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NATIONAL DAM SAFETY PROGRAM. LOCK 2 DAM AT MECHANICVILLE (I.D. --
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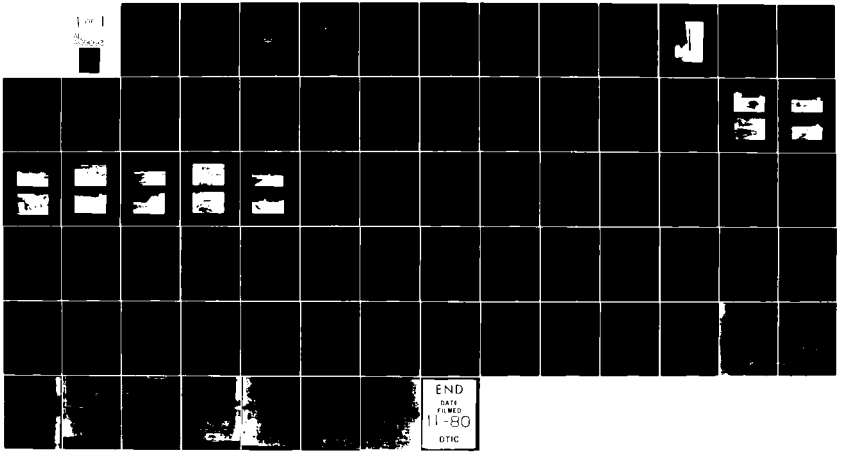

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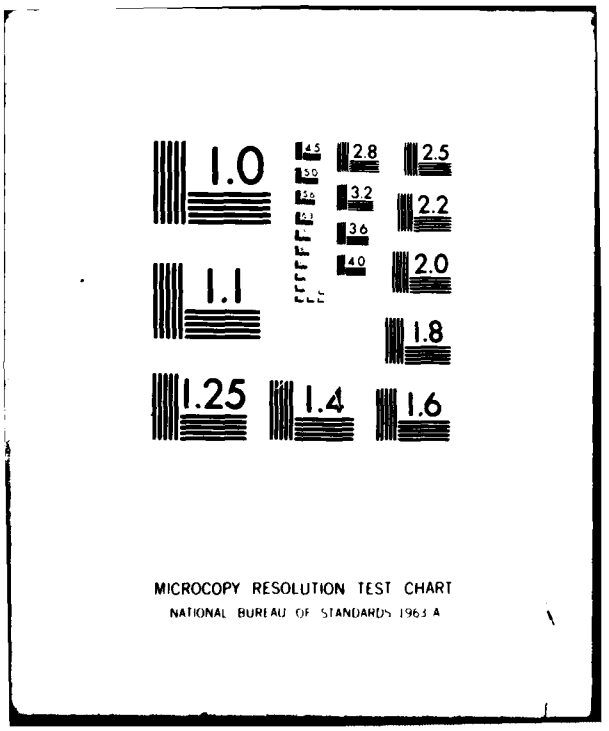
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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

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

Examination of available documents and a visual inspection of the dam revealed several deficiencies which may affect the safety of the dam. There was serious leakage in the vicinity of one of the gates in the gatehouse section. The auxiliary spillway section had failed allowing a portion of the

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river to flow around the left end of the dam.

In addition to these observed deficiencies, structural stability analyses performed for the main spillway section indicate that the structure is unstable when subjected to severe loading conditions such as ice loading or flood flows. Further analysis is required. These studies should include subsurface and structural investigations to obtain information about the condition of the structure and its foundation. This information should then be incorporated into a more detailed stability analysis.

The spillway, not having sufficient discharge capacity for passing one-half the Probable Maximum Flood (PMF), is considered to be inadequate. For such a large storm event, a high tailwater condition would occur, resulting in the flooding of downstream hazard areas. Hence, dam failure from overtopping would not significantly increase the hazard to loss of life from that which would exist just before failure.

Several other deficiencies were also noted on this structure. Among these were deteriorated concrete on the main spillway section, erosion at the east abutment, and minor sloughing at the west abutment. In addition, no emergency action plan exists for this structure.

The investigations into repairing the leak in the gatehouse and reconstructin the failed auxiliary spillway section as well as the evaluation of the structural stability should be commenced within 3 months of the date of notification of the owner. Remedial work deemed necessary as a result of these investigations should be completed within 18 months. Other deficiencies should be corrected within 12 months of the date of notification.

UPPER HUDSON RIVER BASIN

LOCK 2 DAM AT MECHANICVILLE

RENSSELAER & SARATOGA COUNTIES, NEW YORK
INVENTORY NO.N.Y. 988

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

NEW YORK DISTRICT CORPS OF ENGINEERS

SEPTEMBER 1980

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PREFACE

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

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

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

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

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RENSSELAER-SARATOGA COUNTY, NEW YORK.
Phase I Inspection Report.

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PHASE I REPORT
NATIONAL DAM SAFETY PROGRAM

Name of Dam:	Lock 2 Dam at Mechanicville I.D. No. NY 988
State Located:	New York
County:	Rensselaer-Saratoga
Watershed:	Upper Hudson River Basin
Stream:	Hudson River
Date of Inspection:	August 13, 1980

ASSESSMENT

Examination of available documents and a visual inspection of the dam revealed several deficiencies which may affect the safety of the dam. There was serious leakage in the vicinity of one of the gates in the gatehouse section. The auxiliary spillway section had failed allowing a portion of the river to flow around the left end of the dam.

In addition to these observed deficiencies, structural stability analyses performed for the main spillway section indicate that the structure is unstable when subjected to severe loading conditions such as ice loading or flood flows. Further analysis is required. These studies should include subsurface and structural investigations to obtain information about the condition of the structure and its foundation. This information should then be incorporated into a more detailed stability analysis.

The spillway, not having sufficient discharge capacity for passing one-half the Probable Maximum Flood (PMF), is considered to be inadequate. For such a large storm event, a high tailwater condition would occur, resulting in the flooding of downstream hazard areas. Hence, dam failure from overtopping would not significantly increase the hazard to loss of life from that which would exist just before failure.

Several other deficiencies were also noted on this structure. Among these were deteriorated concrete on the main spillway section, erosion at the east abutment, and minor sloughing at the west abutment. In addition, no emergency action plan exists for this structure.

The investigations into repairing the leak in the gatehouse and reconstructing the failed auxiliary spillway section as well as the evaluation of the structural stability should be commenced within 3 months of the date of notification of the owner. Remedial work deemed necessary as a result of these investigations should be completed within 18 months. Other deficiencies should be corrected within 12 months of the date of notification.

George Koch
Chief, Dam Safety Section
New York State Department
of Environmental Conservation
NY License No. 45937

Approved By:

Colonel W. M. Smith Jr.
New York District Engineer

Date: 30 SEP 80

OVERVIEW
LOCK 2 DAM AT MECHANICVILLE
I.D. No. NY 988

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
LOCK 2 DAM AT MECHANICVILLE
I.D. No. NY 988
(#225A-102)
UPPER HUDSON RIVER BASIN
RENSSELAER-SARATOGA 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 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 these deficiencies constitute hazards to life and property, and to recommend remedial measures where required.

1.2 DESCRIPTION OF PROJECT

a. Description of Dam

The Lock 2 Dam at Mechanicville is a run-of-river concrete gravity dam with a main overflow section which extends approximately 700 feet across the Hudson River. At the eastern end of the dam, there was an auxiliary spillway section which was 143 feet long. There is a 120 foot long concrete section at the western end of the structure which contains 12 inoperable gates.

Lock 2 of the Champlain Canal was located adjacent to the western end of the dam. A hydroelectric generating station operated by the Niagara Mohawk Power Corporation was located to the west of the navigation lock.

b. Location

The dam is located on the Hudson River, southeast of the City of Mechanicville. The dam is to the east of Routes 4 and 32.

c. Size Classification

This dam is 23.5 feet high and impounds a reservoir of 2716 acre-feet. It is classified in the intermediate size category as defined by the "Recommended Guidelines for the Safety Inspection of Dams."

d. Hazard Classification

The dam is classified as a "high" hazard structure because of a number of homes located along the banks of the Hudson River downstream of the dam and because of the high economic losses to the barge canal and the power station which would occur if the dam failed.

e. Ownership

The Lock 2 Dam is owned by the State of New York - Department of Transportation (NYS-DOT), Waterways Maintenance Subdivision. It is located in DOT-Region 1, whose headquarters are in Albany, New York. The hydroelectric power station at the western end of the dam is owned and operated by the Niagara Mohawk Power Corporation.

The addresses of the Main Office and Regional Office of DOT are as follows:

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

New York State DOT
Region 1 Office
84 Holland Avenue
Albany, New York 12208
Mr. John Hulchanski
Waterways Maintenance Engineer
(518)474-6715

f. Purpose of Dam

The primary purpose of this dam is for navigation on the Champlain Barge Canal. The impounded waters form a storage pool for Lock No. 2. A supplementary purpose of the dam is to provide a reservoir for hydroelectric generation at the power station.

g. Design and Construction History

Records indicate that this dam was built about 1899. The crest of the spillway section was replaced in 1904 by the Hudson River Power Transmission Company who were the owners of the dam at that time. The Adirondack Electric Power Corporation purchased the dam around 1910. Several years later, the dam was appropriated by the New York State Department of Public Works (NYS-DOT's predecessor) for the Champlain Canal. Lock C-2 was built in about 1915 as part of the construction of the canal. Some modifications to the dam have been made in the time that DOT has owned the dam. No plans or detailed records of these modifications were available. The spillway was recapped and steel sheet piling was driven along the upstream face in the late Forties. The gate house at the western end of the dam was demolished and the gates were sealed in the mid-Sixties.

h. Normal Operating Procedures

Water flows over the ungated spillway. Flow diversions from the pool occur through the intakes of the Lock during boat passage and through the Niagara Mohawk powerhouse.

1.3 PERTINENT DATA

a. Drainage Area (square miles)	4570
b. Discharge at Dam	(cfs)
Top of Lock 2	61,408
c. Elevations (Barge Canal Datum-BCD)	
Top of Lock 2	56.5
Spillway Crest	48.0
Reservoir Pool	48.0
Reservoir Pool (USGS Datum)	47.0

d. Reservoir

	Surface Area (acres)
Top of Lock 2	385
Spillway Crest	286

e. Storage Capacity (acre-feet)

Top of Lock 2	2716
Spillway Crest	1146

f. Dam

(1) Spillway section

Type: Reinforced concrete with concrete apron and vertical steel sheet pile wall on upstream face.

Length (ft):	700
Height (ft):	15

(2) Auxiliary Spillway (Failed section)

Type: Reinforced concrete overflow section-originally 2 feet above spillway crest. Now, segments of the concrete are in downstream channel.

Length (ft): 143

(3) Gatehouse section

Type: Concrete foundation of former gatehouse; Contains 12 bays each with a gate that has been sealed

Length (ft): 117

h. Reservoir Drain

None

i. Appurtenant Structures

(1) Lock 2

Concrete lock on Champlain Canal; Lock is 350 feet long, 45 feet wide (along axis of dam) and 40 feet deep.

(2) Power station:

Power house operated by Niagara Mohawk Power Corp.

Length (ft): 270

SECTION 2: ENGINEERING DATA

2.1 GEOTECHNICAL DATA

a. Geology

The Lock 2 Dam is located in the Hudson Valley Lowlands physiographic province of New York State. Rock in this area was formed during the Cambrian and Ordovician periods. Intricately folded and faulted shale, sandstone and slate are the predominant rock types in this area. There are extensive outcrops of highly weathered shale in the vicinity of the dam. The present surficial soils have resulted primarily from glaciations during the Cenozoic Era; the last of which was the Wisconsin glaciation.

b. Subsurface Investigations

No records of any subsurface investigations performed for this structure could be located. Based on the information which was available, it appears that the dam was founded on shale.

2.2 DESIGN AND CONSTRUCTION RECORDS

No information was available concerning the design or construction of this dam. A plan concerning the 1904 reconstruction of the spillway section was available. A complete set of construction plans for the lock was available at the Main Office of DOT. No plans were available concerning the other modifications which have been made to this structure.

2.3 OPERATION RECORDS

The dam is visually inspected on an irregular basis by engineers from NYS-DOT. Mean daily water levels are recorded at locations both upstream and downstream of the lock. These records are on file at the NYS-DOT Region One Waterways Office.

2.4 EVALUATION OF DATA

The data presented in this report was obtained from the files of the Department of Environmental Conservation and NYS-DOT. Information concerning the dam and its foundation was very limited. The dimensions of the main spillway section shown on the plans did not agree with measurements made during the inspection. In general the information appeared to be adequate for Phase I inspection purposes.

SECTION 3: VISUAL INSPECTION

3.1 FINDINGS

a. General

Visual inspection of the Lock 2 Dam at Mechanicville and the surrounding area was conducted on August 13, 1980. The weather was partly cloudy and the temperature was in the seventies. Depth of flow over the spillway crest at the time of the inspection was less than one foot.

b. Dam-Spillway

The spillway which forms the main portion of the dam could not be observed in great detail because of submergence. Some deterioration of the concrete on the spillway was evidenced by turbulence in the flow or "rooster tails" in several locations. The worst of these irregularities in flow were in two locations at the eastern end of the spillway. There appeared to have been significant concrete removal in these areas. There were also several of these "rooster tails" noted on the apron approximately one-third of the way out from the eastern end of the spillway.

c. Gatehouse Section

The section at the west end of the dam where the gatehouse once stood was in need of repair. The twelve gates had been sealed when the gatehouse was demolished in the midsixties. Dredge material was dumped upstream of the gatehouse to further reduce flow through the gates. At the time of the inspection, there was a substantial flow coming through the fourth bary from the eastern end of the gatehouse (see photo in Appendix A). The magnitude of this flow was great enough to have scoured the concrete separating the bays and allow some of the flow to pass into the fifth bay. There was minor leakage noted emerging from all of the other bays as well.

The concrete on this section of the dam was spalled, cracked and deteriorated. There were numerous cracks in the concrete in the vicinity of the anchor bolts which had supported the gate control mechanism. The surface of the concrete on the upstream face was deteriorated both above and just below the waterline. There was significant erosion of the concrete on the wall separating the seventh and eighth bays of the gate outlets (see photos) Trees and brush growing on the downstream face should be removed.

The western end of the gatehouse tied into the natural ground at the west abutment. The slope downstream of the gate house consisted of some fill over partially decomposed shale. There was surface erosion and some minor sloughing on this slope.

d. Auxiliary Spillway

There was originally a concrete auxiliary spillway at the eastern end of the dam. The crest of this section was two feet above the crest of the main spillway. This entire section failed in 1978. Several large segments which had broken off the spillway were in the channel downstream of their original location. A wall which had deflected flow away from the east abutment had also failed. This had caused a substantial amount of erosion of earth from the eastern abutment (see photo).

e. Reservoir

The reservoir for this dam is a segment of the Hudson River. At the western end of the dam, there is a swampy area and the river channel is not clearly defined in this area. On the eastern side, the bank of the channel is more well defined.

f. Appurtenant Structures

1. Lock C-2

The navigation lock was in satisfactory condition. No major deficiencies were noted on the canal walls or the gate mechanisms.

2. Niagara Mohawk power station

The power station at the far western end of the dam was not inspected in great detail. However, the station was operational and appeared to be in satisfactory condition.

3.2 EVALUATION OF OBSERVATIONS

Visual inspection revealed several deficiencies on this structure. The following items were noted:

1. The auxiliary spillway section at the eastern end of the dam had failed. This was permitting concentrated flow around this end of the dam and had caused substantial erosion at the east abutment.

2. A large volume of water was flowing through one of the bays of the gatehouse.

3. There was substantial deterioration of concrete on the gatehouse section. Trees and brush growing on the downstream face were contributing to this deterioration.

4. Deteriorated concrete on the main spillway sections was evidenced by irregularities in flow in several locations.

5. There was some minor sloughing and surface erosion at the contact between the gatehouse and the west abutment.

SECTION 4: OPERATION AND MAINTENANCE PROCEDURES

4.1 PROCEDURES

The normal water surface is at or slightly above the uncontrolled spillway crest. Flow diversions occur through the Niagara Mohawk power station and through the navigation lock. The navigation season extends from April to December.

4.2 MAINTENANCE OF DAM AND APPURTENANT STRUCTURES

The dam is maintained by NYS-DOT. Some minor maintenance is performed as needed. Overall maintenance efforts have been deficient resulting in many items which now need to be repaired. The lock has been satisfactorily maintained by DOT. Niagara Mohawk maintains the power house.

4.3 WARNING SYSTEM IN EFFECT

No apparent warning system is present.

4.4 EVALUATION

The operation procedures for this dam are satisfactory. Maintenance procedures are deficient as evidenced by the problem areas listed in section 3.2.

SECTION 5: HYDROLOGIC/HYDRAULIC

5.1 DRAINAGE AREA CHARACTERISTICS

The delineation of the contributing watershed to this dam is shown on the map titled "Drainage Area - Lock 2 @ Mechanicville" (Appendix C). With the drainage area encompassing some 4570 square miles including portions of Vermont and Massachusetts, the Hudson River main stem travels approximately 140 miles from its headquarters south of Lake Placid to the Lock 2 Dam. Major tributaries to the Hudson River are the Cedar, Indian, Boreas, Schroon, Sacandaga, and Hoosic Rivers and the Batten Kill. Numerous lakes including Brant, Schroon, Piseco and Saratoga lie within the basin as well as three major reservoirs; Indian Lake, the Tomhannock, and the Sacandaga Reservoir. Approximately one-half to two-thirds of the basin lies within the Adirondack Mountain area where elevations rise to +5344 at Mounty Marcy. Elevations at the east abutment of the dam are near +48. Developed land use has occurred in the lower portion of the basin; the larger developments being the municipalities of Warrensburg, Glens Falls, Hudson Falls, Saratoga Springs; Arlington, Vermont; Greenwich, Schuylerville, Cambridge; Bennington, Vermont; Adams, North Adams, and Williamstown, Massachusetts; and Hoosick Falls.

