********         **********

                                          HYDROGRAPH ROUTING

                 3 CHANNEL ROUTE - MOHAWK RIVER TO ROME ABOVE BARGE CANAL
                        ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                         1022       1       0       0       0       0       1       0       0
                                          ROUTING DATA
                 QLOSS  CLOSS     AVG    IRES   ISAME    IOPT    IPMP            LSTR
                   0.0  0.000    0.00       0       1       0       0               0

                        NSTPS   NSTDL     LAG   AMSKK       X     TSK   STORA  ISPRAT
                            1       0       0   1.000   0.300   0.000      0.       0


          **********         **********         **********         **********         **********
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                         SUB-AREA RUNOFF COMPUTATION

        4 SUB AREA-2 RUNOFF
                  ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                      2       0       0       0       0       0       1       0       0

                                 HYDROGRAPH DATA
          IHYDG    IUHG   TAREA    SNAP   TRSDA   TRSPC   RATIO   ISNOW   ISAME   LOCAL
              1       0    7.00    0.00 3456.00    0.00   0.000       0       1       0

                                   PRECIP DATA
                  SPFE     PMS      R6     R12     R24     R48     R72     R96
                  0.00   21.90   37.50   52.00   62.50   73.50   79.00    0.00
TRSPC COMPUTED BY THE PROGRAM IS 0.929

                                    LOSS DATA
       LROPT   STRKR   DLTKR   RTIOL   ERAIN   STRKS   RTIOK   STRTL   CNSTL   ALSMX   RTIMP
           0    0.07    2.00    1.00    0.00    0.00    1.00    0.00    0.00    0.00    0.00

                             UNIT HYDROGRAPH DATA
                       TC=  6.95      R=  4.47     NTA=  0

                                  RECESSION DATA
                  STRTQ=     7.00     QRCSN=    50.00     RTIOR= 1.30

         UNIT HYDROGRAPH 26 END-OF-PERIOD ORDINATES, LAG=   5.92 HOURS, CP= 0.69  VOL= 1.00
        55.      127.      249.      376.      477.      526.      516.      444.      355.      284.
       227.      181.      145.      115.       92.       74.       59.       47.       38.       30.
        24.       19.       15.       12.       10.        8.        6.        5.

   0                                     END-OF-PERIOD FLOW
 MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS    COMP Q       MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS    COMP Q

                                                                           SUM  16.07  11.62   4.45    53901.
                                                                              ( 408.)( 295.)( 113.)( 1526.30)

       **********        **********        **********        **********        **********

                                COMBINE HYDROGRAPHS

        5 COMBINING 2 HYDROGRAPHS FOR MOHAWK RIVER AT ROME
                  ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                   1002       2       0       0       0       0       1       0       0

       **********        **********        **********        **********        **********

                                HYDROGRAPH ROUTING

        6 CHANNEL ROUTE - MOHAWK RIVER TO ORISKANY
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                    ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                     1003       1       0       0       0       0       1       0       0
                                       ROUTING DATA
           QLOSS    CLOSS     AVG    IRES   ISAME    IOPT    IPMP            LSTR
             0.0    0.000    0.00       0       1       0       0               0

                    NSTPS   NSTDL     LAG   AMSKK       X     TSK   STORA  ISPRAT
                        2       0       0   1.450   0.300   0.000      0.       0

 **********          **********          **********          **********          **********

                               SUB-AREA RUNOFF COMPUTATION

              7 SUB AREA-3 RUNOFF
                    ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                        3       0       0       0       0       0       1       0       0

                                       HYDROGRAPH DATA
          IHYDG    IUHG   TAREA    SNAP   TRSDA   TRSPC   RATIO   ISNOW   ISAME   LOCAL
              1       0  289.00    0.00 3456.00    0.00   0.000       0       1       0

                                        PRECIP DATA
                   SPFE     PMS      R6     R12     R24     R48     R72     R96
                   0.00   21.90   37.50   52.00   62.50   73.50   79.00    0.00
TRSPC COMPUTED BY THE PROGRAM IS 0.929

                                         LOSS DATA
       LROPT   STRKR   DLTKR   RTIOL   ERAIN   STRKS   RTIOK   STRTL   CNSTL   ALSMX   RTIMP
           0    0.13    2.00    1.00    0.00    0.00    1.00    0.00    0.00    0.00    0.00

                                    UNIT HYDROGRAPH DATA
                             TC= 17.65     R=  8.19     NTA=  0

                                       RECESSION DATA
                        STRTQ=  540.00     QRCSN= 4100.00     RTIOR= 1.30

              UNIT HYDROGRAPH 54 END-OF-PERIOD ORDINATES, LAG=  14.43 HOURS, CP= 0.76  VOL= 1.00
          265.     760.    1531.    2412.    3355.    4342.    5344.    6351.    7353.    8276.
         9015.    9563.    9919.   10098.   10105.    9935.    9587.    8899.    7983.    7064.
         6251.    5532.    4895.    4332.    3833.    3392.    3002.    2656.    2351.    2080.
         1841.    1629.    1442.    1276.    1129.     999.     884.     782.     692.     613.
          542.     480.     425.     376.     332.     294.     260.     230.     204.     180.
          160.     141.     125.     111.

       0                                   END-OF-PERIOD FLOW
  MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS    COMP Q      MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS    COMP Q

                                                                        SUM  16.07  10.18   5.89  2012222.
                                                                           ( 408.)( 259.)( 150.)(56979.73)
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**********          **********          **********          **********          **********

                                   COMBINE HYDROGRAPHS

          2 COMBINE 2 HYDROGRAPHS FOR MOHAWK RIVER AT CRISKANY
                  ISTAQ    ICOMP    IECON    ITAPE     JPLT     JPRT    INAME   ISTAGE    IAUTO
                   1003        2        0        0        0        0        1        0        0


**********          **********          **********          **********          **********

                                   HYDROGRAPH ROUTING

          5 CHANNEL ROUTE - MOHAWK RIVER TO UTICA
                  ISTAQ    ICOMP    IECON    ITAPE     JPLT     JPRT    INAME   ISTAGE    IAUTO
                   1004        1        0        0        0        0        1        0        0
                                        ROUTING DATA
          QLOSS   CLOSS      AVG     IRES    ISAME     IOPT     IPMP              LSTR
            0.0   0.000     0.00        0        1        0        0                 0

                  NSTPS    NSTDL      LAG    AMSKK        X      TSK    STORA   ISPRAT
                      1        0        0    2.000    0.200    0.000       0.        0


**********          **********          **********          **********          **********

                                SUB-AREA RUNOFF COMPUTATION

          10 SUB AREA-4 RUNOFF
                  ISTAQ    ICOMP    IECON    ITAPE     JPLT     JPRT    INAME   ISTAGE    IAUTO
                      4        0        0        0        0        0        1        0        0

                                      HYDROGRAPH DATA
      IHYDG    IUHG   TAREA     SNAP    TRSDA    TRSPC    RATIO    ISNOW    ISAME    LOCAL
          1       0   93.00     0.00  3456.00     0.00    0.000        0        1        0

                                        PRECIP DATA
               SPFE      PMS       R6      R12      R24      R48      R72      R96
               0.00    21.90    37.50    52.00    62.50    73.50    79.00     0.00
TRSPC COMPUTED BY THE PROGRAM IS 0.929

                                         LOSS DATA
     LROPT   STRKR    DLTKR   RTIOL    ERAIN    STRKS    RTIOK    STRTL    CNSTL    ALSMX    RTIMP
             0.13     2.00    1.00     0.00     0.00     1.00     0.00     0.00     0.00     0.00

                                   UNIT HYDROGRAPH DATA
                          TC= 13.44    R= 6.98    NTA= 0
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```
                                        RECESSION DATA
                         STRTQ=   140.00      QRCSN=  1100.00      RTIOR=  1.30

             UNIT HYDROGRAPH 45 END-OF-PERIOD ORDINATES, LAG=  11.23 HOURS, CP= 0.74  VOL= 1.00
        115.      425.      851.     1333.     1843.     2368.     2893.     3364.     3719.     3948.
       4052.     4051.     3914.     3550.     3144.     2723.     2359.     2044.     1771.     1534.
       1329.     1151.      997.      864.      748.      648.      562.      487.      422.      365.
        316.      274.      237.      206.      178.      154.      134.      116.      100.       87.
         75.       65.       57.       49.       42.

    0
 MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS      END-OF-PERIOD FLOW
                                                 COMP Q      MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS    COMP Q

                                                                               SUM  16.07  10.18   5.89  642854.
                                                                                  ( 408.)( 259.)( 150.)(18203.58)

      **********          **********          **********          **********          **********

                                           COMBINE HYDROGRAPHS

              11 COMBINE 2 HYDROGRAPHS FROM MOHAWK RIVER AT UTICA
                       ISTAQ     ICOMP     IECON     ITAPE      JPLT      JPRT     INAME    ISTAGE     IAUTO
                        1004         2         0         0         0         0         1         0         0

      **********          **********          **********          **********          **********

                                           HYDROGRAPH ROUTING

              12 CHANNEL ROUTE - MOHAWK RIVER TO ILION
                       ISTAQ     ICOMP     IECON     ITAPE      JPLT      JPRT     INAME    ISTAGE     IAUTO
                        1005         1         0         0         0         0         1         0         0
                                                 ROUTING DATA
              QLOSS     CLOSS       AVG      IRES     ISAME      IOPT      IPMP                LSTR
                0.0     0.000      0.00         0         1         0         0                   0

                       NSTPS     NSTDL       LAG     AMSKK         X       TSK     STORA    ISPRAT
                           2         0         0     2.450     0.200     0.000        0.         0

      **********          **********          **********          **********          **********

                                       SUB-AREA RUNOFF COMPUTATION

              13 SUB AREA-5 RUNOFF
                       ISTAQ     ICOMP     IECON     ITAPE      JPLT      JPRT     INAME    ISTAGE     IAUTO
                           5         0         0         0         0         0         1         0         0

                                             HYDROGRAPH DATA
```

```
      IHYDG    IUHG   TAREA    SNAP   TRSDA   TRSPC   RATIO   ISNOW   ISAME   LOCAL
          1       0  158.00 3456.00  158.00    0.00   0.000       0       1       0

                                      PRECIP DATA
                    SPFE     PMS      R6     R12     R24     R48     R72     R96
                    0.00   21.90   37.50   52.00   62.50   73.50   79.00    0.00
TRSPC COMPUTED BY THE PROGRAM IS 0.877

                                       LOSS DATA
          LROPT   STRKR   DLTKR   RTIOL   ERAIN   STRKS   RTIOK   STRTL   CNSTL   ALSMX   RTIMP
              0    0.10    2.00    1.00    0.00    0.00    1.00    0.00    0.00    0.00    0.00

                                  UNIT HYDROGRAPH DATA
                            TC= 15.69      R=  8.17     NTA=   0

                                     RECESSION DATA
                        STRTQ=  265.00    QRCSN= 2100.00     RTIOR= 1.30

          UNIT HYDROGRAPH 52 END-OF-PERIOD ORDINATES, LAG=  13.21 HOURS, CP= 0.75  VOL= 1.00
       134.       497.      1000.      1577.      2195.      2838.      3492.      4149.      4757.      5245.
      5596.      5817.      5915.      5887.      5721.      5355.      4814.      4259.      3768.      3333.
      2949.      2608.      2308.      2041.      1806.      1598.      1413.      1250.      1106.       979.
       866.       766.       678.       599.       530.       469.       415.       367.       325.       287.
       254.       225.       199.       176.       156.       138.       122.       108.        95.        84.
        75.        66.

    0                                  END-OF-PERIOD FLOW
MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS    COMP Q      MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS    COMP Q

                                                                      SUM  15.18  10.08   5.10  1085146.
                                                                         ( 386.)( 256.)( 130.)(30727.88)

      **********        **********         **********        **********        **********

                                     COMBINE HYDROGRAPHS

              14 COMBINE 2 HYDROGRAPHS FOR MOHAWK RIVER AT ILION
                         ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                          1005       2       0       0       0       0       1       0       0

