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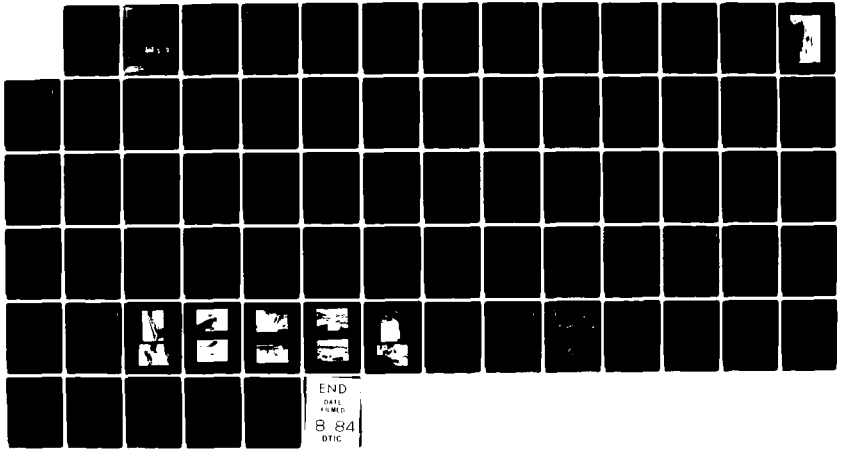
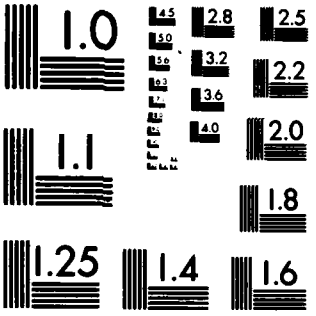
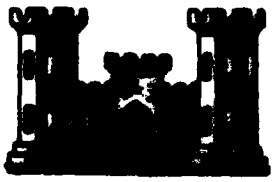




SAUGATUCK RIVER BASIN
WESTPORT, CONNECTICUT

LEE'S POND DAM
CT 00061

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM



DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
WALTHAM, MASS. 02154

SEPTEMBER 1980

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER CT 00061	2. GOVT ACCESSION NO. AD-A142 615	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) Saugatuck River Basin Westport, Conn. Lee's Pond Dam NATIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL DAMS		5. TYPE OF REPORT & PERIOD COVERED INSPECTION REPORT 6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) U.S. ARMY CORPS OF ENGINEERS NEW ENGLAND DIVISION		8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS DEPT. OF THE ARMY, CORPS OF ENGINEERS NEW ENGLAND DIVISION, NEDED 424 TRAPELO ROAD, WALTHAM, MA. 02254		12. REPORT DATE Sept. 1980 13. NUMBER OF PAGES 80
14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office)		15. SECURITY CLASS. (of this report) UNCLASSIFIED 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

APPROVAL FOR PUBLIC RELEASE: DISTRIBUTION UNLIMITED

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

Cover program reads: Phase I Inspection Report, National Dam Inspection Program; however, the official title of the program is: National Program for Inspection of Non-Federal Dams; use cover date for date of report.

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

DAMS, INSPECTION, DAM SAFETY,

Saugatuck River Basin
Westport, Conn.
Lee's Pond Dam

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

Lee's Pond Dam is a stone masonry dam approx. 200 ft. long and 17 ft. high. The overflow spillway is 180 ft. long and is 5 ft. below the top of the dam. A 6'X 9' sluice gate is located 50 ft. from the west abutment. Adjacent to the sluice gate is a fish ladder. Both the sluice gate and the fish ladder were added after the dam was constructed. The drainage area is 77.5 square miles and the pond has 152 acre feet of available storage. The dam is classified as small and ahs a low hazard potential in accordance with guidelines established by the Corps of Engineers. The test flood outflow fro this dam 8,460 cfs and corresponds to the 100 year flood.

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DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02254

REPLY TO
ATTENTION OF:

NEDED

DEC 19 1980

Honorable Ella T. Grasso
Governor of the State of Connecticut
State Capitol
Hartford, Connecticut 06115

Dear Governor Grasso:

Inclosed is a copy of the Lee's Pond Dam (CT-00061) Phase I Inspection Report, which was prepared under the National Program for Inspection of Non-Federal Dams. This report is presented for your use and is based upon a visual inspection, a review of the past performance and a brief hydrological study of the dam. A brief assessment is included at the beginning of the report. I have approved the report and support the findings and recommendations described in Section 7 and ask that you keep me informed of the actions taken to implement them. This follow-up action is a vitally important part of this program.

A copy of this report has been forwarded to the Department of Environmental Protection, the cooperating agency for the State of Connecticut. In addition, a copy of the report has also been furnished the owner, the YMCA of Westport, Conn.

Copies of this report will be made available to the public, upon request, by this office under the Freedom of Information Act. In the case of this report the release date will be thirty days from the date of this letter.

I wish to take this opportunity to thank you and the Department of Environmental Protection for your cooperation in carrying out this program.

Sincerely,

WILLIAM E. HODGSON, JR.
Colonel, Corps of Engineers
Acting Division Engineer

Incl
As stated

LEE'S POND DAM

CT 00061

SAUGATUCK RIVER BASIN

WESTPORT, CONNECTICUT

PHASE I INSPECTION REPORT

NATIONAL DAM INSPECTION PROGRAM

NATIONAL DAM INSPECTION PROGRAM

PHASE I INSPECTION REPORT

Identification Number:	CT 00061
Name:	Lee's Pond Dam
Town:	Westport
County and State:	Fairfield County, Connecticut
Stream:	Saugatuck
Date of Inspection:	May 30, 1980

BRIEF ASSESSMENT

Lee's Pond Dam is a stone masonry dam approximately 200 feet long and 17 feet high. The overflow spillway is 180 feet long and is 5 feet below the top of the dam. A 6'x9' sluice gate is located 50 feet from the west abutment. Adjacent to the sluice gate is a fish ladder. Both the sluice gate and the fish ladder were added after the dam was constructed. The drainage area is 77.5 square miles and the pond has 152 acre-feet of available storage.

The assessment of the dam is based on the visual inspection, available drawings, past operational performance and hydraulic/hydrologic computations. The dam is judged to be in poor condition with several areas that require attention. These areas include seepage through both abutments and the stone masonry and the undermining and advanced stage of deterioration of the spillway apron and the scour hole at the end of the sluice gate outlet.

The dam is classified as small and has a low hazard potential in accordance with guidelines established by the Corps of Engineers. The test flood outflow for this dam is 8,460 cfs and corresponds to the 100-year flood. The test flood outflow will not overtop the dam.

It is recommended that the owner engage the services of a qualified registered engineer experienced in the design of dams to investigate the

seepage through the dam and the abutments; the undermining and poor condition of the spillway apron; the scour hole below the sluice gate; the condition of the sluice gate and repair all cracked and spalled concrete. It is also recommended that the owner clear the downstream channel of debris; repair all joints in the masonry; repair the deck of the catwalk; replace any missing cap stones and riprap and institute an annual technical inspection.

The owner should implement the recommendations and remedial measures described above and in greater detail in Section 7 within one year after receipt of this Phase I Inspection Report.

Joseph F. Merluzzo
Connecticut P.E. #7639
Project Manager

Gary J. Giroux
Connecticut P.E. #11477
Project Engineer

This Phase I Inspection Report on Lee's Pond Dam has been reviewed by the undersigned Review Board members. In our opinion, the reported findings, conclusions, and recommendations are consistent with the Recommended Guidelines for Safety Inspection of Dams, and with good engineering judgment and practice, and is hereby submitted for approval.

ARAMAST MAHTESIAN, MEMBER
Geotechnical Engineering Branch
Engineering Division

CARNEY M. TERZIAN, MEMBER
Design Branch
Engineering Division

RICHARD DIBUONO, CHAIRMAN
Water Control Branch
Engineering Division

APPROVAL RECOMMENDED:

JOE B. FRYAR
Chief, Engineering Division

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Inspections. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Inspection 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 investigations and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I Inspection; 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 continued care and inspection can there be any chance that unsafe conditions be detected.

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 variety 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.

The Phase I Inspection does not include an assessment of the need for fences, gates, "no trespassing" signs, repairs to existing fences and railings and other items which may be needed to minimize trespass and provide greater security for the facility and safety to the public. An evaluation of the project for compliance with Occupational Safety and Health Administration's (OSHA) rules and regulations is also excluded.

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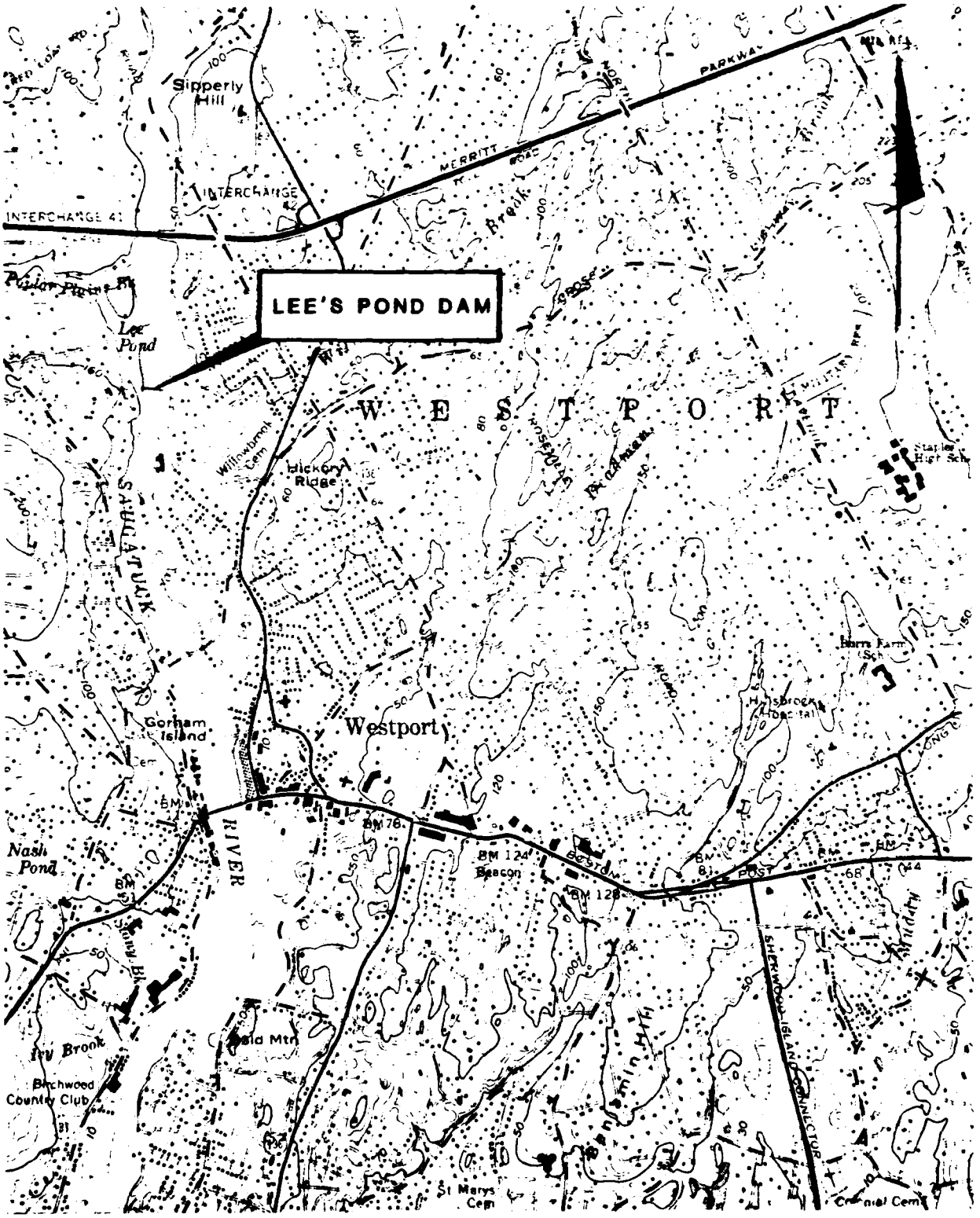
LEES POND DAM



QUADRANGLE. **WESTPORT, CT**

US ARMY, CORPS OF ENGINEERS
NEW ENGLAND DIVISION
WALTHAM, MASS.

SCALE IN FEET
2000' 0 2000' 4000'
1" = 2000'

LOCATION MAP

PHASE I INSPECTION REPORT

LEE'S POND DAM CT 00061

SECTION 1 - PROJECT INFORMATION

1.1 General

a. Authority - Public Law 92-367, August 8, 1972 authorized the Secretary of the Army, through the Corps of Engineers, to initiate a National Program of Dam Inspection throughout the United States. The New England Division of the Corps of Engineers has been assigned the responsibility of supervising the inspection of dams within the New England Region. Storch Engineers has been retained by the New England Division to inspect and report on selected dams in the State of Connecticut. Authorization and notice to proceed were issued to Storch Engineers under a letter of March 6, 1980 from William E. Hodgson, Jr., Colonel, Corps of Engineers. Contract No. DACW33-80-C-0035 has been assigned by the Corps of Engineers for this work.

b. Purpose of Inspection -

(1) Perform technical inspection and evaluation of non-Federal dams to identify conditions which threaten the public safety and thus permit correction in a timely manner by non-Federal interests.

