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OSWEGO RIVER BASIN

LOCK 24 - ERIE CANAL

ONONDAGA COUNTY, NEW YORK

INVENTORY NO. N.Y. 792

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM.

Lock 24 - Erie Canal (Inventory Number NY-792),
Oswego River Basin, Onondaga County, New York.

Phase I Inspection
Report,



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Prepared for
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NEW YORK, NEW YORK

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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. The examination of documents and the visual inspections of the Lock 24 dam did not reveal conditions which constitute an immediate hazard to human life or property. However, the		

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dam has some deficiencies which require further investigation and remedial action.

The spillway cannot pass the peak outflow from one-half the PMF. For this storm and lesser storm events, a high tailwater condition resulting in flooding of downstream areas would occur. Therefore, overtopping would not significantly increase the hazard to loss of life downstream from that which would exist just before such overtopping and the spillway is assessed as inadequate. ←

Stability analyses based on available information indicate that the stability of the dam is inadequate for all loading conditions. Additional stability analyses, taking into account measured characteristics of the dam/bedrock interaction, should be completed within six (6) months of the date of notification of the owner. Based upon the results of these investigations, appropriate remedial measures deemed necessary to insure the safety and integrity of the dam and appurtenant structures should be undertaken and completed during the first construction season following completion of the stability analyses.

During periods of unusually heavy precipitation and high runoff occurring over the watershed, continuous surveillance should be provided both at the dam and in the downstream areas to warn of high floodwater conditions. Such surveillance procedures and other measures deemed necessary should be developed documented and placed in readiness for future use as part of a detailed emergency operation-action plan. A warning system should also be developed and implemented; to be used in the event of dam failure.

In addition, the dam has a number of problem areas which, if left uncorrected, have the potential for the development of hazardous conditions and must be corrected within one year. These areas are:

1. Determine the responsibility for the maintenance of the powerhouse, boat yard, and Mercer mill, and correct the deficiencies noted.
2. Correct concrete deterioration on the dam crest and in the general lock area.

PREFACE

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

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspector 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 INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
LOCK 24 ERIE CANAL
I.D. NO. NY-792
ONONDAGA COUNTY, NEW YORK

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PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

NAME OF DAM: Lock 24 Erie Canal
STATE LOCATED: New York
COUNTY LOCATED: Onondaga
BASIN: Oswego River
STREAM: Seneca River
DATES OF INSPECTION: June 11 and June 26, 1980

ASSESSMENT

The examination of documents and the visual inspections of the Lock 24 dam did not reveal conditions which constitute an immediate hazard to human life or property. However, the dam has some deficiencies which require further investigation and remedial action.

The spillway cannot pass the peak outflow from one-half the PMF. For this storm and lesser storm events, a high tailwater condition resulting in flooding of downstream areas would occur. Therefore, overtopping would not significantly increase the hazard to loss of life downstream from that which would exist just before such overtopping and the spillway is assessed as inadequate.

Stability analyses based on available information indicate that the stability of the dam is inadequate for all loading conditions. Additional stability analyses, taking into account measured characteristics of the dam/bedrock interaction, should be completed within six (6) months of the date of notification of the owner. Based upon the results of these investigations,

appropriate remedial measures deemed necessary to insure the safety and integrity of the dam and appurtenant structures should be undertaken and completed during the first construction season following completion of the stability analyses.

During periods of unusually heavy precipitation and high runoff occurring over the watershed, continuous surveillance should be provided both at the dam and in the downstream areas to warn of high floodwater conditions. Such surveillance procedures and other measures deemed necessary should be developed, documented and placed in readiness for future use as part of a detailed emergency operation-action plan. A warning system should also be developed and implemented; to be used in the event of dam failure.

In addition, the dam has a number of problem areas which, if left uncorrected, have the potential for the development of hazardous conditions and must be corrected within one year.

These areas are:

1. Determine the responsibility for the maintenance of the powerhouse, boat yard, and Mercer mill, and correct the deficiencies noted.
2. Correct concrete deterioration on the dam crest and in the general lock area.

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Panoramic View of
BALDWINVILLE DAM
(Lock 24)

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

LOCK 24 ERIE CANAL

I.D. NO. NY-792

ONONDAGA COUNTY, NEW YORK

SECTION 1: PROJECT INFORMATION

1.1 GENERAL

a. Authority

The Phase I inspection reported herein was authorized by the Department of the Army, New York District, Corps of Engineers, to fulfill the requirements of the National Dam Inspection Act, Public Law 92-367.

b. Purpose of Inspection

This inspection was conducted to evaluate the existing conditions of the dam, to identify deficiencies and hazardous conditions, to determine if they constitute hazards to human life and property, and to recommend remedial measures where necessary.

1.2 DESCRIPTION OF PROJECT

a. Description of the Dam and Appurtenant Structures

The Lock 24 dam is a masonry gravity overflow dam approximately 325 feet in length. It rises approximately 16 feet above its rock foundation to the fixed crest.

Flow is partially controlled by a taintor gate located at the north end (or left side) of the dam. This gate is approximately 50 feet wide.

North of the dam taintor gate, a small hydroelectric powerhouse is maintained by Niagara Mohawk Power Corporation. Flow into the powerhouse is controlled by another taintor gate approximately 50 feet in width.

The south abutment of the dam is a masonry wall of the Baldwinsville Boat Yard.

The lock which is associated with this dam is located to the south of a narrow island, approximately 200 feet south of the south dam abutment. This lock is approximately 350 feet long and 44 feet wide.

On the island are two structures which in the past have utilized the head developed by the dam for power. These are the Baldwinsville Boat Yard and the Mercer mill. These structures receive water from a forebay, or intake channel, which varies in width from approximately 120 feet to approximately 30 feet. Neither structure is utilizing the head at the present time. At the boat yard, upstream water is retained by gates with flashboards. At the time of inspection, the Mercer mill was inaccessible.

b. Location

The dam is located on the Seneca River, in the Village of Baldwinsville, New York.

c. Size Classification

The dam has a head of approximately 10 feet, and a storage volume of approximately 34,100 acre-feet. Therefore, the dam is classified as an intermediate size dam.

d. Hazard Classification

The dam is classified "high" hazard because of downstream residences and the potential impact on navigation.

e. Ownership

The Lock 24 dam is owned by the New York State Department of Transportation, Waterways Maintenance Subdivision. The controlling office is located in Syracuse, New York.

Their address is as follows:

New York State Department of Transportation
Region 3
Canal Maintenance
State Office Building
333 East Washington Street
Syracuse, New York

Mr. Leo Burns
315-473-8194

f. Purpose of the Dam

The primary purpose of the dam is to provide navigable upstream waters. The impounded waters behind the dam provide a storage pool for gravity inflow to the lock. A secondary purpose of the dam is to provide hydroelectric power.

g. Design and Construction History

The present dam is believed to have been constructed about 1893. Plans for the lock, taintor gate, and a concrete cap on the dam crest are dated 1908. Plans for a new taintor gate are dated 1963 and it is reported that this was accomplished at about this time.

h. Normal Operational Procedures

The water level behind the dam is maintained at or slightly above elevation 374.0 (BCD-Barge Canal Datum) (The dam crest elevation). Gauge readings upstream and downstream of the lock are recorded daily.

1.3

PERTINENT DATA

<u>a. Drainage Area</u> (square miles)	3266+
<u>b. Elevations</u> (Barge Canal Datum)	
Top of Dam (Lock Walls)	379.0
Dam Overflow Crest	374.0
Design Pool	374.0
Maximum Recorded Pool	378.8
Taintor Gate Crest	366.0
Streambed at Dam Centerline	358+
Maximum Recorded Tailwater	372.5
Minimum Recorded Tailwater	363+

c. Storage (acre-feet)

Design Pool 34,100+

d. Dam

Type Masonry
Length 325 feet
Height 16+ feet
Top Width 5-6 feet
Foundation Rock

e. Gate

Type One Taintor Gate
Width 50 feet
Crest Elevation 366.0

f. Lock

Size Approximately 350' long
and 44' wide

g. Other Appurtenant Structures

1. Niagara Mohawk Power Corporation powerhouse
with 50' wide taintor gate
2. Baldwinsville Boat Yard
3. Mercer Mill

SECTION 2: ENGINEERING DATA

2.1 GEOTECHNICAL DATA

a. Geology

Lock 24 is located within the Village of Baldwinsville, New York in the Erie-Ontario Lowlands physiographic province.

This channel is a major glacial drainageway and, as a result, the Seneca River valley proper is filled with stratified sand and gravel outwash from the melting continental ice sheet. The surrounding terrain consists of the Iroquoian Lake plain with associated lacustrine deposits; ground moraine (glacial till) underlies these materials in most areas and forms knolls and drumlins which are free of lacustrine sediments by virtue of the fact that they were of sufficient elevation to have formed "islands" during the proglacial phase. All glacial deposits in the area reflect the most recent, or Wisconsinan, stage of the Pleistocene.

Underlying this glacial drift are Upper Silurian age mudstones of the Vernon Formation (Salina Group) and dolostones of the older Lockport Group. The Vernon is known to be gypsiferous while the Lockport Dolomite is characteristically vuggy. All rock units in the area are flat-lying over short distances, although a gentle southward dip may be discerned; all strata are non faulted and the region is considered seismically stable. However, according to Figure 1 of the Guidelines, promulgated by the Corps of Engineers, this is in an area of Zone 2 seismic probability.

b. Subsurface Investigations

No records of subsurface investigations were available. Based upon the available plans and the site characteristics, it appears that the structure is founded on rock.

2.2 DESIGN/CONSTRUCTION RECORDS

No records were available for the original masonry dam. Plans dated 1908 and identified as contract 45 show the dam, lock, taintor gate, and appurtenant structures as they presently exist. Plans for a new taintor gate are dated 1963. Selected drawings are included in Appendix E.

2.3 OPERATION RECORDS

This site has an attendant on a year-round basis. Upstream and downstream water elevation readings are recorded daily throughout the year. The dam taintor gate and the Niagara Mohawk Power Corporation taintor gate are regulated to ensure that the upstream water surface does not drop below elevation 374.0 (BCD) (the dam crest).

2.4 EVALUATION OF DATA

The data presented in this report was obtained during the site inspections and from the files of the New York State Department of Transportation. The information is considered adequate for Phase I inspection purposes.

SECTION 3: VISUAL INSPECTION

3.1 FINDINGS

a. General

Visual inspections of the dam and appurtenant structures were conducted on June 11, 1980 and on June 26, 1980. The weather was generally fair. The upstream water surface elevation was 374.4 (BCD) during the first inspection. For the second inspection, the upstream water surface elevation was drawn down to just below 374.0 (BCD) (the dam crest), so that the dam crest and downstream face could be inspected. This was accomplished by entering the River below the dam in a small boat. The photographs in Appendix A depict the conditions described below.

b. Dam

The original masonry portion of the dam appeared to be in satisfactory condition. Concrete deterioration was noted along the cap that comprises the dam crest.

c. Dam Taintor Gate

The dam taintor gate was operable and appeared to be in satisfactory condition.

d. Lock

The lock in general is in satisfactory condition. Some areas of concrete deterioration were noted.

e. Powerhouse and Appurtenant Structures

Concrete deterioration was noted in the general area of the powerhouse and its appurtenant structures.

f. Baldwinsville Boat Yard and Mercer Mill

Significant concrete deterioration was noted in the area of the gates at the Baldwinsville Boat Yard. Also,

flashboards appeared to be old and were observed to be leaking.

At the time of inspection, the Mercer mill was inaccessible.

g. Upstream and Downstream Channels

The conditions of the river and its banks upstream and downstream of the dam appeared to be satisfactory.

3.2 EVALUATION OF OBSERVATIONS

The following deficiencies were noted:

1. Concrete deterioration along the dam crest.
2. Concrete deterioration in the lock area.
3. Concrete deterioration in the powerhouse intake, gate area, and the tailrace.
4. Concrete deterioration in the gate area at the Baldwinsville Boat Yard.
5. Old and leaking flashboards at the Baldwinsville Boat Yard.

SECTION 4: OPERATION AND MAINTENANCE PROCEDURES

4.1 PROCEDURE

Normal practice is to not allow the upstream water surface to drop below elevation 374.0 (BCD) (the dam crest). Flow is regulated primarily by the dam taintor gate. At very low flows, both the dam taintor gate and the Niagara Mohawk Power Corporation taintor gate must be closed.

4.2 MAINTENANCE OF DAM AND APPURTENANT STRUCTURES

The dam and appurtenant structures (lock and taintor gate) are maintained by the New York State Department of Transportation. The dam tender reported that the current maintenance is on an as-needed basis.

Increased maintenance is required to correct concrete deterioration on the dam crest and in the general lock area.

4.3 MAINTENANCE OF OTHER APPURTENANT STRUCTURES

The maintenance of the other appurtenant or adjunct structures (powerhouse, boat yard and Mercer mill) appears to rest with their respective owners. No documents were found which define this responsibility. Yet there are cases such as deteriorating concrete and leaking flashboards which, if left to continue unchecked, could lead to failure and concomittant loss of control of the pool level.

4.4 WARNING SYSTEM IN EFFECT

No apparent warning system is present.

4.5 EVALUATION

Operation and Maintenance of the dam taintor gate are satisfactory. Additional maintenance is required to correct concrete deterioration on the dam crest, in the

general lock area, in the powerhouse area, and at the Baldwinsville Boat Yard. In addition, old and leaking flashboards at the Baldwinsville Boat Yard should be replaced. Maintenance procedures at the Mercer mill should be reviewed.

A detailed emergency warning system should be developed.

SECTION 5: HYDROLOGIC/HYDRAULIC

5.1 DRAINAGE AREA CHARACTERISTICS

The Oswego River Basin in which the dam and the lock are located is in Central New York State and has a drainage area of approximately 5100 square miles at its mouth. The drainage area of the watershed at the dam is about 3266 square miles. The river system upstream of the dam includes six Finger Lakes, Cross Lake, the Barge Canal, and outlets from the lakes to the canal. The Seneca River and 16 other principal waterways drain the watershed above the dam. The Seneca River flows from Seneca Lake generally northeastward nearly 61 miles to its confluence with the Oneida River approximately 12 miles downstream of the dam. Canals within the watershed include a reach of the Erie Canal, the Seneca Canal, and the Seneca-Cayuga Canal. All of the lakes in the watershed have regulated outlets.

A major part of the Finger Lakes area is a region of rolling hills separated by deeply eroded, steep-sided valleys of moderate width. Major valleys extend generally north-south, and most are largely occupied by the Finger Lakes. This region slopes generally northward from an elevation of approximately 2000 feet near the watershed boundary to an elevation of approximately 1000 feet near the northern ends of the Finger Lakes.

5.2 ANALYSIS CRITERIA

The hydrologic analysis of this dam was performed using the Corps of Engineers HEC-1 computer program, Dam Safety Version. The spillway design flood selected for analysis was the PMF in accordance with the Recommended Guidelines of the U.S. Army Corps of Engineers.

The basic input for this study was taken from an HEC-1 model developed by the New York State Department of Environmental Conservation with assistance from the U.S. Army Corps of Engineers, Buffalo District. The model was calibrated by the D.E.C. to the observed floods of Hurricane Agnes, June 20-26, 1972. The subbasin designation, 6-hour unit hydrographs, routing methods, and loss rates for the model (those used for Hurricane Agnes) were all adopted.

The Probable Maximum Flood (PMF) was developed assuming the uniform distribution of the Probable Maximum Precipitation (PMP) over the watershed above the dam. A PMP of 21.5 inches was obtained from Hydrometeorological Report Number 51 for a 24 hour duration and a 200 square mile area.

The flood routing at the dam was performed by the modified Puls method. It was assumed that the gates in the forebay and the lock are closed during the flood.

5.3

SPILLWAY CAPACITY

The dam has a 352 feet long ungated spillway structure and a 50 feet long spillway with a taintor gate. The crest elevation of the ungated spillway is 374 and the elevation of the taintor gate sill is 366. The discharge over the dam crest was computed assuming that the discharge coefficient varies with head. The values of discharge coefficient ranged from 3.38 to 3.83. The primary spillway was analysed assuming the gate is fully opened. The discharge over the spillway was computed as weir flow for flood elevations up to 379 and as orifice flow above elevation 379. The elevation of the top of the walls on both ends of the dam is 379 and, at all stages exceeding this elevation, there will be overflow from the channel. Therefore, the discharge at both ends of the dam above elevation 379 was also computed by approximating cross sections from the plans and the U.S.G.S. quadrangle for Baldwinsville.

The spillways do not have sufficient capacity for discharging the peak outflow from either the Probable Maximum Flood (PMF) or one-half the PMF. For the PMF, the peak inflow is 111,438 cfs and the peak outflow is 109,132 cfs. For one-half the PMF, the peak inflow is 41,606 cfs and the peak outflow is 41,033 cfs. The computed spillway capacity for a water surface elevation at the top of the dam (wall at both ends) is 23,274 cfs.

5.4 RESERVOIR CAPACITY

The reservoir at normal pool impounded by this dam lies primarily within the limits of the existing channel of the Seneca River, extending approximately 10 miles, and Cross Lake. The total storage capacity of this dam up to elevation 379 is approximately 34,100 acre-feet.

5.5 FLOODS OF RECORD

The maximum known flood in the watershed occurred on June 28, 1972 as a result of Hurricane Agnes. The discharge of 17,200 cfs was recorded at the U.S.G.S. gaging station 04237500 located about 400 feet downstream of the dam. The maximum high water occurred at this same time and was recorded at the dam as 378.8, while the maximum tailwater was 372.5.

5.6 OVERTOPPING POTENTIAL

The hydrologic analysis indicates that the dam does not have sufficient spillway capacity to pass the PMF or one-half the PMF. The dam would be overtopped by 12.95 feet and 7.45 feet during the PMF and one-half PMF, respectively.

5.7

EVALUATION

The spillway will not pass the calculated peak outflow from one-half the PMF. For this storm and lesser storm events, however, a high tailwater condition resulting in flooding of downstream areas would occur. Therefore, the additional overtopping would not significantly increase the hazard to loss of life downstream from that which would exist just before such overtopping.

The spillway is assessed as inadequate.

SECTION 6: STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

a. Visual Observations

No visible evidence of structural instability of the dam was noted. The horizontal and vertical alignments, abutments, joints, and taintor gate all appeared to be satisfactory. The concrete deterioration noted in the visual inspection does not affect structural stability at this time.

b. Design and Construction Data

The subsurface and structural information used in the stability analyses was obtained from the contract drawings included in Appendix E. This information did not include specific properties of the supporting bedrock, precise details of dam embedment, or design details.

c. Data Review and Stability Evaluation

The stability analyses performed used the cross-section information provided on the contract drawings, plus certain simplifying assumptions regarding the dam and its foundation characteristics. The dam was considered a solid gravity section seated on, but not embedded in, bedrock.

The conditions analysed, and the resulting factors of safety, are summarized in the table which follows.

The analyses indicate less than desirable factors of safety for all loading conditions, and failure for most loading conditions. However, further inspections and analyses are required to verify or modify the assumptions made in the stability analyses. The most critical assumptions appear to be those involving the dam/bedrock interface and the actual uplift pressures.

LOCK 24 ERIE CANAL

SUMMARY OF STABILITY ANALYSES

CASE	LOADING CONDITIONS			FACTOR OF SAFETY		Resultant within Middle 1/3	Resultant within Base
	Full Uplift	1/2 Uplift	Ice	Seismic (Zone 2)	Overturning		
a) Normal Pool		X			2.69	1.43	Yes
	X				1.66	.90	Yes
		X	X		1.34	.75	No
	X		X		1.02	.47	No
		X	X	X	1.29	.68	No
b) 1/2 PMF	X		X	X	.99	.43	No
		X			1.67	1.00	Yes
c) PMF		X		X	1.56	.83	Yes
					1.32	.61	Yes
		X		X	1.22	.52	No
							Yes

NOTE: FULL UPLIFT CONDITIONS NOT ANALYZED FOR 1/2 PMF AND PMF BECAUSE 1/2 UPLIFT CONDITIONS INDICATED FAILURE.

d. Seismic Stability

The dam is situated in seismic Zone 2. Therefore, seismic stability analyses were performed based on the Zanger hydrodynamic pressure distribution, which is similar to the Westergaard distribution recommended by the Corps of Engineers Guidelines. The analyses were performed under normal pool, one-half PMF, and full PMF. The results are tabulated in the accompanying table. Although undesirable factors of safety are indicated, further inspections and analyses are required to refine the assumptions made in the stability analyses.

SECTION 7: ASSESSMENT/RECOMMENDATIONS

7.1 ASSESSMENT

a. Safety

The Phase I inspection of the Lock 24 dam did not reveal conditions which constitute an immediate hazard to human life or property. However, additional maintenance is required to correct concrete deterioration on the dam crest and in the general lock area. Also, the responsibility for maintenance of the other appurtenant structures (powerhouse, boat yard, and Mercer mill) should be investigated, because failure of these structures could create problems similar to those caused by loss of the dam itself.

The spillway does not have sufficient discharge capacity for passing one-half the PMF and is considered to be inadequate. For one-half the PMF and lesser storm events, a high tailwater condition resulting in flooding of downstream areas would occur. Therefore, the additional overtopping would not significantly increase the hazard to loss of life downstream from that which would exist just before such overtopping.

The stability analyses, which were based upon assumed parameters, indicate less than adequate factors of safety for all loading conditions and actual failure under severe loadings.

During periods of unusually heavy precipitation and high runoff occurring over the watershed, continuous surveillance should be provided both at the dam and in the downstream areas to warn of high floodwater conditions. Such surveillance procedures and other measures deemed necessary should be developed, documented and placed in readiness for future use as part of a detailed emergency operation-action plan. A warning system should also be developed and implemented; to be used in the event of dam failure.

b. Adequacy of Information

The information available for the preparation of this report was adequate for the purposes of a Phase I investigation. However, additional site specific data will be required for subsequent studies.

c. Necessity for Additional Investigations

Additional investigations are necessary regarding the stability of the dam. Such investigations should be based on actual measurements of embedment, dam/bedrock friction and uplift.

d. Urgency

The stability investigations required should be completed within six (6) months of the date of notification of the owner. Based upon the results of these investigations, appropriate remedial measures deemed necessary to insure the safety and integrity of the dam and appurtenant structures should be undertaken and completed during the first construction season following completion of the stability analyses.

The urgency of other remedial measures is discussed in the following section.

7.2

RECOMMENDED MEASURES

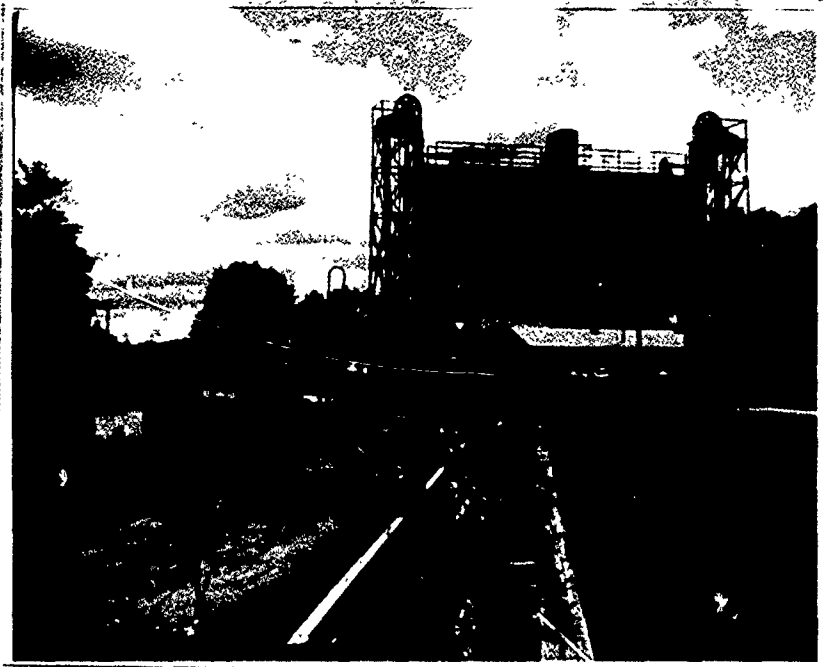
- a) The following actions should be undertaken:
1. Develop and implement a detailed emergency operation-action plan and warning system.
 2. Determine the responsibility for the maintenance of the powerhouse, boat yard, and Mercer mill.
 3. Correct concrete deterioration on the dam crest and in the general lock area.
 4. Correct deficiencies noted for the other appurtenant structures.
 5. Take any remedial actions that may be dictated by the stability analyses.

b) The urgency of the actions listed above is as follows:

- o Items 1 and 2 should be completed within 90 days after notification of the owner.
- o Items 3 and 4 should be completed within 12 months after notification of the owner.
- o Item 5 should be completed within the first construction season following completion of the stability analyses.

APPENDIX A

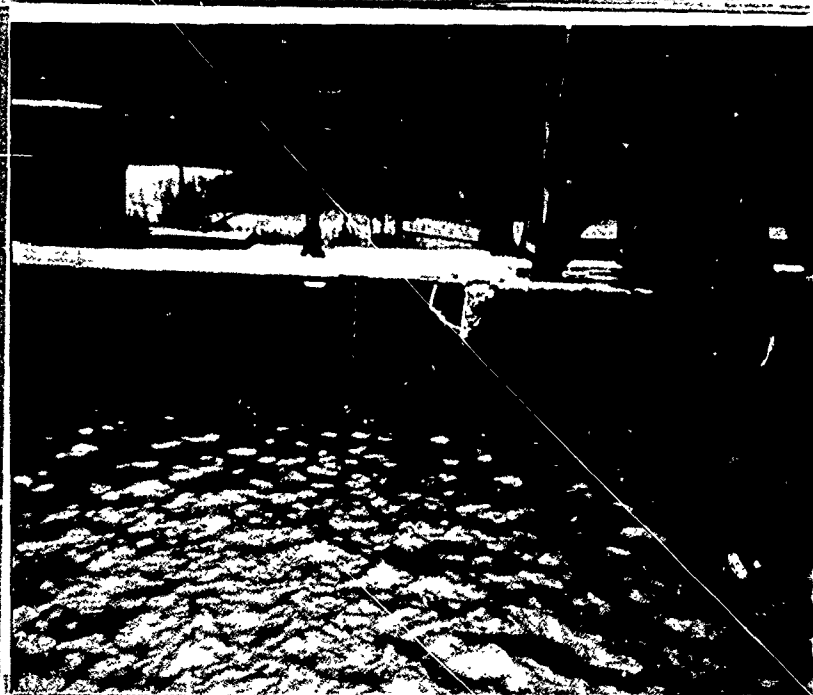
PHOTOGRAPHS



Approach to Lock 24, Facing
downstream



Lock 24, facing downstream

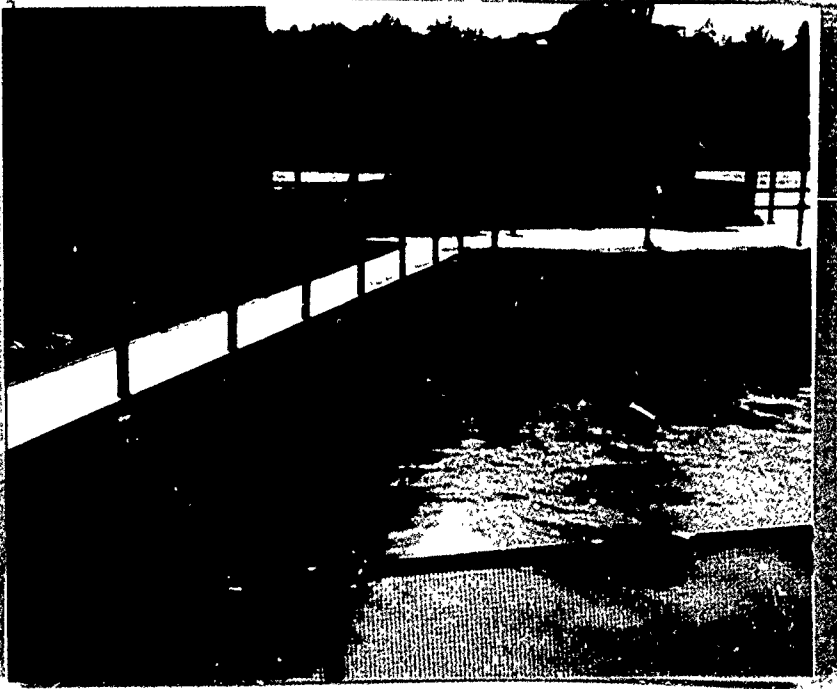


Upstream staff gauge
NOTE: Concrete deterioration

Niagara Mohawk Powerhouse
intakes.



Niagara Mohawk Entrance
Channel and Dam Taintor Gate

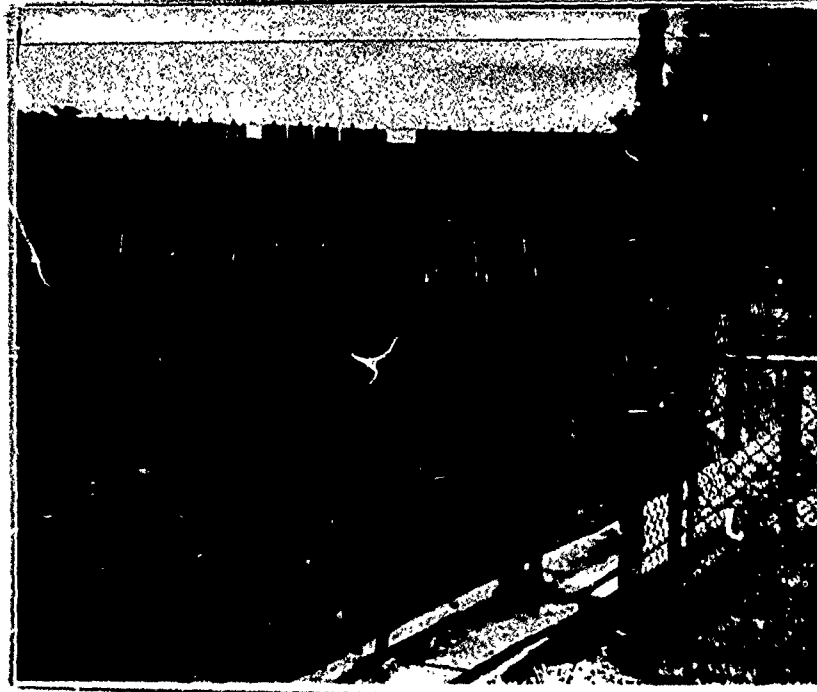


Dam Taintor Gate

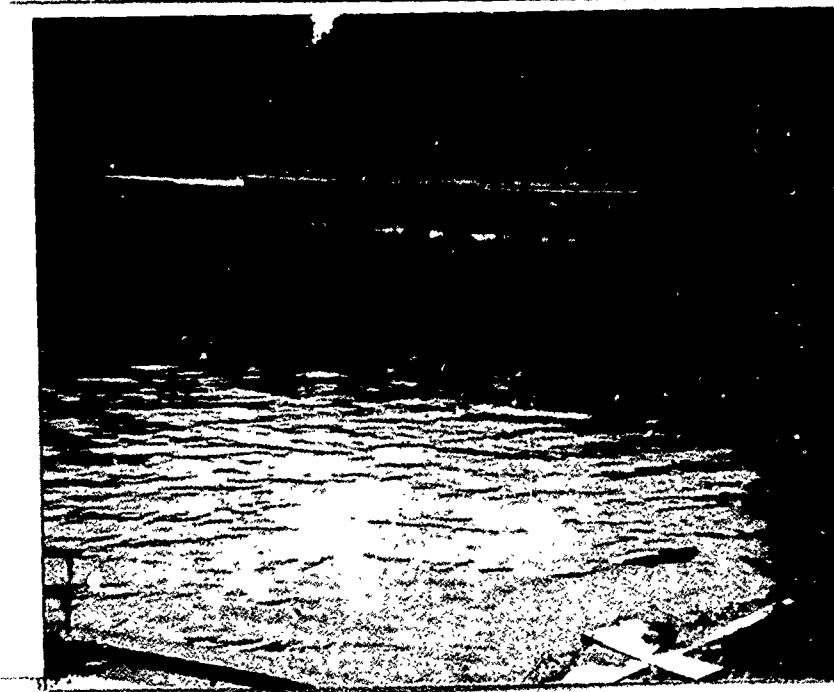




Niagara Mohawk Taintor Gate;
NOTE: Concrete deterioration



Niagara Mohawk Taintor Gate



Bridge between Lock approach
and Mill Intake Channel

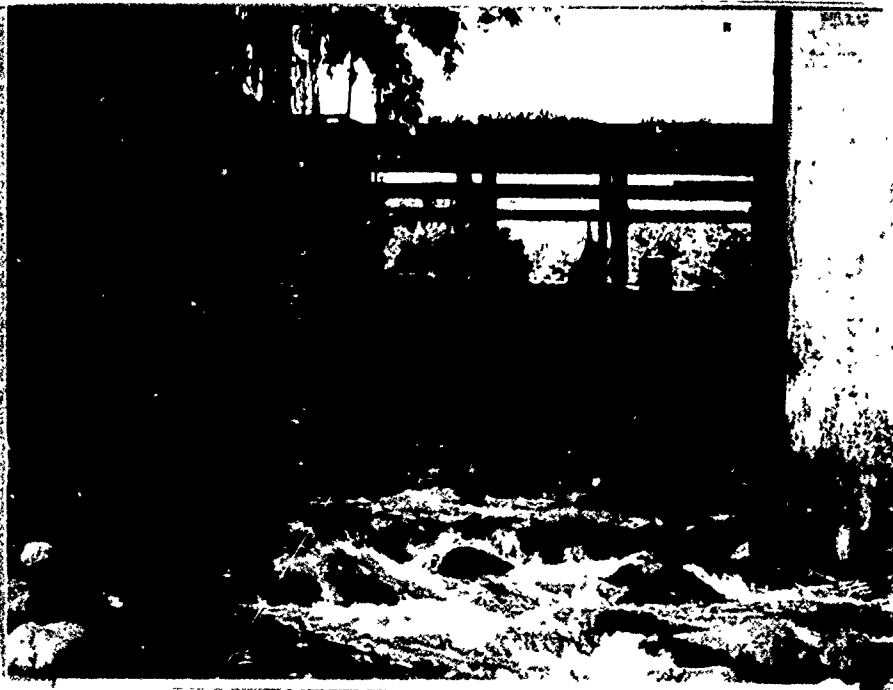
Upstream view of Baldwinsville Boat Yard