5.2 ANALYSIS CRITERIA

The analysis of the spillway capacity of the dam was performed using streamflow gaging station records (Appendix C) and data contained in a Corps of Engineer report entitled "Upper Hudson and Mohawk River Basins Hydrologic Flood Routing Models." The methodology described in this report employed the Corps of Engineers HEC-1 computer program in developing a model that correlated well with past known major storm events; i.e., the storms of October, 1945, December, 1948 and June, 1972. No direct computer analysis using HEC-1 was performed. The spillway design flood selected for analysis was the PMF in accordance with recommended guidelines of the U.S. Army Corps of Engineers.

5.3 SPILLWAY CAPACITY

The ungated spillway section forms the largest portion of the dam. The 700 foot long weir is composed of concrete. The discharge coefficient (c) for the ogee crest varies with the head of water flowing over the section. Coefficients ranging from 3.3 to 3.54 were used in the computations. These coefficients were obtained from Table 5-13 in the Handbook of Hydraulics.

The computed discharge capacity for the water surface at the top of lock (elevation 56.8CD) was 61,408 cfs. Since the present crest elevation of the failed auxiliary spillway section could not be determined, flow over this 143 foot section was not included in the total discharge capacity.

The spillway does not have sufficient capacity for discharging the peak outflow from one-half of the Probable Maximum Flood (PMF). For this storm event, the peak inflow and the peak outflow would be approximately 191,000 cfs. The PMF peak discharge would be approximately 382,000 cfs.

5.4 RESERVOIR CAPACITY

The normal water surface is at or slightly above the spillway crest. Storage capacity of the reservoir with the water surface at the spillway crest is approximately 1150 acre-feet. The storage capacity to the top of the lock is 2716 acre-feet. The upstream limit of the reservoir is the Lock 3 Dam north of Mechanicville.

5.5 FLOODS OF RECORD

The maximum known discharge occurred on March 28, 1913 when a flow of 120,000 cfs was recorded at the Lock 3 Dam, approximately one mile upstream of this structure. The computed water surface elevation for this flow was 59.7 (BCD) which is more than 3 feet over the top of the lock.

5.6 OVERTOPPING POTENTIAL

Analysis indicates that the spillway does not have sufficient discharge capacity for either the PMF (Q=382,000 cfs) or one half (Q=191,000 cfs) of the PMF. Using spillway capacities calculated in the manner described in section 5.3, the depth of flow over the top of the lock would be 8.1 feet for one half the PMF and 16.6 feet for the PMF.

5.7 EVALUATION

The spillway capacity is inadequate for the peak outflow from one half the PMF. For such large storm events, a high tailwater condition would occur resulting in the flooding of the downstream hazard areas. Due to this condition, the failure of the dam would not significantly increase the hazard to loss of life from that which would exist just before overtopping failure. Therefore, the spillway capacity is rated as inadequate.

SECTION 6: STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

a. Visual Observations

Inspection of the main spillway was not possible due to the flow over the section. Some deterioration of the concrete on this section was noted as was described in Section 3. The concrete on the gatehouse section was seriously deteriorated with substantial flow coming through one of the gates. The auxiliary spillway section had failed completely. Large sections of concrete which had broken off the spillway were in the channel downstream of their original location.

b. Data Review and Stability Evaluation

A sectional elevation prepared in 1904 for the spillway portion of the dam was used to perform a structural stability analysis. Since no plans of the gatehouse section could be located, it was not possible to analyze that segment. The following conditions were analyzed:

1. Normal conditions with water level at spillway crest elevation
2. Water level at spillway crest with ice load of 5,000 lb/ft.
3. Water level at elevation of assumed maximum flood (59.7 BCD); flow depth of 11.7 feet over spillway
4. Water level at elevation of one-half PMF (64.6 BCD); flow depth of 16.6 feet over spillway.

The safety factors for overturning and sliding obtained from the analyses are:

Condition	Results of Analysis		
	Overturning	Resultant Within Middle Third	Sliding
1) Normal water level	2.01	YES	1.46
2) Ice load with normal water level	1.63	YES	.85
3) Flood of record, flow depth 11.7	1.60	YES	.57
4) 1/2 PMF, flow depth of 16.6 feet	1.48	YES	.46

The results of these analyses indicate that the safety factors with respect to sliding are deficient when the structure is subjected to severe loading conditions such as ice loading or flood flows. A more detailed analysis of the structural stability is required. Field investigations to accurately define the dimensions of the spillway section and to develop cross sections of the gatehouse section should be undertaken. Information obtained should then be incorporated into a stability evaluation of the structure. Based on the results of this evaluation, it should be determined whether modifications to the structure are required.

e. Seismic Stability

A seismic stability analysis was performed for this structure in accordance with Corps of Engineer's Guidelines using normal conditions and a seismic coefficient of 0.10. The analysis indicated that the factor of safety for overturning with seismic considerations included was 1.65 and the resultant force falls within the base of the dam. The factor of safety against sliding was 0.93.

SECTION 7: ASSESSMENT/RECOMMENDATIONS

7.1 ASSESSMENT

a. Safety

The Phase I inspection of the Lock 2 Dam revealed several deficiencies which can affect the safety of the dam. The auxiliary spillway section had failed allowing a portion of the river to flow around the end of the dam. There was serious leakage in the vicinity of one of the gates in the gatehouse section.

The spillway, while not having sufficient discharge capacity for passing one-half of the PMF, is considered to be inadequate. During periods of unusually heavy precipitation, continuous surveillance should be provided both at the dam and in the downstream areas to warn of hazardous flooding conditions. A detailed emergency operation plan and warning system should be developed.

b. Adequacy of Information

The information available, while sufficient for the preparation of the Phase I inspection report, was deficient in several respects. The cross section of the spillway used in the preparation of the report did not agree with measurements made at the time of the inspection. In addition, no information was available concerning the present elevation of the failed auxiliary spillway section at the eastern end of the dam.

c. Need for Additional Investigations

Further analysis of the structural stability of this dam is needed. These studies should include subsurface and structural investigations to obtain information about the condition of the structure and its foundation. Accurate cross sections of the dam should also be developed. This information should then be incorporated into a detailed stability evaluation.

Studies are also required to determine a means of reconstructing the failed auxiliary spillway section and of repairing the leak in the gatehouse section.

d. Urgency

The investigations of the structural stability into the reconstruction of the auxiliary spillway and concerning the repair of the gatehouse section should be commenced within 3 months of the date of notification of the owner. Remedial work deemed necessary as a result of these investigations should be completed within 18 months. Other deficiencies noted should be corrected within 12 months of the date of notification.

7.2 RECOMMENDED MEASURES

1. Upon completion of the structural stability analysis, appropriate modifications to the structure should be made.

2. The serious leak in the gatehouse section as well as the deteriorated concrete in this area should be repaired.

3. The auxiliary spillway section should be reconstructed.

4. The erosion at the east abutment, beyond the auxiliary spillway section should be treated.

5. The deteriorated concrete on the main spillway section should be repaired.

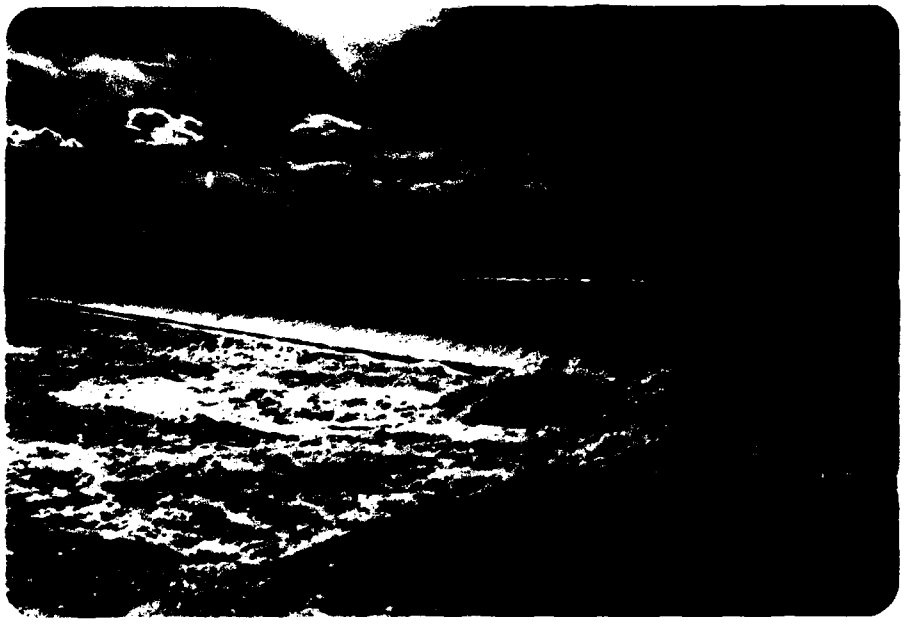
6. The area where minor sloughing and erosion has occurred at the contact between the gatehouse and the west abutment should be regraded.

7. Develop an emergency action plan for notification of downstream residents.

APPENDIX A

PHOTOGRAPHS

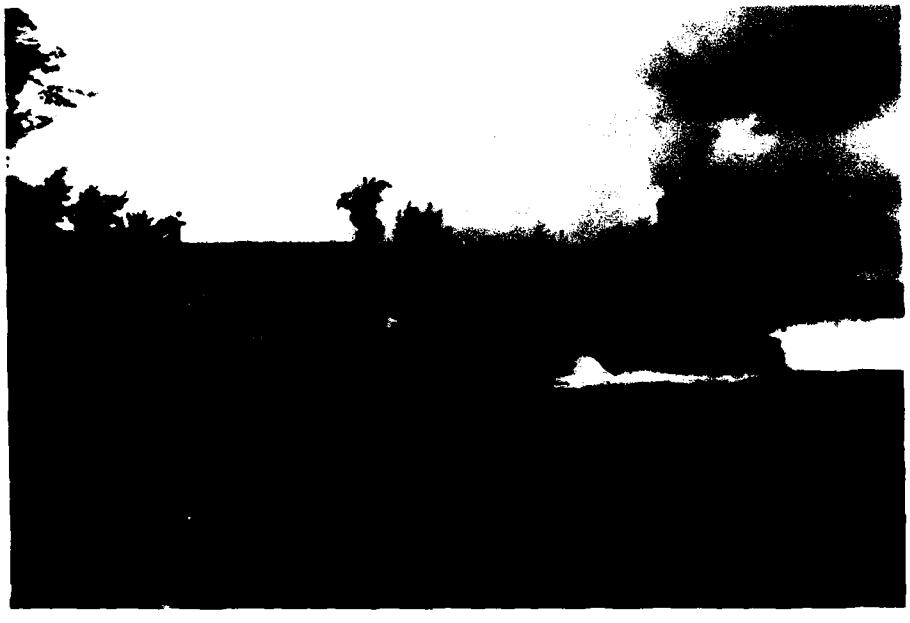
Spillway Section - View from Western End of Dam



Spillway Section - View from Eastern End of Dam; Note Irregularities in Flow (Rooster Falls)

Upstream Face of Gatehouse Segment - Note Deteriorated Concrete

Crest of Gatehouse Section - Note Cracking of Concrete and Trees Growing on Downstream Face



Downstream Face of Gatehouse Section - Note Flow Coming Through Fourth Bay from East End

Base of Gatehouse Section - Note Deteriorated Concrete on Wall Separating Bays

Surface Erosion and Sloughing at Western End of Gatehouse Section

Erosion and Deterioration of Shale Outcrop at Western End of Dam

View Looking West Across Axis of Dam in Area Where Auxiliary Spillway used to Stand

Failed Auxiliary Spillway Section - Segments of Concrete which had Broken off are now in Downstream Channel

Failed Wall at Eastern End of Auxiliary Spillway Section

Erosion of Abutment at East End of Dam

Jetty Separating Barge Canal from Spillway Section

Champlain Canal Lock 2 and Niagara Mohawk Power Station at Western End of Dam

APPENDIX B

VISUAL INSPECTION CHECKLIST

VISUAL INSPECTION CHECKLIST

1) Basic Data

a. General

Name of Dam LOCK C-2 AT MECHANICVILLE

Fed. I.D. # 988 DEC Dam No. #225A-102

River Basin UPPER HUDSON

Location: Town MECHANICVILLE County SARATOGA-RENSSELAER

Stream Name HUDSON RIVER

Tributary of —

Latitude (N) 42° 52.8' Longitude (W) 73° 40.6'

Type of Dam CONCRETE

Hazard Category C

Date(s) of Inspection 8/13/80

Weather Conditions OVERCAST

Reservoir Level at Time of Inspection UPSTREAM 48.7 DOWNSTREAM 30.6

b. Inspection Personnel W.C.LYNICK R.L. WARRENDER

c. Persons Contacted (Including Address & Phone No.) REGION 1
WATERWAYS MAINTENANCE - JACK HUNTINGTON
LESTER MOLL - CHEIF OPERATOR - LOCK 2 (664-9961)

d. History:

Date Constructed PRIOR TO 1897 Date(s) Reconstructed 1904

Designer

Constructed By

Owner NYS/DOT WATERWAYS MAINTENANCE SUBDIVISION

NO EMBANKMENT, DRAINAGE SYSTEM, OR INSTRUMENTATION THEREFORE PAGES 2, 3 & 4 ARE NOT INCLUDED.

5) Reservoir

a. Slopes LOW AREAS - RIVER SWAMPY
EAST ABUTMENT RISES SHARPLY - SOME SHALE OUTCROPS

b. Sedimentation NONE APPARENT

c. Unusual Conditions Which Affect Dam NONE

6) Area Downstream of Dam

a. Downstream Hazard (No. of Homes, Highways, etc.) NUMBER OF HOMES DOWNSTREAM

b. Seepage, Unusual Growth NONE

c. Evidence of Movement Beyond Toe of Dam NONE

d. Condition of Downstream Channel WIDE RIVER - SHALE OUTCROPS ON EAST END

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

MAIN DAM IS OVERFLOW SECTION 700 ft LONG — AUX. SPILLWAY SECTION AT EAST END OF DAM 143 FT LONG - (FAILED SECTION)

a. General

b. Condition of Service Spillway SATISFACTORY - EXCEPT FOR 6 ROOSTER TAILS - THE 2 MOST EASTERLY ONES WERE THE WORST & APPEAR TO HAVE SIGNIFICANT CONCRETE REMOVAL
ALSO 2 ROOSTER TAILS IN APRON ½ WAY OUT FROM EAST END OF SPILLWAY

c. Condition of Auxiliary Spillway FAILED SECTION AT EAST END OF DAM CONCRETE SECTIONS HAVE FAILED & SEGMENTS ARE SITTING IN CHANNEL DOWNSTREAM OF THEIR ORIGINAL LOCATION

d. Condition of Discharge Conveyance Channel MAIN CHANNEL-GOOD EAST END-HAS PROBLEMS - FAILURE OF AUXILIARY SECTION HAS CAUSED SERIOUS EROSION PROBLEMS & MUCH SCOUR ON EAST ABUTMENT- WALL WHICH USED TO DEFLECT FLOW AWAY FROM ABUTMENT ALSO FAILED. HIGHLY WEATHERED SHALE IN CHANNEL

8) Reservoir Drain/Outlet 12 INOPERABLE GATES ON GATE HOUSE

Type: Pipe _____ Conduit _____ Other _____

Material: Concrete _____ Metal _____ Other _____

Size: _____ Length _____

Invert Elevations: Entrance _____ Exit _____

Physical Condition (Describe): Unobservable _____

Material: _____

Joints: _____ Alignment _____

Structural Integrity: _____

_____

Hydraulic Capability: _____

_____

Means of Control: Gate _____ Valve _____ Uncontrolled _____

Operation: Operable _____ Inoperable ✓ Other _____

Present Condition (Describe): GATES WERE SEALED WHEN GATEHOUSE WAS TORN DOWN & DREDGE MATERIAL WAS DUMPED ON UPSTREAM SIDE

9) Structural - GATE HOUSE SECTION

a. Concrete Surfaces MODERATE SURFACE SPALLING & CRACKING IN CONCRETE ALONG UPSTREAM FACE OF ENTIRE BUILDING
SIGNIFICANT SURFACE CONCRETE DETERIORATION AT GATE ENTRANCE BOTH ABOVE & BELOW WATERLINE

b. Structural Cracking YES- AROUND ALL ANCHOR BOLTS OF FORMER GATE CONTROL MACHINERY WITH RESULTING LOSS OF CONCRETE (6" WIDE BLOCKS)

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

d. Junctions with Abutments or Embankments SOME UNDERMINING, SLIGHT EROSION & MINOR SLOUGHING AT WEST ABUTMENT CONTACT.

