QUINEBAUG RIVER BASIN
KILLINGLY, CONNECTICUT

ACME POND DAM
CT 00172

PHASE 1 INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

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

MARCH 1981

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS BEFORE COMPLETING FORM

1. REPORT NUMBER CT 00172	2. GOVT ACCESSION NO. ADA143310	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) Acme 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 March 1981 13. NUMBER OF PAGES 65
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,

Quinebaug River Basin
Killingly, Conn.
Acme Pond Dam

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

The dam at Acme Pond is an earth embankment structure with a vertical downstream stone masonry wall. Its maximum height above the trail race channel to the mill, at the spillway, is 18.7 ft. As a result of the visual inspection and hydraulic and gydrologic calculations, the dam is considered to be in FAIR comdition. The test flood for this dam, classified as SMALL and as having a HIGH hazard potential is half the Probable Maximum 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

JUN 10 1981

Honorable William A. O'Neill
Governor of the State of Connecticut
State Capitol
Hartford, Connecticut 06115

Dear Governor O'Neill:

Inclosed is a copy of the Acme Pond Dam (CT-00172) 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, National Patent Development Corporation, Acme-Chaston Division, 3 Huntington Quadrangle, Suite 2 and 11, Malvern, New York 11746.

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,

C. E. EDGAR, III
Colonel, Corps of Engineers
Commander and Division Engineer

Incl
As stated

QUINEBAUG RIVER BASIN

KILLINGLY, CONNECTICUT

ACME POND DAM
CT 00172

PHASE 1 INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

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

MARCH 1981

NATIONAL DAM INSPECTION PROGRAM

PHASE I - INSPECTION REPORT

Identification No.:	CT 00172
Name of Dam:	Acme Pond Dam
Town:	Killingly
County and State:	Windham, Connecticut
Stream:	Whetstone Brook
Owner:	Acme Chaston Division National Patent Development Corp.
Date of Inspection:	13 November 1980

BRIEF ASSESSMENT

The dam at Acme Pond is an earth embankment structure with a vertical downstream stone masonry wall. It is 12 feet wide at the crest, 570 feet long, and 10 feet high above the roadway which runs along the entire toe of the downstream side of the dam. Its maximum height above the tail race channel to the mill, at the spillway, is 18.7 feet. This channel passes beneath the roadway and the mill, and then exits into a small mill pond about 200 feet downstream of Acme Pond Dam. The stone masonry spillway, located near the right abutment of the dam, is a broad crest weir 16 feet long and 3.2 feet high. On the upstream side of the dam is an intake structure for a 16 inch pipe which passes beneath the dam and road. This pipe is laid within an older 4 foot diameter steel plate pipe and provides water for a storage tank at the mill. The pipe has a valve beneath the mill building which can discharge into a second channel passing beneath the mill,to join the one previously mentioned. Older gate mechanisms may be found near the spillway structure, but they are in a state of disrepair and not considered functional.

The dam is located on Whetstone Brook and is at the outflow point of a 5.2 square mile watershed which contains 5 other reservoirs. Together, these reservoirs provide substantial storage capacity to dampen the effect of major flooding. The storage capacity of Acme Pond at the top of the dam is 29 acre feet.

The dam was probably constructed in 1846 to provide mechanical power for a mill manufacturing cotton cloth products. Since that time only minor repairs have been instituted, and from local information, the dam appears not to have been overtopped.

As a result of the visual inspection and hydraulic and hydrologic calculations, the dam is considered to be in FAIR condition. To assure the long term performance of this structure, several items will require further attention. These items concern themselves with the downstream masonry wall, which has tilted and is bulging at many locations, indicating potential future instability; the crest of the dam, which has settled near the left abutment; and the capacity of the spillway and the downstream channel, which are inadequate to pass the test flood outflows, particularly beneath the mill structure.

The test flood for this dam, classified as SMALL and as having a HIGH hazard potential, is half the Probable Maximum Flood (½ PMF). This test flood has an inflow of 1,670 cfs and an outflow discharge of 1,660 cfs, and will overtop the dam by 1 foot. The maximum outflow capacity of the spillway at the top of the dam is 250 cfs, which represents approximately 15% of the test flood outflow.

It is recommended that the Owner retain the services of a registered professional engineer to perform the tasks outlined in Section 7 of this report, which include a structural analysis and a more in depth hydraulic and hydrologic study. These recommendations and any further remedial measures should be implemented within one year of the Owner's receipt of this report.

LENARD & DILAJ ENGINEERING, INC.

By: ______________________

John F. Lenard, P.E.
President

Michael Dilaj, P.E., Vice President
Project Manager

STATE OF CONNECTICUT JOHN F. LENARD No. 8475 REGISTERED PROFESSIONAL ENGINEER

STATE OF CONNECTICUT MICHAEL DILAJ NO. 9302 REGISTERED PROFESSIONAL ENGINEER

This Phase I Inspection Report on Acme 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 judgement and practice, and is hereby submitted for approval.

Carney M. Terzian

CARNEY M. TERZIAN, MEMBER
Design Branch
Engineering Division

J.W. Finegan

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

Aramast Mahtesian

ARAMAST MAHTESIAN, CHAIRMAN
Geotechnical Engineering 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 Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigations, 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 will 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 need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and downstream damage potential.

The Phase I Investigation 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 OSHA rules and regulations is also excluded.

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TAKEN 15 DEC. 1980

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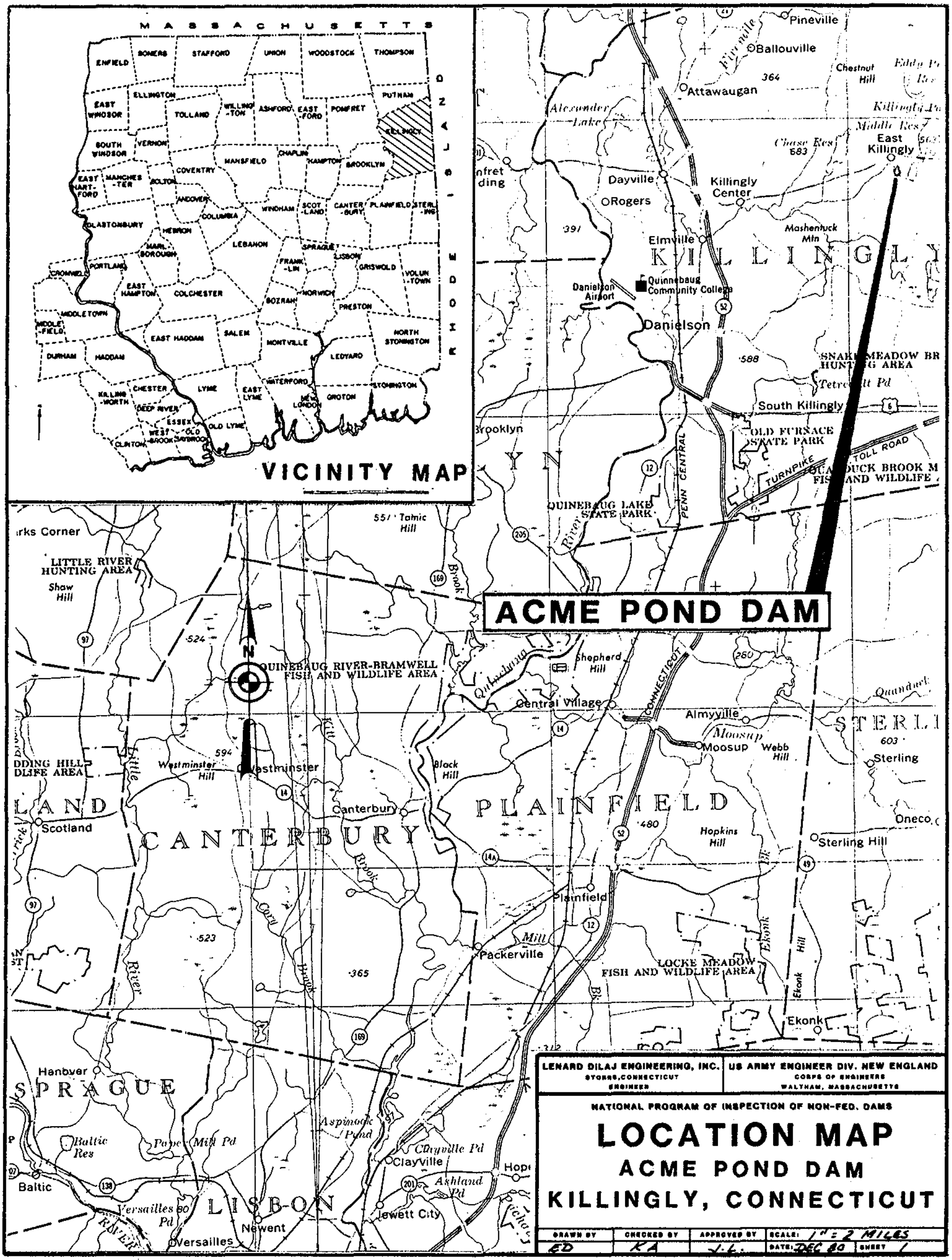
LENARD-DILAJ ENGINEERING, INC. STORRS, CONNECTICUT ENGINEER			


VICINITY MAP
MASSACHUSETTS
RHODE ISLAND
ACME POND DAM
KILLINGLY
PLAINFIELD
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STERLING
SPRAGUE
LISBON
Danielson
Dayville
Killingly Center
East Killingly
Elmville
South Killingly
Central Village
Moosup
Almyville
Plainfield
Packerville
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Versailles
Baltic
Newent
Clayville
Quinebaug Community College
Danielson Airport
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OLD FURNACE STATE PARK
QUINEBAUG RIVER-BRAMWELL FISH AND WILDLIFE AREA
LOCKE MEADOW FISH AND WILDLIFE AREA
LITTLE RIVER HUNTING AREA
TURNPIKE
TOLL ROAD
LENARD DILAJ ENGINEERING, INC.
STORRS, CONNECTICUT
ENGINEERS
US ARMY ENGINEER DIV. NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASSACHUSETTS
NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS
LOCATION MAP
ACME POND DAM
KILLINGLY, CONNECTICUT
DRAWN BY ED
CHECKED BY KA
APPROVED BY J.L.
SCALE: 1" = 2 MILES
DATE: DEC 80
SHEET 1

PHASE I INSPECTION REPORT

SECTION I - 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. Lenard & Dilaj Engineering, Inc. has been retained by the New England Division to inspect and report on selected dams in the States of Connecticut and Rhode Island. Authorization and notice to proceed were issued to Lenard & Dilaj Engineering, Inc. under a letter of 6 November, 1980 from William E. Hodgson, Jr., Colonel, Corps of Engineers. Contract No. DACW33-81-C-0014 has been assigned by the Corps of Engineers for this work.

b. Purpose of Inspection Program: The purposes of the program are to:

1. Perform technical inspection and evaluation of non-federal dams to identify conditions requiring correction in a timely manner by non-federal interest.

2. Encourage and prepare the states to quickly initiate effective dam inspection programs for non-federal dams.

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

c. Scope of Inspection Program: The scope of this Phase I inspection report includes:

1. Gathering, reviewing and presenting all available data as can be obtained from the owners, previous owners, the state and other associated parties.

2. A field inspection of the facility detailing the visual condition of the dam, embankments and appurtenant structures.

3. Computations concerning the hydraulics and hydrology of the facility and its relationship to the calculated flood through the existing spillway.

4. An assessment of the condition of the facility and corrective measures required.

It should be noted that this report does not pass judgment on the safety or stability of the dam other than on a visual basis. The inspection is to identify those features of the dam which need corrective action and/or further study.

1.2 Description of Project:

a. Location: The project is located on Whetstone Brook (a tributary to the Quinebaug River), in the Town of Killingly, County of Windham, and State of Connecticut. The dam is located approximately 1,000 feet south of State Route #101, and is shown on the East Killingly, Conn.-R.I. USGS quadrangle map, having coordinates 41° 50' 48" (north latitude) and 71° 49' 08" (west longitude).

b. Description of Dam and Appurtenances: Acme Pond Dam is an earth embankment dam with a downstream stone masonry wall. It is approximately 500 feet long and 10 feet high, with an average crest width of 12 feet. The downstream wall is the full height of the dam in the vicinity of the spillway and outlet structure, and it is about 7 feet lower than the dam elsewhere. The upstream slope of the dam is very irregular with an inclination of about 1.5H:1.0V. There is partial riprap protection consisting of large stones 1 to 2 feet in size. In many areas, however, there is no riprap at all. Near the right abutment, between the spillway and the outlet structure, there is an upstream stone wall which has collapsed in some areas.

The spillway is located near the right abutment and consists of a cut stone masonry wall with cut stone masonry training walls. The spillway flow passes under Bailey Hill Road through a rectangular stone culvert with an arch at the entrance and then continues beneath the mill to exit on the northwest side of the building.

The outlet works consists of a concrete intake structure and a 16" cast iron pipe installed within a 4' diameter steel plate pipe culvert. The 16" pipe was installed to provide fire protection and limited process water (bleaching) for the plant. A centrifugal pump lifts the water into the water tower which in turn provides the pressure for the fire protection system. Water is withdrawn from the pond only at times when the storage tank needs refilling. Otherwise the flow passes over the spillway. The 16" line ends at a gate valve located beneath the mill, at which point it can discharge into a channel, also passing beneath the building, to join the channel previously mentioned. The flow discharges into a small pond named Mill Pond 50 feet downstream of the structure. This pond is created by a second dam immediately downstream of the mill.

An old outlet works is located at the present spillway structure. It is in a state of disrepair, however, and not considered functional. Its effect on additional future discharge capacity is considered negligible.

c. Size Classification: SMALL - With the pool level at the top of the dam, the impoundment capacity is 29 acre feet. The dam's height above the road which runs along the toe is 10 feet. It is therefore classified as a SMALL structure, in accordance with the recommended guidelines of the Corps of Engineers.

d. Hazard Classification: HIGH - The dam is classified as having a HIGH hazard potential because it is located in an area where the failure discharge could cause a possible loss of more than a few lives and appreciable damage to property. The breach of the dam could cause significant damage to Bailey Hill Road and to the manufacturing facilities located just opposite the dam, which include a large building and a water storage tank.

e. Ownership: Acme Pond Dam is owned by the National Patent Development Corporation, Acme-Chaston Division, with executive offices at 3 Huntington Quadrangle, Suite 2 and 11, Malvern, New York 11746.

f. Operator: The operating personnel of the above company are under the supervision of Joseph Skrypczak, Technical Supervisor, Lake Road, Box 419, Dayville, Connecticut 06241, telephone (203) 774-8541.

g. Purpose of Dam: The dam at Acme Pond was constructed for mechanical power generation. Since the discontinuation of mechanical power generation, the purpose of the dam is only to provide a water supply for fire protection at the mill.

h. Design and Construction History: Acme Pond Dam was probably built in 1846 at the same time the first manufacturing structure was erected across the street. A more detailed history of the mill and dam has been included in the Appendix. There were considerable alterations to the power generating equipment in 1872 when turbines were installed in place of the "wooden breast wheels". During 1945 the 16" discharge pipe and the fire protection system were installed.

i. Normal Operating Procedures: Water is normally maintained at spillway elevation and discharged through the spillway into the tailrace which passes beneath the mill and in turn discharges into Mill Pond. There are 2 centrifugal pumps in the basement of the mill building which draw from the 16" pipe installed into the old outlet works culvert. These pumps are regulated by the water level in the elevated storage tank. The only means of lowering the reservoir is through this 16" pipeline which is normally kept closed by a gate valve and opened only on an intermittent basis. This gate valve is located at the discharge point of the pipe (which is always under pressure). Water for the storage tank is drawn from the pressure section of the pipe before the gate valve. There is another old intake structure located immediately left of the spillway which discharges just downstream of the spillway wall. This old wooden gate structure is presently inoperable.

1.3 Pertinent Data:

a. Drainage Area: Acme Pond and its drainage area are located in Windham County in the northeastern portion of Connecticut. The basin is generally oval in shape with a longitudinal axis of approximately 3 miles and a width of 2 miles. The total drainage area is 5.16 square miles in size. The topography is generally hilly with elevations ranging from a low of 555 feet at the spillway of Acme Pond Dam to a high of 812 feet at the southeastern corner of the watershed. Basin slopes are moderate with grades ranging generally from 5% to 15%.

The dam at Acme Pond impounds water from a system of reservoirs originating approximately 2 miles north and east of the dam. Furthest upstream are the Eddy Pray Reservoir to the north and Killingly Pond to the east. Both of these reservoirs drain into Middle Reservoir. Alvia Chase Reservoir at the southeast portion of the watershed also discharges into Middle Reservoir. Middle Reservoir in turn drains into Bog Meadow Reservoir and then into Acme Pond. Because of the other reservoirs in the system, there is considerable storage available in the watershed. A schematic flow chart is shown in the Appendix. These storage areas will dampen and delay the peak of the surface runoff.

b. Discharge at Dam Site: No records of spillway or outlet works discharges are available. Listed below are calculated discharge data for the spillway and the 16" outlet pipe.

1. Outlet works:

Size:	16 inch diameter pipe
Invert Elev.	545.0 feet
Discharge capacity:	26 cfs (at normal pool level)

2. Maximum known flood at dam site: Discharge unknown.

3. Ungated spillway capacity at top of dam: 250 cfs at Elev.558.2

4. Ungated spillway capacity at test flood elevation: 400 cfs at Elev.559.1

5. Gated outlet works capacity at normal pool elevation: 26 cfs at Elev. 555.0

6. Gated outlet works capacity at test flood elevation: 36 cfs at Elev. 559.1

7. Total discharge capacity at test flood elevation: 440 cfs at Elev.559.1

8. Total project discharge at top of dam: 280 cfs at Elev.558.2

9. Total project discharge at test flood elevation: 1,600 cfs at Elev.559.1

c. <u>Elevation (Feet above National Geodetic Vertical Datum)</u>:

1. Streambed at toe of dam:	539.5
2. Bottom of cutoff:	Unknown
3. Maximum tail water:	Unknown
4. Normal pool:	555.0
5. Full flood control pool:	N/A
6. Spillway crest:	555.0
7. Design surcharge (original design):	Unknown
8. Top of dam:	558.2
9. Test flood surcharge:	559.1

d. <u>Reservoir (Length in feet)</u>:

1. Normal pool:	600
2. Flood control pool:	N/A
3. Spillway crest pool:	600
4. Top of dam:	600
5. Test flood pool:	600

e. <u>Storage (acre-feet)</u>:

1. Normal pool:	16
2. Flood control pool:	N/A
3. Spillway crest pool:	16
4. Top of dam:	29
5. Test flood pool:	34

f. Reservoir Surface (acres):

1.	Normal pool:	3
2.	Flood control pool:	N/A
3.	Spillway crest:	3
4.	Test flood pool:	6
5.	Top of dam:	5

g. Dam:

1.	Type:	Earth embankment vertical downstream masonry walls
2.	Length:	570 feet
3.	Height:	10 feet
4.	Top width:	12 feet
5.	Side slopes:	1.5H:1V upstream vertical and 1.5H:1V downstream
6.	Zoning:	Unknown
7.	Impervious core:	Unknown
8.	Cutoff:	Unknown
9.	Grout curtain:	Unknown

h. Diversion and Regulating Tunnel: N/A

i. Spillway:

1.	Type:	Stone masonry broad crest weir
2.	Length of weir:	16 feet
3.	Crest elevation (without flashboards):	555.0 feet
4.	Gates:	None
5.	U/S channel	Natural bed
6.	D/S channel	Natural bed

j. <u>Regulating Outlets</u>:

1.	Invert:	545.0 feet
2.	Size:	16 inch diameter
3.	Description:	Cast iron pipe
4.	Control mechanism:	Manually operated gate valve beneath mill building.
5.	Other	The gate valve is approachable only through a manhole in the basement floor of the building.

SECTION 2

ENGINEERING DATA

2.1 Design: There is very little known about the design of the dam. It was constructed for power generation purposes probably during 1846. Plans for the original construction were not available. Mechanical power was generated in the adjacent building which is presently occupied by the Acme Cotton Company. Power generation was discontinued in 1945 and at that time an elevated water storage tank was erected for fire protection purposes. Water from the reservoir is pumped into this storage tank for fire prevention.

2.2 Construction: Nothing is known about the construction of the dam. Indications are that it was constructed during 1846, but there is no information available. Judging from the bedrock outcroppings and from the pitch of the bedrock, indications are that the dam was constructed on bedrock.

