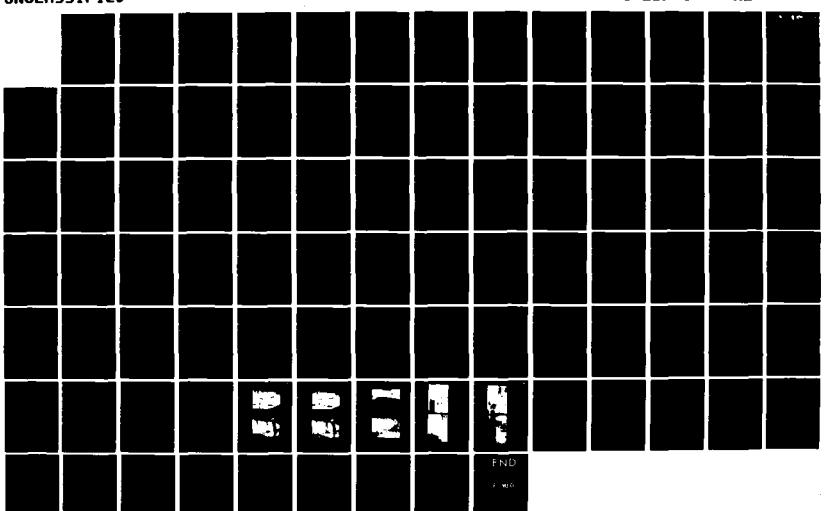
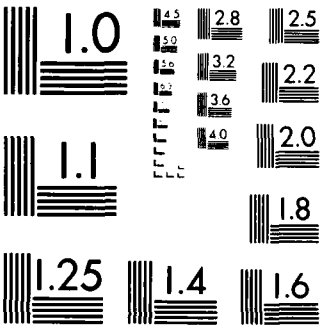
AD-A154 955 NATIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL DAMS 1/1
LYMAN MILL POND (MA 0..(U) CORPS OF ENGINEERS WALTHAM
MA NEW ENGLAND DIV MAR 79

UNCLASSIFIED F/G 13/13 NL





(1)

CONNECTICUT RIVER BASIN

SOUTHAMPTON, MASSACHUSETTS

LYMAN MILL POND

MA 00500

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

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

MARCH 1979

UNCLASSIFIED
SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS BEFORE COMPLETING FORM

1 REPORT NUMBER: MA 00500	2. GOVT ACCESSION NO.: AD-A154955
3. RECIPIENT'S CATALOG NUMBER:	
4 TITLE (and Subtitle): Lyman Mill Pond 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: March 1979 13. NUMBER OF PAGES: 59
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,

Connecticut River Basin
Southampton, Massachusetts
Manhan River

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

The dam is a run-of-river, ten foot high, 90 feet wide spillway, with concrete training walls. The visual inspection of the dam indicated it to ve in generally fair condition, due to the finding of a seepage boil. The dam has a size classification of small and a hazard classification of low. It is recommended that the owner engage a qualified engineer to investigate the foundation of the right abutment wall and if necessary, design a seepage protection system where a seepage boil was found.

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02154

REPLY TO
ATTENTION OF

NEDED

MAY 2 1...

Honorable Edward J. King
Governor of the Commonwealth of
Massachusetts
State House
Boston, Massachusetts 02133

Dear Governor King:

I am forwarding to you a copy of the Lyman Mill Pond 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 Quality Engineering, the cooperating agency for the Commonwealth of Massachusetts. In addition, a copy of the report has also been furnished the owners, Mrs. Edward R. Stone, Brickyard Road, Southampton, Massachusetts, Mr. Richard S. Howland, College Highway, Southampton, Massachusetts and Ms. Miriam Howland, College Highway, Southampton, Massachusetts 01073.

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 Quality Engineering for your cooperation in carrying out this program.

Sincerely yours,

JOHN P. CHANDLER
Colonel, Corps of Engineers
Division Engineer

Incl
As stated

NATIONAL DAM INSPECTION PROGRAM

PHASE I INSPECTION REPORT

BRIEF ASSESSMENT

Identification No.: MA 00500

Name of Dam: Lyman Mill Pond

Town: Southampton

County & State: Hampshire County, Massachusetts

Stream: Manhan River

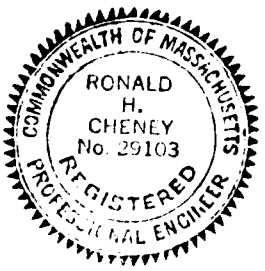
Date of Inspection: December 4, 1978

The dam is a run-of-river, ten foot high, 90 feet wide spillway, with concrete training walls. The right training wall was originally constructed to serve as an integral part of a remnant mill raceway which has since been sealed. There is a four foot by six foot timber covered main draw down located within the spillway. The dam was built in 1938 to replace a damaged dam believed to be built around the turn of the century. The dam is owned by Mrs. Edward Stone, Mr. Richard Howland and Mrs. Miriam Howland of Southampton, Massachusetts. Mr. Richard Howland is the caretaker of the dam. The visual inspection of the dam indicated it to be in generally fair condition, due to the finding of a seepage boil.

The dam has a size classification of small and a hazard classification of low. According to Corps Guidelines, the test flood is the 100 year flood (3628 cfs). The spillway

is capable of passing 71% of this flow and the floodwaters would be about 3/4 feet over the spillway abutments and 4 3/4 feet over the spillway. However, failure under this condition would cause insignificant damage as the downstream flooding would have already occurred. Failure hazard with water to spillway crest would be low. Since indepth engineering data was not available, the adequacy of the dam was assessed primarily on visual inspection, past performance history and hydrologic and hydraulic assumptions.

The dam is generally in fair condition. It is recommended that the owner engage a qualified engineer to investigate the foundation of the right abutment wall and if necessary, design a seepage protection system where a seepage boil was found. Also the spillway structure and foundation should be inspected during a period of low flow. This action should be implemented within one year after receipt of this Phase I Inspection Report by the owner.



Ronald H Cheney

Ronald H. Cheney
Associate

Hayden, Harding & Buchanan, Inc.
Boston, Massachusetts

This Phase I Inspection Report on Lyman Mill Pond 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.

Joseph W. Finegan

JOSEPH W. FINEGAN, JR., MEMBER
Water Control Branch
Engineering Division

Joseph A. McElroy

JOSEPH A. MCELROY, MEMBER
Foundation & Materials Branch
Engineering Division

Carney M. Terzian

CARNEY M. TERZIAN, CHAIRMAN
Chief, Structural Section
Design Branch
Engineering Division

APPROVAL RECOMMENDED:

Joe B. Fryar

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 Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I Investigation: however, the investigation is intended to identify any need for such studies.

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

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through 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 rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aide in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

CONTENTS

At the base of the intersection of the bulkhead and the abutment wall was a seepage boil. Water from this boil was flowing downstream along the base of the abutment wall as shown in Photo No. 8. Photo No. 9 shows the location where water from the boil and leakage through the bulkhead enters the pool formed at the downstream face of the abutment wall. The water flowing along the base of the wall is clear.

The left abutment concrete training wall was in good condition, with no sign of cracks or misalignment.

d. Reservoir Area

The reservoir is a relatively long narrow pond. The surrouding side slopes are steep with sparce trees and vegetation. A more detailed description of the drainage area is included in Section 1.3.a of this report. According to the caretaker, the drawdown was left open during the winter of 1976 resulting in the cleaning out of silt behind the spillway to the invert of the drawdown. The silt condition at this time is unknown.

e. Downstream Channel

The downstream channel is the natural river bed. Bedrock outcrops in the channel floor downstream of the dam. The channel was observed to be free and clear. Some boulders were scattered within the channel and some trees line the shore, however, neither pose a problem to continued free flow.

SECTION 3
VISUAL INSPECTION

3.1 Findings

a. General

The dam, Lyman Mill Pond, was inspected on December 4, 1978. At that time, water was passing over the spillway approximately three inches deep. Therefore, the upstream face of the dam could not be inspected.

b. Dam

The dam is a hollow concrete buttress dam. The entire crest length of about 90 feet acts as an overflow spillway. At the time of inspection, water was flowing over the dam preventing the inspection of the structure and its foundation. Existing records indicate the dam is founded on bedrock. Bedrock outcrops were observed in the river channel immediately below the dam. The spillway appeared to be true and straight without any signs of distress.

c. Appurtenant Structures

The right abutment of the dam is formed by a five foot thick concrete training wall which was constructed to serve as an integral part of the mill structures occupying the right abutment area. A portion of this wall and the mill structure are shown in Photo No. 1.

This abutment wall formed a training wall for the mill raceway which has been filled with a concrete bulkhead as shown in Photo No. 7.

dam, structurally and hydraulically, can not be assessed from the standpoint of review of design calculations, but must be based primarily on the visual inspection, past performance history, and hydrologic and hydraulic assumptions.

c. Validity

The field investigation indicates that the external features substantially agree with those shown on the furnished plans.

SECTION 2
ENGINEERING DATA

2.1 Design

The existing dam was designed to replace an original dam which was built around the turn of the century. The existing dam was designed by Caughey & Pratt of Antrim, New Hampshire in 1938. An unsuccessful attempt was made to locate engineering calculations, however, the engineers have since deceased, the firm disolved,and no information was available.

2.2 Construction

No construction data was located for this dam.

2.3 Operation

No operational manual exists for this dam.

2.4 Evaluation

a. Availability

Plans for the 1938 structure, 1957 repairs, and 1966 and 1968 County Inspection Reports were made available at the Hampshire County Court House, Commissioner's Office Northampton, Massachusetts. State Inspection Reports for the years 1972, 1973, and 1975 were made available at the Massachusetts Department of Environmental Quality Engineering Division of Waterways, Boston office.

b. Adequacy

The lack of indepth engineering data does not allow for a definitive review. Therefore the adequacy of this

abutment with an invert at about elevation 176. As previously described, the opening is covered by horizontal timbers which can be removed manually. A concrete sluiceway within the southerly abutment has been sealed with a concrete bulkhead wall.

g. Dam

(1) Type ---------- gravity, hollow concrete butress and slab structure

(2) Length ---------- 110'±

(3) Height ---------- 10'±

(4) Top Width ---------- 1.5'±

(5) Side Slopes ---------- 2:1 U/S; vertical drop to channel bottom D/S

(6) Zoning ---------- none

(7) Impervious Core ---------- concrete slab on U/S face

(8) Cutoff ---------- none

(9) Grout curtain ---------- none

(10) Other ---------- spillway founded on ledge

h. Diversion and Regulating Tunnel none

i. Spillway

(1) Type ---------- gravity, hollow concrete buttress and slab structure

(2) Length of weir ---------- 90'

(3) Crest elevation ---------- 180'

(4) Gates ---------- none

(5) U/S Channel ---------- none

(6) D/S Channel ---------- none

(7) General ---------- a run-of-river type structure

j. Regulating Outlets

The dam has only one regulating outlet, a rectangular drawdown opening with dimensions of 4' by 6'. The opening is located in the concrete slab about 10' from the southerly

c. Elevation (ft. above MSL)

(1) Streambed at centerline of dam----------170±

(2) Maximum tailwater----------176±

(3) Upstream portal invert diversion tunnel---------none

(4) Recreation pool----------180'

(5) Full flood control pool----------N/A

(6) Spillway crest (ungated)----------180'

(7) Design surcharge (Original Design)----------unknown

(8) Top Dam----------184'

(9) Test flood design surcharge- (100 yr.)-------184.75'

d. Reservoir

(1) Length of maximum pool---------- 4000'(100 yr. flood)

(2) Length of recreation pool----------3200'

(3) Length of flood control pool---------- N/A

e. Storage (acre-feet)

(1) Recreation pool----------27

(2) Spillway crest pool----------27

(3) Flood control pool----------N/A

(4) Top of Dam----------64

(5) Test flood pool----------248

f. Reservoir Surface (acres)

(1) Recreation pool----------4±

(2) Spillway crest----------4±

(3) Top dam ----------15±

(4) Flood-control pool---------- N/A

(5) Test flood pool ---------- 15

upstream of and 4' below the spillway crest, is covered by timbers laid horizontally, and held in place by water pressure. Provisions are available to remove the top two timbers. A concrete side sluiceway at the southerly abutment has been blocked off with a concrete bulkhead wall. The drawdown opening is the only means of dewatering this dam.

The present dam was constructed in 1938 and incorporated portions of the original dam built around the turn of the century. No record of maximum impoundment or spillway discharge is known. During the August 1955 flood, the area beyond the northerly abutment was breached, although the dam proper remained intact. Heavy stone fill was used to close this breach. U.S. Geological Survey data (W.S.P. #1420) indicate a discharge measurement on the Manhan River at Russellville, 3.6 miles upstream of Lyman Pond Dam, of 9,350 cfs on August 19, 1955.

The spillway is ungated, and has an approximate capacity of 2570 cfs at an elevation of 184.

1.3 Pertinent Data

a. Drainage Area

The drainage area(18419 acres - 28.78 s.m.) is comprised of wooded, rolling hills, containing several drainage paths. The main drainage path is the Manhan River. Runoff from the upper 15 s.m. of the drainage area is controlled by the Tighe Carmody Reservoir. Direct runoff comes from 13.78 s.m.. The Manhan River falls about 100' in its first mile below Tighe Carmody Reservoir, and an additional 70' in the next 4.7 miles downstream to Lyman Mill Pond dam.

Development within the drainage area has occurred near Southampton, Montgomery, Russellville, and along the Russellville Road. There are very few homes and farms outside of these areas, especially in that portion of the drainage area above Tighe Carmody Dam. A railroad line and a number of improved secondary roads are located within the area.

Several buildings and homes, located in Southampton, are within 4000 feet downstream of the dam and less than 200 feet away from the Manhan River. Below this point little or no development occurs near the river for several miles downstream.

b. Discharge at Dam Site

This dam has a rectangular, 4'± by 6'±, drawdown opening in the concrete slab about 10' to 12' from the southerly abutment wall. The opening, located about 12 feet

f. Operator

The operator of the dam is Mr. Richard Howland of College Highway, Southampton, Massachusetts 01073. Telephone (413) 527-4838.

g. Purpose of Dam

At this time there appears to be no definitive purpose for the dam other than its possible recreational value.

h. Design and Construction History

The existing dam was built in 1938 to replace the original dam built around the turn of the century. The dam was designed by Coughey and Pratt of Antrim, New Hampshire. Portions of the original dam are incorporated into the existing dam. In 1957, repairs were made to the dam and to the surrounding area about the left abutment. The concrete wingwall at the left abutment and a replacement wood slide gate at the inlet were installed in 1969. In 1976, repairs were made to attempt to seal up the mill raceway. A concrete slab was placed over the sluiceway inlet and a concrete bulkhead was constructed to block the main upstream inlet to the raceway.

i. Normal Operational Procedure

There is no normal operation procedure short of general maintenance. The main spillway drawdown opening is only opened during periods of repair.

a concrete wall containing the remnants of a sluiceway which has been blocked up. There is also a 4' by 6' drawdown opening within the spillway which has a slide gate comprised of timbers. A chain mechanism can be used to raise the gate. The left abutment consists of a 3 foot wide concrete training wall. There are 2 old unoccupied wooden buildings located within the right abutment area.

c. Size Classification

The size of the dam is classified as small according to its height and storage capacity of 10 feet and 27 acre feet respectively.

d. Hazard Classification

The hazard potential due to dam failure is low. Should the dam fail with water to its crest no major damage or loss of life is expected.

e. Ownership

The dam is co-owned by Mrs. Edward R. Stone of Brickyard Road, Southampton, Massachusetts, Mr. Richard S. Howland of College Highway, Southampton, Massachusetts, and Ms. Miriam Howland also of College Highway, Southampton, Massachusetts. Prior to 1973 and since 1960, Mrs. Stone was the sole owner. 1938 design plans indicate the dam to be reconstructed by the H.B. Lyman Company of Southampton, Massachusetts.

b. Purpose

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

(2) Encourage and assist 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

The dam at Lyman Mill Pond is located in the Town of Southampton in Hampshire County, Massachusetts. The Pond is formed at the junction of Red Brook and the Manhan River. The dam is shown on the U.S.G.S. Mount Tom-Massachusetts Quadrangle, with the approximate coordinates of North 42° 13' 00", West 72° 43' 48".

b. Description of Dam and Appurtenances

The dam is comprised of an approximate 10 foot high spillway having a crest width of about 90 feet. The spillway has a vertical downstream face and is composed of concrete buttresses spaced 7' on centers with an upstream concrete slab built on a 2 horizontal to 1 vertical slope. The buttresses are in filled with dry masonry for a vertical height of 4 to 6 feet. The right abutment is composed of