e. Drains - Foundation, Joint, Face DOWNSTREAM FACE - TREES & VEGETATION ESTABLISHED ON CONCRETE FACE OF GATE BUILDING

f. Water Passages, Conduits, Sluices 12 INOPERABLE GATES
ALL GATES SEALED IN LATE 60'S.
SUBSTANTIAL DETERIORATION OF GATEHOUSE BAYS- LARGE VOID AT FIFTH BAY FROM WESTERN END

g. Seepage or Leakage MINOR LEAKAGE THRU ALL GATES
MAJOR LEAK ON THE THIRD GATE FROM THE WEST END- FLOW IS SO SUBSTANTIAL THAT IT IS CAUSING FLOW INTO THE FOURTH BAY

h. Joints - Construction, etc. _____

i. Foundation _____

j. Abutments MINOR EROSION & SLOUGHING AT WEST ABUTMENT

k. Control Gates GATES ARE INOPERABLE

l. Approach & Outlet Channels _____

m. Energy Dissipators (Plunge Pool, etc.) NATURAL RIVER BED

n. Intake Structures _____

o. Stability _____

p. Miscellaneous STEEL SHEET PILE WALL UPSTREAM OF MAIN SPILLWAY

10) Appurtenant Structures (Power House, Lock, Gatehouse, Other)

a. Description and Condition

LOCK C-2 - AT WESTERN END OF DAM IS OPERATIONAL & IN SATISFACTORY CONDITION

NIAGARA MOHAWK POWER STATION - SATISFACTORY CONDITION

APPENDIX C

HYDROLOGIC/HYDRAULIC ENGINEERING DATA AND COMPUTATIONS

CHECK LIST FOR DAMS
HYDROLOGIC AND HYDRAULIC
ENGINEERING DATA

AREA-CAPACITY DATA:

	Elevation (ft.)	Surface Area (acres)	Storage Capacity (acre-ft.)
1) Top of Dam - Top of Lock	56.5	385	2716
2) Design High Water (Max. Design Pool)			
3) Auxiliary Spillway Crest - Failed	No longer in existence		
4) Pool Level with Flashboards			
5) Service Spillway Crest	48.0	286	1146

DISCHARGES

	Volume (cfs)
1) Average Daily	
2) Spillway @ Maximum High Water	61,408
3) Spillway @ Design High Water	
4) Spillway @ Auxiliary Spillway Crest Elevation	
5) Low Level Outlet	
6) Total (of all facilities) @ Maximum High Water	
7) Maximum Known Flood	120,000
8) At Time of Inspection	

CREST: ELEVATION: 56.5

Type: Lock Wall

Width: 45 Ft Length: _____

Spillover Main Dam-Spillway Section

Location _____

SPILLWAY:

PRINCIPAL		EMERGENCY
48.0	Elevation	Failed
Concrete Overflow	Type	
	Width	
	Type of Control	
✓	Uncontrolled	
	Controlled:	
	Type (Flashboards; gate)	
	Number	
	Size/Length	
	Invert Material	
	Anticipated Length of operating service	
	Chute Length	
	Height Between Spillway Crest & Approach Channel Invert (Weir Flow)	

HYDROMETEROLOGICAL GAGES:

Type : STAFF GAGE & WATER-STAGE RECORDER AT LOCK 3

Location: ON RT BANK JUST UPSTREAM OF LOCK 3

Records: (USGS)

Date - 10/1887 TO 9/1956

Max. Reading - HEAD = 11.67' 3/28/1913
DISCHARGE = 120,000cfs

FLOOD WATER CONTROL SYSTEM:

Warning System: NONE

Method of Controlled Releases (mechanisms):

POWER HOUSE OR LOCK C-2

DRAINAGE AREA: 4570

DRAINAGE BASIN RUNOFF CHARACTERISTICS:

Land Use - Type: ½-⅔ AREA IN ADIRONDACK MOUNTAINS

Terrain - Relief: ELEVATIONS RANGE FROM +5344 TO +48 AT DAM

Surface - Soil: VARIES

Runoff Potential (existing or planned extensive alterations to existing (surface or subsurface conditions)

N/A

Potential Sedimentation problem areas (natural or man-made; present or future)

N/A

Potential Backwater problem areas for levels at maximum storage capacity including surcharge storage:

N/A

Dikes - Floodwalls (overflow & non-overflow) - Low reaches along the Reservoir perimeter:

Location: NONE

Elevation: _____

Reservoir:

Length @ Maximum Pool _____ (Miles)

Length of Shoreline (@ Spillway Crest) _____ (Miles)

00-15-1 (3/78)
Formerly GA-17

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PROJECT GRID

JOB	SHEET NO.	CHECKED BY	DATE
LOCK 2 DAM AT MECHANICVILLE	1		
SUBJECT		**COMPUTED BY**	**DATE**
STREAM FLOW GAGE DATA		RLG1	9/5/80

RECORDS TAKEN FROM INFORMATION USED ON THE LOCK 3 DAM NY 215 REPORT

USGS WSP 1302: (RECORDS TO SEPT. 1950)

GAGE #61: MAX Q = 120000 cfs ON 3/28/1913

MAX Q = 118000 cfs ON 1/1/1949

USGS WSP 1722 (RECORDS OCT. 1950 TO SEPT 1960)

GAGE #R355: DISCONTINUED SEPT. 1956)

MAX Q = SAME AS ABOVE

AFTER SEPT. 1956

GAGE #3580 (-) GAGE #3575 = APPROX LOCK 2 FLOW

#3580 - HUDSON RIVER @ GREEN ISLAND, NY

#3575 - MOHAWK RIVER @ CONOES, NY

APRIL 4&5, 1960

#3580 134,900 cfs
#3575 83,300 cfs
} 51,400 cfs [NOT A MAX. Q]

JUNE 24, 1972 (HURRICANE AGNES)

MEAN DAILY

#3580 78,900 cfs [NOT A MAX Q]

#3575 50,900 cfs

DEC-15-1 (3/78)
Formerly CA-17

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PROJECT GRID

JOB	SHEET NO.	CHECKED BY	DATE
LOCK 2 DAM AT MECHANICVILLE	2		
SUBJECT: STREAMFLOW GAGE DATE & SIMULATION DATA		COMPUTED BY: RLW	DATE: 9/5/80

"UPPER HUDSON & MOHAWK RIVER BASINS
"HYDROLOGIC FLOOD ROUTING MODELS"

GREATEST ANNUAL PEAKS OF RECORD - TABLE 9.1

3/28/913	119,000 cfs	APPROX. MAX Q. ←
12/21/1948	94,400 cfs	
4/12/1932	72,900 cfs	

TABLE 6.39: (RESULTS FROM SIMULATION)

SPF = 191,121 cfs — SPS RAINFALL - 9.5"

TRANSPOSED AGNES = 251,604 cfs

PMF ≈ 2 × SPF — PMP RAINFALL - 22" (TP-40)

TRANSPOSED AGNES RAINFALL = 11"

HR #33 PMP RAINFALL 19.5"

PEAK DISCHARGE (PMF) = 382,242 cfs — USE 382,000 cfs ←

00-15-1 (3/78)
Formerly GA-17

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PROJECT GRID

JOB	SHEET NO.	CHECKED BY	DATE
LOCK 2 DAM AT MECHANICVILLE	3		
SUBJECT		**COMPUTED BY**	**DATE**
DISCHARGE COMPUTATIONS		RLW	9/5/80

DISCHARGE COEFFICIENT - SPILLWAY SECTION

TAKEN FROM FIG. 5-13 BASED ON SECTION 5-20
HANDBOOK OF HYDRAULICS

HEAD	1.0	2.0	3.0	4.0	5.0	MORE THAN 5
'C' VALUE	3.3	3.42	3.47	3.54	3.54	3.54

DISCHARGE IN SPILLWAY SECTION L=700ft

ELEVATION	H	C	Q
48.0	—	—	0
49.0	1.0	3.3	2,310
50.0	2.0	3.42	6,771
52.0	4.0	3.54	19,824
54.0	6.0	3.54	36,419
56.0	8.0	"	56,071
56.5	8.5	"	61,408
58.0	10.0	"	78,361
60.0	12.0	"	103,008
62.0	14.0	"	129,806
64.0	16.0	"	158,592
67.0	19.0	"	205,226
70.0	22.0	"	255,702
72.0	24.0	"	291,353
73.0	25.0	"	309,750

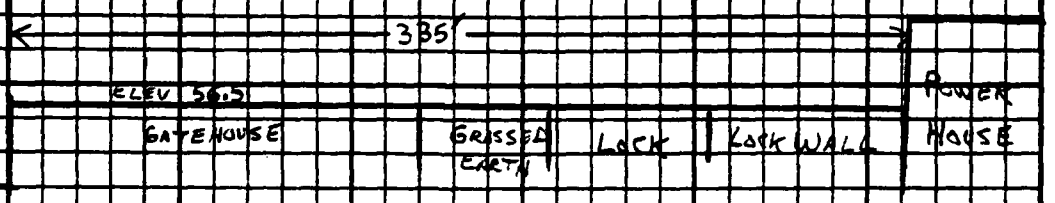
88-15-1 (3/78)
Formerly GA-17

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PROJECT GRID

JOB	SHEET NO.	CHECKED BY	DATE
Lock 2 at Mechanicville	4		
SUBJECT		**COMPUTED BY**	**DATE**
Discharge Computations		RLW	9/5/80

Flow over Gatehouse and Lock at Western End of Dam



Discharge Computations C = 3.087 L = 335 ft

Elevation	H	Q
56.5	—	—
57.0	0.5	366
58.0	1.5	1900
60.0	3.5	6771
62.0	5.5	13339
64.0	7.5	21241
67.0	10.5	35186
70.0	13.5	51296
72.0	15.5	63107
73.0	16.5	69312

Auxiliary Spillway Capacity For Historical Records

Assume Elevation of Crest = 50.0

C = 3.54 (with Head > 5 ft) L = 143 ft

Elevation	H	Q
58.0	8	11454
60.0	10	16008
62.0	12	21143
64.0	14	26517

08-15-1 (3/78)
Formerly GA-17

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PROJECT GRID

JOB	SHEET NO.	CHECKED BY	DATE
LOCK 2 AT MECHANICVILLE	5		
SUBJECT		**COMPUTED BY**	**DATE**
DISCHARGE COMPUTATIONS		RLW	9/5/80

ESTIMATE OF DEPTH OF FLOWS FOR VARIOUS FLOOD FLOWS

DEPTH OF FLOW WHICH COULD BE EXPECTED DURING PMF & ½PMF

		SPILLWAY SECTION		GATEHOUSE & LOCK		Q TOTAL	
	ELEVATION	HEAD	Q	HEAD	Q		
PMF	73.0	25.0	309750	16.5	69312	379062	
	73.1	25.1	311611	16.6	69943	381554	← USE THIS
	73.2	25.2	313474	16.7	70576	384050	
½PMF	69.5	16.5	166084	8.0	23400	189484	
	69.6	16.6	167596	8.1	23840	191436	← USE THIS

DEPTH OF FLOW WHICH MAY HAVE OCCURRED DURING FLOOD OF RECORD

	MAIN SPILLWAY		AUX. SPILLWAY		GATEHOUSE & LOCK		TOTAL
ELEVATION	HEAD	Q	HEAD	Q	HEAD	Q	Q
59.7	11.7	99,170	9.7	15293	3.2	5920	120383
59.8	11.8	100,944	9.8	15,530	3.3	6199	122173

08-15-1 (3/78)
Formerly GA-17

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PROJECT GRID

JOB	SHEET NO.	CHECKED BY	DATE
LOCK 2 AT MECHANICVILLE	6		
SUBJECT		**COMPUTED BY**	**DATE**
STORAGE - SURFACE AREA COMPUTATIONS		RLW	9/5/80

WATER SURFACE - PLANIMETERED FROM BARGE CANAL MAP

AREA BETWEEN LOCK 2 & 3 = 5.25 IN^2
− .66 IN^2 - FOR 2 ISLANDS
4.59 IN^2

1 IN^2 = 63.26 ACRES

4.59 IN^2 = 290.4 ACRES

AREA PLANIMETERED ON USGS QUAD SHEET FOR MECHANICVILLE

SURFACE AREA = 3.59 IN^2
− .47 IN^2
3.12 IN^2

1 IN^2 = 91.83 ACRES

3.12 IN^2 ⇒ 286.5 ACRES

PLANIMETERED 50 CONTOUR ON USGS SHEET = 51 ELEV. BCD

AREA = 3.89 IN^2
− .30 IN^2
3.59 IN^2 ⇒ 329.7 ACRES

PLANIMETERED 60 CONTOUR ON USGS SHEET = 61 ELEV. BCD

AREA = 4.86 IN^2
− .17 IN^2
4.69 IN^2 ⇒ 430.7 ACRES

BARGE CANAL MAP STATES THAT CHANNEL DEPTH IS 12 FT.
SO USE THAT TO CALCULATE STORAGE CAPACITY

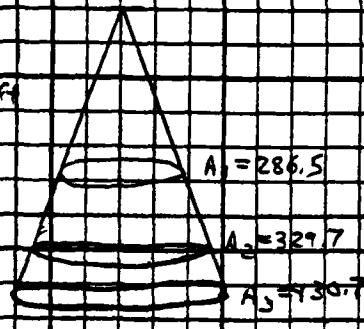
DB-15-1 (3/78)
Formerly GA-17

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PROJECT GRID

JOB	SHEET NO.	CHECKED BY	DATE
LOCK 2 AT MECHANICVILLE	7		
SUBJECT		**COMPUTED BY**	**DATE**
STAGE - STORAGE COMPUTATIONS		RLW	9/5/80

USGS ELEV	BCD ELEV
36	35
47	48
51	50
61	60



AT BCD 48.0

$V_1 = \frac{1}{3} R^2 H = (286.5)(\frac{12}{3}) = 1196$ Ac-Ft

AT BCD 51.0

$V_2 = (329.7)(\frac{12}{3}) = 1648.2$ Ac-Ft

AT BCD 61.0

$V_3 = (430.7)(\frac{24}{3}) = 3589.2$ Ac-Ft

STORAGE AT TOP OF LOCK BCD ELEVATION 56.5

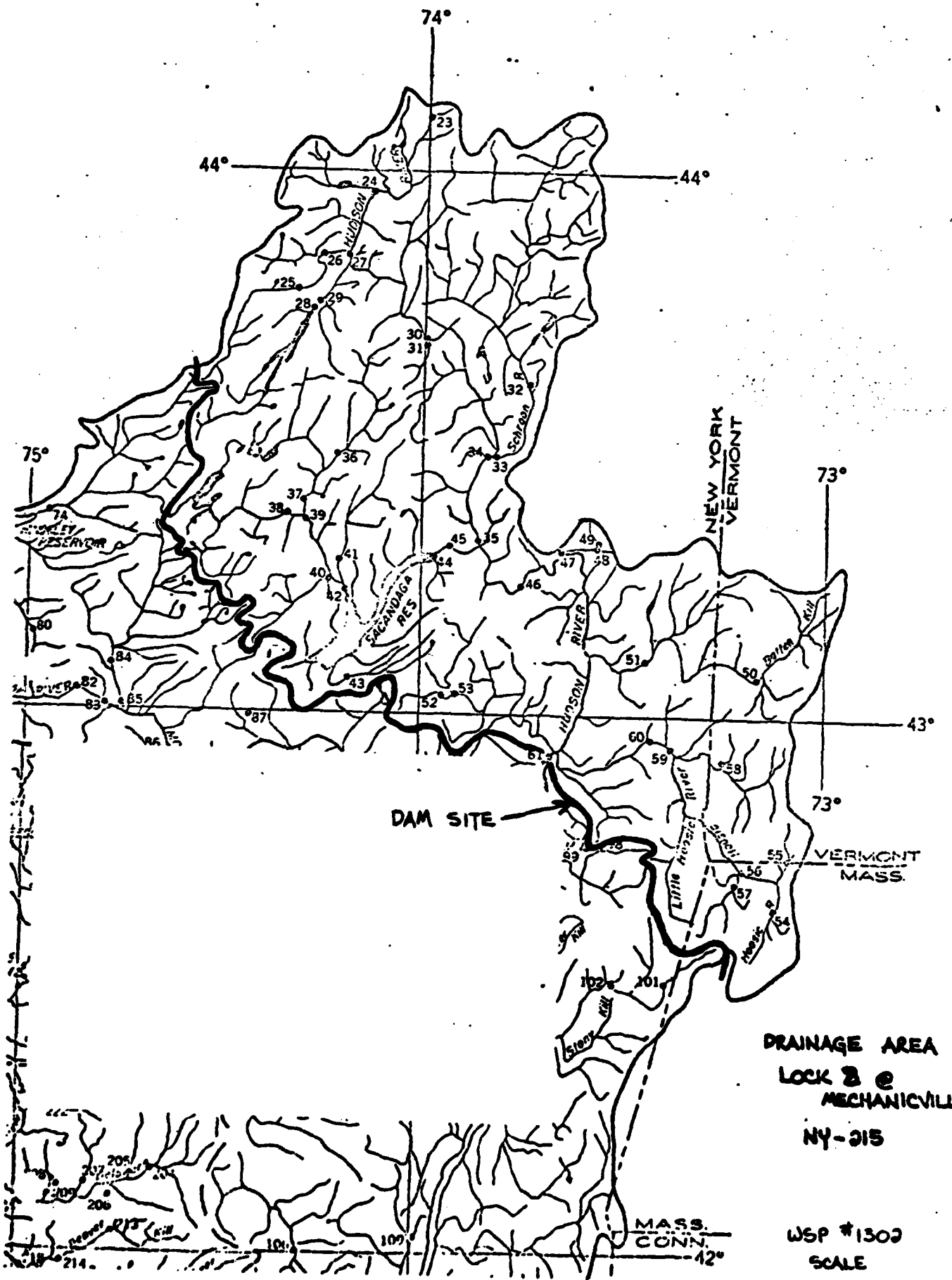
3589.2
1648.2
1941.0

$(1941)(\frac{5.5}{10}) = 1067.5$
$+ 1648.2$
2715.7 #

SURFACE AREA AT TOP OF LOCK

430.7
329.7
101.0

$101(\frac{5.5}{2}) = 55.5$
$+ 329.7$
385.25


74°
44°
44°
75°
73°
73°
43°
NEW YORK
VERMONT
HUDSON
SACANDAGA RES
SCHROON R
HUDSON RIVER
DAM SITE
VERMONT
MASS.
MASS.
CONN.
42°
DRAINAGE AREA
LOCK 8 @
MECHANICVILLE
NY-315
WSP #1309
SCALE
1:1,000,000

61. Hudson River at Mechanicville, N. Y.

Location.--Lat 42°54'45", long 73°40'45", on right bank at dam of West Virginia Pulp & Paper Co., at Mechanicville, Saratoga County, three quarters of a mile upstream from Anthony Kill, and 1½ miles downstream from Hoosic River.

