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NATIONAL DAM SAFETY PROGRAM. PLEASURE LAKE DAM (INVENTORY NO.-3--ETC(U)
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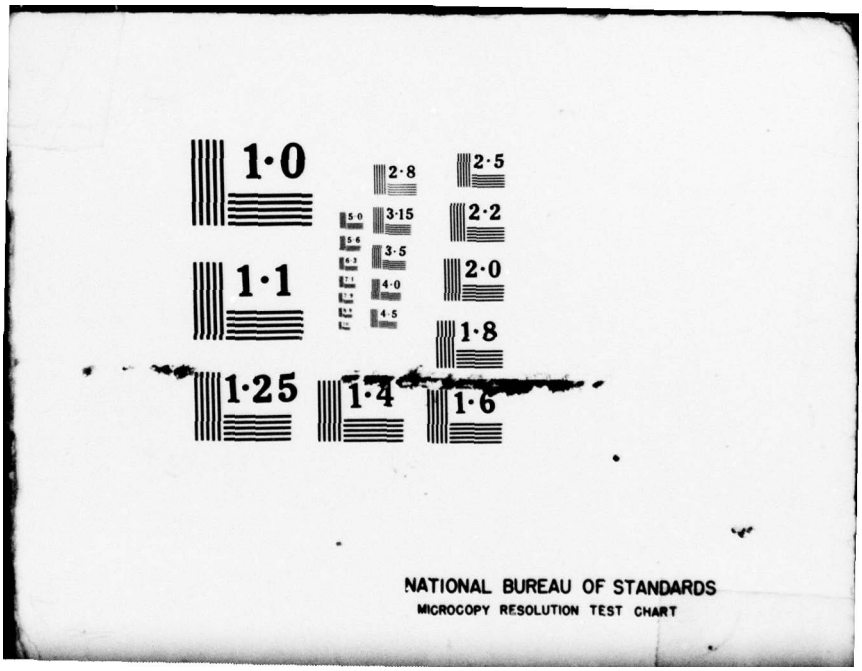
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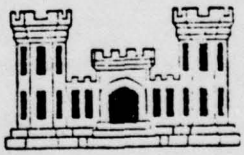
DELAWARE RIVER BASIN

PLEASURE LAKE DAM

SULLIVAN COUNTY, NEW YORK

INVENTORY NO. 345

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM



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NEW YORK DISTRICT CORPS OF ENGINEERS

SEPTEMBER 1978

DEPARTMENT OF THE ARMY
U. S. ARMY ENGINEER DISTRICT, NEW YORK
26 FEDERAL PLAZA
NEW YORK, NEW YORK 10007

NANEN-P

Honorable Hugh L. Carey
Governor of New York
Albany, New York 12224

Dear Governor Carey:

Reference is made to my letter of 2 October 1978 in which clarification of the guidelines used by this office in assessing dams with "seriously inadequate spillways" under the National Program of Inspection of Dams was outlined.

The following dams in your state have been assessed as having seriously inadequate spillways, with capability to pass safely only the percentage of the probable maximum flood as noted in each report. In accordance with revised criteria they are now to be assessed as unsafe:

I.D. NO.	NAME OF DAM
N.Y. 345	Pleasure Lake Dam
N.Y. 670	Myosotis Lake Dam
N.Y. 54	Tarrytown Waterworks Dam

The classification of "unsafe" applied to a dam because of a seriously inadequate spillway is not meant to connote the same degree of emergency as would be associated with an "unsafe" classification applied for a structural deficiency. It does mean, however, that based on an initial screening, and preliminary computations, there appears to be a serious deficiency in spillway capacity so that if a severe storm were to occur, overtopping and failure of the dam would take place, significantly increasing the hazard to loss of life downstream from the dam.

Consequently, it is advisable to implement the recommendations previously furnished in the reports for the above-mentioned dams as soon as practicable.

Sincerely yours,

CLARK H. BENN
Colonel, Corps of Engineers
District Engineer

cc:
Barbero, Descenza
Iarrobino (NAD), Exec Ofc
Engrg File, George Koch, NYS DEC

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Delaware River Basin
Pleasure Lake Dam
Sullivan County, New York Inventory No. N.Y.345

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Pleasure Lake Dam
Delaware River Basin

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.
Pleasure Lake Dam was judged to be unsafe-non-emergency due to a seriously inadequate spillway.

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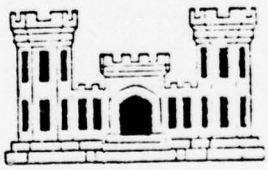
DELAWARE RIVER BASIN

PLEASURE LAKE DAM

SULLIVAN COUNTY, NEW YORK

INVENTORY NO. 345

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM



Prepared by: TIPPETTS-ABBETT-McCARTHY-STRATTON

NEW YORK DISTRICT CORPS OF ENGINEERS

SEPTEMBER 1978

DELAWARE RIVER BASIN
PLEASURE LAKE DAM
INVENTORY NO. 345
PHASE I INSPECTION REPORT

CONTENTS

PHASE I REPORT

NATIONAL DAM SAFETY PROGRAM

Name of Dam:	PLEASURE LAKE DAM (I.D. No. 345)
State Located:	NEW YORK STATE
County Located:	SULLIVAN COUNTY
Stream:	DELAWARE RIVER BASIN
Date of Inspection:	AUGUST 30, 1978

ASSESSMENT

Examination of the available documents and visual inspection of the Pleasure Lake Dam and appurtenant structures did not reveal any conditions which are unsafe.

Using the Corps of Engineers screening criteria for initial review of spillway adequacy, it has been determined that the dam would be overtopped for all storms exceeding approximately 21 percent of the PMF and 53 percent of the SPF. The spillway is, therefore, adjudged as seriously inadequate and the dam is assessed as unsafe, non-emergency.

The classification of "unsafe" applied to a dam because of a seriously inadequate spillway is not meant to connote the same degree of emergency as would be associated with an "unsafe" classification applied for a structural deficiency. It does mean, however, that based on an initial screening, and preliminary computations, there appears to be a serious deficiency in spillway capacity so that if a severe storm were to occur, overtopping and failure of the dam would take place, significantly increasing the hazard to loss of life downstream from the dam.

It is, therefore, recommended that within three months from the date of notification to the Governor of the State of New York, owners engage the services of a professional consultant to determine by more sophisticated methods and procedures the adequacy of the spillway. At the same time, the structural adequacy of the dam during overtopping should be fully evaluated to determine whether mitigating remedial measures are necessary. Borings may be necessary to determine the geometry, extent and condition of the downstream masonry section of the dam which is not visible. Within twelve months of the date of notification to the governor, appropriate remedial measures should have been completed. In the interim, a detailed emergency operation plan and warning system should be promptly developed. Also, during periods of unusually heavy precipitation, around-the-clock surveillance should be provided.

No remedial measures are required to assure the safety of the dam at the present time; however, certain measures are recommended as follow:

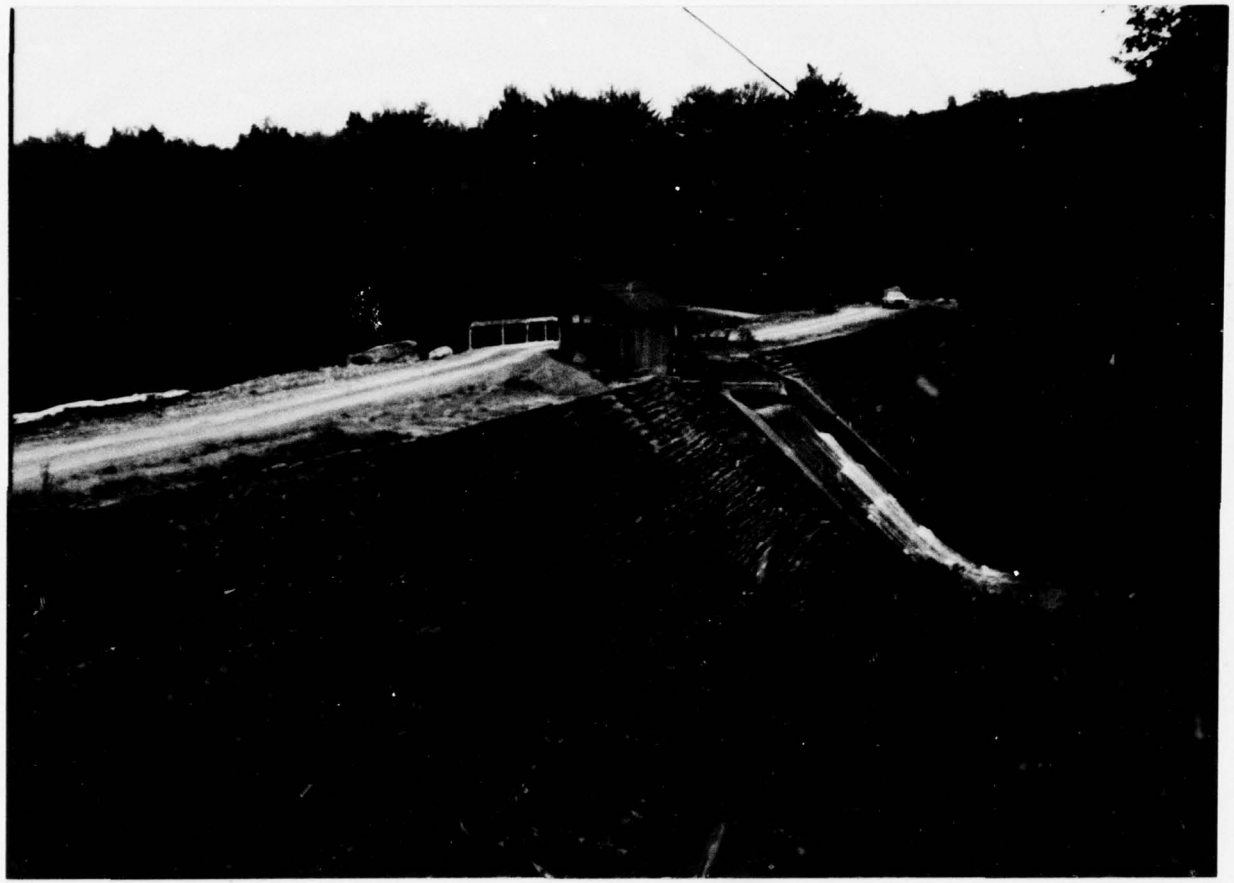
- Flatten and riprap the upstream slope
- Remove debris and vegetation from toe of dam
- Finish grade auxiliary emergency spillway
- Repair spillway and sluiceway pointing
- Prepare O & M manual and establish program of periodic inspections
- Monitor dam area adjacent to sluiceways for settlements.

Eugene O'Brien, P.E.
New York No. 29823

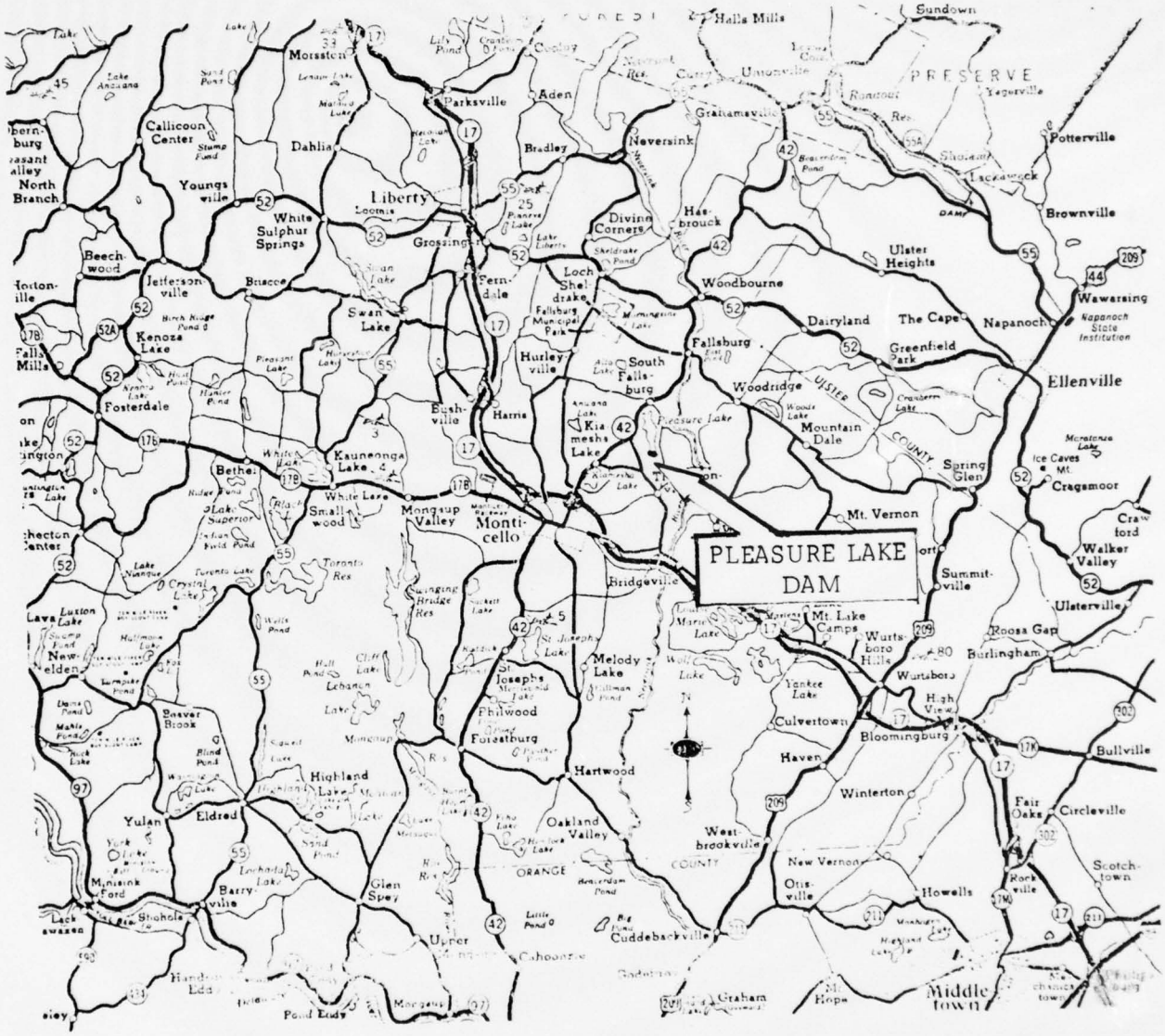
Approved By:

Col. Clark H. Benn
New York District Engineer

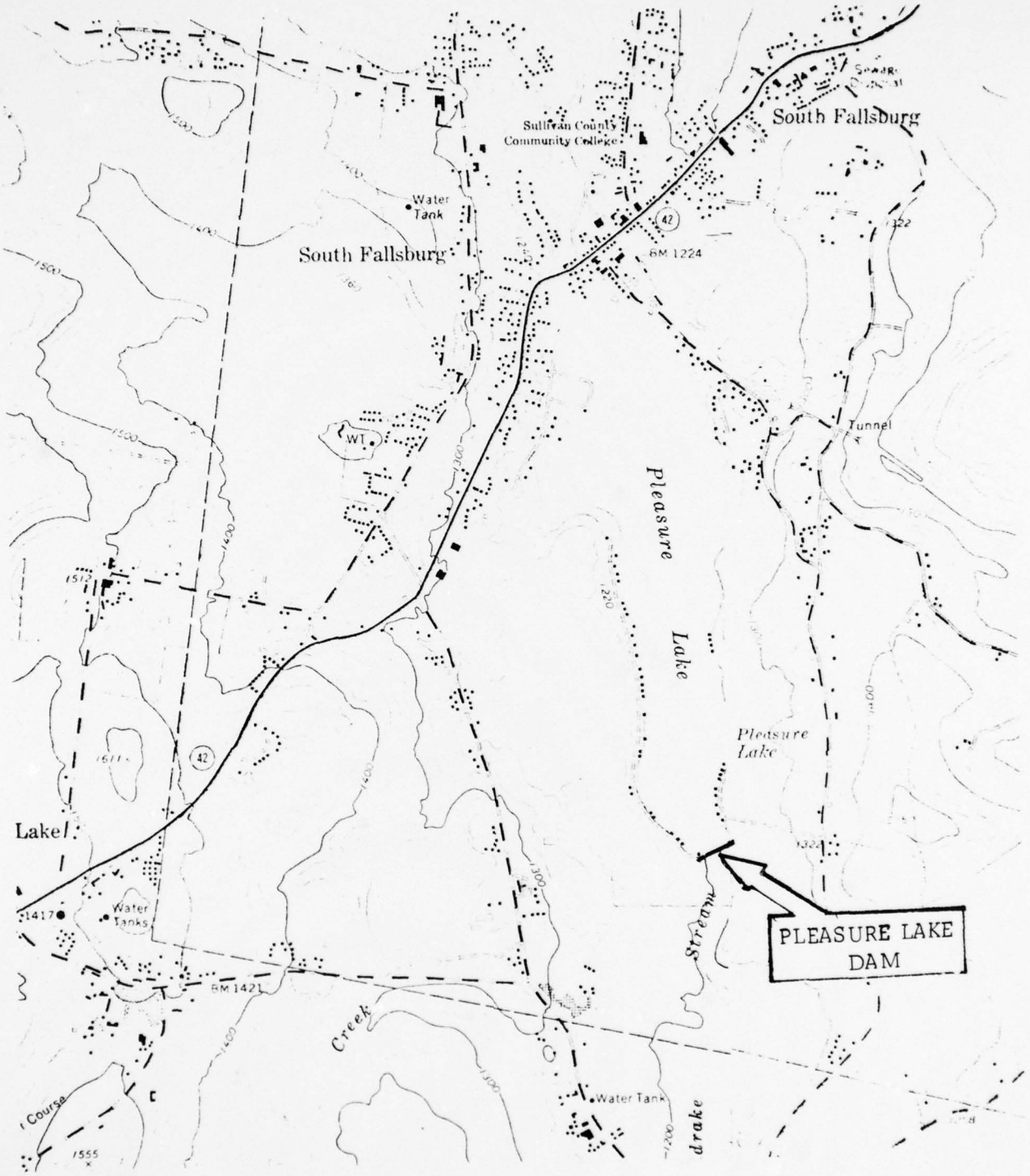
Date: 1978 November 22



1) GENERAL OVERVIEW OF MASONRY - EARTHFILL DAM AND SPILLWAY



VICINITY MAP
PLEASURE LAKE DAM



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DATUM IS MEAN SEA LEVEL

CONTOUR MAP
PLEASURE LAKE DAM

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
PLEASURE LAKE DAM, INVENTORY NO. 345
DELAWARE RIVER BASIN
SULLIVAN 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 by letter dated 31 March 1978, in fulfillment of the requirements of the National Dam Inspection Act, Public Law 92-367, 8 August 1976.

b. Purpose of Inspection

The purpose of this inspection and report is to investigate and evaluate the existing conditions of subject dam in order to: identify deficiencies and hazardous conditions; determine if they constitute hazards to human life or property; and notify the State of New York of these results along with recommendations for remedial measures where necessary.

1.2 DESCRIPTION OF THE PROJECT

a. Description of Dam and Appurtenances

Pleasure Lake Dam is a masonry gravity dam with an earthfill extension on the upstream slope. The length of the dam is about 470 feet and the maximum height is 30 feet; the crest width varies from 17 to 34 feet. The horizontal alignment of the embankment generally follows an east-west trend. A single lane gravel roadway on the crest of the dam provides access to and from numerous lakeside homes. Roadway traffic crosses a steel and wood bridge which spans two sluiceways and a spillway near the center of the dam. According to the personnel contacted and documents reviewed, the dam is constructed on a timber crib of 12 x 12 inch Hemlock planks.

The upstream earthfill surface has a slope of 1 on 1. The downstream masonry slope is also 1 on 1 with the stone placed in regular but stepped courses. The average stone dimensions are 2 feet long, 2 feet wide and 6 inches high.

The two 4-foot long sluiceways are located adjacent to an emergency spillway at the maximum dam section. The sluiceway training walls are fitted with stoplog guides at the head of each sluiceway. These concrete

capped training walls also provide support for a gatehouse located above the stoplogs on the downstream crest of the dam.

The emergency spillway is 25 feet long and 35 feet wide at the crest. The training walls, spillway channel and spillway chute are all concrete capped.

An auxiliary emergency spillway is cut into the east abutment of the embankment. This auxiliary spillway has a 250 foot long trapezoidal channel with a bottom width of about 21 feet and side slopes of about 1(V) on 4(H). The exit slope is approximately 1(V) on 20(H).

Flow from the reservoir is regulated by the two multi-level stoplog gates. By adjusting the height of these gates, water can be discharged either through the sluiceways or over the emergency spillway. The reservoir elevation can also be lowered to 4.5 feet below the emergency spillway crest by complete removal of the stoplogs. Floor openings in the gatehouse provide access for gate adjustments.