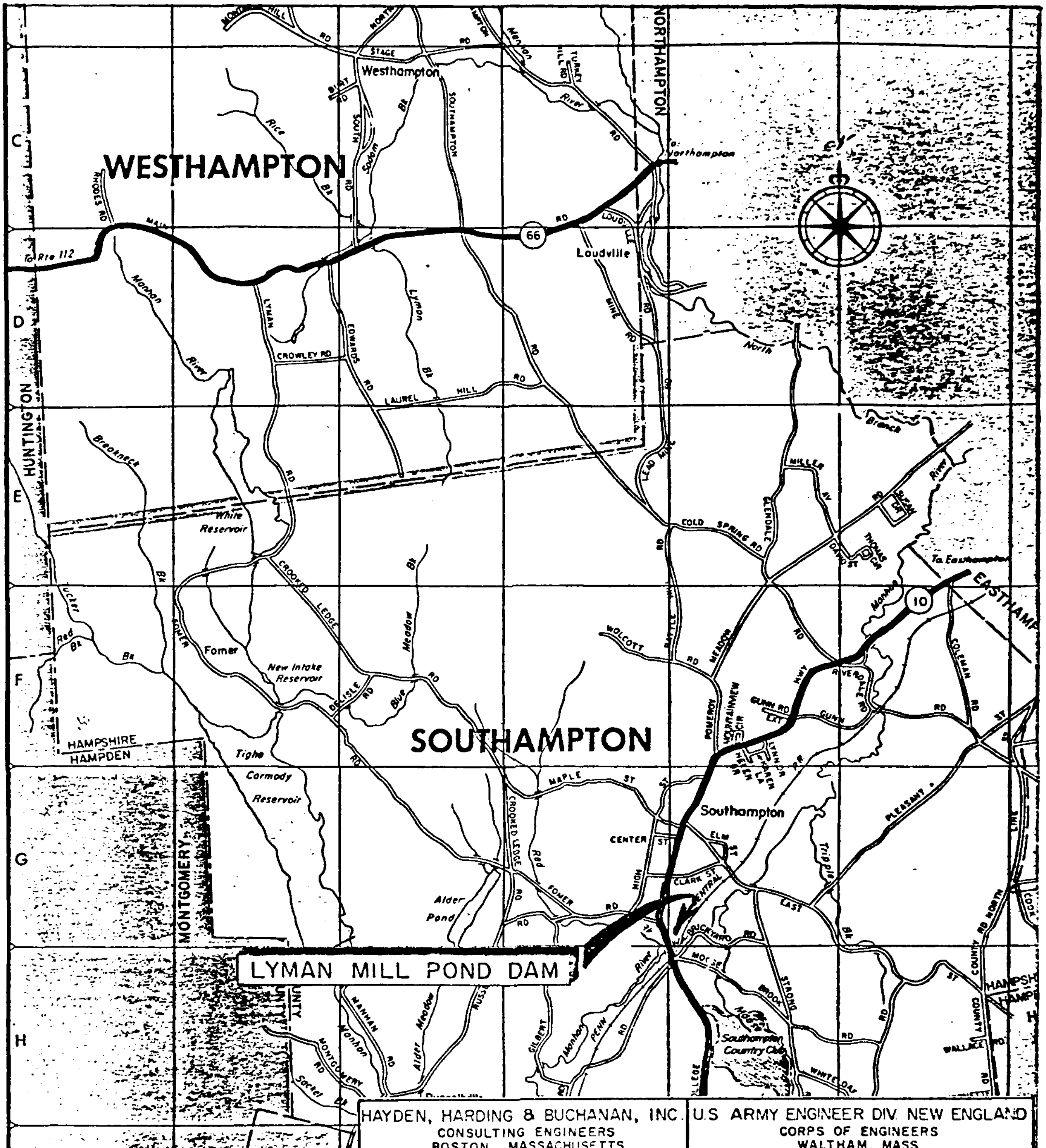
PHASE I
NATIONAL DAM INSPECTION PROGRAM
NAME OF DAM: LYMAN MILL POND

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. Hayden, Harding & Buchanan, Inc. has been retained by the New England Division to inspect and report on selected dams in the State of Massachusetts. Authorization and notice to proceed was issued Hayden, Harding & Buchanan, Inc. under a letter of 28 November 1978 from Max B. Scheider, Colonel, Corps of Engineers. Contract No. DACW 33-79-C-0012 has been assigned by the Corps of Engineers for this work.



HAYDEN, HARDING & BUCHANAN, INC.
CONSULTING ENGINEERS
BOSTON, MASSACHUSETTS

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

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

LYMAN MILL POND

SOUTHAMPTON MASSACHUSETTS

SCALE 1" = 5280'

DATE FEBRUARY, 1979

Approximately 200 feet downstream of the dam is a railroad bridge spanning the river which is shown in Photo No. 6.

3.2 Evaluation

Visual inspection did not reveal any problems that would be an immediate hazard.

A seepage boil was found near the base of the right abutment wall which should be attended to.

Water spilling over the dam prevented inspection of the dam foundation.

The 1975 State Inspection Report alludes to the fact that at the northern end of the spillway, there is "evidence of seepage at the base of the dry stone fill under the concrete slab in the vicinity of the upstream toe of the spillway." According to a telephone conversation with Mr. Richard Howland the co-owner and caretaker, this condition was investigated while the water was drawn down by Mr. Howland and the engaged dam repair contractor during the aforementioned 1976 repairs. They observed the spillway to be founded on the ledge within this area and concluded that the "seepage" represents a crack in the concrete or a small fault in the ledge and does not represent a seepage condition that would effect the stability of the spillway. This conclusion appears feasible as the 1938

plans indicate the spillway to be built on ledge and rock outcrops were observed within this area during our field inspection. The "small deltas of fines" reported in the 1975 State Inspection Report probably represent transported silt which had been noted to be built up to within four feet of the spillway crest. Therefore, it is reasonably certain that the above leakage does not represent a condition which could be of serious consequence to the safety of the dam.

SECTION 4
OPERATIONAL PROCEDURES

4.1 Procedure

The major purpose of the dam at Lyman Mill Pond is for recreation. The sluiceway at the right abutment is sealed. The drawdown is left open only during repairs. There is no formal operational procedure for this dam.

4.2 Maintenance of Dam

The dam is maintained by Mr. Richard Howland, one of the private owners. He is responsible for reviewing the State Inspection Reports and complying with the necessary recommendations. The most recent repairs were in 1976, involving the sealing of the old mill raceway structure to further prevent leakage.

4.3 Maintenance of Operating Facilities

There is no formal operational maintenance program. The caretaker maintains the dam in accordance with the recommendations outlined by the State Inspection Report.

4.4. Description of Warning Systems

There are no warning systems in effect at this facility.

4.5 Evaluation

There is no formal operational procedure for this dam. The caretaker has employed a contractor to attempt to repair the conditions outlined within the 1975 State

Inspection Report. The dam should be inspected annually by qualified personnel who can identify conditions of concern which left unchecked could jeopardize the safety of the dam.

SECTION 5
HYDRAULIC/HYDROLOGIC

5.1 Evaluation of Features

a. General

The original dam was built about 1900 to provide power for the adjacent mill. It is a low storage-high pass run-of-the-river type of project. The dam is a 10 foot high hollow buttress type concrete structure.

b. Design Data

No hydraulic/hydrologic design data was located.

c. Experience Data

The dam has a drainage area of 28.78 s.m., of which, 15 s.m. flow into the Tighe-Carmody Reservoir. Flow out of Tighe-Carmody does occur. On August 19, 1955 discharge at the dam site approached 12,000 cfs. Part of the north river bank abutment was washed out, but the main structure was not affected. The adjacent buildings were apparently not damaged.

d. Visual Observations

Visual observations indicate that flow restrictions at roads and bridges above and below the dam will influence flooding problems.

e. Overtopping Potential

The test flood used, 100 year, developes an inflow of 3628 cfs. Peak outflow from Tighe-Carmody is not assumed to coincide with peak flow from lower drainage areas. The spillway has a capacity of 2570 cfs, thus 1058 cfs flows over the entire length of the dam (the dam itself amounts to one long-low spillway). Water will reach elevation 184.75, 0.75 feet above the dam abutments. The adjacent wooden structures may not be damaged. Due to the depth of tailwater, dam failure should produce no significant affects on downstream flooding conditions. The safety of a railroad bridge (200± feet downstream) due to floodwaters, may be in question.

Beyond the railroad bridge, no development occurs until Strong Road. The Manhan River has large flood plains in this area. Many additional streams add runoff from other drainage areas which would influence flooding problems.

f. Dam Failure Analysis

If the dam failed when full, water to spillway crest elevation 180.0, 2340 cfs of water would be released. This flow should not cause any damage to downstream areas. There is a large flood plain downstream which would dissapate the released water.

SECTION 6
STRUCTURAL STABILITY

6.1 Evaluation of Structural Stability

a. Visual Inspection

The visual observations did not disclose any immediate stability problem associated with the dam. Action should be taken to prevent a seepage boil found at the base of the right abutment wall from increasing in size.

b. Design and Construction Data

The existing structure was built in 1938 to replace an earlier structure. Subsequent repairs and modifications were made in 1957, 1969 and 1976. Plans showing the 1938 and 1957 changes were available at the Hampshire County Court House. No additional design calculations or construction data were located.

c. Operating Records

No operating records were available.

d. Post-Construction Changes

The 1938 modifications involved rebuilding the original structure which had received flood damage.

The left abutment beyond the end of the dam was severely damaged in 1955 due to flooding. Damage caused by the washout of a portion of the left abutment area was repaired about 1957. The repairs consisted of backfilling the washed

out area with compacted clay and placing of an extensive riprap blanket. The area of the repair is shown in Photos 3 and 10 which also show the riprap slope protection placed at the time of repair. The buttress dam was not damaged.

The concrete wingwall at the left abutment and a replacement wood slide gate at the inlet were installed in 1969.

The 1976 repairs attempted to seal up the raceway. A three foot thick by about ten foot long concrete slab was placed over the three foot wide sluiceway inlet leading to the raceway. A concrete bulkhead was also constructed to block the main upstream inlet to the mill raceway.

e. Seismic Stability

The dam is located in Seismic Zone 2, and according to USCE guidelines, it is assumed that there is no earthquake hazard.

SECTION 7
ASSESSMENTS, RECOMMENDATIONS, AND REMEDIAL MEASURES

7.1 Assessment

a. Condition

The visual inspection indicates the dam is in fair condition, due to the finding of a seepage boil.

b. Adequacy of Information

The information made available along with the visual inspection is adequate for a Phase I level investigation.

c. Urgency

The action recommended in Section 7.2 should be implemented within one year after receipt of the report by the owner.

d. Need for Additional Investigation

No additional investigation is needed to complete the Phase I Investigation.

7.2 Recommendations

The owner should engage a qualified engineer to investigate the foundation of the right abutment wall and design a seepage protection system if necessary for the area where the seepage boil was found. The spillway structure and foundation should be inspected at low water.

7.3 Remedial Measures

a. Operational and Maintenance Procedures

The dam should be inspected annually by qualified personnel who can identify conditions of concern which left

unchecked could jeopardize the safety of the dam.

7.4 Alternatives

Not applicable to this dam.

APPENDIX A

INSPECTION CHECKLIST

VISUAL INSPECTION CHECKLIST
PARTY ORGANIZATION

PROJECT Lyman Mill Pond

DATE December 4, 1978

TIME 11:00 AM

WEATHER CLOUDY DRIZZLE 35 ^{0}

W.S. ELEV. 180.2 U.S. ____ DN.S.

PARTY:

1. Ron H. Cheney HHB
2. David Vine HHB
3. Daniel P. LaGatta GEI
4. ____
5. ____
6. ____
7. ____
8. ____
9. ____
10. ____

	PROJECT FEATURE	INSPECTED BY	REMARKS
1.	Spillway	Ron H. Cheney	
2.	Mill Raceway	Ron H. Cheney & Daniel P. LaGatta	
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

PERIODIC INSPECTION CHECKLIST

PROJECT Lyman Mill Pond DATE Dec. 4., 1978

PROJECT FEATURE Concrete and Masonry Dam NAME D. P. LaGatta

DISCIPLINE Geotechnical engineers NAME Ron H. Cheney

Structural Engineer

AREA EVALUATED	CONDITION
DAM EMBANKMENT	Concrete buttress dam
Crest Elevation	180±
Current Pool Elevation	180±
Maximum Impoundment to Date	Unknown
Surface Cracks	
Pavement Condition	
Movement or Settlement of Crest	This structure has no embankment section. Water was spilling over dam and there was a pool at the downstream face preventing examination of the foundation of the dam.
Lateral Movement	
Vertical Alignment	
Horizontal Alignment	
Condition at Abutment and at Concrete Structures	
Indications of Movement of Structural Items on Slopes	
Trespassing on Slopes	
Sloughing or Erosion of Slopes or Abutments	
Rock Slope Protection - Riprap Failures	
Unusual Movement or Cracking at or Near Toe	
Unusual Embankment or Downstream Seepage	
Piping or Boils	There is a spring exiting at the base of the right abutment wall where it intersects the concrete bulkhead that has been placed to seal the old mill sluiceway.
Foundation Drainage Features	
Toe Drains	
Instrumentation System	
Vegetation	

PROJECT Lyman Mill Pond DATE Dec. 4, 1978

PROJECT FEATURE Concrete and Masonry Dam NAME Daniel P. LaGatta

DISCIPLINE Geotechnical Engineer NAME Ron H. Cheney

Structural Engineer

AREA EVALUATED	CONDITIONS
OUTLET WORKS - INTAKE CHANNEL AND INTAKE STRUCTURE	
a. Approach Channel	Original intake structure which was integral part of the mill construction has been sealed with a concrete bulkhead and concrete slab over sluiceway inlet.
Slope Conditions	
Bottom Conditions	
Rock Slides or Falls	
Log Boom	None
Debris	None
Condition of Concrete Lining	None
Drains or Weep Holes	
b. Intake Structure	Drawdown outlet was under water and could not be inspected.
Condition of Concrete	
Stop Logs and Slots	

13. REMARKS AND RECOMMENDATIONS: (Cont'd.)

There are several cracks and some areas of extensive spalling of concrete on the southerly abutment wall. This wall is a combina of concrete, concrete and stone masonry, and dry stone masonry o the very upstream end of wall. A small area of undercutting was noted at extreme downstream end of abutment wall. This abutment wall still appears basically sound but in need of repairs to pre further deterioration.

Mr. Richard S. Howland, one of the co-owners, was present during inspection and all areas which were noted as in need of repairs were brought to his attention. Mr. Howland stated during inspect that he intended to leave drawdown open until at least next summ

The ponded area is silted in to at least a third of total capaci and owners are planning to have this silt removed before refilli pond.

Some evidence of seepage was noted in the northerly end of dam a base of dry stone masonry fill under the concrete slab in vicinit of upstream toe of spillway. Small deltas of fines were noted at two of the northerly buttress stalls on the river bed directly downstream of stone masonry.

It would seem advisable for a reinspection to be made when drawd is closed and pond is refilled to determine how extensive this seepage is unless repairs are made to correct this problem before pond is refilled.

Dam is considered safe at present time but, as stated above, need repairs is indicated to prevent further deterioration and possibl complete failure of dam.

HTS/vk

(12.) OVERALL CONDITION:

1. Safe ______.
2. Minor repairs needed X
3. Conditionally safe - major repairs needed ______
4. Unsafe ______.
5. Reservoir impoundment no longer exists (explain)

   Recommend removal from inspection list ______

(13.) REMARKS AND RECOMMENDATIONS: (Fully Explain)

This is a hollow gravity concrete slab and buttress dam. The abut[illegible] and adjacent structures are built of grouted stone masonry, dry [illegible] masonry, and mass concrete. The river banks upstream of abutment[illegible] are [illegible] with stone rubble. The spillway concrete slab and butt[illegible] all appeared sound with only minor spalling noted in some small [illegible] One small area 6"± long and 3"± wide on lip of spillway at a cons[illegible] tion joint was broken away. Some areas of spillway are constructe[illegible] differently than previous inspection reports showed. Differences noted are as follows, approximately 12' to 14' back of nappe of sp[illegible] way slab, the underside of slab is buttressed by a dry stone mason[illegible] fill which appears to slope back under slab to upstream toe of da[illegible] see sketches; on southerly side of spillway slab, 10' to 12' out [illegible] southerly abutment wall and approximately 12' upstream of spillway crest is a rectangular drawdown opening, 4'± W. x 6'± long, in con[illegible] slab - see sketches. The drawdown gate or cover for opening consi[illegible] of 6" x 8" x 8'±, timbers laid horizontally across opening in slab held in place by water pressure. The two top timbers have an iro[illegible] ring bolt to which a diver can attach a chain and they are then [illegible] by chain falls [illegible] to abutment structure; and it was also not[illegible] a 3'W. x 5'H. concrete [illegible] sluice assumed previously to be the [illegible] [illegible] is actually blocked [illegible] by a concrete bulkhead wall. At [illegible] inspection of [illegible] 9, 1973, the pond was full of water and the [illegible] [illegible] only the [illegible] of [illegible] contractor, who had done work on the [illegible] [illegible]. At present inspection the pond [illegible] [illegible] and [illegible] river [illegible] passing freely through the [illegible] opening. [illegible] of entire [illegible] differences in [illegible] on enclosed sketches.

[illegible] of concrete [illegible] and [illegible] old mill [illegible]

(9.) EMERGENCY SPILLWAY: Available No. Needed No.

Height Above Normal Water_____Ft.

Width_____Ft. Height_____Ft. Material_____

Condition: 1. Good_____. 3. Major Repairs_____.

2. Minor Repairs_____. 4. Urgent Repairs_____.

Comments: Present spillway appears adequate. Spillway opening spa
width of river bed which dam is built across

(10.) WATER LEVEL AT TIME OF INSPECTION: +6- Ft. Above_____. Below X.

Top Dam_____ F.L. Principal Spillway X.

Other Dam drawdown open - Pond drawn down at inspection

Normal Freeboard 4 Ft. to top of abutments.

(11.) SUMMARY OF DEFICIENCIES NOTED:

Growth (Trees and Brush) on Embankment Yes - minor brush growth in cre
south abutment and floodtraining

Animal Burrows and Washouts None found

Damage to Slopes or Top of Dam None found

Cracked or Damaged Masonry Yes - southerly abutment wall spalled - cons
stream end being undercut - upstream end spa
and cracked - Some stone masonry grouting

Evidence of Seepage Yes - heavy seepage in area of old mill race - also
minor seepage noted under spillway also - See sk

Evidence of Piping None found

Leaks Yes - evidence of severe leaks - under old mill building loc
of old mill race.