(2) Encourage and prepare the states to initiate quickly effective dam safety programs for non-Federal dams.

(3) To update, verify and complete the National Inventory of Dams.

1.2 Description of Project

a. Location - Lee's Pond Dam is located in the Town of Westport, Fairfield County, Connecticut approximately 2,200 feet south of the Merritt Parkway (Route 15) bridge and 6,000 feet north of the Route 1 Bridge over the Saugatuck River. The coordinates of the dam are approximately 41°-09.5' north latitude and 73°-22.0' west longitude. The dam is located on the Saugatuck River and is located approximately 4 miles upstream from the confluence with the Long Island Sound.

b. Description of Dam and Appurtenances - Lee's Pond Dam is a stone masonry dam approximately 200 feet long and 17 feet high.

Essentially, the entire dam is the spillway. The total length of the spillway is 180 feet with a 20-foot gap for a fish ladder and sluice gate. The spillway is 6 feet below the top of the dam. A 6'x9' sluice gate is located 50 feet from the west abutment and the fish ladder adjacent to it.

c. Size Classification - Lee's Pond Dam has a maximum capacity of 150 acre-feet at the top of the dam and a maximum height of 17 feet. In accordance with the Recommended Guidelines for Safety Inspection of Dams established by the Corps of Engineers, the dam is classified as small (height less than 40 feet, storage less than 1,000 acre-feet).

d. Hazard Classification - Lee's Pond Dam is classified as having a low hazard potential. Failure of the dam should not cause any loss of life or property damage. Just prior to failure (water level at top of dam), the estimated flow and water depths several hundred feet downstream are 8,800 cfs at 8 feet and just after failure would be 9,430 cfs at 8.4 feet. Estimated flow and water depth under the dry condition (water level at spillway crest) are 1,947 cfs at 4.3 feet. First floor sills of homes in the impact area are approximately 7 feet above the streambed.

e. Ownership - Lee's Pond Dam is owned by:

YMCA of Westport, Inc.
59 Post Road East
Westport, Connecticut 06880

f. Operator - Operating personnel are under the direction of:

Mr. Matthew Johnson
YMCA of Westport, Inc.
59 Post Road East
Westport, Connecticut 06880
(203) 227-4159

g. Purpose of Dam - The dam was originally constructed to impound Lee's Pond for water supply for a downstream mill. Subsequently, the tailrace has been abandoned and the pond is now used for recreation only.

h. Design and Construction History - Lee's Pond Dam was constructed in 1903. In 1959, sluice gates were installed and the pond made deeper. In order to do this, the contractor cut through the dam. The contractor blasted to open this cut.

In 1961, a fish ladder was constructed adjacent to the sluice gate and a grouted riprap apron was placed below the spillway.

Subsequent to 1961, at various times, large boulders or riprap were placed in the downstream channel from the sluice gate.

i. Normal Operational Procedures - There are no normal operational procedures.

1.3 Pertinent Data

a. Drainage Area - The Lee's Pond drainage basin is located in the Towns of Danbury, Ridgefield, Redding, Bethel, Weston, Newtown, Eaton, Wilton, Norwalk and Westport, Connecticut and is irregular in shape.

The area of the drainage basin is 77.5 square miles. Approximately 6.5 miles upstream of Lee's Pond Dam and on the Saugatuck River is the Saugatuck Reservoir Dam. This dam has an effect on 35.5 square miles of the drainage

basin. Also, approximately 6 miles upstream of Lee's Pond Dam and on the Aspetuck River (a tributary to the Saugatuck) is the Aspetuck Reservoir Dam. This dam has an effect on 17.6 square miles of the drainage basin.

Less than 5 percent of the drainage basin is natural storage. The Saugatuck and Aspectuck Reservoirs, however, contain approximately 5,250 acre-feet of available storage. The topography is hilly in the northern sections of the basin and rolling in the southern sections with elevations ranging from 17.45 NGVD at the dam to 950 NGVD. More than 60 percent of the drainage area is wooded and open space and the remainder developed.

b. Discharge at Damsite - There are no records available for discharge at the dam.

(1)	Outlet works sluice gate size:	6'x9'
	Invert elevation (feet above NGVD):	7.45
	Discharge Capacity at top of dam:	590 cfs
(2)	Maximum known flood at damsite: (Oct. 1955)	14,800 cfs
(3)	Ungated spillway capacity at top of dam:	8,800 cfs
	Elevation (NGVD):	23.45
(4)	Ungated spillway capacity at test flood elevation:	8,450 cfs
	Elevation (NGVD):	23.25
(5)	Gated spillway capacity at normal pool elevation:	N/A
	Elevation (NGVD):	N/A
(6)	Gated spillway capacity at test flood elevation:	N/A
	Elevation:	N/A

(7)	Total Spillway capacity at test flood elevation:	8,450 cfs
	Elevation (NGVD):	23.25
(8)	Total project discharge at top of dam:	9,390 cfs
	Elevation (NGVD):	23.45
(9)	Total project discharge at test flood elevation:	9,040 cfs
	Elevation (NGVD):	23.45

c. Elevation (feet above NGVD)

(1)	Streambed at toe of dam:	6.45
(2)	Bottom of cutoff:	unknown
(3)	Maximum tailwater:	14.85
(4)	Normal pool:	17.45
(5)	Full flood control pool:	N/A
(6)	Spillway crest (ungated):	17.45
(7)	Design surcharge (original design):	unknown
(8)	Top of dam:	23.45
(9)	Test flood surcharge:	23.25

d. Reservoir (length in feet)

(1)	Normal pool:	1,400 feet
(2)	Flood control pool:	N/A
(3)	Spillway crest pool:	1,400 feet
(4)	Top of dam:	1,500 feet
(5)	Test flood pool:	1,450 feet

e. Storage (acre-feet)

(1)	Normal pool:	97

(2)	Flood control pool:	N/A
(3)	Spillway crest pool:	97
(4)	Top of dam:	152
(5)	Test flood pool:	151.5
f.	Reservoir Surface (acres)	
(1)	Normal pool:	16.8
(2)	Flood control pool:	N/A
(3)	Spillway crest:	16.8
(4)	Test flood pool:	19
(5)	Top of dam:	18.9
g.	Dam	
(1)	Type:	stone masonry
(2)	Length:	200 feet
(3)	Height:	17 feet
(4)	Top width:	3 feet
(5)	Side slopes:	N/A
(6)	Zoning:	none
(7)	Impervious Core:	N/A
(8)	Cutoff:	unknown
(9)	Grout curtain:	unknown
(10)	Other:	N/A
h.	Diversion and Regulating Tunnel	N/A
i.	Spillway	
(1)	Type:	broad crested weir
(2)	Length of weir:	180 feet

(3)	Crest elevation (without flashboard):	17.45
(4)	Gates:	N/A
(5)	U/S channel:	none
(6)	D/S channel:	concrete apron/riprap
(7)	General:	N/A

Regulating Outlets

(1)	Invert elevation (NGVD):	7.45
(2)	Size:	6'x9' sluice gate
(3)	Description:	wooden gate
(4)	Control Mechanism	Manually operated gate
(5)	Other:	N/A

SECTION 2 - ENGINEERING DATA

2.1 Design Data

No design computations are available for this dam; however, the following drawings are available:

(a) Plans for Lee's Pond Development, Westport, Connecticut - S.E. Muchmore Associates, Consulting Engineers - Sluiceway Construction.

(b) Plans for Proposed Fishway, Lee's Pond Outlet - S.E. Muchmore Associates, Consulting Engineers.

2.2 Construction Data

The dam was constructed in 1903. There are no records of the original construction.

In 1959, a sluice gate was installed and the pond made deeper. In order to do this, the contractor cut through the dam. The contractor blasted to open this cut.

In 1961, a fish ladder was constructed adjacent to the sluice gate and a grouted riprap apron was placed below the spillway.

Subsequent to 1961, at various times, large boulders or riprap was placed in the downstream channel from the sluice gate.

2.3 Operation Data

The pond is used for recreation. The pond can be lowered; however, the location of the handles for the mechanism is unknown. No operating records for this dam have been maintained.

2.4 Evaluation of Data

a. Availability - The information noted above is readily available from the files of the Water Resources Unit - Department of Environmental Protection, State of Connecticut.

b. Adequacy - The data made available along with the visual inspection, past performance history and hydraulic/hydrologic assumptions were adequate to assess the condition of the facility.

c. Validity - The field inspection revealed that the dam was constructed essentially as the data states; however, some of the information must be verifed.

SECTION 3 - VISUAL INSPECTION

3.1 Findings

a. General - The visual inspection was conducted on May 30, 1980 by members of the engineering staff of Storch Engineers, D. Baugh and Associates and Matthews Associates. A copy of the visual inspection checklist is contained in Appendix A of this report. Selected photos of the dam are contained in Appendix C.

In general, the overall condition of the dam and its appurtenant structures is poor.

b. Dam - The dam is a stone masonry dam with stone abutments. The entire length of the dam is used as the spillway. At both abutments, seepage can be seen flowing from cracks (Photos 9 and 10). Both abutments are in fair condition but they need some repointing of joints. The upstream face of the dam is silted up to the spillway crest and was underwater. Its condition could not be observed.

c. Appurtenant Structures - The spillway is essentially the entire length of the dam (180 feet), and it is 6 feet below the top of the dam. The overall condition of the spillway is poor. The top cap stones of the spillway are in various stages of disrepair (Photos 1, 2 and 3). At several locations, these cap stones have been replaced with concrete because they have broken loose. At one location in the center of the dam, several of these cap stones have broken loose and the problem remains uncorrected. Consequently, water flowing over the spillway is concentrated at this location (Photo 3). Throughout the entire length of the spillway, the joints in the stone masonry are in poor condition. Water was observed seeping through many joints and is effectively removing the mortar. Also, because of the water flow, the freeze thaw cycle is deteriorating the mortar.

At the toe of the spillway is a concrete apron that is in poor condition (Photos 4, 7 and 8). At several locations, large holes have been eroded into the apron (Photo 4). Along the entire length of the apron, the downstream end is being undermind (Photos 7 and 8). This undermining in several locations extends several feet under the apron and one to two feet down.

The sluice gate is a wooden gate that has several leaks in it. According to the owner, the gate is operable, however, its actual integrity is questionable (Photo 6). The concrete making up the sluiceway has several areas that are in poor condition with spalled and eroded concrete and exposed reinforcements (Photos 5 and 6). The operating mechanism for the sluice gate is in fair condition, but the location of the handle is unknown.

The deck of the service bridge is in poor condition with missing planks and no hand rail.

This fish ladder is inoperable and the concrete in several locations is eroded, spalled and has exposed reinforcing.

d. Reservoir Area - The area immediately adjacent to the pond is gently sloped lawn area of the abutting property owners with some steeper areas that are well vegetated. The shoreline shows no signs of sloughing or erosion. A rapid rise in the water level of the pond will not endanger life or property.

e. Downstream Channel - The downstream channel is a natural channel of rock and gravel with the area adjacent to it being overgrown with brush and trees. At the end of the sluice gate channel, there exists a 5-foot deep scour hole.

3.2 Evaluation

Overall the general condition of the dam is poor. The visual inspection revealed items that lead to this assessment, such as:

a. Seepage through the abutments and the dam (spillway)

b. Missing mortar and poor condition at the joints

c. Missing cap stones on the spillway

d. Poor condition of the downstream apron

e. Undermining of the apron

f. Scour at the end of the sluice gate channel

g. Questionable condition of the wooden sluice gate

SECTION 4 - OPERATIONAL AND MAINTENANCE PROCEDURES

4.1 Operational Procedures

a. General - The operation of this facility is strickly for the purpose of recreation and the water level is kept at the spillway crest.

b. Description of Any Warning System in Effect - There is no formal warning system in effect for this dam.

4.2 Maintenance of Dam

a. General - There is no specific maintenance program for this dam, and the inspection reveals very little maintenance has been done in the past.

b. Operating Facilities - According to the owner, the sluice gate is operable. The handles to operate it, however, could not be located.

4.3 Evaluation

There is no regularly scheduled maintenance program. A systematic and complete maintenance program should be instituted at the dam and a formal warning system should be developed.

SECTION 5 - EVALUATION OF HYDRAULIC/HYDROLOGIC FEATURES

5.1 General

Lee's Pond Dam is a stone masonry dam approximately 200 feet long and 17 feet high. The major portion of the dam or 180 feet is the spillway. The remainder of the dam is the fish ladder and sluice gate. The sluice gate is 6'x9'.