Gates at Baldwinsville Boat yard



Leakage through flashboards at Baldwinsville Boat Yard





Concrete deterioration at
Boat Yard Gates

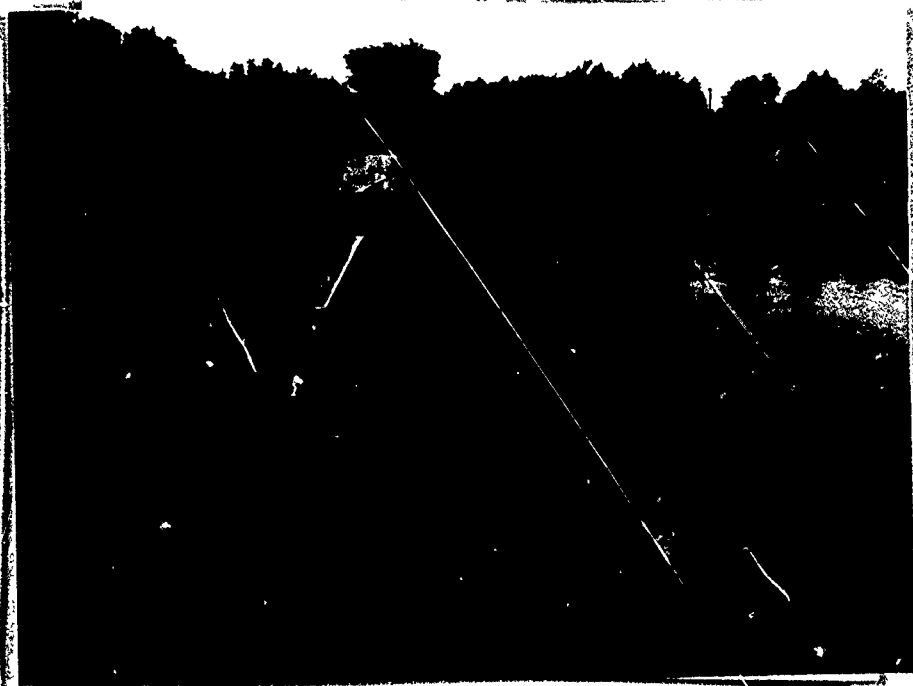


Upstream view of Mercer Mill

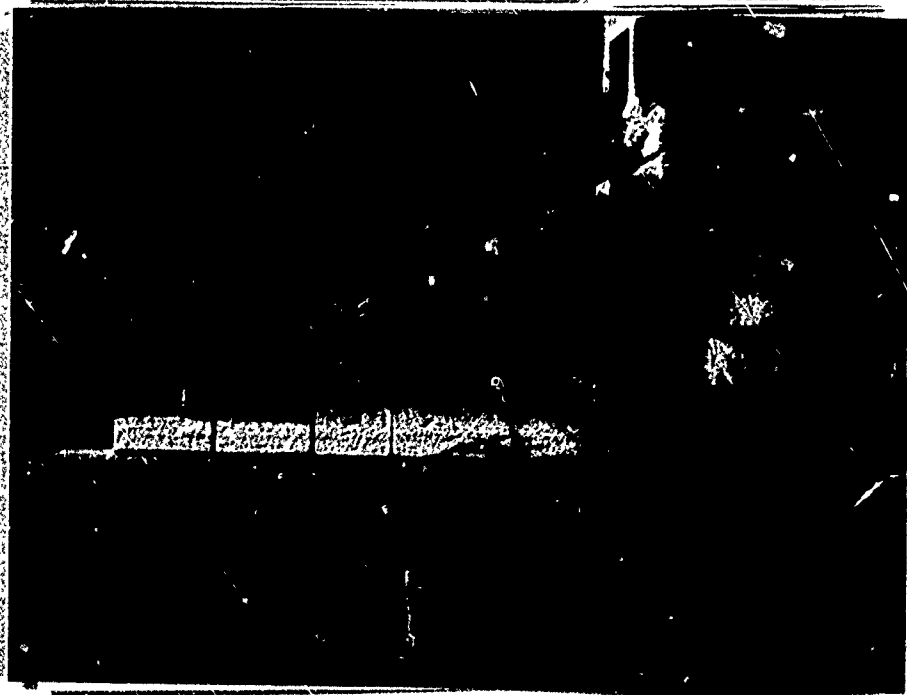


Downstream view of Mercer
Mill

Dam, facing south



South abutment



South interior corner





Concrete deterioration on
Dam Crest

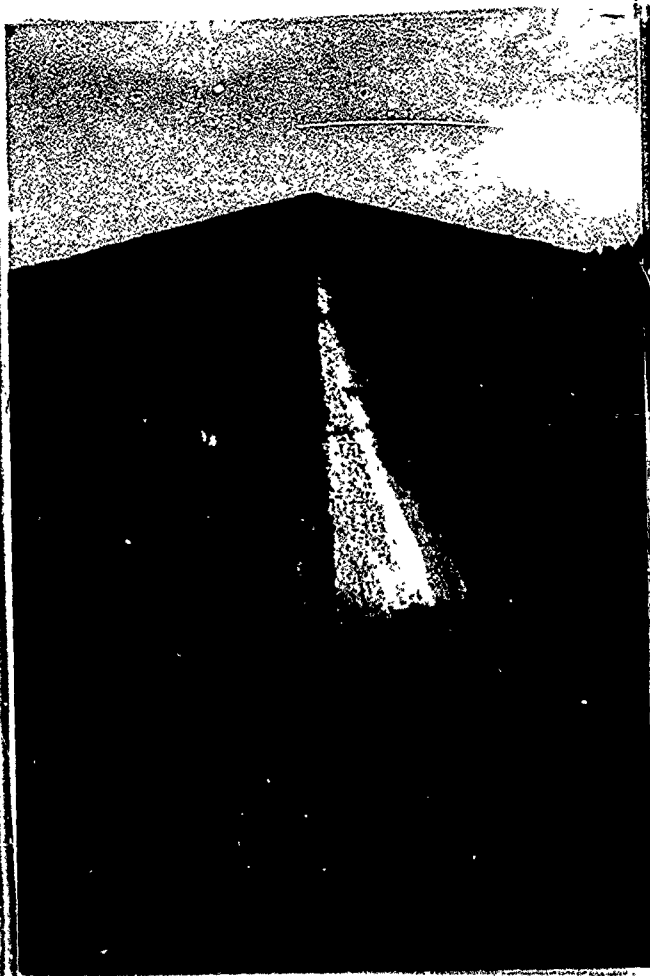


Concrete deterioration on
Dam Crest

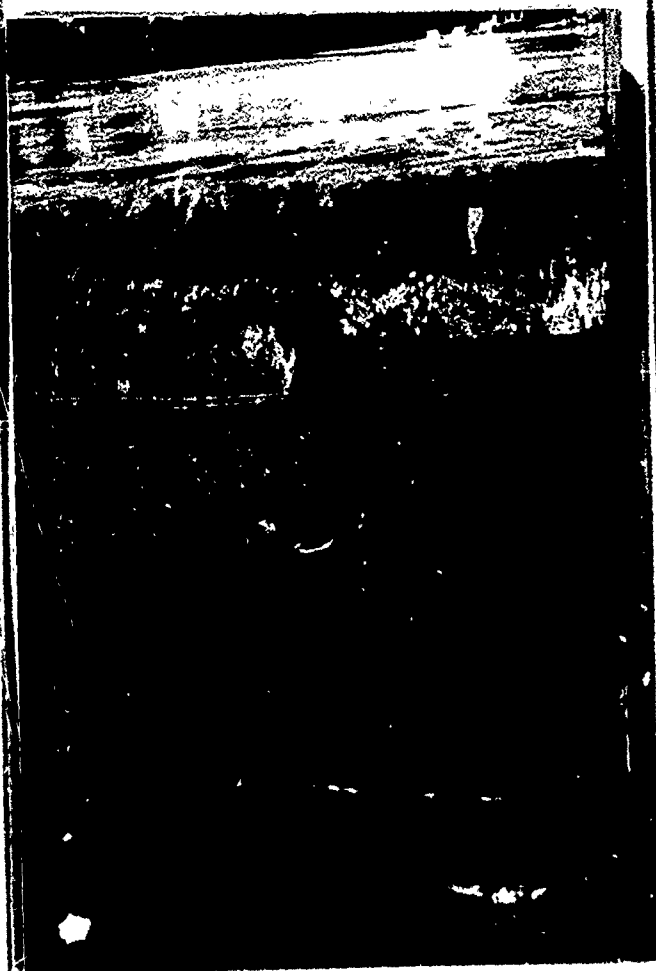
10/10/1988 10:00 AM

10/10/1988 10:00 AM

10/10/1988 10:00 AM



South exterior corner



Concrete deterioration on
Dam Crest

APPENDIX B

VISUAL INSPECTION CHECKLIST

THOMSEN ASSOCIATES
CONSULTING GEOTECHNICAL ENGINEERS & GEOLOGISTS

VISUAL INSPECTION CHECKLIST

1) Basic Data

a. General

Name of Dam LOCK 24 ERIE CANAL
I.D. # 72B-230 DEC. Dam No. 792
River Basin SENECA RIVER
Location: Town LYSANDER County ONONDAGA
U.S.G.S. Quadrangle BALDWINVILLE
Stream Name SENECA RIVER
Tributary of OSWEGO RIVER
Latitude (N) 43° 9' Longitude (W) 76° 20'
Type of Dam MASONRY
Hazard Category HIGH
Date(s) of Inspection 6/11/80, 6/26/80
Weather Conditions FAIR - PARTLY CLOUDY
Reservoir Level at Time of Inspection 377.4
Tailwater Level at Time of Inspection 367.9

b. Inspection Personnel RAY TEEGER (TA)
RICK HOIDT (INS)

c. Persons Contacted (Including Address & Phone No.)
LEE BIRNS, NYS DOT (315-473-8191)

d. History:

Date Constructed APPROX. 1873 Date(s) Reconstructed 1908 (P. 110)
NEW DATE 1963 (P. 115)

Designer UNKNOWN
Constructed by UNKNOWN
Owner PRESENTLY NYS DOT

e. Seismic Zone 2

THOMSEN ASSOCIATES
CONSULTING GEOTECHNICAL ENGINEERS & GEOLOGISTS

VISUAL INSPECTION CHECKLIST

2) Embankment

a. Characteristics

- 1) Embankment Material MASONRY DAM
- 2) Cutoff Type NONE
- 3) Impervious Core NONE
- 4) Internal Drainage System NONE
- 5) Miscellaneous _____

b. Crest

- 1) Vertical Alignment GOOD
- 2) Horizontal Alignment GOOD
- 3) Surface Cracks DETERIORATION OF CONCRETE
- 4) Miscellaneous _____

c. Upstream Slope

- 1) Slope (Estimate) (V:H) N.A.
- 2) Undesirable Growth or Debris, Animal Burrows N.A.
- 3) Sloughing, Subsidence or Depressions N.A.

THOMSEN ASSOCIATES
CONSULTING GEOTECHNICAL ENGINEERS & GEOLOGISTS

VISUAL INSPECTION CHECKLIST

4) Slope Protection N.A.

5) Surface Cracks or Movement at Toe UNOBSERVABLE

d. Downstream Slope

1) Slope (Estimate - V:H) N.A.

2) Undesirable Growth or Debris, Animal Burrows N.A.

3) Sloughing, Subsidence or Depressions N.A.

4) Surface Cracks or Movement at Toe UNOBSERVABLE

5) Seepage UNOBSERVABLE

6) External Drainage System (Ditches, Trenches; Blanket)
NONE

7) Condition Around Outlet Structure GENERALLY GOOD

8) Seepage Beyond Toe UNOBSERVABLE

e. Abutments-Embankment Contact

THOMSEN ASSOCIATES
CONSULTING GEOTECHNICAL ENGINEERS & GEOLOGISTS

VISUAL INSPECTION CHECKLIST

1) Erosion at Contact NONE NOTED

2) Seepage Along Contract NONE NOTED

3) Drainage System

a. Description of System N.A.

b. Condition of System N.A.

c. Discharge from Drainage System N.A.

4) Instrumentation (Momentum/Surveys, Observation Wells, Weirs, Piezometers, Etc.)

STAFF GAUGES - 1 UPSTREAM, 1 DOWNSTREAM

USES MANTAINS 2 DISCHARGE GAUGES

DOWNSTREAM OF DAM

THOMSEN ASSOCIATES
CONSULTING GEOTECHNICAL ENGINEERS & GEOLOGISTS

VISUAL INSPECTION CHECKLIST

5) Reservoir

- a. Slopes GENERALLY GOOD
- b. Sedimentation UNDISSEMIABLE
- c. Unusual Conditions Which Affect Dam NONE NOTED

6) Area Downstream of Dam

- a. Downstream Hazard (No. of Homes, Highways, etc.) SEVERAL HOMES
- b. Seepage, Unusual Growth NONE NOTED
- c. Evidence of Movement Beyond Toe of Dam NONE NOTED
- d. Condition of Downstream Channel GENERALLY GOOD

7) Spillway(s) (Including Discharge Conveyance Channel)

- a. General _____
- b. Condition of Service Spillway GENERALLY GOOD

THOMSEN ASSOCIATES
CONSULTING GEOTECHNICAL ENGINEERS & GEOLOGISTS

VISUAL INSPECTION CHECKLIST

c. Condition of Auxiliary Spillway N.A.

d. Condition of Discharge Conveyance Channel Approx: Good

8) Reservoir Drain/Outlet

Type: Pipe _____ Conduit _____ Other Gate

Material: Concrete _____ Metal X Other _____

Size: Approx. 14" Length 50'

Invert Elevations: Entrance 366.0 Exit 366.0

Physical Condition (Describe): _____ Unobservable _____

Material: Good

Joints: Good Alignment Good

Structural Integrity: Good

Hydraulic Capability: _____

Means of Control: Gate X Valve _____ Uncontrolled _____

Operation: Operable X Inoperable _____ Other _____

Present Condition (Describe): GENERALLY GOOD

THOMSEN ASSOCIATES

CONSULTING GEOTECHNICAL ENGINEERS & GEOLOGISTS

9) Structural

a. Concrete Surfaces SOME DEGRADATION

b. Structural Cracking NONE NOTED

c. Movement - Horizontal & Vertical Alignment (Settlement)
NONE NOTED

d. Junctions with Abutments or Embankments
APPEAR GOOD

e. Drains - Foundation, Joint, Face N.A.

f. Water Passages, Conduits, Sluices APPEAR GOOD

g. Seepage or Leakage N.A.

THOMSEN ASSOCIATES

CONSULTING GEOTECHNICAL ENGINEERS & GEOLOGISTS

h. Joints - Construction, etc. APPEAR GOOD

i. Foundation UNOBSERVABLE

j. Abutments GENERALLY GOOD

k. Control Gates GENERALLY GOOD

l. Approach & Outlet Channels GENERALLY GOOD

m. Energy Dissipators (Plunge Pool, etc.) N.A.

n. Intake Structures (GATES) GENERALLY GOOD

o. Stability _____

p. Miscellaneous _____

APPENDIX C

HYDROLOGIC/HYDRAULIC ENGINEERING
DATA AND COMPUTATIONS

McFarland-Johnson Engineers, Inc.
 171 Front Street
 BINGHAMTON, NEW YORK 13905

JOB HYDROLOGIC STUDY DAM # 111712

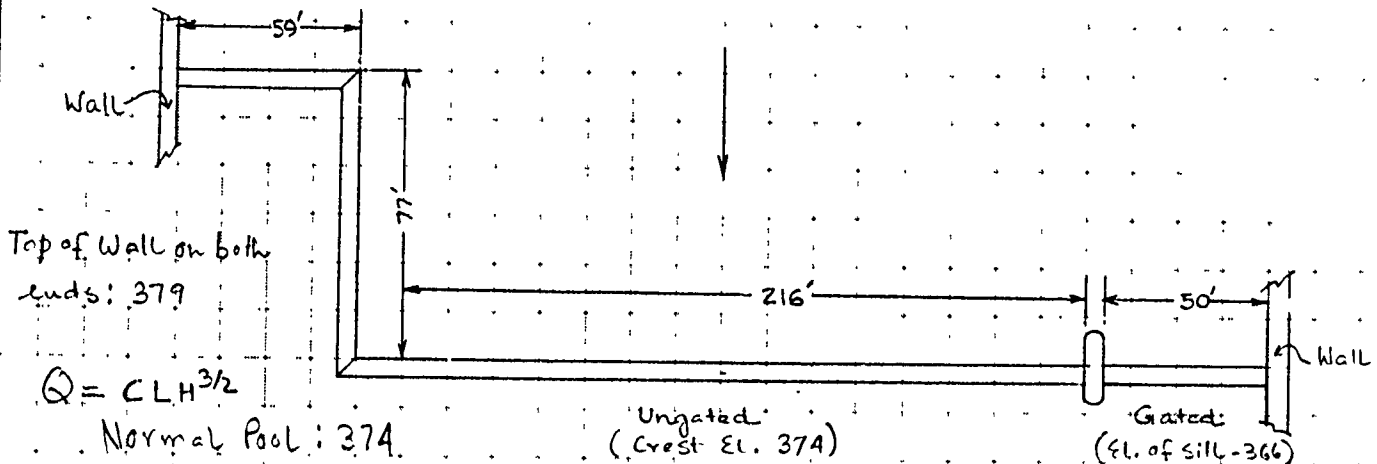
SHEET NO _____ OF _____

CALCULATED BY P.S. DATE 8/18/80

CHECKED BY _____ DATE _____

SCALE _____

STAGE-DISCHARGE COMPUTATIONS (UNGATED SPILLWAY)



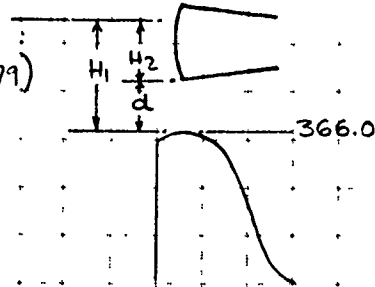
Shape of Spillway is similar to the one shown on Fig 5-17 (King & Brater)
 ALL Elevations are based on Barge Canal Datum.

ELEV.	H	H ^{3/2}	C	L	DISCHARGE
374	0			352	0
375	1	1	3.38	352	1190
376	2	2.83	3.51	352	3496
377	3	5.20	3.58	352	6553
378	4	8.0	3.68	352	10,363
379	5	11.18	3.83	352	15,072
380	6	14.7	3.83	352	19,817
382	8	22.63	3.83	352	30,509
385	11	36.48	3.83	352	49,184
387	13	46.87	3.83	352	63,182

STAGE-DISCHARGE COMPUTATIONS (GATED SPILLWAY)

Assumptions:

- ① Gate is fully open (bottom of gate @ el. 379)
 - ② Neglect Approach Velocity
 - ③ Normal Pool Elev. 374.0
- Elevation of top of sill - 366.0
 Length of spillway - 50'



Discharge $Q = \frac{2}{3} \sqrt{2g} C L (H_1^{3/2} - H_2^{3/2})$ (Eq. used for elev. above El. 379)
 Discharge $Q = C L H^{3/2}$ (Eq. used for flood elev. below 379)

ELEV.	H ₁	d	d/H ₁	C	H ₂	H ₁ ^{3/2}	H ₂ ^{3/2}	H ₁ ^{3/2} - H ₂ ^{3/2}	Discharge
374	8	13	1.62	3.50	0	22.63			3960
375	9	13	1.44	3.50	0	27.0			4725
376	10	13	1.30	3.50	0	31.62			5533
377	11	13	1.18	3.50	0	36.48			6384
378	12	13	1.08	3.50	0	41.57			7275
379	13	13	1.0	3.50	0	46.87			8202
380	14	13	.93	.64	1	52.38	1	51.38	8796
382	16	13	.81	.64	3	64.0	5.20	58.80	10,066
385	19	13	.68	.647	6	82.82	14.70	68.12	11,790
387	21	13	.62	.655	8	96.23	22.63	73.60	12,895

NOTE: BUREC. PUBLICATION "DESIGN OF SMALL DAMS - FIG. 257" WAS USED TO COMPUTE COEFFICIENT OF DISCHARGE 'C' FOR ORIFICE FLOW.

McFarland-Johnson Engineers, Inc.
 171 Front Street
 BINGHAMTON, NEW YORK 13905

JOB HYDROLOGIC STUDY DAM # NY 71

SHEET NO _____ OF _____

CALCULATED BY R.S. DATE 8/20/50

CHECKED BY _____ DATE _____

SCALE _____

STAGE-DISCHARGE COMPUTATIONS IN OVERBANKS

SUBAREA-1

ELEV.	1.486/n	A	P	R	R ^{2/3}	Q	REMARKS
380	42.45	17.5	35	.5	.63	10.5	S=.0005 For all subareas. n=.035
382	42.45	197.5	145	1.36	1.23	230	
385	42.45	842.5	290	2.90	2.04	1631	
387	42.45	1532	395	3.88	2.47	3590	

SUBAREA-2

380	99	100	100	1	1	221	n=.015
382	99	300	100	3	2.08	1381	
385	99	600	100	6	3.30	4383	
387	99	800	100	8	4	7084	

SUBAREA-5

380	99	50	50	1	1	110	n=.015
382	99	150	50	3	2.08	690	
385	99	300	50	6	3.30	2191	
387	99	400	50	8	4.0	3542	

SUBAREA-6

380	148.6	90	90	1	1	299	n=.01
382	148.6	270	90	3	2.08	1866	
385	148.6	540	90	6	3.30	5921	
387	148.6	720	90	8	4.0	9569	

SUBAREA-7

380	49.5	140	280	.5	.63	98	n=.03
382	49.5	700	280	2.5	1.84	1425	
385	49.5	1540	280	5.5	3.11	5301	
387	49.5	2100	280	7.5	3.83	8905	

SUBAREA-8

380							n=.05
382	29.7	60	60	1	1	40	
385	29.7	375	150	2.5	1.84	458	
387	29.7	735	210	3.5	2.30	1125	

NOTE: SEE ATTACHED CROSS SECTION

McFarland-Johnson Engineers, Inc.
 171 Front Street
 BINGHAMTON, NEW YORK 13905

JOB HYDROLOGIC STUDY DAM # NY 792
 SHEET NO _____ OF _____
 CALCULATED BY F.S. DATE 8/20/80
 CHECKED BY _____ DATE _____
 SCALE _____

STAGE-DISCHARGE TABULATION

ELEV. (FEET)	PRIMARY SPILLWAY (C.F.S.)	AUXILIARY SPILLWAY (C.F.S.)	SUBAREA DISCHARGE IN C.F.S.						TOTAL DISCHARGE (C.F.S.)	REMARKS
			1	2	5	6	7	8		
374	3960	0							3,960	Normal Pool Elev. -374.0 (Barge Canal Datum) U.S.G.S. = R.C.D - 1.04
375	4725	1190							5,915	
376	5533	3496							9,029	
377	6384	6553							12,937	
378	7275	10,363							17,638	
379	8202	15,072							23,274	
380	8796	19,817	10	221	110	299	98	0	29,351	
382	10,066	30,509	230	1381	690	1866	1425	40	46,207	
385	11,790	49,184	1631	4383	2191	5921	5201	458	80,859	
387	12,895	63,188	3590	7084	3542	9569	8905	1125	109,898	

Note: Stage-Discharge Curve was plotted to interpolate other values for HEC-1 input. Curve is attached.

McFarland-Johnson Engineers, Inc.
 171 Front Street
 BINGHAMTON, NEW YORK 13905

JOB HYDROLOGIC STUDY DAM # NY 792

SHEET NO _____ OF _____

CALCULATED BY P.S. DATE 8/21/80

CHECKED BY _____ DATE _____

SCALE _____

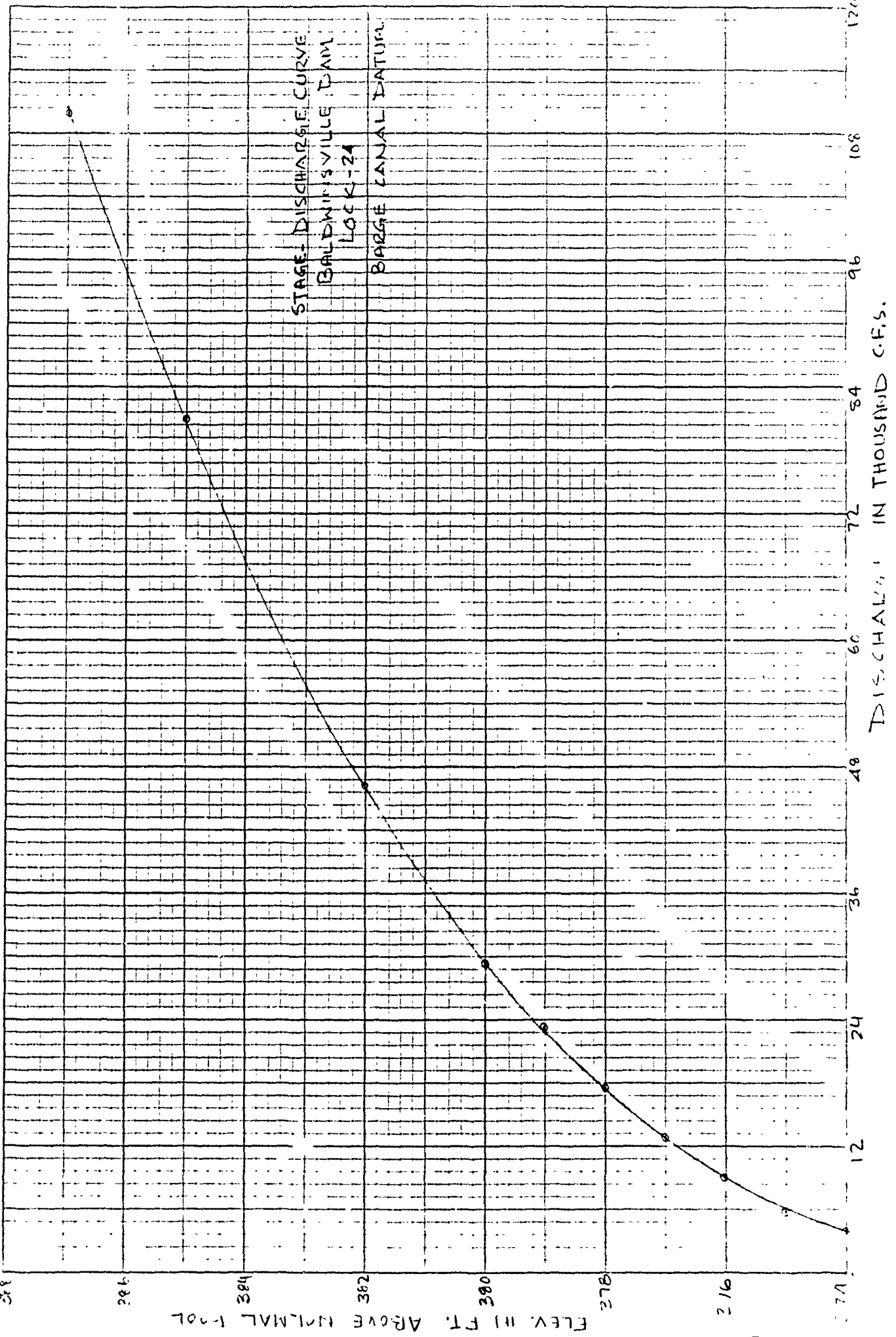
STAGE - STORAGE TABULATION

U.S.G.S. DATUM		B.C.D.	CROSS LAKE STORAGE IN ACRE-FT.	TOTAL STORAGE (ACRE-FT.)	REMARKS
CROSS LAKE ELEV.	ELEV. AT DAM	ELEV. AT DAM			
373	373	374	0	0	
375	374	375	5,000	6,500	Stage-storage data up to elevation 379 was obtained from N.Y. State D.E.C.
377	375	376	10,500	13,650	Storage above elev. 379 was computed by estimating surface area adjacent to Cross Lake from U.S.G.S. quadrangles for Jordan, Lysander and Cato.
379	376	377	16,400	21,320	
380	376.5	377.5	19,400	25,220	
382	378	379	26,200	34,100	
385	380	381	37,500	48,750	
390	384	385	58,750	76,375	Total Pool storage is estimated as 130% of Cross Lake storage in accordance with D.E.C.
395	386	387	82,690	107,500	

Note: Stage-storage curve was plotted to interpolate other values for HEC-1 input. Curve is attached.

46 0782

10 TO 1 1/2 INCHES / X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

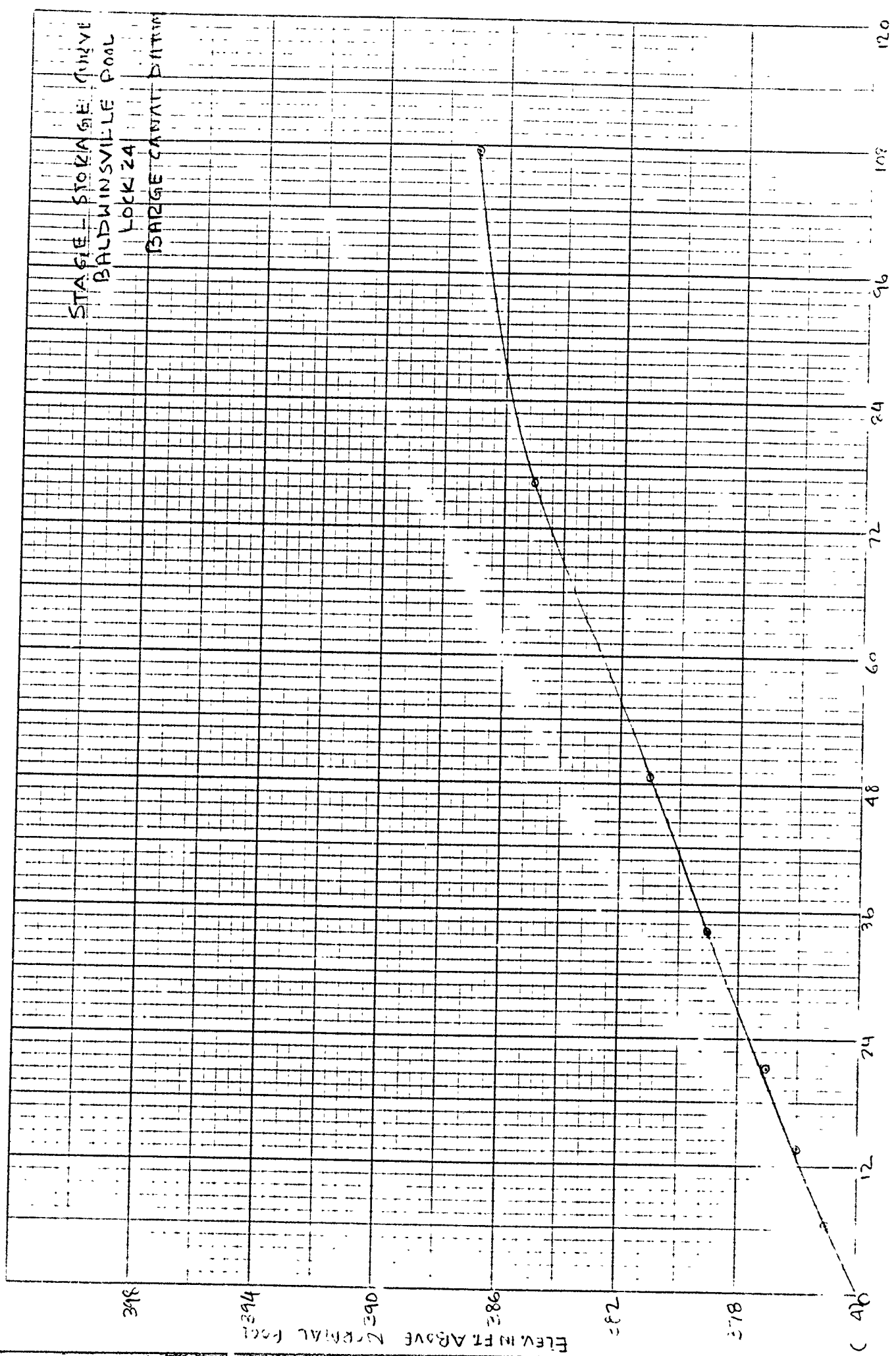


ELEV. IN FT. ABOVE NORMAL POOL

DISCHARGE IN THOUSAND C.F.S.

46 0782

10 T. INCH KEUFFEL & ESSER CO. MADE IN U.S.A.



STAGLE STORAGE CURVE
 BALDWINVILLE POOL
 LOCK 24
 BARGE CANAL DITCH

STAKE IN THOUSANDS ACRES

ELEV. IN FT. ABOVE NORMAL FOOT

Table A-2

Flood Model Drainage Areas

<u>Area Code</u>	<u>Area Description</u>	<u>Drainage Area (sq.mi.)</u>
A1	Canandaigua Lake	184
A2	Flint Creek at Mouth	102
A3	Canandaigua Outlet @ B.C. Confluence	155
B1	Keuka Lake	183
B2	Seneca Lake	524
B3	Cayuga Lake	782
B4	Seneca Lake Outlet to Lock 4	39
B5	Seneca Lake Outlet from Lock 4 to Mud Lock	36
C1	Owasco Lake	201
C2	Skaneateles Lake	74
C3	Otisco Lake	42.7
C4	Onondaga Reservoir	67.7
C5	Onondaga Lake	102.3
C6	Owasco Outlet @ B.C. Confluence	18.7
C7	Skaneateles Creek @ B.C. Confluence	27
C8	Ninemile Creek @ Mouth	72.3
D1	Chittenango Creek @ Mouth	288
D2	Canaseraga Creek @ Mouth	105
D3	Oneida Creek @ Mouth	144
D4	Fish Creek and Wood Creek	529
D5	Local Inflow to Oneida Lake	269
D6	Local Inflow to Oneida River above Lock 23	28.5
D7	Oneida River from Lock 25 to Three Rivers	110
E1	Ganargua Creek @ Lock 29	147
E2	Ganargua Creek @ Lock 27	118
E3	Local Inflow to B.C. Lock 29 to Lock 27	51
E4	Local Inflow to B.C. Lock 27 to Lock 26	89
E5	Local Inflow to B.C. Lock 26 to Lock 25	18
E6	Local Inflow to B.C. Lock 25 to Owasco Outlet	191
E7	Local Inflow to B.C. Owasco to Skaneateles Outlet	98
E8	Local Inflow to B.C. Skaneateles to Lock 24	98
E9	Local Inflow to B.C. Lock 24 to Three Rivers	37

Table A-6
Modelling Parameters

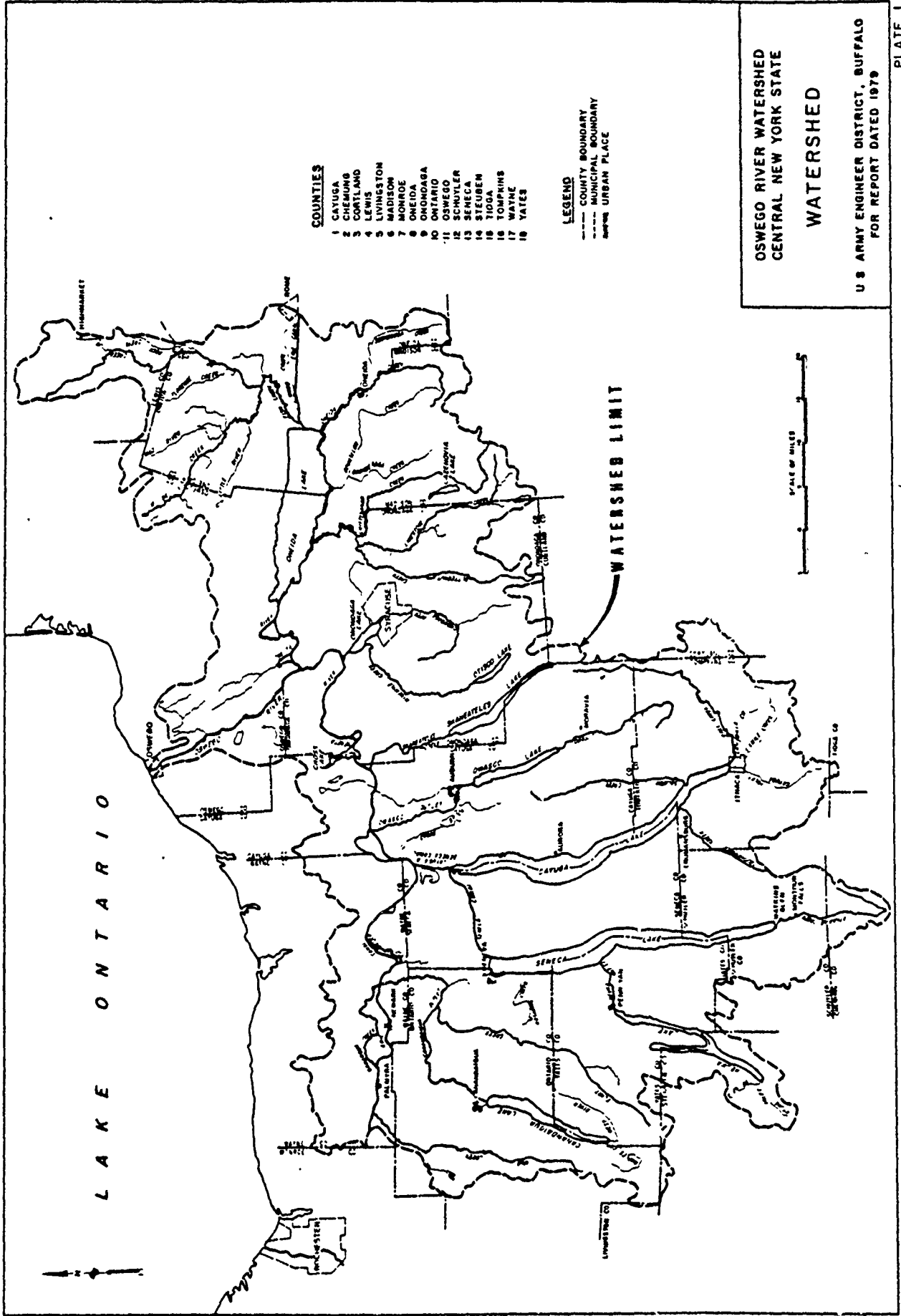
<u>Subbasin</u>	<u>QRSCN*</u>	<u>RTIOR**</u> <u>Ratio</u>	<u>Start Q</u> <u>CFS</u>	<u>Losses</u>	
				<u>Initial</u>	<u>Constant</u> <u>in 1 hr.</u>
A-1 - Canandaigua Lake	1000	1.6	300	1.25	0.03
A-2 - Flint Creek	2000	1.6	90	0.50	0.06
A-3 - Canandaigua Outlet	200	1.6	150	0.60	0.06
B-1 - Keuka Lake	800	1.6	100	1.50	0.03
B-2 - Seneca Lake	2800	1.6	500	1.50	0.03
B-3 - Cayuga Lake	1700	1.6	1000	0.5	0.03
B-4 - Seneca Lake Outlet to Lock CS-4	200	1.6	92	0.50	0.05
B-5 - Seneca Lake Outlet to CS-4 to CS-1	200	1.6	92	0.50	0.05
C-1 - Owasco Lake	1000	1.6	450	0.75	0.05
C-2 - Skaneateles Lake	500	1.6	250	0.75	0.05
C-3 - Otisco Lake	300	1.6	90	0.75	0.05
C-4 - Onondaga Reservoir	302	1.6	250	1.5	0.06
C-5 - Onondaga Lake	500	1.6	250	1.25	0.06
C-6 - Owasco Lake Outlet	200	1.6	90	0.50	0.06
C-7 - Skaneateles Creek	200	1.6	90	0.50	0.06
C-8 - Ninemile Creek	300	1.6	250	1.00	0.06
D-1 - Chittenango Creek	2160	1.6	600	0.25	0.06
D-2 - Canaseraga Creek	800	1.6	240	0.25	0.06
D-3 - Oneida Creek	1080	2.00	320	0.25	0.06
D-4 - Fish Creek	3960	1.6	800	0.25	0.06
D-5 - Area Local to Oneida Lake	2000	1.6	540	0.25	0.05
D-6 - Oneida River above Lock E-23	210	1.6	70	0.5	0.06
D-7 - Oneida River Lock E-23 to Three Rivers	800	2.00	250	0.5	0.06
E-1 - Ganargua Creek Vic. Lock E-29	550	1.6	140	0.5	0.05
E-2 - Ganargua Creek Lock E-27	470	1.6	120	0.5	0.05
E-3 - Area Local to Barge Canal Lock E-29 to E-27	200	1.6	100	0.5	0.05
E-4 - Area Local to Barge Canal E-27 to E-26	360	1.6	100	0.5	0.06
E-5 - Area Local to Barge Canal E-26 to E-28	100	1.6	90	0.5	0.06
E-6 - Area Local to Barge Canal E-28 to Owasco Outlet	400	1.6	140	0.5	0.06
E-7 - Area Local to Barge Canal Owasco Outlet to Skan.Outlet	400	1.6	120	0.5	0.06
E-8 - Area Local to Barge Canal, Skan. Outlet to Lock E-24	400	1.6	120	0.5	0.06
E-9 - Area Local to Barge Canal Lock E-24 to Three Rivers	150	1.6	100	0.5	0.06

*Flow in cfs below which base flow recession occurs.