Erosion None found

Trash and/or Debris Impeding Flow None - drawdown gate open

Clogged or Blocked Spillway None

Other_____

(6.) OUTLETS: OUTLET CONTROLS AND DRAWDOWN

No. 1 Location and Type: Main spillway and dam - 90' W. x 4'H.- con. hollow gravity buttress and slab structure stone masonry upstream toe buttress.

Controls None, TYPE: _____

Automatic____. Manual____. Operative Yes____, No____.

Comments: Founded on ledge - slab and concrete

No. 2 Location and Type: South side of dam - 3' W. x 5'H. sluiceway wall of old mill raceway - 19' above face of d

Controls Yes, Type: Wooden slide gate - entrance now block with concrete bulkhead

Automatic____. Manual____. Operative Yes____, No____.

Comments: _____

No. 3 Location and Type: Southerly end of dam - at base of spillway - 4'±x 6'± opening.

Controls Yes, Type: 6"x 8" timbers - held in place by water pres.

Automatic____. Manual X. Operative Yes X, No____. Horizontally

Comments: The 6"x 8" timbers span horizontally the 4'x 6'± op through concrete slab of spillway at upstream toe slab. First 2 timbers have a ring to remove with

Drawdown present Yes X, No____. Operative Yes X, No____.

Comments: See Item #3 above - drawdown open at time of inspection

(7.) Dam UPSTREAM FACE: Slope 3:1, Depth Water at Dam 3' to 4' - Fe drawn down.

Material: Turf____. Brush & Trees____. Rock Fill____. Masonry X (Conc.). Wood

Other Stone and concrete masonry - stone rubble riprap on side b dam.

Condition: 1. Good____. 3. Major Repairs____.

2. Minor Repairs X. 4. Urgent Repairs____.

Comments: Upstream face of concrete spillway slab in good condit Considerable spalling and cracking of abut. side wall o southerly end of dam. See sketches

(8.) Dam DOWNSTREAM FACE: Slope Vertical - hollow gravity buttress and slab

Material: Turf____. Brush & Trees____. Rock Fill____. Masonry X (Conc.). Wood

Other Ledge at bottom of downwall

Condition: 1. Good____. 3. Major Repairs____.

2. Minor Repairs X. 4. Urgent Repairs____.

Comments: Minor spalling of lip of spillway and of concrete wall Extensive spalling of southerly abutment and mill race wall. Heavy growth of trees and brush evident.

INSPECTION REPORT - DAMS AND RESERVOIRS

(1.) LOCATION:

~~City~~/Town Southampton. County Hampshire. Dam No. 2-6-1[illegible]

Name of Dam Lyman Hill Dam.

Topo Sheet No. 12A. Coordinates: N 446,000, E 266,600.
Mass. Rect.

Inspected by: Harold T. Shumway, On Oct.14,1975. Date Last Inspection [illegible]

(2.) OWNER/S: As of Oct. 14, 1975

per: Assessors_____, Reg. of Deeds_____, Prev. Insp. X, Per. Contact X

Owners

1. Mrs. Edward R. Stone, Brickyard Road, Southampton, Mass.
Name | St. & No. | City/Town | State | Tel.

2. Mr. Richard S. Howland, College Hwy., Southampton, Mass.
Name | St. & No. | City/Town | State | Tel.

3. Ms. Miriam Howland, College Hwy., Southampton, Mass.
Name | St. & No. | City/Town | State | Tel.

(3.) CARETAKER: (if any) e.g. superintendent, plant manager, appointed by absentee owner, appointed by multi owners.

Mr. Richard S. Howland, College Hwy., Southampton, Mass.
Name | St. & No. | City/Town | State | Tel.

(4.) DATA:

No. of Pictures Taken None. Sketches See description of Dam.
Plans, where None located.

(5.) DEGREE OF HAZARD: (if dam should fail completely)*

1. Minor_____. 3. Severe X.

2. Moderate_____. 4. Disastrous_____.

Comments: Approximately 11 million gallons at capacity - drawn[illegible] gate open at time of inspection.

*This rating may change as land use changes (future development).

* P.G.S. cut off on orig

4. There are several areas of minor spalling of concrete the most notable being on the lip of the spillway at a construction joint where a piece of concrete has broken away which could be repaired.

It is noted that you were present during the inspection and indicated that the reservoir would remain in this lowered condition until at least next summer.

We call these conditions to your attention, before they become serious and more expensive to correct. With any correspondence, please include the number of the dam as indicated above.

Very truly yours,

ROBERT T. TIERNEY, P.E.
Chief Engineer

RTT:jmg
cc: F. J. Hoey
R. Salls

October 29, 1975

Mr. Richard S. Howland
College Highway
Southampton, Massachusetts

RE: Inspection-Dam #2-8-276-2
Southampton
Lyman Mill Dam

Dear Mr. Howland:

On October 14, 1973, an engineer from the Massachusetts Department of Public Works made a visual inspection of the above dam. Our records indicate that you are one of three owners and the designated caretaker. Will you please notify this office if this information is not current.

The inspection was made in accordance with Chapter 253 of the Massachusetts General Laws, as amended by Chapter 595 of the Acts of 1970 (Dams-Safety Act).

The results of the inspection indicate that this dam, in its present drawndown condition, appears safe;however, the following conditions were noted that require attention:

1. There is evidence of considerable seepage, leakage and spalling of concrete in the area of the old mill raceway structures which should be corrected as necessary.

2. There are several cracks and some areas of extensive spalling of concrete on the southerly abutment wall which should be cleaned and repaired as needed.

3. Evidence of seepage was noted in the northerly end of the dam at the base of the dry stone fill under the concrete slab in the vicinity of the upstream toe of the spillway. If an investigation and/or repairs are not made while the reservoir is drawn down then it is advised that this area be closely watched during the refilling process. If conditions warrant, prompt action should then be taken to correct this problem.

LIST OF ENGINEERING DATA

1) Plans for the 1938 Construction

2) Plans for the 1957 Repairs

Location: Hampshire County Court House
Commissioner's Office
Northampton, Massachusetts 01060

No other data was made available.

APPENDIX B

ENGINEERING DATA

PERIODIC INSPECTION CHECK LIST

PROJECT Lyman Mill Pond DATE Dec. 4, 1978

PROJECT FEATURE Service Bridge NAME Daniel P. LaGatta

DISCIPLINE Geotechnical Engineer NAME Ron H. Cheney

Structural Engineer

AREA EVALUATED	CONDITIONS
OUTLET WORKS - SERVICE BRIDGE	
a. Super Structure	There is no service bridge.
Bearings	
Anchor Bolts	
Bridge Seat	
Longitudinal Members	
Under Side of Deck	
Secondary Bracing	
Deck	
Drainage System	
Railings	
Expansion Joints	
Paint	
b. Abutment and Piers	
General Condition of Concrete	
Alignment of Abutment	
Approach to Bridge	
Condition of Seat and Backwall	

PERIODIC INSPECTION CHECK LIST

PROJECT Lyman Mill Pond — DATE December 4, 1978

PROJECT FEATURE Concrete and masonry dam — NAME Daniel P. LaGatta

DISCIPLINE Geotechnical Engineer — NAME Ron H. Cheney

Structural Engineer

AREA EVALUATED	CONDITIONS
OUTLET WORKS - SPILLWAY WEIR, APPROACH AND DISCHARGE CHANNELS	
a. Approach Channel	Concrete and masonry dam is a run-of-river structure.
General Condition	
Loose Rock Overhanging Channel	Spillway inspection was limited due to water flow. Crest appeared straight and true. some spalling noticed on right abutment concrete.
Trees Overhanging Channel	
Floor of Approach Channel	
b. Weir and Training Walls	
General Condition of Concrete	
Rust or Staining	
Spalling	
Any Visible Reinforcing	
Any Seepage or Efflorescence	
Drain Holes	
c. Discharge Channel	Discharge channel is entire river channel
General Condition	
Loose Rock Overhanging Channel	None.
Trees Overhanging Channel	None of significance.
Floor of Channel	Boulder strewn.
Other Obstructions	Island downstream of dam.

PERIODIC INSPECTION CHECK LIST

PROJECT Lyman Mill Pond DATE Dec. 4, 1978

PROJECT FEATURE Concrete and masonry dam NAME Daniel P. LaGatta

DISCIPLINE Geotechnical Engineer NAME Ron H. Cheney

Structural Engineer

AREA EVALUATED	CONDITIONS
OUTLET WORKS - OUTLET STRUCTURE AND OUTLET CHANNEL	
General Condition of Concrete	Outlet works has been sealed by concrete bulkhead and concrete slab over the sluiceway inlet. A further description is given within the intake channel and intake structure section.
Rust or Staining	
Spalling	
Erosion or Cavitation	
Visible Reinforcing	
Any Seepage or Efflorescence	
Condition at Joints	
Drain Holes	
Channel	
Loose Rock or Trees Overhanging Channel	
Condition of Discharge Channel	

PERIODIC INSPECTION CHECK LIST

PROJECT Lyman Mill Pond DATE Dec. 4, 1978

PROJECT FEATURE Outlet Works NAME Daniel P. LaGatta

DISCIPLINE Geotechnical Engineer NAME Ron H. Cheney

Structural Engineer

AREA EVALUATED	CONDITIONS
OUTLET WORKS - TRANSITION AND CONDUIT	
General Condition of Concrete	There is no transition or conduit.
Rust or Staining on Concrete	
Spalling	
Erosion or Cavitation	
Cracking	
Alignment of Monoliths	
Alignment of Joints	
Numbering of Monoliths	

PERIODIC INSPECTION CHECK LIST

PROJECT Lyman Mill Pond DATE Dec. 4, 1978

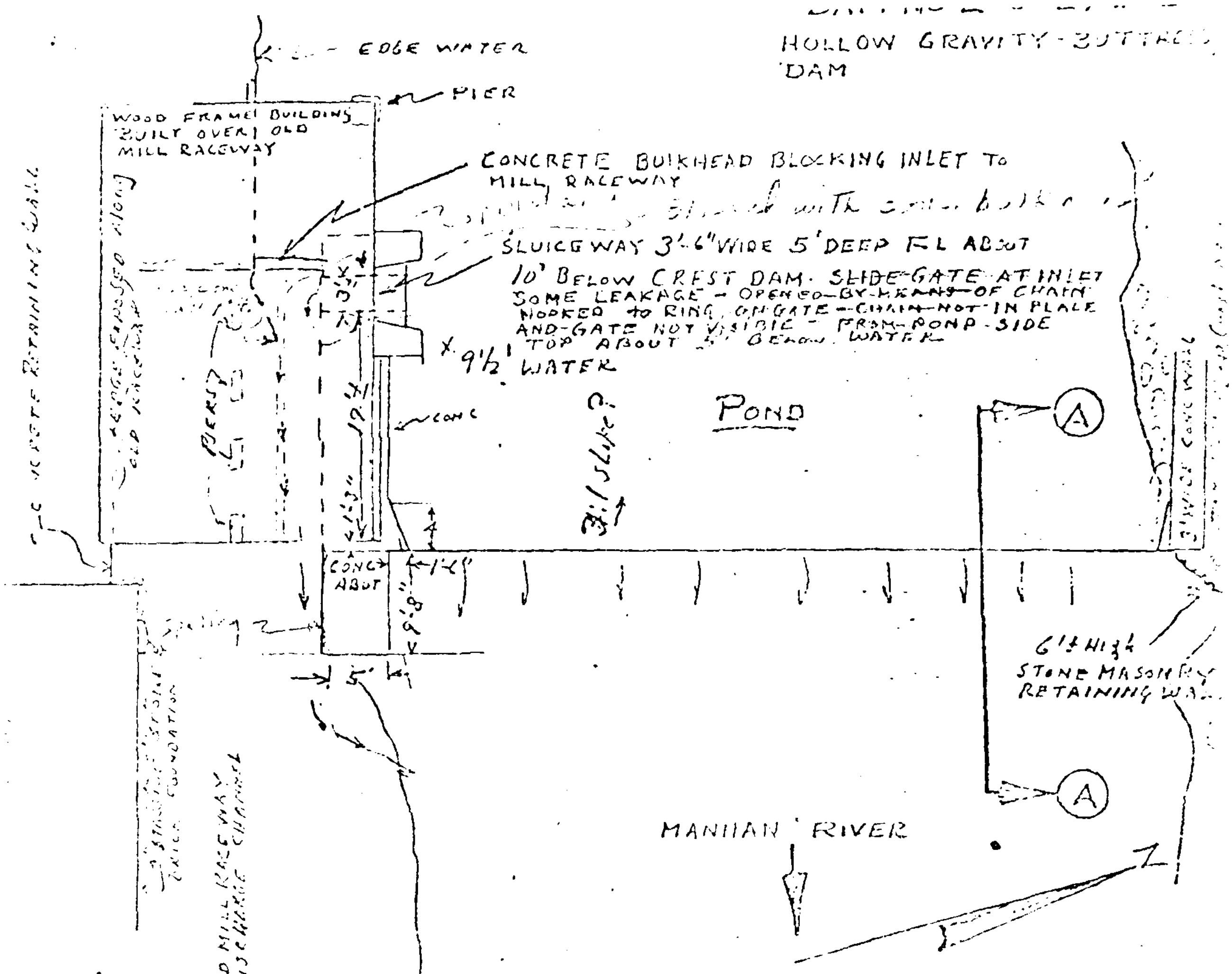
PROJECT FEATURE Concrete and masonry dam NAME Daniel P. LaGatta

DISCIPLINE Geotechnical Engineer NAME Ron H. Cheney

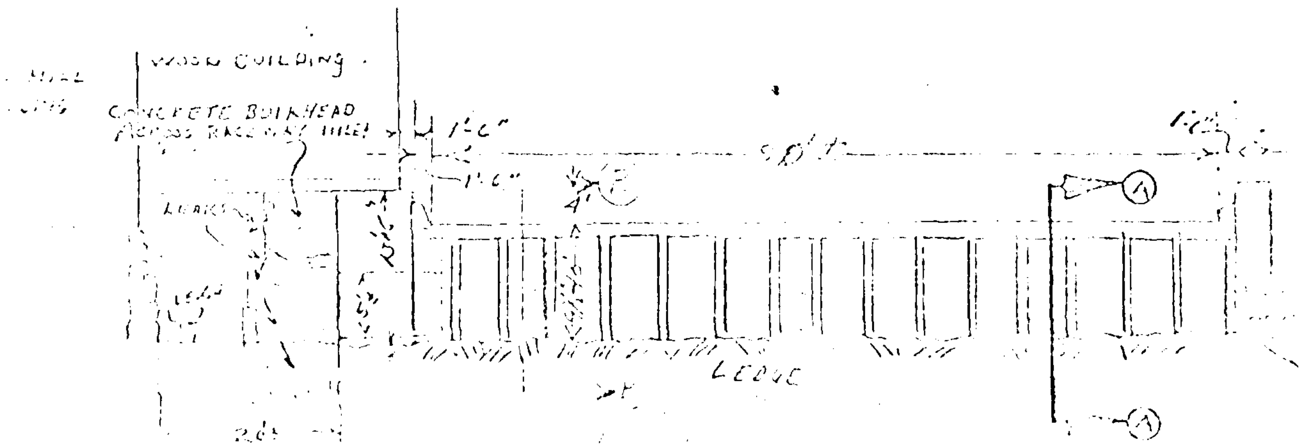
Structural Engineer

AREA EVALUATED	CONDITIONS
OUTLET WORKS - CONTROL TOWER	
a. Concrete and Structural	None
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	None
Air Vents	
Float Wells	
Crane Hoist	
Elevator	
Hydraulic System	
Service Gates	
Emergency Gates	
Lightning Protection System	
Emergency Power System	
Wiring and Lighting System in Gate Chamber	

HOLLOW GRAVITY-BUTTRESS DAM

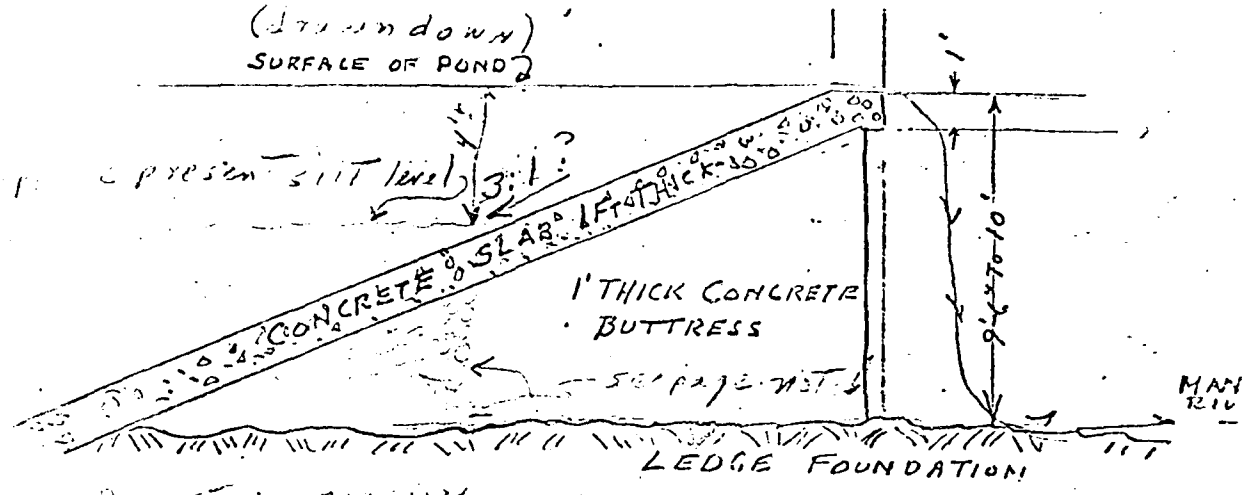


PLAN VIEW

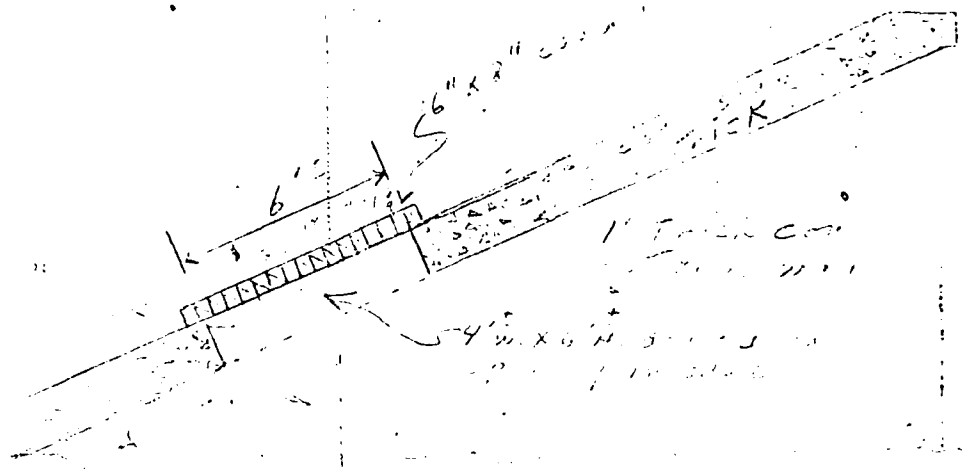


DOWNSTREAM ELEVATION

SHEET 2 OF 2
DAM NO 2-9-276-



X SECTION A A - THROUGH
SPILLWAY DAM



INSPECTION REPORT - DAMS AND RESERVOIRS

1. LOCATION:

~~City~~/Town Southampton. County Hampshire. Dam No. 2-8-276-2

Name of Dam Lyman Mill Dam.