Drainage area.--4,500 sq mi.

Gage.--Water-stage recorder. Datum of gage is 66.63 ft above mean sea level, datum of 1929. Prior to 1911, staff gage at same site and datum.

Average discharge.--63 years (1887-1950), 7,370 cfs, revised (unadjusted).

Extremes.--1887-1950: Maximum discharge, 120,000 cfs Mar. 28, 1913; practically no flow for short periods when plant was shut down.
Maximum known discharge prior to 1913, 70,000 cfs April, 1869 (Report of U. S. Board of Engineers on Deep Waterways).
Since 1930, maximum discharge, 118,000 cfs Jan. 1, 1949.

Remarks.--Discharge computed from flow over spillway, through wheels, and through lock of Champlain Canal since Sept. 30, 1915. Flow appreciably regulated by Indian Lake since 1898 (see p. 45), and Sacandaga Reservoir since Mar. 27, 1930 (see p. 62). During canal navigation season, water is diverted through Glens Falls feeder, Bond Creek (see pp. 66, 67), and Champlain Canal into Lake Champlain basin and occasionally may receive water from that basin through summit level of Champlain Canal at Dunham basin. No adjustment made for these diversions.

Cooperation.--Records of discharge over spillway and through wheels furnished by West Virginia Pulp & Paper Co.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1888	2,365	4,190	8,018	5,367	3,714	6,845	21,200	21,420	4,917	1,537	1,725	2,851	7,096
1889	4,908	10,642	10,014	10,983	3,790	8,280	13,690	8,871	6,869	5,727	4,272	1,963	7,476
1890	3,740	7,888	13,226	11,272	7,913	11,129	15,053	17,931	7,392	1,950	2,019	8,844	9,030
1891	9,215	9,121	3,244	8,284	11,664	17,736	20,021	5,533	3,200	2,337	2,666	2,040	7,922
1892	1,473	4,089	8,577	18,857	9,263	10,929	21,554	19,622	12,395	9,287	5,465	4,448	10,498
1893	2,819	7,404	4,031	3,192	4,805	8,250	17,889	22,285	4,801	2,521	5,005	6,870	7,506
1894	3,665	3,639	7,217	6,757	4,634	14,738	11,135	7,566	7,097	3,188	2,456	1,889	6,197
1895	3,449	6,379	4,367	3,876	3,543	4,204	23,822	6,650	2,816	2,559	3,901	2,629	5,716
1896	2,633	6,421	10,899	6,791	4,468	13,600	24,972	4,610	4,738	2,772	2,442	2,879	7,452
1897	4,100	11,352	6,913	4,007	3,895	12,214	19,274	12,167	11,855	11,108	8,241	2,756	8,374
1898	2,326	3,395	14,382	8,173	6,038	19,517	13,047	10,525	5,069	2,751	5,028	3,810	8,413
1899	7,514	8,978	5,291	8,437	5,147	9,316	24,607	9,591	2,539	2,402	1,417	2,054	7,108
1900	2,614	6,066	7,533	5,841	12,484	7,740	22,614	8,992	4,083	2,352	2,703	1,886	7,058
1901	2,129	5,077	5,331	3,087	2,866	8,085	28,268	11,656	7,806	3,551	4,661	4,024	7,214
1902	4,264	3,732	8,491	‡5,255	4,741	25,130	15,222	†9,749	6,315	8,936	6,286	3,643	‡8,480
1903	6,894	7,076	9,182	7,034	9,845	30,959	14,013	3,509	8,472	4,363	5,905	4,118	9,322
1904	10,117	5,769	5,297	5,805	5,858	11,055	20,737	13,323	6,765	‡3,953	‡5,483	6,660	‡8,485
1905	‡11,029	4,844	3,922	6,097	5,544	9,388	22,748	8,171	9,552	6,935	5,631	12,032	‡8,841
1906	4,367	‡5,853	‡5,510	9,310	7,650	9,000	30,600	13,400	9,290	5,780	3,480	3,070	‡8,500
1907	3,373	5,130	4,870	13,300	4,140	9,570	16,600	23,900	5,560	4,120	‡2,370	6,150	‡7,170
1908	9,560	14,000	12,000	8,410	9,690	24,000	22,300	17,900	3,760	2,140	1,770	1,020	9,710
1909	1,397	1,850	2,010	5,210	11,600	9,227	25,800	27,000	6,020	1,980	1,520	1,460	7,090
1910	1,543	1,680	1,570	5,130	5,460	21,400	17,600	9,230	10,200	1,600	1,980	2,270	6,850
1911	2,563	3,280	2,010	5,270	3,370	5,780	16,800	9,260	4,430	1,360	1,180	2,000	4,780
1912	7,243	7,560	10,000	4,780	3,400	10,000	27,600	12,900	5,540	1,310	1,270	†2,490	7,830
1913	6,953	10,800	8,640	12,700	5,220	25,300	16,300	†6,920	†3,930	1,790	1,070	†1,170	‡8,420
1914	2,723	6,250	4,840	2,310	3,070	7,500	33,700	12,300	2,330	2,140	1,450	1,930	6,750
1915	1,240	2,130	2,590	6,480	10,500	9,110	12,900	5,340	1,940	8,500	7,880	3,350	6,010
1916	4,303	4,200	6,630	10,000	10,100	8,910	22,900	13,000	6,900	3,930	1,710	1,920	7,880
1917	2,240	4,020	6,760	4,500	2,750	10,900	21,300	10,100	14,200	4,360	1,870	1,770	7,080
1918	3,650	6,150	2,600	1,440	4,720	12,000	21,800	10,500	4,870	2,310	1,470	3,130	6,210
1919	4,943	3,800	8,160	6,510	3,430	11,000	15,400	13,200	4,080	2,690	1,970	3,710	6,990
1920	5,020	3,950	6,480	2,210	1,970	13,600	26,400	9,530	3,350	2,320	2,660	1,970	7,140
1921	3,980	6,070	13,090	5,110	3,780	21,800	12,700	5,750	1,780	4,390	2,010	1,390	6,830
1922	2,010	5,830	7,070	3,120	4,010	14,800	30,300	11,300	11,800	5,770	3,120	2,450	8,450
1923	2,323	7,620	1,830	4,330	2,980	7,080	25,200	13,100	3,970	1,870	1,300	1,600	5,710
1924	2,100	4,370	9,110	10,250	3,793	5,530	25,400	20,300	3,630	2,040	1,870	3,000	7,840
1925	5,360	3,620	4,320	1,600	9,470	18,200	18,100	8,850	4,810	6,470	4,800	4,730	7,310
1926	[illegible]	[illegible]	9,240	4,990	4,020	[illegible]	[illegible]	13,300	5,663	3,170	2,510	2,670	7,700
1927	[illegible]	[illegible]	3,850	[illegible]	4,335	[illegible]	[illegible]	[illegible]	4,130	3,070	2,330	2,930	6,310
1928	[illegible]	[illegible]	[illegible]	[illegible]	7,140	8,230	[illegible]	[illegible]	9,820	[illegible]	[illegible]	[illegible]	9,950
1929	2,693	3,270	3,673	5,980	3,820	19,800	24,300	28,000	5,310	3,960	2,040	2,480	7,720
1930	2,960	3,910	4,880	8,380	7,180	12,800	10,700	6,680	6,410	3,110	2,430	2,370	5,980
1931	2,480	2,540	2,700	2,060	1,610	3,440	10,400	7,170	5,150	6,130	3,390	3,690	4,240
1932	4,170	5,090	7,550	10,500	7,580	5,950	14,900	9,360	3,850	4,280	3,790	3,780	6,720
1933	7,050	13,200	7,630	7,810	7,100	7,460	22,300	9,020	3,840	2,370	3,830	4,070	8,000
1934	3,895	4,212	5,315	6,207	3,507	9,315	18,360	5,807	4,687	3,127	2,963	2,687	5,873
1935	3,337	4,423	5,084	9,037	6,283	9,703	9,796	8,669	5,973	12,740	3,579	4,330	7,086
1936	4,333	8,372	8,325	4,999	2,859	28,800	18,240	9,138	3,566	2,736	2,561	3,068	7,788
1937	4,955	8,117	7,386	12,830	7,023	6,309	13,030	13,750	7,264	5,168	4,307	4,227	7,880
1938	4,673	6,868	6,778	7,746	10,430	10,510	8,858	5,317	3,394	4,248	4,408	11,320	7,003
1939	5,795	5,700	17,410	5,965	5,925	10,020	20,310	9,971	4,732	3,352	3,035	2,977	7,819
1940	2,888	3,828	7,781	2,439	2,240	4,483	18,840	15,490	8,404	3,861	3,663	4,736	6,282

† Corrected.
‡ Not previously published; partly estimated on basis of records in reports of State engineer and surveyor of New York.

., N. Y.

: dam of West Virginia Pulp & ...rters of a mile upstream from ...

...ove mean sea level, datum of ...

...sed (unadjusted).

... 28, 1913; practically no flow

...ril, 1889 (Report of U. S. Board

...949.

...ugh wheels, and through lock of ... regulated by Indian Lake since ...7, 1930 (see p. 62). During ...ns Falls feeder, Bond Creek (see ...basin and occasionally may re... ...amplain Canal at Dunham basin.

...ugh wheels furnished by West

...ubic feet per second

...une	July	Aug.	Sept.	The year
.317	1,537	1,725	2,851	7,096
.359	5,727	4,272	1,963	7,476
.332	1,350	2,019	8,846	9,030
.220	2,337	2,566	2,040	7,922
.398	9,287	5,466	4,448	10,498
.301	2,321	5,005	4,870	7,506
.097	3,166	2,456	1,869	6,197
.626	2,850	3,901	2,629	5,716
.738	2,772	2,442	2,879	7,452
.858	11,109	8,741	2,758	8,974
.068	2,731	5,029	3,810	8,413
.539	2,402	1,417	2,064	7,108
.393	2,352	2,703	1,886	7,058
.806	3,581	4,661	4,026	7,214
.315	8,934	6,786	3,643	*8,480
.672	4,863	5,905	4,118	9,322
.765	*3,853	*5,483	6,660	*8,485
.586	6,835	5,651	12,032	*8,641
.259	5,780	3,480	5,070	*8,500
.560	4,120	*2,370	6,150	*7,170
.700	2,140	1,770	1,620	9,710
.080	1,980	1,520	1,440	7,090
.230	1,600	1,980	2,270	6,650
4,430	1,380	1,180	2,000	4,780
5,540	1,310	1,270	*2,490	7,830
3,930	1,780	1,070	*1,170	*8,420
.330	2,160	1,650	1,930	6,750
1,840	6,300	7,880	3,850	6,010
.922	3,930	1,710	1,929	7,860
[illegible]	[illegible]	1,270	1,770	7,150
[illegible]	[illegible]	1,470	3,110	[illegible]
[illegible]	[illegible]	1,970	3,710	6,990
[illegible]	2,620	2,880	1,970	7,140
1,780	4,380	2,010	1,380	6,830
.800	5,770	3,120	2,460	8,450
1,970	1,870	1,300	1,600	5,710
3,680	2,040	1,870	3,000	7,640
4,810	6,470	4,800	4,730	7,810
5,680	3,170	2,310	2,670	7,780
4,130	2,070	2,300	2,930	6,310
3,830	6,410	4,360	3,220	9,950
.312	3,862	2,340	2,480	7,720
.622	3,113	2,430	2,570	5,990
5,152	4,130	3,390	3,680	4,240
3,830	4,280	3,780	3,750	6,720
3,660	2,870	3,830	4,070	8,000
6,687	3,127	2,963	2,867	5,873
5,873	12,780	3,379	4,330	7,096
3,568	2,736	2,361	3,068	7,790
7,264	5,160	4,597	4,227	7,889
3,984	4,248	4,408	11,320	7,003
4,732	3,362	3,035	2,977	7,519
8,406	5,861	5,643	6,736	8,282

...ecords in reports of State engineer and

Monthly and yearly mean discharge, in cubic feet per second, of Hudson River at Mechanicville, N. Y.--Continued

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1941	3,762	6,846	8,013	8,006	6,167	9,395	10,430	2,622	2,009	1,937	1,604	2,169	4,898
1942	2,378	4,066	4,733	5,174	3,387	9,743	13,210	5,957	7,587	3,702	3,075	4,475	5,616
1943	6,596	8,976	8,592	6,780	7,005	13,720	11,340	21,880	7,600	4,564	5,374	3,955	8,890
1944	3,535	6,884	5,213	3,006	3,832	8,929	17,480	9,474	7,422	4,557	3,188	3,577	6,413
1945	4,203	4,283	3,915	6,116	5,230	18,150	11,340	17,690	8,290	7,444	4,742	5,568	8,113
1946	13,840	12,850	8,678	8,146	5,969	15,180	5,654	8,930	7,911	3,836	3,816	3,388	8,210
1947	4,813	4,497	5,047	7,595	9,116	9,592	16,460	20,350	16,750	7,505	4,963	3,181	9,145
1948	3,024	4,156	3,412	2,603	4,225	15,800	13,330	10,490	7,235	4,117	3,470	2,567	6,245
1949	2,663	4,675	8,475	19,430	10,900	10,150	4,749	4,945	2,941	2,563	2,590	3,108	6,657
1950	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1888	0.61	1.04	2.05	1.62	0.89	1.75	5.26	5.49	1.22	0.39	0.44	0.71	21.47
1889	1.18	2.64	2.57	2.81	.88	2.12	3.39	2.27	1.70	1.47	1.09	.49	22.61
1890	.96	1.96	3.39	2.89	1.83	2.85	3.73	4.59	1.83	.50	.52	2.19	27.24
1891	2.36	2.26	.83	2.12	2.70	4.55	4.97	1.42	.79	.60	.68	.51	23.79
1892	.38	1.01	2.27	4.83	2.22	2.80	5.35	5.03	3.08	2.38	1.41	1.10	31.86
1893	.72	1.89	1.03	.82	1.09	2.11	4.44	5.71	1.19	.65	1.28	1.70	22.63
1894	.99	.90	1.85	1.73	1.12	3.78	2.76	1.94	1.76	.81	.63	.47	18.74
1895	.94	1.58	1.12	.80	.82	1.08	5.81	1.76	.70	.66	1.00	.66	17.21
1896	.89	2.08	2.79	1.74	1.12	3.49	6.20	1.18	1.18	.72	.83	.71	22.53
1897	1.05	2.82	1.78	1.03	.90	3.12	4.73	3.11	2.93	2.85	2.11	.89	27.11