**Ratio of recession flow to that flow occurring 10 time intervals later.

A-23

C-143



COUNTIES

- 1 CAYUGA
- 2 CHEMUNG
- 3 CORTLAND
- 4 LEWIS
- 5 LIVINGSTON
- 6 MADISON
- 7 MONROE
- 8 ONTARIO
- 9 ONYON
- 10 OSWEGO
- 11 SCHUYLER
- 12 SENECA
- 13 STEUBEN
- 14 TIOGA
- 15 TOMPKINS
- 16 WAYNE
- 17 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 1979

ANALYSIS OF DAM OVERTIPPING USING RATIOS OF PMF											
HYDROLOGIC-HYDRAULIC ANALYSIS OF SAFETY OF LOCK 24 DAM											
RATIOS OF PMF ROUTED THROUGH THE RESERVOIR											
100	A										
200	A										
300	A										
400	B	40	0	0	0	0	0	0	0	4	
500	B1	5									
600	J	1	0	1							
700	J1	.2	.4	.5	.0	.8	1.0				
800	K	0	1	0	0	0	0	1			
900	K1	1	1 BARGE CANAL LOCK 30 AT MACEDON (SUB AREA G1)								
1000	M	-1	0	100	0	3236	0	0	0	1	
1100	N	372	372	372	372	374	378	379	379	380	
1200	N	390	380	375	372	113	23	25	21	22	
1300	N	22	21	22	22	21	21	22	22	22	
1400	N										
1500	K	1	2	0	0	0	0	1			
1600	K1	2	2 BARGE CANAL LOCK 29 PALMYRA (ROUTED FLOW FROM LOCK 30)								
1700	Y	0	0	0	0	1					
1800	Y1	0	3	1							
1900	K	0	2	0	0	0	0	1			
2000	K1	3	3 GANARUA CREEK LOCAL INFLOWS TO LOCK 29 (SUB-AREA E-1)								
2100	M	1	-1	147	0	3236	0	0	0	1	
2200	P	0	21.5	39	53	61	72				
2300	T	0	0	0	0	0	0	0.5	0.05		
2400	U	21									
2500	U1	514	1940	2950	2055	1978	1472	1095	815	515	
2600	U1	306	250	180	138	103	70	57	42	25	
2700	U1	21									
2800	X	140	550	1.0							
2900	K	2	2	0	0	0	0	0	1		
3000	K1	4	4 COMBINED ROUTED AND LOCAL FLOWS AT LOCK 29								
3100	K	1	0	0	0	0	0	0	1		
3200	K1	5	5 ROUTED HYDROGRAPH TO LOCK 27 AT LYONS								
3300	Y	0	0	0	0	1					
3400	Y1	0	8	3							
3500	K	0	0	0	0	0	0	0	1		
3600	K1	6	6 LOWER GANARUAL LOCAL INFLOWS VICINITY OF LOCK 27 (SUB-AREA E-2)								
3700	M	1	-1	118	0	3236	0	0	0	1	
3800	P	0	21.5	39	53	61	72				
3900	T	0	0	0	0	0	0	0.5	0.05		
4000	U	27									
4100	U1	28	109	293	523	696	773	890	980	1246	
4200	U1	1210	979	704	590	465	303	283	221	173	
4300	U1	105	82	04	50	39	35	35			
4400	X	120	470	1.6							
4500	K	2	6	0	0	0	0	0	1		
4600	K1	7	7 COMBINED AND LOCAL FLOWS AT LOCK 27								
4700	K	0	3	0	0	0	0	0	1		
4800	K1	8	8 LOCAL FLOW E-3 (AREA LOCAL TO BARGE CANAL E-29 TO E-27)								
4900	M	1	-1	51	0	3236	0	0	0	1	
5000	P	0	21.5	39	53	61	72				
5100	T	0	0	0	0	0	0	0.5	0.05		
5200	U	10									
5300	U1	2081	1038	844	383	174	79	36	30	25	
5400	X	100	200	1.0							
5500	K	1	6	0	0	0	0	0	1		
5600	K1	9	9 ROUTED FLOW E-3 TO LYONS (NODE 6)								
5700	Y	0	0	0	0	1					
5800	Y1	0	5	2							
5900	K	2	6	0	0	0	0	0	1		
6000	K1	10	10 COMBINE FLOWS AT NODE 0								
6100	K	0	4	0	0	0	0	0	1		



6200	K1	11 CANANDAIGUA LAKE INFLOW (SUB AREA A1)									
6300	M	1	-1	184	0	3236	0	0	0	1	
6400	P	0	21.5	39	53	61	72				
6500	I	0	0	0	0	0	0	1.25	0.03		
6600	U	0									
6700	U1	8550	5183	3260	1507	691	316	145	30		
6800	X	300	1000	1.0							
6900	K	1	4	0	0	0	0	1			
7000	K1	12 CANANDAIGUA LAKE OUF FLOW USING MODIFIED PULS METHOD									
7100	Y	0	0	0	1	1					
7200	Y1	1	0	0	0	0	0	51000			
7300	Y2	10700	21300	31900	42500	53100	63700	74300	84900	95500	106100
7400	Y2	212500	319000								
7500	Y3	50	50	50	50	280	600	1000	1500	2250	3000
7600	Y3	63000	200360								
7700	K	1	5	0	0	0	0	1			
7800	K1	13 ROUTED OUTFLOW TO FLINT CREEK MOUTH									
7900	Y	0	0	0	0	1					
8000	Y1	0	12	5							
8100	K	0	5	0	0	0	0	1			
8200	K1	14 FLINT CREEK INFLOW A-2									
8300	M	1	-1	102	0	3236	0	0	0	1	
8400	P	0	21.5	39	53	61	72				
8500	I	0	0	0	0	0	0	0.5	0.06		
8600	U	26									
8700	U1	93	534	903	1266	1367	1166	900	801	66	549
8800	U1	455	377	311	259	215	178	147	104	101	84
8900	U1	69	57	47	39	35	32				
9000	X	90	2000	1.0							
9100	K	2	5	0	0	0	0	1			
9200	K1	15 COMBINE ROUTED CANANDAIGUA OUTFLOWS AND FLINT CR INFLOWS									
9300	K	1	56	0	0	0	0	1			
9400	K1	16 ROUTED TO LOCK 27									
9500	Y	0	0	0	0	1					
9600	Y1	0	7	3							
9700	K	0	56	0	0	0	0	1			
9800	K1	17 OUTLET LOCAL FLOW A-3									
9900	M	1	-1	155	0	3236	0	0	0	1	
10000	P	0	21.5	39	53	61	72				
10100	I	0	0	0	0	0	0	0.6	0.06		
10200	U	22									
10300	U1	91	338	905	1348	1716	2408	2601	1921	1413	1038
10400	U1	763	562	412	303	223	164	120	90	65	48
10500	U1	35	34								
10600	X	150	200	1.0							
10700	K	2	56	0	0	0	0	1			
10800	K1	18 COMBINE LOCAL FLOW A-3 WITH FLOW AT LOCK 27									
10900	K	1	0	0	0	0	0	1			
11000	K1	19 ROUTE OUTLET TO CANAL									
11100	Y	0	0	0	0	1					
11200	Y1	0	1								
11300	K	2	0	0	0	0	0	1			
11400	K1	20 COMBINE FLOW AT 6 (OUTLET FLOW + E-1, E-2, E-3)									
11500	K	1	8	0	0	0	0	1			
11600	K1	21 ROUTE FLOWS AT LOCK 27 TO NODE 8									
11700	Y	0	0	0	0	1					
11800	Y1	0	8	3							
11900	K	0	7	0	0	0	0	1			
12000	K1	22 LOCAL INFLOW LOCK 27 TO LOCK 26 (E4)									
12100	M	1	-1	89	0	3236	0	0	0	1	
12200	P	0	21.5	39	53	61	72				

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12300	I	0	0	0	0	0	0	0.5	0.00		
12400	U	23									
12500	U1	697	1678	1441	1144	908	721	572	454	361	287
12600	U1	227	181	133	114	90	72	57	45	36	29
12700	U1	23	23	23							
12800	X	100	360	1.6							
12900	K	1	8	0	0	0	0	1			
13000	K1	23	ROUTE FLOWS AT LOCK 26 TO NODE 8								
13100	Y	0	0	0	0	1					
13200	Y1	0	2								
13300	K	2	8	0	0	0	0	1			
13400	K1	24	COMBINE ROUTED AND LOCAL FLOWS AT NODE 8								
13500	K	1	10	0	0	0	0	1			
13600	K1	25	ROUTE FLOWS AT NODE 8 TO NODE 10								
13700	Y	0	0	0	0	1					
13800	Y1	0	5	2							
13900	K	0	9	0	0	0	0	1			
14000	K1	26	LOCAL FLOW BETWEEN LOCK 26 AND LOCK 25 (E-5)								
14100	M	1	-1	18	0	3236	0	0	0	1	
14200	P	0	21.5	39	53	61	72				
14300	I	0	0	0	0	0	0	0.5	0.00		
14400	U	21									
14500	U1	171	304	313	240	193	152	119	93	73	58
14600	U1	45	35	28	22	17	13	11	8	6	5
14700	U1	4									
14800	X	90	90	1.0							
14900	K	1	10	0	0	0	0	1			
15000	K1	27	ROUTE INFLOW E-5 TO NODE 10								
15100	Y	0	0	0	0	1					
15200	Y1	0	2								
15300	K	2	10	0	0	0	0	1			
15400	K1	28	COMBINE ROUTED FLOW WITH FLOW AT NODE 10								
15500	K	1	15	0	0	0	0	1			
15600	K1	29	ROUTE FLOWS AT NODE 10 TO NODE 15								
15700	Y	0	0	0	0	1					
15800	Y1	0	5	2							
15900	K	0	11	0	0	0	0	1			
16000	K1	30	LOCAL INFLOW B-1 INTO KEUKA LAKE								
16100	M	1	-1	183	0	3236	0	0	0	1	
16200	P	0	21.5	39	53	61	72				
16300	I	0	0	0	0	0	0	1.50	0.03		
16400	U	6									
16500	U1	14318	3342	1273	483	183	0				
16600	X	100	800	1.6							
16700	K	1	11	0	0	0	0	1			
16800	K1	31	KEUKA LAKE OUTFLOW W/ MODIFIED PULS								
16900	Y	0	0	0	1	1					
17000	Y1	1	0	0	0	0	0	147000			
17100	Y2	107000	129500	141000	153500	172000	178000	191000	204000	217000	328550
17200	Y3	120	320	445	530	575	670	890	1130	1470	126000
17300	K	1	12	0	0	0	0	1			
17400	K1	32	ROUTE KEUKA LAKE OUTFLOWS TO 12								
17500	Y	0	0	0	0	1					
17600	Y1	0	6	2							
17700	K	0	12	0	0	0	0	1			
17800	K1	33	SENECA LAKE INFLOWS B-2								
17900	M	1	-1	524	0	3236	0	0	0	1	
18000	P	0	21.5	39	53	61	72				
18100	I	0	0	0	0	0	0	0.5	0.03		
18200	U	12									
18300	U1	26993	10631	6899	4332	2720	1706	1072	6	422	266

18400	J1	107	70										
18500	X	506	2000	1.0									
18600	K	2	12	0	0	0	0	0	1				
18700	K1		34	COMBINE LOCAL FLOW B-2 AND ROUTED KEUKA LAKE JUISET FLOWS									
18800	K	1	12	0	0	0	0	0	1				
18900	K1		35	SENECA LAKE OUTFLOWS - MODIFIED PULS METHOD									
19000	I	0	0	0	1	1							
19100	Y1	1								534000			
19200	Y2372000	414000	450000	500000	543000	586000	630000	650000	674000	720000			
19300	Y2800000	1200000											
19400	Y3	700	700	700	700	700	700	700	1000	3000	3000		
19500	Y3	15000	77000										
19600	K	1	13	0	0	0	0	0	1				
19700	K1		36	SENECA LAKE OUTFLOWS ROUTED TO 13									
19800	Y	0	0	0	0	1							
19900	Y1	0	2										
20000	K	0	13	0	0	0	0	0	1				
20100	K1		37	LOCAL INFLOW B-4									
20200	M	1	-1	39	0	3230	0	0	0	1			
20300	P	0	21.5	39	53	61	72						
20400	I	0	0	0	0	0	0	0.5	0.05				
20500	U	15											
20600	U1	539	1094	796	549	378	260	179	123	85	58		
20700	U1	40	28	19	11	11							
20800	X	92	200	1.0									
20900	K	2	13	0	0	0	0	0	1				
21000	K1		38	COMBINE ROUTED SENECA LAKE OUTFLOW AND LOCAL FLOW B-4									
21100	K	1	14	0	0	0	0	0	1				
21200	K1		39	ROUTE HYDROGRAPH TO 14 (CAYUGA LAKE INFLOW)									
21300	Y	0	0	0	0	1							
21400	Y1	0	0	2									
21500	K	0	14	0	0	0	0	0	1				
21600	K1		40	LOCAL INFLOW B-5									
21700	M	1	-1	36	0	3230	0	0	0	1			
21800	P	0	21.5	39	53	61	72						
21900	I	0	0	0	0	0	0	0.5	0.05				
22000	U	12											
22100	U1	895	1094	692	437	277	175	110	70	44	28		
22200	U1	14	10										
22300	X	92	200	1.0									
22400	K	2	14	0	0	0	0	0	1				
22500	K1		41	COMBINE FLOW B-5 WITH ROUTED FLOW									
22600	K	0	14	0	0	0	0	0	1				
22700	K1		42	CAYUGA LAKE INFLOW B-3									
22800	M	1	-1	782	0	3230	0	0	0	1			
22900	P	0	21.5	39	53	61	72						
23000	I	0	0	0	0	0	0	0.5	0.03				
23100	U	15											
23200	U1	24903	15540	13520	9524	6529	4470	3069	2104	1443	989		
23300	U1	678	465	319	219	81							
23400	X	1000	1700	1.0									
23500	K	2	14	0	0	0	0	0	1				
23600	K1		43	COMBINE LOCAL INFLOW B-3 AND ROUTED FLOW									
23700	K	1	14	0	0	0	0	0	1				
23800	K1		44	CAYUGA LAKE OUTFLOW - MODIFIED PULS									
23900	Y	0	0	1	1								
24000	Y1	1	0	0	0	0	0	490000					
24100	Y2375000	417000	400000	503000	546000	589500	634000	660000	727000	854500			
24200	Y2902000												
24300	Y3	1700	1700	1700	1700	3400	3400	3400	8700	8700	38510		
24400	Y3103500												

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24500	K	1	15	0	0	0	0					1
24600	K1		45 ROUTE CAYUGA LAKE OUTFLOWS TO NODE 15									
24700	Y	0	0	0	0	1						
24800	Y1	0	3	1								
24900	K	2	15	0	0	0	0					1
25000	K1		46 COMBINE ROUTED FLOW WITH FLOW AT NODE 15									
25100	K	1	18	0	0	0						1
25200	K1		47 ROUTE FLOWS TO NODE 18									
25300	Y	0	0	0	0	1						
25400	Y1	0	8	3								
25500	K	0	18	0	0	0	0					1
25600	K1		48 LOCAL FLOW E=0									
25700	M	1	-1	191	0	3236	0		0			1
25800	P	0	21.5	39	53	61	72					
25900	T	0	0	0	0	0	0	0.5	0.06			
26000	U		18									
26100	U1	3851	5102	3130	2409	1710	1175	808	555	381		262
26200	U1	180	123	85	75	70	27					
26300	X	140	400	1.6								
26400	K	1	18	0	0	0	0					1
26500	K1		49 ROUTE LOCAL FLOW E=0 TO NODE 18									
26600	Y	0	0	0	0	1						
26700	Y1	0	2									
26800	K	2	18	0	0	0	0					1
26900	K1		50 COMBINE ROUTED FLOW W/ FLOW AT NODE 18									
27000	K	0	17	0	0	0	0					1
27100	K1		51 HEAD GWASCO INFLOW C-1									
27200	M	1	-1	201	0	3236	0	0	0			1
27300	P	0	21.5	39	53	61	72					
27400	T	0	0	0	0	0	0	0.75	.05			
27500	U		10									
27600	U1	6633	5878	4280	2273	1200	633	334	176	93		30
27700	X	450	1000	1.6								
27800	K	1	17	0	0	0	0					1
27900	K1		52 GWASCO LAKE INFLOWS - MODIFIED PULS METHOD									
28000	Y	0	0	0	1	1						
28100	Y1	1	0	0	0	0	0	92000				
28200	Y2	66000	73200	79900	86500	93200	99800	106500	113200	119600		126500
28300	Y2	152900	205700									
28400	Y3	600	600	600	1100	1700	2300	2860	3400	3400		3400
28500	Y3	24000	69100									
28600	K	1	18	0	0	0	0					1
28700	K1		53 ROUTE GWASCO LAKE OUTLET FLOWS									
28800	Y	0	0	0	0	1						
28900	Y1	0	7	3								
29000	K	2	18	0	0	0	0					1
29100	K1		54 COMBINE FLOWS WITH FLOWS AT NODE 18									
29200	K	0	18	0	0	0	0					1
29300	K1		55 READ LOCAL FLOW C=0									
29400	M	1	-1	19	0	3236	0	0	0			1
29500	P	0	21.5	39	53	61	72					
29600	T	0	0	0	0	0	0	0.5	0.06			
29700	U		18									
29800	U1	157	368	352	268	205	156	119	91	70		53
29900	U1	40	26	23	18	14	10	8	6			
30000	X	90	200	1.6								
30100	K	2	18	0	0	0	0					1
30200	K1		56 COMBINE LOCAL FLOW C=0 WITH FLOW AT NODE 18									
30300	K	1	21	0	0	0	0					1
30400	K1		57 ROUTE FLOW AT 18 TO NODE 21									
30500	Y	0	0	0	0	1						



30600	Y1	0	7	3							
30700	K	0	19	0	0	0	0	1			
30800	K1	58 LOCAL INFLOW C-7									
30900	M	1	-1	98	0	3236	0	0	0	1	
31000	P	0	21.5	39	53	61	72				
31100	T	0	0	0	0	0	0	0.5	0.06		
31200	U	11									
31300	U1	2769	3138	1670	1115	664	396	236	141	84	50
31400	U1	19									
31500	X	120	400	1.6							
31600	K	1	21	0	0	0	0	1			
31700	K1	59 ROUTE LOCAL FLOW TO NODE 21									
31800	Y	0	0	0	0	1					
31900	Y1	0	6	2							
32000	K	2	21	0	0	0	0	1			
32100	K1	60 COMBINE ROUTED FLOW WITH FLOW AT 21									
32200	K	0	20	0	0	0	0	1			
32300	K1	61 SKANEATELES LAKE INFLOWS									
32400	M	1	-1	74	0	3236	0	0	0	1	
32500	P	0	21.5	39	53	61	72				
32600	T	0	0	0	0	0	0	0.75	0.05		
32700	U	5									
32800	U1	6839	791	232	56	10					
32900	X	250	500	1.0							
33000	K	1	20	0	0	0	0	1			
33100	K1	62 SKANEATELES LAKE OUTFLOWS									
33200	Y	0	0	0	1	1					
33300	Y1	1	0	0	0	0	0				
33400	Y2	0	17323	34750	52184	104368	208736	243492			
33500	Y3	0	353	747	1508	6403	13313	17359			
33600	K	1	21	0	0	0	0	1			
33700	K1	63 ROUTE SKANEATELES LAKE OUTFLOWS TO NODE 21									
33800	Y	0	0	0	0	1					
33900	Y1	0	0	2							
34000	K	2	21	0	0	0	0	1			
34100	K1	64 COMBINE ROUTED LAKE OUTFLOW WITH FLOW AT NODE 21									
34200	K	0	21	0	0	0	0	1			
34300	K1	65 LOCAL FLOW C-7									
34400	M	1	-1	27	0	3236	0	0	0	1	
34500	P	0	21.5	39	53	61	72				
34600	T	0	0	0	0	0	0	0.5	0.06		
34700	U	11									
34800	U1	496	946	581	351	212	127	77	46	28	17
34900	U1	7									
35000	X	90	200	1.6							
35100	K	2	21	0	0	0	0	1			
35200	K1	66 COMBINE LOCAL FLOW C-7 WITH FLOWS AT NODE 21									
35300	K	1	22	0	0	0	0	1			
35400	K1	67 ROUTING TO NODE 22									
35500	Y	0	0	0	0	1					
35600	Y1	0	4	1							
35700	K	0	22	0	0	0	0	1			
35800	K1	68 LOCAL FLOW E-8									
35900	M	1	-1	98	0	3236	0	0	0	1	
36000	P	0	21.5	39	53	61	72				
36100	T	0	0	0	0	0	0	0.5	0.06		
36200	U	7									
36300	U1	4687	3059	1402	642	259	135	42			
36400	X	120	400	1.6							
36500	K	2	22	0	0	0	0	1			
36600	K1	69 COMBINE ROUTED FLOW AND LOCAL FLOW AT NODE 22									

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3670J	K	1	22	0	0	0	0	0	1		
3680J	K1	70 BALDWIN-SVIBLE POOL - MODIFIED PUGS METHOD									
3690J	Y	0	0	0	1	1					
3700J	Y1	1	0	0	0	0			-1		
3710J	X2	0	0500	13050	21320	34100	48750	62400		70375	107500
3720J	X3	390J	5915	9029	12337	23274	37200	55680		80859	109900
3730J	K	99									
3740J	A										
3750J	A										
3760J	A										
3770J	A										
3780J	A										

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	5b
RUNOFF HYDROGRAPH AT	5b
COMBINE 2 HYDROGRAPHS AT	5b
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	16
ROUTE HYDROGRAPH TO	18
COMBINE 2 HYDROGRAPHS AT	18
RUNOFF HYDROGRAPH AT	17
ROUTE HYDROGRAPH TO	17
ROUTE HYDROGRAPH TO	18
COMBINE 2 HYDROGRAPHS AT	18
RUNOFF HYDROGRAPH AT	18
COMBINE 2 HYDROGRAPHS AT	18
ROUTE HYDROGRAPH TO	21
RUNOFF HYDROGRAPH AT	19
ROUTE HYDROGRAPH TO	2

McFARLAND - JOHNSON ENGINEERS, INC.



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
END OF NETWORK

McFARLAND - JOHNSON ENGINEERS, INC.



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

TIME OF EXECUTION 27-AUG-80 08:13:58

ANALYSIS OF DAM OVERTIPPING USING RATIOS OF PMF
 HYDROLOGIC-HYDRAULIC ANALYSIS OF SAFETY OF LOCK 24 DAM
 RATIOS OF PMF ROUTED THROUGH THE RESERVOIR

JOB SPECIFICATION										
NQ	NHK	NMIN	IDAY	IHR	IMIN	MEIRC	IPLT	IPRT	NSIAN	
40	6	0	0	0	0	0	0	4	0	
			JUPER	NAT	LROPT	TRACE				
			5	0	0	0				

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

SUB-AREA RUNOFF COMPUTATION

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

ISIAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISLAGE	IAUTO
1	0	0	0	0	0	1	0	0

HYDROGRAPH DATA									
IHYG	IURG	TAREA	SNAP	TRSDA	TKSPC	RATIO	ISNOW	ISAME	LOCAL
-1	0	100.00	0.00	3236.00	0.00	0.000	0	1	0

HYDROGRAPH ROUTING

2 BARGE CANAL LOCK 29 PALMYRA (ROUTED FLOW FROM LOCK 30)

ISIAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISLAGE	IAUTO
2	1	0	0	0	0	1	0	0

ROUTING DATA								
JLOSS	CLOSS	AVG	IRES	ISAME	IDPT	IPMP	LSTR	
0.0	0.000	0.00	0	1	0	0	0	

NSIPS	NSIDL	LAG	AKSKK	X	TSK	STORA	ISPRAT
0	3	1	0.000	0.000	0.000	0.	0

SUB-AREA RUNOFF COMPUTATION
 McFARLAND - JOHNSON ENGINEERS, INC.



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

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

HYDROGRAPH DATA									
IHYDG	IUHG	TAREA	SNAP	IRSDA	TRSPC	RATIO	ISNDW	ISAME	LOCAL
1	-1	147.00	0.00	3236.00	0.00	0.000	0	1	0

PRECIP DATA									
SPFE	PMS	R0	R12	R24	R48	R72	R96		
0.00	21.50	39.00	53.00	61.00	72.00	0.00	0.00		

IRSPC COMPUTED BY THE PROGRAM IS 0.928

LOSS DATA										
LROPT	SIRKR	DLTKR	RIOL	ERAIN	SIRKS	RIOK	STRIL	CNSIL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	0.50	0.05	0.00	0.00

RECESSION DATA		
STRTJ=	140.00	ORCSN= 550.00
		RTIDK= 1.60

END-OF-PERIOD FLOW													
MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	CUMP Q	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	
										SUM	14.37	12.12	2.24
											(365.)	(308.)	(57.)

COMBINE HYDROGRAPHS

4 COMBINED ROUTED AND LOCAL FLOWS AT LOCK 29

ISTAQ	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

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
6	1	0	0	0	0	1	0	0
ROUTING DATA								
QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP		LSTR
0.0	0.000	0.00	0	1	0	0		0
NSTPS	NSTDL	LAG	AMSK	X	ISK	STOR	ISPRAT	
0	8	3	0.000	0.000	0.000	0.	0	



SUB-AREA RUNOFF COMPUTATION

0 LOWER GARARAGUAL LOCAL INFLOWS VICINITY OF LOCK 27 (SUB-AREA E-2)

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

HYDROGRAPH DATA

IHYDG IJHG IAREA SNAP TRSDA TRSPC RATIO ISNOW ISAME LOCAL
 1 -1 118.00 0.00 3236.00 0.00 0.000 0 1 0

PRECIP DATA

SPFE PMS R5 R12 R24 R48 R72 R96
 0.00 21.50 39.00 53.00 61.00 72.00 0.00 0.00

TRSPC COMPUTED BY THE PROGRAM IS 0.928

LOSS DATA

LROPT STRKK DLTKR RTIUL ERAIN STRKS RTIOK STRIL CNSIL ALSMX RTIMP
 0 0.00 0.00 1.00 0.00 0.00 1.00 0.50 0.05 0.00 0.00

RECESSION DATA

STRIQ= 120.00 QRCSN= 470.00 RTIOK= 1.60

END-OF-PERIOD FLOW

MO.OA	HR.MN	PERIOD	RAIN	EXCS	LOSS	CUMP	MO.OA	HR.MN	PERIOD	RAIN	EXCS	LOSS	CUMP
						0							
			SUM	14.37	12.12	2.24				155692.			
				(305.)	(308.)	(57.)				(4408.71)			

COMBINE HYDROGRAPHS

7 COMBINED AND LOCAL FLOWS AT LOCK 27

ISTAQ 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 BARGE CANAL E-29 TO E-27)

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

HYDROGRAPH DATA

IHYDG IJHG IAREA SNAP TRSDA TRSPC RATIO ISNOW ISAME LOCAL
 1 -1 51.00 0.00 3236.00 0.00 0.000 0 1 0

PRECIP DATA

SPFE PMS R6 R12 R24 R48 R72 R96
 0.00 21.50 39.00 53.00 61.00 72.00 0.00 0.00

TRSPC COMPUTED BY THE PROGRAM IS 0.928



LJSS DATA
 LRPT SIRKR DLTKR RIIDL ERAIN STRKS RTIDK STRIL CNSTL ALSMX RTIMP
 0 0.00 0.00 1.00 0.00 0.00 1.00 0.50 0.05 0.00 0.00

RECESSION DATA
 STRTJ= 100.00 QRCSN= 200.00 RTIDR= 1.60

0
 END-OF-PERIOD FLOW
 MO,DA HR,MN PERIOD RAIN EXCS LOSS COMP Q MO,DA HR,MN PERIOD RAIN EXCS LOSS COMP Q
 SUM 14.37 12.12 2.24 68228.
 (365.)(308.)(57.)(1932.00)

HYDROGRAPH ROUTING

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

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

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IDPT	IPMP	LSIK
0.0	0.000	0.00	0	1	0	0	0

NSIPS	NSIDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
0	5	2	0.000	0.000	0.000	0.	0

COMBINE HYDROGRAPHS

10 COMBINE FLOWS AT NODE 6

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

SUB-AREA RUNOFF COMPUTATION

11 CANANDAIGUA LAKE INFLOW

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

HYDROGRAPH DATA

IHDG	IUGG	TAREA	SNAP	TRSDA	TRSPC	RATD	ISNOW	ISAME	LOCAL
1	-1	184.00	0.00	3236.00	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PAS	R6	R12	R24	R48	R72	R96
0.00	21.50	39.00	53.00	61.00	72.00	0.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS 0.928

McFARLAND-JOHNSON ENGINEERS, INC.



LKOP1 0
 SIKR 0.00
 DLFKM 0.00
 KILGL 1.00
 ERAN 0.00
 STRKS 0.00
 RIJA 1.00
 SIKL 1.25
 CHSTL 0.03
 ALSMX 0.00
 RTIMP 0.00

STKIQ= 300.00 RECESSIUN DATA
 GRCSNE 1000.00 RTIOK= 1.00

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

SUM 14.37 12.13 2.24 256548.
 (385.)(308.)(57.)(7264.63)

HYDROGRAPH ROUTING

12 CANANDAIGUA LAKE OUT FLOW USING MODIFIED PULS METHOD

ISIAQ	ICOMP	IECON	ITAPE	JPLI	JPKI	INAME	ISTAGE	IAUTO
4	1	0	0	0	0	1	0	0
CLUSS	AVG	IRLS	ISAME	ICPF	IPMP	LSTR		
0.0	0.000	1	1	0	0	0		
NSIPS	NSIDL	LAG	AMSKK	X	ISK	SIDRA	ISPRAT	
1	0	0	0.000	0.000	0.000	51000.	0	

STORAGE 10700.00 21300.00 31900.00 42500.00 53100.00 63700.00 74300.00 84900.00 95500.00 106100.00
 212500.00 319000.00
 OUIFLOW* 50.00 50.00 50.00 50.00 280.00 600.00 1000.00 1560.00 2250.00 3000.00

HYDROGRAPH ROUTING

13 ROUTED OUIFLOW TO FLINT CREEK MOUTH

ISIAQ	ICOMP	IECON	ITAPE	JPLI	JPKI	INAME	ISTAGE	IAUTO
5	1	0	0	0	0	1	0	0
CLUSS	AVG	IRLS	ISAME	ICPF	IPMP	LSTR		
0.0	0.000	0	1	0	0	0		
NSIPS	NSIDL	LAG	AMSKK	X	ISK	SIDRA	ISPRAT	
0	12	5	0.000	0.000	0.000	0.	0	

SUB-AREA RUNOFF COMPUTATION



McFARLAND - JOHNSON ENGINEERS, INC.

14 FLINT CREEK INFLOW A-2

ISTAG ICOMP IECOM ITAPE JPLT JPRT INAME ISTAGE IAUTO
 5 0 0 0 0 0 1 0 0

HIDROGRAPH DATA
 INYD LUGG IAREA SNAP IRSDA IRSPC RAILO ISHOW ISAME LOCAL
 1 -1 102.00 0.00 3236.00 0.00 0.000 0 1 0

PRECIP DATA
 SPPR PMS R6 R12 R24 R48 R72 R96
 0.00 21.50 39.00 53.00 61.00 72.00 0.00 0.00

IRSPC COMPUTED BY THE PROGRAM IS 0.928

LOSS DATA
 BROPT SIRKR ULTRR RILLO ERAIN SIRKS RTIOK SIRIL CWSIL ALSMX RIIMP
 0 0.00 0.00 1.00 0.00 0.00 1.00 0.50 0.06 0.00 0.00

RECESSION DATA
 SIRKS= 90.00 GRCSN= 2000.00 RTIOK= 1.60

0
 MO.DA HR.MM PERIOD RAIN EXCS LOSS COMP Q MO.DA HR.MM PERIOD RAIN EXCS LOSS COMP Q

SUM 14.37 11.81 2.56 144965.
 (365.)(300.)(55.)(4104.95)

COMBINE HYDROGRAPHS

15 COMBINE ROUTED CANANDAIGUA JOIFLOWS AND FLINT CR INFLOWS

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

HYDROGRAPH ROUTING

16 ROUTED TO LOCK 27

ISTAG ICOMP IECOM ITAPE JPLT JPRT INAME ISTAGE IAUTO
 50 1 0 0 0 0 1 0 0

ROUTING DATA
 WLOSS CLOSS AVG IRES ISAME IUPI JPMF LSTR
 0.0 0.000 0.00 0 1 0 0 0

WSPS WSPDL LAJ ANSKR X TSK SIORA ISPRAT
 0 7 3 0.000 0.000 0.000 0. 0

17 JUPLET LOCAL FLOW A-3

ISIAQ ICOMP IECOM ITAPE JPLT JPRT INAME ISTAGE IAUO
 50 0 0 0 0 0 1 0 0

HYDROGRAPH DATA

IHYG IUNG IAREA SWAP TRSDA TRSPC RATIO ISNOW ISAME LOCAL
 1 -1 155.00 0.00 3236.00 0.00 0.000 0 1 0

PRECIP DATA

SPRE PMS R6 R12 R24 R48 R72 R96
 0.00 21.50 39.00 53.00 61.00 72.00 0.00 0.00

TRSPC COMPUTED BY THE PROGRAM IS 0.928.

LOSS DATA

LROPT SIRKR DLTKK RTIOL ERAIN SIRKS RTIOM SIRIL CHSTL ALSMX RTIMP
 0 0.00 0.00 1.00 0.00 0.00 1.00 0.60 0.00 0.00 0.00

RECESSION DATA

SIRIS= 150.00 GRCSN= 200.00 RTIOR= 1.60

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

SUM 14.37 11.78 2.59 199666.
 (365.)(299.)(66.)(5653.91)

COMBINE HYDROGRAPHS

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

ISIAQ ICOMP IECOM ITAPE JPLT JPRT INAME ISTAGE IAUO
 50 2 0 0 0 0 1 0 0

HYDROGRAPH ROUTING

19 ROUTE JUPLET TO CANAL

ISIAQ ICOMP IECOM ITAPE JPLT JPRT INAME ISTAGE IAUO
 6 1 0 0 0 0 1 0 0

ROUTING DATA

JLOSS CLOSS AVG IKES ISAME IOPT IPMP LSTR
 0.0 0.000 0.00 0 1 0 0 0

NSIPS NSIDL LAG AMSKK X TSK STORA ISPRAT
 0 1 0 0.000 0.000 0.000 0. 0



COMBINE HYDROGRAPHS

20 COMBINE FLOW AT 6 (OUTLET FLOW + E-1, E-2, E-3)

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

HYDROGRAPH ROUTING

21 ROUTE FLOWS AT LOCK 27 TO NODE 8

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
8	1	0	0	0	0	1	0	0

ROUTING DATA

GLOSS	CLOSS	AVG	IKRES	ISAME	IOPT	IPMP	LSFR
0.0	0.000	0.00	0	1	0	0	0

NSIPS	NSIDL	LAG	AMSKK	X	TSK	SFORA	ISPRAT
0	8	3	0.000	0.000	0.000	0.	0

SUB-AREA RUNOFF COMPUTATION

22 LOCAL INFLOW LOCK 27 TO LOCK 26 (E4)

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
7	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUNG	IAREA	SNAP	IKSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	-1	89.00	0.00	3236.00	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PMS	K6	R12	R24	R48	R72	R96
0.00	21.50	39.00	53.00	61.00	72.00	0.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS 0.928

LOSS DATA

LROPI	STRKK	DLTKR	RTIOL	ERAIN	SIRKS	RTIOK	STRIL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	0.50	0.06	0.00	0.00

RECESSION DATA

STRSQ= 100.00 QRCSN= 360.00 RTIOK= 1.60

END-OF-PERIOD FLOW

MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	
										SUM	14.37	11.81	2.56	116859.
											(365.)	(300.)	(65.)	(3309.08)



HYDROGRAPH ROUTING

23 ROUTE FLOWS AT LOCK 26 TO NODE 8

ISIAW	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
8	1	0	0	0	0	1	0	0

ROUTING DATA

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

NSTPS	NSIDL	LAG	AMSKK	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

ISTAW	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
8	2	0	0	0	0	1	0	0

HYDROGRAPH ROUTING

25 ROUTE FLOWS AT NODE 8 TO NODE 10

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

ROUTING DATA

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

NSTPS	NSIDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
0	5	2	0.000	0.000	0.000	0.	0

SUB-AREA RUNOFF COMPUTATION

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

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

HYDROGRAPH DATA

INIDG	LUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	-1	18.00	0.00	3236.00	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	21.50	39.00	53.00	61.00	72.00	0.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS 0.928

McFARLAND-JOHNSON ENGINEERS, INC.