Topo Sheet No. 12A. Mass. Rect. Coordinates: N 446,000, E 266,600.

Inspected by: Russell G. Salls, P.E., On July 9, 1973. Date Last Inspection October 1970

2. OWNER/S: As of November, 1972

per: Assessors X, Reg. of Deeds ____, Prev. Insp. ____, Per. Contact July 9, 19[illegible]

Name	St. & No.	City/Town	State	Tel. No.
1. Mrs. Edward R. Stone	Brickyard Road	Southampton	Mass.	413-527-0739
2.				
3.				

3. CARETAKER: (if any) e.g. superintendent, plant manager, appointed by absentee owner, appointed by multi owners.

Name	St. & No.	City/Town	State	Tel. No

4. DATA:

No. of Pictures Taken None. Sketches See description of Dam.
Plans, Where None located.

5. DEGREE OF HAZARD: (if dam should fail completely)*

1. Minor ____.
2. Moderate ____.
3. Severe X.
4. Disastrous ____.

Comments: Mud and water could damage water supply of Easthampton

*This rating may change as land use changes (future development).

6. OUTLETS: OUTLET CONTROLS AND DRAWDOWN

No. 1 Location and Type: Main spillway and dam - 90'± wide, 4' high, concrete hollow gravity buttress and slab structure

Controls No, TYPE: _____.

Automatic_____. Manual_____. Operative Yes_____, No_____.

Comments: Drop spillway - founded on ledge _____.

No. 2 Location and Type: Sluiceway - 3'± wide, 5' high through wall of Old Mill Raceway, 19' above dam's face on south side of dam.

Controls Yes, Type: Wooden slide gate - not visible from pond side

Automatic_____. Manual X. Operative Yes X, No_____.

Comments: Gate is supposed to be opened by hooking a chain into ring on ga raising manually. Top gate about 5' below water. Owner spoke o opening gate this fall to clean out silt.

No. 3 Location and Type: _____.

Controls_____, Type: _____.

Automatic_____. Manual_____. Operative Yes_____, No_____.

Comments: _____.

Drawdown present Yes X, No_____. Operative Yes X, No_____.

Comments: Item #2 above. Silting could cause difficulty when opening gate.

---

7. DAM UPSTREAM FACE: Slope 3:1, Depth Water at Dam 9½ Ft. at gate.

Material: Turf_____. Brush & Trees_____. Rock fill____. Cement Masonry X. Wood____

Other Slope under water _____.

Condition: 1. Good X. 3. Major Repairs_____.

2. Minor Repairs_____. 4. Urgent Repairs_____.

Comments: Concrete appeared to be in good condition. _____.

---

8. DAM DOWNSTREAM FACE: Slope Vertical - Buttress.

Material: Turf_____. Brush & Trees____. Rock Fill____. Concrete Masonry X. Wood_____.

Other Ledge at bottom of drop _____.

Condition: 1. Good X. 3. Major Repairs_____.

2. Minor Repairs_____. 4. Urgent Repairs_____.

Comments: Portion of buttresses and water side slab visible, is in fair to poor condition. Some spalling of concrete surfaces.

(9.) EMERGENCY SPILLWAY: Available No . Needed No .

Height Above Normal Water _____ Ft.

Width _____ Ft. Height _____ Ft. Material _____

Condition: 1. Good X . 3. Major Repairs _____ .

2. Minor Repairs _____ . 4. Urgent Repairs _____ .

Comments: Present spillway appears adequate; 90'± wide and 4½' high.

(10.) WATER LEVEL AT TIME OF INSPECTION: 3 Inches or 1/4 Ft. Above X . Below _____ .

Top Dam X F.L. Principal Spillway _____ .

Other _____

Normal Freeboard 4 Ft. to top of abutments on either side.

(11.) SUMMARY OF DEFICIENCIES NOTED:

Growth (Trees and Brush) on Embankment None

Animal Burrows and Washouts None

Damage to Slopes or Top of Dam None

Cracked or Damaged Masonry Some spalling of concrete at south abutment and on deterioration of concrete bulkhead across Old Mill inlet.

Evidence of Seepage Yes. Some minor seepage into Old Mill race on top of l

Evidence of Piping None Seen

Leaks Large flow through joint where concrete bulkhead across Old Mill race inlet joins southerly side wall.

Erosion None Noted

Trash and/or Debris Impeding Flow No

Clogged or Blocked Spillway No

Other _____

2. OVERALL CONDITION:

1. Safe_____.
2. Minor repairs needed__X__.
3. Conditionally safe - major repairs needed_____.
4. Unsafe_____.
5. Reservoir impoundment no longer exists (explain)

   Recommend removal from inspection list_____.

---

3. REMARKS AND RECOMMENDATIONS: (Fully Explain)

This dam is a hollow gravity slab and buttress dam built of concrete. It appears to have been built to replace a stone masonry dam, parts of which were incorporated int the abutment and used for rock fill at the northerly end.

At the time of this inspection about 3 to 4 inches of water were overflowing the cre preventing a close inspection of the downstream portion of the spillway. It was poss to see only 5 or 6 buttresses on the north end by looking under the nappe from the en the dam. These were in good condition structurally although some minor surface erosi could be seen. The alignment and grade of the spillway is true and no deviations wer visible. It appears that the main spillway is in good condition.

The concrete wall which forms the upper portion of the northerly abutment was replace in 1969 and Mr. John Hickey of Southampton Road, Westhampton who did the work said th except for the easterly portion this wall is founded on ledge. That portion adjacen the spillway is built on a mortar stone masonry retaining wall in very good conditio the entire area back of the wall is a massive stone fill.

On the south or mill end of the dam there is a massive concrete and stone masonry wal 5 feet thick which formerly was one of the side walls of the old mill race. This wal extends about 10 feet downstream of the spillway crest and 25 feet upstream. There i some spalling of the concrete and one crack downstream of the spillway but no evidenc of structure failure. About 19 feet upstream of the spillway there is a 3' wide by 5 high sluiceway through the bottom of the wall with a wooden slide gate at the inlet. Water was leaking into the sluiceway. The gate was replaced in 1969 and according to Mr. Hickey can be opened by hooking a chain on to a ring in the gate. This gate coul not be seen from the pond side.

DAM NO. 2-8-276-2

15. REMARKS AND RECOMMENDATIONS: (Continued)

Just beyond the sluiceway and at right angles to the wall there is a concrete bulkhead across what was formerly the intake weir of the mill raceway or penstock. There is a large flow of water from openings where the concrete has eroded away where this bulkhead joins the southerly wall of the old intake chamber. At this time no dangerous structural defects were found and the dam appears to be safe. If the water is drawndown this fall for cleaning, the leakage into the sluiceway and the leaks around the bulkhead across the old mill raceway intake should be corrected.

RCS/cd

DISTRICT II

Submitted by Russell C. Salls, P. E. Dam No. 2-8-276-2

Date July 9, 1973 ~~City~~/Town Southampton

Name of Dam Lyman Mill Pond Dam

1. Location: Topo Sheet No. 12A Mass. Rect. Coordinates N 446,000 E 266,600

Provide 8½" x 11" in clear copy of topo map with location of Dam clearly indicated.

On Manhan River about 150 feet easterly of Route 10 (Route 10 crosses pond) and about 1000 feet south of intersection of Route 10 and Former Road.

2. Year built Unknown Year/s of subsequent repairs June, 1969
Concrete abutment wall at north end built.

3. Purpose of Dam: Water Supply _____ Recreational X
Flood Control _____ Irrigation _____ Other Old Mill Pond

4. Drainage Area: 27 sq. mi. _____ acres.
Type: City, Bus. & Ind. _____ Dense Res. _____ Suburban 2% Rural, Farm _____
Wood & Scrub Land 98% Slope: Steep 15% Med. 60% Slight 25%

5. Normal Ponding Area: 5½ Acres; Ave. Depth 6 ft.
Impoundment: 10 3/4 million gals.; 33 acre ft.
Silted in: Yes X No _____ Approx. Amount Storage Area 20%

6. No. and type of dwellings located adjacent to pond or reservoir _____
i.e. summer homes etc. 4 year-round dwellings, plus active sheet metal shop

7. Dimensions of Dam: Length 90'± Max. Height 9½' to 10'
Freeboard 4' to top abutments on either end.
Slopes: Upstream Face 3:1 under water
Downstream Face Vertical
Width across top 18"

Dam No. 2-8-276-2

8.

Classification of Dam by Material:

Earth _____ Conc. Masonry X Stone Masonry _____

Timber _____ Rockfill _____ Other _____

8A.

Dam Type: Gravity X Straight X Curved, Arched _____ Other spil

Overflow _____ Non-overflow _____

Hollow gravity - slab and buttress dam.

9.

A. Description of present land usage downstream of dam:

85 % rural; 15 % urban

B. Is there a storage area or flood plain downstream of dam which could accommodate the impoundment in the event of a complete dam failure? Yes X No _____

C. Character Downstream Valley: Narrow _____ Wide X Developed 15%

Rural 85% Urban _____

10.

Risk to life and property in event of complete failure.

No. of people 5

No. of homes 5

No. of businesses None

No. of industries None Type _____

No. of utilities 3 Type Easthampton water supply, electric and telephone pole lines

Railroads _____

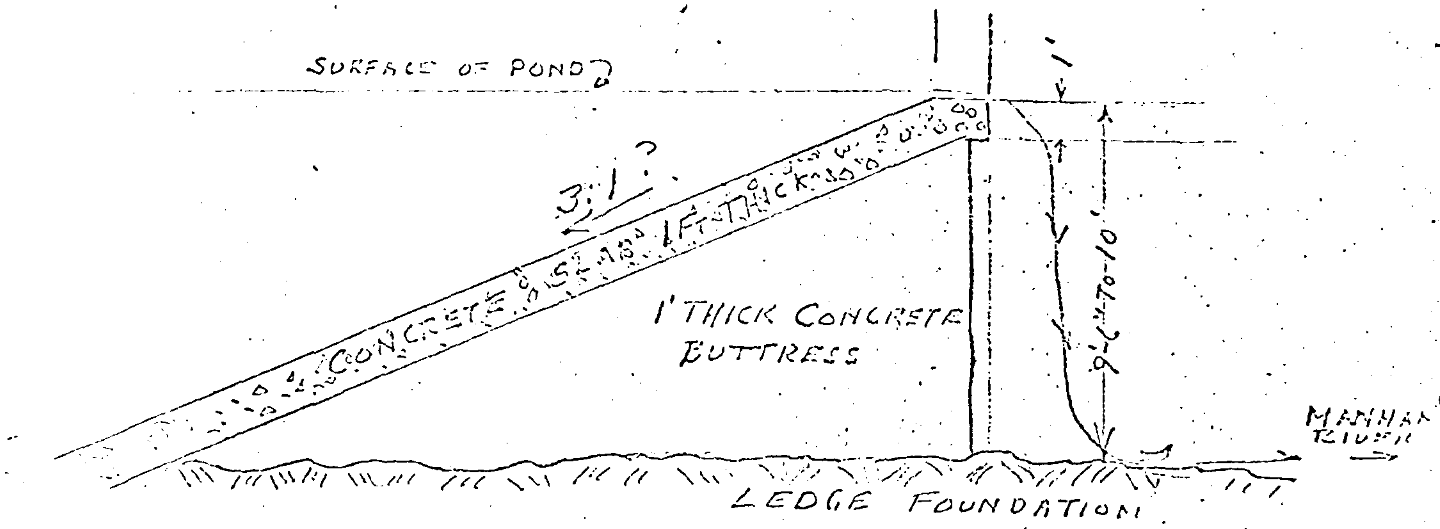
Other dams Easthampton Water Supply Dam Number 2-8-87-3

Other Bridges on Route 10 and town roads.

11.

