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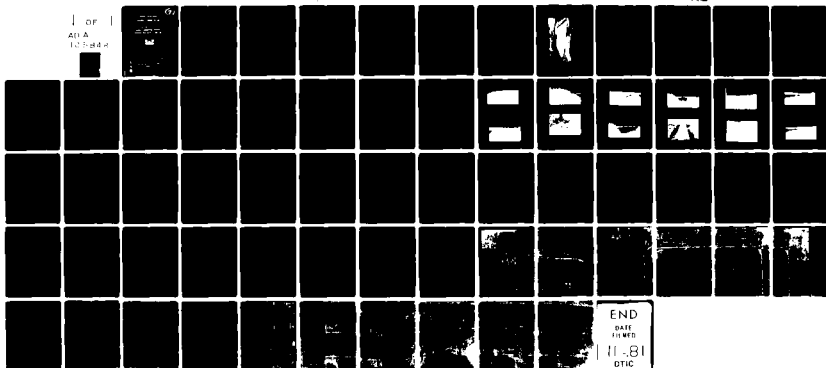
NEW YORK STATE DEPT OF ENVIRONMENTAL CONSERVATION ALBANY F/G 13/13
NATIONAL DAM SAFETY PROGRAM. DEERFIELD RESERVOIR DAM (INVENTORY--ETC(U)
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MOHAWK RIVER BASIN
GREENWICH RESERVOIR DAM
ONEIDA COUNTY, NEW YORK
RESERVOIR NO. NY 1227
PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM



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REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
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National Dam Safety Program.
Deerfield Reservoir Dam (Inventory
Number NY 1227), Mohawk River Basin,
Oneida County, New York. Phase I
Inspection Report.

Dam Safety
National Dam Safety Program
Visual Inspection
Hydrology, Structural Stability

Deerfield Reservoir Dam
Oneida County
Mohawk River Basin

20. ABSTRACT (Limit to 200 words; also fill in necessary data 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 a visual inspection of The Deerfield Reservoir Dam did not reveal conditions which constitute a hazard to human life or property.

Since this is a storage reservoir with both inflow and outflow controlled, the hydrologic/hydraulic analysis was not performed in the normal manner. The drainage area for this structure is limited to the reservoir itself. Assuming a normal water level in the reservoir, the runoff resulting from the Probable Maximum Precipitation can safely be stored and discharged through the waste weir section. Therefore, the spillway capacity is assessed as being adequate.

Several minor deficiencies were noted which should be corrected within 6 months of the date of notification of the owner. The brush and trees growing on the lower portion of the southern slope and on the entire eastern slope should be cut. Small brush growing through the riprap on the inboard slope should be cut. Deteriorated concrete on the gate tower should be repaired. The two soft areas beyond the toe of the outboard slope should be kept under surveillance. An emergency action plan for the notification and evacuation of downstream residents should be developed.

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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.

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
DEERFIELD RESERVOIR
No. 6 Dam
MOHAWK RIVER BASIN
ONEIDA COUNTY, NEW YORK

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Phase I Inspection Report
National Dam Safety Program

Name of Dam: Deerfield Reservoir No. 6 Dam
I.D. No. NY - 1227

State Located: New York

County Located: Oneida

Watershed: Mohawk River Basin

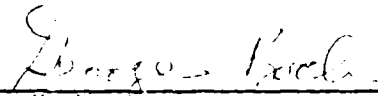
Date of Inspection: October 16, 1980

ASSESSMENT:

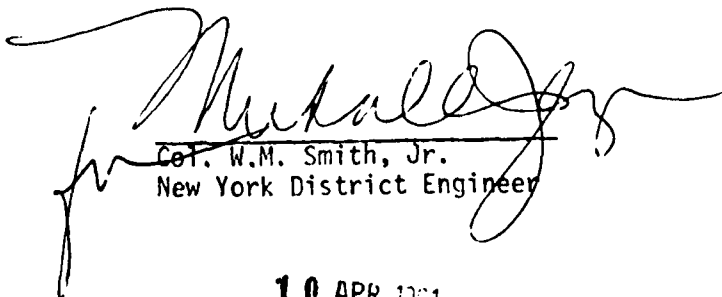
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Several minor deficiencies were noted which should be corrected within 6 months of the date of notification of the owner. The brush and trees growing on the lower portion of the southern slope and on the entire eastern slope should be cut. Small brush growing through the riprap on the inboard slope should be cut. Deteriorated concrete on the gate tower should be repaired. The two soft areas beyond the toe of the outboard slope should be kept under surveillance. An emergency action plan for the notification and evacuation of downstream residents should be developed.


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

Approved by:


Col. W.M. Smith, Jr.
New York District Engineer

Date:

10 APR 1981



OVERVIEW
DEERFIELD RESERVOIR
DAM
I.D. No. NY 1227

Phase I Inspection Report
National Dam Safety Program
Deerfield Reservoir No. 6 Dam
I.D. No. NY 1227
#128A-804
Mohawk River Basin
Oneida 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 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 Deerfield Reservoir Dam is a storage reservoir within the City of Utica Board of Water Supply's system. The reservoir consists of an inflow pool, which was originally used as a settling basin, and the main storage pool. A division weir separates the two pools.

The dam is formed by an earthen embankment with a puddle core wall which surrounds the two pools of the reservoir. The total length of the embankment is 3520 feet. The maximum height of the embankment is 50 feet in the southwest corner of the main storage pool. The minimum height is about 5 feet in the northeast corner of the inflow pool. The inboard slope is 1 vertical on 2 horizontal and the outboard slope is 1 vertical on 1.5 horizontal.

All flow into the reservoir is controlled by valves on one 16 inch and one 24-inch inflow pipe. These pipes enter the reservoir of the northwestern corner of the inflow pool. A 20-inch supply main and a 20-inch waste pipe are used to withdraw water from the reservoir. The supply main extends from a concrete gate tower in the storage pool to the meter house beyond the toe of the embankment. The tower contains four ports at different elevations. A bridge extends approximately 150 feet from the embankment crest to the top of the tower.

Additional outflow capacity is provided by the waste weir segment at the northern end of the dam. The weir is 20 feet wide and its crest is 6 feet below the top of the dam.

There is a sediment pit (waste chamber) at the end of the waste weir. A 20 inch pipe leads from the base of the pit to a gate house beyond the toe of the embankment. These facilities were utilized when the dam was first built but are no longer used.

b. Location

The dam is located in the Town of Deerfield, off South Trenton Road. It is adjacent to the intersection between Trenton Avenue and Route 12. The dam is approximately one mile north of the City of Utica boundary.

c. Size Classification

The dam is a maximum of 50 feet high and has a storage capacity of 321 acre feet. Therefore, the dam is in the intermediate size category as defined by the "Recommended Guidelines for Safety Inspection of Dams".

d. Hazard Classifications

This dam is classified as "high" hazard due to the presence of a number of homes downstream of the southwester portion of the dam.

e. Ownership

The dam is owned by the City of Utica Board of Water Supply. Mr. Russell Lo Galbo Principal Engineer, and Mr. Adrian La Shure, Senior Engineer, were contacted concerning the Phase I Inspection. The Board of Water Supply's address is One Kennedy Plaza, Utica, New York, 13502. Their phone number is (315) 798-3310.

f. Purpose of Dam

The dam is used as a water supply reservoir for the City of Utica.

g. Design and Construction History

This dam was constructed around 1900 for the Consolidated Water Company of Utica. William S. Bagot, Civil Engineer, was the designer of the structure. It does not appear that any major revisions have been made to the structure since the original construction. The only change noted was a switch in the supply lines into the reservoir. The original 20 inch mains were replaced by one 16 inch pipe and one 24 inch pipe.

h. Normal Operating Procedures

All flow into and out of the reservoir is controlled by valves on the inlet and outlet pipes. The water level is normally maintained approximately at elevation 700 but drops substantially lower during the summer. Water is withdrawn from the reservoir as required by the owner.

1.3 PERTINENT DATA

<u>a. Drainage Area (acres)</u>	17.7
<u>b. Discharge at Dam (cfs)</u>	
Supply Main (20 inch) W.S. at Elev. 700	46
Supply Main (20 inch) W.S. at Elev. 701.5	47
Supply Main (20 inch) W.S. at Elev. 706.5	49
Waste Weir W.S. at Elev. 706.5	581
<u>c. Elevation (Plan Datum)</u>	
Top of Dam	706.5
Crest of Waste Weir	701.5
Crest of Division Weir	701.3
Invert of 20 inch Waste Pipe	660
<u>d. Reservoir-Surface Area (Acres)</u>	
Top of Dam	17.4
Crest of Waste Weir	15.7

e. Storage Capacity (acre-feet)

Top of Dam	385
Crest of Waste Weir	321

f. Embankment

Type: Compacted earth fill with a puddle core wall completely surrounding the reservoir with 1:V on 2:H inboard slopes and 1:V on 1.5:H outboard slopes.