The project has no low level outlet. Reportedly the reservoir has not been drained by any other method.

b. Location

The dam is located at the south end of Pleasure Lake on Sheldrake Stream, a tributary to the Neversink River. The dam is approximately 1 mile north of Thompsonville, the nearest downstream community.

c. Size Classification

The dam is less than 40 feet high, has a reservoir less than 1000 acre-feet and is therefore classified as a "small" dam.

d. Hazard Classification

The dam is in the "high" hazard potential category because of the close vicinity of the downstream community.

e. Ownership

Pleasure Lake Dam is owned by the Fallsburg Fishing and Boating Club, Inc. of South Fallsburg. Day-to-day operation and maintenance is managed by the same. The dam was purchased in 1940 from the D&H Canal Company, who owned the dam since 1905.

Ownership prior to 1905 is unknown.

f. Use of Dam

The impoundment provided by the dam is used solely for recreational purposes of the local residents.

g. Design and Construction History

The original design computations, specifications or construction drawings could not be located. It is reported the dam was built about 1875. Names of those responsible for its design or construction could not be determined.

The present owner has instituted several major repair and modification programs. In 1952, repairs were made to the sluiceways and spillway. The wooden stoplog guides were replaced with steel channels, and the masonry surfaces of the sluiceway and spillway channels were resurfaced with concrete. Masonry joints were cleaned and pointed. In 1978, other modifications were made following the recommendations of a recent inspection of a local engineer. Earth was placed on the upstream slope of the embankment increasing the crest width by 8 to 10 feet. The auxiliary emergency spillway was regraded. This spillway was originally cut to provide for additional discharge capacity during the storm of October 1955.

h. Normal Operating Procedures

There is no established minimum downstream discharge requirement. Normally the stoplogs are adjusted such that water discharged primarily over the emergency spillway. Should the reservoir elevation increase 5 to 13 inches above the emergency spillway crest, water will flow over the stoplogs and the auxiliary emergency spillway respectively.

1.3 PERTINENT DATA

a. Drainage Area sq mi	13.1
b. Discharge at Dam Site, cfs	
Maximum known flood at site	Unknown
Emergency spillway, pool at top of dam (El 1213)	1130
Sluice gates, pool at top of dam (El 1213)	390
Auxiliary emergency spillway, pool at top of dam (El 1213)	1160
Total project discharge capacity	2680
c. Elevation (feet above MSL)	
Top of dam	1213±
Spillway crest, emergency	1207±
Spillway crest, auxiliary emergency	1208±
Stream bed at centerline of dam	1181±

d. Reservoir

Length, miles	1.5
Surface area at El 1207, sq mi	0.34

e. Storage, acre-feet

Top of spillway crest (El 1207)	unknown
Surcharge storage between El 1207 and El 1213	1517

f. Dam

Type: Masonry downstream section with an earth embankment upstream section.

Length:	470 ft±
Height:	30 ft±
Top width:	17 to 34 ft
Side slopes: 1(V): 1(H) Upstream and Downstream	
Zoning:	Unknown

g. Spillway

Emergency Spillway

Type: Broad-crested, ungated
Length: 25 ft
Crest: El 1207

Auxiliary Emergency Spillway

Type: Trapezoidal channel, no sill, ungated
Length: 21 ft
Crest: El 1208
Downstream Channel: 200 ft long excavated channel

h. Sluice Gates

Two 4 foot long multi level stoplog gates.
Bottom elevation of gate is 1202 1/2± feet.
The project has no low level outlet.

SECTION 2 - ENGINEERING DATA

2.1 DESIGN

There are no design data or specific design memoranda available for the project features.

2.2 CONSTRUCTION RECORDS

No original construction records are available for the project.

2.3 OPERATION RECORDS

There are no records of operation at the dam. The available written records of the maintenance work performed consists of:

a. Proposed Dam Repairs, Specifications (2 pages, May, 1952) and Drawings(Sheet #1, June, 1950 and Sheet #2, March, 1952)

b. List of Improvements Made to Fallsburg Fishing and Boating Club Dam (1 page, June, 1978)

There does not exist a formal operation and maintenance manual for the project. Records of reservoir elevation and rainfall are not kept but the dam is visually inspected daily by a caretaker.

2.4 EVALUATION OF DATA

Existing information was made readily available by personnel of the Fallsburg Fishing and Boating Club Inc.

The available data reviewed is considered adequate for this Phase I inspection and evaluation of safety.

SECTION 3 - VISUAL OBSERVATIONS

3.1 FINDINGS

a. General

A visual inspection of the Pleasure Lake Dam was made on 30 August, 1978. The weather was sunny with temperatures approaching 85°F. The last rainfall reportedly occurred two nights prior to the inspection. At the time of inspection, the reservoir level was approximately 3 inches above the emergency spillway crest.

b. Dam

The embankment appears to be in generally fair condition. The entire embankment is devoid of vegetation except for minor weeds and some trees located on the extreme west upstream slope.

Crest alignment is generally good with only a few depressions created by traffic. An overlay of 65 tons of crushed rock rolled on to the crest road about 10 weeks before the inspection elevates only the road surface about 6 to 12 inches. The horizontal and vertical alignment of the embankment were good. It was observed that the downstream edge of the masonry crest, east of the gatehouse shows some curvature; however, no recent movement is apparent.

There are several areas of sloughing and erosion along the upstream slope. It is reported 35,000 cubic yards of fill was also recently dumped on the upstream slope increasing the crest width an average of 8 to 10 feet. The soil, a mixture of boulders, gravel, sand, silt and clay was obtained from a borrow area west of the embankment. No controls for compaction were established although the fill was reportedly rolled by a front end loader during placement. The new upstream slope is not sodded and as a result there are many runoff gullys. The slope from the crest to the waterline is steep and has no riprap or other slope protection. The owner has, however, placed logs at the waterline with the intention to reduce wave runup and erosion. Several boulders and smaller cobbles, which are constituents of the borrow material were observed randomly placed along the slope.

A longitudinal crack about 20 feet long is located on the crest, about two feet upstream of the roadway edge and approximately 40 feet west of the bridge. The crack appears to be caused by settlement of the fill placed in 1978.

There is some bulging of the downstream slope; however, there are indications that no movement has occurred recently. Several of the masonry stones on the slope have split but their breakage does not follow any pattern.

Settlement of the embankment has occurred adjacent to the west sluiceway training wall. Seepage was observed at the toe of the embankment near the location where the settlement occurred. The leakage is estimated at 5± gpm. The clear water and limonite stained algae growth tend to indicate that the seepage is an old condition. There are several damp areas along the western toe of the dam; however, no visible seepage was visible at these locations. No seepage was observed along the eastern embankment toe.

The downstream toe area is moderately to heavily vegetated with shrubs, weeds and small saplings. Larger trees have been cleared for a distance of 30 to 40 feet beyond the toe. It is reported that this area is periodically cleared of brush using physical and chemical methods. The last cutting was reportedly last year.

The slopes downstream of the toe generally slope towards the spillway; however, many large piles of debris (mainly consisting of treetrunks, brush and soil) create an irregular surface of mounds and depressions. Accumulation of water from runoff in these depressions appears probable.

c. Appurtenant Structures

The sluiceways and emergency spillway appear to be in generally fair condition. The approach channels to the sluiceways and emergency spillway are clear of aquatic growth. There was evidence of some minor cracking and some missing pointing along the concrete training wall surfaces. Slight leakage was observed between the masonry and gunite surface on the east wall of the west sluiceway.

The spillway crest and chute appear to be in good condition. Some minor erosion of the gunite surface is noted. The spillway chute is covered by gunite placed in an overlapped manner.

A removable fish screen is located at the entrance of the emergency spillway. The east end of the spillway was observed to be 2-3 inches lower than that of the west end; there was no evidence of distress or movement of the spillway.

The auxiliary emergency spillway is an unfinished channel cut into natural ground at the east end of the dam. Some minor depressions and erosion gullys from runoff are noted. The gravel crest roadway crosses the channel near its entrance, the road surface being approximately 6 to 8 inches

above the channel floor. It appears some seed has been planted and grass is beginning to grow.

d. Downstream Channel

The channel downstream of the emergency spillway tailrace is the Sheldrake Stream. The channel is a natural stream with only minimal vegetation and overhanging trees. Present conditions do not impede the discharge of the flow observed. The auxiliary amergency spillway discharges into the Sheldrake Stream about 300 feet downstream of the dam.

e. Reservoir Area

In the upstream vicinity of the dam, there was no evidence of sloughing, potentially unstable slopes or other unusual conditions which would adversely affect the dam.

3.2 EVALUATION OF VISUAL OBSERVATIONS

Visual observations made during the course of the inspection did not indicate any serious problems which would adversely affect the safety of the dam or immediate remedial action.

A monitoring program should be established to determine if there is any continuing movement in the displacements (vertical settlement, bulges and crest curvature).

The upstream slope should be flattened and riprapped.

The downstream toe area should have the heavy brush and debris removed and then be regraded to slope toward the spillway channel.

The auxiliary emergency spillway channel should be finish-graded and seeded.

SECTION 4 - OPERATIONAL AND MAINTENANCE PROCEDURES

4.1 PROCEDURES

There is no specified required release of water. It is reported the reservoir elevation and release over the emergency spillway at the time of inspection were about normal.

4.2 MAINTENANCE OF THE DAM

There is no operation and maintenance manual for the project. The dam is visited daily by a caretaker who visually examines the dam and other project features. There is no formally established program of inspection visits by other personnel.

Because of the recent modifications to the upstream slope it is difficult to assess the past adequacy of the embankment maintenance. The lack of upstream slope protection maintenance, grass and a riprap is considered less than adequate. Maintenance on the downstream slope is adequate. The maintenance of the slopes downstream of the dam toe, because of the piled debris and heavy vegetation, is less than adequate.

No regular maintenance procedures are established for the masonry structures and spillways.

Maintenance of the roadway and bridge appears to be adequate.

4.3 MAINTENANCE OF OPERATING EQUIPMENT

The stoplogs and operating equipment appear to be operable insofar as was visible. New stoplogs are available and stored in the gatehouse.

4.4 WARNING SYSTEMS IN EFFECT

There is no warning system in effect or in preparation.

4.5 EVALUATION

The maintenance of the Pleasure Lake Dam is considered less than adequate in the following areas:

a. Lack of slope protection on the upstream dam surface and the auxiliary emergency spillway.
b. Control of debris and vegetation on the slope downstream of the dam toe.
c. No formal operation and maintenance manuals for the project.

SECTION 5 - HYDROLOGIC/HYDRAULIC

5.1 DRAINAGE BASIN CHARACTERISTICS

Pleasure Lake is located on Sheldrake Stream, a tributary of Neversink River in the Delaware River Basin, south of South Fallsburg in Sullivan County. For this analysis, the drainage area's contributing to the following five lakes, Loch Sheldrake, Evans Lake, Morningside Lake, Alta Lake and an unnamed Lake downstream of Alta Lake, were not included. Total area omitted was about 4 square miles or approximately 32% of the entire drainage area. The remaining land area of 8.6 square miles was further divided into two sub-basins. Sub-basin A, north of the lake is 5.3 square miles with a length to width ratio of about 7. Sub-basin B, west of the Lake is 3.3 square miles in area and roughly square shaped.

The physical features of both basins are otherwise similar with rolling hills and wide valleys, interspersed with small lakes and swamps.

5.2 SPILLWAY

Discharge from Pleasure Lake is passable through the following:

a. The emergency spillway centrally located on the dam. This spillway is a rectangular-shaped concrete structure, with a channel width of 25 feet and a crest at El. 1207, 6.0 feet below the top of the dam.
b. Two sluiceways, located adjacent to the primary spillway are 4 feet wide and at crest El. 1202.5. Stoplogs are usually placed in the sluiceways to maintain the lake at El. 1207.
c. An auxiliary emergency spillway, located at the eastern end of the dam, with a bottom width of 21 feet, side slopes of about 1(V):4(H), and a crest at El. 1208.

The computed spillway capacities with the lake surface at El. 1213, equivalent to the top of the dam, are as follows:

a.	Emergency spillway	1130 cfs
b.	Sluice gates	390 cfs
c.	Auxiliary emergency spillway	1160 cfs
	Total outflow capacity at El. 1213 -	2680 cfs.

5.3 RESERVOIR CAPACITY

The normal capacity of Pleasure Lake is unknown, however, it is

estimated that the surcharge storage between spillway crest (El. 1207) and top of dam (El. 1213) is 1517 acre-feet, which is equivalent to about 2 inches of runoff over the entire drainage basin. The area of the lake at El. 1207 is 0.34 square miles (219.5 acres), 2.6% of the drainage basin area.

5.4 FLOODS OF RECORD

There are no flood records available.

5.5 OVERTOPPING POTENTIAL

The overtopping potential was evaluated by comparing the Probable Maximum Flood (PMF) and the Standard Project Flood (SPF) with the total project discharge capacity.

The Probable Maximum 6-hour rainfall over 13 square miles for the Pleasure Lake area was taken from Weather Bureau sources and distributed, in a probable storm sequence, as indicated in a publication of the World Meteorological Organization.

The rainfall excess was determined, using the Soil Conservation Services curve number method. A triangular unit hydrograph was developed and subsequently used to compute the flood runoff hydrograph for the land area. The runoff resulting from the Probable Maximum Precipitation falling directly on the lake surface was added to the computed flood hydrograph to form the inflow hydrograph and resulted in a peak inflow of 13955 cfs.

The potential of the water overtopping the dam was investigated on the basis of the available surcharge storage and spillway discharge capacities to meet a potential emergency inflow. It was assumed that the stoplogs in both sluiceways were up to El. 1207 and that the lake level was also at El. 1207.

5.6 EVALUATION OF HYDROLOGY/HYDRAULICS

The Probable Maximum Flood, routed through the lake, caused the lake surface to rise to an elevation of 1215.9, 2.9 feet above the top of the dam. The peak discharge over the dam was 12772 cfs. The PMF peak outflow is about 4.7 times the combined outflow capacity.

The Standard Project Flood (1/2 PMF) routed through the lake resulted in a peak discharge of 5038 cfs and a maximum lake elevation of 1214.0, 1.0 foot above the top of the dam. The SPF peak outflow is about 1.9 times the combined outflow capacity.

On the basis of this investigation the project discharge capacity is considered to be seriously inadequate.

SECTION 6 - STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

a. Visual Observations

Visual observations did not indicate any serious structural problems with the embankment or spillway. The deficiencies described in Section 3 require attention and measures to improve these deficiencies are given in Section 7.

b. Design and Construction Data

No design computations or other data pertaining to the structural stability of the dam have been located.

On the basis of the performance experience, the visual inspection, as well as engineering judgment, the dam at present appears to be structurally adequate.

c. Operating Records

There are no operating records available.

d. Post-Construction Changes

It is reported the dam was built about 1875. Post-construction records consist of drawings and specifications used for repairs made in 1952 to the sluiceways and emergency spillway. These repairs included concrete capping of the sluiceway and emergency spillway training walls and crests and replacing the wooden stoplog guides with steel guides.

In 1978 modifications made to the dam include increasing the crest width 8-10 feet by adding fill to the upstream slope. During this operation the original upstream riprap was covered. The auxiliary emergency spillway originally cut in 1955 was regraded. Other minor changes were made to the embankment and crest road.

e. Seismic Stability

The dam is located in Seismic Zone No. 1 and, in accordance with recommended Phase I guidelines, does not warrant seismic analyses.

f. Structural Stability During Overtopping

Inasmuch as there exist no details on the full geometry and extent of the masonry section which forms the downstream face of the combined earth-masonry dam, it cannot be determined at the present time whether the safety of the dam will be adequate if overtopping in the range of 3.5 to 6.7 feet, as described in Section 5, were to occur.

SECTION 7 - ASSESSMENT/REMEDIAL MEASURES

7.1 DAM ASSESSMENT

a. Safety

Examination of the available documents and visual inspection of the Pleasure Lake Dam and appurtenant structures did not reveal any conditions which are unsafe.

Using the Corps of Engineers screening criteria for initial review of spillway adequacy, it has been determined that the dam would be overtopped for all storms exceeding approximately 21 percent of the PMF and 53 percent of the SPF. The spillway is, therefore, adjudged as seriously inadequate and the dam is assessed as unsafe, non-emergency.

The classification of "unsafe" applied to a dam because of a seriously inadequate spillway is not meant to connote the same degree of emergency as would be associated with an "unsafe" classification applied for a structural deficiency. It does mean, however, that based on an initial screening, and preliminary computations, there appears to be a serious deficiency in spillway capacity so that if a severe storm were to occur, overtopping and failure of the dam would take place, significantly increasing the hazard to loss of life downstream from the dam.

It is, therefore, recommended that within three months from the date of notification to the Governor of the State of New York, owners engage the services of a professional consultant to determine by more sophisticated methods and procedures the adequacy of the spillway. At the same time, the structural adequacy of the dam during overtopping should be fully evaluated to determine whether mitigating remedial measures are necessary. Borings may be necessary to determine the geometry, extent and condition of the downstream masonry section of the dam which is not visible. Within twelve months of the date of notification to the governor, appropriate remedial mitigating measures should have been completed. In the interim, a detailed emergency operation plan and warning system should be promptly developed. Also, during periods of unusually heavy precipitation, around-the-clock surveillance should be provided.

b. Adequacy of Information

The information and data available were adequate for performance of this investigation.

The information and data available with regards to operation and maintenance of the project is considered less than adequate in the following areas:

1. Record drawings of the project
2. Operation and maintenance manuals
3. Records of inspections.

c. Necessity for Additional Investigations

Additional investigations are necessary to evaluate the adequacy of the spillways and to determine remedial mitigating measures as recommended in Section 7.1a.

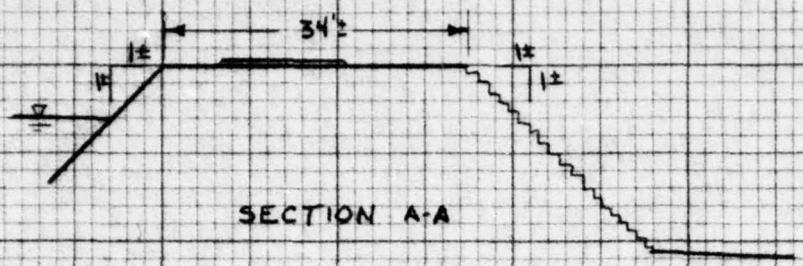
7.2 REMEDIAL MEASURES

No remedial measures are required to assure the safety of the dam at this time. However, certain measures to provide for continued dam safety are recommended as follow:

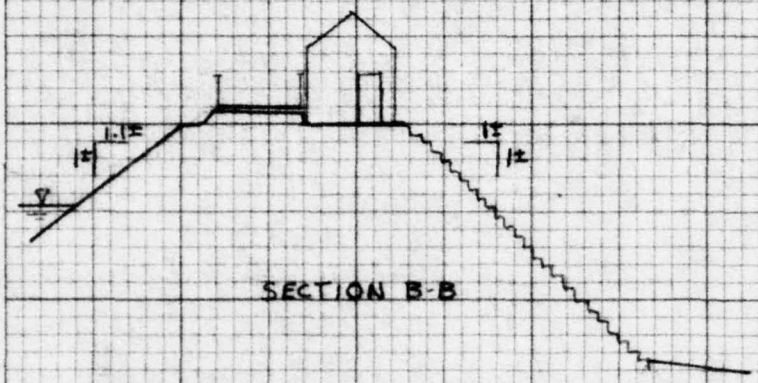
a. The upstream earth slope should be flattened and riprapped. A bedding layer of suitable material should be placed between the earthfill and the riprap. The remainder of the slope should be seeded. The longitudinal crack observed along the upstream slope should be repaired prior to flattening and seeding the slope.
b. The heavy brush and debris should be removed from the downstream toe area.
c. The slope downstream of the toe area should be regraded to prevent runoff accumulations.
d. The auxiliary emergency spillway should be finish-graded and seeded.
e. Loose and missing pointing at sluiceways and emergency spillway should be repaired.
f. An operation and maintenance manual should be prepared and a program of periodic inspections established for the project features.
g. A monitoring program should be established to determine if there is any continuing movement in the displacements, (i.e., vertical settlement, bulges and crest curvature) described in Section 3. The damp areas also described in Section 3 should be identified as either runoff or seepage. In areas where seepage is identified, a systematic program of observation and monitoring of changes in the pattern and quantity of the seepage should be initiated.