Attach Sketch of dam to this form showing section and plan on 8½" x 11" sheet

RCS/vt/ad
Attachments
Locus Plan
Sketches

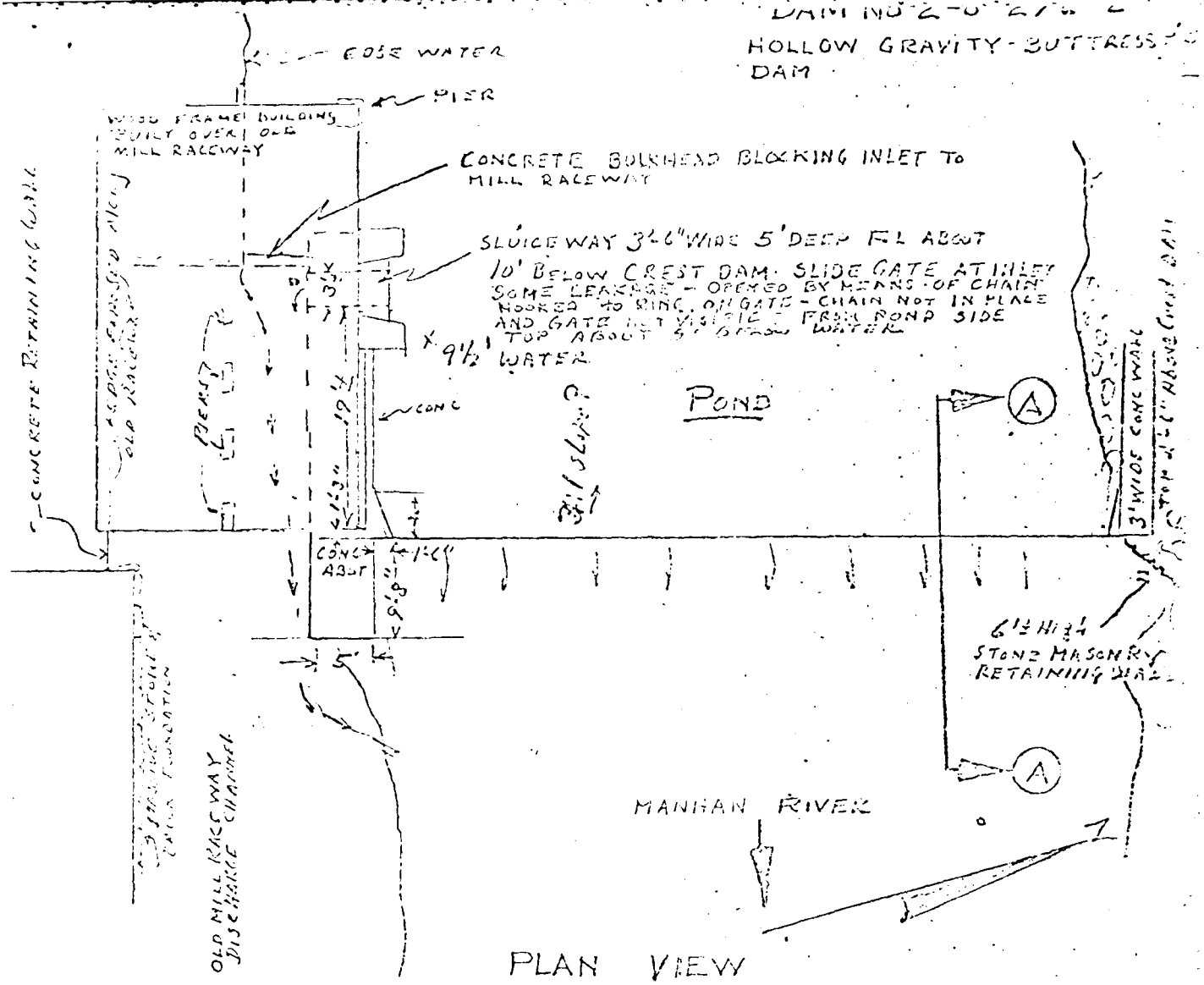


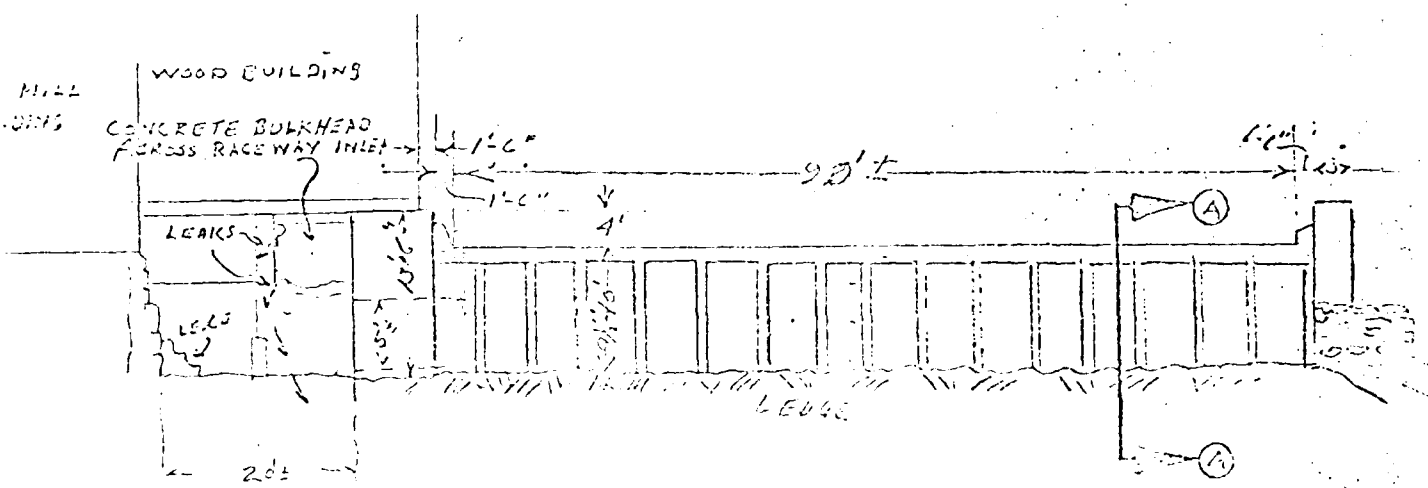
X SECTION AA - THROUGH SPILLWAY DAM

Note: see inspection report dated Oct. 14, 1975 item #13 indicates differences noted. (LRA)

DAM NO 2-0 27[illegible]

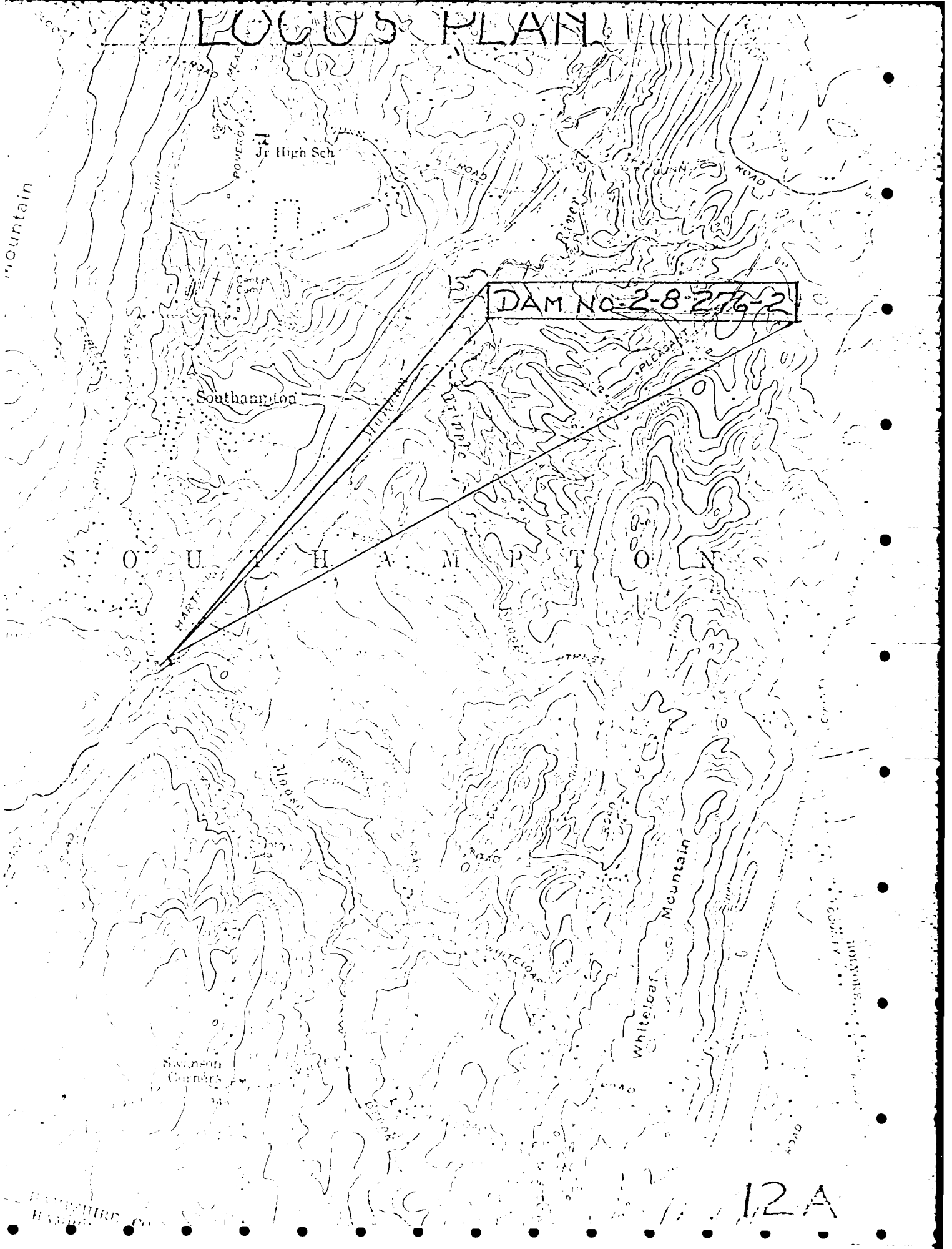
HOLLOW GRAVITY-BUTTRESS DAM





: see inspection report dated Oct. 14, 1975 item #13

indicates differences noted (LRA)


LOCUS PLAN
DAM NO-2-8-276-2
Jr High Sch
Southampton
S O U T H A M P T O N
Whiteloar Mountain
12A

COUNTY INSPECTION REPORT - 1968

C. Lyman Mill Pond Dam

The concrete wall forming the left abutment of this dam is badly eroded at the end of the wall and on the face adjacent to the end of the spillway crest. This is the wall on the opposite side of the dam from the two red buildings and on the side of the plant parking lot. This wall has been deteriorating for a number of years. The amount of erosion and weathering has now increased to a point where the wall should be repaired in 1969 at the latest to prevent further and deeper deterioration.

The right abutment wall is also eroded but this condition is not as bad as that at the left abutment wall. The right abutment wall is also cracked. However, this does not appear to affect its safety and function.

The concrete crest of the dam itself is o.k. There were no flashboards on the crest and water level was spilling over the dam on the day of inspection.

The concrete cell construction and the inner stone walls were noted to be o.k. The toe area in the stream was satisfactory.

The heavy rock fill to the left of the dam and beyond the plant parking area was in satisfactory condition.

Though this dam does need attention as mentioned hereinbefore, and the repairs should be made within the next year to prevent the necessity for more extensive repairs at a later date, in the opinion of the undersigned, the dam is safe.

COUNTY INSPECTION REPORT - 1966

Lyman Mill Pond Dam

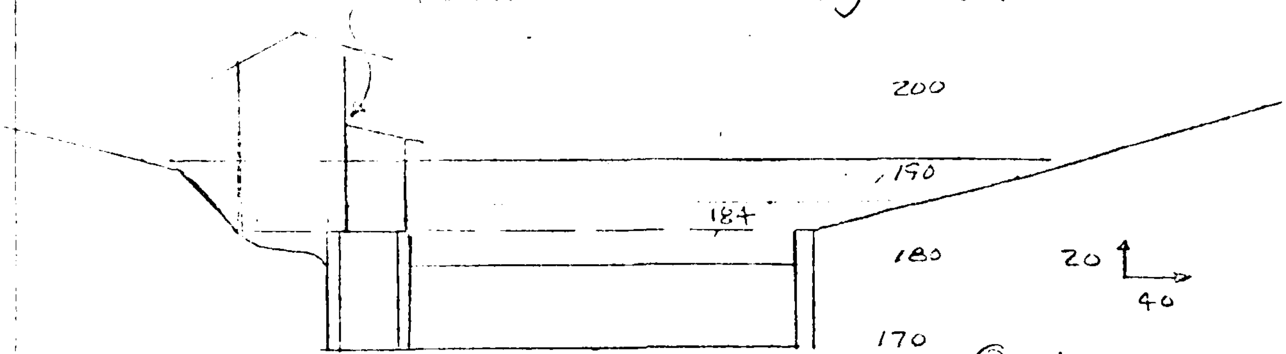
The concrete cells and the crest masonry were found to be satisfactory. The right abutment masonry is cracked but is no worse than noted in the past. At the left abutment the concrete masonry wall above the spillway is becoming well eroded at spillway crest elevation. Also, the left end of the spillway is becoming eroded at the point where it joins the left abutment wall. As a result of this erosion, the width of the left abutment training wall is becoming narrow. As of the time of the last inspection, the loss of concrete was not great enough to require repairs to this wall. However, within the next few years, further deterioration of the wall will probably require a recommendation that the concrete masonry wall be repaired.

The area breached in the flood of August, 1955 and located to the left of the dam proper is in satisfactory condition. This area shows no signs of erosion and the heavy stone fill placed in the void was found to be okay.

On the day of inspection, water level behind the dam was at the crest of the masonry spillway and no flashboards were on the crest. No changes have been made at this dam since the time of the last inspection and the structure was considered safe when checked.

Stage Discharge Above Dam Spillway

Assume Wood Frame Bldgs. Intact



$Q_{reqd} = 17285$

S ≈ [illegible] = 0.004'/'
n = 0.0[illegible]

Elev	P	Area	R	$R^{2/3}$	V (fps)	Q (cfs)	$Q_{spill+v}$
[illegible]	[illegible]	720 sf	8.47	4.19	13.11	9440.	12010
[illegible]	1[illegible]5'	[illegible]	10.56	4.85	15.2	31318.	33889
[illegible]	145	1400.	9.65	4.57	14.31	20039	22609
1[illegible]	135	1240	9.19	4.42	13.84	17162	19732
18[illegible]							

Q_{p_1} = 3[illegible]8   Elev. = 184.75   Stor. = 53 a-f or 1/10"

No effective storage $Q_{p_1} = Q_{p_2}$ = 3628 cfs

Failure Analysis $W_b = 0.4(110) = 44'$

$Q_{p_1} = \frac{8}{27}(44)\sqrt{32.2}\,(10)^{3/2} = 2340$ cfs

[illegible] adjacent stream banks, entire [illegible] as [illegible] long, low spillway.

[illegible] outflow, 2340 cfs, will be dissipated before any developed areas.

Stage Discharge at Dam — Spillway

$Q = CLH^{3/2}$
$C = 3.57$ (King-Brater)

Elev	D	C	L	$H^{3/2}$	Q cfs
180	0	3.57	90'	0	0.0
181	1	↓	↓	1	321.3
182	2			2.83	909.0
183	3	321.3		5.2	1670.0
184	4	↓	↓	8	2,570.0

$Q_{in} = 3628$ cfs

elev 184.75 $Q \simeq 3600$ cfs

Stage Storage at Dam

Elev	Area-Acres	Ave Area	Stor	Accum Stor
170	1.80	0	0	0
180	3.67	2.74	27.4 a-f	27.4 a-f
184	14.69	9.18	36.72	64.12 a-f
190	31.22	23.—	138.—	202.12 a-f
191	59.66	45.45	45.5	247.62 a-f

(records show 1/3 base stor may be silted-in)

[illegible] Hazard Potential: Low
No houses near River until Strong Road (3500' downstream), here 1 home could be damaged by flood water. At East Hampton, about 3 mi. downstream, 2 houses at Laudville Road and 8 at Main Str (Rte 141 & 10) could be damaged by flood water Not dam failure. Large flood plain exists between dam and East Hampton. Hazards produced by flood flow - Not Dam Failure. Test flood = 100 yr Storm

100 yr flow = 0.25 (13.82) 1050 = 3628 cfs

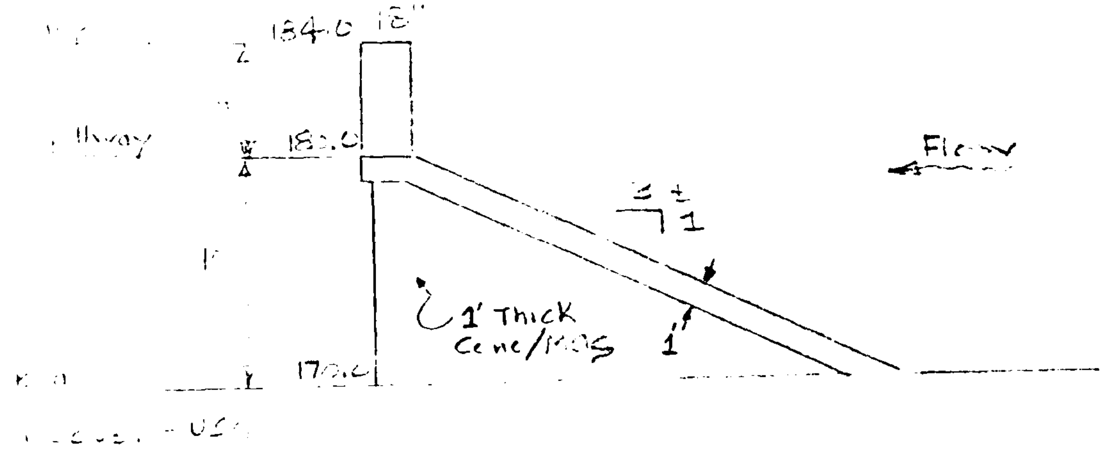
35% [illegible]tainous 545 + 65% Flat 505 = 1050 cfs/sm

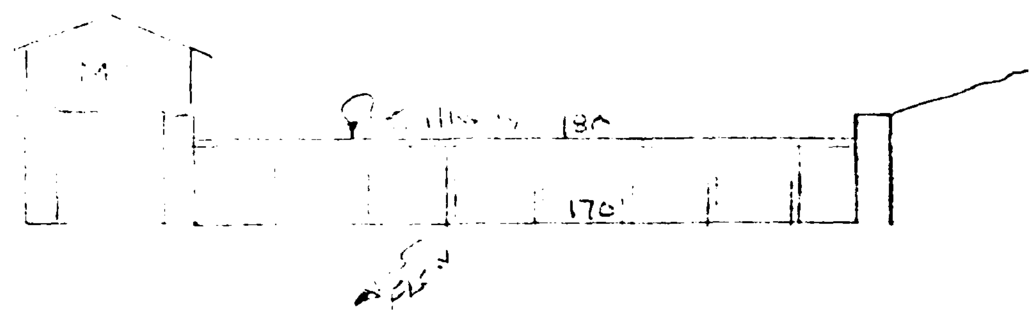
accounts for direct runoff only as 14.9 sm area above Tighe Carmody Dam not included - peaks are not [illegible] simultaineous.

Built during 1938 to replace 1900 dam
Hydraulic Height = 10'± (State)
Storage Capacity ≈ 33± (State) max 55 a-f.
Spillway Length ≈ 90'± . "
" Depth ≈ 4'± .
Size Class = Small .
Drainage Area = 28.78 sq mi , 14.96 controlled
by Tighe-Carmody Reservoir spillway
13.82 sq mi direct runoff area. Long "flat
drainage paths".

1955 ... washed-out area to left of dam
... down-stream. Main dam was OK.

... report indicated 1/3 base storage capacity
...-in, may not have been removed.





APPENDIX D

HYDROLOGIC AND HYDRAULIC COMPUTATIONS

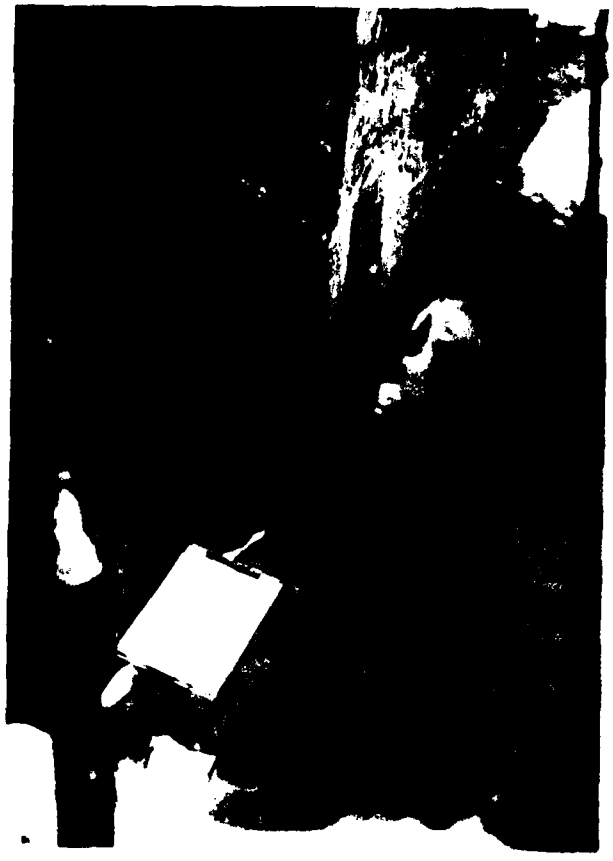


PHOTO NO. 9 - Flow at downstream end of right abutment wall due mainly to spring at sluiceway bulkhead.