Dam Length (ft): 3520
Crest Width (ft): 15
Height: Varies; 50 feet maximum

g. Inflow Pipes

Type: 16 and 24 inch pipes flowing into inflow pool
Control: Butterfly valve on each pipe.

h. Outflow Pipes

Type: Two 20 inch pipes through embankment flowing into meter house beyond downstream toe. Flow through supply main controlled by operation of gates on gate tower. These pipes can also function as a reservoir drain.

i. Division Weir

Type: Masonry weir which separates inflow pool from storage reservoir. Weir is 2 feet wide and 20 feet long. Riprap on either side of weir.

j. Waste Weir

Type: Masonry weir at northern end of dam which serves as auxiliary spillway. Weir is 2.5 feet wide and 20 feet long. Riprap covers area upstream of weir.

k. Appurtenant Structures

1. Meter House-south of dam embankment; venturi meters measure flow from the two 20 inch pipes coming out of the reservoir.

2. Waste Chamber and Valve House-located to north of the waste weir; originally used for sediment control; now abandoned.

SECTION 2: ENGINEERING DATA

2.1 GEOTECHNICAL DATA

a. Geology

The Deerfield Reservoir No. 6 Dam is located near the northern edge of the Mohawk Lowlands physiographic province of New York State. The western Adirondack Hills province is north of this area. The lowland was eroded in the soft shales between the hard rocks of the Adirondacks and the Appalachians. The area in the vicinity of the dam is underlain by soft rock from the Utica Shale formation of the Upper Ordovician age.

The surficial soils and features of the area are the result of 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 were available.

2.2 DESIGN RECORDS

Design records were available for this dam at the City of Utica Board of Water Supply's Engineering Office. A plan prepared in 1900 by William S. Bagot, Civil Engineer provided most of the information about the design. This plan has been included in Appendix E.

2.3 CONSTRUCTION RECORDS

No construction records concerning the original construction of the dam were located.

2.4 OPERATIONAL RECORDS

This dam is operated as a storage reservoir by the owner. They maintain some operation records for the structure.

2.5 EVALUATION OF DATA

The data used for the preparation of this report was obtained from the City of Utica Board of Water Supply and from the Department of Environmental Conservation files. The data available appeared to be accurate.

SECTION 3: VISUAL INSPECTION

3. 1 FINDINGS

a. General

Visual inspection of the Deerfield Reservoir No. 6 Dam was conducted on October 16, 1980. The weather was overcast and the temperature was around 50 degrees. At the time of the inspection, the water surface was 11 feet below the top of the dam.

b. Embankment

The embankment completely surrounds this reservoir. The crest is level with a grass cover and in good condition. The inboard slope is lined with riprap. There was small brush growing through the riprap in several locations. The outboard slope on the northern and western sides of the dam were grass and had been mowed. The upper portion of the southern outboard slope was also in good condition. However, the lower portion of the southern slope at the eastern end was covered with brush and trees. The eastern slope was completely overgrown. The brush on this slope made a detailed inspection impossible.

The overall stability of the embankment appeared to be satisfactory. Several animal burrow holes were noted both on the crest and on the outboard slope. There were two soft areas beyond the toe of the outboard slope. One of these areas was near the southern end of the eastern slope. The other was beyond the toe of the northern slope on the main storage pool. No actual seepage was observed in either of these areas.

c. Inflow/Outlet Pipes

The pipes controlling flow into and out of the reservoir were submerged and, therefore, unobservable. Water bubbling up in two locations in the upper pool was evidence that there was flow into the reservoir. A single vortex upstream of the gate tower indicated water was only being released from one of the outlet pipes.

The gate tower is a concrete structure in the main storage pool rising to the top of dam elevation. The concrete on this tower was deteriorated and spalling. Some minor surface cracks were noted as well. The bridge extending from the embankment crest to the tower was in satisfactory condition, although some of the timber deck planks were rotted. None of the four gate control storms on the tower appeared to have been operated recently, but they are reported to be operable.

One other pipe was observed during the visual inspection. The outlet of a 12 inch diameter cast iron pipe was located near the base of the outboard slope on the southern end of the reservoir. There was a very small amount of flow coming out of the pipe. The function of this pipe could not be determined.

d. Waste Weir

The waste weir on the northern end of the structure was in satisfactory condition. If the water surface was to rise above the crest of the weir, flow into the sediment pit would occur. The 20 inch pipe leading from the base of the pit to the gate house would take some of this overflow, but most would probably spill over the northern wall of the sediment pit and away from the reservoir, flowing over the existing ground surface.

3.2 EVALUATION

Visual inspection of this dam revealed the following deficiencies.

1. Brush and trees growing on the lower portion of the southern slope and on the entire eastern slope.
2. Small brush growing through the riprap on the inboard slope in several locations.
3. Several animal burrow holes on the crest and outboard slopes.
4. Two soft areas beyond the toe of the outboard slope.
5. Deterioration of the concrete on the gate tower.

SECTION 4: OPERATIONAL PROCEDURES

4.1 PROCEDURES

This reservoir is used as a storage facility by the City of Utica Board of Water Supply. The flow of all water into and out of the reservoir is regulated by valves on the inlet and outlet pipes. This gives the owner complete control over the water level in the reservoir. The water level is normally maintained at approximately elevation 700 but drops substantially during the summer.

4.2 MAINTENANCE OF THE DAM

The dam is maintained by the owner. Mowing and other routine maintenance is performed regularly. Periodic visits are made to the site to check on conditions of the facilities.

4.3 WARNING SYSTEM IN EFFECT

There is no apparent warning system for the notification and evacuation of downstream residents.

4.4 EVALUATION

The operation and maintenance procedures on this structure are generally satisfactory. Some additional maintenance efforts are required to correct some of the minor deficiencies which exist on the structure.

SECTION 5: HYDROLOGIC/HYDRAULIC

5.1 DRAINAGE AREA CHARACTERISTICS

This dam is a storage reservoir which is completely surrounded by embankment. Therefore, the structure's drainage area consists exclusively of the reservoir itself. The total drainage area for this dam is 17.7 acres.

5.2 ANALYSIS CRITERIA

Since the drainage area for this structure is the reservoir itself, inflow is limited to rain falling on the reservoir and flow through the 16 and 24 inch supply pipes. For this reason, no hydrologic analysis, using the Corps of Engineers HEC-1DB computer program, was performed for this structure. Inflow and outflow can be controlled by valves on the pipes, so preventing overtopping simply involves proper operation.

5.3 SPILLWAY CAPACITY

The primary outflow capacity for this dam is provided by 20 inch pipes which extend through the embankment. One of these is designated as a waste pipe. Its inlet is 50 feet to the east of the gate tower and its control mechanism is unknown. The inlet to the other conduit (the supply main) is at the base of the gate tower. There are four ports at different elevations in the gate tower, each controlled by one of the valve stems on top of the tower. There are four ports at different elevations in the gate tower, each controlled by one of the valve stems on the top of the tower. No detailed plans of the gate tower were available so the invert elevation of the pipe and the size of the inlet ports was not known.

For the purposes of calculating the maximum outflow through the supply main, it was assumed that the capacity of the pipe was the limiting factor. Based on this assumption, the maximum discharge capacity through the supply main with the water surface at the top of the dam was calculated to be 49 cfs.

Additional spillway capacity is provided by the waste weir at the northern end of the reservoir. If the water surface was to rise above elevation 701.5, this weir would act as an auxiliary spillway. The spillway was analyzed as a broad crested weir with a discharge coefficient (c) of 2.6. The discharge capacity through this spillway with the water surface at the top of the dam is 581 cfs.

5.4 RESERVOIR CAPACITY

The normal storage capacity of this reservoir is 321 acre feet. Approximately 64 acre feet of additional storage capacity is available between the crest of the waste weir and the top of the dam.

5.5 FLOODS OF RECORD

Since this is a storage reservoir with a drainage area equal to the surface and with almost complete control over the inflow and outflow, the concept of record flows is not applicable.

5.6 OVERTOPPING POTENTIAL

To determine overtopping potential, both inflow and outflow through the pipes was assumed to be zero. It was also assumed that the initial water level in the reservoir was at the crest of the waste weir. The volume of runoff produced by the Probable Maximum Precipitation of 19.2 inches over the 17.7 acre drainage area would be 28 acre feet. This would raise the water level in the reservoir by about 2 feet. The discharge over the waste weir section would be approximately 170 cfs.

5.7 EVALUATION

The limited hydrologic/hydraulic analysis performed for this structure indicates that the reservoir could safely store and discharge the runoff produced by the Probable Maximum Precipitation. Therefore, the spillway capacity is assessed as adequate according to the Corps of Engineer's screening criteria.