Yearly discharge, in cubic feet per second

Year	W.S.P. no.	Water year ending Sept. 30							Calendar year	
		Maximum day		Minimum day	Mean	Per square mile	Runoff in inches		Mean	Runoff in inches
		Discharge	Date							
1888	24	-	-	-	7,096	1.58	21.47		7,397	24.16
1889	24	-	-	-	7,476	1.66	22.61		7,442	22.53
1890	24	-	-	-	9,030	2.01	27.24		8,757	26.38
1891	24	-	-	-	7,922	1.76	23.79		7,302	22.00
1892	24	-	-	-	10,498	2.33	31.86		10,524	31.84
1893	24	-	-	-	7,506	1.67	22.63		7,528	22.73
1894	24	-	-	-	6,197	1.38	18.74		6,170	18.64
1895	24	-	-	-	5,716	1.27	17.21		6,346	19.13
1896	35	-	-	-	7,452	1.66	22.53		7,497	22.62
1897	35	31,060	July 15, 1897	2,180	8,974	1.99	27.11		9,352	28.27
1898	47	39,231	Mar. 14, 1898	1,183	8,413	1.87	25.40		7,987	24.08
1899	47	41,475	Apr. 26, 1899	304	7,108	1.58	21.32		6,625	19.91
1900	47	43,546	Apr. 23, 1900	713	7,058	1.57	21.11		6,770	20.17
1901	65	54,862	Apr. 24, 1901	1,377	7,214	1.80	21.84		7,344	22.88
1902	82	42,940	Mar. 18, 1902	1,400	*8,840	*1.98	*26.07		*9,034	*27.36
1903	97	56,283	Mar. 25, 1903	1,057	9,322	2.07	27.70		9,160	27.63
1904	166	36,305	Apr. 11, 1904	705	*8,485	*1.88	*25.30		*8,353	*24.89
1905	166	48,877	Apr. 1, 1905	-	*8,641	*1.92	*26.07		*8,711	*26.24
1906	202	40,300	Apr. 16, 1906	197	*8,500	*1.89	*25.59		7,910	23.82
1907	241	36,700	Apr. 1, 1907	872	*7,170	*1.59	*21.69		*9,020	*27.31
1908	261	34,300	Apr. 28, 1908	673	9,710	2.16	29.35		7,190	21.69
1909	261	46,300	Apr. 16, 1909	235	7,090	1.58	21.23		7,050	21.12
1910	281	37,800	Apr. 3, 1910	345	6,650	1.48	20.04		6,900	20.80
1911	301	26,200	May 3, 1911	333	4,760	1.06	14.38		6,190	18.67
1912	321	47,275	Apr. 8, 1912	499	7,830	1.74	23.68		7,950	24.08
1913	351	a120,[illegible]	Mar. 28, 1913	[illegible]	*8,470	*1.67	*25.42		*[illegible]	*22.25
1914	331	64,[illegible]	Apr. 22, 1914	424	[illegible]	[illegible]	[illegible]		[illegible]	13.28
1915	401	33,185	Feb. 25, 1915	750	[illegible]	1.34	13.14		[illegible]	[illegible]
1916	431	35,845	Apr. 2, 1916	882	7,850	1.74	23.75		7,700	23.24
1917	461	36,300	June 13, 1917	899	7,060	1.57	21.31		7,010	21.16
1918	471	35,500	Apr. 3, 1918	576	6,210	1.38	18.71		7,010	21.13
1919	501	31,600	Apr. 13, 1919	1,360	6,990	1.55	21.14		6,980	21.01
1920	501	36,100	Apr. 6, 1920	1,090	7,140	1.59	21.60		7,280	22.04
1921	521	35,000	Mar. 22, 1921	715	6,830	1.52	20.61		6,140	18.53
1922	541	72,900	Apr. 12, 1922	725	8,450	1.88	25.50		7,750	23.38
1923	561	43,700	Apr. 9, 1923	743	5,710	1.27	17.23		6,500	19.59
1924	581	39,800	Apr. 19, 1924	820	7,640	1.70	23.10		7,440	22.52
1925	601	44,300	Mar. 30, 1925	696	7,510	1.67	22.63		8,700	26.22
1926	621	51,800	Apr. 26, 1926	995	7,760	1.72	23.41		7,090	21.39
1927	641	35,600	Mar. 21, 1927	613	6,310	1.40	19.05		7,940	24.03
1928	661	70,000	Nov. 4, 1927	933	9,950	2.21	30.13		7,480	22.58
1929	681	40,200	Mar. 25, 1929	685	7,720	1.72	23.27		7,900	23.80
1930	696	25,600	Apr. 6, 1930	806	5,990	1.33	18.08		5,650	17.04
1931	711	24,300	July 22, 1931	614	4,240	.942	12.77		5,000	15.08
1932	726	27,700	Apr. 12, 1932	1,470	6,720	1.49	20.33		7,680	23.15
1933	741	46,700	Apr. 19, 1933	1,420	8,000	1.78	24.16		6,780	20.45
1934	756	29,400	Apr. 12, 1934	1,170	5,873	1.31	17.71		5,821	17.57
1935	781	34,000	Jan. 10, 1935	1,520	7,095	1.58	21.43		7,781	23.49

* Not previously published.
a Maximum peak discharge.

Yearly discharge, in cubic feet per second, of Hudson River at Mechanicville, N. Y.--Continued

Year	W.S.P. no.	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1936	801	72,700	Mar. 19, 1936	1,500	7,758	1.72	23.46	7,711	23.31
1937	821	28,500	May 14, 1937	1,780	7,889	1.75	23.80	7,719	23.30
1938	851	65,600	Sept.22, 1938	1,670	7,003	1.56	21.14	7,473	22.56
1939	871	33,800	Apr. 29, 1939	1,060	7,519	1.67	22.71	6,284	18.97
1940	891	40,100	Mar. 31, 1940	1,320	6,282	1.40	19.01	7,062	21.37
1941	921	22,600	Dec. 31, 1940	896	4,898	1.09	14.78	4,274	12.90
1942	951	27,100	Apr. 8, 1942	843	5,616	1.25	16.96	6,705	20.24
1943	971	33,100	May 13, 1943	2,050	8,890	1.98	26.80	8,171	24.64
1944	1001	32,800	Apr. 28, 1944	1,060	6,413	1.43	19.41	6,146	18.60
1945	1031	32,600	Mar. 22, 1945	1,170	8,113	1.80	24.46	10,040	30.26
1946	1051	31,500	Mar. 9, 1946	1,070	8,210	1.82	24.75	6,448	19.44
1947	1081	40,700	June 4, 1947	1,070	9,145	2.03	27.56	6,626	26.60
1948	1111	40,100	Mar. 23, 1948	773	6,245	1.39	18.88	6,686	20.22
1949	1141	94,400	Dec. 31, 1948	886	6,657	1.48	20.07	6,654	20.01
1950	1171	27,000	Apr. 5, 1950	1,640	7,124	1.58	21.50	-	-

Note.--Monthly figures of discharge per square mile and runoff, in inches, since October 1898, previously published in water-supply papers, may be subject to considerable error because of diversions, and storage and evaporation in Indian Lake since 1930, and in Sacandaga Reservoir since Mar. 27, 1930. These figures are not published herein.

62. Black River Canal (flowing south) near Boonville, N. Y.

Location.--Lat 43°27'20", long 75°19'25", gage 1 on left bank at lock 69, 2 miles south of Boonville, Oneida County, and gage 2 on right bank of Lansingkill spillway, 100 ft downstream from spillway headgates, 600 ft upstream from lock 70, and half a mile upstream from lock 69.

Gage.--Two water-stage recorders and concrete controls. Datum of gage 1 is 1,105.56 ft above mean sea level, datum of 1929. Prior to June 7, 1929, station was operated as a slope station on summit level of canal. September 1915 to September 1942 station was operated only during canal season.

Extremes.--1915-50: Maximum daily discharge recorded, 323 cfs Nov. 30, 1915; practically no flow at times when no water is being diverted.

Remarks.--Records include combined flow at gages 1 and 2 and represents total diversion from Black River at Forestport, through Forestport feeder, into Delta Reservoir in Mohawk basin. Discharge during periods when no water was diverted is made up of leakage through headgates and runoff from area draining into canal above station.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1916	230	254	-	-	-	-	-	-	220	206	210	200	-
1917	210	225	-	-	-	-	-	-	189	183	173	169	-
1918	176	182	-	-	-	-	-	-	177	154	161	158	-
1919	137	131	-	-	-	-	-	-	-	176	164	169	-
1920	184	-	-	-	-	-	-	-	-	151	136	118	-
1921	144	-	-	-	-	-	-	-	146	166	156	158	-
1922	156	-	-	-	-	-	-	-	-	123	142	144	-
1923	145	-	-	-	-	-	-	-	-	84.6	87.7	129	-
1924	141	-	-	-	-	-	-	-	-	111	125	109	-
1925	125	-	-	-	-	-	-	-	-	47.6	40.8	57.6	-
1926	35.7	-	-	-	-	-	-	-	108	151	161	153	-
1927	130	-	-	-	-	-	-	-	-	97.5	93.8	87.5	-
1928	-	-	-	-	-	-	-	-	25.5	51.7	88.1	65.7	-
1929	-	-	-	-	-	-	-	-	-	34.7	19.7	7.30	-
1930	4.68	-	-	-	-	-	-	-	23.9	84.9	84.5	91.1	-
1931	98.1	-	-	-	-	-	-	12.5	26.8	20.4	49.2	72.5	-
1932	84.1	-	-	-	-	-	-	-	-	-	30.5	38.0	-
1933	47.5	-	-	-	-	-	-	-	-	78.4	99.2	121	-
1934	138	-	-	-	-	-	-	-	-	52.4	56.5	62.6	-
1935	-	-	-	-	-	-	-	-	22.7	31.1	50.4	60.5	-
1936	57.8	63.0	-	-	-	-	-	-	30.1	41.8	45.6	51.3	-
1937	88.4	-	-	-	-	-	-	-	16.5	33.8	56.8	67.4	-
1938	69.2	-	-	-	-	-	-	-	19.0	42.3	47.6	51.9	-
1939	56.5	-	-	-	-	-	-	-	49.9	52.0	51.4	54.6	-
1940	42.3	-	-	-	-	-	-	6.76	30.5	38.4	42.9	14.2	-
1941	62.5	-	-	-	-	-	-	43.0	46.7	53.5	53.0	56.2	-
1942	62.7	-	-	-	-	-	9.2	44.3	48.2	55.3	56.6	61.4	-
1943	27.3	34.2	9.66	4.58	4.24	14.5	16.8	19.6	12.6	34.2	47.7	55.7	23.8
1944	62.5	17.1	6.11	2.06	1.81	97.4	76.0	8.29	36.5	21.0	18.1	29.2	19.2
1945	28.7	12.6	4.76	6.42	4.96	16.2	15.8	25.0	14.9	54.5	57.3	48.6	26.3
1946	22.6	9.33	4.86	5.71	5.46	12.1	4.29	7.50	18.5	22.8	23.8	29.8	14.0
1947	66.9	12.6	1.16	.95	.61	.83	1.46	1.29	1.26	7.08	8.46	61.7	12.9
1948	72.0	80.7	4.20	1.86	4.17	12.6	3.52	33.7	38.1	46.1	58.3	66.5	35.0
1949	63.9	50.3	1.65	1.73	1.86	1.87	1.64	27.0	63.1	62.5	62.2	76.3	34.6
1950	62.1	37.9	1.75	1.93	1.66	2.16	4.26	8.99	19.0	33.2	24.7	42.0	21.1

63. Delta Re

Location.--Lat 43°16'20", long 75°23 Mohawk River 4 miles upstream fro

Drainage area.--145 sq mi.

Gage.--Staff gage. Datum of gage is

Remarks.--Dam completed Aug. 3, 1912 able began May 1, 1913. Usable 2,800,000 cu ft. Reservoir is u

Cooperation.--Records not previously State Department of Public Works.

Contents, in milli

Water year	Oct.	Nov.	Dec.	Jan.	F
1913	-	-	-	-	
1914	542	1,470	1,980	2,120	
1915	1,470	1,758	1,718	1,530	
1916	2,482	2,493	1,804	954	
1917	1,495	1,780	1,[illegible]	[illegible]	
1918	2,660	1,782	1,334	[illegible]	
1919	1,900	2,205	1,705	1,[illegible]	
1920	2,848	2,770	2,273	942	
1921	1,282	2,180	2,806	2,728	
1922	1,920	2,312	839	1,198	
1923	2,020	1,995	1,422	1,370	
1924	2,145	2,185	1,100	22	
1925	2,188	2,135	1,995	1,110	
1926	3	4	1	2	
1927	2,356	2,890	1,486	530	
1928	1,718	2,926	2,606	2,504	
1929	1,955	1,905	1,790	1,286	
1930	1,145	1,229	1,714	1,010	
1931	1,286	1,274	1,330	1,120	
1932	2,145	2,383	2,818	2,740	
1933	2,864	2,686	2,462	2,170	
1934	1,822	2,155	2,175	1,532	
1935	1,546	1,905	1,975	1,480	
1936	1,885	2,508	2,322	1,354	
1937	1,865	2,515	2,872	2,891	
1938	2,120	2,842	2,405	1,723	
1939	1,134	824	11	384	
1940	1,114	896	1,013	750	
1941	1,606	2,100	2,950	1,486	
1942	2,100	1,462	1,506	[illegible]	
1943	2,438	2,559	2,312	[illegible]	
1944	2,383	2,372	1,466	[illegible]	
1945	1,895	1,596	1,878	[illegible]	
1946	2,225	2,130	1,576	1,514	
1947	2,338	2,328	2,045	2,442	
1948	1,428	1,358	1,100	[illegible]	
1949	1,162	1,840	2,356	[illegible]	
1950	1,615	1,746	2,427	1,454	

64. Mohawk Rive

Location.--Lat 43°15'50", long 75°[illegible] 1 mile downstream from Delta Dam

Drainage area.--150 sq mi.

Gage.--Water-stage recorder. Datum datum). Prior to Jan. 24, 1937,

Average discharge.--29 years (1921-

Extremes.--1927-50: Maximum [illegible] minimum, 40 cfs Sept. 27, 194[illegible] Jan. 17, 1931.

Remarks.--During canal navigation Forestport feeder and Black Rive tion (see p. 82). Flow almost station). Small quantity of wat and later returned to river, pa

Cooperation.--Records for 1921-27, nished by State engineer and su

[illegible] Eagle Bridge, N. Y.

[illegible] right bank three-quarters of a mile down-[illegible]utheast of village of Eagle Bridge,

[illegible] July 1923 to September 1960.

[illegible] 355.41 ft above mean sea level, datum of [illegible] July 24, 1923, to July 18, 1930, water-[illegible] upstream at different datum.

[illegible] 980 cfs.

[illegible] 56,430 cfs Dec. 31, 1948 (gage height, [illegible]), from rating curve extended above 13,000 [illegible] and contracted-opening measurements at [illegible] cfs Sept. 14, 1913; minimum daily, 30 cfs

[illegible] flow caused by powerplants above station.

[illegible], in cubic feet per second

[illegible]	May	June	July	Aug.	Sept.	The year
[illegible]	861	510	748	565	643	1,144
[illegible]	2,372	1,824	293	250	268	1,183
[illegible]	2,034	455	203	156	127	978
[illegible]	1,873	906	252	287	597	864
[illegible]	884	397	186	418	222	697
[illegible]	1,819	713	268	139	377	1,064
[illegible]	887	456	348	148	152	659
[illegible]	1,176	380	395	245	291	850
[illegible]	863	421	250	198	178	796
[illegible]	809	557	471	410	1,561	1,217

[illegible] runoff, in inches

[illegible]	May	June	July	Aug.	Sept.	The year
[illegible]	1.98	1.12	1.69	1.28	0.97	30.45
[illegible]	3.12	3.55	.68	.54	.58	31.43
[illegible]	4.73	.99	.46	.35	.28	26.03
[illegible]	4.23	1.98	.37	.60	1.31	23.01
[illegible]	1.46	.87	.42	.55	.49	23.86
[illegible]	4.11	1.56	.61	.31	.82	28.40
[illegible]	2.22	1.00	.79	.33	.33	17.85
[illegible]	2.66	.83	.88	.58	.64	22.08
[illegible]	[illegible]	.92	.56	.45	.39	21.17
[illegible]	[illegible]	1.22	1.06	.83	3.61	32.47

[illegible] cubic feet per second

Sept. 30			Calendar year	
Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
-	-	-	1,019	27.12
[illegible]	[illegible]	30.45	1,218	32.44
[illegible]	[illegible]	[illegible]	960	25.61
[illegible]	[illegible]	[illegible]	1,002	26.47
[illegible]	[illegible]	23.01	1,011	26.60
[illegible]	1.76	[illegible]	927	24.42
1,064	[illegible]	[illegible]	951	25.30
[illegible]	[illegible]	17.85	[illegible]	16.21
[illegible]	[illegible]	22.08	[illegible]	21.82
796	[illegible]	21.17	960	25.24
1,217	[illegible]	32.47	-	-

3355. Hudson River at Mechanicville, N. Y.

Location.--Lat 42°54'45", long 73°40'45", on right bank at dam of West Virginia Pulp & Paper Co. at Mechanicville, Saratoga County, three-quarters of a mile upstream from Anthony Kill and 1½ miles downstream from Hoosic River.

Drainage area.--4,500 sq mi.

Records available.--October 1887 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 66.63 ft above mean sea level, datum of 1929. Prior to 1911, staff gage at same site and datum.

Average discharge.--69 years (1887-1956), 7,431 cfs (unadjusted).

Extremes.--1887-1956: Maximum discharge, 120,000 cfs Mar. 28, 1913; practically no flow for short periods when plant was shut down.
Maximum known discharge prior to 1913, 70,000 cfs April 1869 (report of U.S. Board of Engineers on Deep Waterways).
Since 1930, maximum discharge, 118,000 cfs Jan. 1, 1949.

Remarks.--Discharge computed from flow over spillway, through wheels and through lock of Champlain (Barge) Canal since Sept. 30, 1915. Flow appreciably regulated by Indian Lake since 1898 and Sacandaga Reservoir since Mar. 27, 1930. During canal navigation season, water is diverted through Glens Falls feeder, Bond Creek, and Champlain (Barge) Canal into Lake Champlain basin and occasionally may receive water from that basin through summit level of Champlain (Barge) Canal at Dunham Basin. No adjustment made for these diversions. Records of water temperatures for the period October 1954 to September 1960 are published in reports of the Geological Survey.

Cooperation.--Records of discharge over spillway and through wheels furnished by West Virginia Pulp & Paper Co.