The watershed encompasses 77.5 square miles of which 53.1 square miles is under some control by water supply dams further upstream (Saugatuck Reservoir - 35.5 square miles and Aspetuck - 17.6 square miles). The topography is hilly in the northern sections and rolling in the southern areas with elevations rising approximately 932 feet.

Less than 5 percent of the drainage area is natural storage. Manmade storage (Saugatuck and Aspetuck Reservoirs) account for 5,250 acre-feet of storage. More than 60 percent of the drainage basin is wooded and open space and the remainder developed.

5.2 Design Data

No design data for the dam is available. Computations for this dam were developed and used in the evaluation of the dam.

5.3 Experience Data

The dam has withstood the floods of the 1930's and 1950's and some of the more recent floods such as January, 1979. The flood of record is October, 1955. The discharge at the dam was 14,800 cfs.

5.4 Test Flood Analysis

Based on the Recommended Guidelines for Safety Inspection of Dams, the dam is classified as a small structure with a low hazard potential. The

test flood for these conditions ranges from the 50-year to 100-year flood. The 100-year flood was used for this dam because of the size of the watershed.

Approximately 2,000 feet upstream of the dam, the USGS maintains a gaging station. According to USGS calculations, a 100-year flood will produce a flow of approximately 8,500 cfs. This flow was used for the test flood inflow.

The routing procedure used was developed by the Corps of Engineers and it gave an approximate outflow of 8,450 cfs. The spillway capacity of the dam is approximately 8,800 cfs or 104 percent of the test flood outflow. The test flood will flow over the spillway by 5.9 feet.

Storage behind the dam was assumed to begin at the elevation of the spillway crest. Storage was determined by an average area depth analysis. Capacity curves for the spillway channel assumed a broad crested weir.

5.5 Dam Failure Analysis

A dam failure analysis was performed using the Rule of Thumb method in accordance with guidelines established by the Corps of Engineers. Failure was assumed to occur when the water level in the pond was at the top of the dam.

The spillway discharge just prior to dam failure is 8,800 cfs and will produce a depth of flow of approximately 8.0 feet several hundred feet downstream from the dam. The calculated dam failure discharge is 9,486 cfs and will produce a depth of flow of approximately 8.4 feet immediately downstream from the dam or an increase in water depth at failure of approximately 0.4 feet. The failure analysis covered a distance of approximately 3,000 feet downstream where the depth of flow was calculated to be 4.2 feet.

First floor sills of homes in the impact area are approximately 7 feet above the streambed. Therefore, failure of Lee's Pond Dam under the above conditions will probably not result in the loss of any lives nor damage any property because there will only be a very slight increase in the depth of water.

Dam failure was also assumed to occur when the water level in the pond was at the spillway crest. Failure under this condition would create an instantaneous increase from no flow to flow 4.3 feet deep. Failure of Lee's Pond Dam under these conditions should not cause any loss of life or any economic loss.

SECTION 6 - EVALUATION OF STRUCTURAL STABILITY

6.1 Visual Observations

The general structural stability of the dam is good as evidenced by the vertical, horizontal and lateral alignment. The joints, however, are in poor condition with missing mortar and in some areas there is water seeping through. The abutments are in fair condition with some cracks and joints that need repair. There are areas of the sluice gate and fish ladder where the concrete is in poor condition but structurally they are still sound. The concrete apron is in poor condition.

6.2 Design and Construction Data

The dam was constructed in 1903.

The design and construction data consists of plans showing the installation of the sluice gate and the fish ladder. Upon verification of these plans, the evaluation was based on the visual inspection and these plans.

6.3 Post-Costruction Changes

In 1959, sluice gates were installed and the pond made deeper. In order to do this, the contractor cut through the dam. The contractor blasted to open this cut.

In 1961, a fish ladder was constructed adjacent to the sluice gate and a grouted riprap apron was placed below the spillway.

Subsequent to 1961, at various times, large boulders or riprap were placed in the channel downstream from the sluice gate.

6.4 Seismic Stability

The dam is located in Seismic Zone 1 and in accordance with Recommended Phase I Guidelines does not warrant a seismic analysis.

SECTION 7 - ASSESSMENT, RECOMMENDATIONS AND REMEDIAL MEASURES

7.1 Dam Assessment

a. Condition - After consideration of the available information, the results of the inspection, contact with the owner and hydraulic/hydrologic computations, the general condition of Lee's Pond Dam is poor.

b. Adequacy of Information - The information available is such that assessment of the safety of the dam should be based on the available data, the visual inspection results, past operational performance of the dam and its appurtenant structures and computations developed for this rpeort.

c. Urgency - It is considered that the recommendations and remedial measures suggested below be implemented within one year after receipt of this Phase I Inspection Report.

7.2 Recommendations

The following recommendations should be carried out under the direction of a qualified registered engineer.

a. Seepage through the abutments and the dam should be investigated further to determine its origin and monitored to determine any change.

b. The downstream apron should be repaired or reconstructed.

c. Proper lining at the end of this sluice gate channel should be placed to prevent any further scour.

d. The condition of the wooden sluice gate should be investigated.

e. Cracked and spalled concrete and reinforcement should be repaired as necessary.

Any recommendations made by the engineer should be implemented by the owner.

7.3 Remedial Measures

a. Operation and Maintenance Procedures -

(1) Clear the downstream channel of debris.

(2) Repair all joints in the masonry.

(3) Repair the deck to the catwalk.

(4) Replace missing riprap along the downstream toe.

(5) Replace missing cap stones of the spillway.

(6) Maintain the gate in an operation condition and store the handles where they are easily accessible.

(7) Institute a program of annual technical inspection by a qualified Engineer.

7.4 Alternatives

There are no practical alternatives to the above recommendations.

APPENDIX A

INSPECTION CHECKLIST

INSPECTION CHECK LIST

PARTY ORGANIZATION

PROJECT Lee's Pond Dam

DATE 5-30-80

TIME 9:30 a.m.

WEATHER Fair

W.S. ELEV._____ U.S.____ DN.S.

PARTY:

1. J. F. Schearer, SE, Civil
2. K. J. Pudeler, SE, Civil
3. G. J. Giroux, SE, Hyd/Civil
4. P. Austin, DBA, Civil
5. M. Haire, DBA, Civil
6. J. Pozzato, MA, Mech.
7.
8.
9.
10.

	PROJECT FEATURE	INSPECTED BY	REMARKS
1.	Dam Enbankment	G. Giroux M. Haire	Fair
2.	Mechanical	J. Pozzato	Fair
3.	Spillway	G. Giroux K. Pudeler	Fair
4.	Discharge Channel	P. Austin	Poor
5.			
6.			
7.			
8.			
9.			
10.			

INSPECTION CHECK LIST

PROJECT Lee's Pond Dam DATE 5-30-80

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITIONS
DAM EMBANKMENT	
Crest Elevation	Poor
Current Pool Elevation	Poor
Maximum Impoundment to Date	Unknown
Surface Cracks	N/A
Pavement Condition	N/A
Movement or Settlement of Crest	Blocks along first course of spillway missing
Lateral Movement	None
Vertical Alignment	Good
Horizontal Alignment	Good
Condition at Abutment and at Concrete Structures	Mortor missing at bottom of abutment; some cracking / Poor
Indications of Movement of Structural Items on Slopes	None observed
Trespassing on Slopes	Problem
Vegitation on Slopes	N/A
Sloughing or Erosion of Slopes or Abutments	None observed
Rock Slope Protection - Riprap Failures	None
Unusual Movement or Cracking at or near Toes	Underwater Evidence of undermining of apron
Unusual Embankment or Downstream Seepage	Yes - through abutment & dam
Piping or Boils	None observed
Foundation Drainage Features	None
Toe Drains	None
Instrumentation System	None

INSPECTION CHECK LIST

PROJECT Lee's Pond Dam DATE 5-30-80

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITION
OUTLET WORKS - INTAKE CHANNEL AND INTAKE STRUCTURE	Underwater
a. Approach Channel	
Slope Conditions	
Bottom Conditions	
Rock Slides or Falls	
Log Boom	
Debris	
Condition of Concrete Lining	
Drains or Weep Holes	
b. Intake Structure	
Condition of Concrete	Fair
Stop Logs and Slots	

INSPECTION CHECK LIST

PROJECT Lee's Pond Dam DATE 5-30-80

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITION
OUTLET WORKS - CONTROL TOWER	None
a. Concrete and Structural	
General Condition	
Condition of Joints	
Spalling	
Visible Reinforcing	
Rusting or Staining of Concrete	
Any Seepage or Efflorescence	
Joint Alignment	
Unusual Seepage or Leaks in Gate Chamber	
Cracks	
Rusting or Corrosion of Steel	
b. Mechanical and Electrical	
Air Vents	
Float Wells	
Crane Hoist	
Elevator	
Hydraulic System	
Service Gates	Operable - according to owner
Emergency Gates	
Lightning Protection System	
Emergency Power System	
Wiring and Lighting System in Gate Chamber	

INSPECTION CHECK LIST

PROJECT Lee's Pond Dam DATE 5-30-80

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITION
OUTLET WORKS - TRANSITION AND CONDUIT	N/A
General Condition of Concrete	
Rust or Staining on Concrete	
Spalling	
Erosion or Cavitation	
Cracking	
Alignment of Monoliths	
Alignment of Joints	
Numbering of Monoliths	

INSPECTION CHECK LIST

PROJECT Lee's Pond Dam DATE 5-30-80

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITION
OUTLET WORKS - SPILLWAY WEIR, APPROACH AND DISCHARGE CHANNELS	
a. Approach Channel	Underwater
General Condition	
Loose Rock Overhanging Channel	
Trees Overhanging Channel	
Floor of Approach Channel	
b. Weir and Training Walls - Mortared Stone	
General Condition ~~of Concrete~~	Poor
Rust or Staining	N/A
Spalling	N/A
Any Visible Reinforcing	N/A
Any Seepage or Efflorescence	Yes - fairly extensive
Drain Holes	None
c. Discharge Channel	
General Condition	Fair
Loose Rock Overhanging Channel	None
Trees Overhanging Channel	Few further downstream
Floor of Channel	Very rocky
Other Obstructions	Large piece of mortared stone at bottom of dam 4' in diameter.

INSPECTION CHECK LIST

PROJECT Lee's Pond Dam DATE 5-30-80

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITION
OUTLET WORKS - OUTLET STRUCTURE AND OUTLET CHANNEL	
General Condition of Concrete	Fair
Rust or Staining	None
Spalling	Yes - westerly side
Erosion or Cavitation	None
Visible Reinforcing	Yes - westerly side
Any Seepage or Efflorescence	None
Condition at Joints	Good
Drain holes	None
Channel	Good
Loose Rock or Trees Overhanging Channel	None
Condition of Discharge Channel	Fair - largescour hole at end of concrete 5' deep

INSPECTION CHECK LIST

PROJECT Lee's Pond Dam DATE 5-30-80

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITION
OUTLET WORKS - SERVICE BRIDGE	
a. Super Structure	
Bearings	N/A
Anchor Bolts	N/A
Bridge Seat	Fair
Longitudinal Members	Rusted
Under Side of Deck	N/A
Secondary Bracing	N/A
Deck	Poor
Drainage System	N/A
Railings	None
Expansion Joints	None
Paint	None
b. Abutment & Piers	
General Condition of Concrete	Good
Alignment of Abutment	Good
Approach to Bridge	Poor
Condition of Seat & Backwall	Good

APPENDIX B

ENGINEERING DATA

Information pertaining to the history, maintenance and modification to Lee's Pond Dam as well as copies of past reports are located at:

State of Connecticut
Department of Environmental Protection
Water Resources Section
State Office Building
Hartford, Connecticut 06115

CLARENCE BLAIR ASSOCIATES, INC.

Civil Engineers

P. O. BOX 236 SPRUCE 7-7279

93 WHITNEY AVENUE — NEW HAVEN, CONN.

ROGER C. BROWN
JAMES C. BEACH
FRANK BASAINI

CHARLES E. AUGUR, JR.
GORDON SILIDES
JOHN M. BREST
DONALD L. DISBROW
NICHOLAS PIPERAS, JR.

WATER SUPPLY
SEWAGE DISPOSAL
WASTE DISPOSAL
SURVEYS
LAND DEVELOPMENT

January 4, 1962

Mr. William S. Wise, Director
State Water Resources Commission
650 Main Street
Hartford 15, Connecticut

Re: Dam # 20 - SA 3.4
Lees Pond - Saugatuck River

Dear Mr. Wise:

On Thursday, December 21, 1961 I accompanied Mr. Joseph W. Cone on an inspection of Lees Pond Dam on the Saugatuck River. My presence at this inspection was at the request of Mr. Cone and was authorized by you over the telephone on December 19th.

At the time of our visit the pond level was down several feet below the crest of the dam and the sluice gate was partially open and was discharging a flow estimated at 140 ± cfs.

The surface of the area immediately below the dam was eroded to such an extent as to make it evident that flow over the spillway had taken place recently.