SECTION 6: STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

a. Visual Observations

Visual observation of the embankment was hindered by the brush and trees growing on the lower portion of the southern slope and on the entire eastern slope. The remainder of the embankment was grass covered and well maintained.

No areas of instability or active seepage were noted on the structure. Two soft areas were observed beyond the toe of the outboard slope. One of these areas was near the southern end of the eastern slope, and the other was on the northern slope of the main storage pool.

b. Design and Construction Data

A construction plan for this structure, prepared by William S. Bagot, Civil Engineer, was available and has been included in Appendix E. This was the only design or construction data available.

c. Seismic Stability

No seismic stability analysis was performed for this structure.

SECTION 7: ASSESSMENT/RECOMMENDATIONS

7.1 ASSESSMENT

a. Safety

The Phase I Inspection of the Deerfield Reservoir No. 6 Dam did not reveal conditions which constitute a hazard to human life or property. The earth embankment is considered to be stable. Since this is a storage reservoir with controlled inflow and outflow, the spillway is considered to be adequate.

b. Adequacy of Information

The plans which were available for this structure appeared to be accurate and relatively complete. No plans were available concerning the gate tower and the 4 gate stems rising from it, so exact elevations of the 4 discharge ports were not determined.

c. Need for Additional Investigations

No additional investigations are necessary at this time.

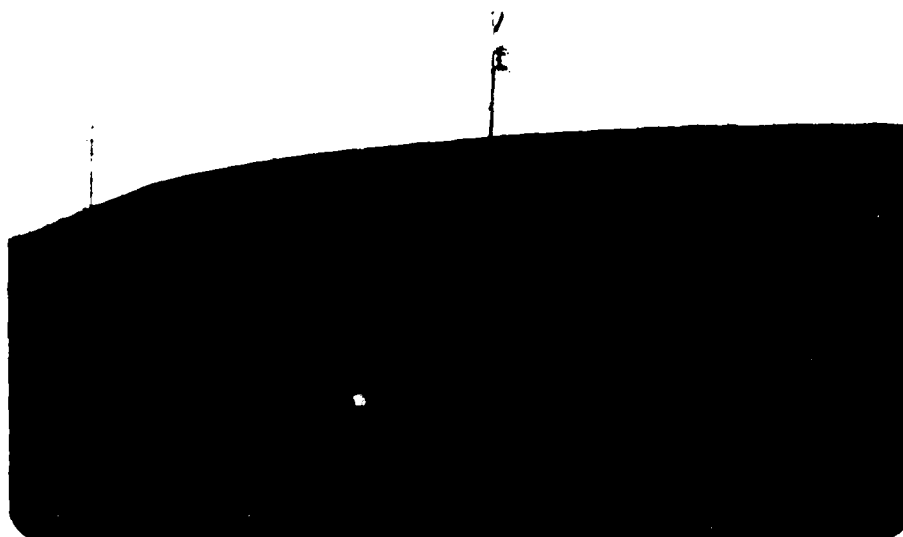
7.2 RECOMMENDED MEASURES

The following actions should be taken within 6 months, of the date of notification of the owner:

- a. All brush and trees growing on the lower portion of the southern slope and on the entire eastern slope should be cut.
- b. Small brush growing through the riprap on the inboard slope should be cut.
- c. Deteriorated concrete on the gate tower should be repaired.
- d. The two soft areas beyond the toe of the outboard slope should be kept under surveillance.
- e. All animal burrow holes should be filled and a continuing program for rodent elimination developed and implemented.
- f. An emergency action plan for the notification and evacuation of downstream residents should be developed and implemented.

APPENDIX A

PHOTOGRAPHS



Western End of Southern Outboard Slope



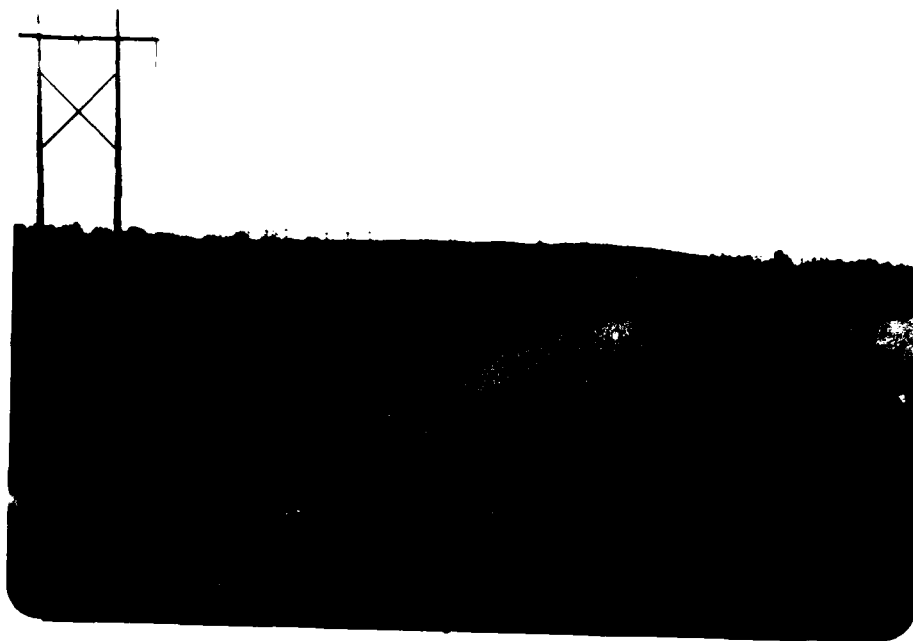
Eastern End of Southern Outboard Slope;
Note Brush and Trees on Lower Portion of Slope



Brush and Trees Growing on Eastern Slope



Outlet of 12 Inch Pipe Located
Near Base of Southern Slope



Riprap on Inboard Slope



View from Northern End of the Dam Looking
Across Waste Weir Towards Division Weir



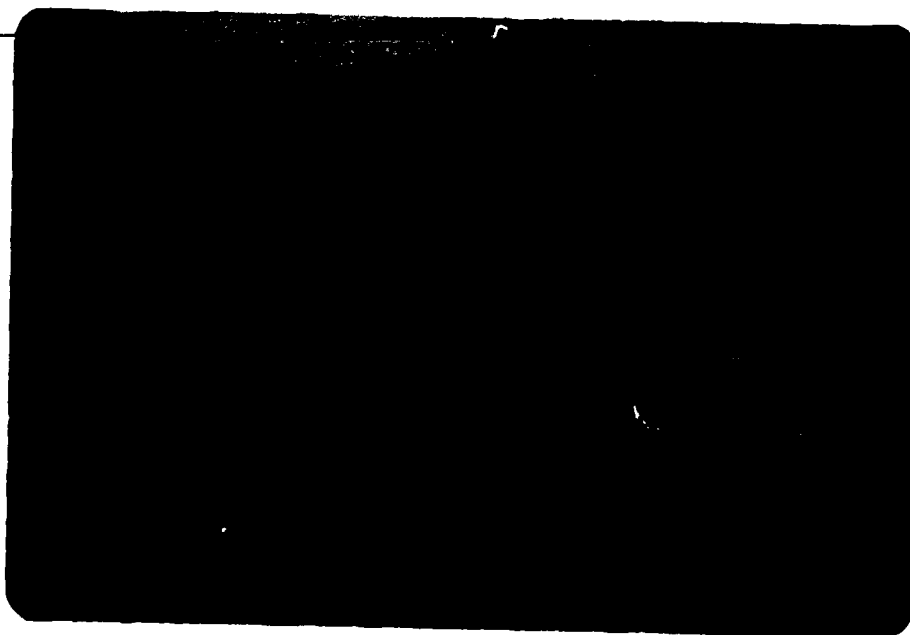
Waste Weir Section at the
Northern End of the Dam