Monthly and yearly mean discharge, in cubic feet per second

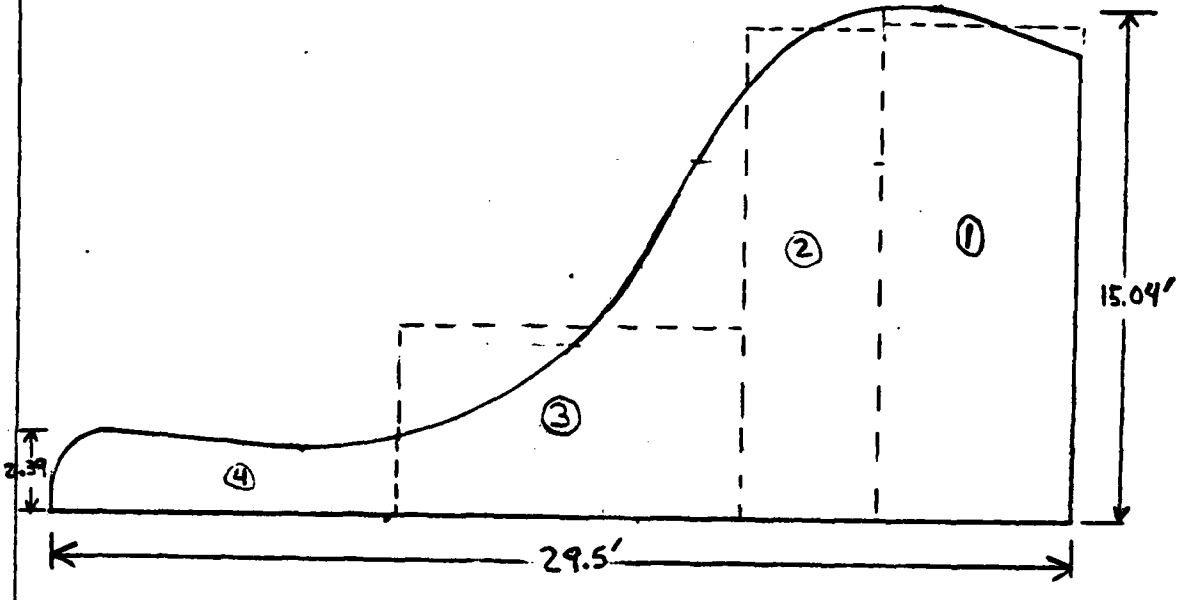
Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	3,409	5,937	9,865	7,528	11,000	10,810	23,840	7,013	4,557	7,770	5,151	4,995	8,454
1952	6,610	12,380	11,190	11,230	9,338	11,780	26,450	12,880	9,822	4,209	3,541	3,428	10,240
1953	3,035	2,898	7,803	7,941	8,490	14,950	16,390	17,730	4,048	3,177	3,275	3,154	7,747
1954	3,234	3,245	6,748	5,746	10,340	9,182	19,190	15,460	9,373	3,215	2,898	4,280	7,809
1955	3,584	7,401	8,030	5,823	5,959	9,618	19,790	5,853	5,329	2,818	3,712	3,181	6,780
1956	7,130	11,520	6,188	5,945	5,006	7,234	16,930	12,210	7,472	4,068	3,864	4,748	7,698
1957	-	-	-	-	-	-	-	-	-	-	-	-	-
1958	-	-	-	-	-	-	-	-	-	-	-	-	-
1959	-	-	-	-	-	-	-	-	-	-	-	-	-
1960	-	-	-	-	-	-	-	-	-	-	-	-	-

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30							Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches		Mean	Runoff in inches
		Discharge	Date							
1950	-	-	-	-	-	-	-		7,432	22.41
1951	1202	33,400	Mar. 31, 1951	1,770	8,454	1.88	25.49		9,369	28.29
1952	1232	46,300	Apr. 6, 1952	1,290	10,240	2.28	30.97		8,870	26.86
1953	1272	44,400	Mar. 27, 1953	1,130	7,747	1.72	23.35		7,703	23.21
1954	1332	38,200	Apr. 18, 1954	1,070	7,809	1.74	23.54		8,286	24.98
1955	1382	33,000	Apr. 18, 1955	1,010	6,780	1.50	20.38		7,262	21.92
1956	1432	32,900	Apr. 30, 1956	2,030	7,698	1.71	23.29		-	-
1957	-	-	-	-	-	-	-		-	-
1958	-	-	-	-	-	-	-		-	-
1959	-	-	-	-	-	-	-		-	-
1960	-	-	-	-	-	-	-		-	-

APPENDIX D

STABILITY COMPUTATIONS



SEGMENT	AREA	DISTANCE FROM CENTROID TO TOE
①	$(19.5)(5.6) = 81.2\ ft^2$	26.8 ft
②	$(14.2)(4) = 56.8\ ft^2$	22 ft
③	$(5.6)(10) = 56\ ft^2$	15 ft
④	$(2.5)(10) = 25\ ft^2$	5 ft

Structural Stability Analysis - Conditions Analyzed

Condition 1: Normal conditions with water level at spillway crest elevation

Condition 2: Water level at spillway crest with ice load of 5,000 lb/ft.

Condition 3: Water level at elevation of assumed maximum flood (59.7BCD); flow depth of 11.7 feet over spillway

Condition 4: Water level at elevation of one-half PMF (64.6BCD) flow depth of 16.6 feet over spillway.

LOCK 2 AT MECHANICVILLE
NY 988

STABILITY ANALYSIS PROGRAM - WORK SHEET

INPUT ENTRY		ANALYSIS CONDITION 1	2	3	4	5
Unit Weight of Dam (K/ft^3)	0	0.15	0.15	0.15	0.15	0.15
Area of Segment No. 1 (ft^2)	1	81.2	81.2	81.2	81.2	81.2
Distance from Center of Gravity of Segment No. 1 to Downstream Toe (ft)	2	26.8	26.8	26.8	26.8	26.8
Area of Segment No. 2 (ft^2)	3	56.8	56.8	56.8	56.8	56.8
Distance from Center of Gravity of Segment No. 2 to Downstream Toe (ft)	4	22.0	22.0	22.0	22.0	22.0
Area of Segment No. 3 (ft^2)	5	56.0	56.0	56.0	56.0	56.0
Distance from Center of Gravity of Segment No. 3 to Downstream Toe (ft)	6	15.0	15.0	15.0	15.0	15.0
Base Width of Dam (Total) (ft)	7	29.5	29.5	29.5	29.5	29.5
Height of Dam (ft)	8	15.0	15.0	15.0	15.0	15.0
Ice Loading (K/L ft.)	9	—	5	—	—	—
Coefficient of Sliding	10	0.6	0.6	0.6	0.6	0.6
Unit Weight of Soil (K/ft^3) (deduct 18)	11	0.055	0.055	0.055	0.055	0.055
Active Soil Coefficient - Ka	12	0.33	0.33	0.33	0.33	0.33
Passive Soil Coefficient - Kp	13	3.0	3.0	3.0	3.0	3.0
Height of Water over Top of Dam or Spillway (ft)	14	—	—	16.6	11.7	—
Height of Soil for Active Pressure (ft)	15	—	—	—	—	—
Height of Soil for Passive Pressure (ft)	16	—	—	—	—	—
Height of Water in Tailrace Channel (ft)	17	2.4	2.4	2.4	2.4	2.4
Weight of Water (K/ft^3)	18	.0624	.0624	.0624	.0624	.0624
Area of Segment No. 4 (ft^2)	19	25.0	25.0	25.0	25.0	25.0
Distance from Center of Gravity of Segment No. 4 to Downstream Toe (ft)	20	5.0	5.0	5.0	5.0	5.0
Height of Ice Load or Active Water (ft) (does not include 14)	46	15.0	15.0	15.0	15.0	15.0
Seismic Coefficient (g)	50	—	—	—	—	0.1
RESULTS OF ANALYSIS						
Factor of Safety vs. Overturning		2.01	1.63	1.48	1.60	1.65
Distance From Toe to Resultant (ft)		19.63	15.17	12.70	14.75	15.44
Factor of Safety vs. Sliding		1.46	0.85	0.45	0.57	0.93

APPENDIX E

REFERENCES

REFERENCES

1) US Army Corps of Engineers; New York District; Upper Hudson and Mohawk River Basins Hydrologic Flood Routing Models, October 1976.

2) US Geological Survey; Compilation of Records of Surface Waters of the United States, Part 1-B North Atlantic Slope Basins;

   Water Supply Paper 1302 (Through September 1950), 1960.

   Water Supply Paper 1722 (October 1950 to September 1960), 1964.

3) H.W. King and E.F. Brater; Handbook of Hydraulics, 5th edition, McGraw - Hill, 1963.

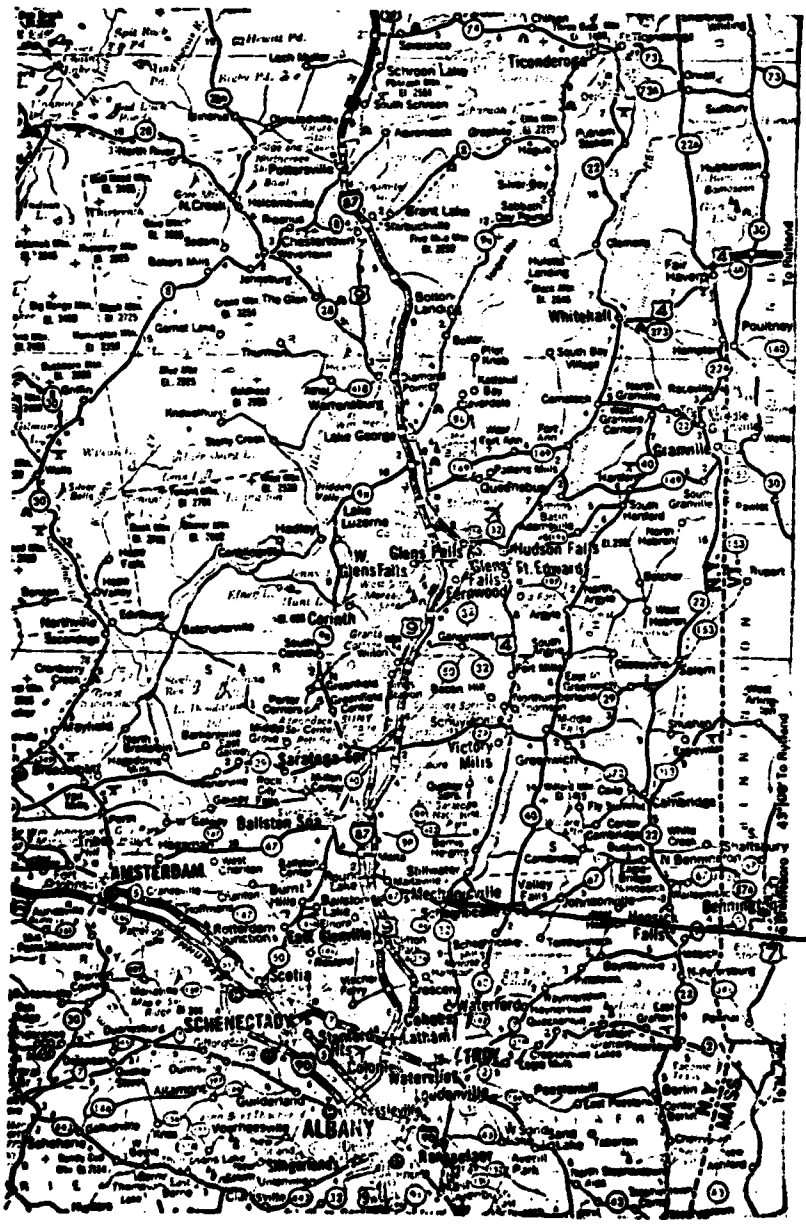
4) E.E. Seelye; Design, 3rd edition, John Wiley and Sons, Inc., 1960.

5) University of the State of New York; Geology of New York, Education Leaflet 20, Reprinted 1973.

6) U.S. Department of the Interior, Bureau of Reclamation; Design of Small Dams, 2nd edition (rev. reprint), 1977.

APPENDIX F

DRAWINGS



VICINITY MAP

LOCK 2 DAM @ MECHANICVILLE

Form IW31. 11-6-14-1000 (9-1925) Acc. 382

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

STATE OF NEW YORK
CONSERVATION COMMISSION
ALBANY

~~Lock~~ Lock 2

Sheet 225 i
N. 152 UH

DAM REPORT

....., 191....
(Date)

CONSERVATION COMMISSION,

DIVISION OF INLAND WATERS.

GENTLEMEN:

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

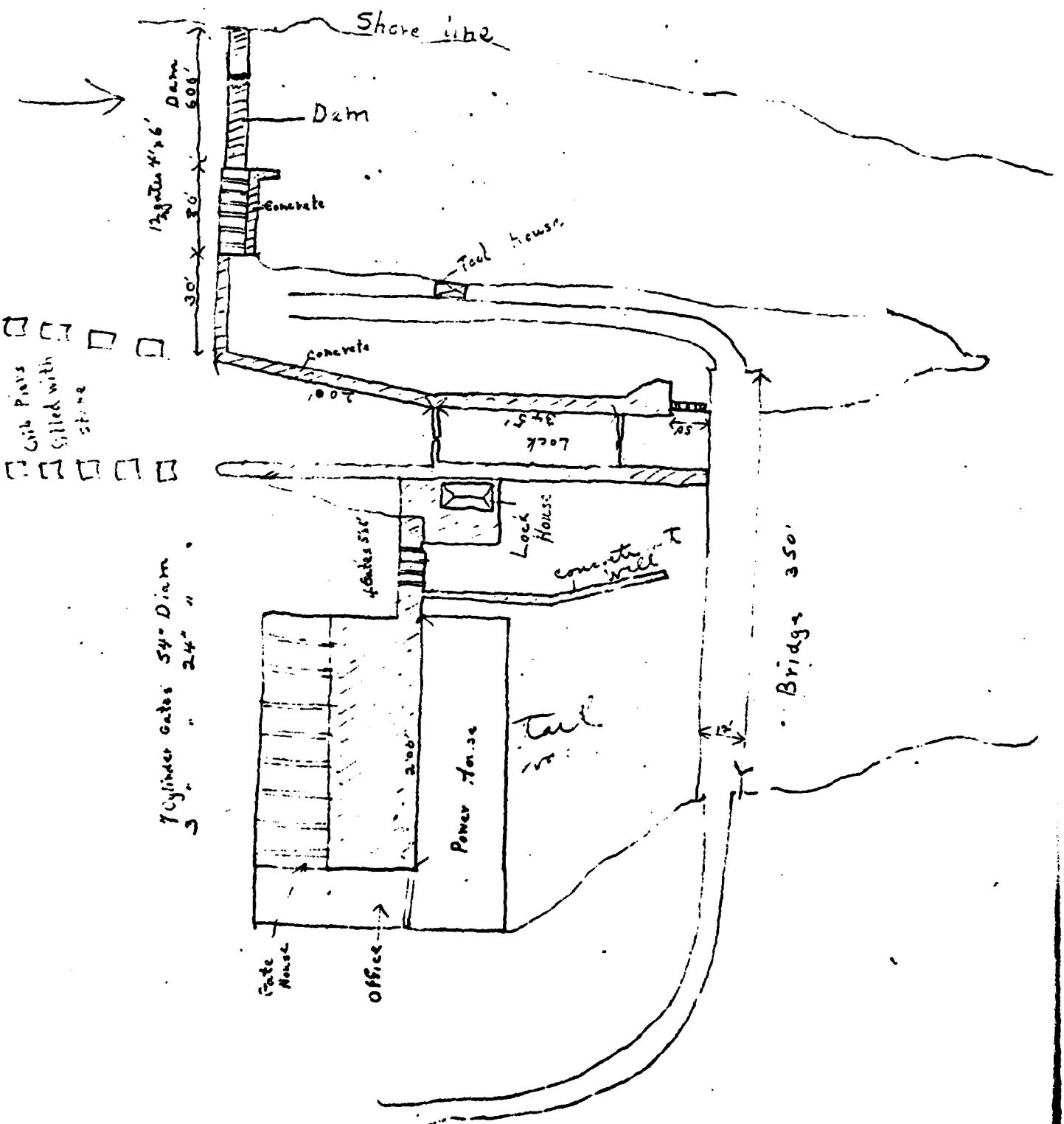
This dam is situated upon the Hudson River
(Give name of stream)
in the Town of Mechanicsville, Saratoga County,
about 1/2 mile (State distance) from the Village or City of Mechanicsville.
The distance up (Up or down) stream from the dam, to the Mechanicsville Bridge (Give name of nearest important stream or of a bridge),
is about 1/2 miles (State distance). D P Works,

The dam is now owned by Adirondack Electric Power Corporation Glen Falls N.Y.
(Give name and address in full)
and was built in or about the year 1899, and was extensively repaired or reconstructed during the year.....

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

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

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



The total length of this dam is 600 feet. The spillway or waste-weir portion, is about 600 feet long, and the crest of the spillway is about ..... feet below the top of the dam.

The number, size and location of discharge pipes, waste pipes or gates which may be used for drawing off the water from behind the dam, are as follows: 12 gate (4x6) 4 gates (5'x6') 7 large cylinder head gates 54" Diam, 3 cylinder head gates 24" diam.

At the time of this inspection the water level above the dam was 1 ft. ..... in. ~~below~~ above the crest of the spillway.