DRAWINGS

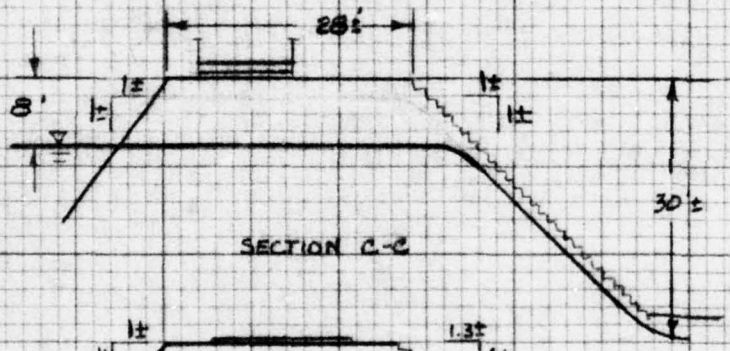
APPENDIX A



SECTION A-A

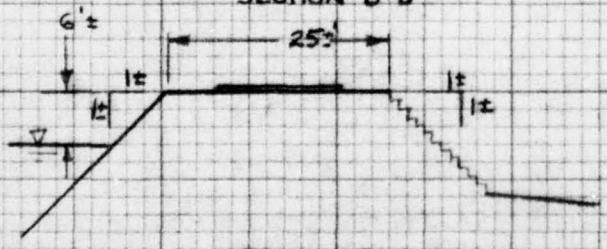


SECTION B-B



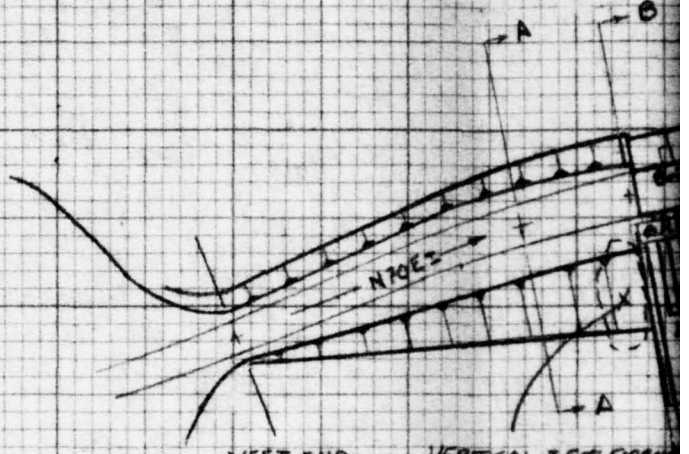
SECTION C-C

SECTION D-D



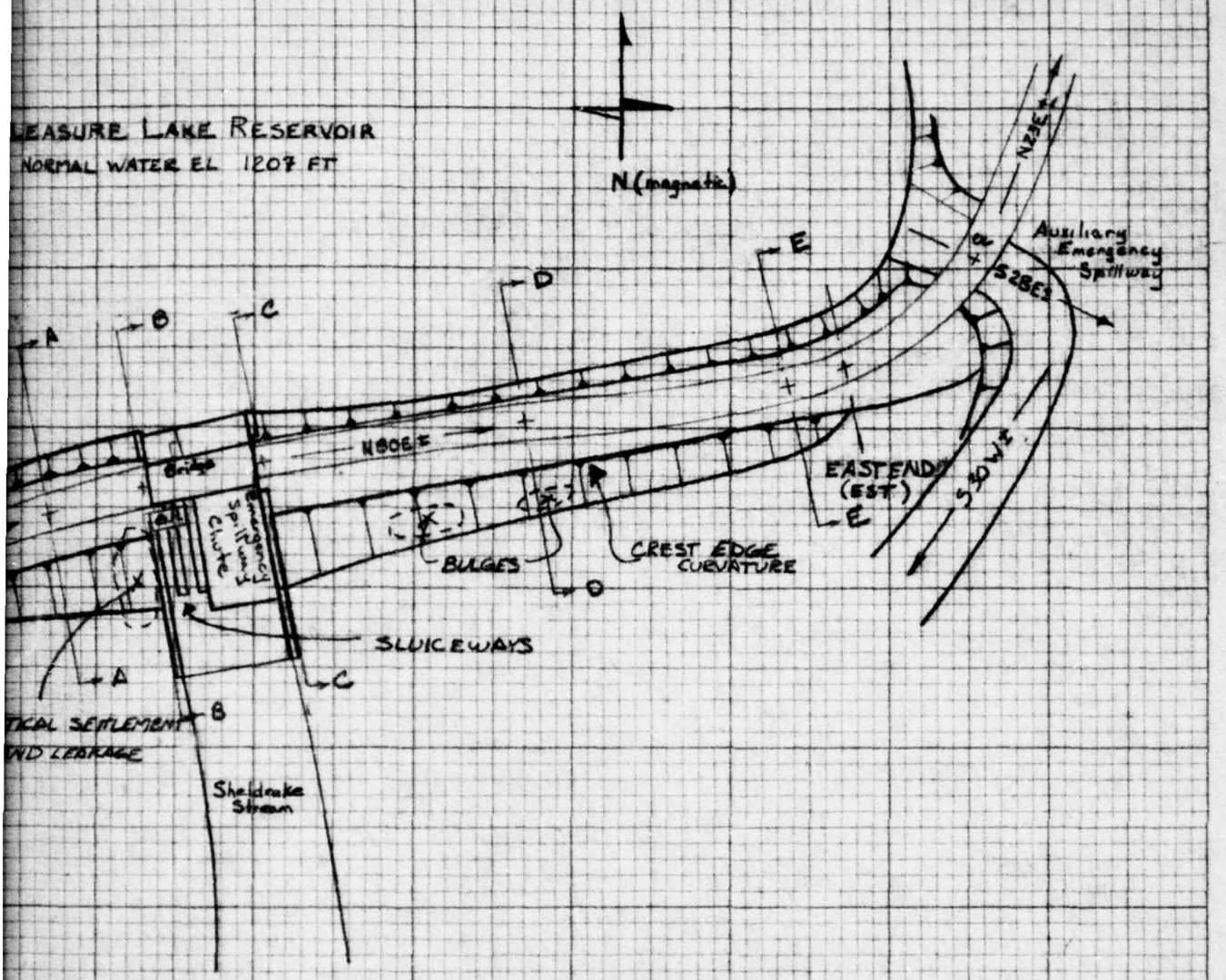
SECTION E-E

PLEASURE LA
NORMAL WATER



DISTANCES FROM WEST END	
TO:	LENGTH±
A-A	109'
B-B	149'
C-C	190'
D-D	293'
E-E	393'
EAST END	415' (est)
℄ OF SPWY	483

NOTE: DRAWING BASED ON ROUGH FIELD MEASUREMENTS MADE DURING VISUAL INSPECTION

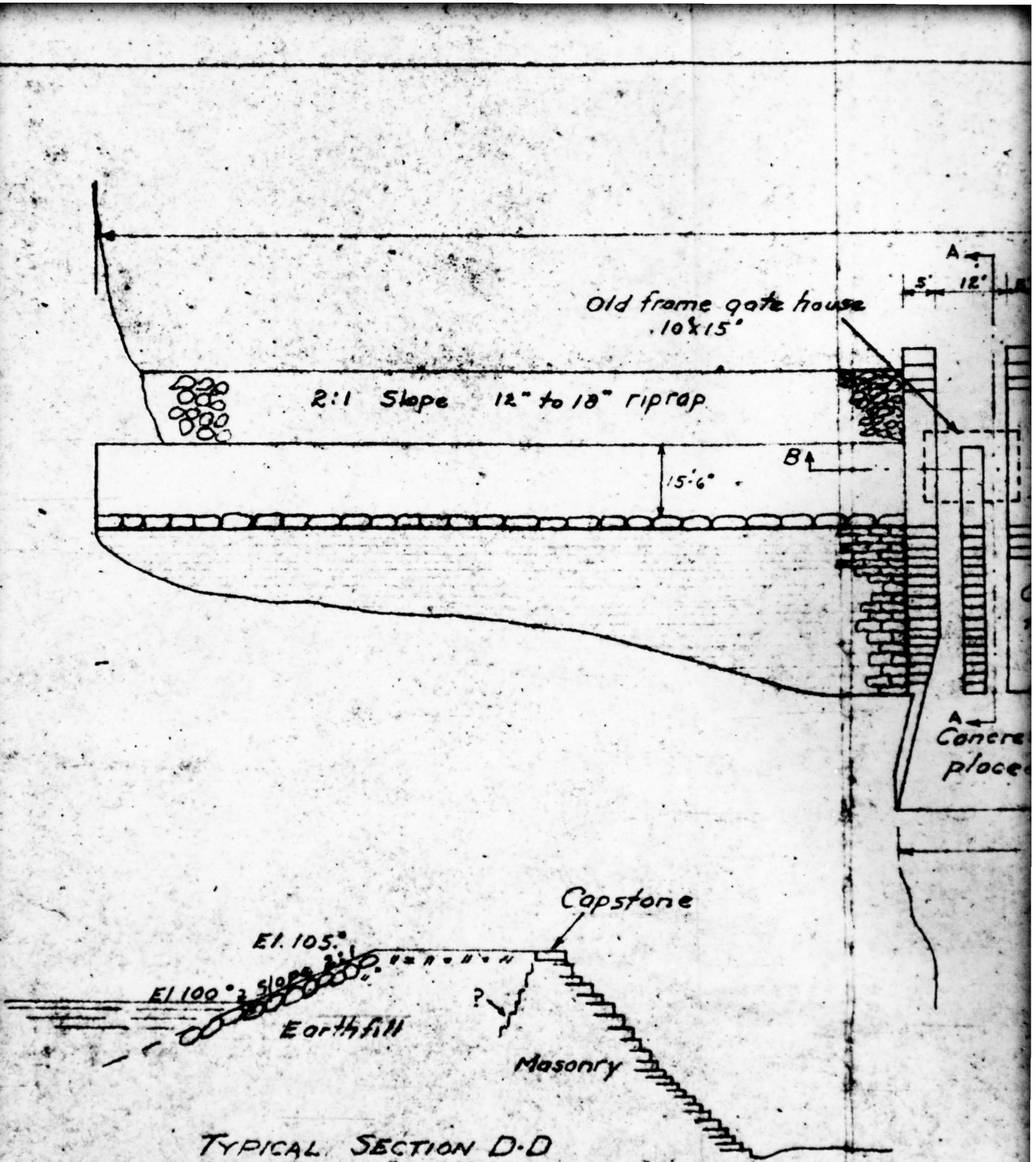


PLEASURE LAKE DAM

PLAN AND SECTION

SCALE - NTS	DATE - AUG 1978

IGH FIELD
DURING



TYPICAL SECTION D-D
Scale 1" = 10'-0"

PLEASURE LAKE

470' long

C

25'

4'

D

Spillway
Concrete
resurfaced
in 1936

B

15' roadway

Massive Masonry Retaining Wall

Concrete
face placed
in 1936

rete Apron
ed in 1936

-PLAN-
Scale 1 in = 20 ft.

C

48'

Center & side piers
Massive squared ston

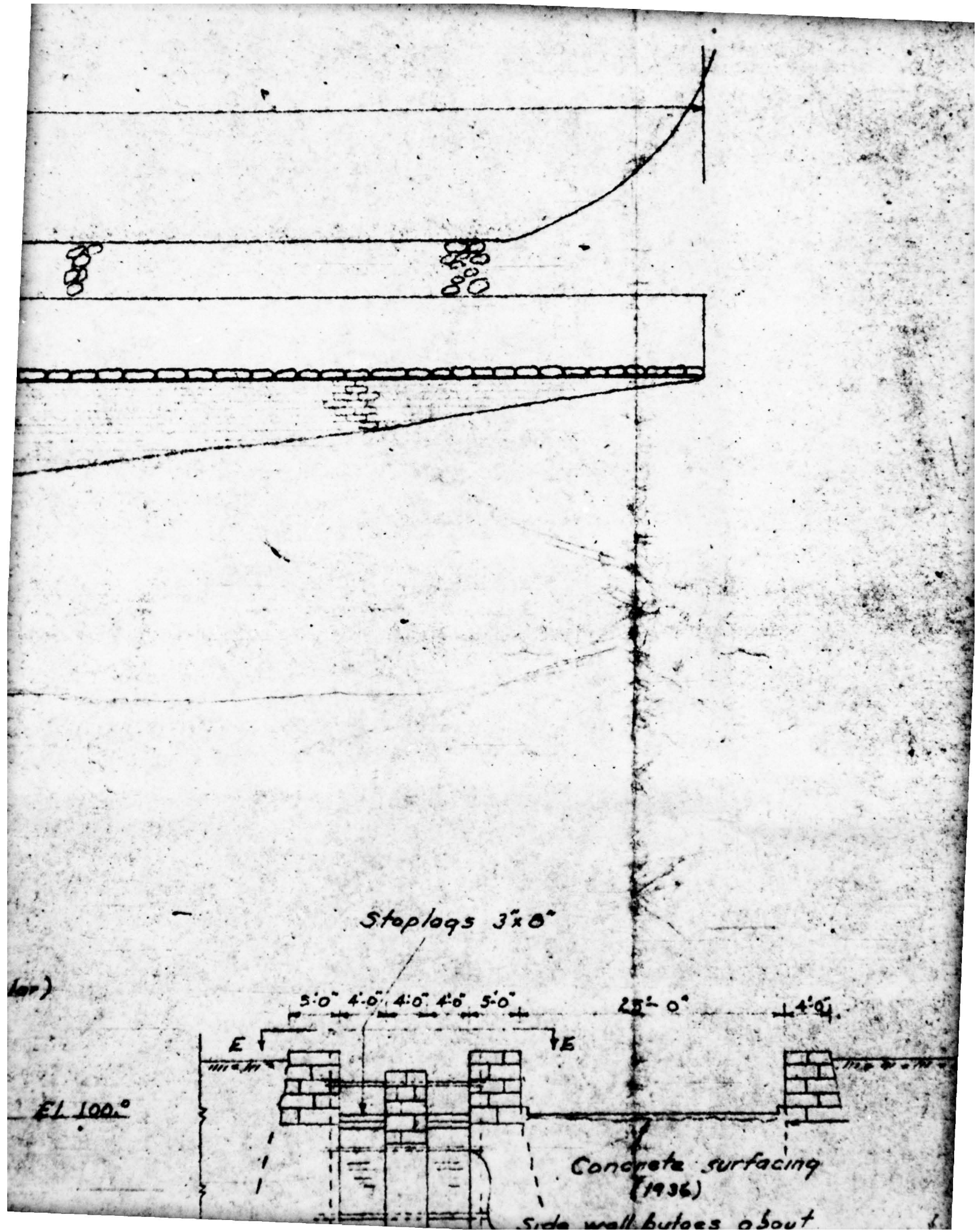
West Abutm't Wal
(East wall s

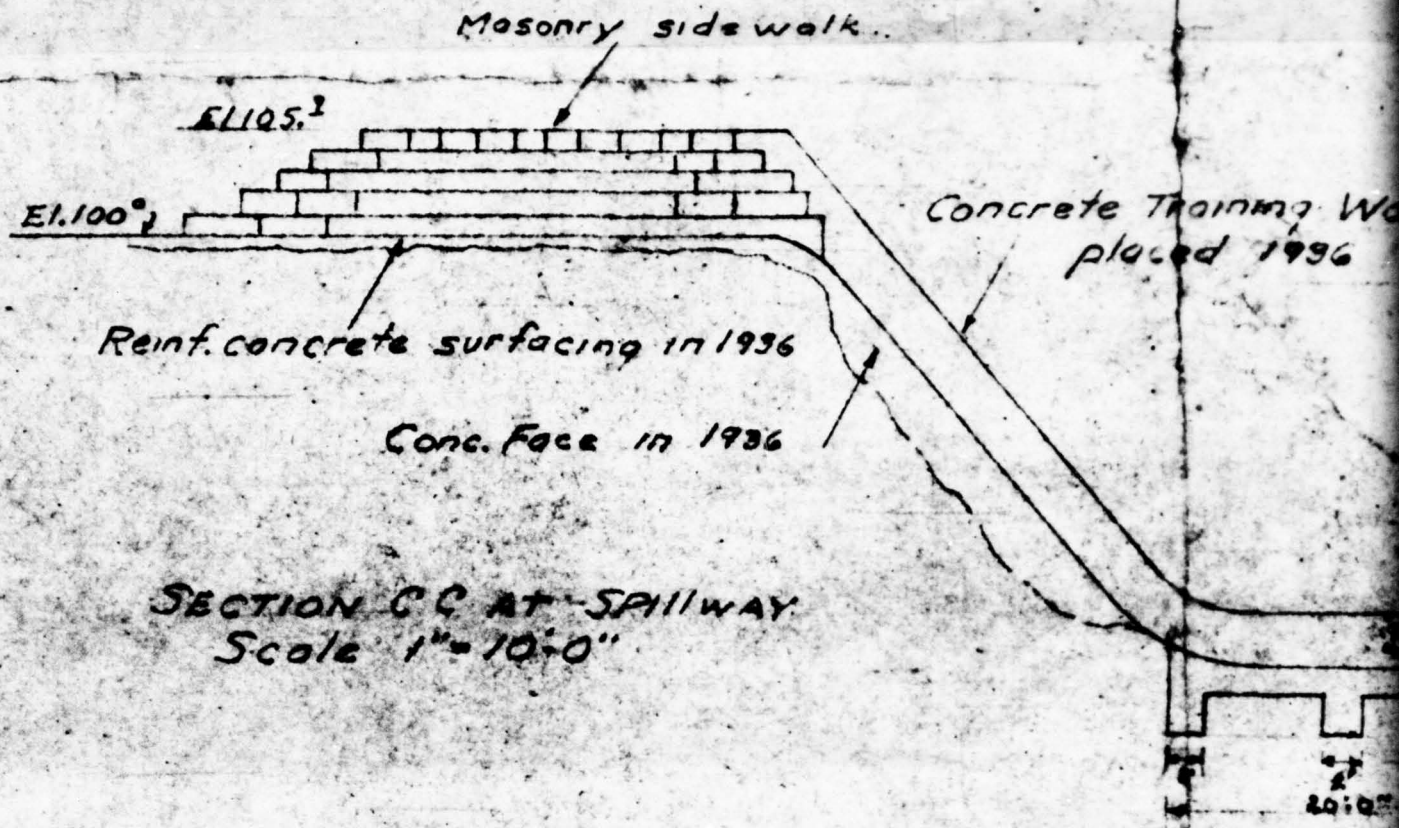
24'-0"

El. 106'

W.S.

Needles (6" rails), bonded thru
ctr. wall & into side walls.
(bond now largely lost by
erosion of adjacent stone)


Stoplogs 3"x8"
5'-0"
4'-0"
4'-0"
4'-0"
5'-0"
25'-0"
4'-0"
E
E
EL 100.0
Concrete surfacing
(1936)



SECTION C C AT SPILLWAY
Scale 1"=10'-0"

Existing Dam - Principol construction
present condition as r

Designation - 163-1090 Delaware R
See plan dated July 19
For presently proposed

(Bond now largely lost by erosion of adjacent stone)

Center Pier

13" x 16" Timber guides

3" x 8" stoplogs

crib

Concrete, placed in 1936

Timber foundation, detail not known, no displacement, and seems sound and in original condition.

El. 79.°

El. 76.° ℄ Tailwater

El. 70.°

SECTION A-A
Scale 1"=10-0"

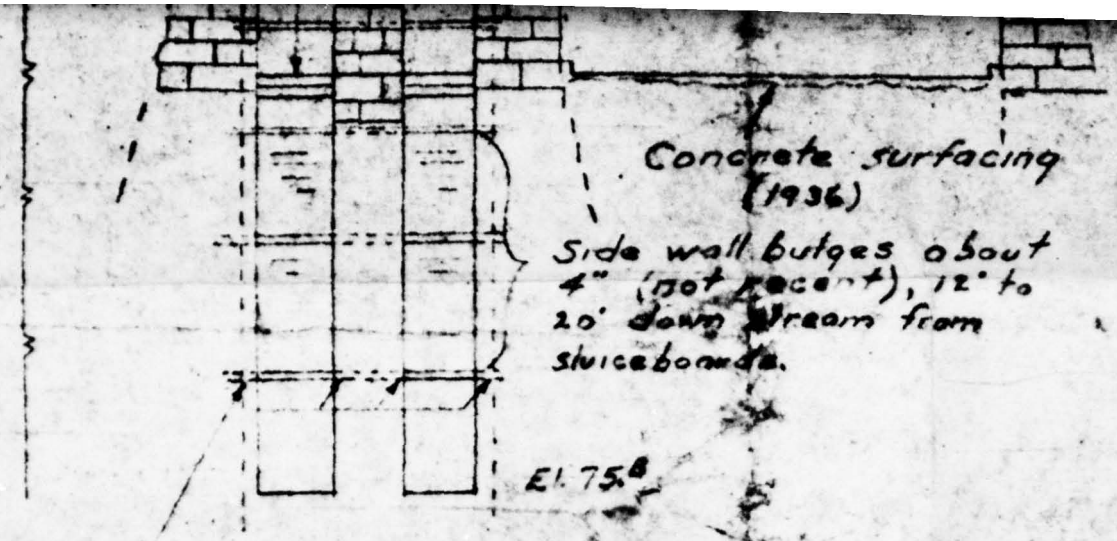
Moderate boil here, (clear), indicates some hydrostatic uplift under apron.