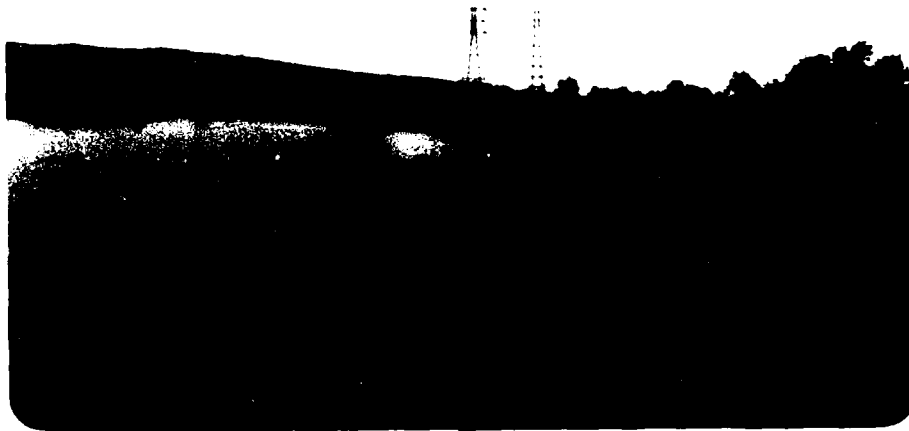
Sediment Pit at End of Waste Weir



Outboard Slope in Northwestern Corner, Soft
Area Beyond Toe of Slope



Close up of Soft Area Shown Above



Gate Tower with Bridge Leading from Crest
of Dam Embankment



Gate Tower with Four Gate Stems which
Control Flow through Ports

APPENDIX B

VISUAL INSPECTION CHECKLIST

VISUAL INSPECTION CHECKLIST1) Basic Data

a. General

Name of Dam DEERFIELD RESERVOIR DAM
Fed. I.D. # NY 1227 DEC Dam No. 128A-804A
River Basin MONAWK
Location: Town DEERFIELD County ONEIDA
Stream Name
Tributary of
Latitude (N) 43° 8.5' Longitude (W) 75° 12.5'
Type of Dam EARTH EMBANKMENT
Hazard Category C
Date(s) of Inspection 10/16/80
Weather Conditions 50° OVERCAST
Reservoir Level at Time of Inspection 11 FEET BELOW TOP OF DAM

b. Inspection Personnel ROBIN WARRENDER WALTER LYNICK

c. Persons Contacted (Including Address & Phone No.) 315-798-3310
RUSSELL LOGALBO - ADRIAN LA SHURE
CITY OF UTICA BOARD OF WATER SUPPLY
1 KENNEDY PLAZA
UTICA, N.Y.

d. History:

Date Constructed ABOUT 1900 Date(s) Reconstructed

Designer WILLIAM S. BAGOT
Constructed By
Owner CITY OF UTICA BOARD OF WATER SUPPLY

2) Embankment

a. Characteristics

- (1) Embankment Material GLACIAL TILL
- (2) Cutoff Type NONE
- (3) Impervious Core PUDDLE CORE WALL
- (4) Internal Drainage System NONE
- (5) Miscellaneous _____

b. Crest

- (1) Vertical Alignment TOP WIDTH $\approx$ 12'-15'
- (2) Horizontal Alignment RECTANGULAR
- (3) Surface Cracks NONE NOTED
- (4) Miscellaneous _____

c. Upstream Slope - INBOARD SLOPE

- (1) Slope (Estimate) (V:H) 1 ON 2
- (2) Undesirable Growth or Debris, Animal Burrows SMALL BRUSH GROWING
THROUGH RIPRAP
- (3) Sloughing, Subsidence or Depressions NONE

(4) Slope Protection MEDIUM SIZED, PLACED RIP RAP TO
NEAR TOP OF DAM

(5) Surface Cracks or Movement at Toe NONE NOTED

d. Downstream Slope - OUTBOARD SLOPE

(1) Slope (Estimate - V:H) 1 ON 1 1/2 SOME ANIMAL BURROWS

(2) Undesirable Growth or Debris, Animal Burrows BRUSH & TREES - NO
GRASS ON EASTERN & LOWER SOUTHERN SLOPE - REST OF SLOPE

(3) Sloughing, Subsidence or Depressions IS GRASSED
NONE NOTED

(4) Surface Cracks or Movement at Toe NONE

(5) Seepage NO SEEPAGE OBSERVED - BUT 2 WET AREAS FOUND
ONE BEYOND SOUTHWEST CORNER ONE NEAR NORTHWEST
CORNER

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

(7) Condition Around Outlet Structure NO OUTLET STRUCTURE

(8) Seepage Beyond Toe SOFT AREAS MENTIONED ABOVE

e. Abutments - Embankment Contact

NOT APPLICABLE / ALL EMBANKMENT

(1) Erosion at Contact N/A

(2) Seepage Along Contact N/A

3) Drainage System

a. Description of System NONE

b. Condition of System _____

c. Discharge from Drainage System _____

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

NONE

5) Reservoir

- a. Slopes RIPRAPPED INBOARD SLOPE
- b. Sedimentation NO
- c. Unusual Conditions Which Affect Dam ONLY INFLOW IS PIPELINE OR RAINFALL DIRECTLY ON RESERVOIR SURFACE

6) Area Downstream of Dam

- a. Downstream Hazard (No. of Homes, Highways, etc.) 12 PLUS ALONG SOUTH TRENTON ROAD
- b. Seepage, Unusual Growth NONE
- c. Evidence of Movement Beyond Toe of Dam NO
- d. Condition of Downstream Channel HEAVY BRUSH & TREES

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

- WATER CONTROL TOWER WITH 4 GATE STEMS - DO NOT APPEAR TO HAVE BEEN OPERATED RECENTLY
- a. General ONLY INFLOW & OUTFLOW CONTROLLED BY WATER SUPPLY PIPES WATER FLOWING IN FROM 2 PIPES AS EVIDENCED BY WATER BUBBLING UP IN UPPER POOL WATER BEING RELEASED FROM 1 PIPE - VORTEX UPSTREAM OF GATE TOWER
- b. Condition of Service Spillway _____

c. Condition of Auxiliary Spillway NONE

d. Condition of Discharge Conveyance Channel N/A

8) Reservoir Drain/Outlet

Type: Pipe _____ Conduit _____ Other WATER SUPPLY WITHDRAWAL

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): _____

9) Structural - CONCRETE GATE TOWERa. Concrete Surfaces SOME DETERIORATION & SPALLED AREASb. Structural Cracking MINOR SURFACE CRACKSc. Movement - Horizontal & Vertical Alignment (Settlement) NONEd. Junctions with Abutments or Embankments N/Ae. Drains - Foundation, Joint, Face N/Af. Water Passages, Conduits, Sluices N/Ag. Seepage or Leakage N/A

- h. Joints - Construction, etc. N/A
- i. Foundation N/A
- j. Abutments N/A
- k. Control Gates GATE STEMS - DO NOT APPEAR TO HAVE BEEN OPERATED RECENTLY
- l. Approach & Outlet Channels N/A
- m. Energy Dissipators (Plunge Pool, etc.) N/A
- n. Intake Structures ABANDONED GATE HOUSE & SEDIMENT PIT ON NORTHERN END OF STRUCTURE - WAS USED TO KEEP SEDIMENT OUT OF RESERVOIR
- o. Stability
- p. Miscellaneous STEEL SINGLE SPAN BRIDGE TO GATE TOWER - OKAY EXCEPT FOR SOME ROTTING PLANKS
VERTICAL LADDER DOWN TO INTAKE STRUCTURE - TOP RUNGS MISSING OR BROKEN
12" CAST IRON PIPE FOUND AT TOE OF SOUTHERN SLOPE (25' FROM EDGE OF CLEARING) - SLIGHT DISCHARGE COMING FROM IT

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

a. Description and Condition _____

PUMP HOUSE BUILDING - DOWNSTREAM OF DAM11) Operation Procedures (Lake Level Regulation):RESERVOIR LEVEL DROPPED IN FALL & BROUGHT
BACK UP TO NORMAL LEVEL IN SPRING

APPENDIX C

HYDROLOGIC/HYDRAULIC
ENGINEERING DATA AND COMPUTATIONS

CHECK LIST FOR DAMS
HYDROLOGIC AND HYDRAULIC
ENGINEERING DATA

1

AREA-CAPACITY DATA:

	<u>Elevation</u> (ft.)	<u>Surface Area</u> (acres)	<u>Storage Capacity</u> (acre-ft.)
1) Top of Dam	<u>706.5</u>	<u>17.4</u>	<u>385</u>
2) Design High Water (Max. Design Pool)	<u> </u>	<u> </u>	<u> </u>
3) Auxiliary Spillway Crest	<u> </u>	<u> </u>	<u> </u>
4) Pool Level with Flashboards	<u> </u>	<u> </u>	<u> </u>
5) Service Spillway Crest - WASTE WEIR	<u>701.5</u>	<u>15.7</u>	<u>321</u>

DISCHARGES

	<u>Volume</u> (cfs)
1) Average Daily	<u> </u>
2) Spillway ^{WASTE WEIR} @ Maximum High Water	<u>581</u>
3) Spillway @ Design High Water	<u> </u>
4) Spillway @ Auxiliary Spillway Crest Elevation	<u> </u>
5) Low Level Outlet - SUPPLY MAIN	<u>49</u>
6) Total (of all facilities) @ Maximum High Water	<u>630</u>
7) Maximum Known Flood	<u>N/A</u>
8) At Time of Inspection	<u>UNKNOWN</u>

CREST:

ELEVATION: 706.5Type: EARTHWidth: 15 FT Length: 3520 FTSpillover WASTE WEIRLocation NORTHERN END OF DAM

SPILLWAY:

SERVICE

AUXILIARY

701.5

Elevation

MASONARY WEIR

Type

20 FT

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 : NONE

Location: _____

Records:

Date - _____

Max. Reading - _____

FLOOD WATER CONTROL SYSTEM:

Warning System: NONE

Method of Controlled Releases (mechanisms):

RELEASE THROUGH LOW LEVEL OUTLET
(SUPPLY MAIN)

DRAINAGE AREA: 17.7 ACRES

DRAINAGE BASIN RUNOFF CHARACTERISTICS:

Land Use - Type: RESERVOIR COMPOSES ENTIRE DRAINAGE AREA

Terrain - Relief: N/A

Surface - Soil: N/A

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)

NONE

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

NONE

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

Location: NONE

Elevation: _____

Reservoir:

Length @ Maximum Pool N/A (Miles)

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

PROJECT GRID

JOB DEERFIELD RESERVOIR DAM	SHEET NO. 1	CHECKED BY	DATE
SUBJECT HYDRAULIC CALCULATIONS		COMPUTED BY RLW	DATE 1/2/81

GIVEN FROM UTICA BOARD OF WATER SUPPLY PUBLICATION
RESERVOIR CAPACITY 104,578,000 GAL = 321 AC-FT

ASSUME NORMAL WATER LEVEL IS AT ELEV 701.5-

$V = 321 \text{ AC-FT}$ SURFACE AREA (PLANIMETERED) = 15.7 ACRES

$A = 7.02 = 15.7 \text{ ACRES}$

$r = \sqrt{\frac{15.7 \times 43560}{\pi}} = 466.6 \text{ FT}$

$V = \frac{\pi r^2}{3} h \Rightarrow h = \frac{3(321)}{15.7} = 61.34 \text{ FT} - \text{ASSUMED DEPTH OF CONE}$

STORAGE AT TOP OF DAM
 $V_2 = \frac{17.4 \text{ AC}}{3} (61.34 + 5) = 385 \text{ AC-FT}$

DISEARGE CAPACITY - 20 INCH PIPE - GATE FULLY OPENED
WATER SURFACE AT TOP OF DAM

$q = A \sqrt{\frac{2gH}{1 + K_e + K_b + K_f L}} = 2.18 \sqrt{\frac{2(32.2)(46.5)}{1 + .5 + .0217(200)}} = 49.3 \text{ cfs}$

W.S. AT ELEV 701.5

$q = 2.18 \sqrt{\frac{2(32.2)(4.5)}{1 + .5 + .0217(200)}} = 46.6 \text{ cfs}$

W.S. AT ELEV 700

$q = 2.18 \sqrt{\frac{2(32.2)(4)}{1 + .5 + .0217(200)}} = 45.8 \text{ cfs}$

PROJECT GRID

JOB	DEERFIELD RESERVOIR DAM	SHEET NO.	2	CHECKED BY		DATE	
SUBJECT	HYDRAULIC COMPUTATIONS			COMPUTED BY	RLW	DATE	1/15/21
FLOW THROUGH WASTE WEIR SEGMENT							
C = 2.6 L = 20 ft							
$Q = CLH^{3/2}$							
WATER SURFACE AT TOP OF DAM							
$Q = 2.6(20)(5)^{3/2} = 58 \text{ cfs}$							
WATER SURFACE AT PUMP LEVEL							
$Q = 2.6(20)(2.2)^{3/2} = 170 \text{ cfs}$							

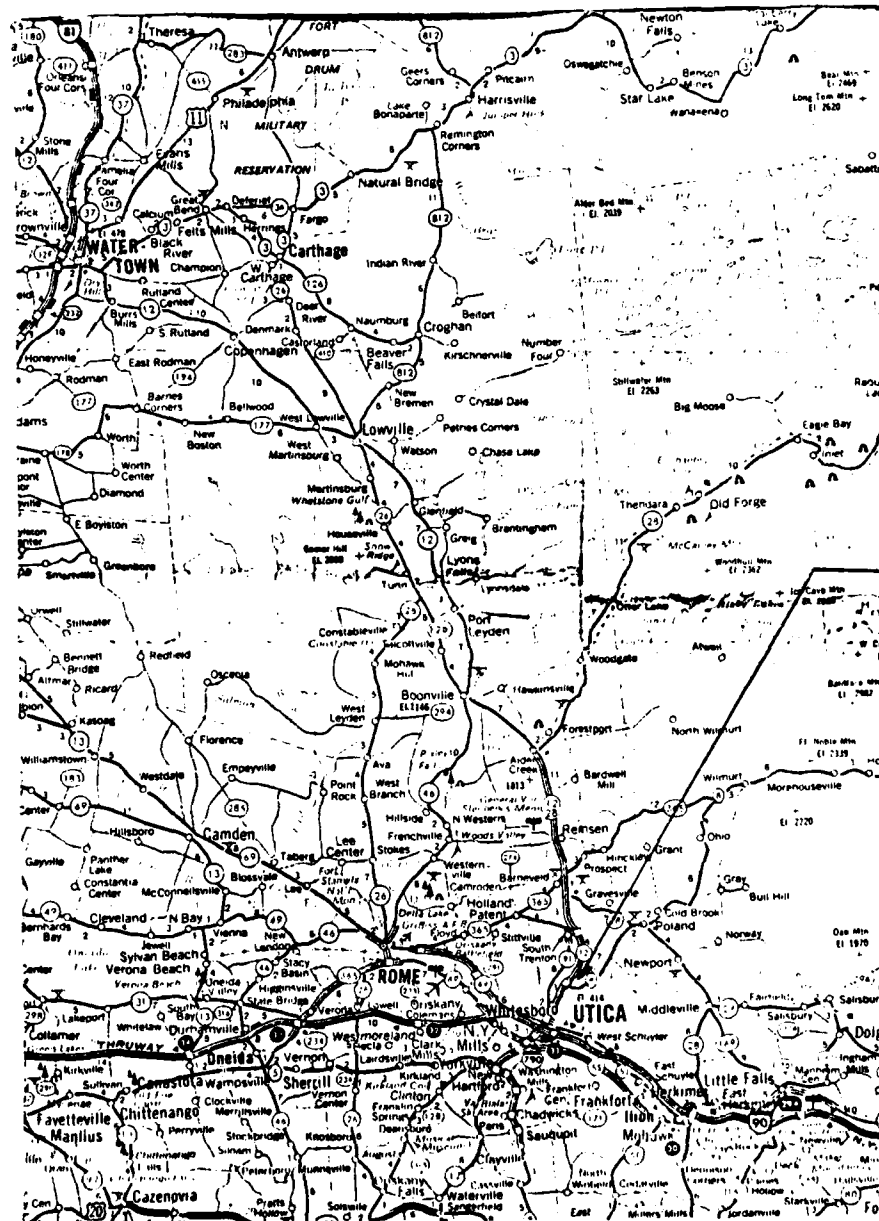
APPENDIX D
REFERENCES

APPENDIX D

REFERENCES

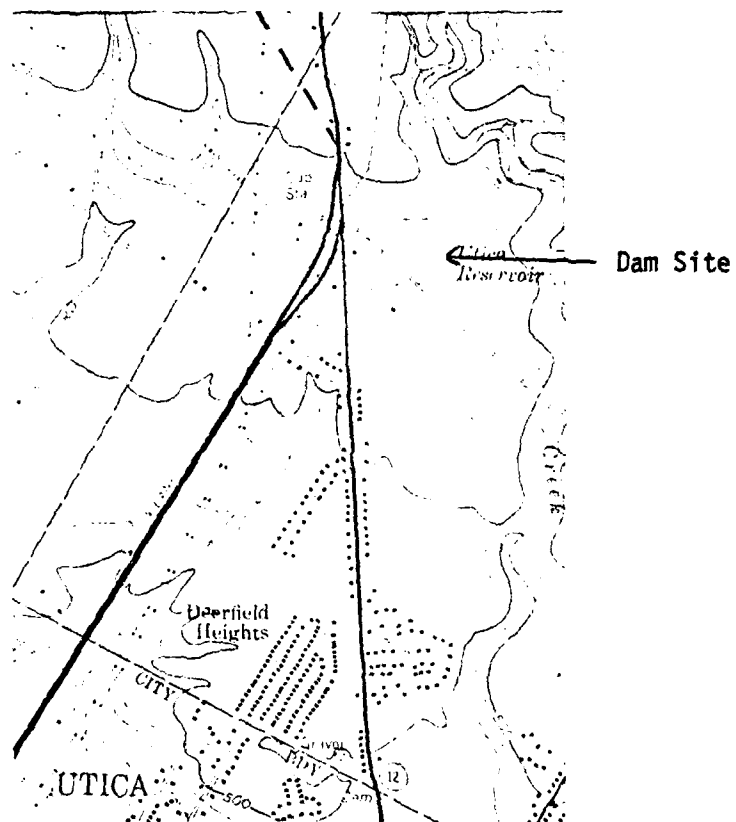
- 1) U.S. Department of Commerce; Weather Bureau;
Hydrometeorological Report No. 33 - Seasonal Variation of the Probable
Maximum Precipitation East of the 105th Meridian for Areas from 10 to
1,000 Square Miles and Durations of 6, 12, 24, and 48 Hours, April 1956.
- 2) H.W. King and E.F. Brater, Handbook of Hydraulics, 5th edition,
McGraw-Hill, 1963.
- 3) University of the State of New York, Geology of New York, Education
Leaflet 20, Reprinted 1973.
- 4) Elwyn E. Seelye, Design, 3rd edition, John Wiley and Sons, Inc., 1960.
- 5) U.S. Department of the Interior, Bureau of Reclamations;
Design of Small Dams, 2nd edition (rev. reprint), 1977.