      **********        **********         **********        **********        **********

                                      HYDROGRAPH ROUTING

              15 CHANNEL ROUTE - MOHAWK RIVER BELOW W. CANADA CREEK
                         ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                          1010       1       0       0       0       0       1       0       0
                                             ROUTING DATA
               QLOSS   CLOSS     AVG    IRES   ISAME    IOPT    IPMP            LSTR
```

0.0	0.000	0.00	0	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	1.500	0.200	0.000	0.	0

********** ********** ********** ********** **********

SUB-AREA RUNOFF COMPUTATION

16 SUB AREA-6 RUNOFF

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
6	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	0	375.00	0.00	3456.00	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	21.90	37.50	52.00	62.50	73.50	79.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS 0.929

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0	0.07	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00

UNIT HYDROGRAPH DATA

TC= 22.55 R= 15.88 NTA= 0

RECESSION DATA

STRTQ= 725.00 QRCSN= 5700.00 RTIOR= 1.30

UNIT HYDROGRAPH 97 END-OF-PERIOD ORDINATES, LAG= 20.02 HOURS, CP= 0.68 VOL= 1.00

98.	567.	754.	1212.	1722.	2270.	2847.	3446.	4063.	4692.
5350.	5963.	6547.	7051.	7475.	7822.	8093.	8287.	8404.	8440.
8389.	8234.	7919.	7476.	7019.	6591.	6188.	5811.	5456.	5123.
4810.	4516.	4241.	3982.	3739.	3510.	3296.	3095.	2906.	2728.
2562.	2406.	2259.	2121.	1991.	1870.	1756.	1648.	1548.	1453.
1365.	1281.	1203.	1130.	1061.	996.	935.	878.	824.	774.
727.	682.	641.	602.	565.	530.	498.	468.	439.	412.
387.	363.	341.	320.	301.	283.	265.	249.	234.	220.
206.	194.	182.	171.	160.	150.	141.	133.	125.	117.
110.	103.	97.	91.	85.	80.	75.			

0

END-OF-PERIOD FLOW

MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q
									SUM	16.07	12.00	4.07	2988156.
										(408.)	(305.)	(103.)	(84615.08)

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**********          **********          **********          **********          **********

                              HYDROGRAPH ROUTING

          17 CHANNEL ROUTE - W. CANADA CREEK BELOW HINCKLEY RESERVOIR (USGS 3440)
                    ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                     1006       1       0       0       0       0       1       0       0
                                         ROUTING DATA
          QLOSS     CLOSS     AVG    IRES   ISAME    IOPT    IPMP            LSTR
            0.0     0.000    0.00       1       1       0       0               0

                    NSTPS   NSTDL     LAG   AMSKK       X     TSK   STORA  ISPRAT
                        1       0       0   0.000   0.000   0.000 157900.       0

STORAGE    5517[illegible]   80400.00  129710.00  157900.00  161100.00  164540.00  167750.00  170960.00  174400.00
OUTFLOW       0.00       0.00       0.00       0.00     474.00    1340.00    2462.00    3790.00    5297.00

**********          **********          **********          **********          **********

                           SUB-AREA RUNOFF COMPUTATION

          18 SUB AREA-7 RUNOFF
                    ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                        7       0       0       0       0       0       1       0       0

                                     HYDROGRAPH DATA
          IHYDG    IUHG   TAREA    SNAP   TRSDA   TRSPC   RATIO   ISNOW   ISAME   LOCAL
              1       0    7.00    0.00 3456.00    0.00   0.000       0       1       0

                                       PRECIP DATA
                SPFE     PMS      R6     R12     R24     R48     R72     R96
                0.00   21.90   37.50   52.00   62.50   73.50   79.00    0.00
TRSPC COMPUTED BY THE PROGRAM IS 0.929

                                        LOSS DATA
      LROPT   STRKR   DLTKR   RTIOL   ERAIN   STRKS   RTIOK   STRTL   CNSTL   ALSMX   RTIMP
          0    0.07    1.00    1.00    0.00    0.00    1.00    0.00    0.00    0.00    0.00

                                  UNIT HYDROGRAPH DATA
                          TC=  7.12      R=   4.91     NTA=   0

                                    RECESSION DATA
                    STRTQ=     7.00     QRCSN=    50.00     RTIOR= 1.30

       UNIT HYDROGRAPH 30 END-OF-PERIOD ORDINATES, LAG=   6.00 HOURS, CP= 0.00  VOL= 1.00
    31.     113.     223.     340.     437.     491.     494.     440.     340.     293.
   234.     195.     159.     130.     106.      86.      70.      57.      47.      38.
```

```
    31.       25.       21.       17.       14.       11.        9.        7.        6.        5.

                                           END-OF-PERIOD FLOW
   MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS   COMP Q      MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS    COMP Q

                                                                    SUM  16.07   12.00    4.07    55565.
                                                                        ( 408.)( 305.)( 103.)( 1573.42)

           **********        **********        **********        **********        **********

                                        COMBINE HYDROGRAPHS

                 19 COMBINE 2 HYDROGRAPHS FOR W. CANADA CREEK AT TRENTON
                          ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                           1007       2       0       0       0       0       1       0       0

           **********        **********        **********        **********        **********

                                    SUB-AREA RUNOFF COMPUTATION

                 20 SUB AREA-8 RUNOFF
                          ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                              8       0       0       0       0       0       1       0       0

                                         HYDROGRAPH DATA
              IHYDG     IUHG    TAREA     SNAP    TRSDA    TRSPC    RATIO    ISNOW    ISAME    LOCAL
                  1        0    53.00     0.00  3456.00     0.00    0.000        0        1        0

                                          PRECIP DATA
                     SPFE      PMS       R6       R12      R24      R48      R72      R96
                     0.00    21.90    37.50    52.00    62.50    73.50    79.00     0.00
TRSPC COMPUTED BY THE PROGRAM IS 0.929

                                           LOSS DATA
           LROPT   STRKR   DLTKR   RTIOL   ERAIN   STRKS   RTIOK   STRTL   CNSTL   ALSMX   RTIMP
               0    0.07    1.00    1.00    0.00    0.00    1.00    0.00    0.00    0.00    0.00

                                      UNIT HYDROGRAPH DATA
                               TC= 11.62      R=  6.25      NTA=  0

                                         RECESSION DATA
                          STRTQ=    72.00     QRCSN=   550.00     RTIOR= 1.30

            UNIT HYDROGRAPH 40 END-OF-PERIOD ORDINATES, LAG=   9.71 HOURS, CP= 0.73   VOL= 1.00
          96.      333.      663.     1032.     1420.     1814.     2169.     2430.     2584.     2638.
        2586.     2389.     2075.     1771.     1509.     1285.     1095.      933.      795.      677.
         577.      491.      41_.      356.      304.      259.      220.      188.      160.      136.
         116.       99.       84.       72.       61.       52.       44.       38.       32.       27.
```

```
         0                                      END-OF-PERIOD FLOW
MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS    COMP Q       MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS    COMP Q

                                                                          SUM  16.07  12.00   4.07  426114.
                                                                             ( 408.)( 305.)( 103.)(12066.19)

      **********          **********          **********          **********          **********

                                    COMBINE HYDROGRAPHS

           21 COMBINE 2 HYDROGRAPHS FOR W. CANADA CREEK BELOW CINNCINNATI CREEK
                    ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                     1008       2       0       0       0       0       1       0       0

      **********          **********          **********          **********          **********

                                    HYDROGRAPH ROUTING

           22 CHANNEL ROUTE - W. CANADA CREEK TO KAST BRIDGE (USGS 3460)
                    ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                     1009       1       0       0       0       0       1       0       0
                                        ROUTING DATA
           QLOSS    CLOSS     AVG    IRES   ISAME    IOPT    IPMP           LSTR
             0.0    0.000    0.00       0       1       0       0              0

                    NSTPS   NSTDL     LAG   AMSKK       X     TSK    STORA  ISPRAT
                        4       0       0   1.080   0.300   0.000     0.        0

      **********          **********          **********          **********          **********

                                SUB-AREA RUNOFF COMPUTATION

           23 SUB AREA-9 RUNOFF
                    ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                        9       0       0       0       0       0       1       0       0
                                      HYDROGRAPH DATA
        IHYDG    IUHG   TAREA    SNAP   TRSDA   TRSPC   RATIO   ISNOW   ISAME   LOCAL
            1       1  121.00    0.00 3456.00    0.00   0.000       0       1       0
                                        PRECIP DATA
              SPFE     PMS      R6     R12     R24     R48     R72     R96
              0.00   21.90   37.50   52.00   62.50   73.50   79.00    0.00
TRSPC COMPUTED BY THE PROGRAM IS 0.929

                                        LOSS DATA
     LROPT   STRKR   DLTKR   RTIOL   ERAIN   STRKS   RTIOK   STRTL   CNSTL   ALSMX   RTIMP
         0    0.07    1.00    1.00    0.00    0.00    1.00    0.00    0.00    0.00    0.00
```

```
                              UNIT HYDROGRAPH DATA
                        TC= 14.17     R=  7.00    NTA=  0

                                  RECESSION DATA
                    STRTQ=  150.00     QRCSN= 1450.00     RTIOR= 1.30

         UNIT HYDROGRAPH 45 END-OF-PERIOD ORDINATES, LAG=  11.63 HOURS, CP= 0.75  VOL= 1.00
      138.       510.      1021.      1598.      2210.      2639.      3473.      4072.      4555.      4867.
     5079.      5135.      5055.      4812.      4345.      3775.      3272.      2836.      2458.      2130.
     1846.      1600.      1386.      1202.      1041.       903.       782.       678.       588.       509.
      441.       382.       331.       287.       249.       216.       187.       162.       140.       122.
      106.        91.        79.        69.        60.

       0                                END-OF-PERIOD FLOW
 MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS    COMP Q       MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS    COMP Q

                                                                        SUM  16.07  12.00   4.07   977729.
                                                                           ( 408.)( 305.)( 103.)(27686.18)

      **********         **********          **********          **********          **********

                                  COMBINE HYDROGRAPHS

            24 COMBINE 2 HYDROGRAPHS FOR W. CANADA CREEK AT KAST BRIDGE (USGS 3460)
                       ISTAQ    ICOMP    IECON    ITAPE     JPLT     JPRT    INAME   ISTAGE    IAUTO
                        1009        2        0        0        0        0        1        0        0

      **********         **********          **********          **********          **********

                                  HYDROGRAPH ROUTING

            25 CHANNEL ROUTE - W. CANADA CREEK TO MOHAWK RIVER
                       ISTAQ    ICOMP    IECON    ITAPE     JPLT     JPRT    INAME   ISTAGE    IAUTO
                        1010        1        0        0        0        0        1        0        0
                                             ROUTING DATA
              QLOSS    CLOSS      AVG     IRES    ISAME     IOPT     IPMP              LSTR
                0.0    0.000     0.00        0        1        0        0                 0

                       NSTPS    NSTDL      LAG    AMSKK        X      TSK    STORA   ISPRAT
                           1        0        0    0.720    0.300    0.000       0.        0


      **********         **********          **********          **********          **********

                               SUB-AREA RUNOFF COMPUTATION

            26 SUB AREA-10 RUNOFF
                       ISTAQ    ICOMP    IECON    ITAPE     JPLT     JPRT    INAME   ISTAGE    IAUTO
```

```
             10        0         0         0         0         0         1         0         0

                                        HYDROGRAPH DATA
          IHYDG     IUHG    TAREA     SNAP     TRSDA     TRSPC     RATIO     ISNOW     ISAME     LOCAL
              1        0    45.00     0.00   3456.00     0.00     0.000        0         1         0

                                          PRECIP DATA
                    SPFE       PMS        R6       R12       R24       R48       R72       R96
                    0.00     21.90     37.50     52.00     62.50     73.50     79.00      0.00
TRSPC COMPUTED BY THE PROGRAM IS 0.929

                                           LOSS DATA
         LROPT    STRKR    DLTKR    RTIOL    ERAIN    STRKS    RTIOK    STRTL    CNSTL    ALSMX    RTIMP
             0     0.07     2.00     1.00     0.00     0.00     1.00     0.00     0.00     0.00     0.00

                                       UNIT HYDROGRAPH DATA
                                 TC= 11.33      R=  6.41     NTA=  0

                                         RECESSION DATA
                            STRTQ=    60.00     QRCSN=   500.00     RTIOR= 1.30

            UNIT HYDROGRAPH 41 END-OF-PERIOD ORDINATES, LAG=   9.46 HOURS, CP= 0.72  VOL= 1.00
        78.      287.      572.      892.     1229.     1570.     1871.     2085.     2208.     2242.
      2160.     1984.     1712.     1464.     1252.     1071.      916.      783.      670.      573.
       490.      419.      359.      307.      262.      224.      192.      164.      140.      120.
       103.       88.       75.       64.       55.       47.       40.       34.       29.       25.
        22.

     0                                END-OF-PERIOD FLOW
MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS    COMP Q        MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS    COMP Q

                                                                           SUM  16.07  11.62   4.45   351728.
                                                                              ( 408.)( 295.)( 113.)( 9959.82)

          **********          **********          **********          **********          **********

                                      COMBINE HYDROGRAPHS

                27 COMBINE 3 HYDROGRAPHS AT MOHAWK RIVER BELOW W. CANADA CREEK
                            ISTAQ     ICOMP     IECON     ITAPE      JPLT      JPRT     INAME    ISTAGE     IAUTO
                             1010         3         0         0         0         0         1         0         0

          **********          **********          **********          **********          **********

                                      HYDROGRAPH ROUTING

                28 CHANNEL ROUTE - MOHAWK RIVER AT LITTLE FALLS
                            ISTAQ     ICOMP     IECON     ITAPE      JPLT      JPRT     INAME    ISTAGE     IAUTO
                             1011         1         0         0         0         0         1         0         0
```

```
                                    ROUTING DATA
           QLOSS    CLOSS     AVG    IRES   ISAME    IOPT    IPMP            LSTR
             0.0    0.000    0.00       0       1       0       0               0

                    NSTPS    NSTDL    LAG   AMSKK       X     TSK   STORA  ISPRAT
                        1        0      0   2.100   0.200   0.000      0.       0

**********      **********      **********      **********      **********

                              SUB-AREA RUNOFF COMPUTATION

         29 SUB AREA-11 RUNOFF
                    ISTAQ    ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                       11        0       0       0       0       0       1       0       0

                                    HYDROGRAPH DATA
       IHYDG    IUHG    TAREA     SNAP   TRSDA   TRSPC   RATIO   ISNOW   ISAME   LOCAL
           1       0    27.00     0.00 3456.00    0.00   0.000       0       1       0

                                     PRECIP DATA
              SPFE      PMS       R6      R12     R24      R48      R72      R96
              0.00    21.90    37.50    52.00   62.50    73.50    79.00     0.00
TRSPC COMPUTED BY THE PROGRAM IS 0.929

                                      LOSS DATA
     LROPT   STRKR   DLTKR   RTIOL   ERAIN   STRKS   RTIOK   STRTL   CNSTL   ALSMX   RTIMP
         0    0.07    1.00    1.00    0.00    0.00    1.00    0.00    0.00    0.00    0.00

                                 UNIT HYDROGRAPH DATA
                         TC=  9.83      R=  5.63      NTA=  0

                                    RECESSION DATA
                    STRTQ=   32.00     QRCSN=  280.00    RTIOR= 1.30

            UNIT HYDROGRAPH 36 END-OF-PERIOD ORDINATES, LAG=   8.20 HOURS, CP= 0.71  VOL= 1.00
       65.      239.      473.      733.     1004.     1250.     1428.     1522.     1535.     1446.
     1259.     1054.      882.      738.      618.      517.      433.      362.      303.      254.
      212.      178.      149.      124.      104.       87.       73.       61.       51.       43.
       36.       30.       25.       21.       18.       15.

  0                                 END-OF-PERIOD FLOW
MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS   COMP Q     MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS    COMP Q

                                                                     SUM  16.07  12.00   4.07   217007.
                                                                         ( 408.)( 305.)( 103.)( 6144.95)

**********      **********      **********      **********      **********

                                 COMBINE HYDROGRAPHS
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30 COMBINE 2 HYDROGRAPHS AT MOHAWK RIVER IN LITTLE FALLS
            ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
             1011       2       0       0       0       0       1       0       0

**********          **********          **********          **********          **********

                              HYDROGRAPH ROUTING

31 CHANNEL ROUTE - MOHAWK RIVER AT LITTLE FALLS (USGS 3470)
            ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
             1012       1       0       0       0       0       1       0       0
                                  ROUTING DATA
    QLOSS   CLOSS     AVG    IRES   ISAME    IOPT    IPMP            LSTR
      0.0   0.000    0.00       0       1       0       0               0

            NSTPS   NSTDL     LAG   AMSKK       X     TSK   STORA  ISPRAT
                1       0       0   1.700   0.200   0.000      0.       0

**********          **********          **********          **********          **********

                             SUB-AREA RUNOFF COMPUTATION

32 SUB AREA-12 RUNOFF
            ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
               12       0       0       0       0       0       1       0       0

                                  HYDROGRAPH DATA
    IHYDG    IUHG   TAREA    SNAP   TRSDA   TRSPC   RATIO   ISNOW   ISAME   LOCAL
        1       0   23.00    0.00 3456.00    0.00   0.000       0       1       0

                                   PRECIP DATA
             SPFE     PMS      R6     R12     R24     R48     R72     R96
             0.00   21.90   37.50   52.00   62.50   73.50   79.00    0.00
TRSPC COMPUTED BY THE PROGRAM IS 0.929

                                    LOSS DATA
   LROPT   STRKR   DLTKR   RTIOL   ERAIN   STRKS   RTIOK   STRTL   CNSTL   ALSMX   RTIMP
       0    0.07    1.00    1.00    0.00    0.00    1.00    0.00    0.00    0.00    0.00

                               UNIT HYDROGRAPH DATA
                         TC=  9.46     R=  5.54    NTA=  0

                                  RECESSION DATA
                  STRTQ=   27.00    QRCSN=  250.00    RTIOR= 1.30

    UNIT HYDROGRAPH 35 END-OF-PERIOD ORDINATES, LAG=   8.04 HOURS, CP= 0.72  VOL= 1.00
      60.      219.      433.      670.      915.     1130.     1275.     1342.     1332.     1217.
    1034.      863.      720.      601.      501.      418.      349.      291.      243.      203.
     1[illegible].      141.      11[illegible].       9[illegible].       8[illegible].       6[illegible].       57.       48.       40.       33.
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     ...      ...      ...      ...      ...
     28.      23.      19.      16.      13.

                                    END-OF-PERIOD FLOW
MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS   COMP Q     MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS    COMP Q

                                                                      SUM   16.07  12.00   4.07   185130.
                                                                          ( 408.)( 305.)( 103.)( 5242.29)

          **********          **********          **********          **********          **********

                                    COMBINE HYDROGRAPHS

                33 COMBINE 2 HYDROGRAPHS AT MOHAWK RIVER IN LITTLE FALLS (USGS 3470)
                     ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                      1012       2       0       0       0       0       1       0       0

          **********          **********          **********          **********          **********

                                    HYDROGRAPH ROUTING

                34 CHANNEL ROUTE - MOHAWK RIVER BELOW E. CANADA CREEK
                     ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                      1015       1       0       0       0       0       1       0       0
                                      ROUTING DATA
                QLOSS    CLOSS     AVG    IRES   ISAME    IOPT    IPMP            LSTR
                  0.0    0.000    0.00       0       1       0       0               0

                     NSTPS   NSTDL     LAG   AMSKK       X     TSK   STORA  ISPRAT
                         1       0       0   0.900   0.200   0.000      0.       0

          **********          **********          **********          **********          **********

                                 SUB-AREA RUNOFF COMPUTATION

                35 SUB AREA-13 RUNOFF
                     ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                        13       0       0       0       0       0       1       0       0

                                    HYDROGRAPH DATA
           IHYDG    IUHG   TAREA    SNAP   TRSDA   TRSPC   RATIO   ISNOW   ISAME   LOCAL
               1       0  261.00    0.00 3456.00    0.00   0.000       0       1       0

                                      PRECIP DATA
                  SPFE     PMS      R6     R12     R24     R48     R72     R96
                  0.00   29.10   37.50   52.00   62.50   73.50   79.00    0.00
TRSPC COMPUTED BY THE PROGRAM IS 0.929
```

```
                                    LOSS DATA
   LROPT   STRKR   DLTKR   RTIOL   ERAIN   STRKS   RTIOK   STRTL   CNSTL   ALSMX   RTIMP
       0    0.07    1.00    1.0C    C.00    0.0C    1.00    C.00    0.00    C.CC    0.CC

                              UNIT HYDROGRAPH DATA
                         TC= 17.C9     R=  7.88     NTA=  C

                                  RECESSION DATA
                       STRTQ=  480.CC     QRCSN= 3650.00     RTIOR= 1.30

      UNIT HYDRCGRAPH 52 END-OF-PERIOD ORDINATES, LAG=  14.C2 HOURS, CP= 0.77  VOL= 1.C0
     201.      746.     150C.     2361.     3283.     4237.     52C8.     6181.     7137.     7985.
    8637.     9093.     9367.     9466.     9392.     9136.     8646.     7843.     6913.     6088.
    5361.     4722.     4158.     3662.     3225.     2840.     2501.     2203.     1940.     1708.
    1505.     1325.     1167.     1C28.      905.      797.      7C2.      618.      544.      479.
     422.      372.      327.      288.      254.      224.      197.      173.      153.      135.
     118.      104.

        C                                END-OF-PERIOD FLOW
  MO.DA  HR.MN  PERIOD   RAIN   EXCS   LCSS   COMP Q      MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS    COMP Q

                                                                          SUM  21.36  16.91   4.45  2943572.
                                                                              ( 542.)( 430.)( 113.)(83352.59)


        **********        **********        **********        **********        **********

                             SUB-AREA RUNOFF COMPUTATION

               36 SUB AREA-14 RUNOFF
                         ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                            14       0       0       0       0       0       1       C       C

                                     HYDROGRAPH DATA
                IHYDG    IUHG   TAREA    SNAF   TRSDA   TRSPC   RATIC   ISNOW   ISAME   LOCAL
                    1       C   30.CC    0.CC 3456.0C    0.CC   C.0CC       0       1       C

                                       PRECIP DATA
                     SPFE     PMS      R6     R12     R24     R48     R72     R96
                     0.00   21.9C   37.5C   52.00   62.50   73.50   79.00    C.00
TRSPC COMPUTED BY THE PROGRAM IS C.929

                                    LOSS DATA
   LROPT   STRKR   DLTKR   RTIOL   ERAIN   STRKS   RTIOK   STRTL   CNSTL   ALSMX   RTIMP
       C    0.07    1.00    1.0C    C.00    C.00    1.00    C.0C    0.0C    0.CC    0.CC

                              UNIT HYDROGRAPH DATA
                         TC= 10.C4     R=  5.64     NTA=  C

                                  RECESSION DATA
                       STRTQ=   37.CC     QRCSN=  32C.00     RTIOR= 1.30
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```
          UNIT HYDROGRAPH 36 END-OF-PERIOD ORDINATES, LAG=   8.31 HOURS, CP= 0.71  VOL= 1.00
     70.       257.       509.       788.      1079.      1350.      1551.      1663.      1689.      1618.
   1429.      1197.      1002.       839.       702.       588.       492.       412.       345.       289.
    242.       202.       169.       142.       119.        99.        83.        70.        58.        49.
     41.        34.        29.        24.        20.        17.

      0                                      END-OF-PERIOD FLOW
 MO.DA   HR.MN  PERIOD   RAIN   EXCS   LOSS    COMP Q        MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS     COMP Q

                                                                             SUM  16.07  12.00   4.07   241383.
                                                                                ( 408.)( 305.)( 103.)( 6835.20)

          **********          **********          **********          **********          **********

                                             COMBINE HYDROGRAPHS

                 37 COMBINE 2 HYDROGRAPHS AT E. CANADA CREEK AT EAST CREEK (USGS 3480)
                       ISTAQ     ICOMP     IECON     ITAPE      JPLT      JPRT     INAME    ISTAGE     IAUTO
                        1014         2         0         0         0         0         1         0         0

          **********          **********          **********          **********          **********

                                             HYDROGRAPH ROUTING

                 38 CHANNEL ROUTE - E. CANADA CREEK TO EAST CREEK (USGS 3480)
                       ISTAQ     ICOMP     IECON     ITAPE      JPLT      JPRT     INAME    ISTAGE     IAUTO
                        1014         1         0         0         0         0         1         0         0
                                                   ROUTING DATA
                  QLOSS    CLOSS       AVG      IRES     ISAME      IOPT      IPMP                LSTR
                    0.0    0.000      0.00         0         1         0         0                   0

                       NSTPS     NSTDL       LAG     AMSKK         X       TSK     STORA    ISPRAT
                           1         0         0    14.000     0.000     0.000       0.         0

          **********          **********          **********          **********          **********

                                             HYDROGRAPH ROUTING

                 39 CHANNEL ROUTE - MOHAWK RIVER BELOW E. CANADA CREEK
                       ISTAQ     ICOMP     IECON     ITAPE      JPLT      JPRT     INAME    ISTAGE     IAUTO
                        1015         1         0         0         0         0         1         0         0
                                                   ROUTING DATA
                  QLOSS    CLOSS       AVG      IRES     ISAME      IOPT      IPMP                LSTR
                    0.0    0.000      0.00         0         1         0         0                   0

                       NSTPS     NSTDL       LAG     AMSKK         X       TSK     STORA    ISPRAT
                           1         0         0     1.000     0.200     0.000       0.         0
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**********        **********        **********        **********        **********

                              SUB-AREA RUNOFF COMPUTATION

                 40 SUB AREA-15 RUNOFF
                        ISTAQ    ICOMP    IECON    ITAPE     JPLT     JPRT    INAME   ISTAGE    IAUTO
                           15        0        0        0        0        0        1        0        0

                                      HYDROGRAPH DATA
          IHYDG     IUHG    TAREA     SNAP    TRSDA    TRSPC    RATIO    ISNOW    ISAME    LOCAL
              1        0    37.00     0.00  3456.00     0.00    0.000        0        1        0

                                        PRECIP DATA
                       SPFE      PMS       R6      R12      R24      R48      R72      R96
                       0.00    21.90    37.50    52.00    62.50    73.50    79.00     0.00
TRSPC COMPUTED BY THE PROGRAM IS 0.929

                                         LOSS DATA
       LROPT    STRKR    DLTKR    RTIOL    ERAIN    STRKS    RTIOK    STRTL    CNSTL    ALSMX    RTIMP
           0     0.07     1.00     1.00     0.00     0.00     1.00     0.00     0.00     0.00     0.00

                                    UNIT HYDROGRAPH DATA
                              TC= 10.48      R=  5.86     NTA=   0

                                       RECESSION DATA
                          STRTQ=    44.00    QRCSN=   400.00     RTIOR= 1.30

          UNIT HYDROGRAPH 37 END-OF-PERIOD ORDINATES, LAG=   8.87 HOURS, CP= 0.73  VOL= 1.00
       76.       287.       570.       885.      1214.      1532.      1785.      1941.      2002.      1967.
     1798.      1542.      1299.      1095.       923.       778.       655.       552.       466.       392.
      331.       279.       235.       198.       167.       141.       118.       100.        84.        71.
       60.        50.        42.        36.        30.        25.        21.

   0                                   END-OF-PERIOD FLOW
MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS    COMP Q      MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS    COMP Q

                                                                    SUM  16.07  12.00   4.07  297725.
                                                                       ( 408.)( 305.)( 103.)( 8430.63)


**********        **********        **********        **********        **********

                                    COMBINE HYDROGRAPHS

                 41 COMBINE 3 HYDROGRAPHS AT MOHAWK RIVER BELOW E. CANADA CREEK
                        ISTAQ    ICOMP    IECON    ITAPE     JPLT     JPRT    INAME   ISTAGE    IAUTO
                         1015        3        0        0        0        0        1        0        0

**********        **********        **********        **********        **********
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HYDROGRAPH ROUTING

42 CHANNEL ROUTE - MOHAWK RIVER BELOW CAROGA CREEK

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
1016	1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP		LSTR
0.0	0.000	0.00	0	1	0	0		0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	2.500	0.200	0.000	0.	0

**********   **********   **********   **********   **********

SUB-AREA RUNOFF COMPUTATION

43 SUB AREA-16 RUNOFF

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
16	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	0	151.00	0.00	3456.00	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	21.90	37.50	52.00	62.50	73.50	79.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS 0.929

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0	0.07	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00

UNIT HYDROGRAPH DATA

TC= 18.56   R= 17.91   NTA= 0

RECESSION DATA

STRTQ= 250.00   QRCSN= 3500.00   RTIOR= 1.30

UNIT HYDROGRAPH100 END-OF-PERIOD ORDINATES, LAG= 17.35 HOURS, CP= 0.59 VOL= 0.59

47.	177.	363.	586.	834.	1102.	1385.	1681.	1986.	2293.
2578.	2824.	3030.	3196.	3321.	3405.	3443.	3428.	3333.	3171.
2999.	2836.	2682.	2536.	2399.	2268.	2145.	2029.	1918.	1814.
1716.	1622.	1534.	1451.	1372.	1298.	1227.	1161.	1097.	1038.
981.	928.	878.	830.	785.	742.	702.	664.	628.	594.
561.	531.	502.	475.	449.	425.	402.	380.	359.	340.
321.	304.	287.	272.	257.	243.	230.	217.	205.	194.
184.	174.	164.	155.	147.	139.	131.	124.	118.	111.
105.	99.	94.	89.	84.	80.	75.	71.	67.	64.

```
        60.      57.      54.      51.      48.      45.      43.      41.      38.      36.

