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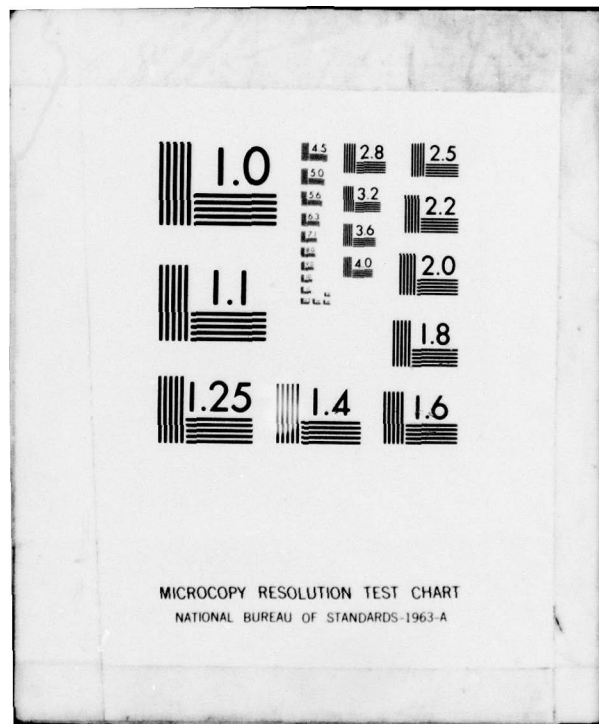
NEW YORK STATE DEPT OF ENVIRONMENTAL CONSERVATION ALBANY F/6 13/13
NATIONAL DAM SAFETY PROGRAM. CURVED DAM-LOCK 7 (INVENTORY NUMBE--ETC(U)
SEP 79 J B STETSON DACW51-79-C-0001

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OSWEGO RIVER BASIN

CURVED DAM-LOCK 7

OSWEGO COUNTY
NEW YORK

INVENTORY NO NY 398

11 28 Sep 79

(10) John B. /Stetson



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PHASE I INSPECTION REPORT

NATIONAL DAM SAFETY PROGRAM.

Curved Dam-Lock 7 (Inventory Number NY 398),
Oswego River Basin, Oswego County, New
York. Phase I Inspection Report.

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NEW YORK DISTRICT CORPS OF ENGINEERS

JULY 1979

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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 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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PHASE I REPORT
NATIONAL DAM SAFETY PROGRAM

Name of Dam Curved Dam at Lock 7, NY398

State Located New York
County Located Oswego
Stream Oswego River
Date of Inspection May 31, June 7, 1979

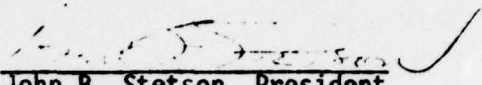
ASSESSMENT OF
GENERAL CONDITIONS

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. Within one year of notification, complete the following investigations:
 - a. Perform a detailed investigation including subsurface investigations to determine the extent of and method of repair for through-the-dam and under-the-dam seepage.
2. After the aforementioned investigations, the remaining deficiencies requiring remedial work should be completed within the next construction season. The following improvement needs have been identified:
 - a. Repair seepage and leaks through and beneath the dam.
 - b. Repair the masonry in the east abutment wall. Align the masonry units and replace the missing masonry unit.
 - c. Repair the boil located in a land area along the riverside wall of the navigation channel.

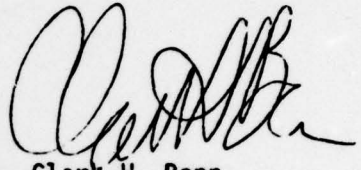
Computations prepared according to the Corps of Engineers' Screening Criteria establish the spillway capacity of 62,500 cfs at 76% of the PMF, with the PMF and 1/2 PMF flows at 81,900 cfs and 46,800 cfs respectively. Since the dam is capable of passing the 1/2 PMF without being overtopped, it is assessed as inadequate.

Dale Engineering Company


John B. Stetson, President

Approved By:
Date:

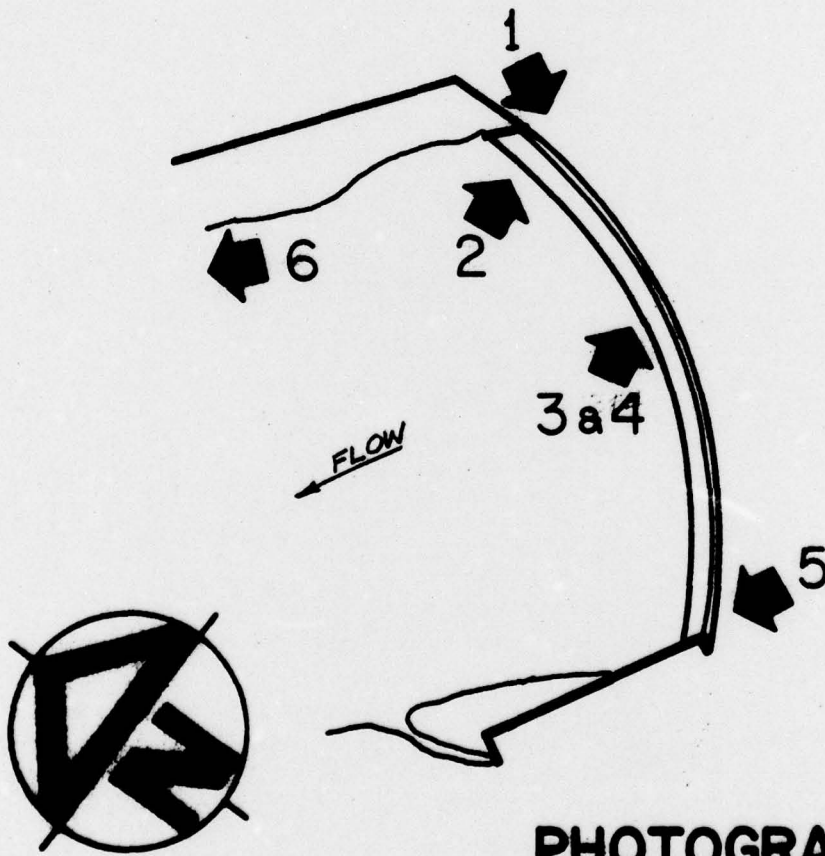
28 Sept 79


Col. Clark H. Benn
New York District Engineer



Overview of stone masonry dam located adjacent to Lock 0-7 at mile 1.4 of the Oswego River at Oswego, New York (Lower Dam). Reservoir pool is drawn down below spillway crest and flashboards are in process of being replaced.

CURVED DAM



PHOTOGRAPH KEY MAP



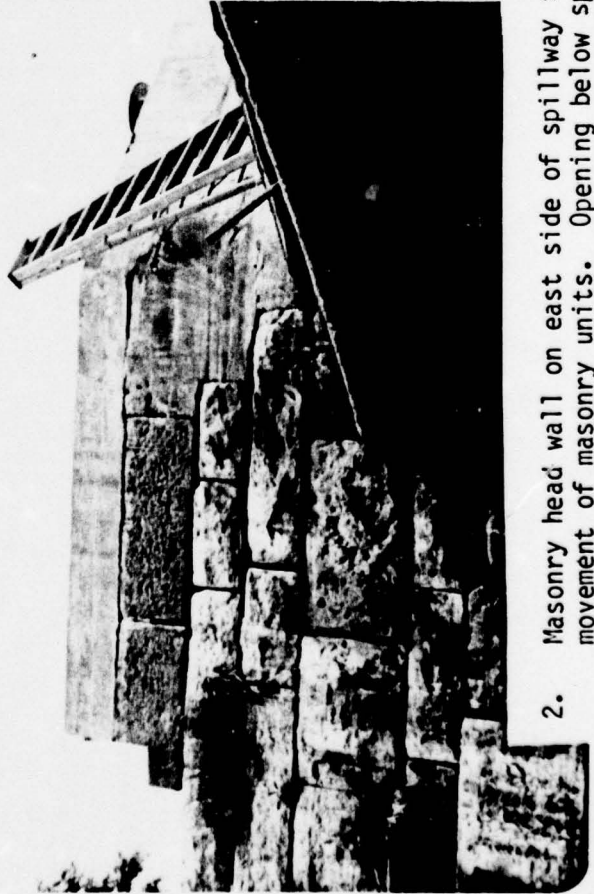
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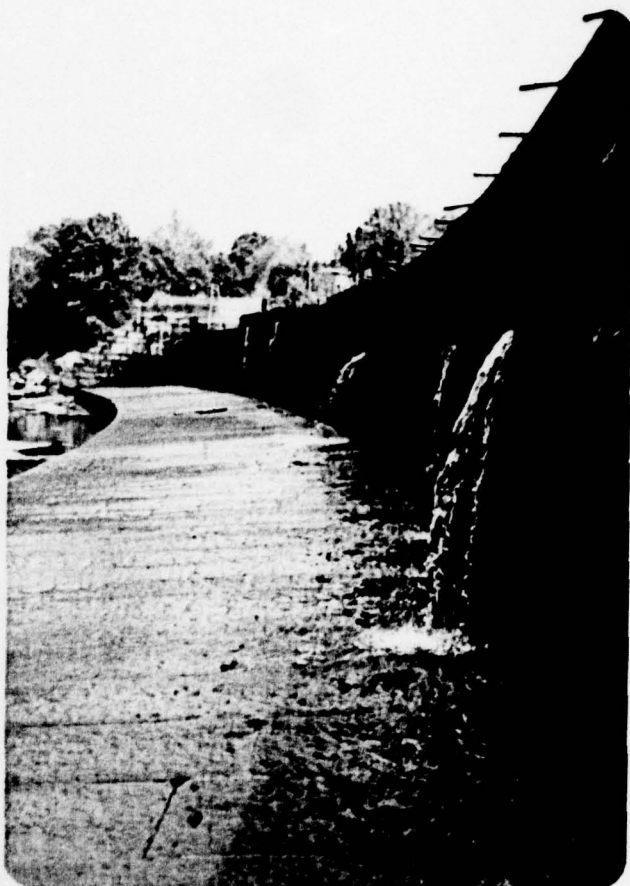
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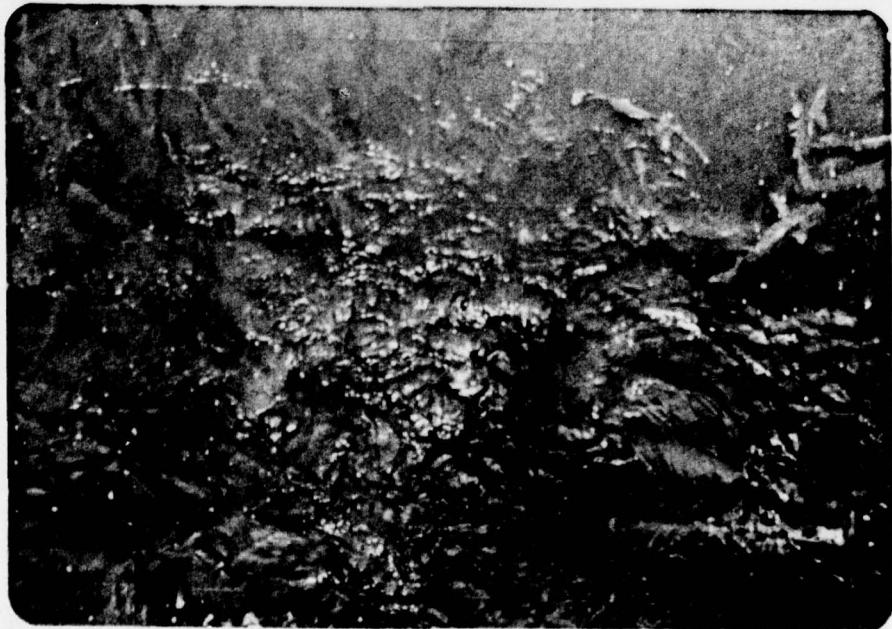
1. View across top of spillway showing large cap stones.



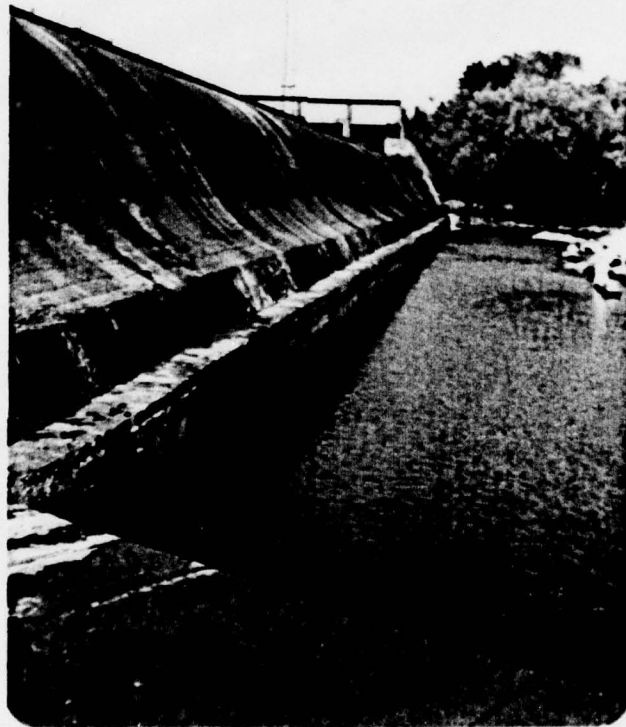
2. Masonry head wall on east side of spillway shows some movement of masonry units. Opening below spillway apron caused movement of masonry element above it.



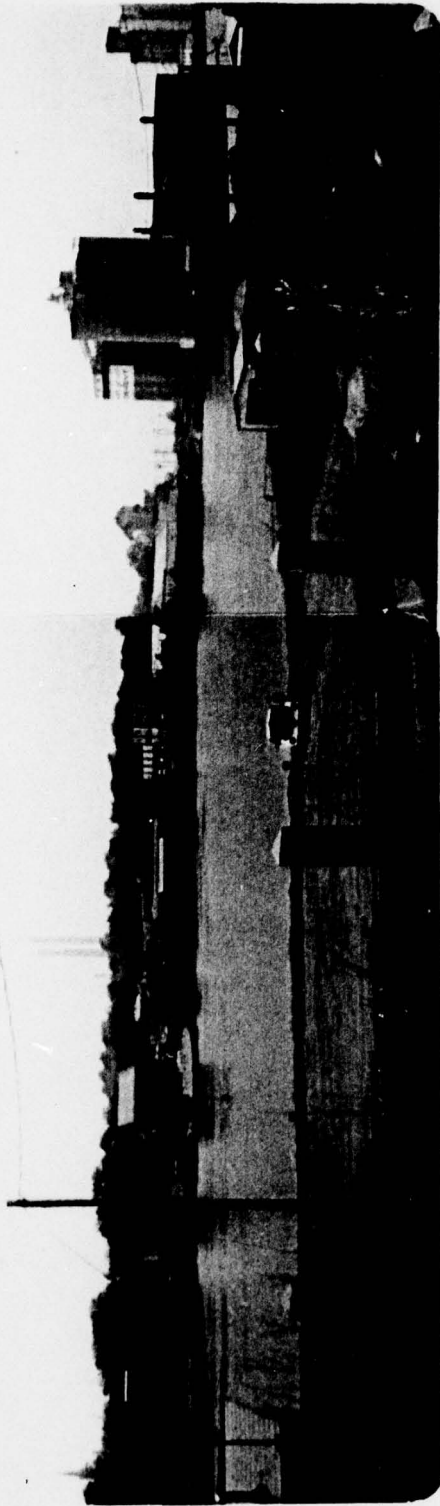
3. Examples of seepage through masonry joints.



4. Through or under the dam flows were located below the apron in the center of the dam as shown in the close-ups. These flows can be seen just beyond the people. The second location is approximately 25 feet beyond the first.



5. The side channel spillway on the west side of the river appears to be in relatively good condition.



6. Downstream hazard area in the City of Oswego.

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
NAME OF DAM - CURVED DAM - LOCK NO. 7 ID# - NY 398

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 Curved Dam - Lock Number 7 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 Curved Dam at Lock Number 7 consists of a 517 foot long curved masonry gravity structure. The curved section terminates on the west bank of the river in a 250 foot long concrete side channel spillway. The spillway in turn terminates at the face of a power generating station which is situated on the west bank of the river. The east abutment of the dam terminates at an approach channel wall to Lock No. 7 of the Oswego Canal. The dam is 14 feet high and is founded on bedrock throughout its length. The combination of lock, dam and power generating station spans the entire width of the Oswego River. The dam is the last of a series of six dams which regulate the flow in the Oswego River for use in navigation and power generation.

b. Location

The Curved Dam at Lock Number 7 is located in the City of Oswego, Oswego County, New York.

c. Size Classification

The maximum height of the dam is approximately 14 feet, the storage volume in the impoundment is approximately 650 acre feet. Therefore, the dam is in the Small Size Classification as defined by The Recommended Guidelines for Safety Inspection of Dams.

d. Hazard Classification

The Oswego River flows through the City of Oswego, and it is also used for navigational purposes. The dam is therefore 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:

Region Three:

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

New York State - DOT
Syracuse State Office
333 E. Washington Street
Syracuse, New York 13202
Engineer - Mr. Leo Burns
(315) 473-8194

f. Purpose of the Dam

The dam is used to regulate flows in the Oswego River for navigation use and power generation. The Oswego River is also used for recreational purposes.

g. Design and Construction History

The main dam was originally completed in 1857. In 1894 the timber apron in front of the dam was replaced with a stone-block masonry apron. In 1896 the dam was raised so that the depth of the Oswego Canal could be increased from 7 to 9 feet. In 1908 when the Barge Canal was built, the dam was again raised about 2-1/4 feet by the addition of coping stones. This work was completed in 1912. The side spillway weir was constructed sometime subsequent to 1925. No plans were found on the construction of this weir.

h. Normal Operational Procedures

The facility is operated by the New York State Department of Transportation in cooperation with the Niagara Mohawk Power Corporation. The main function of the facility is to provide adequate pool elevations for navigation in the Oswego Canal. The secondary function of the facility is for power generation at the Niagara Mohawk Power Generating Facilities. In order to fulfill the primary function of the facility, navigation, it is necessary to maintain the upstream water level at the elevation of the spillway crest. In order to maintain this level and have adequate flows for power generation, the Niagara Mohawk Power Corporation places flashboards on the dam each spring to provide sufficient impounded water during the low run-off periods. The gates which control the flow into the forebay of the power generating station are owned and operated by the New York State Department of Transportation. These gates may be closed to shut off the flow to the generating facility. Representatives of the New York State Department of Transportation indicate that it has been unnecessary to manipulate these gates in order to regulate the generating flow. The gates are used only to dewater the forebay channel for maintenance purposes.

1.3 PERTINENT DATA

a. Drainage Area

The drainage area of the Curved Dam - Lock 7 is 5121+ square miles.

b. Discharge at Dam Site

Peak discharges recorded at USGS gage 0424900 at site.

28 Mar 1936	37,900 cfs
10 Apr 1940	35,000 cfs
27 Jun 1972	32,300 cfs.

For other values of annual peaks, see Appendix C.

Computed discharges:

Ungated spillway, top of dam (total)	62,500 cfs w/o flashboards
	30,000 cfs w/flashboards**
Main spillway section only	38,000 cfs w/o flashboards
Ungated spillway, design flood	30,000 cfs
PMF	81,900 cfs
1/2 PMF	46,800 cfs
Maximum Navigation Pool	17,000 cfs
Gated drawdown, <u>peak through powerhouse</u>	7,400 cfs

**Flashboards are designed to fail at 1.5 feet of head. However, if flashboard failure does not occur, discharge capacity will be as indicated.

c. Elevation* Barge Canal Datum (U.S.G.S. + 0.99)

Top of dam	275.6
Ungated Spillway	
PMF	277.0
1/2 PMF	273.5 w/o flashboards
Maximum Navigation Pool	273.0 w/o flashboards
Spillway crest with flashboards	271.0
w/o flashboards	268.5
Stream bed at centerline of dam	254.5

d. Reservoir (Up to Dam at Lock 6)

Length of maximum pool	2000 ft.
Length of normal pool	2000 ft.

e. Reservoir Area

Top of dam	46.8 acre
Maximum pool	46.8 acre (1/2 PMF)
Spillway pool	46.8 acre

f. Dam

Type - Stone masonry primary spillway, crested concrete side spillway
Length - 517 feet across river
Height - 14 feet
Freeboard between normal pool and top of dam - 5 feet.
Top width - 7 feet, 8 inches.
Side slopes - Downstream 1 inch/foot
 Upstream 3 inches/foot

g. Spillway

Type - Overflow weir main spillway, crested weir side channel spillway.
Length - 482.5 main spillway, 250.0 feet side channel spillway.
Crest elevation - 268.5 w/o flashboards.
Gates - Gates only control flow to hydropower facility.

h. Regulating Outlets

Maximum discharge through powerhouse 7400 cfs.

SECTION 2 - ENGINEERING DATA

2.1 DESIGN

The information available for evaluation consisting of contract drawings of this dam, has been included in this report. This information is contained in Figures 1 through 12. No information on design of the dam was available.

2.2 CONSTRUCTION

Details regarding the construction of this facility are included in Figures 2 through 12 along with previous inspection reports on the dam by New York State Department of Transportation and New York State Department of Environmental Conservation. A record of modifications and major maintenance activities by the Department of Transportation are also included through 1967. The last recorded New York State Department of Environmental Conservation inspection was dated 1915. An additional site channel spillway section, not included in the original construction plans, was added to the dam on the west side of the river in 1925.

2.3 OPERATION

No operation manual is known to exist for this structure.

2.4 EVALUATION

The plans reviewed as a part of this investigation agree with observations made in the field. The spillway capacity of the west bank section was estimated without the benefit of having plans. The information included in this report is adequate to complete this Phase I investigation. Therefore, no additional requirement for data is given.

SECTION 3 - VISUAL INSPECTION

3.1 FINDINGS

a. General

The Curved Dam at Lock Number 7 was inspected on May 31, 1979 and again on June 7, 1979. The Dale Engineering Company inspection team was accompanied on the inspection by Richard Aldrich of the New York State Department of Transportation, Region 3, and on the second inspection by Robert McCarty of the New York State Department of Environmental Conservation, Dam Safety Section.

b. Dam

Modifications to the dam structure and appurtenant facilities have taken place throughout the years since its original construction. During the second inspection of the dam the water level was drawn down below the flashboards to allow a detailed inspection of the front face of the dam. During this inspection four leaks were found in the masonry on the downstream face of the dam. These leaks are shown in Photograph No. 3. In each case seepage is occurring through the deteriorated masonry joints. This inspection also disclosed two points where flow is occurring through or under the dam. These flows are located near the toe of the concrete apron near center of the dam (See Photograph No. 4). Masonry units on the east abutment also show some settlement. Both the surface of the spillway and the concrete apron were found to be generally in good condition.

c. Spillway

The side channel spillway at the west end of the curved dam also appeared to be in generally good condition. The spillway was operating at a head of approximately 3 inches at the time of the first inspection. Stop planks were in place in the outlet structure to an elevation of 2 feet, 6 inches above the spillway level.

d. Appurtenant Structures

The east end of the dam terminates at an upstream approach channel to Lock Number 7. The concrete wall at the upstream approach channel to Lock Number 7 has been resurfaced on the face toward the canal. This restoration was done in approximately 1970. Concrete surfaces above the waterline are in generally good condition, although some deterioration was noted below the water level. A small boil was found to exist at a point on the west face of the approach channel wall approximately 4 feet from the toe of the wall. Silt material was bubbling up and deposited in a boil type configuration. This flow was located approximately halfway down the upstream approach channel to Lock Number 7. The area in question was operating with a hydraulic

head of approximately 5-1/2 feet. Some dampness was also noted on the exterior face of the wall in this area.

The flow into the Niagara Mohawk Power Generating Station, located on the west bank of the Oswego River, at the end of the side channel spillway, is controlled by a series of gates which are owned and operated by the New York State Department of Transportation. These gates are mechanically operated wooden stop gates which control the flow into the forebay of the generating station. The gates are hoisted by a chain hoist which travels on rails across the top of each individual gate. The gates are hoisted up and locked into place by pins in the rail assembly. These gates, although operable, have not been used in a long time.

e. Control Outlet

Outlet from the impounded area is controlled by regulating the flow through the power generating station. Drawdown of the impoundment for the second inspection was accomplished by increasing flow through the power generating station. The power generating station is in use at present by Niagara Mohawk Power Corporation.

f. Reservoir Area

The reservoir area extends approximately 2,000 feet upstream to Dam No. 6 which performs a function similar to this facility. There are no areas of bank instability along this reach of river.

g. Downstream Channel

The downstream channel is formed in bedrock and is in generally good condition. No evidence of erosion was noted.

3.2 EVALUATION

Visual inspection reveals spurting leaks through the masonry of the curved dam and through or under the dam seepage under the apron of the curved dam. A boil was observed along the base of the upstream approach channel to Lock Number 7. The dam is founded on bedrock and shows no other evidence of structural problems or instability. No major deformation of the alignment of the structure was noted in the visual inspection.

SECTION 4 - OPERATIONAL PROCEDURES

4.1 PROCEDURES

The primary operational procedure is to control water level in the impoundment upstream from the dam for navigational purposes in the Oswego River. A secondary operational procedure is the utilization of excess water for power generating purposes. Total operational procedure is under the control of the New York State Department of Transportation. The operation is done in cooperation with Niagara Mohawk Power Corporation.

4.2 MAINTENANCE OF THE DAM

Maintenance and operation of the dam is controlled by the New York State Department of Transportation. The flashboards are put in place by Niagara Mohawk Power Corporation. Once every two years a visual inspection is made of the structure by a New York State Department of Transportation inspector, and a report on the condition of the structure is filed at the Department of Transportation Central Office in Albany. Maintenance to the structure is scheduled on a priority basis partly as a result of the bi-annual inspection.

4.3 MAINTENANCE OF OPERATING FACILITIES

The gates controlling the entrance to the forebay of the power generating station are under the control of the New York State Department of Transportation. These gates are operated infrequently and are used to accommodate Niagara Mohawk when dewatering of the forebay is required.

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 Department of Transportation. Maintenance on the control gates to the forebay of Niagara Mohawk Power Station has been infrequent. Recent maintenance and repairs has been performed on the locks and approach channel wall. The fact that the through-the-dam seepage has been known to exist prior to this inspection and that no investigative action prior to this inspection was taken, indicates that past maintenance procedures on this dam may have been adequate. This inspection team cannot concur with the Department's conclusions presented in Appendix B on the basis of a visual inspection.

SECTION 5 - HYDROLOGIC/HYDRAULIC

5.1 DRAINAGE AREA CHARACTERISTICS

The Oswego River Basin, located in central New York State, has a drainage area of approximately 5,123 square miles. It flows northerly discharging into Lake Ontario in the City of Oswego. The complex river system includes the seven Finger Lakes, Oneida Lake, Onondaga Lake, the Barge Canal and outlets from the lakes to the canal. The basin's major rivers, the Seneca, Oswego and Oneida, are incorporated into the Barge Canal System as are Oneida, Cayuga and Seneca Lake. All of the lakes have regulated outlets except Onondaga.

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 also considered as flood control devices.

Different scenarios of partial dam failures, i.e., tainter gates or 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. From a commentary viewpoint, the dam inspection team concludes that a partial failure under normal conditions would potentially be a navigational hazard rather than an inundation hazard.

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 Small Dam Category and is a High Hazard, the guidelines criteria (Ref. 1) require that the dam be capable of passing one-half the Probable Maximum Flood.

The hydrologic analysis was performed using the unit hydrograph method to develop the flood hydrograph. Due to the limited scope of this Phase I investigation, certain assumptions based on experience and existing data were used in this analysis and in the determination of the dam's spillway capacity to pass the PMF.

An HEC-1 computer model for the basin was obtained from the New York State Department of Environmental Conservation. This model has been developed over the years through a number of study efforts by the Department with assistance from the U.S. Army Corps of Engineers, Buf-

falo District. The model was calibrated by D.E.C. to a peak flood event, Hurricane Agnes, June 20-26, 1972. The dam investigation team briefly reviewed these findings. It then obtained the flood records at the USGS gage at Lock 7 near the dam sites, and within the constraints of this scope of work, verification of the existing model was obtained (See Figure C-8). The sub-basin designation, 6-hour unit hydrographs, routing methods, and loss rates for the model (those used for Hurricane Agnes) were all adopted. The model was recorded for the HEC-1DB PMF analysis. In reviewing the regulated outlet rating curves, it was determined the high discharges for this PMF analysis were not adequately described. However, these flows were accounted for by increasing the Modified Puls Method rating curves for these outlets (See Appendix C). In one instance, a rating curve developed for one of these outlets and used by the inspection team on a previous inspection report was substituted into the model.

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 21.5 inches, Hydrometeorological Report (HMR #51) for a 24-hour duration, 200 square mile basin. Loss rates used from the D.E.C. model were in the range of 1.0 inches initial abstraction and 0.1 inches/hour continuous loss rate. Actual values used were those calibrated during the storm of Hurricane Agnes, June 20-26, 1972. Only one multi-plan analysis (.2, .4, .5, .6, .8, 1.0 PMP) was performed; it distributed the rainfall over the 5,100 square mile area. If further in-depth investigations are made, they should attempt to center the storm for critical flows since the major sub-basins lend themselves to such an analysis and a potential for greater run-off. This work effort would be a refinement of the analysis provided herein.

This dam investigation at Lock No. 7 is one of six dam investigations on the Oswego River. These dams are located at Locks 1,2,3,5,6, and 7. The hydrologic analysis provides flood flows up to Lock 1 at Phoenix, New York (Lock 7 is near the mouth of the river at Oswego). It assumes the discharges from the 6-hour time increment PMF hydrographs will effectively be the same for all the dam sites since the upstream run-off area is over 5,000 square miles and the downstream run-off area is about 100 square miles. The results of the analysis have been compared to the USGS gage discharge-frequency plot results at Lock 7 (See Figure 14).

5.3 SPILLWAY CAPACITY

The spillway is a crested spillway which reaches across the effective width of the river, a distance of 500.0 feet. Since the dam is a slightly curved gravity dam and has a 250 foot side channel spillway, the effective crest length is 767 feet. The side channel spillway design head was estimated from the geometry of the section, and computed to be at 8.00 feet (no plans are available, taken from photographs). Subsequently, discharge coefficients were computed in the range of 3.30 to 4.23. The overflow spillway discharge coefficient was 3.3.

Submergence was checked and found not to be effective up through the PMF. At the top of dam elevation, the overflow spillway capacity was computed at 38,000 cfs, with the side channel the total capacity is 62,500 cfs. Certain plans for these six dams, some of which were constructed under a single contract, call out the original design flood as 30,000 cfs. The side channel spillway was apparently added sometime after. The gage at Lock 7 has recorded no events greater in magnitude than the total spillway top of dam capacity. The PMF magnitude was computed at 81,900 cfs while the 1/2 PMF flood was computed at 46,800 cfs.

SPILLWAY CAPACITY

	<u>Discharge</u>	<u>Without Flashboards Capacity as % of PMF</u>
PMF	81,900 cfs	76%
1/2 PMF	46,800 cfs	133%

The inspection team found no plans for the side channel spillway. In performing and reviewing the above analysis a slight discrepancy may have been discovered in assuming the side channel spillway crest is the same as the main dam spillway. It may likely be a foot higher as can be observed in the photographs provided in this report. No effort has been made in this report to resolve this problem. The result is that the dam is still capable of passing the 1/2 PMF even with a 1 foot error in the assumed elevation. If during a major flood the flashboards stand up, dam overtopping would result at a flow lower than 35,000 cfs. Niagara Mohawk Power Corporation indicates the flashboards were designed to fail with 1.5 feet of head. The flashboard system consists of solid steel pins with steel poles, 1-3/4 inches o.d., spaced 5.5 feet o.c. with wood flashboards. The dam is stable at the 1/2 PMF flow.

5.4 RESERVOIR CAPACITY

The reservoir storage at top of dam is estimated at approximately 650 acre feet in the river channel. Lock 6 is approximately 1/2 mile upstream where the Upper Oswego Dam (High Dam) is located.

5.5 FLOOD OF RECORD

Floods are measured at USGS gaging station 04249000 at Lock 7. The gage datum is 246.0 ft.; the drainage area of the gage is 5121 sq. mi.; the period of record is from 1934 to present. The records through 1974 show that 4 events have had flood discharges in excess of the dam's original design flood. None were greater than the existing top of dam discharge capacity.

March 28, 1936	37,500 cfs
April 10, 1940	35,000 cfs
June 27, 1972	34,300 cfs
April 4, 1960	31,200 cfs

A Corps of Engineers' investigation entitled Post Hurricane Agnes, June 20-26, 1972 Investigations indicated only \$14,000 in damages occurred in the reach from Lock 1 through Lock 7 to Lake Ontario.

5.6 OVERTOPPING ANALYSIS

The HEC1-DB analysis indicates that the dam would be overtopped as follows:

<u>OVERTOPPING IN FEET</u>	
PMF	1.4
1/2 PMF	None

According to this analysis, the dam has not been overtopped to date since the top of dam discharge capacity is around 62,500 cfs. The dam would not be overtopped with a 1/2 PMF flood.

5.7 EVALUATION

The spillway is inadequate to pass the Probable Maximum Flood (PMF) without overtopping the dam. However, based on the Corps of Engineers' Screening Criteria, it is not considered seriously inadequate since the spillway will pass the 1/2 PMF without overtopping the dam.

SECTION 6 - STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

a. Visual Observations And Data Review

The dam facility was observed under drawn down conditions, so that the downstream faces of the main curved dam spillway and side dam spillway were visible. The upstream faces of these structures were below water. The sections visually retain stability, with the construction materials generally in good condition. Leakage does occur through joints in the stone of the main curved dam at several locations, but, the condition does not appear to be having an adverse effect on the structure's stability. Seepage was noted at two locations slightly downstream of the block stone spillway apron, but the condition has not had a noticeable structural effect on the dam sections. The poured concrete comprising the visible section of the side dam/spillway is in sound condition.

Some lateral displacement in the stone block headwall for the curved dam's east abutment has apparently occurred. The condition appears to have had no effect on the adjacent dam section.

The navigation channel to Lock 0-7 is located east of curved dam, with the lock being some distance downstream of the dam. A land area separates the channel and the dam's downstream area of river. A poured concrete structure serves as the wall between the ship channel and adjacent land. The surface of the concrete in this channel wall has deteriorated at numerous locations, and limited through-the-wall seepage occurs.

b. Geology and Seismic Stability

Curved dam is in the Oswego River drainage basin, located within the Ontario Lowland which is part of the Central Lowland Province. The dam is sited on bedrock which is a fine-grained, well-cemented sandstone, the Oswego Sandstone of Upper Ordovician age. Dip of the unit is less than 1° to the south.

According to the inspection report by Stellato, May 24, 1979, (included in Appendix B), the apron's stone masonry blocks are bolted to bedrock and pinned together. It is also indicated that in 1894, the joints in the sandstone bedrock were to be filled with concrete and masonry. It is felt that through-the-dam seepage seen near the apron toe are the result of seepage through bedrock joints where mortar has deteriorated or was not applied. The bedrock is considered as having good bearing capacity and durability, and does not weather nor deteriorate readily. However, poor grouting and under-dam seepage could account for removal of layers of bedrock at the dam's apron.

The stone blocks comprising the downstream face of the dam are limestone. The blocks were observed to be in good condition. Leaks between the blocks are not attributed to block deterioration.

There are no known faults or shear zones in the vicinity of the dam according to the New York State Geologic Map (1970). The Preliminary Brittle Structures Map of the New York State Geologic Survey (1977) indicates a possible fault zone, based on drill hole data, located about 4 miles southeast of the dam.

This area is located near the border of a Zone 2 - Zone 3 designation on the Seismic Probability Map but is most probably in Zone 2. No earthquake activity has been recorded in the vicinity of the dam. The closest earthquake, intensity III (modified Mercalli Scale), occurred in 1925 about 30 miles west of the dam. In 1954, an earthquake of intensity IV occurred about 31 miles to the south. Several other minor earthquakes have occurred in the region, none closer than the two mentioned nor more recent than 1954.

c. Data Review and Stability Evaluation

Design drawings and past reports made available for this study (Figures 2 - 12) provide information on the dam's cross section, construction materials and foundation material. However, properties of the dam materials and foundation rock are not indicated. Stability analysis for curved dam are not included, but such computations for the subsequently constructed side of the spillway are shown. As part of the present study, stability evaluations for the curved dam have been performed. Where data necessary for analysis was lacking, practical assumptions have been made; properties of the site's dam and foundation materials have not been determined in this investigation. The stability computations utilize a cross-section based on dimensions indicated by the plans included in this report, and assumed the dam section to be a monolith possessing necessary internal resistance to shear and bending occurring as a result of loadings. It should be considered that in areas where deterioration has occurred, section dimensions would be less than indicated by the plans with some adverse effect on the structural strength expected.

The results of stability computations for different loading conditions are summarized in the table below. The stability analysis are included in Appendix D.

RESULTS OF STABILITY COMPUTATIONS

<u>Loading Condition</u>	<u>Factor of Safety*</u> <u>Overturning</u> <u>Sliding**</u>	<u>Location of Resultant***</u> <u>Passing through Base</u>
(I) Water elevations at normal operating levels, uplift on base plus 7.5 kip per lineal foot ice load acting	3.0+(1) 1.25+(2)	0.33(b)(2)
(II) Water elevations at 1/2 PMF level, uplift acting on base as computed for normal operating conditions.	4.7(1) 1.37(2)	0.33b(2)
(III) Water elevations at PMF levels, uplift acting on base as computed for normal operating conditions.	4.1+(1) 1.27+(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)Based on full passive resistance developed by a downstream apron monolith, see Appendix D.

(2)Based on 20 percent or less partial passive resistance developed by downstream apron, see Appendix D.

The analysis indicates the dam is stable under forces expected under normal operating conditions (including ice), and the 1/2 PMF and PMF condition.

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 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 pressure was assumed to vary linearly between the dam's upstream and downstream corners, and act upon 100 percent of the dam base. The resulting uplift force represents a condition that is significant in arriving at the computed factors of safety against overturning.

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.

Consideration of the field observations and stability analysis indicate the need for some corrective measures to improve the stability of the curved dam. Paths of under-dam seepage should be sealed, for it is expected that the uplift pressures acting at locations of such flow during flood conditions would be greater than the uplift assumed in analysis, and is a condition which could effect stability and cause progressive deterioration of the structure. Similarly, open joints in dam masonry should be mortared to assure the structural integrity of the dam section is retained. Masonry repair/maintenance should extend to the abutment headwall at the dam's east end. Similarly, corrective measures to correct the leakage condition occurring in the shipping lock's channel wall should be undertaken.

SECTION 7 - ASSESSMENT/REMEDIAL MEASURES

7.1 DAM ASSESSMENT

a. Safety

This Phase I inspection of the Curved Dam at Lock 7 did not indicate conditions which constitute an immediate hazard to human life or property. However, the through-the-dam seepage condition could develop into a hazardous condition at some time in the future. The dam would not be overtopped by the 1/2 PMF and can safely discharge 76 percent to the PMF. Therefore, the spillway is not considered seriously inadequate, based on the Corps of Engineers' Screening Criteria.

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

1. Four leaks were found in the downstream spillway face of the dam. Seepage is occurring through deteriorated masonry joints.
2. At two locations, through or under the dam flows were observed at the toe of the apron in the center of the dam.
3. Masonry units on the east abutment show some settlement. An abutment masonry unit is missing at the location of the apron.
4. A boil was discovered in a land area adjacent to the navigation channel on the riverside of the concrete wall midway between the dam and the lock.
5. The dam visually conforms to the plans except that a side channel spillway, 250 feet in length, has been added to the west side of the dam, parallel to river channel flow.
6. The mechanical equipment of the locks is in operating condition.

b. Adequacy of Information

The information available is adequate for this Phase I investigation, although plans were not available for the side channel spillway. Information was in general, limited to construction plans.

c. Urgency

The through-the-dam seepage condition needs to be further evaluated. This investigation should be undertaken immediately and completed within one year from notification. Upon completion of the investigative phase, required design and construction should commence and the remedial work should be completed within two years of notification.

d. Need for Additional Investigation

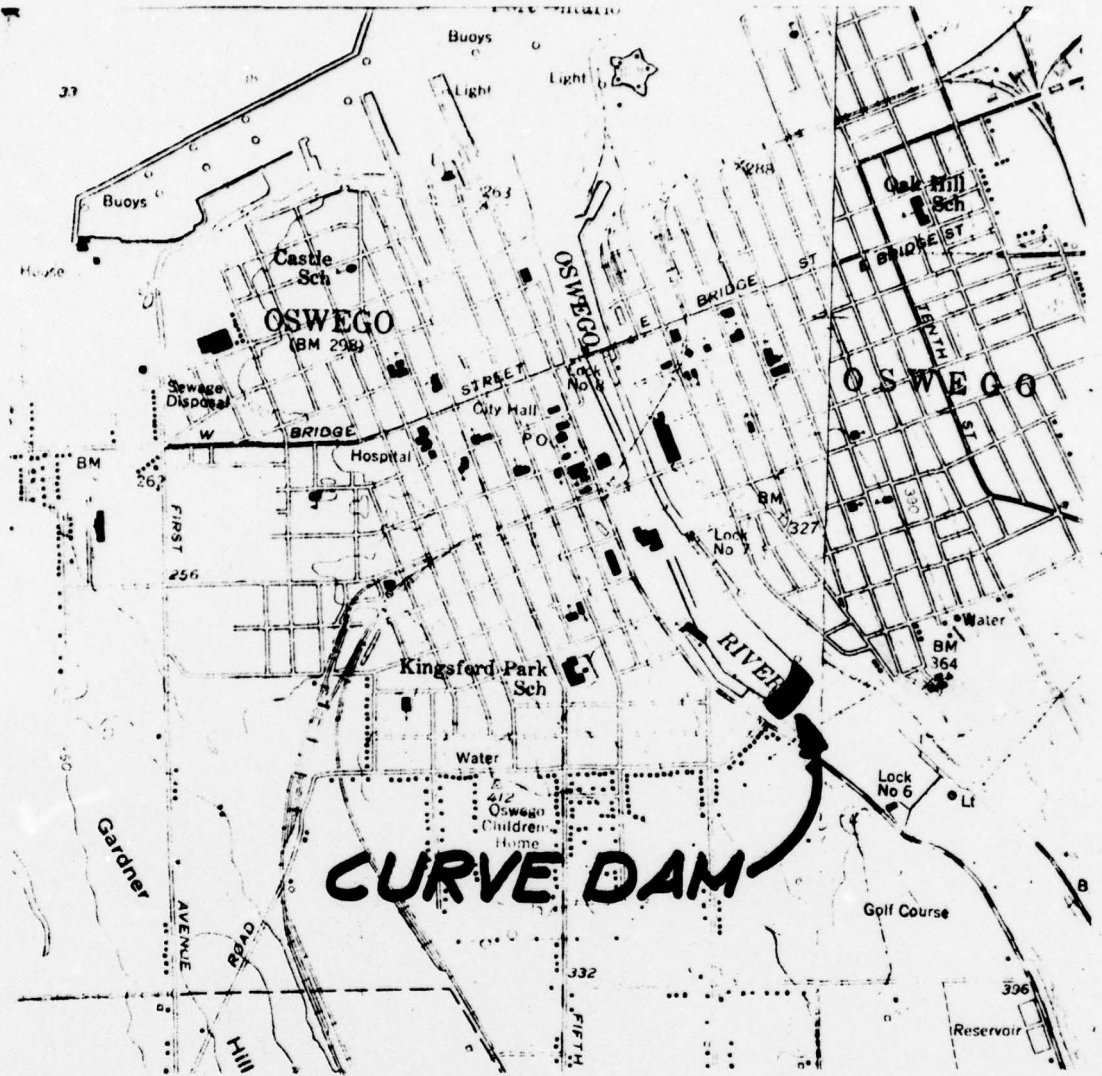
To prevent the development of potentially hazardous conditions, seepage condition investigations should be performed to determine remedial measures to repair the seepage and evaluate the existing stability of the spillway. This work should include subsurface investigations involving borings.

7.2 REMEDIAL MEASURES

- a. Results of the aforementioned investigations will determine the remedial measures required.

The following improvement needs have been identified:

1. Seepage and leaks through and beneath the dam should be repaired.
2. The east abutment masonry units should be aligned and the missing masonry unit replaced.
3. The boil on the riverside wall of the navigation channel should be investigated and the condition corrected.