2.3 Operation: The dam was originally constructed for mechanical power generation. As indicated above, water is presently used for fire protection purposes only. The Acme Company, which owns the property, maintains the facilities, but keeps no formal records of operation. There are no records available indicating that the dam was ever overtopped.

2.4 Evaluation:

a. Availability: The facilities were made available for visual inspection. All accessible operating parts of the facility were inspected. No plans or other design information were found to be available.

b. Adequacy: The limited amount of data available was inadequate to perform an in-depth assessment of the dam and appurtenant facilities. Therefore, the final assessment of this dam must be based primarily on visual inspection, performance history, and hydraulic and hydrologic computations of spillway and outlet capacity.

c. Validity: Due to the lack of available data, the conclusions and recommendations found in this report are based on the visual inspection and hydraulic/hydrologic computations.

SECTION 3

VISUAL INSPECTION

3.1 Findings:

a. General: An inspection of Acme Pond Dam was performed on November 13, 1980 by Lenard & Dilaj Engineering, Inc. with the assistance of Geotechnical Engineers, Inc. The weather was cloudy and the temperature was about 30°F. At the time of inspection the water level in the pond was about 2 inches higher than the spillway crest elevation.

As a result of the visual inspection, the dam at Acme Pond and its appurtenances are judged to be in fair condition. Saplings up to 3 inches in diameter and bushes are growing on the earth embankments. Riprap is sparse along the upstream slope and portions of a masonry wall on the upstream side have also collapsed. Various portions of the downstream stone masonry wall are bulging and out of alignment.

b. Dam: The dam is an earth embankment dam with a downstream stone masonry wall. No construction drawings are available, nor are the details of design known. Indications are that the dam was built during 1846 at the time the original factory was erected.

1. Crest: The crest of the dam is covered with grass and it has a footpath along the center. Fifty feet from the left abutment there is a low area, approximately 20 feet long, in the crest of the dam, probably a result of past erosion or settlement (See Site Plan). There are a number of saplings growing on the crest, particularly near the spillway. Some of the saplings are 3 inches in diameter.

2. Upstream slope: The upstream slope of the dam is irregular with an inclination of about 1.5H:1.0V. Partial riprap protection is provided. The riprap consists of large 1 to 2 foot diameter stones (Photo 1). At the left abutment there is a short section of a dry masonry stone wall which changes into riprap protection (Photo 2). Between the intake structure and the spillway structure, the upstream stone wall has collapsed (Photo 9). There is also a heavy growth of bushes and saplings in this area of the upstream slope (Photo 9). There

are the remnants of a concrete wall on the upstream slope between the intake structure and spillway, but its purpose could not be ascertained. At the spillway, the joints of the upstream training walls have been cemented (Photos 7 and 8).

3. Downstream slope: The downstream stone masonry wall is the full height of the dam in the vicinity of the spillway and outlet structure and is about 7 feet lower than the dam elsewhere (Photos 3 and 4). The downstream stone wall has tilted in several areas, particularly near the right abutment (Photos 5 and 6). Because of the excessive tilting, the joints opened up as shown in Photo 6. It should be noted that the bulging of the downstream walls was first observed some time ago, as noted in the inspection report of William W. Pike in 1954. Apparently because of this report, a section of the downstream wall was repaired with a concrete wall left of the spillway (Photo 3). The concrete wall has no drainage holes. The remaining downstream slope above the wall is irregular and its inclination ranges from 1.5H:1.0V to 2.0H:1.0V. The slope has some growth of bushes and saplings. No seepage was observed on the downstream slope nor at the toe. A masonry stairway is built into the stone wall just south of the intake structure (See Site Plan and Photo 10). Immediately south of the stairway, the stone wall bulges as shown in Photo 10. Towards the left abutment several bedrock outcroppings were observed at the toe of the stone masonry wall. Indications are that this section of the dam is resting on bedrock. No seepage was noted on the left side of the dam.

c. Appurtenant Structures: The appurtenant structures for this dam are the spillway, the intake structure for a pipeline, and a gate structure at the left training wall of the spillway.

1. Spillway: The spillway is located near the right abutment and is constructed of cut stone masonry, with an approximately vertical downstream wall. Training walls are also constructed of stone masonry. On top of the left training wall there is an old inoperable gate structure (Photo 8), whose construction and dimensions could not be ascertained. It appears to have discharged through an opening visible just downstream of the spillway in the

vertical masonry wall. The training walls are in fair condition with some indication of longitudinal distortion (Photo 7). There are signs, however, that soil may be washing into the culvert, as shown by the cavities between stones of the training walls. The spillway flow passes beneath Bailey Hill Road and the mill building through a rectangular stone culvert with an arch at the entrance (Photo 3). There is a depression at the ground surface near the edge of the road at the upstream end of the culvert. The cause and extent of this depression could not be ascertained, but its implications should be studied along with the stability analysis. The culvert extends through the basement of the mill building and exits about 150 feet downstream of the dam. The spillway is in generally fair condition. Clear seepage exiting out of the downstream face of the spillway could be observed at the left end (Photo 11 and closeup, Photo 12). The quantity of seepage here and elsewhere on the downstream face could not be ascertained because of water flowing over the spillway. The spillway is a broad-crested weir and is 16 feet long at an elevation of 555 feet. The training walls extend 3 feet above the spillway crest on both sides. The approach channel was clear of obstructions, but showed signs of minor siltation.

2. Outlet works: The outlet works include a concrete intake structure which is in good condition (Photo 9) and two upstream stone wingwalls which could be observed under water. There is a 16 inch pipe which passes beneath the road, installed inside an existing 4 foot diameter steel plate pipe which shows signs of corrosion and whose condition should be assessed along with a stability analysis. A brick arch could be observed over the downstream end of this pipe where it entered the basement of the mill building. The outlet continues through the building as a culvert. The bottom of the culvert was cut into bedrock with masonry of different types above. The outlet joins the spillway culvert immediately upstream of the point where the flow exits out of the building into an open channel (See Site Plan).

   There is another outlet, as shown on Photo 8, with a wooden sluice gate on the left training wall. This outlet discharges immediately downstream of the spillway, but is not presently operable. The intake end of this outlet could not be observed because it was under water.

d. Reservoir area: The reservoir edge slopes gently in the vicinity of the dam. Near the left abutment of the dam and on the south shore of the reservoir, bedrock is exposed. Indications are that bedrock is sloping from the south shore towards the mill building.

e. Downstream channel: The channel downstream of the mill building carries the spillway and outlet flow. It is an open channel, with stone walls adjacent to the mill building, and irregularly sloped banks downstream. The channel does not contain any significant obstructions to the flow.

3.2 Evaluation: On the basis of the visual inspection, the dam is judged to be in fair condition. The integrity of the dam could be affected in the future by the continued tilting of the downstream wall at several locations along the dam, by the corrosion of the 4 foot diameter pipe beneath the dam and road, and by the distortion of the spillway training walls. There are also indications of soil washing into the stone culvert below the spillway, as shown by the cavities between stones of the training walls. If the culvert were to deteriorate and eventually collapse, the water would flow along the road and cause flooding of the mill structure.

There is depression on the dam crest near the left abutment. The partial collapse and irregularity of riprap on the upstream slope may further erode if not repaired and could cause deterioration of the dam. There is extensive growth of saplings and small bushes, in particular, near the spillway. This growth should be checked and regularly cleared.

Although some discharge capacity is available through the 16 inch outlet pipe, the valve is opened only on an intermittent basis and because of its location beneath the building, it may not be accessible in an emergency situation. Because the old outlet works near the spillway is inoperable, it is possible that there may not be any functioning outlet during an emergency.

SECTION 4

OPERATIONAL AND MAINTENANCE PROCEDURES

4.1 Operational Procedures:

a. General: The Acme Cotton Company operates the dam and appurtenant facilities. The operation of this facility is for fire protection purposes only. Pumping equipment installed in the basement of the factory draws on the 16 inch discharge pipe and delivers water into the elevated storage tank. There are no operational procedures at the dam. Water level is at spillway elevation, and according to reports, the dam has never been overtopped.

b. Description of any Warning System in Effect: Emergency action and/or warning is coordinated through the operations department of the Acme Company. No formal emergency or contingency plan is in effect.

4.2 Maintenance Procedures:

a. General: Maintenance is carried out as the need arises; no set procedure is in effect. Trees and other material have been removed from the dam and it is maintained in fair condition.

b. Operating Facilities: The outlet gate is in disrepair and not operational. The fire protection equipment utilizing discharge from the pond is maintained within the mill building. The valve controlling the 16 inch discharge pipe is opened only on an intermittent basis to check its operation.

4.3 Evaluation: Maintenance of the dam and appurtenant facilities is inadequate. A formal program of operational maintenance procedures should be implemented including documentation to provide complete records for future reference. Also, a downstream warning system should be developed and implemented.

SECTION 5

EVALUATION OF HYDRAULIC/HYDROLOGIC FEATURES

5.1 General: Acme Pond Dam is an earth embankment dam with a vertical stone masonry face along part of the downstream side. The dam is approximately 570 feet long and 10 feet high. Its spillway has a length of 16 feet and the crest is 3.2 feet below the top of the dam. For purposes of hydraulic calculations the spillway weir was considered to be broad crested. A 16-inch discharge pipe passes through the dam and is controlled by a gate valve which is operated on an intermittent basis.

The downstream channel passes beneath the road and mill building and is restricted at its narrowest point to an opening of 3 feet by 4 feet. Once it exits from the building, the flow passes through another pond and dam and then into a steep wooded channel.

The watershed encompasses an area of 5.16 square miles. Its upper reaches are basically undeveloped while the lower portion has some residential areas.

At spillway elevation, Acme Pond has a storage capacity of approximately 16 acre-feet; this increases to 29 acre-feet at the top of the dam.

5.2 Design Data: No design data was found to be available for this dam.

5.3 Experience Data: According to long-term personnel at the site, the dam has never been overtopped.

5.4 Test Flood Analysis: Based on the "Recommended Guidelines for Safety Inspection of Dams", the dam is classified as SMALL in size with a HIGH hazard potential. The test flood for these conditions ranges from half the Probable Maximum Flood to the Probable Maximum Flood (½ PMF to PMF). Because of the size of the dam, the potential downstream damage, and the possible loss of life involved with failure, the ½ PMF was chosen as the test flood for this dam.

Using the HEC-1 Flood Hydrograph Computer program developed by the Army Corps of Engineers for dam safety investigations, the inflow and outflow for the test flood were found to be 1,670 cfs and 1,660 cfs, respectively. As a basis of comparison, the PMF resulted in an inflow and outflow of 9,160 cfs. The spillway capacity of 250 cfs represents 15% of the test flood outflow. One foot of overtopping would be associated with this outflow.

In development of the inflow hydrograph to Acme Pond, several upstream reservoirs were considered in the calculations. Because of the storage available at these sites, the effect of the test flood is considerably dampened.

5.5 Dam Failure Analysis: A dam failure analysis was performed using the "Rule of Thumb" method for estimating downstream dam failure hydrographs established by the Corps of Engineers. Failure was assumed to occur when the water level in the pond was at the level of the top of the dam.

The calculated dam failure discharge is 10,600 cfs and will produce a depth of flow of approximately 10 feet at the mill immediately downstream of the dam, where there was no flow prior to failure since the spillway discharge passes beneath the mill. The failure analysis covered a distance of approximately 1,400 feet downstream, as shown by the calculations in Appendix D. The depth of flow at that point was calculated to be approximately 2.6 feet for the dam failure, indicating an increase in depth of 2 feet over the pre-failure flow of 250 cfs from the spillway.

The dam breach would cause appreciable damage and the possible loss of more than a few lives at the mill downstream of the dam. As shown above, the level of the water at the mill in the event of a failure would be 10 feet, high enough to inundate the basement level and first two floors.

SECTION 6

EVALUATION OF STRUCTURAL STABILITY

6.1 Visual Observations: The visual inspection showed evidence of instability in several areas of the dam. The downstream wall has tilted locally at several points, particularly near the right abutment. Stones dislodged from these tilted walls could lead to an unstable situation in this area of the dam. At the upstream end of the culvert passing the spillway discharge beneath the mill building, there is evidence of a depression. Because it could lead to a collapse and blockage of the discharge channel, the cause and extent of this depression should be further investigated. The 4 foot diameter steel plate pipe passing beneath the dam and road is corroded. Because it houses the only discharge pipe from the dam (the 16" diameter pipe), its condition should be further assessed and evaluated. Failure of this pipe casing would mean the loss of the only means of drawing down the water from the pond behind the dam, and it could also lead to a partial collapse of the dam over the section of pipe passing beneath it. The longitudinal distortion of the spillway walls could lead to the collapse of the spillway channel or a blockage of the opening. Along with the cavities between the stones of these walls, which may indicate a wash out of soil particles, this distortion should be assessed and repairs instituted. It is recommended that an in-depth stability analysis of the dam be conducted, particularly with respect to the above mentioned items of concern.

6.2 Design and Construction Data: There was no design and construction data available at the time of inspection.

6.3 Post-Construction Changes: There are no known structural post-construction changes except for the construction of a downstream concrete wall left of the spillway and the installation of the 16-inch pipe into the 4 foot diameter penstock.

6.4 Seismic Stability: The dam is located near the boundary between seismic zones 1 and 2 and in accordance with the Phase I inspection guidelines does not warrant seismic stability analysis.

SECTION 7

ASSESSMENT, RECOMMENDATIONS, AND REMEDIAL MEASURES

7.1 Dam Assessment:

a. Condition: The visual inspection indicates that Acme Pond Dam is in FAIR condition. The major concerns regarding the long term performance of this dam include:

1. Continued tilting and bulging of the downstream stone masonry wall at several locations along the dam.

2. Overtopping of the dam by test flood flows as well as storms of lesser magnitude.

3. Lack of complete riprap coverage on the upstream slope.

4. Vegetation and sapling growth on the upstream and downstream slope of the embankment.

5. A depression on the crest of the dam near the left abutment and a depression at the upstream end of the culvert at the spillway.

6. The corrosion of the 4 foot diameter steel plate pipe passing beneath the dam and the road.

b. Adequacy of Information: The lack of in-depth engineering data did not allow for a definitive review. Therefore, the adequacy of this dam could not be assessed from the standpoint of reviewing design and construction data, but is based primarily on the visual inspection, past performance history, and sound engineering judgment.

c. Urgency: The recommendations and remedial measures described below should be implemented by the Owner within one year of the receipt of this Phase I Inspection Report.

7.2 Recommendations: The Owner should engage the services of a qualified registered engineer to accomplish the following:

a. Conduct an in-depth hydraulic and hydrologic study to determine what alternative measures are necessary to significantly improve discharge capabilities of the dam, spillway and discharge channel, to reduce the overtopping potential, and to provide adequate freeboard allowances. Alternatives may include an emergency spillway, independent of the existing appurtenances.

b. Restore riprap protection on the upstream slope in unprotected areas.

c. Analyze the stability of the dam and the downstream stone wall in particular. Stabilization measures should include appropriate drainage features. Also, analyze and assess the depression at the culvert spillway and the condition of the 4' diameter outlet pipe casing.

d. Restore the crest elevation of the dam to a uniform height.

e. Investigate the condition of the right spillway wall, which shows signs of longitudinal distortion.

7.3 Remedial Measures:

a. Operating and Maintenance Procedures:

1. Saplings and brush on the dam should be removed and any excavations resulting therefrom should be backfilled with suitable material. Grass should be planted in these disturbed areas to protect the embankment from erosion.

2. Emergency procedures, consisting of an operations and warning system for downstream residents and downstream manufacturing, should be developed and implemented.

3. Technical inspections of this facility should be continued on an annual basis. A system should be developed for the recording of data with regard to items such as: water levels, discharges, time and drawdown to assist those responsible for the monitoring and operation of the structure. The dam should be monitored particularly during and after periods of intense rainfall.

4. Implement and intensify a program of diligent and periodic maintenance including, but not limited to: mowing brush on slopes; backfilling animal burrows or tire ruts with suitable well tamped material; cleaning debris from spillways and slopes.

7.4 Alternatives: There are no practical alternatives to the recommendations of Sections 7.2 and 7.3.

APPENDIX A

INSPECTION CHECKLIST

VISUAL INSPECTION CHECKLIST
PARTY ORGANIZATION

PROJECT *ACME POND DAM*

DATE *NOVEMBER 13, 1980*

TIME *9 am*

WEATHER *Cloudy*

W.S. ELEV. *2" > spillway* U.S. ____ DN.S.

PARTY:

1. *John Lenard, L.D.E.I.*
2. *Michael Dilaj, L.D.E.I.*
3. *Karl Acimovic, L.D.E.I.*
4. *Kent Healy, L.D.E.I.*
5. *Gonzalo Castro, GEI*
6. ____
7. ____
8. ____
9. ____
10. ____

PROJECT FEATURE	INSPECTED BY	REMARKS
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

PERIODIC INSPECTION CHECKLIST

PROJECT *ACME POND DAM* DATE *NOVEMBER 13, 1980*

PROJECT FEATURE ______ NAME ______

DISCIPLINE ______ NAME ______

AREA EVALUATED	CONDITION
DAM EMBANKMENT	
Crest Elevation	
Current Pool Elevation	
Maximum Impoundment to Date	*Reportedly never overtopped.*
Surface Cracks	*None observed.*
Pavement Condition	*Not applicable.*
Movement or Settlement of Crest	*None observed.*
Lateral Movement	*Downstream wall tilted along most of length.*
Vertical Alignment	*Too irregular to judge.*
Horizontal Alignment	*Downstream wall bulged at several locations.*
Condition at Abutment and at Concrete Structures	*Good.*
Indications of Movement of Structural Items on Slopes	*Not applicable.*
Trespassing on Slopes	*Footpath on downstream slope and along crest.*
Sloughing or Erosion of Slopes or Abutments	*None observed.*
Rock Slope Protection - Riprap Failures	*Randomly distributed.*
Unusual Movement or Cracking at or Near Toe	*None, except for wall movement.*
Unusual Embankment or Downstream Seepage	*None observed.*
Piping or Boils	*None observed.*
Foundation Drainage Features	*None known.*
Toe Drains	*None known.*
Instrumentation System	*None known.*
Vegetation	*Grass, bushes, saplings.*

PERIODIC INSPECTION CHECKLIST

PROJECT *ACME POND DAM* DATE *NOVEMBER 13, 1980*

PROJECT FEATURE ______ NAME ______

DISCIPLINE ______ NAME ______

AREA EVALUATED	CONDITION
DIKE EMBANKMENT	*There is no dike at this location.*
Crest Elevation	
Current Pool Elevation	
Maximum Impoundment to Date	
Surface Cracks	
Pavement Condition	
Movement or Settlement of Crest	
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 Toes	
Unusual Embankment or Downstream Seepage	
Piping or Boils	
Foundation Drainage Features	
Toe Drains	
Instrumentation System	
Vegetation	

PERIODIC INSPECTION CHECKLIST

PROJECT *ACME POND DAM* DATE *NOVEMBER 13, 1980*

PROJECT FEATURE ______ NAME ______

DISCIPLINE ______ NAME ______

AREA EVALUATED	CONDITION
OUTLET WORKS - INTAKE CHANNEL AND INTAKE STRUCTURE	
a. Approach Channel	*Not observable, under water.*
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	*Good, some spalling at water level.*
Stop Logs and Slots	*None.*

PERIODIC INSPECTION CHECKLIST

PROJECT *ACME POND DAM*	DATE *NOVEMBER 13, 1980*
PROJECT FEATURE	NAME
DISCIPLINE	NAME

AREA EVALUATED	CONDITION
OUTLET WORKS - CONTROL TOWER	
a. Concrete and Structural	*There is no control tower at this location.*
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	
Emergency Gates	
Lightning Protection System	
Emergency Power System	
Wiring and Lighting System	