The discharge from the sluiceway at the time of our inspection had a high velocity and was causing extremely turbulent conditions in the stream immediately downstream from the end of the sluiceway and around the lower end of the fishway structure.

The force of water after it left the sluiceway had apparently excavated a hole of some depth in the bottom of the channel. Some of this excavated material was deposited in the channel a short distance downstream where it formed a partial obstruction to the flow and caused back eddies. There was a noticeable current proceeding upstream along the east bank of the channel and from east to west across the downstream wall of the fishway.

Erosion along the two sides of the channel and at the downstream end of the sluiceway is very noticeable. I was particularly disturbed by the erosion that had taken place at the toe of the dam at the point where it abuts the west wall of sluiceway. This is shown in photograph # 5 taken by Mr. Cone on December 21, 1961. Erosion here has uncovered what may be the bottom of the dam. If this is the bottom of the dam, then the bottom of the channel in the depression excavated by the flow from the sluiceway is well below the bottom of the dam. In my opinion the condition which existed at the time of my visit constitutes a threat to the safety of the structure. Erosion has taken place to the extent that the downstream end of the foundations of the fishway and the sluiceway are in danger of being undermined. Such erosion will continue when the sluiceway is discharging as it was at the time of my visit.

If the sluice gates were closed and the flow of the stream allowed to go over the crest, I believe that the erosive action would be somewhat lessened. However, it would still be serious, judging from the gulleys which were formed when water recently did go over the crest. The water flowing over the crest tends

to concentrate in the deeper channel and the cross currents leading to the channel have eroded the gulleys shown in Mr. Cone's photographs 4 and 5. This condition is most critical in the area just east of the east wall of the fishway and in the area west of the sluiceway.

Whether the flow of the stream is being discharged thru the sluiceway or over the crest, the most serious erosion takes place adjacent to the new construction of the sluiceway and fishway and is progressing upstream toward the toe of the dam.

In my opinion, this erosion will have to be stopped and this will require the installation of heavy paving on the bottom and side slopes of the deep channel and also along the west side of the sluiceway and east side of the fishway. Such paving should extend downsteam far enough to prevent any possibility of erosion working back to the dam or its appurtenances.

Such permanent paving must be placed in the dry with proper bedding and therefore will have to be done during a period of low stream flow when the flow of the stream can either be stored in the pond or carried over the work area in a flume.

In the meantime, I would suggest that heavy gravel and stone fill be dumped into the channel and the eroded areas in an attempt to halt the erosion until permanent paving can be placed.

Very truly yours,

Roger C Brown

Roger C. Brown

CLARENCE BLAIR ASSOCIATES, INC.

RCB:mmg
cc: Mr. Joseph W. Cone

BUCK & BUCK

ENGINEERS

98 WADSWORTH STREET, HARTFORD, CONNECTICUT 06106

JAMES A. THOMPSON
ROBINSON W. BUCK
LAWRENCE P. BUCK

HENRY WOLCOTT BUCK
1921-1965
ROBINSON D. BUCK
1925-1959

COMM. 5713-58

November 8, 1972

Mr. William H. O'Brien III,
Water & Related Resources Section,
Department of Environmental Protection,
State Office Building,
Hartford, Connecticut

Subject: Lee's Pond Dam
Saugatuck River,
Westport, Connecticut

Dear Bill:

We inspected the subject dam yesterday and found the water level very low. Workmen were doing some patching of eroded concrete on the fish ladder and the timber work in the ladder itself had been replaced. With the river at low flow, the entire spillway and its downstream apron were completely exposed. The downstream apron, which is composed of boulders and stones with a slurry concrete, had been eroded and undermined severely in several locations, both to the East and West of the fish ladder. We also noted that several mortar joints in the step spillway have been severely eroded and adjacent to the East abutment, one stone has come loose and dropped out of place.

The spillway of this structure, by its very nature, creates very turbulent water across its section and immediately downstream. Erosion or undermining of the apron will create further turbulence and thus accelerate the rate of erosion. Because of this acceleration effect, and because of the difficulty in inspecting the structure once water is passing over it, we strongly recommend that the owner repair the above mentioned deficiencies, before being permitted to impound water again.

Sincerely,

BUCK & BUCK

James A. Thompson

James A. Thompson

JAT:fb

REPORT AND RECOMMENDATIONS

to

State of Connecticut
for
Lee Pond Dam
Westport, Connecticut

869-0136

ESTABLISHED 1887

S. E. MINOR & CO., INC.
CIVIL ENGINEERS
161 MASON STREET
GREENWICH, CONNECTICUT 06830

November 20, 1974

State of Connecticut
Department of Environmental Protection
State Office Building
Hartford, Connecticut 06115

Attention: Mr. Victor F. Galgowski
Superintendent of Dam Maintenance
Water and Related Resources

Re: Lee Pond Dam
Westport, Connecticut

Dear Mr. Galgowski:

In accordance with your request, we have visited the site and examined the subject dam in order to ascertain its structural soundness and stability. Prior to our visit to the site, I contacted one of the present owners; namely, Nat H. Greenburg at Westport, Connecticut in order to ascertain the extent of repairs completed by him. He advised me that approximately one year ago they completed rather extensive repairs to the concrete base and also replaced several of the stone steps in the general vicinity of the fish ladder. Mr. Greenburg indicated to me that this work was completed approximately one year ago and was supervised by an engineer retained by him. I do not at this time have the name of the supervising engineer, but Mr. Greenburg advised me that he would dig into his records and advise us of same should it be required.

We have prepared a drawing of the subject dam based on field sketches made at the time of our visit. It should be pointed out that the dimensions are only approximate since we were unable to obtain actual field measurements during our visit. There were several areas (minor in size) where evidence of partial erosion or falling out of some stones has occurred. Said areas

are indicated on the enclosed plan. I would recommend that these areas be rechinked in the near future to prevent any further erosion. At the time of our inspection, there was a substantial flow over the dam which prevented a thorough investigation of the back of the dam. It appears to us that the dam is a structurally sound one and that its stability is certainly acceptable. There was no evidence of spalling or deterioration of the concrete portion of the dam.

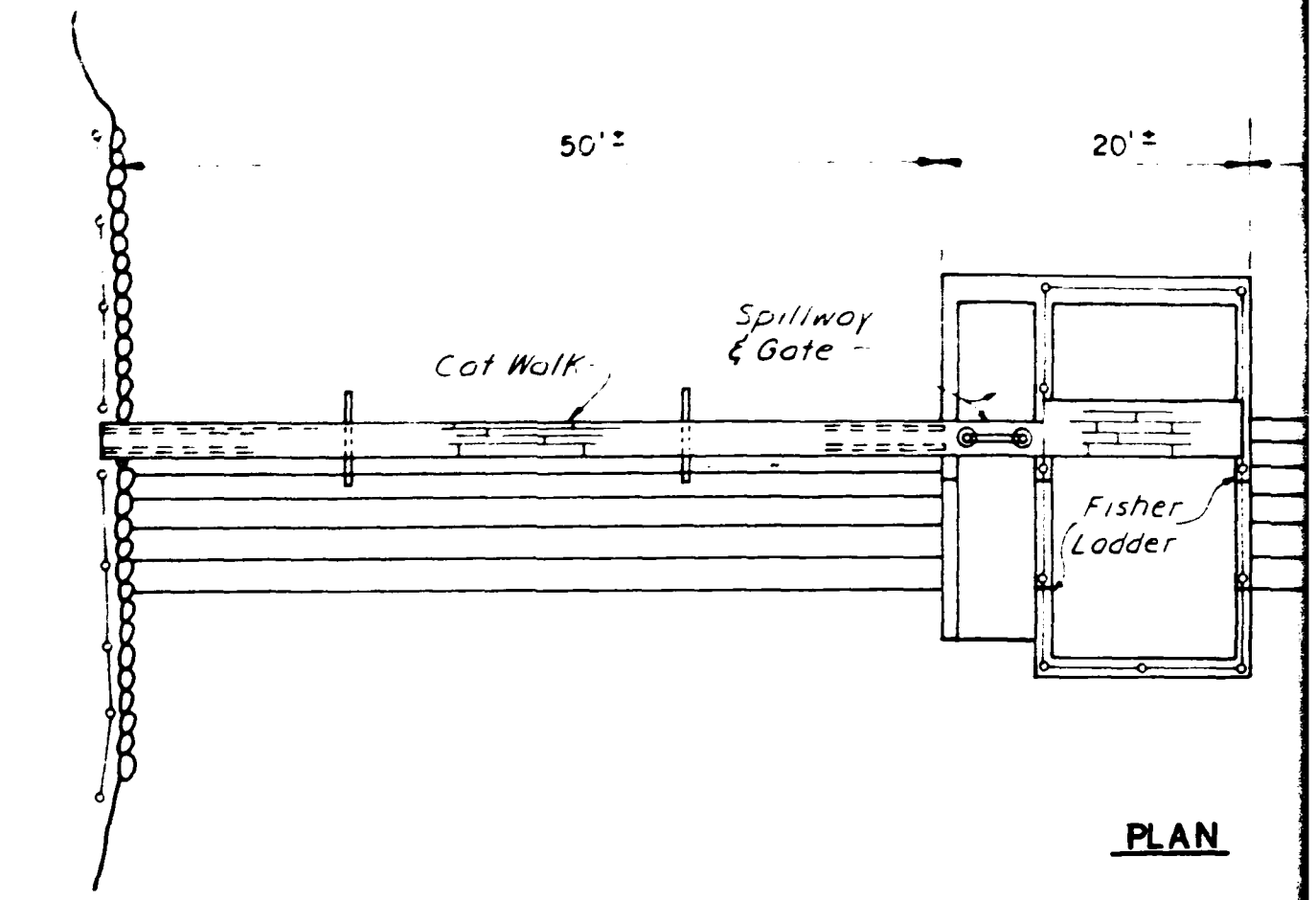
It is our considered opinion that the aforementioned maintenance steps should be taken in the relatively near future and that a normal preventive maintenance check be conducted annually in order to insure the continued structural soundness of the dam.

Respectfully submitted,

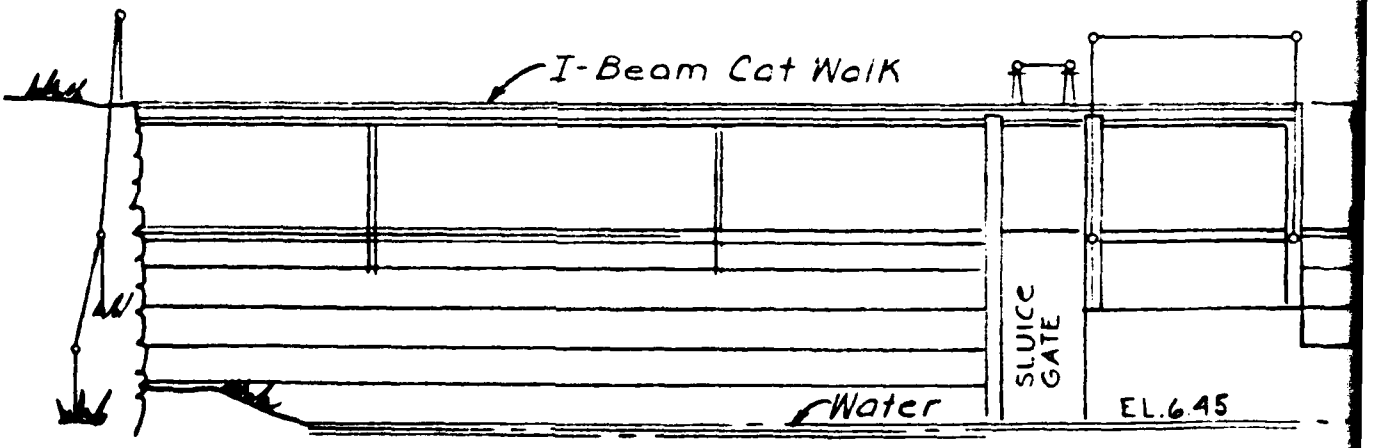
S. E. MINOR & CO., INC.