APPENDIX E
DRAWINGS



Dam Site

VICINITY MAP
DEERFIELD RESERVOIR DAM
I.D. No. NY 1227

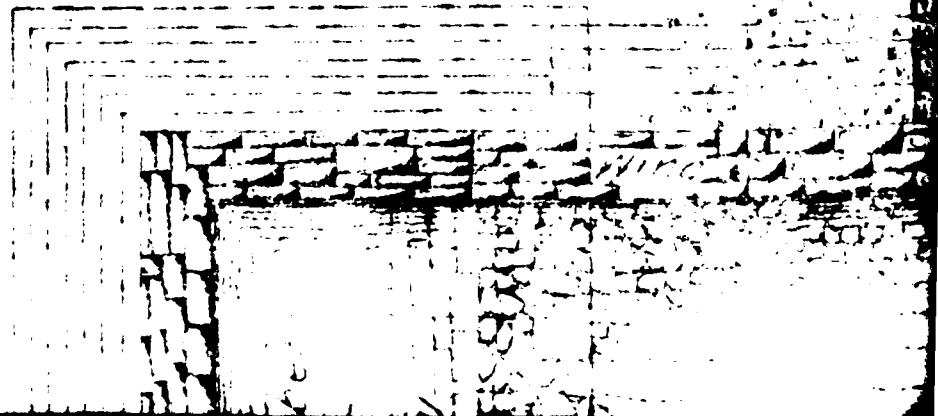


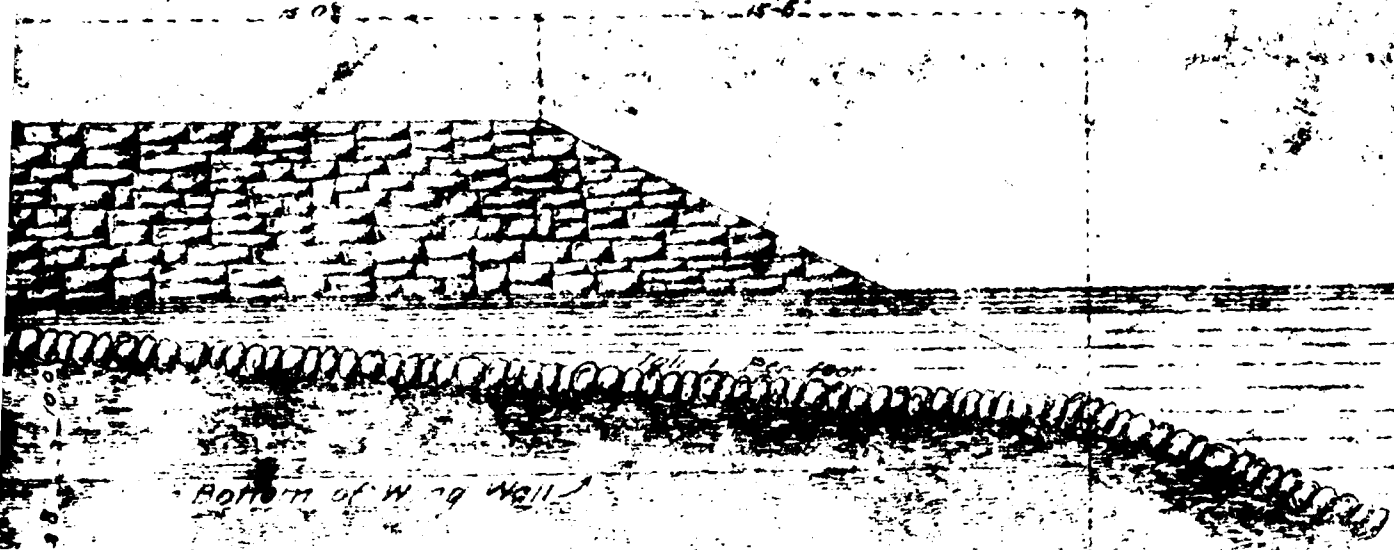
TOPOGRAPHIC MAP
DEERFIELD RESERVOIR DAM
I.O. No. NY 1227

2" Spruce Plank Cover

6" I Beam

Concrete Base 8" deep

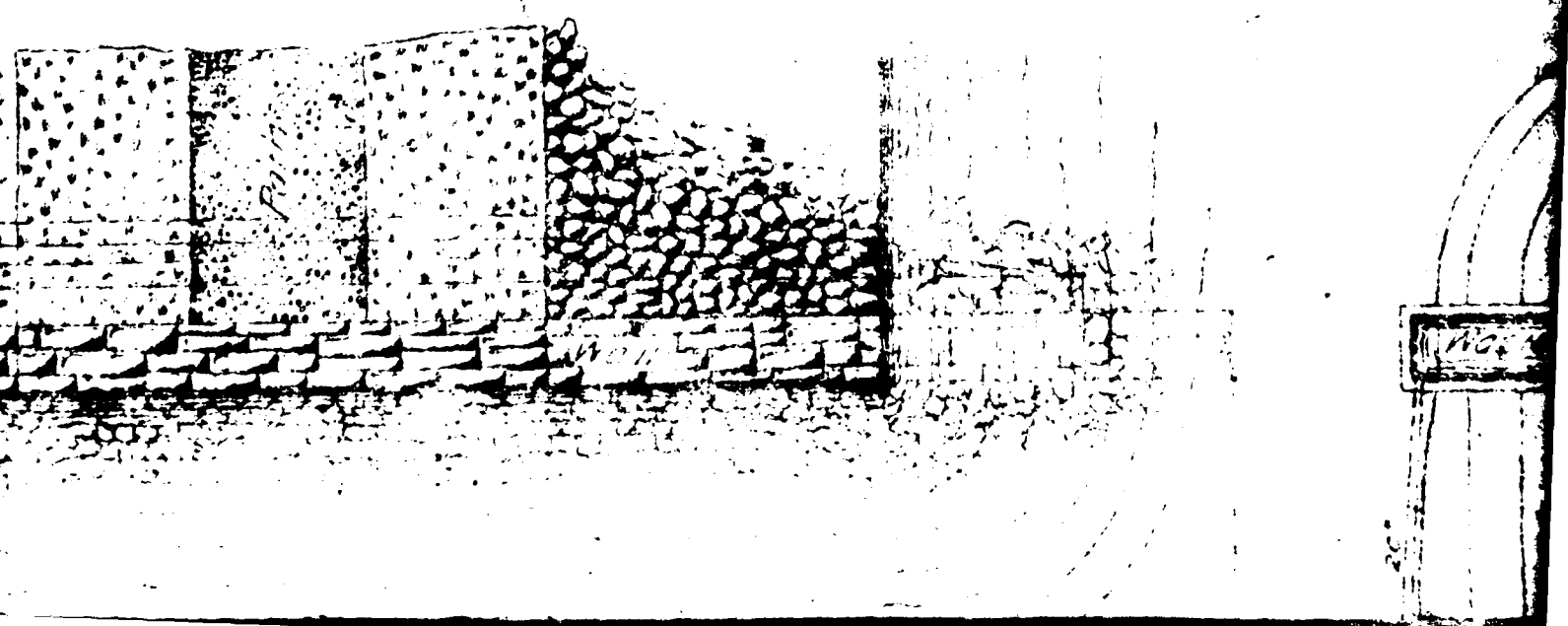




Bottom of Weir Wall

CROSS SECTION AT CENTER OF WASTE WEIR

Scale line 1 inch = 5 feet



110

WOLFENBURG

DIVISION

FORE BAY

4
Faint Inboard Slope

STORAGE RESERVE

Cap. 100,000,000 Gall.

Scale One Inch = 50 Feet

RESERVOIR

100,000. Gall.