PHOTO NO. 10 - Crest of dam viewed from right abutment. Note that silting upstream of dam is visible below water surface.

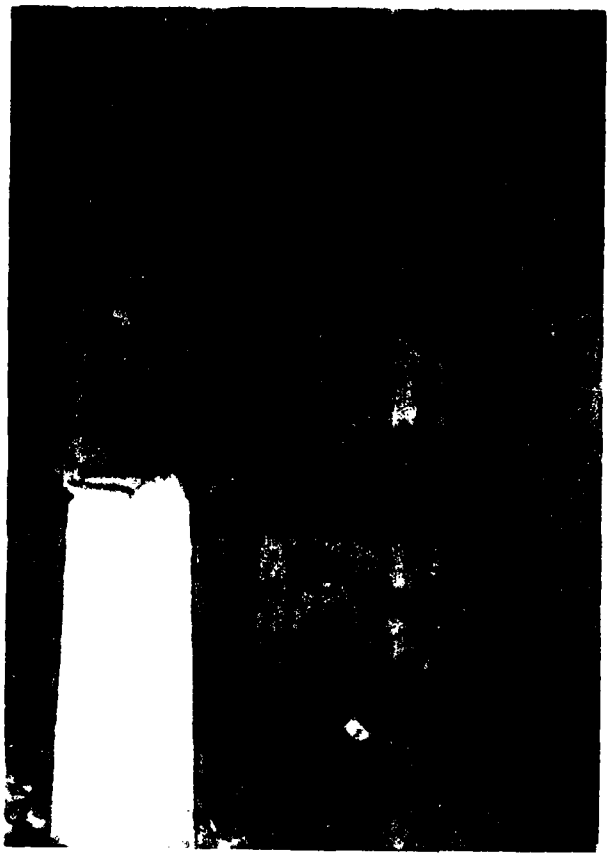


PHOTO NO. 7 - Right abutment wall and concrete bulkhead at old outlet sluiceway.

PHOTO NO. 8 - Interior face of wall which forms right abutment of dam. Water flowing along base of wall is mainly from spring located at the intersection of abutment wall and bulkhead

PHOTO NO. 5 - Downstream view from upstream highway bridge.

PHOTO NO. 6 - Downstream channel showing railroad bridge.

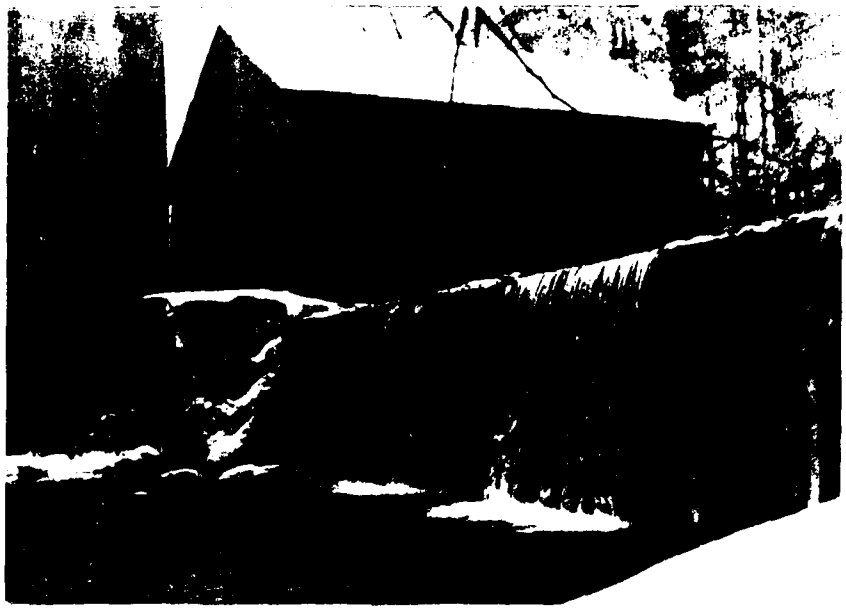


PHOTO NO. 1 - Downstream face of dam from left abutment.

PHOTO NO. 2 - Downstream face of dam from right abutment.

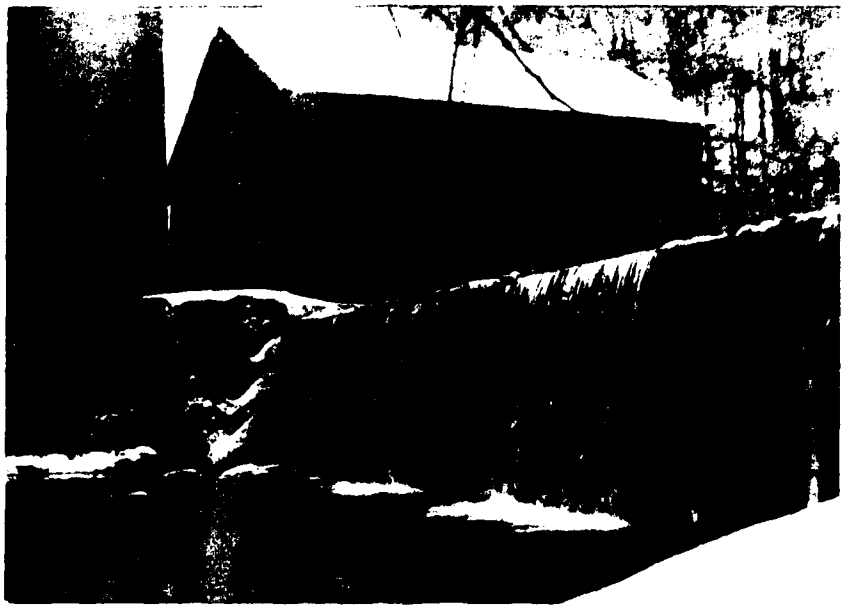
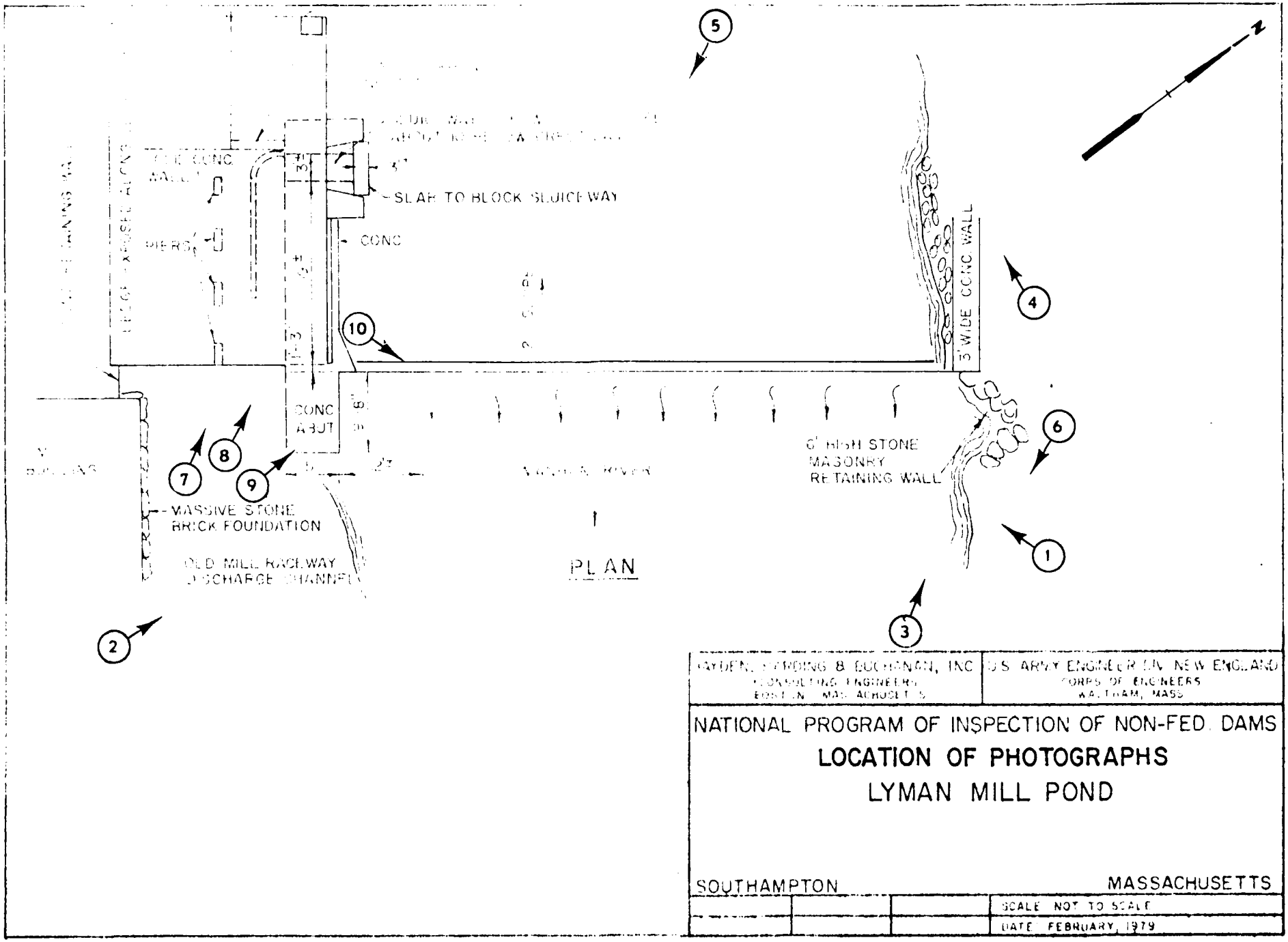


PHOTO NO. 1 - Downstream face of dam from left abutment.

PHOTO NO. 2 - Downstream face of dam from right abutment.



GYDEN, FARDING & BUCHANAN, INC CONSULTING ENGINEERS BOSTON, MASSACHUSETTS	U.S. ARMY ENGINEER DIV. NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS.

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

LOCATION OF PHOTOGRAPHS

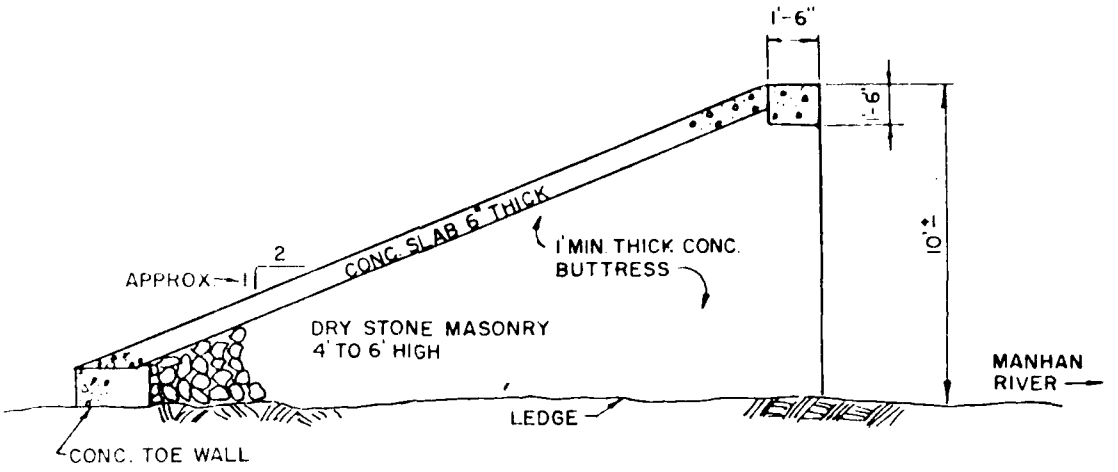
LYMAN MILL POND

SOUTHAMPTON MASSACHUSETTS

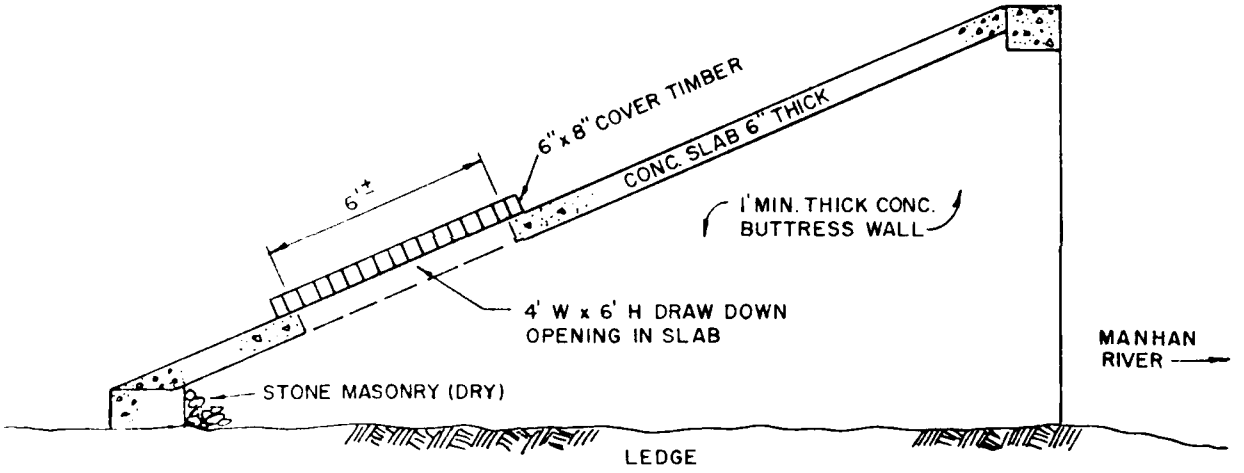
			SCALE NOT TO SCALE
			DATE FEBRUARY, 1979

APPENDIX C

PHOTOGRAPHS



SECTION A-A



SECTION B-B

HAYDEN, HARDING & BUCHANAN, INC. *CONSULTING ENGINEERS BOSTON, MASSACHUSETTS	U.S. ARMY ENGINEER DIV. NEW ENGL CORPS OF ENGINEERS WALTHAM, MASS.