Edward F. Ahneman, Jr., P.E.
Chief Engineer

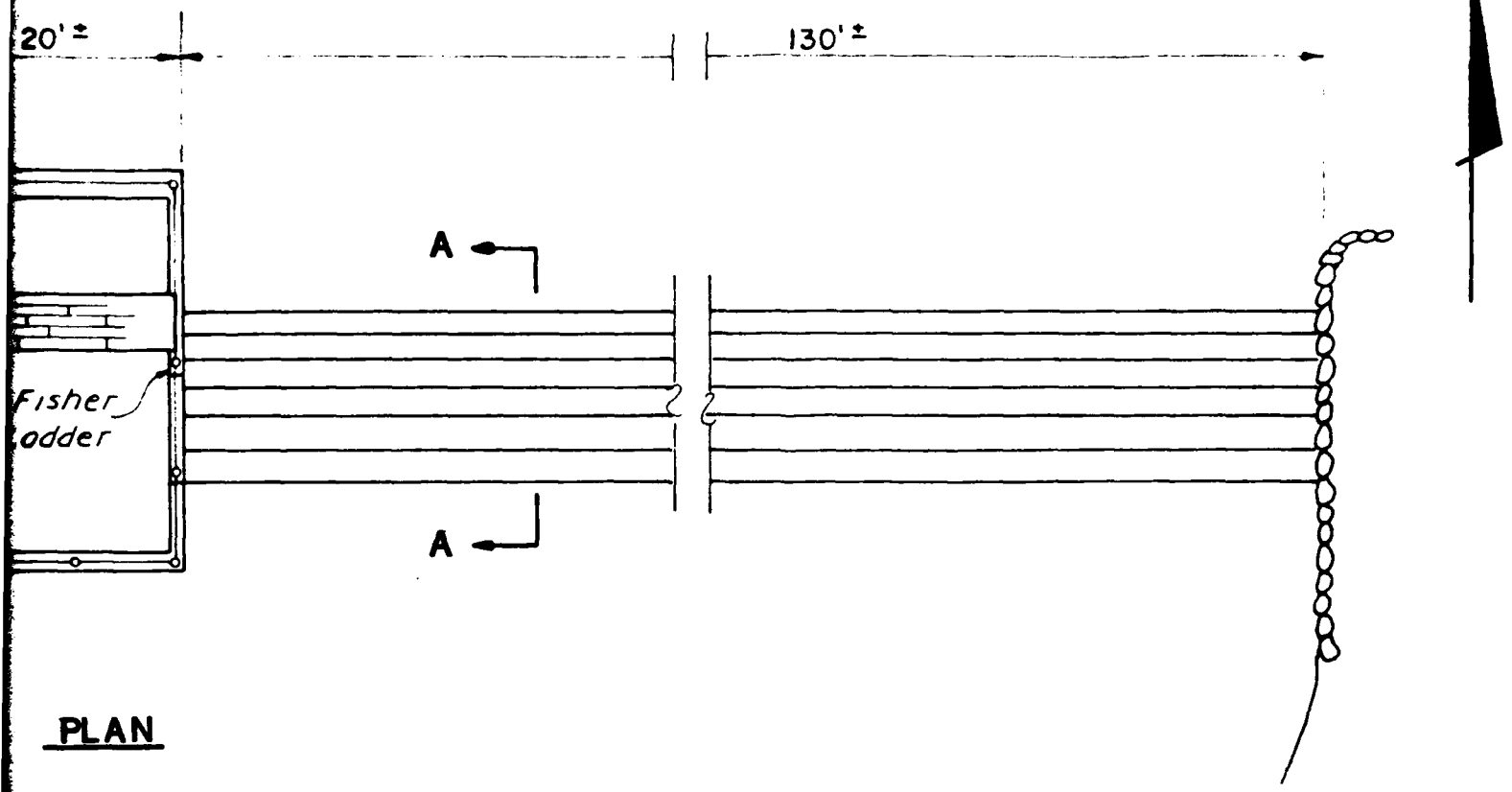
EFA:lb
Enclosure



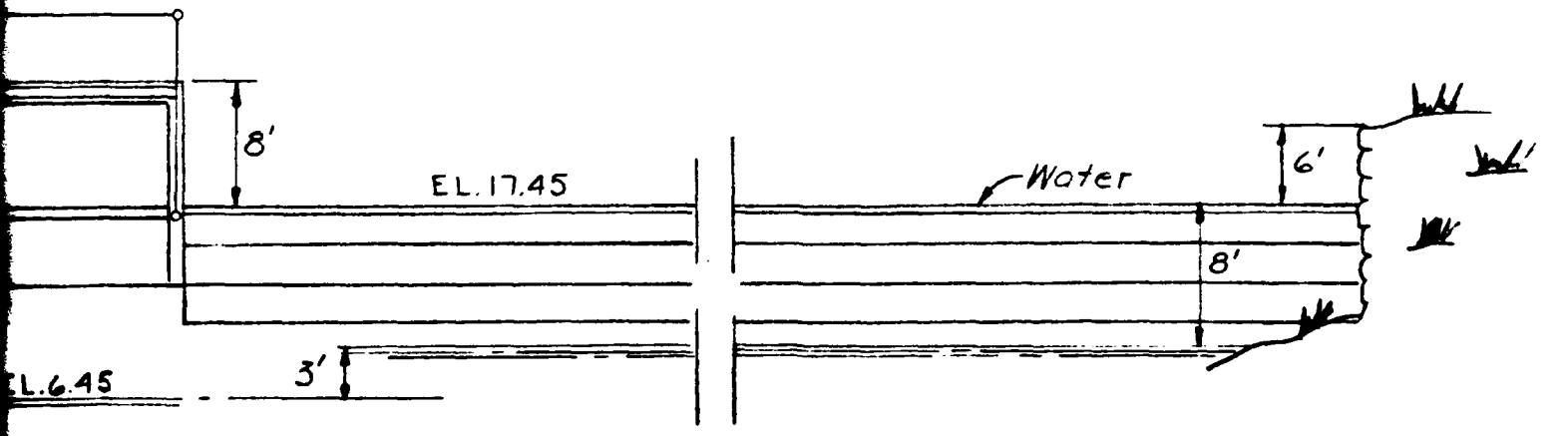
PLAN



ELEVATION



PLAN



ELEVATION

scale: 3/32"=1'-0"

PLATE 1

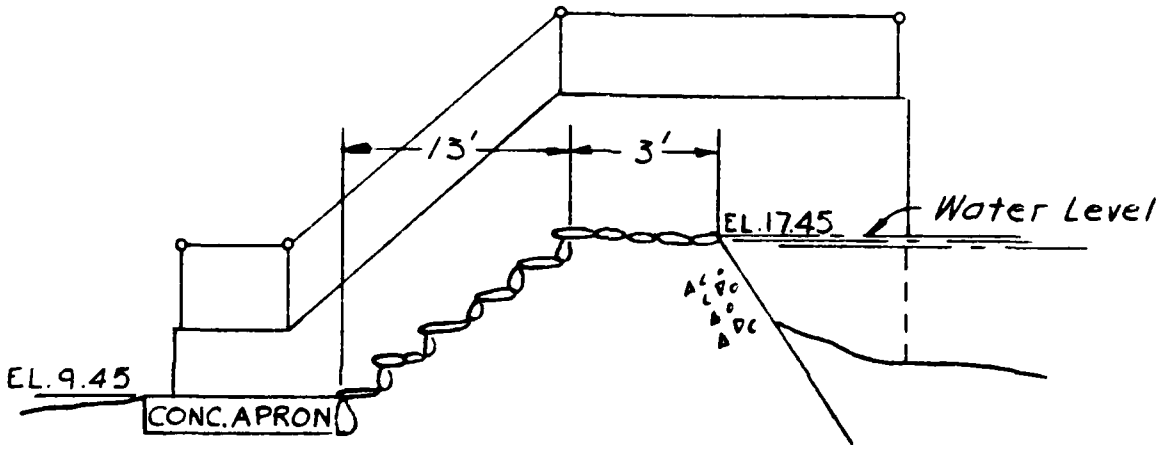
STORCH ENGINEERS WETHERSFIELD, CONNECTICUT	U.S. ARMY ENGINEER DIV NEW ENGLAND CORPS OF ENGINEERS WALTHAM MASS

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

LEE'S POND DAM

2

			SCALE AS SHOWN
			DATE SEPTEMBER 1980



ASSUMED SECTION A-A

not to scale

PLATE 2

STORCH ENGINEERS WETHERSFIELD, CONNECTICUT	U.S. ARMY ENGINEER DIV NEW ENGLAND CORPS OF ENGINEERS WALTHAM MASS

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

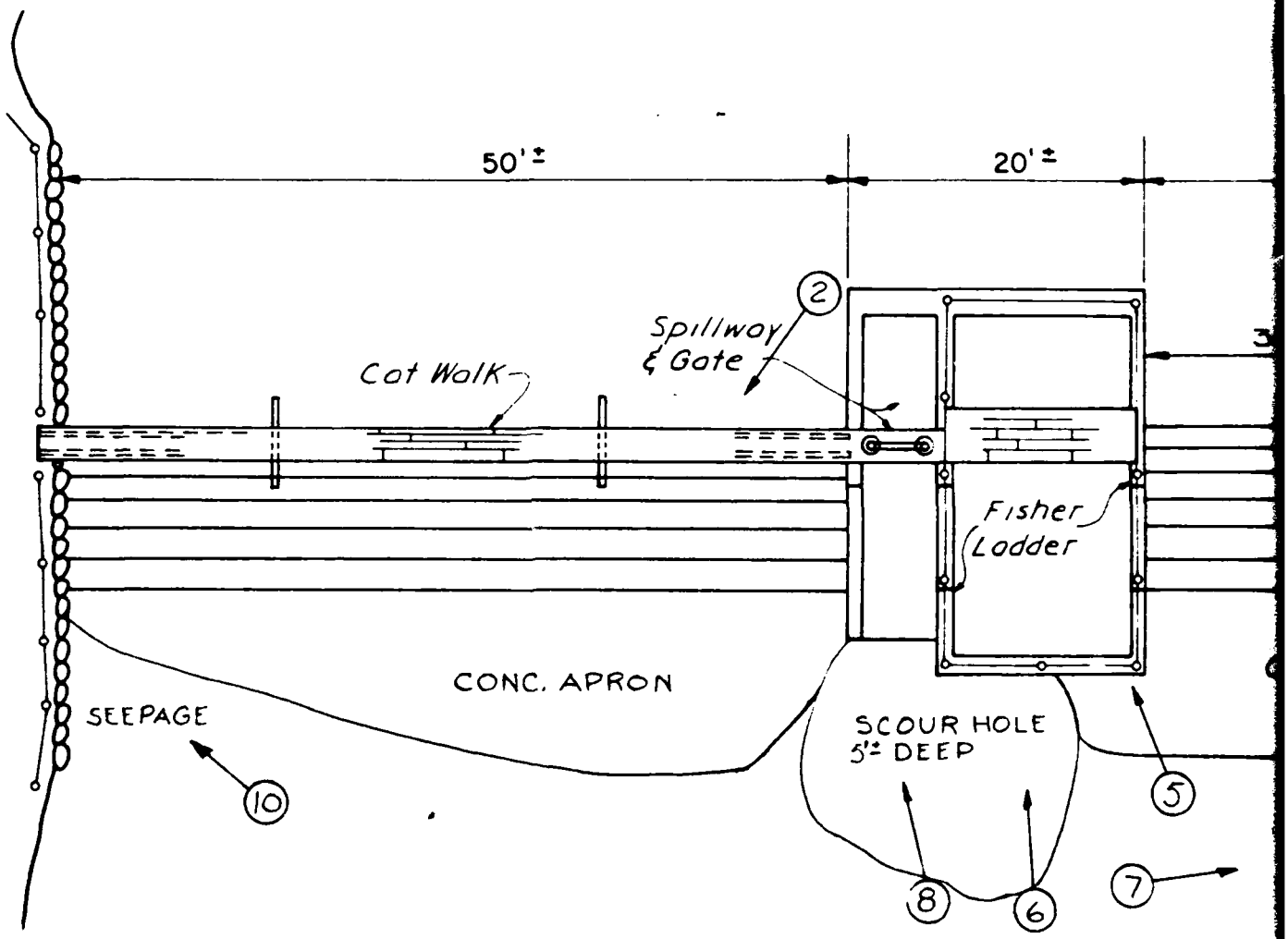
LEE'S POND DAM

SCALE AS SHOWN

DATE SEPTEMBER 1980

APPENDIX C

PHOTOGRAPHS


50'±
20'±
2
Spillway & Gate
Cat Walk
Fisher Ladder
CONC. APRON
SEEPAGE
10
SCOUR HOLE 5'± DEEP
5
8
6
7