PERIODIC INSPECTION CHECKLIST

PROJECT *ACME POND DAM* DATE *NOVEMBER 13, 1980*

PROJECT FEATURE ______ NAME ______

DISCIPLINE ______ NAME ______

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

PERIODIC INSPECTION CHECKLIST

PROJECT *ACME POND DAM* DATE *NOVEMBER 13, 1980*

PROJECT FEATURE ______ NAME ______

DISCIPLINE ______ NAME ______

AREA EVALUATED	CONDITION
OUTLET WORKS - ~~OUTLET STRUCTURE~~ AND OUTLET CHANNEL	*Outlet channel is a 4-ft. pipe with an inside 16-in. pipe and a brick arch culvert under building. Both culvert inverts are in bedrock.*
General Condition of ~~Concrete~~	*Brick arch culvert in good condition. 4-ft. pipe in fair condition, but inside 16-in. pipe in good condition. Upstream end of stone culvert in good condition.*
Rust or Staining	*Not applicable.*
Spalling	*Not applicable.*
Erosion or Cavitation	*Not applicable.*
Visible Reinforcing	*Not applicable.*
Any Seepage or Efflorescence	*Not applicable.*
Condition at Joints	*Not applicable.*
Drain holes	*Not applicable.*
Channel	*Natural stream channel.*
Loose Rock or Trees Overhanging Channel	*Several trees overhanging channel.*
Condition of Discharge Channel	*Good.*

PERIODIC INSPECTION CHECKLIST

PROJECT *ACME POND DAM* DATE *NOVEMBER 13, 1980*

PROJECT FEATURE ______ NAME ______

DISCIPLINE ______ NAME ______

AREA EVALUATED	CONDITION
<u>OUTLET WORKS - SPILLWAY WEIR, APPROACH AND DISCHARGE CHANNELS</u>	
a. Approach Channel	*Reservoir.*
General Condition	
Loose Rock Overhanging Channel	
Trees Overhanging Channel	
Floor of Approach Channel	
b. Weir and Training Walls	*Cut stone dry masonry.*
General Condition	*Good, some settling or lost stones in right wall.*
Rust or Staining	*Not applicable.*
Spalling	*Not applicable.*
Any Visible Reinforcing	*Not applicable.*
Any Seepage or Efflorescence	*Leakage out of left side of downstream face of spillway.*
Drain Holes	*Not applicable.*
c. Discharge Channel	*Square stone culvert, arches at transitions.*
General Condition	*Good.*
Loose Rock Overhanging Channel	*Not applicable.*
Trees Overhanging Channel	*Not applicable.*
Floor of Channel	*Bedrock.*
Other Obstructions	*Columns towards downstream end of culvert.*
Other Comments	

PERIODIC INSPECTION CHECKLIST

PROJECT *ACME POND DAM* DATE *NOVEMBER 13, 1980*

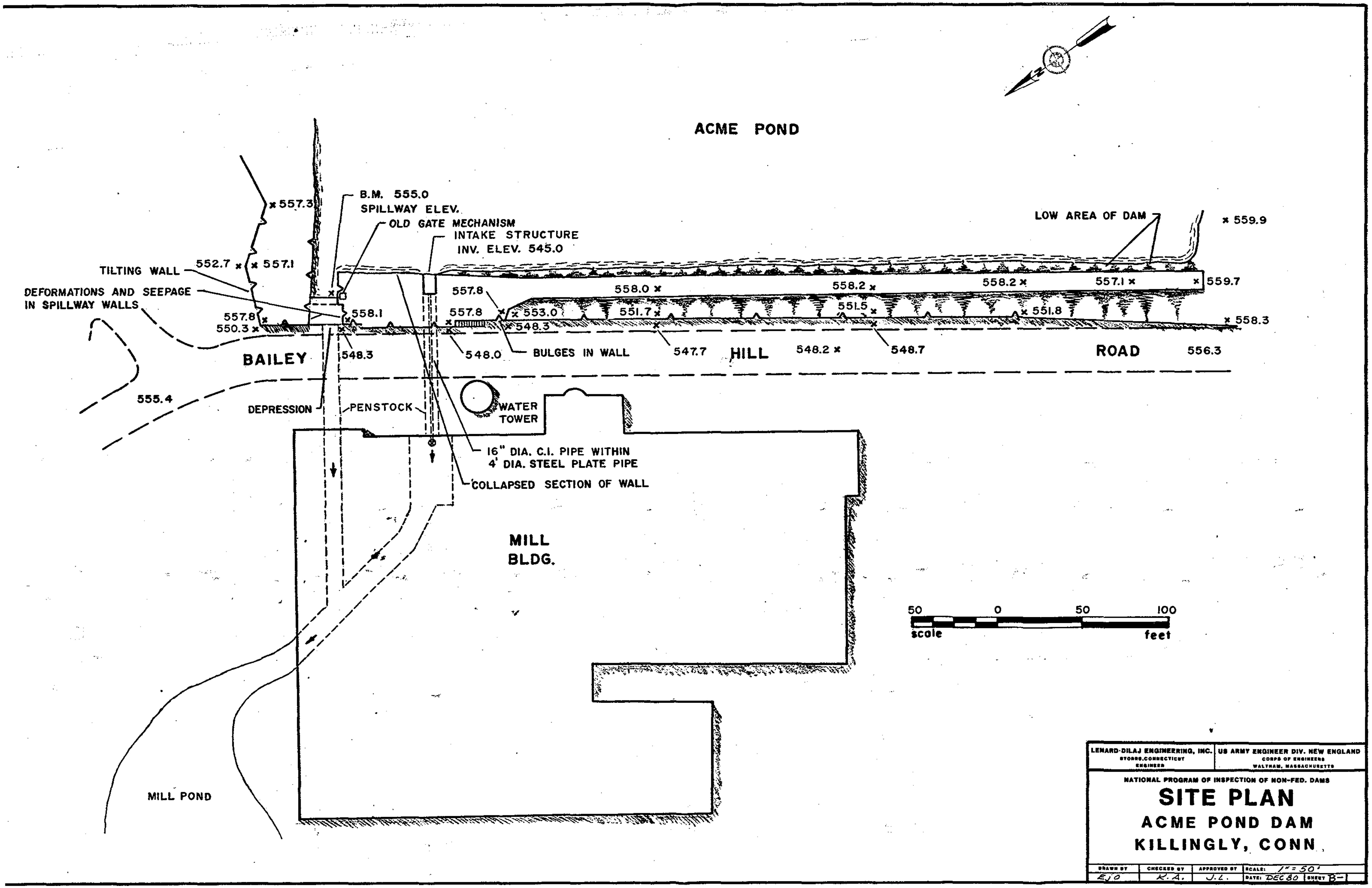
PROJECT FEATURE ____________ NAME ____________

DISCIPLINE ____________ NAME ____________

AREA EVALUATED	CONDITION
<u>OUTLET WORKS - SERVICE BRIDGE</u>	*There is no service bridge at this location.*
a. Super Structure	
Bearings	
Anchor Bolts	
Bridge Seat	
Longitudinal Members	
Underside of Deck	
Secondary Bracing	
Deck	
Drainage System	
Railings	
Expansion Joints	
Paint	
b. Abutment & Piers	
General Condition of Concrete	
Alignment of Abutment	
Approach to Bridge	
Condition of Seat & Backwall	

APPENDIX B

ENGINEERING DATA


ACME POND
B.M. 555.0
SPILLWAY ELEV.
OLD GATE MECHANISM
INTAKE STRUCTURE
INV. ELEV. 545.0
LOW AREA OF DAM
559.9
557.3
552.7
557.1
TILTING WALL
DEFORMATIONS AND SEEPAGE
IN SPILLWAY WALLS
557.8
550.3
558.1
548.3
557.8
557.8
553.0
548.3
558.0
551.7
558.2
551.5
558.2
551.8
557.1
559.7
558.3
BAILEY
HILL
ROAD
548.0
BULGES IN WALL
547.7
548.2
548.7
556.3
555.4
DEPRESSION
PENSTOCK
WATER
TOWER
16" DIA. C.I. PIPE WITHIN
4' DIA. STEEL PLATE PIPE
COLLAPSED SECTION OF WALL
MILL
BLDG.
50 0 50 100
scale feet
MILL POND
LENARD-DILAJ ENGINEERING, INC.
STORRS, CONNECTICUT
ENGINEERS
US ARMY ENGINEER DIV. NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASSACHUSETTS
NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS
SITE PLAN
ACME POND DAM
KILLINGLY, CONN.
DRAWN BY EJO
CHECKED BY K.A.
APPROVED BY J.L.
SCALE: 1" = 50'
DATE: DEC 80
SHEET B-1

HISTORY OF ACME POND DAM

The Acme Pond Dam is located across the street from the Acme-Chasten Warehouse. This warehouse is a conglomerate of much older buildings. The oldest portion of the warehouse dates back to 1846. This section measures 36'x 100' and is 4 stories high. It was built by Westcott and Pray, probably as a cotton cloth mill.

The major source of water for the mill was supplied by the Middle and Bog Meadow Reservoirs. In 1832 Ebenezer Young built the dam at the Middle Reservoir. The Bog Meadow Reservoir was raised 2 feet in 1849 by Westcott and Pray to increase storage to operate their mill. Five years later Eddy Pray Reservoir Dam was constructed by the Chestnut Hill Reservoir Company. This dam failed in May 1865, but it was promptly rebuilt and has stood since that time.

After the mill was built in 1846, it changed hands at least seven times until 1981, when Acme purchased the property. The chronological order of owners includes:

John D. Burgess	1849-1856
Mayhew Miller	1856-1869
Thomas Pray	1869-1874
John L. Ross	1874-1899
A.G.Bishop	1899- ?
United Tool Co.	1907-1910
Walter Guile	1910-1918

In 1872 the "old fashioned wooden breast wheels" were replaced by the "modern" turbines in the mill. At this time steam furnaces were installed to complement the available waterpower. According to James Minges and Associates of Farmington, "Up until the 1920's the plant used water as a source of power which created the need for the storage of water ...". In 1945, a 16" cast iron pipe equipped with gate valves was slid into the much older 4' diameter steel pipe for use as an intake pipe. Water was only used for bleaching operations, so the 4' diameter pipe was too large. The condition of the 4' pipe is not known.

William W. Pike inspected all of the Chestnut Hill Reservoir dams in 1946, 1949 and again in 1954. The Acme Pond Dam was only mentioned in the 1954 inspection, when he recommended retaining wall improvements on the Acme Pond Dam's south side. (See Photo

In January 1954 C.H. Knox recommended seasonal adjustments for the system of dams to adjust the reservoir levels. However, the Minges report notes that in 1972, "the dams are presently kept at fixed high water levels and the gates are only opened for inspection or for gate maintenance."

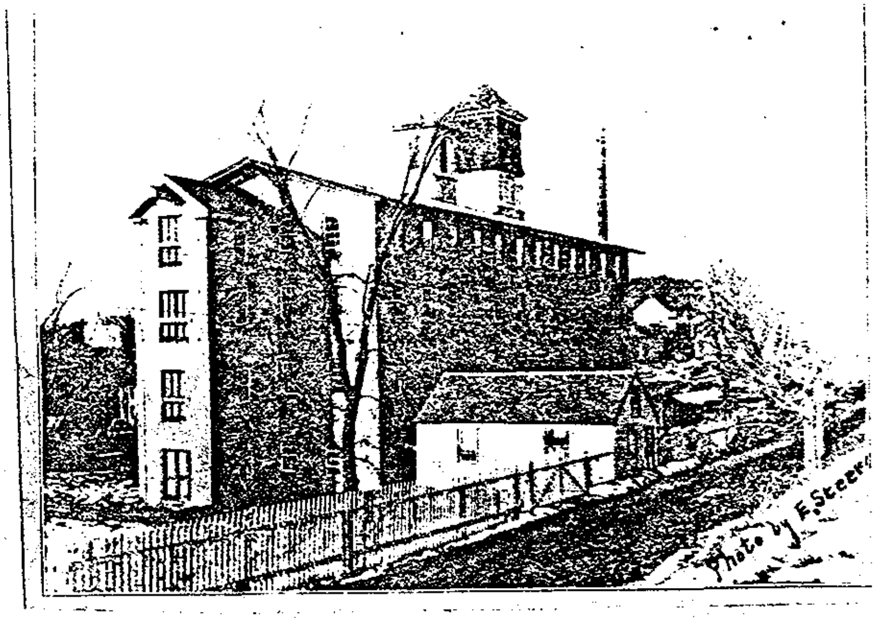
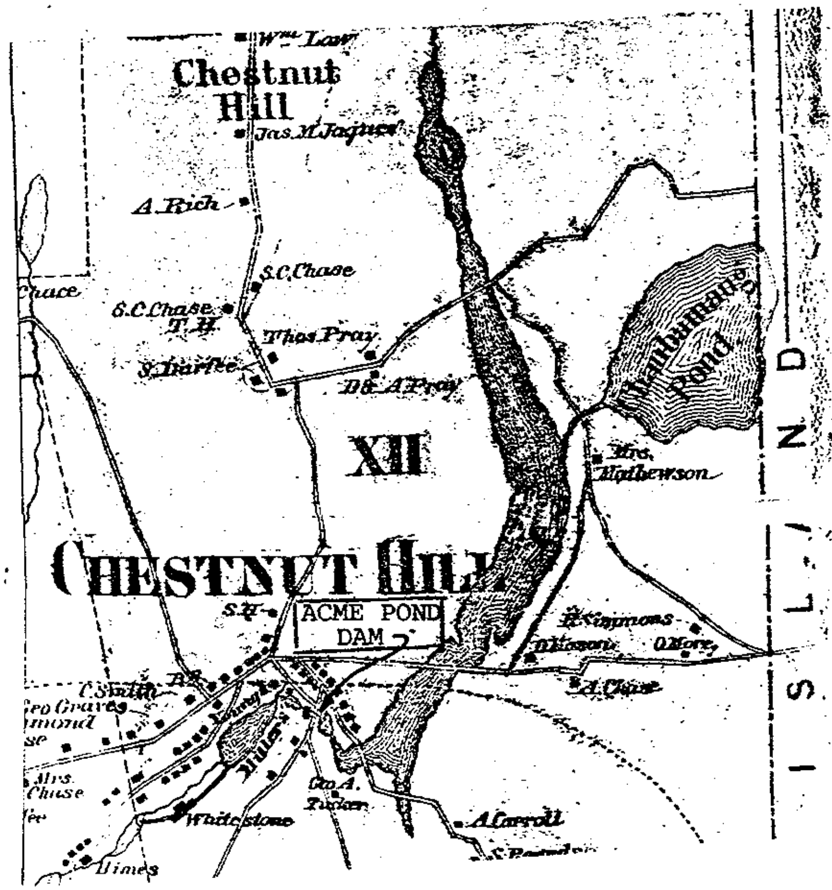
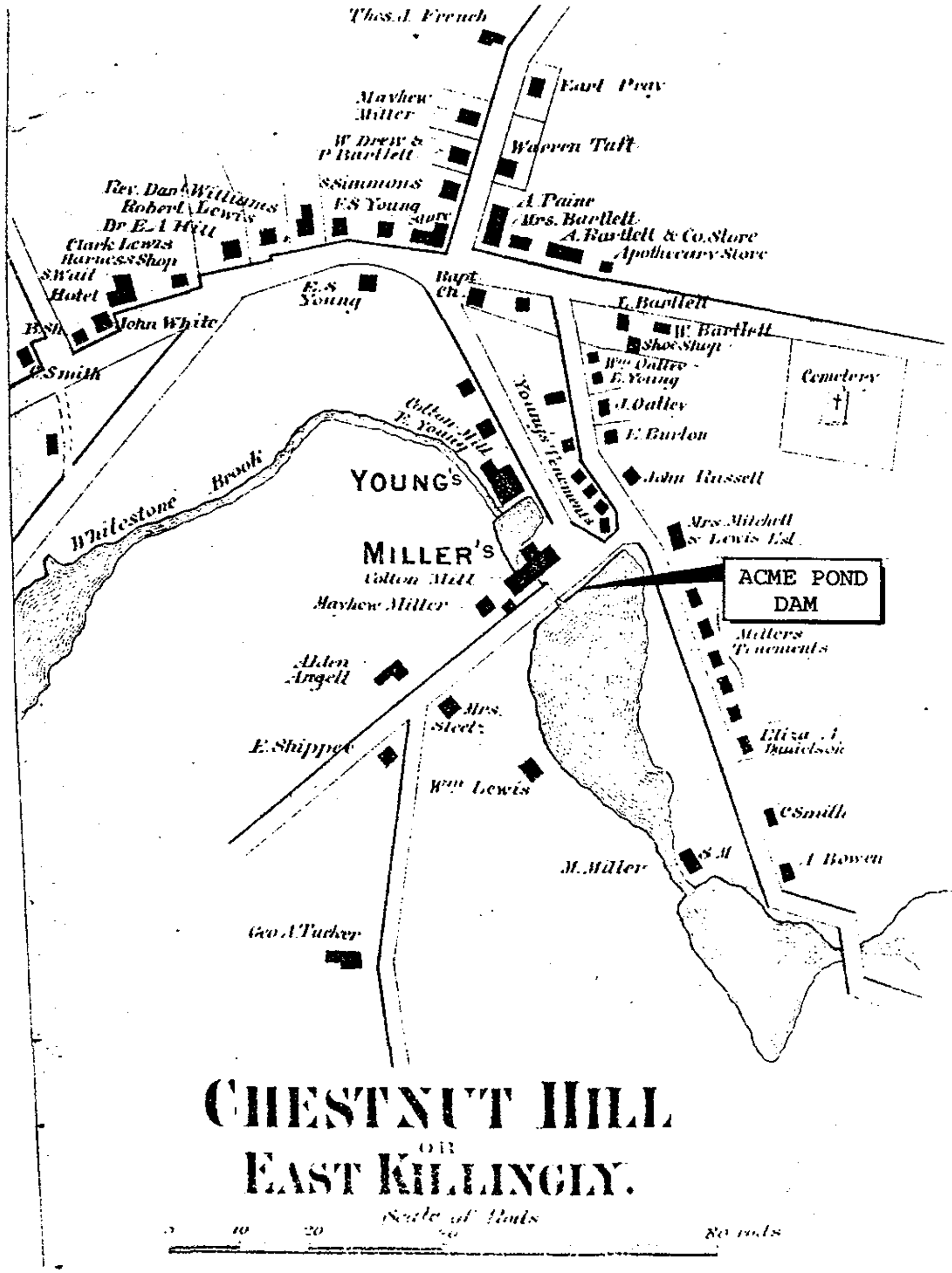
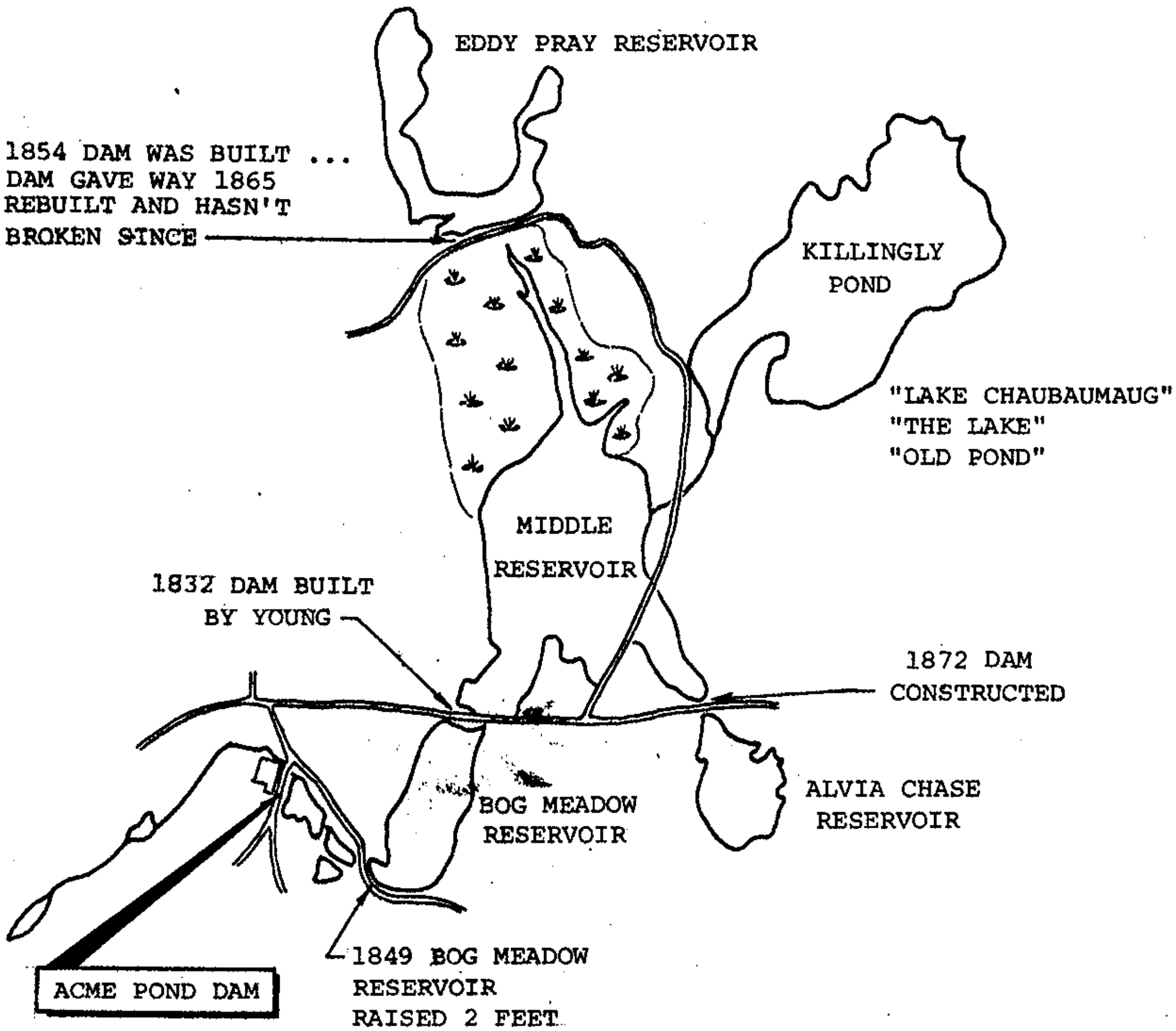