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

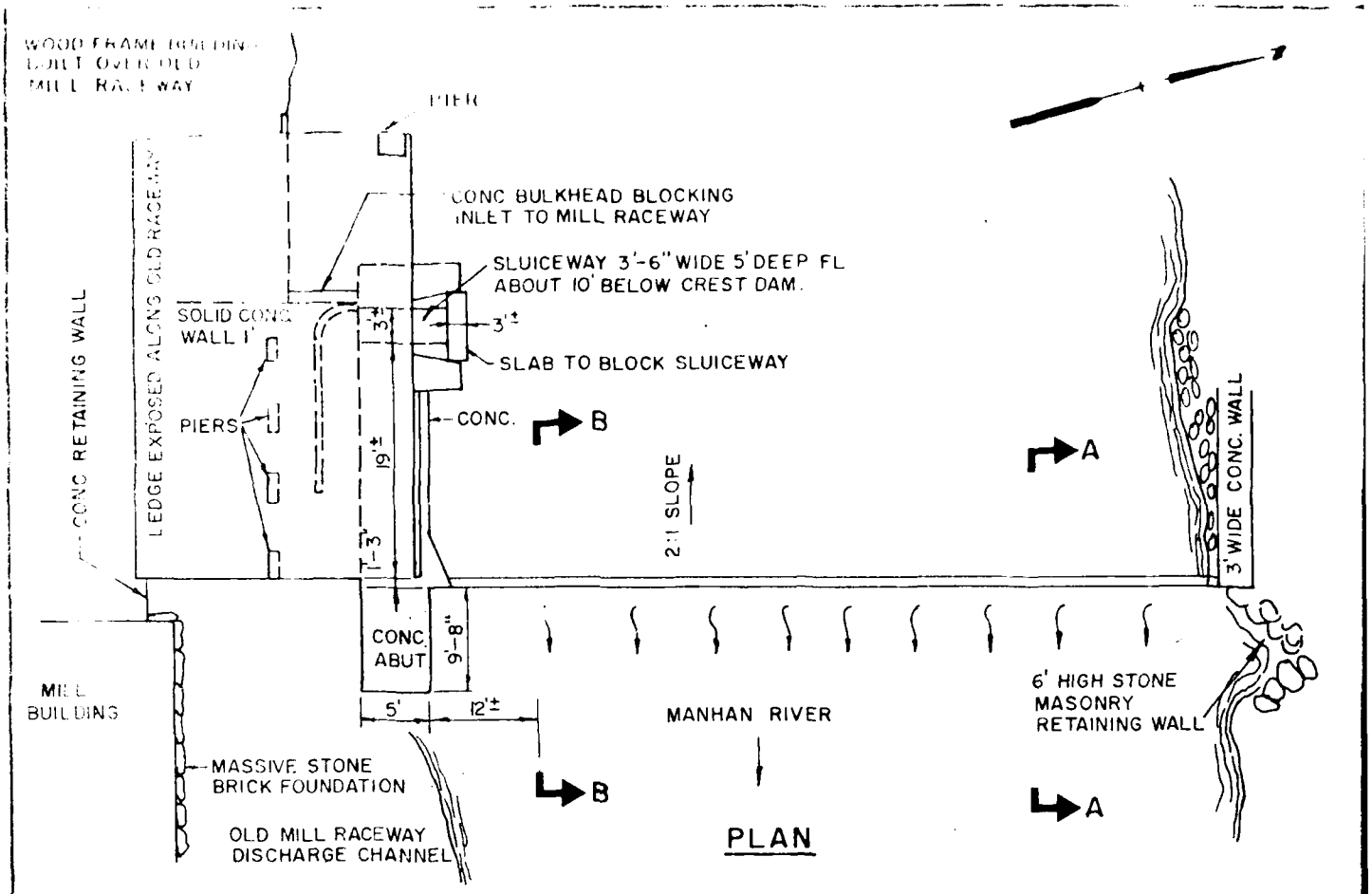
LYMAN MILL POND

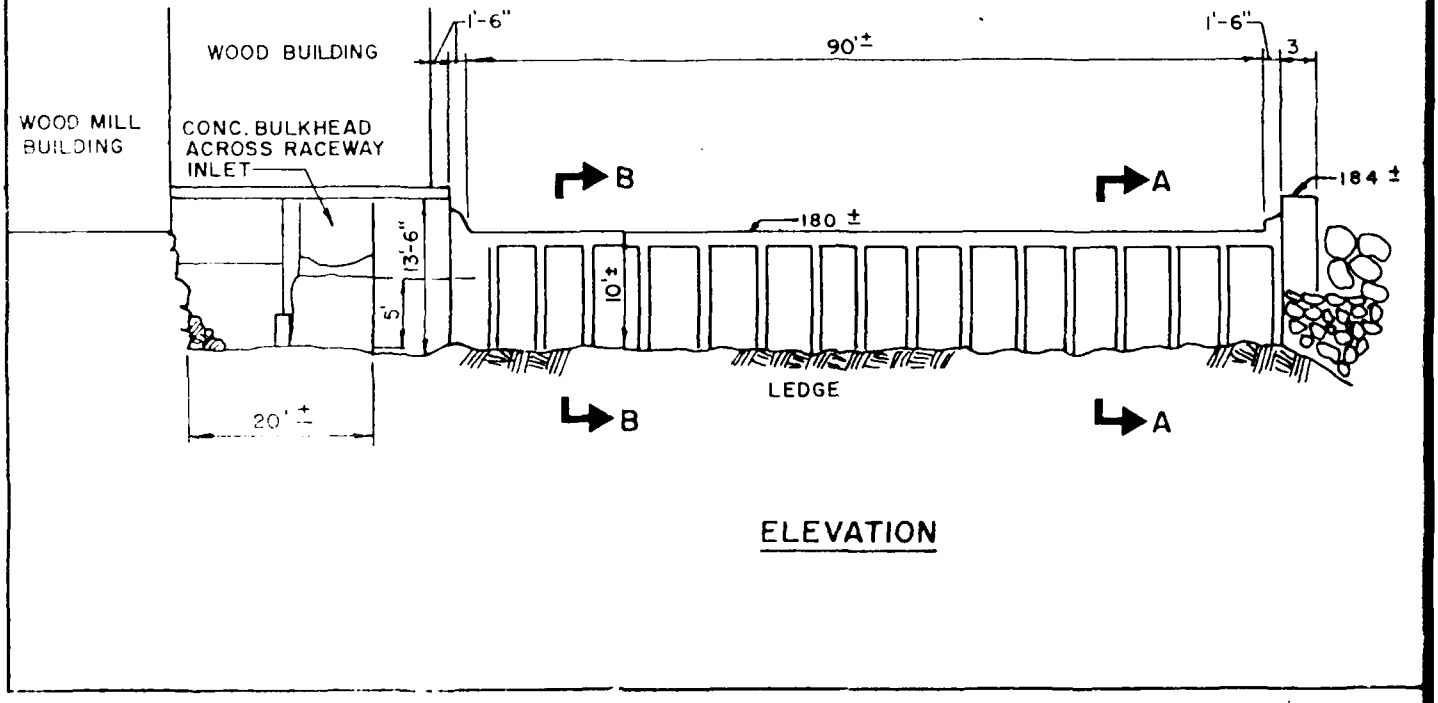
SOUTHAMPTON MASSACHUSETTS

TAKEN FROM CAUGHEY & PRATT JULY 8, 1938 DESIGN PLAN AND 1975 STATE INSPECTION REPORT SKETCHES.

SCALE: NOT TO SCALE

DATE: FEBRUARY, 1979


WOOD FRAME BUILDING
OUTLET OVER OLD
MILL RACEWAY
PIER
CONC BULKHEAD BLOCKING
INLET TO MILL RACEWAY
SLUICEWAY 3'-6" WIDE 5' DEEP FL
ABOUT 10' BELOW CREST DAM.
SOLID CONC.
WALL 1'
3'±
SLAB TO BLOCK SLUICEWAY
CONC RETAINING WALL
LEDGE EXPOSED ALONG OLD RACEWAY
PIERS
CONC.
B
A
19'±
1'-3"
2:1 SLOPE
3' WIDE CONC. WALL
CONC ABUT
9'-8"
MILL
BUILDING
5'
12'±
MANHAN RIVER
6' HIGH STONE
MASONRY
RETAINING WALL
MASSIVE STONE
BRICK FOUNDATION
OLD MILL RACEWAY
DISCHARGE CHANNEL
PLAN

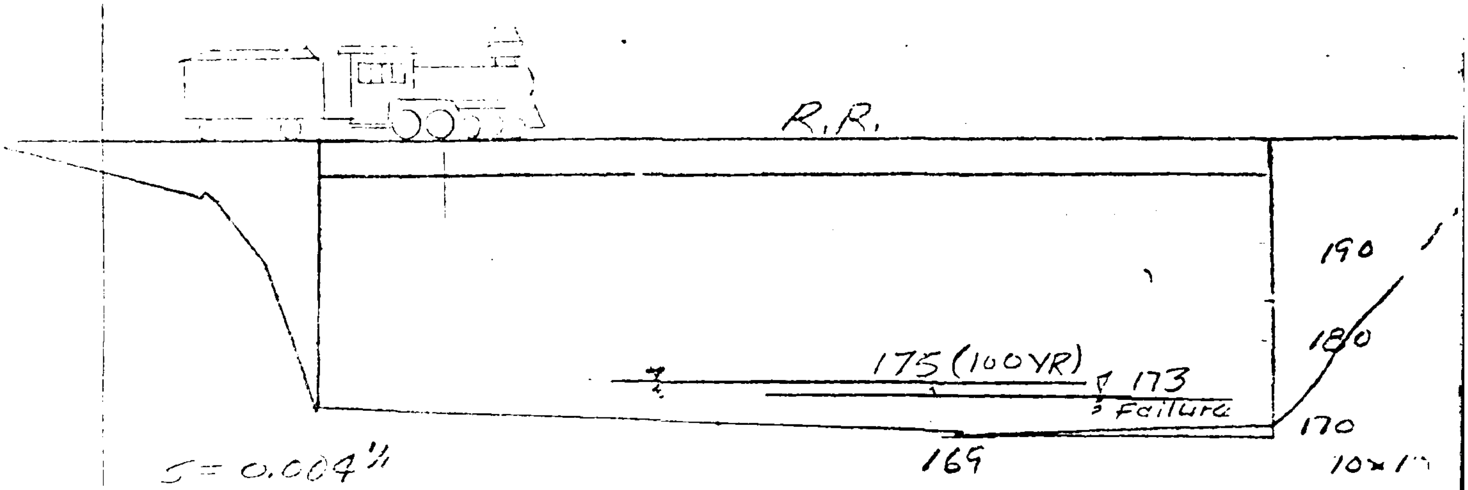

WOOD BUILDING
1'-6"
90'±
1'-6"
3
WOOD MILL
BUILDING
CONC. BULKHEAD
ACROSS RACEWAY
INLET
B
A
184 ±
180 ±
13'-6"
5'
10'±
LEDGE
20'±
B
A
ELEVATION

REPRODUCED AT GOVERNMENT EXPENSE

HAYDEN, HARDING & BUCHANAN INC.
CONSULTING ENGINEERS
BOSTON, MASSACHUSETTS

DATE 4/?/78
BY FDS

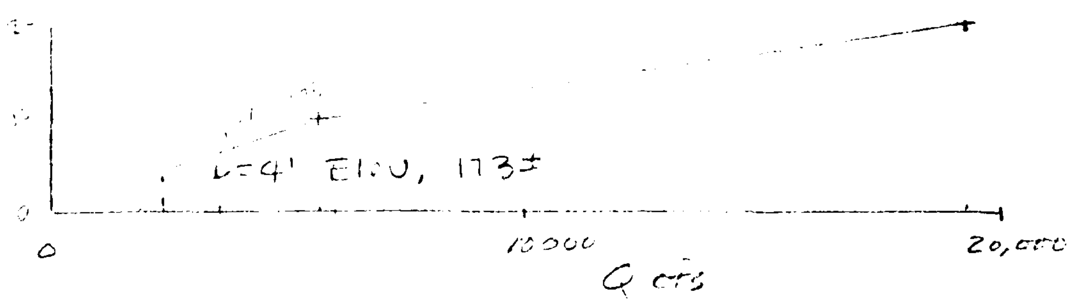
SHEET NO.
JOB Dams
SUBJECT Lyman Pond
CLIENT Corps



S = 0.004%
n = 0.05

D	WP	A	R	$R^{2/3}$	V	Q
10'	118	825	6.99	3.68	6.92	5707 cfs
20'	138	1825	13.23	5.64	10.61	19353 cfs

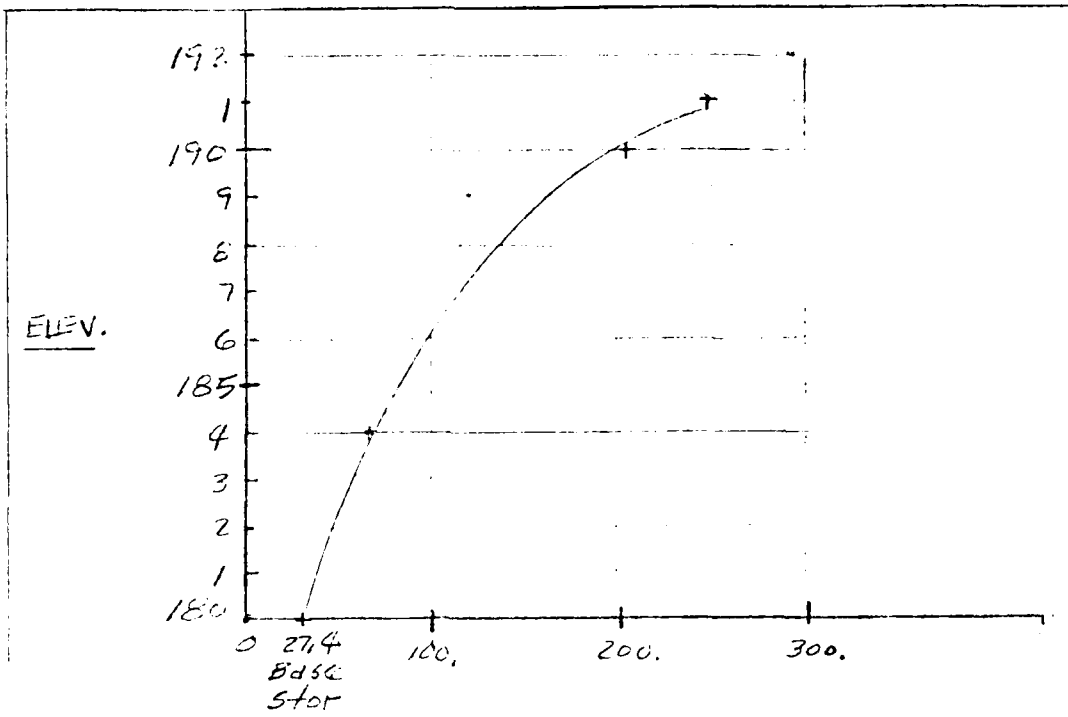
Beyond this location, channel "flatens and widens" significantly. Many additional brooks and a significant amount of drainage area contribute runoff into the Manhan River. Hazards downstream are due to flooding conditions caused by channel controls (culverts, roads) not "dam failure".