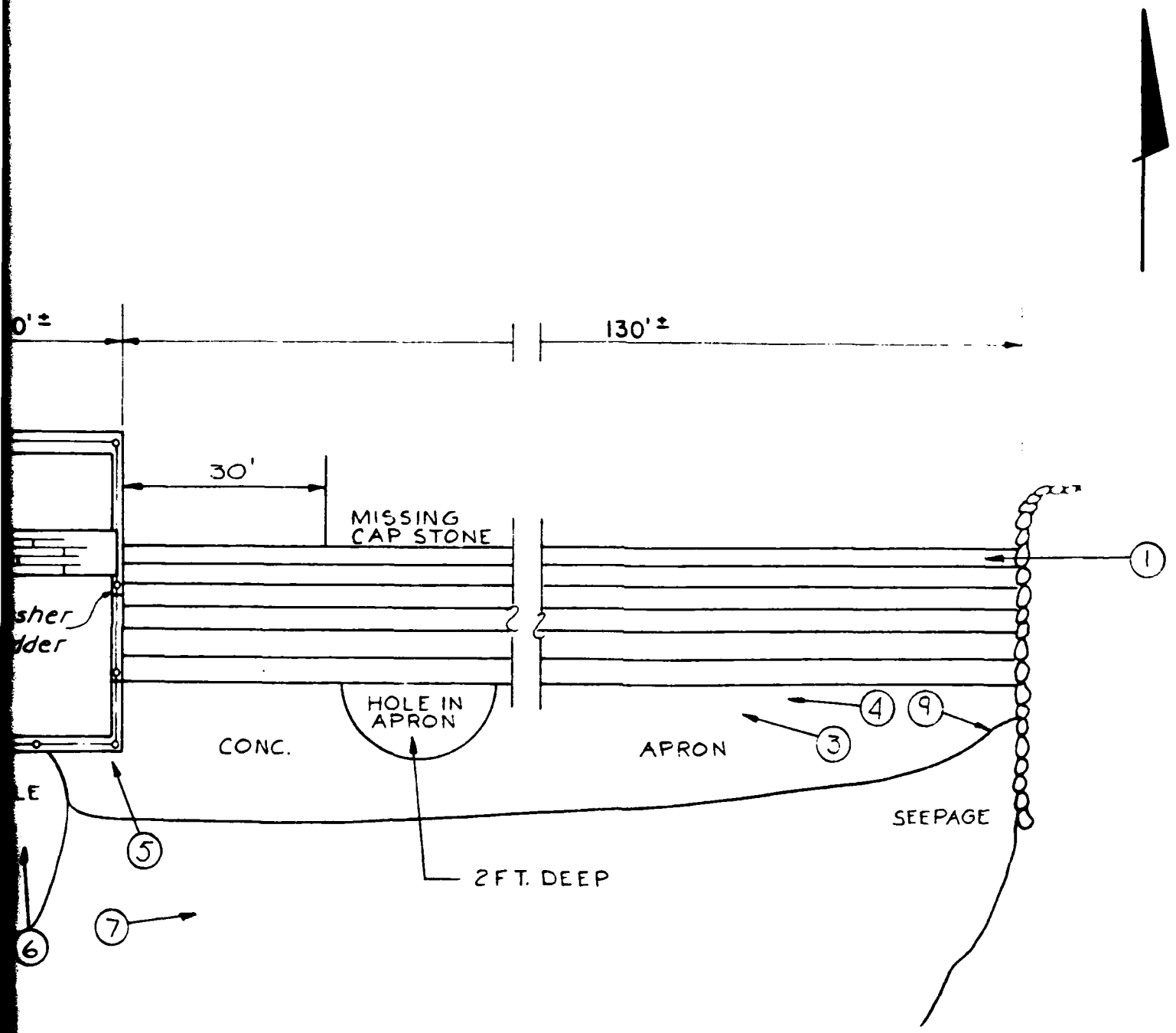


PHOTO LOCATION PLAN

PLATE 3

STORCH ENGINEERS WETHERSFIELD, CONNECTICUT	U.S. ARMY ENGINEER DIV NEW ENGLAND CORPS OF ENGINEERS WALTHAM MASS

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

LEE'S POND DAM

2

SCALE AS SHOWN

DATE SEPTEMBER 1980

PHOTO 1

SPILLWAY CREST LOOKING WEST

PHOTO 2

SPILLWAY CREST LOOKING WEST

PHOTO 3

SPILLWAY CREST - MISSING CAP STONES

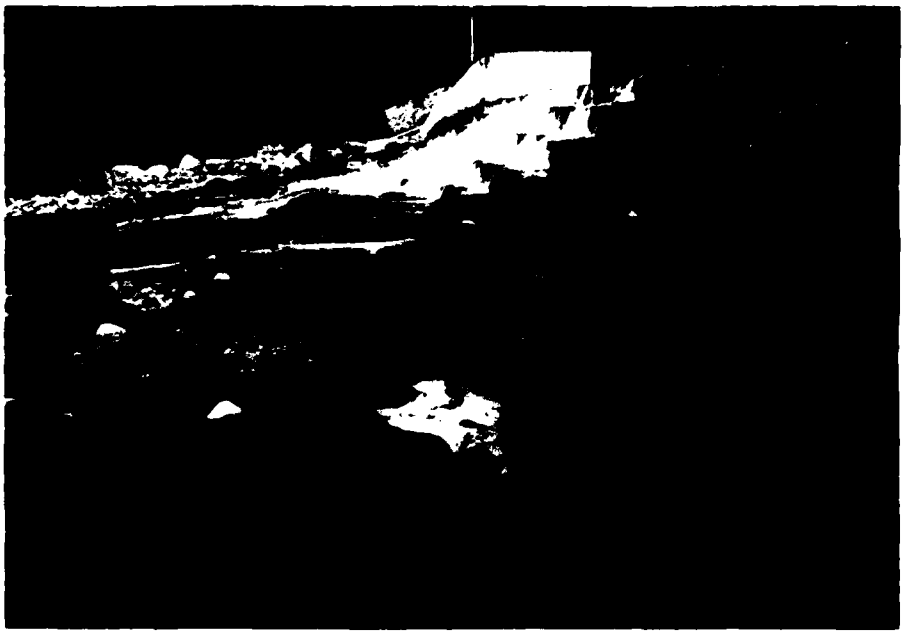


PHOTO 4

SPILLWAY APRON

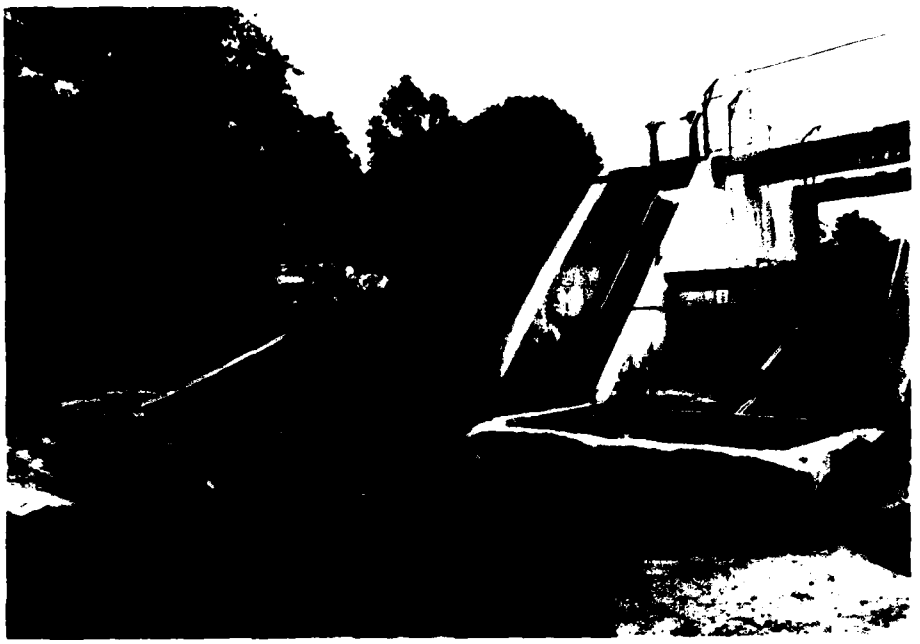


PHOTO 5

SPILLWAY APRON SCOUR POOL

PHOTO 6

SLUICE GATE - FISHLADDER

PHOTO 7

SPILLWAY APRON LOOKING EAST

PHOTO 8

SPILLWAY APRON

PHOTO 9

SEEPAGE EAST ABUTMENT

PHOTO 10

SEEPAGE WEST ABUTMENT

APPENDIX D

HYDROLOGIC AND HYDRAULIC COMPUTATIONS

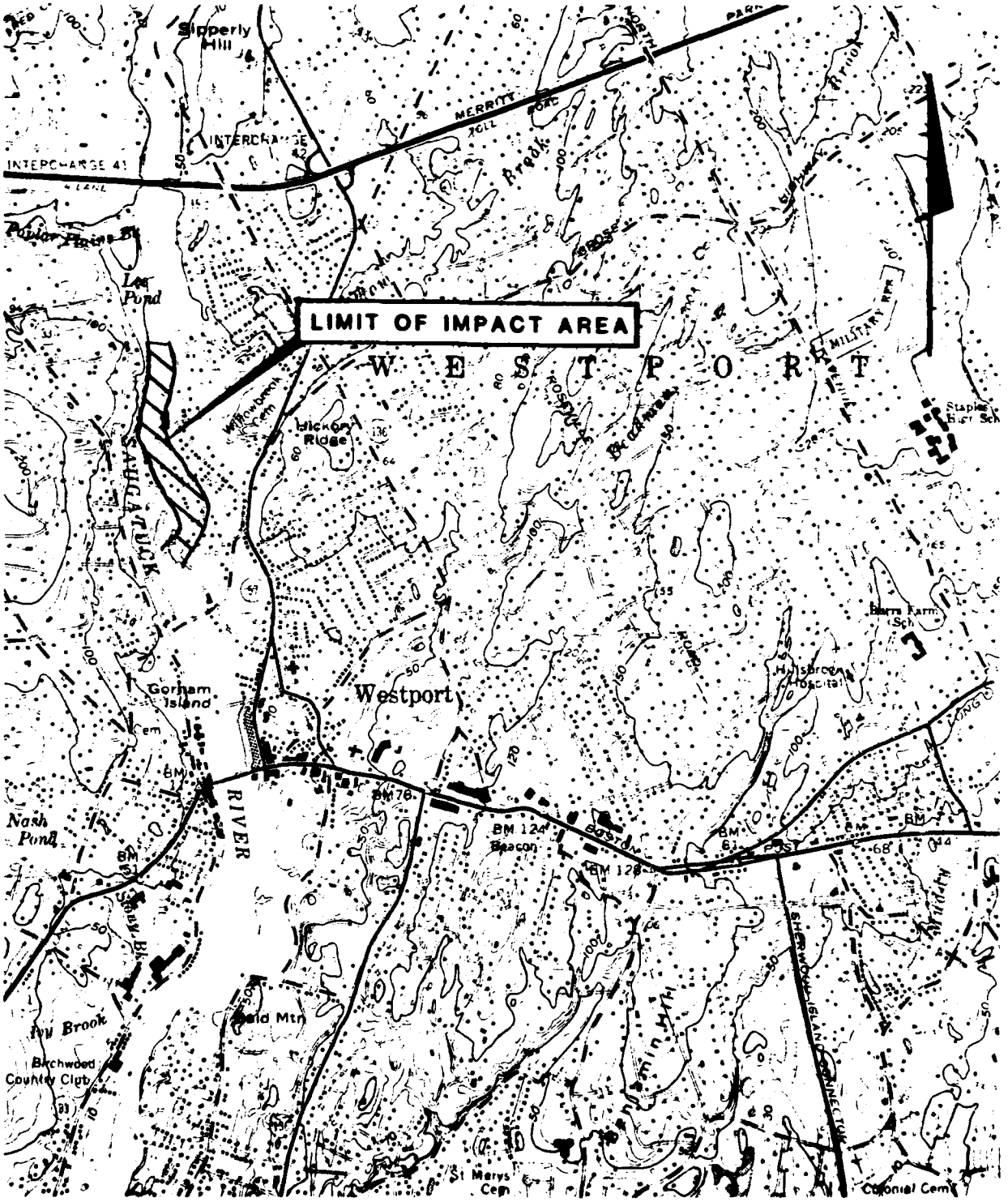


PLATE 4

STORCH ENGINEERS WETHERSFIELD, CONNECTICUT	U.S. ARMY ENGINEER DIV NEW ENGLAND CORPS OF ENGINEERS WALTHAM MASS

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

LEE'S POND DAM

			SCALE AS SHOWN
			DATE SEPTEMBER 1980

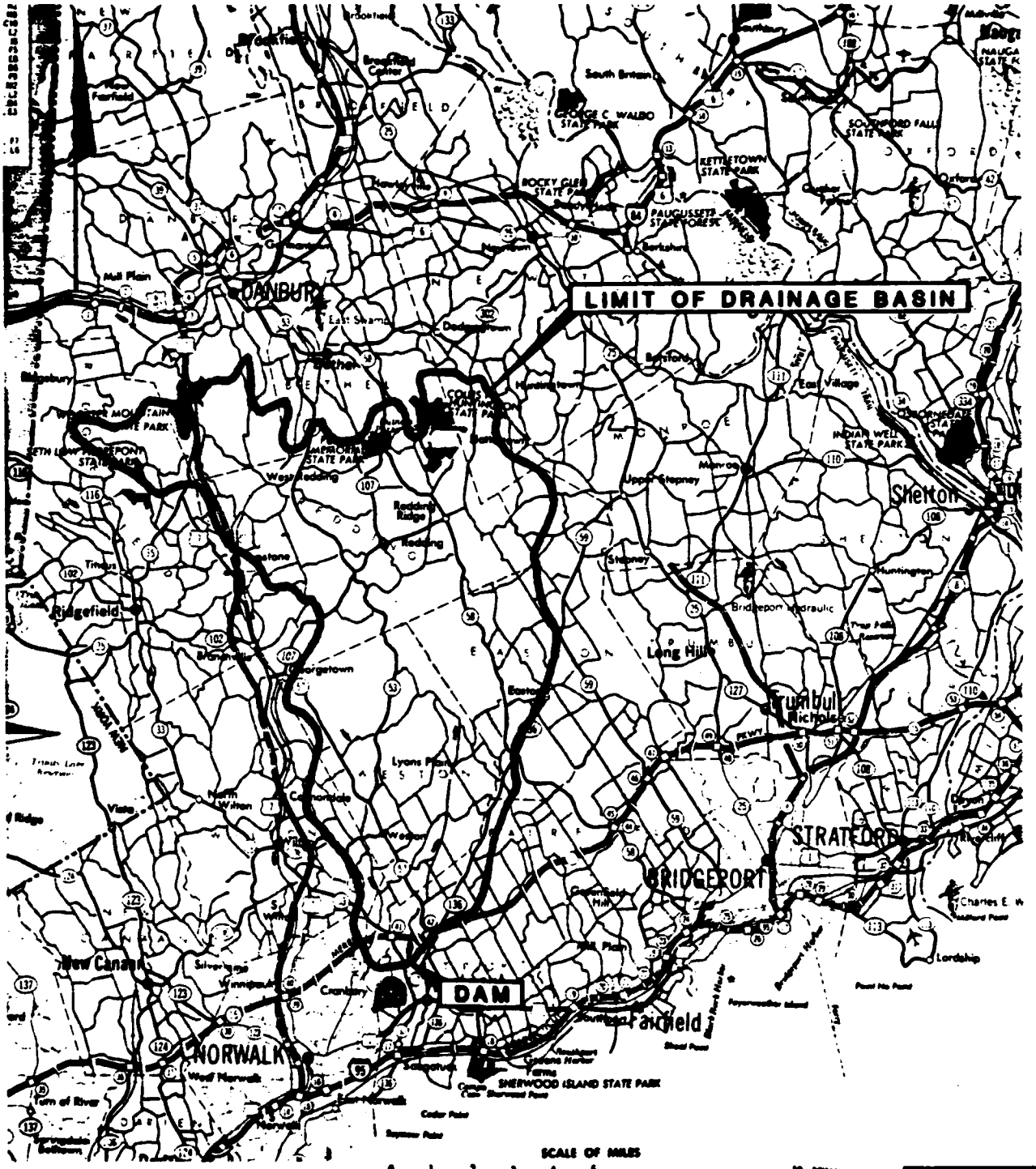


PLATE 5

STORCH ENGINEERS WETHERSFIELD, CONNECTICUT	U.S. ARMY ENGINEER DIV NEW ENGLAND CORPS OF ENGINEERS WALTHAM MASS

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

LEE'S POND DAM

SCALE AS SHOWN

DATE SEPTEMBER 1980

STORCH ENGINEERS
Engineers · Landscape Architects
Planners · Environmental Consultants

JOB Phase I Dam Inspection - #4463
SHEET NO _____ OF _____
CALCULATED BY GJG DATE 6/24/80
CHECKED BY RDC DATE 8/21/80

Determination of Test Flood

NAME OF DAM Lee's Pond Dam

DRAINAGE AREA 77.5 SM Saugatuck Res Controls 35.5 SM
Net DA = 24.4 SM Aspetuck Res Controls 17.6 SM