    0                                 END-OF-PERIOD FLOW
MO.DA  HR.MN  PERIOD  RAIN  EXCS  LOSS  COMP Q      MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS    COMP Q

                                                                   SUM  16.07  12.00   4.07  1212509.
                                                                      ( 408.)( 305.)( 103.)(34334.40)

     **********      **********      **********      **********      **********

                                 COMBINE HYDROGRAPHS

         44 COMBINE 2 HYDROGRAPHS AT MOHAWK RIVER BELOW CAROGA CREEK
                ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                 1016       2       0       0       0       0       1       0       0

     **********      **********      **********      **********      **********

                                  HYDROGRAPH ROUTING

         45 CHANNEL ROUTE - MOHAWK RIVER BELOW OTSQUAGO CREEK
                ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                 1018       1       0       0       0       0       1       0       0
                                   ROUTING DATA
         QLOSS  CLOSS     AVG    IRES   ISAME    IOPT    IPMP            LSTR
           0.0  0.000    0.00       0       1       0       0               0

                NSTPS   NSTDL     LAG   AMSKK       X     TSK   STORA  ISPRAT
                    1       0       0   1.000   0.200   0.000      0.       0

     **********      **********      **********      **********      **********

                               SUB-AREA RUNOFF COMPUTATION

         46 SUB AREA-17 RUNOFF
                ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                   17       0       0       0       0       0       1       0       0

                                     HYDROGRAPH DATA
      IHYDG    IUHG   TAREA    SNAP   TRSDA   TRSPC   RATIO   ISNOW   ISAME   LOCAL
          1       0   59.20    0.00 3456.00    0.00   0.000       0       1       0

                                       PRECIP DATA
             SPFE     PMS      R6     R12     R24     R48     R72     R96
             0.00   21.90   37.50   52.00   62.50   73.50   79.00    0.00
TRSPC COMPUTED BY THE PROGRAM IS 0.929

                                        LOSS DATA
```

```
     516.      426.      351.      290.      239.      197.      163.      134.      111.       92.
      76.       62.       51.       42.       35.       29.       24.       20.       16.       13.
      11.        9.        8.

       0                                  END-OF-PERIOD FLOW
MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS    COMP Q      MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS    COMP Q

                                                                        SUM  16.07  12.00   4.07   104233.
                                                                            ( 408.)( 305.)( 103.)( 2951.55)


             **********        **********        **********        **********        **********

                                          COMBINE HYDROGRAPHS

                   48 COMBINE 3 HYDROGRAPHS AT MOHAWK RIVER BELOW OTSQUAGO CREEK
                              ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                               1018       3       0       0       0       0       1       0       0

             **********        **********        **********        **********        **********

                                          HYDROGRAPH ROUTING

                   49 CHANNEL ROUTE-MOHAWK RIVER BELOW CANAJOHARIE  CREEK
                              ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                               1019       1       0       0       0       0       1       0       0
                                                ROUTING DATA
                    QLOSS     CLOSS     AVG    IRES   ISAME    IOPT    IPMP            LSTR
                      0.0     0.000    0.00       0       1       0       0               0

                              NSTPS   NSTDL     LAG   AMSKK       X     TSK   STORA  ISPRAT
                                  1       0       0   1.200   0.200   0.000      0.       0

             **********        **********        **********        **********        **********

                                          SUB-AREA RUNOFF COMPUTATION

                   50 SUB AREA - 19 RUNOFF
                              ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                                 19       0       0       0       0       0       1       0       0

                                              HYDROGRAPH DATA
                 IHYDG    IUHG   TAREA    SNAP   TRSDA   TRSPC   RATIO   ISNOW   ISAME   LOCAL
                     1       0   72.00    0.00 3456.00    0.00   0.000       0       1       0

                                              PRECIP DATA
                         SPFE     PMS      R6     R12     R24     R48     R72     R96
                         0.00   21.90   37.50   52.00   62.50   73.50   79.00    0.00
TRSPC COMPUTED BY THE PROGRAM IS 0.929
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                                         LOSS DATA
 LROPT   STRKR   DLTKR   RTIOL   ERAIN   STRKS   RTIOK   STRTL   CNSTL   ALSMX   RTIMP
     0    0.07    1.00    1.00    0.00    0.00    1.00    0.00    0.00    0.00    0.00

                              UNIT HYDROGRAPH DATA
                        TC= 12.44      R=  6.41     NTA=  0

                                 RECESSION DATA
                     STRTQ=   103.00    QRCSN=   700.00    RTIOR= 1.30

       UNIT HYDROGRAPH 41 END-OF-PERIOD ORDINATES, LAG=  10.28 HOURS, CP= 0.74  VOL= 1.00
     108.      399.      796.     1241.     1709.     2187.     2646.     3018.     3265.     3393.
    3406.     3294.     3004.     2601.     2225.     1903.     1627.     1392.     1190.     1018.
     871.      745.      637.      545.      466.      399.      341.      292.      249.      213.
     182.      156.      133.      114.       98.       83.       71.       61.       52.       45.

                0
                                    END-OF-PERIOD FLOW
 MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS    COMP Q     MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS    COMP Q

                                                                        SUM  16.07  12.00   4.07   577484.
                                                                           ( 408.)( 305.)( 103.)(16352.51)

       **********          **********          **********          **********          **********

                                 COMBINE HYDROGRAPHS

           51 COMBINE 2 HYDROGRAPHS AT MOHAWK RIVER BELOW CANAJOHARIE CREEK
                  ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                   1019       2       0       0       0       0       1       0       0

       **********          **********          **********          **********          **********

                                 HYDROGRAPH ROUTING

           52 CHANNEL ROUTE - MOHAWK RIVER AT SPRAKERS
                  ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                   1020       1       0       0       0       0       1       0       0
                                        ROUTING DATA
          QLOSS   CLOSS     AVG    IRES   ISAME    IOPT    IPMP            LSTR
            0.0   0.000    0.00       0       1       0       0               0

                  NSTPS   NSTDL     LAG   AMSKK       X     TSK   STORA  ISPRAT
                      1       0       0   1.200   0.200   0.000      0.       0

       **********          **********          **********          **********          **********
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                              SUB-AREA RUNOFF COMPUTATION

              53 SUB AREA-20 RUNOFF
                         ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                            20       0       0       0       0       0       1       0       0

                                     HYDROGRAPH DATA
             IHYDG    IUHG   TAREA    SNAP   TRSDA   TRSPC   RATIO   ISNOW   ISAME   LOCAL
                 1       0   55.00    0.00 3456.00    0.00   0.000       0       1       0

                                       PRECIP DATA
                     SPFE     PMS      R6     R12     R24     R48     R72     R96
                     0.00   21.90   37.50   52.00   62.50   73.50   79.00    0.00
TRSPC COMPUTED BY THE PROGRAM IS 0.929

                                        LOSS DATA
          LROPT   STRKR   DLTKR   RTIOL   ERAIN   STRKS   RTIOK   STRTL   CNSTL   ALSMX   RTIMP
              0    0.07    1.00    1.00    0.00    0.00    1.00    0.00    0.00    0.00    0.00

                                  UNIT HYDROGRAPH DATA
                            TC= 11.78     R=  6.38     NTA=  0

                                     RECESSION DATA
                        STRTQ=    75.00     QRCSN=   550.00     RTIOR= 1.30

             UNIT HYDROGRAPH 41 END-OF-PERIOD ORDINATES, LAG=   9.94 HOURS, CP= 0.74  VOL= 1.00
          90.      332.      662.     1032.     1422.     1819.     2182.     2455.     2623.     2690.
        2655.     2483.     2184.     1867.     1596.     1364.     1165.      996.      851.      728.
         622.      531.      454.      388.      332.      284.      242.      207.      177.      151.
         129.      110.       94.       81.       69.       59.       50.       43.       37.       31.
          27.

     0                                   END-OF-PERIOD FLOW
  MO.DA   HR.MN  PERIOD    RAIN    EXCS   LOSS     COMP Q       MO.DA   HR.MN  PERIOD    RAIN    EXCS    LOSS     COMP Q

                                                                                SUM  16.07   12.00    4.07   441616.
                                                                                   ( 408.)( 305.)( 103.)(12505.16)

          **********         **********         **********         **********         **********

                                    COMBINE HYDROGRAPHS

              54 COMBINE 2 HYDROGRAPHS AT MOHAWK RIVER AT SPRAKERS
                         ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                          1020       2       0       0       0       0       1       0       0

          **********         **********         **********         **********         **********

                                    HYDROGRAPH ROUTING
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55 CHANNEL ROUTE - MOHAWK RIVER BELOW CAYADUTTA CREEK
          ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
           1023       1       0       0       0       0       1       0       0
                             ROUTING DATA
   QLOSS  CLOSS     AVG    IRES   ISAME    IOPT    IPMP            LSTR
     0.0  0.000    0.00       0       1       0       0               0

          NSTPS   NSTDL     LAG   AMSKK       X     TSK   STORA  ISPRAT
              2       0       0   1.550   0.200   0.000      0.       0

**********     **********     **********     **********     **********

                        SUB-AREA RUNOFF COMPUTATION

56 SUB AREA-21   RUNOFF
          ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
             21       0       0       0       0       0       1       0       0

                             HYDROGRAPH DATA
   IHYDG   IUHG   TAREA    SNAP   TRSDA   TRSPC   RATIO   ISNOW   ISAME   LOCAL
       1      0   12.70    0.00 3456.00    0.00   0.000       0       1       0

                              PRECIP DATA
          SPFE     PMS      R6     R12     R24     R48     R72     R96
          0.00   21.90   37.50   52.00   62.50   73.50   79.00    0.00
TRSPC COMPUTED BY THE PROGRAM IS 0.929

                               LOSS DATA
  LROPT  STRKR  DLTKR  RTIOL  ERAIN  STRKS  RTIOK  STRTL  CNSTL  ALSMX  RTIMP
      0   0.07   1.30   1.00   0.00   0.00   1.00   0.00   0.00   0.00   0.00

                          UNIT HYDROGRAPH DATA
                  TC=  8.6?     R=  6.32    NTA=  0

                             RECESSION DATA
             STRTQ=   13.00    QRCSN=  120.00    RTIOR= 1.30

  UNIT HYDROGRAPH 39 END-OF-PERIOD ORDINATES, LAG=   7.38 HOURS, CP= 0.65  VOL= 1.00
     34.      124.      247.      384.      523.      636.      705.      727.      689.      604.
    516.      440.      376.      320.      274.      233.      199.      170.      145.      124.
    106.       90.       77.       66.       56.       48.       41.       35.       30.       25.
     22.       18.       16.       13.       11.       10.        8.        7.        6.

0                            END-OF-PERIOD FLOW
MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS   COMP Q     MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS    COMP Q

                                                                       SUM  16.07  11.90   4.17   100847.
                                                                         ( 408.)( 302.)( 106.)( 2855.67)
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**********          **********          **********          **********          **********

                              SUB-AREA RUNOFF COMPUTATION

            57 SUB AREA-22   RUNOFF
                     ISTAQ    ICOMP    IECON    ITAPE     JPLT     JPRT    INAME   ISTAGE    IAUTO
                        22        0        0        0        0        0        1        0        0

                                         HYDROGRAPH DATA
         IHYDG     IUHG    TAREA     SNAP    TRSDA    TRSPC    RATIO    ISNOW    ISAME    LOCAL
             1        0    23.00     0.00  3456.00     0.00    0.000        0        1        0

                                          PRECIP DATA
                  SPFE      PMS       R6      R12      R24      R48      R72      R96
                  0.00    21.90    37.50    52.00    62.50    73.50    79.00     0.00
TRSPC COMPUTED BY THE PROGRAM IS 0.929

                                           LOSS DATA
       LROPT    STRKR    DLTKR    RTIOL    ERAIN    STRKS    RTIOK    STRTL    CNSTL    ALSMX    RTIMP
           0     0.07     1.30     1.00     0.00     0.00     1.00     0.00     0.00     0.00     0.00

                                      UNIT HYDROGRAPH DATA
                               TC=  9.61      R=  5.86     NTA=  0

                                         RECESSION DATA
                          STRTQ=    27.00     QRCSN=  250.00     RTIOR= 1.30

         UNIT HYDROGRAPH 37 END-OF-PERIOD ORDINATES, LAG=   8.15 HOURS, CP= 0.70   VOL= 1.00
        55.       203.       404.       626.       859.      1067.      1214.      1290.      1254.      1204.
      1041.       877.       739.       623.       525.       442.       373.       314.       265.       223.
       188.       159.       134.       113.        95.        80.        67.        57.        48.        40.
        34.        29.        24.        20.        17.        14.        12.

     0                                     END-OF-PERIOD FLOW
  MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS    COMP Q       MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS    COMP Q

                                                                          SUM  16.07  11.90   4.17   183691.
                                                                             ( 408.)( 302.)( 106.)( 5201.54)

**********          **********          **********          **********          **********

                                        COMBINE HYDROGRAPHS

            58 COMBINE 2 HYDROGRAPHS AT CAYADUTTA CREEK AT JOHNSTOWN
                     ISTAQ    ICOMP    IECON    ITAPE     JPLT     JPRT    INAME   ISTAGE    IAUTO
                      1022        2        0        0        0        0        1        0        0

**********          **********          **********          **********          **********
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                              HYDROGRAPH ROUTING

           59 CHANNEL ROUTE - MOHAWK RIVER BELOW CAYADUTTA CREEEK
                 ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                  1023       1       0       0       0       0       1       0       0
                                     ROUTING DATA
           QLOSS   CLOSS     AVG    IRES   ISAME    IOPT    IPMP            LSTR
             0.0   0.000    0.00       0       1       0       0               0

                 NSTPS   NSTDL     LAG   AMSKK       X     TSK   STORA  ISPRAT
                     1       0       0   1.400   0.300   0.000      0.       0

 **********    **********    **********    **********    **********

                           SUB-AREA RUNOFF COMPUTATION

           60 SUB AREA-23  RUNOFF
                 ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                    23       0       0       0       0       1       0       0       0

                                   HYDROGRAPH DATA
       IHYDG    IUHG   TAREA    SNAP   TRSDA   TRSPC   RATIO   ISNOW   ISAME   LOCAL
           1       0   84.00    0.00 3456.00    0.00   0.000       0       1       0

                                     PRECIP DATA
                  SPFE     PMS      R6     R12     R24     R48     R72     R96
                  0.00   21.90   37.50   52.00   62.50   73.50   79.00    0.00
TRSPC COMPUTED BY THE PROGRAM IS 0.929

                                      LOSS DATA
     LROPT   STRKR   DLTKR   RTIOL   ERAIN   STRKS   RTIOK   STRTL   CNSTL   ALSMX   RTIMP
         0    0.07    1.00    1.00    0.00    0.00    1.00    0.00    0.00    0.00    0.00

                                UNIT HYDROGRAPH DATA
                            TC= 13.14     R=  6.92    NTA=  0

                                    RECESSION DATA
                        STRTQ=  125.00    QRCSN=  870.00     RTIOR= 1.30

      UNIT HYDROGRAPH 44 END-OF-PERIOD ORDINATES, LAG=  11.06 HOURS, CP= 0.74  VOL= 1.00
       108.      400.      801.     1254.     1734.     2226.     2716.     3144.     3457.     3651.
      3733.     3701.     3536.     3191.     2767.     2394.     2071.     1792.     1551.     1342.
      1161.     1004.      869.      752.      651.      563.      487.      421.      365.      315.
       273.      236.      204.      177.      153.      132.      115.       99.       86.       74.
        64.       56.       48.       42.

   0                                 END-OF-PERIOD FLOW
 MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS    COMP Q       MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS    COMP Q
  1.01   1.00       1   0.03   0.00   0.03      122.        1.04   4.00      76   0.00   0.00   0.00     1927.
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1.01	2.00	2	0.03	0.00	0.03	119.	1.04	5.00	77	0.00	0.00	0.00	1685.
1.01	3.00	3	0.03	0.00	0.03	116.	1.04	6.00	78	0.00	0.00	0.00	1448.
1.01	4.00	4	0.03	0.00	0.03	113.	1.04	7.00	79	0.00	0.00	0.00	1240.
1.01	5.00	5	0.03	0.00	0.03	110.	1.04	8.00	80	0.00	0.00	0.00	1059.
1.01	6.00	6	0.03	0.00	0.03	107.	1.04	9.00	81	0.00	0.00	0.00	893.
1.01	7.00	7	0.09	0.00	0.09	104.	1.04	10.00	82	0.00	0.00	0.00	851.
1.01	8.00	8	0.09	0.00	0.09	101.	1.04	11.00	83	0.00	0.00	0.00	829.
1.01	9.00	9	0.09	0.00	0.09	99.	1.04	12.00	84	0.00	0.00	0.00	808.
1.01	10.00	10	0.09	0.00	0.09	96.	1.04	13.00	85	0.00	0.00	0.00	787.
1.01	11.00	11	0.09	0.00	0.09	94.	1.04	14.00	86	0.00	0.00	0.00	766.
1.01	12.00	12	0.09	0.00	0.09	91.	1.04	15.00	87	0.00	0.00	0.00	746.
1.01	13.00	13	0.13	0.04	0.10	93.	1.04	16.00	88	0.00	0.00	0.00	727.
1.01	14.00	14	0.16	0.08	0.09	110.	1.04	17.00	89	0.00	0.00	0.00	708.
1.01	15.00	15	0.20	0.12	0.08	158.	1.04	18.00	90	0.00	0.00	0.00	690.
1.01	16.00	16	0.51	0.43	0.08	285.	1.04	19.00	91	0.00	0.00	0.00	672.
1.01	17.00	17	0.19	0.11	0.07	523.	1.04	20.00	92	0.00	0.00	0.00	655.
1.01	18.00	18	0.15	0.07	0.07	846.	1.04	21.00	93	0.00	0.00	0.00	638.
1.01	19.00	19	0.04	0.00	0.04	1221.	1.04	22.00	94	0.00	0.00	0.00	621.
1.01	20.00	20	0.04	0.00	0.04	1621.	1.04	23.00	95	0.00	0.00	0.00	605.
1.01	21.00	21	0.04	0.00	0.04	2023.	1.05	0.00	96	0.00	0.00	0.00	589.
1.01	22.00	22	0.04	0.00	0.04	2408.	1.05	1.00	97	0.00	0.00	0.00	574.
1.01	23.00	23	0.04	0.00	0.04	2739.	1.05	2.00	98	0.00	0.00	0.00	559.
1.02	0.00	24	0.04	0.00	0.04	2986.	1.05	3.00	99	0.00	0.00	0.00	545.
1.02	1.00	25	0.14	0.07	0.07	3143.	1.05	4.00	100	0.00	0.00	0.00	531.
1.02	2.00	26	0.14	0.07	0.07	3220.	1.05	5.00	101	0.00	0.00	0.00	517.
1.02	3.00	27	0.14	0.07	0.07	3219.	1.05	6.00	102	0.00	0.00	0.00	504.
1.02	4.00	28	0.14	0.07	0.07	3145.	1.05	7.00	103	0.00	0.00	0.00	491.
1.02	5.00	29	0.14	0.07	0.07	2998.	1.05	8.00	104	0.00	0.00	0.00	478.
1.02	6.00	30	0.14	0.07	0.07	2831.	1.05	9.00	105	0.00	0.00	0.00	465.
1.02	7.00	31	0.49	0.42	0.07	2746.	1.05	10.00	106	0.00	0.00	0.00	453.
1.02	8.00	32	0.49	0.42	0.07	2823.	1.05	11.00	107	0.00	0.00	0.00	442.
1.02	9.00	33	0.49	0.42	0.07	3098.	1.05	12.00	108	0.00	0.00	0.00	430.
1.02	10.00	34	0.49	0.42	0.07	3576.	1.05	13.00	109	0.00	0.00	0.00	419.
1.02	11.00	35	0.49	0.42	0.07	4254.	1.05	14.00	110	0.00	0.00	0.00	408.
1.02	12.00	36	0.49	0.42	0.07	5127.	1.05	15.00	111	0.00	0.00	0.00	398.
1.02	13.00	37	0.76	0.69	0.08	6209.	1.05	16.00	112	0.00	0.00	0.00	387.
1.02	14.00	38	0.92	0.84	0.08	7531.	1.05	17.00	113	0.00	0.00	0.00	377.
1.02	15.00	39	1.14	1.07	0.08	9128.	1.05	18.00	114	0.00	0.00	0.00	368.
1.02	16.00	40	2.90	2.82	0.08	11221.	1.05	19.00	115	0.00	0.00	0.00	358.
1.02	17.00	41	1.07	0.99	0.08	13938.	1.05	20.00	116	0.00	0.00	0.00	349.
1.02	18.00	42	0.84	0.76	0.08	17089.	1.05	21.00	117	0.00	0.00	0.00	340.
1.02	19.00	43	0.21	0.14	0.07	20419.	1.05	22.00	118	0.00	0.00	0.00	331.
1.02	20.00	44	0.21	0.14	0.07	23664.	1.05	23.00	119	0.00	0.00	0.00	322.
1.02	21.00	45	0.21	0.14	0.07	26648.	1.06	0.00	120	0.00	0.00	0.00	314.
1.02	22.00	46	0.21	0.14	0.07	29260.	1.06	1.00	121	0.00	0.00	0.00	306.
1.02	23.00	47	0.21	0.14	0.07	31322.	1.06	2.00	122	0.00	0.00	0.00	298.
1.03	0.00	48	0.21	0.14	0.07	32673.	1.06	3.00	123	0.00	0.00	0.00	290.
1.03	1.00	49	0.01	0.00	0.01	33256.	1.06	4.00	124	0.00	0.00	0.00	283.
1.03	2.00	50	0.01	0.00	0.01	33045.	1.06	5.00	125	0.00	0.00	0.00	275.
1.03	3.00	51	0.01	0.00	0.01	32062.	1.06	6.00	126	0.00	0.00	0.00	268.
1.03	4.00	52	0.01	0.00	0.01	30343.	1.06	7.00	127	0.00	0.00	0.00	261.