Depth 50 Feet

Slope
Outward



Seeds Outboard Slope

Waste Channel

East Wall

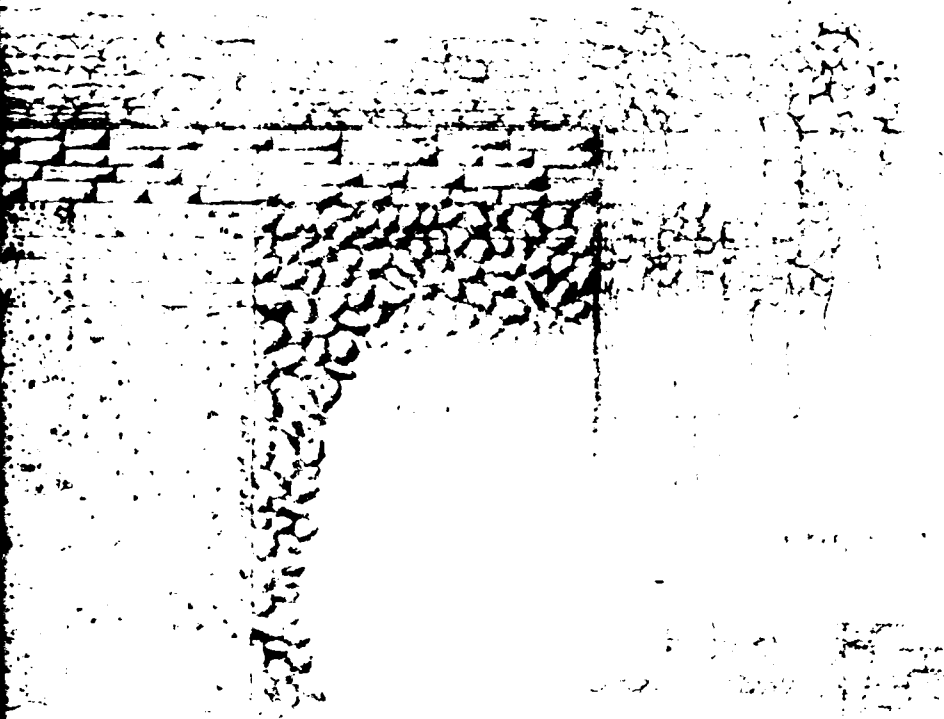
Part 1

Introduction

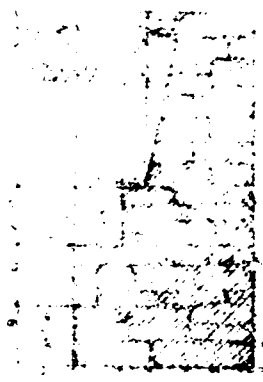
PLAN OF THE TOMB
Some of the details

100

1000



1000



NOTED IN SECTION A CENTER OF
Depth 100 Inch - 5 Feet

9

Cap. 6,500,000 Gall.

16' Node 5' 1/2"
20' Supply Main

Paved 31' 2"

Paved Inboard 31' 2"

Paved 31' 2"