Photo by F. Steere


Wm Law
Chestnut Hill
Jas. M. Jaques
A. Rich
S.C. Chase
S.C. Chase T.H.
Thos. Pray
Dr. A. Pray
XII
Mrs. Mathewson
CHESTNUT HILL
ACME POND DAM
H. Simmons
O. More
A. Chase
Whitestone
Geo. A. Tucker
A. Carroll
I S L A N D


Thos. J. French
Earl Pray
Mayhew Miller
W. Drew & P. Bartlett
Warren Taft
S. Simmons
F.S. Young
Store
Rev. Dan Williams
Robert Lewis
Dr E. A. Hill
Clark Lewis Harness Shop
S. Wait Hotel
John White
C. Smith
A. Paine
Mrs. Bartlett
A. Bartlett & Co. Store
Apothecary Store
E.S. Young
Bapt. Ch.
L. Bartlett
W. Bartlett
Shoe Shop
E. Young
J. Oatley
E. Burton
John Russell
Cemetery
Cotton Mill F. Young
Young's Tenements
YOUNG'S
Whitestone Brook
MILLER'S
Cotton Mill
Mayhew Miller
Mrs. Mitchell
ACME POND DAM
Millers Tenements
Alden Angell
Mrs. Steere
E. Shippee
Wm Lewis
Eliza A. Danielson
C. Smith
A. Bowen
M. Miller
Geo. A. Tucker
CHESTNUT HILL
OR
EAST KILLINGLY.
Scale of Rods
10
20
80 rods



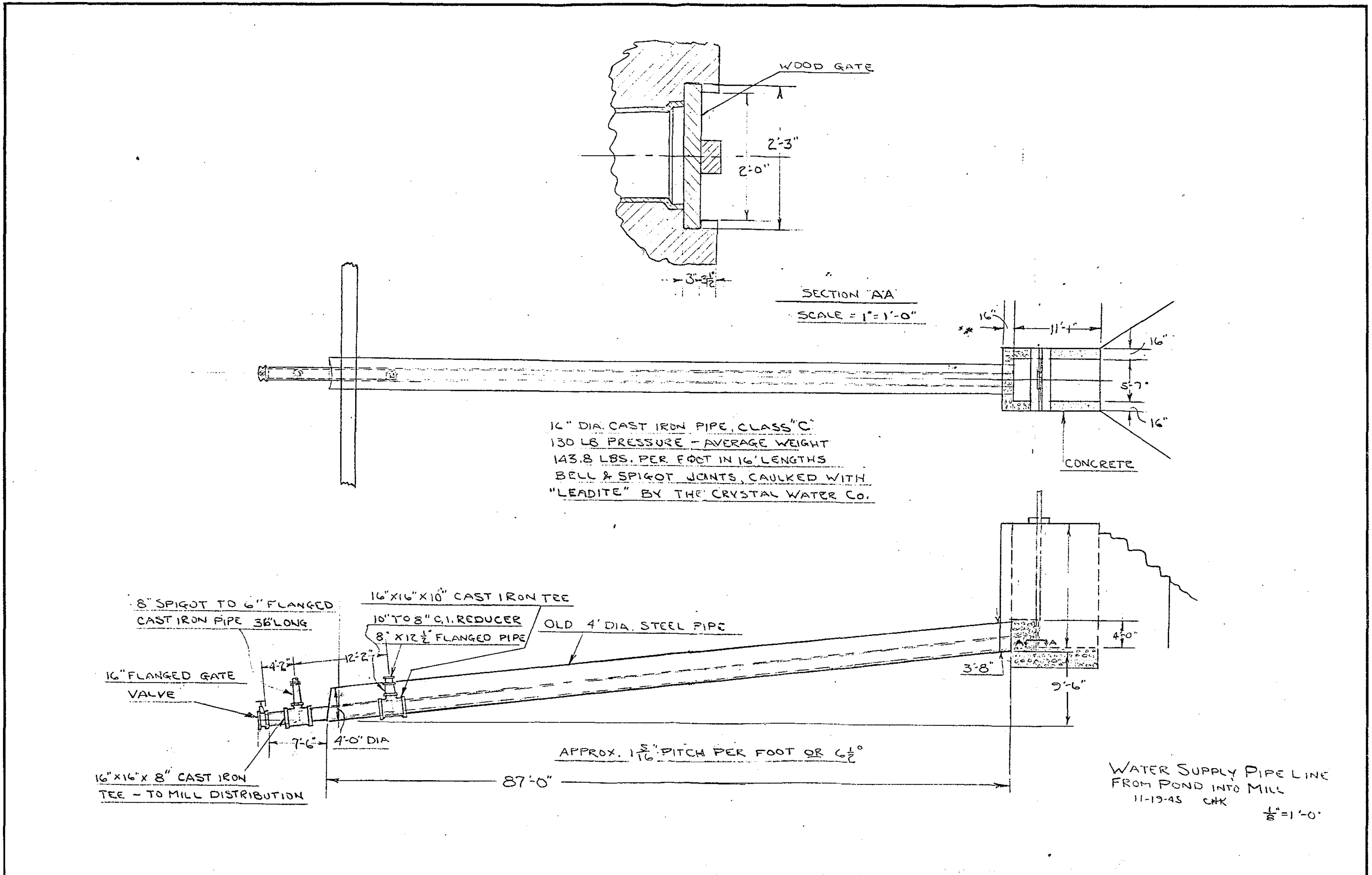
Layout of

ACME POND RESERVOIR SYSTEM

For Historical References

Not To Scale

LENARD & DILAJ ENGINEERING, INC.
Storrs, Connecticut 06268


WOOD GATE
2'-3"
2'-0"
3'-3½"
SECTION "A-A"
SCALE = 1" = 1'-0"
16"
11'-1"
16"
5'-7"
16"
CONCRETE
16" DIA. CAST IRON PIPE, CLASS "C"
130 LB PRESSURE - AVERAGE WEIGHT
143.8 LBS. PER FOOT IN 16' LENGTHS
BELL & SPIGOT JOINTS, CAULKED WITH
"LEADITE" BY THE CRYSTAL WATER Co.
8" SPIGOT TO 6" FLANGED
CAST IRON PIPE 36" LONG
16"X16"X10" CAST IRON TEE
10" TO 8" C.I. REDUCER
8" X 12½" FLANGED PIPE
OLD 4' DIA. STEEL PIPE
16" FLANGED GATE
VALVE
4'-2"
12'-2"
4'-0"
3'-8"
9'-6"
7'-6"
4'-0" DIA
APPROX. 1 5/16" PITCH PER FOOT OR 6½°
16"X16"X 8" CAST IRON
TEE - TO MILL DISTRIBUTION
87'-0"
WATER SUPPLY PIPE LINE
FROM POND INTO MILL
11-19-45 CHK
1/8" = 1'-0"

CHESTNUT HILL RESERVOIR CO.
EAST KILLINGLY, CONN.
DANIELSON 4-5541

May 3rd, 1954

Mr. William W. Pike
22 Hutchins Street
Danielson, Connecticut

Dear Mr. Pike:

Mr. Buckman has asked me to request you to make an inspection of the dams and other properties of the Chestnut Hill Reservoir Company, as you have in years past.

Please send us a written report stating the condition in which you find the various dams, etc.

Thanking you we remain

Yours very truly

CHESTNUT HILL RESERVOIR CO.

CHKnox

C. H. Knox,

CHK/dw

September 4, 1954

WORK NEEDED TO BE DONE ON THE DAMS
OF
THE CHESTNUT HILL RESERVOIR CO.

There are three items of work that apply to all of the dams, namely:

1. Trees should be cut and the brush should be kept cut from all of the dams.
2. Leaks should be stopped, driving plank priming where necessary.
3. Woodchuck holes should be stopped up.

The following conditions were found at the different dams and should be given attention:

ACME RESERVOIR

1. The stone wall on the lower side of the dam (South end) is being pushed out by the earth of the dam and this wall is leaning to the degree where it is no longer very stable.
2. The stone wall on the lower side of the dam at the transformer station is also leaning considerably.

BOG MEADOW RESERVOIR

1. Vegetation is clogging the channel just above the gates. This vegetation appears not to be securely rooted and thus likely to move about and could foul the gates.

ALVIA CHASE RESERVOIR

1. Water is leaking through the stonework at the gates. There appears to be more water going through the stonework than is going through the gates. At the present time there is no indication of undermining, the undermining that was evident two years ago has been filled in and does not show. However, such a volume of water going through the stonework is very likely taking away some of the earth which backs up said stonework.

OLD KILLINGLY POND

1. Earth fill has been placed on the lower side of the dam at its westerly end and this has backed up the leaning wall and should prevent its falling. A section of the top of this leaning wall near the easterly end of the dam has toppled down now. This earth backing should extend the entire length of the dam.

September 4, 1954

WORK NEEDED TO BE DONE ON THE DAMS
OF
THE CHESTNUT HILL RESERVOIR CO.
(continued)

EDDY PRAY RESERVOIR

1. This reservoir is not now in use.
   The leaks in said dam which have persisted for many years are still there even though the water is not high enough to run through said leaks.
2. The ditch at the foot of the dam should be cleaned out and opened up to let the water at the foot of the dam drain off so that the soil at the foot of the dam would not be so soft.

Respectfully submitted,
September 4, 1954,

William W. Pike

4 June 1973

Acme Carton Products Company, Inc.
147 South Franklin Avenue
Valley Stream, New York

K-10

Re: Acme Pond
Killingly, CT

Gentlemen:

Members of our staff recently inspected the above named dam on Whetstone Brook, which our records indicate belongs to you.

In general, the structure appears safe. I would, however, like to point out two areas of concern:

1. Determining and repairing the source of seepage in the south corner of the spillway would prevent further deterioration and possibly a much more expensive repair job in the future.

2. Brush which is growing on the upstream side of the dam should be removed.

Please consider the above as suggestions and not as a formal order by this department.

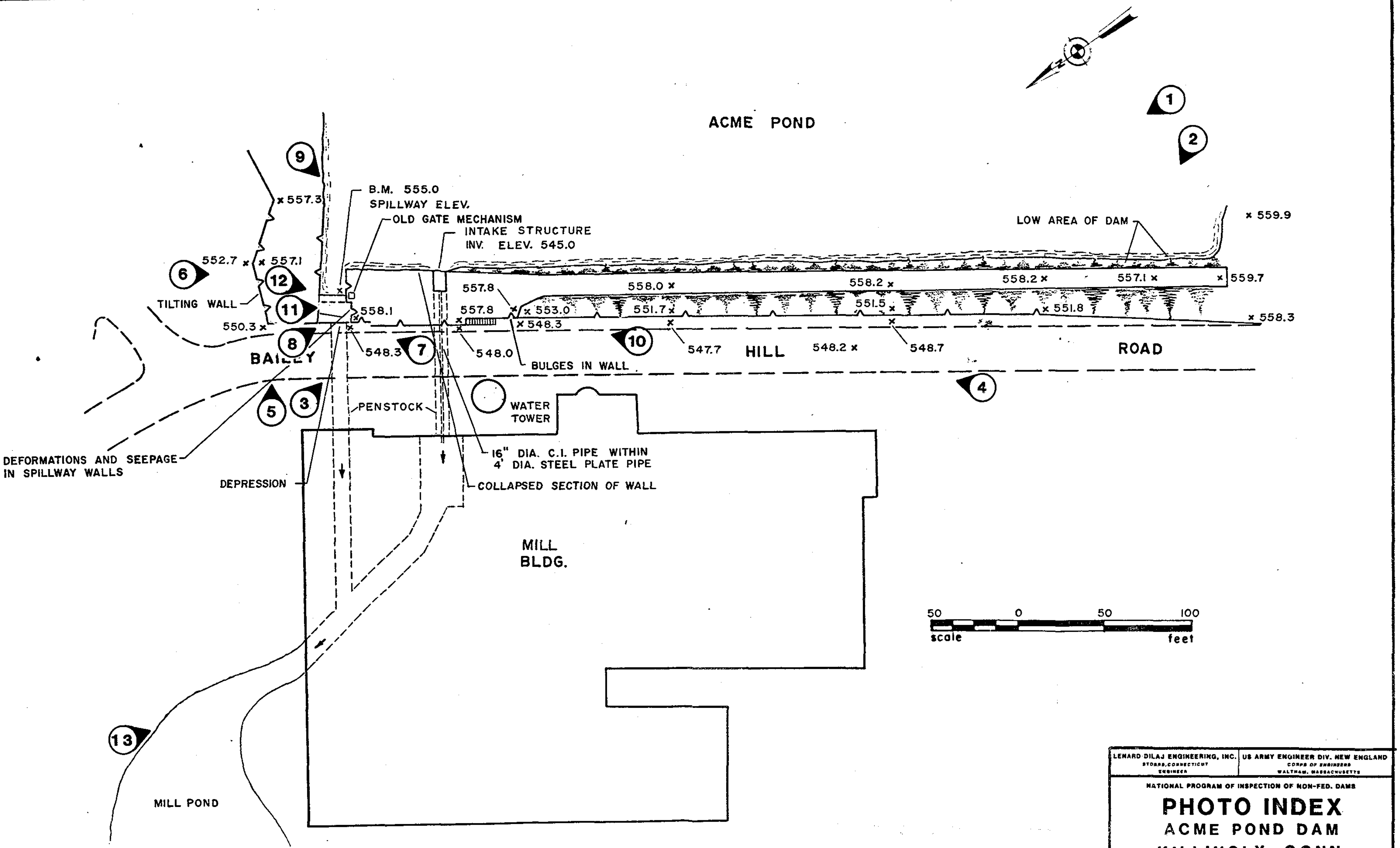
Very truly yours,

Victor F. Galgowski
Supt. of Dam Maintenance
Water & Related Resources

VFG:ljg

APPENDIX C

PHOTOGRAPHS



LENARD DILAJ ENGINEERING, INC.
STORRS, CONNECTICUT
ENGINEERS

US ARMY ENGINEER DIV. NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASSACHUSETTS

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

PHOTO INDEX
ACME POND DAM
KILLINGLY, CONN

DRAWN BY	CHECKED BY	APPROVED BY	SCALE: 1" = 50'	
EJO	K.A.	J.L.	DATE: DEC 80	SHEET C-1

Photos 1 & 2. View of upstream side of dam as seen from left abutment. Note stone wall near left abutment and large riprap to the right of the dam. Spillway is at far right.

US ARMY ENGINEER DIV. NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASSACHUSETTS LENARD-DILAJ ENGINEERING, INC. STORRS, CONNECTICUT ENGINEER	NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS	ACME POND DAM KILLINGLY, CONNECTICUT CT 00172 JAN. 1981 C- 2

Photo 3. Downstream wall of dam and spillway. Note reinforced concrete wall installed to the left of the spillway.

Photo 4. Overall view of downstream wall and slope.

US ARMY ENGINEER DIV. NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASSACHUSETTS	NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS	ACME POND DAM KILLINGLY, CONNECTICUT CT 00172 JAN. 1981 C-3
LENARD-DILAJ ENGINEERING, INC. STORRS, CONNECTICUT ENGINEER		

Photo 5. Tilted downstream wall near right abutment.

Photo 6. Closeup of tilted downstream wall at right abutment. Note voids between stones as a result of tilting of wall. Markings on wall are for parking purposes.

US ARMY ENGINEER DIV. NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASSACHUSETTS	NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS	ACME POND DAM KILLINGLY, CONNECTICUT CT 00172
LENARD-DILAJ ENGINEERING, INC. STORRS, CONNECTICUT ENGINEER		JAN. 1981 C- 4

Photo 7. Right wall of spillway. Note apparent deformation of wall.

Photo 8. Left training wall of spillway. Note remains of gate mechanism. Discharge from gate mechanism is apparently downstream of spillway wall.

US ARMY ENGINEER DIV. NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASSACHUSETTS	**NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS**	ACME POND DAM KILLINGLY, CONNECTICUT CT 00172
LENARD·DILAJ ENGINEERING, INC. STORRS, CONNECTICUT ENGINEER		JAN. 1981 C- 5

Photo 9

Upstream wall between inlet structure and spillway.

Photo 10

Downstream wall of dam at stairs left of spillway. Note bulging of wall at about third point from bottom.

Photo 11

Left wall of spillway. Note leakage at corner of wall and downstream face of spillway.

Photo 12

Closeup of leakage of left wall.

Photo 13. Outlet side of spillway discharge channel below mill building.

APPENDIX D

HYDROLOGIC AND HYDRAULIC

COMPUTATIONS

LENARD & DILAJ ENGINEERING, INC.
1066 Storrs Road
STORRS, CONNECTICUT 06268
(203) 429-7308

JOB ACME POND DAM
SHEET NO. ______ OF ______
CALCULATED BY K. A. DATE ______
CHECKED BY ______ DATE ______
SCALE ______

DETERMINATION OF SPILLWAY TEST FLOOD*

A. SIZE CLASSIFICATION

Based on either storage or height

			THIS DAM:
Small (circled)	Storage	50-999 Ac.-Ft.	29 Ac. Ft.
	Height	25-39 Ft.	10 Ft.
Intermediate	Storage	1,000-50,000 Ac.Ft.	
	Height	40-100 Ft.	
Large	Storage	More than 50,000 Ac.-Ft.	
	Height	Greater than 100 Ft.	