VICINITY MAP

LOCATION PLAN

FIGURE 1

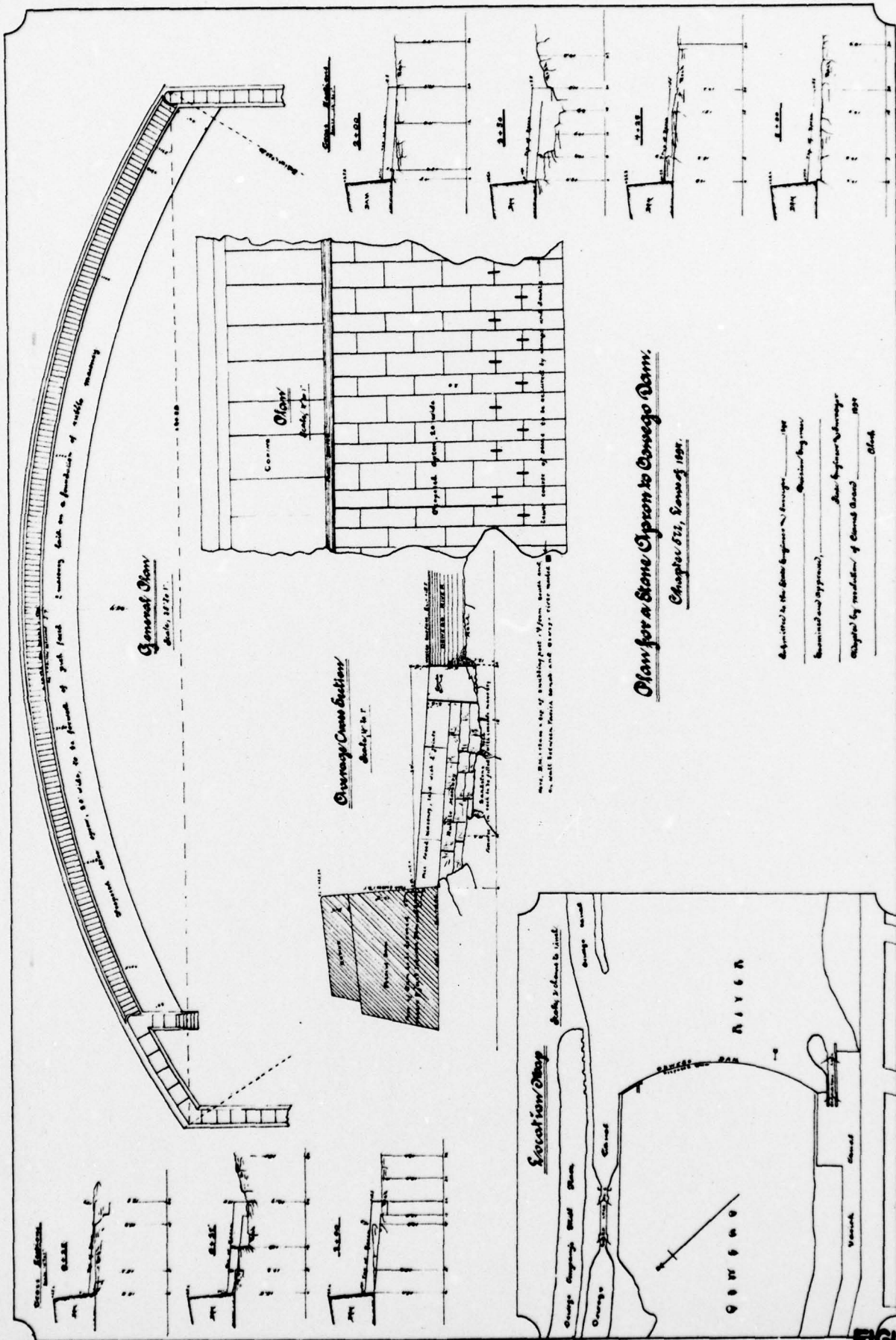


FIGURE 2

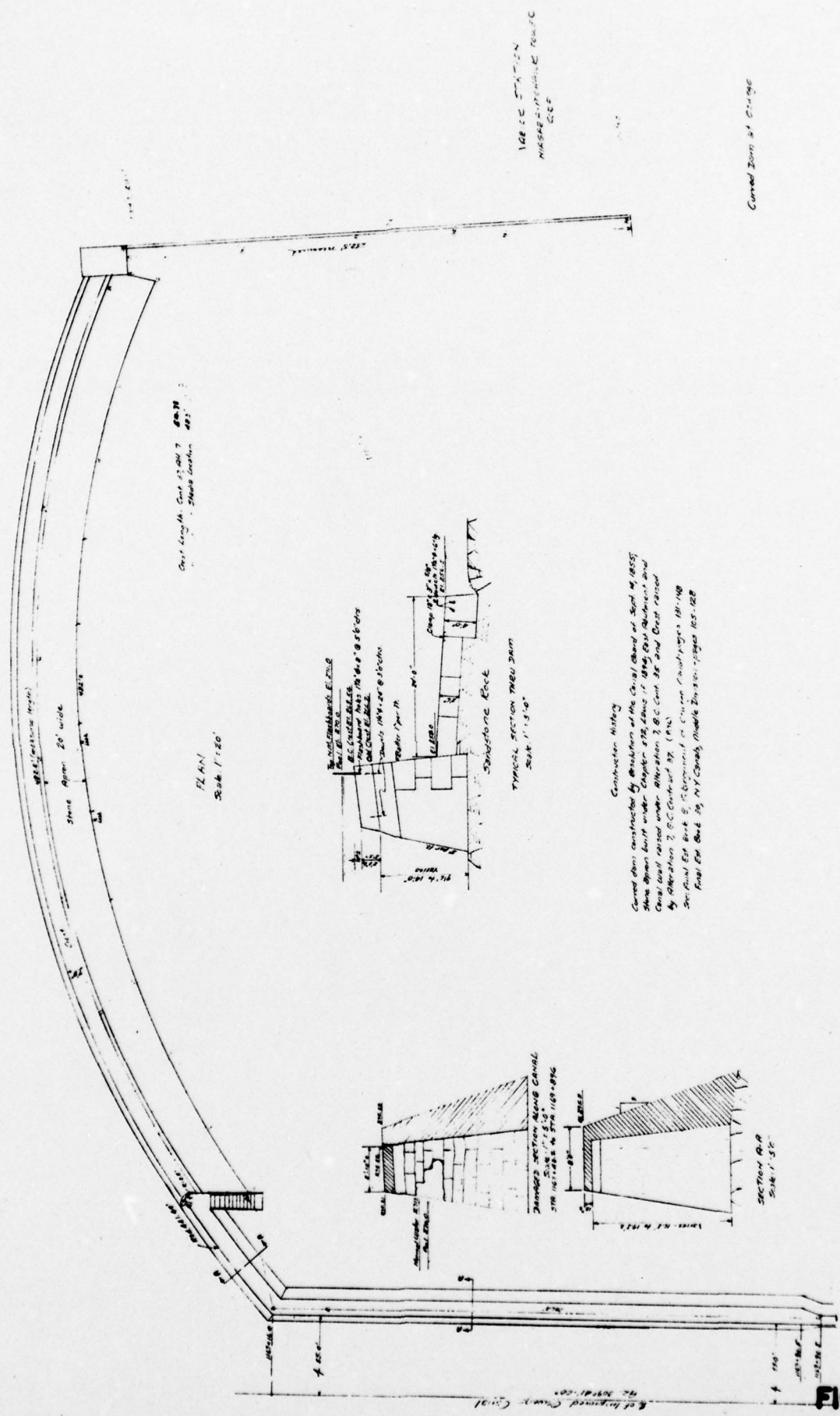
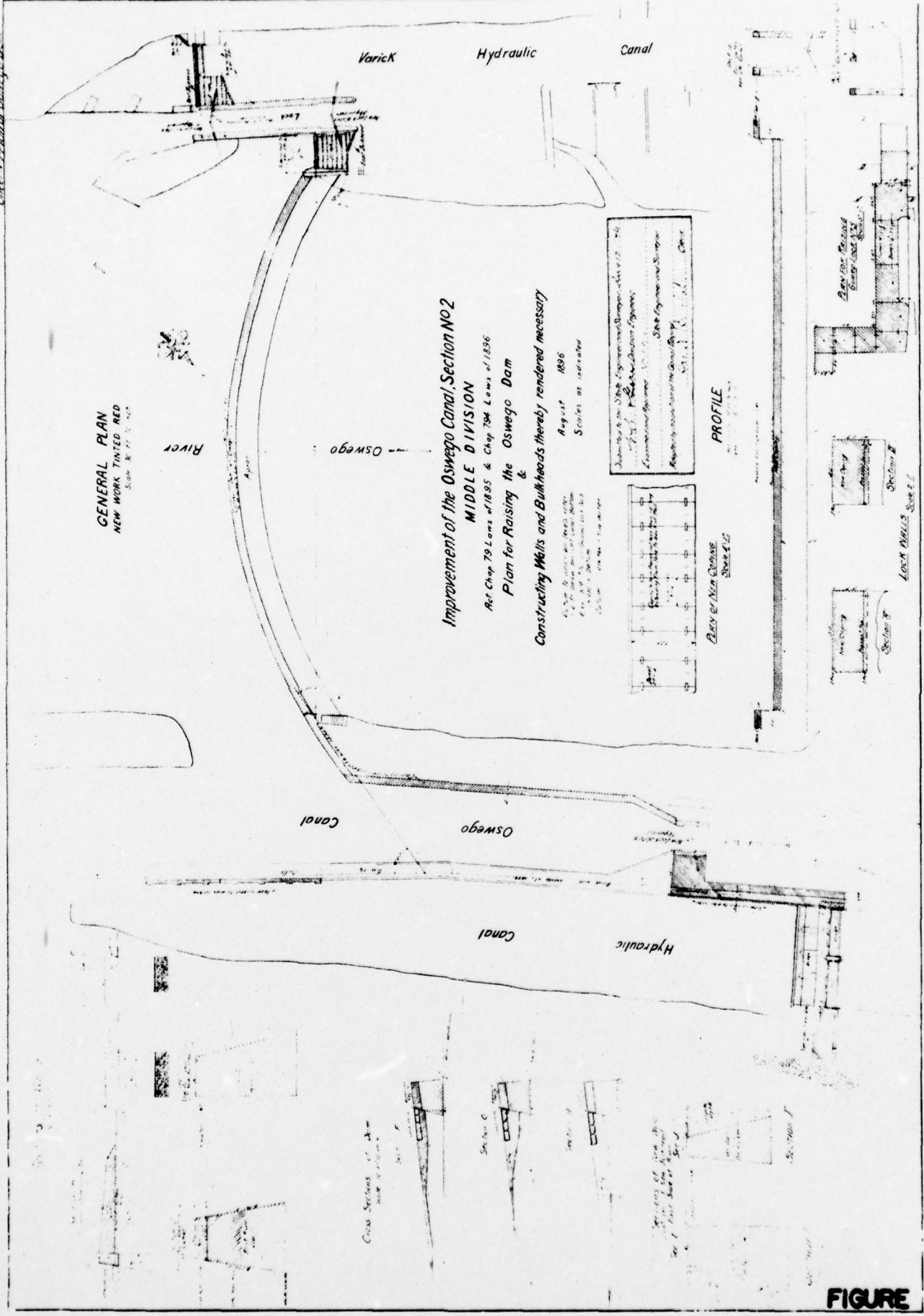


FIGURE 3

Structural Design D.



GENERAL PLAN
NEW WORK TINTED RED
Scale 3/4" = 1'-0"

Improvement of the Oswego Canal, Section No. 2
MIDDLE DIVISION

Act Chap 79 Laws of 1895 & Chap 704 Laws of 1896

Plan for Raising the Oswego Dam

&
Constructing Walls and Bulkheads thereby rendered necessary

August 1896
Scales as indicated

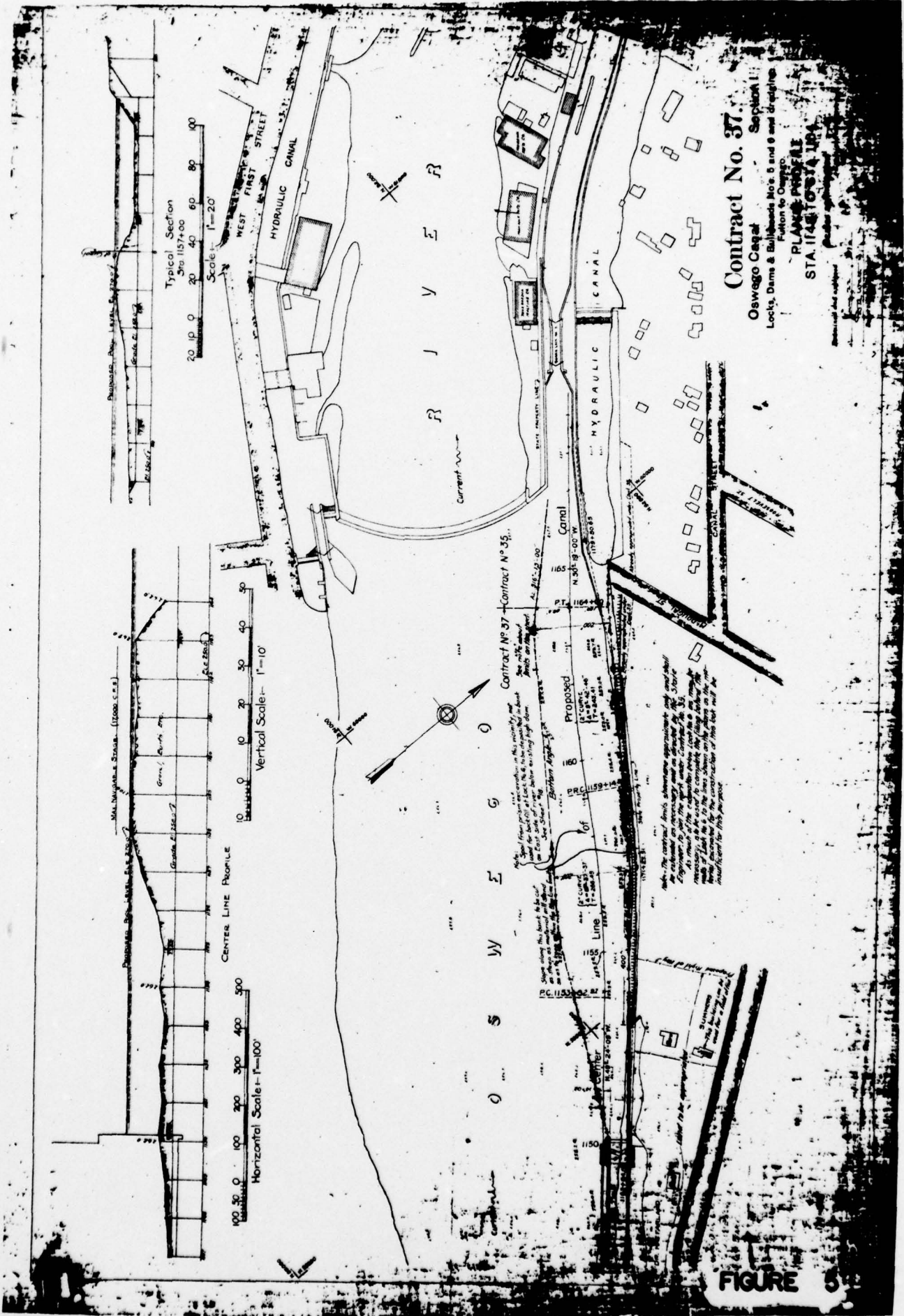
Examined by the State Engineer and Surveyor
Approved by the State Engineer and Surveyor
Approved by the State Engineer and Surveyor
Approved by the State Engineer and Surveyor
Approved by the State Engineer and Surveyor
Approved by the State Engineer and Surveyor

PROFILE

PIERS OR NEW DAMS
Scale 1/2"

LOCK WELLS
Scale 1/2"

FIGURE 4



Contract No. 37
 Oswego Canal Section I
 Locks, Dams & Buildings Nos. 5 and 9 and dredging
 Fulton to Oswego.
PLANS PROFILE
STA. 1148 TO STA. 1154

FIGURE 5

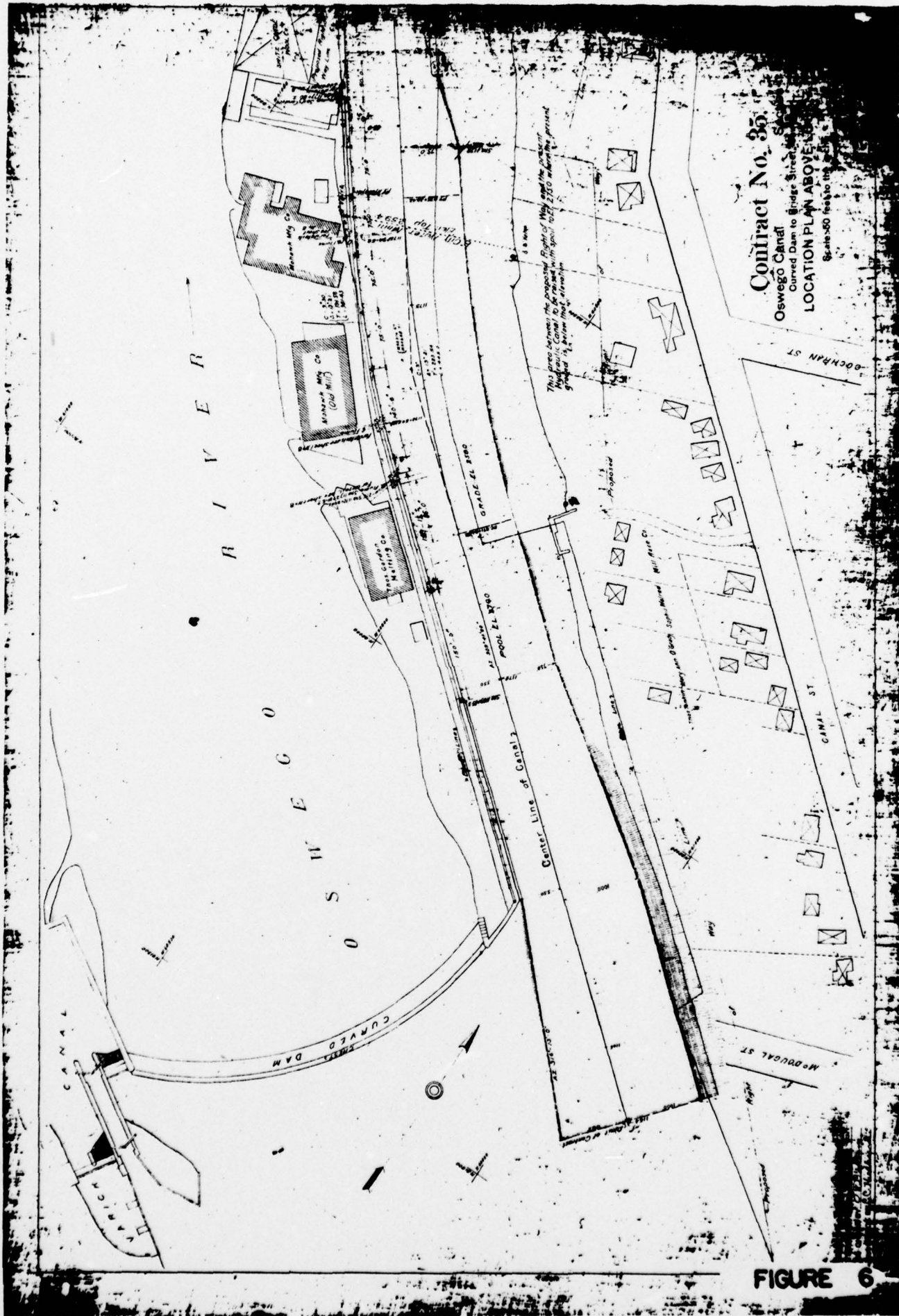


FIGURE 6

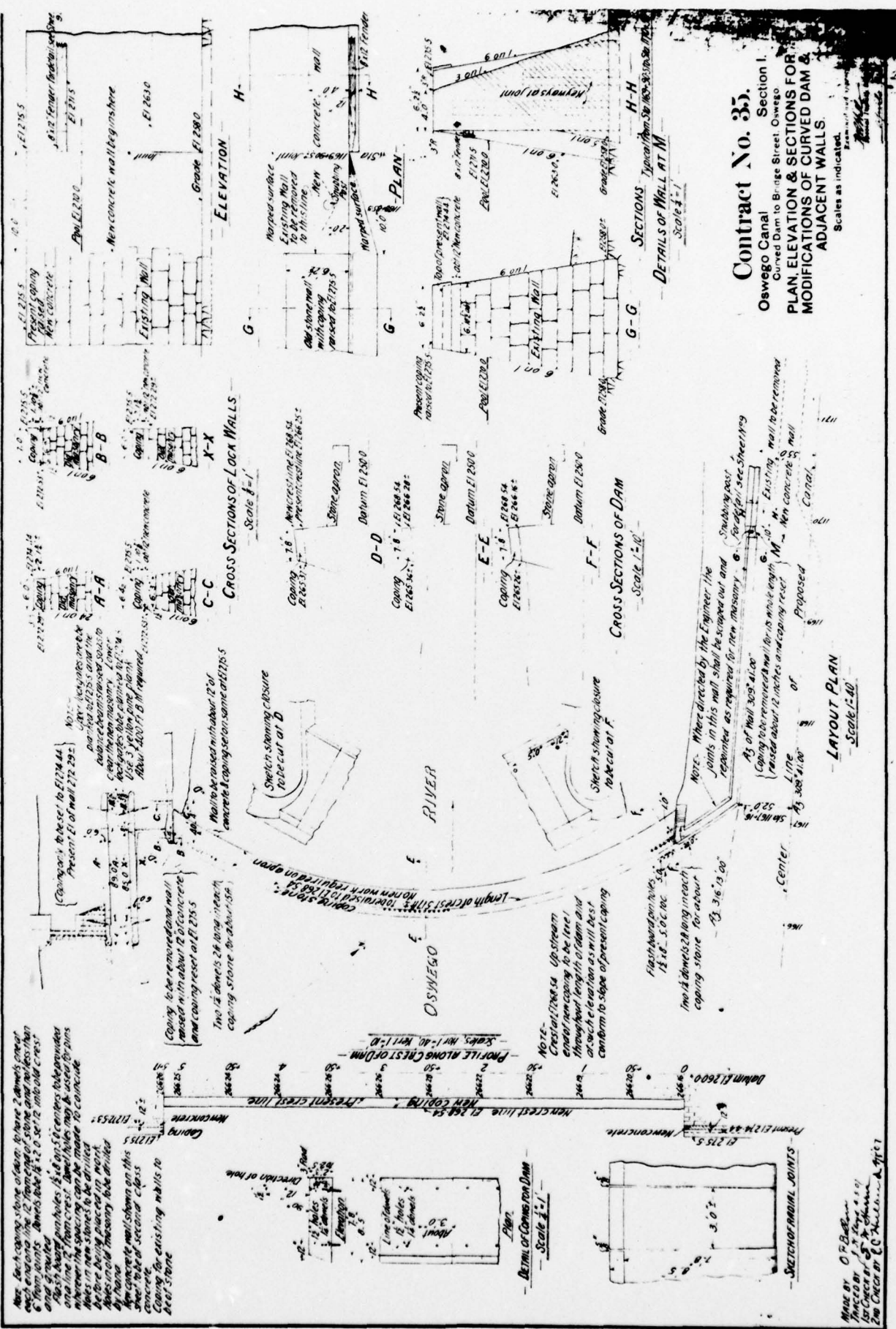
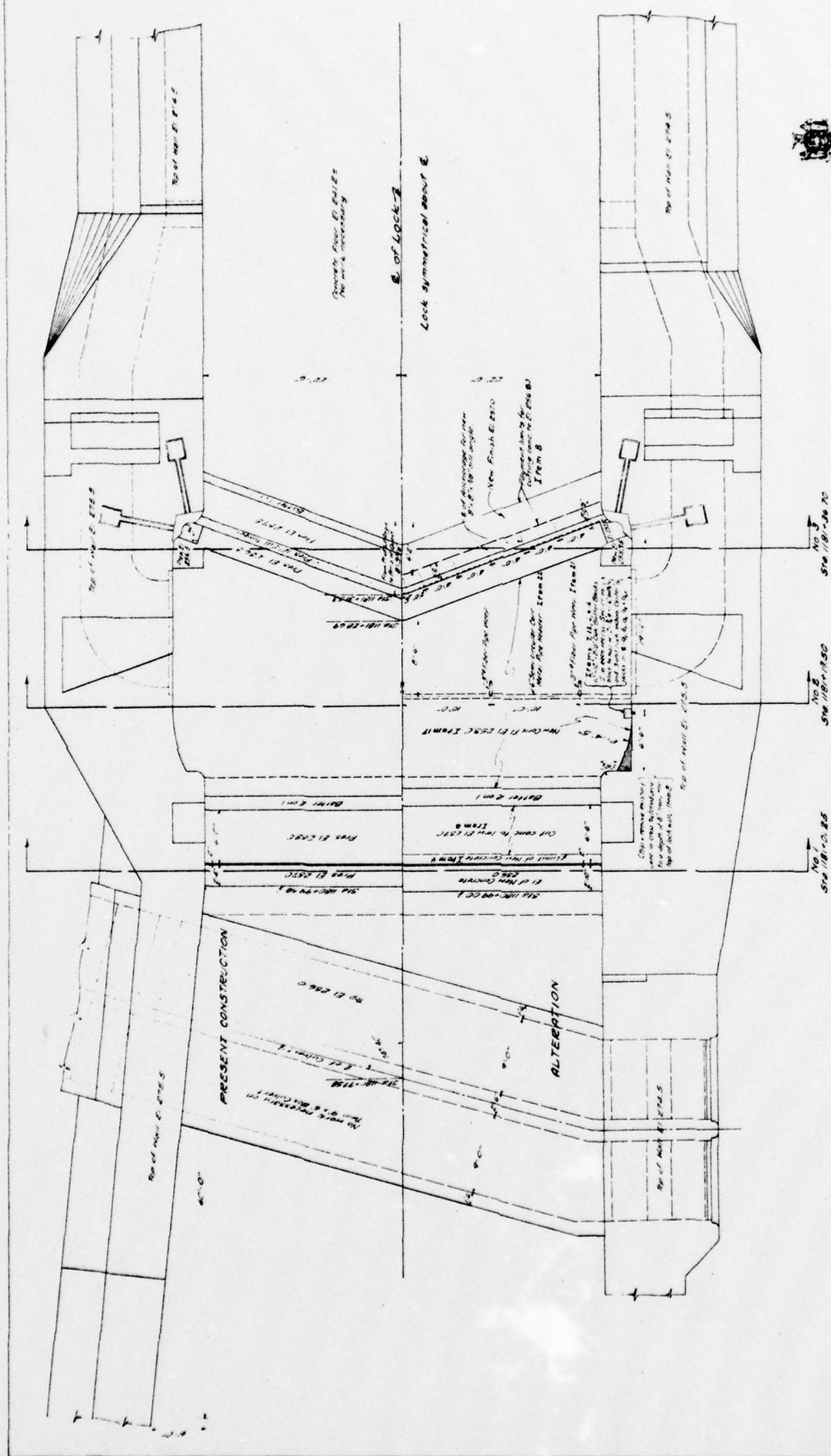


FIGURE - 7



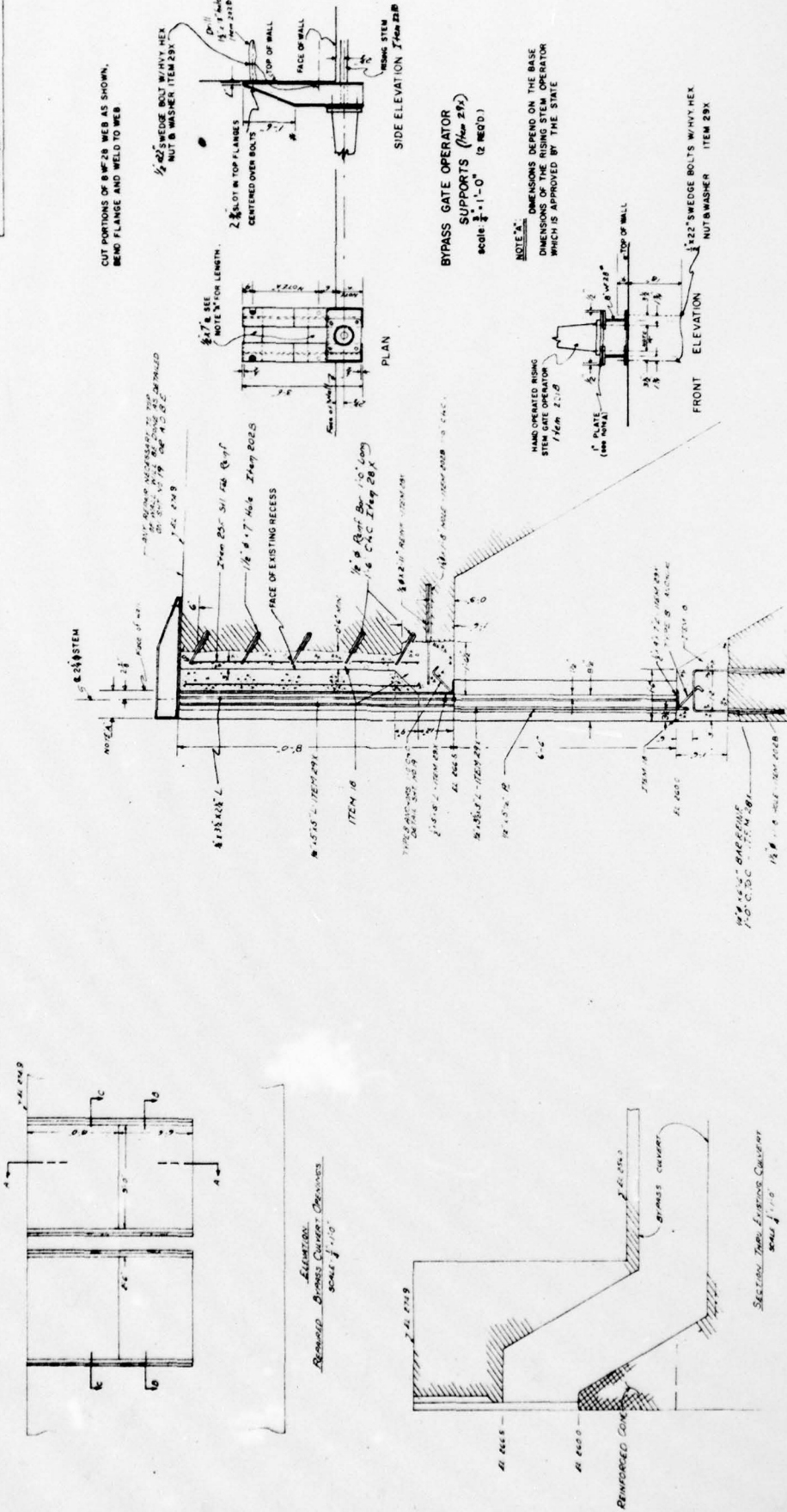
STATE OF NEW YORK
 DEPARTMENT OF PUBLIC WORKS
 BARGE CANAL IMPROVEMENT
 CHAPTER 482 LAWS OF 1924 AS AMENDED
CONTRACT U.S. 101
 For New Gates and Lowering Upper Sill &
 Miscellaneous Work at Lock 0.7
OSWEGO CANAL
 Oswego County New York



PLAN - UPPER END OF LOCK 3 OSWEGO CANAL
 Sheet No. 11

FIGURE 8 F

M 70-9		REV. NO.	DATE	BY	CHKD.	TOTAL
		1	11/1	W. J. BROWN	W. J. BROWN	66
CONTRACT		M 70-9				
PROJECT		REPAIRS OF BYPASS CULVERT INLET				
DRAWING NO.		M 70-9-01				



REPAIRS OF BYPASS
CULVERT INLET

SECTION A-A
SCALE 1/4" = 1'-0"

Prepared pursuant to the (CSDU) laws and recommended
by W. J. BROWN, District Engineer, District No. 7
November 1, 1970
W. J. BROWN

IN WITNESS WHEREOF, I have hereunto set my hand and the seal of the District Engineer, District No. 7, at the City of St. Louis, Missouri, this 1st day of November, 1970.
W. J. BROWN, District Engineer

FIGURE 9

21 100

RD NO	DATE	NO. AND PROVING	SHEET NO.	TOTAL SHEETS
CONTRACT M70-9	1930	2nd	2nd	66

of 120-017

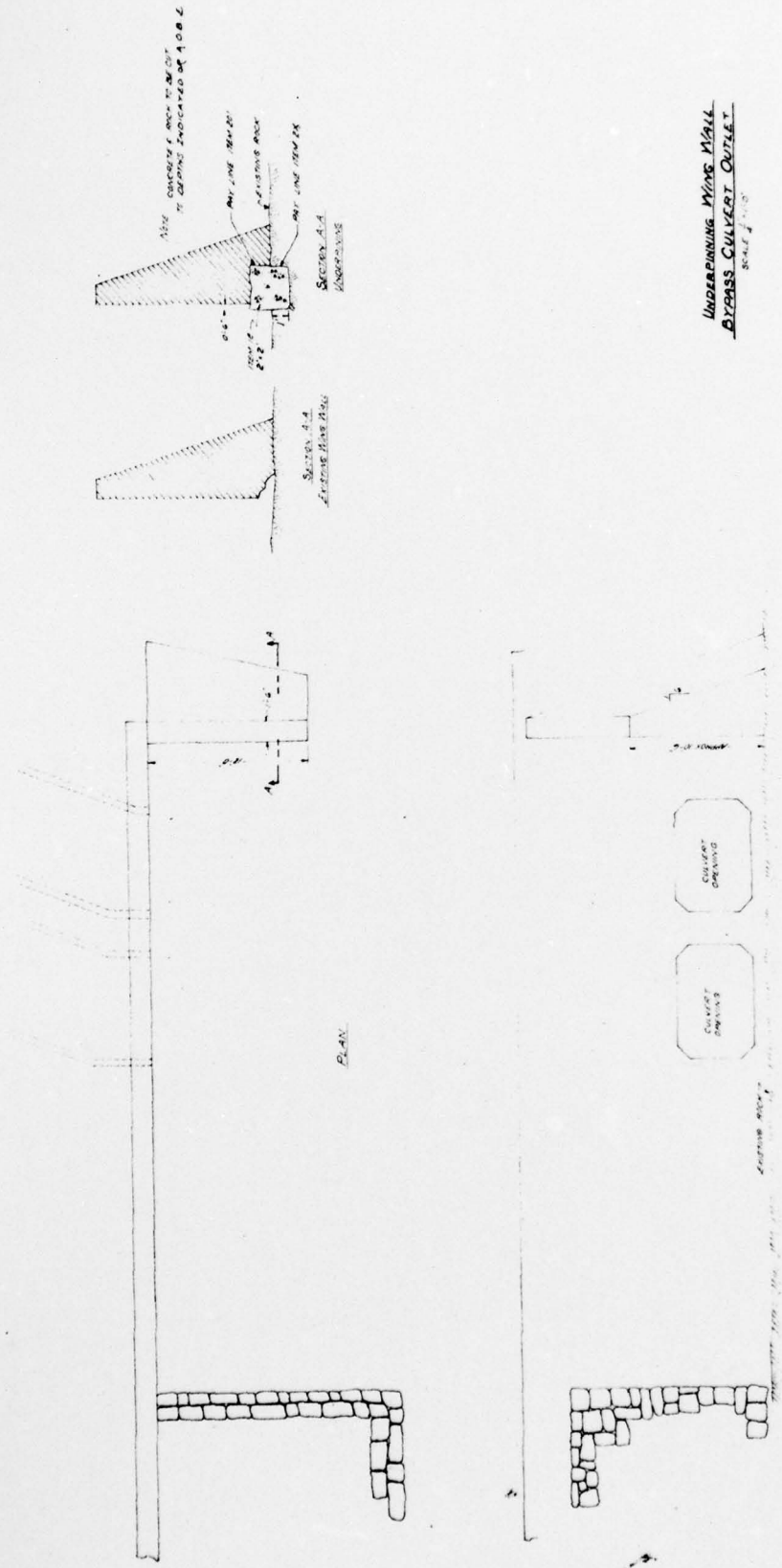


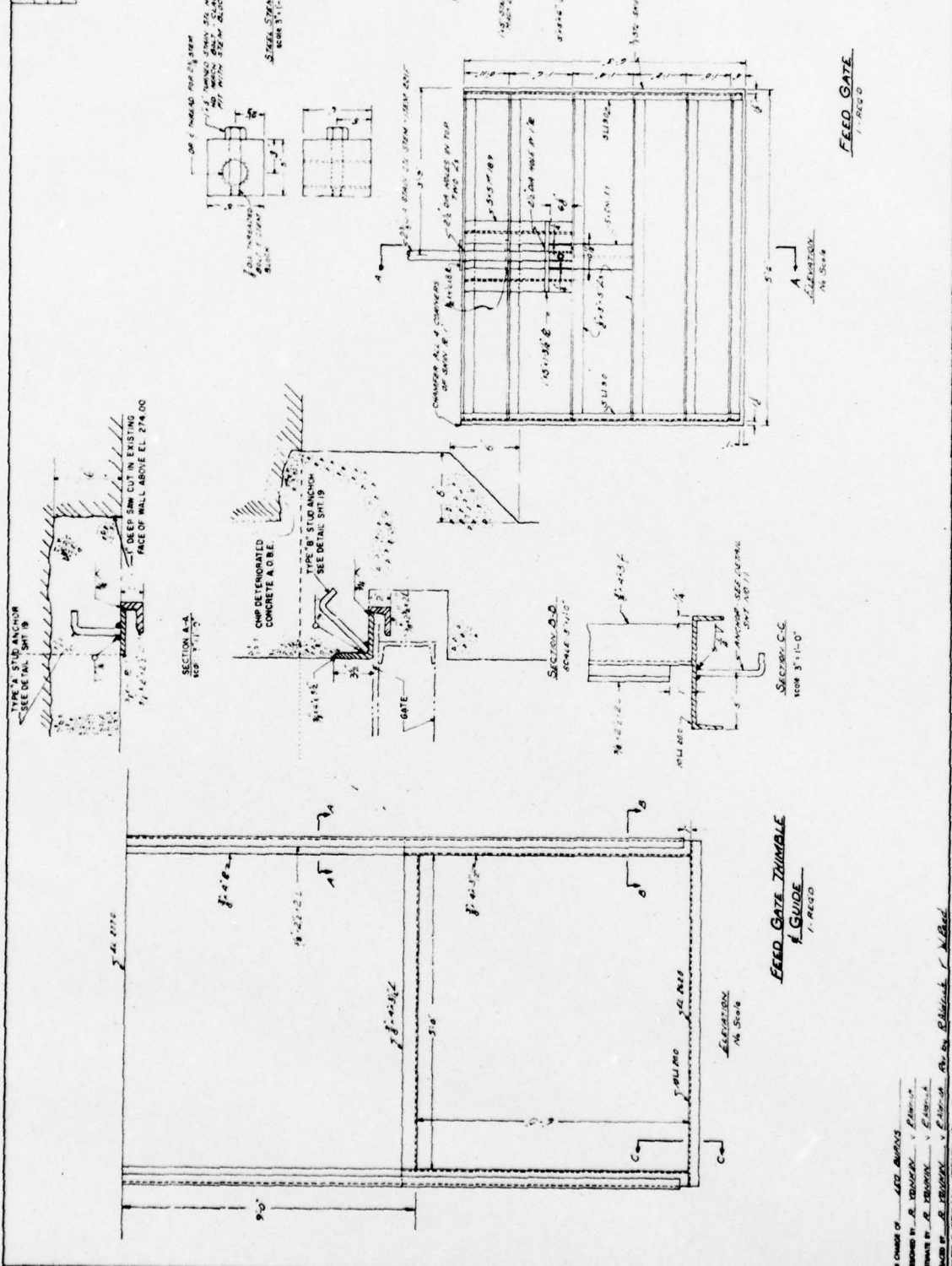
FIGURE 10

Prepared pursuant to the plans, lists and specifications by the U.S. Highway Bureau, under contract M70-9, 1930.

IN CHARGE OF: *W. L. BROWN*
 DRAWN BY: *W. L. BROWN*
 CHECKED BY: *W. L. BROWN*
 APPROVED BY: *W. L. BROWN*

By *W. L. BROWN* and *W. L. BROWN*

REV.	DATE	BY	CHKD.	NO.
17	66			
CONTRACT NO. 9 AND ADDENDUM NO. 1				
DATE: 07-20-67				



IN CHARGE OF: **LEO BARNES**
 DESIGNER: **A. YOUNG**
 CHECKER: **R. YOUNG**
 MADE BY: **R. YOUNG**

APPROVED: **R. YOUNG**
 PROJECT: **REHABILITATION OF**

PREPARED PURSUANT TO THE ORDER OF THE BOARD OF SUPERVISORS
 COUNTY OF ALBANY, N.Y.
 DRAWING NO. 12

FIGURE 12

CONTROL STRUCTURE AT LOCK 0-7, OSWEGO
(FROM N.Y.S.D.E.C.)

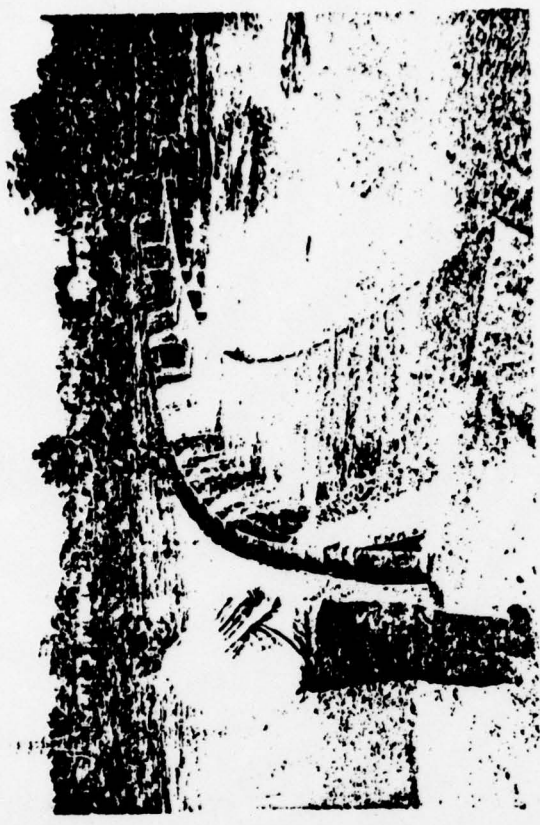
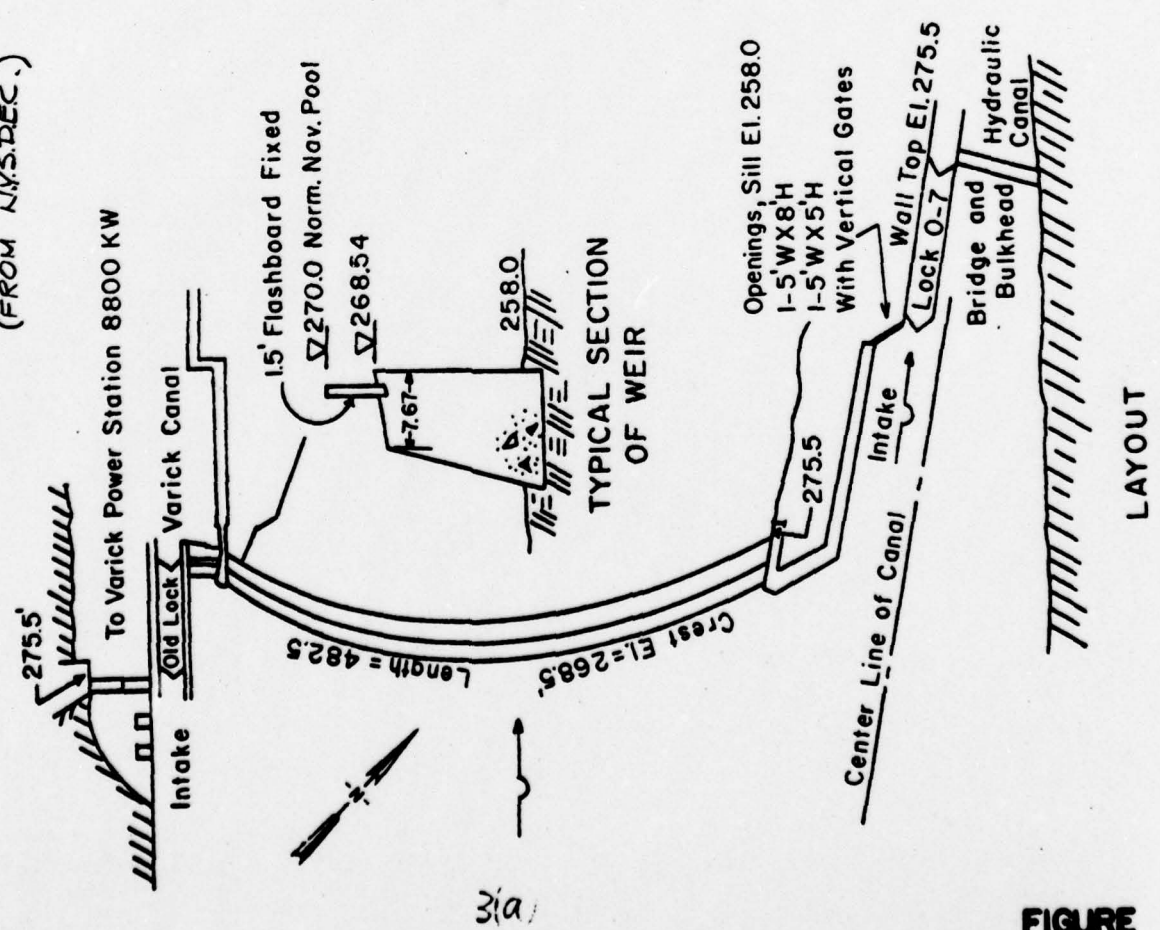
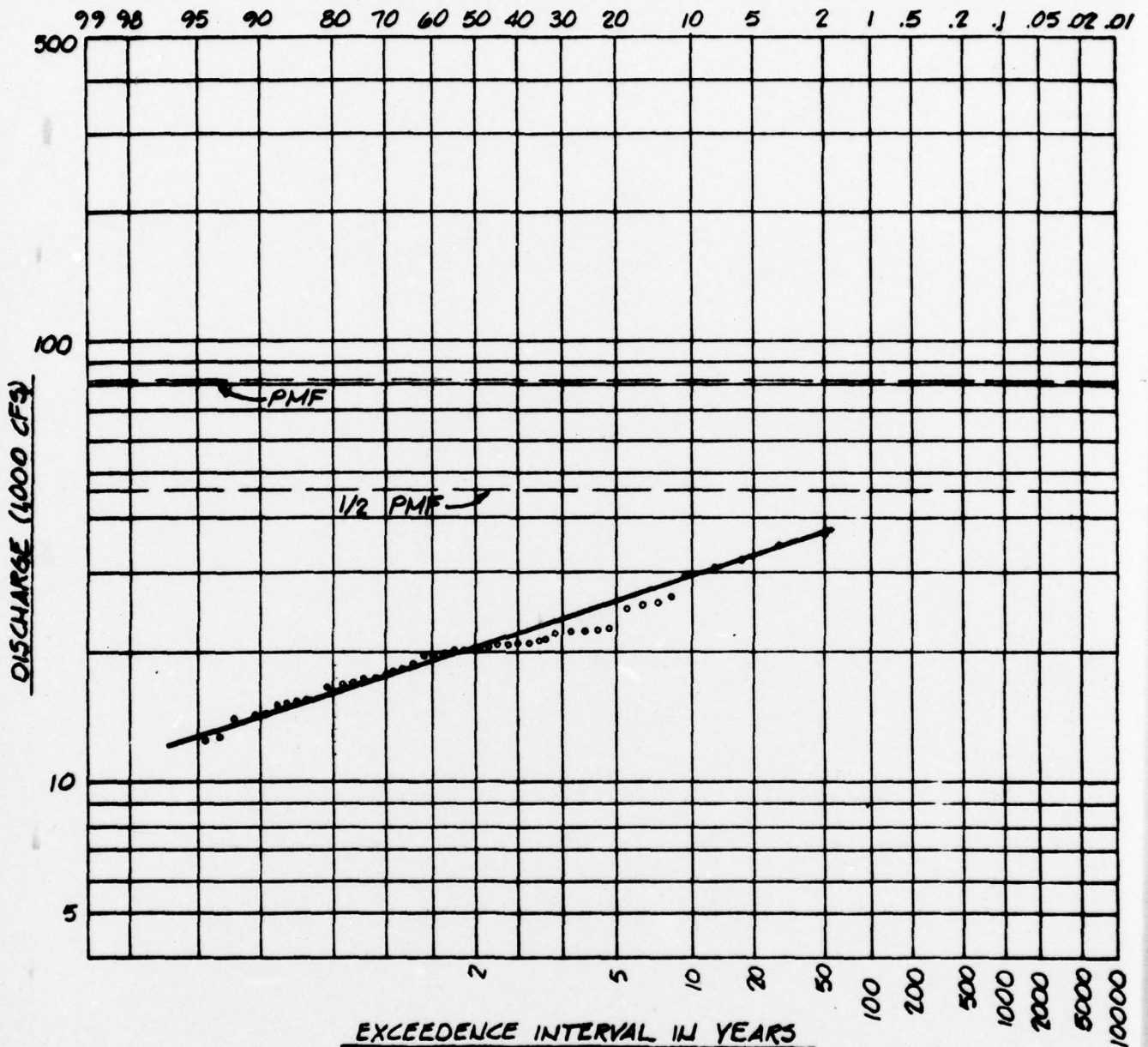


FIGURE 13

EXCEEDENCE FREQUENCY PER 100 YEARS



EXCEEDENCE INTERVAL IN YEARS

USGS GAGE
 STATION 04249000
 TOTAL DRAINAGE AREA = 5121 SQ MI
 GAGE DATUM = 246.0 FT
 PERIOD OF RECORD = 1934 - 1974

DISCHARGE - FREQUENCY
CURVE



STETSON · DALE

DATE 6.28.79

DRAWN JPG

JOB 2305

FIGURE 14

OSWEGO
 RIVER
 LOCK #7

APPENDIX A
FIELD INSPECTION REPORT

**CHECK LIST
VISUAL INSPECTION**

PHASE 1

Name Dam Lower Oswego (Curved Dam) at Lock 7 County Oswego State New York ID # 398

Type of Dam Masonry Gravity Overflow Hazard Category High

Date(s) Inspection (1) May 31, 1979
(2) June 7, 1979 Weather Sunny Temperature 70's

Pool Elevation at Time of Inspection (1) 271.7 * (2) 265 M.S.L. Tailwater at Time of Inspection (1) 256.90*
(2) Dry bedrock

Use of Dam: Hydro Power, Navigation Lifts: Lock 8 to 7 10.8 feet

This inspection does not pertain to an independent evaluation of the condition of the lock or hydropower facility.