LOSS DATA
 LROPT 0 SIRKR 0.00 DLTKR 0.00 RIIDL 1.00 ERAIN 0.00 SIRKS 0.00 RIUK 1.00 SIRIL 0.50 CNSIL 0.06 ALSMA 0.00 RIIMP 0.00

RECESSION DATA
 SIRTU= 90.00 JKCSN= 90.00 RIUR= 1.60

0
 MD.DA HR.MN PERIOD RAIN EXCS LOSS END-OF-PERIOD FLOW
 COMP 0 MD.DA HR.MN PERIOD RAIN EXCS LOSS COMP 0
 SUM 14.37 11.81 2.56 24784.
 (365.)(300.)(65.)(701.80)

HYDROGRAPH ROUTING

27 ROUTE INFLOW E-5 TO NODE 10

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
10	1	0	0	0	0	1	0	0
ROUTING DATA								
QLOSS	CLOSS	AVG	IRES	ISAME	IJFT	IPMP	LSIR	
0.0	0.000	0.00	0	1	0	0	0	
NSIPS	NSIDL	LAG	AMSKK	X	TSK	STGRA	ISPRAT	
0	2	0	0.000	0.000	0.000	0.	0	

COMBINE HYDROGRAPHS

28 COMBINE ROUTED FLOW WITH FLOW AT NODE 10

ISTAQ	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

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
15	1	0	0	0	0	1	0	0
ROUTING DATA								
QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSIR	
0.0	0.000	0.00	0	1	0	0	0	
NSIPS	NSIDL	LAG	AMSKK	X	ISK	STGRA	ISPRAT	
0	5	2	0.000	0.000	0.000	0.	0	



SUB-AREA RUNOFF COMPUTATION

30 LOCAL INFLOW B-1 INTO KEUKA LAKE

ISIAQ ICOMP IECON ITAPE JPLI JPRT INAME ISTAGE IAUTO
 11 0 0 0 0 0 1 0 0

HYDROGRAPH DATA
 IHYDQ IUNG IAREA SNAP TRSDA TRSPC RAIIO ISNDW ISAME LOCAL
 1 -1 183.00 0.00 3236.00 0.00 0.000 0 1 0

PRECIP DATA
 SPFE PMS R6 R12 R24 R48 R72 R96
 0.00 21.50 39.00 53.00 61.00 72.00 0.00 0.00

TRSPC COMPUTED BY THE PROGRAM IS 0.928

LOSS DATA
 LRUP1 SIRKR DLYKK RTIOL ERAIN SIRKS RTIOK STRIL CNSTL ALSMX RTIMP
 0 0.00 0.00 1.00 0.00 0.00 1.00 1.50 0.03 0.00 0.00

RECESSION DATA
 SIRTR= 100.00 QRCSN= 800.00 RTIOR= 1.60

END-OF-PERIOD FLOW
 MO.DA HR.MN PERIOD RAIN EXCS LOSS COMP Q MO.DA HR.MN PERIOD RAIN EXCS LOSS COMP Q
 SUM 14.37 11.91 2.46 246833.
 (365.)(302.)(62.)(6989.53)

HYDROGRAPH ROUTING

31 KEUKA LAKE OUTFLOW W/ MODIFIED PULS

ISIAQ ICOMP IECON ITAPE JPLI JPRT INAME ISTAGE IAUTO
 11 1 0 0 0 0 1 0 0

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

NSIPS NSTDL LAG AMSKK X TSK STORA ISPRAT
 1 0 0 0.000 0.000 0.000 147000. 0

STORAGE 107000.00 129500.00 141000.00 153500.00 172000.00 178000.00 191000.00 204000.00 217000.00
 OUTFLOW 120.00 320.00 445.00 530.00 575.00 670.00 890.00 1130.00 1470.00

HYDROGRAPH ROUTING

32 ROUTE KEUKA LAKE OUTFLOWS TO 12

McFARLAND-JOHNSON ENGINEERS, INC.



SUB-AREA RUNOFF COMPUTATION

30 LOCAL INFLOW B-1 INTO KEUKA LAKE

ISTAG ICOMP IECON ITAPE JPLT JPRT INAME ISTAGE IAUTO
11 0 0 0 0 0 1 0 0

HYDROGRAPH DATA

LDG LUHG FAREA SNAP IRSDA TRSPC RATIO ISNOW ISAME LOCAL
1 -1 183.00 0.00 3236.00 0.00 0.000 0 1 0

PRECIP DATA

SPFE PMS R6 R12 R24 R48 R72 R96
0.00 21.50 39.00 53.00 61.00 72.00 0.00 0.00

PROGRAM IS 0.928

LOSS DATA

SIRKR ULTKK RIOL ERAIN SIRKS RTIOK STRIL CNSIL ALSMX RTIMP
0.00 0.00 1.00 0.00 0.00 1.00 1.50 0.03 0.00 0.00

RECESSION DATA

SIRIQ= 100.00 RCASN= 800.00 RIIOK= 1.60

END-OF-PERIOD FLOW

IOD RAIN EXCS LOSS COMP Q MD,DA HR,MM PERIOD RAIN EXCS LOSS COMP Q
SUM 14.37 11.91 2.46 246833.
(365.)(302.)(62.)(6989.53)

HYDROGRAPH ROUTING

31 KEUKA LAKE OUTFLOW w/ MODIFIED PULS

ISTAG ICOMP IECON ITAPE JPLT JPRT INAME ISTAGE IAUTO
11 1 0 0 0 0 1 0 0

ROUTING DATA

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

NSIPS NSTDL LAG AMSKK X TSK SIORA ISPRAT
1 0 0 0.000 0.000 0.000 147000. 0

29500.00 141000.00 153500.00 172000.00 178000.00 191000.00 204000.00 217000.00 328550.00
320.00 445.00 530.00 575.00 670.00 690.00 1130.00 1470.00 126000.00

HYDROGRAPH ROUTING

32 ROUTE KEUKA LAKE OUTFLOWS 10 12

McFARLAND-JOHNSON ENGINEERS, INC.



2


```

          ISTAQ  ICOMP  IECON  ITAPE  JPLT  JPRT  INAME  ISTAGE  IAUTO
           12      1      0      0      0      0      1      0      0
LOSS      CLOSS  AVG      IRES  ISAME  IOPF  IPMP      LSTR
0.0      0.000  0.00      0      1      0      0      0

          NSTPS  NSTDL  LAG  AMSKK  X  TSK  STORA  ISPRAI
           0      0      2  0.000  0.000  0.000  0.      0

```

SUB-AREA RUNOFF COMPUTATION

33 SENECA LAKE INFLOWS B-2

```

          ISTAQ  ICOMP  IECON  ITAPE  JPLT  JPRT  INAME  ISTAGE  IAUTO
           12      0      0      0      0      0      1      0      0

          HYDROGRAPH DATA
IHYDQ  IUNG  TAREA  SNAE  TRSDA  TRSPC  RATIO  ISNOW  ISAME  LOCAL
 1      -1  524.00  0.00  3236.00  0.00  0.000  0      1      0

```

```

          PRECIP DATA
          SPFE  PMS  R6  R12  R24  R48  R72  R96
          0.00  21.50  39.00  53.00  61.00  72.00  0.00  0.00

```

TRSPC COMPUTED BY THE PROGRAM IS 0.926

```

          LOSS DATA
LROPI  STRAR  DLTKR  RTIDL  ERAIN  STRKS  RTIOK  STRIL  CNSIL  ALSMX  RTIMP
 0      0.00  0.00  1.00  0.00  0.00  1.00  0.50  0.03  0.00  0.00

```

```

          RECESSION DATA
          STRIQ= 500.00  QRCSN= 2800.00  RTIDR= 1.60

```

```

          END-OF-PERIOD FLOW
MO.DA  HR.MN  PERIOD  RAIN  EXCS  LOSS  COMP Q  MO.DA  HR.MN  PERIOD  RAIN  EXCS  LOSS  COMP Q
                                SUM  14.37  12.75  1.62  758979.
                                ( 365.)( 324.)( 41.)(21491.89)

```

COMBINE HYDROGRAPHS

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

```

          ISTAQ  ICOMP  IECON  ITAPE  JPLT  JPRT  INAME  ISTAGE  IAUTO
           12      2      0      0      0      0      1      0      0

```

HYDROGRAPH ROUTING

McFARLAND - JOHNSON ENGINEERS, INC.



35 SENECA LAKE OUTFLOWS - MODIFIED PULS METHOD

ISIAV	ICOMP	IECON	ITAPE	JPLI	JPFT	INAME	ISAGE	IAUTO
12	1	0	0	0	0	1	0	0
COLJSS	AVG	IRRES	ISAME	IUPI	IPMP		LSTR	
0.0	0.000	1	1	0	0		0	
NSIPS	NSIDL	LAG	AMSKK	X	TSK	SIOKA	ISPRAT	
1	0	0	0.000	0.000	0.000	534000.	0	

STORAGE	372000.00	414000.00	500000.00	543000.00	586000.00	630000.00	650000.00	674000.00	720000.00
OUTFLOW	700.00	700.00	700.00	700.00	700.00	700.00	1000.00	3000.00	3000.00

HYDROGRAPH ROUTING

36 SENECA LAKE OUTFLOWS ROUTED TO 13

ISIAV	ICOMP	IECON	ITAPE	JPLI	JPRT	INAME	ISAGE	IAUTO
13	1	0	0	0	0	1	0	0
COLJSS	AVG	IRRES	ISAME	IUPI	IPMP		LSTR	
0.0	0.000	0	1	0	0		0	
NSIPS	NSIDL	LAG	AMSKK	X	TSK	SIOKA	ISPRAT	
0	2	0	0.000	0.000	0.000	0.	0	

SUB-AREA RUNOFF COMPUTATION

37 LOCAL INFLOW b-4

ISTAV	ICOMP	IECON	ITAPE	JPLI	JPRT	INAME	ISAGE	IAUTO
13	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYDG	IURJ	IAREA	SNAP	IRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	-1	39.00	0.00	3236.00	0.00	0.000	0	1	0

PRECIP DATA

SPRF	PMS	K6	R12	R24	R48	R72	R96
0.00	21.50	39.00	53.00	61.00	72.00	0.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS 0.928

LOSS DATA										
LKOPT	SIRK	DLIK	RIJUL	ERAIN	STNKS	RIJUK	SIRIL	CNSIL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	0.50	0.05	0.00	0.00

RECESSION DATA

SIRJW	92.00	GRCSN	200.00	RIJUK	1.60
-------	-------	-------	--------	-------	------

0
 MO.DA HR.MN PERIOD RAIN EXCS LOSS END-JF-PERIOD FLOW
 MO.DA HR.MN PERIOD RAIN EXCS LOSS COMP Q MO.DA HR.MN PERIOD RAIN EXCS LOSS COMP Q
 SUM 14.37 14.12 2.24 54130.
 (365.)(308.)(57.)(1532.79)

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 (CAYUGA LAKE INFLOW)

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

ROUTING DATA

LOSS	LOSS	AVG	IKES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	0	1	0	0	0

NSIPS	NSIDL	LAG	AMSKK	X	ISK	SIORA	ISPRAI
0	0	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

IHYD	IUNG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNO	ISAME	LOCAL
1	-1	36.00	0.00	3236.00	0.00	0.000	0	1	0

PRECIP DATA

SPF	PMS	NO	R12	R24	R48	R72	R96
0.00	21.50	39.00	53.00	61.00	72.00	0.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS 0.926

LOSS DATA

LROPI	STRAR	DLRKR	RISUL	ERAIN	SIRKS	RISJK	SIRTL	CNSTL	ALSMX	RIIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	0.50	0.05	0.00	0.00

RECESSION DATA
 SIRI= 92.00 JKCS= 200.00
 McFARLAND-JOHNSON ENGINEERS, INC.

0				END-JF-PERIOD FLOW				0									
MO.DA	HR.MM	PERIOD	RAIN	EXCS	LOSS	COMP Q	MO.DA	HR.MM	PERIOD	RAIN	EXCS	LOSS	COMP Q				
													SUM	14.37	12.12	2.24	50339.
														(365.)	(308.)	(57.)	(1425.44)

COMBINE HYDROGRAPHS

41 COMBINE FLOW B-5 WITH ROUTED FLOW

ISIAW	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

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

HYDROGRAPH DATA

IHYDG	IUNG	TAKEA	SNAP	IRSDA	TRSPC	RAID	ISNOW	ISAME	LOCAL
1	-1	762.00	0.00	3230.00	0.00	0.000	0	1	0

PRECIP DATA

SPPe	PMS	R6	R12	R24	R48	R72	R90
0.00	21.50	39.00	53.00	61.00	72.00	0.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS 0.928

LOSS DATA

LROPT	SIRKR	DLTKR	RIOL	ERAIN	STRKS	RIOK	SIRIL	CNSTL	ALSMX	RIIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	0.50	0.03	0.00	0.00

RECESSION DATA

STRTO= 1000.00 JKCSN= 1700.00 R10R= 1.60

0				END-JF-PERIOD FLOW				0									
MO.DA	HR.MM	PERIOD	RAIN	EXCS	LOSS	COMP Q	MO.DA	HR.MM	PERIOD	RAIN	EXCS	LOSS	COMP Q				
													SUM	14.37	12.75	1.62	1103464.
														(365.)	(324.)	(41.)	(31240 61)

COMBINE HYDROGRAPHS

43 COMBINE LOCAL INFLOW B-3 AND ROUTED FLOW

McFARLAND-JOHNSON ENGINEERS, INC.

ISTAG 1: ICOMP 2 IECON 0 IIAPE 0 JPLI 0 JPRT 0 INAME 1 ISTAGE 0 IAUTO 0

HYDROGRAPH ROUTING

44 CAYUGA LAKE OUTFLOW - MODIFIED PULS

ISTAG 14 ICOMP 1 IECON 0 IIAPE 0 JPLI 0 JPRT 0 INAME 1 ISTAGE 0 IAUTO 0
 ROUTING DATA
 CLJSS 0.000 AVG 0.000 IRES 1 ISAME 1 IOPT 0 LSIR 0
 NSIPS 1 NSIDL 0 LAG 0 AMSAK X TSK STORA ISPRAT 0
 0.000 0.000 0.000 0.000 0.000 0.000 490000.00

STORAGE 375000.00 417000.00 503000.00 545000.00 589500.00 634000.00 660000.00 727000.00 854500.00
 982000.00
 OUTFLOW 1700.00 1700.00 1700.00 3400.00 3400.00 3400.00 8700.00 8700.00 38510.00
 103500.00

HYDROGRAPH ROUTING

45 ROUTE CAYUGA LAKE OUTFLOWS TO NODE 15

ISTAG 15 ICOMP 1 IECON 0 IIAPE 0 JPLI 0 JPRT 0 INAME 1 ISTAGE 0 IAUTO 0
 ROUTING DATA
 CLJSS 0.000 AVG 0.000 IRES 1 ISAME 1 IOPT 0 LSIR 0
 NSIPS 0 NSIDL 3 LAG 1 AMSAK X TSK STORA ISPRAT 0
 0.000 0.000 0.000 0.000 0.000 0.000 0.000

COMBINE HYDROGRAPHS

46 COMBINE ROUTED FLOW WITH FLOW AT NODE 15

ISTAG 15 ICOMP 2 IECON 0 IIAPE 0 JPLI 0 JPRT 0 INAME 1 ISTAGE 0 IAUTO 0

HYDROGRAPH ROUTING

47 ROUTE FLOWS TO NODE 18
 McFARLAND - JOHNSON ENGINEERS, INC.



	ISIAQ	ICOMP	IECON	IIAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
	18	1	0	0	0	0	1	0	0
	ROUTING DATA								
WLOSS	CLOSS	AVG	IRLS	ISAME	IQPT	IPMP		LSIR	
0.0	0.000	0.00	0	1	0	0		0	
NSIPS	NSIDL	LAG	AMSKK	X	ISK	STORA	ISPRAI		
0	8	3	0.000	0.000	0.000	0.	0		

SUB-AREA RUNOFF COMPUTATION

48 LOCAL FLOW E-6

	ISIAQ	ICOMP	IECON	IIAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
	16	0	0	0	0	0	1	0	0
	HYDROGRAPH DATA								
IHYG	IUHG	TAREA	SNAP	TRSDA	TKSPC	RATIO	ISNOW	ISAME	LOCAL
1	-1	191.00	0.00	3236.00	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PMS	Ro	R12	R24	R48	R72	R96
0.00	21.50	39.00	53.00	61.00	72.00	0.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS 0.928

LOSS DATA

LROPT	STRKR	DUTKR	RIIDL	ERAIN	SIRKS	RFLUK	STRIL	CNSIL	ALSMX	RIIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	0.50	0.06	0.00	0.00

RECESSION DATA

SIRIG= 140.00 JKCSn= 400.00 RIOR= 1.60

END-OF-PERIOD FLOW

MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP	
										SUM	14.37	11.81	2.56	242885.
											(365.)	(300.)	(65.)	(6877.74)

HYDROGRAPH ROUTING

49 ROUTE LOCAL FLOW E-6 TO NODE 16

	ISIAQ	ICOMP	IECON	IIAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
	18	1	0	0	0	0	1	0	0
	ROUTING DATA								
WLOSS	CLOSS	AVG	IRLS	ISAME	IQPT	IPMP		LSIR	
0.0	0.000	0.00	0	1	0	0		0	
NSIPS	NSIDL	LAG	AMSKK	X	ISK	STORA	ISPRAI		
0	2	0	0.000	0.000	0.000	0.	0		

McFARLAND - JOHNSON ENGINEERS, INC.



COMBINE HYDROGRAPHS

50 COMBINE ROUTED FLOW W/ FLOW AT NODE 18

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

SUB-AREA RUNOFF COMPUTATION

51 HEAD UWASCO INFLOW C-1

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

HYDROGRAPH DATA

IHDG	IUGG	FAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	-1	201.00	0.00	3236.00	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	21.50	39.00	53.00	61.00	72.00	0.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS 0.928

LOSS DATA

LROPT	STRAN	DLTKP	RTIOL	ERAIN	SIRKS	RTIQR	STRIL	CNSIL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	0.75	0.05	0.00	0.00

RECESSION DATA

STRSQ= 450.00 GRCSN= 1000.00 RTIQR= 1.60

END-OF-PERIOD FLOW

MO.DA	HR.MM	PERIOD	RAIN	EXCS	LOSS	COMP Q	MO.DA	HR.MM	PERIOD	RAIN	EXCS	LOSS	COMP Q
-------	-------	--------	------	------	------	--------	-------	-------	--------	------	------	------	--------

SUM 14.37 11.97 2.39 276691.
(365.)(304.)(61.)(7835.01)

HYDROGRAPH ROUTING

52 UWASCO LAKE INFLOWS - MODIFIED PULS METHOD

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

ROUTING DATA

QLOSS	CLLOSS	AVG	IRES	ISAME	IDPT	IPMP	LSIR
0.0	0.000	0.00	1	1	0	0	0

MSIPS	MSIDL	LAG	AMSKA	X	ISK	STORA	ISPRAI
1	0	0	0.000	0.00	0.000	92000.	0

McFARLAND - JOHNSON ENGINEERS, INC.

STORAGE	6000.00	73200.00	80500.00	93200.00	99800.00	106500.00	113200.00	119800.00	126500.00
	152900.00	205700.00							
WATERFLOW	600.00	600.00	1100.00	1700.00	2300.00	2860.00	3400.00	3400.00	3400.00
	24000.00	69100.00							

HYDROGRAPH ROUTING

53 ROUTE JAMESCO LAKE OULET FLOWS

INSTA	ICOMP	IECON	ITAPE	JPLI	JPRI	INAME	ISTAGE	IAUTO
18	1	0	0	0	0	1	0	0
ROUTING DATA								
QLJSS	CLOSS	AVG	INRES	ISAME	IOPT	IPMP	LSIR	
0.0	0.000	0.00	0	1	0	0	0	
NSIPS	NSIDL	LAG	AMSKK	X	TSK	STOKA	ISPRAT	
0	7	3	0.000	0.000	0.000	0.	0	

CUMBIANE HYDRUGRAPHS

54 COMBIANE FLOWS WITH FLOWS AT NODE 18

INSTA	ICOMP	IECON	ITAPE	JPLI	JPRI	INAME	ISTAGE	IAUTO
18	2	0	0	0	0	1	0	0

SUB-AREA RUNOFF COMPUTATION

55 READ LOCAL FLOW C-6

INSTA	ICOMP	IECON	ITAPE	JPLI	JPRI	INAME	ISTAGE	IAUTO	
18	0	0	0	0	0	1	0	0	
HYDROGRAPH DATA									
IHYD	IUMG	TAREA	SNAP	FRSUA	TRSPC	RATIO	ISNGW	ISAME	LOCAL
1	-1	19.00	0.00	3236.00	0.00	0.000	0	1	0
PRECIP DATA									
SPFE	PMS	K8	R12	K24	R48	K72	R96		
0.00	21.50	39.00	53.00	61.00	72.00	0.00	0.00		

TRSCP COMPUTED BY THE PROGRAM IS 0.928

LKOP1	SIRIK	DLIRK	RIIUL	ERAIN	STRKS	RIIOK	SIRIL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	0.50	0.06	0.00	0.00

0
 M.J.O.A HR.MN PERIOD RAIN EXCS LOSS END-OF-PERIOD FLOW HR.MN PERIOD RAIN EXCS LOSS COMP Q
 M.J.O.A COMP Q MD.OA
 SUM 14.37 11.81 2.56 20786.
 (305.)(300.)(65.)(758.49)

COMBINE HYDROGRAPHS

56 COMBINE LOCAL FLOW C-0 WITH FLOW AT NODE 18

ISIAU	ICOMP	IECON	ITAPE	JPLI	JPRI	INAME	ISTAGE	IAUTO
18	2	0	0	0	0	1	0	0

HYDROGRAPH ROUTING

57 ROUTE FLOW AT 18 TO NODE 21

ISTAQ	ICOMP	IECON	ITAPE	JPLI	JPRI	INAME	ISTAGE	IAUTO
21	1	0	0	0	0	1	0	0

ROUTING DATA
 QLOSS 0.000 AVG 0.000 IRES 0.000 ISAME 1 ICPT 0.000 IPMP 0.000 LSTR 0.000
 WSIPS 0 NSIDL 7 LAG 3 AMSKK X TSK STORA ISPRAT 0.000 0.000

SUB-AREA RUNOFF COMPUTATION

58 LOCAL INFLOW E-7

ISIAU	ICUMP	IECON	ITAPE	JPLI	JPRI	INAME	ISTAGE	IAUTO
19	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYD3	IUMG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	-1	98.00	0.00	3230.00	0.00	0.000	0	1	0

PRECIP DATA
 SFE R12 R24 R48 R72 R96
 0.00 21.50 39.00 53.00 61.00 72.00
 TRSPC RATIO
 0.00 3230.00 0.00 0.000

IRSPC COMPUTED BY THE PROGRAM IS 0.928

LRDPI	SIRK	ULIAR	KILUL	ERAIW	SIRKS	RTIDK	STRIL	CMSTL	ALSNX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	0.50	0.06	0.00	0.00

SIRTD= 120.00 JRCSN= 400.00 RIIDK= 1.00

0		END-JR-PERIOD FLOW											
MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q
		SUM 14.37 11.81 2.56 130662.											
		(365.)(300.)(65.)(3699.93)											

HYDROGRAPH ROUTING

59 ROUTE LOCAL FLOW TO NODE 21

ISIAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISIAQE	IAUTO
21	1	0	0	0	0	1	0	0

ROUTING DATA

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

NSIPS	NSIDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
0	0	2	0.000	0.000	0.000	0.	0

COMBINE HYDROGRAPHS

60 COMBINE ROUTED FLOW WITH FLOW AT 21

ISIAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISIAQE	IAUTO
21	2	0	0	0	0	1	0	0

SUB-AREA RUNOFF COMPUTATION

61 SKANEATELES LAKE INFLOWS

ISIAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISIAQE	IAUTO
20	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYDQ	LONG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOw	ISAME	LOCAL
1	-1	74.00	0.00	3236.00	0.00	0.000	0	1	0

PRECIP DATA

SPPE	PMS	R6	R12	R24	R48	R72	R96
0.00	21.50	39.00	53.00	61.00	72.00	0.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS 0.928

LOSS DATA

LRUPI	SIRKR	DLTKR	RTIOL	ERAIN	SIRKS	RIIDK	STRIL	CNSIL	ALSMX	RIIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	0.75	0.05	0.00	0.00

McFARLAND-JOHNSON ENGINEERS, INC.



RECESSION DATA
 SRTQ= 250.00 JRCSN= 500.00 RIIDK= 1.00

NO. DA	HR. MM	PERIOD	RAIN	EXCS	LOSS	CUMP W	NO. DA	HR. MM	PERIOD	RAIN	EXCS	LOSS	CUMP Q				
													SUM	14.37	11.97	2.39	104801.
														(365.)	(304.)	(61.)	(2967.63)

HYDROGRAPH ROUTING

02 SKANEATELES LAKE OUTFLOWS

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
20	1	0	0	0	0	1	0	0
ROUTING DATA								
QLOSS	CLOSS	AVG	IRCS	ISAME	IOPT	IPMP	LSTR	
0.0	0.000	0.00	1	1	0	0	0	
NSFPS	NSIDL	LAG	AMSK	X	TSK	STORA	ISPRAT	
1	0	0	0.000	0.000	0.000	0.	0	

STORAGE	0.00	17323.00	34750.00	52184.00	104308.00	208730.00	243492.00
OUTFLOW	0.00	353.00	747.00	1508.00	6403.00	13313.00	17359.00

HYDROGRAPH ROUTING

03 ROUTE SKANEATELES LAKE OUTFLOWS TO NODE 21

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
21	1	0	0	0	0	1	0	0
ROUTING DATA								
QLOSS	CLOSS	AVG	IRCS	ISAME	IOPT	IPMP	LSTR	
0.0	0.000	0.00	0	1	0	0	0	
NSFPS	NSIDL	LAG	AMSK	X	TSK	STORA	ISPRAT	
0	6	2	0.000	0.000	0.000	0.	0	

COMBINE HYDROGRAPHS

04 COMBINE ROUTED LAKE OUTFLOW WITH FLOW AT NODE 21

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

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SUB-AREA RUNOFF COMPUTATION

05 LOCAL FLOW C-7

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

HYDROGRAPH DATA

IHYDG IUNG IAREA SNAP IRSDA TRSPC RATIO ISNO# ISAME LOCAL
 1 -1 27.00 0.00 3236.00 0.00 0.000 0 1 0

PRECIP DATA

SPFE PMS K0 R12 R24 R48 R72 R96
 0.00 21.50 39.00 53.00 61.00 72.00 0.00 0.00

TRSPC COMPUTED BY THE PROGRAM IS 0.928

LOSS DATA

LROPI SIRKR DLTKR RIIDL ERAIN SIRKS RIIDK STRIL CNSTL ALSMX RTIMP
 0 0.00 0.00 1.00 0.00 0.00 1.00 0.50 0.06 0.00 0.00

RECESSION DATA

STRID= 90.00 QRCSN= 200.00 RIIDR= 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 14.37 11.81 2.56 37841.
 (365.)(300.)(65.)(1071.54)

COMBINE HYDROGRAPHS

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

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

HYDROGRAPH ROUTING

07 ROUTING TO NODE 22

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

ROUTING DATA

QLOSS CLLOSS AVG IRES ISAME IOPT IPMP LSIR
 0.0 0.000 0.00 0 1 0 0 0

WSTPS WSIDL LAG AMSKK X ISK STORA ISPRAI
 0 4 1 0.000 0.000 0.000 0. 0



SUB-AREA RUNOFF COMPUTATION

08 LOCAL FLOW 2-0

ISTAW 22 ICOMP 0 IECON 0 ITAPE 0 JPLT 0 JPRT 0 INAME 1 ISTAGE 0 IAUTO 0

HYDROGRAPH DATA

IMDUG 1 IUGG -1 IAREA 98.00 SNAP 0.00 IRSDA 3236.90 TRSPC 0.00 RATIO 0.010 ISNOW 0 ISAME 1 LOCAL 0

PRECIP DATA

SFFE 0.00 PMS 21.50 R5 39.00 R12 53.00 R24 61.00 R48 72.10 R72 0.00 R96 0.00

TRSPC COMPUTED BY THE PROGRAM IS 0.928

LOSS DATA

LRDPT 0 SIRKR 0.00 DLIRK 0.00 RIUL 1.00 ERAIN 0.00 SIRKS 0.00 RIOR 1.00 SIRIL 0.50 CNSTL 0.06 ALSMX 0.00 RIIMP 0.00

RECESSION DATA

SIRL= 120.00 JRCSN= 400.00 RIOR= 1.60

0

END-OF-PERIOD FLOW

MJ.DA HR.MN PERIOD RAIN EXCS LOSS CUM P MJ.DA HR.MN PERIOD RAIN EXCS LOSS COMP Q

SUM 14.37 11.81 2.56 130265.
(365.)(300.)(65.)(3688.69)

COMBINE HYDROGRAPHS

09 COMBINE ROUTED FLOW AND LOCAL FLOW AT NODE 22

ISTAW 22 ICOMP 2 IECON 0 ITAPE 0 JPLT 0 JPRT 0 INAME 1 ISTAGE 0 IAUTO 0

HYDROGRAPH ROUTING

70 BALDWINVILLE POOL - MODIFIED PULS METHOD

ISTAW 22 ICOMP 1 IECON 0 ITAPE 0 JPLT 0 JPRT 0 INAME 1 ISTAGE 0 IAUTO 0

ROUTING DATA

QLUSS 0.0 CLOSS 0.000 AVG 0.00 IRES 1 ISAME 1 IOPT 0 IPMP 0 LSIK 0

ISIPS 1 RSTDL 0 LAG 0 AMSK 0.000 X 0.000 ISK 0.000 STORA -1. ISPRAT 0

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STORAGE	0.00	6500.00	13650.00	21320.00	34100.00	48750.00	62400.00	76375.00	107500.00
UNIFLOW	3900.00	5915.00	9029.00	12937.00	23274.00	37200.00	55680.00	80859.00	109900.00



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

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO FLOWS					
				RATIO 1 0.20	RATIO 2 0.40	RATIO 3 0.50	RATIO 4 0.60	RATIO 5 0.80	RATIO 6 1.00
HYDROGRAPH AT	1	100.00 (259.00)	1	78. (2.22)	157. (4.44)	190. (5.55)	235. (6.66)	314. (8.88)	392. (11.10)
ROUTED TO	2	100.00 (259.00)	1	78. (2.20)	156. (4.41)	195. (5.51)	234. (6.61)	311. (8.82)	389. (11.02)
HYDROGRAPH AT	2	147.00 (380.73)	1	6409. (181.47)	12817. (362.95)	16022. (453.69)	19226. (544.42)	25035. (725.90)	32044. (907.37)
2 COMBINED	2	247.00 (639.73)	1	6485. (183.03)	12970. (367.27)	16212. (459.09)	19455. (550.90)	25940. (734.54)	32425. (918.17)
ROUTED TO	6	247.00 (639.73)	1	3948. (111.79)	7896. (223.59)	9870. (279.48)	11844. (335.38)	15792. (447.17)	19740. (558.97)
HYDROGRAPH AT	6	118.00 (305.62)	1	2948. (83.49)	5897. (166.98)	7371. (208.73)	8845. (250.47)	11794. (333.96)	14742. (417.46)
2 COMBINED	6	365.00 (945.35)	1	6705. (189.87)	13410. (379.73)	16763. (474.07)	20115. (569.60)	26620. (759.47)	33525. (949.33)
HYDROGRAPH AT	3	51.00 (132.09)	1	4042. (114.45)	8084. (228.91)	10105. (286.14)	12126. (343.36)	16168. (457.82)	20210. (572.27)
ROUTED TO	6	51.00 (132.09)	1	2199. (62.26)	4398. (124.53)	5497. (155.06)	6596. (186.79)	8795. (249.05)	10994. (311.31)
2 COMBINED	6	416.00 (1077.44)	1	7200. (203.88)	14400. (407.76)	18000. (509.70)	21600. (611.64)	28800. (815.52)	36000. (1019.40)
HYDROGRAPH AT	4	184.00 (476.56)	1	16154. (457.44)	32308. (914.87)	40386. (1143.59)	48463. (1372.31)	64617. (1829.75)	80771. (2287.18)
ROUTED TO	4	184.00 (476.56)	1	905. (25.62)	2085. (59.05)	2802. (79.34)	6179. (174.96)	13864. (392.59)	20866. (590.85)
ROUTED TO	5	184.00 (476.56)	1	659. (24.32)	1910. (54.09)	2549. (72.17)	3773. (106.84)	7286. (206.33)	11042. (312.66)
HYDROGRAPH AT	5	102.00 (264.18)	1	2955. (83.67)	5910. (167.35)	7387. (209.18)	8865. (251.02)	11820. (334.69)	14775. (418.37)
2 COMBINED	5	286.00 (740.74)	1	3402. (96.33)	6714. (190.11)	8413. (238.23)	10551. (296.77)	15688. (444.24)	21015. (595.09)
ROUTED TO	56	286.00 (740.74)	1	2790. (78.99)	5529. (156.57)	6952. (196.86)	8854. (250.72)	13652. (386.59)	18710. (529.80)



HYDROGRAPH AT	50	155.00 (401.45)	1	5300.	10775.	13159.	10163.	21551.	20939.
				(152.50)	(105.13)	(381.41)	(457.09)	(010.25)	(762.82)
2 COMBINED	50	441.00 (1142.18)	1	7901.	15670.	19596.	23797.	32819.	42051.
				(223.72)	(443.90)	(554.91)	(673.86)	(929.33)	(1190.76)
ROUTED TO	0	441.00 (1142.18)	1	7901.	15670.	19596.	23797.	32819.	42051.
				(223.72)	(443.90)	(554.91)	(673.86)	(929.33)	(1190.76)
2 COMBINED	0	857.00 (2219.02)	1	14095.	29204.	30582.	44180.	59990.	76022.
				(410.11)	(828.67)	(1035.88)	(1251.02)	(1698.89)	(2152.70)
ROUTED TO	8	857.00 (2219.62)	1	12617.	25130.	31434.	38065.	52001.	60109.
				(357.28)	(711.76)	(890.11)	(1077.67)	(1472.50)	(1872.01)
HYDROGRAPH AT	7	89.00 (230.51)	1	3532.	7063.	8829.	10595.	14126.	17658.
				(100.00)	(200.00)	(250.00)	(300.00)	(400.00)	(500.01)
ROUTED TO	6	89.00 (230.51)	1	3307.	0614.	6268.	9921.	13229.	16536.
				(93.65)	(187.30)	(234.12)	(280.95)	(374.59)	(468.24)
2 COMBINED	8	946.00 (2450.13)	1	13208.	26400.	33000.	39859.	54239.	68908.
				(375.70)	(747.74)	(934.02)	(1128.09)	(1535.89)	(1951.24)
ROUTED TO	10	940.00 (2450.13)	1	12730.	25347.	31084.	38281.	52220.	66372.
				(300.06)	(717.70)	(897.20)	(1084.01)	(1478.71)	(1879.46)
HYDROGRAPH AT	9	18.00 (40.02)	1	003.	1305.	1707.	2046.	2731.	3413.
				(19.33)	(38.60)	(48.33)	(57.99)	(77.33)	(96.66)
ROUTED TO	10	18.00 (40.02)	1	070.	1351.	1089.	2027.	2703.	3379.
				(19.13)	(38.27)	(47.84)	(57.40)	(76.54)	(95.67)
2 COMBINED	10	964.00 (2496.75)	1	12830.	25534.	31918.	38562.	52520.	66747.
				(303.30)	(723.05)	(903.81)	(1091.94)	(1487.20)	(1890.06)
ROUTED TO	15	964.00 (2496.75)	1	12404.	24687.	30860.	37298.	50823.	64014.
				(351.25)	(699.05)	(873.86)	(1056.16)	(1439.15)	(1829.67)
HYDROGRAPH AT	11	183.00 (473.97)	1	23066.	47331.	59104.	70997.	94663.	118328.
				(670.14)	(1340.27)	(1675.34)	(2010.41)	(2680.55)	(3350.69)
ROUTED TO	11	183.00 (473.97)	1	564.	872.	1078.	1346.	12291.	24065.
				(15.90)	(24.70)	(30.51)	(38.12)	(348.04)	(681.45)
ROUTED TO	12	183.00 (473.97)	1	503.	865.	1068.	1328.	6994.	14452.
				(15.94)	(24.49)	(30.23)	(37.61)	(198.04)	(409.24)
HYDROGRAPH AT	12	524.00 (1357.15)	1	48102.	96203.	120254.	144305.	192407.	240509.
				(1362.09)	(2724.16)	(3405.22)	(4080.27)	(5448.36)	(6810.44)
2 COMBINED	12	707.00 (1831.12)	1	48597.	96710.	120770.	144637.	192975.	241115.
				(1376.12)	(2738.53)	(3419.81)	(4101.34)	(5464.44)	(6827.02)
ROUTED TO	12	707.00 (1831.12)	1	700.	2711.	3000.	5220.	14284.	23751.
				(19.82)	(70.76)	(84.95)	(147.82)	(404.48)	(672.55)
ROUTED TO	13	707.00 (1831.12)	1	700.	2795.	3000.	5212.	14270.	23707.
				(19.82)	(70.59)	(84.95)	(147.60)	(404.25)	(671.32)
HYDROGRAPH AT	13	39.00	1	2214.	4426.	5535.	6642.	8850.	11070.