B. HAZARD POTENTIAL CLASSIFICATION

Category	Loss of Life	Economic Loss
Low	None expected	Minimal
Significant	Few	Appreciable (circled)
High (circled)	More than few (circled)	Excessive

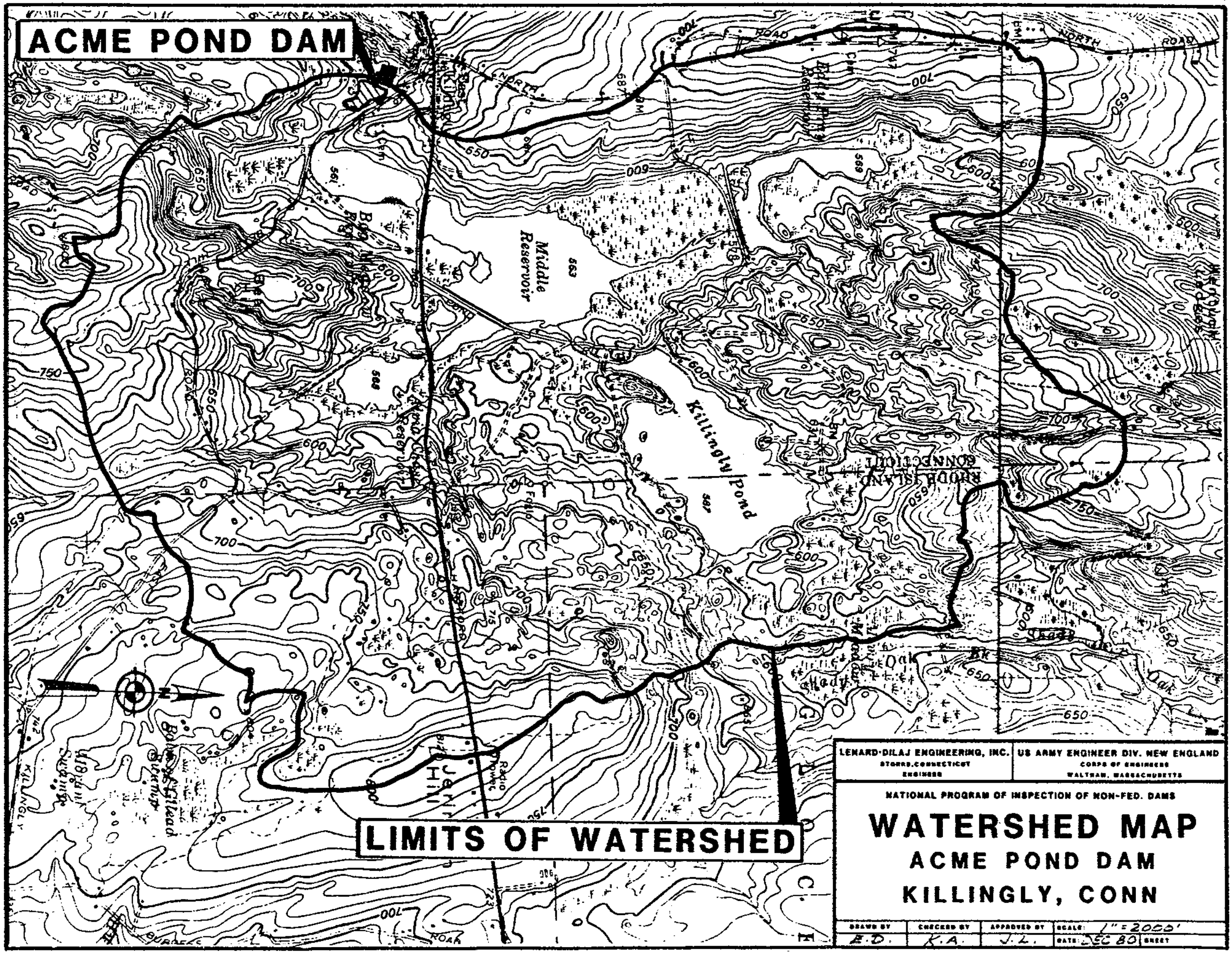
Hazard Classification HIGH

C. HYDROLOGIC EVALUATION GUIDELINES

Hazard	Size	Spillway Test Flood
Low	Small	50 to 100-Year Frequency
	Intermediate	100-Year Frequency to ½ PMF
	Large	½ PMF to PMF
Significant	Small	100-Year Frequency to ½ PMF
	Intermediate	½ PMF to PMF
	Large	PMF
High (circled)	Small (circled)	½ PMF to PMF (circled)
	Intermediate	PMF
	Large	PMF

Spillway Test Flood ½ PMF

* Based upon "Recommended Guidelines for Safety Inspection of Dams" Department of the Army, Office of the Chief of Engineers, November 1976.


ACME POND DAM
LIMITS OF WATERSHED
Middle Reservoir
Killingly Pond
RHODE ISLAND
CONNECTICUT
LENARD-DILAJ ENGINEERING, INC.
STORRS, CONNECTICUT
ENGINEERS
US ARMY ENGINEER DIV. NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASSACHUSETTS
NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS
WATERSHED MAP
ACME POND DAM
KILLINGLY, CONN
DRAWN BY E.D.
CHECKED BY K.A.
APPROVED BY J.L.
SCALE: 1" = 2000'
DATE: DEC 80
SHEET

PREVIEW OF SEQUENCE OF STREAM NETWORK CALCULATIONS

RUNOFF HYDROGRAPH AT	1
ROUTE HYDROGRAPH TO	2
RUNOFF HYDROGRAPH AT	3
ROUTE HYDROGRAPH TO	4
COMBINE 2 HYDROGRAPHS AT	5
RUNOFF HYDROGRAPH AT	6
COMBINE 2 HYDROGRAPHS AT	7
ROUTE HYDROGRAPH TO	8
RUNOFF HYDROGRAPH AT	9
COMBINE 2 HYDROGRAPHS AT	10
ROUTE HYDROGRAPH TO	11
END OF NETWORK	