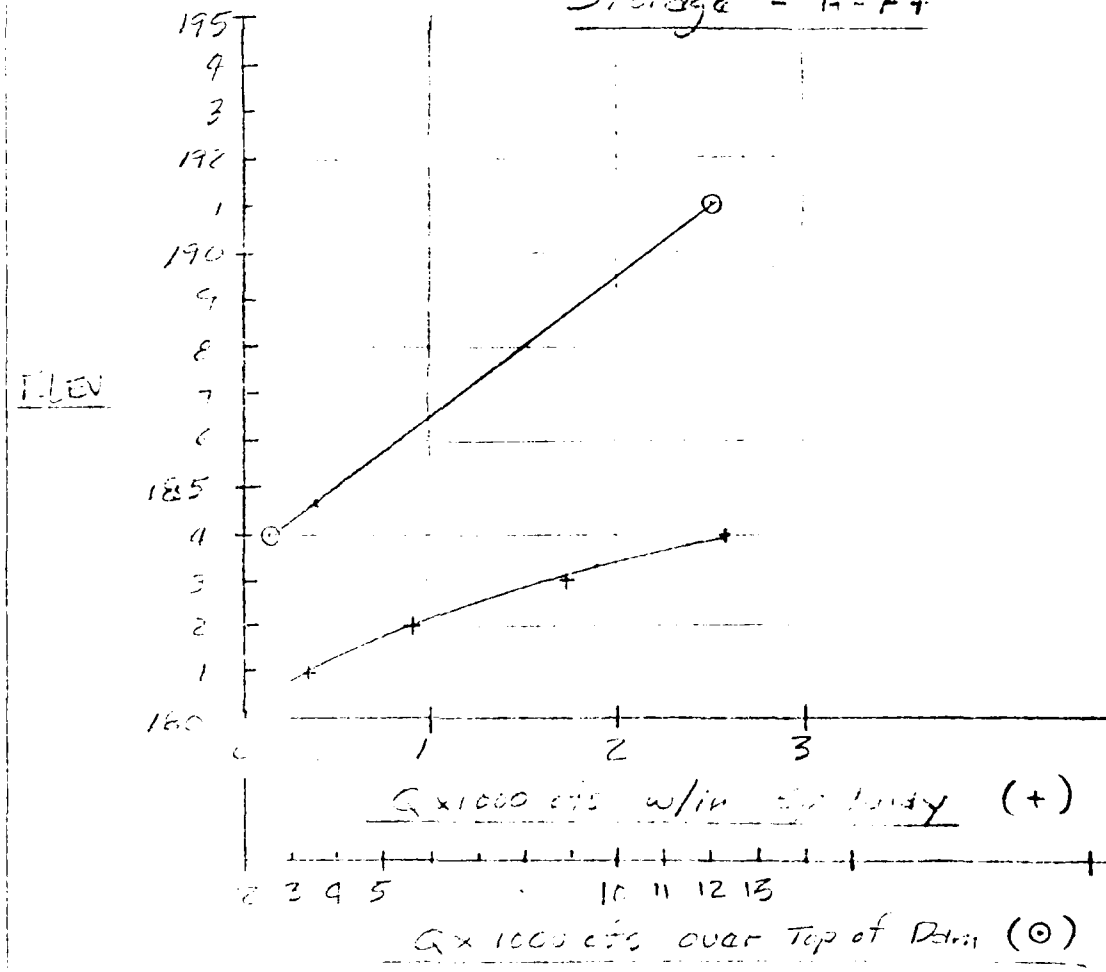
DATE 1/20/78
BY
CD BY TDD

HAYDEN, HARDING & BUCHANAN, INC
CONSULTING ENGINEERS
BOSTON MASSACHUSETTS

JOB Dams
SUBJECT Cymon R...
CLIENT Corps



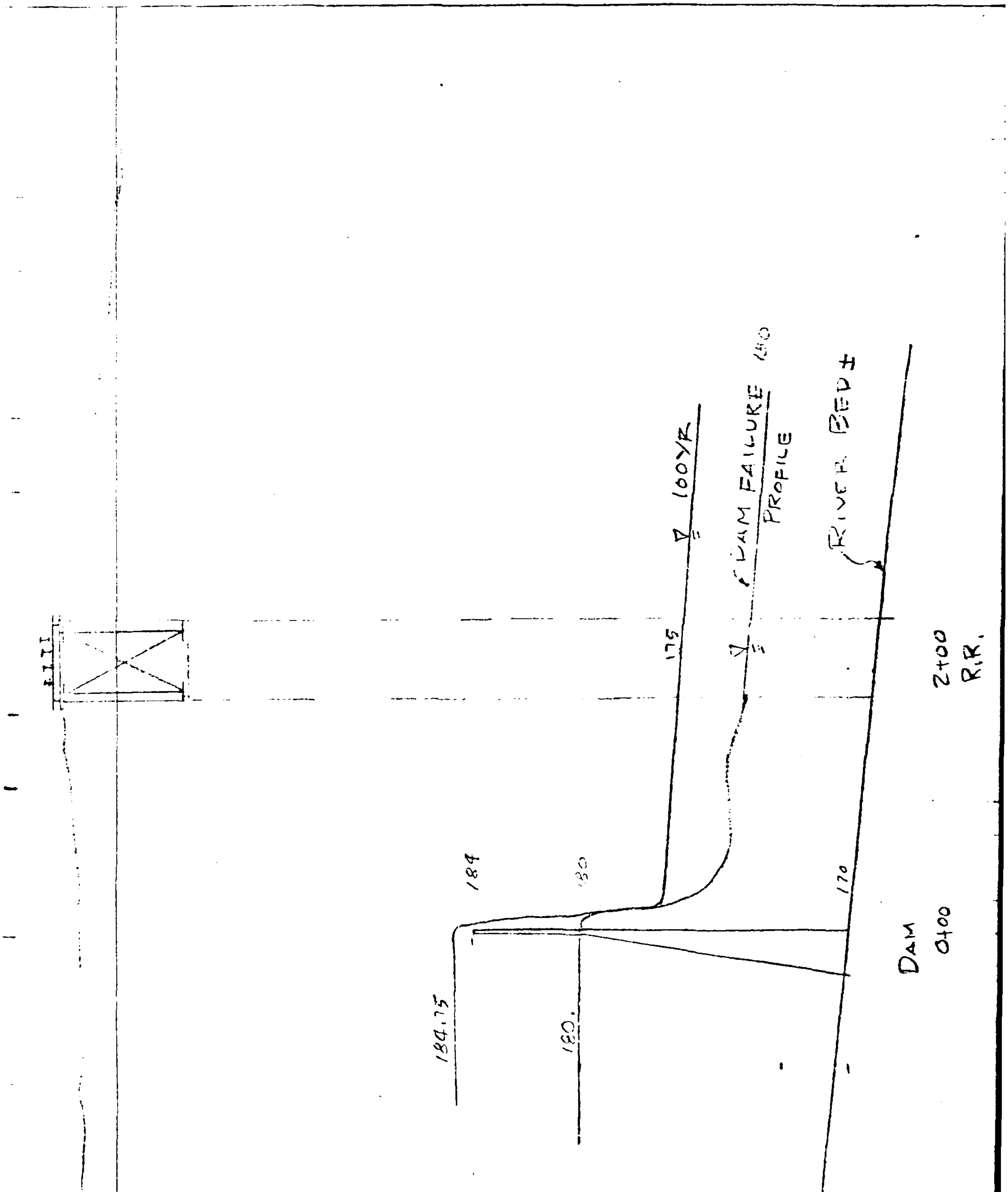
Storage = A-Ft

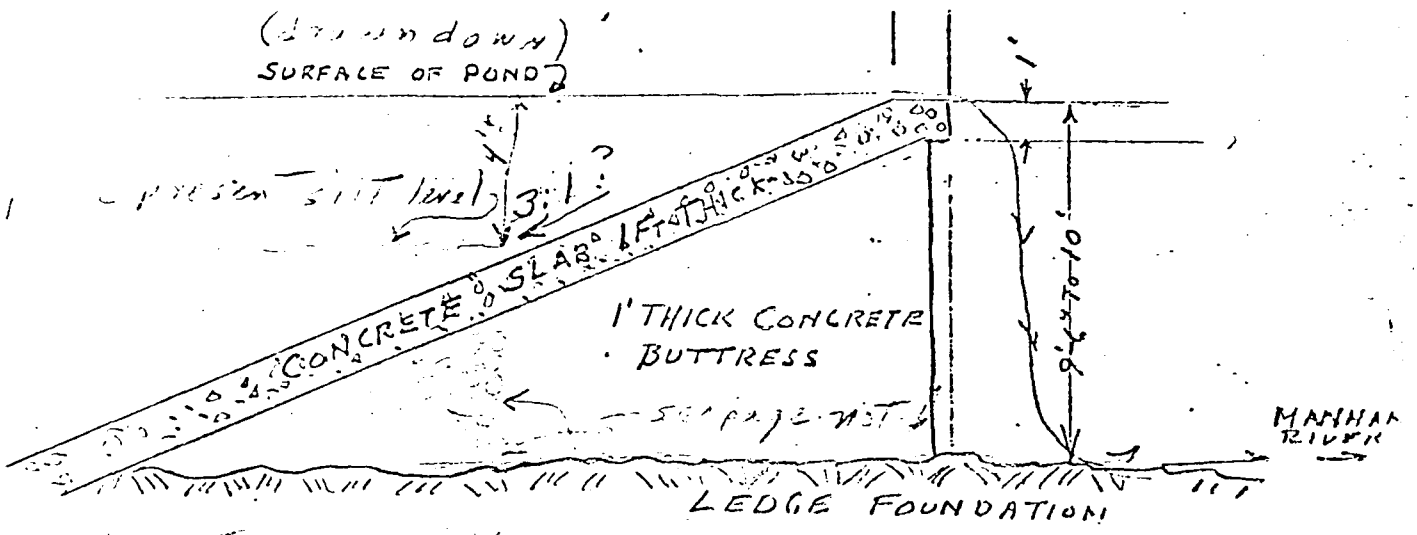


...No. 70-884.1
...TE 12/1/78
BY ...
...D BY TDD

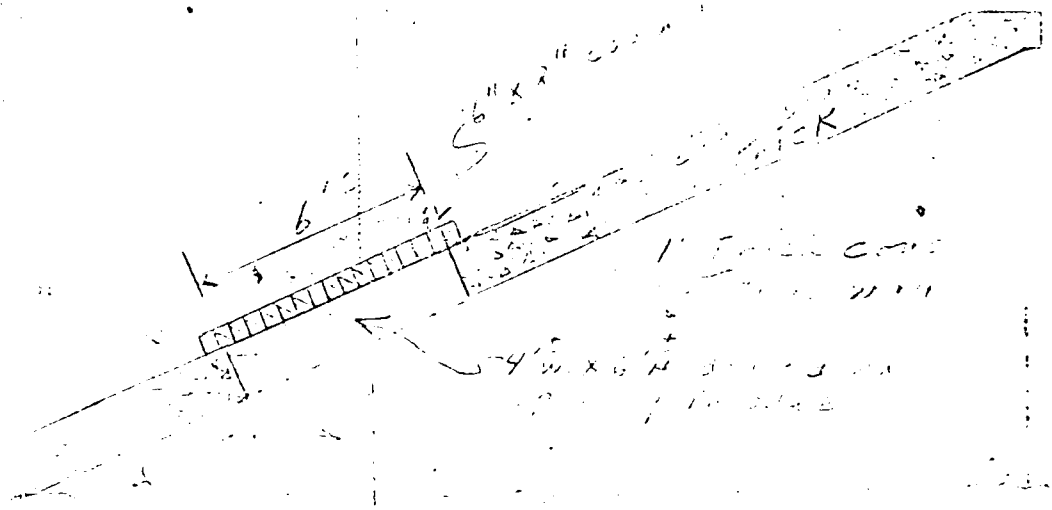
HAYDEN, HARDING & BUCHANAN, INC
CONSULTING ENGINEERS
BOSTON MASSACHUSETTS

SHEET NO. 7
JOB Dams
SUBJECT Lymdn Pond
CLIENT Corps

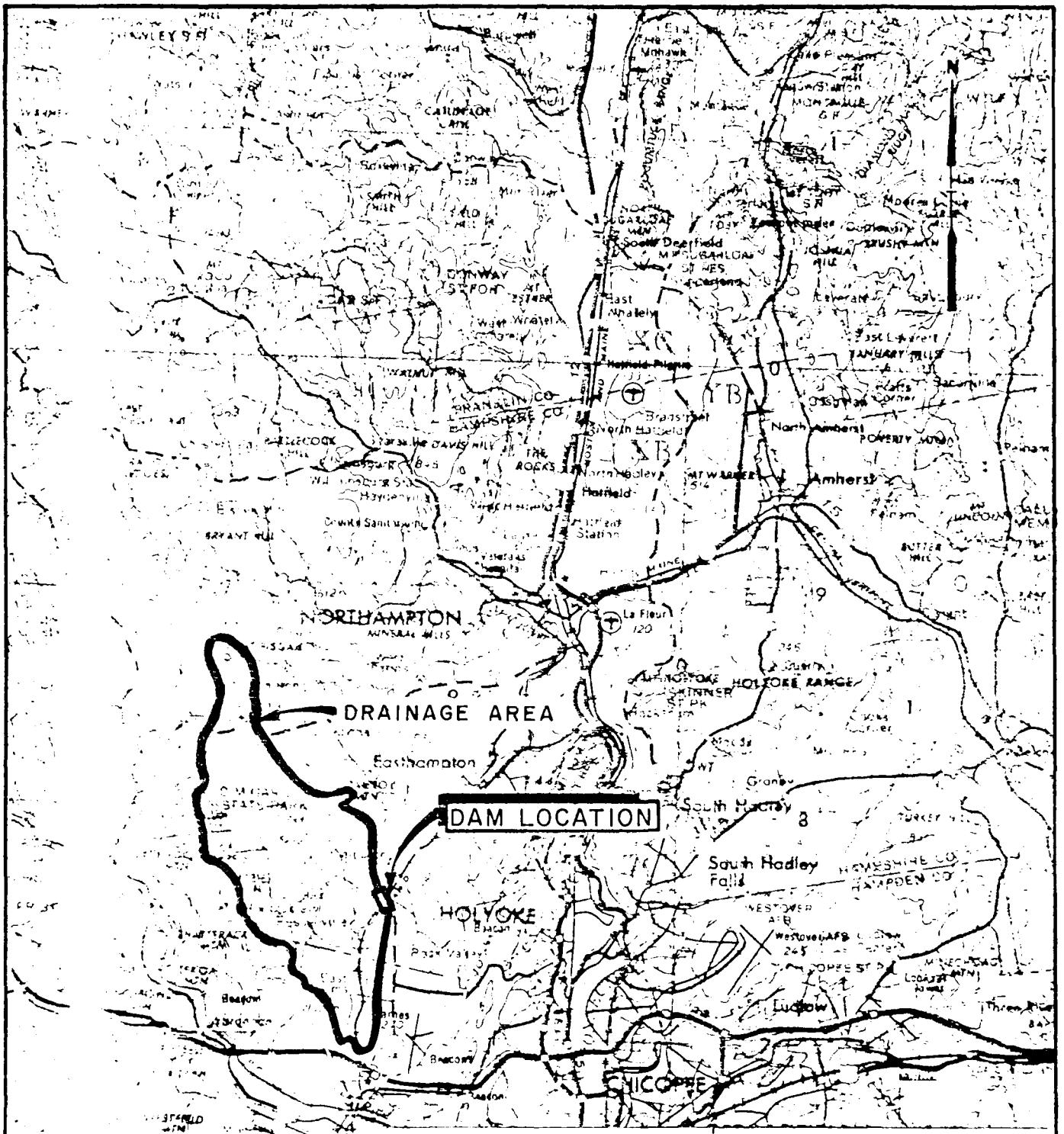




X SECTION A A - THROUGH
SPILLWAY DAM



X-SECTION B-B



HAYDEN, HARDING & BUCHANAN, INC
CONSULTING ENGINEERS
BOSTON, MASSACHUSETTS

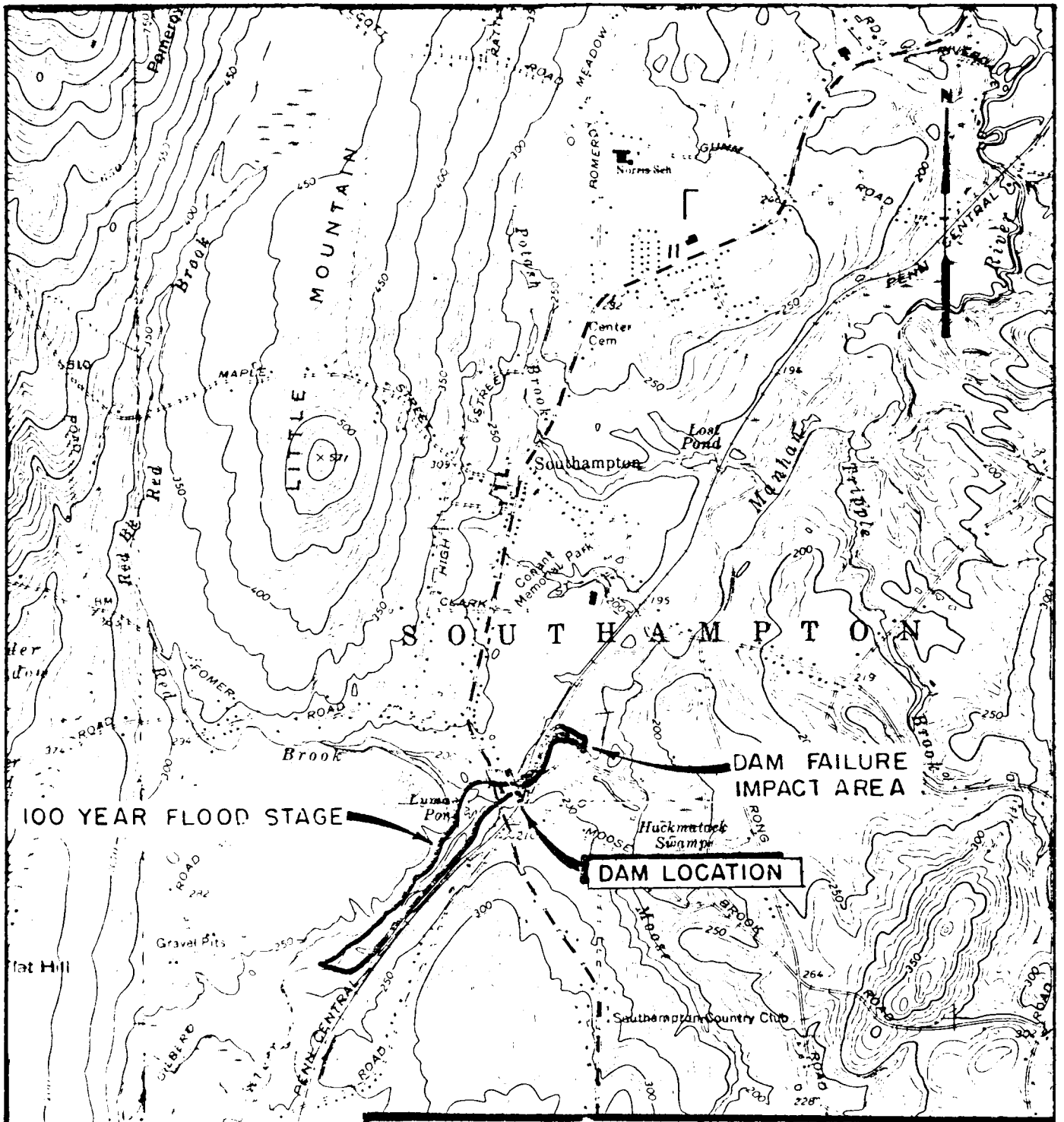
U.S. ARMY ENGINEER DIV NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

LYMAN MILL POND

SOUTHAMPTON MASSACHUSETTS

			SCALE 1" = 250,000'
			DATE FEBRUARY, 1979



HAYDEN, HARDING & BUCHANAN, INC. CONSULTING ENGINEERS BOSTON, MASSACHUSETTS	U.S. ARMY ENGINEER DIV. NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS.

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

LYMAN MILL POND

SOUTHAMPTON MASSACHUSETTS

			SCALE 1" = 2000'
			DATE: FEBRUARY, 1979

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	(10) NAME	(11) LATITUDE (NORTH)	(12) LONGITUDE (WEST)	(13) REPORT DATE DAY	MO	YR
MA	[illegible]	NEC	MA	015	01				LYMAN MILL POND DAM	4213.[illegible]	7243.8	23	FEB	79

(14) POPULAR NAME	(15) NAME OF IMPOUNDMENT
	LYMAN POND

(16) REGION	(17) BASIN	(18) RIVER OR STREAM	(19) NEAREST DOWNSTREAM CITY–TOWN–VILLAGE	(20) DIST FROM DAM (MI.)	(21) POPULATION
01	08	MANHAM RIVER	SOUTHAMPTON	0	3069

(22) TYPE OF DAM	(23) YEAR COMPLETED	(24) PURPOSES	(25) STRUCTURAL HEIGHT (FT.)	(26) HYDRAULIC HEIGHT (FT.)	(27) IMPOUNDING CAPACITIES MAXIMUM (ACRE–FT.)	(28) NORMAL (ACRE–FT.)
ERCPCT	1900	R	14	10	64	27

DIST	OWN	FED R	PRV/FED	SCS A	VER/DATE
NED	N	N	N	N	07MAR79

(29) REMARKS

(30) U/S HAS	(31) SPILLWAY CREST LENGTH	(32) TYPE	(33) WIDTH (FT.)	(34) MAXIMUM DISCHARGE (FT.)	(35) VOLUME OF DAM (CY)	(36) POWER CAPACITY INSTALLED (MW)	(37) PROPOSED (MW)	(38) NAVIGATION LOCKS NO	LENGTH (FT.)	WIDTH (FT.)	LENGTH (FT.)	WIDTH (FT.)	LENGTH (FT.)	WIDTH (FT.)	LENGTH (FT.)	WIDTH (FT.)
Y	90	U	90	2570												

(39) OWNER	(40) ENGINEERING BY	(41) CONSTRUCTION BY
MRS. EDWARD STONE		

(42) REGULATORY AGENCY			
DESIGN	CONSTRUCTION	OPERATION	MAINTENANCE
NONE	NONE	NONE	NONE

(43) INSPECTION BY	(44) INSPECTION DATE DAY	MO	YR	(45) AUTHORITY FOR INSPECTION
HAYDEN HARDING + BUCHANAN, INC	04	DEC	78	PUBLIC LAW 92-367

(46) REMARKS

END

FILMED

7-85

DTIC