ENTER OF WASTE W/

Inch 45 Feet

10

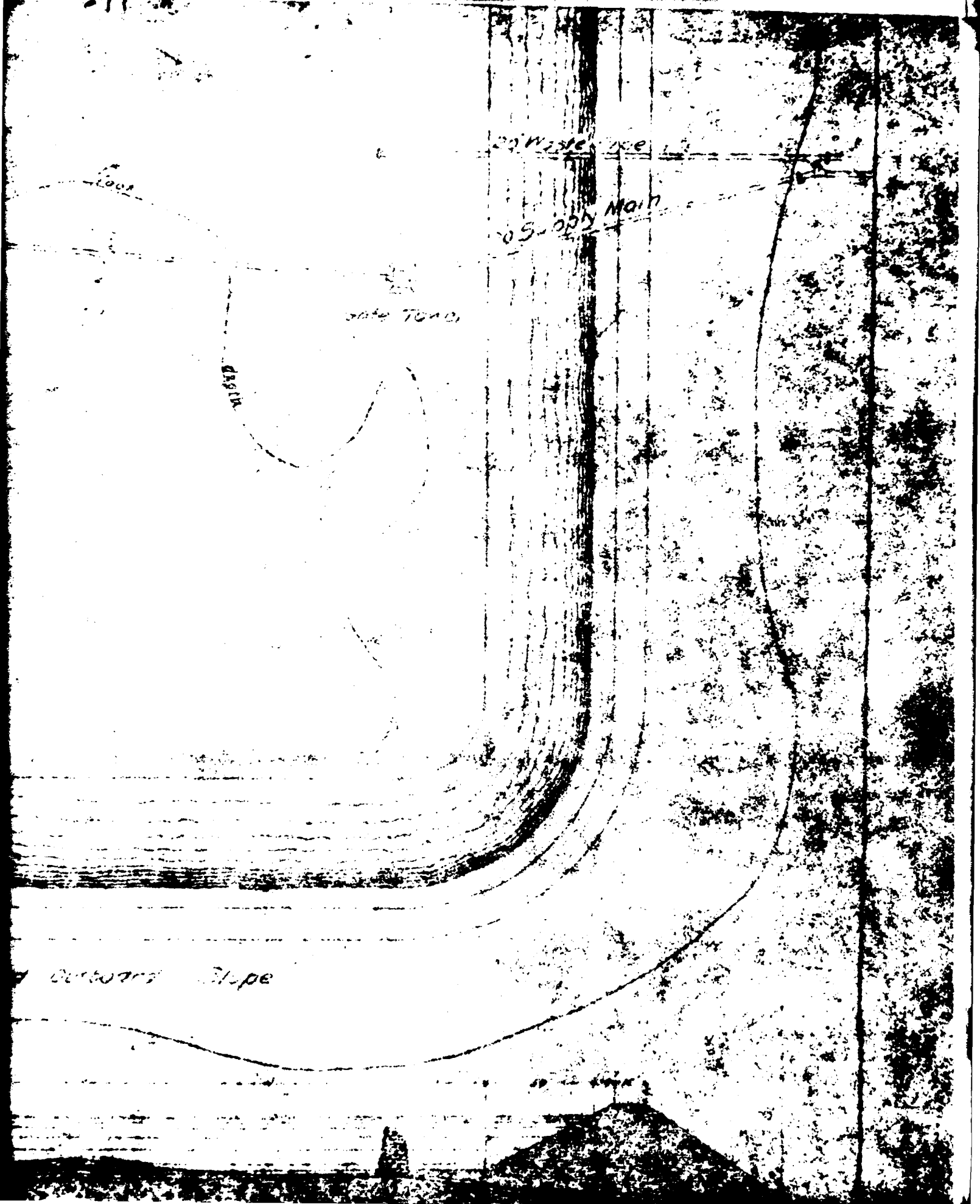
Seam

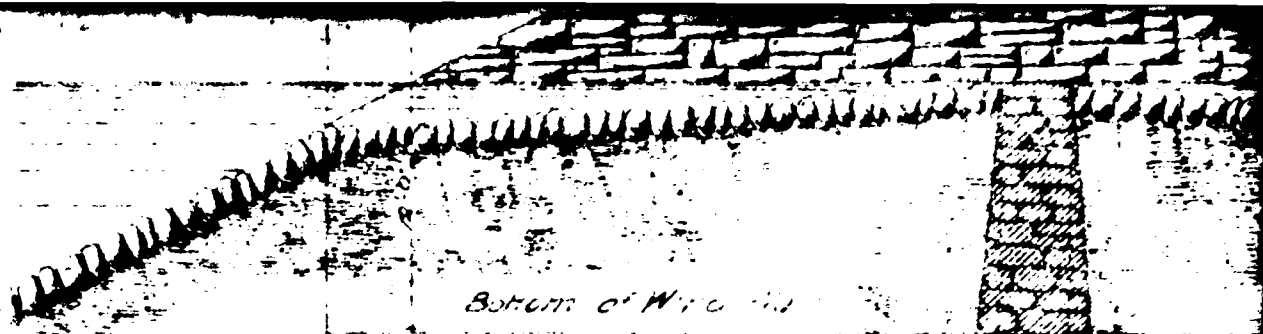
20 Supply

Twenty

Twenty

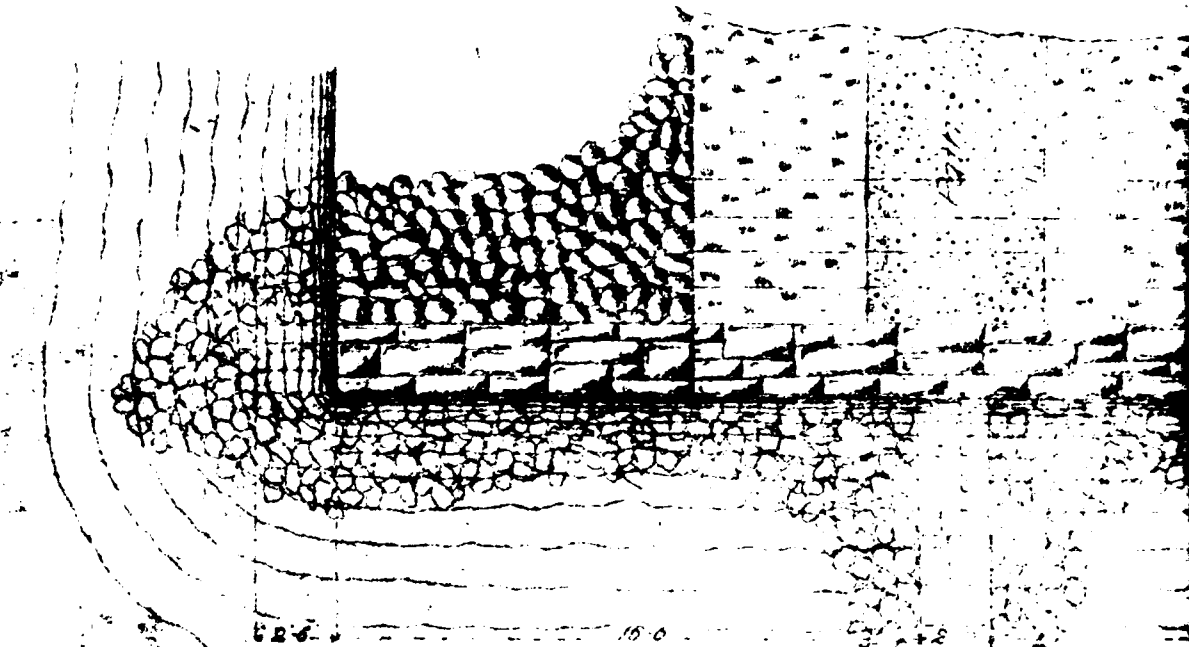
271



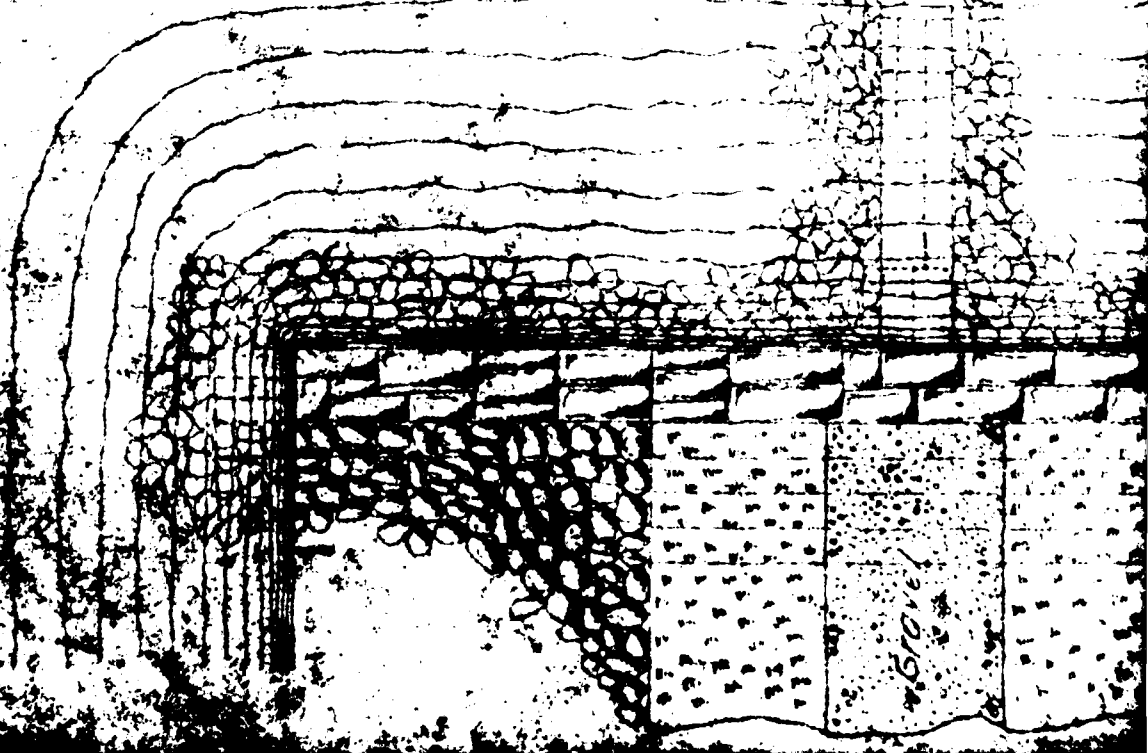


Bottom of Weir

CROSS SECTION AT CENTER OF DIV
Scale One Inch = 5 Feet



PLAN OF DIVISION WEIR
Scale One Inch = 5 Feet

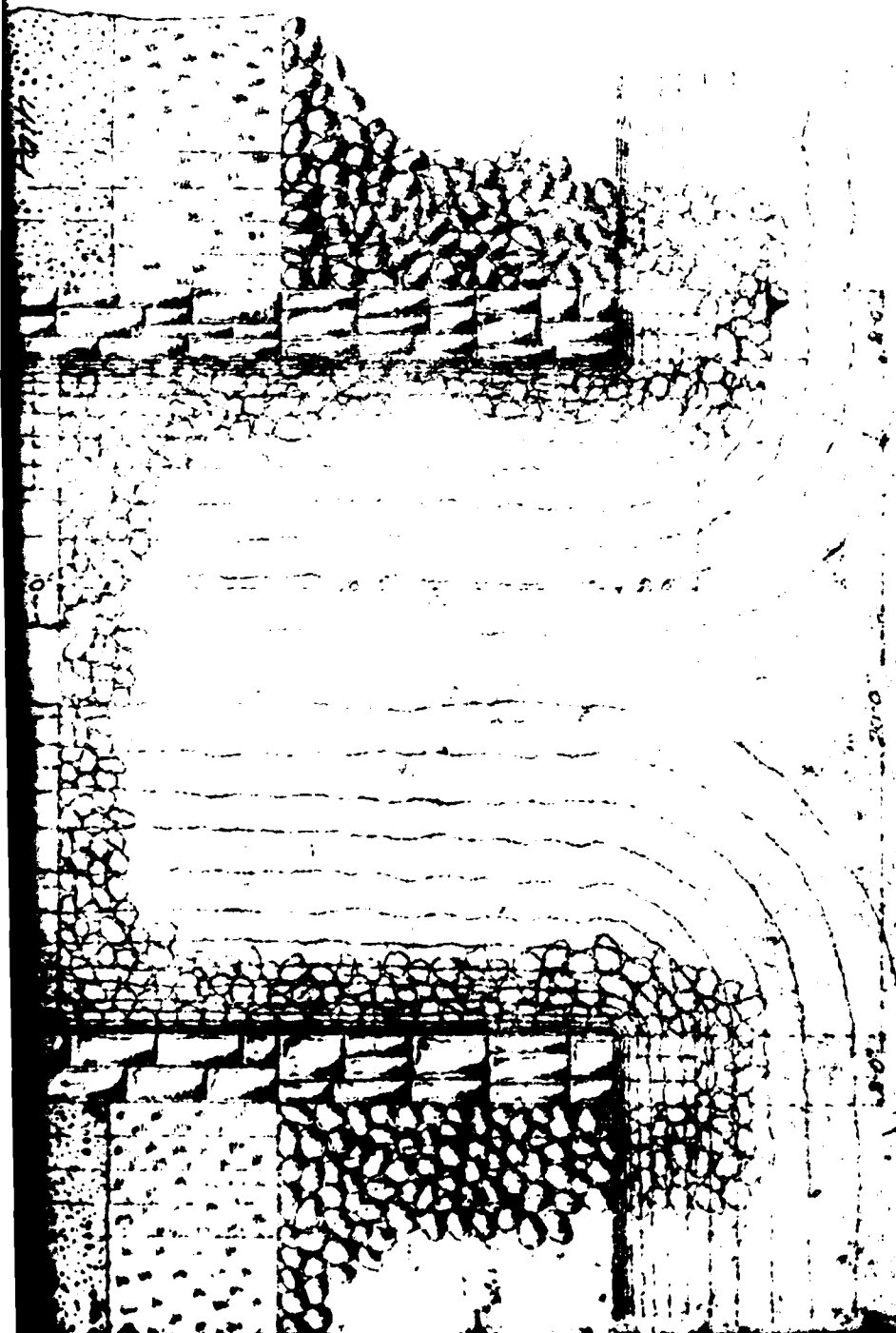


13

TER OF DIVISION WEIR
h = 5 Feet.

CROSS SECTION
Scale 0

CONSOLIDATION



SE SECTION ON PIPE LINE

Scale One inch = 20 Feet

Water Surface

General level of Ground Elevation

Runway

UNITED WATER COMPANY

UNION

ST. LOUIS, MO.

TRIPLE DE BULGARD

3000 Q70 100 ft. 50 Feet

Elev 702.5

Gravel Path

Water Surface Elev 1016

Earth Fill

Core

Earth Fill

White Pipe

COMPANY

CROSS SECTION OF EARTH EMBANKMENT

Scale One inch = 10 feet



ATE
LME