1.03	5.00	53	0.01	0.00	0.01	27920.	1.06	8.00	128	0.00	0.00	0.00	255.
1.03	6.00	54	0.01	0.00	0.01	25121.	1.06	9.00	129	0.00	0.00	0.00	248.
1.03	7.00	55	0.04	0.00	0.04	22340.	1.06	10.00	130	0.00	0.00	0.00	242.
1.03	8.00	56	0.04	0.00	0.04	19740.	1.06	11.00	131	0.00	0.00	0.00	235.
1.03	9.00	57	0.04	0.00	0.04	17383.	1.06	12.00	132	0.00	0.00	0.00	229.
1.03	10.00	58	0.04	0.00	0.04	15251.	1.06	13.00	133	0.00	0.00	0.00	223.
1.03	11.00	59	0.04	0.00	0.04	13324.	1.06	14.00	134	0.00	0.00	0.00	217.
1.03	12.00	60	0.04	0.00	0.04	11581.	1.06	15.00	135	0.00	0.00	0.00	212.
1.03	13.00	61	0.07	0.00	0.07	10038.	1.06	16.00	136	0.00	0.00	0.00	206.
1.03	14.00	62	0.08	0.01	0.07	8687.	1.06	17.00	137	0.00	0.00	0.00	201.
1.03	15.00	63	0.10	0.03	0.07	7523.	1.06	18.00	138	0.00	0.00	0.00	196.
1.03	16.00	64	0.26	0.18	0.07	6542.	1.06	19.00	139	0.00	0.00	0.00	191.
1.03	17.00	65	0.09	0.02	0.07	5735.	1.06	20.00	140	0.00	0.00	0.00	186.
1.03	18.00	66	0.07	0.00	0.07	5070.	1.06	21.00	141	0.00	0.00	0.00	181.
1.03	19.00	67	0.02	0.00	0.02	4520.	1.06	22.00	142	0.00	0.00	0.00	176.
1.03	20.00	68	0.02	0.00	0.02	4063.	1.06	23.00	143	0.00	0.00	0.00	172.
1.03	21.00	69	0.02	0.00	0.02	3684.	1.07	0.00	144	0.00	0.00	0.00	167.
1.03	22.00	70	0.02	0.00	0.02	3367.	1.07	1.00	145	0.00	0.00	0.00	163.
1.03	23.00	71	0.02	0.00	0.02	3094.	1.07	2.00	146	0.00	0.00	0.00	159.
1.04	0.00	72	0.02	0.00	0.02	2845.	1.07	3.00	147	0.00	0.00	0.00	155.
1.04	1.00	73	0.00	0.00	0.00	2611.	1.07	4.00	148	0.00	0.00	0.00	151.
1.04	2.00	74	0.00	0.00	0.00	2389.	1.07	5.00	149	0.00	0.00	0.00	147.
1.04	3.00	75	0.00	0.00	0.00	2159.	1.07	6.00	150	0.00	0.00	0.00	143.

SUM 16.07 12.00 4.07 675000.
(408.)(305.)(103.)(19113.85)

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	33256.	32026.	21453.	9045.	674858.
CMS	942.	907.	607.	256.	19110.
INCHES		3.55	9.50	12.02	12.46
MM		90.09	241.38	305.29	316.38
AC-FT		15881.	42551.	53819.	55773.
THOUS CU M		19589.	52486.	66385.	68795.

HYDROGRAPH AT STA 23 FOR PLAN 1, RTIO 1

24.	24.	23.	23.	22.	21.	21.	20.	20.	19.
19.	18.	19.	22.	32.	57.	105.	169.	244.	324.
405.	482.	548.	597.	629.	644.	644.	629.	600.	566.
549.	565.	620.	715.	851.	1025.	1242.	1506.	1826.	2244.
2768.	3418.	4084.	4733.	5330.	5852.	6264.	6535.	6651.	6609.
6412.	6069.	5584.	5024.	4468.	3948.	3477.	3050.	2665.	2316.
2008.	1737.	1505.	1308.	1147.	1014.	904.	813.	737.	673.
619.	569.	522.	478.	432.	385.	337.	290.	248.	212.
179.	170.	166.	162.	157.	153.	149.	145.	142.	138.
134.	131.	128.	124.	121.	118.	115.	112.	109.	106.
103.	101.	98.	96.	93.	91.	88.	86.	84.	82.
80.	77.	75.	74.	72.	70.	68.	66.	64.	63.
61.	60.	58.	57.	55.	54.	52.	51.	50.	48.
47.	46.	45.	43.	42.	41.	40.	39.	38.	37.
36.	35.	34.	33.	33.	32.	31.	30.	29.	29.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	6651.	6405.	4291.	1809.	134971.
CMS	188.	181.	121.	51.	3822.
INCHES		0.71	1.90	2.40	2.49
MM		18.02	48.28	61.06	63.28
AC-FT		3176.	8510.	10764.	11155.
THOUS CU M		3918.	10497.	13277.	13759.

HYDROGRAPH AT STA 23 FOR PLAN 1, RTIO 2

49.	47.	46.	45.	44.	43.	42.	41.	39.	38.
37.	36.	37.	44.	63.	114.	209.	338.	488.	648.
809.	963.	1096.	1194.	1257.	1288.	1288.	1258.	1159.	1132.
1098.	1129.	1239.	1430.	1702.	2051.	2484.	3013.	3651.	4489.
5575.	6836.	8168.	9465.	10659.	11704.	12529.	13069.	13302.	13218.
12825.	12137.	11168.	10048.	8936.	7896.	6953.	6100.	5330.	4633.
4015.	3475.	3009.	2617.	2294.	2028.	1808.	1625.	1473.	1347.
1238.	1138.	1044.	955.	864.	771.	674.	579.	496.	424.
357.	340.	332.	323.	315.	306.	299.	291.	283.	276.
269.	262.	255.	248.	242.	236.	230.	224.	218.	212.
207.	201.	196.	191.	186.	181.	177.	172.	168.	163.
159.	155.	151.	147.	143.	140.	136.	132.	129.	126.
122.	119.	116.	113.	110.	107.	105.	102.	99.	97.
94.	92.	89.	87.	85.	83.	80.	78.	76.	74.
72.	71.	69.	67.	65.	63.	62.	60.	59.	57.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	13302.	12811.	8581.	3618.	269943.
CMS	377.	363.	243.	102.	7644.
INCHES		1.42	3.80	4.81	4.98
MM		36.03	96.55	122.12	126.55
AC-FT		6352.	17021.	21528.	22309.
THOUS CU M		7835.	20995.	26554.	27518.

HYDROGRAPH AT STA 23 FOR PLAN 1, RTIO 3

61.	59.	58.	56.	55.	53.	52.	51.	49.	48.
47.	46.	46.	55.	79.	143.	262.	423.	610.	810.
1012.	1204.	1369.	1493.	1572.	1610.	1610.	1573.	1499.	1415.
1373.	1412.	1549.	1788.	2127.	2563.	3104.	3766.	4564.	5611.
6969.	8545.	10209.	11832.	13324.	14630.	15661.	16337.	16628.	16522.
16031.	15171.	13960.	12560.	11170.	9870.	8691.	7625.	6662.	5791.
5019.	4343.	3762.	3271.	2867.	2535.	2260.	2032.	1842.	1684.
1547.	1422.	1306.	1194.	1079.	964.	842.	724.	620.	530.
447.	426.	414.	404.	393.	383.	373.	364.	354.	345.
336.	327.	319.	311.	303.	295.	287.	280.	272.	265.
258.	252.	245.	239.	233.	227.	221.	215.	210.	204.
199.	194.	189.	184.	179.	174.	170.	165.	161.	157.
153.	149.	145.	141.	138.	134.	131.	127.	124.	121.
118.	115.	112.	109.	106.	103.	101.	98.	95.	93.
90.	88.	86.	84.	81.	79.	77.	75.	73.	71.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	16628.	16013.	10727.	4522.	337429.
CMS	471.	453.	304.	128.	9555.
INCHES		1.77	4.75	6.01	6.23
MM		45.04	120.69	152.65	158.19
AC-FT		7940.	21276.	26910.	27887.
THOUS CU M		9794.	26243.	33192.	34398.

HYDROGRAPH AT STA 23 FOR PLAN 1, RTIO 4

73.	71.	69.	68.	66.	64.	62.	61.	59.	58.
56.	55.	56.	66.	95.	171.	314.	508.	733.	972.
1214.	1445.	1643.	1791.	1886.	1932.	1932.	1887.	1799.	1699.
1648.	1694.	1859.	2145.	2553.	3076.	3725.	4519.	5477.	6733.
8363.	10254.	12251.	14198.	15989.	17556.	18793.	19604.	19954.	19827.
19237.	18205.	16752.	15072.	13404.	11844.	10430.	9150.	7995.	6949.
6023.	5212.	4514.	3925.	3441.	3042.	2712.	2438.	2210.	2020.
1856.	1707.	1567.	1433.	1295.	1156.	1011.	869.	744.	636.
536.	511.	497.	485.	472.	460.	448.	436.	425.	414.
403.	393.	383.	373.	363.	354.	344.	336.	327.	318.
310.	302.	294.	287.	279.	272.	265.	258.	251.	245.
239.	232.	226.	221.	215.	209.	204.	199.	193.	188.
184.	179.	174.	170.	165.	161.	157.	153.	149.	145.
141.	138.	134.	130.	127.	124.	121.	117.	114.	111.
109.	106.	103.	100.	98.	95.	93.	90.	88.	86.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	19954.	19216.	12872.	5427.	404915.
CMS	565.	544.	364.	154.	11466.
INCHES		2.13	5.70	7.21	7.47
MM		54.05	144.83	183.18	189.83
AC-FT		9529.	25531.	32291.	33464.
THOUS CU M		11753.	31492.	39831.	41277.

HYDROGRAPH AT STA 23 FOR PLAN 1, RTIO 5

97.	95.	92.	90.	88.	85.	83.	81.	79.	77.
75.	73.	74.	88.	126.	228.	419.	677.	977.	1296.
1619.	1926.	2191.	2388.	2515.	2576.	2576.	2516.	2398.	2265.
2197.	2259.	2478.	2861.	3403.	4101.	4967.	6025.	7302.	8977.
11151.	13672.	16335.	18931.	21318.	23408.	25057.	26139.	26605.	26436.
25649.	24274.	22336.	20097.	17872.	15792.	13906.	12200.	10660.	9265.
8031.	6950.	6019.	5234.	4588.	4056.	3616.	3251.	2947.	2694.
2475.	2276.	2089.	1911.	1727.	1542.	1348.	1158.	992.	847.
715.	681.	663.	646.	629.	613.	597.	582.	567.	552.
538.	524.	510.	497.	484.	472.	459.	447.	436.	425.
414.	403.	392.	382.	372.	363.	353.	344.	335.	327.
318.	310.	302.	294.	286.	279.	272.	265.	258.	251.
245.	238.	232.	226.	220.	215.	209.	204.	198.	193.
188.	183.	179.	174.	169.	165.	161.	157.	153.	149.
145.	141.	137.	134.	130.	127.	124.	121.	117.	114.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	26605.	25621.	17162.	7236.	539885.
CMS	753.	726.	486.	205.	15288.
INCHES		2.84	7.60	9.62	9.96
MM		72.07	193.10	244.23	253.10
AC-FT		12705.	34041.	43055.	44619.
THOUS CU M		15671.	41989.	53108.	55036.

HYDROGRAPH AT STA 23 FOR PLAN 1, RTIO 6

122.	119.	116.	113.	110.	107.	104.	101.	99.	96.
94.	91.	93.	110.	158.	285.	523.	846.	1221.	1621.
2023.	2408.	2739.	2986.	3143.	3220.	3219.	3145.	2958.	2831.
2746.	2823.	3098.	3576.	4254.	5127.	6209.	7531.	9128.	11221.
13938.	17089.	20419.	23664.	26648.	29260.	31322.	32673.	33256.	33045.
32062.	30342.	27920.	25121.	22340.	19740.	17383.	15251.	13324.	11581.
10038.	8687.	7523.	6542.	5735.	5070.	4520.	4063.	3684.	3367.
3094.	2865.	2611.	2389.	2159.	1927.	1685.	1448.	1240.	1059.
893.	851.	829.	808.	787.	766.	746.	727.	708.	690.
672.	655.	638.	621.	605.	589.	574.	559.	545.	531.
517.	504.	491.	478.	465.	453.	442.	430.	419.	408.
398.	387.	377.	368.	358.	349.	340.	331.	322.	314.
306.	298.	290.	283.	275.	268.	261.	255.	248.	242.
235.	229.	223.	217.	212.	206.	201.	196.	191.	186.
181.	176.	172.	167.	163.	159.	155.	151.	147.	143.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	33256.	32026.	21453.	9045.	674858.
CMS	942.	907.	607.	256.	19110.
INCHES		3.55	9.50	12.02	12.46
MM		90.09	241.38	305.29	316.38
AC-FT		15881.	42551.	53819.	55773.
THOUS CU M		19589.	52486.	66385.	68795.

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COMBINE HYDROGRAPHS

61 COMBINE 3 HYDROGRAPHS AT MOHAWK RIVER BELOW CAYADUTTA CREEK

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
1023	3	0	0	0	0	1	0	0

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HYDROGRAPH ROUTING

62 CHANNEL ROUTE - MOHAWK RIVER BELOW SCHOHARIE CREEK

ISTAQ ICOMP IECON ITAPE JPLT JPRT INAME ISTAGE IAUTO

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              1029        1        0        0        0        0        1        0        0
                                       ROUTING DATA
        QLOSS    CLOSS      AVG     IRES    ISAME     IOPT     IPMP              LSTR
          0.0    0.000     0.00        0        1        0        0                 0

                 NSTPS    NSTDL      LAG    AMSKK        X      TSK    STORA   ISPRAT
                     1        0        0    2.500    0.200    0.000       0.        0

   **********       **********        **********        **********        **********

                             SUB-AREA RUNOFF COMPUTATION

        63 SUB AREA-24  RUNOFF
                 ISTAQ    ICOMP    IECON    ITAPE     JPLT     JPRT    INAME   ISTAGE    IAUTO
                    24        0        0        0        0        0        1        0        0

                                     HYDROGRAPH DATA
        IHYDG     IUHG    TAREA     SNAP    TRSDA    TRSPC    RATIO    ISNOW    ISAME    LOCAL
            1        0    39.30     0.00  3456.00     0.00    0.000        0        1        0

                                       PRECIP DATA
             SPFE      PMS       R6      R12      R24      R48      R72      R96
             0.00    21.90    37.50    52.00    62.50    73.50    79.00     0.00
TRSPC COMPUTED BY THE PROGRAM IS 0.929

                                        LOSS DATA
   LROPT    STRKR    DLTKR    RTIOL    ERAIN    STRKS    RTIOK    STRTL    CNSTL    ALSMX    RTIMP
       0     0.07     2.00     1.00     0.00     0.00     1.00     0.00     0.00     0.00     0.00

                                   UNIT HYDROGRAPH DATA
                             TC= 11.12      R=  6.63     NTA=  0

                                      RECESSION DATA
                        STRTQ=    51.00     QRCSN=  420.00     RTIOR= 1.30

          UNIT HYDROGRAPH 42 END-OF-PERIOD ORDINATES, LAG=    9.36 HOURS, CP= 0.70  VOL= 1.00
        68.      250.      499.      780.     1076.     1375.     1635.     1817.     1920.     1944.
      1876.     1695.     1460.     1255.     1079.      928.      798.      686.      590.      507.
       436.      375.      322.      277.      238.      205.      176.      151.      130.      112.
        96.       83.       71.       61.       53.       45.       39.       33.       29.       25.
        21.       18.

     0                                 END-OF-PERIOD FLOW
 MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS    COMP Q      MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS    COMP Q

                                                                     SUM  16.07  11.62   4.45   306584.
                                                                        ( 408.)( 295.)( 113.)( 8681.48)

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                              HYDROGRAPH ROUTING

              64 CHANNEL ROUTE - BATAVIA KILL AT WINDHAM
                  ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                   1025       1       0       0       0       0       1       0       0
                                  ROUTING DATA
              QLOSS   CLOSS     AVG    IRES   ISAME    IOPT    IPMP            LSTR
                0.0   0.000    0.00       0       1       0       0               0

                  NSTPS   NSTDL     LAG   AMSKK       X     TSK   STORA  ISPRAT
                      1       0       0   1.300   0.300   0.000      0.       0

  *********          *********          *********          *********          *********

                          SUB-AREA RUNOFF COMPUTATION

              65 SUB AREA-25
                  ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                     25       0       0       0       0       0       1       0       0

                                  HYDROGRAPH DATA
        IHYDG    IUHG   TAREA    SNAP   TRSDA   TRSPC   RATIO   ISNOW   ISAME   LOCAL
            1       0  186.50    0.00 3465.00    0.00   0.000       0       1       0

                                   PRECIP DATA
               SPFE     PMS      R6     R12     R24     R48     R72     R96
               0.00   21.90   37.50   52.00   62.50   73.50   79.00    0.00
TRSPC COMPUTED BY THE PROGRAM IS 0.929

                                    LOSS DATA
      LROPT   STRKR   DLTKR   RTIOL   ERAIN   STRKS   RTIOK   STRTL   CNSTL   ALSMX   RTIMP
          0    0.07    2.00    1.00    0.00    0.00    1.00    0.00    0.00    0.00    0.00

                              UNIT HYDROGRAPH DATA
                          TC= 16.24      R=  8.22     NTA=  0

                                  RECESSION DATA
                     STRTQ=  320.00    QRCSN= 2500.00    RTIOR= 1.30

          UNIT HYDROGRAPH 53 END-OF-PERIOD ORDINATES, LAG=  13.45 HOURS, CP= 0.74  VOL= 1.00
        149.      554.     1115.     1758.     2449.     3166.     3897.     4632.     5334.     5924.
       6361.     6653.     6809.     6830.     6710.     6422.     5892.     5234.     4633.     4102.
       3632.     3215.     2846.     2520.     2231.     1975.     1749.     1548.     1371.     1213.
       1074.      951.      842.      745.      660.      584.      517.      458.      405.      359.
        318.      281.      249.      221.      195.      173.      153.      135.      120.      106.
         94.       83.       74.

     0                                 END-OF-PERIOD FLOW
MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS   COMP Q       MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS    COMP Q
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                                                                  SUM  16.07  11.62   4.45  1465833.
                                                                     ( 408.)( 295.)(-113.)(41507.73)

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                                    COMBINE HYDROGRAPHS

                  66 COMBINE HYDROGRAPHS AT BATAVIA KILL AT WINDHAM
                        ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                         1025       2       0       0       0       0       1       0       0

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                                 SUB-AREA RUNOFF COMPUTATION

                  67 SUB AREA-26
                        ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                           26       0       0       0       0       0       1       0       0

                                       HYDROGRAPH DATA
                 IHYDG    IUHG   TAREA    SNAF   TRSDA   TRSPC   RATIO   ISNOW   ISAME   LOCAL
                     1       0   10.20    0.00 3456.00    0.00   0.000       0       1       0

                                         PRECIP DATA
                      SPFE     PMS      R6     R12     R24     R48     R72     R96
                      0.00   21.90   37.50   52.00   62.50   73.50   79.00    0.00
TRSPC COMPUTED BY THE PROGRAM IS 0.929

                                          LOSS DATA
              LROPT   STRKR   DLTKR   RTIOL   ERAIN   STRKS   RTIOK   STRTL   CNSTL   ALSMX   RTIMP
                  0    0.07    1.50    1.00    0.00    0.00    1.00    0.00    0.00    0.00    0.00

                                   UNIT HYDROGRAPH DATA
                              TC=  7.65      R=  4.73     NTA=   0

                                       RECESSION DATA
                          STRTQ=    10.00     QRCSN=    70.00     RTIOR= 1.30

              UNIT HYDROGRAPH 30 END-OF-PERIOD ORDINATES, LAG=   6.32 HOURS, CP= 0.69  VOL= 1.00
             42.      153.      300.      460.      601.      690.      717.      669.      563.      456.
            369.      298.      241.      195.      158.      128.      103.       83.       67.       55.
             44.       36.       29.       23.       19.       15.       12.       10.        8.        7.

         0                                END-OF-PERIOD FLOW
   MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS   COMP Q      MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS    COMP Q

                                                                  SUM  16.07  11.82   4.25    79783.
                                                                     ( 408.)( 300.)( 108.)( 2259.20)
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                                        COMBINE HYDROGRAPHS

                   68 COMBINE 2 HYDROGRAPHS AT SCHOHARIE CREEK AT PRATTSVILLE (USGS 35C0)
                            ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                             1026       2       0       0       0       0       1       0       0

          **********          **********          **********          **********          **********

                                     SUB-AREA RUNOFF COMPUTATION

                   69 SUB AREA-127   RUNOFF
                            ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                              127       0       0       0       0       0       1       0       0

                                          HYDROGRAPH DATA
                   IHYDG     IUHG    TAREA     SNAP   TRSDA   TRSPC   RATIO   ISNOW   ISAME   LOCAL
                       1        0    78.00     0.00 3456.00    0.00   0.000       0       1       0

                                            PRECIP DATA
                        SPFE      PMS      R6      R12      R24      R48      R72      R96
                        0.00    21.90   37.50    52.00    62.50    73.50    79.00     0.00
TRSPC COMPUTED BY THE PROGRAM IS 0.929

                                             LOSS DATA
               LROPT   STRKR   DLTKR   RTIOL   ERAIN   STRKS   RTIOK   STRTL   CNSTL   ALSMX   RTIMP
                   0    0.07    1.50    1.00    0.00    0.00    1.00    0.00    0.00    0.00    0.00

                                        UNIT HYDROGRAPH DATA
                                TC= 12.96      R=  6.94     NTA=  0

                                           RECESSION DATA
                             STRTQ=   115.00     QRCSN=   800.00     RTIOR= 1.30

              UNIT HYDROGRAPH 44 END-OF-PERIOD ORDINATES, LAG=  10.92 HOURS, CP= 0.74   VOL= 1.00
            102.      379.      758.     1186.     1640.     2106.     2567.     2965.     3250.     3423.
           3469.     3446.     3264.     2922.     2529.     2189.     1895.     1640.     1420.     1229.
           1064.      921.      797.      690.      597.      517.      447.      387.      335.      290.
            251.      217.      188.      163.      141.      122.      106.       91.       79.       69.
             59.       51.       44.       38.