Masonry Coping stone

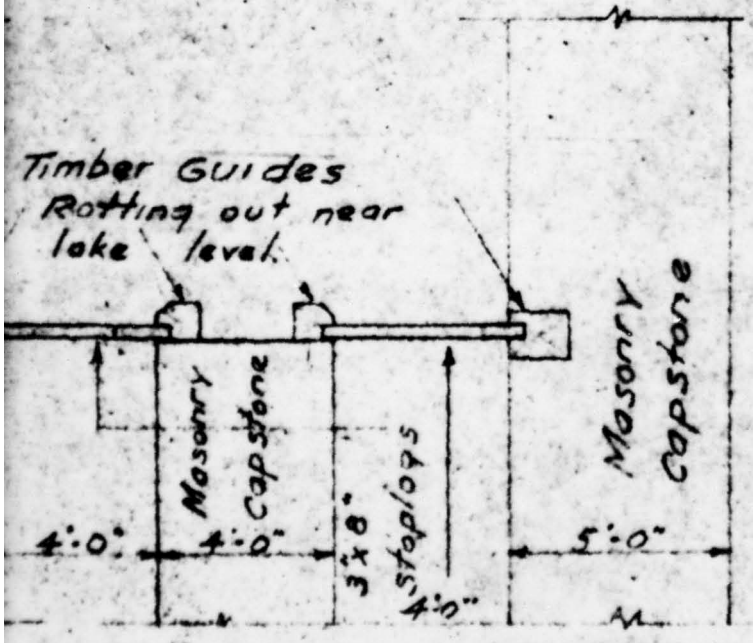
5:0"

details and notes
ecently examined.
Watershed
36 approved Aug 10, 1938.
repairs and additions see sheet 2

PAR
Sco



SECTION B-B
Scale 1"=10'-0"



PLAN AT E-E
1/4" = 1'-0"

DEPART
DIVIS

This plan for
Delawa
approved under t
Conservation Law.

Examined and
approval.

APPROVED

This Sheet "1 is
of plans of E.M. Wil
information on pres

Olney B

Concrete surfacing (1936)

Side wall bulges about 4" (not recent), 12' to 20' down stream from sluiceboards.

El. 758

/2

stones.

STATE OF NEW YORK
DEPARTMENT OF PUBLIC WORKS
DIVISION OF CONSTRUCTION
ALBANY, N. Y. May 12, 1952

This plan for Re-constructing dam No. 163-1597 Delaware River watershed is hereby approved under the provisions of Section 948 of the Conservation Law.

Examined and recommended to the Chief Engineer for approval.

H. K. Clark
ASSOCIATE CIVIL ENGINEER

APPROVED

CHIEF ENGINEER
Department of Public Works
By Henry Lee Hogan
Deputy Chief Engineer

This Sheet #1 is a tracing of sheet #1 of plans of E.M. Wilbur CE and is for information on present dam structure.

Olney Bordeau C.E.

STATE OF NEW YORK
DEPARTMENT OF PUBLIC WORKS
DIVISION OF CONSTRUCTION
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Department of Public Works
By Henry Law Thompson
Deputy Chief Engineer

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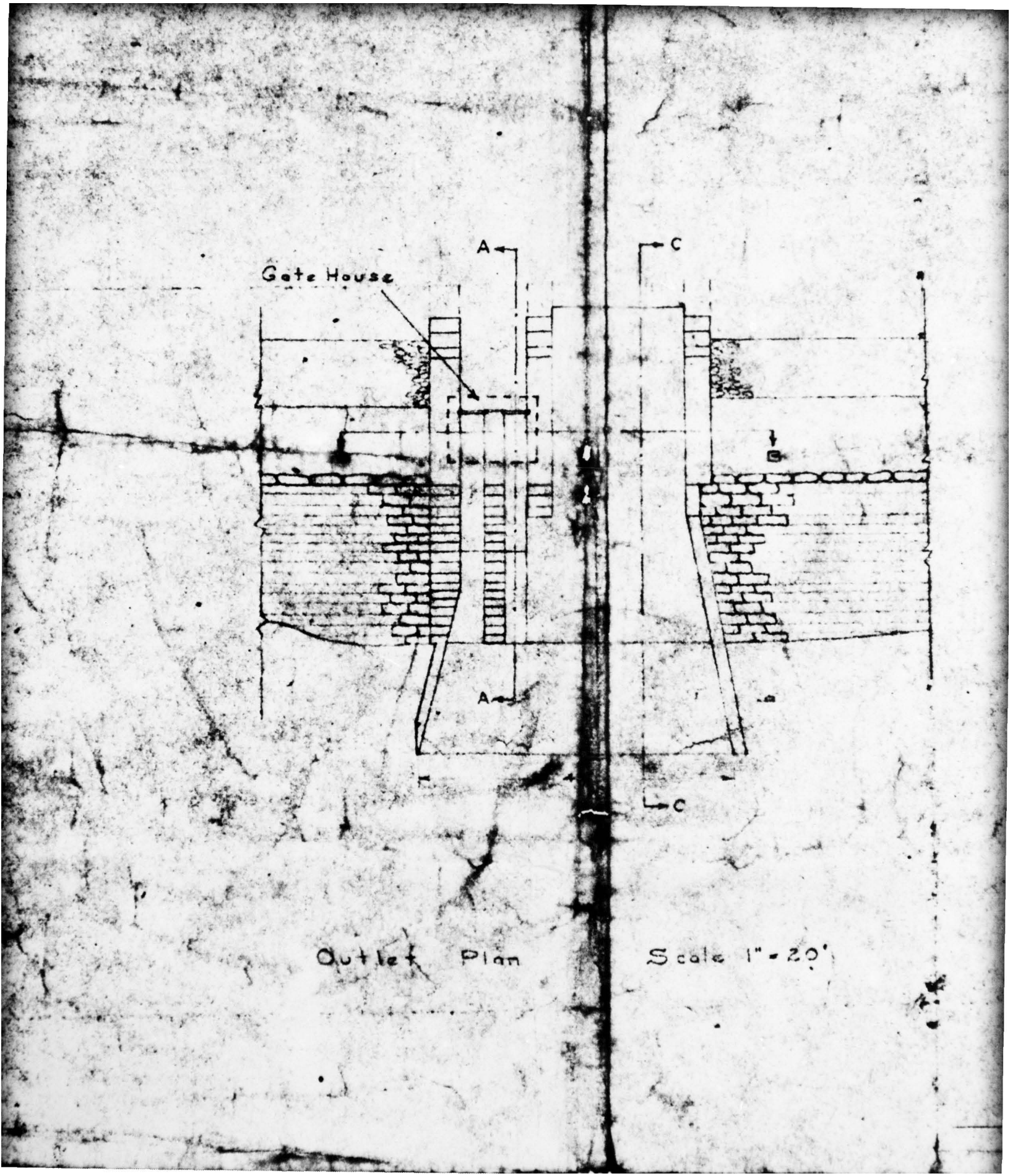
Olney Bordin C.E.

7

FALLSBURG FISHING & BOATING CLUB -INC.
SOUTH FALLSBURG N.Y.
PROPOSED REPAIRS - DAM
Scale - as indicated

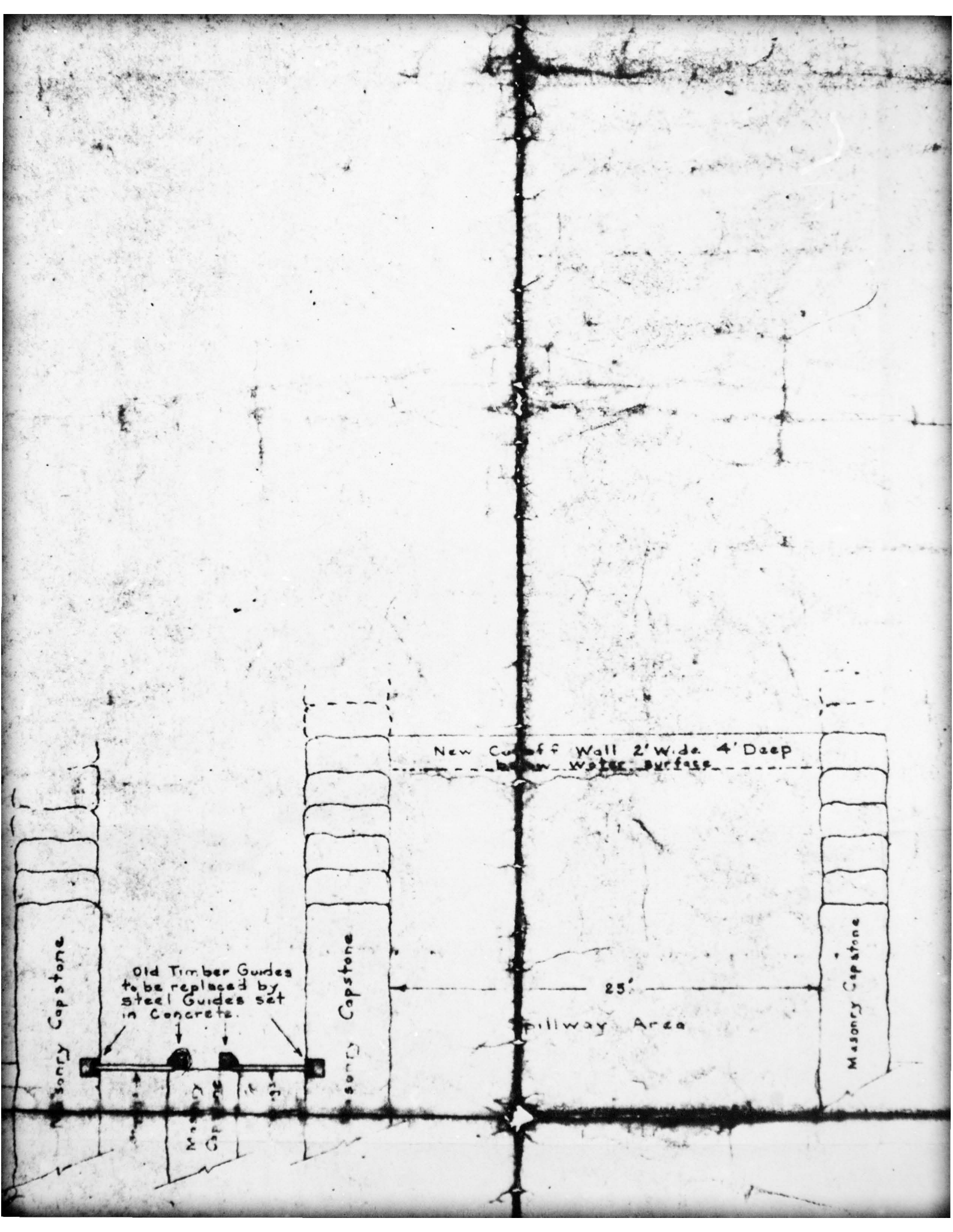
E.M. Wilbur - C.E.
Port Jervis N.Y.
June 10, 1950

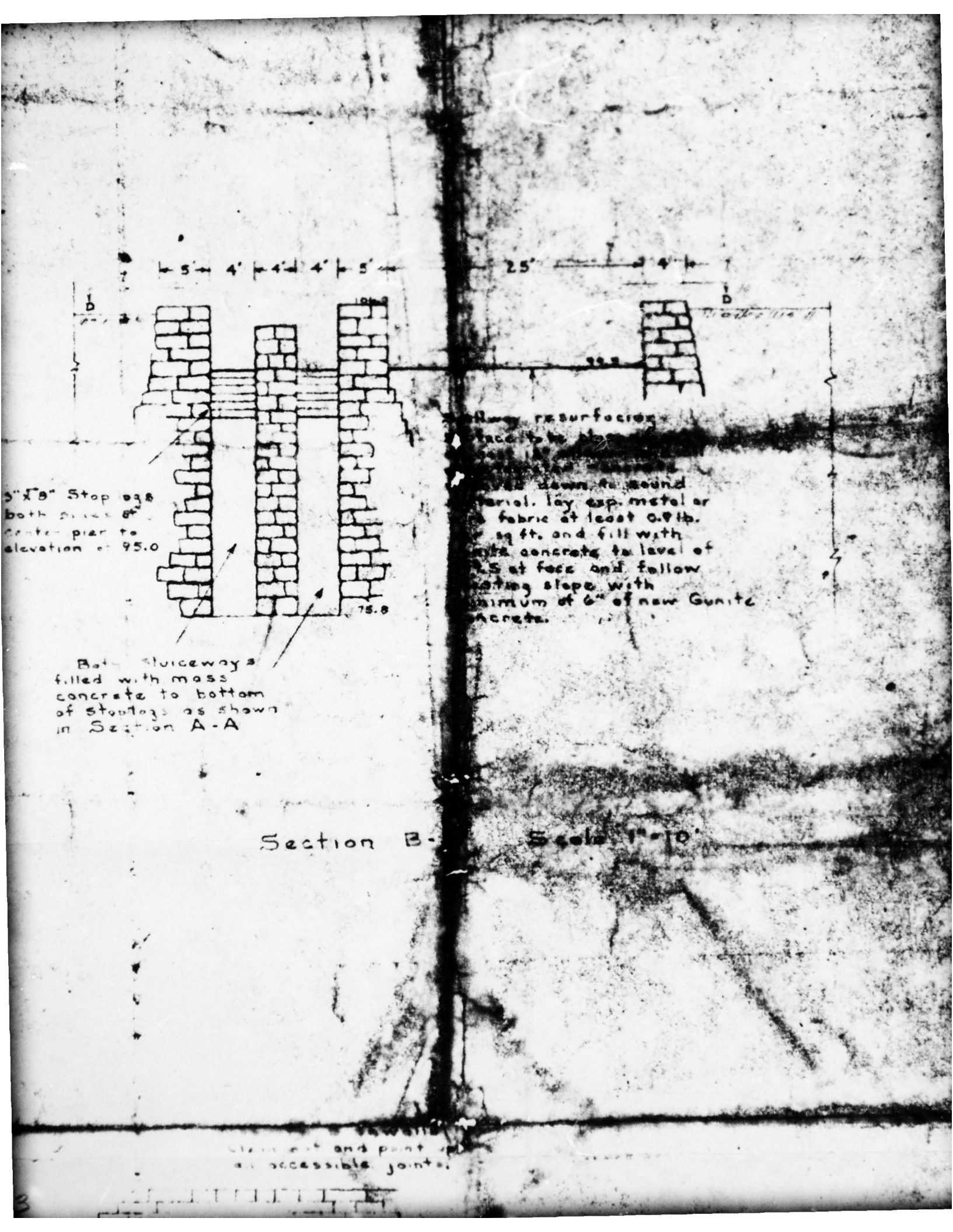
SHEET 1

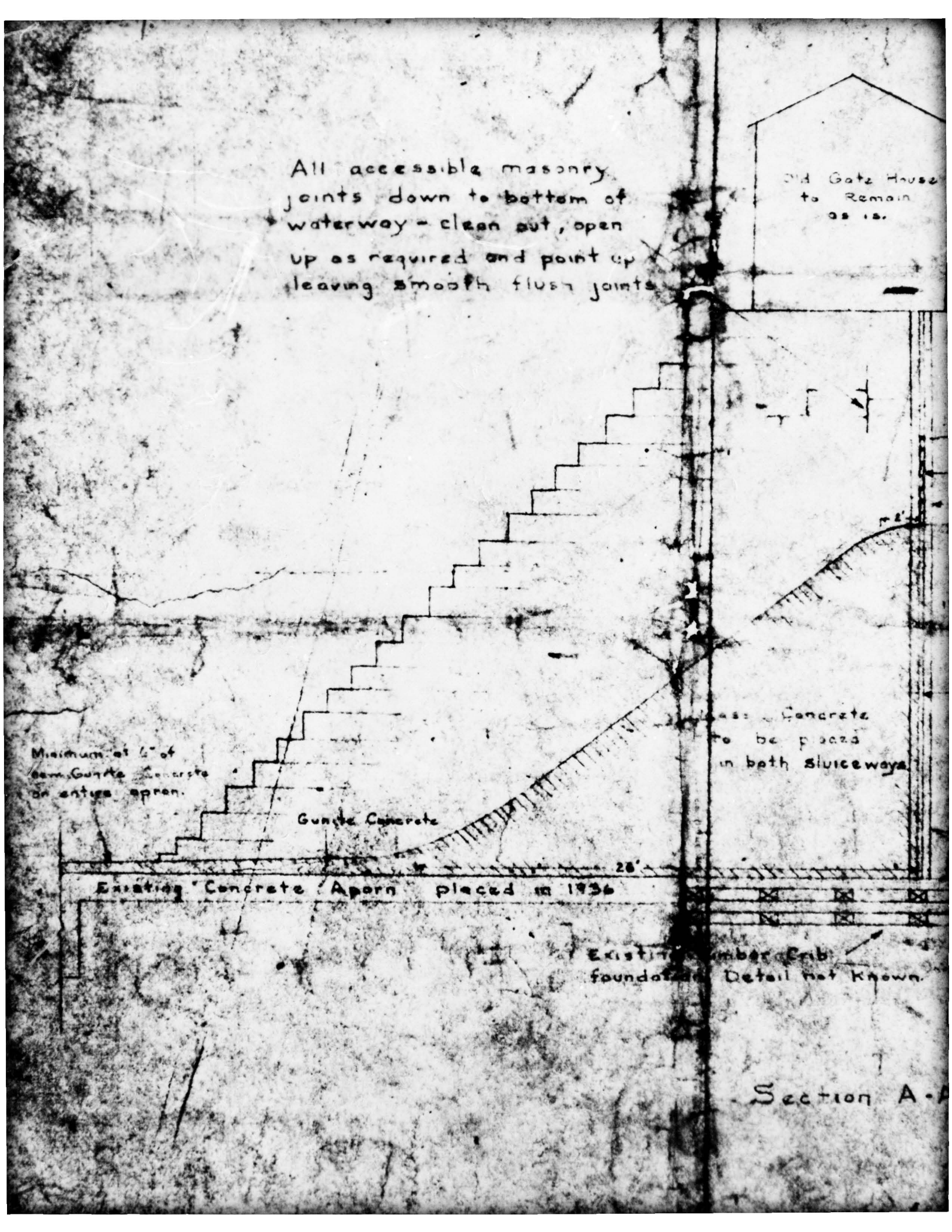


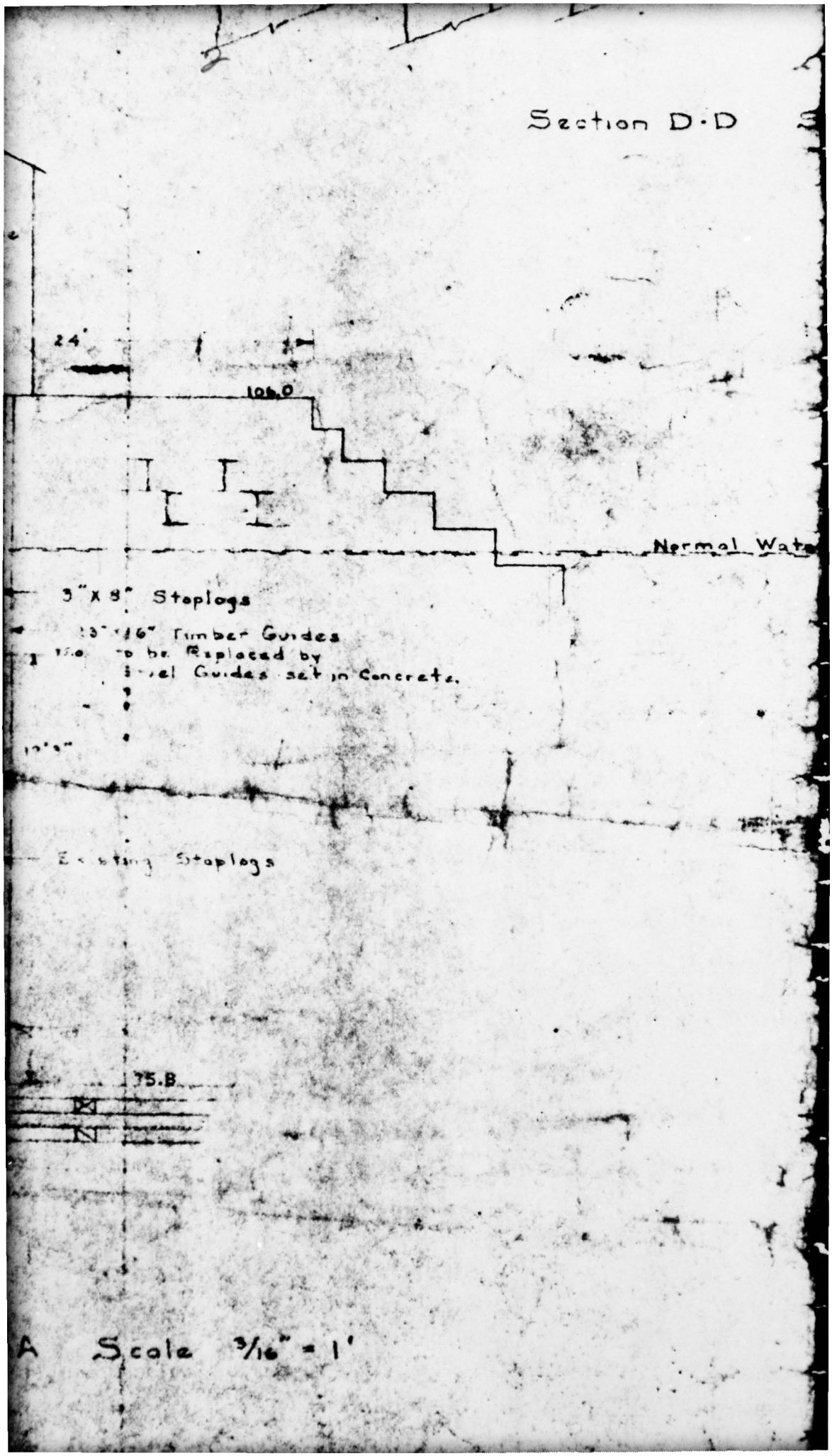
Outlet Plan

Scale 1" = 20'