Inspection Personnel:

- (1), (2) F.W. Byszewski - Stetson-Dale (1), (2) Richard Aldrich N.Y.S.D.O.T., Region 3
- (1), (2) N.F. Dunlevy - Stetson-Dale (2) Robert McCarty N.Y.S.D.E.C., Dam Safety Section
- (1), (2) D.F. McCarthy - Stetson-Dale
- (1), (2) H. Muskatt - Stetson-Dale

*Barge Canal Datum (USGS + 0.99 feet)

N. F. Dunlevy Recorder

CONCRETE/MASONRY DAMS

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
ANY NOTICEABLE SEEPAGE	Seepage observed at a number of locations through the masonry. These locations were in the center 2/3 of the dam and the point where the wall meets the apron and three-four feet above the apron on the wall.	The water level was lowered below the spillway crest so that the flashboards could be re-placed. Therefore the head was at or near the spillway crest at the time of observation.
STRUCTURE TO ABUTMENT/EMBANKMENT JUNCTIONS	Some movement of the layed up stone work was observed. A stone just beyond the apron is missing and this may be the cause of the movement.	
DRAINS	None observed.	
WATER PASSAGES	Water passages are not located in the dam section but are found in the lock area on the east side of the river and at the hydropower station on the west side.	
FOUNDATION	Two boils were observed in the center of the dam just beyond the apron. This area is entirely bedrock. No other foundation problems observed.	These conditions observed with the spillway in a non-overflow condition.

CONCRETE/MASONRY DAMS

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SURFACE CRACKS CONCRETE SURFACES	The dam section contains no concrete surfaces. The navigation channel approaching the lock has some seepage and spalled concrete surfaces. Minor seepage was observed in the wall midway along the upstream channel on the river side.	The navigation channel below the lock has a deteriorated wall adjacent to the municipal parking lot. The downstream lock abutment wall has cracks and spalling, some movement noted. This area seems to have a lot of people milling about since it's located in the middle of the city.
STRUCTURAL CRACKING	None observed in spillway area of dam.	Comments are pertinent to use of space during operating conditions with limited hazard to navigation system users and fishermen in the area as well as limited of downtown area by residents of community.
VERTICAL & HORIZONTAL ALIGNMENT	Good alignment observed. No visible signs of instability observed.	
MONOLITH JOINTS	None.	
CONSTRUCTION JOINTS	See Sheet 1 for elevations.	
STAFF GAGE OF RECORDER		

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 ALIGNMENT 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 (overflow spillway across face of dam)	Seepage noted, thru and below weir noted, some limited movement and separation observed.	Seepage should be eliminated.
APPROACH CHANNEL	Pool area of dam.	Flashboards are used to raise pool elevation for hydro production.
DISCHARGE CHANNEL	Founded on bedrock.	
BRIDGE AND PIERS	None across dam.	

GATED SPILLWAY

Exists with hydropower station. Reservoir cannot be entirely drawn down without damage to power station or locks.

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONCRETE SILL	No observations.	
APPROACH CHANNEL	No observation.	
DISCHARGE CHANNEL	No observations.	
BRIDGE AND PIERS	No observations.	
GATES AND OPERATION EQUIPMENT	No observations.	

OUTLET WORKS

Same comment as for gated spillway.

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CRACKING AND SPALLING OF CONCRETE SURFACES IN OUTLET CONDUIT	No observations.	
INTAKE STRUCTURE	No observations.	
OUTLET STRUCTURE	No observations.	
OUTLET CHANNEL	No observations.	
EMERGENCY GATE	No observations.	

DOWNSTREAM CHANNEL

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONDITION (OBSTRUCTIONS, DEBRIS, ETC.)	Clear, unobstructed channel.	
SLOPES	Navigable waterway. Dam 0.7 miles from Lake Ontario.	
APPROXIMATE NO. OF HOMES AND POPULATION	Center City of Oswego streets slope towards river. Not a wide flood flow area.	Threshold of property damage estimated at 5-10 feet above river.
	Type of improvements in floodway	-marina -occupied dwellings -industrial buildings -commercial buildings
	Loss of life potential - likely greater than 4. Economic loss potential less than \$1,000,000 Hazard During Operational Period	High Hazard recommendation. Appreciable Economic Loss Recommendation. Recreational Boating, Fishing along shoreline.

INSTRUMENTATION

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

RESERVOIR

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SLOPES	River located in shallow gorge Rock outcropping exists on all sides.	No opportunity for landslides.
SEDIMENTATION	No noticeable siltation in lake.	

NAME OF DAM Lower Oswego (Curved D

ID # 398

CHECK LIST
ENGINEERING DATA
DESIGN, CONSTRUCTION, OPERATION
PHASE 1

ITEM	REMARKS
AS-BUILT DRAWINGS	Exists and included in report.
REGIONAL VICINITY MAP	Exists and included in report.
CONSTRUCTION HISTORY	Exists and included in report.
TYPICAL SECTIONS OF DAM	Exists and included in report.
OUTLETS - PLAN - DETAILS - CONSTRAINTS - DISCHARGE RATINGS	Exists and included in report.
RAINFALL/RESERVOIR RECORDS	Exists and included in report.

ITEM	REMARKS
DESIGN REPORTS	None.
GEOLOGY REPORTS	None.
DESIGN COMPUTATIONS HYDROLOGY & HYDRAULICS DAM STABILITY SEEPAGE STUDIES	None.
MATERIALS INVESTIGATIONS BORING RECORDS LABORATORY FIELD	None.
POST-CONSTRUCTION SURVEYS OF DAM	See Report.
BORROW SOURCES	N/A.

ITEM	REMARKS
MONITORING SYSTEMS	None.
MODIFICATIONS	See report for some data.
HIGH POOL RECORDS	No data.
POST CONSTRUCTION ENGINEERING STUDIES AND REPORTS	None.
PRIOR ACCIDENTS OR FAILURE OF DAM DESCRIPTION REPORTS	None reported.
MAINTENANCE OPERATION: RECORDS	See report for information provided.

ITEM	REMARKS
SPILLWAY PLAN SECTIONS DETAILS	See report.
OPERATING EQUIPMENT PLANS & DETAILS	See report.
GENERAL DESCRIPTION OF OPERATING PROCEDURES	Lock operated by N.Y.S.D.O.T. Hydro Power by Niagara Mohawk. Dam owned by N.Y.S.D.O.T. Operation procedures are documented by N.Y.S.D.O.T. Lock operates 15 April to 30 November. Hours 7:00 a.m. to 10:30 p.m. for recreational, and 24 hours for commercial. Lock has been closed only once due to high river discharges
INSPECTION PROGRAM	Inspection performed and report prepared bi-annually by N.Y.S.D.O.T. Maintenance provided when needed by the department.

CHECK LIST
HYDROLOGIC & HYDRAULIC
ENGINEERING DATA

DRAINAGE AREA CHARACTERISTICS: 5100 square miles
ELEVATION TOP NORMAL POOL (STORAGE CAPACITY): w/flashboards (Nav. Season) 290.8
w/o flashboards (Winter Seas.) 290.0
ELEVATION TOP FLOOD CONTROL POOL (STORAGE CAPACITY): -----
ELEVATION MAXIMUM DESIGN POOL: -----
ELEVATION TOP DAM: 275.6*

CREST: Barge Canal Datum (USGS + 0.99 feet)

a.	Elevation	<u>-----</u>	w/o flashboards	<u>268.5</u>
			w/flashboards	<u>271.0</u>
b.	Type	<u>Overflow masonry</u>		
c.	Width	<u>7.67 feet</u>		
d.	Length	<u>482.5 feet</u>		
e.	Location Spillover	<u>Center of dam</u>		
f.	Number and Type of Gates	<u>none</u>		

OUTLET WORKS:

a. Type Through power house, maximum drawdown capacity 6800 cfs
b. Location west side of river
c. Entrance Inverts -----
d. Exit Inverts -----
e. Emergency Draindown Facilities peak 6800 cfs, cannot draw completely down.

HYDROMETEOROLOGICAL GATES:

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

MAXIMUM NON-DAMAGING DISCHARGE: 40,000 cfs (estimated)

*B.C. Datum

APPENDIX B

PREVIOUS INSPECTION REPORTS/RELEVANT CORRESPONDENCE

Lower Pool 255.80

Upper Mitre Sill 257.0

Upper Pool 270.00

Lower Mitre Sill 242.5

6 x 8 valves

- 928 - Gate house painted, Buffer beams painted.
- 930 - Checker plates on anchor recesses. Anchors set for gate "A" frames.
- 931 - Raised capstans from sumps. Installed Lock signal lights and placed angles on wall for wire. Reset buffer beam stop casting at So. end. Unwatered-new rails, wheels, cup and saucer castings under lower gates. Placed conc. floor in bottom of lock chamber. Painted gate house.
- 933 - Overhauled generator nearest door-Shaft machined at shop and new bearings installed. Conc. placed on floor of wheel pit.
- 938 - New shaft installed on #2 turbine.
- 939 - Gate spars replaced with heavier type.
- 941-2 - Lock completely rewired.
- 944 - #2 turbine overhauled and balanced.
- 1945 - Additional snub posts placed along Up. app. wall.
- 1946 - Valves replaced also new seating rails. 2 new light poles placed lower end.
- 1947 - Waste gates-up end repaired and reinstalled.
- 1948 - One Gen. & turbine overhauled. Gate & valve motors overhauled. Light poles cut down, new lamps installed-poles rewired.
- 1949 - Pier light on Up. app. connected to Lock power, tops of several sections of wall resurfaced with up to 2 ft. of new conc.
- 1950 - Lower gates overhauled-gates painted. New anchor rod exten., New Upper sills.
- 1951 - Unwatered, valves overhauled, lower sills repaired, gates painted, new rub sticks, new buffer beam at Up. end, New Lock House, new septic tank.
- 1953 - Gate & Valve motors overhauled, new mot. base up left gate, repaired Lock walls on lower Rt. valve also upper right & left valve with reinf. conc.-Removed old head gates on Up. end of lock and rebuilt walls with reinf. conc.-Installed new storm windows for Lock house. Boxed in and insulated all heat runs. Connected new oil heat plant.-New pier light on upper wall.-Plugged waterpower open. above Lk.
- 1954 - New operating stands, new Up. & Low, gate walks, New stop log for powerhouse. Motors overhauled.
- 1955 - Heat plant installed-Gate between Lk 7 & 8 repaired. Water wheel repaired. New stop logs.
- 1956 - Sealed raceway gates. New elect. service cable installed. Limit switches relocated and rewired
- 1957 - Oil furnaces inst. in lockhouse & powerhouse. Rub sticks replaced. New stop log. Limit switch panels replaced.
- 1959 - Temporary low gate repairs, powerhouse-new roof & painted. New cable duct E. wall. New work bench. Overhauled Gen. & waterwheels.
- 1960 - Pumped-rebuilt valves installed, replaced seating rails, cup wheels & valve shafts,

built up Z bars, new chains. Repaired conc. around up valve pits. Rebushed all anchor arms. Touch up paint on gates, painted trash racks. Refaced 150' top of lock wall. New fuel tanks. Replaced rub timbers.

- 1961 - Contract U.S. 101, New upper sill & steel angle on lower end. Repaired Conc. around anchor arms on lower E. approach wall. Lower approach walls resurfaced. Motors overhauled. ~~Vacuum lines repaired.~~ Painted safety railing on W. wall. New parking area. Built curbing & put in new lawn.
- 1962 - Waterwheels inspected & repaired. 8 motor control panels rewired. Gate machinery rebuilt. Conc. repaired on up. W. wall. Machinery and Motor box raised on upper W. Gate. Trash can enclosures built.
- 1963 - Up gate mach. raised, valves replaced, seal strips replaced. Conc. around anchor arms repaired.
- 1964 - Conc. repairs to up. E. appr. wall, new trash racks on powerhouse intakes.
- 1965 - Conc. repaired around up. & low anchor arms.
- 1967 - Steel repairs to gate recess.

(NOTICE: After filling out one of these forms as completely as possible for each dam in your district, return it at once to the Conservation Commission, Albany.)

STATE OF NEW YORK
CONSERVATION COMMISSION
ALBANY

DAM REPORT

13 Oswego

5/17/1915
(Date)

CONSERVATION COMMISSION,

DIVISION OF INLAND WATERS.

GENTLEMEN:

I have the honor to make the following report in relation to the structure known as the Lower State Dam.

This dam is situated upon the Oswego River (Give name of stream) in the City of Oswego, Oswego County,

about in (State distance) from the ~~Village~~ or City of Oswego

The distance down (Up or down) stream from the dam, to the Titica St. Bridge (Give name of nearest important stream or of a bridge) is about 3/4 (State distance) miles.

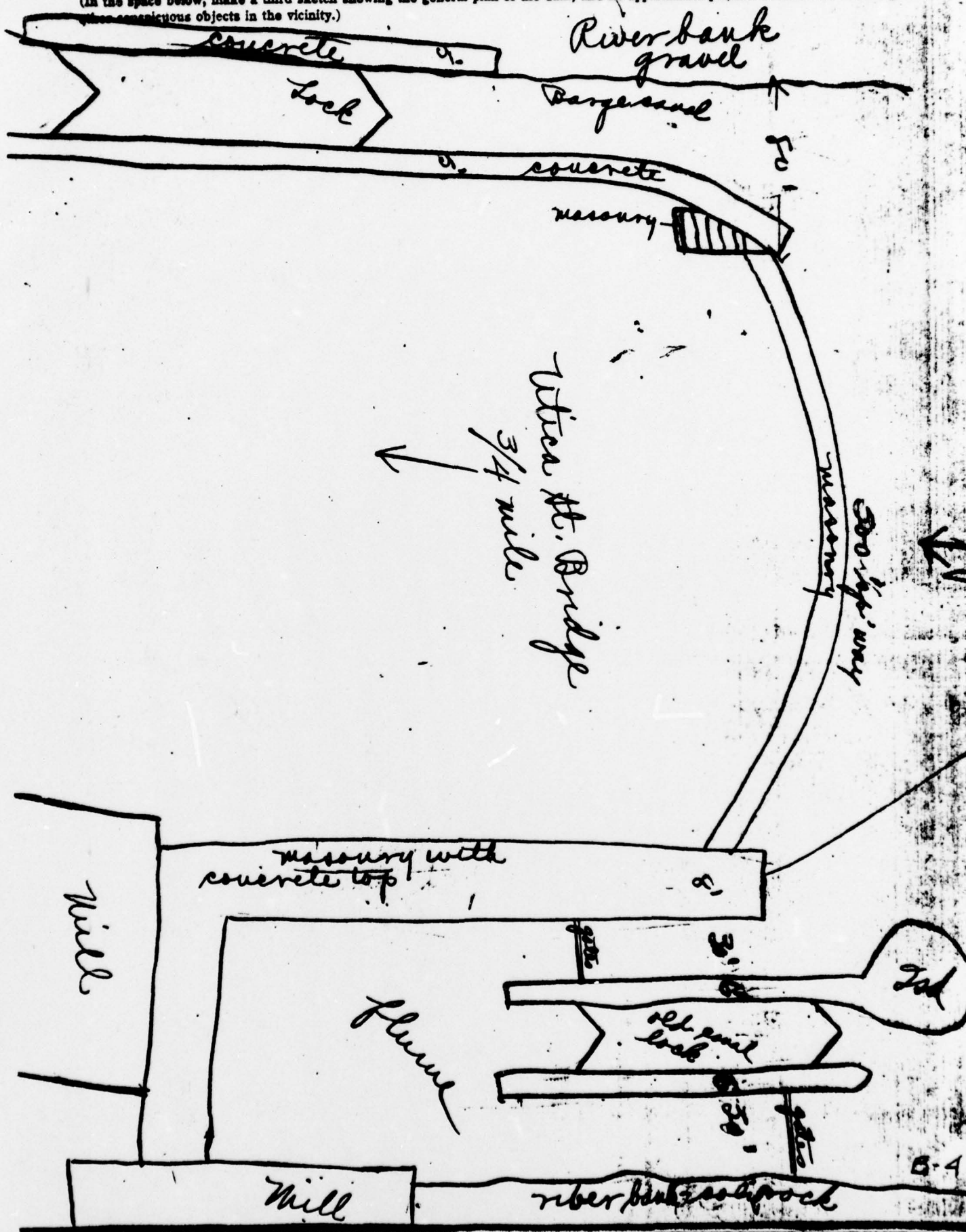
The dam is now owned by New York State (Give name and address in full)

and was built in or about the year 1855, and was extensively repaired or reconstructed during the year 1895 & 1914

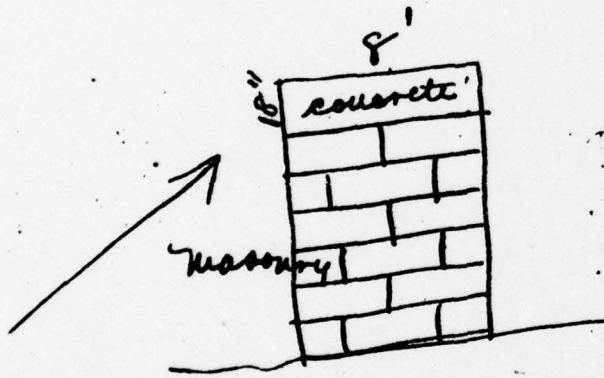
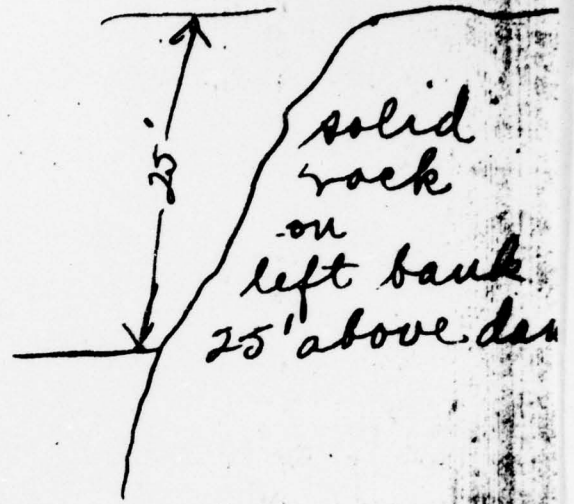
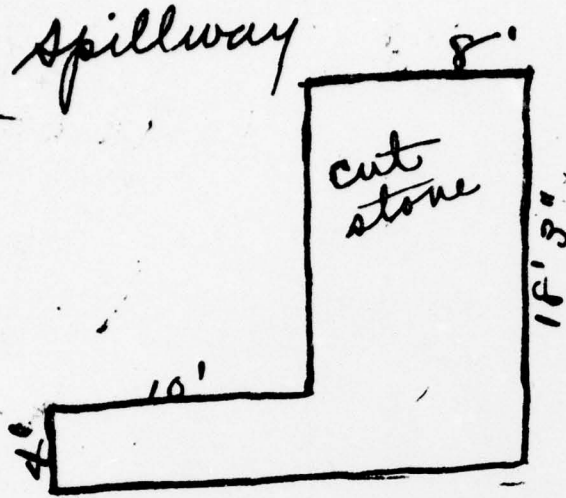
As it now stands, the spillway portion of this dam is built of masonry (State whether of masonry, concrete or timber) and the other portions are built of masonry and concrete (State whether of masonry, concrete, earth or timber with or without rock fill)

As nearly as I can learn, the character of the foundation bed under the spillway portion of the dam is solid rock and under the remaining portions such foundation bed is " " "

(In the space below, make a third sketch showing the general plan of the dam, and its approximate position in relation to buildings or other conspicuous objects in the vicinity.)



(In the space below, make one sketch showing the form and dimensions of a cross section through the spillway or waste-weir of this dam, and a second sketch showing the same information for a cross section through the other portion of the dam. Show particularly the greatest height of the dam above the stream bed, its thickness at the top, and thickness at the bottom, as nearly as you can learn.)



The total length of this dam is 750 feet. The spillway or waste-weir portion, is about 200 feet long, and the crest of the spillway is about 6 feet below the top of the dam.

The number, size and location of discharge pipes, waste pipes or gates which may be used for drawing off the water from behind the dam, are as follows: head gates to flume
12' - 6' wide x 10 deep

At the time of this inspection the water level above the dam was 8 ft. 8 in. ~~below~~ above the crest of the spillway.

(State briefly, in the space below, whether, in your judgment, this dam is in good condition, or bad condition, describing particularly any leaks or cracks which you may have observed.)

This dam is in good condition - no visible leaks or cracks - concrete tops put on masonry on left bank in last two years - all solid and strong

Reported by C. W. H. Douglas
(Signature)

115 Standard St.
(Address - Street and number, P. O. Box or R. F. D. route)

Syracuse, N. Y.
(Name of place)

STATE OF NEW YORK
DEPARTMENT OF

State Engineer and Surveyor

ALBANY

Received Oct 20th 1925

Dam No. 13 Oswego Watershed

Disposition Oct 21- 1925

Serial No. 653

Foundation inspected

Structure inspected

Application for the Construction or Reconstruction of a Dam

Application is hereby made to the State Engineer, Albany, N. Y., in compliance with the provisions of Chapter LXV of the Consolidated Laws and Chapter 647, Laws of 1911, Section 22 as amended, for the approval of specifications and detailed drawings, marked 6-2; 12-3; 16-2; 20-2; 22-1; and 28-3

herewith submitted for the { construction reconstruction } of a dam located as stated below. All provisions of law will be complied with in the erection of the proposed dam. It is intended to complete the work covered by the application about twelve months
(Date)

1. The dam will be on Oswego River flowing into Lake Ontario in the City town of Oswego, County of Oswego and west end of Curved Dam
(Give exact distance and direction from a well-know bridge, dam, village main cross-roads or mouth of a stream)

2. The name and address of the owner is The General Development Corporation, Oswego, N. Y.
Additional spillway section for Curved Dam, as portion

3. The dam will be used for of head race for power purposes

4. Will any part of the dam be built upon or its pond flood any State lands? ** See back of sheet

5. The watershed at the proposed dam draining into the pond to be formed thereby is 5,100 sq. miles square miles.

6. The proposed dam will have a pond area at the spillcrest elevation of the same as at present and will impound same as at present feet of water.

7. The lowest part of the natural shore of the pond is as at present feet vertically above the spillcrest; and everywhere else the shore will be at least as at present feet above the spillcrest.

8. The maximum known flow of the stream at the dam site was 27,500 cubic feet per second on April 3, 4, 5, 1916
(Date)

9. State if any damage to life or to any buildings, roads or other property could be caused by any possible failure of the proposed dam damage would be minimized because new structure will replace old structures

10. The natural material of the bed on which the proposed dam will rest is (clay, sand, gravel, boulders, granite, shale, slate, limestone, etc.) sandstone of very close texture

11. The material of the right bank, in the direction with the current, is.....; at the spillcrest elevation this material has a top slope ofinches vertical to a foot horizontal on the center line of the dam, a vertical thickness at this elevation of.....feet, and the top surface extends for a vertical height offeet above the spillcrest. The proposed structure has no right bank because it joins the State's Curved Dam.

12. The material of the left bank is sandstone; has a top slope of ^{vertical}.....inches to a foot horizontal, a thickness of.....feet, and a height of 12.....feet. above crest

13. State the character of the bed and the banks in respect to the hardness, perviousness, water bearing, effect of exposure to air and to water, uniformity, etc. hard, common, close-grained sandstone, impervious, non-water bearing, not affected by exposure to air or water.

14. If the bed is in layers, are the layers horizontal or inclined? horizontal If inclined what is the direction of the horizontal outcropping relative to the axis of the main dam and the inclination and direction of the layers in a plane perpendicular to the horizontal outcropping not inclined

15. What is the thickness of the layers? about two feet.

16. Are there any porous seams or fissures? no

17. WASTES. The spillway of the above proposed dam ^{is an extension 275' long of Curved Dam} will be held at the right end by a.....the top of which will befeet above the spillcrest, and have a top width of.....feet; and at the left end by a.....the top of which will be.....feet above the spillcrest, and have a top width of.....feet.

18. There will be also for flood discharge a ^{gate sluice 4' high by 4' wide}.....and the bottom will be 16' feet below the spillcrest, a sluice ^{4' high by 4' wide}.....feet wide in the clear byfeet high, and the bottom will be.....feet below the spillcrest.

19. APRON. Below the proposed dam there will be an apron built of no apron, solid rock foundation feet long across the stream,feet wide and.....feet thick. The downstream side of the apron ^{bucket on down-stream face of proposed O-G type spillway} will have a thickness of.....feet for a width of.....feet.

20. PLANS. Each application for a permit of a dam over 12 feet in height must be accompanied by a location map and complete working drawings in triplicate of the proposed structure, one set of which will be returned if they are approved. Each drawing should have a title giving the parts shown, the name of the town and county in which the dam site is located, and the name of the owner and of the engineer.

The location map (U. S. Geological Quadrangle or other map) should show the exact location of the proposed dam; of buildings below the dam which might be damaged by any failure of the dam; of roads adjacent to or crossing the stream below the dam, giving the lowest elevation of the roadway above the stream bed and giving the shape

the height and the width of stream openings; and of any embankments or steep slopes that any flood could pass over. Also indicate the character and use made of the ground below the dam.

The complete working drawings should give all the dimensions necessary for the calculations of the stability of the structure, and all the information asked for below under "Sketches." There may be attached to the application any written reports, calculations, investigations or opinions that may aid in showing the data and method used by the designer. State the assumed ice and uplift pressures and the conditions on which based.

21. **SKETCHES.** For small and unimportant structures, if plans have not been made, on the back of this application make a sketch to scale for each different cross-section at the highest point; giving the height and the depth from the surface of the foundation, the bottom width, the top width (for a concrete or masonry spill at 18 inches below the crest), the elevation of the top in reference to the spillcrest, the length of the section, and the material of which the section is to be constructed; on the spillway section show a cross section of the apron, giving its width, thickness and material, and show the abutment or wash wall at the end of the spillway, giving its height and thickness. Mark each section with a capital letter. Also sketch a plan; show the above sections by their top lines, giving the mark and the length of each; the openings by their horizontal dimensions; the abutments by their top width and top lengths from the upstream face of the spillcrest; and outline the apron. Also sketch an elevation of each end of the dam with a cross section of the banks, giving the depth and width excavated into the banks.

22. **ELEVATIONS.** Also give the elevations, if possible from the Mean Sea Level, of at least two permanent Bench Marks; of the spillcrest for any existing dam on the proposed dam site, at the middle and at the ends of the spill; of the spillcrest for the above proposed dam; and of the spillcrest of any adjacent dams.

23. **SAMPLES.** When so instructed, send samples of the materials to be used in the construction of the proposed dam, using shipping tags which will be furnished. For sand, one-half a cubic foot is desired (exclusive of any stone over $\frac{3}{4}$ inch in size mixed therewith); for cement, three pints; and for the natural bed, twenty cubic inches if of ledge and one-half a cubic foot if of soil.

24. **INSPECTION.** State how inspection is to be provided for during construction ~~close inspection during~~ construction by our engineers, State inspection at option of the State

25. **WATER SUPPLY.** Are the waters impounded by the above dam to be used for a public water supply? no... Has an application under the provisions of Article IX of the Conservation Law for such use been made to the Water Control Commission, Albany, N. Y.?

** Junction with Curved Dam will be on State Canal land, during construction, and when completed, will be deeded to the State.

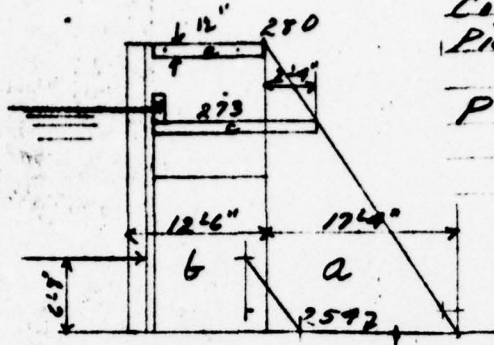
General. The proposed spillway will join the west end of the State's Curved Dam, extend down stream, parallel to the flow of the stream, a total of 284 feet and there join a Regulating Gate structure, 182 feet long, said Regulating Gates extending to the west bank of the present Varick Canal, full details being shown on the above mentioned plans which plans are hereby made a part of this application.

The above information is correct to the best of my knowledge and belief.

Oswego, New York.
(Address of signer)

Oct. 20. 1925
(Date)

The General Development Corp
Ernest E Whitney, Vice. Pres.
(A person signing for owner should indicate title or authority)



Concrete 140 Lbs per Cu. Ft.
Piers 2'-6" Wide, 19'-0" C-C, 11'6" Clear

$$P = 62.5 \times 20^2 \times 19.0 = 175000$$

Sect.	Volume	Cu. Ft.	Weight	Arm	Moment
a	17.33 x 26.0 x 2.5	562	78700	18.50	1440000
b	12.5 x 26.0 x 2.5	813	117000	6.25	712000
c	12.33 x 10 x 1.5	192	19900	7.67	175000
d	1.0 x 2.5 x 1.5	29	4060	3.00	12000
C.	10.0 x 1.0 x 1.5	115	16100	7.50	121000
P	175000 [#]			6.67	1165000
			232860		3626000

Coef. of Sliding
175000 / 232860 = 0.752

$$Pos. of Res = 3626000 \div 232860 = 15.58'$$



$$Pos. of Res. Water Press = \frac{15+12}{15+5} \times \frac{15}{2} = 5.87$$

$$Amt. of Water Press = 4.19 \times 62.5 \times 15 = 10800 \text{ Lbs (P)}$$

Neglect Vert. Press. (k.) and Chamber on (e)

Upward Press $\frac{1}{2}$ h action, 0 wt heel.

$$19 \times 62.5 \times \frac{1}{2} = 15.0 = 2670$$

Sect.	Area	Weight	Arm	Moment
a	1.0 x 2.5 = 2.5	350	0.5'	175
b	15.5 x 3.3 = 51.1	7150	8.75'	62525
c	11.75 x 2.7 = 31.7	4440	6.88'	30600
d	3.33 x 5.0 = 16.65	2310	5.17'	11950
e	3.25 x 7.0 = 22.75	3185	2.62'	8350
f	1.65 x 3.3 = 5.445	762	17.03'	13000
g	3.75 x 2.7 = 10.125	1417	14.00'	19800
h	3.92 x 5.0 = 19.6	2740	10.47'	28600
i	4.58 x 7.0 = 32.06	4492	5.78'	25950
		23150		169100
P	10800 [#]		5.87'	63900
		23150		227500
V		-2670	6.00'	-16000
		20480		211500

Coef. of Sliding (No Upthrust)
10800 / 23150 = 0.47

Coef. of Sliding (With Upthrust)
10800 / 20480 = 0.53

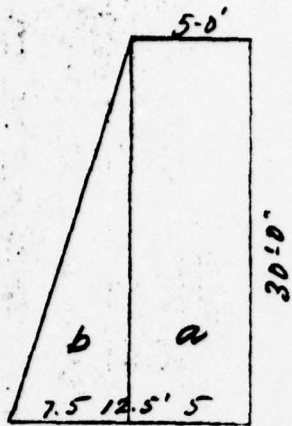
169100 / 23150 = 7.31 % to C.C.

227500 / 23150 = 9.83

211500 / 20480 = 10.32

H.E. Bromard
Sept. 16-1925

13 Page B-11.



$$P = 50 \times (535 \times 130) = 12900$$

Section	Area	Weight	Arm	Moment
a	150	21200	2.5	53000
b	112.5	15800	7.5	118500
P	(12900)		10	129000
		37000		300500

$$\frac{300500}{37000} = 8.12 \text{ heel to resultant. } 8.93 \text{ to Middle Th.}$$

Hor. Is on gate

$$\text{Pres port. ft.} = 19 \times 62.5 = 1187.5 \text{ Lbs}$$

$$M = 2790 \cdot 6.0^2 \cdot 1.5 = 196000 \quad 9.25$$

$$5" \text{ I } 10^4 \text{ Sec Mod} = 48, \quad 196000 \div 4.8 = 20000$$

279

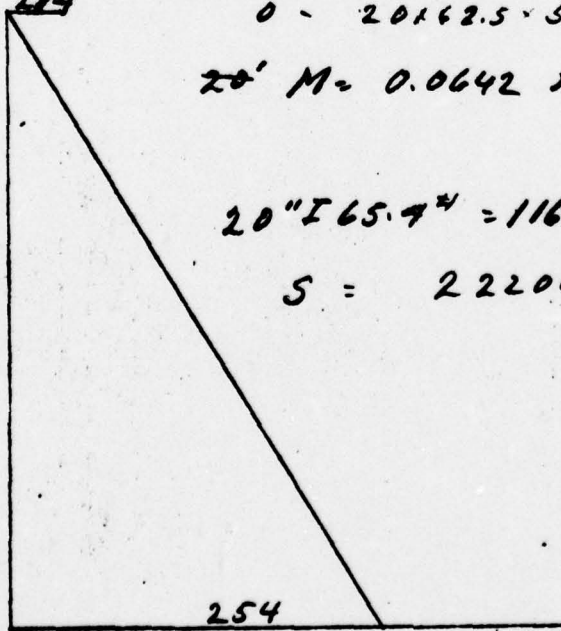
$$0 = 20 \times 62.5 \cdot 5 = 6250$$

$$20' M = 0.0642 \times 7200 \times 20^2 = 185000 \text{ Lbs}$$

$$= 2,220,000 \text{ Lbs}$$

$$20" \text{ I } 65.4^4 = 116.9$$

$$S = 2220000 \div 116.9 = 19000$$



H.E. 13 10-21-25

B. 12

13 Q. 10

68

STRUCTURE INVENTORY - GENERAL LISTING

STRUCTURE ID NO SEC/HIST TYPE	CANAL	STATION - APPROX STRUCTURE CENTER	POOL ELEV (LOW/ONLY)	LIFT/ HEIGHT	TUNNEL SZ/ NO GATES	ORIG CONTRACT	HISTORICAL NAME AND LOCATOR
WS 0037 701 3A	0	1166+00	270.0	12.0	35		CURVED DAM AT LOCK 07 - OSWEGO
WS X001 701 3A	X						CARPENTER BROOK DIVERSION DAM (NOT NEEDED)
WS Y002 701 3A	Y	5090+00	375.4		5		OWASCO CREEK ENTRANCE 550FT LEFT
WS 0023 701 3C	E		369.9	0.0	M93		CAUGHRENDY DAM
WS 0124 701 3D	E	3931+50			635		TAINTOR GATE CONT M63+5
WS F002 701 3D	F				1		WASTE GATE - BUTTERNUT AQUEDUCT
WS F081 701 3D	F				2		BUTTERNUT FEEDER BULKHEAD
WS F004 701 3D	F				4		DERUYTER INLET HEADGATES
WS F003 701 3D	F			5.0			STREAM ENT. - DERUYTER INLET
WS F001 701 3D	F	1280.0		3.0			DERUYTER DAM SPILLWAY
WS F002 701 3D	F				3		DERUYTER DAM OUTLET GATES
WS F0F1 701 3D	F				4		LIMESTONE FEEDER BULKHEAD
WS F001 701 3D	F				1		WASTE GATE - LIMESTONE AQUEDUCT
WS F0J1 701 3D	F				3		JAMESVILLE DAM SPILLWAY
WS F0J2 701 3D	F				3		JAMESVILLE DAM OUTLET GATES
WS 0031 701 3D	0	363.0		12.0	6		TAINTOR GATES <i>Key E, Movable Crest</i>
WS 0021 701 3D	0	363.0			66		NORTH AUTO FLASHBOARD BLOCKED TOP <i>Key D</i>
WS 0051 701 3D	0	363.0			60		SOUTH AUTO FLASHBOARD BLOCKED TOP <i>Key F</i>
WS 0011 701 3D	0	363.0		11.0	60		NORTH SPILLWAY <i>Key P</i>
WS 0041 701 3D	0	363.0		11.0	60		SOUTH SPILLWAY <i>Key F</i>
WS 0012 701 3D	0	352.6		10.3	10A		SPILLWAYS <i>Key H</i>
WS 0022 701 3D	0				6		TAINTOR GATES <i>Key I</i>
WS 0001 701 3D	0	661+00			205		SPILLWAY IN DIKE BELOW LOCK 03
WS 0005 701 3D	0	1180+75			35		BY-PASS CULVERT ABOVE LK 07 2 GATES
WS 0007 701 3D	0	1180+80			709		FEED GATE - LOCK 07

0

3D-5 (22)

SUJICE GATES, SPILLWAYS, WASTE WEIRS - 1977

STRUCTURE ID NO	CONCRETE	SUPER STRUCTURE	MACHINERY	SL GATES	GATES FLSHRDS	STPLCS	ELECT	T R A S H R E C O M M E N D	G E N R E C O M M E N D
5 0124 3D	A P U D S S	O C R	S F	S G	B A	S G	7 7	N 7	N 7
5 002 3D	B I P M P P H	P A I	N N	P A A A T A I	O B C	N 7	N N	N 7	N 7
5 003 3D	M R T I L N	T W L I N G L E S	7 7	S T T E T E T A I D	A R H O R S	N N	N N	N 7	N 7
5 004 3D	M S R M Y I	I N G L E S	7 7	G E A R T E T E S S	D R S	N N	N N	N 7	N 7
5 005 3D	T B L A A S T	T E S	N N	V F S S E		N N	N N	N 7	N 7
5 006 3D	K P P R R	S	N N	L V A N A L		N N	N N	N 7	N 7
5 007 3D	H R P P F I	S	N N	L W M P S		N N	N N	N 7	N 7
5 008 3D	D O N C O	S	N N	L L E L A		N N	N N	N 7	N 7
5 009 3D	S H E R	S	7	L L E R		N N	N N	N 7	N 7
5 010 3D			7			N N	N N	N 7	N 7
5 011 3D			7			N N	N N	N 7	N 7
5 012 3D			7			N N	N N	N 7	N 7
5 013 3D			7			N N	N N	N 7	N 7
5 014 3D			7			N N	N N	N 7	N 7
5 015 3D			7			N N	N N	N 7	N 7
5 016 3D			7			N N	N N	N 7	N 7
5 017 3D			7			N N	N N	N 7	N 7
5 018 3D			7			N N	N N	N 7	N 7
5 019 3D			7			N N	N N	N 7	N 7
5 020 3D			7			N N	N N	N 7	N 7
5 021 3D			7			N N	N N	N 7	N 7
5 022 3D			7			N N	N N	N 7	N 7
5 023 3D			7			N N	N N	N 7	N 7
5 024 3D			7			N N	N N	N 7	N 7
5 025 3D			7			N N	N N	N 7	N 7
5 026 3D			7			N N	N N	N 7	N 7
5 027 3D			7			N N	N N	N 7	N 7
5 028 3D			7			N N	N N	N 7	N 7
5 029 3D			7			N N	N N	N 7	N 7
5 030 3D			7			N N	N N	N 7	N 7
5 031 3D			7			N N	N N	N 7	N 7
5 032 3D			7			N N	N N	N 7	N 7
5 033 3D			7			N N	N N	N 7	N 7
5 034 3D			7			N N	N N	N 7	N 7
5 035 3D			7			N N	N N	N 7	N 7
5 036 3D			7			N N	N N	N 7	N 7
5 037 3D			7			N N	N N	N 7	N 7
5 038 3D			7			N N	N N	N 7	N 7
5 039 3D			7			N N	N N	N 7	N 7
5 040 3D			7			N N	N N	N 7	N 7
5 041 3D			7			N N	N N	N 7	N 7
5 042 3D			7			N N	N N	N 7	N 7
5 043 3D			7			N N	N N	N 7	N 7
5 044 3D			7			N N	N N	N 7	N 7
5 045 3D			7			N N	N N	N 7	N 7
5 046 3D			7			N N	N N	N 7	N 7
5 047 3D			7			N N	N N	N 7	N 7
5 048 3D			7			N N	N N	N 7	N 7
5 049 3D			7			N N	N N	N 7	N 7
5 050 3D			7			N N	N N	N 7	N 7
5 051 3D			7			N N	N N	N 7	N 7
5 052 3D			7			N N	N N	N 7	N 7
5 053 3D			7			N N	N N	N 7	N 7
5 054 3D			7			N N	N N	N 7	N 7
5 055 3D			7			N N	N N	N 7	N 7
5 056 3D			7			N N	N N	N 7	N 7
5 057 3D			7			N N	N N	N 7	N 7
5 058 3D			7			N N	N N	N 7	N 7
5 059 3D			7			N N	N N	N 7	N 7
5 060 3D			7			N N	N N	N 7	N 7
5 061 3D			7			N N	N N	N 7	N 7
5 062 3D			7			N N	N N	N 7	N 7
5 063 3D			7			N N	N N	N 7	N 7
5 064 3D			7			N N	N N	N 7	N 7
5 065 3D			7			N N	N N	N 7	N 7
5 066 3D			7			N N	N N	N 7	N 7
5 067 3D			7			N N	N N	N 7	N 7
5 068 3D			7			N N	N N	N 7	N 7
5 069 3D			7			N N	N N	N 7	N 7
5 070 3D			7			N N	N N	N 7	N 7
5 071 3D			7			N N	N N	N 7	N 7
5 072 3D			7			N N	N N	N 7	N 7
5 073 3D			7			N N	N N	N 7	N 7
5 074 3D			7			N N	N N	N 7	N 7
5 075 3D			7			N N	N N	N 7	N 7
5 076 3D			7			N N	N N	N 7	N 7
5 077 3D			7			N N	N N	N 7	N 7
5 078 3D			7			N N	N N	N 7	N 7
5 079 3D			7			N N	N N	N 7	N 7
5 080 3D			7			N N	N N	N 7	N 7
5 081 3D			7			N N	N N	N 7	N 7
5 082 3D			7			N N	N N	N 7	N 7
5 083 3D			7			N N	N N	N 7	N 7
5 084 3D			7			N N	N N	N 7	N 7
5 085 3D			7			N N	N N	N 7	N 7
5 086 3D			7			N N	N N	N 7	N 7
5 087 3D			7			N N	N N	N 7	N 7
5 088 3D			7			N N	N N	N 7	N 7
5 089 3D			7			N N	N N	N 7	N 7
5 090 3D			7			N N	N N	N 7	N 7
5 091 3D			7			N N	N N	N 7	N 7
5 092 3D			7			N N	N N	N 7	N 7
5 093 3D			7			N N	N N	N 7	N 7
5 094 3D			7			N N	N N	N 7	N 7
5 095 3D			7			N N	N N	N 7	N 7
5 096 3D			7			N N	N N	N 7	N 7
5 097 3D			7			N N	N N	N 7	N 7
5 098 3D			7			N N	N N	N 7	N 7
5 099 3D			7			N N	N N	N 7	N 7
5 100 3D			7			N N	N N	N 7	N 7

N. cable frayed

clear brush out of walls, clean silt + debris above
 some stones moved
 broken floor stand

Abutment needs painting

main anch. poor, elect. poor, finish paint, all conc. poor

6" +/- of surface worn away, copper pier. v. poor, hole in spill crec
 align. racks + pinion, paint, ReKage thru abut wall

paint frame holding grating

3

GENERAL LISTING

STRUCTURE ID NO SEC/MIST TYPE	CANAL	STATION - APPROX STRUCTURE CENTER	POOL ELEV (LOW/ONLY)	LIFT/ NIGHT	TUNNEL SZ/ NO GATES	ORIG CONTRACT	HISTORICAL NAME AND LOCATION
MS 0002 701 3D	0	1191+00	255.0			M64	SIDE SPILLWAY BETWEEN LOCKS 07 & 08
MS 0003 701 3D	0	1203+71	255.0			M64	SIDE SPILLWAY WEST WALL ABOVE LOCK 8
MS Y001 701 3D	Y	60+15				720	ONDNDAGA CREEK SPILLWAY
MS 0224 701 3E	E	3931+90				200	TAINTOR GATE NM POWER RACE 530 FT L
MS F001 701 3E	F						OVERFLOW FLUME - DERUYTER DAM
MS F002 701 3E	F						DERUYTER OUTLET FLUME
MS 0051 701 3E	0	118+80		3		80	SOUTH HEADGATE NO 1 PLUGGED <i>Key G</i>
MS 0061 701 3E	0	119+10		4		80	SOUTH HEADGATE NO 2 PLUGGED " "
MS 0071 701 3E	0	119+40		3		80	SOUTH HEADGATE NO 3 PLUGGED " "
MS 0011 701 3E	0	121+80	352.0	13.3		80	NORTH HEADGATE NO 1 <i>Backway SILL</i>
MS 0021 701 3E	0	121+56		3		80	NORTH HEADGATE NO 2 PLUGGED <i>Key C</i>
MS 0031 701 3E	0	121+42		3		80	NORTH HEADGATE NO 3 PLUGGED " "
MS 0041 701 3E	0	121+28		3		80	NORTH HEADGATE NO 4 PLUGGED " "
MS 0053 701 3E	0	640+00				108	POWER FOREWAY - LOCK 03 - FULTON <i>Key D</i>
MS 0043 701 3E	0	640+35		2		108	BULKHEAD NO 4 W SIDE LOWER DAM <i>Key M</i>
MS 0033 701 3E	0	640+50		.10		108	BULKHEAD NO 3 W SIDE LOWER DAM " "
MS 0023 701 3E	0	642+20		3		108	BULKHEAD NO 2 E SIDE LOWER DAM <i>Key H</i>
MS 0063 701 3E	0	652+00				10	POWER TAILRACE BELOW LOCK 03 <i>Key P</i>
MS 0005 701 3E	0	972+15				37	BULKHEAD NO 5 - MINETTO
MS 0052 701 3E	0			17		10	BULKHEAD NO 5 (UPPER DAM) <i>Key G</i>
MS 0006 701 3E	0	1145+90		24		37	BULKHEAD NO 6 - HIGH DAM - OSWEGO
MS 0077 701 3E	0	1169+06		24			BULKHEAD NO 7 - CURVED DAM - OSWEGO
MS 0017 701 3E	0	1185+00				35	HYDRAULIC CANAL BULKHEAD (SEALED)
MS 0001 701 4A	E		369.0			720	CLEVELAND TERMINAL
MS 0002 701 4A	E						DOCK-FRENCHMANS IS

MAY 29 1979

NEW YORK REGION #3
DEPT. OF TRANSP.