         0                                END-OF-PERIOD FLOW
     MO.DA   HR.MN   PERIOD    RAIN    EXCS    LOSS    COMP Q      MO.DA   HR.MN   PERIOD    RAIN    EXCS    LOSS     COMP Q

                                                                                  SUM  16.07   11.82    4.25   617686.
                                                                                     ( 408.)( 300.)( 108.)(17490.90)
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          **********          **********          **********          **********          **********

                                              COMBINE HYDROGRAPHS

                    70 COMBINE 2 HYDROGRAPHS AT SCHOHARIE RESERVOIR AT GILBOA DAM
                              ISTAQ     ICOMP     IECON     ITAPE      JPLT      JPRT     INAME    ISTAGE     IAUTO
                              10127         2         0         0         0         0         1         0         0

          **********          **********          **********          **********          **********

                                              HYDROGRAPH ROUTING

                    70(A) ROUTE OVER GILBOA DAM
                              ISTAQ     ICOMP     IECON     ITAPE      JPLT      JPRT     INAME    ISTAGE     IAUTO
                              10127         1         0         0         0         0         1         0         0
                                                       ROUTING DATA
                    QLOSS     CLOSS       AVG      IRES     ISAME      IOPT      IPMP                LSTR
                      C.0     0.000      0.00         1         1         0         0                   C

                              NSTPS     NSTDL       LAG     AMSKK         X       TSK     STORA    ISPRAT
                                  1         0         0     0.000     0.000     0.000    6066C.         C

STORAGE      15530.00    30880.0C    4912C.0C    55260.00    6066C.00    6175C.00    6284C.CC    63?20.00    6501C.C0

OUTFLOW          C.0C        C.0C        C.0C        0.00        C.00     348C.00     989C.CC    18160.00    2796C.C0

          **********          **********          **********          **********          **********

                                              HYDROGRAPH ROUTING

                    71 CHANNEL ROUTE - SCHOHARIE CREEK BELOW COBLESKILL CREEK
                              ISTAQ     ICOMP     IECON     ITAPE      JPLT      JPRT     INAME    ISTAGE     IAUTO
                               1C27         1         0         0         0         0         1         C         0
                                                       ROUTING DATA
                    QLOSS     CLOSS       AVG      IRES     ISAME      IOPT      IPMP                LSTR
                      C.0     0.C00      C.CC         0         1         0         0                   C

                              NSTPS     NSTDL       LAG     AMSKK         X       TSK     STORA    ISPRAT
                                  4         0         0     1.4C0     0.3C0     C.0C0        C.         C


          **********          **********          **********          **********          **********

                                         SUB-AREA RUNOFF COMPUTATION

                    72 SUB AREA-27   RUNOFF
                              ISTAQ     ICOMP     IECON     ITAPE      JPLT      JPRT     INAME    ISTAGE     IAUTO
                                 27         0         0         0         0         0         1         0         0
```

```
                                        HYDROGRAPH DATA
          IHYDG    IUHG   TAREA    SNAP    TRSDA    TRSPC    RATIO   ISNOW   ISAME   LOCAL
              1       0  491.00    0.00  3456.00    0.00    0.000       0       1       0

                                         PRECIP DATA
                     SPFE     PMS      R6      R12      R24      R48      R72      R96
                     0.00   21.90   37.50    52.00    62.50    73.50    79.00     0.00
TRSPC COMPUTED BY THE PROGRAM IS 0.929

                                          LOSS DATA
       LROPT   STRKR   DLTKR   RTIOL   ERAIN   STRKS   RTIOK   STRTL   CNSTL   ALSMX   RTIMP
          0     0.07    1.25    1.00    0.00    0.00    1.00    0.00    0.00    0.00    0.00

                                     UNIT HYDROGRAPH DATA
                               TC= 20.79      R=  9.87    NTA=  0

                                        RECESSION DATA
                          STRTQ= 1010.00     QRCSN= 6800.00     RTIOR= 1.30

             UNIT HYDROGRAPH 64 END-OF-PERIOD ORDINATES, LAG=  17.22 HOURS, CP= 0.76  VOL= 1.00
        228.      850.     1724.     2736.     3835.     4991.     6182.     7392.     8611.     9830.
      11023.    12089.    12948.    13606.    14073.    14358.    14467.    14398.    14145.    13683.
      12909.    11824.    10684.     9654.     8723.     7881.     7121.     6435.     5814.     5254.
       4747.     4289.     3876.     3502.     3164.     2859.     2583.     2334.     2109.     1906.
       1722.     1556.     1406.     1270.     1148.     1037.      937.      847.      765.      691.
        625.      564.      510.      461.      416.      376.      340.      307.      278.      251.
        227.      205.      185.      167.

 0                                    END-OF-PERIOD FLOW
MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS   COMP Q     MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS   COMP Q

                                                                      SUM  16.07  11.92   4.15  3945252.
                                                                         ( 408.)( 303.)( 106.)($111716.)


      **********         **********         **********         **********         **********

                                      COMBINE HYDROGRAPHS

             73 COMBINE 2 HYDROGRAPHS AT SCHOHARIE CREEK BELOW COBLESKILL CREEK
                        ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                         1027       2       0       0       0       0       1       0       0

      **********         **********         **********         **********         **********

                                      HYDROGRAPH ROUTING

             74 CHANNEL ROUTE - SCHOHARIE CREEK AT BURTONSVILLE (USGS 3515)
                        ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
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```
      1028      1         0         0         0         0         1         0         0
                                ROUTING DATA
     QLOSS     CLOSS      AVG      IRES     ISAME      IOPT      IPMP                LSTR
       0.0     0.000     0.00         0         1         0         0                   0

               NSTPS     NSTDL      LAG     AMSKK        X        TSK     STORA    ISPRAT
                   1         0        0     1.200     0.200     0.000        0.         0

**********      **********      **********      **********      **********

                         SUB-AREA RUNOFF COMPUTATION

     75 SUB AREA - 28  RUNOFF
               ISTAQ     ICOMP     IECON     ITAPE      JPLT      JPRT     INAME    ISTAGE     IAUTO
                  28         0         0         0         0         0         1         0         0

                                HYDROGRAPH DATA
    IHYDG      IUHG     TAREA      SNAP     TRSDA     TRSPC     RATIO     ISNOW     ISAME     LOCAL
        1         0     78.00      0.00   3456.00      0.00     0.000         0         1         0

                                  PRECIP DATA
               SPFE       PMS        R6       R12       R24       R48       R72       R96
               0.00     21.90     37.50     52.00     62.50     73.50     79.00      0.00
TRSPC COMPUTED BY THE PROGRAM IS 0.929

                                   LOSS DATA
   LROPT     STRKR     DLTKR     RTIOL     ERAIN     STRKS     RTIOK     STRTL     CNSTL     ALSMX     RTIMP
       0      0.07      1.25      1.00      0.00      0.00      1.00      0.00      0.00      0.00      0.00

                              UNIT HYDROGRAPH DATA
                       TC= 12.75        R=  6.59      NTA=  0

                                 RECESSION DATA
                 STRTQ=   115.00      QRCSN=   800.00      RTIOR= 1.30

     UNIT HYDROGRAPH 42 END-OF-PERIOD ORDINATES, LAG=  10.51 HOURS, CP= 0.74   VOL= 1.00
    110.      406.      812.     1267.     1748.     2239.     2720.     3123.     3402.     3561.
   3604.     3526.     3284.     2892.     2485.     2134.     1833.     1575.     1352.     1162.
    998.      857.      736.      632.      543.      467.      401.      344.      296.      254.
    218.      187.      161.      138.      119.      102.       88.       75.       65.       56.
     46.       41.

    0                               END-OF-PERIOD FLOW
MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS    COMP Q      MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS     COMP Q

                                                                       SUM  16.07  11.92   4.15    622578.
                                                                          ( 408.)( 303.)( 106.)(17629.43)

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                                    COMBINE HYDROGRAPHS

                 76  COMBINE 2 HYDROGRAPHS AT SCHOHARIE CREEK AT BURTONSVILLE (USGS 3515)
                          ISTAQ    ICOMP    IECON    ITAPE     JPLT     JPRT    INAME  ISTAGE   IAUTO
                           1028        2        0        0        0        0        1       0       0

**********          **********          **********          **********          **********

                                    HYDROGRAPH ROUTING

                 77 CHANNEL ROUTE - MOHAWK RIVER BELOW SCHOHARIE CREEK
                          ISTAQ    ICOMP    IECON    ITAPE     JPLT     JPRT    INAME  ISTAGE   IAUTO
                           1029        1        0        0        0        0        1       0       0
                                            ROUTING DATA
                 QLOSS    CLOSS      AVG     IRES    ISAME     IOPT     IPMP              LSTR
                   0.0    0.000     0.00        0        1        0        0                 0

                          NSTPS    NSTDL      LAG    AMSKK        X      TSK    STORA  ISPRAT
                              1        0        0    2.100    0.200    0.000       0.       0

**********          **********          **********          **********          **********

                                 SUB-AREA RUNOFF COMPUTATION

                 78  SUB AREA - 29  RUNOFF
                          ISTAQ    ICOMP    IECON    ITAPE     JPLT     JPRT    INAME  ISTAGE   IAUTO
                             29        0        0        0        0        0        1       0       0
                                          HYDROGRAPH DATA
            IHYDG     IUHG    TAREA     SNAP    TRSDA    TRSPC    RATIO    ISNOW    ISAME    LOCAL
                1        0    87.00     0.00  3456.00     0.00    0.000        0        1        0
                                           PRECIP DATA
                  SPFE      PMS       R6      R12      R24      R48      R72      R96
                  0.00    21.90    37.50    52.00    62.50    73.50    79.00     0.00
TRSPC COMPUTED BY THE PROGRAM IS 0.929
                                            LOSS DATA
          LROPT    STRKR    DLTKR    RTIOL    ERAIN    STRKS    RTIOK    STRTL    CNSTL    ALSMX    RTIMP
              0     0.07     1.10     1.00     0.00     0.00     1.00     0.00     0.00     0.00     0.00
                                     UNIT HYDROGRAPH DATA
                              TC= 13.13      R=  6.75     NTA=  0
                                          RECESSION DATA
                        STRTQ=   132.00     QRCSN=   920.00     RTIOR= 1.30
```

```
                 UNIT HYDROGRAPH 44 END-OF-PERIOD ORDINATES, LAG=  11.0C HOURS, CP= 0.75  VOL= 1.0C
       115.      425.      849.     1327.     1832.     2350.     2864.     3311.     3635.     3833.
      3912.     3872.     3690.     3319.     2867.     2471.     2130.     1837.     1583.     1365.
      1177.     1014.      874.      754.      650.      560.      483.      416.      359.      309.
       267.      230.      198.      171.      147.      127.      109.       94.       81.       70.
 0
MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS     END-OF-PERIOD FLOW
                                                COMP Q      MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS    COMP Q

                                                                           SUM  16.07  11.97   4.10   698533.
                                                                              ( 408.)( 304.)( 104.)(19780.23)

        **********         **********         **********         **********         **********

                                      COMBINE HYDROGRAPHS

                 79 COMINE 3 HYDROGRAPHS AT MOHAWK RIVER BELOW SCHOHARIE CREEK
                      ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                       1029       3       0       0       0       0       1       0       0

        **********         **********         **********         **********         **********

                                      HYDROGRAPH ROUTING

                 80 CHANNEL ROUTE - MOHAWK RIVER AT AMSTERDAM
                      ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                       1030       1       0       0       0       0       1       0       0
                                          ROUTING DATA
                 QLOSS    CLOSS     AVG    IRES   ISAME    IOPT    IPMP            LSTR
                   0.0    0.000    0.00       0       1       0       0               0

                      NSTPS   NSTDL     LAG   AMSKK       X     TSK   STORA  ISPRAT
                          1       0       0   2.100   0.200   0.000      0.       0

        **********         **********         **********         **********         **********

                                 SUB-AREA RUNOFF COMPUTATION

                 81 SUB AREA-30  RUNOFF
                      ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                         30       0       0       0       0       0       1       0       0
                                        HYDROGRAPH DATA
            IHYDG    IUHG   TAREA    SNAP   TRSDA   TRSPC   RATIO   ISNOW   ISAME   LOCAL
                1       0  103.00    0.00 3456.00    0.00   0.000       0       1       0
                                          PRECIP DATA
```

```
                SPFE      PMS       R6       R12       R24       R48       R72       R96
                0.0C     21.9C     37.5C     52.00     62.50     73.50     79.00      C.00
 TRSPC COMPUTED BY THE PROGRAM IS 0.929

                                     LOSS DATA
          LROPT    STRKR    DLTKR    RTIOL    ERAIN    STRKS    RTIOK    STRTL    CNSTL    ALSMX    RTIMP
              C     0.07     1.0C     1.0C     0.00     0.00     1.00     C.0C     0.0C     C.0C     0.CC

                                  UNIT HYDROGRAPH DATA
                              TC= 15.61      R= 11.14     NTA=  C

                                    RECESSION DATA
                     STRTQ=  160.CC      QRCSN= 115C.00     RTIOR= 1.30

          UNIT HYDRCGRAPH 68 END-OF-PERICD ORDINATES, LAG=  13.78 HOURS, CP= 0.67  VOL= 1.CC
        65.       245.       496.       794.      1117.      1460.      1815.      2177.      252C.      28C7.
      3031.      3191.      3289.      3321.      3281.      3132.      2895.      2646.      2419.      2211.
      2021.      1847.      1689.      1543.      1411.      1290.      1179.      1C78.       985.       900.
       823.       752.       688.       629.       575.       525.       48C.       439.       4C1.       367.
       335.       306.       280.       256.       234.       214.       196.       179.       163.       149.
       137.       125.       114.       104.        95.        87.        8C.        73.        67.        61.
        56.        51.        46.        42.        39.        35.        32.        30.

     C                                  END-OF-PERICD FLOW
 MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS    COMP Q       MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS    COMP Q

                                                                     SUM  16.07   12.00    4.07   823683.
                                                                        ( 408.)( 3C5.)( 103.)(23324.08)


        **********          **********          **********          **********          **********

                                    COMBINE HYDROGRAPHS

               82 COMBINE 2  HYDROGRAPHS AT MOHAWK RIVER AT AMSTERDAM
                         ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                          1C30       2       0       0       0       0       1       0       0


        **********          **********          **********          **********          **********

                                    HYDROGRAPH ROUTING

               83 CHANNEL ROUTE - MOHAWK RIVER AT CRANESVILLE
                         ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                          1C31       1       0       0       0       0       1       C       0
                                             ROUTING DATA
                 QLOSS   CLOSS     AVG    IRES   ISAME    IOPT    IPMP            LSTR
                   C.0   0.C00    0.C0       0       1       0       0               0

                         NSTPS   NSTDL     LAG   AMSKK       X     TSK   STORA  ISPRAT
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          1      0      0   1.300   0.260   0.000    0.      0

**********    **********    **********    **********    **********

                 SUB-AREA RUNOFF COMPUTATION

     84 SUB AREA-31  RUNOFF
          ISTAQ   ICOMP   IECON   ITAPE   JPLT    JPRT   INAME  ISTAGE  IAUTO
             31       0       0       0      0       0       1       0      0

                          HYDROGRAPH DATA
   IHYDG   IUHG   TAREA    SNAF   TRSDA   TRSPC   RATIO   ISNOW   ISAME   LOCAL
       1      0   28.00    0.00 3456.00    0.00   0.000       0       1       0

                            PRECIP DATA
          SPFE     PMS      R6     R12     R24     R48     R72     R96
          0.00   21.90   37.50   52.00   62.50   73.50   79.00    0.00
TRSPC COMPUTED BY THE PROGRAM IS 0.929

                             LOSS DATA
   LROPT  STRKR  DLTKR  RTIOL  ERAIN  STRKS  RTIOK  STRTL  CNSTL  ALSMX  RTIMP
       0   0.07   1.00   1.00   0.00   0.00   1.00   0.00   0.00   0.00   0.00

                       UNIT HYDROGRAPH DATA
                   TC=  9.98     R=  5.79    NTA=  0

                           RECESSION DATA
              STRTQ=   34.00    QRCSN=  100.00    RTIOR= 1.30

       UNIT HYDROGRAPH 37 END-OF-PERIOD ORDINATES, LAG=   8.31 HOURS, CP= 0.71  VOL= 1.00
       64.     236.     469.     727.     997.    1248.    1434.    1538.    1562.    1493.
     1318.    1109.     932.     784.     659.     555.     466.     392.     330.     277.
      233.     196.     165.     139.     117.      98.      83.      69.      58.      49.
       41.      35.      29.      25.      21.      17.      15.

    0
                               END-OF-PERIOD FLOW
MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS    COMP Q    MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS    COMP Q

                                                                   SUM  16.07  12.00   4.07  219623.
                                                                      ( 408.)( 305.)( 103.)( 6219.02)

**********    **********    **********    **********    **********

                        COMBINE HYDROGRAPHS

     85 COMINE 2 HYDROGRAPHS AT MOHAWK RIVER AT CRANESVILLE
          ISTAQ   ICOMP   IECON   ITAPE   JPLT    JPRT   INAME  ISTAGE  IAUTO
           1031       2       0       0      0       0       1       0      0
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**********          **********          **********          **********          **********

                              HYDROGRAPH ROUTING

            86 CHANNEL ROUTE - MOHAWK RIVER AT ROTTERDAM JUNCTION
                   ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                    1032       1       0       0       0       0       1       0       0
                                        ROUTING DATA
            QLOSS  CLOSS     AVG    IRES   ISAME    IOPT    IPMP            LSTR
              0.0  0.000    0.00       0       1       0       0               0

                   NSTPS   NSTDL     LAG   AMSKK       X     TSK   STORA  ISPRAT
                       1       0       0   2.100   0.200   0.000      0.       0


**********          **********          **********          **********          **********

                           SUB-AREA RUNOFF COMPUTATION

            87 SUB AREA-32  RUNOFF
                   ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                      32       0       0       0       0       0       1       0       0

                                        HYDROGRAPH DATA
       IHYDG    IUHG   TAREA    SNAF   TRSDA   TRSPC   RATIO   ISNOW   ISAME   LOCAL
           1       0   32.00    0.00 3456.00    0.00   0.000       0       1       0

                                        PRECIP DATA
                SPFE     PMS      R6     R12     R24     R48     R72     R96
                0.00   21.90   37.50   52.00   62.50   73.50   79.00    0.00
TRSPC COMPUTED BY THE PROGRAM IS 0.929

                                        LOSS DATA
       LROPT   STRKR   DLTKR   RTIOL   ERAIN   STRKS   RTIOK   STRTL   CNSTL   ALSMX   RTIMP
           0    0.07    1.00    1.00    0.00    0.00    1.00    0.00    0.00    0.00    0.00

                                        UNIT HYDROGRAPH DATA
                              TC= 11.69      R= 10.19      NTA=   0

                                        RECESSION DATA
                         STRTQ=    40.00     QRCSN=  350.00     RTIOR= 1.30

       UNIT HYDROGRAPH 61 END-OF-PERIOD ORDINATES, LAG=  10.45 HOURS, CP= 0.61  VOL= 1.00
       34.      128.      259.      411.      577.      752.      918.     1054.     1151.     1211.
     1229.     1189.     1097.      994.      901.      817.      741.      671.      609.      552.
      500.      453.      411.      372.      338.      306.      277.      251.      228.      207.
      187.      170.      154.      139.      126.      115.      104.       94.       85.       77.
       70.       64.       58.       52.       47.       43.       39.       35.       32.       29.
       26.       24.       22.       20.       18.       16.       15.       13.       12.       11.
       10.
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```
                                  0                                     END-OF-PERIOD FLOW
                                MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS    COMP Q      MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS    COMP Q

                                                                                                          SUM  16.07  12.00   4.07  256081.
                                                                                                               ( 408.)( 305.)( 103.)( 7251.40)

          **********          **********          **********          **********          **********

                                          COMBINE HYDROGRAPHS

                   68 COMBINE 2 HYDROGRAPHS AT MOHAWK RIVER AT ROTTERDAM JUNCTION
                              ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                               1032       2       0       0       0       0       1       0       0

          **********          **********          **********          **********          **********

                                          HYDROGRAPH ROUTING

                   89 CHANNEL ROUTE - MOHAWK RIVER AT SCHENECTADY
                              ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                               1033       1       0       0       0       0       1       0       0
                                                    ROUTING DATA
                     QLOSS    CLOSS     AVG    IRES   ISAME    IOPT    IPMP            LSTR
                       0.0    0.000    0.00       0       1       0       0               0

                              NSTPS   NSTDL     LAG   AMSKK       X     TSK   STORA  ISPRAT
                                  2       0       0   1.500   0.200   0.000      0.       0

          **********          **********          **********          **********          **********

                                     SUB-AREA RUNOFF COMPUTATION

                   90 SUB AREA-33  RUNOFF
                              ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                                 33       0       0       0       0       0       1       0       0

                                                  HYDROGRAPH DATA
                    IHYDG    IUHG   TAREA    SNAP   TRSDA   TRSPC   RATIO   ISNOW   ISAME   LOCAL
                        1       0   38.00    0.00 3456.00    0.00   0.000       0       1       0

                                                    PRECIP DATA
                          SPFE     PMS      R6     R12     R24     R48     R72     R96
                          0.00   21.90   37.50   52.00   62.50   73.50   79.00    0.00
TRSPC COMPUTED BY THE PROGRAM IS 0.929

                                                     LOSS DATA
                     LROPT   STRKR   DLTKR   RTIOL   ERAIN   STRKS   RTIOK   STRTL   CNSTL   ALSMX   RTIMP
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   0    0.07   1.00   1.00   0.00   0.00   1.00   0.00   0.00   0.00   0.00

                          UNIT HYDROGRAPH DATA
                     TC= 10.67    R=  5.89    NTA=  0

                             RECESSION DATA
                STRTQ=   49.00    QRCSN=  400.00    RTIOR= 1.30

     UNIT HYDROGRAPH 38 END-OF-PERIOD ORDINATES, LAG=   9.02 HOURS, CP= 0.73  VOL= 1.00
      78.      286.      568.      881.     1209.     1530.     1791.     1957.     2030.     2009.
    1862.     1614.     1361.     1148.      968.      817.      689.      581.      490.      414.
     345.      294.      248.      209.      177.      149.      126.      106.       89.       75.
      64.       54.       45.       38.       32.       27.       23.       19.