WATERSHED ANALYSIS

ACME POND DAM

X

```
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION       JULY 1978
  LAST MODIFICATION  26 FEB 79
********************************

RUN  DATE0 01/07/81.
     TIME0 08.33.48.


                    ACME POND DAM   EAST KILLINGLY  CONNECTICUT
                    80-27-1
                    NOVEMBER 1980-DESIGN STORM- 1/2 PMF

                                   JOB SPECIFICATION
        NQ      NHR     NMIN     IDAY     IHR     IMIN    METRC     IPLT     IPRT    NSTAN
       150        0       30        0       0        0        0        0        4        0
                              JOPER     NWT    LROPT    TRACE
                                  5       0        0        0


                         MULTI-PLAN ANALYSES TO BE PERFORMED
                              NPLAN= 1 NRTIO= 6 LRTIO= 1
              RTIOS=     .10     .20     .30     .50     .80    1.00


         **********          **********          **********          **********          **********

                              SUB-AREA RUNOFF COMPUTATION

                CALCULATION OF INFLOW HYDROGRAPH TO EDDY PRAY RESERVOIR

                   ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                       1       0       0       0       1       0       1       0       0

                                    HYDROGRAPH DATA
        IHYDG    IUHG    TAREA     SNAP    TRSDA    TRSPC    RATIO   ISNOW   ISAME   LOCAL
            1       1      .82     0.00      .82     0.00    0.000       0       0       0

                                      PRECIP DATA
                    SPFE     PMS      R6     R12     R24     R48     R72     R96
                    0.00   24.40  100.00  111.00  120.00  127.00    0.00    0.00
TRSPC COMPUTED BY THE PROGRAM IS   .800

                                       LOSS DATA
      LROPT   STRKR   DLTKR   RTIOL   ERAIN   STRKS   RTIOK   STRTL   CNSTL   ALSMX   RTIMP
          0    0.00    0.00    1.00    0.00    0.00    1.00    1.00     .20    0.00    0.00

                                 UNIT HYDROGRAPH DATA
                            TP=  1.82     CP= .63     NTA=  0

                                     RECESSION DATA
                        STRTQ=    -1.80     QRCSN=     -.05     RTIOR= 1.00

           UNIT HYDROGRAPH 21 END-OF-PERIOD ORDINATES, LAG=   1.83 HOURS, CP=  .63  VOL= 1.00
        23.       81.      145.      178.      161.      121.       90.       67.       50.       37.
        27.       20.       15.       11.        8.        6.        5.        3.        3.        2.
         1.

      0                            END-OF-PERIOD FLOW
    MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS    COMP Q       MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS   COMP Q
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********** ********** ********** ********** **********

HYDROGRAPH ROUTING

ROUTED FLOW THROUGH EDDY PRAY RESERVOIR

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
2	1	0	0	1	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	0.	0

STORAGE	0.00	229.00	266.00	305.00	387.00
OUTFLOW	0.00	100.00	238.00	2062.00	8456.00
STAGE	569.00	573.50	574.00	574.50	575.50
FLOW	0.00	100.00	238.00	2062.00	8456.00

MAXIMUM STAGE IS 570.3

MAXIMUM STAGE IS 571.7

MAXIMUM STAGE IS 573.0

MAXIMUM STAGE IS 574.1

MAXIMUM STAGE IS 574.4

MAXIMUM STAGE IS 574.5

********** ********** ********** ********** **********

SUB-AREA RUNOFF COMPUTATION

CALCULATION OF INFLOW HYDROGRAGH TO KILLINGLY POND

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
3	0	0	0	1	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	.1	1.39	0.00	1.39	0.00	0.000	0	0	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	24.40	100.00	111.00	120.00	127.00	0.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS .800

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	1.00	.20	0.00	0.00

UNIT HYDROGRAPH DATA

RECESSION DATA

STRTQ= -1.80 QRCSN= -.05 RTIOR= 1.00

UNIT HYDROGRAPH 25 END-OF-PERIOD ORDINATES, LAG= 2.21 HOURS, CP= .62 VOL= 1.00

24.	85.	164.	227.	251.	226.	178.	139.	109.	85.
67.	52.	41.	32.	25.	20.	15.	12.	9.	7.
6.	4.	4.	3.	2.					

0

END-OF-PERIOD FLOW

MO.DA HR.MN PERIOD RAIN EXCS LOSS COMP Q MO.DA HR.MN PERIOD RAIN EXCS LOSS COMP Q

SUM 24.79 19.28 5.51 42350.
(630.)(490.)(140.)(1199.22)

********** ********** ********** ********** **********

HYDROGRAPH ROUTING

ROUTED FLOW THROUGH KILLINGLY POND

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
4	1	0	0	1	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	0.	0

STORAGE	0.00	251.00	396.00	647.00	1059.00
OUTFLOW	0.00	54.00	580.00	5069.00	17723.00
STAGE	587.00	589.00	590.00	591.60	594.00
FLOW	0.00	54.00	580.00	5069.00	17723.00

MAXIMUM STAGE IS 588.0

MAXIMUM STAGE IS 589.0

MAXIMUM STAGE IS 589.5

MAXIMUM STAGE IS 590.2

MAXIMUM STAGE IS 590.6

MAXIMUM STAGE IS 590.8

********** ********** ********** ********** **********

COMBINE HYDROGRAPHS

COMBINE HYDROGRAPHS FROM ABOVE SUBBASINS 2 AND 4

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
5	2	0	0	1	0	1	0	0

SUB-AREA RUNOFF COMPUTATION

CALCULATION OF INFLOW HYDROGRAPH TO MIDDLE RESERVOIR

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
6	0	0	0	1	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	1	2.57	0.00	2.57	0.00	0.000	0	0	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	24.40	100.00	111.00	120.00	127.00	0.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS .800

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	1.00	.20	0.00	0.00

UNIT HYDROGRAPH DATA
TP= 2.38 CP= .63 NTA= 0

RECESSION DATA
STRTQ= -1.80 QRCSN= -.05 RTIOR= 1.00

UNIT HYDROGRAPH 26 END-OF-PERIOD ORDINATES, LAG= 2.38 HOURS, CP= .63 VOL= 1.00

38.	138.	267.	380.	436.	413.	339.	269.	214.	170.
135.	107.	85.	67.	53.	42.	34.	27.	21.	17.
13.	11.	8.	7.	5.	4.				

0

END-OF-PERIOD FLOW

MO.DA HR.MN PERIOD RAIN EXCS LOSS COMP Q MO.DA HR.MN PERIOD RAIN EXCS LOSS COMP Q

SUM 24.79 19.28 5.51 77476.
(630.)(490.)(140.)(2193.88)

********** ********** ********** ********** **********

COMBINE HYDROGRAPHS

COMBINE ABOVE TWO HYDROGRAPHS 6 AND 7

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
7	2	0	0	1	0	1	0	0

********** ********** ********** ********** **********

HYDROGRAPH ROUTING

ROUTED FLOWS THROUGH MIDDLE RESERVOIR DAM

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
8	1	0	0	1	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	1	0	0	0

1 0 0 0.000 0.000 0.000 -562. -1

STAGE	562.00	563.00	564.00	564.30	566.00	568.00	570.00
FLOW	0.00	36.70	111.20	139.60	482.40	492.60	568.80

SURFACE AREA=	60.	126.	170.	204.	227.	246.	262.	275.	288.
CAPACITY=	0.	91.	238.	425.	640.	876.	1130.	1399.	1680.
ELEVATION=	562.	563.	564.	565.	566.	567.	568.	569.	570.

CREL	SPWID	COQW	EXPW	ELEVL	COQL	CAREA	EXPL
562.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

DAM DATA

TOPEL	COQD	EXPD	DAMWID
568.0	2.6	1.5	986.

PEAK OUTFLOW IS 108. AT TIME 48.50 HOURS

PEAK OUTFLOW IS 263. AT TIME 47.50 HOURS

PEAK OUTFLOW IS 420. AT TIME 48.50 HOURS

PEAK OUTFLOW IS 1611. AT TIME 46.00 HOURS

PEAK OUTFLOW IS 5968. AT TIME 44.00 HOURS

PEAK OUTFLOW IS 8600. AT TIME 43.50 HOURS

********** ********** ********** ********** **********

SUB-AREA RUNOFF COMPUTATION

CALCULATION OF INFLOW HYDROGRAPH TO ACME POND

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
9	0	0	0	1	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	1	.39	0.00	.39	0.00	0.000	0	0	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	24.40	100.00	111.00	120.00	127.00	0.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS .800

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	1.00	.20	0.00	0.00

UNIT HYDROGRAPH DATA

TP= 1.70 CP= .63 NTA= 0

RECESSION DATA

STRTQ= -1.80 QRCSN= -.05 RTIOR= 1.00

UNIT HYDROGRAPH 19 END-OF-PERIOD ORDINATES, LAG= 1.70 HOURS, CP= .63 VOL= 1.00

12.	44.	77.	90.	77.	56.	40.	29.	21.	15.
11.	8.	6.	4.	3.	2.	2.	1.	1.	

0

END-OF-PERIOD FLOW

MO.DA HR.MN PERIOD RAIN EXCS LOSS COMP Q MO.DA HR.MN PERIOD RAIN EXCS LOSS COMP Q

	RAIN	EXCS	LOSS	COMP Q
SUM	24.79	19.28	5.51	12426.
	(630.)	(490.)	(140.)	(351.87)

COMBINE HYDROGRAPHS

COMBINE ABOVE TWO HYDROGRAPHS 8 AND 9