MAY 29 '79

May 24, 1979

**P.I.N. ML7000.701.11, MANAGEMENT BY OBJECTIVES
INSPECTION OF WATER IMPOUNDMENT STRUCTURES IN REGION 3**

J. J. Murphy, Materials Bureau, Rm. 210, Bldg. 7A

J. R. Stellato, Waterways Maint. Subdiv., Rm. 216, Bldg. 7

cc L. E. Burns, Waterways Maintenance Engineer, Region 3
L. H. Moore, Soil Mechanics Bureau, Rm. 102, Bldg. 7

RTE.	INIT
REGIONAL DIRECTOR	
ADMINISTRATION	
CONSTRUCTION	
OPERATIONS	
INSPECTION	
PERSONNEL	
PLANNING	
REAL ESTATE	
TRAINING	
UTILITY	

THOMAS

ORIGINAL FILED BY
W. J. CONLISK

In the Fall of 1978 and the Spring of 1979, the seven "Priority 3" structures (as outlined in your letter of January 31, 1978) were inspected by Mr. Sam Candib. There are no "Priority 4" structures, but three non-priority structures will be inspected. The "Priority 3" structures are:

- Oswego Curved Dam (Lock 0-7)
- Butternut Creek Feeder Dam (DeWitt)
- DeBryter Reservoir Inlet Feeder Dam
- Lock 30E Bypass Retention Dam (Macedon)
- Canandaigua Outlet Retention Dam (Lock 27E, Lyons)
- Oswego Creek Retention Dam (Howland Island)
- Military Run Culvert (Newark)

The only large structure is the Oswego Curved Dam on the Oswego River, just south of Lock 0-7. It is the first dam upstream from Lake Ontario. All the other structures, except Military Run Culvert, are small dams which impound little water.

Problems were found associated with the Oswego Curved Dam, Butternut Creek Feeder Dam and the Military Run Culvert.

Oswego Curved Dam (Lock 0-7)

This spillway dam is approximately 14 feet high, over 750 feet long and consists of two sections. The 517 foot long, curved main section was built with stone block masonry and the 250 foot long, west end side spillway section was constructed with portland cement concrete.

The main curved section was originally completed in 1857 as a replacement for a wooden dam needed for the Oswego Canal and the Varick Canal. The privately owned Varick Canal consisted of a bulkhead and guard lock at the west end of the dam and a 3,000 foot long walled channel serving mills along the river.

J. R. Stellato
May 24, 1979
Page Two

In 1894, the timber apron in front of the dam was replaced with a stone block masonry one. The apron was bolted to bedrock and prevented the wearing away of the soft bedrock.

In 1896, the dam was raised so that the depth of the Oswego Canal could be increased from 7 feet to 9 feet. We assume the dam was raised by the addition of stone block masonry, as opposed to flashboards.

In 1908 when the Barge Canal was built, Contract 35 called for the dam to be raised again about 2½ feet by the addition of coping stones. The coping stones or stone blocks were to have sockets so that flashboards could be added. The Varick Canal guard lock and bulkhead were also supposed to be raised at this time. However, none of this work was done under Contract 35 as the raising of the water level would have affected Contract 37 construction of Lock 0-6 immediately upstream. By Alteration #11, the work was transferred from Contract 35 to Contract 37 and in 1912, the work was completed under Alteration #7 of Contract 37.

Since then, there has been no known further work done by contract or by State Maintenance Forces, but the top 2 feet of the main dam is composed of concrete instead of stone masonry. One possible explanation is that concrete substituted for stone masonry under Alteration #7, Contract 37. The final books would have to be checked to determine whether this is correct.

Also, no plans were found for the construction of the concrete side spillway and the bulkhead across the power raceway which feeds a Niagara Mohawk Power Station about 1,000 feet north of the bulkhead. On page 4 of the 1925 Superintendent of Public Works Report, a paragraph was found which mentioned an agreement between the State and the General Development Corporation of Oswego for enlargement of the curve dam spillway. The permit for this work eliminated the Varick Canal and converted it into a power raceway.

With this information, the Region contacted the Niagara Mohawk Power Corporation and obtained a copy of the permit (#428) and the plans for the work. A file card for the permit, but not the permit, was later located in your office, but the number had been changed from #428 to #359. The file card noted that more information is contained in a special folder of Contract 35.

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May 24, 1979
Page Three

The plans seem to agree with the existing structure, except that there are three sluice gates located at the west end of the bulkhead instead of the two shown on the plans. The plans, permit and transmittal letter sent to Mr. Candib are attached. As mentioned in the transmittal letter, it is not known if the land and structures were ever deeded to the State, but the permit says that the structures now belong to the State.

It was fortunate at the time of inspection that all of the Oswego River was flowing through the powerhouse and none was going over the dam's flashboards. One could easily walk all along the bottom front of the dam.

The front face of the main curved dam is an 8 foot high nearly vertical wall with 1½ foot high flashboards on top. In front of this wall is a gently sloping 20 foot long apron which is about 3-4 feet high at the downstream end. The whole dam rests on bedrock. The stone masonry blocks of the apron are pinned together near the toe with U shaped iron bars that extend down into bedrock. The bars looked identical to those used to hold the stone masonry Erie Canal lock walls vertical.

Nearly all the stone masonry joint areas looked in good condition with most of the joint mortar intact. However, there were at least 6 places where small streams of water were squirting out from the joints and a few others where water was running down the face of the dam. None of these small leaks presently appeared large enough to require immediate plugging.

In the riverbed downstream from the stone masonry apron, there was an uneven 1-3 foot deep pool in bedrock. Near the middle of the main curved dam, two boils, about 30 feet apart, were seen rising in the pool about 3 feet from the apron toe. A rough estimate of the flow would be that capable of passing through a 6 inch diameter pipe under the dam at one boil and a 4 inch diameter pipe at the other. Since the dam is on bedrock and the river runs through a gorge to Lake Ontario just over 1 mile downstream, this problem is not serious, but the leaks should be plugged.

At the east end of the bulkhead on the upstream side of the raceway, there are three sluice gates through the dam wall at three different levels. The two upper gates appear to have been disconnected and no longer open. The lowest gate would normally open, but the steel rails which are attached to the sliding door are nearly rusted through at the waterline and would snap if an attempt to open is made. This sluice gate also leaks considerably.

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May 24, 1979
Page Four

The west side of the raceway appeared to be lined with a concrete wall attached to bedrock. About 30 feet upstream from the bulkhead, the beginning corner of this wall has been undermined for at least 6 feet by the collapse of the underlying bedrock. If this corner fails, it will take out a section of chain link fence and lawn.

Butternut Creek Feeder Dam

When constructed, around 1875 water passed over this 70-80 foot long, stone masonry dam and probably dropped some 4-5 feet. Due to sediment deposits, tree growth and trapped debris, the channel downstream of the dam has filled to the point where the water drop today is only 4-5 inches.

Immediately downstream from the west abutment, the embankment between the feeder channel and Butternut Creek is now too low. During high water, the Creek overflows this embankment and feeds directly into the feeder channel. Some gravel has been dumped into the area in an attempt to raise the embankment, but more is needed.

Military Run Culvert (Newark)

Military Run passed under the original Erie Canal through an approximately 8 foot wide by 4 foot high, stone block, arch culvert. The Barge Canal location coincided with the Enlarged Erie, but at a much lower depth which required removal of half or more of the downstream section. The upstream or south section was supposed to be removed by Contract 76, but for some unknown reason it was retained. This section exits from the south bank of the Barge Canal about 1 foot above normal water elevation.

Since then, the land adjacent to the old culvert and all along the south canal bank in this area of Newark has been filled in for business development along nearby Route 31. No fill was deposited over the culvert as this was State land. This created a 20-25 foot wide by 50-60 foot long tree covered area about 6 feet lower than the adjacent land. Fences were erected along the edge of the adjacent land to keep people from falling in and the land paved.

Sometime possibly within the last 20 years, an 8 foot round section near the center of the culvert totally collapsed. Two large trees growing on the edge of the collapsed section appear to have caused the failure. However, the extent of root development down into the collapsed area indicated that the trees were very small when the collapse occurred. Thus the roots probably had little to do with the collapse.

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May 24, 1979
Page Five

After the collapse, soil began washing into the hole and an edge of the parking area was undermined. One of the fence posts and its in-ground concrete support is now suspended in air. Boards and rocks have been thrown into the hole by the fence so no one will fall into it.

Between Route 31 and the culvert entrance, the stream channel is walled. Soil under the parking area has apparently been washing into the stream and the blacktop has settled. Part of a telephone pole has been laid in front of the area to keep cars out. It is not known if the wall area in front of the culvert is the State's responsibility.

Conclusion

The problems noted at these structures should be investigated further and appropriate action taken. At the Oswego Dam, the most immediate problem should be the stabilization of the undermined west wall corner just up from the bulkhead. The leaks through and under the dam have undoubtedly been there for years, but they should be plugged. The sluice gates are not really needed anymore and the lower one could probably also be sealed.

At Butternut Creek, the embankment should be raised to avoid an embankment failure further downstream.

At Military Run, the easiest solution would probably be to remove the existing stone block arch culvert and replace it with a new corrugated metal pipe.

A more detailed report with pictures of each structure will be forwarded at a later date.

In cooperation with the Region, the Niagara Mohawk Power Corporation and nature, attempts will be made to divert all river water through power houses at other Oswego River Dams. Then, a thorough inspection of the dam face and toe areas will be made.

JM:SJC:FS
File: 17.1-2-2

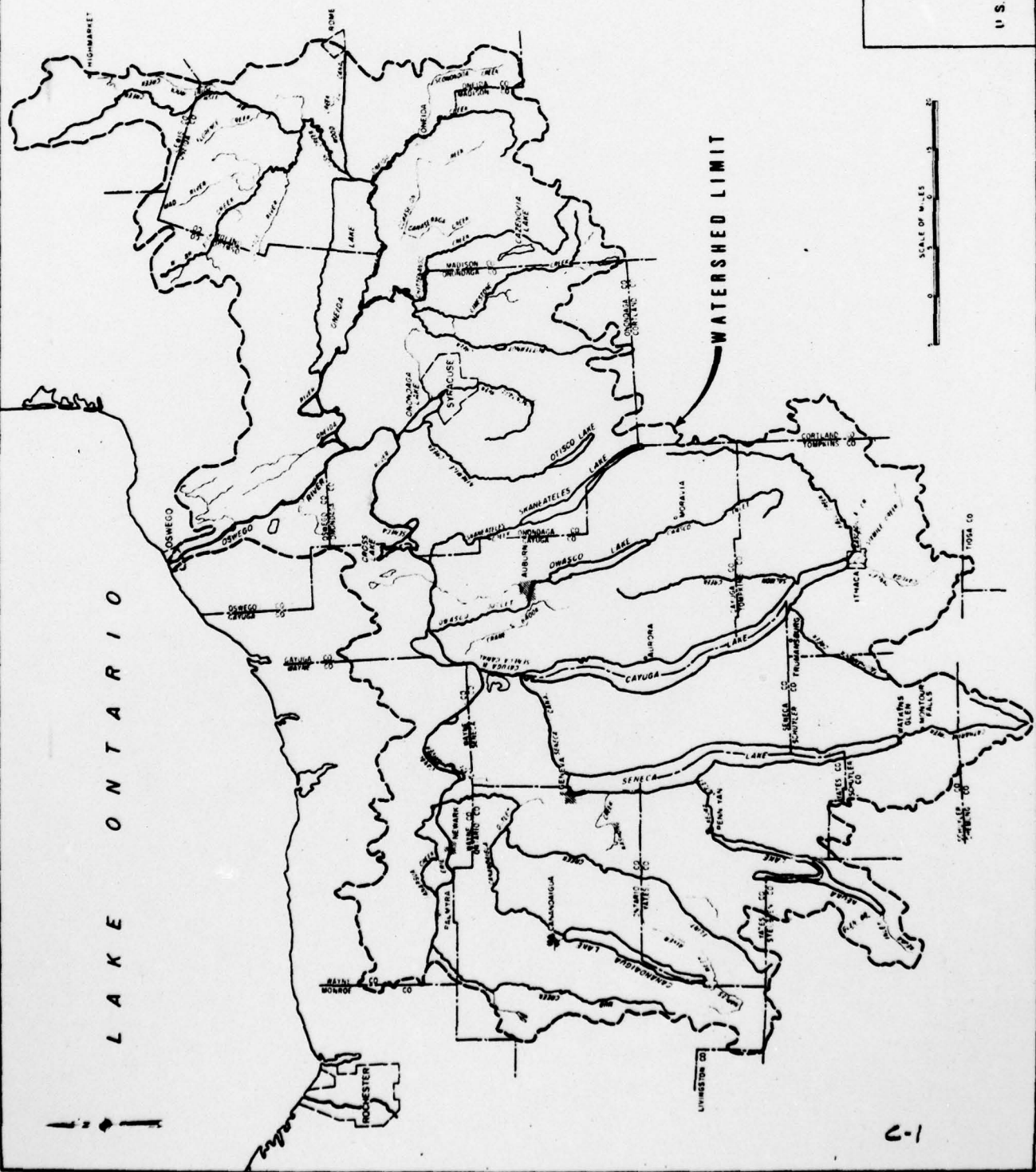
Attachment

APPENDIX C

HYDROLOGIC AND HYDRAULIC COMPUTATIONS

HYDROLOGY

Figure C-1	Watershed - Oswego River Basin
Figure C-2	Principal Drainage System
Figure C-3	Facilities (Water Management)
Figure C-4	Storm Pattern June 20-25, 1972
Figure C-5	HEC-1 Derived Discharge-Frequency Curve By N.Y.S.D.E.C.
Figure C-6	Basin Model (HEC-1) Sub-Basins and Sub-Areas
Figure C-7	Basin Model (HEC-1) Flood Routing System
Figure C-8	Calibrated HEC-1 Results (June 20-25, 1972)
Table I-1	Physical Characteristics of Lakes in the Basin



COUNTIES

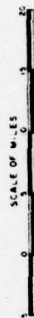
- 1 CAYUGA
- 2 CHEMUNG
- 3 CORTLAND
- 4 LEWIS
- 5 LIVINGSTON
- 6 MADISON
- 7 MONROE
- 8 ONEIDA
- 9 ONONDAGA
- 10 ONTARIO
- 11 OSWEGO
- 12 SCHUYLER
- 13 SENECA
- 14 STEUBEN
- 15 TIOGA
- 16 TOMPKINS
- 17 WAYNE
- 18 YATES

LEGEND

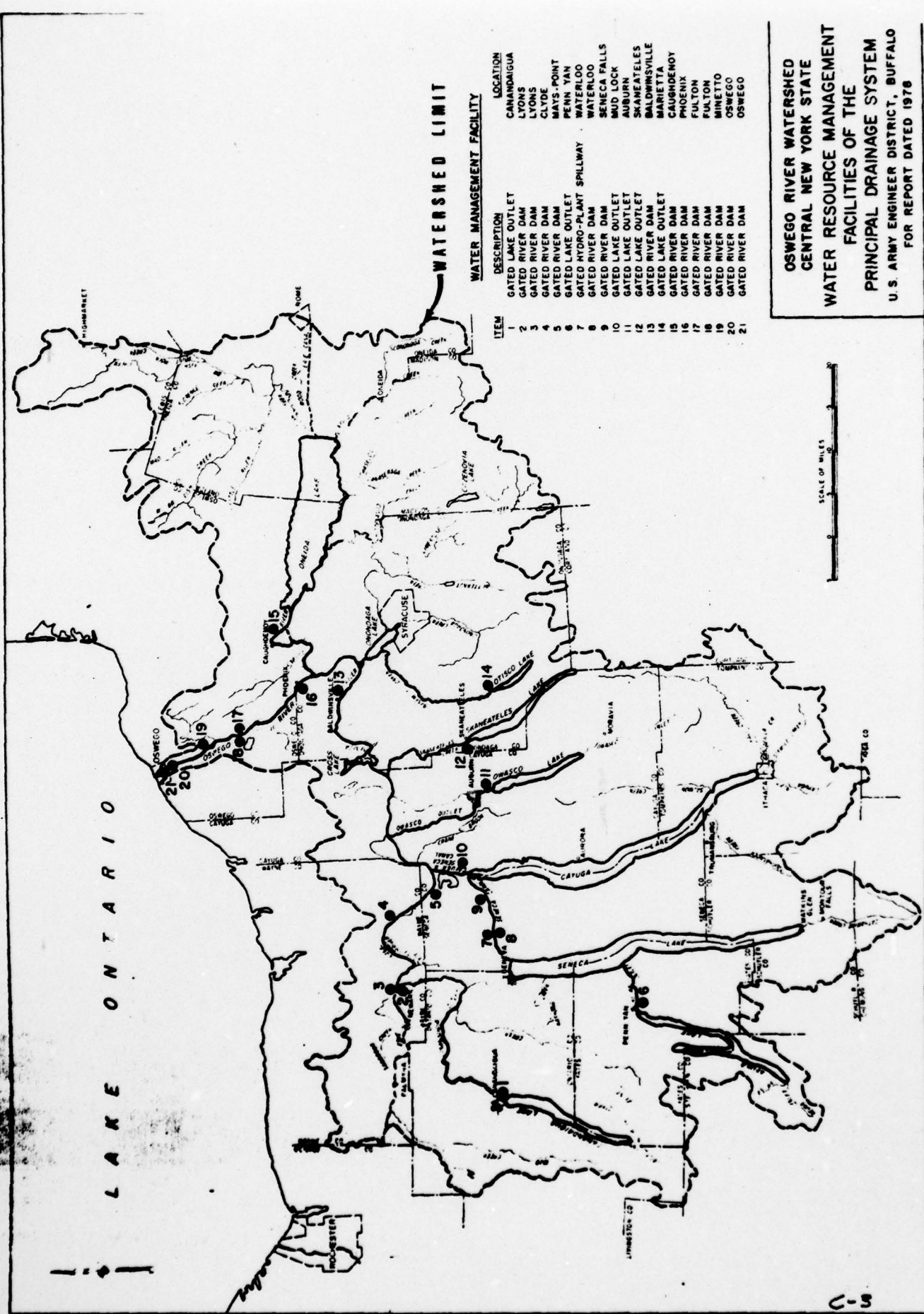
- COUNTY BOUNDARY
- - - MUNICIPAL BOUNDARY
- URBAN PLACE

OSWEGO RIVER WATERSHED
CENTRAL NEW YORK STATE
WATERSHED

U. S. ARMY ENGINEER DISTRICT, BUFFALO
FOR REPORT DATED 1978



L A K E O N T A R I O

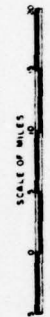


WATERSHED LIMIT

WATER MANAGEMENT FACILITY

ITEM	DESCRIPTION	LOCATION
1	GATED LAKE OUTLET	CANANOA
2	GATED RIVER DAM	LYONS
3	GATED RIVER DAM	CLYDE
4	GATED RIVER DAM	MAYS POINT
5	GATED RIVER DAM	PENN YAN
6	GATED LAKE OUTLET	WATERLOO
7	GATED HYDRO-PLANT SPILLWAY	WATERLOO
8	GATED RIVER DAM	SENECA FALLS
9	GATED RIVER DAM	MUD LOCK
10	GATED LAKE OUTLET	AUBURN
11	GATED LAKE OUTLET	SKANEATELES
12	GATED RIVER DAM	BALDWINVILLE
13	GATED LAKE OUTLET	MARIETTA
14	GATED LAKE OUTLET	CAUGHDENY
15	GATED RIVER DAM	PHOENIX
16	GATED RIVER DAM	FULTON
17	GATED RIVER DAM	MINETTO
18	GATED RIVER DAM	OSWEGO
19	GATED RIVER DAM	OSWEGO
20	GATED RIVER DAM	OSWEGO
21	GATED RIVER DAM	OSWEGO

OSWEGO RIVER WATERSHED
CENTRAL NEW YORK STATE
WATER RESOURCE MANAGEMENT
FACILITIES OF THE
PRINCIPAL DRAINAGE SYSTEM
U. S. ARMY ENGINEER DISTRICT, BUFFALO
FOR REPORT DATED 1976



LAKE ONTARIO

C-58

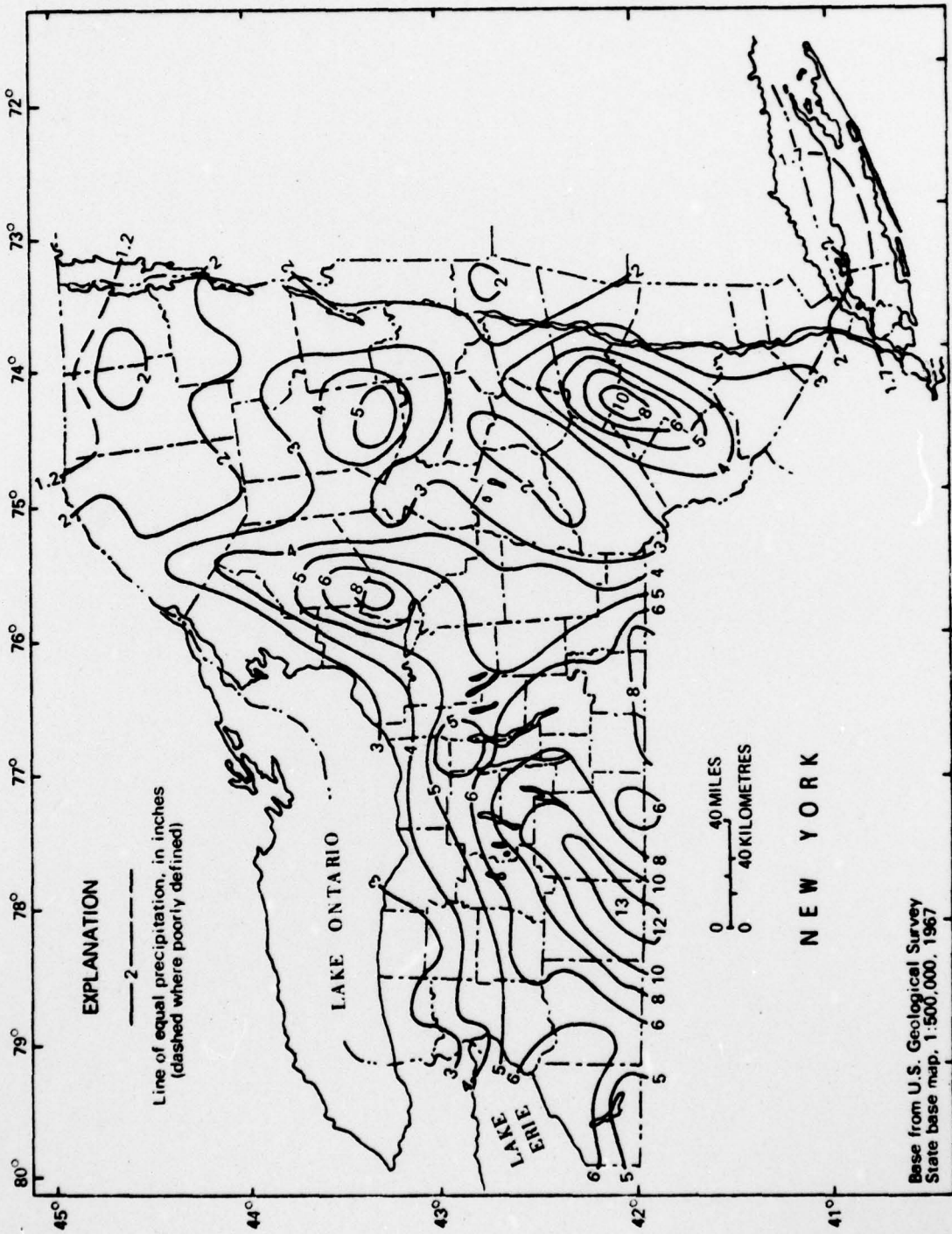
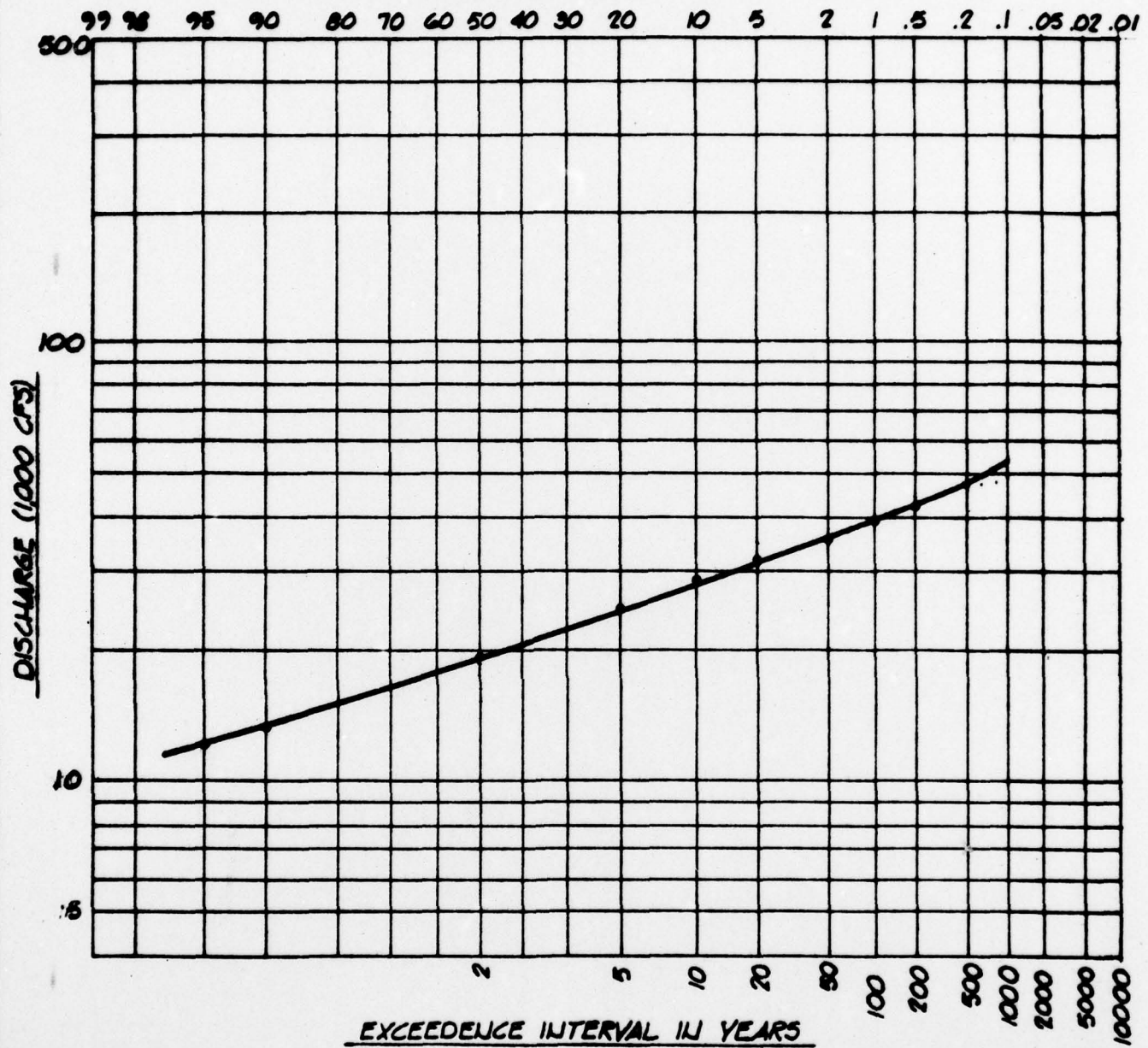


Figure 3.--Precipitation in New York, June 20-25. (Adapted from map furnished by A. B. Pack, Climatologist, National Weather Service, Ithaca, New York.)

EXCEEDENCE FREQUENCY PER 100 YEARS



NOTE: DISCHARGE - FREQUENCY CURVE CONVERTED FROM STAGE - FREQUENCY CURVE, USING STAGE - DISCHARGE RATING CURVES DEVELOPED BY D.E.C.

DISCHARGE - FREQUENCY CURVE

C-5

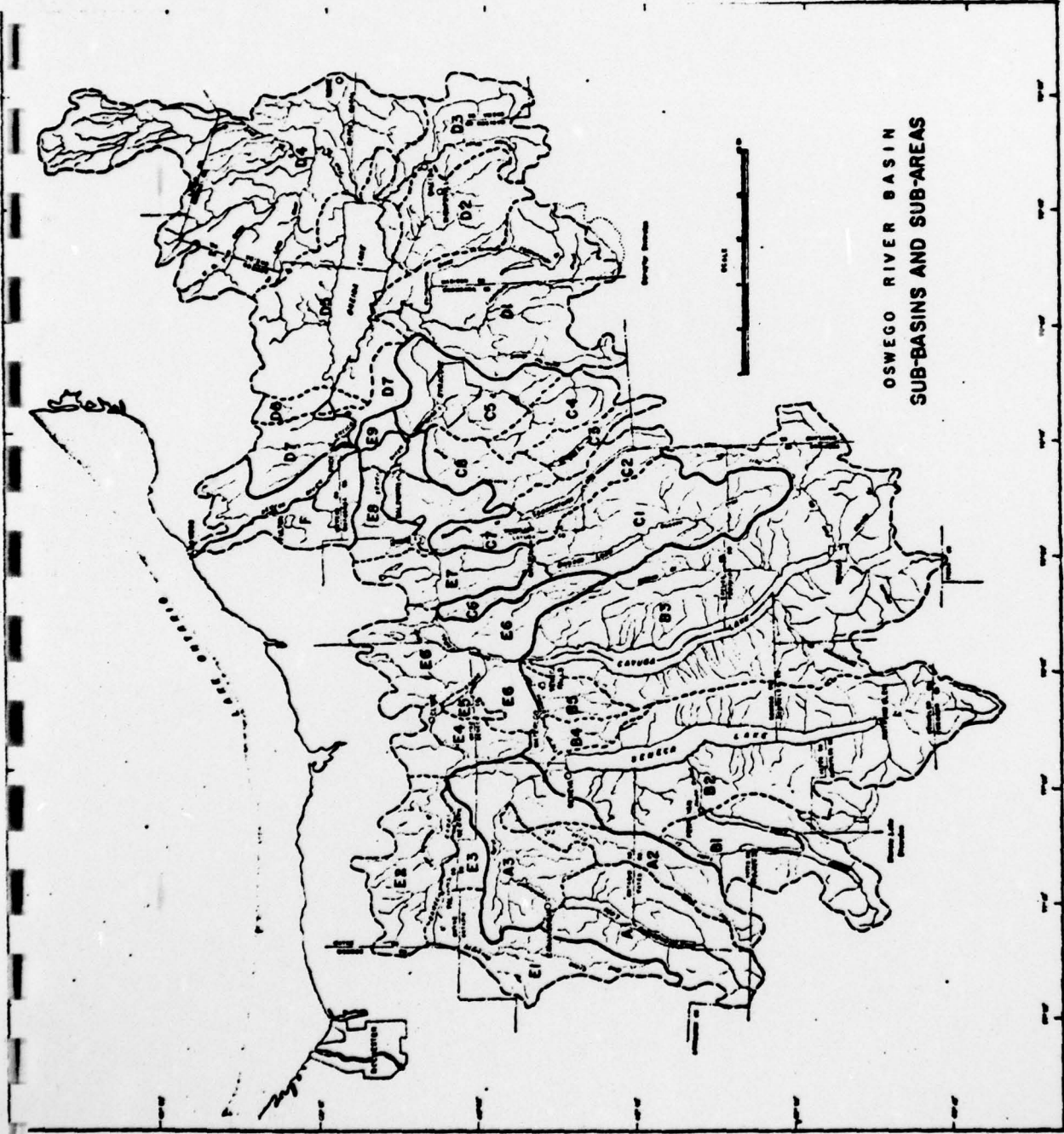


STETSON • DALE

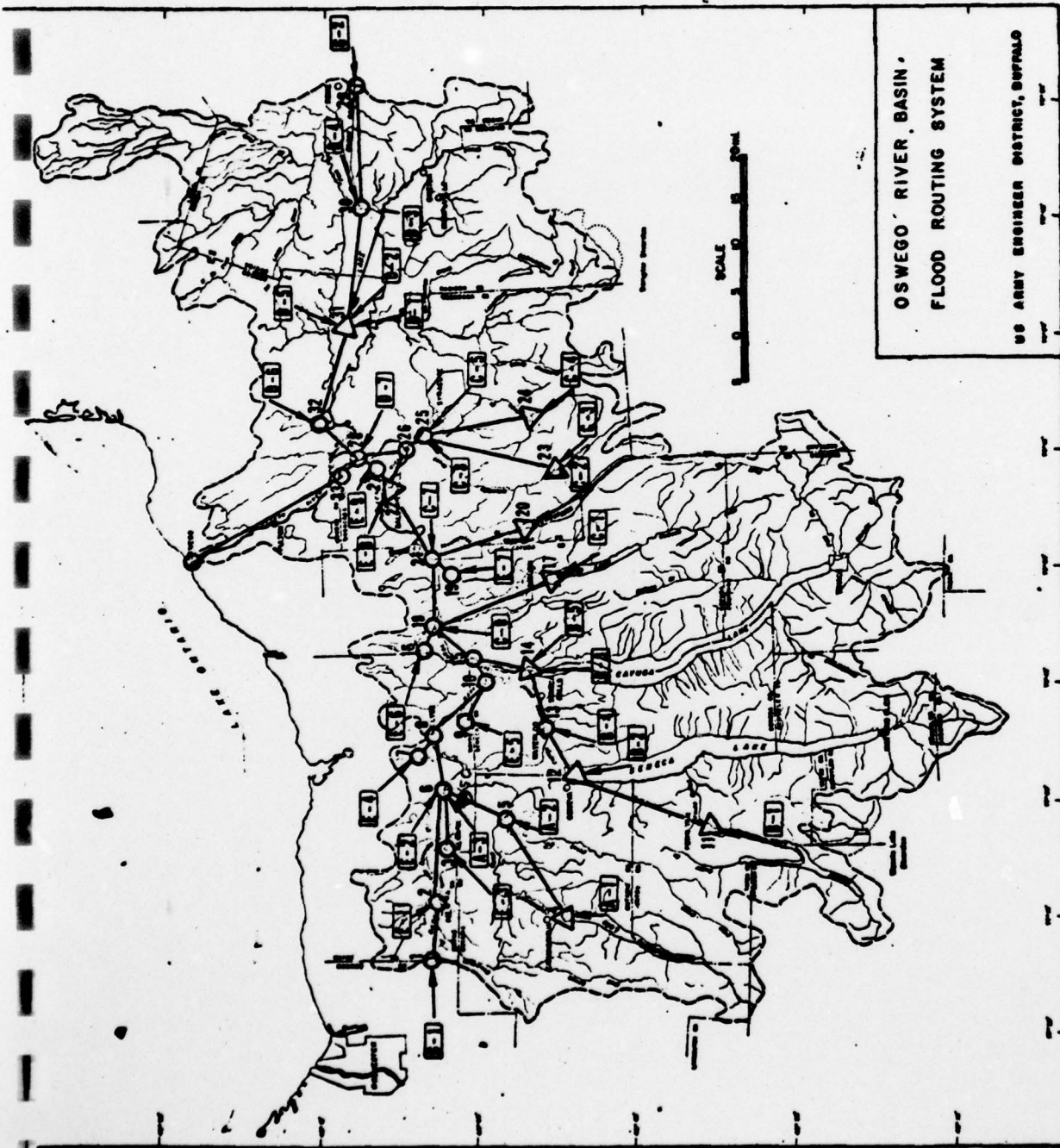
DATE 6.27.79
JOB 2305

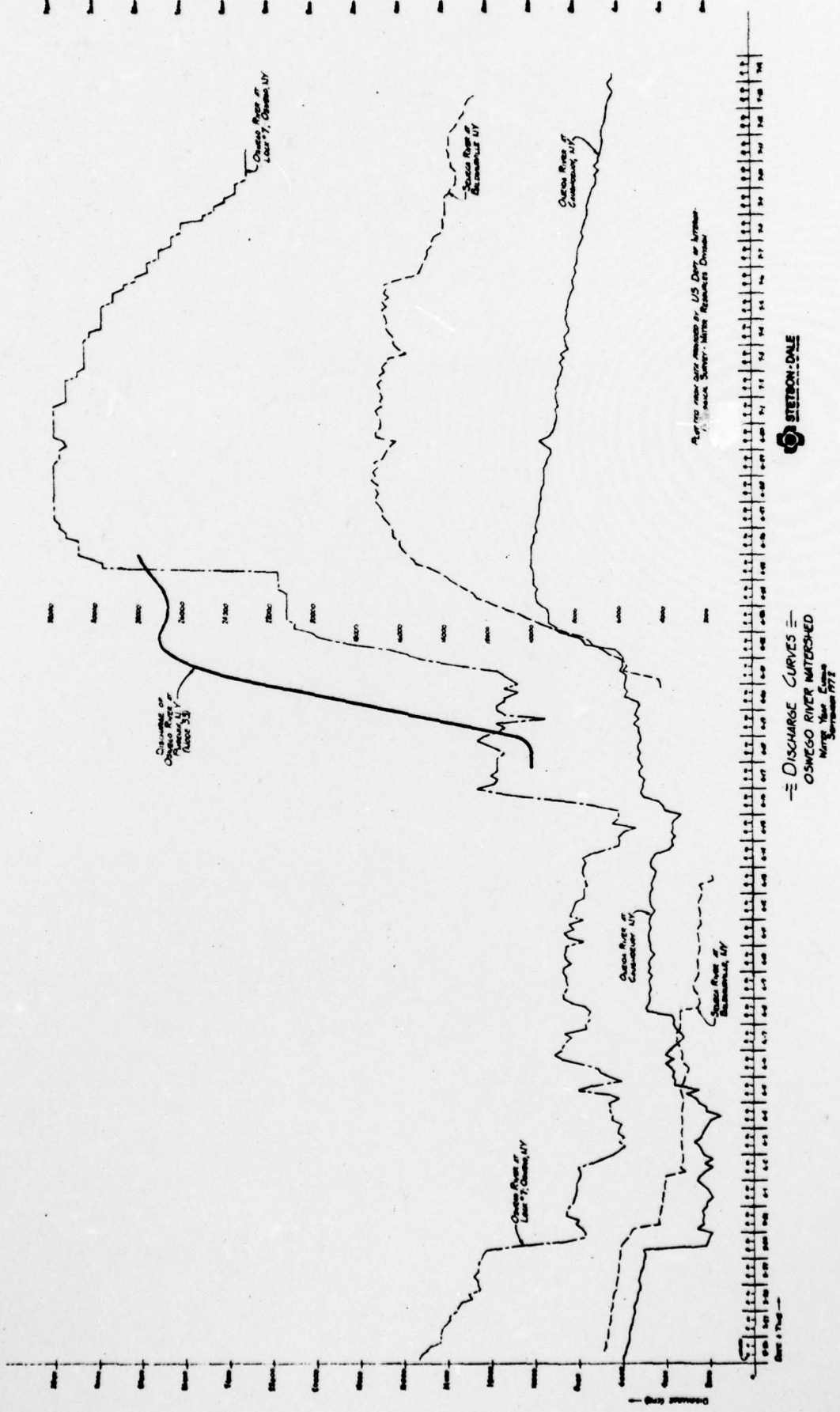
DRAWN JPB
APP'D

THREE RIVERS (NODE 28)



OSWEGO RIVER BASIN
SUB-BASINS AND SUB-AREAS







PROJECT NAME NEW YORK STATE DAM INSPECTION DATE 6-29-79
 SUBJECT OSWEGO RIVER CURVED DAM - LOCK #7 PROJECT NO. 2205
DISCHARGE - FREQUENCY RANKING DRAWN BY JFG