   0                                  END-OF-PERIOD FLOW
MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS    COMP Q      MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS    COMP Q

                                                                 SUM  16.07  12.00   4.07  305765.
                                                                    ( 408.)( 305.)( 103.)( 8658.29)

       **********    **********    **********    **********    **********

                              COMBINE HYDROGRAPHS

         51 COMBINE 2 HYDROGRAPHS AT MOHAWK RIVER AT SCHENECTADY
                  ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                   1033       2       0       0       0       0       1       0       0

       **********    **********    **********    **********    **********

                              HYDROGRAPH ROUTING

         52 CHANNEL ROUTE - VISCHERS FERRY
                  ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                   1034       1       0       0       0       0       1       0       0
                                     ROUTING DATA
          QLOSS   CLOSS     AVG    IRES   ISAME    IOPT    IPMP            LSTR
            0.0   0.000    0.00       0       1       0       0               0

                  NSTPS   NSTDL     LAG   AMSKK       X     TSK   STORA  ISPRAT
                      2       0       0   1.800   0.200   0.000      0.       0

       **********    **********    **********    **********    **********

                          SUB-AREA RUNOFF COMPUTATION

         53 SUB AREA-34 RUNOFF
                  ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
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                    34       0       0       0       0       0       1       C       0

                                      HYDROGRAPH DATA
          IHYDG    IUHG   TAREA    SNAF   TRSDA   TRSPC   RATIO   ISNOW   ISAME   LOCAL
              1       C  108.CC    C.CC 3456.0C    0.CC   C.00C       0       1       0

                                        PRECIP DATA
                  SPFE     PMS      R6     R12     R24     R48     R72     R96
                  C.0C   21.9C   37.5C   52.00   62.50   73.50   79.00    C.00
TRSPC COMPUTED BY THE PROGRAM IS C.929

                                         LOSS DATA
      LROPT   STRKR   DLTKR   RTIOL   ERAIN   STRKS   RTIOK   STRTL   CNSTL   ALSMX   RTIMP
          C    C.C7    1.0C    1.0C    C.00    C.00    1.00    C.00    C.0C    C.CC    0.CC

                                    UNIT HYDROGRAPH DATA
                                 TC= 14.E5    R=  8.81    NTA=  C

                                       RECESSION DATA
                          STRTQ=  170.CC    QRCSN= 1250.00    RTIOR= 1.30

          UNIT HYDRCGRAPH 55 END-OF-PERIOD ORDINATES, LAG=  12.65 HOURS, CP= 0.71  VOL= 1.CC
         92.      344.      695.     1C99.     1534.     1968.     2453.     2915.     3322.     3635.
       3855.     3983.     4021.     3962.     3769.     3436.     3067.     2738.     2444.     2181.
       1947.     1738.     1551.     1385.     1236.     1103.      985.      879.      784.      700.
        625.      558.      496.      444.      397.      354.      316.      282.      252.      225.
        201.      179.      16C.      143.      127.      114.      1C1.       91.       81.       72.
         64.       57.       51.       46.       41.

       C                                END-OF-PERICD FLOW
   MO.DA  HR.MN  PERICD    RAIN    EXCS    LCSS    COMP Q        MO.DA  HR.MN  PERIOD    RAIN    EXCS    LOSS    COMP Q

                                                                         SUM  16.07  12.00   4.07   868935.
                                                                              ( 408.)( 3C5.)( 103.)(24605.48)

       **********        **********        **********        **********        **********

                                       COMBINE HYDROGRAPHS

                    94 COMBINE 2 HYDROGRAPHS AT MOHAWK RIVER AT VISCHERS FERRY
                              ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                                 34       2       0       0       0       0       1       C       0

       **********        **********        **********        **********        **********

                                       HYDROGRAPH ROUTING

                    95 CHANNEL ROUTE -MOHAWK RIVER AT COHOES  (USGS 3575)
                              ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
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                    1LSS        1        0        0        0        0        1        0        0
                                             ROUTING DATA
              QLOSS     CLOSS       AVG     IRES    ISAME     IOPT     IPMP              LSTR
                C.0     0.CCO      C.C0        0        1        0        0                 0

                        NSTPS     NSTDL      LAG    AMSKK        X      TSK     STORA  ISPRAT
                            1         0        0    1.500    0.200    C.CCO       C.        0

     **********      **********      **********      **********      **********

                                SUB-AREA RUNOFF COMPUTATION

             96 SUB AREA-35  RUNOFF
                        ISTAQ     ICOMP    IECON    ITAPE     JPLT     JPRT    INAME   ISTAGE   IAUTO
                           35         0        0        0        0        0        1        0       0

                                          HYDROGRAPH DATA
             IHYDG     IUHG     TAREA      SNAP    TRSDA    TRSPC    RATIO    ISNOW    ISAME    LOCAL
                 1        0     33.00      0.00  3456.00     0.0C   0.000C        0        1        0

                                            PRECIP DATA
                    SPFE       PMS        R6      R12      R24      R48      R72      R96
                    0.0C     21.9C     37.5C    52.00    62.5C    73.50    79.00     C.00
TRSPC COMPUTED BY THE PROGRAM IS 0.929

                                             LOSS DATA
       LROPT   STRKR   DLTKR   RTIOL   ERAIN   STRKS   RTIOK   STRTL   CNSTL   ALSMX   RTIMP
           0    C.07    1.00    1.0C    C.00    0.0C    1.00    C.0C    C.0C    C.CC    0.C0

                                       UNIT HYDROGRAPH DATA
                                TC= 10.42      R=  5.98     NTA=  C

                                          RECESSION DATA
                        STRTQ=    41.CC     QRCSN=  370.00     RTIOR= 1.30

          UNIT HYDROGRAPH 38 END-OF-PERIOD ORDINATES, LAG=    8.86 HOURS, CP= 0.73  VOL= 1.CC
          69.       254.      504.      784.     1076.     1358.     1582.     1720.     1774.     1742.
        1590.      1363.     1153.      975.      824.      697.      59C.      499.      422.      357.
         302.       255.      216.      182.      154.      130.      11C.       93.       79.       67.
          56.        48.       40.       34.       29.       24.       21.       17.

      C                                      END-OF-PERIOD FLOW
  MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS   COMP Q      MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS    COMP Q

                                                                          SUM  16.07  12.00   4.07   266C76.
                                                                             ( 408.)( 3C5.)( 103.)( 7534.43)

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COMBINE HYDROGRAPHS

97 COMBINE 2 HYDROGRAPHS AT MOHAWK RIVER AT COHOES (USGS 3575)

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
1035	2	0	0	0	0	1	0	0

********** ********** ********** ********** **********

PEAK FLOW AND STORAGE (END OF PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
AREA IN SQUARE MILES (SQUARE KILOMETERS)

OPERATION	STATION	AREA	PLAN	RATIO 1 0.20	RATIO 2 0.40	RATIO 3 0.50	RATIO 4 0.60	RATIO 5 0.80	RATIO 6 1.00
				RATIOS APPLIED TO FLOWS					
HYDROGRAPH AT	1	150.00	1	11124.	22247.	27809.	33371.	44494.	55618.
		(388.50)		(314.98)(	629.97)(	787.46)(	944.95)(	1259.93)(	1574.92)(
ROUTED TO	1001	150.00	1	5981.	13919.	17760.	21565.	29121.	36633.
		(388.50)		(169.37)(	394.13)(	502.90)(	610.65)(	824.60)(	1037.32)(
ROUTED TO	1022	150.00	1	5969.	13887.	17721.	21518.	29059.	36556.
		(388.50)		(169.01)(	393.23)(	501.79)(	609.33)(	822.86)(	1035.15)(
HYDROGRAPH AT	2	7.00	1	786.	1571.	1964.	2357.	3143.	3929.
		(18.13)		(22.25)(	44.50)(	55.62)(	66.75)(	89.00)(	111.25)(
2 COMBINED	1002	157.00	1	6029.	14048.	17922.	21761.	29382.	36960.
		(406.63)		(170.73)(	397.80)(	507.51)(	616.19)(	832.00)(	1046.58)(
ROUTED TO	1003	157.00	1	5971.	13921.	17763.	21569.	29126.	36639.
		(406.63)		(169.07)(	394.20)(	502.99)(	610.76)(	824.74)(	1037.49)(
HYDROGRAPH AT	3	289.00	1	17626.	35252.	44065.	52879.	70505.	88131.
		(748.50)		(499.12)(	998.23)(	1247.79)(	1497.35)(	1996.47)(	2495.58)(
2 COMBINED	1003	446.00	1	21041.	44563.	56371.	68118.	91510.	114822.
		(1155.13)		(595.83)(	1261.87)(	1596.25)(	1928.88)(	2591.28)(	3251.39)(
ROUTED TO	1004	446.00	1	20742.	43909.	55537.	67113.	90172.	113151.
		(1155.13)		(587.35)(	1243.36)(	1572.64)(	1900.43)(	2553.37)(	3204.08)(
HYDROGRAPH AT	4	93.00	1	6702.	13405.	16756.	20107.	26810.	33512.
		(240.87)		(189.79)(	379.59)(	474.48)(	569.38)(	759.17)(	948.96)(
2 COMBINED	1004	539.00	1	25589.	53113.	67103.	81061.	108886.	136626.
		(1395.99)		(724.59)(	1503.99)(	1900.14)(	2295.38)(	3083.30)(	3868.81)(
ROUTED TO	1005	539.00	1	24517.	51014.	64399.	77767.	104445.	131060.
		(1395.99)		(694.26)(	1444.56)(	1823.57)(	2202.12)(	2957.56)(	3711.20)(
HYDROGRAPH AT	5	158.00	1	9878.	19757.	24696.	29635.	39514.	49392.
		(409.22)		(279.73)(	559.45)(	699.32)(	839.18)(	1118.91)(	1398.63)(
2 COMBINED	1005	697.00	1	31462.	64218.	80534.	97450.	130816.	164109.

		(1805.21)		(890.90)	(1818.46)	(2288.95)	(2760.62)	(3704.23)	(4647.06)
ROUTED TO	1010	697.00	1	31184.	63790.	80311.	96861.	129958.	163023.
		(1805.21)		(883.03)	(1806.32)	(2274.14)	(2742.79)	(3680.00)	(4616.28)
HYDROGRAPH AT	6	375.00	1	17345.	34690.	43363.	52035.	69380.	86725.
		(971.24)		(491.16)	(982.31)	(1227.89)	(1473.47)	(1964.63)	(2455.79)
ROUTED TO	1006	375.00	1	9219.	20148.	25537.	30902.	41604.	52284.
		(971.24)		(261.04)	(570.54)	(723.12)	(875.05)	(1178.11)	(1480.53)
HYDROGRAPH AT	7	7.00	1	754.	1508.	1885.	2262.	3016.	3771.
		(18.13)		(21.35)	(42.71)	(53.38)	(64.06)	(85.42)	(106.77)
2 COMBINED	1007	382.00	1	9241.	20202.	25604.	30985.	41726.	52436.
		(989.37)		(261.68)	(572.05)	(725.01)	(877.39)	(1181.55)	(1484.83)
HYDROGRAPH AT	8	53.00	1	4535.	9071.	11339.	13606.	18142.	22677.
		(137.27)		(128.43)	(256.86)	(321.07)	(385.29)	(513.72)	(642.15)
2 COMBINED	1008	435.00	1	9552.	20899.	26493.	32063.	43168.	54253.
		(1126.64)		(270.49)	(591.81)	(750.21)	(907.92)	(1222.39)	(1536.29)
ROUTED TO	1009	435.00	1	9527.	20841.	26427.	31988.	43071.	54123.
		(1126.64)		(269.78)	(590.14)	(748.32)	(905.79)	(1219.63)	(1532.58)
HYDROGRAPH AT	9	121.00	1	9296.	18591.	23239.	27887.	37182.	46478.
		(313.39)		(263.22)	(526.44)	(658.06)	(789.67)	(1052.89)	(1316.11)
2 COMBINED	1009	556.00	1	15307.	31557.	39931.	48522.	65812.	83057.
		(1440.02)		(433.44)	(893.59)	(1130.71)	(1373.99)	(1863.58)	(2351.92)
ROUTED TO	1010	556.00	1	15296.	31491.	39817.	48402.	65648.	82843.
		(1440.02)		(433.12)	(891.74)	(1127.48)	(1370.60)	(1858.94)	(2345.85)
HYDROGRAPH AT	10	45.00	1	3843.	7685.	9607.	11528.	15370.	19213.
		(116.55)		(108.81)	(217.62)	(272.03)	(326.43)	(435.24)	(544.05)
3 COMBINED	1010	1298.00	1	46213.	94756.	119745.	144782.	194834.	244826.
		(3361.78)		(1308.62)	(2683.19)	(3390.81)	(4099.76)	(5517.07)	(6932.69)
ROUTED TO	1011	1298.00	1	45517.	93629.	118275.	142961.	192393.	241758.
		(3361.78)		(1288.89)	(2651.28)	(3349.16)	(4048.75)	(5447.95)	(6845.82)
HYDROGRAPH AT	11	27.00	1	2529.	5058.	6322.	7586.	10115.	12644.
		(69.93)		(71.61)	(143.22)	(179.02)	(214.82)	(286.43)	(358.04)
2 COMBINED	1011	1325.00	1	46253.	94865.	119820.	144834.	194865.	244848.
		(3431.71)		(1309.74)	(2686.28)	(3392.91)	(4101.25)	(5517.95)	(6933.31)
ROUTED TO	1012	1325.00	1	45847.	94192.	118885.	143674.	193291.	242871.

[illegible]	[illegible]	[illegible] (3431.71)		(1298.25)	(2667.20)	(3366.44)	(4068.39)	(5473.39)	(6877.34)
HYDROGRAPH AT	12	23.00 (59.57)	1	2188. (61.96)	4376. (123.92)	5470. (154.90)	6564. (185.88)	8752. (247.84)	10941. (309.80)
2 COMBINED	1012	1348.00 (3491.28)	1	46262. (1310.00)	95021. (2690.70)	119922. (3395.81)	144913. (4103.48)	194939. (5520.04)	244945. (6936.07)
ROUTED TO	1015	1348.00 (3491.28)	1	46152. (1306.87)	94851. (2685.88)	119712. (3389.87)	144660. (4096.32)	194596. (5510.35)	244512. (6923.80)
HYDROGRAPH AT	13	261.00 (675.98)	1	24547. (695.10)	49095. (1390.21)	61368. (1737.76)	73642. (2085.31)	98190. (2780.42)	122737. (3475.52)
HYDROGRAPH AT	14	30.00 (77.70)	1	2791. (79.02)	5581. (158.04)	6976. (197.55)	8372. (237.06)	11162. (316.08)	13953. (395.10)
2 COMBINED	1014	291.00 (753.68)	1	26574. (752.49)	53148. (1504.99)	66435. (1881.24)	79722. (2257.48)	106296. (3009.98)	132871. (3762.47)
ROUTED TO	1014	291.00 (753.68)	1	16901. (478.58)	33802. (957.16)	42252. (1196.44)	50702. (1435.73)	67603. (1914.31)	84504. (2392.89)
ROUTED TO	1015	291.00 (753.68)	1	16861. (477.44)	33721. (954.88)	42151. (1193.59)	50582. (1432.31)	67442. (1909.75)	84303. (2387.19)
HYDROGRAPH AT	15	37.00 (95.83)	1	3341. (94.61)	6682. (189.22)	8353. (236.53)	10023. (283.83)	13365. (378.44)	16706. (473.05)
3 COMBINED	1015	1676.00 (4340.79)	1	63735. (1804.77)	129914. (3678.76)	163541. (4630.97)	197255. (5585.63)	264723. (7496.10)	332170. (9405.99)
ROUTED TO	1016	1676.00 (4340.79)	1	62786. (1777.90)	127997. (3624.46)	161093. (4561.65)	194301. (5501.98)	260738. (7383.28)	327148. (9263.80)
HYDROGRAPH AT	16	151.00 (391.09)	1	6975. (197.51)	13950. (395.02)	17438. (493.78)	20925. (592.53)	27900. (790.04)	34875. (987.55)
2 COMBINED	1016	1827.00 (4731.88)	1	68354. (1935.56)	139049. (3937.44)	174883. (4952.14)	210810. (5969.47)	282731. (8006.04)	354656. (10042.72)
ROUTED TO	1018	1827.00 (4731.88)	1	68197. (1931.13)	138775. (3929.66)	174534. (4942.24)	210385. (5957.44)	282157. (7989.78)	353933. (10022.27)
HYDROGRAPH AT	17	59.20 (153.33)	1	5022. (142.20)	10043. (284.40)	12554. (355.50)	15065. (426.60)	20087. (568.80)	25109. (711.00)
HYDROGRAPH AT	18	13.10 (33.93)	1	1327. (37.59)	2655. (75.17)	3318. (93.97)	3982. (112.76)	5309. (150.34)	6637. (187.93)
3 COMBINED	101[illegible]	1[illegible]94.30	1	69272.	140612.	176[illegible]19.	213128.	285816.	358504.

		(4919.13)		(1961.56)	(3981.68)	(5006.96)	(6035.11)	(8093.33)	(10151.71)
ROUTED TO	1019	1899.30	1	65040.	140296.	176409.	212618.	285115.	357626.
		(4919.13)		(1955.00)	(3972.72)	(4995.33)	(6020.66)	(8073.55)	(10126.82)
HYDROGRAPH AT	19	72.00	1	5965.	11929.	14912.	17894.	23859.	29824.
		(186.48)		(168.90)	(337.80)	(422.26)	(506.71)	(675.61)	(844.51)
2 COMBINED	1019	1971.30	1	70137.	142291.	178798.	215452.	288894.	362350.
		(5105.61)		(1986.06)	(4029.24)	(5062.98)	(6100.92)	(8180.56)	(10260.59)
ROUTED TO	1020	1971.30	1	69934.	141918.	178411.	215004.	288277.	361572.
		(5105.61)		(1980.30)	(4018.68)	(5052.04)	(6088.23)	(8163.08)	(10238.57)
HYDROGRAPH AT	20	55.00	1	4647.	9295.	11618.	13942.	18589.	23236.
		(142.45)		(131.60)	(263.19)	(328.99)	(394.79)	(526.38)	(657.98)
2 COMBINED	1020	2026.30	1	70607.	143182.	179886.	216768.	290630.	364513.
		(5248.06)		(1999.38)	(4054.46)	(5093.79)	(6138.19)	(8229.70)	(10321.84)
ROUTED TO	1023	2026.30	1	70045.	142034.	178531.	215123.	288397.	361699.
		(5248.06)		(1982.31)	(4021.94)	(5055.44)	(6091.61)	(8166.49)	(10242.18)
HYDROGRAPH AT	21	12.70	1	1176.	2353.	2941.	3529.	4705.	5882.
		(32.89)		(33.31)	(66.62)	(83.27)	(99.93)	(133.24)	(166.55)
HYDROGRAPH AT	22	23.00	1	2136.	4272.	5340.	6408.	8544.	10681.
		(59.57)		(60.49)	(120.98)	(151.22)	(181.46)	(241.95)	(302.44)
2 COMBINED	1022	35.70	1	3307.	6615.	8268.	9922.	13229.	16537.
		(92.46)		(93.65)	(187.31)	(234.13)	(280.96)	(374.61)	(468.27)
ROUTED TO	1023	35.70	1	3263.	6526.	8157.	9789.	13052.	16315.
		(92.46)		(92.40)	(184.80)	(230.99)	(277.19)	(369.59)	(461.99)
HYDROGRAPH AT	23	84.00	1	6651.	13302.	16628.	19954.	26605.	33256.
		(217.56)		(188.34)	(376.68)	(470.85)	(565.02)	(753.36)	(941.71)
3 COMBINED	1023	2146.00	1	71172.	144330.	181305.	218393.	292699.	367066.
		(5558.08)		(2015.36)	(4086.98)	(5133.98)	(6184.20)	(8288.30)	(10394.15)
ROUTED TO	1024	2146.00	1	70518.	143068.	179770.	216566.	290259.	363996.
		(5558.08)		(1996.85)	(4051.23)	(5090.50)	(6132.45)	(8219.21)	(10307.21)
HYDROGRAPH AT	24	39.30	1	3333.	6666.	8332.	9999.	13332.	16665.
		(101.79)		(94.38)	(188.76)	(235.94)	(283.13)	(377.51)	(471.89)
ROUTED TO	1025	39.30	1	3296.	6591.	8239.	9887.	13182.	16478.
		(101.79)		(93.32)	(186.64)	(233.30)	(279.96)	(373.28)	(466.60)
HYDROGRAPH AT	25	[illegible]	1	12804.	25609.	32011.	38413.	51217.	64021.