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		(101.01)		(02.05)	(125.39)	(150.74)	(188.08)	(250.70)	(313.47)	(
2 COMBINED	13	740.00 (1932.13)	1	2914. (02.52)	5128. (140.21)	0360. (180.11)	8206. (234.62)	15072. (443.78)	25512. (722.41)	(
ROUTED TO	14	746.00 (1932.13)	1	2025. (57.34)	3806. (110.03)	5354. (151.01)	6738. (190.79)	15192. (430.18)	24047. (703.58)	(
HYDROGRAPH AT	14	30.00 (93.21)	1	2182. (61.79)	4304. (123.57)	5455. (154.47)	6540. (185.36)	8728. (247.15)	10910. (308.94)	(
2 COMBINED	14	782.00 (2025.37)	1	3689. (104.40)	0678. (189.11)	8194. (232.02)	9825. (278.20)	15579. (441.15)	25342. (717.61)	(
HYDROGRAPH AT	14	782.00 (2025.37)	1	49040. (1300.65)	98079. (2777.29)	122599. (3471.61)	147119. (4105.94)	190158. (5554.58)	245198. (6943.23)	(
2 COMBINED	14	1504.00 (4050.74)	1	52189. (1477.83)	103079. (2935.85)	129423. (3064.85)	155166. (4393.86)	200072. (5852.31)	258304. (7314.36)	(
ROUTED TO	14	1504.00 (4050.74)	1	3400. (96.28)	8700. (246.30)	11777. (333.48)	20620. (583.89)	37920. (1073.94)	67160. (1901.93)	(
ROUTED TO	15	1504.00 (4050.74)	1	3400. (96.28)	8700. (246.30)	11630. (329.49)	20384. (577.21)	37073. (1060.78)	65888. (1805.75)	(
2 COMBINED	15	2528.00 (6547.49)	1	15004. (447.53)	33387. (945.41)	41208. (1100.88)	54138. (1533.01)	82157. (2320.44)	108878. (3083.09)	(
ROUTED TO	18	2528.00 (6547.49)	1	14896. (421.82)	31591. (894.50)	38900. (1101.68)	51012. (1461.50)	78794. (2231.20)	106408. (3013.15)	(
HYDROGRAPH AT	16	191.00 (494.09)	1	9900. (282.19)	19931. (504.38)	24914. (705.48)	29897. (846.58)	39862. (1126.77)	49828. (1410.96)	(
ROUTED TO	18	191.00 (494.09)	1	9363. (265.12)	18725. (530.24)	23400. (602.80)	28088. (795.36)	37450. (1060.40)	46813. (1325.59)	(
2 COMBINED	18	2719.00 (7042.18)	1	14970. (423.90)	31738. (898.73)	39099. (1107.15)	51844. (1468.05)	79103. (2239.94)	107170. (3034.71)	(
HYDROGRAPH AT	17	201.00 (520.59)	1	13453. (330.94)	20906. (701.88)	33632. (952.35)	40358. (1142.82)	53811. (1523.70)	67264. (1904.70)	(
ROUTED TO	17	201.00 (520.59)	1	2812. (79.63)	4403. (124.68)	9412. (266.51)	14557. (412.20)	23040. (652.41)	31912. (903.66)	(
ROUTED TO	18	201.00 (520.59)	1	2090. (70.18)	3678. (104.10)	6064. (188.71)	9981. (282.63)	16287. (461.21)	22844. (646.88)	(
2 COMBINED	18	2920.00 (7562.77)	1	10994. (481.21)	35094. (993.75)	42499. (1203.42)	55244. (1564.33)	82579. (2338.39)	112189. (3176.83)	(
HYDROGRAPH AT	18	19.00 (49.21)	1	797. (22.57)	1594. (45.14)	1993. (50.43)	2391. (67.71)	3188. (90.20)	3985. (112.85)	(
2 COMBINED	18	2939.00 (7611.98)	1	17029. (482.22)	35102. (995.07)	42587. (1205.94)	55351. (1567.35)	82720. (2342.61)	112414. (3183.22)	(
ROUTED TO	21	2939.00 (7611.98)	1	10550. (408.06)	54119. (900.10)	41239. (1107.75)	53792. (153.22)	81030. (2294.52)	110244. (3121.77)	(

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HYDROGRAPH AT	19	98.00 (253.82)	1	6003. (171.07)	12125. (343.35)	15156. (429.18)	18186. (515.02)	24250. (686.09)	30313. (858.37)
ROUTED TO	21	98.00 (253.82)	1	3527. (99.89)	7055. (199.77)	8819. (249.71)	10582. (299.66)	14110. (399.54)	17637. (499.43)
2 COMBINED	21	3037.00 (7865.79)	1	16008. (470.29)	34229. (909.27)	41382. (1171.82)	53965. (1528.11)	81271. (2301.35)	110560. (3130.72)
HYDROGRAPH AT	20	74.00 (191.00)	1	10683. (302.51)	21366. (605.01)	26707. (750.27)	32049. (907.52)	42732. (1210.03)	53415. (1512.53)
ROUTED TO	20	74.00 (191.00)	1	188. (5.34)	379. (10.74)	484. (13.09)	584. (16.64)	841. (23.80)	1233. (34.92)
ROUTED TO	21	74.00 (191.00)	1	187. (5.29)	370. (10.64)	479. (13.56)	582. (16.48)	824. (23.34)	1207. (34.18)
2 COMBINED	21	3111.00 (8057.45)	1	16782. (475.22)	34575. (979.06)	41825. (1184.36)	54502. (1543.34)	82002. (2322.03)	111610. (3160.45)
HYDROGRAPH AT	21	27.00 (69.93)	1	1805. (51.12)	3611. (102.25)	4514. (127.81)	5416. (153.37)	7222. (204.49)	9027. (255.62)
2 COMBINED	21	3138.00 (8127.38)	1	16807. (475.93)	34623. (980.41)	41888. (1186.13)	54578. (1545.46)	82107. (2325.00)	111748. (3164.34)
ROUTED TO	22	3138.00 (8127.38)	1	16665. (471.90)	34374. (973.36)	41500. (1175.32)	54199. (1534.74)	81546. (2309.13)	111208. (3149.07)
HYDROGRAPH AT	22	98.00 (253.82)	1	8894. (251.86)	17788. (503.71)	22235. (629.64)	26683. (755.57)	35577. (1007.42)	44471. (1259.28)
2 COMBINED	22	3236.00 (8381.20)	1	16705. (473.03)	34454. (975.62)	41606. (1178.14)	54324. (1536.29)	81713. (2313.85)	111438. (3155.57)
ROUTED TO	22	3236.00 (8381.20)	1	16236. (459.75)	33608. (951.67)	41033. (1161.92)	53595. (1517.65)	81106. (2296.60)	109132. (3090.27)

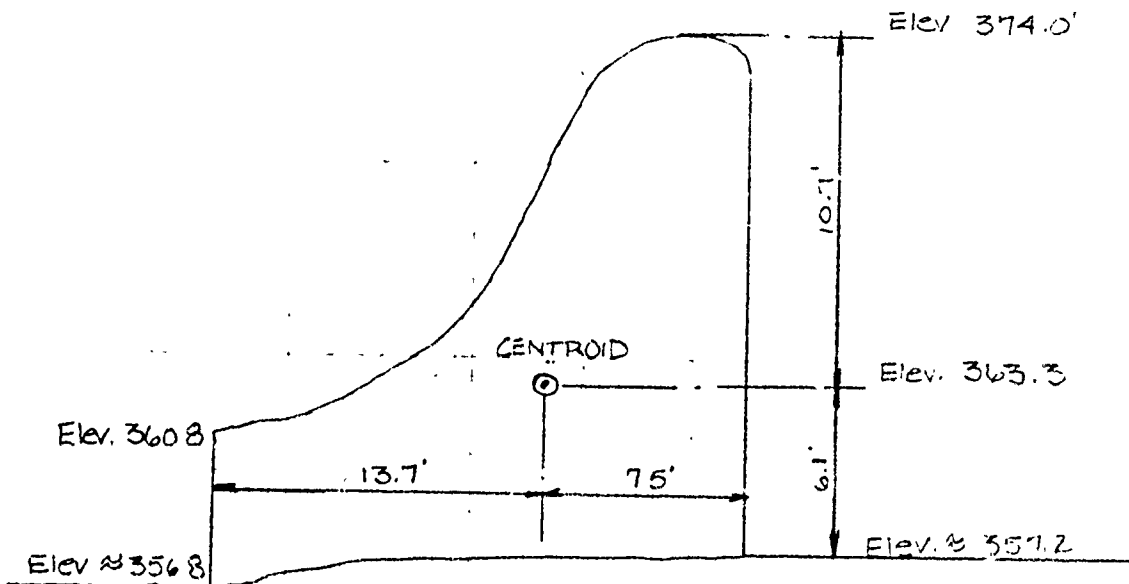


APPENDIX D

STRUCTURAL STABILITY ANALYSIS

LOCKE 24
Stability Analysis

20:0-D1



① Determine Weight of Masonry Dam

$$\begin{aligned}
 W_D &= (\text{Area})(150 \text{ pcf}) \\
 &= (204 \text{ sf})(150 \text{ pcf}) \\
 &= 30600 \text{ lbs/lin ft} \\
 &= 30.6 \text{ Kips/lin. ft.}
 \end{aligned}$$

② Determine Water Force for Following Conditions

A. Upstream

- | | |
|----------------|--------------|
| 1. Normal Pool | Elev. 374.0 |
| 2 1/2 DMF | Elev. 381.45 |
| 3. PMF | Elev. 386.95 |

Locke 24
Stability Analysis

page 22

B. Downstream

- | | |
|-----------------------------|-------------|
| 1. Low Tailwater | Elev. 363.0 |
| 2. High Tailwater of Record | Elev. 372.5 |

A₁. Upstream Normal Pool

$$\begin{aligned}
 P_{\text{UNP}} &= \frac{1}{2} \gamma_w h^2 \\
 &= \frac{1}{2} (62.4) (16.8)^2 \\
 &= 8806 \text{ lbs/lin.ft} \\
 &= 8.81 \text{ Kips/lin.ft}
 \end{aligned}$$

Resultant Acts 5.6' Above Base

A₂. Upstream 1/2 PMF

$$\begin{aligned}
 P'_{\text{U}1/2\text{PMF}} &= \frac{1}{2} (62.4) (24.25)^2 - \frac{1}{2} (62.4) (7.45)^2 \\
 &= 18348 - 1732 \\
 &= 16616 \text{ lbs/lin.ft.} \\
 &= 16.62 \text{ Kips/lin.ft}
 \end{aligned}$$

Location of Resultant

$$\begin{aligned}
 \bar{y} [(16.8)(7.45) + \frac{1}{2}(16.8)(16.8)] &= (8.4)(16.8)(7.45) + (5.6) \frac{1}{2} (16.8)(16.8) \\
 \bar{y} (125.16 + 141.12) &= 1051.34 + 790.27 \\
 \bar{y} (266.28) &= 1841.61 \\
 \bar{y} &= 6.92' \text{ Above Base}
 \end{aligned}$$

Locke 24
Stability Analysis

A₃ Upstream Full PMF

$$\begin{aligned}
 P_{UPMF} &= \left(\frac{1}{2}\right)(62.4)(29.75)^2 - \left(\frac{1}{2}\right)(62.4)(12.95)^2 \\
 &= 27614 - 5232 \\
 &= 22382 \text{ lbs./lin. ft.} \\
 &= 22.38 \text{ kips/lin ft.}
 \end{aligned}$$

Location of Resultant

$$\begin{aligned}
 \bar{y} &= \left[(16.8)(12.95) + \frac{1}{2}(16.8)(16.8) \right] + (8.4)(16.8)(12.95) + (5.6)\left(\frac{1}{2}\right)(16.3)(16.8) \\
 \bar{y} &= (217.56 + 141.12) + 1827.50 + 790.27 \\
 \bar{y} &= (358.68) = 2617.77 \\
 \bar{y} &= 7.30' \text{ Above Base}
 \end{aligned}$$

B₁ Downstream Low Tailwater

$$\begin{aligned}
 P_{DLT} &= \frac{1}{2}(62.4)(6.20)^2 \\
 &= 1199 \text{ lbs./lin. ft.} \\
 &= 1.20 \text{ kips/lin ft.}
 \end{aligned}$$

Resultant Acts 2.07' Above Base

B₂ Downstream High Tailwater

$$\begin{aligned}
 P_{DHT} &= \frac{1}{2}(62.4)(15.7)^2 \\
 &= 7690 \text{ lbs./lin. ft.} \\
 &= 7.69 \text{ kips/lin ft.}
 \end{aligned}$$

Resultant Acts 5.23' Above Base

Case 24
Stability Analysis

23_0 D4

③ Determine Ice Load

$$P_{I \text{ MAX}} = \frac{(5000 \text{ psf})(2' \text{ deep})}{1000}$$

$$= 10 \text{ Kips/lin ft.}$$

Resultant Acts 15.8' Above Base

④ Determine Upstream Siltation Force

Assume Siltation to Elev. 366 (Gate Crest)

$$P_s = \frac{1}{2} (85 \text{ psf})(366.0 - 357.2)^2$$

$$= 3291.2 \text{ lbs/lin. ft.}$$

$$= 3.29 \text{ Kips/lin ft}$$

Resultant Acts 2.93' Above Base

⑤ Determine Hydrodynamic Pressure, Force, and Moment

$$P_e = c \lambda \gamma_w \sqrt{z h}$$

$$\text{for } z/h = 1 \quad c = .73$$

$$\text{for zone 2} \quad \lambda = .05$$

$$P_e = \frac{(.73)(.05)(62.4)(16.8)}{1000} = .0383 \text{ Ksf / lin ft}$$

(for Normal Pool)

Locke 24
Stability Analysis

Page D5

$$\begin{aligned} V_e &= .726 P_e z \\ &= (.726)(.0383)(16.8) \\ &= .47 \text{ Kips / lin. ft.} \\ &\quad (\text{for Normal Pool}) \end{aligned}$$

$$\begin{aligned} M_e &= .299 P_e z^2 \\ &= (.299)(.0383)(16.8)^2 \\ &= 3.23 \text{ Kip-ft / lin. ft.} \\ &\quad (\text{for Normal Pool}) \end{aligned}$$

For 1/2 PMF:

$$P_e = \frac{(.73)(.05)(62.4)(24.25)}{1000} = .0552 \text{ Ksf / lin. ft.}$$

$$V_e = (.726)(.0552)(24.25) = .97 \text{ Kips / lin. ft.}$$

$$M_e = (.299)(.0552)(24.25)^2 = 9.71 \text{ Kip-ft / lin. ft.}$$

For Full PMF:

$$P_e = \frac{(.73)(.05)(62.4)(29.75)}{1000} = .0678 \text{ Ksf / lin. ft.}$$

$$V_e = (.726)(.0678)(29.75) = 1.46 \text{ Kips / lin. ft.}$$

$$M_e = (.299)(.0678)(29.75)^2 = 17.94 \text{ Kip-ft / lin. ft.}$$

Locke 24
Stability Analysis

DS-C-26

- ⑥ Determine Inertia Force Due to Seismic

$$P_c = \lambda W_c$$

$$= (.05)(30.6)$$

$$= 1.53 \text{ Kips/lin.ft.}$$

Resultant Acts Through Centroid,
6.1 Above Base

- ⑦ Determine Full and 1/2 Uplift Pressures at Normal Pool,
1/2 PMF, and Full PMF

At Normal Pool:

$$P_{u, \text{Full}} = (62.4)(21.2)(365 - 356.8) + \frac{1}{2}(62.4)(21.2)$$

$$\left[(374 - 357.2) - (365 - 356.8) \right]$$

$$= 10847 + 5688$$

$$= 16535 \text{ lbs/lin.ft.}$$

$$= 6.54 \text{ Kips/lin.ft.}$$

$$\bar{X} (10847 + 5688) = (10.6)(10847) + (14.1)(5688)$$

$$\bar{X} 16535 = 195179$$

$$\bar{X} = 11.8' \text{ From Toe}$$

At 1/2 PMF:

$$P_{u, \text{Full}} = (62.4)(21.2)(372.5 - 356.8) + \frac{1}{2}(62.4)(21.2)$$

$$\left[24.25 - (372.5 - 356.8) \right]$$

$$= 20769 + 5655$$

$$= 26424 \text{ lbs/lin.ft.}$$

$$= 26.42 \text{ Kips/lin.ft.}$$

Locke 24
Stability Analysis

$$P_{u\frac{1}{2}} = 13.21 \text{ Kips/lin ft.}$$

$$\bar{X} (20769 + 5655) = (10.6)(20769) + (14.1)(5655)$$

$$\bar{X} 26424 = 299887$$

$$\bar{X} = 11.35' \text{ From Toe}$$

At Full PMF:

$$P_{u\text{ Full}} = 20769 + \frac{1}{2}(62.4)(21.2)(29.75 - 15.7)$$

$$= 20769 + 9293$$

$$= 30062 \text{ lbs./lin.ft}$$

$$= 30.06 \text{ Kips/lin.ft}$$

$$P_{u\frac{1}{2}} = 15.03 \text{ Kips/lin.ft.}$$

$$\bar{X} (20769 + 9293) = (10.6)(20769) + (14.1)(9293)$$

$$\bar{X} 30062 = 351183$$

$$\bar{X} = 11.68' \text{ From Toe}$$

Locke 24
Stability Analysis

FORCE and MOMENT

LOADING		FORCE (KIPS)	MOMENT ARM (FT.)	MOMENT ABOUT TOE (KIP-FT)
Weight of Dam	W_c	30.6	13.7	+419.22
Water Forces				
Downstream				
Low	P_{DLT}	1.20	2.07	+2.48
High	P_{DHT}	7.69	5.23	+40.22
Upstream				
Normal	P_{UNP}	8.81	-5.6	-49.34
1/2 PMF	$P_{1/2 PMF}$	16.62	-6.92	-115.01
PMF	P_{UPMF}	22.38	-7.30	-163.37
Ice	P_{IMAX}	10.0	-15.8	-158.00
Silt	P_s	3.29	-2.93	-9.64
Hydrodynamic Loading (V_c, M_c)				
Normal		.97	-6.87	-3.23
1/2 PMF		.97	-10.01	-9.71
PMF		1.46	-12.29	-17.94
Seismic Inertia Force	P_c	1.53	-6.1	-9.33
Hydrostatic Uplift	(P_u)			
Normal Pool				
Full Uplift		16.54	-11.8	-193.17
1/2 Uplift		8.27	-11.8	-97.59
1/2 PMF				
Full Uplift		26.42	-11.35	-299.87
1/2 Uplift		13.21	-11.35	-149.93
PMF				
Full Uplift		30.06	-11.68	-351.10
1/2 Uplift		15.03	-11.68	-175.55

Locke 24
Stability Analysis

page D9

STABILITY CALCULATIONS

① Normal Pool, 1/2 Uplift, No Ice, No Seismic

A. OVERTURNING STABILITY

$$\text{Resisting Moments} = 419.22 + 2.48 = 421.7$$

$$\text{Overturning Moments} = -49.34 - 9.64 - 97.59 = 156.57$$

$$F.S. = \frac{421.70}{156.57} = 2.69 \text{ (with respect to overturning)}$$

$$\bar{x} = \frac{421.7 - 156.27}{30.6 - 8.27} = 11.87$$

$$e = B/2 - \bar{x} = \frac{21.2}{2} - 11.87 = -1.27$$

$$\frac{B}{6} = \frac{21.6}{6} = 3.53 > 1.27 \text{ (Resultant within Middle 1/3)}$$

B. SLIDING STABILITY

$$F.S. = \frac{(W_c - P_u) \tan \phi}{\sum F_{\text{horizontal}}}$$

$$= \frac{30.6 - 8.27 \tan 35^\circ}{1.20 - 8.81 - 3.29} = \frac{(22.33)(.70)}{10.9} = 1.43$$

② Normal Pool, Full Uplift, No Ice, No Seismic

A. OVERTURNING

$$\text{Resisting Moments} = 419.22 + 2.48 = 421.7$$

$$\text{Overturning Moments} = -49.34 - 9.64 - 195.17 = 254.15$$

$$F.S. = \frac{421.7}{254.15} = 1.66$$

Locke 24
Stability Analysis

$$\bar{x} = \frac{421.7 - 254.15}{30.6 - 16.54} = 11.92$$

$$e = 10.6 - 11.92 = 1.32 < 3.53 \text{ (Resultant within Middle } \frac{1}{3} \text{)}$$

B. SLIDING

$$F.S. = \frac{(30.6 - 16.54)(1.70)}{1.20 - 8.81 - 3.29} = .90$$

③ Normal Pool, $\frac{1}{2}$ PMF, Ice, No Seismic

A. OVERTURNING

$$\text{Resisting Moments} = 419.22 + 2.48 = 421.7$$

$$\text{Overturning Moments} = -49.34 - 158.0 - 9.64 - 97.59 = -314.57$$

$$F.S. = \frac{421.7}{314.57} = 1.34$$

$$\bar{x} = \frac{421.7 - 314.57}{30.6 - 8.27} = 4.80$$

$$e = 10.6 - 4.80 = 5.8 > 3.53 \text{ (Resultant outside Middle } \frac{1}{3} \text{)}$$

B. SLIDING

$$F.S. = \frac{(30.6 - 8.27)(1.70)}{1.20 - 8.81 - 10.0 - 3.29} = .75$$

④ Normal Pool, Full Uplift, Ice, No Seismic

A. OVERTURNING

$$\text{Resisting Moments} = 419.22 + 2.48 = 421.7$$

$$\text{Overturning Moments} = -49.34 - 158.0 - 9.64 - 195.17 = -412.15$$

Locke 24
Stability Analysis

page 211

$$F.S. = \frac{421.7}{412.15} = 1.02$$

$$\bar{x} = \frac{421.7 - 412.15}{30.6 - 16.54} = .68$$

$$e = 10.6 - 6.8 = 9.92 > 3.53 \text{ (Resultant outside Middle } \frac{1}{3} \text{)}$$

B. SLIDING

$$F.S. = \frac{(30.6 - 16.54)(.70)}{1.20 - 8.81 - 10.0 - 3.29} = .47$$

⑤ Normal Pool, 1/2 Uplift, Ice, Seismic

A. OVERTURNING

$$\text{Resisting Moments} = 419.22 + 2.48 = 421.7$$

$$\text{Overturning Moments} = -49.34 - 158.0 - 9.64 - 3.23 - 9.33 - 97.59 \\ = 327.13$$

$$F.S. = \frac{421.7}{327.13} = 1.29$$

$$\bar{x} = \frac{421.7 - 327.13}{30.6 - 8.27} = 4.24$$

$$e = 10.6 - 4.24 = 6.36 > 3.53 \text{ (Resultant outside Middle } \frac{1}{3} \text{)}$$

B. SLIDING

$$F.S. = \frac{(30.6 - 8.27)(.70)}{1.20 - 8.81 - 10.0 - 3.29 - .47 - 1.53} = .68$$

Locke 24
Stability Analysis

page - D12

⑥ Normal Pool, Full Uplift, Ice, Seismic

A. OVERTURNING

$$\text{Resisting Moments} = 419.22 + 2.48 = 421.7$$

$$\begin{aligned} \text{Overturning Moments} &= -49.34 - 158.0 - 9.64 - 3.23 - 9.33 - 195.17 \\ &= -424.71 \end{aligned}$$

$$F.S. = \frac{421.7}{424.71} = .99$$

$$\bar{x} = \frac{421.7 - 424.71}{30.6 - 16.54} = -.21$$

$$e = 10.6 + .21 = 10.81 \text{ (Resultant outside Base)}$$

B. SLIDING

$$F.S. = \frac{(30.6 - 16.54)(.70)}{1.20 - 8.81 - 10.0 - 3.29 - .47 - 1.53} = .43$$

⑦ 1/2 PMF, 1/2 Uplift, No Ice, No Seismic

A. OVERTURNING

$$\text{Resisting Moments} = 419.22 + 40.22 = 459.44$$

$$\text{Overturning Moments} = -115.01 - 9.64 - 149.93 = -274.58$$

$$F.S. = \frac{459.44}{274.58} = 1.67$$

$$\bar{x} = \frac{459.44 - 274.58}{30.6 - 13.21} = 10.63$$

$$e = 10.6 - 10.63 = -.03 < 3.53 \text{ (Resultant Middle 1/3)}$$

Locke 24
Stability Analysis

Page - D13

B. SLIDING

$$F.S. = \frac{(30.6 - 13.21)(.70)}{7.69 - 16.62 - 3.29} = 1.0$$

⑧ 1/2 PMF, 1/2 Uplift, No Ice, Seismic

A. OVERTURNING

$$\text{Resisting Moments} = 419.22 + 40.22 = 459.44$$

$$\text{Overturning Moments} = -115.01 - 9.64 - 9.71 - 9.33 - 149.93 = 293.62$$

$$F.S. = \frac{459.44}{293.62} = 1.56$$

$$\bar{x} = \frac{459.44 - 293.62}{30.6 - 13.21} = 9.54$$

$$e = 10.6 - 9.54 = 1.06 < 3.53 \text{ (Resultant Middle 1/3)}$$

B. SLIDING

$$F.S. = \frac{(30.6 - 13.21)(.70)}{7.69 - 16.62 - 3.29 - .97 - 1.53} = .83$$

⑨ PMF, 1/2 Uplift, No Ice, No Seismic

A. OVERTURNING

$$\text{Resisting Moments} = 419.22 + 40.22 = 459.44$$

$$\text{Overturning Moments} = -163.37 - 9.64 - 175.55 = 348.56$$

$$F.S. = \frac{459.44}{348.56} = 1.32$$

$$\bar{x} = \frac{459.44 - 348.56}{30.6 - 15.03} = 7.12$$

Locke 24
Stability Analysis

page D14

$$e = 10.6 - 7.12 = 3.48 < 3.53 \text{ (Resultant Middle } 1/3)$$

B. SLIDING

$$F.S. = \frac{(30.6 - 15.03)(.70)}{7.69 - 22.38 - 3.29} = .61$$

(10) PMF, 1/2 Uplift, No Ice, Seismic

A. OVERTURNING

$$\text{Resisting Moments} = 419.22 + 40.22 = 459.44$$

$$\text{Overturning Moments} = -163.37 - 9.64 - 17.94 - 9.33 - 175.55 \\ = -375.83$$

$$F.S. = \frac{459.44}{375.83} = 1.22$$

$$\bar{x} = \frac{(459.44 - 375.83)(.70)}{30.6 - 15.03} = 5.37$$

$$e = 10.6 - 5.37 = 5.23 > 3.53 \text{ (Resultant outside Middle } 1/3)$$

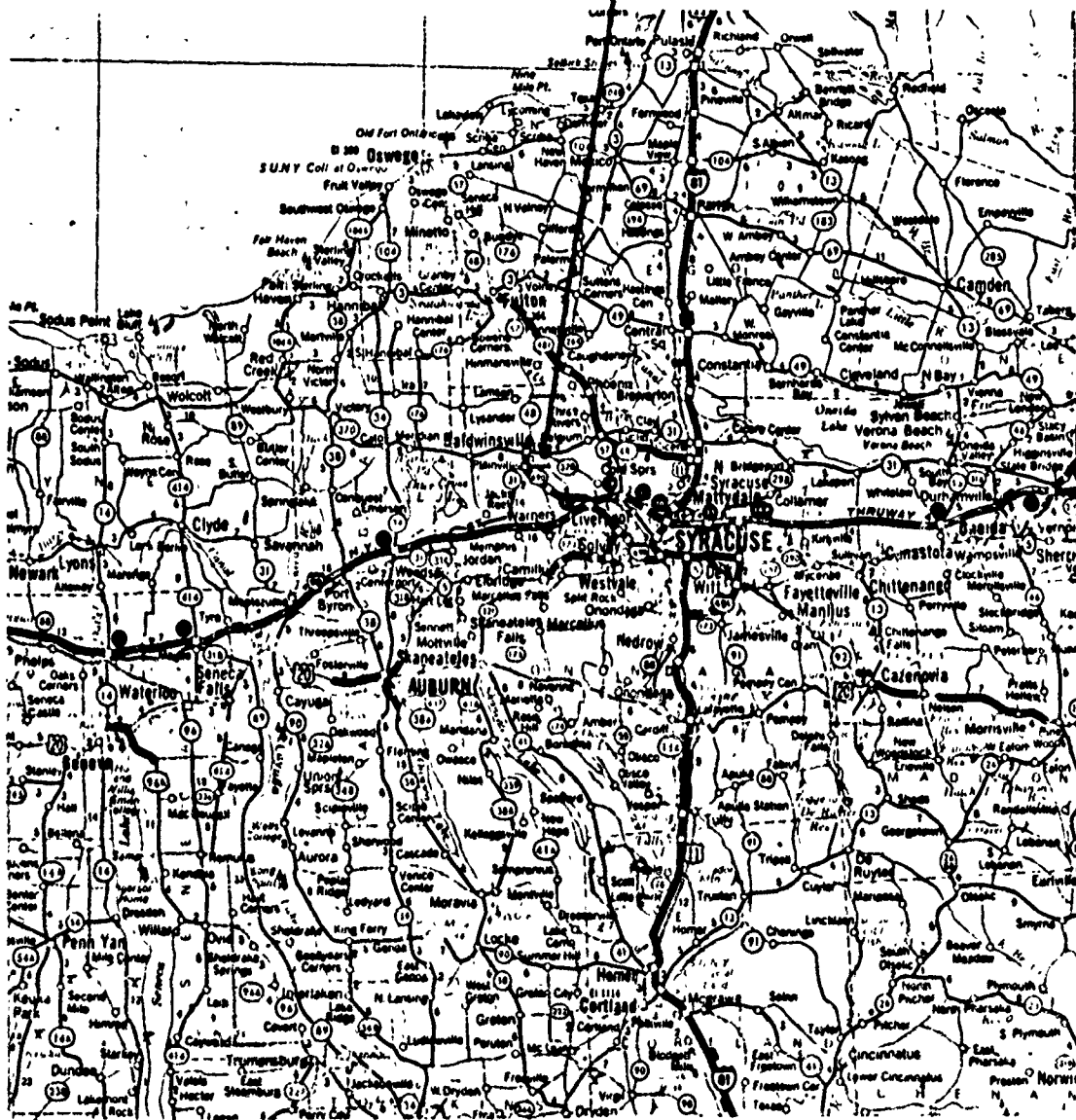
B. SLIDING

$$F.S. = \frac{(30.6 - 15.03)(.70)}{7.69 - 22.38 - 3.29 - 1.46 - 1.53} = .52$$

APPENDIX E

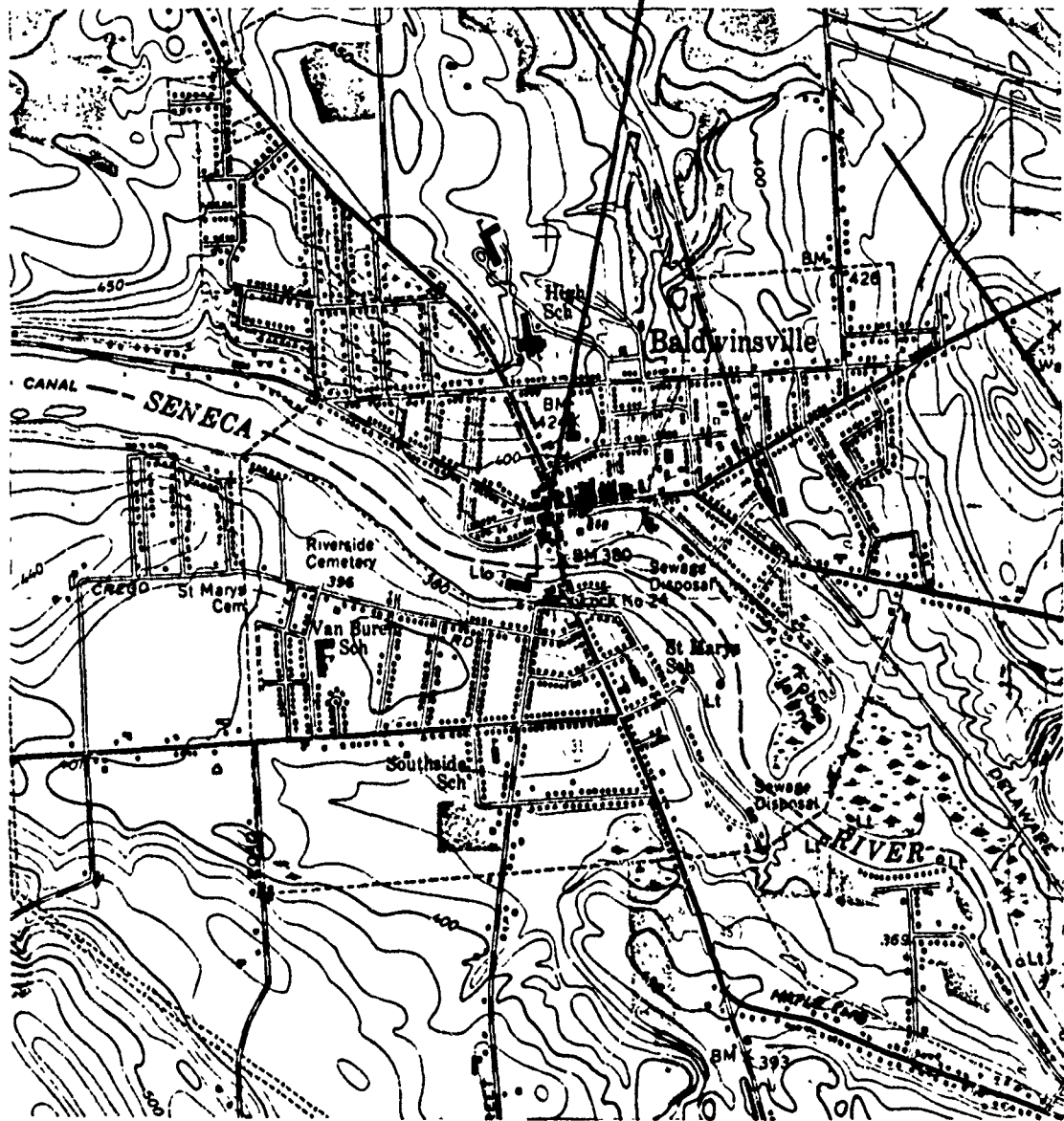
DRAWINGS

DAM SITE



VICINITY MAP
LOCK 24 ERIE CANAL
I.D. NO. N.Y. 792

DAM SITE



TOPOGRAPHIC MAP
LOCK 24 ERIE CANAL
I.D. NO. N.Y. 792

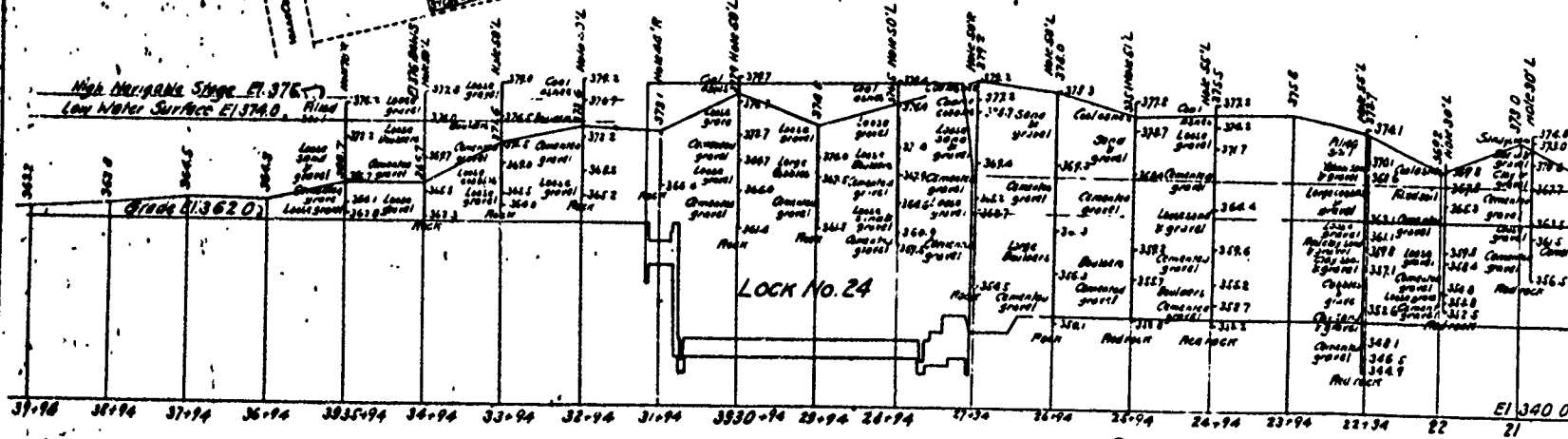
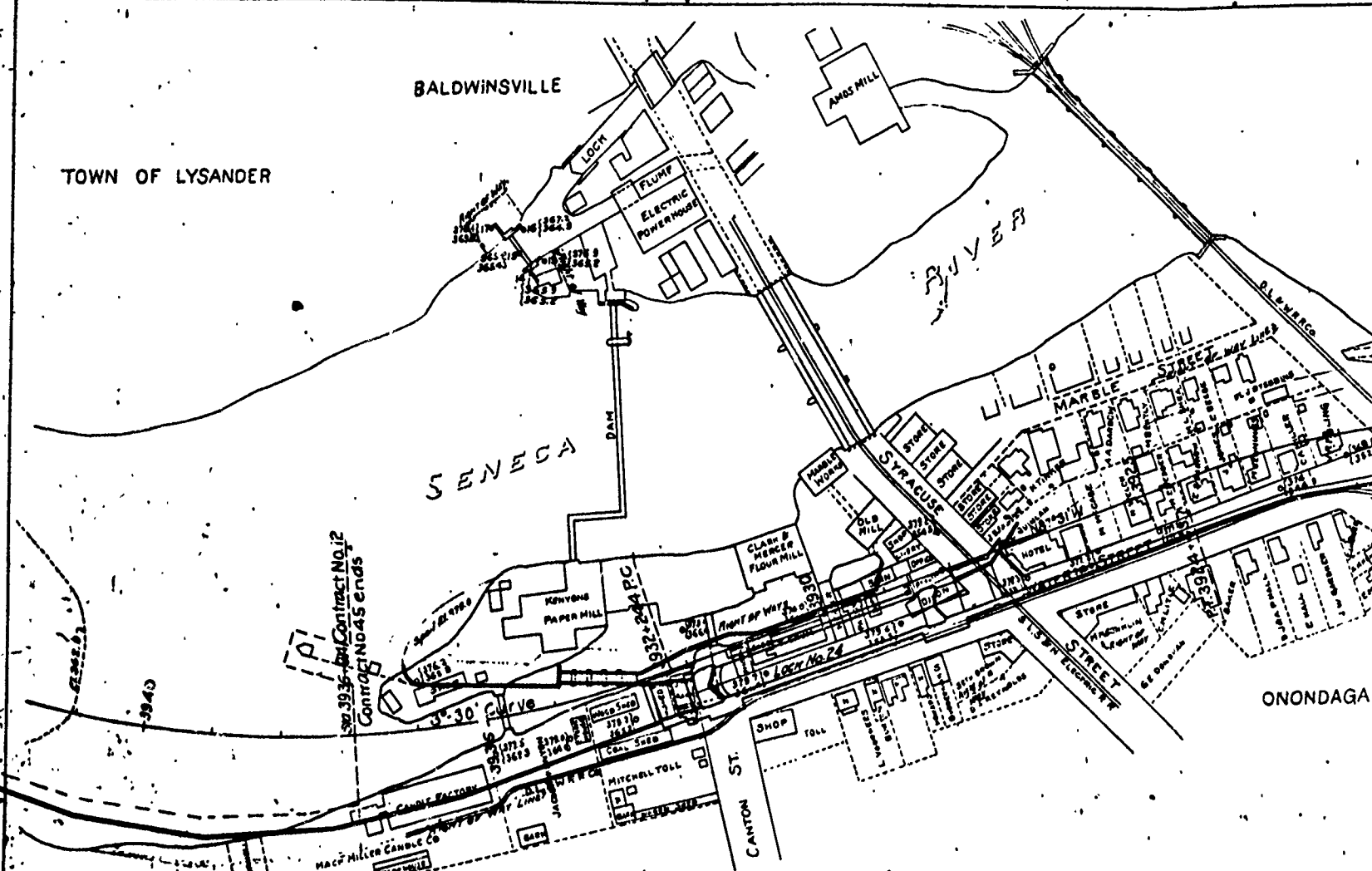
BALDWINVILLE

TOWN OF LYSANDER

SENECA RIVER

RIVER

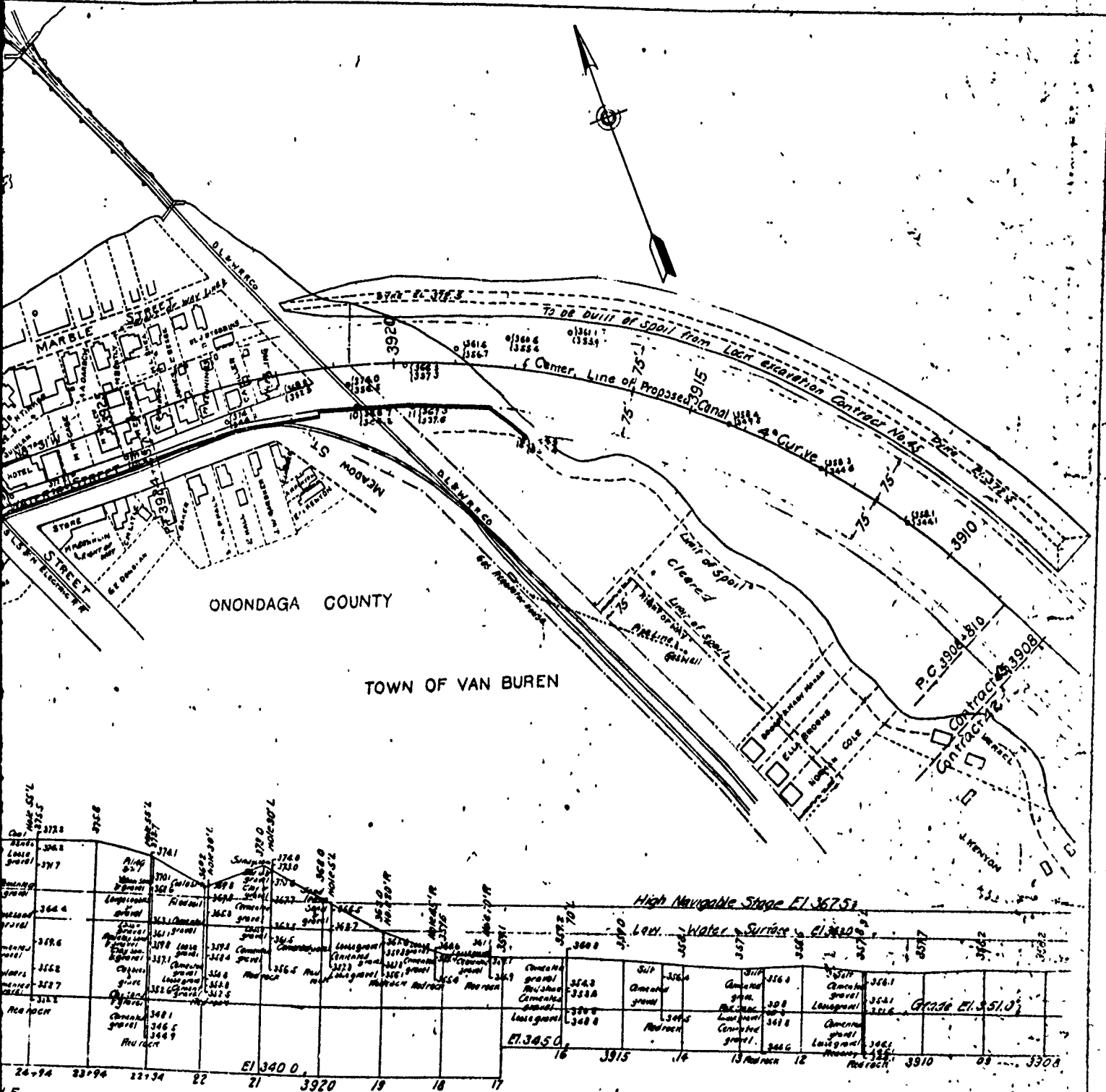
ONONDAGA



PROFILE
 Scale: Hor 1"=100'
 Vert 1"=10'

MADE BY: [Signature]
 TRACED BY: [Signature]
 CHECKED BY: [Signature]
 CHECK BY: [Signature]

1



Contract No. 45.

