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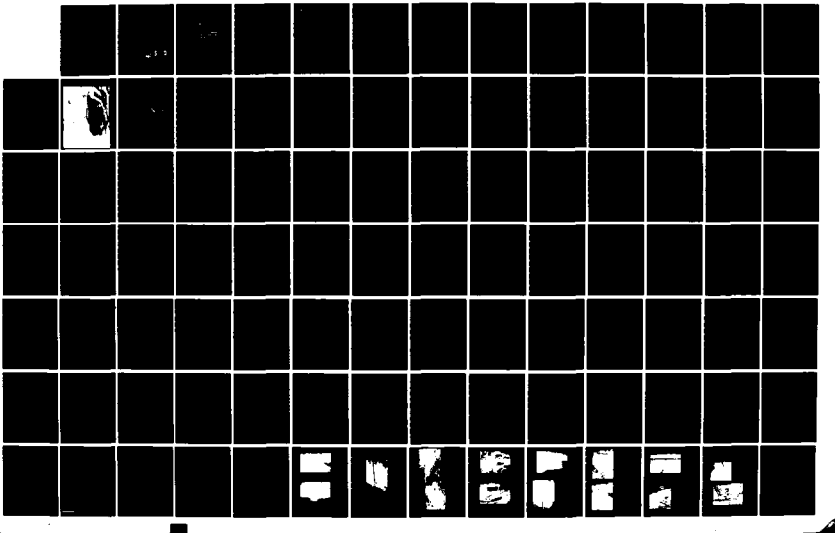

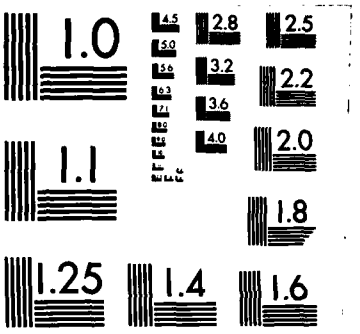

CONNECTICUT RIVER BASIN

SOUTH HADLEY, MASSACHUSETTS

HILLSIDE BEACH
MA 00600

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

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

JUNE 1979

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REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER MA 00600	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) Hillside Beach 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 June 1979 13. NUMBER OF PAGES 53
14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office)		15. SECURITY CLASS. (of this report) UNCLASSIFIED 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

APPROVAL FOR PUBLIC RELEASE: DISTRIBUTION UNLIMITED

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

18. SUPPLEMENTARY NOTES

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

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

DAMS, INSPECTION, DAM SAFETY,

Connecticut River Basin
South Hadley, Massachusetts
Tributary to Buttery Brook

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

THe dam is a 332 ft. long, 21 ft. high, gravity earth embankment structure with a concrete core wall, concrete intake structure and a 10'-10" long, 3 ft. high overflow spillway. It is generally in poor condition. The dam has a size of small and a hazard potential of high. It is recommended that the owner engage a qualified engineer to design repairs for these seriously eroded areas and to improve the spillway capacity.

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

REPLY TO
ATTENTION OF:
NEDED-E

SEP 29 1979

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

Dear Governor King:

Inclosed is a copy of the Hillside Beach Dam Phase I Inspection Report, which was prepared under the National Program for Inspection of Non-Federal Dams. The report is based upon a visual inspection, a review of past performance, and a preliminary hydrological analysis. A brief assessment is included at the beginning of the report.

The visual inspection has revealed that the downstream toe of the earthen embankment portion of the dam adjacent to the spillway has suffered erosion in the past due to spillway discharge. In addition, the preliminary hydrologic analysis has indicated that the spillway capacity for the Hillside Beach Dam would likely be exceeded by floods greater than 14 percent of one-half the Probable Maximum Flood (1/2 PMF), the test flood for spillway adequacy. Our screening criteria specifies that a dam of this class which does not have sufficient spillway capacity to discharge the 1/2 PMF, should be adjudged as having a seriously inadequate spillway. Due to the recurring erosion caused by spillway discharge in conjunction with the serious inadequacy of the spillway, the dam has been assessed as unsafe until the corrective measures as outlined below are completed.