<u>WATER YR</u>	<u>PEAK DISCHARGE</u>	<u>DATE</u>	<u>RANKING</u>	<u>DISCHARGE PROT PPSI</u>
1936	37500 CFS	3-28-36	1	.02
1940	35000 CFS	4-10-40	2	.04
1972	32300 CFS	6-27-72	3	.06
1960	31200 CFS	4-4-60	4	.08
1950	29400 CFS	3-30-50	5	.11
1956	26800 CFS	4-13-56	6	.13
1942	25900 CFS	3-18-42	7	.15
1943	25400 CFS	5-15-43	8	.17
1947	25100 CFS	4-8-47	9	.19
1955	23600 CFS	3-23-55	10	.21
1951	23500 CFS	2-22-51	11	.23
1945	23400 CFS	3-26-45	12	.25
1939	23200 CFS	3-8-39	13	.28
1959	23100 CFS	4-6-59	14	.30
1973	23000 CFS	4-7-73	15	.32
1961	22700 CFS	2-26-61	16	.34
1971	22600 CFS	3-18-71	17	.36
1902	22500 CFS	3-13-02	18	.38
1904	22200 CFS	4-02-04	19	.40
1946	22000 CFS	10-4-46	20	.42
1963	21900 CFS	3-28-63	21	.45
1970	21600 CFS	4-6-70	22	.47
1905	21300 CFS	3-28-05	23	.49
1937	21200 CFS	4-24-37	24	.51
1969	20900 CFS	2-4-69	25	.53
1903	20300 CFS	3-35-03	26	.55
1954	20000 CFS	5-9-54	27	.57
1941	19900 CFS	4-7-41	28	.60
1974	19900 CFS	4-7-74	29	.62
1958	19100 CFS	4-23-58	30	.64
1952	18700 CFS	3-12-52	31	.66
1948	18400 CFS	3-26-48	32	.68



STETSON • DALE

BANKERS TRUST BUILDING
UTICA • NEW YORK • 13501
TEL 315-797-5800

DESIGN BRIEF

PROJECT NAME NEW YORK STATE DAM INSPECTION DATE 6.28.79
SUBJECT OSWEGO RIVER CURVED DAM - LOCK #7 PROJECT NO. 2305
DISCHARGE - FREQUENCY RANKING DRAWN BY PS

WATER YR	PEAK DISCHARGE	DATE	RANKING	DISCHARGE PLOT POSI
1968	18100 CFS	6.30.68	33	.70
1953	18000 CFS	3.28.53	34	.72
1938	18000 CFS	3.1.38	35	.74
1966	17600 CFS	3.6.66	36	.77
1964	17500 CFS	3.18.64	37	.79
1935	16900 CFS	7.14.35	38	.81
1934	16400 CFS	4.15.34	39	.83
1949	16300 CFS	2.17.49	40	.85
1944	16000 CFS	4.14.44	41	.87
1957	15200 CFS	3.15.57	42	.89
1962	15200 CFS	3.16.62	43	.91
1964	14900 CFS	4.10.64	44	.94
1965	13200 CFS	4.26.65	45	.96
1967	12900 CFS	5.17.67	46	.98

AD-A077 445

NEW YORK STATE DEPT OF ENVIRONMENTAL CONSERVATION ALBANY F/G 13/13
NATIONAL DAM SAFETY PROGRAM. CURVED DAM-LOCK 7 (INVENTORY NUMBE--ETC(U)
SEP 79 J B STETSON DACW51-79-C-0001

UNCLASSIFIED

NL

2 OF 2

AD
A077445



END
DATE
FILMED
12-79
DDC



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A



PROJECT NAME NEW YORK STATE DAM INSPECTION DATE 6-26-79
 SUBJECT EXPANSION OF STAGE - DISCHARGE PROJECT NO. 2305
CURVES TO UPPER LIMITS DRAWN BY JAG & NEC

SENECA LAKE $Q = \frac{1.49}{n} AR^{2/3} S^{1/2}$ ASSUME: $n = .085$

HEIGHT	1.49/n	A	R	S	Q	STORAGE
10	42.57	10000	10	.001	66745	800000
20	42.57	24800	20	.001	248455	1200000

CANANOAIGUA LAKE

HEIGHT	1.49/n	A	R	S	Q	STORAGE (TOTAL)
0	42.57	0	0	.001	0	106,500
10	42.57	10000	10	.001	62965	212,500
20	42.57	20000	20	.001	200366	319,000

KEUKA LAKE

HEIGHT	1.49/n	A	R	S	Q	STORAGE (TOTAL)
0	42.57	0	0	.004	0	217000
10	42.57	10000	10	.004	111550	328550

CAYUGA LAKE

HEIGHT	1.49/n	A	R	S	Q	STORAGE (TOTAL)
0	42.57	0	0	.0005	0	727000
3	42.57	15000	3	.0005	29810	854500
6	42.57	30000	6	.0005	94053	982000

OWASCO LAKE

HEIGHT	1.49/n	A	R	S	Q	STORAGE (TOTAL)
0	42.57	0	0	.006	0	119800
3	42.57	3000	3	.006	20,653	126500
6	42.57	6000	6	.006	65,720	152900
9	42.57	9000	9	.006	129,350	205700



PROJECT NAME NEW YORK STATE DAM INSPECTION DATE 6-22-79
 SUBJECT EXPANSION OF STAGE - DISCHARGE PROJECT NO. 2305
CURVES TO UPPER LIMITS DRAWN BY JPG

OTISCO LAKE

HEIGHT	1.49/n	A	R	S	Q	STORAGE (TOTAL)
0	42.57	0	0	.004	0	39,200
3	42.57	900	3	.004	5060	45700
6	42.57	1800	6	.004	16100	52300
9	42.57	2700	9	.004	31700	58800
12	42.57	3600	12	.004	51200	65300

QUONDAGA LAKE

HEIGHT	1.49/n	A	R	S	Q	STORAGE (TOTAL)
0	42.57	0	0	.001	0	32500
3	42.91	1500	3	.001	4200	43500
6	42.57	3000	6	.001	13400	52300
9	42.57	4500	9	.001	26400	62200
12	42.57	6000	12	.001	42700	72100

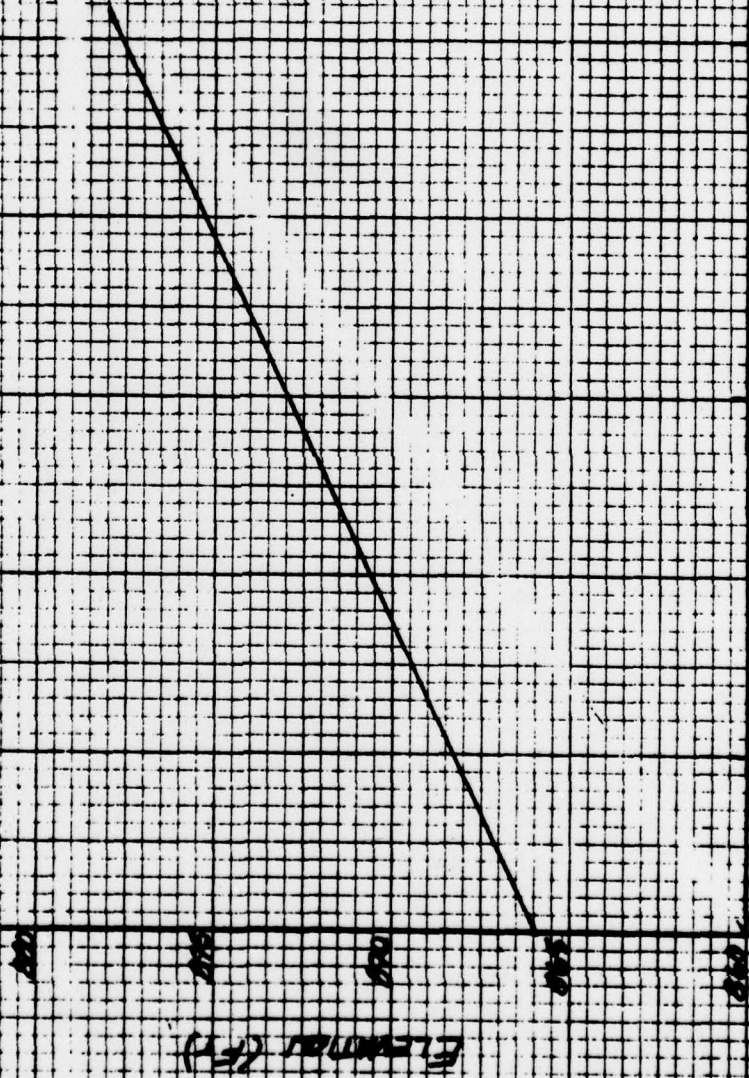
QUEIDA LAKE

HEIGHT	1.49/n	A	R	S	Q	STORAGE (TOTAL)
0	42.57	0	0	.001	0	845000
3	42.57	6000	3	.001	16900	998000
6	42.57	12000	6	.001	53700	1150000
9	42.57	18000	9	.001	103600	1304000

SKANEATELES LAKE

SEE SKANEATELES DAM INSPECTION REPORT DATE: SEPT 14
 SHEETS C-4 & C-5

SKANEATELES LAKE DAM
STAGE STORAGE



SKANEATELES REPORT
(2-6)

C-13



PROJECT NAME NY DAM INSPECTION DATE 9.15.78
PROJECT SKANEATELES LAKE DAM PROJECT NO. 2210
DRAWN BY JS

STAGE - DISCHARGE TABULATION (FROM CREST OF SPILLWAY)

ELV	PRINCIPAL SPILLWAY	Q DAM	Q TOTAL
866	—	—	—
867	124.80	—	124.80
868	352.99	—	352.99
868.5 (TOP OF DAM)	493.32	—	493.32
869	648.48	98.11	746.59
870	998.40	509.80	1508.20
871	1393.31	1096.92	2490.23
872	1834.18	1817.04	3651.22
873	2311.33	2649.00	4960.33
874	2823.90	3579.37	6403.27
875	3369.60	4598.68	7968.28
876	3946.52	5699.74	9646.26
877	4553.06	6876.88	11429.94
878	5187.84	8125.47	13313.31
879	5849.65	9491.63	15291.28
880	6537.42	10822.04	17359.46

SKANEATELES REPORT
(K-5)
C-14

STATION 0629000 OSWEGO RIVER AT LOCK 7, OSWEGO, N.Y.

TOTAL D.A. = 5121.00 CONTR. D.A. =
GAGE DATUM = 246.00 FT.

WATER YEAR	ANNUAL PEAK DISCH., CFS	DATE	CODES	HIGHEST SINCE	GAGE WEIGHT OF ANNUAL PEAK, FT	CODE	ANNUAL MAX GAGE HT., FT	DATE	CODE
1901	20700	04-21-01	KR						
1902	22500	03-13-02	KR						
1903	20300	03-25-03	KR						
1904	22200	04-02-04	KR						
1905	21300	03-28-05	KR						
1906	14900	04-10-06	KR						
1934	14400	04-15-34	KR		8.22				
1935	16900	07-14-35	KR		8.32				
1936	37500	03-28-36	KR		13.10				
1937	21700	04-24-37	KR		9.10				
1938	16000	03-01-38	KR		8.55				
1939	23700	03-08-39	KR		9.87				
1940	35000	04-10-40	KR		13.46				
1941	19900	04-07-41	KR		9.19				
1942	25900	03-18-42	KR		11.09				
1943	25400	05-15-43	KR		10.92				
1944	16000	04-14-44	KR		8.15				
1945	23400	03-26-45	KR		10.34				
1946	22000	10-04-45	KR		9.94				
1947	25100	04-08-47	KR		11.07				
1948	18400	03-26-48	KR		9.05				
1949	16300	02-17-49	KR		8.42				
1950	29400	03-30-50	KR		12.17				
1951	23500	02-22-51	KR		10.38				
1952	18700	03-12-52	KR		9.00	NM	10.32	01-03-52	RW
1953	18000	03-28-53	KR		8.78				
1954	20000	05-09-54	KR		9.49				
1955	23600	03-23-55	KR		10.55				
1956	26000	04-13-56	KR		11.18				
1957	15200	03-15-57	KR		7.97				
1958	19100	04-23-58	KR		9.08				
1959	23100	04-06-59	KR		10.16				
1960	31200	04-04-60	KR		12.26				
1961	27700	02-26-61	KR		10.07				
1962	15200	03-16-62	KR		7.91				
1963	21900	03-28-63	KR		9.84				
1964	17500	03-18-64	KR		8.63				
1965	13200	04-26-65	KR		7.36				
1966	17600	03-06-66	KR		8.66				
1967	12900	05-17-67	KR		7.24				
1968	18100	06-30-68	KR		8.77				
1969	20900	02-04-69	KR		9.56				
1970	21600	04-06-70	KR		9.78				
1971	22600	03-18-71	MD KR			NM	11.87	03-18-71	
1972	32300	06-27-72	MD KR					06-29-72	
1973	23000	04-07-73	MD KR						
1974	19900	04-07-74	MD KR						
					10.05				
					9.57				

OSWEGO RIVER BASIN										
HEC100										
PMF- OVERFLOW ANALYSIS										
LA	40	6	0	0	0	0	0	0	0	4
A										
B	5									
J	1	6	1							
J1	.2	.4	.5	.6	.8	1.0				
K	0	1	0	0	0	0	1			
K1	1 BARCE CANAL LOCK 30 AT NACEDON (SUB AREA A1)									
N	-1	0	100	0	5100	0	0	0	1	
N	372	372	372	372	374	378	379	379	384	392
N	390	300	375	372	113	23	25	21	21	22
N	22	21	22	22	21	21	22	22	22	0
N										
K	1	2	0	0	0	0	1			
K1	2 BARCE CANAL LOCK 29 PALMYRA (ROUTED FLOW FROM LOCK 30)									
T	0	0	0	0	1					
T1	0	3	1							
K	0	2	0	0	0	0	1			
K1	3 CANARACIA CREEK LOCAL INFLOWS TO LOCK 29 (SUB-AREA E-1)									
N	1	-1	147	0	5100	0	0	0	1	
P	0	21.5	33	47	55	65	72	74		
T	0	0	0	0	0	0	0.5	0.05		
U	21									
I	514	1946	2958	2655	1978	1472	1095	815	515	309
I	366	250	186	130	103	76	57	42	25	25
I	21									
I	140	550	1.6							
K	2	2	0	0	0	0	1			
K1	4 COMBINED ROUTED AND LOCAL FLOWS AT LOCK 29									
K	1	6	0	0	0	0	1			
K1	5 ROUTED HYDROGRAPH TO LOCK 27 AT LYONS									
T	0	0	0	0	1					
T1	0	8	3							
K	0	6	0	0	0	0	1			
K1	6 LOWER CANARACIAL LOCAL INFLOWS VICINITY OF LOCK 27 (SUB-AREA E-2)									
N	1	-1	118	0	5100	0	0	0	1	
P	0	21.5	33	47	55	65	72	74		
T	0	0	0	0	0	0	0.5	0.05		
U	27									
I	28	109	293	523	696	773	896	980	1246	1312
I	1218	979	764	596	465	363	283	221	173	135
I	105	82	64	50	39	35	35			
I	120	470	1.6							
K	2	6	0	0	0	0	1			
K1	7 COMBINED AND LOCAL FLOWS AT LOCK 27									
K	0	3	0	0	0	0	1			
K1	8 LOCAL FLOW E-3 (AREA LOCAL TO BARCE CANAL E-29 TO E-27)									
N	1	-1	51	0	5100	0	0	0	1	
P	0	21.5	33	47	55	65	72	74		
T	0	0	0	0	0	0	0.5	0.05		
U	10									
I	2001	1630	844	383	174	79	36	30	25	16
I	100	200	1.6							
K	1	6	0	0	0	0	1			

7 ROUTED FLOW E-3 TO LYONS (NODE 6)										
Y	0	0	0	0	1					
T1	0	5	2							
K	2	6	0	0	0	0	1			
K1	10 COMBINE FLOWS AT NODE 6									
K	0	4	0	0	0	0	1			
K1	11 CANANDAIGUA LAKE INFLOW									
H	1	-1	184	0	5100	0	0	0	1	
P	0	21.5	33	47	55	65	72	74		
T	0	0	0	0	0	0	1.25	0.03		
U	8									
I	8556	5103	3260	1507	691	316	145	30		
I	300	1000	1.6							
K	1	4	0	0	0	0	1			
K1	12 CANANDAIGUA LAKE OUT FLOW USING MODIFIED PULS METHOD									
Y	0	0	0	1	1					
T1	0	0	0	0	0	0	51000			
T2	10700	21300	31900	42500	53100	63700	74300	84900	95500	106100
T22	12500	319000								
T3	50	50	50	50	200	600	1000	1500	2250	3000
T3	63000	200366								
K	1	5	0	0	0	0	1			
K1	13 ROUTED OUTFLOW TO FLINT CREEK MOUTH									
Y	0	0	0	0	1					
T1	0	12	5							
K	0	5	0	0	0	0	1			
K1	14 FLINT CREEK INFLOW A-2									
H	1	-1	102	0	5100	0	0	0	1	
P	0	21.5	33	47	55	65	72	74		
T	0	0	0	0	0	0	0.5	0.06		
U	26									
I	93	534	903	1266	1367	1166	966	801	663	549
I	455	377	311	259	215	170	147	104	101	84
I	69	57	47	39	35	32				
I	90	2000	1.6							
K	2	5	0	0	0	0	1			
K1	15 COMBINE ROUTED CANANDAIGUA OUTFLOWS AND FLINT CR INFLOWS									
K	1	56	0	0	0	0	1			
K1	16 OUTLET ROUTED TO LOCK 27									
Y	0	0	0	0	1					
T1	0	7	3							
K	0	56	0	0	0	0	1			
K1	17 OUTLET LOCAL FLOW A-3									
H	1	-1	155	0	5100	0	0	0	1	
P	0	21.5	33	47	55	65	72	74		
T	0	0	0	0	0	0	0.6	0.06		
U	22									
I	91	330	905	1340	1710	2400	2601	1921	1413	1030
I	763	562	412	303	223	164	120	90	65	48
I	35	34								
I	150	200	1.6							
K	2	56	0	0	0	0	1			
K1	18 COMBINE LOCAL FLOW A-3 WITH FLOW AT LOCK 27									
K	1	6	0	0	0	0	1			
K1	19 ROUTE OUTLET TO CANAL									
Y	0	0	0	0	1					
T1	0	1								
K	2	6	0	0	0	0	1			
K1	20 COMBINE FLOW AT 6 (OUTLET FLOW + E-1, E-2, E-3)									
K	1	0	0	0	0	0	1			
K1	21 ROUTE FLOWS AT LOCK 27 TO NODE 0									
Y	0	0	0	0	1					
T1	0	0	3							
K	0	7	0	0	0	0	1			
K1	22 LOCAL INFLOW LOCK 27 TO LOCK 26 (E-4)									
H	1	-1	09	0	5100	0	0	0	1	

P	0	21.5	33	47	55	65	72	74		
T	0	0	0	0	0	0	0.5	0.06		
U	23									
I	897	1678	1441	1144	908	721	572	454	361	287
I	227	181	143	114	90	72	57	45	36	29
I	23	23	23							
I	100	360	1.6							
K	1	0	0	0	0	0	1			
K1	23	ROUTE FLOWS AT LOCK 26 TO NODE 8								
Y	0	0	0	0	1					
T1	0	2								
K	2	0	0	0	0	0	1			
K1	24	COMBINE ROUTED AND LOCAL FLOWS AT NODE 8								
K	1	10	0	0	0	0	1			
K1	25	ROUTE FLOWS AT NODE 8 TO NODE 10								
Y	0	0	0	0	1					
T1	0	5	2							
K	0	9	0	0	0	0	1			
K1	26	LOCAL FLOW BETWEEN LOCK 26 AND LOCK 25 (E-5)								
N	1	-1	18	0	5100	0	0	0	1	
P	0	21.5	33	47	55	65	72	74		
T	0	0	0	0	0	0	0.5	0.06		
U	21									
I	171	304	313	246	193	152	119	93	73	58
I	45	35	28	22	17	13	11	8	6	5
I	4									
I	90	90	1.6							
K	1	10	0	0	0	0	1			
K1	27	ROUTE INFLOW E-5 TO NODE 10								
Y	0	0	0	0	1					
T1	0	2								
K	2	10	0	0	0	0	1			
K1	28	COMBINE ROUTED FLOW WITH FLOW AT NODE 10								
K	1	15	0	0	0	0	1			
K1	29	ROUTE FLOWS AT NODE 10 TO NODE 15								
Y	0	0	0	0	1					
T1	0	5	2							
K	0	11	0	0	0	0	1			
K1	30	LOCAL INFLOW B-1 INTO KEUKA LAKE								
N	1	-1	183	0	5100	0	0	0	1	
P	0	21.5	33	47	55	65	72	74		
T	0	0	0	0	0	0	1.50	0.03		
U	6									
I	14318	3342	1273	483	183	0				
I	100	800	1.6							
K	1	11	0	0	0	0	1			
K1	31	KEUKA LAKE OUTFLOW W/ MODIFIED PULS								
Y	0	0	0	1	1					
T1	0	0	0	0	0	0	147000			
Y2107000	129500	141000	153500	172000	170000	191000	204000	217000		
Y2320350										
T3	120	320	445	530	575	670	890	1130	1470	
T3124000										
K	1	12	0	0	0	0	1			
K1	32	ROUTE KEUKA LAKE OUTFLOWS TO 12								
Y	0	0	0	0	1					
T1	0	6	2							
K	0	12	0	0	0	0	1			
K1	33	SENECA LAKE INFLOWS B-2								
N	1	-1	524	0	5100	0	0	0	1	
P	0	21.5	33	47	55	65	72	74		
T	0	0	0	0	0	0	0.5	0.03		
U	12									
I	26993	10031	6099	4332	2720	1700	1072	673	422	266
I	167	70								
I	500	2000	1.6							

K1	47 ROUTE FLOWS TO NODE 18										
T	0	0	0	0	1						
T1	0	8	3								
K	0	16	0	0	0	0	1				
K1	48 LOCAL FLOW E-6										
H	1	-1	191	0	5100	0	0	0	1		
P	0	21.5	33	47	55	65	72	74			
T	0	0	0	0	0	0	0.5	0.06			
U	16										
I	3851	5102	3130	2469	1710	1175	808	555	381	262	
I	100	123	85	75	70	27					
I	140	400	1.6								
K	1	18	0	0	0	0	1				
K1	49 ROUTE LOCAL FLOW E-6 TO NODE 18										
T	0	0	0	0	1						
T1	0	2									
K	2	18	0	0	0	0	1				
K1	50 COMBINE ROUTED FLOW W/ FLOW AT NODE 18										
K	0	17	0	0	0	0	1				
K1	51 HEAD OMASCO INFLOW C-1										
H	1	-1	201	0	5100	0	0	0	1		
P	0	21.5	33	47	55	65	72	74			
T	0	0	0	0	0	0	0.75	.05			
U	10										
I	6633	5070	4200	2273	1200	633	334	176	93	30	
I	450	1000	1.6								
K	1	17	0	0	0	0	1				
K1	52 OMASCO LAKE INFLOWS - MODIFIED PULS METHOD										
T	0	0	0	1	1						
T1	0	0	0	0	0	0	92000				
T2	66000	73200	79900	86500	93200	99000	106300	113200	119000	126300	
T2152900	205700										
T3	600	600	600	1100	1700	2300	2900	3400	3400	3400	
T3	24000	69100									
K	1	18	0	0	0	0	1				
K1	53 ROUTE OMASCO LAKE OUTLET FLOWS										
T	0	0	0	0	1						
T1	0	7	3								
K	2	18	0	0	0	0	1				
K1	54 COMBINE FLOWS WITH FLOWS AT NODE 18										
K	0	18	0	0	0	0	1				
K1	55 READ LOCAL FLOW C-6										
H	1	-1	19	0	5100	0	0	0	1		
P	0	21.5	33	47	55	65	72	74			
T	0	0	0	0	0	0	0.5	0.06			
U	10										
I	157	368	352	260	205	156	119	91	70	53	
I	40	26	23	10	14	10	0	6			
I	90	200	1.6								
K	2	18	0	0	0	0	1				
K1	56 COMBINE LOCAL FLOW C-6 WITH FLOW AT NODE 18										
K	1	21	0	0	0	0	1				
K1	57 ROUTE FLOW AT 18 TO NODE 21										
T	0	0	0	0	1						
T1	0	7	3								
K	0	19	0	0	0	0	1				
K1	58 LOCAL INFLOW E-7										
H	1	-1	90	0	5100	0	0	0	1		
P	0	21.5	33	47	55	65	72	74			
T	0	0	0	0	0	0	0.5	0.06			
U	11										
I	2769	3130	1070	1115	644	396	236	141	04	50	
I	19										
I	120	400	1.6								
K	1	21	0	0	0	0	1				
K1	59 ROUTE LOCAL FLOW TO NODE 21										

I	98	300	1.6							
K	1	23	0	0	0	0	1			
K1	73	OTISCO LAKE OUTFLOWS - MODIFIED PULS METHOD								
Y	0	0	0	1	1					
T1	0	0	0	0	0	0	29300			
T2	19400	21800	23900	26100	28300	30500	32600	34800	37000	39200
T3	45700	52300	58800	65300						
T3	200	200	200	200	200	400	900	1600	2000	2800
T3	7060	18100	33700	53200						
K	1	25	0	0	0	0	1			
K1	74	ROUTE OTISCO LAKE OUTFLOWS TO NODE 25								
Y	0	0	0	0	1					
T1	0	10	4							
K	0	24	0	0	0	0	1			
K1	75	INFLOW INTO ONONDAGA RESERVOIR C-4								
H	1	-1	68	0	5100	0	0	0	0	1
P	0	21.5	33	47	55	65	72	74		
T	0	0	0	0	0	0	1.5	0.06		
U	6									
I	2018	3341	1250	435	151	57				
I	250	300	1.6							
K	1	24	0	0	0	0	1			
K1	76	ROUTE ONONDAGA RESERVOIR - MODIFIED PULS METHOD								
Y	0	0	0	1	1					
T1	0	0	0	0	0	0	0			
T2	0	180	700	1980	3500	7940	18200	22200	27000	32500
T2	43400	52300	62200	72100						
T3	80	430	660	880	1070	1420	1770	1040	2000	2900
T3	6200	15400	28400	44700						
K	1	25	0	0	0	0	1			
K1	77	ROUTE ONONDAGA RESERVOIR OUTFLOWS TO NODE 25								
Y	0	0	0	0	1					
T1	0	0	3							
K	2	25	0	0	0	0	1			
K1	78	COMBINE ROUTED FLOW WITH FLOW AT NODE 25								
K	0	25	0	0	0	0	1			
K1	79	LOCAL INFLOW C-5								
H	1	-1	102	0	5100	0	0	0	0	1
P	0	21.5	33	47	55	65	72	74		
T	0	0	0	0	0	0	1.25	0.06		
U	11									
I	2671	3269	2030	1215	727	436	261	156	77	56
I	27									
I	250	300	1.6							
K	2	25	0	0	0	0	1			
K1	80	COMBINE ROUTED FLOWS, LOCAL INFLOW								
K	0	25	0	0	0	0	1			
K1	81	LOCAL FLOW C-8								
H	1	-1	72	0	5100	0	0	0	0	1
P	0	21.5	33	47	55	65	72	74		
T	0	0	0	0	0	0	1.0	.06		
U	14									
I	459	1455	1854	1454	926	590	376	239	152	97
I	62	39	25	12						
I	250	300	1.6							
K	2	25	0	0	0	0	1			
K1	82	COMBINE LOCAL FLOW AT NODE 25								
K	1	26	0	0	0	0	1			
K1	83	ROUTE FLOWS TO NODE 26								
Y	0	0	0	0	1					
T1	0	8	3							
K	2	26	0	0	0	0	1			
K1	84	COMBINE ROUTED FLOW AND FLOW AT NODE 26								
K	1	28	0	0	0	0	1			
K1	85	ROUTE FLOWS TO NODE 28 (THREE RIVERS)								
Y	0	0	0	0	1					

K	0	27	0	0	0	0	1			
K1	86 LOCAL FLOW (E-9) AT NODE 27									
N	1	-1	37	0	5100	0	0	0	1	
P	0	21.5	33	47	55	65	72	74		
T	0	0	0	0	0	0	0.5	0.06		
U	4									
I	2140	1119	437	171	67	11				
I	100	150	1.6							
K	1	20	0	0	0	1				
K1	87 ROUTE LOCAL FLOW E-9 TO NODE 20									
T	0	0	0	0	1					
T1	0	3	1							
K	2	20	0	0	0	0	1			
K1	88 COMBINE HYDROGRAPHS AT 20									
K	0	29	0	0	0	0	1			
K1	89 INFLOWS TO BARCE CANAL FROM EASTERN END OF BASIN (G-2)									
N	-1	0	100	0	5100	0	0	0	1	
N										
N										
N										
K	1	30	0	0	0	0	1			
K1	90 ROUTE FLOW AT NODE 29 TO NODE 30									
T	0	0	0	0	1					
T1	0	7	3							
K	0	30	0	0	0	0	1			
K1	91 LOCAL INFLOW D-4									
N	1	-1	529	0	5100	0	0	0	1	
P	0	21.5	33	47	55	65	72	74		
T	0	0	0	0	0	0	0.25	0.06		
U	15									
I	940	4797	11090	12700	10200	6513	4014	2473	1524	939
I	579	356	220	140	102					
I	800	3960	1.6							
K	2	30	0	0	0	0	1			
K1	92 COMBINE LOCAL FLOW WITH ROUTED FLOW									
K	1	31	0	0	0	0	1			
K1	93 ROUTE FLOWS TO NODE 31									
T	0	0	0	0	1					
T1	0	1								
K	0	31	0	0	0	0	1			
K1	94 LOCAL FLOW D-3									
N	1	-1	144	0	5100	0	0	0	1	
P	0	21.5	33	47	55	65	72	74		
T	0	0	0	0	0	0	0.25	0.06		
U	24									
I	370	1076	2155	2396	2356	1742	1209	953	705	522
I	306	286	183	156	115	85	63	47	34	30
I	30	30	30	24						
I	320	1000	2.0							
K	2	31	0	0	0	0	1			
K1	95 COMBINE LOCAL FLOW WITH FLOW AT NODE 31									
K	0	31	0	0	0	0	1			
K1	96 LOCAL FLOW D-2									
N	1	-1	105	0	5100	0	0	0	1	
P	0	21.5	33	47	55	65	72	74		
T	0	0	0	0	0	0	0.25	0.06		
U	14									
I	353	1062	2750	2357	1404	929	501	363	227	142
I	89	49	35	18						
I	240	800	1.6							
K	2	31	0	0	0	0	1			
K1	97 COMBINE LOCAL FLOW D-2 WITH FLOW AT NODE 31									
K	0	31	0	0	0	0	1			
K1	98 LOCAL FLOW D-1									

N	1	-1	288	0	5100	0	0	0		
P	0	21.5	33	47	55	65	72	74		
T	0	0	0	0	0	0	0.25	0.06		
U	24									
I	103	504	1042	1512	2516	3750	4112	4139	3602	2445
I	1916	1204	866	727	527	320	276	200	145	105
I	76	55	50	50						
I	600	2160	1.6							
K	2	31	0	0	0	0	1			
K1	99 COMBINE LOCAL FLOW D-1 WITH FLOW AT NODE 31									
K	0	31	0	0	0	0	1			
K1	100 LOCAL FLOW D-5									
N	1	-1	269	0	5100	0	0	0		1
P	0	21.5	33	47	55	65	72	74		
T	0	0	0	0	0	0	0.25	0.05		
U	12									
I	12227	5835	4245	2585	1574	950	503	355	216	132
I	00	36								
I	540	2000	1.6							
K	2	31	0	0	0	0	1			
K1	101 COMBINE LOCAL D-5 WITH FLOW AT NODE 31									
K	1	31	0	0	0	0	1			
K1	102 ONEIDA LAKE OUTFLOW BY MODIFIED PULS METHOD									
Y	0	0	0	1	1					
T1	0	0	0	0	0	0	670000			
T2442000	635000	640000	650000	600000	735000	804000	845000			
T2990000	1150000	1304000								
T3	1000	1000	2000	4000	6000	8000	10000	11000		
T3	27900	64700	116600							
K	1	32	0	0	0	0	1			
K1	103 ROUTE FLOWS TO NODE 32									
Y	0	0	0	0	1					
T1	0	1								
K	0	32	0	0	0	0	1			
K1	104 LOCAL FLOW D-6									
N	1	-1	28	0	5100	0	0	0		1
P	0	21.5	33	47	55	65	72	74		
T	0	0	0	0	0	0	0.5	0.06		
U	15									
I	274	531	601	491	330	233	160	110	76	53
I	36	25	18	12	7					
I	70	210	1.6							
K	2	32	0	0	0	0	1			
K1	105 COMBINE LOCAL FLOW D-6 WITH FLOW AT 32									
K	1	28	0	0	0	0	1			
K1	106 ROUTE FLOW AT 32 TO NODE 28									
Y	0	0	0	0	1					
T1	0	6	2							
K	2	28	0	0	0	0	1			
K1	107 COMBINE ROUTED FLOW WITH FLOW AT NODE 28									
K	0	28	0	0	0	0	1			
K1	108 LOCAL FLOW D-7									
N	1	-1	110	0	5100	0	0	0		1
P	0	21.5	33	47	55	65	72	77		
T	0	0	0	0	0	0	0.5	0.06		
U	24									
I	602	1403	1000	1072	1496	1127	049	536	402	363
I	273	206	155	117	80	67	50	38	20	22
I	20	20	20	0						
I	250	000	2.0							
K	2	28	0	0	0	1	1			
K1	109 COMBINE WITH FLOW AT NODE 28									
K	1	33	0	0	0	1	1			
K1	110 ROUTE FLOW AT 28 TO NODE 33									
Y	0	0	0	0	1					
T1	0	3	1							

OROUT 14:31 JUN 27, '79

FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAN SAFETY VERSION JULY 1978
LAST MODIFICATION 26 FEB 79

1 PREVIEW OF SEQUENCE OF STREAM NETWORK CALCULATIONS

RUNOFF HYDROGRAPH AT	1
ROUTE HYDROGRAPH TO	2
RUNOFF HYDROGRAPH AT	2
COMBINE 2 HYDROGRAPHS AT	2
ROUTE HYDROGRAPH TO	6
RUNOFF HYDROGRAPH AT	6
COMBINE 2 HYDROGRAPHS AT	6
RUNOFF HYDROGRAPH AT	3
ROUTE HYDROGRAPH TO	6
COMBINE 2 HYDROGRAPHS AT	6
RUNOFF HYDROGRAPH AT	4
ROUTE HYDROGRAPH TO	4
ROUTE HYDROGRAPH TO	5
RUNOFF HYDROGRAPH AT	5
COMBINE 2 HYDROGRAPHS AT	5
ROUTE HYDROGRAPH TO	56
RUNOFF HYDROGRAPH AT	56
COMBINE 2 HYDROGRAPHS AT	56
ROUTE HYDROGRAPH TO	6
COMBINE 2 HYDROGRAPHS AT	6
ROUTE HYDROGRAPH TO	8
RUNOFF HYDROGRAPH AT	7
ROUTE HYDROGRAPH TO	8
COMBINE 2 HYDROGRAPHS AT	8
ROUTE HYDROGRAPH TO	10
RUNOFF HYDROGRAPH AT	9
ROUTE HYDROGRAPH TO	10
COMBINE 2 HYDROGRAPHS AT	10
ROUTE HYDROGRAPH TO	15
RUNOFF HYDROGRAPH AT	11
ROUTE HYDROGRAPH TO	11
ROUTE HYDROGRAPH TO	12
RUNOFF HYDROGRAPH AT	12
COMBINE 2 HYDROGRAPHS AT	12
ROUTE HYDROGRAPH TO	12
ROUTE HYDROGRAPH TO	13
RUNOFF HYDROGRAPH AT	13
COMBINE 2 HYDROGRAPHS AT	13
ROUTE HYDROGRAPH TO	14
RUNOFF HYDROGRAPH AT	14
COMBINE 2 HYDROGRAPHS AT	14
RUNOFF HYDROGRAPH AT	14
COMBINE 2 HYDROGRAPHS AT	14
ROUTE HYDROGRAPH TO	14
ROUTE HYDROGRAPH TO	15
COMBINE 2 HYDROGRAPHS AT	15
ROUTE HYDROGRAPH TO	18
RUNOFF HYDROGRAPH AT	15
ROUTE HYDROGRAPH TO	18
COMBINE 2 HYDROGRAPHS AT	18
RUNOFF HYDROGRAPH AT	17
ROUTE HYDROGRAPH TO	17
ROUTE HYDROGRAPH TO	16
COMBINE 2 HYDROGRAPHS AT	16
ROUTE HYDROGRAPH TO	16
RUNOFF HYDROGRAPH AT	16
ROUTE HYDROGRAPH TO	16

COMBINE 2 HYDROGRAPHS AT	19
ROUTE HYDROGRAPH TO	21
RUNOFF HYDROGRAPH AT	19
ROUTE HYDROGRAPH TO	21
COMBINE 2 HYDROGRAPHS AT	21
RUNOFF HYDROGRAPH AT	20
ROUTE HYDROGRAPH TO	20
ROUTE HYDROGRAPH TO	21
COMBINE 2 HYDROGRAPHS AT	21
RUNOFF HYDROGRAPH AT	21
COMBINE 2 HYDROGRAPHS AT	21
ROUTE HYDROGRAPH TO	22
RUNOFF HYDROGRAPH AT	22
COMBINE 2 HYDROGRAPHS AT	22
ROUTE HYDROGRAPH TO	22
ROUTE HYDROGRAPH TO	26
RUNOFF HYDROGRAPH AT	23
ROUTE HYDROGRAPH TO	23
ROUTE HYDROGRAPH TO	25
RUNOFF HYDROGRAPH AT	24
ROUTE HYDROGRAPH TO	24
ROUTE HYDROGRAPH TO	25
COMBINE 2 HYDROGRAPHS AT	25
RUNOFF HYDROGRAPH AT	25
COMBINE 2 HYDROGRAPHS AT	25
RUNOFF HYDROGRAPH AT	25
COMBINE 2 HYDROGRAPHS AT	25
ROUTE HYDROGRAPH TO	26
COMBINE 2 HYDROGRAPHS AT	26
ROUTE HYDROGRAPH TO	28
RUNOFF HYDROGRAPH AT	27
ROUTE HYDROGRAPH TO	28
COMBINE 2 HYDROGRAPHS AT	28
RUNOFF HYDROGRAPH AT	29
ROUTE HYDROGRAPH TO	30
RUNOFF HYDROGRAPH AT	30
COMBINE 2 HYDROGRAPHS AT	30
ROUTE HYDROGRAPH TO	31
RUNOFF HYDROGRAPH AT	31
COMBINE 2 HYDROGRAPHS AT	31
RUNOFF HYDROGRAPH AT	31
COMBINE 2 HYDROGRAPHS AT	31
RUNOFF HYDROGRAPH AT	31
COMBINE 2 HYDROGRAPHS AT	31
ROUTE HYDROGRAPH TO	31
ROUTE HYDROGRAPH TO	32
RUNOFF HYDROGRAPH AT	32
COMBINE 2 HYDROGRAPHS AT	32
ROUTE HYDROGRAPH TO	28
COMBINE 2 HYDROGRAPHS AT	28
RUNOFF HYDROGRAPH AT	28
COMBINE 2 HYDROGRAPHS AT	28
ROUTE HYDROGRAPH TO	33
END OF NETWORK	

FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAN SAFETY VERSION JULY 1978
LAST MODIFICATION 26 FEB 79

RUN DATE# 79/06/27.
TIME# 13.35.35.