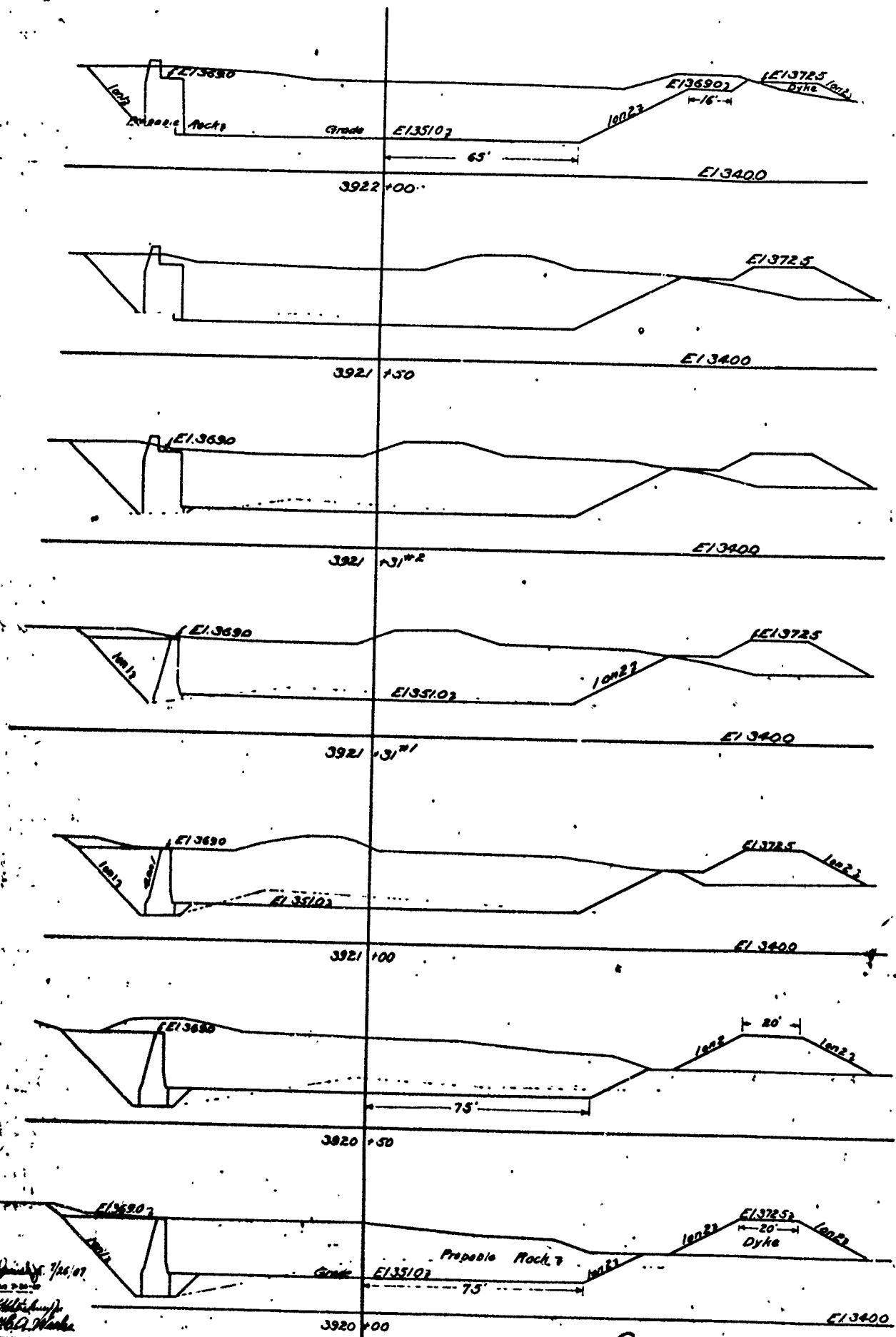
Erie Canal -- Section 6.
 For the construction of a dam in the Onondaga River at
 Oughdenoy and of Lock No. 24 and appertaining
 structures at Baldwinsville

PLAN & PROFILE OF LOCK NO. 24 & APPROACHES

Scales: Hor. 100 feet to the inch
 Vert. 1" = 10'

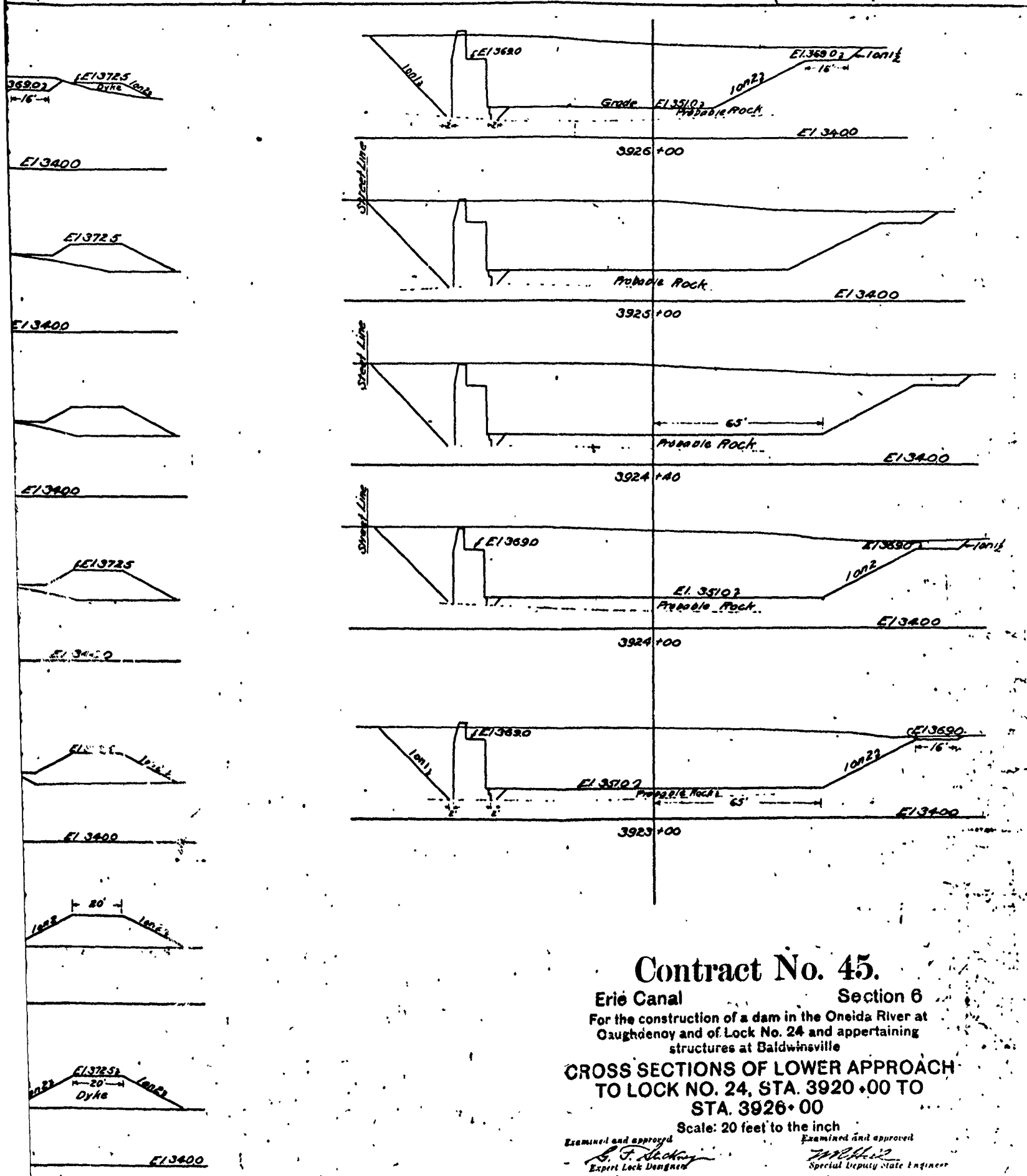
Examined and approved
G. F. Shaw
 Paper from District
 Nov. 27 1907

Examined and approved
W. H. Hill
 District Engineer
 Nov. 22 1907



MADE BY *[Signature]* 7/26/07
 TRACED BY *[Signature]*
 CHECKED BY *[Signature]*
 2ND CHECK BY *[Signature]*

↑



Contract No. 45.

Erie Canal Section 6
 For the construction of a dam in the Oneida River at
 Oughdenoy and of Lock No. 24 and appertaining
 structures at Baldwinsville

CROSS SECTIONS OF LOWER APPROACH TO LOCK NO. 24, STA. 3920+00 TO STA. 3926+00

Scale: 20 feet to the inch

Examined and approved
S. F. Shockey
 Expert Lock Designer
 720 V. 27. 1907

Examined and approved
W. H. Hill
 Special Deputy State Engineer
 Jan. 27 1907

2

For details of Guard
See sheet No 26

Present Shore Line



Proposed

Center Line of Proposed Canal

1305'
Sta. 9941+95.3

ET. 3790 (Curve)
R. 355.57
Δ = 34° 31' 08"

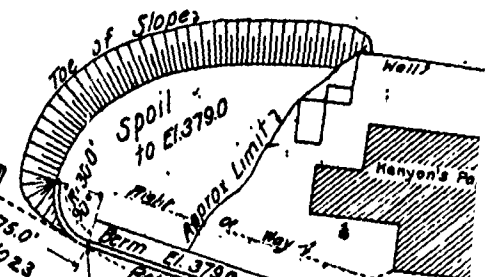
1200'

Spoil to El. 379.0

180' Berm to El. 379.0

Grade = 362.0

No. 1 Timber Crips
No. 2
No. 3
500' 300' 75.0'
For detail see sheet No 23



105.0'

393'

100.0'

175.25'

100.0'

660' 100.0'

312-2935' P.C. & Curve

Branch D.L. & W.R.R.

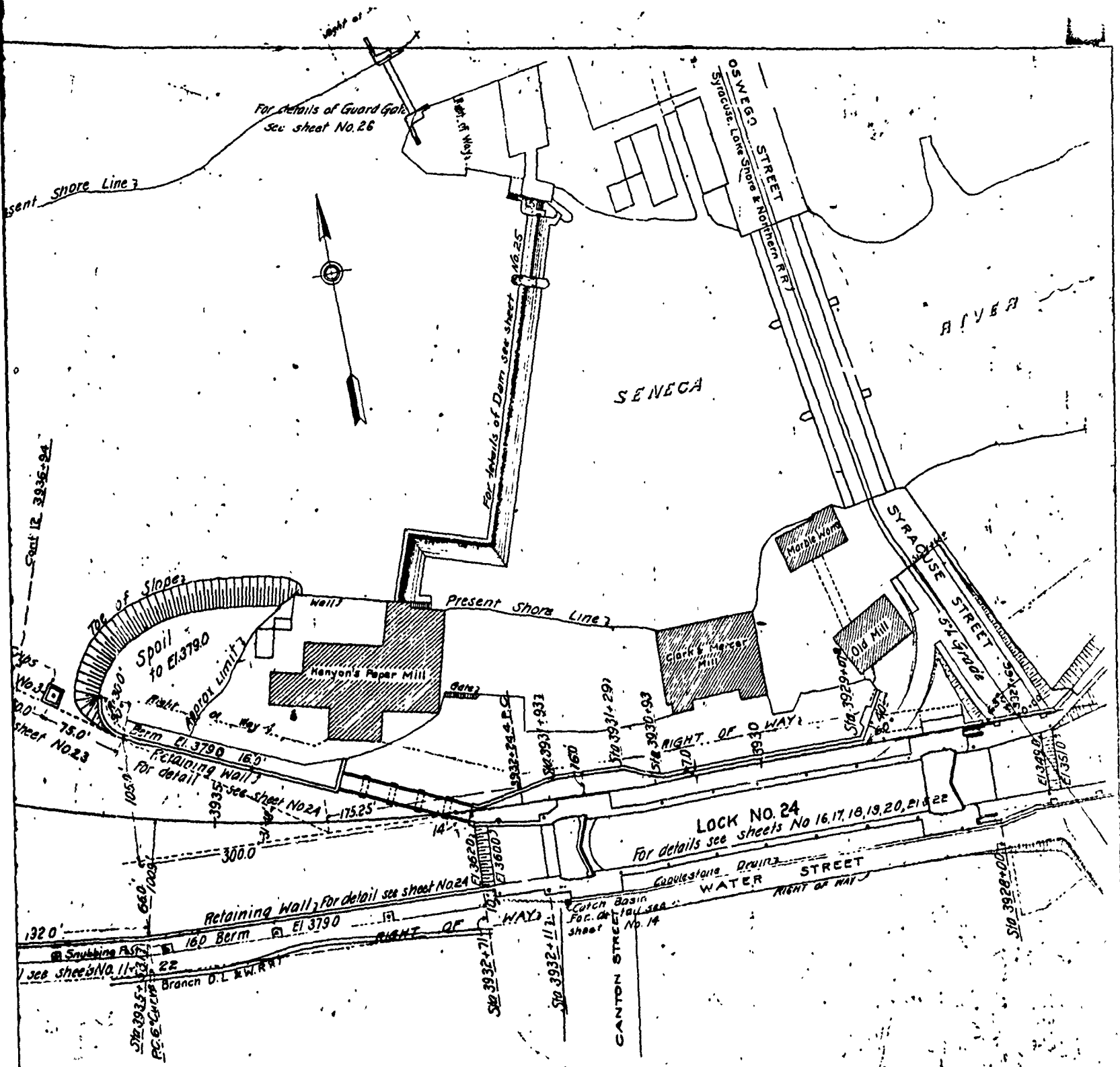
192.15'
Wall on Crips
For detail see sheet No 23

192.0'
Cost Street
Shrubbing Area
For detail see sheet No. 11-22

Retaining Wall, For detail

16.0' Berm to El. 379.0

Drawn by Schaeffer 4/1/07
Checked by P. Anderson
100' Check on 2/1/11
and Check on 2/1/11



Contract No. 45.

Erie Canal Section 6.

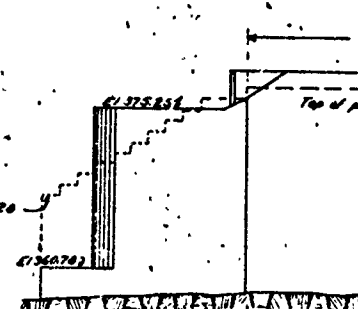
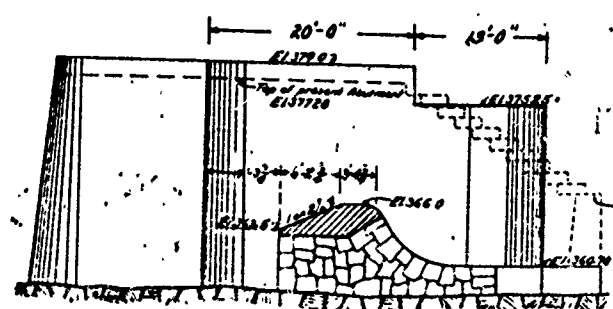
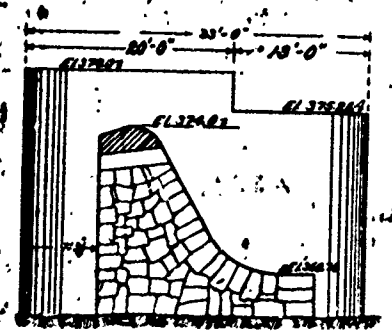
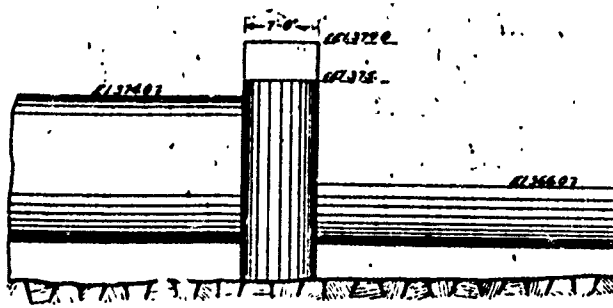
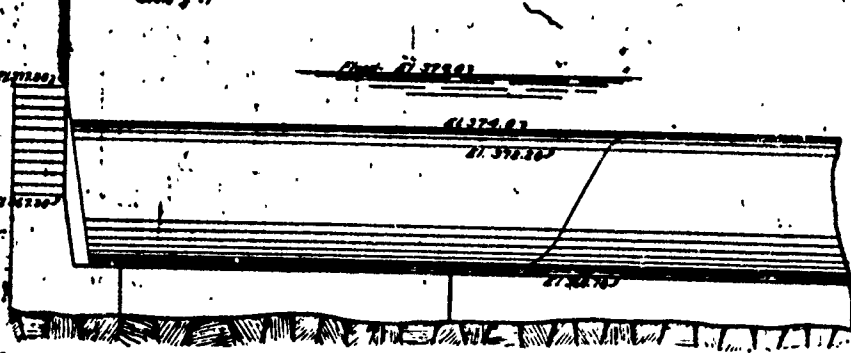
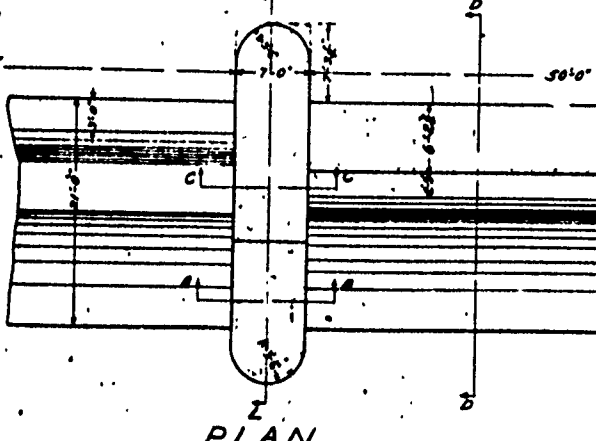
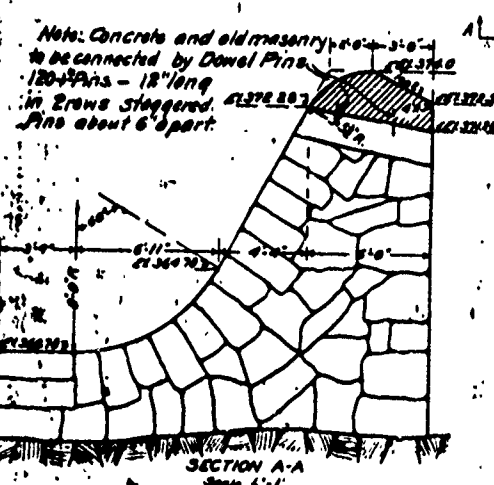
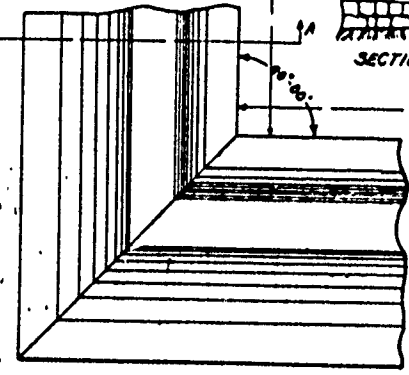
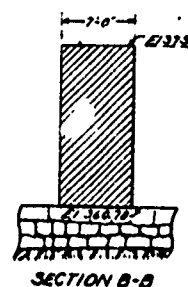
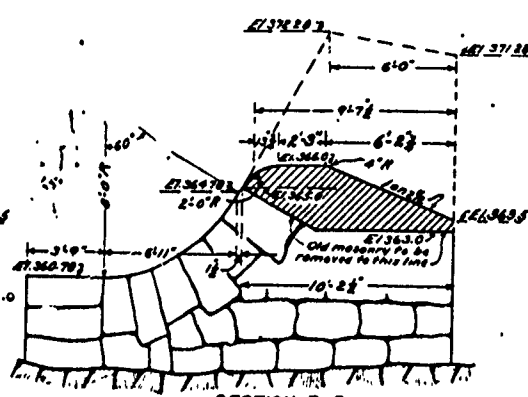
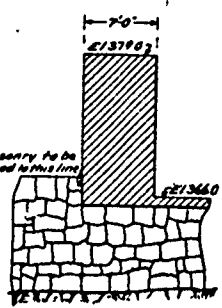
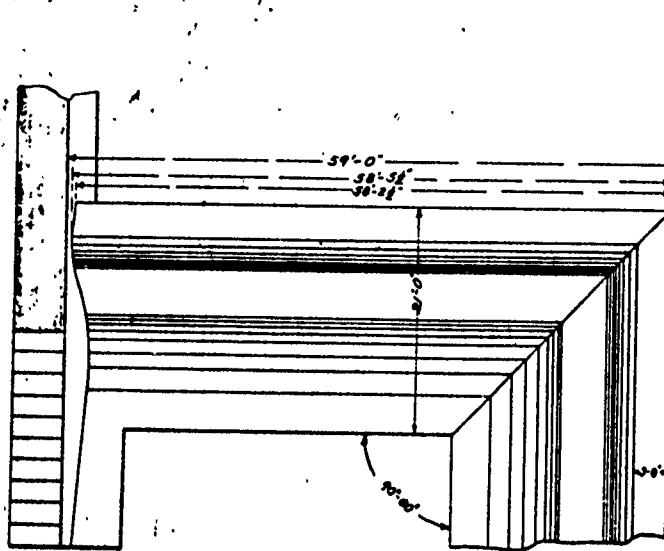
For the construction of a dam in the Oneida River at Oughdenoy and of Lock No. 24 and appertaining structures at Baldwinsville

DETAILED LOCATION PLAN OF UPPER APPROACH TO LOCK NO. 24

Scale: 50 feet to the inch

Examined and approved
B. F. Johnson
 Expert Lock Designer
 Nov. 27, 1907

Examined and approved
W. H. Hill
 Special Deputy State Engineer
 Jan 22

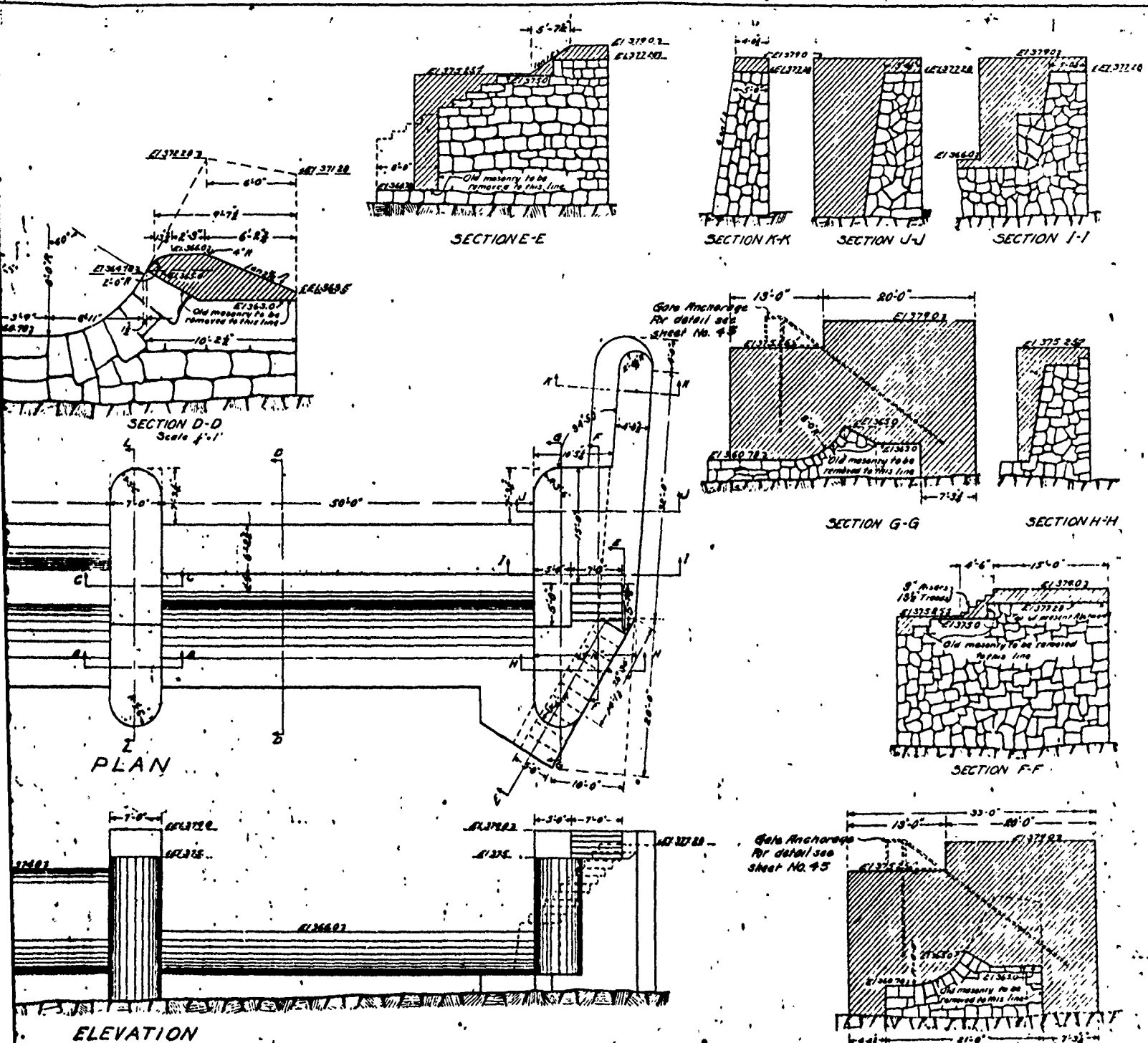


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 TRACED BY: *[Signature]*
 1ST CHECK BY: *[Signature]* 6-87
 2ND CHECK BY: *[Signature]*

ELEVATION OF NORTH ABUTMENT - (DAM SIDE)

ELEVATION OF NORTH A

2



Contract No. 45.

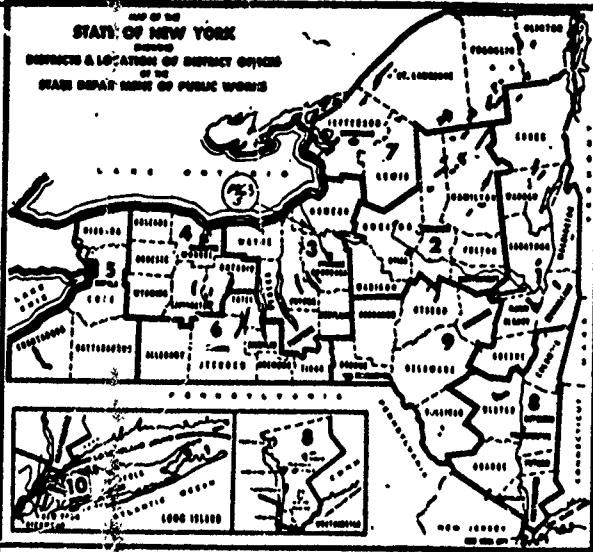
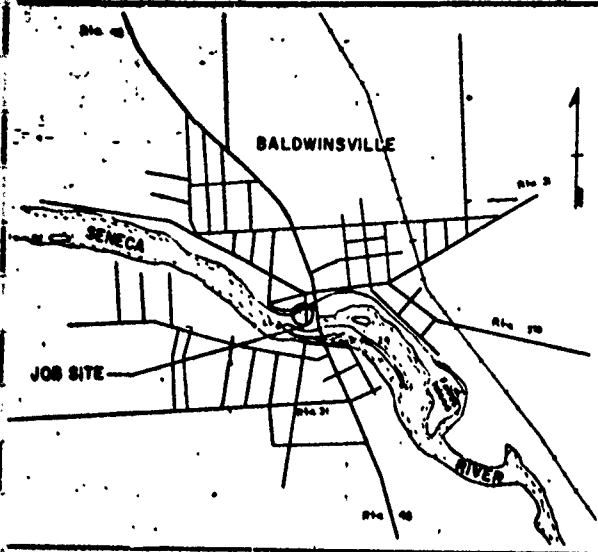
Erie Canal Section 6.
For the construction of a dam in the Oneida River at
Oughdenoy and of Lock No. 24 and appertaining
structures at Baldwinsville

DETAIL PLAN OF BALDWINSVILLE DAM

Scale: 8 feet to the inch
unless otherwise noted

Examined and approved
[Signature]
Expert Lock Engineer
Nov 27 1907

Examined and approved
[Signature]
Special Deputy State Engineer
Nov 22 1907



2



STATE OF NEW YORK
DEPARTMENT OF PUBLIC WORKS
DIVISION OF CONSTRUCTION
CHAPTER 542, LAWS OF 1939

CONTRACT M 63-5

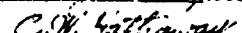
FOR
RECONSTRUCTION OF TAINTOR GATE
BALDWINSVILLE DAM
BALDWINSVILLE
ONONDAGA COUNTY
NEW YORK

SCALES AS INDICATED
SHEETS 1 TO 5

The provisions of the Public Works
Specifications of January 2, 1962 shall
apply to this contract.