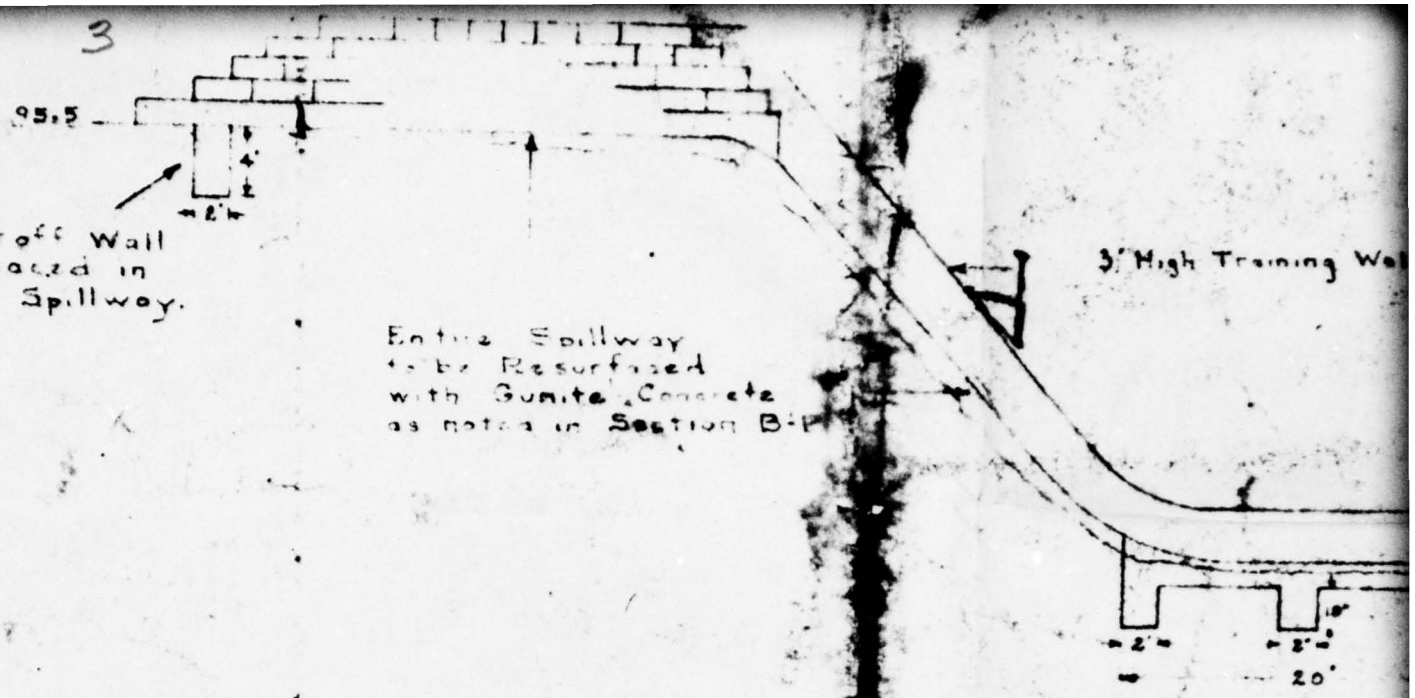

New Cutoff Wall 2' Wide 4' Deep
below water surface
Masonry Capstone
Old Timber Guides to be replaced by steel Guides set in Concrete.
Masonry Capstone
25'
Spillway Area
Masonry Capstone


5'
4'
4'
4'
5'
25'
4'
D
D
9"x8" Stop logs
both sides 6'
Center pier to
elevation of 95.0
75.8
Both sluiceways
filled with mass
concrete to bottom
of stoplogs as shown
in Section A-A
resurfacing
down to sound
material. lay exp. metal or
fabric at least 0.9 lb.
sq ft. and fill with
mix concrete to level of
.5 at face and follow
sloping slope with
minimum of 6" of new Gunite
concrete.
Section B-
Scale 1"-10'
clean out and point
all accessible joints.


All accessible masonry joints down to bottom of waterway - clean out, open up as required and point up leaving smooth flush joints.
Old Gate House to Remain as is.
Minimum of 6" of Gunite Concrete on entire apron.
Gunite Concrete
Concrete to be placed in both sluiceways
28'
Existing Concrete Apron placed in 1936
Existing timber crib foundation Detail not known.
Section A-A


Section D·D
24'
105.0
Normal Wate
3"X 8" Stoplogs
13"x16" Timber Guides
to be Replaced by
Steel Guides set in Concrete.
Existing Stoplogs
75.8
A Scale 3/16" = 1'

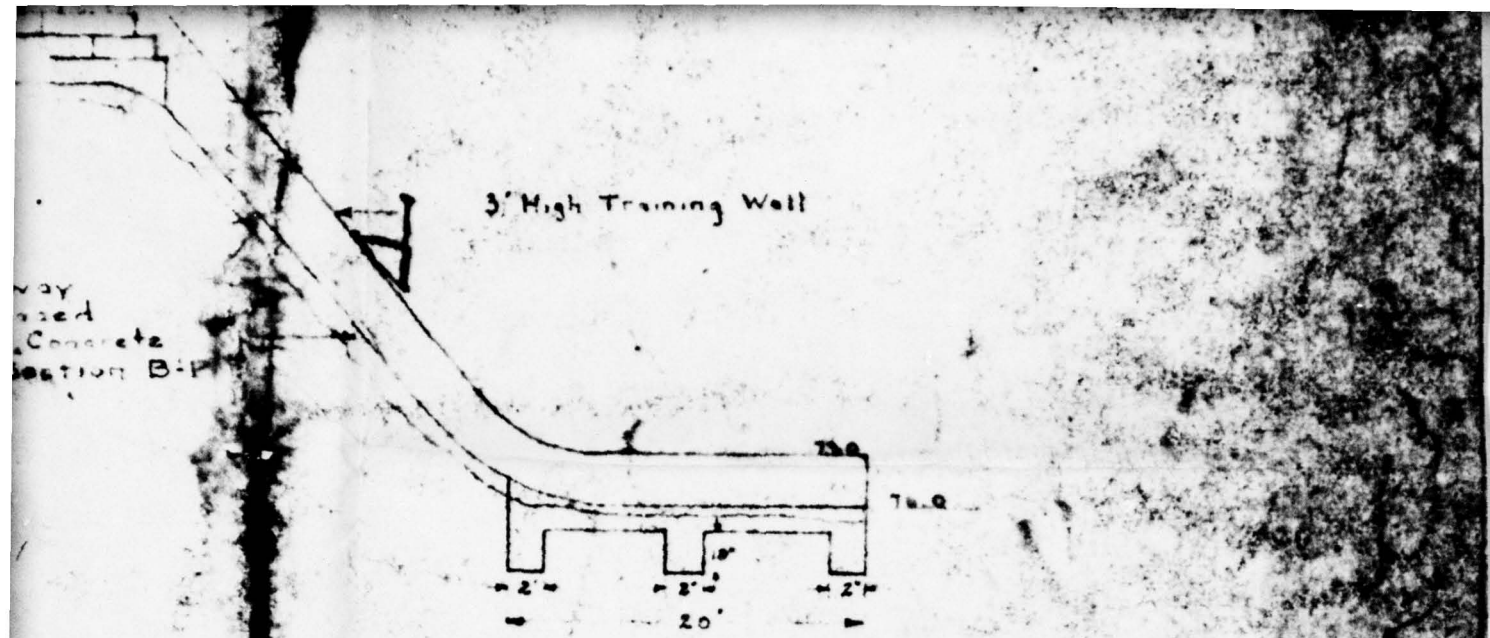
3



Section C-C Scale 1"=10'

THIS PAGE IS BES
FROM COPY FURNIS

Proposed D
Pleasure
Fallsburg Fishing an
South Fall
Scales as shown
Survey and Plans
N.Y. State Lic. "12
Shee



Scale 1" = 10'

Proposed Dam Repairs
Pleasure Lake
Fallsburg Fishing and Boating Club, Inc.
South Fallsburg, N.Y.
Scales as shown March 1952
Survey and Plans by: Otto Bu
N.Y. State Lic. # 12270 Liberty, N.Y.

Sheet # 2

SPECIFICATIONS FOR REPAIRS TO DAM

OF

THE FALLSBURGH FISHING & BOATING CLUB
IN THE TOWN OF FALLSBURGH, SULLIVAN
COUNTY, NEW YORK.

GENERAL CONDITIONS AND WORK TO BE DONE

The mass concrete for back-up wall in sluice ways and the concrete cut-off wall on front of spillway, are to be constructed as shown on plans made by Olney Bordon, C.E. and approved by New York State Departement of Public Works on May 12, 1952.

Spillway Section:

The surface of the spillway is to be chipped out to a depth of 12", and also all other disintergrated concrete removed below that depth down to sound concrete. A minimum of 4" of first class 1:2:4 concrete is first to be placed plus 2" of gunite on top of same. 6" x 6" wire mesh reinforcing is to be placed 2" from the spillway surface.

Red lead to be used on sluiceway guides.

3 Railroad rails are to be placed in the front center of the spillway at least 12" above the concrete surface, and with slots placed in the wing walls opposite so that flash boards to height of 6" can be used in the summer.

The wall section of the spillway are to have all disintergrated concrete chipped out and replaced with first class concrete with not less than 3" of concrete at any point.

Gunite is to be used on the spillway apron.

All broken concrete in the floor of the sluiceway is to be removed by Contractor.

REPAIRS OF MASONRY PIERS OF SLUICEWAYS

This work is to be done with gunite to be used on the upstream side of the sluiceway masonry piers.

All accessible masonry joints are to be cleaned out, opened up as required, and pointed up, leaving smooth flush x joints.

Old timber guides are to be replaced by steel guides set in concrete.

Masonry side walls to be cleaned out all all accessible joints to be pointed up.

All other work shown on the aforementioned plans is to be completed in accordance with said plans.

Contractor to furnish all labor, equipments and materials for performing the aforesaid work.

SPECIFICATIONS FOR REPAIRS TO DAM

OF

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IN THE TOWN OF FALLSBURGH, SULLIVAN
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All other work shown on the aforementioned plans is to be completed in accordance with said plans.

Contractor to furnish all labor, equipments and materials for performing the aforesaid work.

SPECIFICATIONS

These specifications are intended to supplement and clarify the plan. All work incidental to completion of structures as shown or described on plan and/or specifications, obviously intended and necessary for a complete and finished job, is to be supplied by the contractor, whether or not specifically shown or described.

CLEANING SURFACES

All suffaces bonding to new work are to be thoroughly cleaned of all mud, slime, moss, etc. before placing new work. Where concrete is to be poured at floor and in lower levels of the outlet suitable provision is to be made to divert and bypass any running leakage, until concrete has set.

If conditions are such that concrete must unavoidably be placed in water, the water must be stilled, with no current, the concrete shall be placed in large chargesx, spouted or dumped close to the bottom, and kept together to avoid separation of materials. A tremie shall be used, if necessary to accomplish this.

Mixing and Placing

Concrete shall be mixed at least two (2) minutes after all ingredients are in the mixer. The mix x is to be as dry as handling conditions will permit, and in no case shall more than seven (7) gallons of water be used per bag of cement.

Each batch shall be in place within 20 minutes after water has been added.

Concrete shall be thoroughly worked and spaded into the forms according to good practise.

Cement shall be new stock, of standard manufacture acceptable to the Engineer, and shall be kept dry and protected while in storage before used.

Sand shall be clean, sharp and well graded, without perceptible clay or organic matter.

Coarse Aggregate xhix shall be clean, hard, well graded broken stone or washed gravel, with maximum size limited according to nature of the work.

Cleaning Up

Upon completion of the work, all waste material shall be removed and the site left in a neat and presentable condition.

Laws

All work shall be done in accordance with laws and ordinances of any public agencies having jurisdiction.

IMPROVEMENTS MADE TO FALLSBURG FISHING AND BOATING CLUB DAM

WORK DONE BY TENNESSEE CONSTRUCTION CORP.

SUPERVISED BY LEONARD REYNOLDS, SOUTH FALLSBURG

MADE 30 FT. RUNAROUND ON EAST SIDE OF DAM, WHEN WATER RAISES 13 INCHES ON 25 FT. SPILLWAY WATER WILL START FLOWING THROUGH RUNAROUND TO RELIEVE PRESSURE ON DAM.

FILLED IN 12 FT. IN FRONT OF SPILLWAY TO TOP OF CONCRETE ABUTMENTS WITH ABOUT 800 YARDS OF DIRT.

FILLED IN FACE OF DAM WITH ABOUT 35,000 YARDS OF DIRT PACKED AND ROLLED.

INCREASED WIDTH OF ROAD OVER DAM BY 8 TO 10 FEET.

BACK FILLED GRAVEL UNDER LOWER SPILLWAY DECK.

PUT 65 TONS OF CRUSHER RUN ON NEW RUNAROUND AND ROAD ON EAST SIDE OF DAM.

PUT 25 YARDS OF OLD BLACKTOP ON HILL ON WEST SHORE ROAD.

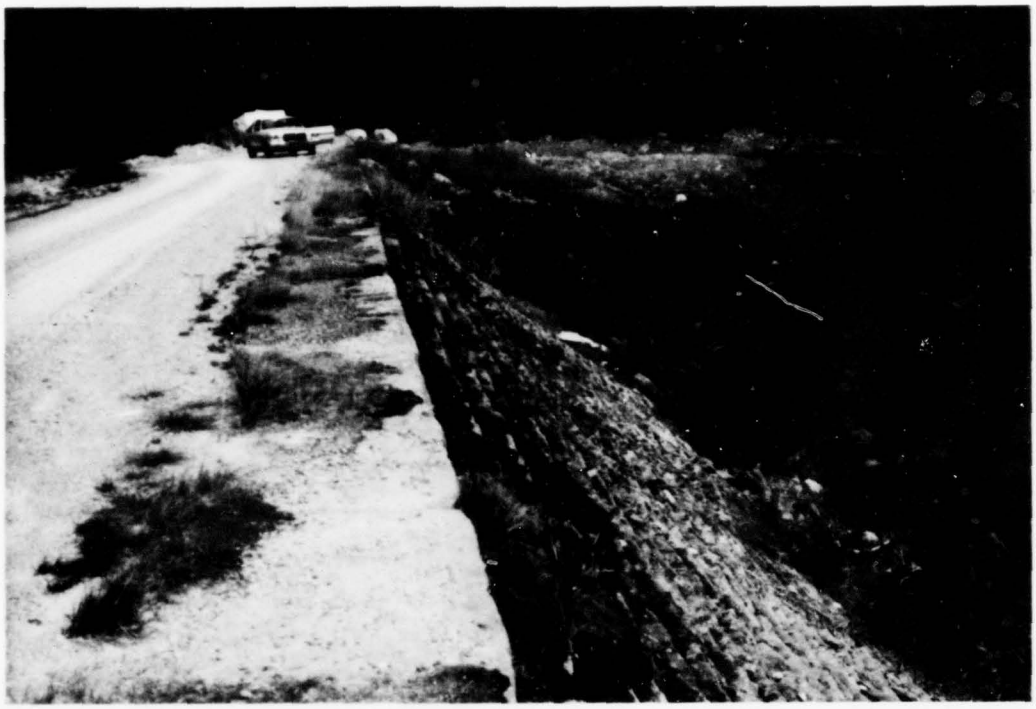
WORK STARTED MAY 30th., COMPLETED JUNE 15th. 1978.

PHOTOGRAPHS

APPENDIX B

2) CREST OF DAM LOOKING EAST

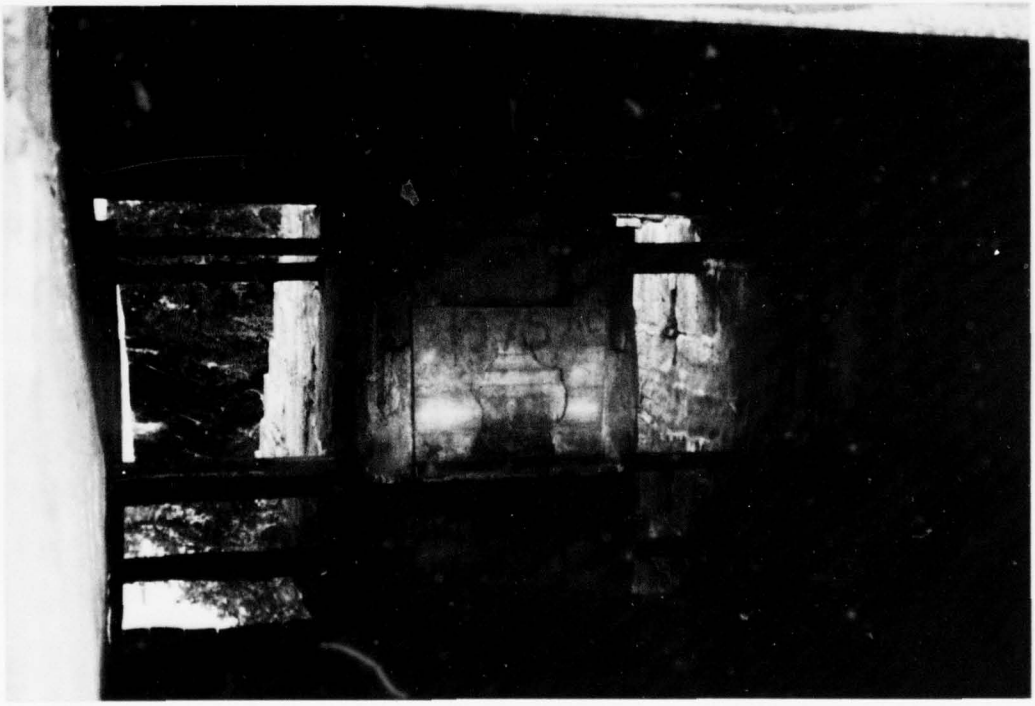
3) UPSTREAM SLOPE LOOKING WEST, NOTE LOGS AT WATERLINE



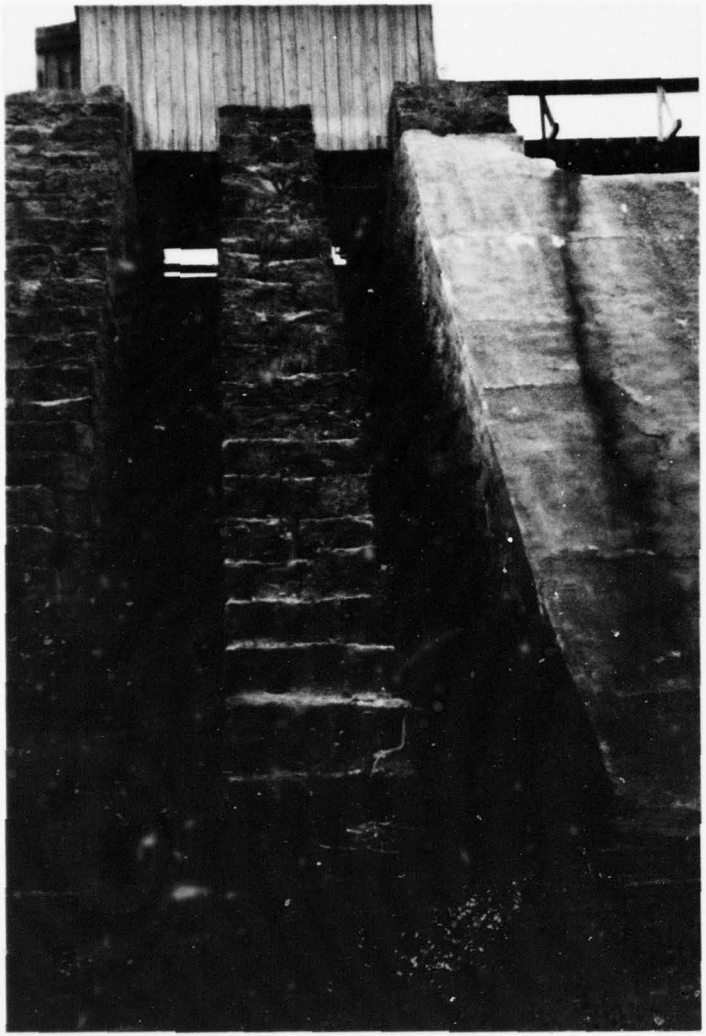
4) DOWNSTREAM SLOPE LOOKING EAST, NOTE AUXILIARY EMERGENCY SPILLWAY TO RIGHT OF AUTO