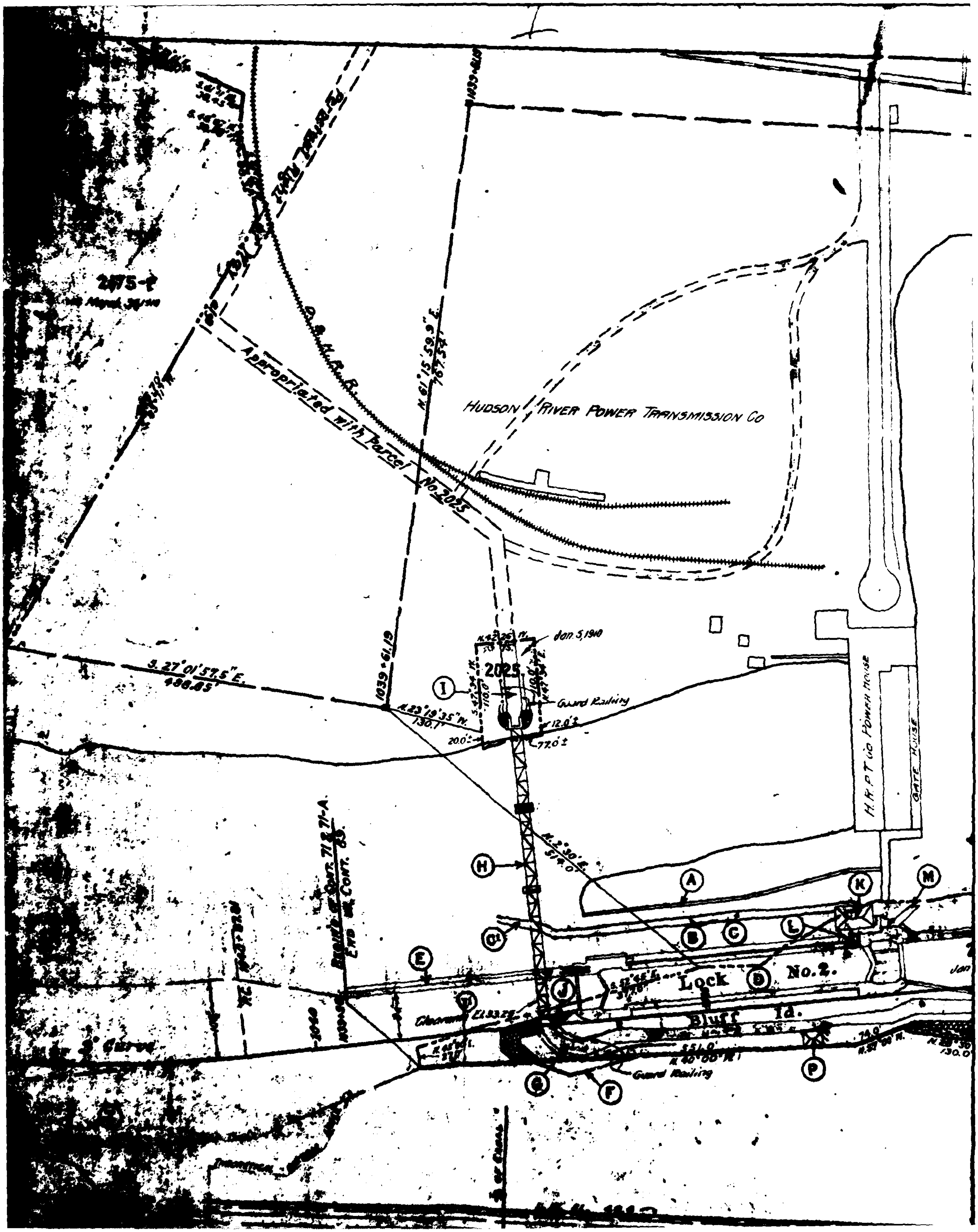
(State briefly, in the space below, whether, in your judgment, this dam is in good condition, or bad condition, describing particularly any leaks or cracks which you may have observed.)

Dam is in good condition.

Reported by Charles A. Prudhon
(Signature)

110 Stadium Pl
(Address—Street and number, P. O. Box or R. F. D. route)

Syracuse N.Y.
(Name of place)



HUDSON RIVER POWER TRANSMISSION Co
Appropriated with Parcel No. 2025
2025
Jan. 5, 1910
Guard Railing
S. 27°01'57.5" E.
1039+61.19
N. 23°19'35" W.
130.1'
H.R.P.T. Co. POWER HOUSE
GATE HOUSE
Lock No. 2.
Bluff Id.
Guard Railing
A
B
C
D
E
F
G
H
I
J
K
L
M
P

2

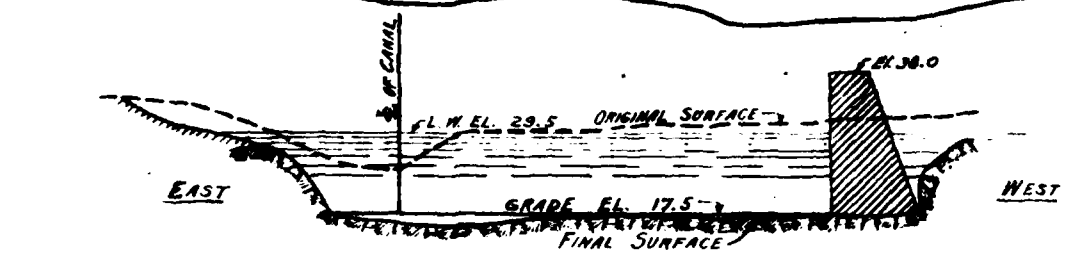
HUDSON VALLEY R. R.

WATERFORD AND WHITEHALL

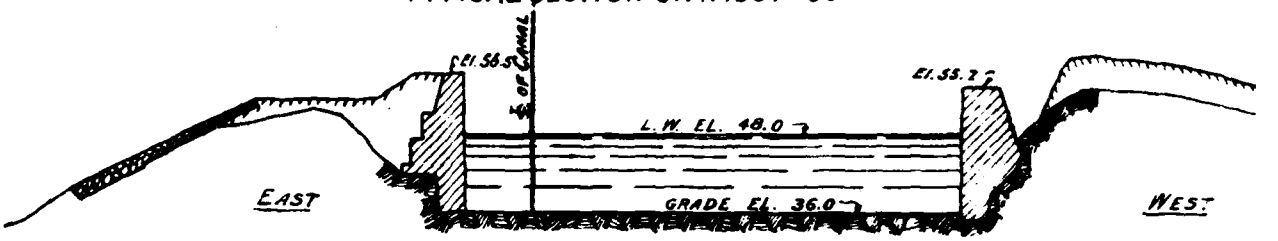
S. 33°11'51.9" E.
2439.14'

MONUMENTED BASE LINE

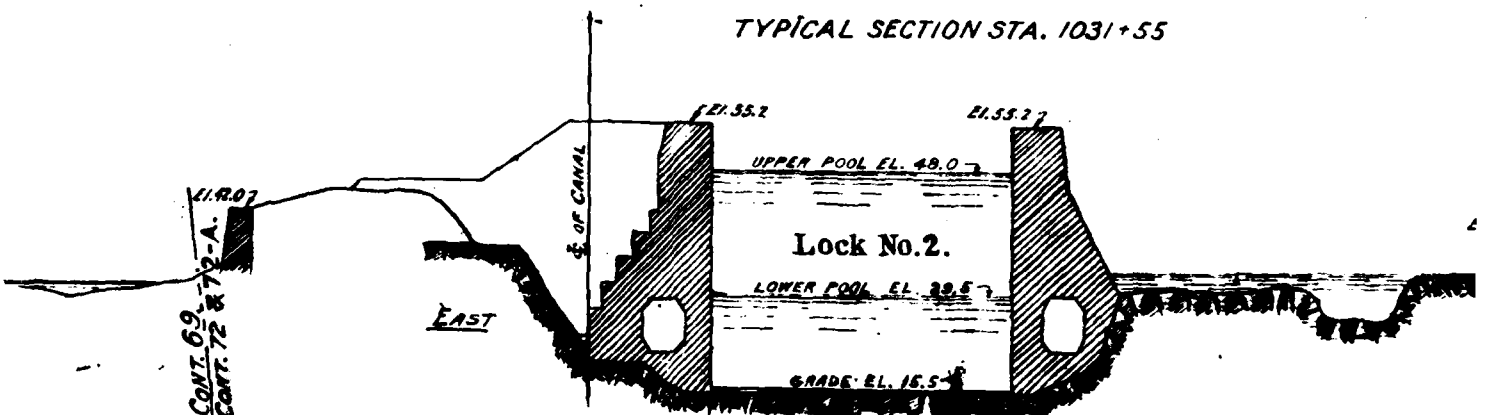
HALF MOON



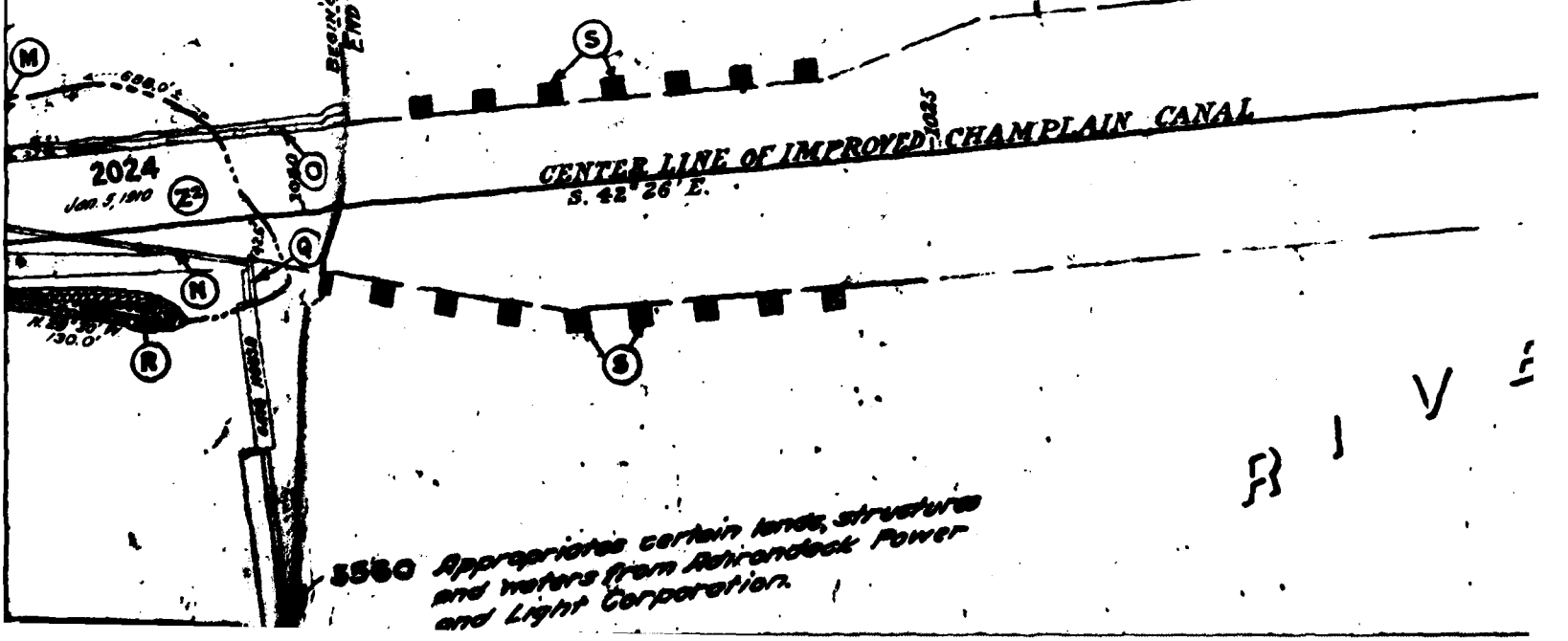
TYPICAL SECTION STA. 1037+90



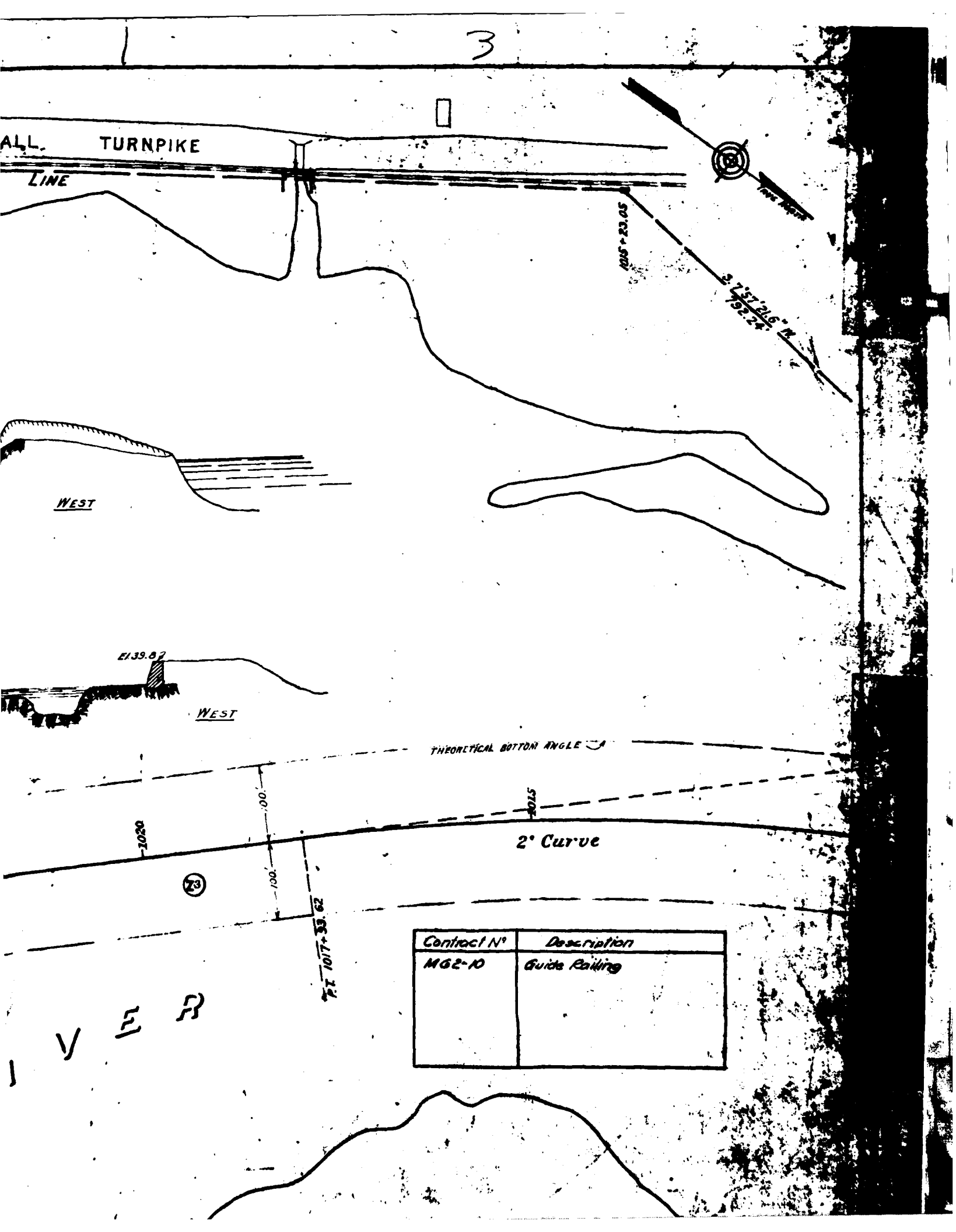
TYPICAL SECTION STA. 1031+55

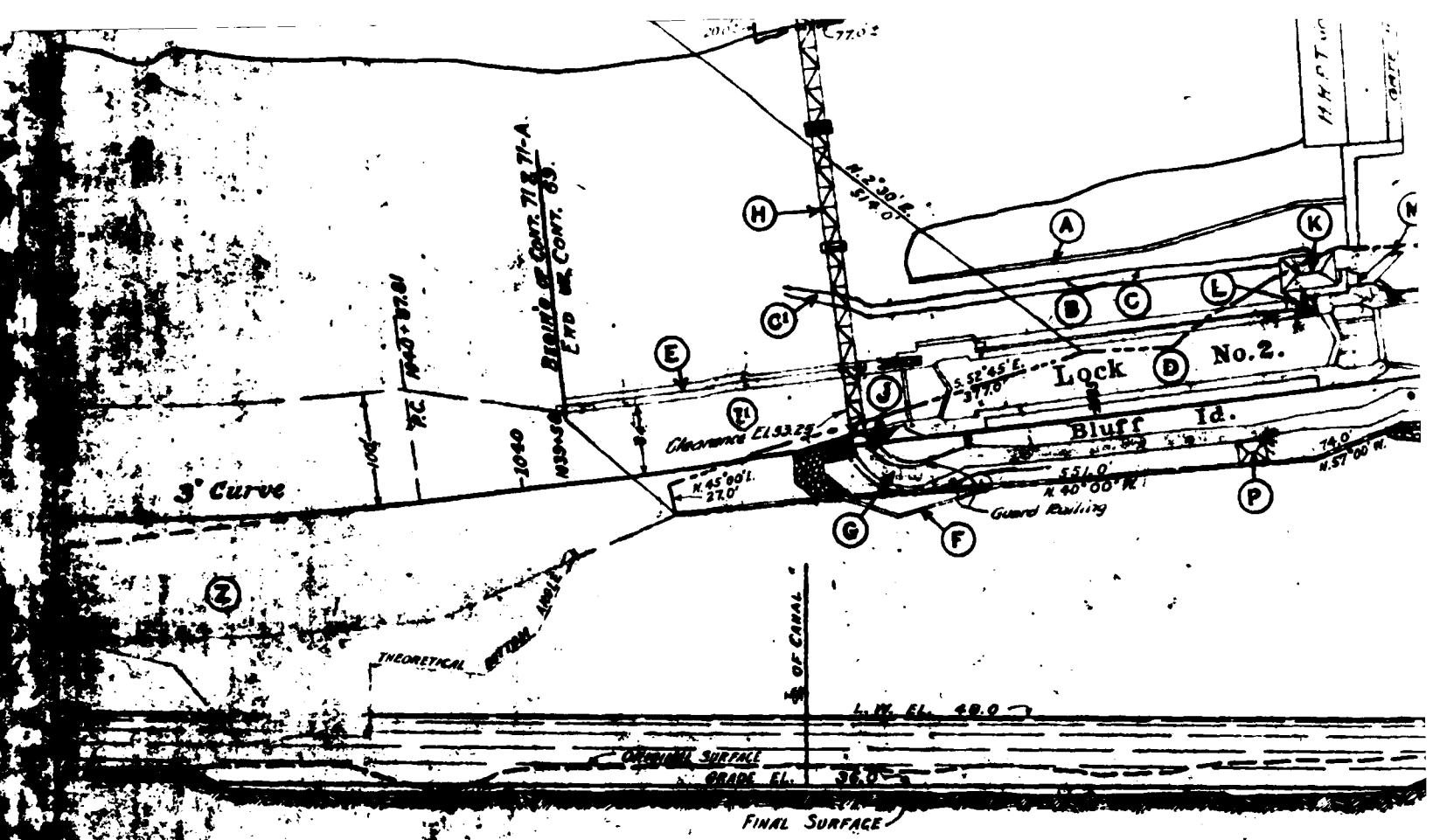


TYPICAL SECTION STA. 1035+50



5580 Appropriates certain lands, structures and waters from Adirondack Power and Light Corporation.


1
3
ALL TURNPIKE
LINE
1015+23.05
S. 7°57'21.6" W.
192.24
WEST
El 39.82
WEST
THEORETICAL BOTTOM ANGLE
1020
1015
2° Curve
100.00
100.
Z3
P.T. 1017+33.62
Contract N°
Description
MG2-10
Guide Railing
I V E R