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
10	2	0	0	1	0	1	0	0

HYDROGRAPH ROUTING

ROUTED FLOWS THROUGH ACME POND DAM

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
11	1	0	0	1	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	-555.	-1

STAGE	555.00	556.00	557.00	558.00	558.20	560.00	562.00			
FLOW	0.00	42.90	119.90	221.20	244.50	499.10	889.00			
SURFACE AREA=	3.	4.	4.	5.	5.	6.	7.	8.	10.	12.
CAPACITY=	0.	3.	7.	12.	17.	22.	40.	62.	80.	102.
ELEVATION=	555.	556.	557.	558.	559.	560.	563.	566.	568.	570.

CREL	SPWID	COQW	EXPW	ELEVL	COQL	CAREA	EXPL
555.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

DAM DATA

TOPEL	COQD	EXPD	DAMWID
558.2	2.6	1.5	554.

PEAK OUTFLOW IS 141. AT TIME 43.00 HOURS

PEAK OUTFLOW IS 311. AT TIME 42.00 HOURS

PEAK OUTFLOW IS 488. AT TIME 43.00 HOURS

PEAK OUTFLOW IS 1664. AT TIME 46.00 HOURS

PEAK OUTFLOW IS 6291. AT TIME 44.00 HOURS

PEAK OUTFLOW IS 9161. AT TIME 43.50 HOURS

********** ********** ********** ********** **********

PEAK FLOW AND STORAGE (END OF PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
AREA IN SQUARE MILES (SQUARE KILOMETERS)

OPERATION	STATION	AREA	PLAN	RATIO 1 .10	RATIO 2 .20	RATIO 3 .30	RATIO 4 .50	RATIO 5 .80	RATIO 6 1.00
				RATIOS APPLIED TO FLOWS					
HYDROGRAPH AT	1	.82	1	204.	408.	612.	1019.	1631.	2039.
		(2.12)	(	5.77)(	11.55)(	17.32)(	28.87)(	46.18)(	57.73)(
ROUTED TO	2	.82	1	30.	60.	90.	666.	1585.	1997.
		(2.12)	(	.85)(	1.69)(	2.54)(	18.86)(	44.88)(	56.54)(
HYDROGRAPH AT	3	1.39	1	313.	626.	939.	1565.	2504.	3130.
		(3.60)	(	8.86)(	17.73)(	26.59)(	44.31)(	70.90)(	88.63)(
ROUTED TO	4	1.39	1	27.	54.	306.	1017.	2175.	2813.
		(3.60)	(	.76)(	1.52)(	8.66)(	28.81)(	61.59)(	79.65)(
2 COMBINED	5	2.21	1	56.	113.	395.	1647.	3549.	4641.
		(5.72)	(	1.60)(	3.19)(	11.20)(	46.65)(	100.49)(	131.42)(
HYDROGRAPH AT	6	2.57	1	559.	1117.	1676.	2793.	4469.	5587.
		(6.66)	(	15.82)(	31.64)(	47.46)(	79.10)(	126.56)(	158.20)(
2 COMBINED	7	4.78	1	592.	1184.	1776.	3818.	7920.	10105.
		(12.38)	(	16.76)(	33.53)(	50.29)(	108.12)(	224.28)(	286.16)(
ROUTED TO	8	4.78	1	108.	263.	420.	1611.	5968.	8600.
		(12.38)	(	3.05)(	7.45)(	11.89)(	45.62)(	168.99)(	243.52)(
HYDROGRAPH AT	9	.39	1	101.	201.	302.	503.	805.	1006.
		(1.01)	(	2.85)(	5.70)(	8.54)(	14.24)(	22.78)(	28.48)(
2 COMBINED	10	5.17	1	144.	296.	485.	1666.	6290.	9141.
		(13.39)	(	4.08)(	8.37)(	13.73)(	47.19)(	178.12)(	258.84)(
ROUTED TO	11	5.17	1	141.	311.	488.	1664.	6291.	9161.
		(13.39)	(	4.01)(	8.81)(	13.80)(	47.13)(	178.15)(	259.40)(

PLAN 1 STATION 2

EDDY PRAY RESERVOIR DAM

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.10	30.	570.3	46.00
.20	60.	571.7	46.00
.30	90.	573.0	46.00
.50	666.	574.1	43.50
.80	1585.	574.4	42.00
1.00	1997.	574.5	42.00

PLAN 1 STATION 4

MAXIMUM MAXIMUM TIME

KILLINGLY POND DAM

RATIO	FLOW,CFS	STAGE,FT	HOURS
.10	27.	588.0	48.00
.20	54.	589.0	48.00
.30	306.	589.5	45.50
.50	1017.	590.2	44.00
.80	2175.	590.6	43.00
1.00	2813.	590.8	43.00

MIDDLE RESERVOIR DAM

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 ....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	562.00	562.00	568.00
STORAGE	0.	0.	1130.
OUTFLOW	0.	0.	493.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
.10	563.95	0.00	230.	108.	0.00	48.50	0.00
.20	565.10	0.00	445.	263.	0.00	47.50	0.00
.30	566.39	0.00	729.	420.	0.00	48.50	0.00
.50	568.57	.57	1281.	1611.	10.00	46.00	0.00
.80	569.65	1.65	1579.	5968.	18.50	44.00	0.00
1.00	570.14	2.14	1721.	8600.	33.50	43.50	0.00

ACME POND DAM

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1		INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
	ELEVATION	555.00	555.00	558.20
	STORAGE	0.	0.	13.
	OUTFLOW	0.	0.	245.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
.10	557.21	0.00	8.	141.	0.00	43.00	0.00
.20	558.31	.11	13.	311.	13.00	42.00	0.00
.30	558.48	.28	14.	488.	34.50	43.00	0.00
.50	559.14	.94	17.	1664.	36.00	46.00	0.00
.80	560.72	2.52	26.	6291.	36.50	44.00	0.00
1.00	561.48	3.28	31.	9161.	37.00	43.50	0.00

LENARD & DILAJ ENGINEERING, INC.
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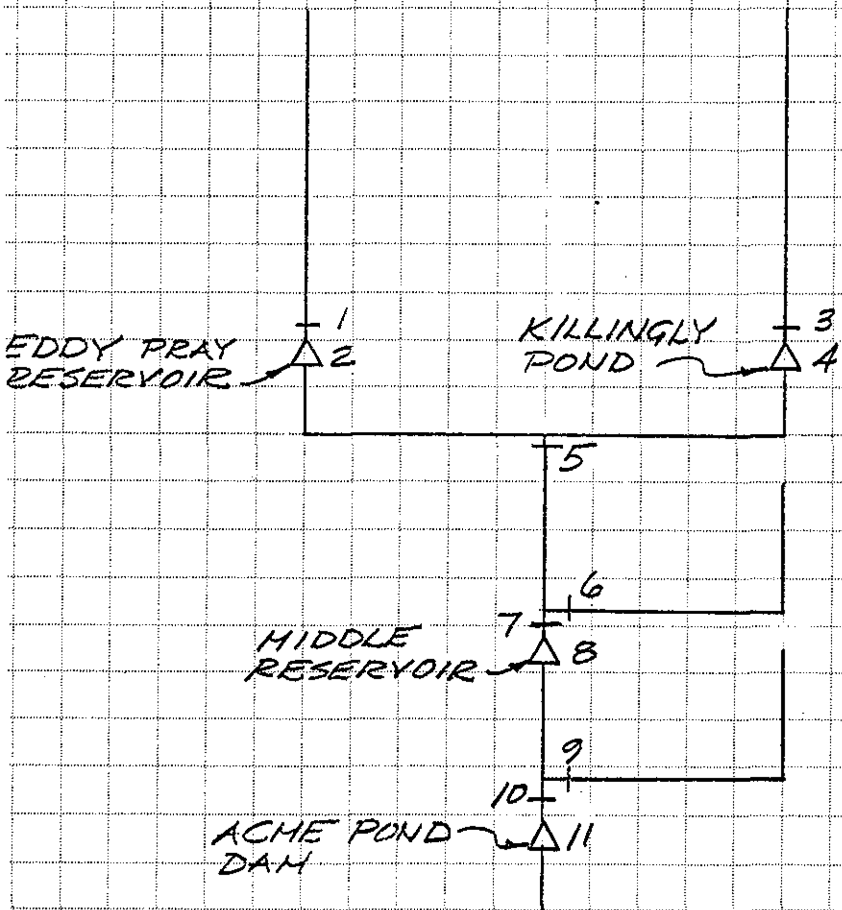
JOB: ACME POND DAM
SHEET NO. 1 OF 15
CALCULATED BY: M.D. DATE: 12/29/80
CHECKED BY: K.A. DATE: 12/30/80
SCALE:

SCHEMATIC



1 – RUNOFF EDDY PRAY WATERSHED
2 – ROUTED INFLOW THROUGH EDDY PRAY RESERVOIR
3 – RUNOFF KILLINGLY POND
4 – ROUTED INFLOW THROUGH KILLINGLY POND
5 – COMBINE ABOVE TWO FLOWS
6 – RUNOFF MIDDLE RESERVOIR WATERSHED
7 – COMBINE FLOWS 5 & 6
8 – ROUTED INFLOW 7 THROUGH MIDDLE RESERVOIR
9 – RUNOFF ACME POND WATERSHED
10 – COMBINE FLOWS 8 & 9
11 – ROUTED INFLOW 10 THROUGH ACME POND DAM

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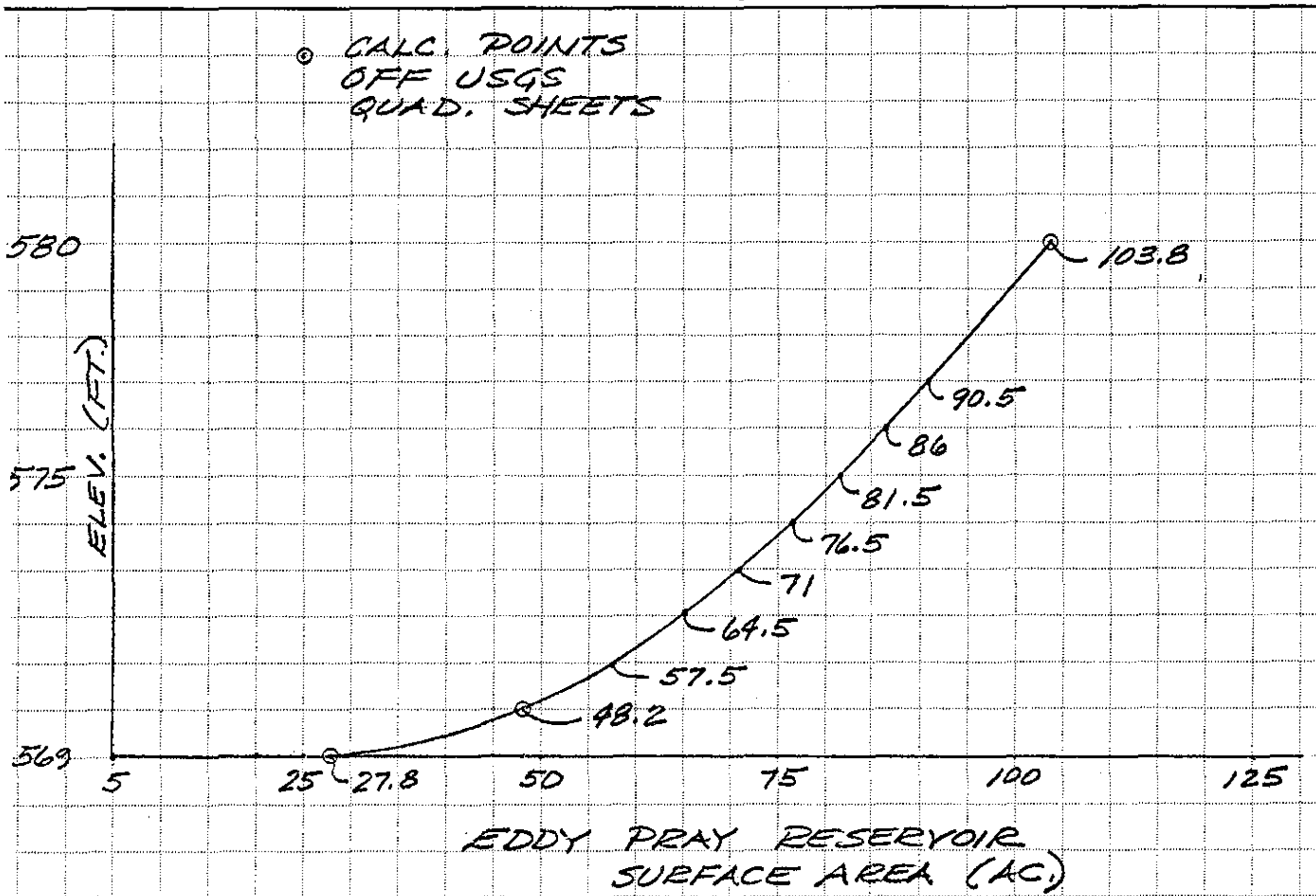
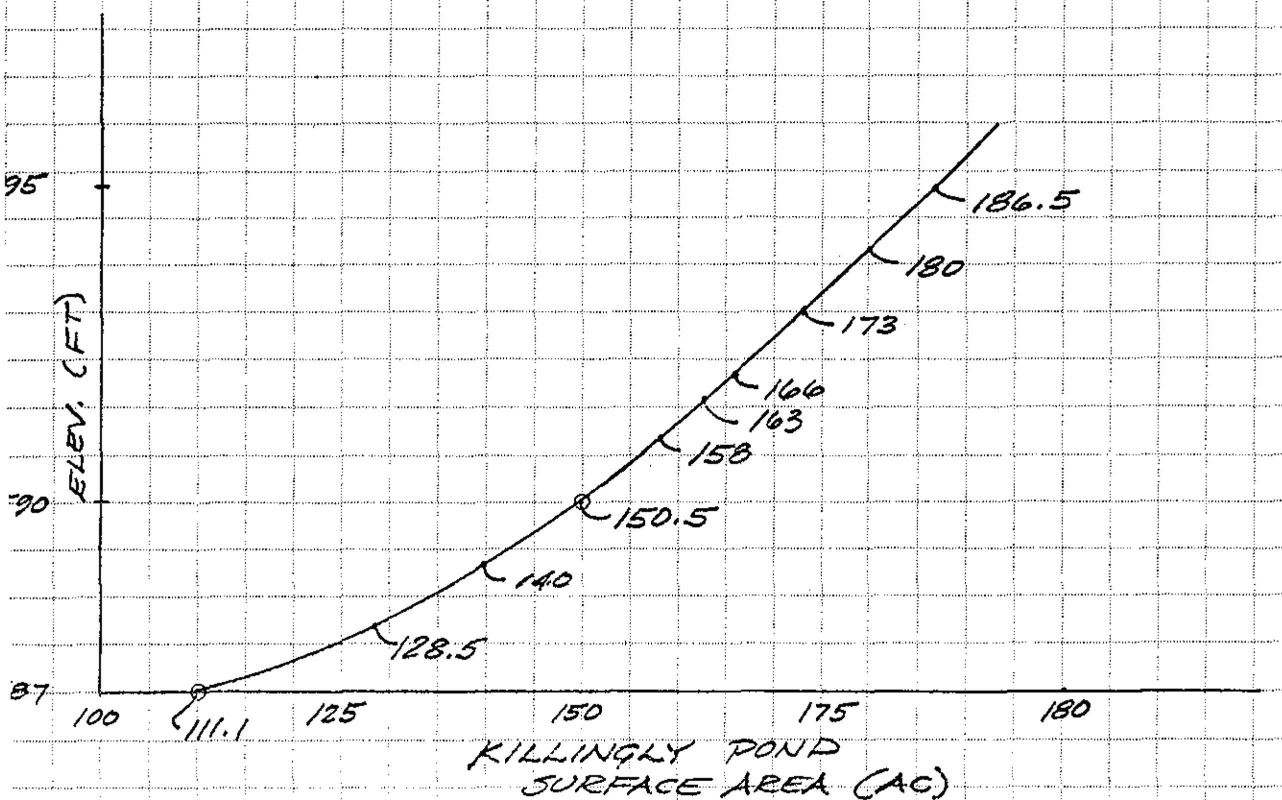
JOB: CORPS - ACME POND
SHEET NO. 2 OF 15
CALCULATED BY: MD DATE: 12/29/80
CHECKED BY: K. A. DATE: 12/30/80
SCALE:





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(203) 429-7308

JOB ACME POND DAM
SHEET NO. 3 OF 15
CALCULATED BY MD DATE 12/29/80
CHECKED BY K.A. DATE 12/30/80
SCALE

LAG TIME CALC. (SNYDER'S METHOD)

KILLINGLY POND:

$L = 10,650$ FT. = 2.02 MI.
$L_{CA} = 3,650$ FT. = 0.69 MI.
$C_t = 2.0$

$t_p = C_t (L L_{CA})^{0.3}$
$t_p = 2.21$ HRS.

EDDY PRAY RESERVOIR:

$L = 7,100$ FT. = 1.34 MI.
$L_{CA} = 2,900$ FT. = 0.55 MI.
$C_t = 2.0$

$t_p = C_t (L L_{CA})^{0.3}$
$t_p = 1.82$ HRS.

MIDDLE RESERVOIR:

$L = 12,850$ FT. = 2.43 MI.
$L_{CA} = 3,900$ FT. = 0.74 MI.
$C_t = 2.0$

$t_p = C_t (L L_{CA})^{0.3}$
$t_p = 2.38$

DRAINAGE AREAS:

KILLINGLY POND: 5142, 4585, 5144 — 557, 559, 558 = 1.27 S.M.

5120, 5173, 5224 — 53, 51, 52 = 0.12 S.M.

TOTAL = 1.39 S.M.

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JOB: ACME POND DAM
SHEET NO. 4 OF 15
CALCULATED BY: MD DATE: 12/29/80
CHECKED BY: K. A. DATE: 12/30/80
SCALE:

DRAINAGE AREAS CONT'D

EDDY PRAY RESERVOIR:

5392	322		
5070		324	
5396	326		359.5 =
5224	9		0.82 S.M.
5215		10	
5226	11		
5087			
5062	25	25.5	
5088	26		

MIDDLE RESERVOIR:

6216		
7344	1128	1124 = 2.57 S.H.
8464	1120	

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JOB: ACME POND DAM
SHEET NO. 5 OF 15
CALCULATED BY: Hoskins DATE: Dec. 31, '80
CHECKED BY: K. A. DATE: 1/2/81
SCALE:

DISCHARGE - EDDY PRAY RES.

[illegible]	[illegible]	[illegible]	[illegible]	h_n	h_n	Σh_n	$Q = C^4 L \Sigma h_n$
574.0	2.6	1315'	1040	0.16	0.064		173.06
			90	0.20	0.089		20.83
			85	0.26	0.133		29.4
			100	0.15	0.058		15.1
							ΣQ = 238.4
574.5	2.6	1525'	1040	0.66	0.536		1449.3
			90	0.70	0.586		137.1
			85	0.76	0.663		146.5
			100	0.65	0.524		136.2
			210	0.50	0.354		193.0
							ΣQ = 2062.1
575.5	2.6	1550	1050	1.66	2.14		5842.2
			90	1.70	2.22		519.5
			85	1.76	2.33		514.9
			100	1.65	2.12		551.2
			215	1.50	1.84		1028.6
							ΣQ = 8456.4

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JOB: ACME POND DAM
SHEET NO. 6 OF 15
CALCULATED BY: GB DATE: 1-5-81
CHECKED BY: K.A. DATE: 1/6/81
SCALE:

KILLINGLY POND - DISCHARGE

[illegible]	[illegible]	L	ℓ	h_n	h_n[illegible]	Σh_n	$\Delta Q = C \ell \Sigma h_n$[illegible]
590 (DAM)	2.5	230	73	0.3	0.164		29.9
			88	0.8	0.716		157.5
			28	0.9	0.854		59.8
			41	0.3	0.164		16.8
							ΣQ = 264.0
590 (DIKE)	2.5	395	40	0.4	0.252		25.2
			111	0.6	0.465		129.0
			131	0.4	0.252		82.5
			113	0.2	0.089		25.1
							ΣQ = 261.8
591.6 (DAM)	2.5	290	7	0.7	0.586		10.3
			57	1.8	2.415		344.1
			28	2.4	3.718		260.3
			88	2.5	3.953		869.7
			73	2.0	2.838		517.9
			31	1.4	1.657		128.4
			6	.6	0.465		8.0
							ΣQ = 2138.7
591.6 (DIKE)	2.5	485	121	1.2	1.315		397.8
			111	2.2	3.263		905.5
			132	2.0	2.828		933.2
			113	1.8	2.415		682.2
			8	0.7	0.586		11.7
							ΣQ = 2930.4

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JOB: Acme Pond Dam
SHEET NO. 7 OF 15
CALCULATED BY: GB DATE: 1-5-81
CHECKED BY: K.A. DATE: 1/6/81
SCALE:

Killingly Pond - Discharge

[illegible]	[illegible]	[illegible]	[illegible]	h_n	h_n	Σh_n	$Q = CAL\Sigma h_n^{1.5}$
594 (DAM)	2.6	313	19	2.0	2.829		139.7
			57	4.2	8.607		1275.5
			28	4.8	10.516		765.6
			88	4.9	10.847		2481.8
			73	4.4	9.230		1751.8
			30	3.7	7.117		555.1
			18	1.8	2.415		113.0
							ΣQ = 7087.5
594 (DIKE)	2.6	515	16	1.4	2.319		68.9
			122	3.6	6.831		2166.8
			110	4.5	9.546		2730.2
			132	4.3	8.917		3060.3
			112	4.1	8.302		2417.5
			23	2.0	2.828		169.1