INFLOW Small size - Low Hazard - 100 yr flood

from USGS gage located approximately 2000 ft upstream

Q_{100} = 8500 cfs

Estimating the effect of surcharge storage on the Maximum Probable Discharges

1. Q_{P1} = 8500 cfs

2a. H_1 = 5.9 (elev.)

b. $STOR_1$ = .04"

c. $Q_{P2} = Q_{P1}(1 - STOR_1/5.0)$ = 8425 cfs

3a. H_2 = 5.8" $STOR_2$ = .04"

b. $STOR_A$ = .04

Q_{PA} = 8460

H_A = 5.85' $STOR_A$ = .04"

Test Flood = 8460 cfs

Capacity of the spillway when the pond elevation is at the top of the dam

Q = 8800 cfs or 104 % of the Test Flood

STORCH ENGINEERS
Engineers - Landscape Architects
Planners - Environmental Consultants

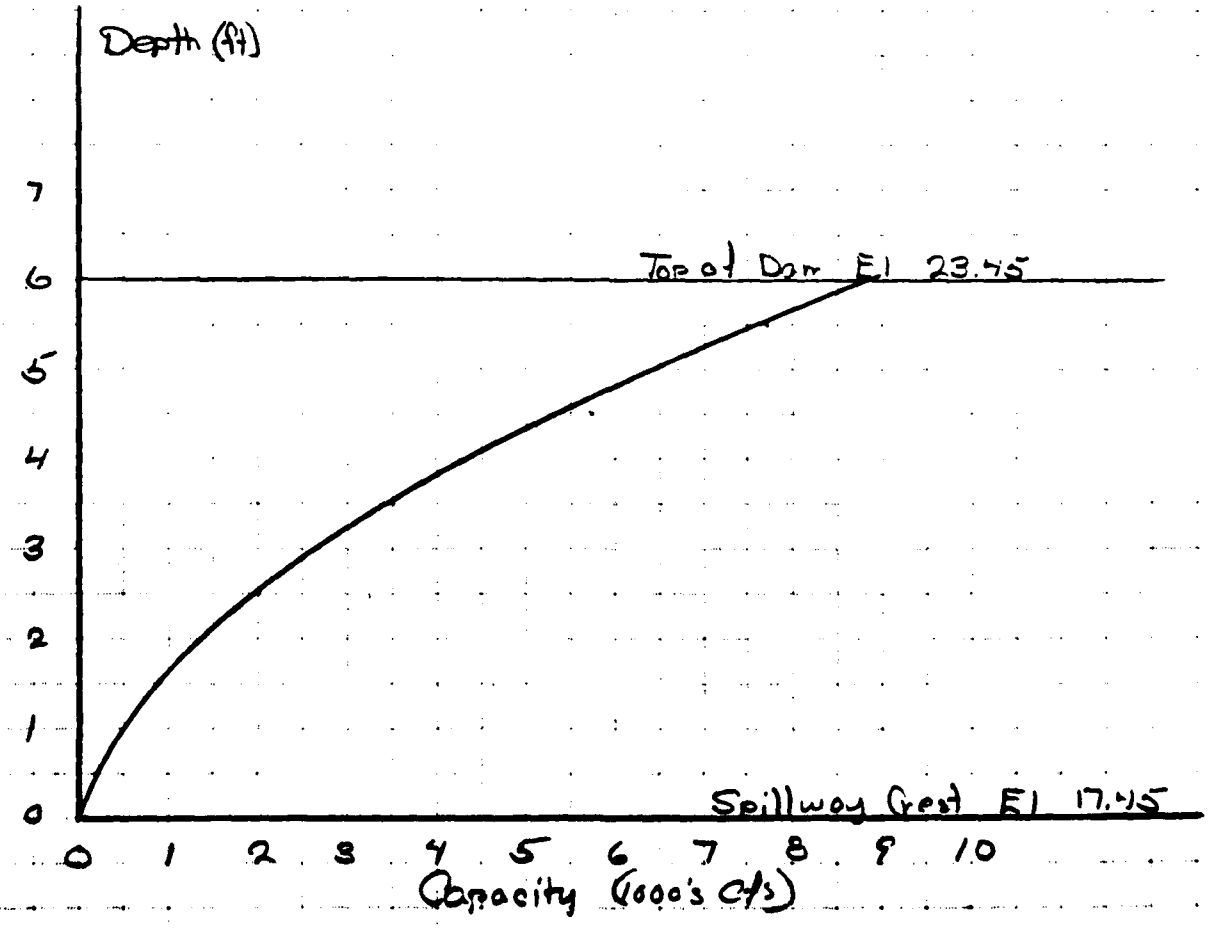
JOB Phase I Dam Inspection 4463
SHEET NO _____ OF _____
CALCULATED BY GJG DATE 6/20/80
CHECKED BY _____ DATE _____

Stage Discharge

NAME OF DAM Lee's Pond Dam

$Q = CLH^{3/2}$

	Spillway I				Spillway II				Dam				
Elev	C	L	H	Q	C	L	H	Q	C	L	H	Q	QT
17.45		190	0	0									
18.0	2.6		.55	190									
19.0	2.66		1.5	890									
20.0	2.81		2.5	2000									
21.0	2.97		3.5	3500									
22.0	3.32		4.5	5700									
23.0	3.32		5.5	7700									
23.45	3.32		6.0	8800									



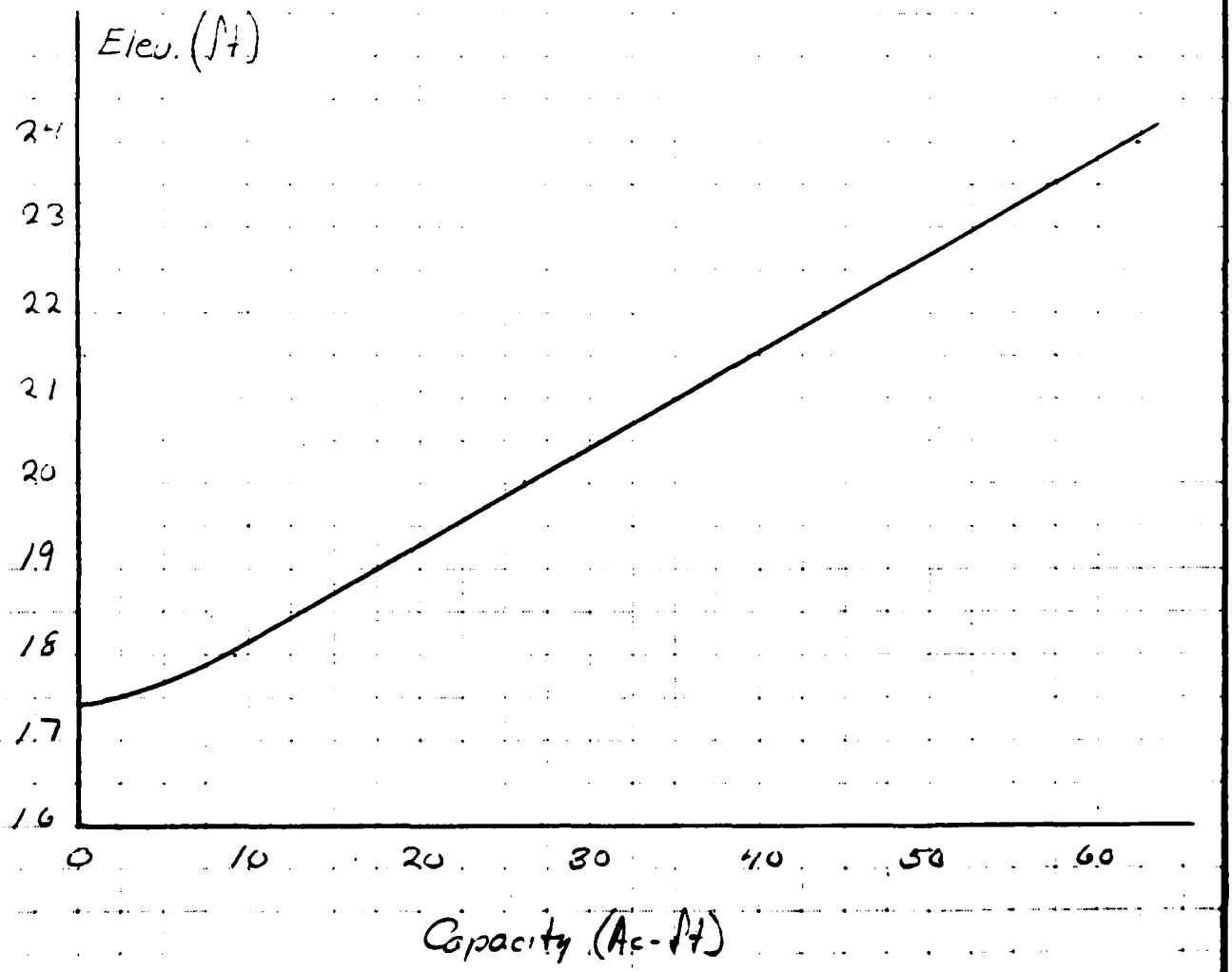
STORCH ENGINEERS
Engineers - Landscape Architects
Planners - Environmental Consultants

JOB Phase I Dam Inspection 4463
SHEET NO _____ OF _____
CALCULATED BY GJG DATE 6/20/80
CHECKED BY _____ DATE _____

AREA - CAPACITY

Name of Dam: Lee's Pond Dam

ELEV	DEPTH	AREA	AVG. AREA	VOL	Σ VOL
17.45		16.8			0
	.55		16.8	9.24	
18.0		16.5			9.24
	1.0		17.0	17.0	
20.0		17.2			26.24
	1.0		17.6	17.6	
22.0		18.0			43.84
	1.0		18.5	18.5	
23.0		19.0			62.34