		(483.03)		(362.58)(	725.15)(	906.44)(	1087.73)(	1450.30)(	1812.88)(
2 COMBINED	1025	225.40	1	15961.	31922.	39903.	47884.	63845.	79806.
		(584.82)		(451.97)(	903.94)(	1129.93)(	1355.91)(	1807.89)(	2259.86)(
HYDROGRAPH AT	26	10.20	1	1087.	2175.	2719.	3262.	4350.	5437.
		(26.42)		(30.79)(	61.59)(	76.99)(	92.38)(	123.18)(	153.97)(
2 COMBINED	1026	236.00	1	16553.	33106.	41382.	49658.	66211.	82764.
		(611.23)		(468.72)(	937.44)(	1171.80)(	1406.16)(	1874.88)(	2343.60)(
HYDROGRAPH AT	127	78.00	1	6196.	12392.	15490.	18588.	24784.	30980.
		(202.02)		(175.45)(	350.90)(	438.63)(	526.35)(	701.81)(	877.26)(
2 COMBINED	10127	314.00	1	22695.	45390.	56738.	68085.	90780.	113475.
		(813.25)		(642.65)(	1285.30)(	1606.63)(	1927.96)(	2570.61)(	3213.26)(
ROUTED TO	10127	314.00	1	22247.	44750.	55940.	67129.	89506.	111883.
		(813.25)		(629.97)(	1267.18)(	1584.05)(	1900.89)(	2534.53)(	3168.17)(
ROUTED TO	1027	314.00	1	21588.	43412.	54276.	65136.	86851.	108565.
		(813.25)		(611.30)(	1229.28)(	1536.93)(	1844.44)(	2459.35)(	3074.21)(
HYDROGRAPH AT	27	491.00	1	28651.	57301.	71626.	85952.	114602.	143253.
		(1271.68)		(811.29)(	1622.58)(	2028.23)(	2433.88)(	3245.17)(	4056.46)(
2 COMBINED	1027	805.00	1	49680.	99790.	124761.	149722.	199636.	249547.
		(2084.93)		(1406.78)(	2825.74)(	3532.83)(	4239.65)(	5653.05)(	7066.37)(
ROUTED TO	1028	805.00	1	49364.	99212.	124047.	148869.	198503.	248132.
		(2084.93)		(1397.84)(	2809.36)(	3512.61)(	4215.50)(	5620.97)(	7026.30)(
HYDROGRAPH AT	28	78.00	1	6352.	12703.	15879.	19055.	25406.	31758.
		(202.02)		(179.86)(	359.71)(	449.64)(	539.57)(	719.42)(	899.28)(
2 COMBINED	1028	883.00	1	52436.	105537.	131980.	158401.	211221.	264033.
		(2286.94)		(1484.81)(	2988.48)(	3737.25)(	4485.40)(	5981.11)(	7476.57)(
ROUTED TO	1029	883.00	1	51621.	103856.	129900.	155920.	207931.	259929.
		(2286.94)		(1461.73)(	2940.87)(	3678.36)(	4415.15)(	5887.95)(	7360.35)(
HYDROGRAPH AT	29	87.00	1	6954.	13908.	17385.	20862.	27816.	34770.
		(225.33)		(196.91)(	393.83)(	492.29)(	590.74)(	787.66)(	984.57)(
3 COMBINED	1029	3116.00	1	112163.	224869.	281339.	337866.	451066.	564425.
		(8070.35)		(3176.09)(	6367.57)(	7966.62)(	9567.29)(	12772.76)(	15982.71)(
ROUTED TO	1030	3116.00	1	111293.	223167.	279225.	335339.	447763.	560323.
		(8070.35)		(3151.47)(	6319.39)(	7906.76)(	9495.73)(	12679.23)(	15868.25)(
HYDROGRAPH AT	30	163.00	1	6347.	12694.	15867.	19041.	25388.	31734.

		(266.77)		(179.72)(	359.45)(	449.31)(	539.17)(	718.90)(	898.62)(
2 COMBINED	1030	3219.00	1	114402.	229385.	286597.	344665.	460145.	575738.
		(8337.11)		(3239.50)(	6495.45)(	8126.83)(	9759.81)(	13029.85)(	16304.21)(
ROUTED TO	1031	3219.00	1	114062.	228738.	286186.	343687.	458825.	574109.
		(8337.11)		(3229.86)(	6477.13)(	8103.87)(	9732.12)(	12992.47)(	16256.95)(
HYDROGRAPH AT	31	28.00	1	2584.	5169.	6461.	7753.	10338.	12922.
		(72.52)		(73.18)(	146.37)(	182.96)(	219.55)(	292.74)(	365.92)(
2 COMBINED	1031	3247.00	1	114303.	229221.	286790.	344411.	459791.	575317.
		(8409.63)		(3236.70)(	6490.81)(	8120.97)(	9752.64)(	13019.83)(	16291.15)(
ROUTED TO	1032	3247.00	1	113500.	227642.	284828.	342067.	456679.	571486.
		(8409.63)		(3213.96)(	6446.10)(	8065.43)(	9686.26)(	12931.69)(	16182.68)(
HYDROGRAPH AT	32	32.00	1	2227.	4455.	5568.	6682.	8909.	11136.
		(82.88)		(63.07)(	126.14)(	157.67)(	189.21)(	252.27)(	315.34)(
2 COMBINED	1032	3279.00	1	114069.	228781.	286251.	343775.	458956.	574278.
		(8492.51)		(3230.08)(	6478.34)(	8105.73)(	9734.62)(	12996.17)(	16261.72)(
ROUTED TO	1033	3279.00	1	113310.	227281.	284390.	341554.	456014.	570669.
		(8492.51)		(3208.57)(	6435.87)(	8053.02)(	9671.72)(	12912.87)(	16159.52)(
HYDROGRAPH AT	33	38.00	1	3401.	6802.	8502.	10202.	13603.	17004.
		(98.42)		(96.30)(	192.60)(	240.75)(	288.90)(	385.20)(	481.50)(
2 COMBINED	1033	3317.00	1	113533.	227727.	284947.	342223.	456906.	571727.
		(8590.93)		(3214.88)(	6448.51)(	8068.81)(	9690.67)(	12938.14)(	16189.48)(
ROUTED TO	1034	3317.00	1	112547.	225760.	282512.	339330.	453104.	567014.
		(8590.93)		(3186.99)(	6392.79)(	7999.85)(	9608.75)(	12830.47)(	16056.02)(
HYDROGRAPH AT	34	108.00	1	7479.	14959.	18698.	22438.	29917.	37396.
		(279.72)		(211.79)(	423.58)(	529.47)(	635.37)(	847.16)(	1058.95)(
2 COMBINED	34	3425.00	1	113601.	227867.	285147.	342491.	457319.	572282.
		(8870.65)		(3216.82)(	6452.47)(	8074.44)(	9698.26)(	12949.82)(	16205.20)(
ROUTED TO	1035	3425.00	1	113200.	227095.	284176.	341316.	455797.	570416.
		(8870.65)		(3205.47)(	6430.61)(	8046.96)(	9664.97)(	12906.72)(	16152.36)(
HYDROGRAPH AT	35	33.00	1	2964.	5927.	7409.	8891.	11854.	14818.
		(85.47)		(83.92)(	167.84)(	209.79)(	251.75)(	335.67)(	419.59)(
2 COMBINED	1035	3458.00	1	113322.	227348.	284492.	341694.	456228.	570946.
		(8956.12)		(3208.91)(	6437.76)(	8055.90)(	9675.70)(	12918.92)(	16167.37)(

PROJECT NAME ______ DATE 8-16-79
SUBJECT Vischer's Ferry PROJECT NO. ______
DRAWN BY JAG

Spillway Discharge - from 1230' ogee crest plus 690' trapezoidal spillway.

Ogee Crest - uncontrolled overflow
Length, L = 1230'   Crest Elev. = 211.0
Spillway Height, h ~32'
H.W. Elev. ~217 ∴ Assume H_d = 6'
Reference: Open-Channel Hydraulics - Chow
$C_d = 4.03$; $h/H_d = 32/6 = 5.3$

Elev.	He	He/Hd	C/Cd	C	$Q = CLHe^{3/2}$
211	0	0	0		0
213	2'	0.33	0.84	3.38	11,760 cfs
215	4	0.67	0.94	3.79	37,290
217	6	1.0	1.0	4.03	72,850
219	8	1.33	1.02	4.11	114,390
221	10	1.67	1.03	4.15	161,420
223	12	2.0	1.03	4.15	212,190
225	14	2.33	1.03	4.15	267,390
227	16	2.67	1.03	4.15	326,690
229	18	3.0	1.03	4.15	389,820
231	20	3.33	1.03	4.15	456,560

Trapezoidal Spillway
Spillway Length, L = 690'
Reference: Handbook of Hydraulics - King & Brater

H	C
2'	~3.4
4	3.4
6	3.5 (conservatively)
↓	↓

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PROJECT NAME ______ DATE ______

SUBJECT Vischer's Ferry PROJECT NO. ______

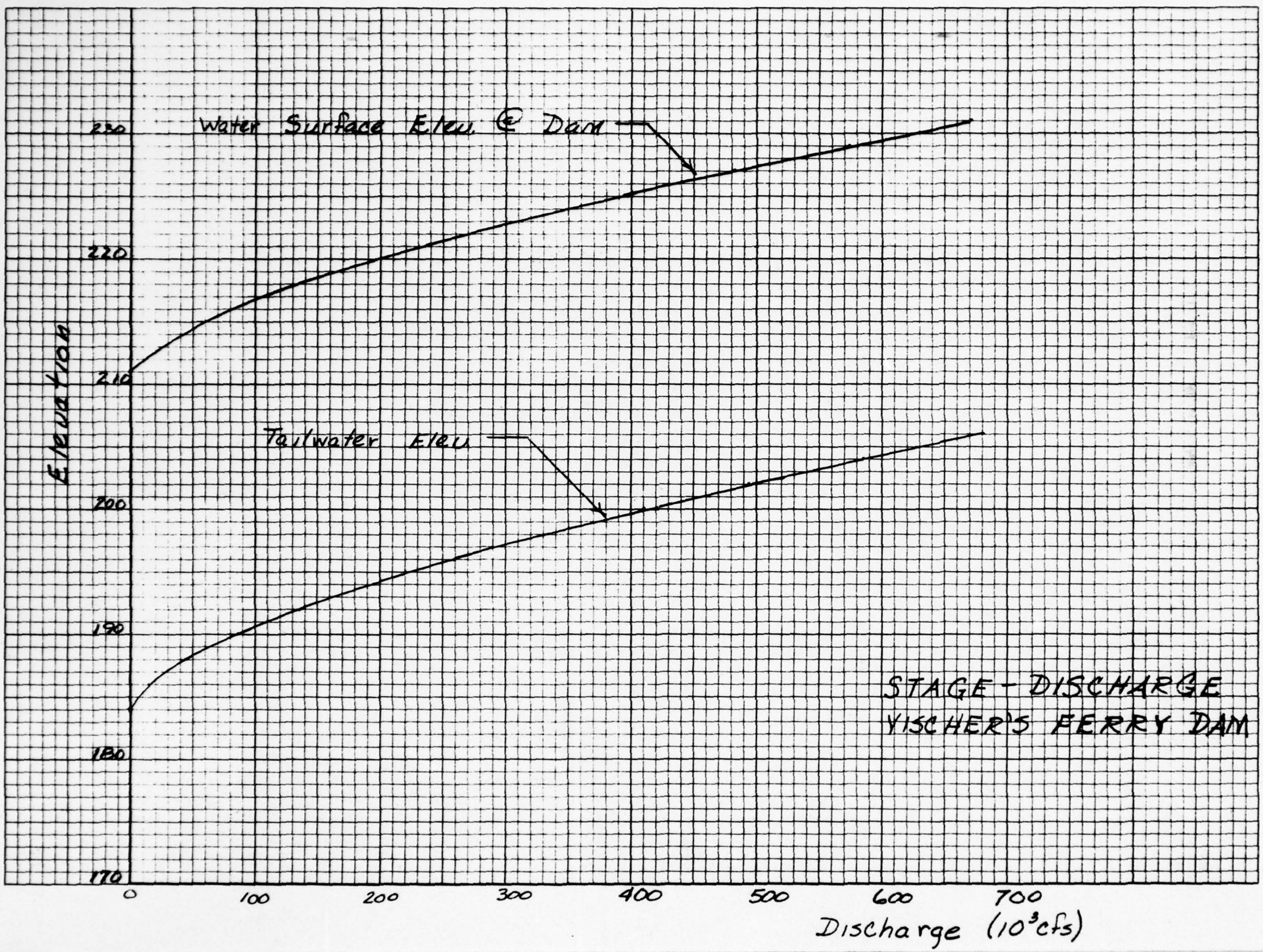
DRAWN BY JAG

Downstream of spillway appears to slope sufficiently so as not to affect discharge over spillway

Elev.	H_e	C	$Q = C L H_e^{3/2}$
211	0	—	—
213	2'	3.4	6,640 cfs
215	4	3.4	18,770
217	6	3.5	35,490
219	8	↓	54,650
221	10		76,370
223	12		100,390
225	14		126,500
227	16		154,560
229	18		184,430
231	20	3.5	216,000

Total Flow Over Spillway - Ogee + Trapezoidal Sections

Elev.	H_e (ft.)	Q (cfs)
211	0	—
213	2	18,400
215	4	56,060
217	6	108,340
219	8	169,040
221	10	237,790
223	12	312,580
225	14	393,890
227	16	481,250
229	18	574,250
231	20	672,560


Water Surface Elev. @ Dam
Tailwater Elev.
STAGE - DISCHARGE
VISCHER'S FERRY DAM
Elevation
230
220
210
200
190
180
170
0
100
200
300
400
500
600
700
Discharge (10^3cfs)

STATION 01336000 MOHAWK R BELOW DELTA DAM, NEAR ROME, N. Y.

TOTAL D.A. = 150.00 CONTR. D.A. =
GAGE DATUM = 474.00 FT.

WATER YEAR	ANNUAL PEAK DISCH.CFS	DATE	CODES	HIGHEST SINCE	GAGE HEIGHT OF ANNUAL PEAK.FT	CODE	ANNUAL MAX GAGE HT.FT	DATE	CODE
1928	2930	04-08-28	ES KR		6.9				
1929	1940	05-03-29	KR		5.4				
1930	1600	01-15-30	KR		4.9				
1931	1540	04-11-31	KR		4.9				
1932	2220	01-18-32	KR		5.85				
1933	2050	11-02-32	KR		5.6				
1934	1300	04-13-34	KR		4.4				
1935	4060	07-09-35	KR		8.1				
1936	3610	03-27-36	KR		7.6				
1937	2840	01-15-37	KR		6.8				
1938	3110	03-21-38	KR		7.31				
1939	1440	12-13-38	KR		4.67				
1940	2830	04-12-40	KR		6.83				
1941	1250	12-31-40	KR		4.35				
1942	1250	04-11-42	KR		4.35	NM	4.42	12-30-41	RW
1943	2420	03-22-43	KR		6.25				
1944	2130	04-25-44	KR		5.78				
1945	2560	09-30-45	KR		6.37				
1946	8560	10-02-45	KR		11.18				
1947	6350	05-22-47	KR		9.86				
1948	3540	03-22-48	KR		7.41				
1949	1630	03-28-49	KR		5.00				
1950	1920	04-04-50	KR		5.41				
1951	1970	04-13-51	KR		5.52				
1952	1750	04-08-52	KR		5.19				
1953	1550	05-03-53	KR		4.88				
1954	1860	04-28-54	KR		5.35				
1955	1850	04-15-55	KR		5.33				
1956	2610	05-13-56	KR		6.46				
1957	1040	04-23-57	KR		4.08				
1958	649	12-26-57	KR		3.27				
1959	1440	05-20-59	KR		4.80	NM	5.32	01-22-59	RW
1960	3960	04-24-60	KR		7.91				
1961	1940	06-22-61	KR		5.54				
1962	936	04-07-62	KR		3.83				
1963	2430	04-04-63	KR		6.21				
1964	2840	04-15-64	KR		6.72				
1965	2220	04-22-65	KR		5.95				
1966	1040	05-19-66	KR		4.07				
1967	796	05-12-67	KR		3.56				
1968	2450	06-28-68	KR		6.24				
1969	6630	05-20-69	KR		10.02				
1970	1810	04-25-70	KR		5.36				
1971	1650	05-04-71	KR		5.12				
1972	6360	06-22-72	KR		9.87				
1973	2480	04-05-73	KR		6.27				
1974	3320	05-13-74	KR		7.25				
1975	4530	09-26-75	KR		8.44				

STATION 01347000 MOHAWK RIVER NEAR LITTLE FALLS, N. Y.

TOTAL D.A. = 1348.00 - CONTR. D.A. =
GAGE DATUM = 310.0 FT.

WATER YEAR	ANNUAL PEAK DISCH.CFS	DATE	CODES	HIGHEST SINCE	GAGE HEIGHT OF ANNUAL PEAK.FT	CODE	ANNUAL MAX GAGE HT.FT	DATE	CODE
• 1913	34200	03-28-13	HK						
1928	16400	11-30-27	KR		14.20				
1929	21300	03-15-29	KR		16.4				
1930	19200	01-10-30	KR		15.5				
1931	10600	07-22-31	KR		11.41				
1932	16000	12-14-31	KR		14.05				
1933	19200	10-06-32	KR		15.46				
1934	16900	03-27-34	KR		14.37	NM	15.95	03-05-34	8W
1935	21100	01-09-35	KR		16.30				
1936	23200	03-18-36	KR		17.26				
1937	17200	04-06-37	KR		14.58				
1938	22700	09-22-38	KR		17.01				
1939	14900	03-27-39	KR		13.46				
1940	22800	04-09-40	KR		17.05				
1941	20200	12-29-40	KR		15.91				
1942	15700	03-17-42	KR		13.9				
1943	19800	03-17-43	KR		15.73				
1944	16300	04-10-44	KR		14.17				
1945	17300	03-18-45	KR		14.59				
1946	25300	10-03-45	KR		17.60				
1947	22900	06-04-47	KR		16.89				
1948	22100	03-20-48	KR		16.57				
1949	17300	12-30-48	KR		14.56				
1950	21200	03-29-50	KR		16.22				
1951	19300	03-31-51	KR		15.42				
1952	11900	04-06-52	KR		12.10				
1953	13700	03-27-53	KR		12.96				
1954	18000	02-17-54	KR		14.85				
1955	20900	03-11-55	KR		16.07				
1956	21100	04-05-56	KR		16.17				
1957	10600	02-27-57	KR		11.29	NM	15.34	01-23-57	8W
1958	12900	12-21-57	KR		12.52				
1959	17400	01-22-59	KR		14.54				
1960	23000	11-28-59	KR		16.90				
1961	23000	02-26-61	KR		16.99				
1962	14400	03-31-62	KR		13.22				
1963	16300	04-05-63	KR		13.96				
1964	27200	03-05-64	KR		16.33				
1965	14400	04-12-65	KR		12.56				
1966	12100	02-14-66	KR		11.49				
1967	10700	12-08-66	KR		11.52				
1968	16100	03-23-68	KR		13.96				
1969	17800	05-21-69	KR		14.70				
1970	17300	04-02-70	KR		14.48				
1971	16100	04-14-71	KR		13.95				
1972	19300	06-23-72	KR		16.37				
1973	22300	11-09-72	KR		16.19				
1974	21200	07-03-74	KR		15.72				
1975	27200	02-25-75	KR		14.33				
• 1976	18000	05-20-76	KR		14.35				

PEAKS MARKED WITH • NOT PASSED TO LOG PEARSON PROGRAM

APPENDIX D

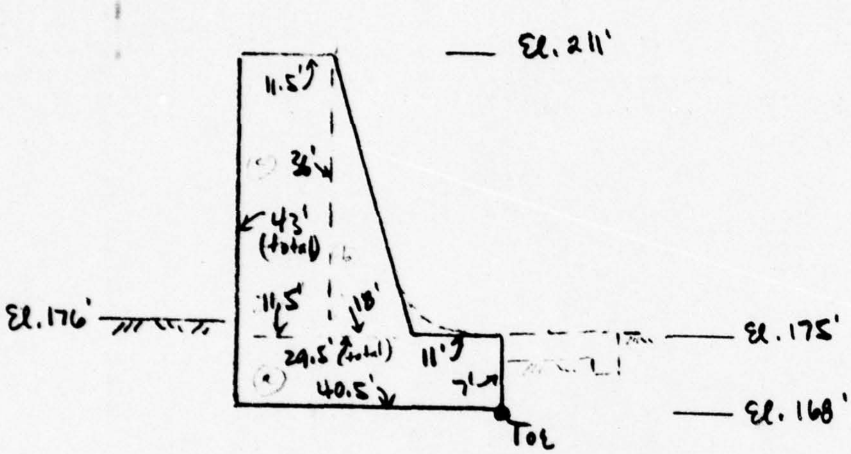
STABILITY ANALYSIS

PROJECT NAME VISCHERS FERRY DAM DATE

SUBJECT STABILITY ANALYSIS — OVERTURNING & SLIDING PROJECT NO.