Approved Sept 6 1963

M.A. BEEBE
Deputy Chief Engineer

Approved August 30 1963

C.W. HATHAWAY
Asst. Deputy Chief Engineer (Design)



Note: For further details and information of concrete repair and other work on gate recess see 31:03

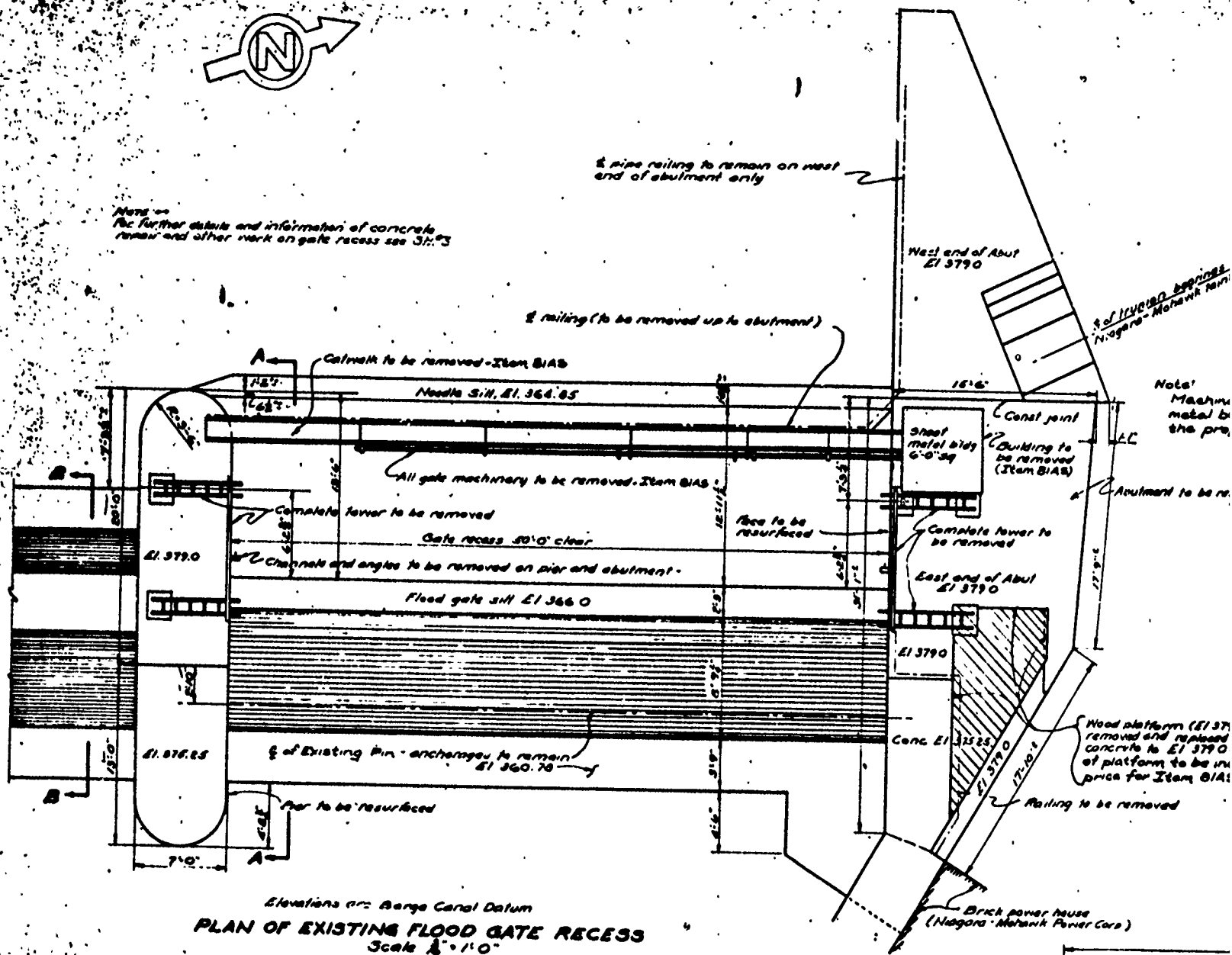
2" pipe railing to remain on west end of abutment only

2" railing (to be removed up to abutment)

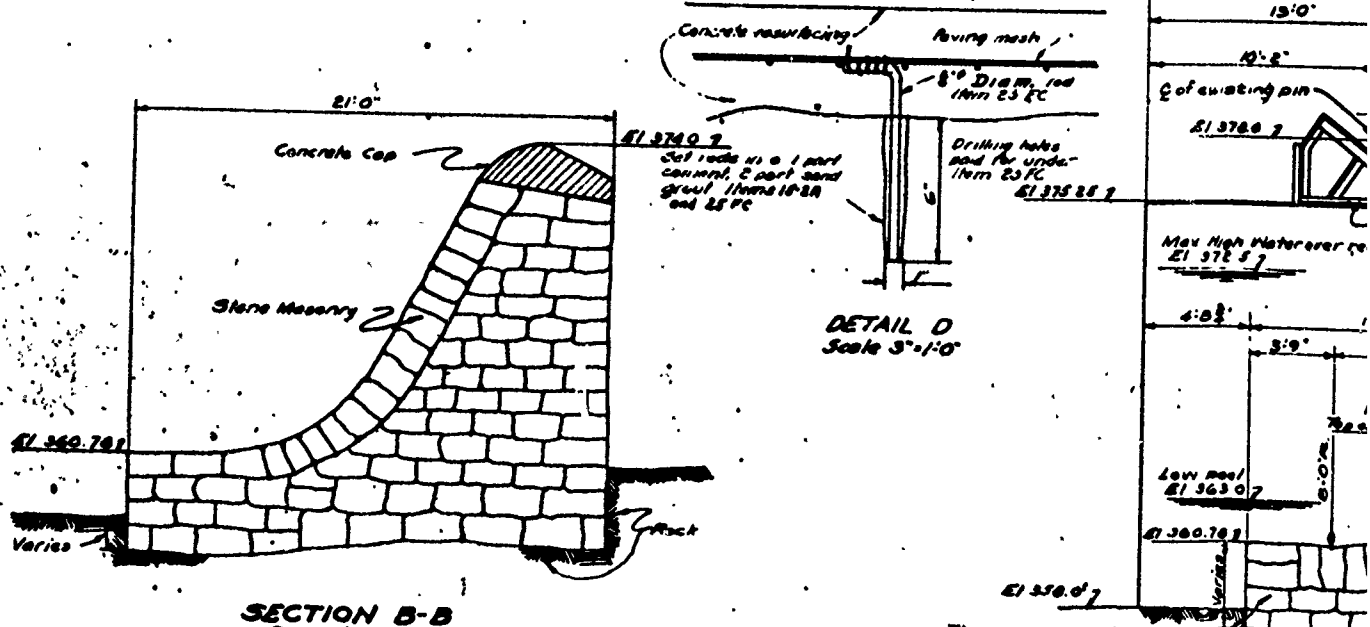
West end of Abut
E1 3790

2" of 1/2" dia. spacing
Niagara-Mohawk Power

Note: Machine metal by the pro

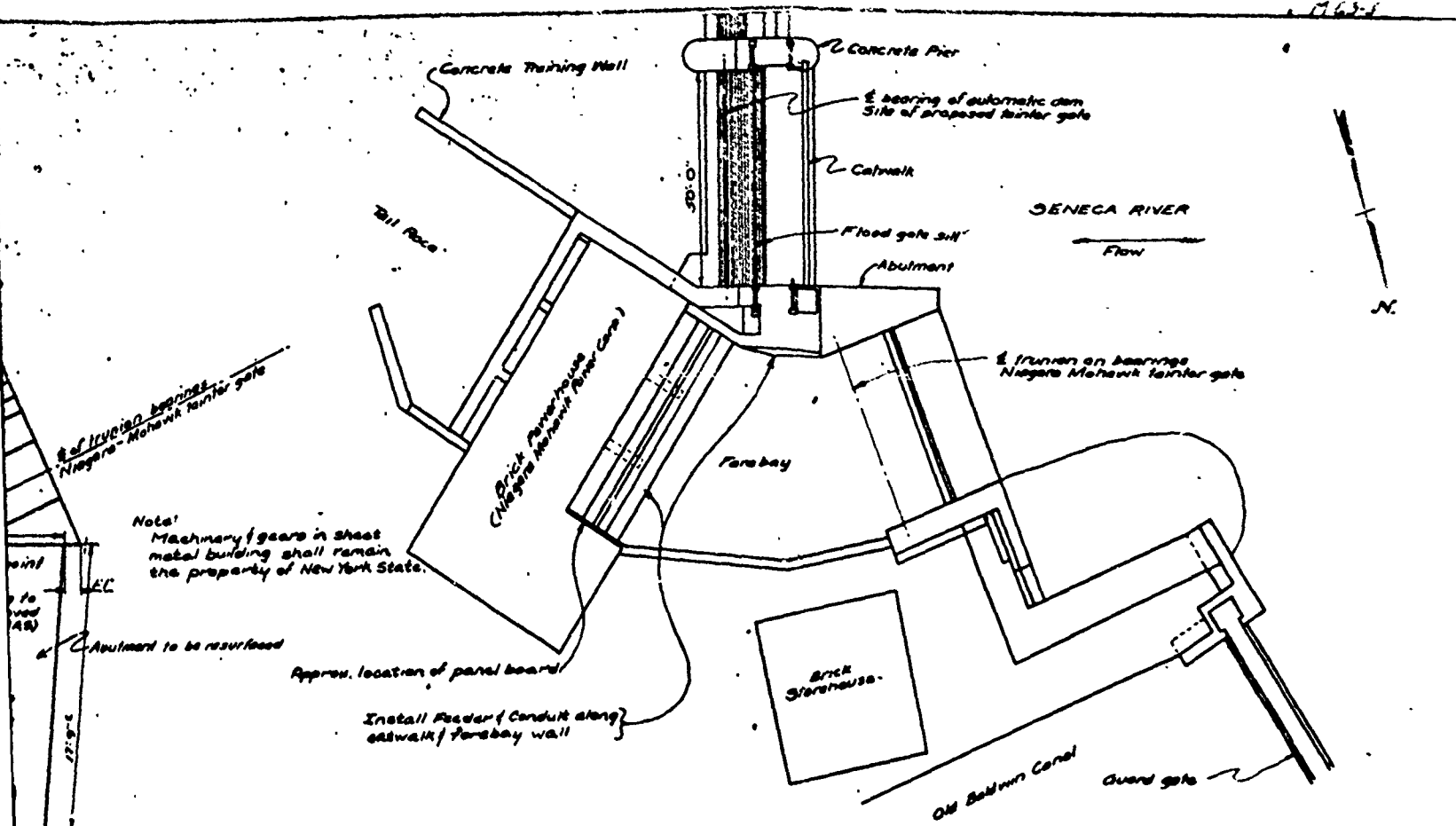


Elevations are: Range Canal Datum
PLAN OF EXISTING FLOOD GATE RECESS
Scale 1/8" = 1'0"



SECTION B-B

DETAIL D
Scale 3" = 1'0"



LOCATION PLAN
Scale 1" = 20'0"

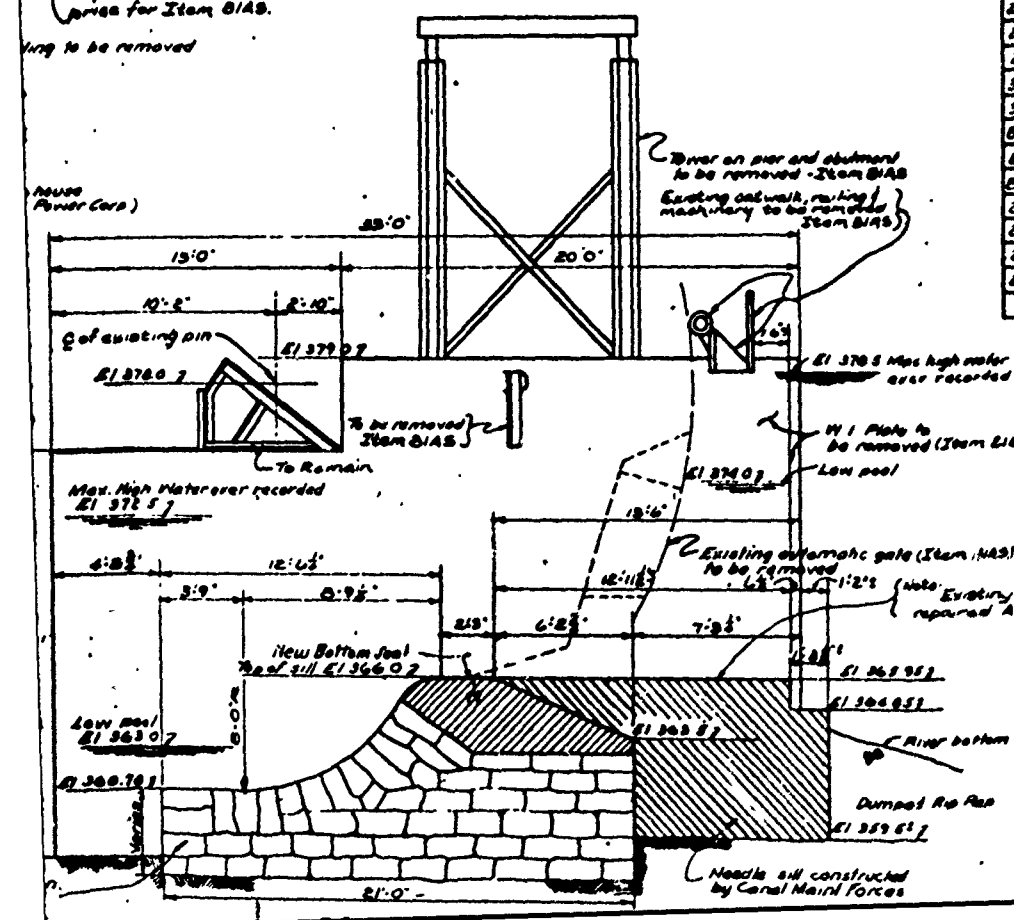
ESTIMATE OF QUANTITIES			
Item No	Description	Unit	Quantities Prop.
5	Trench, Culvert, 18 in. Excavation	CY	5
15-24	Portland Cement - Type SA	Bo	140
18	Class A Concrete For Structures	CY	80
257C	Steel Fabric Reinforcement	SY	80
25C	Bar Reinforcement For Structures	Lb	1260
299	Structural Steel	Lb	39,900
308C	Open Steel Floor	SF	140
37C	Metal Railing	LF	140
6145	Removing Existing Structure	LS	Nec
623	Cofferdams	LS	Nec
635	Steel Sheet Piling	SF	247
215	Finishing (Applying Two Coats Epoxy Coal Tar Paint)	Gal	55
216	Removing Existing Concrete	CF	1270
217	Repairing Gate Sill Concrete	CF	3
218	Hoisting Equipment (Electrical Connections)	LS	Nec.

Note
The Contractor shall note, that due to the nature of the work involved, the actual quantities for some items may be considerably higher or lower than those shown in the Estimate of Quantities.
Item 217 of this contract is a contingent item, which may or may not be used depending upon whether the concrete gate sill is in need of repairs, which will be determined by the Engineer upon inspection in the field.

Note:
Machinery & gears in sheet metal building shall remain the property of New York State.

Wood platform (E1 379 0) to be removed and replaced with concrete to E1 379 0 - Removal of platform to be included in bid price for Item 6145.

House (Pond Core)



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BALDWINVILLE TAINTOR GATE

Note:
Deteriorated concrete shall
removed to sound concrete
A.O.B.E. under Item 216.

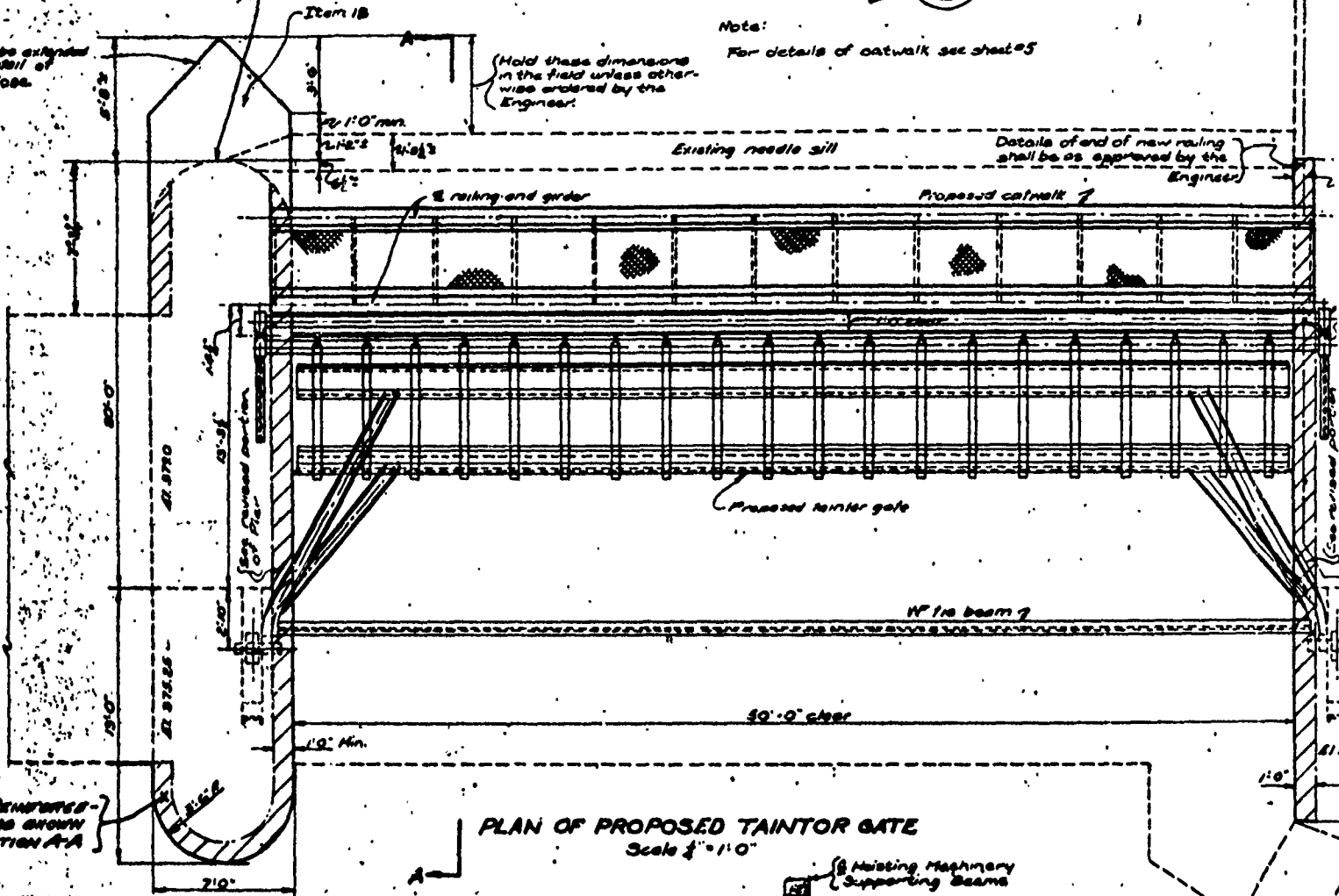
Bar to be extended
See detail of
Plan No. 2.

(Hold these dimensions
in the field unless other-
wise ordered by the
Engineer.)

Note:
For details of catwalk see sheet #5



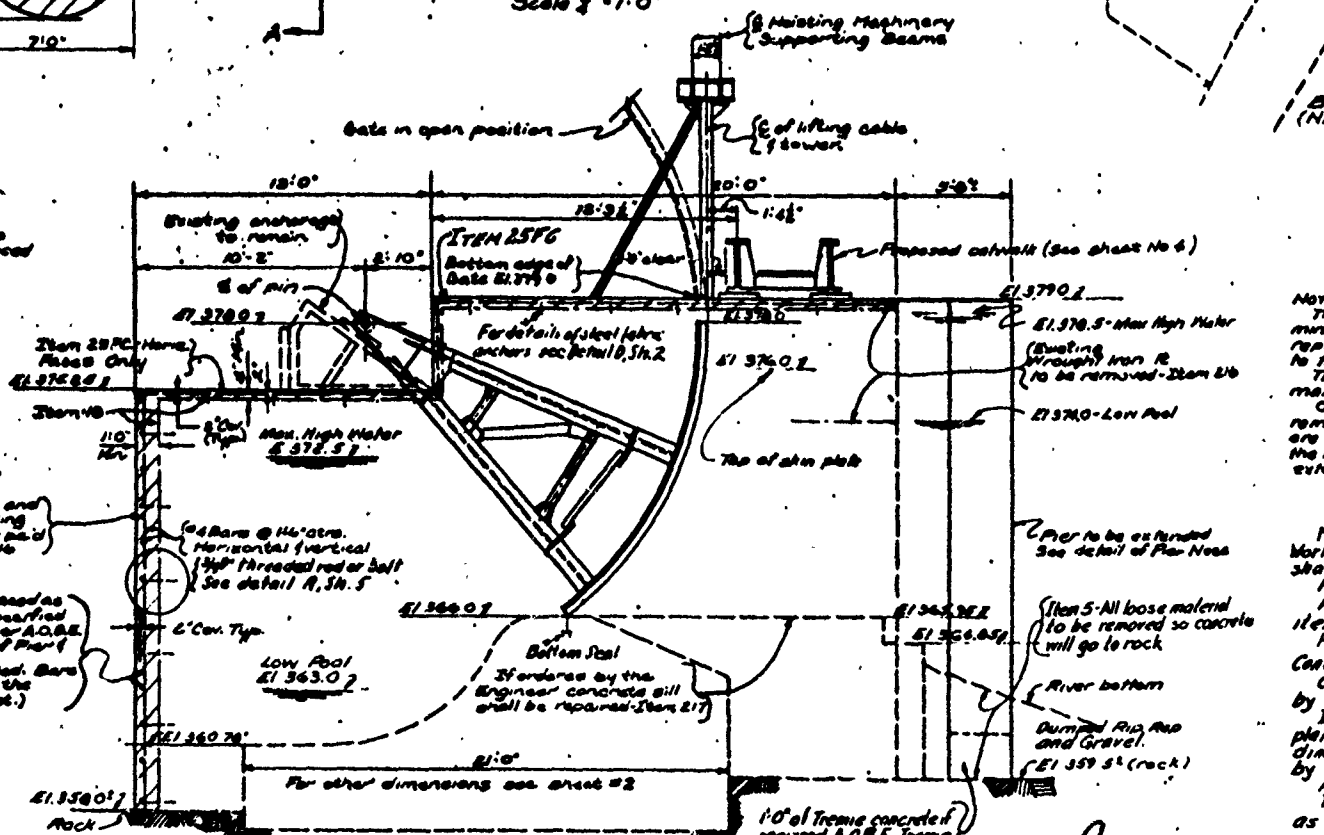
Details of end of new railing
shall be as approved by the
Engineer.



PLAN OF PROPOSED TAINTOR GATE
Scale 1/4" = 1'-0"

SYMBOLS

- Existing
- Proposed
- Area of concrete to be removed and replaced



Item 257C shall be placed as shown (Thrust) (as specified in the specifications or A.O.B.E. to all vertical faces of Pier.)
Abutment to be repaired. Bars shall be cut off bent in the field to fit. (No bar tied.)

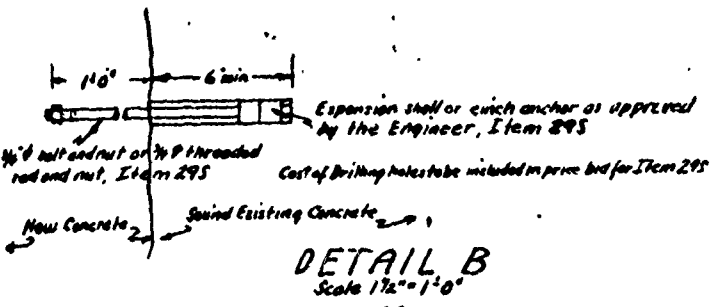
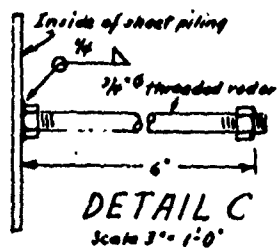
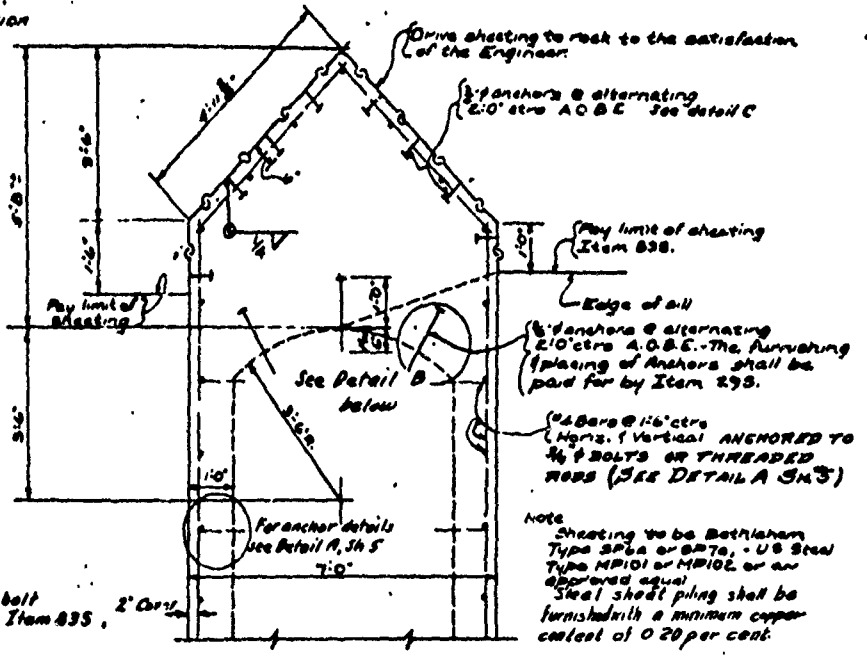
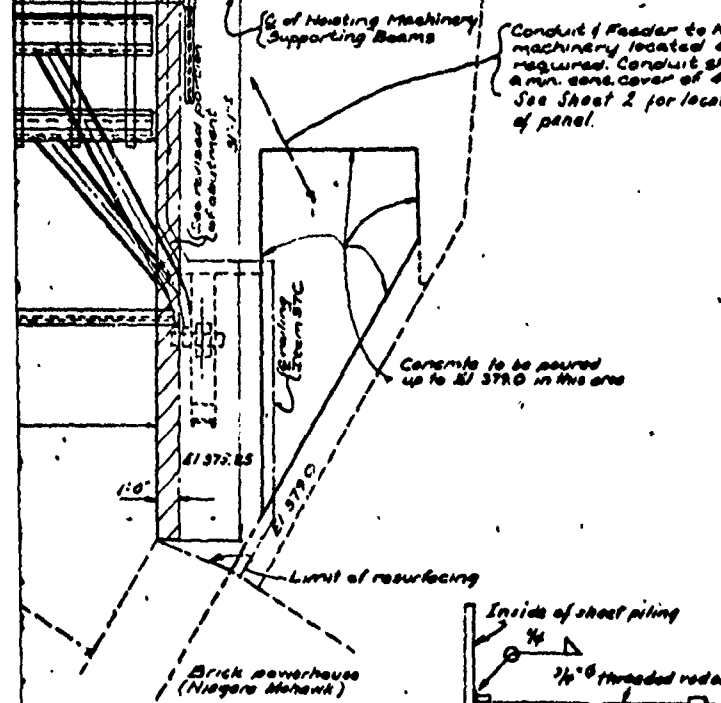
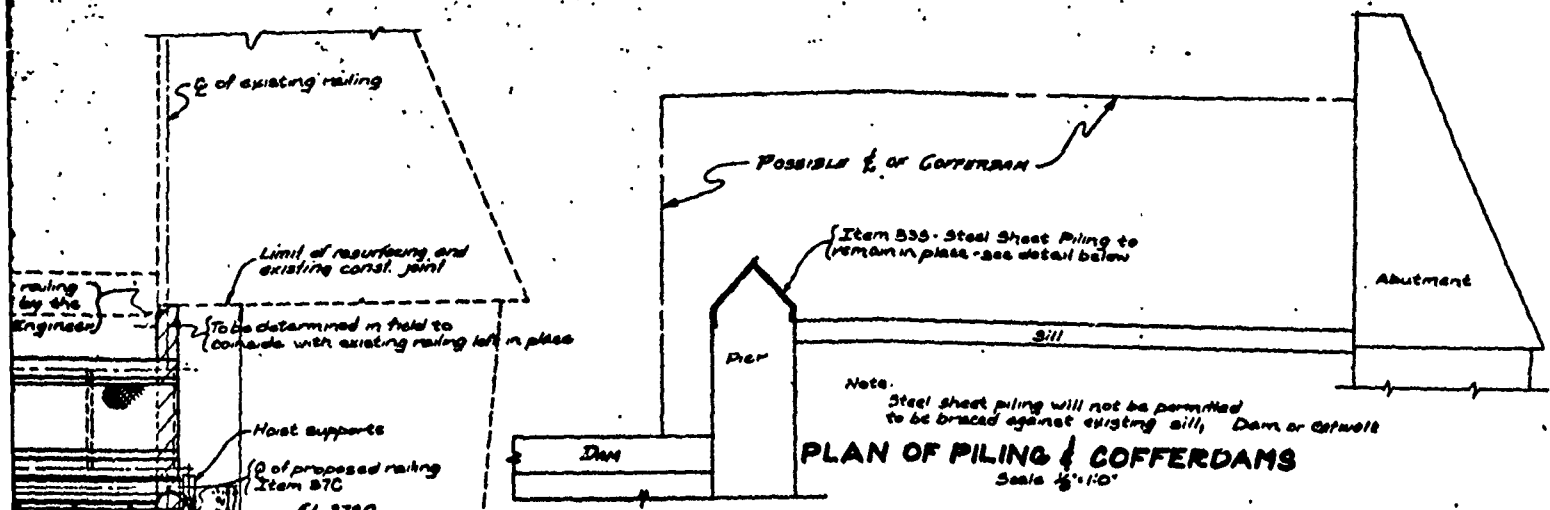
The shipping and removal of shifting concrete shall be paid for by Item 216

Note:
Elevations are Base Cont. D.

SECTION A-A

Note:
The max. depth to the main. One removal to the low water

Mr. Marks shall Re. All items. For Concre. Co. by the plans, dimen. by the A. The as ca.

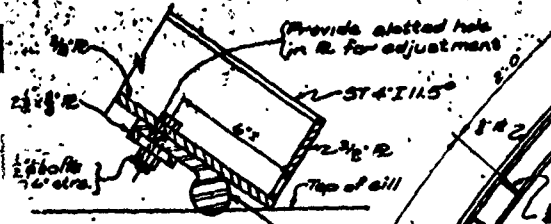


Notes on
 The entire horizontal surface of the pier is to be resurfaced four (4) inches min. or to sound concrete (A.O.B.E.) of existing concrete is to be removed and replaced with concrete including steel fabric reinforcement (Item 237) up to the elevations shown on the plans.
 The horizontal surface of the abutment is to be resurfaced in the same manner as the pier within the limits shown.
 One (1) foot min. or to sound concrete (A.O.B.E.) of existing concrete is to be removed from the vertical surfaces of the pier and abutment. These areas are to be replaced with new concrete from the top of the pier and abutment to the top of the existing sill. In the areas beyond the sill the new concrete shall extend down to rock.

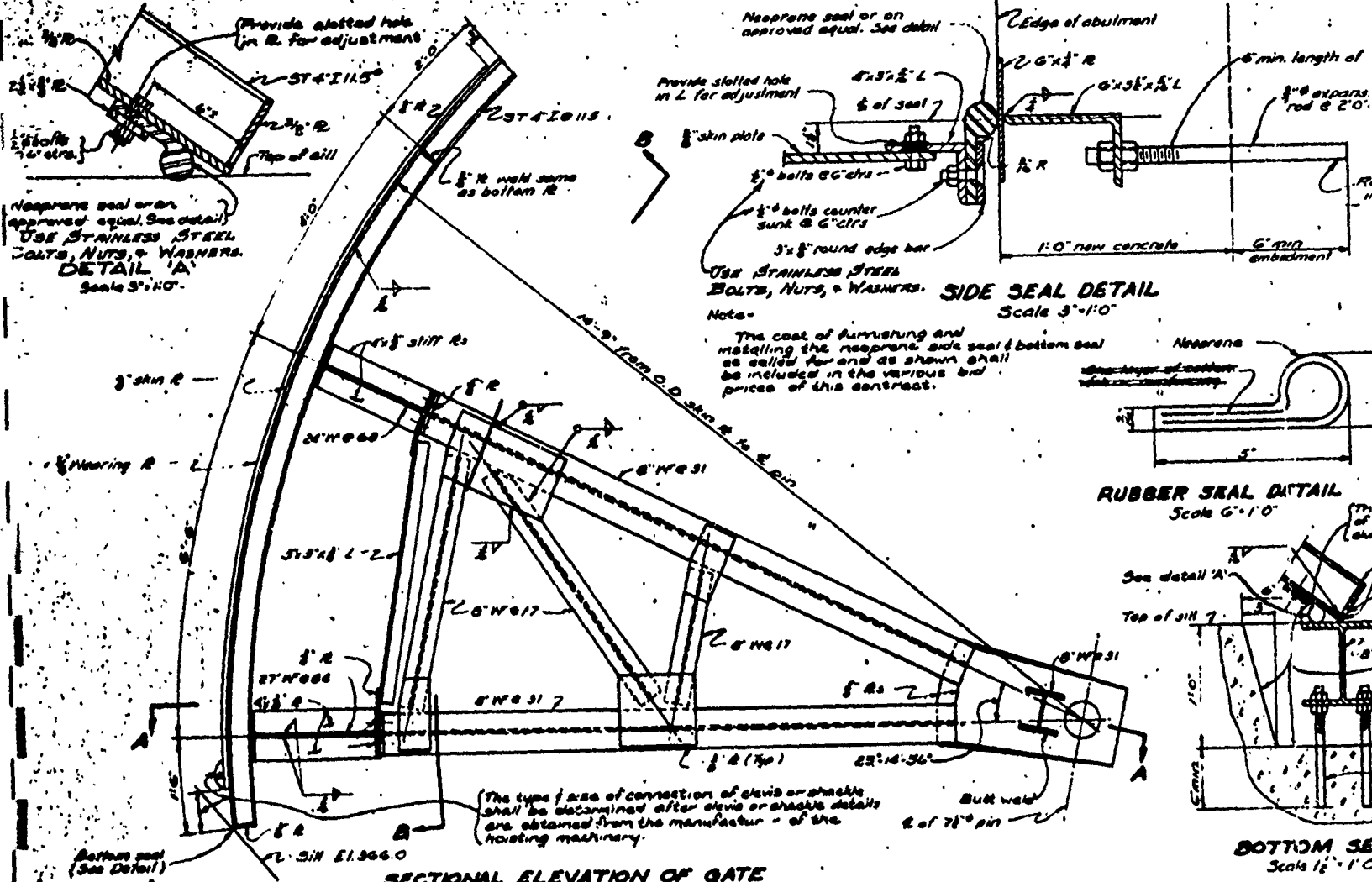
GENERAL NOTES

Material and Construction Specifications of N.Y.S. Department of Public Works dated January 2, 1962 with current additions and modifications shall be used.
 Reinforcing Bars shall be lapped a minimum of 20 diameters.
 All joint material if used, A.O.B.E., will be paid for under the various items of the contract.
 Portland Cement, Type 2A, Item 15-2A shall be used in Item 18 - Class A Concrete for Structures.
 Concrete surfaces exposed to view shall be rubbed if ordered by the Engineer.
 If field conditions and dimensions differ from those shown on the plans, the Contractor shall work from actual field conditions and dimensions to satisfactorily perform the required work, as approved by the Engineer.
 A field Engineer's Office is not required for this contract.
 The support for the hoisting machinery shall be checked for stability, as called for by Item 21B, by the supplier of the machinery.

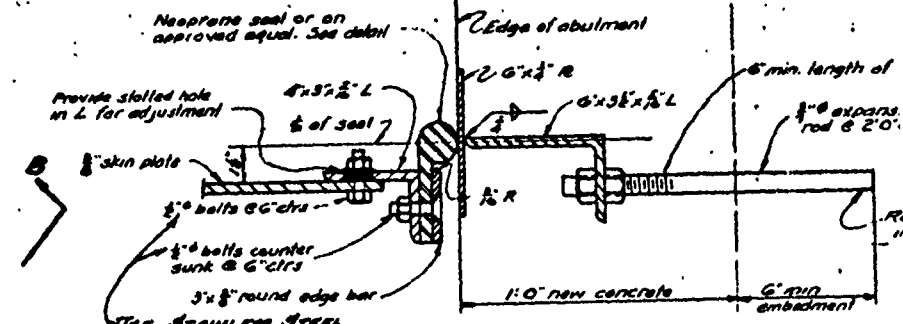
STATE OF NEW YORK
 DEPARTMENT OF PUBLIC WORKS
 DIVISION OF CONSTRUCTION
CONTRACT M 63-5
 BALDWINVILLE TAINTOR GATE



Neoprene seal or an approved equal. See detail.
USE STAINLESS STEEL BOLTS, NUTS, & WASHERS.
DETAIL A
 Scale 3"=1'0"

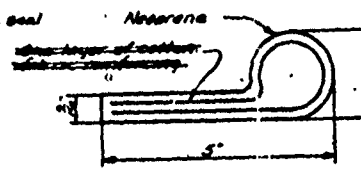


SECTIONAL ELEVATION OF GATE
 Scale 1/2"=1'0"

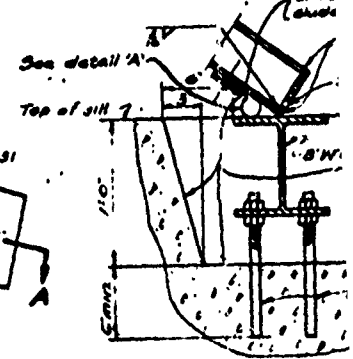


SIDE SEAL DETAIL
 Scale 3"=1'0"

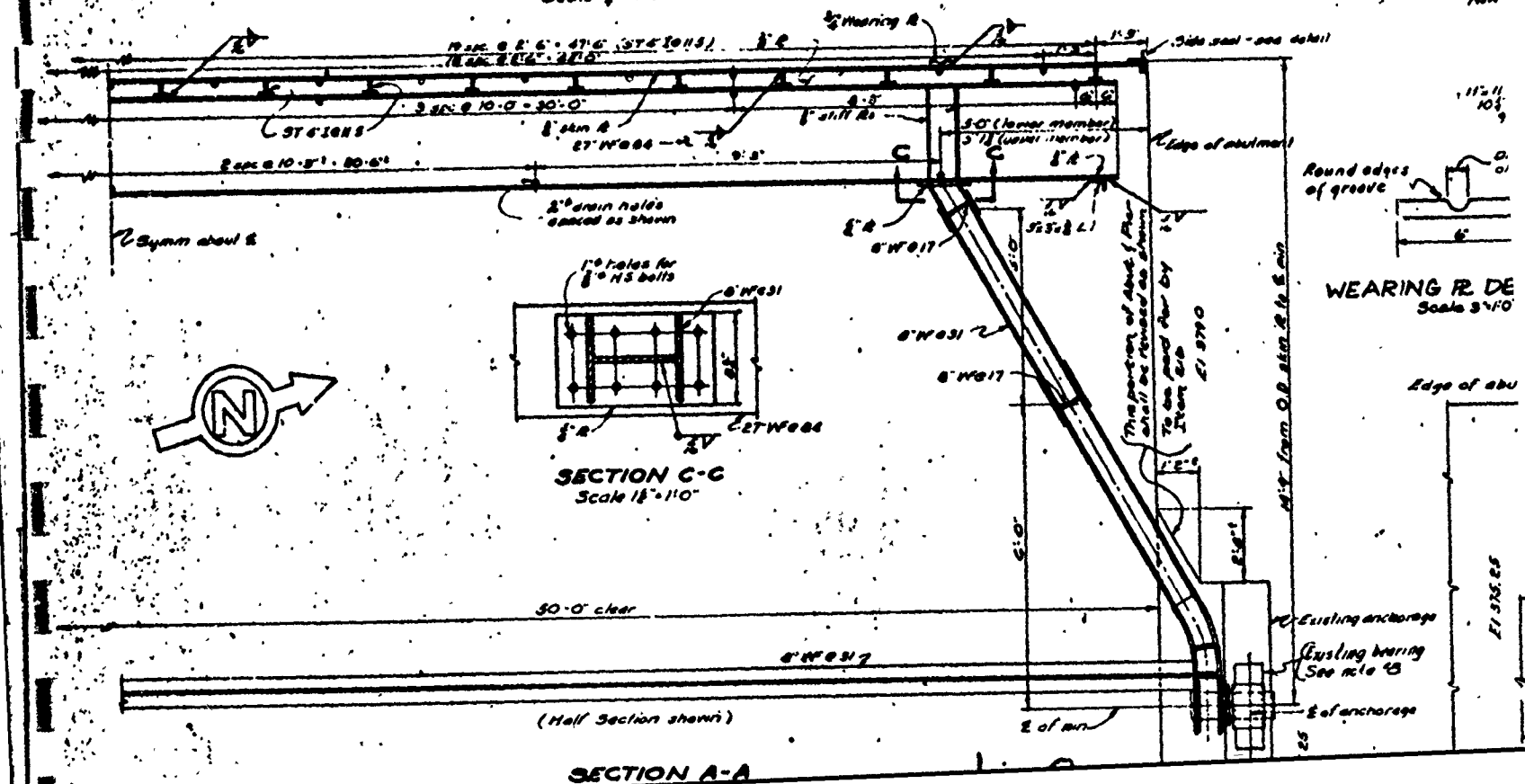
Note-
 The cost of furnishing and installing the neoprene side seal & bottom seal as called for and as shown shall be included in the various bid prices of this contract.