5) SPILLWAY AND SLUICEWAYS

6) SPILLWAY CHUTE AND DOWNSTREAM CHANNEL

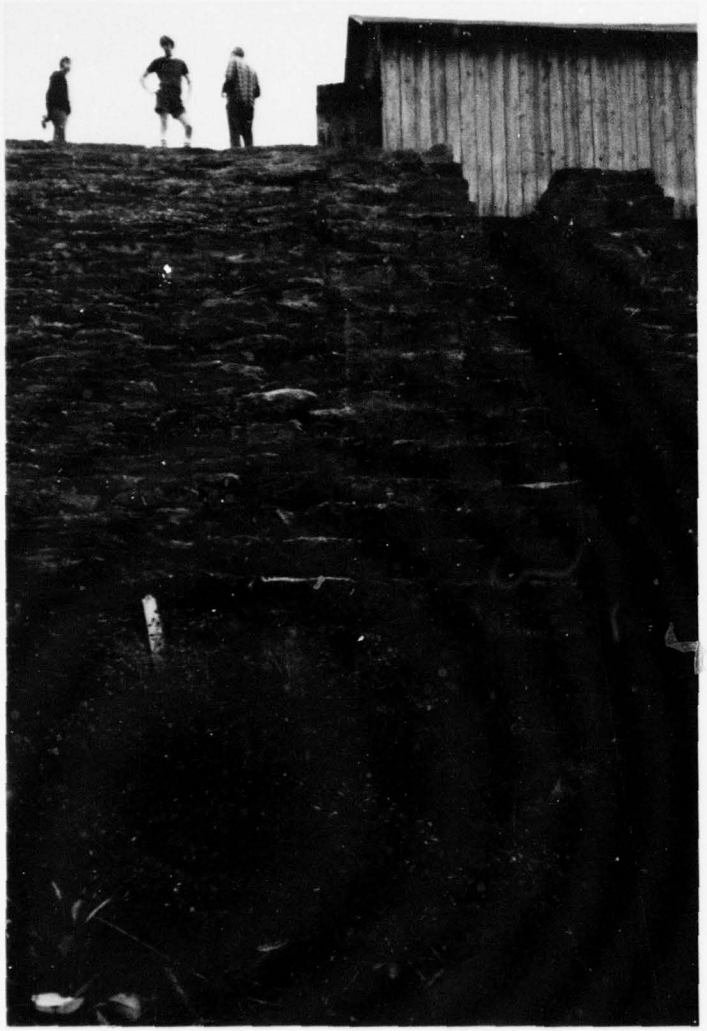


7) APPROACH CHANNEL TO STOPLOG GATES



8) SLUICEWAYS

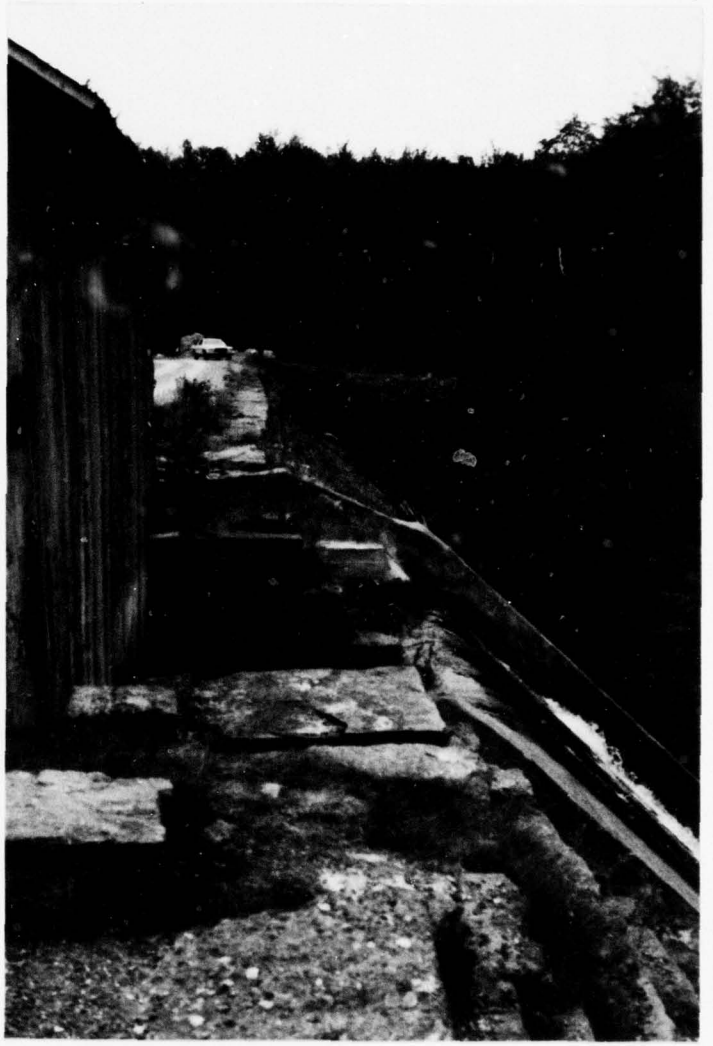
9) EAST WALL OF WEST SLUICEWAY, NOTE LEAKAGE



10) ABUTMENT WEST OF SLUICEWAYS, NOTE VERTICAL SETTLEMENT IN MASONRY

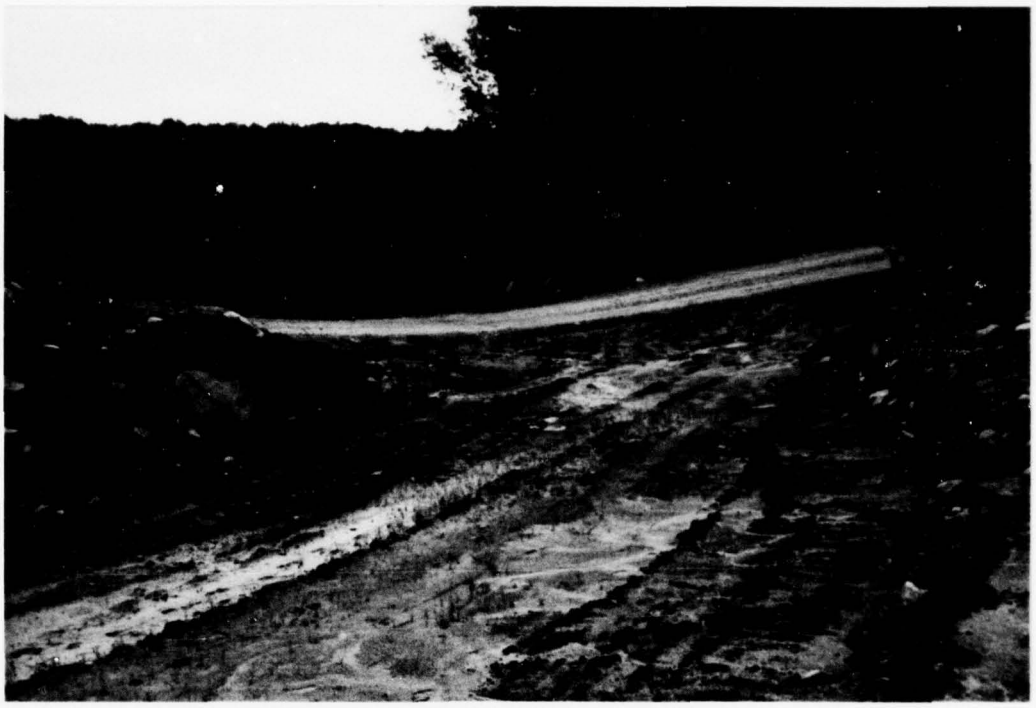
11) SEEPAGE (IN CENTER OF PHOTO) LOCATED AT SETTLEMENT NEAR WEST ABUTMENT OF SLUICEWAYS

12) DEBRIS AND VEGETATION AT DOWNSTREAM TOE, NOTE BULGES ON MASONRY FACE ABOVE LOG PILE AND BUSHES



13) EAST VIEW ALONG DOWNSTREAM CREST, NOTE CURVATURE ALONG CREAT EDGE

14) EARTH AND DEBRIS MOUND ON EAST EMBANKMENT TOE



15) UPSTREAM VIEW OF AUXILIARY EMERGENCY SPILLWAY

16) DOWNSTREAM VIEW OF AUXILIARY EMERGENCY SPILLWAY AND CHANNEL

ENGINEERING DATA CHECKLIST

APPENDIX C

CHECKLIST
ENGINEERING DATA
DESIGN, CONSTRUCTION, OPERATION
PHASE I

NAME OF DAM Pleasure Lake

ID # 345

ITEM	REMARKS
AS-BUILT DRAWINGS	None
REGIONAL VICINITY MAP	USGS Quadrangle - Monticello, NY
CONSTRUCTION HISTORY	Built about 1875, the dam was owned by the D&H Canal Company in 1905 but no earlier records were available. The Fallsburg Fishing and Boating Club have owned the dam since 1940.
TYPICAL SECTIONS OF DAM	None
OUTLETS-PLAN	Proposed Dam Repairs - Sheet #1 June 1950
-DETAILS	- Sheet #2 March 1952
-CONSTRAINTS	None
-DISCHARGE RATINGS	None
RAINFALL/RESERVOIR RECORDS	None

ITEM	REMARKS
DESIGN REPORTS	None
GEOLOGY REPORTS	None
DESIGN COMPUTATIONS	None
HYDROLOGY & HYDRAULICS	None
DAM STABILITY	None
SEEPAGE STUDIES	None
MATERIALS INVESTIGATIONS	None
BORING RECORDS	None
LABORATORY	None
FIELD	None
POST-CONSTRUCTION SURVEYS OF DAM	None
BORROW SOURCES	[illegible] borrow [illegible]. The fill used for the extention of the upstream [illegible] 1978 reportedly came from the area west of the dam.

ITEM	REMARKS
MONITORING SYSTEMS	Daily visual inspection only.
MODIFICATIONS	Repairs to training walls, spillway and crest roadway. Additional rock placed on upstream slope. Auxiliary emergency spillway cut to increase spillway capacity
HIGH POOL RECORDS	None
POST CONSTRUCTION ENGINEERING STUDIES AND REPORTS	None
PRIOR ACCIDENTS OR FAILURE OF DAM	None known
DESCRIPTION REPORTS	Maximum high water reportedly occurred during the storm of October 1955. At that time, water was breaking on the dam crest. To prevent overtopping, the auxiliary emergency spillway was dug.
MAINTENANCE	None.
OPERATION RECORDS	Downstream face of dam vegetation [illegible]. No records of gate operations on file.

ITEM	REMARKS
SPILLWAY PLAN (Emergency Spillway only)	
SECTIONS } DETAILS	Proposed Dam Repairs - Sheet #1 June 1950 - Sheet #2 March 1952
OPERATING EQUIPMENT	Two 12" Butterfly Valves
PLANS & DETAILS	Proposed Dam Repairs - Sheet #1 June 1950 - Sheet #2 March 1952

The project has no low level outlets.

VISUAL INSPECTION CHECKLIST

APPENDIX D

VISUAL INSPECTION CHECKLIST

1. Basic Data

a. General

Name of Dam Pleasure Lake Dam Hazard Category High

County Sullivan ID# 345

Stream Name Sheldrake Stream Tributary of Neversink River

Location Sullivan County Nearest Town (P.O.) Ft. Jefferson

Longitude 74° 39' 35" W Latitude 41° 41' N Other Directions Dam is 1 mile north of Thompsonville on on Sheldrake Stream

Date of Insp Aug 30, 1978 Weather Sunny Haze Temperature 85°F

b. Inspection Personnel Harvey Feldman - Team Captain & Geotechnical Engineer, Glenn Gaynor - Mechanical Engineer both of TAMS - New York Office

c. Persons Contacted Paul A. Schupp, President of Club
Leonard Reynolds
Kenneth Crane, Caretaker

d. History: Date Constructed 1900's

Present Owner Fishing, Fishing & Boating Club Inc.

Designed by Unknown

Constructed by Unknown

Recent History Repaired & Maintained by local people

2. Technical Data

Type of Dam Stone Masonry & Earth Drainage Area 8400 ± Acres

Height 30 feet Length 470 feet

Upstream Slope 1V on 1H Downstream Slope 1V on 1H

Crest Width 17 to 34 feet Freeboard at Spillway Crest 5 feet

b. Upstream Slope Recently dumped and dozer rolled earth

(1) Undesirable Growth or Debris Minor vegetation at west abutment, some debris in form of logs

(2) Sloughing, Subsidence, or Depressions Slope uncovered, steep, sloughing, eroding and gullied.

(3) Slope Protection None; Owner has placed logs at slope and waterline contact

(a) Condition of Riprap N/A

(b) Durability of Individual Stones N/A

(c) Adequacy of Slope Protection Against Waves and Runoff Not adequate.

(d) Gradation of Slope Protection - Localized Areas of Fine Material N/A

(4) Surface Cracks None

c. Downstream Slope Stone Masonry - 2'x2'x6" gran[illegible]

(1) Undesirable Growth or Debris Mineral; some moss; some trees near east abutment

Low Level Control: (Type and Size) None

Valve Condition —

Emergency Spillway Type (Material) Concrete Width 25 feet

Side Slopes Vertical

Height (Crest to Top) 6 feet ±

Exit Slope ≈ 1V on 1H

Exit Length 60 feet ±

Ponded Surface Area 220 ± Acres

Capacity (Normal Level) Unknown Acre Feet

Capacity Emergency Spillway Level Unknown Acre Feet

Capacity between El 1207 and El 1213 1520 Acre Feet

3. Embankment

a. Crest Slab & gravel roadway over storage tank & earth

(1) Vertical Alignment Good except for sunk depression

(2) Horizontal Alignment Good except for channel curvature in D/s crestedge to left of spillway (east)

(3) Longitudinal Surface Cracks Near D/s slope about 2 ft from edge 20 feet long about 100 feet from W abutment

(4) Transverse Surface Cracks None

(5) General Condition of Surface Good

(6) Miscellaneous Good cleared for approach to spillway bridge

(2) Sloughing, Subsidence, or Depressions; Abnormal Bulges or Non-Uniformity

Two areas approx 200 ft^2 appear as bulges about 12" seem to be old movements

(3) Surface Cracks on Face of Slope Adjacent to right (west) training wall there appears to be a settlement which has caused a vertical displacement of stones approx 3"

(4) Surface Cracks or Evidence of Heaving at Embankment Toe

None

(5) Wet of Saturated Areas or Other Evidence of Seepage on Face of Slope; Evidence of "Piping" or "Boils"

Leakage approx 5-10 gpm at right (west) training wall at toe; water clear; appears old because of lime & algae growth. Several other damp zones at toe, no moving water, may be runoff.

(6) Fill Contact with Outlet Structure Good

(7) Condition of Grass Slope Protection None

d. Abutments

(1) Erosion of Contact of Embankment with Abutment from Surface Water Runoff, Upstream or Downstream

None

(2) Springs or Indications of Seepage Along Contact of Embankment with the Abutments

None

(3) Springs or Indications of Seepage in Areas a Short Distance Downstream of Embankment - Abutment Tie-in

None

e. Area Downstream of Embankment, Including Tailrace Channel

None

(1) Localized Subsidence, Depressions, Sinkholes, Etc. None

(2) Evidence of "Piping" or "Boils" None

(3) Unusual Presence of Lush Growth, such as Swamp Grass, etc.

Forested area cut about 20-40 feet below toe

(4) Unusual Muddy Water in Downstream Channel None

(5) Sloughing or Erosion None

(6) Surface Cracks or Evidence of Heaving Beyond Embankment, Toe

None

(7) Stability of Tailrace Channel Sideslopes Good

(8) Condition of Tailrace Channel Riprap None

(9) Adequacy of Slope Protection Against Waves, Currents and Surface Runoff

Adequate

(10) Miscellaneous —

f. Drainage System None

(1) Condition of Relief Wells, Drains and Appurtenances —

(2) Unusual Increase or Decrease in Discharge from Relief Wells

—

4. Instrumentation

None

(1) Monumentation/Surveys —

(2) Observation Wells —

(3) Weirs —

(4) Piezometers —

(Other) —

5. Reservoir

a. Slopes Relatively flat; appears stable

b. Sedimentation Indeterminate

6. Spillways (See Miscellaneous on next page)

a. Principal Spillway: Inlet Condition See General Remarks Pipe Condition

General Remarks (include information such as recently repaired, potential for debris accumulation, special items of note, etc.)

Two sluiceways fitted with 4.5ft± of flashboards condition good

b. Emergency Spillway: General Condition Good

Tree Growth No

Erosion Minor erosion of gunite surface

Other Observations Spillway crest slightly tilted so that west side is about 3 inches higher than east side.

7. Structural (if required) See Attached Appendix

8. Downstream Channel

Natural fall with boulders & gravel, clear for approx 200 ft. Narrows beyond and is natural creek

a. Condition (obstructions, debris, etc.) See above

b. Slopes good

c. Approximate No. Homes and Population

Villages about 1 mile downstream of relatively small valley

7.c. ~~Miscellaneous~~ General: Auxiliary emergency spillway constructed in left abutment (east) about 22 feet wide unpaved and about 13 inches above elevation of floodboards of primary spillway. Channel open for about 200 feet and converges with primary spillway channel about 200 feet D/s of primary spillway

Harvey S. Holmes

TEAM CAPTAIN

STRUCTURAL INSPECTION CHECKLIST

PHASE I DAM INSPECTION

1. Concrete Surfaces Gunite surface on spillway and lower portions of training walls. Condition good with some cracking

2. Structural Cracking Minor

3. Movement - Horizontal and Vertical Alignment None except for tilting of spillway crest

4. Junctions with Abutments or Embankments Spillway floor & wall contact on east wall slightly open

5. Drains - Foundation, Joint, Face None

6. Water Passages, Conduits, Sluices Sluices in relatively good condition, walls missing pointing where not gunited New flashboards in gate house

7. Seepage or Leakage Center sluiceway wall has minor leakage about 9 feet above chute toe

8. Monolith Joints - Construction Joints Upstream approach slab to spillway has open construction joints

9. Foundation Reportedly on 12x12 timber crib wall and concrete slab placed subsequently

10. Abutments Good except for noted leakage on east training wall (See paragraph 3.c.5 of main checklist)

11. Control Gates Flash boards (2 sets)

12. Approach and Outlet Channels Good

13. Stilling Basin None; concrete apron

14. Intake Structure No

15. Settlement As noted in 3

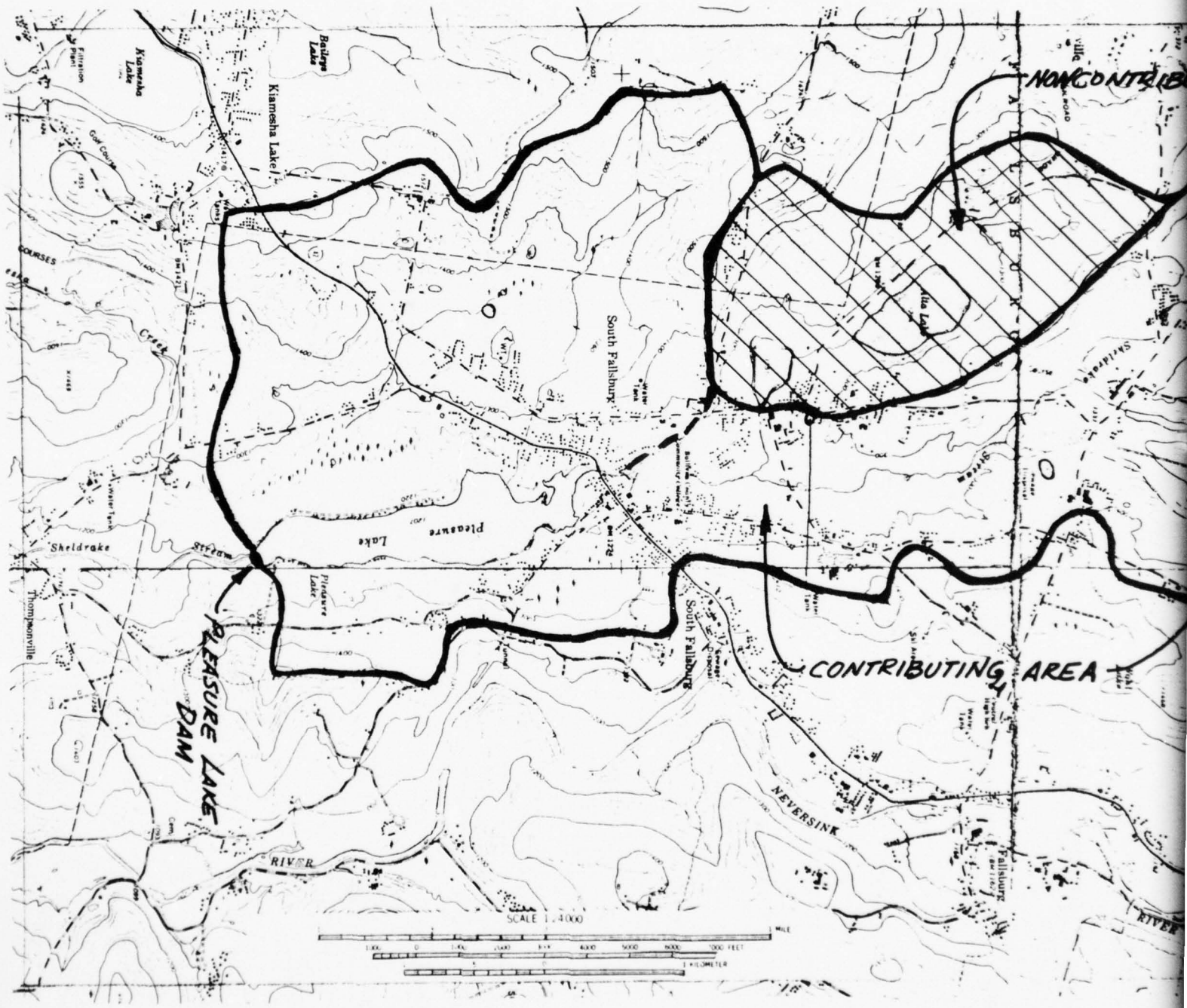
16. Stability Not applicable
    a. Overturning –
    b. Sliding –
    c. Seismic –