STORCH ENGINEERS
Engineers - Landscape Architects
Planners - Environmental Consultants

JOB Phase I Dam Inspection - #4463
SHEET NO _____ OF _____
CALCULATED BY GJG DATE 6/17/80
CHECKED BY EJC DATE 6/17/80
Downstream Hydrographs

"Rule of Thumb" Guidance for Estimating Downstream Failure Hydrographs

NAME OF DAM Lee's Pond Dam

Section I at Dam

1. $S = \frac{96.3}{8/27\ W_b\sqrt{g}}$ Acft
2. $Q_{p1} = 8/27\ W_b\sqrt{g}\ Y^{3/2} = 8/27\ (89)\sqrt{822}\ (17)^{1.5} = 9430$ cfs
3. See Sections

Section II at

4a. H_2 = 8.4' A_2 = 3000 SF L_2 = 500' V_2 = 34.4 Acft

b. $Q_{p2} = Q_{p1}\ (1-V_2/S)$ = 6061 cfs

c. H_2 = 6.9' A_2 = 2400 SF

A_A = 2700 SF V_2 = 31 Acft

$Q_{p2} = 9430(1 - 31/96.3) = 6395$ cfs

Section III at

4a. H_3 = 7.0' A_3 = 2450 SF L_3 = 500' V_3 = 28.1 Acft

b. $Q_{p3} = Q_{p2}\ (1-V_3/S)$ = 3645 cfs

c. H_3 = 5.6' A_3 = 1750 SF

A_A = 2100 SF V_3 = 24.1 Acft

$Q_{p3} = 6395\ (1 - 24.1/65.3) = 4035$ cfs

Section IV at

4a. H_4 = 5.7' A_4 = 1800 SF L_4 = 500' V_4 = 20.7 Acft

b. $Q_{p4} = Q_{p3}(1-V_4/S)$ = 2010 cfs

c. H_4 = 4.4 A_4 = 1250 SF

A_A = 1525 SF V_4 = 17.5 Acft

$Q_{p4} = 4035\left(1 - 17.5/41.2\right) = 2320$

Downstream Hydrographs (Continued)

Section V at

4a. H_5 = 4.6' A_5 = 1400 SF L_5 = 600' V_5 = 16.1 Acft

b. $Q_{P5} = Q_{P4}(1-V_5/S)$ = 745 cfs

c. H_5 = 3.0 A_5 = 650 SF

A_A = 1025 SF V_5 = 11.8 Acft

Q_{P5} = 2320 (1 - 11.8/23.7) = 1165 cfs

Section VI at

4a. H_6 = 3.3 A_6 = _____ L_6 = _____ V_6 = _____ Acft

b. $Q_{P6} = Q_{P5}(1-V_6/S)$ = _____ cfs

c. H_6 = _____ A_6 = _____

A_A = _____ V_6 = _____ Acft

Section VII at

4a. H_7 = _____ A_7 = _____ L_7 = _____ V_7 = _____ Acft

b. $Q_{P7} = Q_{P6}(1-V_7/S)$ = _____ cfs

c. H_7 = _____ A_7 = _____

A_A = _____ V_7 = _____ Acft

Q_{P7} =

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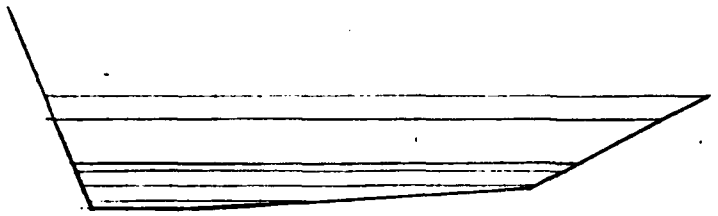
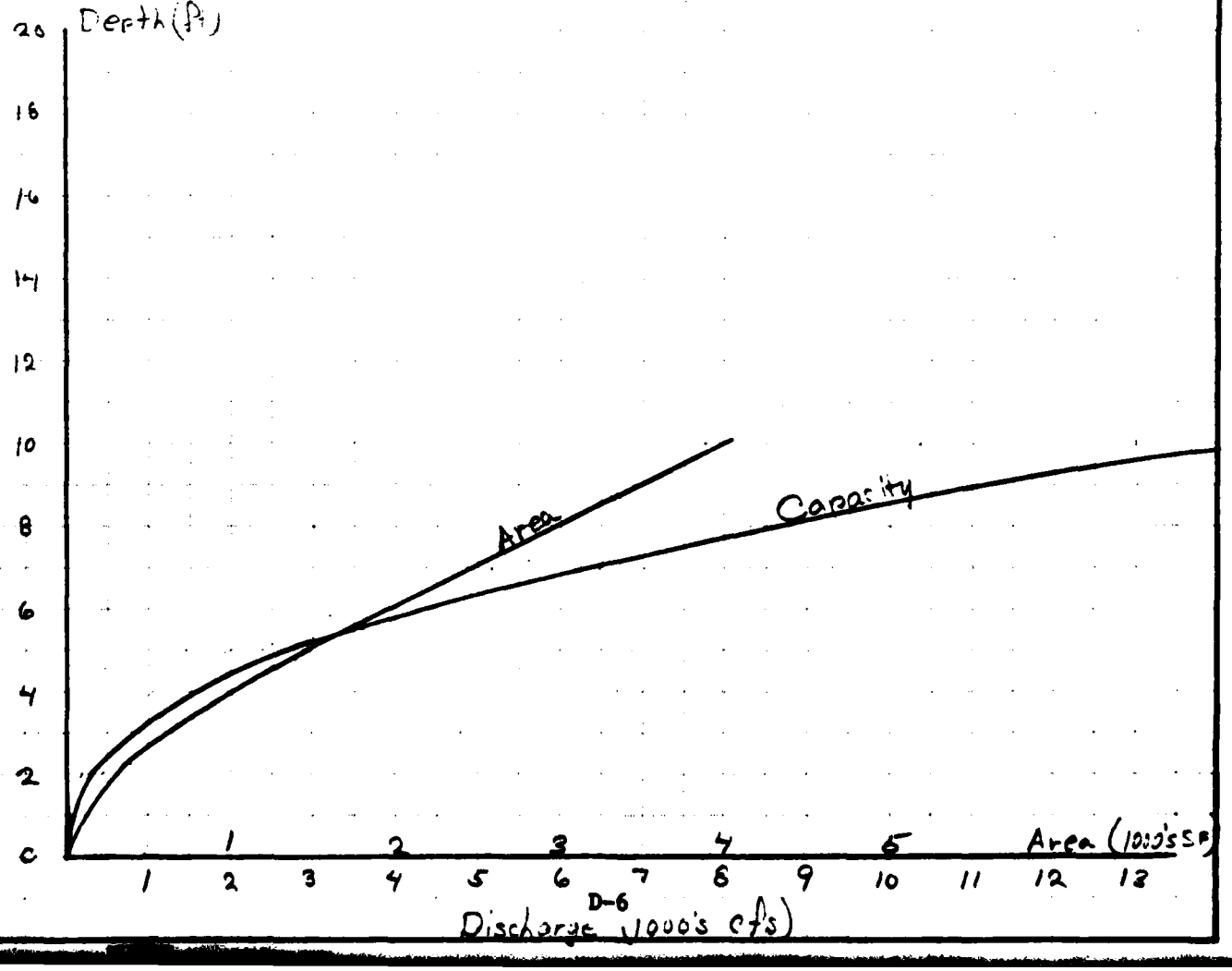
JOB _____
SHEET NO _____ OF _____
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____
SCALE Typical Section



n = .05
S = 0.1%

D	WP	A	R	$R^{2/3}$	$S^{1/2}$	V	Q
2	280	300	1.2	1.12	.031	1.03	309
5	500	1425	2.85	2.02	.031	1.85	2646
8	550	3000	5.45	3.1	.031	2.87	8613
10	570	4120	7.22	3.67	.031	3.46	14284
20	680	10370	15.25	6.2	.031	5.7	59,290



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JOB Phase I Dam Inspection - #4463
SHEET NO _____ OF _____
CALCULATED BY G.G. DATE 7/30/80
CHECKED BY _____ DATE _____

Downstream Hydrographs

"Rule of Thumb" Guidance for Estimating Downstream Failure Hydrographs

NAME OF DAM Lee's Pond Dam

Section I at Dam Water at Spillway Crest

1. $S = \frac{97.0}{}$ Acft
2. $Q_{P1} = 8/27\ W_b \sqrt{g}\ Y^{3/2} = 8/27\ (80)\sqrt{32.2}\ (11)^{3/2} = 4907$ cfs
3. See Sections

Section II at

4a. $H_2 =$ 6.1' $A_2 =$ 2000 SF $L_2 =$ 500' $V_2 =$ 22.9 Acft

b. $Q_{P2} = Q_{P1}\ (1-V_2/S) =$ 3745 cfs

c. $H_2 =$ 5.7' $A_2 =$ 1850 SF

$A_A =$ 1925 SF $V_2 =$ 22.1 Acft

$Q_{P2} = 4907(1 - 22.1/97) = 3790$ cfs

Section III at

4a. $H_3 =$ 5.5' $A_3 =$ 1900 SF $L_3 =$ 500' $V_3 =$ 21.8 Acft

b. $Q_{P3} = Q_{P2}\ (1-V_3/S) =$ 2687 cfs

c. $H_3 =$ 5.0' $A_3 =$ 1750 SF

$A_A =$ 1675 SF $V_3 =$ 19.2 Acft

$Q_{P3} = 3790(1 - 19.2/74.9) = 2818$ cfs

Section IV at

4a. $H_4 =$ 5.2' $A_4 =$ 1500 SF $L_4 =$ 500' $V_4 =$ 17.2 Acft

b. $Q_{P4} = Q_{P3}(1-V_4/S) =$ 1947 cfs

c. $H_4 =$ 4.3' $A_4 =$ 1200 SF

$A_A =$ 1350 SF $V_4 =$ 15.5 Acft

$Q_{P4} = 2818(1 - 15.5/56.7) = 2035$ cfs

APPENDIX E

INFORMATION AS CONTAINED IN

THE NATIONAL INVENTORY OF DAMS

INVENTORY OF DAMS IN THE UNITED STATES

(1) STATE	(2) IDENTITY NUMBER	(3) DIVISION	(4) STATE	(5) COUNTY	(6) CONGR DIST.	(7) STATE	(8) COUNTY	(9) CONGR DIST.	(9) NAME	(10) LATITUDE (NORTH)	(11) LONGITUDE (WEST)	(12) REPORT DATE DAY | MO | YR
CT	51	NED	CT	001	04				LEE'S POND DAM	4109.5	7322.0	17SEP80

(13) POPULAR NAME	(14) NAME OF IMPOUNDMENT
	LEE POND

(15) REGION	(16) BASIN	(17) RIVER OR STREAM	(18) NEAREST DOWNSTREAM CITY–TOWN–VILLAGE	(19) DIST FROM DAM (MI.)	(20) POPULATION
01	10	SAUGATUCK RIVER	WESTPORT	0	27500

(21) TYPE OF DAM	(22) YEAR COMPLETED	(23) PURPOSES	(24) STRUCTURAL HEIGHT (FT.)	(25) HYDRAULIC HEIGHT (FT.)	(26) IMPOUNDING CAPACITIES (27) MAXIMUM (ACRE–FT.)	(27) NORMAL (ACRE–FT.)
DT	1903	R	17	17	152	97

DIST	OWN	FED R	PRV/FED	SCS A	VER/DATE
NED	N	N	N	N	

(28) REMARKS
21=MASONRY

(29) D/S HAS	(30) SPILLWAY CREST LENGTH	(31) TYPE	(32) WIDTH (FT.)	(33) MAXIMUM DISCHARGE (FT.)	(34) VOLUME OF DAM (CY)	(35) POWER CAPACITY INSTALLED (MW)	(36) PROPOSED (MW)	(37) NAVIGATION LOCKS NO.	(38) LENGTH (FT.)	(39) WIDTH (FT.)	(40) LENGTH (FT.)	(41) WIDTH (FT.)	(42) LENGTH (FT.)	(43) WIDTH (FT.)	(44) LENGTH (FT.)	(45) WIDTH (FT.)
3	200		180	8800												

(46) OWNER	(47) ENGINEERING BY	(48) CONSTRUCTION BY
YMCA OF WESTPORT INC	UNKNOWN	UNKNOWN

(49) REGULATORY AGENCY DESIGN	CONSTRUCTION	OPERATION	MAINTENANCE
NONE	NONE	CT DEP	CT DEP

(50) INSPECTION BY	(51) INSPECTION DATE DAY | MO | YR	(52) AUTHORITY FOR INSPECTION
STONEH ENGINEERS	30MAY80	PL 92-367

(53) REMARKS