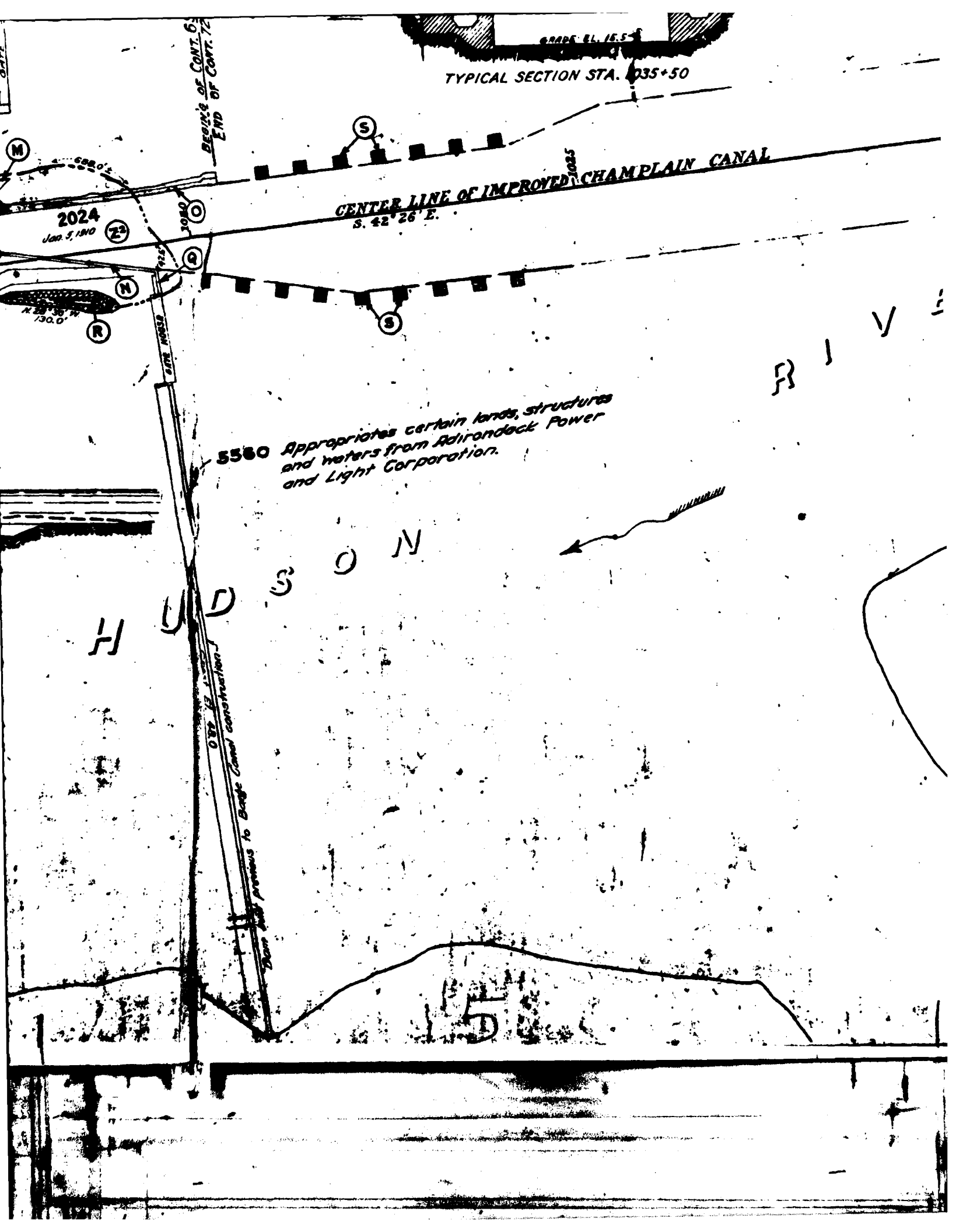
TYPICAL SECTION STA. 1020+00

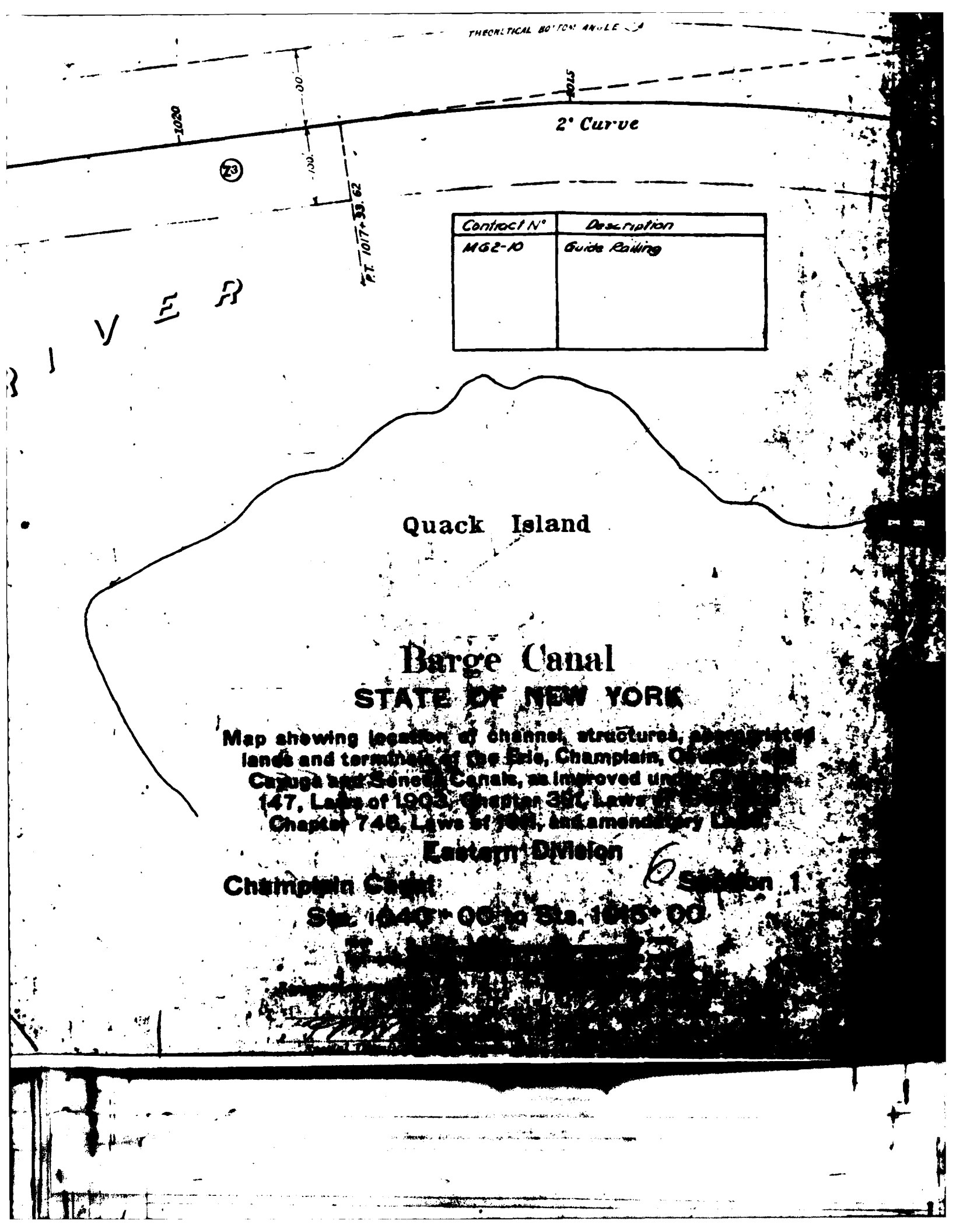
Structures

DESCRIPTION	Aux.	Cont.
Retaining Wall (Lock No. 2.)		69
" " "		69
Abutment		69
Concrete Gates, Valves, etc. (Lock No. 2.)		69
" " "		69
Bridge Str. 1037+00		69
Bridge Str. 1037+00		69
Bridge Str. 1037+00		69
Bridge Abutment		69
		92
		92
		69
		69
		69
		71-A
		71
		69

Appropriated Lands

PARCEL NUMBER		NUMBER OWNER	ACRES
2024	69	Hudson River Power Transmission Co.	2.200±
2025	69	" " " " " "	0.210±
2175-B	71	Alice H. Smith	55.880±
2175-F	71	Part of 2175-D retained	23.71± 27.14±
5360	69	Adirondack Power & Light Corp	Certain Lands, Structures & Waters


GRADE EL. 16.5
TYPICAL SECTION STA. 1035+50
BEGIN'S OF CONT. 6
END OF CONT. 72
CENTER LINE OF IMPROVED CHAMPLAIN CANAL
S. 42° 26' E.
1025
1080
2024
Jan. 5, 1910
588.0'
N 28° 36' W
130.0'
5580 Appropriates certain lands, structures and waters from Adirondack Power and Light Corporation.
HUDSON
RIV
Dam and Bridge Canal Construction
Elev. 48.0
15



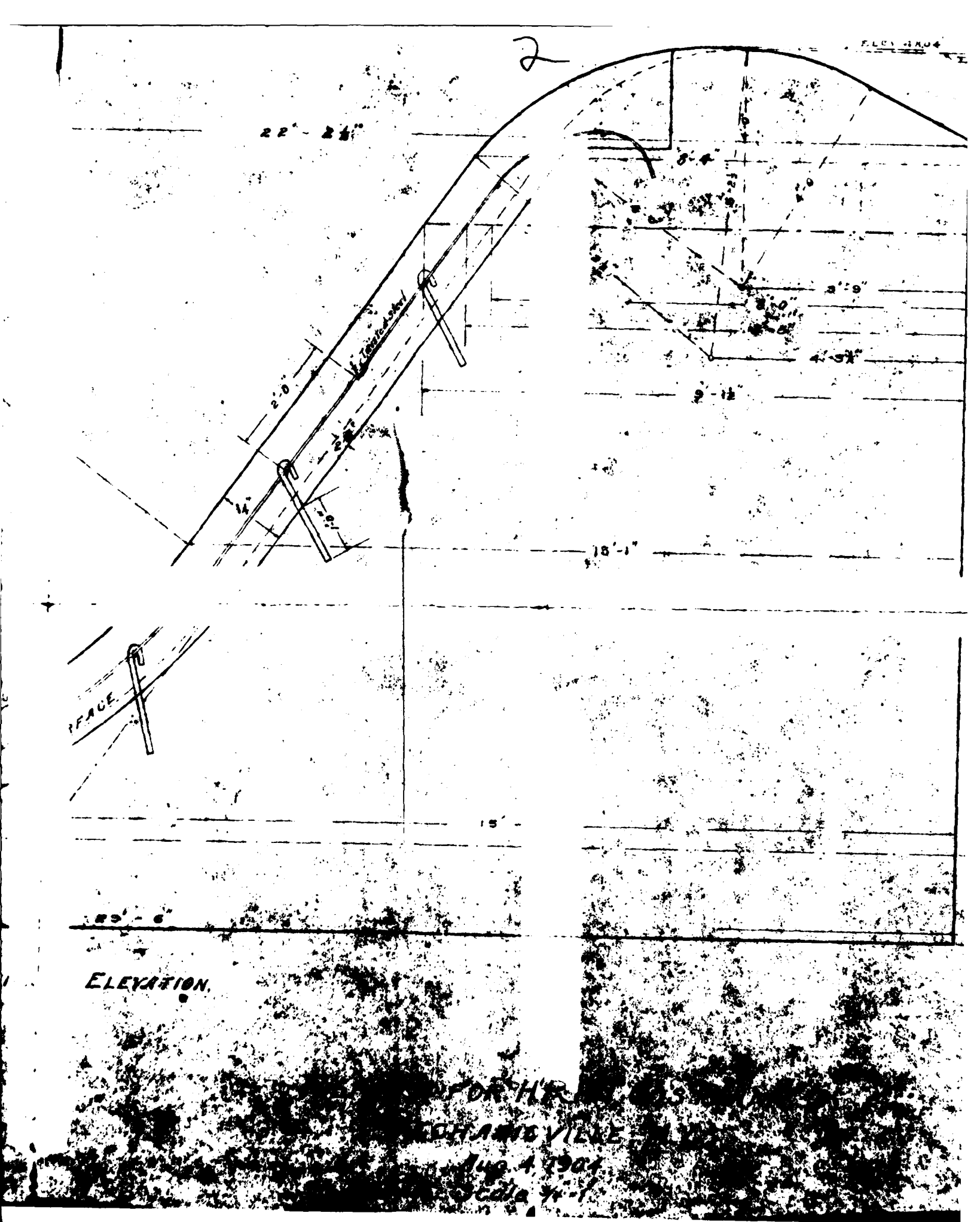
Contract N°	Description
M62-10	Guide Railing

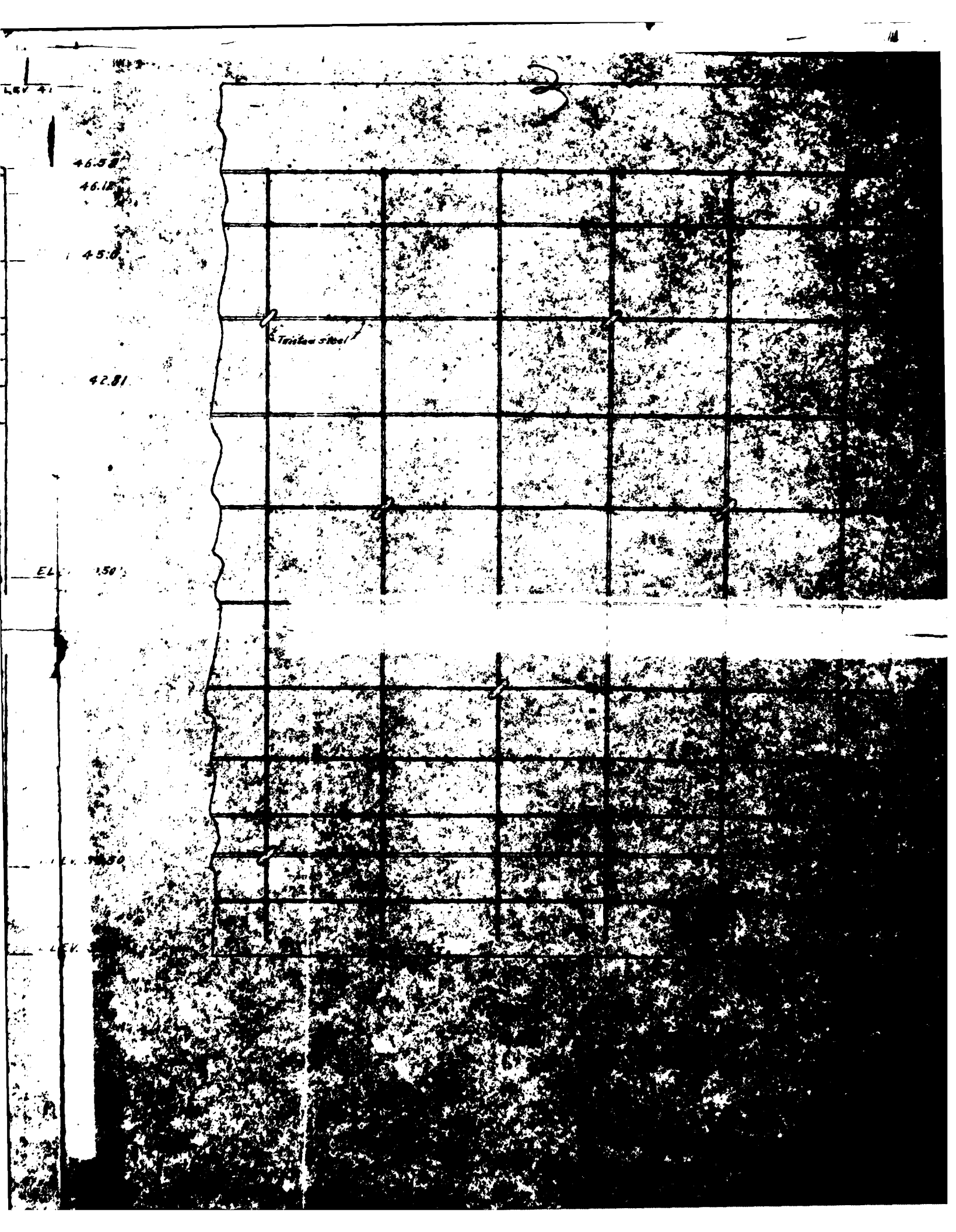
ELEV. 46.45

PROPOSED

ORIGINAL

SECTI


2
22' - 2½"
2'-0"
2'-2"
14"
8'-4"
3'-9"
4'-5"
9'-12"
18'-1"
15'
ELEVATION.


46.58
46.18
45.0
Tmtbar steel
42.81
EL 150'

END

DATE
FILMED

11-80

DTIC