							ΣQ = 10612.8

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JOB: ACME POND DAM

CALCULATED BY: GC DATE: 1-5-81
CHECKED BY: K.A. DATE: 1/6/81
SCALE:

KILLINGLY POND · DISCHARGE

INV.	ELEV.	HW	HW/D	Q/PIPE	Q
2-18"					
586.7	587	0.3	0.2	1.2	2.4
	588	1.3	0.9	5.8	11.6
	589	2.3	1.7	12.5	25.0
3-18"					
587.0	587	0	0	0	0
	588	1.0	.7	3.8	11.4
	589	2.0	1.3	9.5	28.5
1- 30"					
571.1	587	15.9	6.4	110	110
	588	16.9	6.8	115	115
	589	17.9	7.2	120	120

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JOB ACME POND DAM
SHEET NO. 9 OF 15
CALCULATED BY K. A. DATE 12/29/80
CHECKED BY M. D. DATE 12/29/80
SCALE

STORAGE

EDDY PRAY

Elev.	AREA	Aave.	ΔH	ΔS	STOTAL (AC.FT.)
569	27.8				0
		50.9	4.5	229	
573.5	74.0				229
		75.3	0.5	37.7	
574.0	76.5				266
		77.8	0.5	38.9	
574.5	79.0				305
		81.5	1.0	81.5	
575.5	84.0				387

KILLINGLY POND

Elev.	AREA	Aave.	ΔH	ΔS	STOTAL (AC.FT.)
587	111.1				0
		125.6	2	251.2	
589	140				251
		145.3	1	145.3	
590	150.5				396
		156.8	1.6	250.9	
591.6	163				647
		171.5	2.4	411.6	
594.0	180				1059

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JOB CORPS — ACME POND
SHEET NO. 10 OF 15
CALCULATED BY MR DATE 11/20/80
CHECKED BY MD DATE 11/25/80
SCALE

STORAGE ABOVE SPILLWAY FOR MIDDLE RESERVOIR

WATER SURFACE AREA @ EL. 56.3

READINGS 6826 87
6913 85.5 AVE 86 × 63,654 ÷ 43,560
DOUB 7084 = 125.7 AC.

AREA @ EL. 565

READINGS 7084 140
7224 139 AVE 139.3 × 63,654 ÷ 43,560
DOUB 7502 = 203.6 AC.

AREA @ EL 570

READINGS 7502 198
7700 197 AVE 197.3 × 63,654 ÷ 43,560
8094 = 288.3 AC.

04-1 Available from NEBS Inc., Groton, Mass. 01450

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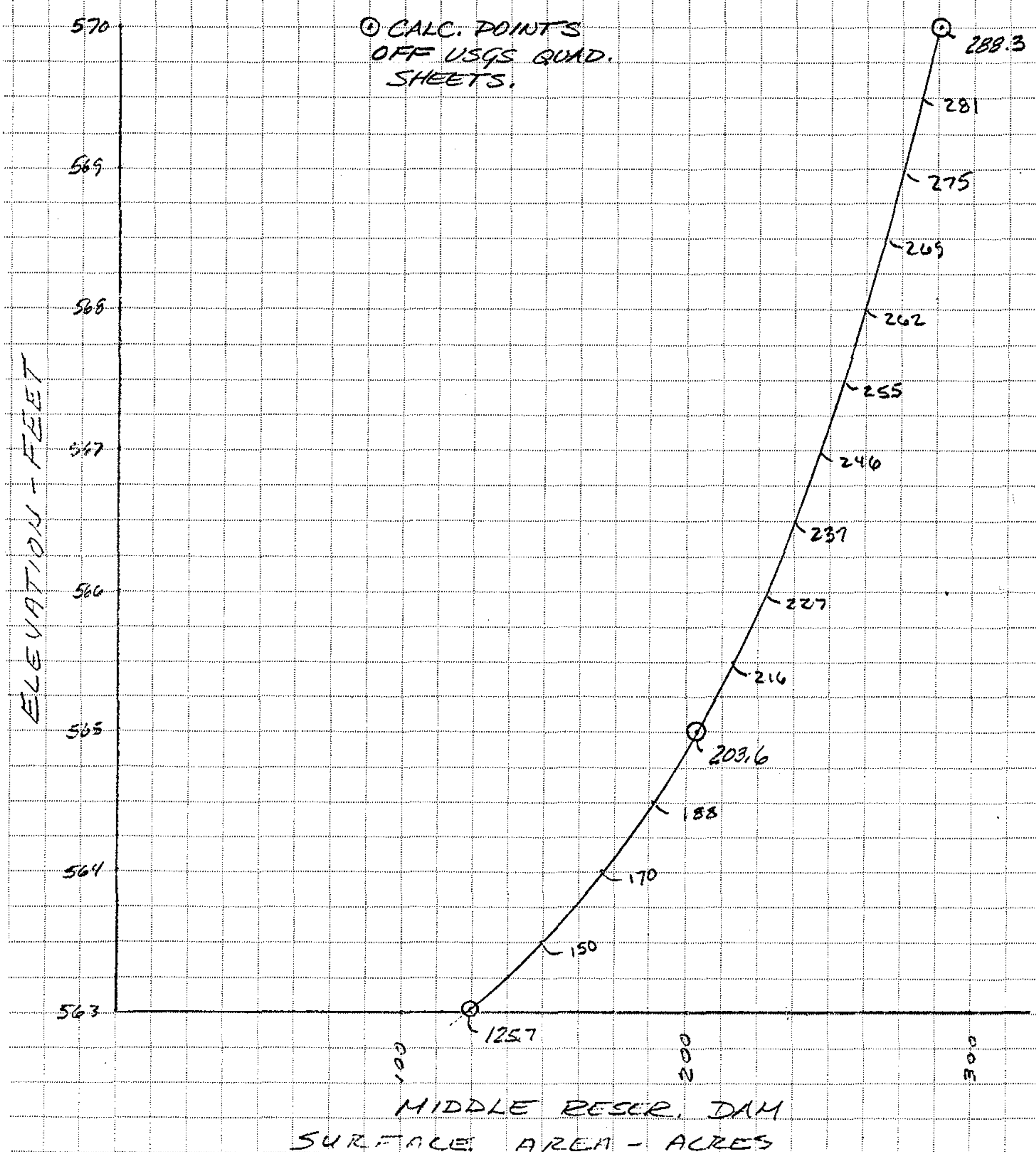
JOB CORPS. - ACME POND

CALCULATED BY MR DATE 11/20/80
CHECKED BY MD DATE 11/25/80
SCALE



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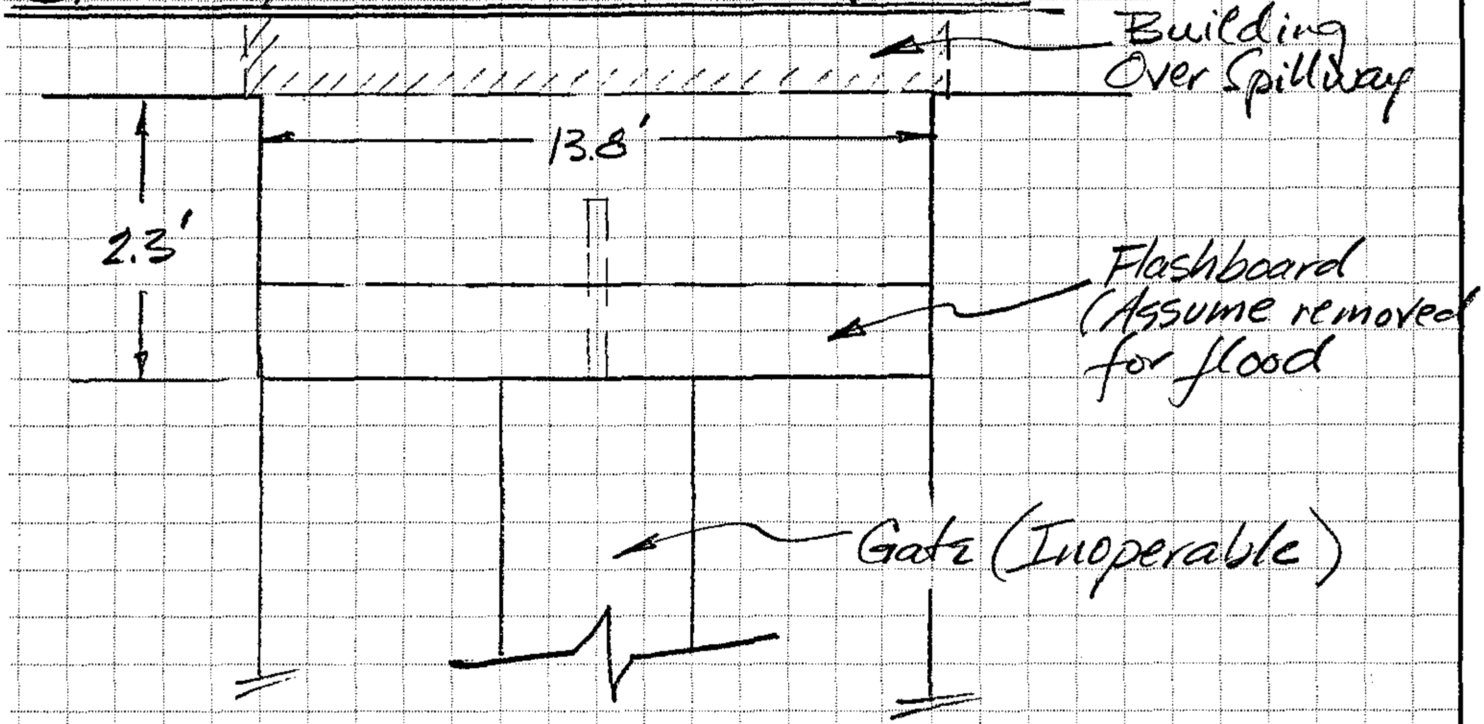
JOB Acme Pond Dam

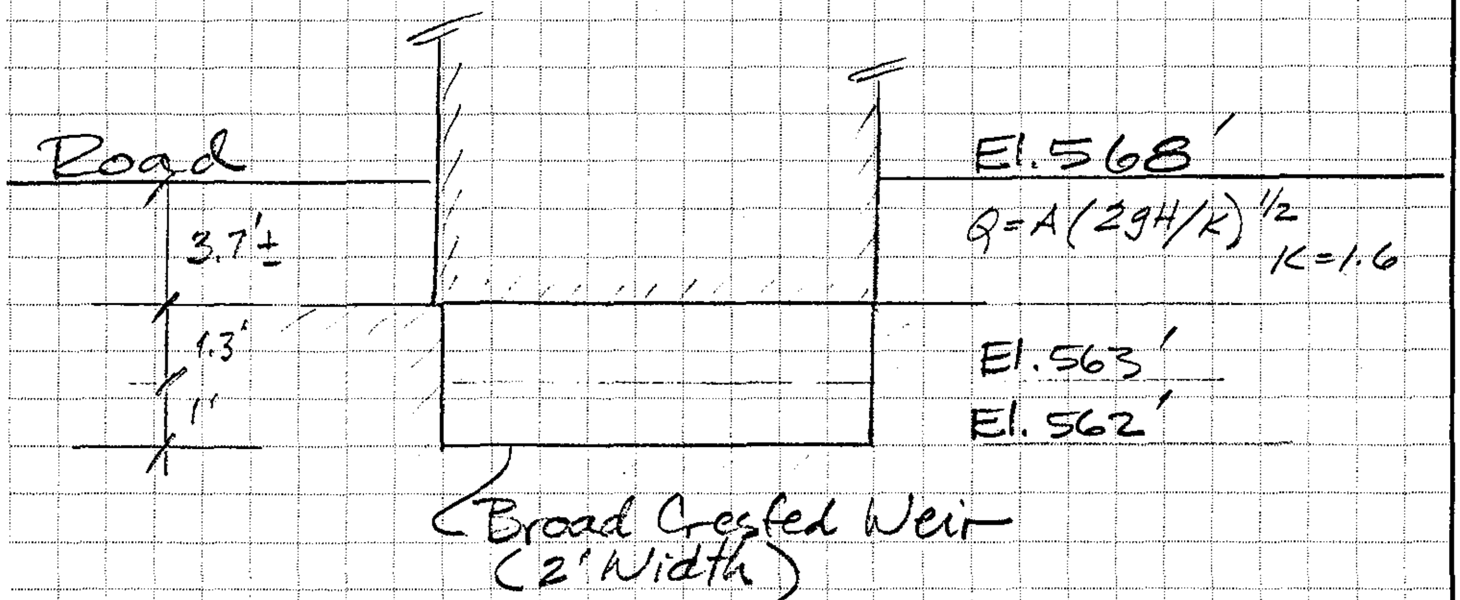
CALCULATED BY KA DATE 11-20-80

CHECKED BY MD DATE 11-25-80

SCALE

Spillway - Middle Reservoir





$Q = A(2gH/K)^{1/2}$ $K = 1.6$

ength of Dam = L = Total - Spillway
= 1000± - 14
L = 986'

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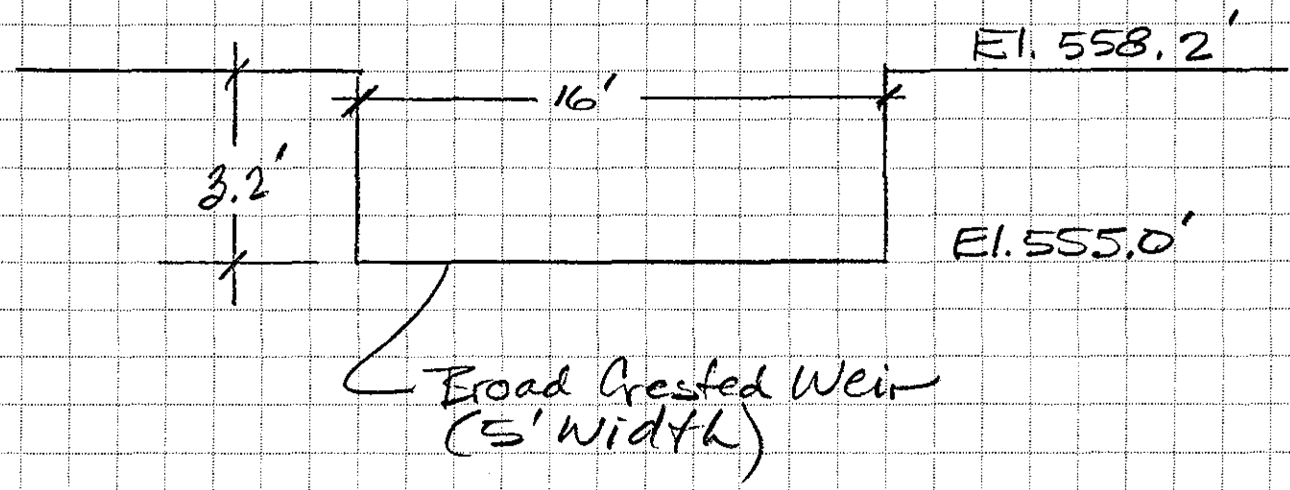
SPILLWAY – ACME POND DAM



MIDDLE RESERVOIR – SPILLWAY CAPACITY *

Elev.	C	L	H	$Q = CLH^{1.5}$ (cfs)
562	2.5	13.8	0	0
563	2.66	"	1	36.7
564	2.85	"	2	111.2
564.3	2.9	"	2.3	139.6
Elev.	**K**	**A**	**H**	$Q = A(2gH/K)^{1/2}$
566	1.6	31.7	1.7	262.2
568	1.6	"	3.7	386.9
570	1.6	"	5.7	480.2

* ASSUME GATE IS CLOSED.

ACME POND – SPILLWAY CAPACITY

Elev.	C	L	H	$Q = CLH^{1.5}$ (cfs)
555.0	2.34	16'	0	0
556.0	2.68	"	1	42.9
557.0	2.65	"	2	119.9
558.0	2.66	"	3	221.2
558.2	2.67	"	3.2	244.5
560.0	2.79	"	5	499.1
562.0	3.0	"	7	889.0
[illegible]	3.?	16	4.1	398.5

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PMP 6-HOUR PRECIPITATION

24.4 INCHES

FROM WEATHER BUREAU
TECH. PAPER NO. 40

ACME POND – WATERSHED AREA

168 grads
170 grads } ⟹ 0.386 S.M.

0.39 S.M.

ACME POND – LAG TIME (SNYDER'S)

$L = 6300\ ft. = 1.19\ MI.$

$L_{CA} = 2600\ ft. = 0.49\ MI.$

$C_t = 2.0$

$t_p = C_t (L L_{CA})^{0.3}$

$= 2.0(1.19 \times 0.49)^{0.3}$

$t_p = 1.70\ HRS.$

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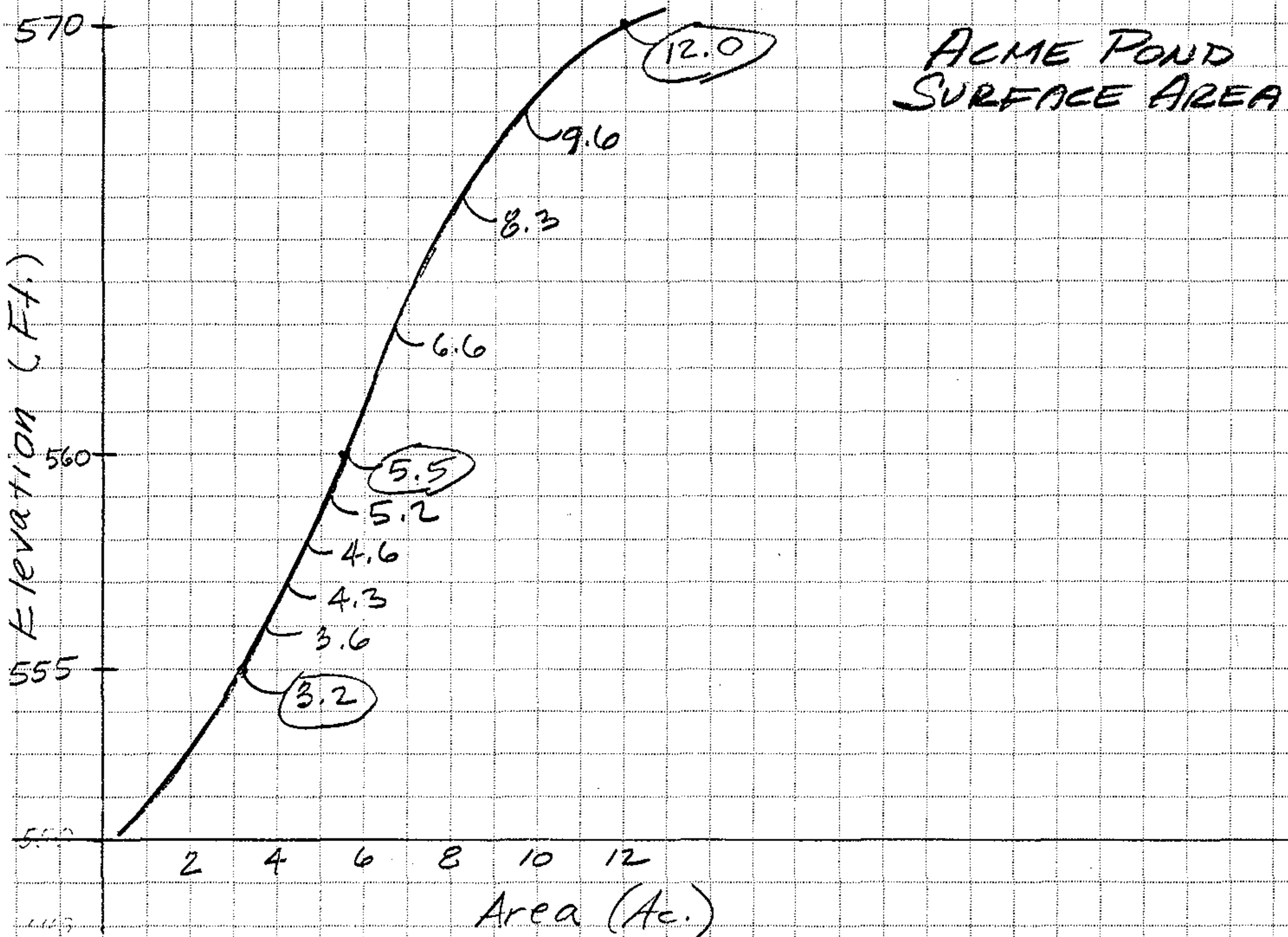
JOB: ACME POND DAM
SHEET NO. 15 OF 15
CALCULATED BY: K. A. DATE: 11-24-80
CHECKED BY: M.D. DATE: 11-25-80
SCALE:



ACME POND DAM: Length = Total − Spillway

$L = 570 - 16$

$L = 554'$

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ACME POND DAM - DAM BREACH

S = STORAGE AT TIME OF FAILURE

= 23 ac. ft.

Q_{p_1} = PEAK FAILURE OUTFLOW

$= 8/27 \, W_b \sqrt{g} \, Y_0^{3/2}$

W_b = BREACH WIDTH; 40% OF DAM LENGTH AT MID HEIGHT

= (0.40)(500) = 200'

Y_0 = TOTAL HEIGHT FROM RIVER BED TO POOL LEVEL AT TIME OF FAILURE

= 10.0 ft.

$Q_{p_1} = 8/27 \, (200)(\sqrt{32.2})(10.0)^{3/2}$

= 10,600 c.f.s.

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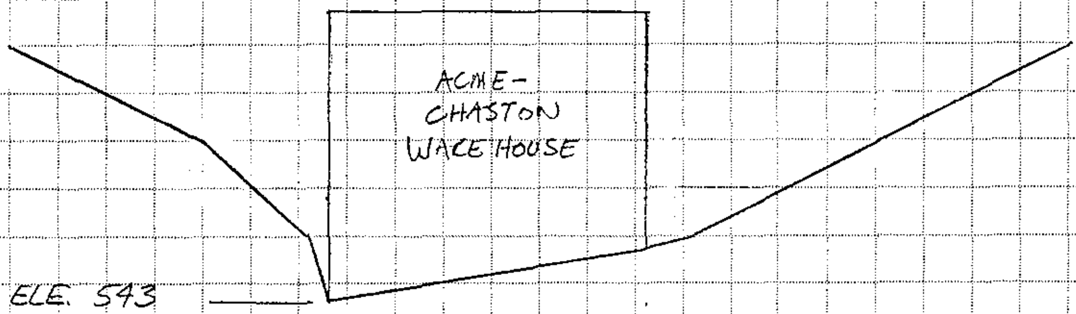
JOB ACME POND X-SECTIONS
SHEET NO. 2 OF 9
CALCULATED BY M.H. DATE 12-31-80
CHECKED BY MR DATE 1/7/81
SCALE

SECTION #1

HOR: 1" = 200'
VERT: 1" = 20'



H	A	WP	R	V	Q
7	108	78	1.4	10.35	1118
9	290	142	2.0	13.13	3808
11	605	213	2.8	16.43	9940
12	858	263	3.3	18.34	15,736
13	1160	340	3.4	18.71	21,704

n = 0.050
S = 0.077
L = 65'

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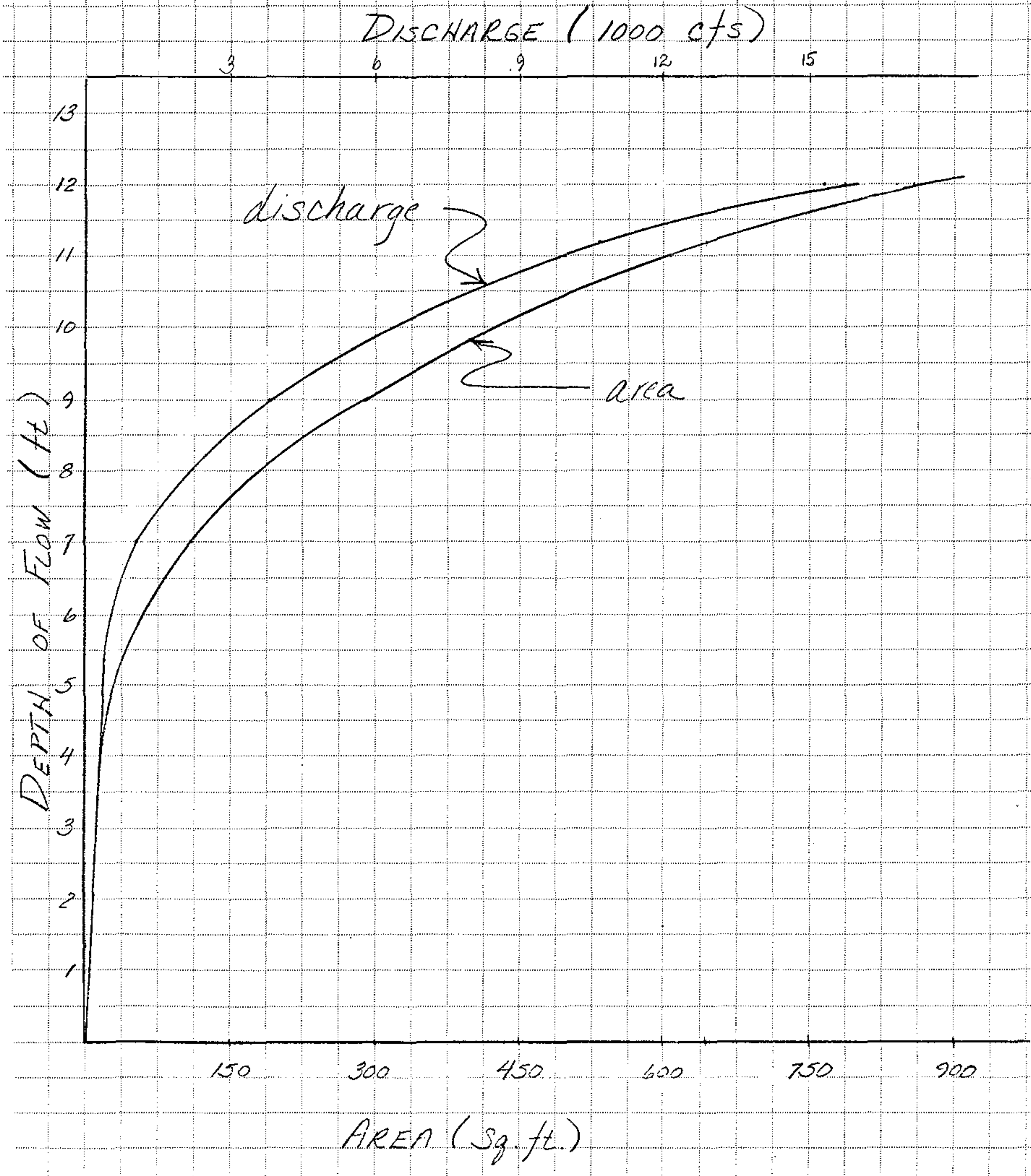
JOB Acme Pond Dam
SHEET NO. 3 OF 9
CALCULATED BY MH DATE 1/6/81
CHECKED BY MR DATE 1/7/81
SCALE

Acme Pond Dam - Section 1



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JOB Acme Pond Dam

CALCULATED BY MCH DATE 1/6/81
CHECKED BY M.R. DATE 1/7/81
SCALE

FLOOD ROUTING SECTION 1

n_1 = MANNING COEFFICIENT = 0.050

S = STORAGE AT TIME OF FAILURE = 23 ac. ft.

L_1 = LENTH OF REACH = 65 ft

Q_{P1} = INFLOW INTO REACH = 10,600 cfs

H_1 = DEPTH OF FLOW = 11.2 ft.

A_1 = CROSS SECTIONAL AREA = 645 sq. ft.

V_1 = STORAGE IN REACH = .96 ac. ft.

Q_{P2} (TRIAL) = TRIAL REACH OUTFLOW = 10,160 c/s.

H_1 (TRIAL) = TRIAL DEPTH OF FLOW = 11.05 ft.

A_1 (TRIAL) = TRIAL CROSS SECTIONAL AREA = 610 sq. ft.

V_1 (TRIAL) = TRIAL STORAGE IN REACH = .91 ac ft.

Q_{P2} = REACH OUTFLOW = 10,200 c/s.

H_2 DEPTH OF FLOW = 11.1 ft.

4-1 Available from NEBS Inc., Groton, Mass 01450

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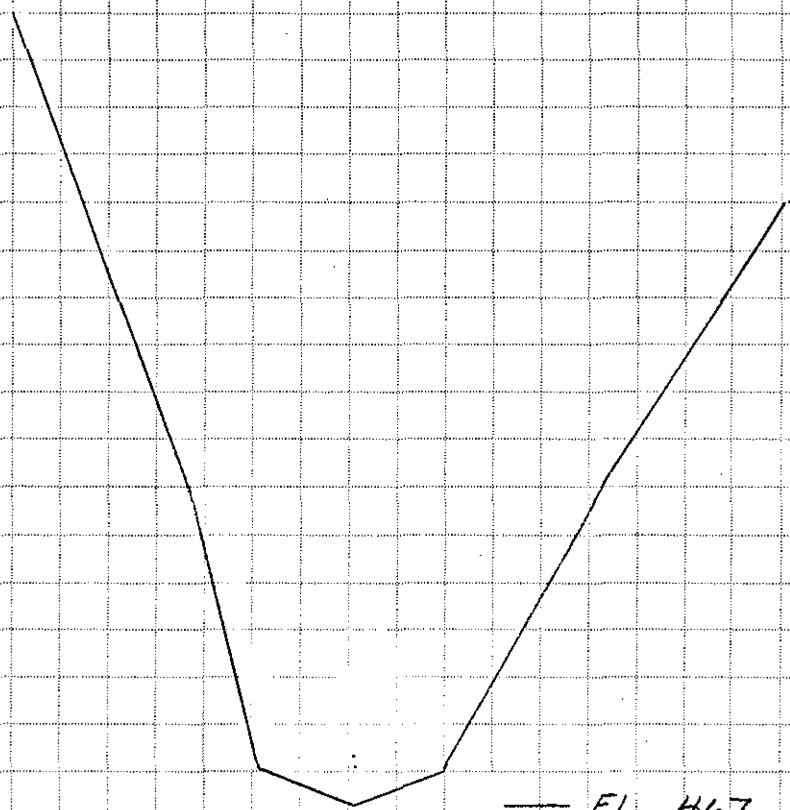
JOB: ACME POND X-SECTION
SHEET NO.: 5 OF 9
CALCULATED BY: G.B. DATE: 1-5-81
CHECKED BY: MR DATE: 1/7/81
SCALE:

SECTION # 2 - ACME POND



HOR. 1" = 200'
VERT 1" = 20'

H	A	WP	R	V	Q
3	270	180	1.5	13.53	3653
4	460	190	2.4	18.51	8515
5	672	200	3.4	23.35	15,691
6	782	210	3.7	24.71	19,323
7	1092	220	4.9	29.80	32,542

n = 0.050
S = 0.12
L = 650'

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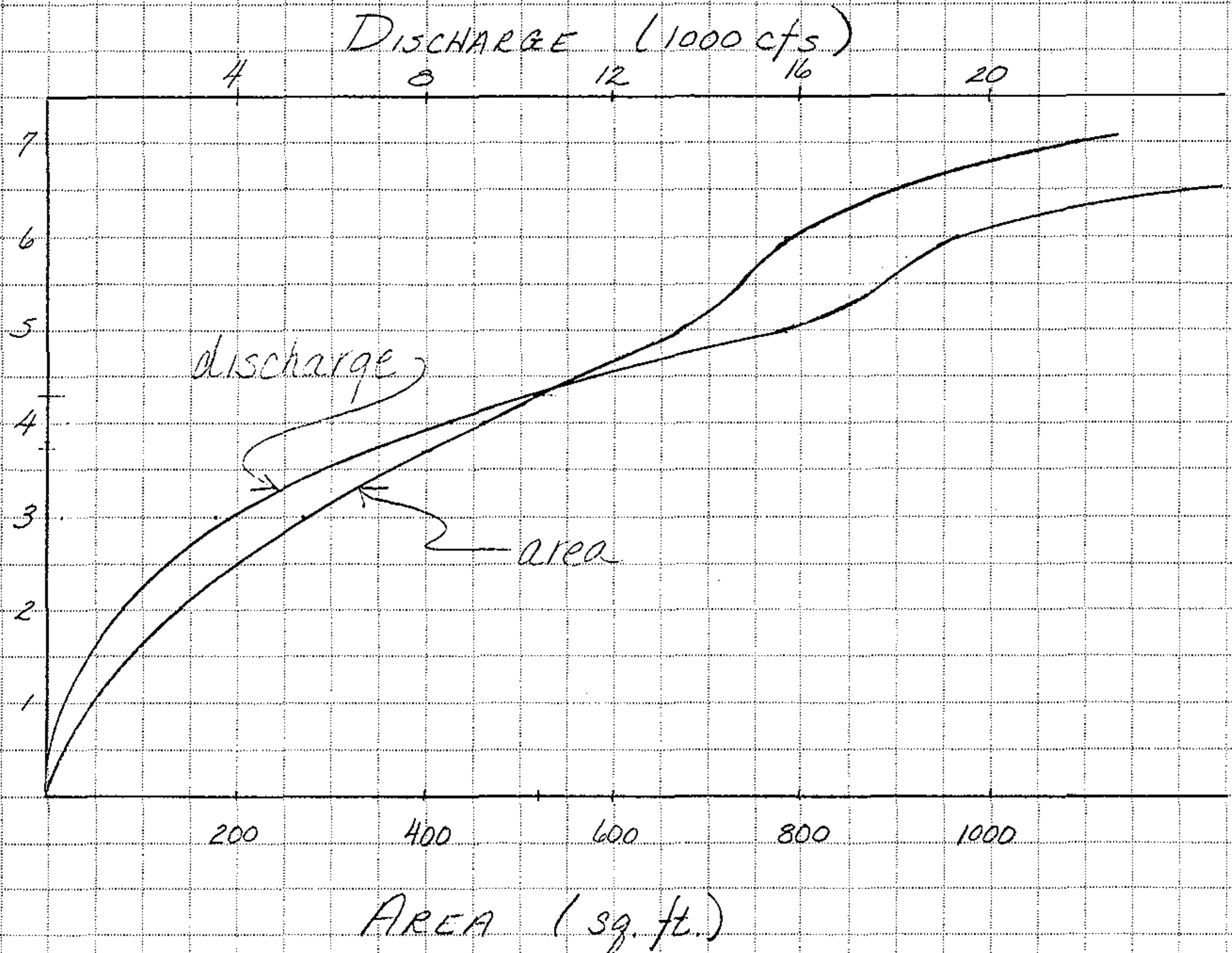
(203) 429-7308

JOB Acme Pond Dam
SHEET NO. 6 OF 9
CALCULATED BY MH DATE 1/6/81
CHECKED BY MR DATE 1/7/81
SCALE

Acme Pond Dam - Section 2



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FLOOD ROUTING SECTION 2

n_2 = MANNING COEFFICIENT = 0.050

S = STORAGE AT TIME OF FAILURE = 23 ac.ft.

L_2 = LENTH OF REACH = 650 ft.

Q_{P2} = INFLOW INTO REACH = 10,200 cfs

H_2 = DEPTH OF FLOW = 4.3 ft.

A_2 = CROSS SECTIONAL AREA = 520 sq.ft.

V_2 = STORAGE IN REACH = 7.8 ac.ft.

Q_{P3} (TRIAL) = TRIAL REACH OUTFLOW = 6,800 cfs.

H_2 (TRIAL) = TRIAL DEPTH OF FLOW = 3.7 ft.

A_2 (TRIAL) = TRIAL CROSS SECTIONAL AREA = 400 sq.ft

V_2 (TRIAL) = TRIAL STORAGE IN REACH = 6.0 ac.ft.

Q_{P3} = REACH OUTFLOW = 7,160 cfs

H_3 DEPTH OF FLOW = 3.8 ft.

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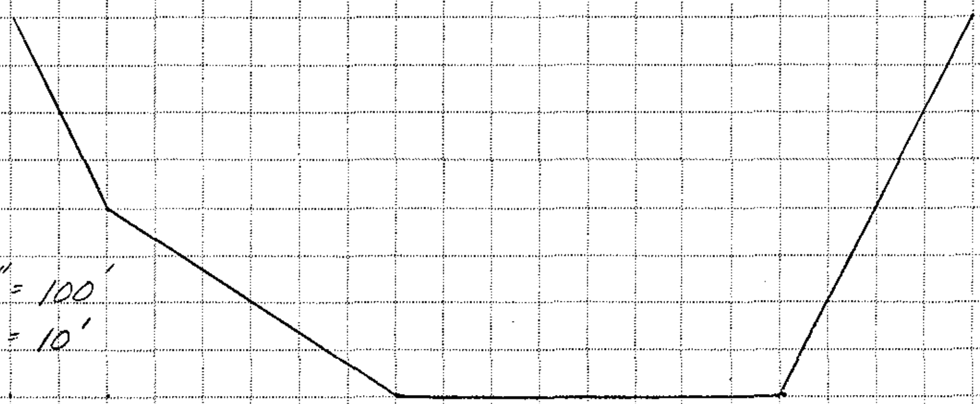
JOB: Acme Pond Dam
SHEET NO. 8 OF 9
CALCULATED BY: McH DATE: 1/6/81
CHECKED BY: MR DATE: 1/7/81
SCALE:

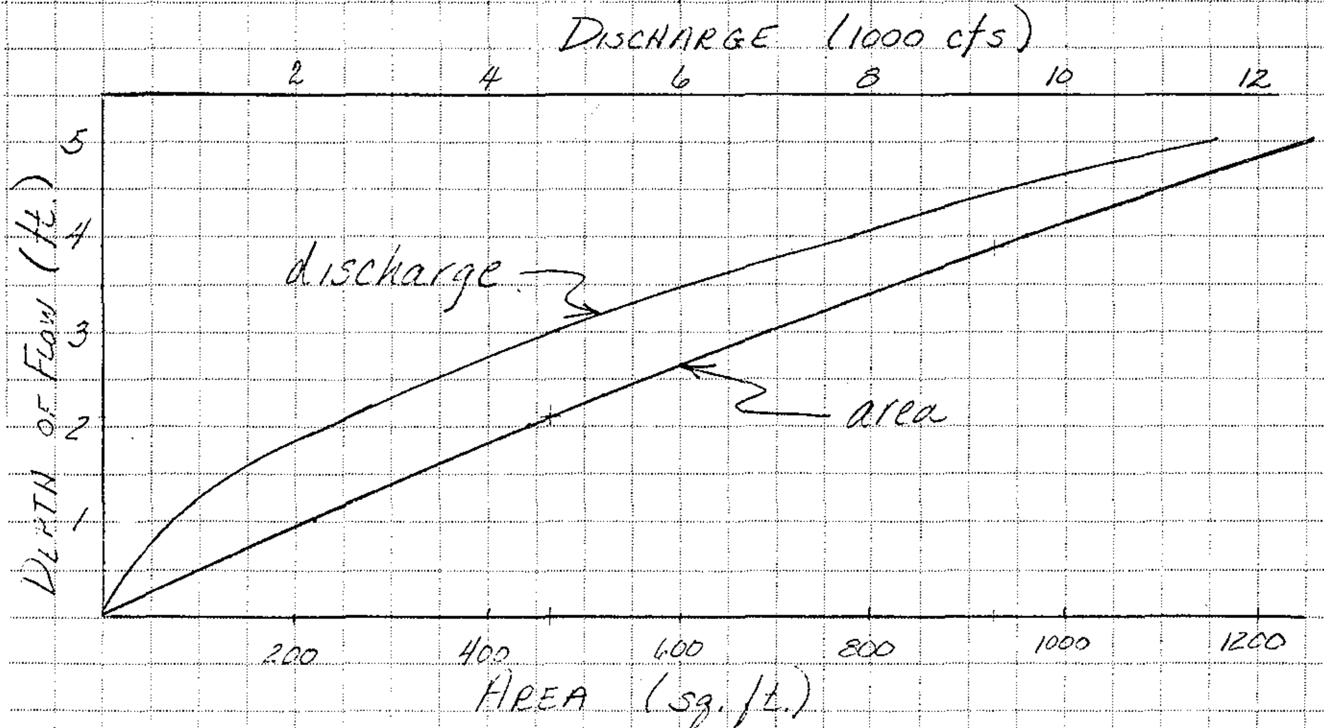
Acme Pond Dam - Section 3

Hor 1" = 100'
Vert 1" = 10'



H	A	WP	R	V	Q
1	210	220	.95	3.4	725
2	440	240	1.83	5.3	2352
3	690	260	2.65	6.8	4726
4	960	280	3.43	8.1	7807
5	1250	301	4.15	9.2	11558

n = 0.05
s = 0.014
L = 700



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FLOOD ROUTING SECTION 3

n_3 = MANNING COEFFICIENT = 0.050

S = STORAGE AT TIME OF FAILURE = 23 ac. ft.

L_3 = LENGTH OF REACH = 700 ft

Q_{P3} = INFLOW INTO REACH = 7160 cfs

H_3 = DEPTH OF FLOW = 3.9 ft

A_3 = CROSS SECTIONAL AREA = 920 sq. ft

V_3 = STORAGE IN REACH = 14.8 ac ft

Q_{P4} (TRIAL) = TRIAL REACH OUTFLOW = 2560 cfs

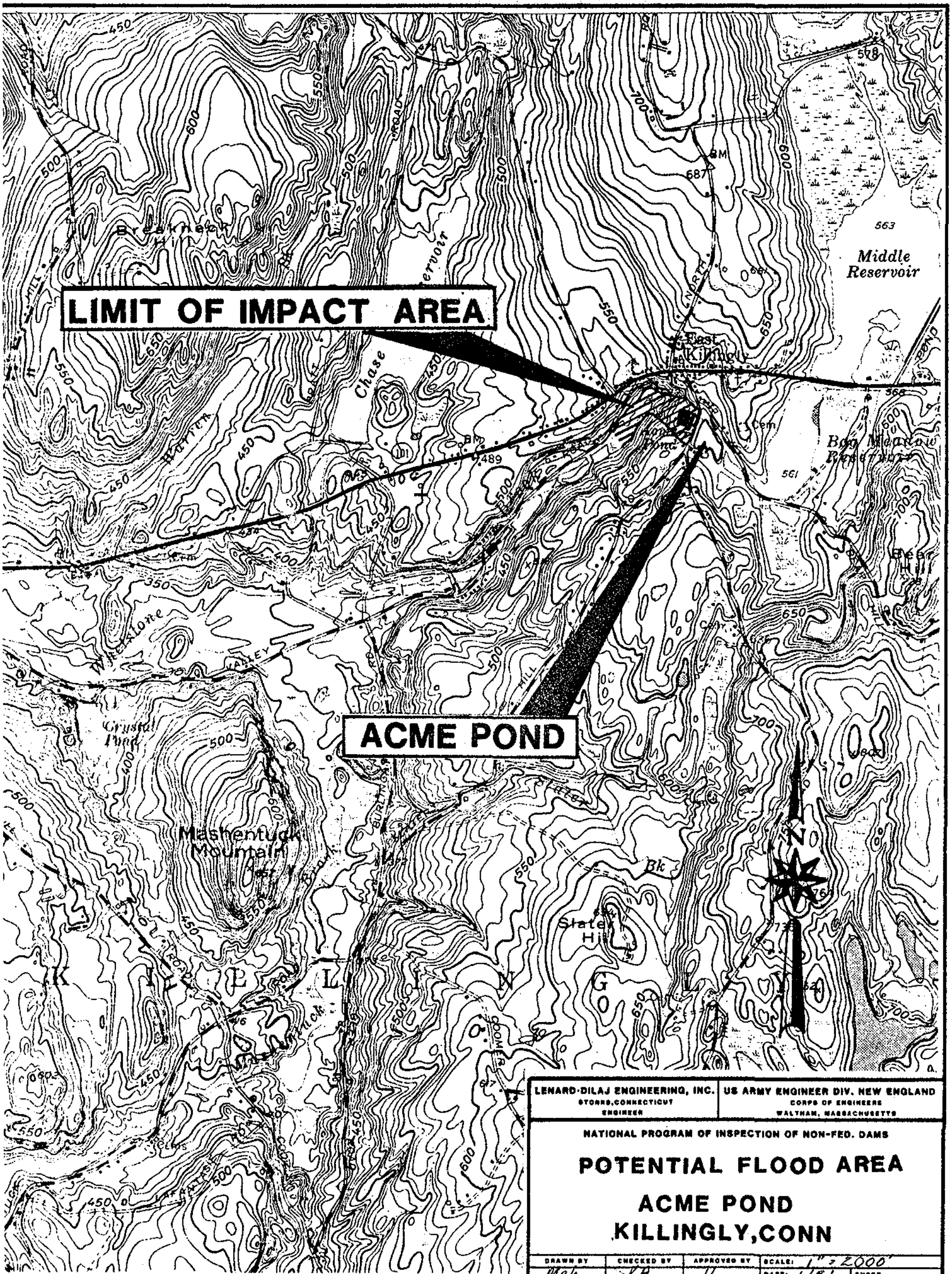
H_3 (TRIAL) = TRIAL DEPTH OF FLOW = 2.1

A_3 (TRIAL) = TRIAL CROSS SECTIONAL AREA = 465 sq ft.

V_3 (TRIAL) = TRIAL STORAGE IN REACH = 7.5 ac ft.

Q_{P4} = REACH OUTFLOW = 3700

H_4 DEPTH OF FLOW = 2.6


LIMIT OF IMPACT AREA
ACME POND
Middle Reservoir
East Killingly
Chase
Mashentuck Mountain
Slater Hill
Crystal Pond
Bear Hill
LENARD-DILAJ ENGINEERING, INC.
STORRS, CONNECTICUT
ENGINEER
US ARMY ENGINEER DIV. NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASSACHUSETTS
NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS
POTENTIAL FLOOD AREA
ACME POND
KILLINGLY, CONN
DRAWN BY
CHECKED BY
APPROVED BY
SCALE: 1" = 2000'
DATE: 1/81
SHEET

APPENDIX E

INFORMATION AS CONTAINED IN THE

NATIONAL INVENTORY OF DAMS

NOT AVAILABLE AT THIS TIME