OSMEGO RIVER BASIN
 MECIDB
 PWF- OVERFLOW ANALYSIS

JOB SPECIFICATION

NO	MHR	MNIN	IDAY	IHR	ININ	METRC	IPLT	IPRT	NSTAN
40	6	0	0	0	0	0	0	4	0
			JOPER	MNT	LROPT	TRACE			
			5	0	0	0			

MULTI-PLAN ANALYSES TO BE PERFORMED
 NPLAN= 1 NRTIO= 6 LRTIO= 1
 RTIOS= .20 .40 .50 .60 .80 1.00

SUB-AREA RUNOFF COMPUTATION

1 BARCE CANAL LOCK 30 AT MACEDON (SUB AREA A1)

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
1	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IWDC	IUNC	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
-1	0	100.00	0.00	5100.00	0.00	0.000	0	1	0

HYDROGRAPH ROUTING

2 BARCE CANAL LOCK 29 PALMIRA (ROUTED FLOW FROM LOCK 30)

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
2	1	0	0	0	0	1	0	0

ROUTING DATA

GLOSS	CLOSS	AVC	IRES	ISAME	IOPT	IPWP	LSTR
0.0	0.000	0.00	0	1	0	0	0

NSTPS	NSTDJ	LAC	MASKK	X	TSK	STORA	ISPRAT
0	3	1	0.000	0.000	0.000	0.	0

SUB-AREA RUNOFF COMPUTATION

3 GAMARGUA CREEK LOCAL INFLOWS TO LOCK 29 (SUB-AREA E-1)

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
2	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IWDC	IUNC	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	-1	147.00	0.00	5100.00	0.00	0.000	0	1	0

PRECIP DATA

TRSPC COMPUTED BY THE PROGRAM IS .934

LOSS DATA
 LROPT STKR BLTKR RTIOL ERAIN STRKS RTIOK STRTL CNSTL ALSHX RTIMP
 0 0.00 0.00 1.00 0.00 0.00 1.00 .50 .05 0.00 0.00

RECESSION DATA
 STRTO= 140.00 ORCSH= 550.00 RTIOR= 1.60

END-OF-PERIOD FLOW
 NO.DA HR.MM PERIOD RAIN EXCS LOSS COMP Q NO.DA HR.MM PERIOD RAIN EXCS LOSS COMP Q
 SUM 14.86 11.56 3.30 186787.
 (377.)(294.)(84.)(5289.22)

COMBINE HYDROGRAPHS

4 COMBINED ROUTED AND LOCAL FLOWS AT LOCK 29

ISTAG ICOMP IECON ITAPE JPLT JPRT INAME ISTAGE IAUTO
 2 2 0 0 0 0 1 0 0

HYDROGRAPH ROUTING

5 ROUTED HYDROGRAPH TO LOCK 27 AT LYONS

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

ROUTING DATA

GLOSS CLOSS AVC IRES ISAME IOPT IPHP LSTR
 0.0 0.000 0.00 0 1 0 0 0

NSTPS NSTDL LAC ANSKX X TSK STORA ISPRAT
 0 0 3 0.000 0.000 0.000 0. 0

SUB-AREA RUNOFF COMPUTATION

6 LOWER GAMBRACIAL LOCAL INFLOWS VICINITY OF LOCK 27 (SUB-AREA E-2)

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

HYDROGRAPH DATA

INYDC IUNG TAREA SWAP TRSBA TRSPC RATIO ISHOW ISAME LOCAL
 1 -1 110.00 0.00 5100.00 0.00 0.000 0 1 0

PRECIP DATA

SPFE PHS R6 R12 R24 R48 R72 R96
 0.00 21.50 33.00 47.00 55.00 65.00 72.00 74.00

TRSPC COMPUTED BY THE PROGRAM IS .934

LOSS DATA
 LROPT STRKR DLTKR RTIOL ERAIN STRKS RTIOK STRTL CNSTL ALSHX RTIMP
 0 0.00 0.00 1.00 0.00 0.00 1.00 .50 .05 0.00 0.00

RECESSION DATA
 STRTD= 120.00 BRCSN= 470.00 RTIOR= 1.60

END-OF-PERIOD FLOW
 NO.DA HR.MM PERIOD RAIN EXCS LOSS COMP Q NO.DA HR.MM PERIOD RAIN EXCS LOSS COMP Q
 SUM 14.06 11.56 3.30 147310.
 (377.)(294.)(84.)(4171.50)

COMBINE HYDROGRAPHS

7 COMBINED AND LOCAL FLOWS AT LOCK 27

ISTAG ICOMP IECON ITAPE JPLT JPRT INAME ISTAGE IAUTO
 6 2 0 0 0 0 1 0 0

SUB-AREA RUNOFF COMPUTATION

8 LOCAL FLOW E-3 (AREA LOCAL TO LARGE CANAL E-29 TO E-27)

ISTAG ICOMP IECON ITAPE JPLT JPRT INAME ISTAGE IAUTO
 3 0 0 0 0 0 1 0 0

HYDROGRAPH DATA

INTBC IUNC TAREA SNAP TRSDA TRSPC RATIO ISNOW ISAME LOCAL
 1 -1 51.00 0.00 5100.00 0.00 0.000 0 1 0

PRECIP DATA

SPFE PMS R6 R12 R24 R48 R72 R96
 0.00 21.50 33.00 47.00 55.00 65.00 72.00 74.00

TRSPC COMPUTED BY THE PROGRAM IS .934

LOSS DATA
 LROPT STRKR DLTKR RTIOL ERAIN STRKS RTIOK STRTL CNSTL ALSHX RTIMP
 0 0.00 0.00 1.00 0.00 0.00 1.00 .50 .05 0.00 0.00

RECESSION DATA
 STRTD= 100.00 BRCSN= 200.00 RTIOR= 1.60

END-OF-PERIOD FLOW
 NO.DA HR.MM PERIOD RAIN EXCS LOSS COMP Q NO.DA HR.MM PERIOD RAIN EXCS LOSS COMP Q
 SUM 14.06 11.56 3.30 65033.
 (377.)(294.)(84.)(1042.10)

HYDROGRAPH ROUTING

9 ROUTED FLOW E-3 TO LYONS (NODE 6)

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
6	1	0	0	0	0	1	0	0
ROUTING DATA								
BLDSS	CLOSS	AVC	IBES	ISAME	IOPT	IPWP	LSTR	
0.0	0.000	0.00	0	1	0	0	0	
MSTPS	MSTL	LAC	ANSKX	I	TSK	STORA	ISPRAT	
0	5	2	0.000	0.000	0.000	0.	0	

COMBINE HYDROGRAPHS

10 COMBINE FLOWS AT NODE 6

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
6	2	0	0	0	0	1	0	0

SUB-AREA RUNOFF COMPUTATION

11 CANANDAIGUA LAKE INFLOW

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
4	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

INYDC	IUNC	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	-1	104.00	0.00	5100.00	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	21.50	33.00	47.00	55.00	65.00	72.00	74.00

TRSPC COMPUTED BY THE PROGRAM IS .934

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSNX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	1.25	.03	0.00	0.00

RECESSION DATA

STRTO= 300.00 GRCSN= 1000.00 RTIOR= 1.60

END-OF-PERIOD FLOW

NO.DA	HR.MM	PERIOD	RAIN	EXCS	LOSS	COMP Q	NO.DA	HR.MM	PERIOD	RAIN	EXCS	LOSS	COMP Q
-------	-------	--------	------	------	------	--------	-------	-------	--------	------	------	------	--------

SUN 14.06 12.00 2.06 252691.
(377.)(305.)(73.)(7192.41)

HYDROGRAPH ROUTING

12 CANANDAIGUA LAKE OUT FLOW USING MODIFIED PULS METHOD

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
4	1	0	0	0	0	1	0	0

ROUTING DATA

COMBINE HYDROGRAPHS

15 COMBINE ROUTED CAMANDAIGUA OUTFLOWS AND FLINT CR INFLOWS

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
5	2	0	0	0	0	1	0	0

HYDROGRAPH ROUTING

16 OUTLET ROUTED TO LOCK 27

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
56	1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVC	IRES	ISAME	IOPT	IPNP	LSTR
0.0	0.000	0.00	0	1	0	0	0

MSTPS	MSTDL	LAG	MYSKK	X	TSK	STORA	ISPRAT
0	7	3	0.000	0.000	0.000	0.	0

SUB-AREA RUNOFF COMPUTATION

17 OUTLET LOCAL FLOW A-3

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
56	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHTDC	IUNG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNDW	ISAME	LOCAL
1	-1	155.00	0.00	5100.00	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PHS	R6	R12	R24	R48	R72	R96
0.00	21.50	33.00	47.00	55.00	65.00	72.00	74.00

TRSPC COMPUTED BY THE PROGRAM IS .934

LOSS DATA

LROPT	STOKR	DLTKR	RTIOL	ERAIN	STOKS	RTIOK	STRTL	CMSTL	ALSMI	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	.60	.05	0.00	0.00

RECESSION DATA

STRTO= 150.00 ORCSH= 200.00 RTIOR= 1.60

END-OF-PERIOD FLOW

NO.DA	HR.NM	PERIOD	RAIN	EXCS	LOSS	COMP Q	NO.DA	HR.NM	PERIOD	RAIN	EXCS	LOSS	COMP Q
-------	-------	--------	------	------	------	--------	-------	-------	--------	------	------	------	--------

SUN 14.86 11.06 3.00 187176.
(377.)(281.)(97.)(5300.23)

COMBINE HYDROGRAPHS

18 COMBINE LOCAL FLOW A-3 WITH FLOW AT LOCK 27

LOSS DATA

LROPT	STMR	BLTKR	RTIOL	ERAIN	STAKS	RTIOK	STRTL	CHSTL	ALSMI	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	.50	.06	0.00	0.00

RECESSION DATA

STRTO= 100.00 QRCSS= 340.00 RTIOR= 1.60

END-OF-PERIOD FLOW

NO.DA	HR.MM	PERIOD	RAIN	EXCS	LOSS	COMP Q	NO.DA	HR.MM	PERIOD	RAIN	EXCS	LOSS	COMP Q
-------	-------	--------	------	------	------	--------	-------	-------	--------	------	------	------	--------

SUM 14.86 11.08 3.78 109181.
 (377.)(281.)(96.)(3091.66)

HYDROGRAPH ROUTING

23 ROUTE FLOWS AT LOCK 26 TO NODE 8

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
0	1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVC	IRCS	ISAME	IOPT	IPWP	LSTR
0.0	0.000	0.00	0	1	0	0	0

MSTPS	MSTDL	LAC	MNSKX	X	TSK	STORA	ISPRAT
0	2	0	0.000	0.000	0.000	0.	0

COMBINE HYDROGRAPHS

24 COMBINE ROUTED AND LOCAL FLOWS AT NODE 8

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
0	2	0	0	0	0	1	0	0

HYDROGRAPH ROUTING

25 ROUTE FLOWS AT NODE 8 TO NODE 10

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
10	1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVC	IRCS	ISAME	IOPT	IPWP	LSTR
0.0	0.000	0.00	0	1	0	0	0

MSTPS	MSTDL	LAC	MNSKX	X	TSK	STORA	ISPRAT
0	5	2	0.000	0.000	0.000	0.	0

SUB-PHEN RUNOFF COMPUTATION

26 LOCAL FLOW BETWEEN LOCK 26 AND LOCK 25 (E-5)

ISTAG ICOMP IECON ITAPE JPLT JPRT INAME ISTAGE IAUTO
 9 0 0 0 0 0 0 1 0 0

HYDROGRAPH DATA

INYDC IUNG TAREA SNAP TRSDA TRSPC RATIO ISNOW ISAME LOCAL
 1 -1 18.00 0.00 5100.00 0.00 0.000 0 1 0

PRECIP DATA

SPFE PMS R6 R12 R24 R48 R72 R96
 0.00 21.50 33.00 47.00 55.00 65.00 72.00 74.00

TRSPC COMPUTED BY THE PROGRAM IS .934

LOSS DATA

LROPT STRKR DLTKR RTIOL ERAIN STRKS RTIOK STRTL CMSTL ALSHX RTIMP
 0 0.00 0.00 1.00 0.00 0.00 1.00 .50 .04 0.00 0.00

RECESSION DATA

STRTO= 90.00 GRCSN= 90.00 RTIOR= 1.60

END-OF-PERIOD FLOW

NO.DA HR.NN PERIOD RAIN EXCS LOSS COMP 0 NO.DA HR.NN PERIOD RAIN EXCS LOSS COMP 0

SUN 14.86 11.00 3.78 23275.
 (377.)(281.)(96.)(659.07)

HYDROGRAPH ROUTING

27 ROUTE INFLOW E-5 TO NODE 10

ISTAG ICOMP IECON ITAPE JPLT JPRT INAME ISTAGE IAUTO
 10 1 0 0 0 0 1 0 0

ROUTING DATA

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

MSTPS MSTDL LAC ANSKK I TSK STORA ISPRAT
 0 2 0 0.000 0.000 0.000 0.

COMBINE HYDROGRAPHS

28 COMBINE ROUTED FLOW WITH FLOW AT NODE 10

ISTAG ICOMP IECON ITAPE JPLT JPRT INAME ISTAGE IAUTO
 10 2 0 0 0 0 1 0 0

HYDROGRAPH ROUTING

29 ROUTE FLOWS AT NODE 10 TO NODE 15

ISTAG ICOMP IECON ITAPE JPLT JPRT INAME ISTAGE IAUTO

HYDROGRAPH ROUTING

32 ROUTE KEUKA LAKE OUTFLOWS TO 12

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	IMANE	ISTAGE	IAUTO
12	1	0	0	0	0	1	0	0
ROUTING DATA								
GLOSS	CLOSS	AVC	IREB	ISAME	IOPT	IPMP	LSTR	
0.0	0.000	0.00	0	1	0	0	0	
NSTPS	NSTD	LAC	AMSK	X	TSK	STOR	ISPRAT	
0	6	2	0.000	0.000	0.000	0.	0	

SUB-AREA RUNOFF COMPUTATION

33 SENECA LAKE INFLOWS B-2

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	IMANE	ISTAGE	IAUTO
12	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

INTDC	IUNG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISMOW	ISAME	LOCAL
1	-1	524.00	0.00	5100.00	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	21.50	33.00	47.00	55.00	65.00	72.00	74.00

TRSPC COMPUTED BY THE PROGRAM IS .934

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STNKS	RTIOK	STRTL	CNSTL	ALSHX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	.50	.03	0.00	0.00

RECESSION DATA

STRTO= 500.00 URCSH= 2000.00 RTIOR= 1.60

END-OF-PERIOD FLOW

NO.DA	HR.NN	PERIOD	RAIN	EXCS	LOSS	COMP	NO.DA	HR.NN	PERIOD	RAIN	EXCS	LOSS	COMP
-------	-------	--------	------	------	------	------	-------	-------	--------	------	------	------	------

SUN 14.06 12.52 2.34 7411.90.
(377.)(318.)(59.)(21007.99)

COMBINE HYDROGRAPHS

34 COMBINE LOCAL FLOW B-2 AND ROUTED KEUKA LAKE OUTLET FLOWS

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	IMANE	ISTAGE	IAUTO
12	2	0	0	0	0	1	0	0

HYDROGRAPH DATA

35 SENECA LAKE OUTFLOWS - MODIFIED PULS METHOD

	ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO	
	12	1	0	0	0	0	1	0	0	
ROUTING DATA										
	GLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPHP	LSTR		
	0.0	0.000	0.00	1	1	0	0	0		
	NSTPS	NSTDL	LAG	ANSKK	X	TSK	STORA	ISPRAT		
	0	0	0	0.000	0.000	0.000	534000.	0		
STORAGE	372000.00	414000.00	456000.00	500000.00	543000.00	586000.00	630000.00	650000.00	674000.00	720000.00
	800000.00	1200000.00								
OUTFLOW	700.00	700.00	700.00	700.00	700.00	700.00	700.00	1000.00	3000.00	3000.00
	15000.00	77000.00								

HYDROGRAPH ROUTING

36 SENECA LAKE OUTFLOWS ROUTED TO 13

	ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
	13	1	0	0	0	0	1	0	0
ROUTING DATA									
	GLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPHP	LSTR	
	0.0	0.000	0.00	0	1	0	0	0	
	NSTPS	NSTDL	LAG	ANSKK	X	TSK	STORA	ISPRAT	
	0	2	0	0.000	0.000	0.000	0.	0	

SUB-AREA RUNOFF COMPUTATION

37 LOCAL INFLOW B-4

	ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO	
	13	0	0	0	0	0	1	0	0	
HYDROGRAPH DATA										
	IMYDC	IUMC	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
	1	-1	39.00	0.00	5100.00	0.00	0.000	0	1	0

PRECIP DATA

	SPFE	PMS	R6	R12	R24	R48	R72	R96
	0.00	21.50	33.00	47.00	55.00	65.00	72.00	74.00

TRSPC COMPUTED BY THE PROGRAM IS .934

LOSS DATA

	LROPT	STWR	BLTKR	RTIOL	ERAIN	STWKS	RTIOK	STRTL	CNSTL	ALSMI	RTIMP
	0	0.00	0.00	1.00	0.00	0.00	1.00	.50	.05	0.00	0.00

RECESSION DATA

STRTO= 92.00 QRCSH= 200.00 RTIOR= 1.60

END-OF-PERIOD FLOW

NO.DA HR.MN PERIOD RAIN EXCS LOSS NO.DA HR.MN PERIOD RAIN EXCS LOSS COMP 0

SUM 14.86 11.56 3.30 51530.
 (377.)(294.)(84.)(1459.17)

COMBINE HYDROGRAPHS

38 COMBINE ROUTED SENECA LAKE OUTFLOW AND LOCAL FLOW B-4

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
13	2	0	0	0	0	1	0	0

HYDROGRAPH ROUTING

39 ROUTE HYDROGRAPH TO 14 (CATUGA LAKE INFLOW)

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
14	1	0	0	0	0	1	0	0

ROUTING DATA

GLOSS	CLOSS	AVC	IRES	ISANE	IOPT	IPWP	LSTR
0.0	0.000	0.00	0	1	0	0	0

MSTPS	MSTDL	LAC	ANSKK	X	TSK	STORA	ISPRAT
0	6	2	0.000	0.000	0.000	0.	0

SUB-AREA RUNOFF COMPUTATION

40 LOCAL INFLOW B-5

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
14	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

INYDC	IUNC	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISMOW	ISANE	LOCAL
1	-1	36.00	0.00	5100.00	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	21.50	33.00	47.00	55.00	65.00	72.00	74.00

TRSPC COMPUTED BY THE PROGRAM IS .934

LOSS DATA

LROPT	STRKR	BLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CHSTL	ALSHI	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	.50	.05	0.00	0.00

RECESSION DATA

STRTO= 92.00 GRCSM= 200.00 RTIOR= 1.60

END-OF-PERIOD FLOW

NO.DA	HR.NN	PERIOD	RAIN	EXCS	LOSS	COMP 0	NO.DA	HR.NN	PERIOD	RAIN	EXCS	LOSS	COMP 0
-------	-------	--------	------	------	------	--------	-------	-------	--------	------	------	------	--------

SUM 14.86 11.56 3.30 47972.
 (377.)(294.)(84.)(1356.42)

COMBINE HYDROGRAPHS

41 COMBINE FLOW B-3 WITH ROUTED FLOW

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
14	2	0	0	0	0	1	0	0

SUB-AREA RUNOFF COMPUTATION

42 CAYUGA LAKE INFLOW B-3

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
14	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYDC	IUNC	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISARE	LOCAL
1	-1	782.00	0.00	5100.00	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	21.50	33.00	47.00	55.00	65.00	72.00	74.00

TRSPC COMPUTED BY THE PROGRAM IS .934

LOSS DATA

LROPT	STKR	DLTKR	RTIOL	ERAIN	STIKS	RTIOK	STRTL	CNSTL	ALSHI	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	.50	.03	0.00	0.00

RECESSION DATA

STRTO= 1000.00 GRCSH= 1700.00 RTIOR= 1.46

END-OF-PERIOD FLOW

NO.DA	HR.MM	PERIOD	RAIN	EXCS	LOSS	COMP	NO.DA	HR.MM	PERIOD	RAIN	EXCS	LOSS	COMP
-------	-------	--------	------	------	------	------	-------	-------	--------	------	------	------	------

SUN	14.06	12.52	2.34	1081195.
	(377.)	(318.)	(59.)	(30616.03)

COMBINE HYDROGRAPHS

43 COMBINE LOCAL INFLOW B-3 AND ROUTED FLOW

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
14	2	0	0	0	0	1	0	0

HYDROGRAPH ROUTING

44 CAYUGA LAKE OUTFLOW - MODIFIED PULS

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
14	1	0	0	0	0	1	0	0

		ROUTING DATA									
		GLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPNP	LSTR		
		0.0	0.000	0.00	1	1	0	0	0		
		NSTPS	NSTDL	LAC	ANSKK	X	TSK	STORA	ISPRAT		
		0	0	0	0.000	0.000	0.000	490000.	0		
STORAGE	375000.00 654500.00	417000.00 982000.00	440000.00	503000.00	544000.00	509500.00	634000.00	640000.00	727000.00	0.00	
OUTFLOW	1700.00 30510.00	1700.00 103500.00	1700.00	1700.00	3400.00	3400.00	3400.00	8700.00	8700.00	0.00	

HYDROGRAPH ROUTING

45 ROUTE CAYUGA LAKE OUTFLOWS TO NODE 15

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	IMME	ISTAGE	IAUTO
15	1	0	0	0	0	1	0	0
ROUTING DATA								
GLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPNP	LSTR	
0.0	0.000	0.00	0	1	0	0	0	
NSTPS	NSTDL	LAC	ANSKK	X	TSK	STORA	ISPRAT	
0	3	1	0.000	0.000	0.000	0.	0	

COMBINE HYDROGRAPHS

46 COMBINE ROUTED FLOW WITH FLOW AT NODE 15

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	IMME	ISTAGE	IAUTO
15	2	0	0	0	0	1	0	0

HYDROGRAPH ROUTING

47 ROUTE FLOWS TO NODE 10

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	IMME	ISTAGE	IAUTO
10	1	0	0	0	0	1	0	0
ROUTING DATA								
GLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPNP	LSTR	
0.0	0.000	0.00	0	1	0	0	0	
NSTPS	NSTDL	LAC	ANSKK	X	TSK	STORA	ISPRAT	
0	0	3	0.000	0.000	0.000	0.	0	

SUB-AREA RUNOFF COMPUTATION

48 LOCAL FLOW E-6

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

HYDROGRAPH DATA

INTDC	IUNG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	-1	191.00	0.00	5100.00	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	21.50	33.00	47.00	55.00	65.00	72.00	74.00

TRSPC COMPUTED BY THE PROGRAM IS .934

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CHSTL	ALSHX	RTIHP
0	0.00	0.00	1.00	0.00	0.00	1.00	.50	.06	0.00	0.00

RECESSION DATA

STRTO= 140.00 BRCSH= 400.00 RTIOR= 1.60

END-OF-PERIOD FLOW

NO.DA	HR.MM	PERIOD	RAIN	EXCS	LOSS	COMP Q	NO.DA	HR.MM	PERIOD	RAIN	EXCS	LOSS	COMP Q
-------	-------	--------	------	------	------	--------	-------	-------	--------	------	------	------	--------

SUM 14.86 11.00 3.70 227590.
(377.)(281.)(96.)(6444.63)

HYDROGRAPH ROUTING

49 ROUTE LOCAL FLOW E-6 TO NODE 10

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
10	1	0	0	0	0	1	0	0

ROUTING DATA

GLOSS	CLOSS	AVC	IRES	ISAME	IOPT	IPHP	LSTR
0.0	0.000	0.00	0	1	0	0	0

MSTPS	MSTL	LAC	AMSK	X	TSK	STORA	ISPRAT
0	2	0	0.000	0.000	0.000	0.	0

COMBINE HYDROGRAPHS

50 COMBINE ROUTED FLOW W/ FLOW AT NODE 10

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
10	2	0	0	0	0	1	0	0

SUB-AREA RUNOFF COMPUTATION

51 HEAD MASCO INFLOW C-1

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
17	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

TRSDC 1 -1 201.00 0.00 5100.00 0.00 0.000 0 1 0
 PRECIP DATA
 SPFE PMS R6 R12 R24 R48 R72 R96
 0.00 21.50 33.00 47.00 55.00 65.00 72.00 74.00
 TRSPC COMPUTED BY THE PROGRAM IS .934

LOSS DATA
 LROPT STKR DLTKR RTIOL ERDIN STKRS RTIOK STRTL CWSTL ALSHK RTIMP
 0 0.00 0.00 1.00 0.00 0.00 1.00 .75 .05 0.00 0.00

RECESSION DATA
 STRTQ= 450.00 ORCSM= 1000.00 RTIOR= 1.60

END-OF-PERIOD FLOW
 NO.DA HR.MM PERIOD RAIN EXCS LOSS COMP Q NO.DA HR.MM PERIOD RAIN EXCS LOSS COMP Q
 SUN 14.06 11.46 3.39 264013.
 (377.)(291.)(86.)(7498.67)

HYDROGRAPH ROUTING

S2 ONASCO LAKE INFLOWS - MODIFIED PULS METHOD

	ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO	
	17	1	0	0	0	0	1	0	0	
	ROUTING DATA									
	GLOSS	CLOSS	AVC	INES	ISAME	IOPT	IPWP	LSTR		
	0.0	0.000	0.00	1	1	0	0	0		
	NSTPS	NSTBL	LAC	ANSKX	I	TSK	STORA	ISPRAT		
	0	0	0	0.000	0.000	0.000	92000.	0		
STORAGE	66000.00	73200.00	79900.00	86500.00	93200.00	99000.00	104500.00	113200.00	119000.00	124500.00
	152900.00	205700.00								
OUTFLOW	400.00	400.00	400.00	1100.00	1700.00	2300.00	2940.00	3400.00	3400.00	3400.00
	24000.00	69100.00								

HYDROGRAPH ROUTING

S3 ROUTE ONASCO LAKE OUTLET FLOWS

	ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
	10	1	0	0	0	0	1	0	0
	ROUTING DATA								
	GLOSS	CLOSS	AVC	INES	ISAME	IOPT	IPWP	LSTR	
	0.0	0.000	0.00	0	1	0	0	0	
	NSTPS	NSTBL	LAC	ANSKX	I	TSK	STORA	ISPRAT	
	0	7	3	0.000	0.000	0.000	0.	0	

COMBINE HYDROGRAPHS

54 COMBINE FLOWS WITH FLOWS AT NODE 18

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
18	2	0	0	0	0	1	0	0

SUB-AREA RUNDFF COMPUTATION

55 READ LOCAL FLOW C-6

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
18	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYDC	IUNG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNON	ISAME	LOCAL
1	-1	19.00	0.00	5100.00	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PWS	R6	R12	R24	R48	R72	R96
0.00	21.50	33.00	47.00	55.00	65.00	72.00	74.00

TRSPC COMPUTED BY THE PROGRAM IS .934

LOSS DATA

LBOPT	STNR	BLTKR	RTIOL	ERAIN	STRMS	RTIOL	STRTL	CNSTL	ALSHI	RTINP
0	0.00	0.00	1.00	0.00	0.00	1.00	.50	.06	0.00	0.00

RECESSION DATA

STRTO= 90.00 ORCSH= 200.00 RTIOR= 1.60

END-OF-PERIOD FLOW

NO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	NO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q
SUM													
14.86 11.00 3.78 2500.0													
(377.)(281.)(96.)(710.41)													

COMBINE HYDROGRAPHS

56 COMBINE LOCAL FLOW C-6 WITH FLOW AT NODE 18

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
18	2	0	0	0	0	1	0	0

HYDROGRAPH ROUTING

57 ROUTE FLOW AT 18 TO NODE 21

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
21	1	0	0	0	0	1	0	0

ROUTING DATA

GLOSS	CLOSS	AVC	IRCS	ISAME	IOPT	IPWP	LSTR
0.0	0.000	0.00	0	1	0	0	0

MSTPS 0 7 3 0.000 0.000 0.000 0.000 0.000 0.000 0.000

SUB-AREA RUNOFF COMPUTATION

50 LOCAL INFLOW E-7

ISTAG ICOMP IECON ITAPE JPLT JPRT INAME ISTAGE IAUTO
 19 0 0 0 0 0 0 1 0 0

HYDROGRAPH DATA

INYDC IUNG TAREA SNAP TRSDA TRSPC RATIO ISNOW ISANE LOCAL
 1 0.00 -1 90.00 0.00 5100.00 0.00 0.000 0 1 0

PRECIP DATA

SPFE PMS R4 R12 R24 R48 R72 R96
 0.00 21.50 33.00 47.00 55.00 65.00 72.00 74.00

TRSPC COMPUTED BY THE PROGRAM IS .934

LOSS DATA

LROPT STRKR BLTKR RTIOL ERAIN STRKS RTIOK STRTL CNSTL ALSNI RTIMP
 0 0.00 0.00 1.00 0.00 0.00 1.00 .50 .06 0.00 0.00

RECESSION DATA

STRTO= 120.00 ORCSN= 400.00 RTIOR= 1.60

END-OF-PERIOD FLOW

NO.BA HR.NH PERIOD RAIN EXCS LOSS COMP 0 NO.BA HR.NH PERIOD RAIN EXCS LOSS COMP 0

SUN 14.06 11.00 3.70 122486.
 (377.)(281.)(96.)(3468.42)

HYDROGRAPH ROUTING

59 ROUTE LOCAL FLOW TO NODE Z1

ISTAG ICOMP IECON ITAPE JPLT JPRT INAME ISTAGE IAUTO
 21 1 0 0 0 0 0 1 0 0

ROUTING DATA

BLOSS CLOSS AVC IRES ISANE IOPT IPMP LSTR
 0.0 0.000 0.00 0 1 0 0 0

MSTPS MSTBL LAC ANSKK X TSK STORA ISPRAT
 0 6 2 0.000 0.000 0.000 0. 0

COMBINE HYDROGRAPHS

60 COMBINE ROUTED FLOW WITH FLOW AT Z1

ISTAG ICOMP IECON ITAPE JPLT JPRT INAME ISTAGE IAUTO
 21 2 0 0 0 0 0 1 0 0

SUB-AREA RUNOFF COMPUTATION

51 SKANEATELES LAKE INFLOWS

ISTAG ICOMP IECON ITAPE JPLY JPRT INME ISTAGE IAUTO
20 0 0 0 0 0 1 0 0

HYDROGRAPH DATA

INYDC IUNG TAREA SHAP TRSDA TRSPC RATIO ISNDW ISAME LOCAL
1 -1 74.00 0.00 5100.00 0.00 0.000 0 1 0

PRECIP DATA

SPFE PHS R6 R12 R24 R48 R72 R96
0.00 21.50 33.00 47.00 55.00 65.00 72.00 74.00

TRSPC COMPUTED BY THE PROGRAM IS .934

LOSS DATA

LROPT STRKR DLTKR RTIOL ERATN STNKS RTIOK STRTL CNSTL ALSHX RTIMP
0 0.00 0.00 1.00 0.00 0.00 1.00 .75 .05 0.00 0.00

RECESSION DATA

STRTO= 250.00 ORCSH= 500.00 RTIOR= 1.60

END-OF-PERIOD FLOW

NO.DA HR.MN PERIOD RAIN EXCS LOSS COMP Q NO.DA HR.MN PERIOD RAIN EXCS LOSS COMP Q

SUN 14.06 11.46 3.39 100.49.
(377.)(291.)(06.)(2847.23)

HYDROGRAPH ROUTING

62 SKANEATELES LAKE OUTFLOWS

ISTAG ICOMP IECON ITAPE JPLY JPRT INME ISTAGE IAUTO
20 1 0 0 0 0 1 0 0

ROUTING DATA

QLOSS CLOSS AVC INES ISAME IOPT IPMP LSTR
0.0 0.000 0.00 1 1 0 0 0

MSTPS MSTOL LAC ANSCK I TSK STORA ISPRAT
0 0 0 0.000 0.000 0.000 0. 0

STORAGE 0.00 17323.00 34756.00 52104.00 104348.00 208736.00 243492.00

OUTFLOW 0.00 353.00 747.00 1500.00 6403.00 13313.00 17359.00

HYDROGRAPH ROUTING

63 ROUTE SKANEATELES LAKE OUTFLOWS TO NODE 21

ISTAG ICOMP IECON ITAPE JPLY JPRT INME ISTAGE IAUTO
21 1 0 0 0 0 1 0 0

ROUTING DATA

QLOSS CLOSS AVC INES ISAME IOPT IPMP LSTR

NSTPS	NSTD	LAC	ANSKK	X	TSK	STOR	ISPRAT
0	6	2	0.000	0.000	0.000	0.	0

COMBINE HYDROGRAPHS

64 COMBINE ROUTED LAKE OUTFLOW WITH FLOW AT NODE 21

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
21	2	0	0	0	0	1	0	0

SUB-AREA RUNOFF COMPUTATION

65 LOCAL FLOW C-7

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
21	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IMYDC	IUMC	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOH	ISAME	LOCAL
1	-1	27.00	0.00	5100.00	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	21.50	33.00	47.00	55.00	65.00	72.00	74.00

TRSPC COMPUTED BY THE PROGRAM IS .934

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSHX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	.50	.06	0.00	0.00

RECESSION DATA

STRTO= 90.00 BRCSH= 200.00 RTIOR= 1.60

END-OF-PERIOD FLOW

NO.DA	HR.NH	PERIOD	RAIN	EXCS	LOSS	COMP Q	NO.DA	HR.NH	PERIOD	RAIN	EXCS	LOSS	COMP Q
-------	-------	--------	------	------	------	--------	-------	-------	--------	------	------	------	--------

SUM 14.06 11.00 3.78 35566.
(377.)(281.)(96.)(1007.12)

COMBINE HYDROGRAPHS

66 COMBINE LOCAL FLOW C-7 WITH FLOWS AT NODE 21

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
21	2	0	0	0	0	1	0	0

HYDROGRAPH ROUTING

67 ROUTING TO NODE 22

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	IMME	ISTAGE	IAUTO
22	1	0	0	0	0	1	0	0

ROUTING DATA

GLSS	CLSS	AVC	IRCS	ISME	IOPT	IPMP	LSTR
0.0	0.000	0.00	0	1	0	0	0

NSTPS	NSTL	LAC	ANSKK	X	TSK	STOR	ISPRAT
0	4	1	0.000	0.000	0.000	0.	0

SUB-AREA RUNOFF COMPUTATION

68 LOCAL FLOW E-8

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	IMME	ISTAGE	IAUTO
22	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

INYDC	IUNC	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	-1	90.00	0.00	5100.00	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PHS	R6	R12	R24	R48	R72	R96
0.00	21.50	33.00	47.00	55.00	65.00	72.00	74.00

TRSPC COMPUTED BY THE PROGRAM IS .934

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSHY	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	.50	.06	0.00	0.00

RECESSION DATA

STRTO= 120.00 GRCSH= 400.00 RTIOR= 1.60

END-OF-PERIOD FLOW

NO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP	NO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP
-------	-------	--------	------	------	------	------	-------	-------	--------	------	------	------	------

SUN 14.06 11.00 3.70 122095.
(377.)(281.)(96.)(3457.35)

COMBINE HYDROGRAPHS

69 COMBINE ROUTED FLOW AND LOCAL FLOW AT NODE 22

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	IMME	ISTAGE	IAUTO
22	2	0	0	0	0	1	0	0

HYDROGRAPH ROUTING

70 BALDWINVILLE POOL - MODIFIED PULS METHOD

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	IMME	ISTAGE	IAUTO
22	0	0	0	0	0	1	0	0

HYDROGRAPH ROUTING

73 OTISCO LAKE OUTFLOWS - MODIFIED PULS METHOD

	ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO	
	23	1	0	0	0	0	1	0	0	
ROUTING DATA										
	GLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR		
	0.0	0.000	0.00	1	1	0	0	0		
	NSTPS	NSTD	LAC	ANSKK	X	TSK	STORA	ISPRAT		
	0	0	0	0.000	0.000	0.000	29300.	0		
STORAGE	19600.00	21800.00	23900.00	26100.00	28300.00	30500.00	32600.00	34800.00	37000.00	39200.00
	45700.00	52300.00	58800.00	65300.00						
OUTFLOW	200.00	200.00	200.00	200.00	200.00	400.00	900.00	1600.00	2000.00	2000.00
	7060.00	18100.00	33700.00	53200.00						

HYDROGRAPH ROUTING

74 ROUTE OTISCO LAKE OUTFLOWS TO NODE 25

	ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
	25	1	0	0	0	0	1	0	0
ROUTING DATA									
	GLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR	
	0.0	0.000	0.00	0	1	0	0	0	
	NSTPS	NSTD	LAC	ANSKK	X	TSK	STORA	ISPRAT	
	0	10	4	0.000	0.000	0.000	0.	0	

SUB-AREA RUNOFF COMPUTATION

75 INFLOW INTO ONONDAGA RESERVOIR C-4

	ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
	24	0	0	0	0	0	1	0	0
HYDROGRAPH DATA									
INTDC	IUNG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	-1	68.00	0.00	5100.00	0.00	0.000	0	1	0
PRECIP DATA									
SPFE	PMS	R6	R12	R24	R48	R72	R96		
0.00	21.50	33.00	47.00	55.00	65.00	72.00	74.00		

TRSPC COMPUTED BY THE PROGRAM IS .934

LOSS DATA										
LROPT	STORR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSHX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	1.50	.04	0.00	0.00

RECESSION DATA
 STRTO= 250.00 QRCSN= 300.00 RTIOR= 1.60

END-OF-PERIOD FLOW
 NO. DA HR. MIN PERIOD RAIN EXCS LOSS COMP NO. DA HR. MIN PERIOD RAIN EXCS LOSS CON' 0

HYDROGRAPH ROUTING

76 ROUTE ONONDAGA RESERVOIR - MODIFIED PULS METHOD

	ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO	
	24	1	0	0	0	0	1	0	0	
	ROUTING DATA									
	GLOSS	CLOSS	AVC	IRES	ISAME	IOPT	IPMP	LSTR		
	0.0	0.000	0.00	1	1	0	0	0		
	NSTPS	NSTBL	LAC	ANSKK	X	TSK	STORA	ISPRAT		
	0	0	0	0.000	0.000	0.000	0.	0		
STORAGE	0.00	100.00	700.00	1900.00	3500.00	7940.00	10200.00	22200.00	27000.00	32500.00
	43400.00	52300.00	62200.00	72100.00						
OUTFLOW	00.00	430.00	660.00	880.00	1070.00	1420.00	1770.00	1840.00	2000.00	2000.00
	6200.00	15400.00	20400.00	44700.00						

HYDROGRAPH ROUTING

77 ROUTE ONONDAGA RESERVOIR OUTFLOWS TO NODE 25

	ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
	25	1	0	0	0	0	1	0	0
	ROUTING DATA								
	GLOSS	CLOSS	AVC	IRES	ISAME	IOPT	IPMP	LSTR	
	0.0	0.000	0.00	0	1	0	0	0	
	NSTPS	NSTBL	LAC	ANSKK	X	TSK	STORA	ISPRAT	
	0	0	3	0.000	0.000	0.000	0.	0	

COMBINE HYDROGRAPHS

78 COMBINE ROUTED FLOW WITH FLOW AT NODE 25

	ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
	25	2	0	0	0	0	1	0	0

SUB-AREA RUNOFF COMPUTATION

79 LOCAL INFLOW C-5

	ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
	25	0	0	0	0	0	1	0	0

HYDROGRAPH DATA
 INYDC IUNC TAREA SMAP TRSDA TRSPC RATIO ISNOW ISAME LOCAL
 1 -1 182.00 0.00 5100.00 0.00 0.000 0 1 0

PRECIP DATA
 SPFE PMS R6 R12 R24 R48 R72 R96
 0.00 21.50 33.00 47.00 55.00 65.00 72.00 74.00

TRSPC COMPUTED BY THE PROGRAM IS .934

LOSS DATA
 LAOPT STRKR BLTKR RTIOL ERAIN STRKS RTIOK STRTL CMSTL ALSHX RTIMP
 0 0.00 0.00 1.00 0.00 0.00 1.00 1.25 .06 0.00 0.00

RECESSION DATA
 STRTQ= 250.00 GRCSH= 500.00 RTIOR= 1.60

END-OF-PERIOD FLOW
 NO.DA HR.MM PERIOD RAIN EXCS LOSS COMP Q NO.DA HR.MM PERIOD RAIN EXCS LOSS COMP Q
 SUM 14.86 10.77 4.08 126945.
 (377.)(274.)(104.)(3594.68)

COMBINE HYDROGRAPHS

00 COMBINE ROUTED FLOWS, LOCAL INFLOW

ISTAQ ICOMP IECON ITAPE JPLT JPRT INAME ISTAGE IAUTO
 25 2 0 0 0 0 1 0 0

SUB-AREA RUNOFF COMPUTATION

01 LOCAL FLOW C-8

ISTAQ ICOMP IECON ITAPE JPLT JPRT INAME ISTAGE IAUTO
 25 0 0 0 0 0 1 0 0

HYDROGRAPH DATA
 INYDC IUNC TAREA SMAP TRSDA TRSPC RATIO ISNOW ISAME LOCAL
 1 -1 72.00 0.00 5100.00 0.00 0.000 0 1 0

PRECIP DATA
 SPFE PMS R6 R12 R24 R48 R72 R96
 0.00 21.50 33.00 47.00 55.00 65.00 72.00 74.00

TRSPC COMPUTED BY THE PROGRAM IS .934

LOSS DATA
 LAOPT STRKR BLTKR RTIOL ERAIN STRKS RTIOK STRTL CMSTL ALSHX RTIMP
 0 0.00 0.00 1.00 0.00 0.00 1.00 1.00 .06 0.00 0.00

RECESSION DATA
 STRTQ= 250.00 GRCSH= 300.00 RTIOR= 1.60

END-OF-PERIOD FLOW
 NO.DA HR.MM PERIOD RAIN EXCS LOSS COMP Q NO.DA HR.MM PERIOD RAIN EXCS LOSS COMP Q

SUM 14.86 10.77 4.08 126945.
 (377.)(274.)(104.)(3594.68)

COMBINE HYDROGRAPHS

82 COMBINE LOCAL FLOW AT NODE 25

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
25	2	0	0	0	0	1	0	0

HYDROGRAPH ROUTING

83 ROUTE FLOWS TO NODE 26

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
26	1	0	0	0	0	1	0	0

ROUTING DATA

GLOSS	CLOSS	AVC	INES	ISANE	IOPT	IPNP	LSTR
0.0	0.000	0.00	0	1	0	0	0

NSTPS	NSTBL	LAC	ANSKK	X	TSK	STORA	ISPRAT
0	0	3	0.000	0.000	0.000	0.	0

COMBINE HYDROGRAPHS

84 COMBINE ROUTED FLOW AND FLOW AT NODE 26

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
26	2	0	0	0	0	1	0	0

HYDROGRAPH ROUTING

85 ROUTE FLOWS TO NODE 28 (THREE RIVERS)

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
28	1	0	0	0	0	1	0	0

ROUTING DATA

GLOSS	CLOSS	AVC	INES	ISANE	IOPT	IPNP	LSTR
0.0	0.000	0.00	0	1	0	0	0

NSTPS	NSTBL	LAC	ANSKK	X	TSK	STORA	ISPRAT
0	6	2	0.000	0.000	0.000	0.	0

SUB-AREA RUNOFF COMPUTATION

86 LOCAL FLOW (E-9) AT NODE 27

ISTAG ICOMP IECON ITAPE JPLT JPRT INAME ISTAGE IAUTO
 27 0 0 0 0 0 1 0 0

HYDROGRAPH DATA
 IHYDC IUNG TAREA SNAP TRSDA TRSPC RATIO ISNOW ISAME LOCAL
 1 -1 37.00 0.00 5100.00 0.00 0.000 0 1 0

PRECIP DATA
 SPFE PMS R6 R12 R24 R48 R72 R96
 0.00 21.50 33.00 47.00 55.00 65.00 72.00 74.00

TRSPC COMPUTED BY THE PROGRAM IS .934

LOSS DATA
 LMOPT STRKR BLTKR RTIOL ERRAIN STRKS RTIOK STRTL CNSTL ALSHX RTIMP
 0 0.00 0.00 1.00 0.00 0.00 1.00 .50 .06 0.00 0.00

RECESSION DATA
 STRTQ= 100.00 ORCSH= 150.00 RTIOR= 1.60

END-OF-PERIOD FLOW
 NO.DA HR.MN PERIOD RAIN EXCS LOSS COMP Q NO.DA HR.MN PERIOD RAIN EXCS LOSS COMP Q
 SUM 14.86 11.00 3.78 46074.
 (377.)(281.)(96.)(1327.32)

HYDROGRAPH ROUTING

87 ROUTE LOCAL FLOW E-9 TO NODE 28

ISTAG ICOMP IECON ITAPE JPLT JPRT INAME ISTAGE IAUTO
 28 1 0 0 0 1 0 0 0

ROUTING DATA
 GLOSS CLOSS AWC IRES ISAME IOPT IPWP LSTR
 0.0 0.000 0.00 0 1 0 0 0

MSTPS MSTDL LAC ANSKK X TSK STORA ISPRAT
 0 3 1 0.000 0.000 0.000 0. 0

STATION 28, PLAN 1, RTIO 1

OUTFLOW
 19. 19. 18. 17. 17. 37. 168. 235. 280. 528.
 1549. 2110. 1986. 996. 473. 259. 173. 74. 37. 28.
 27. 26. 25. 24. 22. 21. 20. 20. 19. 18.
 17. 16. 15. 15. 14. 13. 13. 12. 12. 11.

PEAK 6-HOUR 24-HOUR 72-HOUR TOTAL VOLUME
 CFS 2110. 2848. 1602. 734. 9368.
 CMS 60. 58. 45. 21. 265.
 INCHES .51 1.61 2.22 2.36
 MH 13.00 40.91 56.28 59.82
 AC-FT 1015. 3177. 4370. 4645.
 THOUS CU H 1253. 3919. 5390. 5730.

STATION 28, PLAN 1, RTIO 2

OUTFLOW
 30. 30. 36. 35. 33. 75. 337. 470. 539. 1056.

3876.	421.	3771.	1773.	146.	319.	348.	146.	74.	37.
54.	52.	49.	47.	45.	43.	41.	39.	37.	36.
34.	32.	31.	29.	28.	27.	26.	24.	23.	23.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	4221.	4096.	3283.	1469.	18736.
CMS	128.	116.	91.	42.	531.
INCHES		1.83	3.22	4.43	4.71
MM		26.16	81.83	112.95	119.45
AC-FT		2831.	6354.	8748.	9291.
THOUS CU H		2585.	7837.	10788.	11468.

STATION 28, PLAN 1, RTIO 3

OUTFLOW									
48.	47.	46.	43.	41.	39.	421.	588.	699.	1328.
3872.	5276.	4964.	2491.	1182.	647.	432.	185.	92.	71.
68.	65.	62.	59.	56.	54.	51.	49.	47.	44.
42.	40.	39.	37.	35.	33.	32.	30.	29.	28.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	5276.	5128.	4084.	1836.	23428.
CMS	149.	145.	113.	52.	643.
INCHES		1.29	4.83	5.54	5.89
MM		32.69	182.28	148.69	149.56
AC-FT		2539.	7942.	10925.	11613.
THOUS CU H		3131.	9797.	13475.	14325.

STATION 28, PLAN 1, RTIO 4

OUTFLOW									
57.	54.	55.	52.	50.	112.	585.	785.	839.	1584.
4646.	6331.	5957.	2989.	1419.	777.	519.	222.	111.	85.
81.	78.	74.	71.	67.	64.	61.	59.	56.	53.
51.	48.	46.	44.	42.	40.	38.	37.	35.	34.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	6331.	6144.	4885.	2283.	28185.
CMS	179.	174.	136.	62.	796.
INCHES		1.54	4.83	6.65	7.87
MM		39.23	122.74	168.83	179.47
AC-FT		3846.	9531.	13189.	13936.
THOUS CU H		3758.	11756.	16178.	17198.

STATION 28, PLAN 1, RTIO 5

OUTFLOW									
76.	75.	73.	70.	66.	149.	674.	948.	1118.	2112.
6195.	8441.	7942.	3986.	1891.	1836.	692.	296.	148.	114.
188.	183.	99.	94.	98.	86.	82.	78.	74.	71.
68.	65.	62.	59.	56.	54.	51.	49.	47.	45.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	8441.	8192.	6487.	2937.	37473.
CMS	239.	232.	181.	83.	1061.
INCHES		2.86	6.44	8.86	9.42
MM		52.31	163.65	225.18	239.38
AC-FT		4862.	12788.	17479.	18582.
THOUS CU H		5818.	15675.	21568.	22928.

STATION 28, PLAN 1, RTIO 6

OUTFLOW									
95.	94.	91.	87.	83.	187.	842.	1175.	1398.	2648.
7744.	18351.	9928.	4982.	2364.	1295.	864.	378.	184.	142.
136.	129.	123.	118.	112.	187.	182.	98.	93.	89.
85.	81.	77.	74.	78.	67.	64.	61.	58.	56.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	18351.	18248.	8889.	3672.	46841.
CMS	299.	298.	227.	104.	1326.
INCHES		2.57	8.85	11.88	11.78
MM		65.39	284.57	281.38	299.12
AC-FT		5877.	15885.	21849.	23227.
THOUS CU H		6263.	19594.	26958.	28458.