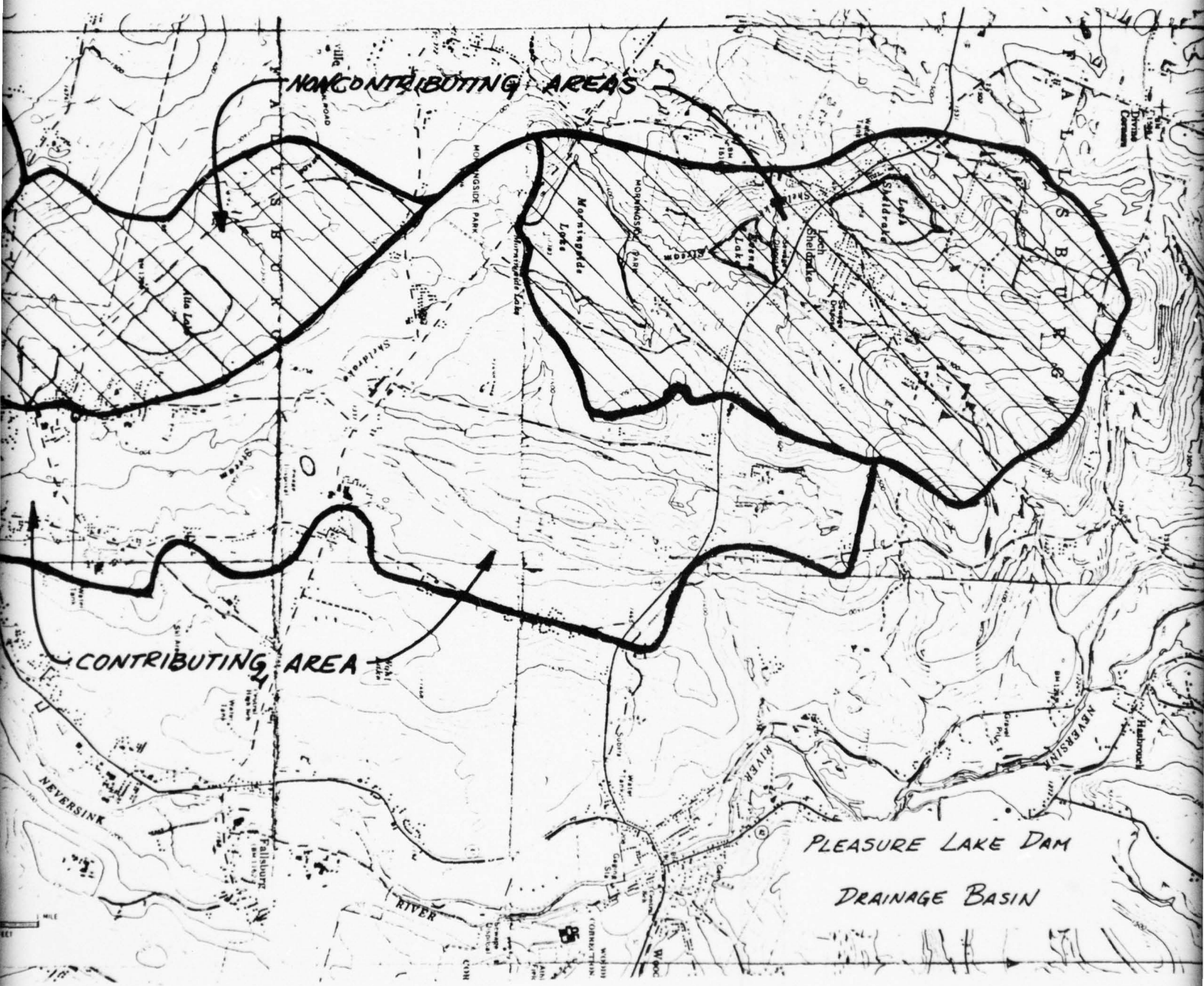
17. Instrumentation None
    a. Alignment –
    b. Uplift –
    c. Seismic –

18. Miscellaneous –

HYDROLOGIC DATA AND COMPUTATIONS

APPENDIX E


NONCONTRIB
CONTRIBUTING AREA
PLEASURE LAKE DAM
Kiamesha Lake
Beilers Lake
Kiamesha Lake
Golf Courses
Creek
South Fallsburg
Pleasure Lake
Sheldrake Stream
Thompsonville
South Fallsburg
NEVERSINK
RIVER
SCALE 1:24000
MILE
1 KILOMETER


NON-CONTRIBUTING AREAS
CONTRIBUTING AREA
PLEASURE LAKE DAM
DRAINAGE BASIN
NEVERSINK
RIVER
Morningside Lake
Sheldrake Lake
Loch Sheldrake
Fallsburg
Hasbrouck

TAMS

Job No. 1487-14 Sheet 1 of _____
Project INSPECTION PLEASURE LAKE. Date OCT 9, 1978
Subject _____ By RH
_____ Ch'k. by _____

A Sub-basin A

L_{CA_1} = 1.89 miles Assume C_t = 2.0 640 C_p = 400

L_1 = 4.73 miles

A_1 = 5.3 sq. miles

$t_p = C_t (L_1 L_{CA_1})^{0.3}$ = 3.86 hrs

$t_r = t_p / 5.5$ = 0.70 hrs

$q_p = \frac{640 C_p}{t_p}$ = 103.63 cfs / mile^2

Q = 103.63 × 5.3 = 549 cfs

B Sub-basin B

L_{CA_2} = 0.76 miles Assume C_t = 2.0 640 C_p = 400

L_2 = 1.93 miles

A_2 = 3.3 sq. miles

$t_p = C_t (L_2 L_{CA_2})^{0.3}$ = 2.24 hrs.

$t_r = t_p / 5.5$ = 0.4 hrs.

$q_p = \frac{640 C_p}{t_p}$ = 178.57 cfs. / mile^2

Q = 178.57 × 3.3 = 589 cfs

LAKE AREA 219.5 acres.

TAMS

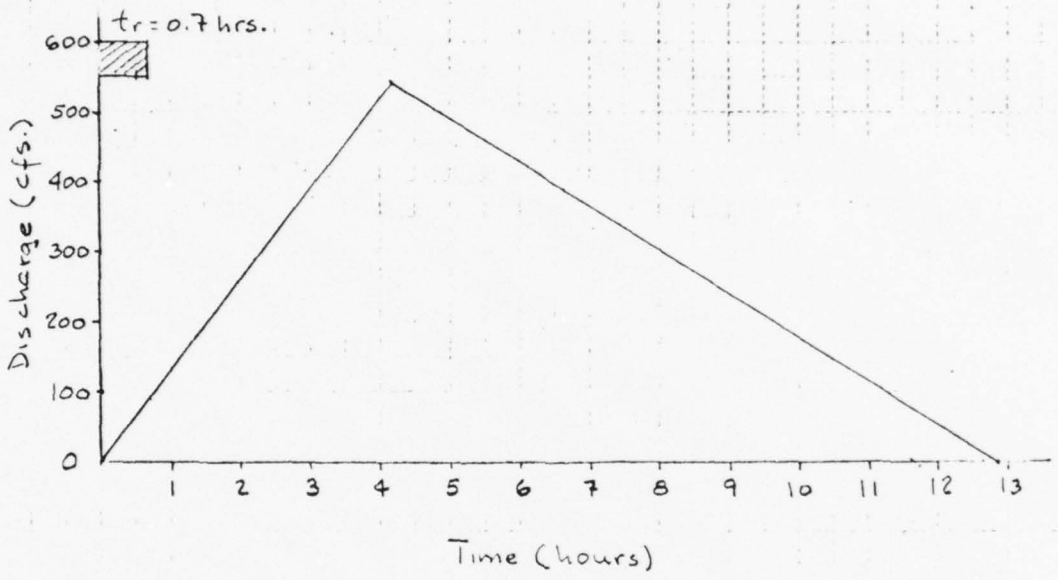
Job No. 1487-14 Sheet 2 of _____

Project INSPECTION PLEASUREE LAKE Date Oct 10, 1978

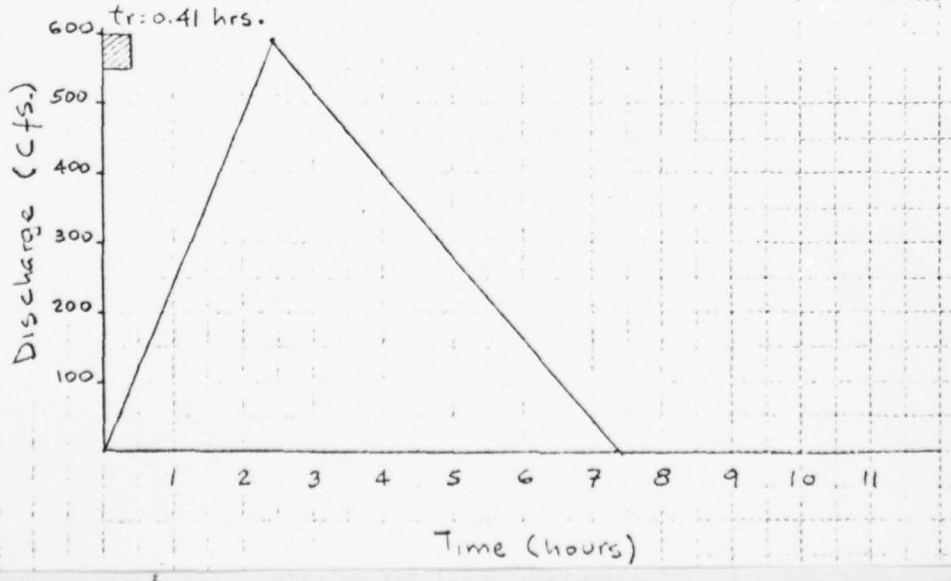
Subject _____ By RH

_____ Ch'k. by _____

Unit Graph (A)



Unit Graph (B)



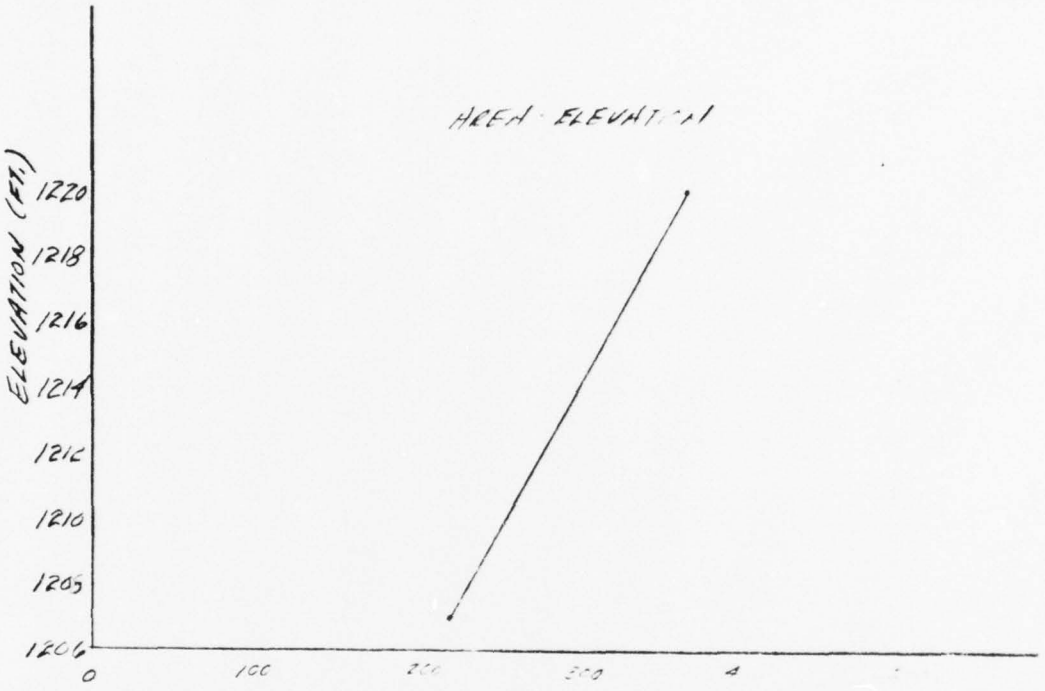
TAMS

Job No. 1487-14 Sheet 3 of _____

Project DAM INSPECTION - PLEASANT LAKE Date 9/26/78

Subject _____ By _____

ELEVATION VS. AREA Ch'k. by _____



ELEVATION (FT.)	AREA (AC.)	AREA (ACRES) MEAN AREA (AC.)	VOL (AC-FT)	TOTAL VOL. (AC-FT)
1207	219.5			
		224.8	224.8	
1208	230.0			224.8
		239.0	239.0	
1209	248.0			463.8
		247.0	247.0	
1210	256			710.8
		259.0	259.0	
1211	264.0			969.8
		270.0	270.0	
1212	276.0			1239.8
		281.0	281.0	
1213	286.0			1520.8
		292.0	292.0	
1214	298			1812.8
		303.0	303.0	
1215	308.0			2115.8
		314.0	314.0	
1216	320.0			2429.8
		326.0	326.0	
1217	332.0			2755.8
		339.0	339.0	
1218	346.0			3094.8
		349.5	349.5	
1219	353.5			3444.3
		358.0	358.0	
1220	362.5			3802.3
				4232.1

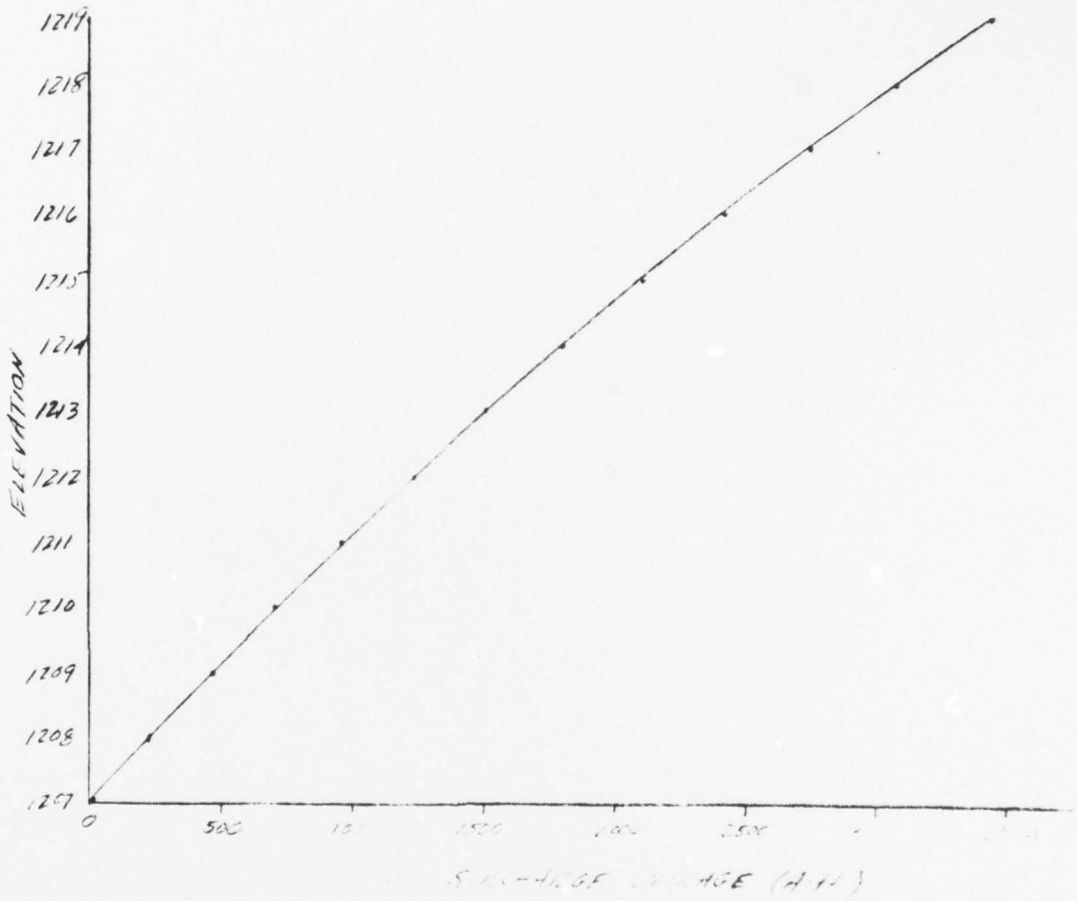
TAMS

Job No. 1487-14 Sheet 4 of _____

Project DAM INSPECTION - PLEASURE LAKE Date 9/26/79

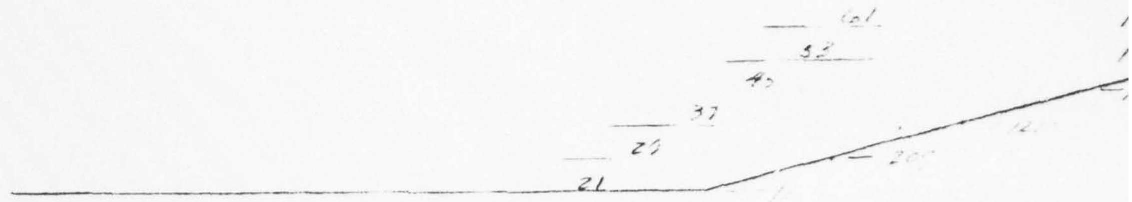
Subject _____ By WB

[illegible] STORAGE vs. ELEVATION Ch'k. by _____



TAMS

Job No. 1487-14 | Sheet 5 of
Project PLEASURE [illegible] INSPECTION | Date 7/27, 78
Subject Q [illegible] | By WD
Ch'k. by



ELEVATION	Δ AREA (FT^2)	AREA	WIDTH	H	Q
1208	-	-	21	-	0
1209	25	25	29	[illegible]	71.4
1210	33	58	37	1.57	224.7
1211	4[illegible]	[illegible]	45	2.2[illegible]	453.4
1212	49	146	53	2.75	[illegible]
1213	57	205	61	3.3[illegible]	[illegible]
1214	61	266	61	4.36	17[illegible]
1215	[illegible]	327	61	5.[illegible]	2[illegible]37.1
1217	122	449	61	7.3[illegible]	[illegible]
1219	122	571	[illegible]	[illegible]	[illegible]

$Q = CLH^{3/2}$

C = 3.087 [illegible] CREST
C = 3.52 [illegible] CREST

Q [illegible] SLUICE GATES

	H	Q		H	Q
1207'	0	0	1214'	7	[illegible]
1208'	1	[illegible]	1215'	8	[illegible]
1209'	2	[illegible]	12[illegible]'	9	8[illegible]
1210'	3	[illegible]	12[illegible]'	[illegible]	[illegible]
1211'	4	21[illegible]			
1212'	5	2[illegible]			
1213'	6	[illegible]			

TAMS

Job No. 1987-14 Sheet 6 of _____

Project PLEASANT LAKE DAM INSPE... Date 2-[illegible]-[illegible]

Subject CULVERT NG Q By [illegible]

Ch'k. by _____

ASSUME WATER SPILLING OVER DAM + SPILLWAY LAST IS @ CRITICAL DEPTH

MAX USE Q = 4LH^1.5 L DAM = 452'

L SPILL = 28'

(EMERGENCY SPILLWAY Q DETERMINED ON LAST PAGE)

WATER SPILLS: SPILLWAY @ 1207'
DAM @ 1213'