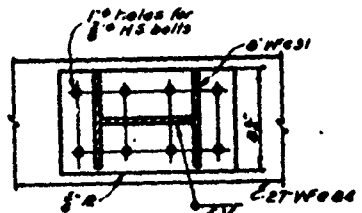
RUBBER SEAL DETAIL
 Scale 6"=1'0"



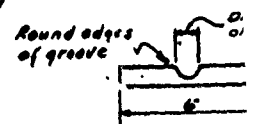
BOTTOM SEAL
 Scale 12"=1'0"



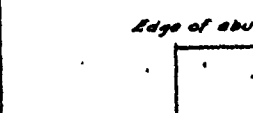
SECTION A-A



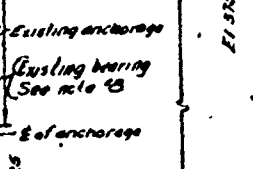
SECTION C-C
 Scale 1/2"=1'0"



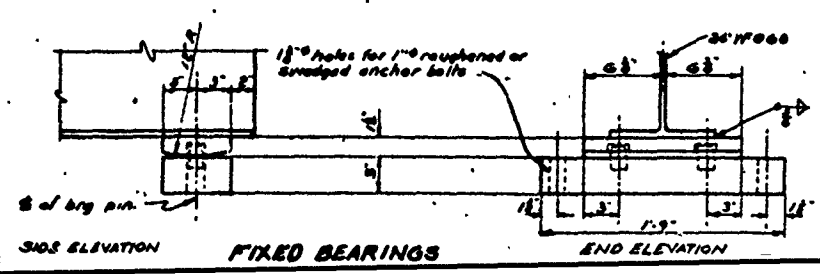
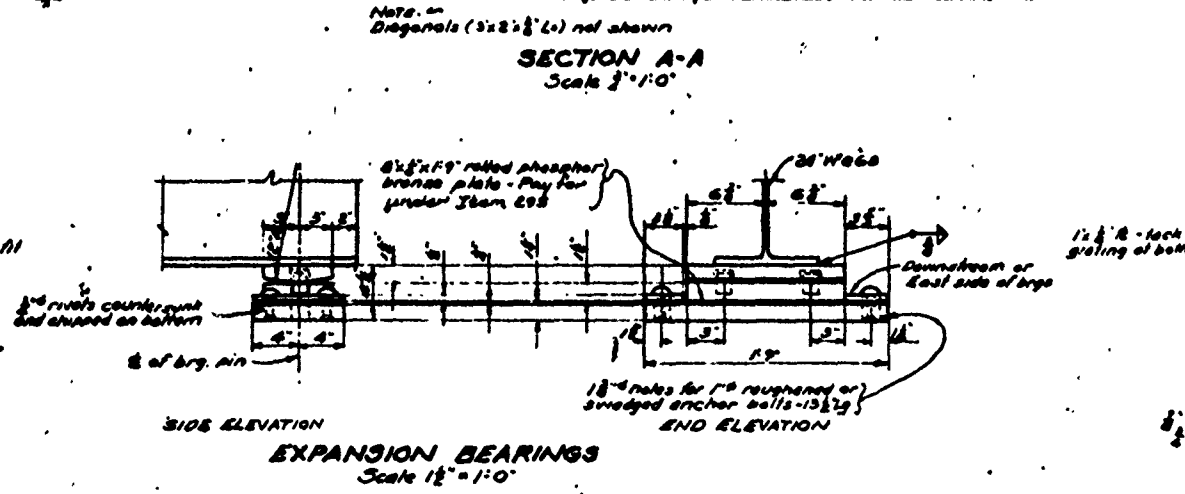
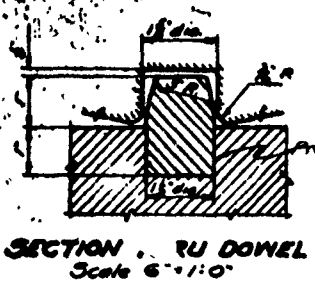
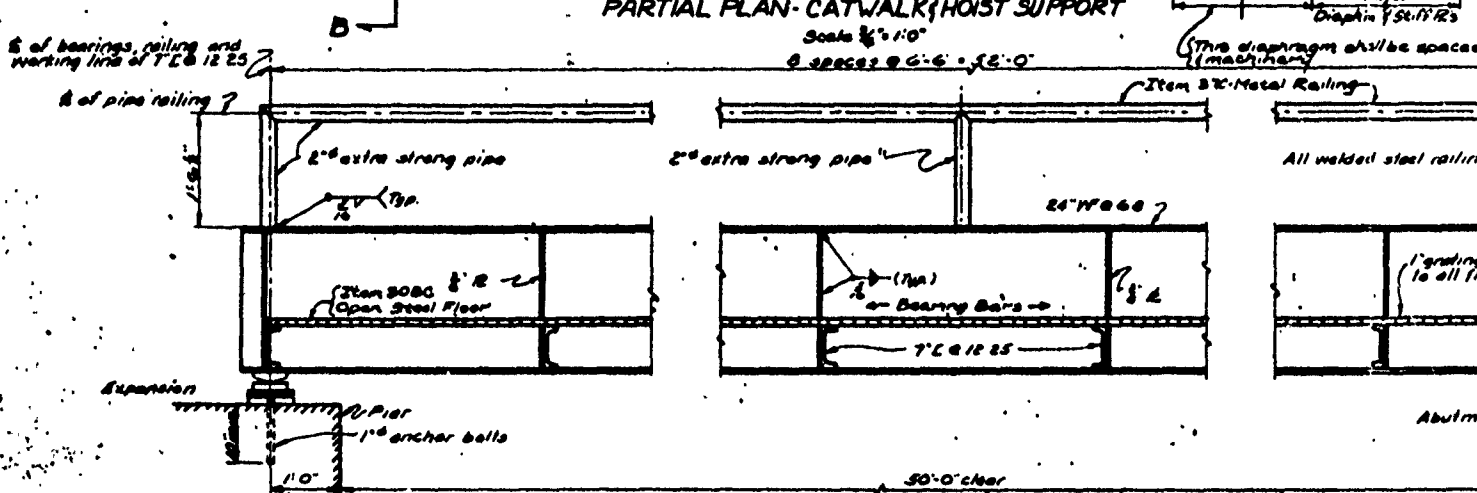
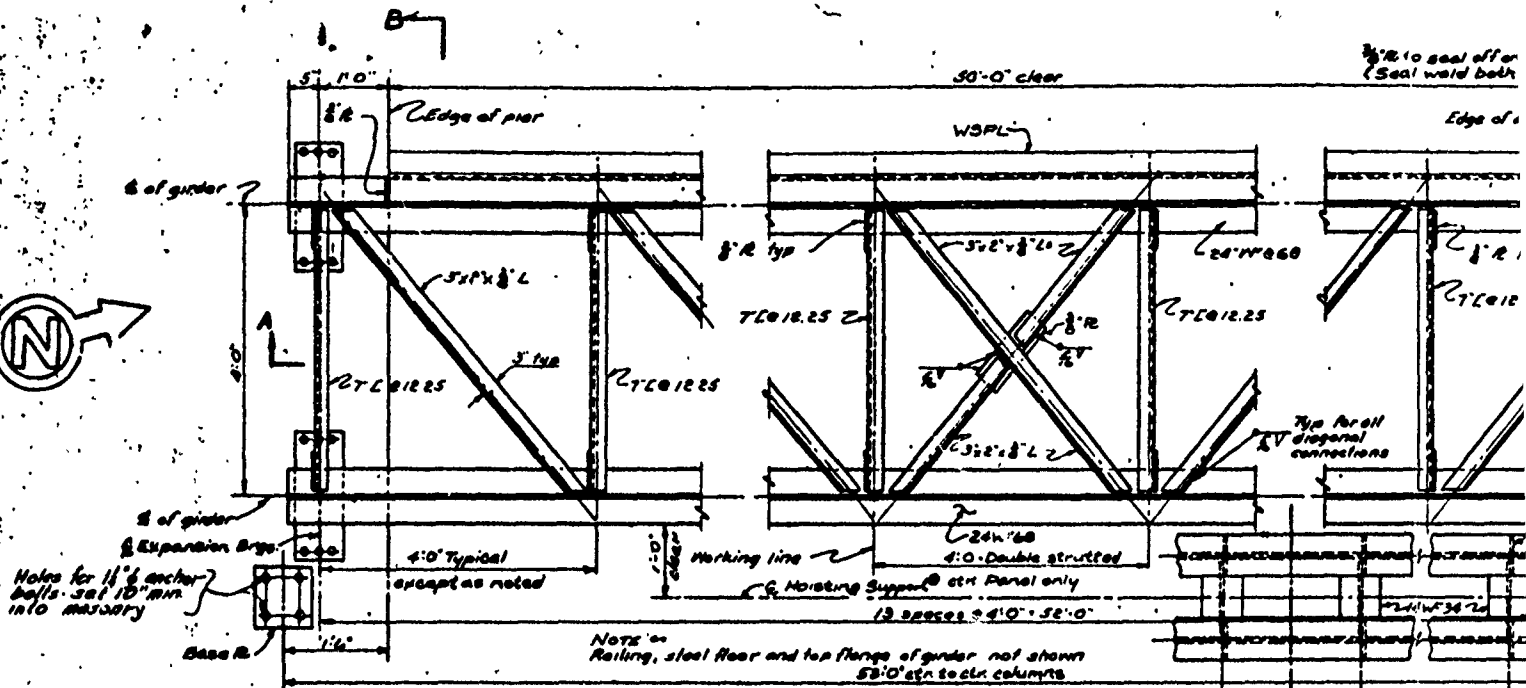
WEARING R. DETAIL
 Scale 3"=1'0"

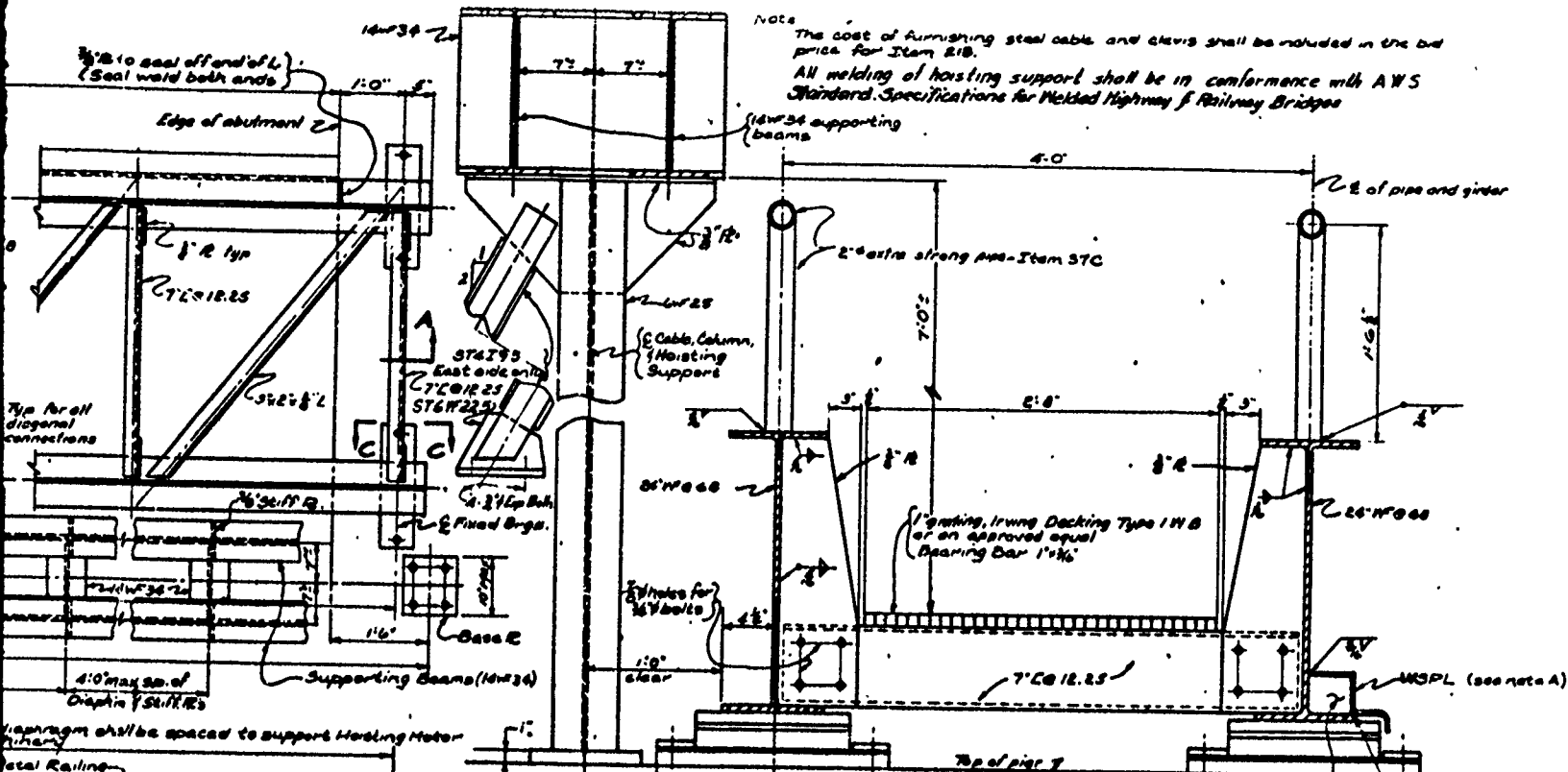


Edge of abutment



Existing anchorage
Existing bearing
 (See note 'B')

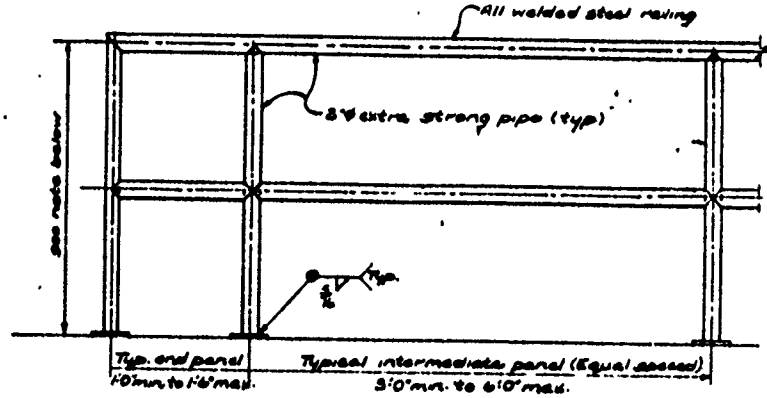




NOTE
 The cost of furnishing steel cable and clevis shall be included in the bid price for Item 21B.
 All welding of hoisting support shall be in conformance with AWS Standard Specifications for Welded Highway & Railway Bridges

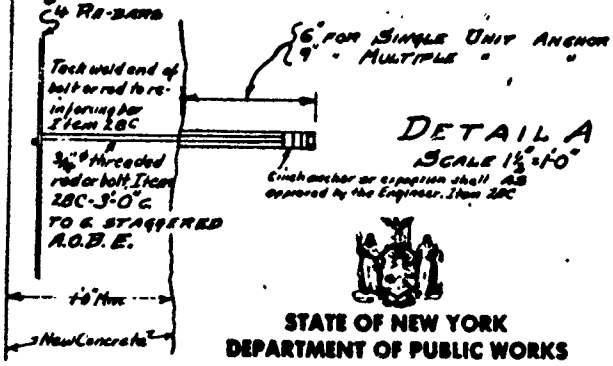
NOTE A:
 It is not necessary to use A242 Steel for the WSPL but the grade of steel shall be approved by the Deputy Chief Engineer (Bridges).

SECTION B-B
 Scale 1/2" = 10"

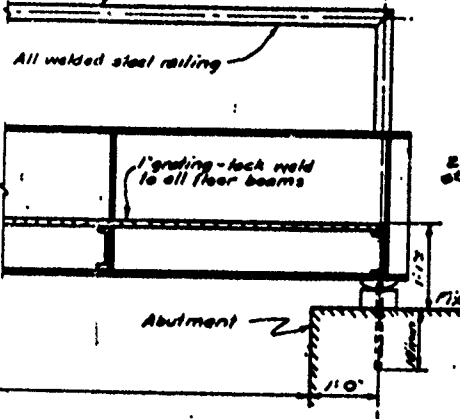


From dimensions taken in the field the Contractor shall lay out new railing for the North Abutment as approved by the Engineer. The height of the railing shall be determined in the field from the existing railing on the West end of the North Abutment.

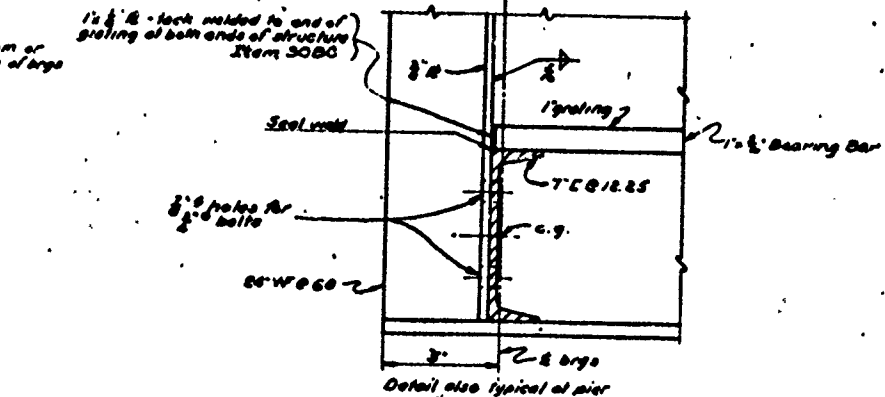
RAILING ELEVATION
 Scale 1/2" = 10"



DETAIL A
 Scale 1 1/2" = 10"



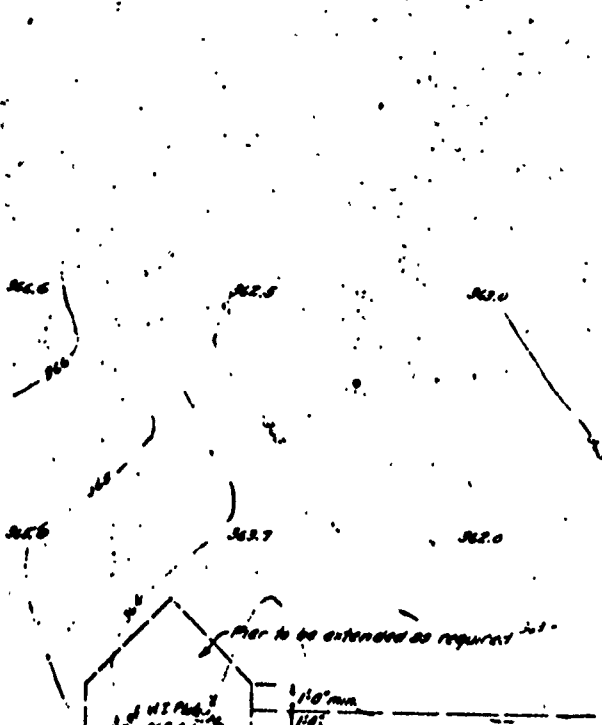
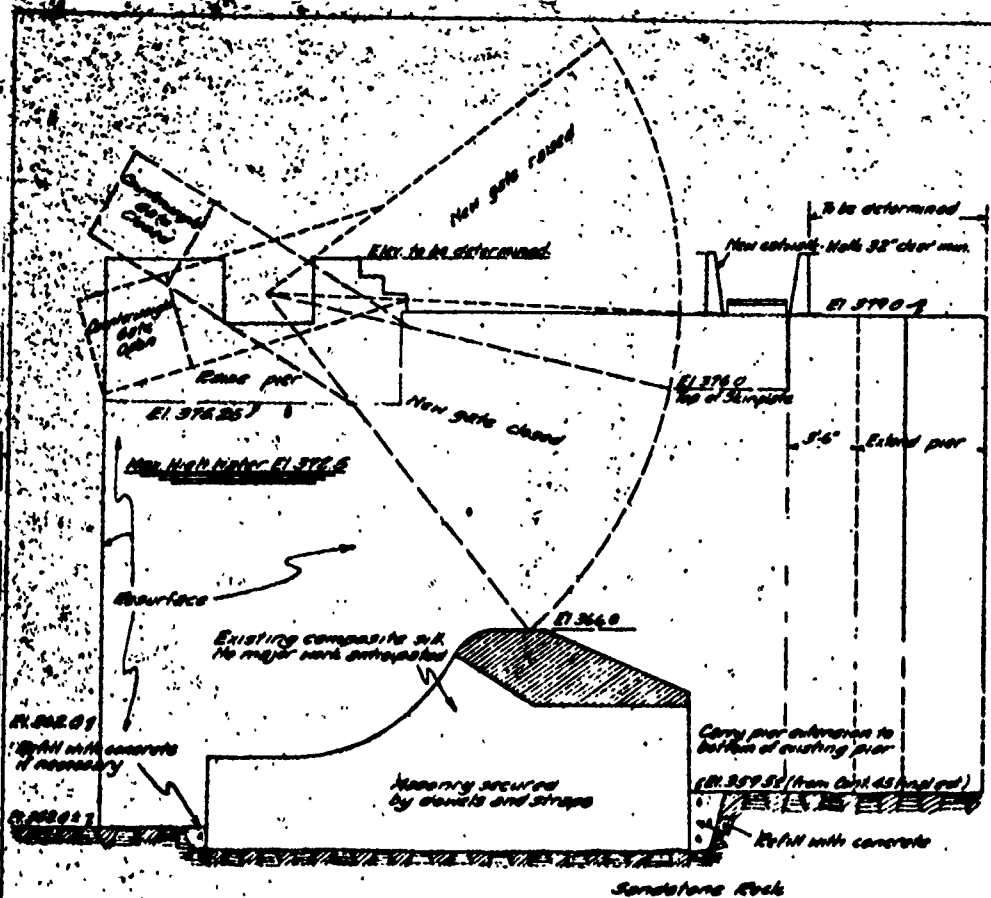
RAILING BASE B
 Scale 3" = 10"



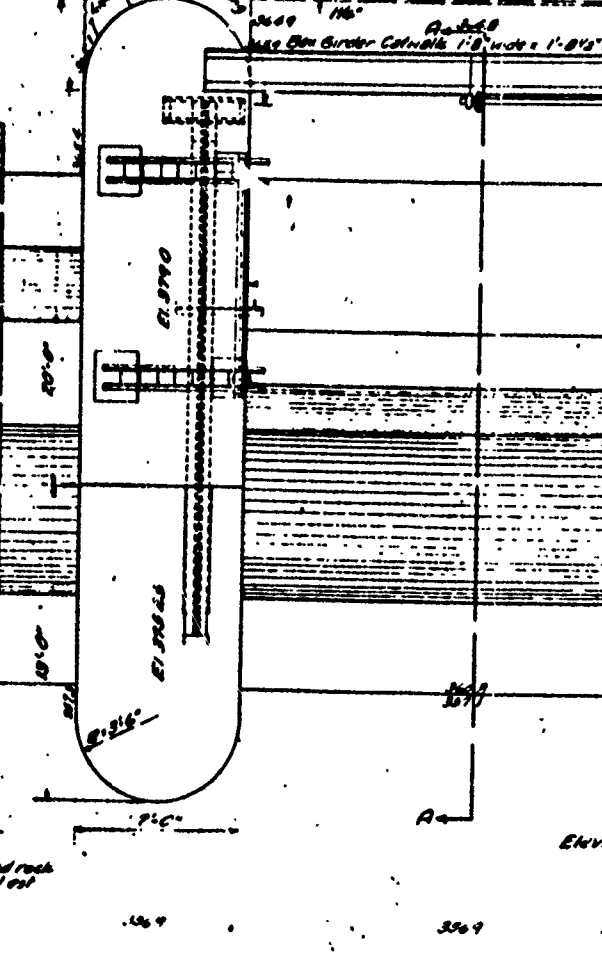
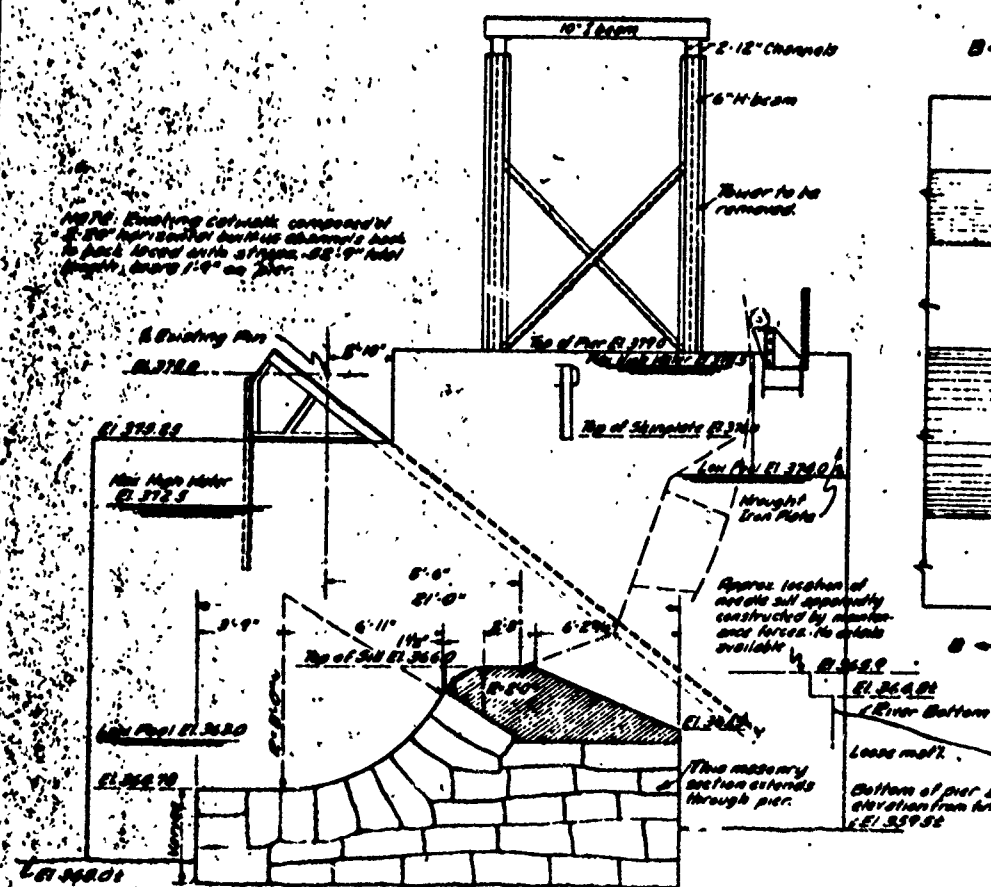
SECTION C-C
 Scale 3" = 10"

STATE OF NEW YORK
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NOTE: Column needs to be offset down from top of pier to allow 1 1/2" in 8" buffer on sheet piling remains. Sections used are DP-1 or DP-2, 22'-0" long.



REQUIRED



NOTE: Existing column composed of 2-12\"/>

Approx location of needle sill apparently constructed by manila and forces. No details available.

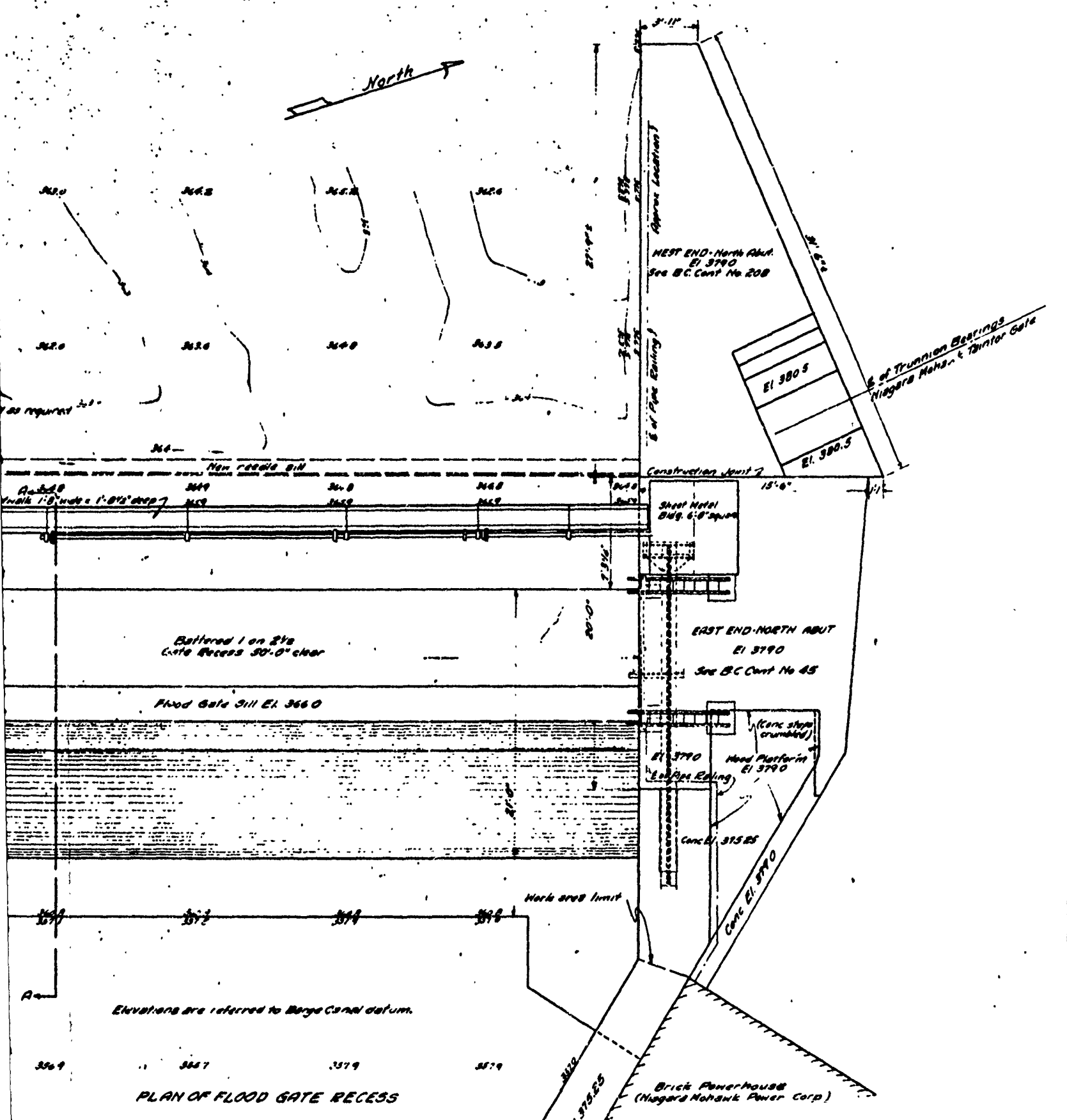
Bottom of pier and rock elevation from final est. (E) 359.55

Take on submerged portions from BC Cont. 45 plans and final estimate Sandstone

SECTION A-A

Elev (ft)

PL



as required

Gravel
width 1'-0" under 1'-0 1/2" deep

Non-rod'd bit

Battered 1 on 2 1/2
Gate recess 50'-0" clear

Flood Gate Sill El. 3660

NEST END-NORTH ABUT.
El. 3790
See B.C. Cont. No. 208

Construction Joint 7

Sheet Metal
Bldg. 6'-8" square

EAST END-NORTH ABUT.
El. 3790

See B.C. Cont. No. 85

El. 3790
Hood Platform
El. 3790

(Concrete slabs crumbled)

Conc. El. 375.25

Conc. El. 3790

6 of Trunnion Bearings
Niagara Mohawk Turbine Gate

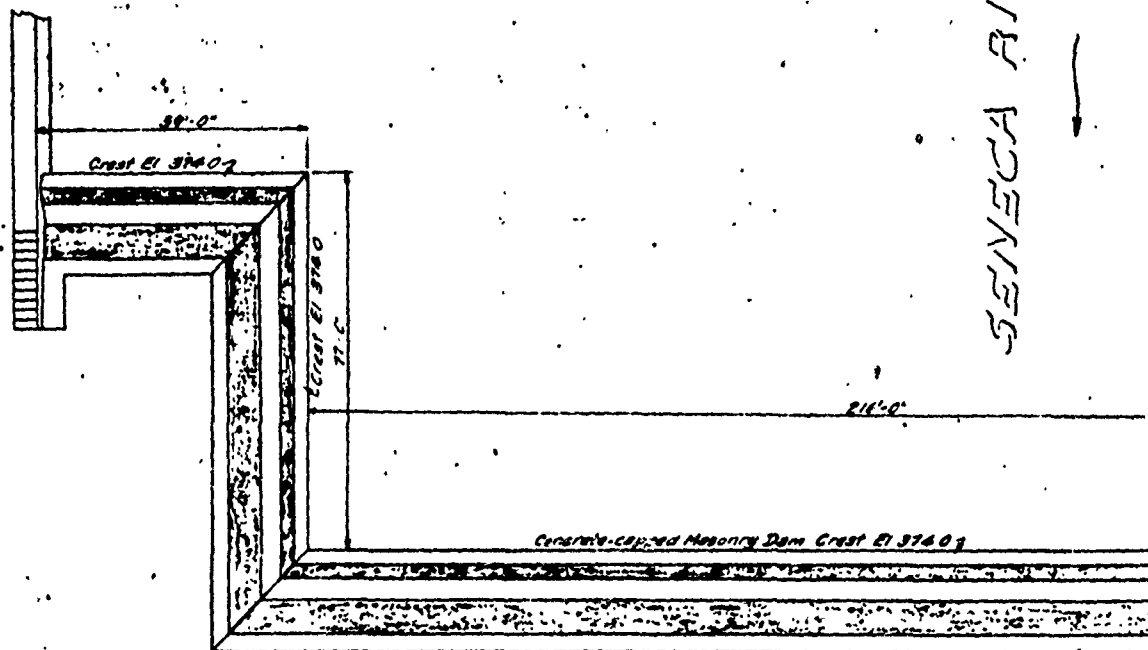
Elevations are referred to Barge Canal datum.

PLAN OF FLOOD GATE RECESS

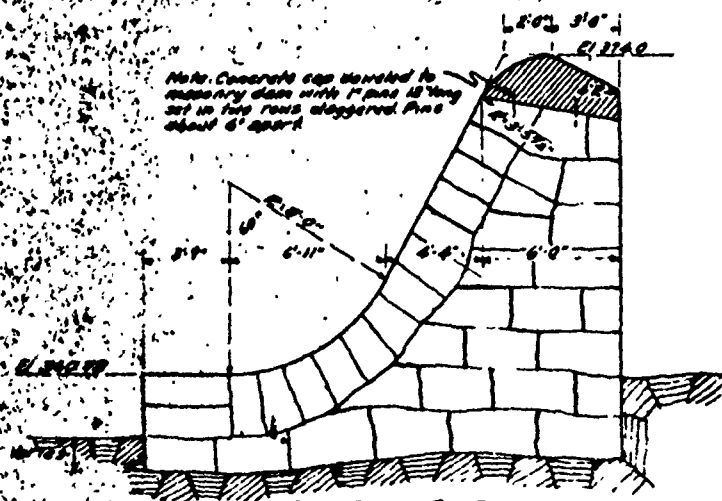
Brick Powerhouse
(Niagara Mohawk Power Corp.)

REPAIRS TO BALDWINVILLE DAM
NEW FLOOD GATE
ONDONDEGA COUNTY

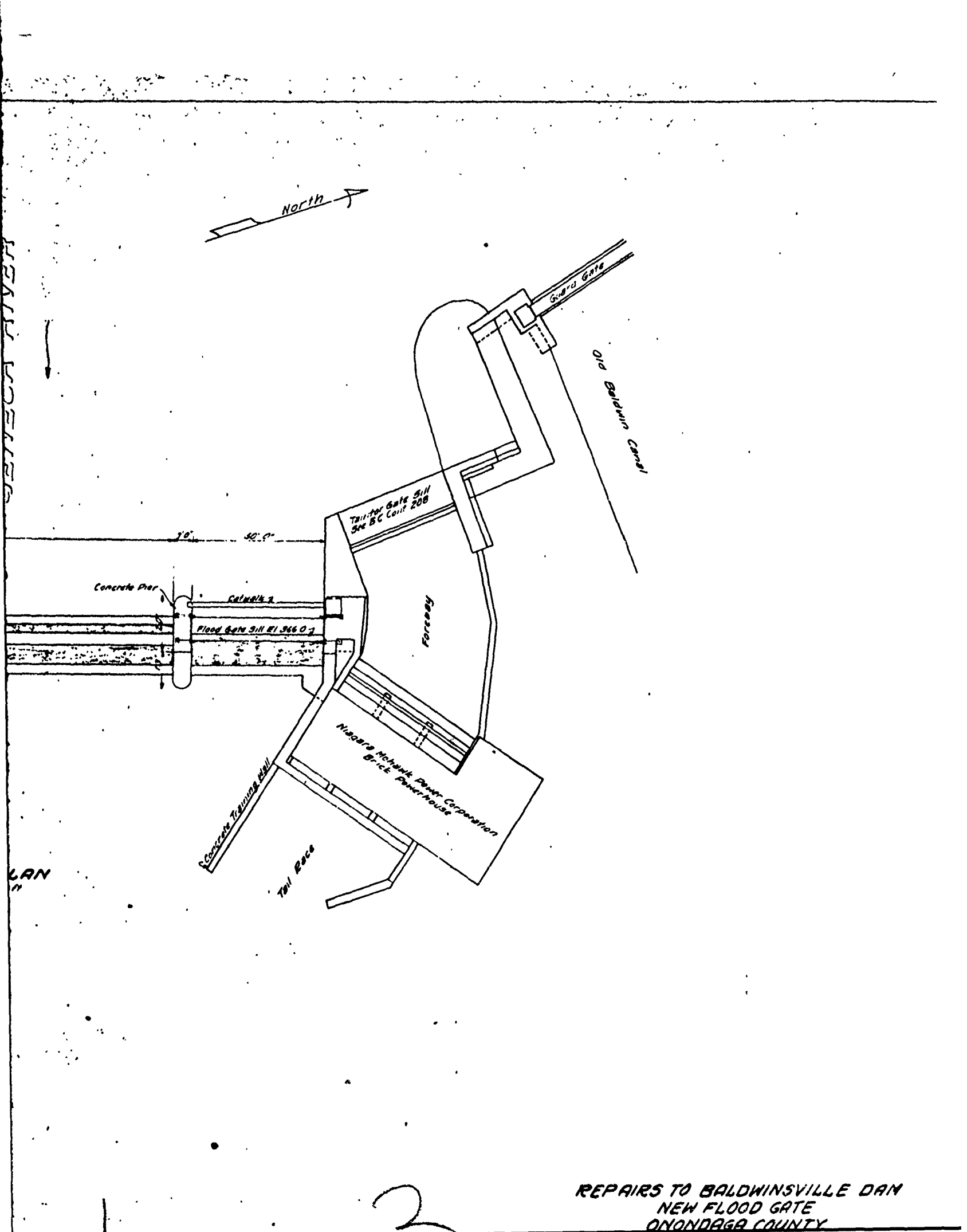
SENECA RIVER



Note: Concrete cap bonded to masonry dam with 1" rods @ 12" spacing in top row staggered 6" apart



LOCATION PLAN
Scale 1"=20'



REPAIRS TO BALDWINSVILLE DAM
 NEW FLOOD GATE
 ONONDAGA COUNTY

2