COMBINE HYDROGRAPHS

88 COMBINE HYDROGRAPHS AT 28

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
28	2	0	0	0	0	1	0	0

SUB-AREA RUNOFF COMPUTATION

89 INFLOWS TO BARGE CANAL FROM EASTERN END OF BASIN (C-2)

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
29	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

INHC	IUNC	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISMON	ISANE	LOCAL
-1	0	100.00	0.00	5100.00	0.00	0.000	0	1	0

HYDROGRAPH ROUTING

98 ROUTE FLOW AT NODE 29 TO NODE 30

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
30	1	0	0	0	0	1	0	0

ROUTING DATA

CLASS	CLOSS	AVC	INES	ISANE	IOPT	IPWP	LSTR
0.0	0.000	0.00	0	1	0	0	0

MSIPS	MSBL	LAC	MSGX	I	TSK	STORA	ISPRAT
0	7	3	0.000	0.000	0.000	0.	0

SUB-AREA RUNOFF COMPUTATION

91 LOCAL INFLOW D-4

ISTAG	ICMP	IECON	ITAPE	JPLT	JPRT	IMME	ISTAGE	IAUTO
30	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

INTDC	INMG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	-1	529.00	0.00	5100.00	0.00	0.000	0	1	0

PRECIP DATA

SPPE	PMS	R6	R12	R24	R48	R72	R96
0.00	21.30	33.00	47.00	55.00	65.00	72.00	74.00

TRSPC COMPUTED BY THE PROGRAM IS .934

LOSS DATA

LADPT	STNRK	BLTKR	RTIOL	EMAIN	STNKS	RTIOK	STRTL	CMSTL	ALSHX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	.25	.06	0.00	0.00

RECESSION DATA

STRTO= 000.00 CRCSI= 3960.00 RTIOR= 1.60

END-OF-PERIOD FLOW

NO.DA	HR.MM	PERIOD	RAIN	EIXS	LOSS	COMP 0	NO.DA	HR.MM	PERIOD	RAIN	EIXS	LOSS	COMP 0
			SUN	14.06	11.00	3.70				681577.			
				(377.)	(201.)	(96.)				(19300.11)			

COMBINE HYDROGRAPHS

92 COMBINE LOCAL FLOW WITH ROUTED FLOW

ISTAG	ICMP	IECON	ITAPE	JPLT	JPRT	IMME	ISTAGE	IAUTO
30	2	0	0	0	0	1	0	0

HYDROGRAPH ROUTING

93 ROUTE FLOWS TO NODE 31

ISTAG	ICMP	IECON	ITAPE	JPLT	JPRT	IMME	ISTAGE	IAUTO
31	1	0	0	0	0	1	0	0

ROUTING DATA

LOSS	CLOSS	AVC	IRIS	ISAME	IOPT	IPWP	LSTR
0.0	0.000	0.00	0	1	0	0	0

MSPTS	MSL	LAC	ANSXK	X	TSK	STORA	ISPRAT
0	1	0	0.000	0.000	0.000	0.	0

SUB-AREA RUNOFF COMPUTATION

94 LOCAL FLOW D-3

ISTAG ICOMP IECON ITAPE JPLT JPRT INAME ISTAGE IAUTO
 31 0 0 0 0 0 1 0 0

HYDROGRAPH DATA
 INYDC IUNG TAREA SMAP TRSDA TRSPC RATIO ISNOW ISAME LOCAL
 1 -1 144.00 0.00 5100.00 0.00 0.000 0 1 0

PRECIP DATA
 SPFE PMS R6 R12 R24 R48 R72 R96
 0.00 21.50 33.00 47.00 55.00 65.00 72.00 74.00

TRSPC COMPUTED BY THE PROGRAM IS .934

LOSS DATA
 LAOPT STRKR BLTKR RTIOL ERRAIN STRKS RTIOK STRTL CNSTL ALSHX RTIMP
 0 0.00 0.00 1.00 0.00 0.00 1.00 .25 .06 0.00 0.00

RECESSION DATA
 STRTU= 320.00 ORCSN= 1000.00 RTIOR= 2.00

END-OF-PERIOD FLOW
 NO.DA HR.NH PERIOD RAIN EXCS LOSS COMP 0 NO.DA HR.NH PERIOD RAIN EXCS LOSS COMP 0

SUM 14.06 11.00 3.78 176726.
 (377.)(201.)(96.)(5004.32)

COMBINE HYDROGRAPHS

95 COMBINE LOCAL FLOW WITH FLOW AT NODE 31

ISTAG ICOMP IECON ITAPE JPLT JPRT INAME ISTAGE IAUTO
 31 2 0 0 0 0 1 0 0

SUB-AREA RUNOFF COMPUTATION

% LOCAL FLOW D-2

ISTAG ICOMP IECON ITAPE JPLT JPRT INAME ISTAGE IAUTO
 31 0 0 0 0 0 1 0 0

HYDROGRAPH DATA
 INYDC IUNG TAREA SMAP TRSDA TRSPC RATIO ISNOW ISAME LOCAL
 1 -1 105.00 0.00 5100.00 0.00 0.000 0 1 0

PRECIP DATA
 SPFE PMS R6 R12 R24 R48 R72 R96
 0.00 21.50 33.00 47.00 55.00 65.00 72.00 74.00

TRSPC COMPUTED BY THE PROGRAM IS .934

LOSS DATA
 LAOPT STRKR BLTKR RTIOL ERRAIN STRKS RTIOK STRTL CNSTL ALSHX RTIMP
 0 0.00 0.00 1.00 0.00 0.00 1.00 .25 .06 0.00 0.00

RECESSION DATA
 STRTU= 240.00 ORCSN= 800.00 RTIOR= 1.00

END-OF-PERIOD FLOW

NO. DA HR. MN PERIOD RAIN EXCS LOSS COMP 0 NO. DA HR. MN PERIOD RAIN EXCS LOSS COMP 0

SUN 14.86 11.00 3.78 134512.
(377.)(281.)(96.)(3845.99)

000000000 000000000 000000000 000000000 000000000

COMBINE HYDROGRAPHS

97 COMBINE LOCAL FLOW D-2 WITH FLOW AT NODE 31

ISTAB	ICOMP	IECON	ITAPE	JPLT	JPRT	IMANE	ISTAGE	IAUTO
31	2	0	0	0	0	1	0	0

000000000 000000000 000000000 000000000 000000000

SUB-AREA RUNOFF COMPUTATION

98 LOCAL FLOW D-1

ISTAB	ICOMP	IECON	ITAPE	JPLT	JPRT	IMANE	ISTAGE	IAUTO
31	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

INVC	IUNG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISANE	LOCAL
1	-1	200.00	0.00	5100.00	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	21.50	33.00	47.00	55.00	65.00	72.00	74.00

TRSPC COMPUTED BY THE PROGRAM IS .934

LOSS DATA

LROPT	STORR	DLTKR	RTIOL	ERAIN	STNKS	RTIOK	STRTL	CASTL	ALSHX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	.25	.06	0.00	0.00

RECESSION DATA

STRTO= 600.00 GRCSH= 2160.00 RTIOR= 1.60

0
NO. DA HR. MN PERIOD RAIN EXCS LOSS COMP 0 NO. DA HR. MN PERIOD RAIN EXCS LOSS COMP 0

SUN 14.86 11.00 3.78 361700.
(377.)(281.)(96.)(10244.70)

000000000 000000000 000000000 000000000 000000000

COMBINE HYDROGRAPHS

99 COMBINE LOCAL FLOW D-1 WITH FLOW AT NODE 31

ISTAB	ICOMP	IECON	ITAPE	JPLT	JPRT	IMANE	ISTAGE	IAUTO
31	2	0	0	0	0	1	0	0

000000000 000000000 000000000 000000000 000000000

SUB-AREA RUNOFF COMPUTATION

100 LOCAL FLOW D-5

ISTAG ICOMP IECON ITAPE JPLT JPRT INAME ISTAGE IAUTO
 31 0 0 0 0 0 1 0 0

HYDROGRAPH DATA

INTDC IUNC TAREA SHAP TRSDA TRSPC RATIO ISHOW ISANE LOCAL
 1 -1 269.00 0.00 5100.00 0.00 0.000 0 1 0

PRECIP DATA

SPFE PMS R6 R12 R24 R48 R72 R96
 0.00 21.50 33.00 47.00 55.00 65.00 72.00 74.00

TRSPC COMPUTED BY THE PROGRAM IS .934

LOSS DATA

LROPT STRKR DLTKR RTIOL ERAIN STRKS RTIOK STRTL CMSTL ALSHX RTIMP
 0 0.00 0.00 1.00 0.00 0.00 1.00 .25 .05 0.00 0.00

RECESSION DATA

STRTO= 540.00 ORCSH= 2000.00 RTIOR= 1.60

END-OF-PERIOD FLOW
 NO.DA HR.MM PERIOD RAIN EXCS LOSS COMP 0 NO.DA HR.MM PERIOD RAIN EXCS LOSS COMP 0

SUN 14.86 11.56 3.30 363523.
 (377.)(294.)(84.)(10293.83)

COMBINE HYDROGRAPHS

101 COMBINE LOCAL D-5 WITH FLOW AT NODE 31

ISTAG ICOMP IECON ITAPE JPLT JPRT INAME ISTAGE IAUTO
 31 2 0 0 0 0 1 0 0

HYDROGRAPH ROUTING

102 ONEIDA LAKE OUTFLOW BY MODIFIED PULS METHOD

ISTAG ICOMP IECON ITAPE JPLT JPRT INAME ISTAGE IAUTO
 31 1 0 0 0 0 1 0 0

ROUTING DATA

BLOSS CLOSS AVC IRES ISANE IOPT IPWP LSTR
 0.0 0.000 0.00 1 1 0 0 0

HSTPS HSTBL LAG ANSKK X TSK STORA ISPRAT
 0 0 0 0.000 0.000 0.000 670000. 0

STORAGE 442000.00 635000.00 640000.00 630000.00 600000.00 735000.00 804000.00 845000.00 0.00 0.00
 990000.00 1150000.00 1204000.00

OUTFLW 1000.00 1000.00 2000.00 4000.00 6000.00 8000.00 10000.00 11000.00 0.00 0.00
 27900.00 64700.00 116600.00

HYDROGRAPH ROUTING

183 ROUTE FLOWS TO NODE 32

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
32	1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLASS	AVC	IBES	ISAME	IOPT	IPWP	LSTR
0.0	0.000	0.00	0	1	0	0	0

NSTPS	NSTDL	LAC	ANSKK	I	TSK	STORA	ISPRAT
0	1	0	0.000	0.000	0.000	0.	0

SUB-AREA RUNOFF COMPUTATION

184 LOCAL FLOW D-6

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
32	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

INVC	IUNC	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	-1	20.00	0.00	5100.00	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	21.50	33.00	47.00	55.00	65.00	72.00	74.00

TRSPC COMPUTED BY THE PROGRAM IS .934

LOSS DATA

LROPT	STKR	BLTKR	RTIOL	ERAIN	STMS	RTIOL	STRTL	CHSTL	ALSHI	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	.50	.05	0.00	0.00

RECESSION DATA

STRTO= 70.00 GRCSN= 210.00 RTIOR= 1.60

END-OF-PERIOD FLOW

NO.DA	HR.NM	PERIOD	RAIN	EXCS	LOSS	COMP Q	NO.DA	HR.NM	PERIOD	RAIN	EXCS	LOSS	COMP Q
			SUN	14.06	11.00	3.78						36884.	
				(377.)	(281.)	(96.)						(1044.44)	

COMBINE HYDROGRAPHS

185 COMBINE LOCAL FLOW D-6 WITH FLOW AT 32

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
32	2	0	0	0	0	1	0	0

HYDROGRAPH ROUTING

186 ROUTE FLOW AT 32 TO NODE 32

107 ROUTE FLOW AT NODE 28

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
28	1	0	0	0	0	1	0	0

ROUTING DATA

BLDSS	CLOSS	AVG	IBES	ISAME	IOPT	IPWP	LSTR
0.0	0.000	0.00	0	1	0	0	0

HSTPS	HSTBL	LAC	ANSHK	X	TSK	STORA	ISPRAT
0	6	2	0.000	0.000	0.000	0.	0

COMBINE HYDROGRAPHS

107 COMBINE ROUTED FLOW WITH FLOW AT NODE 28

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
28	2	0	0	0	0	1	0	0

SUB-AREA RUNOFF COMPUTATION

100 LOCAL FLOW D-7

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
28	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

INYDC	IUNG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	-1	110.00	0.00	5100.00	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	21.50	33.00	47.00	55.00	65.00	72.00	77.00

TRSPC COMPUTED BY THE PROGRAM IS .934

LOSS DATA

LAOPT	STKRA	DLTKR	RTIDL	ERAIN	STKRS	RTIOK	STRTL	CMSTL	ALSHX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	.50	.06	0.00	0.00

RECESSION DATA

STRTO= 250.00 BRCSH= 000.00 RTIOR= 2.00

END-OF-PERIOD FLOW

NO.DA	HR.NN	PERIOD	RAIN	EXCS	LOSS	COMP Q	NO.DA	HR.NN	PERIOD	RAIN	EXCS	LOSS	COMP Q
-------	-------	--------	------	------	------	--------	-------	-------	--------	------	------	------	--------

SUN	15.46	11.25	4.21	130583.
	(393.)	(286.)	(107.)	(3924.23)

COMBINE HYDROGRAPHS

109 COMBINE WITH FLOW AT NODE 28

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
28	2	0	0	0	1	1	0	0

SUM OF 2 HYDROGRAPHS AT 28 PLAN 1 RTIO 1									
8875.	8852.	8835.	8814.	8772.	8751.	8953.	9171.	9387.	10184.
12925.	15932.	18110.	19114.	20399.	22072.	23698.	24853.	25760.	26134.
26110.	25817.	25341.	24713.	24079.	23540.	23137.	22847.	22676.	22619.
22449.	22741.	22854.	22966.	23041.	23044.	23024.	22909.	22782.	22456.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	26136.	26123.	25903.	24637.	753394.
CMS	740.	740.	734.	698.	21334.
INCHES		.85	.19	.54	1.37
MM		1.28	4.77	13.61	34.78
AC-FT		12954.	51379.	146400.	373584.
THOUS CU H		15978.	63375.	180828.	446809.

SUM OF 2 HYDROGRAPHS AT 28 PLAN 1 RTIO 2									
9194.	9172.	9183.	9204.	9200.	9256.	9778.	10326.	10873.	12582.
18236.	24255.	28504.	30267.	32344.	35048.	37554.	39189.	40382.	40638.
40257.	39735.	38908.	37933.	37040.	36447.	36090.	35900.	35844.	35971.
36287.	36350.	36973.	37448.	37939.	38410.	38828.	39161.	39482.	39559.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	40638.	40510.	40210.	38315.	1155580.
CMS	1151.	1147.	1139.	1005.	32722.
INCHES		.87	.29	.83	2.10
MM		1.07	7.41	21.17	53.22
AC-FT		20808.	79755.	227993.	573015.
THOUS CU H		24778.	98376.	281225.	786083.

SUM OF 2 HYDROGRAPHS AT 28 PLAN 1 RTIO 3									
9353.	9332.	9357.	9399.	9414.	9508.	10191.	10904.	11615.	13797.
20040.	28325.	33482.	35435.	37781.	40731.	43514.	45298.	46658.	46955.
44699.	44045.	43287.	44100.	43287.	42689.	42483.	42299.	42352.	42545.
42050.	43269.	43752.	44274.	44810.	45319.	45744.	46123.	46381.	46549.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	46955.	46827.	46496.	44555.	1340699.
CMS	1330.	1324.	1317.	1262.	37964.
INCHES		.80	.34	.97	2.43
MM		2.16	8.57	24.62	61.74
AC-FT		23220.	92224.	265123.	644810.
THOUS CU H		28641.	113757.	327024.	820031.

SUM OF 2 HYDROGRAPHS AT 28 PLAN 1 RTIO 4									
9513.	9492.	9531.	9595.	9620.	9761.	10604.	11483.	12350.	15010.
23482.	32353.	38377.	40457.	42871.	46182.	49248.	51253.	52815.	53242.
53063.	52450.	51593.	50531.	49630.	49076.	48000.	48077.	49031.	49317.
49711.	50109.	50725.	51290.	51059.	52391.	52852.	53211.	53444.	53627.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	53627.	53547.	53135.	51275.	1527493.
CMS	1519.	1516.	1505.	1452.	43254.
INCHES		.10	.39	1.12	2.77
MM		2.47	9.79	28.34	70.34
AC-FT		26352.	105391.	305106.	757435.
THOUS CU H		32751.	129990.	376342.	934282.

SUN OF 2 HYDROGRAPHS AT 28 PLAN 1 RTIO 5									
9831.	9813.	9879.	9985.	10058.	10267.	11430.	12640.	13863.	17443.
28680.	48298.	47974.	58278.	52989.	56966.	60770.	63310.	65480.	66295.
66360.	65848.	64971.	63888.	62825.	62263.	62134.	62211.	62450.	62820.
63301.	63860.	64490.	65164.	65834.	66468.	67021.	67451.	67758.	67951.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	67951.	67854.	67360.	65143.	1904358.
CMS	1924.	1921.	1907.	1845.	53925.
INCHES		.12	.49	1.42	3.45
MM		3.12	12.41	36.00	87.70
AC-FT		33447.	133606.	387626.	944310.
THOUS CU N		41503.	164801.	478129.	1164789.

SUN OF 2 HYDROGRAPHS AT 28 PLAN 1 RTIO 6									
10150.	10133.	10220.	10376.	10407.	10774.	12257.	13819.	15410.	19894.
33860.	48171.	57454.	59943.	62941.	67689.	72185.	75346.	78178.	79405.
79789.	79278.	78374.	77006.	75992.	75392.	75293.	75420.	75715.	76152.
76710.	77360.	78102.	78885.	79603.	80444.	81114.	81440.	82016.	82255.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	82255.	82136.	81530.	78889.	2279043.
CMS	2329.	2326.	2309.	2234.	64535.
INCHES		.15	.59	1.72	4.13
MM		3.78	15.02	43.60	104.95
AC-FT		40720.	161712.	469421.	1130104.
THOUS CU N		50230.	199469.	579023.	1393963.

HYDROGRAPH ROUTING

110 ROUTE FLOW AT 28 TO NODE 33

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	IMME	ISTAGE	IAUTO
33	1	0	0	0	1	1	0	0
ROUTING DATA								
GLOSS	CLOSS	AVC	INES	ISAME	IOPT	IPMP	LSTR	
0.0	0.000	0.00	0	1	0	0	0	
NSTPS	NSTDL	LAC	ANSKK	I	TSK	STORA	ISPRAT	
0	3	1	0.000	0.000	0.000	0.	0	

STATION 33 PLAN 1, RTIO 1

OUTFLOW									
8875.	8840.	8854.	8834.	8807.	8779.	8825.	8950.	9171.	9501.
10032.	13014.	15654.	17719.	19200.	20529.	22056.	23541.	24770.	25583.
26002.	26021.	25756.	25291.	24711.	24111.	23505.	23175.	22807.	22713.
22640.	22649.	22749.	22854.	22954.	23024.	23043.	22999.	22905.	22824.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	26021.	26012.	25804.	24505.	739529.
CMS	737.	737.	731.	696.	20941.
INCHES		.05	.19	.33	1.34

UNIT	1.2.20	4.7.73	13.7.79	34.96
AC-FT	12898.	51181.	146298.	366789.
THOUS CU H	15918.	63131.	188446.	452328.

STATION 33, PLAN 1, RTIO 2

OUTFLOW									
9194.	9187.	9183.	9186.	9196.	9228.	9411.	9787.	10326.	11268.
13897.	18398.	23665.	27675.	30372.	32568.	34989.	37278.	39842.	40878.
48459.	48244.	39667.	38859.	37978.	37149.	36535.	36146.	35952.	35912.
36814.	36242.	36576.	36998.	37433.	37932.	38392.	38799.	39138.	39322.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	48459.	48351.	48832.	38248.	1125333.
CMS	1146.	1143.	1134.	1883.	31866.
INCHES	.87	.29	.83		2.84
MM	1.86	7.37	21.13		51.82
AC-FT	28889.	79482.	227544.		558816.
THOUS CU H	24681.	97948.	288671.		688383.

STATION 33, PLAN 1, RTIO 3

OUTFLOW									
9353.	9346.	9348.	9363.	9398.	9441.	9784.	10281.	10983.	12186.
15424.	28994.	27956.	32414.	35339.	37956.	48649.	43181.	45154.	46381.
46768.	46573.	45998.	45151.	44225.	43385.	42793.	42463.	42351.	42398.
42585.	42891.	43293.	43766.	44279.	44882.	45298.	45736.	46098.	46295.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	46768.	44678.	46384.	44495.	1383631.
CMS	1324.	1322.	1311.	1268.	36915.
INCHES	.88	.34	.97		2.36
MM	2.15	8.53	24.59		68.83
AC-FT	23142.	91842.	264766.		646429.
THOUS CU H	28546.	113285.	326583.		797358.

STATION 33, PLAN 1, RTIO 4

OUTFLOW									
9513.	9586.	9512.	9539.	9585.	9661.	9998.	10616.	11482.	12953.
16953.	23618.	31484.	37862.	48568.	43178.	46187.	48981.	51112.	52437.
53848.	52921.	52372.	51528.	50585.	49745.	49195.	48944.	48929.	49875.
49353.	49799.	50288.	50736.	51292.	51847.	52367.	52818.	53176.	53381.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	53381.	53279.	52744.	50892.	1483582.
CMS	1512.	1509.	1494.	1441.	42888.
INCHES	.18	.38	1.11		2.69
MM	2.45	9.72	28.12		68.32
AC-FT	26419.	184616.	382829.		735421.
THOUS CU H	32588.	129842.	373533.		987375.

STATION 33, PLAN 1, RTIO 5

OUTFLOW									
9831.	9825.	9841.	9892.	9974.	10183.	10585.	11446.	12644.	14648.
19995.	28887.	38984.	46183.	58413.	53411.	56988.	68349.	63186.	65828.
44845.	44168.	45726.	44876.	43868.	42965.	42487.	42283.	42285.	42494.

0207. 0300. 0307. 0410. 0510. 0622. 0641. 0670. 0740. 0750.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	67656.	67533.	66892.	64674.	1846386.
CMS	1916.	1912.	1894.	1831.	52284.
INCHES		.12	.49	1.41	3.35
MM		3.11	12.32	35.74	85.83
AC-FT		33487.	132679.	384838.	915563.
THOUS CU M		41286.	163657.	474691.	1129331.

STATION 33, PLAN 1, RTIO 6

OUTFLOW

18150.	18144.	18170.	18246.	18364.	18546.	11173.	12283.	13829.	16374.
23055.	33975.	46495.	55189.	68113.	63498.	67578.	71713.	75236.	77643.
79097.	79464.	79128.	78246.	77151.	76156.	75559.	75368.	75476.	75762.
76192.	76743.	77393.	78118.	78898.	79671.	80414.	81066.	81598.	81891.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	81891.	81748.	80963.	78329.	2287121.
CMS	2319.	2315.	2293.	2218.	62499.
INCHES		.15	.59	1.78	4.08
MM		3.76	14.91	43.29	101.64
AC-FT		48532.	168587.	466888.	1094448.
THOUS CU M		49996.	198881.	574912.	1349972.

0000000000 0000000000 0000000000 0000000000 0000000000

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	RATIOS APPLIED TO FLOWS						
			PLAN	RATIO 1	RATIO 2	RATIO 3	RATIO 4	RATIO 5	RATIO 6
				.20	.40	.50	.60	.80	1.00
HYDROGRAPH AT	1	188.00 (239.00)	1	78.	157.	196.	235.	314.	392.
				(2.22)	(4.44)	(5.55)	(6.66)	(8.88)	(11.10)
ROUTED TO	2	188.00 (239.00)	1	78.	156.	195.	234.	311.	389.
				(2.20)	(4.41)	(5.51)	(6.61)	(8.82)	(11.02)
HYDROGRAPH AT	2	147.00 (308.73)	1	5716.	11432.	14291.	17149.	22865.	28581.
				(161.86)	(323.73)	(404.66)	(485.59)	(647.46)	(809.32)
2 COMBINED	2	247.00 (639.73)	1	5793.	11585.	14481.	17378.	23178.	28963.
				(164.80)	(329.60)	(410.87)	(492.88)	(656.11)	(828.13)
ROUTED TO	6	247.00 (639.73)	1	3651.	7301.	9127.	10952.	14682.	18253.
				(103.37)	(206.75)	(258.43)	(310.12)	(413.50)	(516.87)
HYDROGRAPH AT	6	118.00 (305.62)	1	2735.	5469.	6837.	8284.	10939.	13674.
				(77.44)	(154.88)	(193.68)	(232.32)	(309.75)	(387.19)
2 COMBINED	6	365.00 (945.35)	1	6222.	12444.	15535.	18666.	24888.	31118.
				(176.19)	(352.38)	(440.87)	(528.57)	(704.75)	(886.94)

HYDROGRAPH AT	3	51.00 (132.09)	1	3559. (100.79)	7119. (281.50)	8898. (251.97)	10478. (302.37)	14237. (403.16)	17797. (503.95)
ROUTED TO	6	51.00 (132.09)	1	1974. (55.09)	3948. (111.70)	4934. (139.73)	5921. (167.67)	7895. (223.56)	9869. (279.46)
2 COMBINED	6	416.00 (1077.44)	1	6357. (185.60)	13115. (371.36)	16393. (464.21)	19672. (537.05)	26229. (742.73)	32707. (928.41)
HYDROGRAPH AT	4	104.00 (476.56)	1	14200. (402.32)	20416. (604.65)	35520. (1005.81)	42624. (1206.97)	56032. (1609.30)	71040. (2011.62)
ROUTED TO	4	104.00 (476.56)	1	860. (24.50)	1985. (56.20)	2666. (75.40)	5119. (144.96)	11504. (328.03)	18145. (513.00)
ROUTED TO	5	104.00 (476.56)	1	820. (23.45)	1033. (31.09)	2447. (69.29)	3475. (98.40)	6907. (195.59)	10424. (300.04)
HYDROGRAPH AT	5	102.00 (264.10)	1	2630. (74.70)	5276. (149.40)	6595. (186.75)	7914. (224.11)	10552. (290.01)	13190. (373.51)
2 COMBINED	5	206.00 (740.74)	1	3060. (86.66)	6020. (170.47)	7544. (213.63)	9246. (261.02)	13000. (390.99)	18451. (528.15)
ROUTED TO	56	206.00 (740.74)	1	2577. (72.97)	5093. (144.22)	6405. (181.30)	7999. (226.50)	12497. (353.00)	17263. (480.03)
HYDROGRAPH AT	56	155.00 (401.45)	1	4049. (137.32)	9690. (274.63)	12123. (343.29)	14540. (411.95)	19397. (549.26)	24246. (686.50)
2 COMBINED	56	441.00 (1142.10)	1	7157. (202.66)	14104. (401.65)	17730. (502.07)	21420. (606.56)	29520. (836.13)	37910. (1073.71)
ROUTED TO	6	441.00 (1142.10)	1	7157. (202.66)	14104. (401.65)	17730. (502.07)	21420. (606.56)	29520. (836.13)	37910. (1073.71)
2 COMBINED	6	857.00 (2219.62)	1	13490. (382.23)	26067. (760.00)	33505. (951.01)	40445. (1145.20)	54094. (1554.43)	69626. (1971.59)
ROUTED TO	8	857.00 (2219.62)	1	11700. (331.29)	23294. (659.62)	29131. (824.91)	35150. (995.56)	40020. (1360.00)	61131. (1731.02)
HYDROGRAPH AT	7	09.00 (230.51)	1	3132. (80.69)	6264. (177.30)	7830. (221.72)	9396. (266.07)	12520. (354.76)	15660. (443.44)
ROUTED TO	8	09.00 (230.51)	1	2937. (83.16)	5073. (146.31)	7342. (207.09)	8010. (249.47)	11746. (332.62)	14603. (415.70)
2 COMBINED	8	946.00 (2450.13)	1	12296. (340.10)	24459. (692.99)	30571. (865.60)	36030. (1043.14)	50260. (1423.43)	63931. (1810.31)
ROUTED TO	10	946.00 (2450.13)	1	11029. (334.95)	23520. (666.25)	29410. (832.79)	35496. (1005.12)	40475. (1372.67)	61600. (1746.50)
HYDROGRAPH AT	9	10.00 (46.62)	1	600. (17.23)	1217. (36.45)	1521. (43.07)	1825. (51.60)	2433. (60.91)	3042. (86.13)
ROUTED TO	10	10.00 (46.62)	1	601. (17.01)	1201. (36.02)	1502. (42.52)	1802. (51.00)	2403. (60.04)	3003. (85.05)
2 COMBINED	10	946.00 (2496.75)	1	11922. (337.50)	23714. (671.51)	29642. (839.37)	35710. (1011.43)	40772. (1301.00)	62051. (1757.09)
ROUTED TO	15	946.00 (2496.75)	1	11544. (326.00)	22961. (650.10)	28702. (812.76)	34395. (979.61)	47266. (1300.43)	60150. (1703.49)

HYDROGRAPH AT	11	183.00 (473.97)	1	28366. (576.78)	48732. (1133.48)	58915. (1441.75)	61898. (1738.18)	81444. (2386.88)	181838. (2883.49)
ROUTED TO	11	183.00 (473.97)	1	568. (15.85)	839. (23.74)	1836. (29.34)	1282. (36.38)	1845. (52.23)	2486. (68.14)
ROUTED TO	12	183.00 (473.97)	1	559. (15.83)	831. (23.52)	1826. (29.85)	1263. (35.78)	1817. (51.46)	2371. (67.13)
HYDROGRAPH AT	12	524.00 (1357.15)	1	41859. (1185.31)	93719. (2378.42)	184647. (2963.28)	125577. (3555.94)	167436. (4741.25)	289295. (5926.56)
Z COMBINED	12	787.00 (1831.12)	1	42358. (1199.22)	84221. (2384.88)	185156. (2977.69)	126181. (3578.79)	167996. (4757.11)	289892. (5943.48)
ROUTED TO	12	787.00 (1831.12)	1	788. (19.82)	2514. (71.28)	3888. (84.95)	4713. (133.47)	12318. (348.82)	19824. (561.34)
ROUTED TO	13	787.00 (1831.12)	1	788. (19.82)	2588. (71.81)	3888. (84.95)	4781. (133.12)	12312. (348.45)	19787. (558.85)
HYDROGRAPH AT	13	39.00 (101.81)	1	1958. (55.44)	3915. (118.87)	4894. (138.59)	5873. (164.31)	7831. (221.75)	9789. (277.18)
Z COMBINED	13	746.00 (1932.13)	1	2458. (75.26)	4615. (138.69)	5657. (168.19)	7189. (281.31)	13847. (392.89)	21998. (622.98)
ROUTED TO	14	746.00 (1932.13)	1	1917. (54.28)	3419. (96.83)	4912. (139.89)	5982. (169.39)	13164. (372.76)	28914. (592.22)
HYDROGRAPH AT	14	36.00 (93.24)	1	1927. (54.56)	3854. (109.12)	4817. (136.48)	5788. (163.68)	7787. (218.24)	9634. (272.88)
Z COMBINED	14	782.00 (2025.37)	1	3364. (95.26)	6828. (178.69)	7378. (288.71)	8781. (248.66)	13478. (381.42)	21512. (609.16)
HYDROGRAPH AT	14	782.00 (2025.37)	1	43279. (1225.51)	86557. (2451.83)	188197. (3863.78)	129836. (3676.54)	173114. (4982.85)	216393. (6127.57)
Z COMBINED	14	1544.00 (4058.74)	1	46193. (1388.84)	91684. (2596.25)	114432. (3248.36)	137179. (3884.47)	182681. (5172.96)	228285. (6464.31)
ROUTED TO	14	1544.00 (4058.74)	1	3488. (96.28)	8788. (246.36)	8788. (246.36)	8788. (246.36)	8788. (246.36)	8788. (246.36)
ROUTED TO	15	1544.00 (4058.74)	1	3488. (96.28)	8788. (246.36)	8788. (246.36)	8788. (246.36)	8788. (246.36)	8788. (246.36)
Z COMBINED	15	2528.00 (6547.49)	1	14944. (423.15)	31661. (896.54)	37482. (1059.12)	43295. (1225.97)	55966. (1584.78)	68858. (1949.84)
ROUTED TO	18	2528.00 (6547.49)	1	14139. (488.37)	38871. (851.52)	35426. (1083.14)	48968. (1159.86)	52754. (1493.83)	64739. (1833.21)
HYDROGRAPH AT	16	191.00 (494.69)	1	8778. (248.33)	17539. (496.66)	21924. (628.83)	26389. (744.99)	35879. (993.32)	43849. (1241.65)
ROUTED TO	18	191.00 (494.69)	1	8387. (235.22)	16613. (478.43)	28766. (888.84)	24928. (785.65)	33226. (948.86)	41533. (1176.88)
Z COMBINED	18	2719.00 (7042.18)	1	14213. (482.46)	38219. (855.78)	35618. (1088.36)	41181. (1166.12)	53849. (1582.18)	65188. (1843.65)
HYDROGRAPH AT	17	281.00 (528.99)	1	11928. (337.54)	23848. (675.89)	29881. (843.86)	35761. (1012.68)	47681. (1388.17)	59681. (1687.71)

ROUTED TO	17	281.00 (528.99)	1	2523. (71.45)	3400. (96.28)	6868. (194.75)	18099. (388.61)	19286. (546.11)	27153. (768.87)
ROUTED TO	18	281.00 (528.99)	1	2440. (69.89)	3400. (96.28)	5197. (147.16)	8317. (235.52)	14130. (400.12)	28256. (573.58)
2 COMBINED	18	2928.00 (7562.77)	1	16048. (454.42)	33461. (947.51)	39018. (1104.64)	44301. (1262.40)	56449. (1598.46)	68523. (1948.35)
HYDROGRAPH AT	18	19.00 (49.21)	1	708. (20.04)	1416. (40.09)	1776. (50.11)	2124. (60.13)	2831. (80.18)	3539. (100.22)
2 COMBINED	18	2939.00 (7611.90)	1	16082. (435.38)	33529. (949.43)	39095. (1107.04)	44683. (1265.28)	56585. (1602.38)	68692. (1945.15)
ROUTED TO	21	2939.00 (7611.90)	1	15451. (443.19)	32572. (922.73)	37923. (1073.86)	43327. (1226.88)	54984. (1554.71)	66786. (1888.91)
HYDROGRAPH AT	19	90.00 (253.82)	1	5333. (151.82)	10666. (302.84)	13333. (377.55)	19999. (533.86)	21333. (604.87)	26666. (755.89)
ROUTED TO	21	90.00 (253.82)	1	3197. (90.54)	6395. (181.87)	7993. (226.34)	9592. (271.61)	12789. (362.15)	15986. (452.68)
2 COMBINED	21	3837.00 (7865.79)	1	15718. (444.84)	32683. (925.89)	38862. (1077.88)	43494. (1231.62)	53127. (1561.82)	66985. (1896.79)
HYDROGRAPH AT	20	74.00 (191.66)	1	9896. (257.56)	18191. (515.12)	22739. (643.98)	27287. (772.68)	36383. (1038.24)	45478. (1287.88)
ROUTED TO	20	74.00 (191.66)	1	179. (5.06)	358. (10.13)	456. (12.93)	555. (15.72)	757. (21.44)	1124. (31.83)
ROUTED TO	21	74.00 (191.66)	1	177. (5.01)	354. (10.02)	451. (12.78)	549. (15.54)	745. (21.08)	1098. (31.08)
2 COMBINED	21	3111.00 (8057.85)	1	15877. (449.59)	33016. (934.92)	38484. (1089.74)	44887. (1246.13)	55821. (1588.66)	67932. (1923.62)
HYDROGRAPH AT	21	27.00 (69.93)	1	1584. (44.85)	3168. (89.69)	3959. (112.12)	4751. (134.54)	6335. (179.39)	7919. (224.24)
2 COMBINED	21	3138.00 (8127.38)	1	15983. (458.31)	33065. (936.29)	38545. (1091.46)	44879. (1248.19)	55918. (1583.41)	68853. (1927.86)
ROUTED TO	22	3138.00 (8127.38)	1	15786. (447.81)	32815. (929.21)	38247. (1083.84)	43745. (1238.71)	55465. (1578.59)	67485. (1918.96)
HYDROGRAPH AT	22	90.00 (253.82)	1	7764. (219.84)	15527. (439.69)	19489. (549.61)	23291. (639.53)	31855. (879.38)	38819. (1099.22)
2 COMBINED	22	3236.00 (8381.28)	1	15827. (448.18)	32896. (931.35)	38351. (1085.97)	43869. (1242.23)	55638. (1575.27)	67692. (1916.82)
ROUTED TO	22	3236.00 (8381.28)	1	15835. (425.76)	27531. (779.59)	32586. (928.48)	37545. (1063.17)	48117. (1362.53)	58777. (1664.38)
ROUTED TO	26	3236.00 (8381.28)	1	14971. (423.92)	27442. (777.87)	32486. (917.62)	37489. (1059.38)	47928. (1357.23)	58548. (1657.66)
HYDROGRAPH AT	23	42.78 (118.59)	1	4418. (125.18)	8835. (258.19)	11044. (312.74)	13253. (375.29)	17671. (508.38)	22889. (625.48)
ROUTED TO	23	42.78 (118.59)	1	748. (21.18)	1736. (49.17)	2888. (86.63)	2218. (62.81)	4376. (123.91)	6539. (188.17)

ROUTED TO	25	42.70 (110.99)	1	584. (16.59)	1319. (37.35)	1647. (47.21)	1911. (54.13)	2720. (77.03)	3610. (102.22)
HYDROGRAPH AT	24	60.00 (176.12)	1	5101. (144.45)	10202. (280.90)	12733. (361.13)	15304. (433.35)	20405. (577.00)	25506. (722.25)
ROUTED TO	24	60.00 (176.12)	1	1160. (32.05)	1510. (42.90)	1620. (46.11)	1743. (49.35)	1909. (54.05)	2000. (56.63)
ROUTED TO	25	60.00 (176.12)	1	1005. (30.72)	1401. (41.95)	1594. (45.13)	1707. (48.33)	1874. (53.05)	2000. (56.63)
Z COMBINED	25	110.70 (206.71)	1	1656. (46.91)	2000. (79.29)	3261. (92.33)	3610. (102.46)	4594. (130.09)	5610. (150.05)
HYDROGRAPH AT	25	102.00 (244.10)	1	5570. (157.74)	11141. (315.40)	13926. (394.34)	16711. (473.21)	22202. (630.95)	27052. (700.69)
Z COMBINED	25	212.70 (350.09)	1	6264. (177.37)	12169. (344.30)	15006. (427.20)	17971. (500.09)	23907. (676.97)	29054. (845.30)
HYDROGRAPH AT	25	72.00 (106.40)	1	3355. (94.99)	6709. (109.90)	8306. (237.40)	10064. (204.97)	13410. (379.97)	16773. (474.96)
Z COMBINED	25	204.70 (737.37)	1	9262. (262.26)	10145. (314.37)	22501. (639.43)	26965. (763.56)	35099. (1016.54)	44044. (1269.05)
ROUTED TO	26	204.70 (737.37)	1	5545. (157.03)	10654. (301.69)	13130. (372.02)	15563. (440.69)	20730. (507.02)	25914. (733.01)
Z COMBINED	26	3520.70 (9110.57)	1	17460. (496.42)	20027. (016.30)	34150. (967.24)	39533. (1119.46)	50532. (1430.91)	61524. (1742.17)
ROUTED TO	20	3520.70 (9110.57)	1	16731. (473.76)	20545. (000.86)	33060. (959.02)	39250. (1111.67)	50002. (1421.35)	61123. (1730.02)
HYDROGRAPH AT	27	37.00 (95.03)	1	3270. (92.02)	6556. (105.64)	0195. (232.06)	9034. (270.47)	13112. (371.29)	16390. (464.11)
ROUTED TO	20	37.00 (95.03)	1	2110. (59.76)	4221. (119.51)	5276. (109.39)	6331. (179.27)	0441. (239.03)	10551. (290.70)
Z COMBINED	20	3557.70 (9214.60)	1	16750. (474.52)	20507. (009.50)	33096. (959.02)	39292. (1112.62)	50047. (1422.03)	61100. (1732.42)
HYDROGRAPH AT	29	100.00 (239.00)	1	0. (0.00)	0. (0.00)	0. (0.00)	0. (0.00)	0. (0.00)	0. (0.00)
ROUTED TO	30	100.00 (239.00)	1	0. (0.00)	0. (0.00)	0. (0.00)	0. (0.00)	0. (0.00)	0. (0.00)
HYDROGRAPH AT	30	529.00 (1370.10)	1	23005. (699.93)	46610. (1319.06)	50263. (1449.02)	69915. (1979.70)	93221. (2639.71)	116526. (3299.64)
Z COMBINED	30	629.00 (1629.10)	1	23005. (699.93)	46610. (1319.06)	50263. (1449.02)	69915. (1979.70)	93221. (2639.71)	116526. (3299.64)
ROUTED TO	31	629.00 (1629.10)	1	23005. (699.93)	46610. (1319.06)	50263. (1449.02)	69915. (1979.70)	93221. (2639.71)	116526. (3299.64)
HYDROGRAPH AT	31	144.00 (372.96)	1	4722. (123.71)	9444. (267.41)	11004. (304.27)	14165. (401.12)	10007. (304.03)	23609. (660.53)
Z COMBINED	31	773.00 (2002.06)	1	20027. (700.60)	56054. (1507.27)	79067. (1904.09)	04001. (2000.00)	112100. (3174.50)	140135. (3960.17)

HYDROGRAPH AT	31	105.00 (271.93)	1	5045. (142.05)	10089. (285.69)	12611. (357.11)	15134. (428.54)	20170. (571.38)	25223. (714.23)
2 COMBINED	31	870.00 (2274.01)	1	32185. (911.30)	64370. (1822.75)	96442. (2270.44)	143355. (2734.13)	180740. (3645.50)	160925. (4556.00)
HYDROGRAPH AT	31	200.00 (745.92)	1	8352. (236.51)	16705. (473.03)	28081. (991.20)	25057. (709.54)	33410. (946.06)	41762. (1102.57)
2 COMBINED	31	1146.00 (3019.93)	1	34321. (1034.15)	73041. (2040.29)	91301. (2505.36)	109562. (3102.44)	144002. (4136.50)	182603. (5170.73)
HYDROGRAPH AT	31	249.00 (696.71)	1	19077. (540.19)	38153. (1000.30)	47691. (1350.47)	57230. (1620.57)	76306. (2160.75)	95303. (2700.94)
2 COMBINED	31	1435.00 (3716.63)	1	42495. (1200.33)	84990. (2400.65)	106230. (3000.32)	127405. (3609.90)	169900. (4813.31)	212476. (6016.44)
ROUTED TO	31	1435.00 (3716.63)	1	8666. (245.30)	12305. (348.44)	14006. (398.07)	15077. (449.59)	19464. (551.15)	23053. (652.79)
ROUTED TO	32	1435.00 (3716.63)	1	8666. (245.30)	12305. (348.44)	14006. (398.07)	15077. (449.59)	19464. (551.15)	23053. (652.79)
HYDROGRAPH AT	32	20.00 (72.52)	1	1215. (34.41)	2430. (68.81)	3830. (86.02)	3445. (103.22)	4060. (137.62)	6075. (172.03)
2 COMBINED	32	1443.00 (3709.15)	1	8004. (249.30)	12502. (354.01)	14309. (405.10)	16110. (456.41)	19761. (559.50)	23409. (662.06)
ROUTED TO	20	1443.00 (3709.15)	1	8756. (247.95)	12431. (352.02)	14229. (402.92)	16032. (453.90)	19659. (556.69)	23209. (659.47)
2 COMBINED	20	5020.70 (13000.95)	1	25503. (722.17)	39439. (1116.79)	46390. (1313.05)	53447. (1513.45)	67711. (1917.35)	81954. (2320.69)
HYDROGRAPH AT	20	110.00 (204.90)	1	3626. (102.67)	7251. (205.34)	9064. (256.67)	10077. (300.01)	14503. (410.67)	18120. (513.34)
2 COMBINED	20	5130.70 (13200.45)	1	26136. (740.00)	40630. (1150.75)	46935. (1329.62)	53627. (1510.56)	67951. (1924.16)	82255. (2329.20)
ROUTED TO	33	5130.70 (13200.45)	1	26021. (736.03)	40459. (1145.67)	46760. (1324.32)	53001. (1511.50)	67656. (1915.79)	81091. (2310.09)

 FLOOD HYDROGRAPH PACKAGE (MCC-1)
 DAN SAFETY VERSION JULY 1970
 LAST MODIFICATION 26 FEB 79

TERMINAL 325 TIME OUT.