ELEVATION	H SPILL	H DAM	Q SPILL	Q DAM	Q FLOW SPILL + HIGHER TOTAL
1207'	0	-	0	-	0
1208'	1	-	77.2	-	2.16 [illegible]
1209'	2	-	21[illegible]	-	146.5 [illegible]
1210'	3	-	401.1	-	362.7 [illegible]
1211'	4	-	611.5	-	[illegible] [illegible]
1212'	5	-	813.0	-	[illegible] [illegible]
1213'	6	0	1037.7	0	1550.4 [illegible]
1214'	7	1	42[illegible]	[illegible]	[illegible] [illegible]
1215'	8	2	74[illegible]	3041.2	2[illegible] [illegible]
1216 13,000					
1217 23,20	17	4	27[illegible]	[illegible]	[illegible] [illegible]
1219'	12	[illegible]	[illegible]	[illegible]	[illegible] [illegible]

* Q FLOW OVER TOP

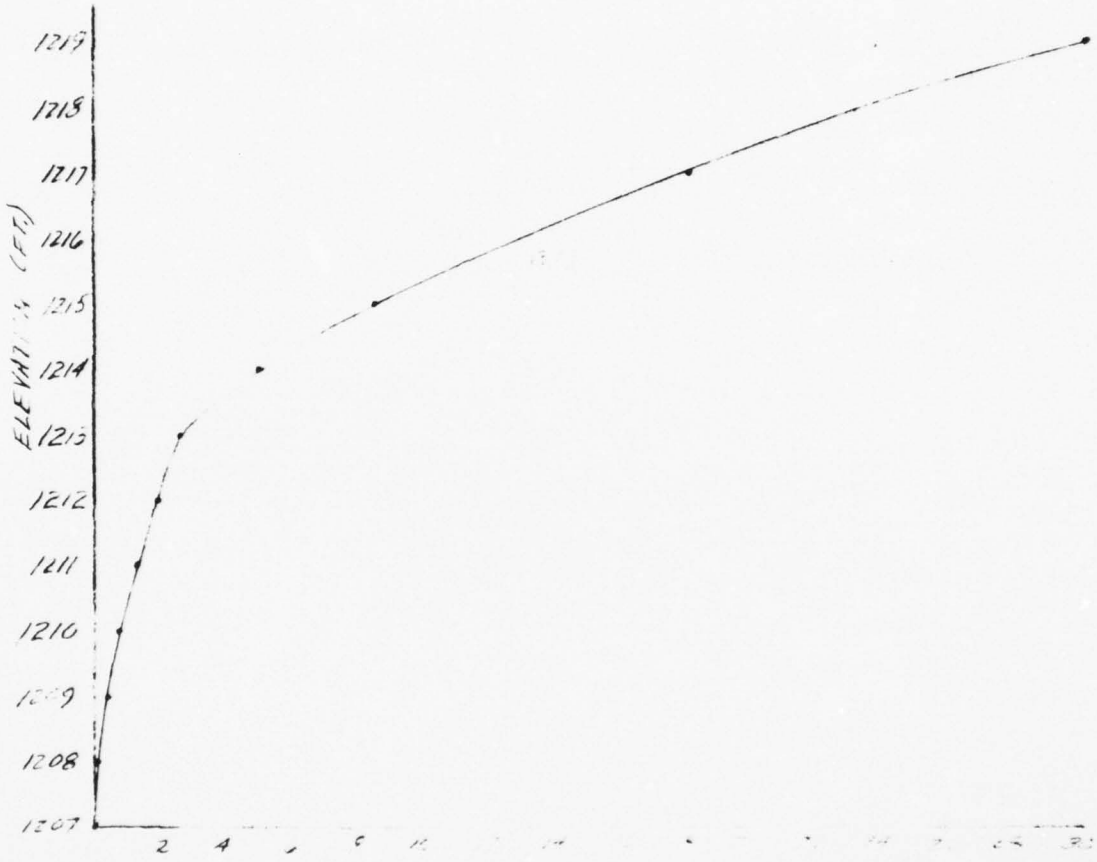
TAMS

Job No. 421-14 Sheet 1 of

Project [illegible] Date 2/21/78

Subject [illegible] By [illegible]

Ch'k. by



$C_1 = 0.53$

$C_2 = .13$

[illegible] CN-79

TAMS

Job No. 1487-14
Project INSPECTION PLEASURE LAKE
Subject
Sheet 8 of
Date Sep 27, 1978
By DLC
Ch'k. by

Probable Maximum 6 Hour Rainfall over 10 sq mi
= 24 in.
Reduced by 20% (EC 1110-2-27) = 19.2"

LOCATION Long 74° 37' 35"
Lat 41° 41'

15%	[illegible]	92	13.5
6 %	Forest	7[illegible]	4[illegible]
[illegible]	[illegible]	8[illegible]	[illegible]
5	[illegible]	[illegible]	5
			[illegible]

AMC II [illegible] CN 79.5 ~ 79.

$S = \frac{1000}{CN} - 10 = \frac{1000}{79} - 10$

$= [illegible].66$

$Q = \frac{(P - 0.2S)^2}{P + 0.8S} = \frac{(P - [illegible])^2}{P + [illegible]}$

1487-14 PLEASURE LAKE DAM INSPECTION
SULLIVAN COUNTY
SPILLWAY ADEQUACY TEST

FULL PMF

INPUT PARAMETERS

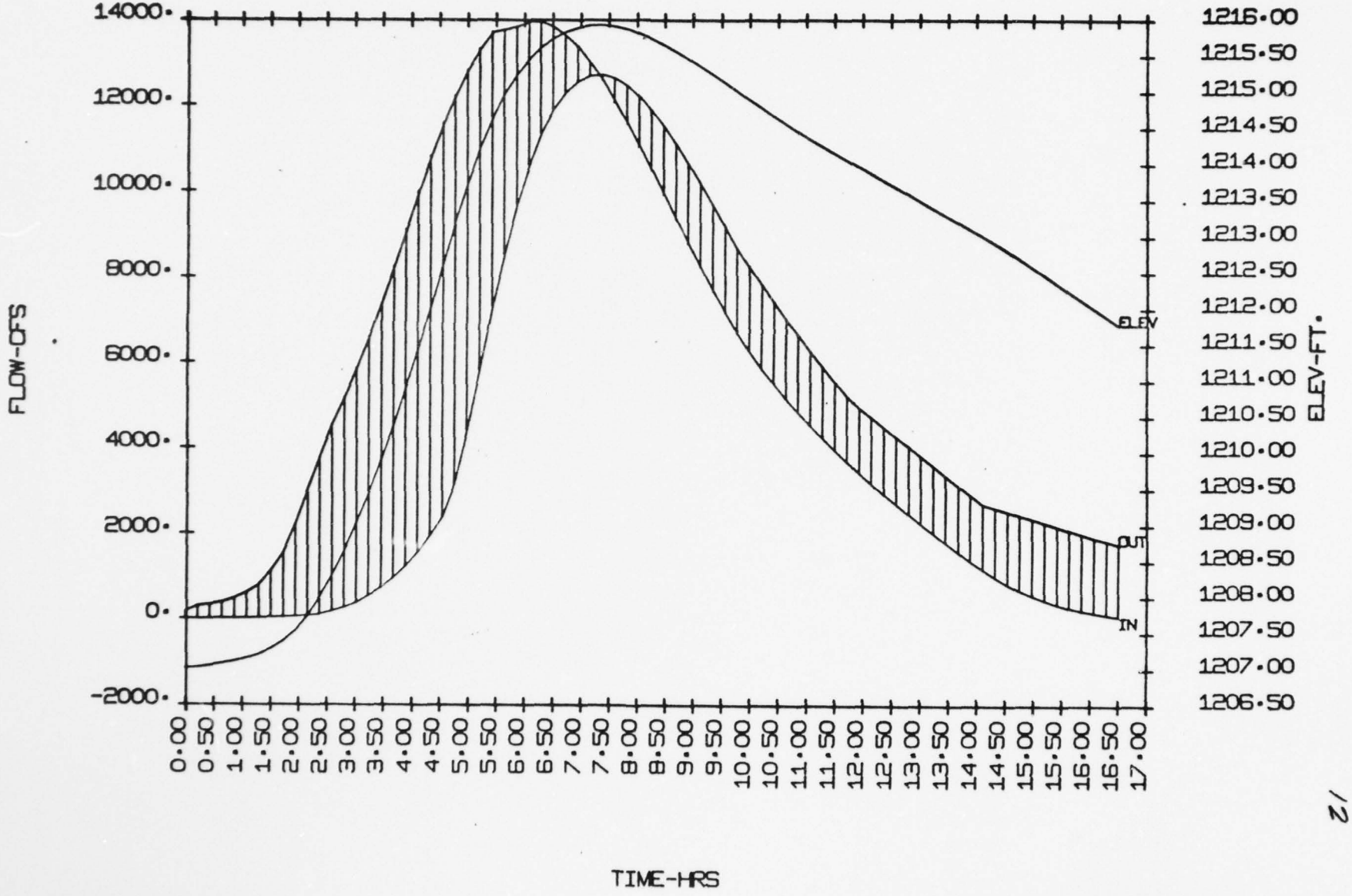
STARTING ELEV (FT.)	TIME INTERVAL (HOURS)	STARTING TIME (HOURS)	ENDING TIME (HOURS)	PRINT INTERVAL	GATE OPTION	PLOT OPTION	STORAGE COEF.	OUTFLOW COEF.	INFLOW COEF.	TIME COEF.	BREAK TIME
1207.00	0.21	0.00	16.80	1	NO	YES	1.000	1.000	1.000	1.000	0.000

RESERVOIR ELEV. (FT.)	RESERVOIR STORAGE (ACFT)	RESERVOIR OUTFLOW (CFS)
1207.00	0.0000	0.00
1208.00	224.8000	103.80
1209.00	460.8000	364.30
1210.00	707.8000	763.80
1211.00	965.8000	1283.40
1212.00	1235.8000	1922.50
1213.00	1516.8000	2684.90
1214.00	1809.8000	5031.60
1215.00	2111.8002	8631.90
1216.00	2425.8002	13000.00
1217.00	2751.8002	18205.80
1218.00	3089.8002	23200.00
1219.00	3432.4001	30216.30

TIME (HRS)	INFLOW (CFS)	OUTFLOW (CFS)	STORAGE (ACFT)	ELEVATION (FT.)
0.00	0.00		0.0000	1207.00
0.22	156.00	0.64	1.3930	1207.00
0.43	292.70	2.48	5.3885	1207.02
0.65	325.54	5.01	10.8650	1207.04
0.87	377.98	7.87	17.0579	1207.07
1.08	473.38	11.32	24.5199	1207.10
1.30	607.88	15.68	33.9733	1207.15
1.52	726.47	21.30	46.1446	1207.20
1.74	1117.79	28.98	62.7455	1207.27
1.95	1239.03	39.69	85.9495	1207.37
2.17	2235.79	54.93	118.9694	1207.52
2.39	3068.63	76.10	164.8207	1207.73
2.60	3782.39	103.47	224.1047	1207.99
2.82	4543.38	132.75	296.1951	1208.30
3.04	5104.51	274.69	379.3199	1208.65
3.25	5853.63	393.58	472.4277	1209.04
3.47	6605.19	550.50	575.7620	1209.44
3.69	7398.99	734.72	689.8040	1209.92
3.91	8253.53	979.73	814.9199	1210.41
4.12	9130.76	1252.75	950.5833	1210.94
4.34	9997.71	1592.80	1096.5132	1211.49
4.56	10906.65	1964.21	1251.1762	1212.05
4.77	11598.59	2402.70	1412.5120	1212.63
4.99	12223.45	3178.10	1578.1734	1213.21
5.21	12833.10	4433.09	1734.3308	1213.74
5.42	12313.60	5850.84	1877.7473	1214.22
5.64	13711.26	7321.12	2001.4958	1214.63
5.86	13766.75	8553.01	2105.1611	1214.97
6.07	13844.80	9702.03	2198.7270	1215.24
6.29	13955.31	10628.90	2255.3544	1215.45
6.51	13947.91	11342.51	2308.0595	1215.62
6.73	13825.79	11919.85	2341.1543	1215.75
6.94	13411.44	12316.99	2376.7026	1215.84
7.16	13350.35	12573.97	2395.1752	1215.90
7.38	13974.85	12704.48	2404.5571	1215.93
7.59	12546.37	12721.73	2405.7968	1215.93
7.81	12077.07	12625.50	2399.5986	1215.91
8.03	11544.00	12455.57	2386.4440	1215.87
8.25	11037.56	12200.60	2368.3359	1215.81
8.46	10407.55	11824.20	2345.5814	1215.74
8.68	9924.26	11514.76	2319.0341	1215.65
8.90	9566.09	11100.87	2289.2522	1215.56
9.11	8734.25	10653.62	2257.1318	1215.46
9.33	8270.32	10181.72	2223.2094	1215.35
9.55	7686.27	9691.70	2187.9043	1215.24
9.76	7187.50	9193.86	2152.1972	1215.12
9.98	6705.54	8697.67	2116.5258	1215.01
10.20	6282.16	8267.17	2081.1054	1214.89
10.42	5874.42	7847.95	2045.8239	1214.78

TIME (HRS)	INFLOW (CFS)	OUTFLOW (CFS)	STORAGE (ACFT)	ELEVATION (FT.)
10.63	5519.44	7435.43	2011.1057	1214.66
10.85	5167.27	7033.83	1977.3073	1214.55
11.07	4845.55	6644.73	1944.5412	1214.44
11.28	4534.63	6269.61	1912.9907	1214.34
11.50	4240.82	5908.44	1882.5952	1214.24
11.72	3956.96	5561.34	1853.3933	1214.14
11.93	3688.86	5227.70	1825.3039	1214.05
12.15	3427.93	4906.44	1798.2041	1213.96
12.37	3174.60	4725.61	1770.7275	1213.86
12.59	2938.72	4501.45	1742.8371	1213.77
12.80	2701.54	4275.64	1714.7299	1213.67
13.02	2475.39	4049.17	1686.5620	1213.58
13.24	2259.15	3822.81	1658.3072	1213.49
13.45	2057.53	3596.91	1630.2295	1213.39
13.67	1900.48	3371.75	1602.2746	1213.29
13.89	1590.67	3147.27	1574.3554	1213.19
14.10	1394.33	2924.57	1546.6337	1213.10
14.32	1191.46	2704.88	1519.2995	1213.00
14.54	1009.83	2615.90	1491.4040	1212.90
14.76	841.99	2535.39	1461.7251	1212.80
14.97	693.59	2451.21	1430.6062	1212.69
15.19	564.99	2364.69	1398.8082	1212.58
15.41	452.75	2276.80	1366.4060	1212.46
15.62	364.84	2188.34	1333.7944	1212.34
15.84	291.54	2100.00	1301.2334	1212.23
16.06	224.73	2012.54	1268.5919	1212.11
16.27	175.76	1926.48	1237.2483	1212.00
16.49	130.24	1852.28	1206.1359	1211.89
16.71	98.39	1779.86	1175.5407	1211.77
MAX. VALUES	13955.31	12721.73		1215.93
MIN. VALVES	0.00	0.00		1207.00

Pleasure Lake
PMF.



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NAD-14 PLEASURE LAKE DAM INSPECTION
SULLIVAN COUNTY
SPILLWAY ADEQUACY TEST
HALF PMF

INPUT PARAMETERS

STARTING ELEV (FT.)	TIME INTERVAL (HOURS)	STARTING TIME (HOURS)	ENDING TIME (HOURS)	PRINT INTERVAL	GATE OPTION	PLOT OPTION	STORAGE COEF.	OUTFLOW COEF.	INFLOW COEF.	TIME COEF.	BREAK TIME
1207.00	0.21	0.00	14.30	1	NO	YES	1.000	1.000	0.500	1.000	0.000

RESERVOIR ELEV. (FT.)	RESERVOIR STORAGE (ACFT)	RESERVOIR OUTFLOW (CFS)
1207.00	0.0000	0.00
1208.00	224.8000	102.80
1209.00	460.9000	364.80
1210.00	707.1000	767.80
1211.00	965.8000	1283.40
1212.00	1235.8000	1922.50
1213.00	1516.5000	2694.80
1214.00	1806.8000	5031.60
1215.00	2111.5002	9631.00
1216.00	2425.8002	13000.00
1217.00	2751.8002	19205.80
1218.00	3089.5002	27300.00
1219.00	3439.6001	30214.30

TIME (HRS)	INFLOW (CFS)	OUTFLOW (CFS)	STORAGE (ACFT)	ELEVATION (FT.)
0.00	0.00		0.0000	1207.00
0.02	79.00	0.32	0.4965	1207.00
0.43	164.35	1.24	2.6942	1207.01
0.65	163.77	2.50	5.4285	1207.02
0.87	198.69	3.93	8.5289	1207.03
1.08	235.68	5.66	12.2998	1207.05
1.30	305.94	7.84	16.9866	1207.07
1.52	393.23	10.65	23.0783	1207.10
1.74	555.69	14.49	31.3827	1207.13
1.95	760.51	19.84	42.8947	1207.19
2.17	1117.47	27.45	58.4547	1207.26
2.39	1584.31	38.05	82.4102	1207.36
2.60	1951.19	51.73	112.0922	1207.49
2.82	2371.68	68.47	148.7005	1207.65
3.04	2564.25	87.96	190.5141	1207.84
3.25	2651.81	110.60	238.2020	1208.05
3.47	2685.59	133.45	291.4041	1208.28
3.69	3169.49	242.72	350.4216	1208.57
3.91	4126.76	314.60	415.5977	1208.80
4.12	4556.76	407.27	487.0971	1209.10
4.34	4641.35	522.12	564.3952	1209.41
4.56	4603.79	668.64	646.9145	1209.78
4.77	5034.79	816.75	734.0944	1210.10
4.99	6111.72	998.06	824.5691	1210.45
5.21	6419.05	1188.73	917.3037	1210.81
5.42	6454.30	1391.56	1011.4974	1211.14
5.64	6395.67	1614.52	1105.6684	1211.52
5.86	6356.57	1838.94	1197.9870	1211.84
6.07	6020.40	2061.16	1286.9147	1212.19
6.29	5977.65	2293.32	1376.4924	1212.40
6.51	6073.95	2515.67	1464.4572	1212.77
6.73	6012.36	2804.72	1551.7816	1213.05
6.94	6040.73	3240.98	1636.4784	1213.28
7.16	6473.17	3804.19	1716.8905	1213.47
7.38	6489.92	4177.12	1792.4826	1213.63
7.59	6282.68	4474.33	1838.4421	1213.74
7.81	6021.53	4701.34	1767.7084	1213.85
8.03	5720.00	4863.61	1782.8949	1213.93
8.25	5515.79	4969.32	1801.0390	1213.97
8.44	5264.77	5024.87	1807.9628	1213.99
8.60	4962.13	5037.57	1806.7024	1214.00
8.80	4678.04	5006.66	1805.6975	1213.99
9.11	4327.12	4943.70	1797.8622	1213.96
9.33	4110.16	4811.67	1786.4135	1213.93
9.55	3847.13	4754.83	1771.8745	1213.87
9.76	3554.75	4558.40	1754.8804	1213.81
9.98	3352.77	4447.37	1736.1001	1213.75
10.20	3143.58	4296.40	1716.0798	1213.68
10.42	2939.21	4119.29	1695.2863	1213.61

TIME (HRS)	INFLOW (CFS)	OUTFLOW (CFS)	STORAGE (ACFT)	ELEVATION (FT.)
10.63	2759.22	3948.81	1674.0744	1213.63
10.85	2582.63	3777.35	1652.7604	1213.44
11.07	2403.77	3606.32	1631.4404	1213.25
11.28	2267.31	3437.02	1610.3255	1213.07
11.50	2156.41	3270.15	1589.6230	1212.89
11.72	1978.43	3106.36	1569.2534	1212.71
11.93	1843.43	2945.67	1549.2563	1213.11
12.15	1717.96	2789.29	1529.8012	1213.04
12.37	1597.30	2669.21	1510.6977	1212.97
12.59	1489.36	2614.06	1490.7755	1212.90
12.80	1390.77	2556.88	1469.4611	1212.83
13.02	1297.69	2496.90	1447.5290	1212.75
13.24	1205.09	2434.43	1424.5114	1212.67
13.45	1014.76	2369.64	1400.4263	1212.59
13.67	984.74	2302.69	1375.8465	1212.60
13.89	895.33	2233.70	1350.8493	1212.47
14.10	695.19	2162.85	1324.4772	1212.21
14.32	595.73	2090.82	1297.8424	1212.23
14.54	504.41	2017.65	1270.8774	1212.13
14.76	419.99	1943.69	1243.6147	1212.03
14.97	343.70	1870.15	1216.2076	1211.93
15.19	273.49	1811.26	1188.8046	1211.82
15.41	231.37	1746.65	1161.5139	1211.72
15.62	192.42	1612.66	1134.4768	1211.62
15.84	145.77	1414.54	1107.8127	1211.52
16.06	112.36	1257.60	1081.4413	1211.42
16.27	7.98	1147.83	1056.0505	1211.33
16.49	60.12	1077.98	1031.1081	1211.24
16.71	44.69	1380.50	1006.8231	1211.15
MAX. VALUES	6977.65	5077.57		1214.00
MIN. VALUES	0.00	0.00		1207.00

PLEASURE LAKE ½PMF