DRAWN BY

Assumed Section Based on Dimensions for Dam "D"



Resisting moment about toe due to mass of dam =

$= (40.5 \times 7 \times .15)(\frac{40.5}{2}) + (\frac{1}{2} \times 18 \times 36 \times .15)(11 + \frac{2 \times 18}{3}) + (36 \times 11.5 \times .15)(29 + \frac{11.5}{2}) =$

$= 861^k + 1118^{1k} + 2158^{1k} = 4137^{1k}$

Wt. of dam $= (40.5 \times 7 \times .15) + (\frac{1}{2} \times 18 \times 36 \times .15) + (36 \times 11.5 \times 15) =$

$= 42.5^k + 48.6^k + 62.1^k = 153^k$

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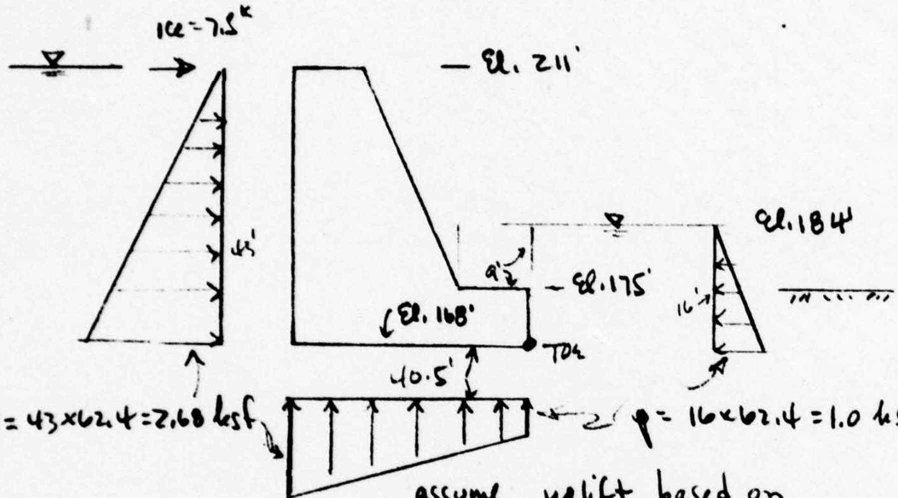
DESIGN BRIEF

PROJECT NAME ____________ DATE ______

SUBJECT ____________ PROJECT NO. ______

____________ DRAWN BY ______

I. WL @ normal operating levels — upstream elev. 211', downstream elev 184'



assume uplift based on hydrostatic pressures determined from elevation difference above base of dam: if flow net for seepage through foundation was provided, expect upst. pressure to be less than hydrostatic, but ds pressure to be greater. Assumption expected to be slightly conservative.

Moments about toe resisting overturning $= 4137^{\prime k} + \left(1.0 \times \frac{16}{2} \times \frac{16}{3}\right) + \left(9 \times 9 \times 62.4 \times \frac{9}{2}\right) =$

$= 4137^{\prime k} + 43^{\prime k} + 23^{\prime k} = 4203^{\prime k}$

Moments about toe causing overturning $= \left(2.68 \times \frac{43}{2} \times \frac{43}{3}\right) + \left(1.0 \times 40.5 \times \frac{40.5}{2}\right) + \left(2.68 - 1.0\right)\left(\frac{40.5}{2}\right)\left(\frac{2}{3} \times 40.5\right) + (7.5 \times 4$

(uplift = 1852)

$= 826^{\prime k} + 820^{\prime k} + 1032^{\prime k} + 315^{\prime k} = 2993^{\prime k}$

FS against overturning $= \frac{4203^{\prime k}}{2993^{\prime k}} = \underline{1.4 \pm}$

Position of resultant measured from toe, $d = \frac{\Sigma M_{toe}}{\Sigma V}$

$$d = \frac{(4203 - 2993)^{1k}}{153^k - \left(\frac{2.68+1.0}{2}\right)(40.5) + (9 \times 9 \times .144)} = \frac{1210^{1k}}{83.5^k} = 14.5'$$

74.5 5

d in terms of base dimension, $d = \frac{14.5'}{40.5}(b) = 0.36(b)$

FS against sliding (friction-shear method, assuming bond is so[und] and $\mu = 0.65$)

$$FS = \frac{\mu N + \text{bond/shear} + \text{dst. } H_2O}{\text{upstream } H_2O}$$

neglect passive resistance of rock downstre[am]

54.2 292 8

$$FS = \frac{(0.65)(83.5) + (.05 \times 144 \times 40.5) + (1.0 \times \frac{16}{2})}{(2.68 \times \frac{43}{2})} = \frac{354}{57.6} = 6.1 \pm$$

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PROJECT NAME ______ DATE ______

SUBJECT ______ PROJECT NO. ______

______ DRAWN BY ______

Position of resultant measured from toe, $d = \frac{\Sigma M_{toe}}{\Sigma V}$

$$\underline{d} = \frac{(4203 - 2993)^{k}}{153^{k} - \left(\frac{2.68+1.0}{2}\right)(40.5) + (9 \times 9 \times .144)} = \frac{1210^{k}}{83.5^{k}} = \underline{14.5'}$$

74.5 5

$\underline{d}$ in terms of base dimension, $\underline{d} = \frac{14.5'}{40.5}(b) = \underline{0.36(b)}$

FS against sliding (friction-shear method, assuming bond is 50 psi and $\mu = 0.65$)

$$FS = \frac{\mu N + \text{bond/shear} + \text{dst. } H_2O}{\text{upstream } H_2O}$$

neglect passive resistance of rock downstream

$$\underline{FS} = \frac{(0.65)(83.5) + (.05 \times 144 \times 40.5) + (1.0 \times \frac{16}{2})}{(2.68 \times \frac{43}{2})} = \frac{354}{57.6} = \underline{6.1 \pm}$$

54.2 292 8

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NATIONAL DAM SAFETY PROGRAM. VISCHER RRY DAM (NY 170), MOHAWK--ETC(U)
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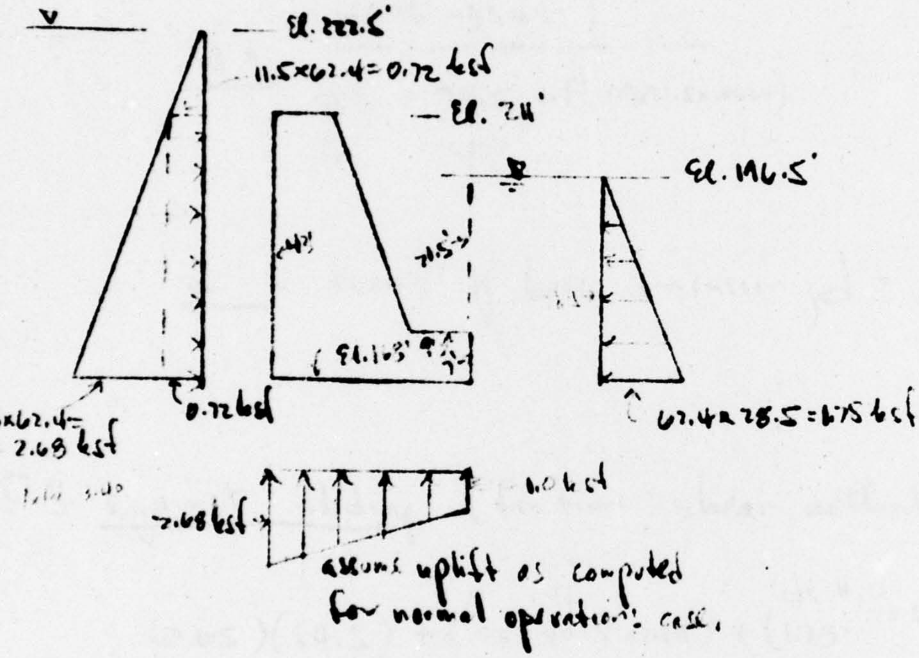
II. WL @ ½ PMF elevations

upstream elev. 222.5' (11.5' above dam)
downstream el. 196.5'



Moments about toe resisting overturning = 4137^k + (1.78 × 28.5/2 × 28.5/3) + ½(9×71.5×.0624×…)

= 4137^k + 241^k + 27^k = 4405^k

Moments about toe causing overturning =

= (0.72 × 43 × 43/2) + (2.68 × 43/2 × 43/3) + 1552 = 3344^k

FS against overturning = 4405^k / 3344^k = 1.32

neglecting passive resistance of downstream apron and rock

Position of resultant measured from toe, $d = \frac{\Sigma M_{net}}{\Sigma V}$

$$d = \frac{(4405 - 3344)^{1k}}{153 - 74.5 + (\frac{1}{2} \times 9 \times 21.5 \times .0624)} = \frac{1061}{84.5^k} = \underline{12.6'}$$

wt dam uplift

$\underline{d}$ in terms of base dimension, $d = \frac{12.6}{40.5}(b) = \underline{0.31(b)}$

FS against sliding (friction-shear method: bond = 50 psi, μ = 0.65)

$$\underline{FS} = \frac{(0.65)(84.5) + (.05 \times 40.5 \times 144) + (1.78 \times \frac{28.5}{2})}{(\frac{0.72 + 3.40}{2})(43')} = \frac{372^k}{88.6^k} = \underline{4.2 \pm}$$

bond shear 292; d/s H_2O

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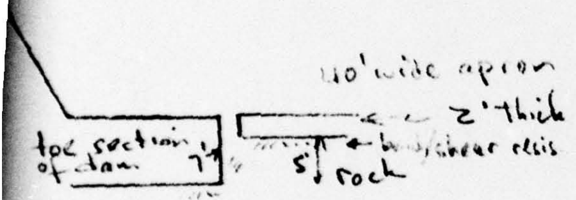
For resultant to be located at the third point, $d_{req} = 13.5'$,
Passive resistance by downstream apron and rock
has, not been considered but is expected to exist.

Required M_{toe} for result to be at 0.33(b) is $= (\Sigma V)(d)$

$$= (84.5^k)(13.5') = 1141^{1k}$$

req'd extra moment resisting overturning $= 1141^{1k} - 1061^{1k} = 80^{1k}$



(a) for 80^{1k} moment about toe to be provided from bond between apron and rock, bond force reqd is —

$$80^{1k}/5' = 16^k$$

if bond is 50psi, effective length of apron would be —

$$L = \frac{16^k}{(.05 \times 144)} = 2.3' \pm$$ (small, reasonable to expect)

passive resistance developed within rock neglected in analysis

(b) reasonable to expect that similar resistance would be developed by horiz/diag shear/bond in rock adjacent to toe if required.

<u>FS against overturning would be</u> $= \frac{4405 + 80}{3344} = \underline{1.34^+}$, $\underline{d = 0.33(b)}$

<u>FS against sliding would be</u> $= \frac{372 + 16}{88.6} = \underline{4.4}$

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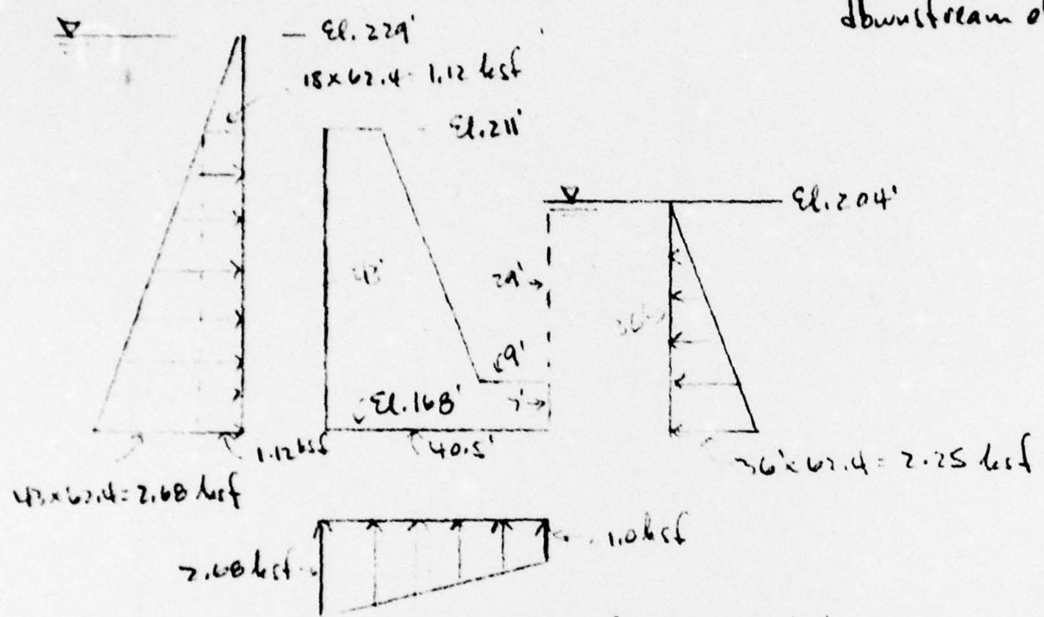
III. WL @ PMF elevations — upstream elev. 229' (18' above dam), downstream elev. 204'



assume uplift as computed for normal operations case

Moments about toe resisting overturning $= 4137 + (2.25 \times \frac{36}{2} \times \frac{36}{3}) + (\frac{1}{2})(\frac{9^2}{2} \times 29 \times 62.4)$

$= 4137 + 486^{1K} + 37^{1K} = 4660^{1K}$

Moments about toe causing overturning:

$= (1.12 \times 43 \times \frac{43}{2}) + (2.68 \times \frac{43}{2} \times \frac{43}{3}) + 1852 = 3713^{1K}$

<u>FS against overturning</u> $= \frac{4660^{1K}}{3713^{1K}} = \underline{1.26} \pm$

omitting passive resistance of ds apron and rock

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Position of resultant measured from toe, $d = \frac{\Sigma M_{toe}}{\Sigma V}$

$$\underline{d} = \frac{(4660 - 3713)^{1k}}{153 - 74.5 + (\frac{1}{2} \times 9 \times 29 \times .0624)} = \frac{947^{1k}}{86.5^{k}} = \underline{11' \pm}$$

$\underline{d}$ in terms of base dimension, $d = \frac{11}{40.5}(b) = \underline{0.27(b)}$

FS against sliding (friction - shear method : bond = 50psi, $\mu = 0.65$)

$$\underline{FS} = \frac{(0.65)(86.5) + (.05 \times 40.5 \times 144) + (2.75 \times \frac{30}{2})}{(\frac{1.12 + 3.80}{2})(43)} = \frac{389}{106} = \underline{3.7 \pm}$$

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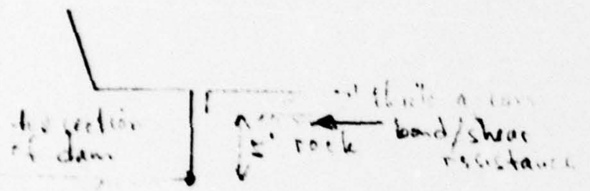
For resultant to be located at $b/3$, $d_{req} = 13.5'$. Passive resistance by downstream apron and rock has not been considered but is expected to exist.

Required M_{toe} for resultant to be at $0.33(b)$ is $= \Sigma V \cdot d$

$$= 86.5^k \times 13.5' = 1168^{'k}$$

req'd extra moment resisting overturning $= 1168^{'k} - 947^{'k} = 221^{'k}$



passive resistance developed within rock neglected in analysis

(a) for $221^{'k}$ moment about toe to be provided from bond between apron and rock, bond force req'd is –

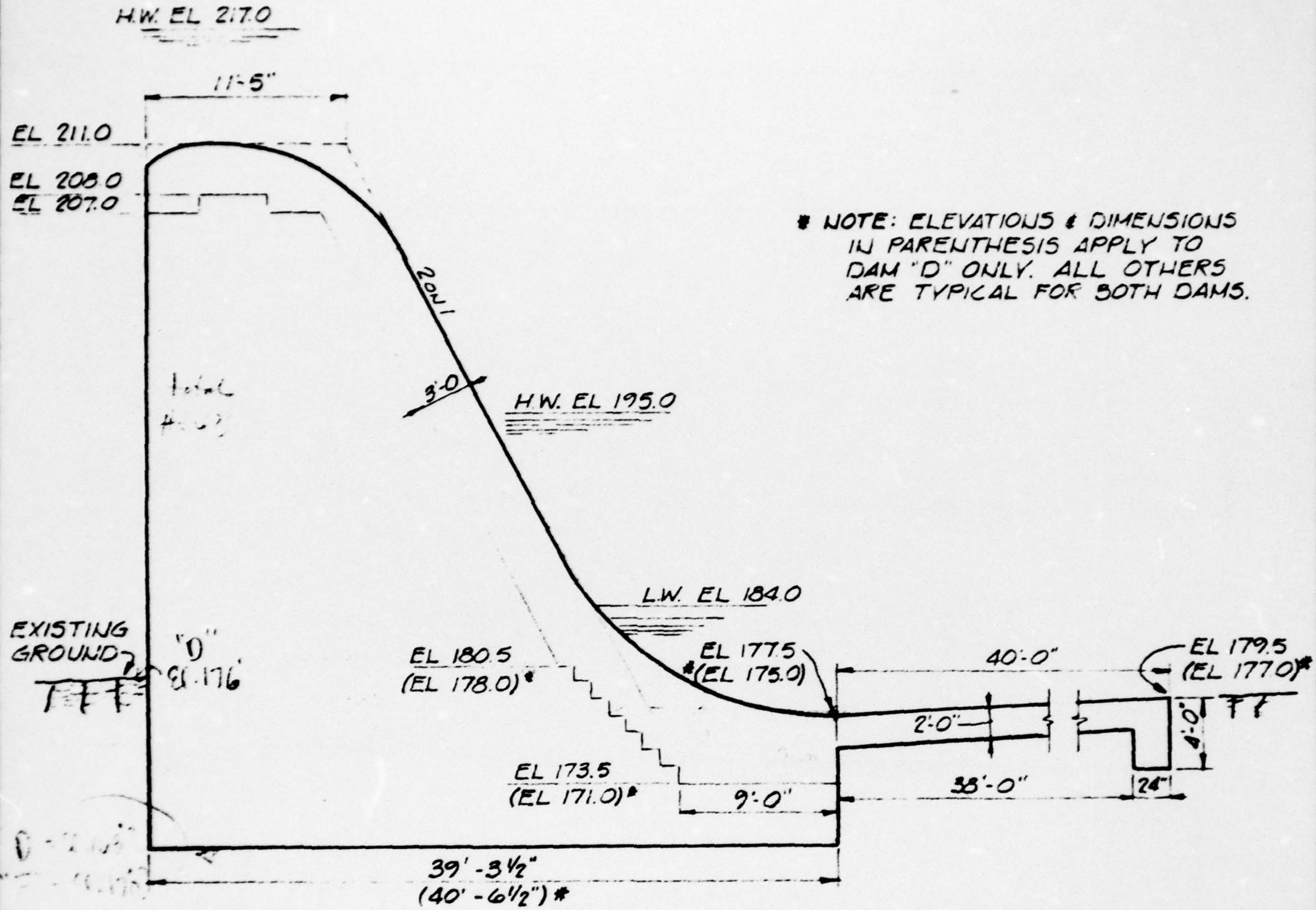
$$221^{'k}/5' = 44^k \text{ say } 45^k$$

if bond is 50 psi, effective length of apron necessary is –

$$L = \frac{45^k}{(.05 \times 144)} = 6.25' \text{ (reasonable to expect)}$$

__FS against overturning__ would be $= \frac{(4660 + 221)^{'k}}{3712^{'k}} = \underline{1.31} +$, $d = 0.33(b)$

__FS against sliding__ would be $= \frac{(389 + 45)}{106^k} = \underline{4.1} +$



* NOTE: ELEVATIONS & DIMENSIONS IN PARENTHESIS APPLY TO DAM "D" ONLY. ALL OTHERS ARE TYPICAL FOR BOTH DAMS.

VISCHERS FERRY DAM
DAM "D" & "F" - TYP. SECT.

SCALE: 1/8" = 1'-0"

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DATE	DRAWN	
8·2·79	JPG	VISCHER'S FERRY DAM
JOB 2305	APP'D	

APPENDIX E

REFERENCES

APPENDIX

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