300- 3124 REV- 7.366

Table I-1: Physical Characteristics of Lakes in the Basin

<u>Name</u>	<u>Regulating Agency</u>	<u>Drainage Area (sq. mi.)</u>	<u>Surface Area (sq. mi.)</u>	<u>Shoreline (miles)</u>	<u>Principal Regulation Purpose</u>
Canandaigua Lake	City of Canandaigua	184	16.57	36	WS, WQ, FC, R
Keuka Lake	Village of Penn Yan	179	17.43	19	WS, SQ, Rec.
Seneca Lake	N.Y. Electric & Gas Co. & N.Y.S. Dept. of Transportation	714	66.9	75	WS, Nav., P, I Rec.
Cayuga Lake	N.Y.S. Dept. of Transportation	780	66.4	85	WS, Nav., I FC
Owasco Lake	City of Auburn	206	10.25	25	WS, WQ, FC, R
Skanateles Lake	City of Syracuse	74	13.8	33	WS, SQ, FC, R
Otisco Lake	Onondaga County Water Authority	42.7	3.4	13	WS, SQ, FC, I
Oneida Lake	N.Y.S. Dept. of Transportation	1382	79.8	55	Nav., FC, R

WS - Water Supply
 WQ - Water Quality
 FC - Flood Control
 Nav. - Navigation
 P - Power
 Rec. - Recreation



PROJECT NAME NEW YORK STATE DAM INSPECTION DATE 7-31-77
 SUBJECT OSWEGO RIVER BASIN PROJECT NO. 2305
DEPTH - AREA - DURATION RELATIONSHIP # DRAWN BY JPG

AREA	DURATION	DEPTH	% INDEX
200 Sq Mi	6 Hr	16.0	76
	12 Hr	19.0	90
	24 Hr	21.0	100
	48 Hr	23.5	112
200 Sq Mi	72 Hr	25.0	119
1000 Sq Mi	6 Hr	11.6	55
	12 Hr	14.3	68
	24 Hr	16.0	76
	48 Hr	18.8	89
1000 Sq Mi	72 Hr	20.0	95
5000 Sq Mi	6 Hr	7.1	34
	12 Hr	9.6	46
	24 Hr	11.6	55
	48 Hr	13.9	66
	72 Hr	15.2	72
10000 Sq Mi	6 Hr	5.3	25
	12 Hr	7.9	38
	24 Hr	9.5	45
	48 Hr	11.8	56
10000 Sq Mi	72 Hr	13.3	63

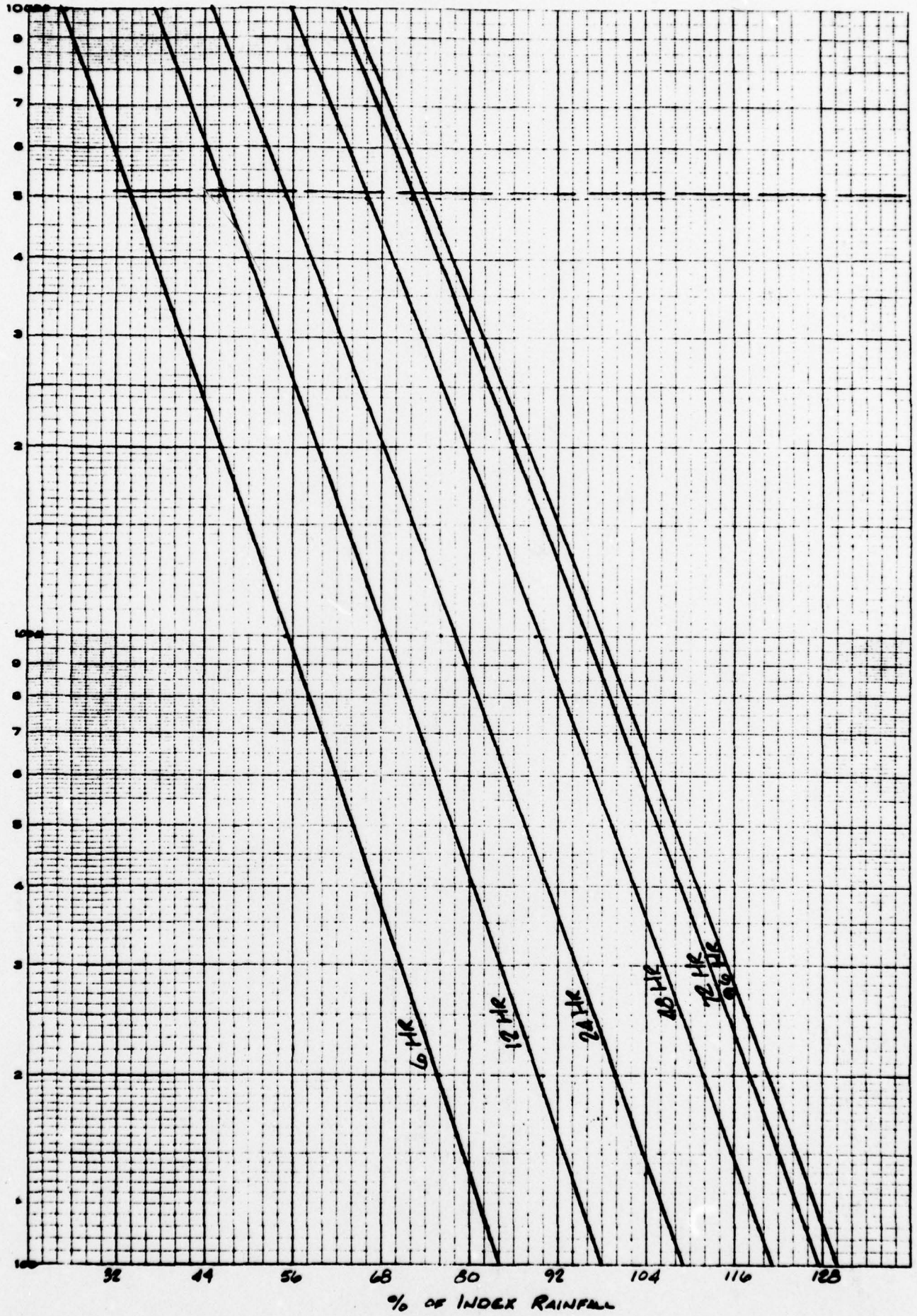
← PMF INDEX RAINFALL

FROM HYDROMETEOROLOGICAL REPORT NR 51
 SEPT 1976

<u>PMF</u>	<u>DURATION</u>	<u>% INDEX</u>
	6 Hr	33
	12 Hr	47
	24 Hr	55
	48 Hr	65
	72 Hr	72
	96 Hr	74

MADE IN U. S. A.

SEMI-LOGARITHMIC
2 CYCLES X 60 DIVISIONS (6 DIV. PER UNIT)



DRAINAGE AREA (Sq Mi.)



PROJECT NAME: New York State Dam Inspection
 PROJECT NO: 2202
 DRAWN BY: [Name]

For Water Flow - 2000 CFS
 SPILLWAY = 200'
 Top of Dam = 205.2
 B.C. Datum
 207.2
 205.2 Datum
 H₀ = 8.00 (assumed no pump)

Station	Elev (ft)	H ₀ /H ₁	C ₁ /C ₂	C	Q = C A ₁ V ₁	Area
207.2	0	0	0	0	0	0
206.0	2.2	2.2	2.2	2.2	2.2	1000
205.2	5.0	5.0	5.0	5.0	5.0	2000
204.0	7.7	7.7	7.7	7.7	7.7	3000
203.2	10.0	10.0	10.0	10.0	10.0	4000
202.0	12.2	12.2	12.2	12.2	12.2	5000
201.2	15.0	15.0	15.0	15.0	15.0	6000
200.0	17.2	17.2	17.2	17.2	17.2	7000
198.8	20.0	20.0	20.0	20.0	20.0	8000
198.0	22.2	22.2	22.2	22.2	22.2	9000
197.2	25.0	25.0	25.0	25.0	25.0	10000
196.0	27.2	27.2	27.2	27.2	27.2	11000

Station	Elev (ft)	H ₀	H ₁	Q ₁	Q ₂	Area
207.2	0	0.0	0.0	0.0	0.0	0
206.0	2.2	2.2	2.2	2.2	2.2	1000
205.2	5.0	5.0	5.0	5.0	5.0	2000
204.0	7.7	7.7	7.7	7.7	7.7	3000
203.2	10.0	10.0	10.0	10.0	10.0	4000
202.0	12.2	12.2	12.2	12.2	12.2	5000
201.2	15.0	15.0	15.0	15.0	15.0	6000
200.0	17.2	17.2	17.2	17.2	17.2	7000
198.8	20.0	20.0	20.0	20.0	20.0	8000
198.0	22.2	22.2	22.2	22.2	22.2	9000
197.2	25.0	25.0	25.0	25.0	25.0	10000
196.0	27.2	27.2	27.2	27.2	27.2	11000

Sheet Dimensions



PROJECT NAME NEW YORK STATE DAM INSPECTION DATE 7-13-79
 SUBJECT CURVED DAM - Lock N° 7 PROJECT NO. 2505
STAGE - DISENARGE RELATIONSHIP DRAWN BY JRS/HPD

FREE WEIR FLOW - SIDE CHANNEL SPILLWAY (WEST SIDE)

SPILLWAY = 250'

TOP OF DAM = 268.5 B.C. DATUM

Cd = 4.03

267.5 USGS DATUM

Hd = 8.00' (ASSUMED - NO PLANS)

<u>ELEV (USGS)</u>	<u>He</u>	<u>Hd/Hd</u>	<u>C/Cd</u>	<u>C</u>	<u>Q = C L H^{1.5}</u>	<u>Q TOT.</u>
267.5	0	0	0	0	0	0
270.0	2.5	.312	.830	3.34	3300	10050
272.5	5.0	.625	.925	3.73	10425	29525
275.0	7.5	.938	.980	3.95	20282	55322
277.5	10.0	1.250	1.030	4.15	32810	86710
280.0	12.5	1.560	1.050	4.23	46735	122135
282.5	15.0	1.875	1.050	4.23	61435	160535
285.0	17.5	2.188	1.050	4.23	77417	
287.5	20.0	2.50	1.050	4.23	92585	
290.0	22.5	2.813	1.050	4.23	112864	

SUBMERGENCE

<u>ELEV (USGS)</u>	<u>h</u>	<u>d</u>	<u>Q_{DR}</u>	<u>He</u>	<u>hd</u>	<u>hd/He</u>	<u>hd+d He</u>	<u>% REDUCT</u>
267.5	0	14	40380	6.0	6.0	1.0	3.33	0
270.0	8.5	16.5	54750	7.0	4.5	.643	3.00	.5%
272.5	5.0	19.0	71638	8.8	3.8	.432	2.59	2.0%
275.0	7.5	21.5	88525	10.6	3.0	.286	2.33	4.0%

NEGLECT SUBMERGENCE



PROJECT NAME NEW YORK STATE DAM INSPECTION

DATE 6-19-79

SUBJECT HIGH DAM - LOCK NO 7

PROJECT NO. 2305

STAGE-DISCHARGE RELATIONSHIP

DRAWN BY JPGEN-D

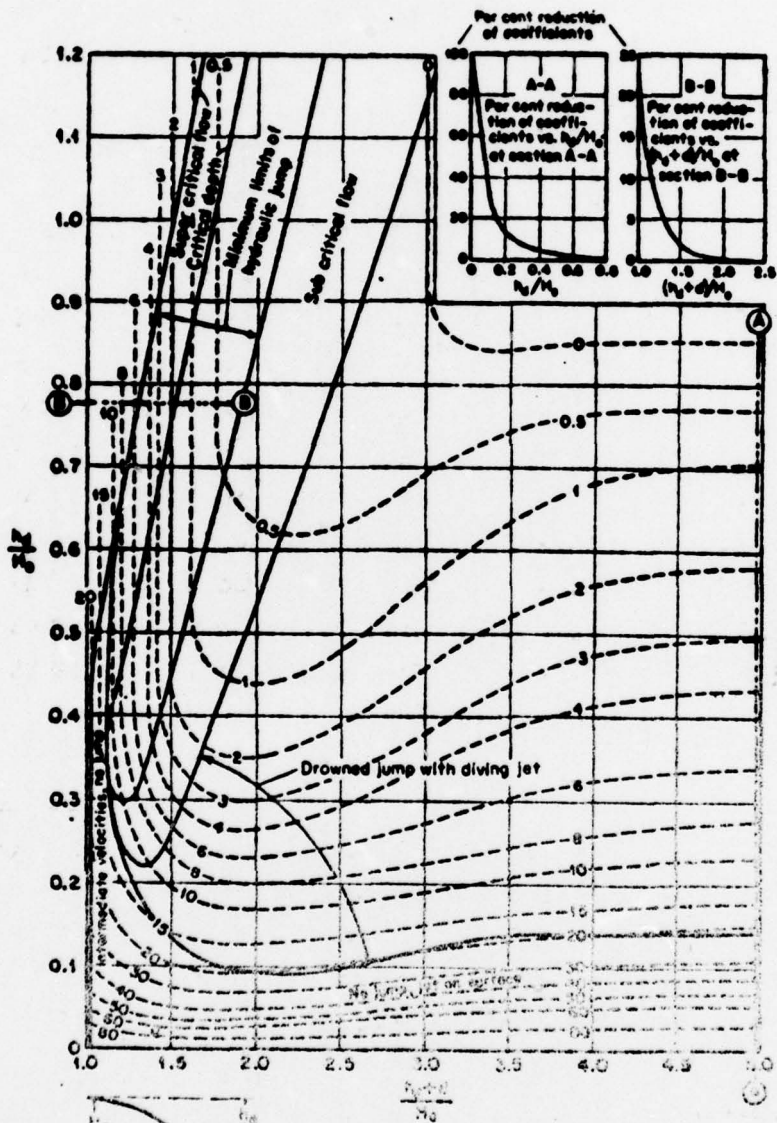
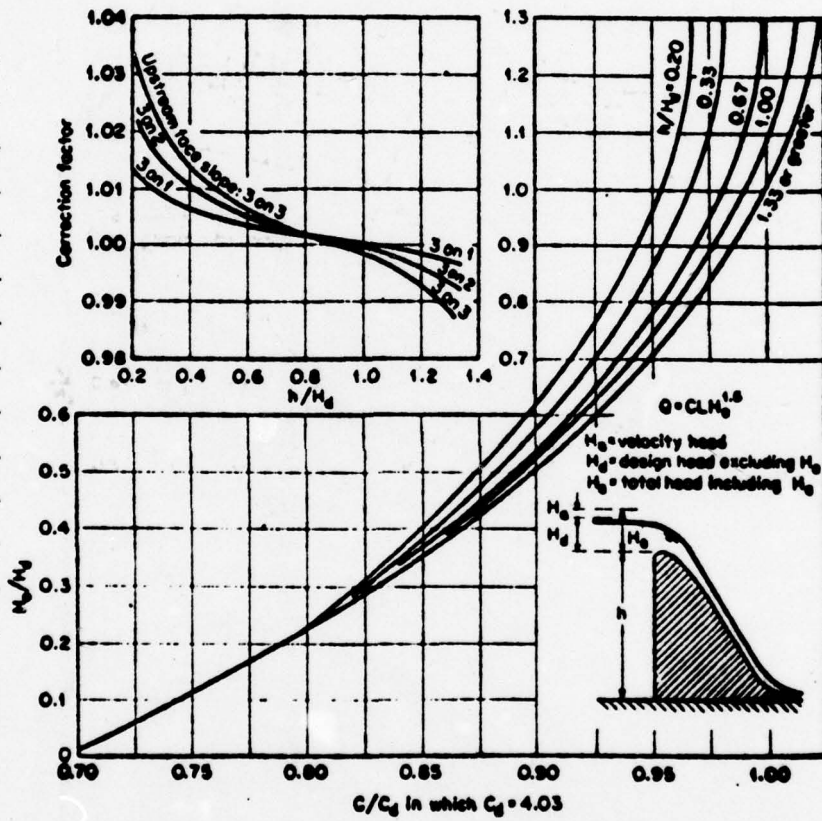


Fig. 16-17. Increase in discharge coefficient for submerged overflow spillways.
(U.S. Army Engineers Waterways Experiment Station)



PROJECT NAME NEW YORK STATE INSPECTION DATE 6.19.79
 SUBJECT HIGH DAM - LOCK No 7 PROJECT NO. 2307
STAGE-DISCHARGE RELATIONSHIP DRAWN BY JPS



C-106



PROJECT NAME NEW YORK STATE DAM INSPECTION

DATE 6.19.79

SUBJECT CURVE DAM - LOCK #7

PROJECT NO. 2305

STAGE - DISCHARGE RELATIONSHIP

DRAWN BY _____

FRANCIS SUBMERGED WEIR FORMULA

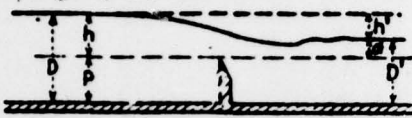


FIG. 22.—Submerged sharp-crested weir.

- where Q = discharge, cfs.
- l = effective length of weir, ft.
- h = measured head on crest, ft, upstream from weir beyond beginning of surface curve.
- h' = difference in elevation of water surfaces ($= h - d$).
- d = depth of submergence.

$$Q = 3.33 l \sqrt{h'} (h + 0.381 d)$$

$$Q = 3.33 l \sqrt{h'} (h' + 1.381 d)$$

SOLVE FOR h' WITH DOWNSTREAM Q 'S

ELEV (MSL)	d	Qd	l	h'	h	WATER SURFACE ELEV
267.5	0	0	517	0	0	
270.0	2.5	54,750	↓	7.85	10.35	277.85
275.0	7.5	88,525		7.90	15.40	282.90
280.0	12.5	128,500		8.40	20.90	288.40
285.0	17.5	174,250	517	8.90	26.40	293.90

NEGLECT SUBMERGENGE



PROJECT NAME NEW YORK STATE DAM INSPECTION DATE 6-19-79
 SUBJECT CURVE DAM - LOCK #7 PROJECT NO. 2305
STAGE - DISCHARGE RELATIONSHIP DRAWN BY JPG & NFD

DOWNSTREAM CHANNEL FLOW

MANNING'S FORMULA : $Q = \frac{1.49}{n} A R^{2/3} S^{1/2}$

ASSUME : $n = 0.035$

$S = 0.00122 \text{ ft/ft}$

CHANNEL IS RECTANGULAR - 400' WIDTH

ELEV (USGS)	h	1.49/n	A	R	S	Q		
255	0	42.57	0	0	0.00122	0		
260	5	↓	2000	5	↓	8,750		
265	10		4000	10		27,820		
TOP OF DAM 267.5	12.5		5000	12.5		40,380		
270	15		6000	15		54,750		
275	20		8000	20		88,525		
280	25		10000	25		120,500		
285	30		12000	30		174,250		
290	35		42.57	14000		35	0.00122	224,400

FREE WEIR FLOW

BC - BARGE CANAL DATUM
USGS - USGS DATUM

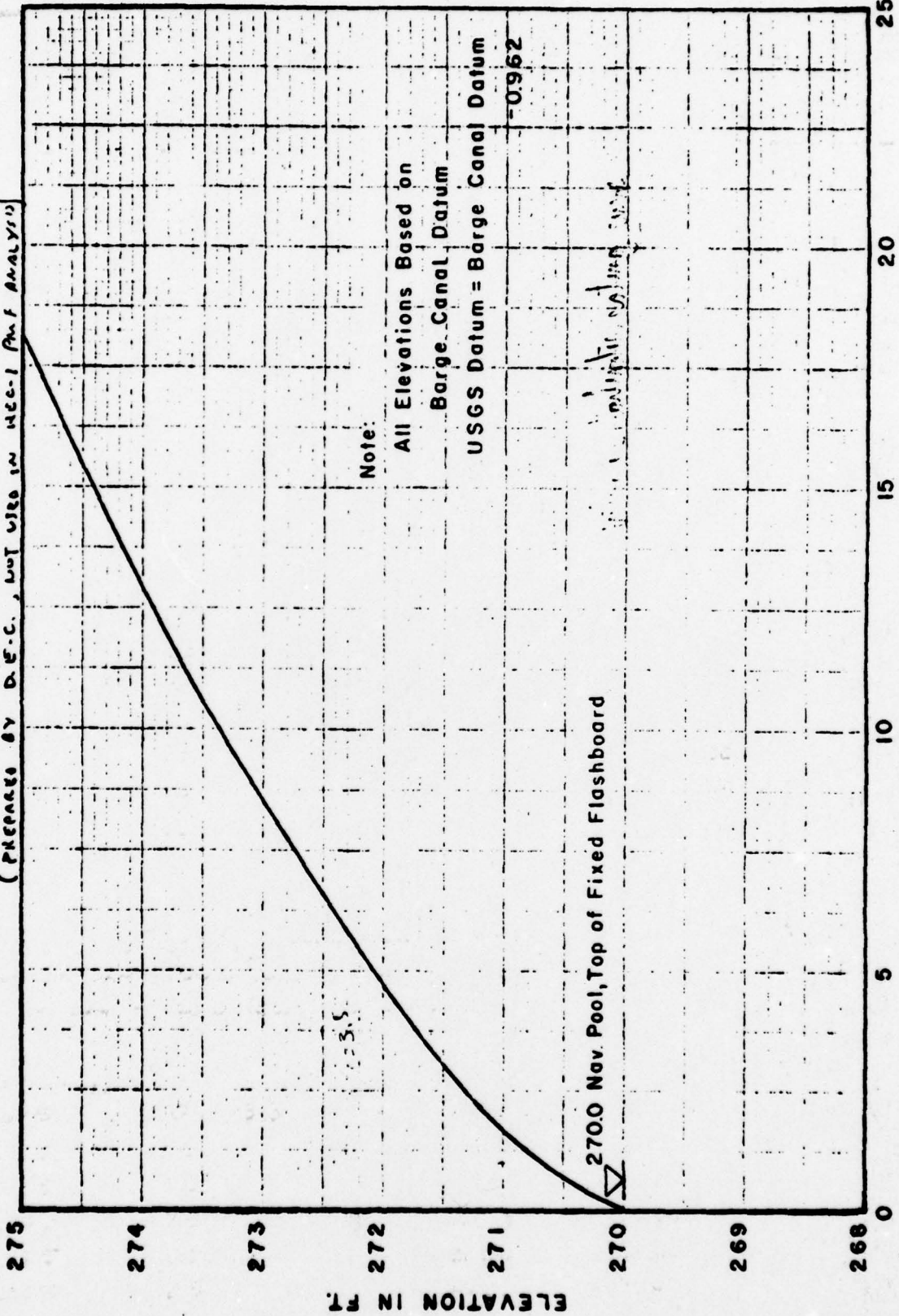
BASE OF DAM - 256.0 (BC) ; 255.0 (USGS)

TOP OF DAM - 268.5 (BC) ; 267.5 (USGS)

ELEV (USGS)	h	C	L	H ^{1.5}	Q		
267.5	0	3.3	517	0	0		
270.0	2.5	↓	↓	3.95	6,750		
272.5	5.0			11.18	19,100		
275.0	7.5			20.54	35,040		
277.5	10.0			31.60	53,900		
280.0	12.5			44.20	75,400		
282.5	15.0			58.10	99,100		
285.0	17.5			73.21	124,900		
290.0	22.5			3.3	517	106.73	182,100

RATING CURVE AT LOCK 0-7, OSWEGO

(PREPARED BY D.E.C., BUT USE IN REC-1 ANALYSIS)



Note:

All Elevations Based on

Barge Canal Datum

USGS Datum = Barge Canal Datum

-0962

2700 Nav. Pool, Top of Fixed Flashboard

Handwritten note: 2700 Nav. Pool, Top of Fixed Flashboard

ELEVATION IN FT.

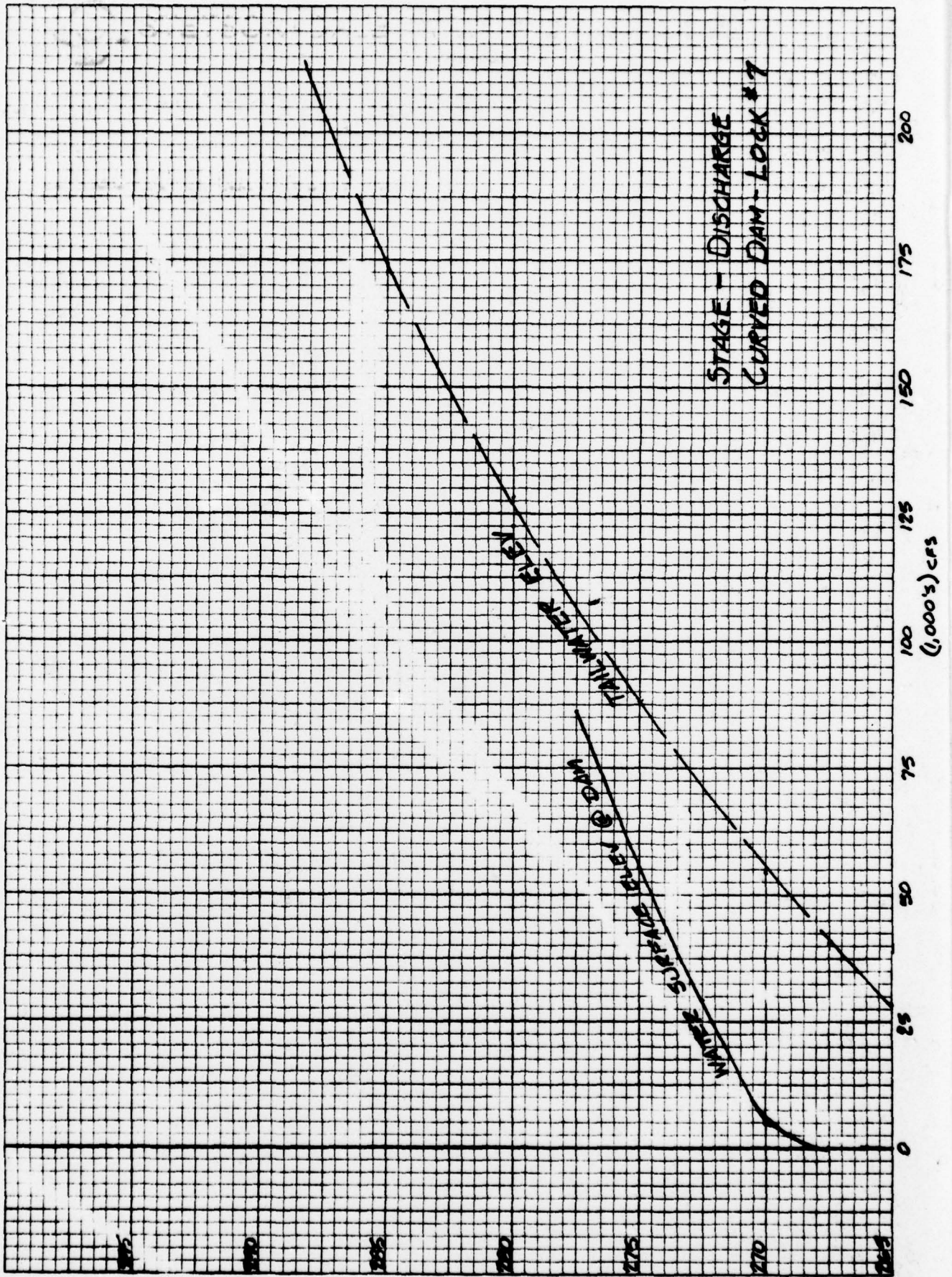
DISCHARGE IN 1000 CFS

193

4-7

HYDRAULICS

- Figure C-17 Rating Curve At Lock 0-7
- Figure C-18 Stage Discharge Computations
- Figure C-19 Stage Discharge Curve
- Figure C-20 Stage Storage Computations



STAGE - DISCHARGE
CURVED DAM-LOCK #7



STETSON • DALE

BANKERS TRUST BUILDING
UTICA • NEW YORK • 13501

TEL 315-797-5800

DESIGN BRIEF

PROJECT NAME NEW YORK STATE DAM INSPECTION DATE 6.18.79

SUBJECT CURVED DAM - LOCK #7 PROJECT NO. 2305

STAGE - STORAGE RELATIONSHIP DRAWN BY JRB

ELEV	END AREA (ACR)	VOL (ACRE-FT)	STORAGE (ACRE-FT)
251	.0289	2.9	2.9
252	.0291	11.6	14.5
254	.0294	23.5	38.0
256	.0299	35.9	73.9
258	.0303	48.5	122.4
260	.0308	60.0	182.4
262	.0310	62.0	244.4
264	.0314	62.8	307.2
266	.0318	63.6	370.8
268	.0321	64.2	435.0
270	.0325	65.0	600.0
272	.0329	65.8	665.8
274	.0332	66.4	732.2
276	.0336	67.2	799.2
278	.0340	68.0	867.4
280	.0343	68.6	936.0
282	.0347	69.4	1005.4
284	.0351	70.2	1075.6
286	.0354	70.8	1146.4
288	.0358	71.6	1218.0



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NEW YORK, N.Y.
10017

APPENDIX D
STABILITY ANALYSIS

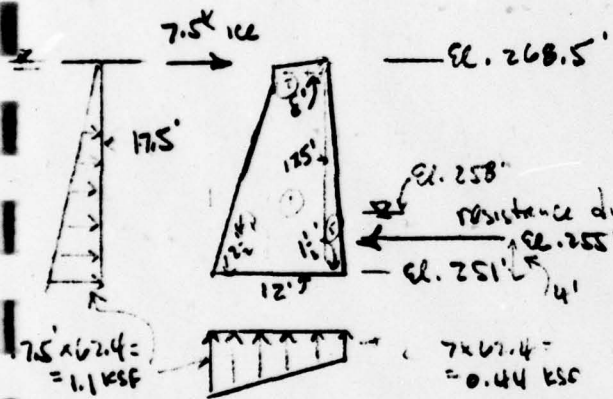


PROJECT NAME CURVED DAM - LOCK #7 DATE _____
 SUBJECT STABILITY ANALYSIS - PROJECT NO. _____
OVERTURNING & SLIDING DRAWN BY _____

see attached sketch for dam cross-section

OVERTURNING

- I. WL @ normal operating level
 assume WL @ top of dam (elev. 268.5) with ice force acting;
 if flashboards are utilized, WL is raised and water pressure
 on dam is increased but ice load cannot be assumed
 because flashboards would fail under the ice force.



neglect wt. of
top on upstream
face (safe)

$\mu = 0.65$
bond = 50 psi

resistance due to apron = $\mu(20' \times 7.5' \times 15') + (0.5 \times 144 \times 20')$
 $= 5 + 144 = 149 \text{ k/ft}$

data review indicates the stone
 apron is bolted to rock and pinned
 together - assume bolting resistance
 is greater than shear-bond value

(i) moments about toe resisting overturning = $M_{\text{dam}} + M_{\text{apron}}$
 $= [(8 \times 14 \times 15)(5.5) + (2.5 \times 8 \times 15)(5.5) + (8.1 \times \frac{1}{2} \times 15)(\frac{8}{3} + 1.5) + (2.5 \times 14 \times 15)(10.3) + (17.5 \times 1.5 \times \frac{1}{2} \times 15)(1.0)] + (149 \times 4) = 140.5 + 596 = 737 \text{ k}$

(ii) moments about toe causing out = $M_{\text{H}_2\text{O}} + M_{\text{uplift}} + M_{\text{ice}}$
 $= (1.1 \times \frac{17.5}{2} \times \frac{17.5}{3}) + (7.5 \times 17) + [(0.44 \times 12 \times \frac{12}{2}) + (0.1 - 0.44)(\frac{12}{2})(\frac{7 \times 12}{3})] = 56 + 128 + 32 + 32 = 248 \text{ k}$

64
56 / 110



PROJECT NAME _____ DATE _____
 SUBJECT _____ PROJECT NO. _____
 DRAWN BY _____

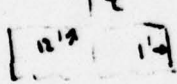
$$FS \text{ against overturning} = \frac{737^{1k}}{248^{1k}} = 3.0$$

note this FS based on utilizing maximum resistance of downstream apron - the apron resistance is passive, developing as needed up to its maximum value.

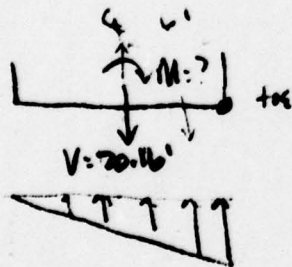
Position of resultant using the maximum resisting moment is outside the dam section. Working backwards, determine the lower limit of apron resistance necessary in order for resultant to be located at $\frac{1}{3}$ base:

$$\Sigma V = \text{wt. dam} - \text{uplift} = 25^k - \left(\frac{1 + 0.44}{2} \right) (12') = 15.8^k$$

$$I_{xx} \text{ for 1' wide section of dam} = \frac{1}{12} b h^3 = \frac{1}{12} (1)(12 \times 12 \times 12) = 144 \text{ ft}^4$$

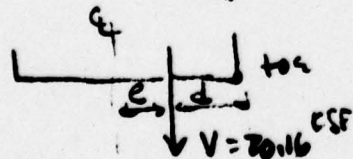


$$\frac{V}{A} = \frac{15.8^k}{12 \times 1 \text{ ft}^2} = 1.32 \text{ ksf}$$



for triangular stress distribution, $M_c = 31.7^k$

s.e. $\left[\sigma = \frac{M c}{I} \text{ or } M_c = \frac{\sigma I}{c} = \frac{1.32 \times 144}{6} = 31.7^k \right]$



location of V: $e = \frac{M}{V} = \frac{31.7}{15.8} = 2'$

therefore $d = 4'$

$M_{\text{tors}} \text{ due to } V \text{ and } d = 15.8^k \times 4' = 63^{1k}$

(cont'd)



PROJECT NAME _____ DATE _____

SUBJECT _____ PROJECT NO. _____

DRAWN BY _____

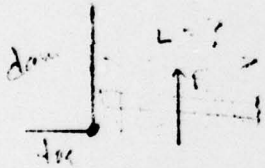
check

for resisting moment of forces acting on dam to be
81 ^{ik} greater than ^{1/2} overturning moment ^{1/2} M
total resisting moment is $63^{ik} + 0.748^{ik} = 311^{ik}$

Since resisting moment due to wt. of dam = 140^{ik} ^{we}
resisting moment to be provided by apron becomes $311 - 140 = 171^{ik}$

The required resistance can be developed in shear bond
if the apron remains a monolith.

Check possibility that apron section adjacent to dam buckles
and fractures. What width section (L) is required to keep
dam stable —



based upon bond/tensile resistance of 50 psi
between apron and fill

$$M \text{ due to } F = 171^{ik} = .05 \times 1000 \times L^2$$
$$L = 4\frac{1}{2}'$$

reasonable to assume this can develop

bond/shear on a $4\frac{1}{2}'$ apron section = $(.05 \times 1000 \times 4\frac{1}{2}) = 32.4^{ik}$
moment about dam toe due to 27.6^{ik} lateral force
 $= 27.6^{ik} \times 4\frac{1}{2} = 130^{ik}$ close,

note: require
at least 55 psi
to develop
171^{ik} moment



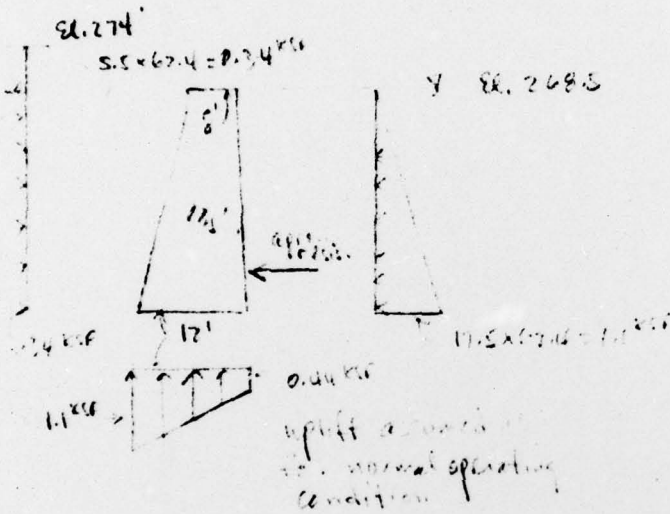
PROJECT NAME _____ DATE _____

SUBJECT _____ PROJECT NO. _____

DRAWN BY _____

II. WL @ 1, PMF elevations

elev. upstream 274', 5/2' above dam
elev. downstream 268.5'



neglect vertical force of H₂O on upstream face (safe)

(i) resisting moment due to wt dam = 141 k'

(ii) resisting moment due to downstream water pressure = $11 \times \frac{11}{2} \times \frac{11}{3} = 53 k'$

(iii) moment causing rot due to uplift = 64 k'

(iv) moment causing rot due to upstream hydro. water pressure = $(0.34 \times 11 \times 11) + (11 \times \frac{11}{2} \times \frac{11}{3}) = 105 k'$

(v) moment resulting out due to presence of foundation upon = up to 5/6

max. available FS against overturning = $\frac{(141 + 53 - 64)}{(105 + 64)} = \frac{790}{169} = 4.7$

as for case I open spillway in positive developing (increasing) as required, until max. value is obtained

could



PROJECT NAME _____ DATE _____

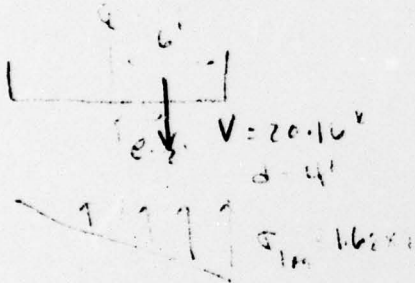
SUBJECT _____ PROJECT NO. _____

DRAWN BY _____

Contd determine apron resistance required for stability against overturning and resultant passing thru $\frac{1}{3}$ point of base

$$\Sigma V = \text{wt. dam} - \text{uplift} = 25 - 9.3 = 15.7$$

$$\frac{V}{A} = \frac{15.7}{12.1} = 1.31 \text{ ksf}$$



for triangular stress distribution, $M_{\text{req}} = 31.7 \text{ k}$

$$\text{since } \sigma = \frac{Mc}{I}$$

$$\text{or } M = \frac{\sigma I}{c} = \frac{1.31 \times 12.1^3}{6} = 31.7 \text{ k}$$

$$I_{\text{heel}} = \frac{V}{A} = \frac{Mc}{I}$$
$$1.31 = \frac{1.31 \times 4}{c}$$

$$c_{\text{heel}} = 1.31 \times 4 = 5.24 \text{ ft}$$

$$M_{\text{toe}} \text{ due to } V \text{ and } d = 15.7 \times 4 = 63 \text{ k}$$

For resulting moment about toe to be 81" greater the casing, the total resisting moment required becomes

$$63 \text{ k} + 169 \text{ k} = 232 \text{ k}$$

Since resisting moment due to wt. dam and downst. H₂O pressure = 141 + 53 = 194
the resulting moment to be provided by apron becomes $232 - 194 = 38 \text{ k}$,
reasonable to assume a 95' face would be developed by a 2' width of apron

$$FS \text{ against } \text{Nerturning} \text{ would be } \frac{232 \text{ k}}{169 \text{ k}} = 1.37$$



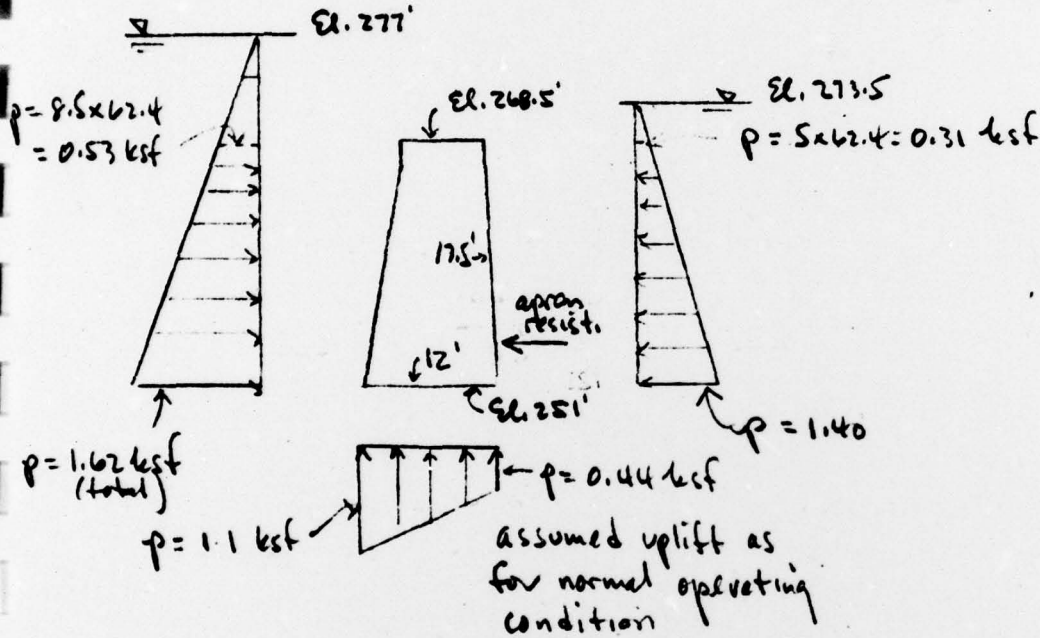
PROJECT NAME _____ DATE _____

SUBJECT _____ PROJECT NO. _____

DRAWN BY _____

III. WL @ PMF elevations

elev. upstream 277', 8.5' above spillway
elev. downstream 273.5'



(i) resisting moment due to wt. dam = 141 ^{1k}

(ii) resisting moment due to downstream H₂O pressure =

$$= (0.31 \times 17.5 \times \frac{17.5}{2}) + (1.40 - 0.31) (\frac{17.5}{2} \times \frac{17.5}{3}) = 103 \text{ } ^{1k}$$

(iii) moment causing out due to uplift = 64 ^{1k}

(iv) moment causing out due to upstream H₂O pressure =

$$= (0.53 \times 17.5 \times \frac{17.5}{2}) + (1.62 - 0.53) (\frac{17.5}{2} \times \frac{17.5}{3}) = 137 \text{ } ^{1k}$$

(a) FS against overturning, neglecting apron resistance

$$= \frac{141 + 103}{64 + 137} = \frac{244}{201} = 1.21$$



PROJECT NAME _____ DATE _____

SUBJECT _____ PROJECT NO. _____

DRAWN BY _____

Position of resultant would be

$$d = \frac{\sum M_{toe}}{\sum V} = \frac{(244 - 201) \text{ k}}{(29.4 - 9.3) \text{ k}} = 2' \text{ from toe}$$

(note $\frac{b}{3} = 4'$)

(b) FS against ovt applying max. passive resistance of apron ($M_{apron} = 5$)

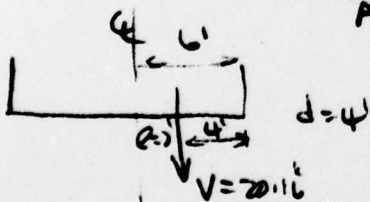
$$FS = \frac{244 + 596}{201} = 4.18$$

(c) as for case I and II, apron resistance is passive, developing (increasing as required until reaching max value)

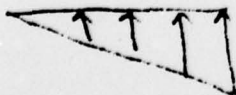
determine apron resistance required for stability against overturning and resultant passing thru $\frac{1}{3}$ base

$$\sum V = \text{wt. dam} - \text{uplift} = 25 - 9.3 = 15.7 \text{ k}$$

$$\frac{V}{A} = \frac{15.7}{12 \times 1} = 1.31 \text{ ksf}$$



$$M_{toe} \text{ due to } V \text{ and } d = 15.7 \text{ k} \times 4' = 63 \text{ k'}$$





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For resisting moment about toe to be 63^k greater than causing,
the total resisting moment required becomes

$$63^k + 201^k = 264^k$$

Since resisting moment due to wt. dam and downstream H_2O pressure =
 $= 141 + 103 = 244^k$

the moment to be provided by apron resistance becomes
 $264^k - 244^k = 20^k$

with a moment arm distance of 4', the apron resistance $\approx 5^k$,
reasonable to assume this would be developed by a 1' width

$$\underline{FS} \text{ against overturning would be } = \frac{244^k}{201^k} = \underline{1.20}$$



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II. WL @ 1/2 PMF elevations

(i) wt. of dam = 25 k

(ii) uplift = 9.3 k

(iii) lateral water force upstream = $(\frac{0.34 + 1.44}{2})(17.5) = 15.6 \text{ k}$

(iv) lateral water force downstream = $(1.1 \times \frac{17.5}{2}) = 9.6 \text{ k}$

(v) lateral resistance provided by apron as required for vt. stability = 9.5 k

FS against sliding (friction - shear)

$$FS = \frac{(0.65)(25 - 9.3) + (0.05 \times 144 \times 12) + 9.6 + 9.5}{15.6}$$

$$= \frac{116}{15.6} = 7.4 \pm$$

III. WL @ PMF elevations

$$FS \text{ against sliding} = \frac{(0.65)(25 - 9.3) + (0.05 \times 144 \times 12) + 5 + (\frac{0.34 + 1.44}{2} \times 17.5)}{(0.53 + 1.62)(17.5)}$$

$$= \frac{117}{18.8} = 6.2 \pm$$



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SLIDING

I. WL @ normal pool level

$$(i) \text{ wt. of dam} = [(8 \times 14 \times 1.15) + (2.5 \times 8 \times 1.15) + (8 \times 1 \times \frac{1}{2} \times 1.15) + (2.4 \times 14 \times 1.15) + (17.5 \times 1.5 \times 1.15)] = 16.8 + 3 + 0.6 + 26 + 2 = 25^k$$

$$(ii) = (11.1 \pm 0.44) (12) = 9.3 \quad \text{uplift force}$$

FS against sliding (friction-shear method using 50 psi bond between dam and rock fdtn, $\mu = 0.65$)

$$FS = \frac{\mu N + (50 \times 144 \times 12 \text{ ft}) + \text{wt. force from apron + water}}{\text{horiz. water press + ice}}$$

$$= \frac{(0.65 \times 25^k) + (0.50 \times 144 \times 12) + 32^k}{(11.1 \times \frac{17.5}{2}) + 25^k}$$

$$= \frac{129}{17.1} = 7.5 \pm \quad (25^k \text{ ice + uplift act}) - \text{dc.}$$

APPENDIX E

REFERENCES

APPENDIX

REFERENCES


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REPORT DOCUMENTATION PAGE

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1. REPORT NUMBER		2. GOVT ACCESSION NO.		3. RECIPIENT'S CATALOG NUMBER	
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7. AUTHOR(s) John B. Stetson, P.E.				6. CONTRACT OR GRANT NUMBER(s) DACW-51-79-C-0001	
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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.					

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1. Within one year of notification, complete the following investigations:
 - a. Perform a detailed investigation including subsurface investigations to determine the extent of and method of repair for through-the-dam and under-the-dam seepage.
2. After the aforementioned investigations, the remaining deficiencies requiring remedial work should be completed within the next construction season. The following improvement needs have been identified:
 - a. Repair seepage and leaks through and beneath the dam.
 - b. Repair the masonry in the east abutment wall. Align the masonry units and replace the missing masonry unit.
 - c. Repair the boil located in a land area along the riverside wall of the navigation channel.

Computations prepared according to the Corps of Engineers' Screening Criteria establish the spillway capacity of 62,500 cfs at 76% of the PMF, with the PMF and 1/2 PMF flows at 81,900 cfs and 46,800 cfs respectively. Since the dam is capable of passing the 1/2 PMF without being overtopped, it is assessed as inadequate.