The term "unsafe" applied to a dam because of a spillway deficiency does not indicate the same degree of emergency as that term would if applied because of structural deficiency. It does indicate, however, that a severe storm causing significant spillway discharge could seriously erode the downstream toe and cause possible failure of the dam with significant damage and potential loss of life downstream.

NEDED-E
Honorable Edward J. King

It is recommended that the owner immediately engage the services of a professional consulting engineer to design and implement an immediate solution to prevent erosion from occurring at the downstream toe of the dam due to spillway discharge. The engineer should also determine by more sophisticated methods and procedures the magnitude of the spillway deficiency. Based on this determination, appropriate remedial mitigating measures should be designed and completed within 12 months of this date of notification. In the interim a detailed emergency operation plan and warning system should be promptly developed. During periods of unusually heavy precipitation, round-the-clock surveillance should be provided.

I have approved the report and support the findings and recommendations described in Section 7, with qualifications as noted above. I request that you keep me informed of the actions taken to implement these recommendations since this follow-up is an important part of the non-Federal Dam Inspection Program.

A copy of this report has been forwarded to the Department of Environmental Quality Engineering, the cooperating agency for the Commonwealth of Massachusetts. This report has also been furnished to the owner of the project, Theroux Brothers Realty Trust, South Hadley, Massachusetts 01075.

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

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

Sincerely,

MAX B. SCHEIDER
Colonel, Corps of Engineers
Division Engineer

NATIONAL DAM INSPECTION PROGRAM
PHASE I INSPECTION REPORT
BRIEF ASSESSMENT

Identification Number: MA 00600

Name of Dam: Hillside Beach

Town: South Hadley

County and State: Hampshire County, Massachusetts

Stream: Tributary of Buttery Brook

Date of Inspection: December 4, 1978 and April 12, 1979

The dam is a 332± foot long, 21± foot high, gravity earth e bankment structure with a concrete core wall, concrete intake structure and a 10'-10" long, 3 foot high overflow spillway. The original construction date is unknown. Modifications were made in 1955. The purpose of the dam is for recreation. The dam is owned, operated and maintened by the Theroux Brothers Realty Trust Company of South Hadley, Massachusetts.

The visual inspection indicated the dam to be in generally poor condition. Heavy erosion of the downstream spillway channel and embankment area were observed. Excessive spalling cracking and erosion of the concrete surrounding the outlet pipe from the intake structure were also observed.

The dam has a size classification of small and a hazard classification of high. Based on Corps guidelines, the test flood has a range between a 1/2 and full probable maximum flood (PMF). The test flood used is the 1/2 PMF. This flood would produce an inflow of 1380 cfs. The dam has little stormwater

storage capacity, therefore, the outflow is 1380 cfs. The spillway has a capacity of 190 cfs or 14 percent of the 1380 cfs outflow resulting in the dam being overtopped by about one foot.

There were no indepth engineering data available and therefore, the adequacy of the dam was evaluated based primarily on the visual inspection, past performance history and engineering judgment.

The dam is generally in poor condition. There are areas of severe erosion and the potential for overtopping is high since the spillway has a capacity of only 14 percent of the 1/2 PMF test flood. It is recommended that the owner engage a qualified engineer to design repairs for these seriously eroded areas and to improve the spillway capacity. Remedial measures include removal of trees and brush overhanging the discharge channel and from within the channel and the establishment of a formal warning system. Also around the clock monitoring of the facility should be provided during periods of intense rainfall. These recommendations should be implemented within one year after receipt of this Phase I Inspection Report. In the interim and until repairs to the eroded areas are made and increased spillway capacity provided, it is recommended that the reservoir be drawn down.

Ronald H. Cheney, P.E.
Associate

Hayden, Harding & Buchanan, Inc.
Boston, Massachusetts

Hillside Beach

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

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

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

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

APPROVAL RECOMMENDED:

JOE B. FRYAR
Chief, Engineering Division

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Inspections. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I Investigation: however, the investigation is intended to identify any need for such studies.

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

It is important to note that the condition of a dam depends or numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aide in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

CONTENTS

REPORT

SECTION 3

VISUAL INSPECTION

3.1 Findings

a. General

Hillside Beach Dam was inspected April 12, 1979. Water (1"± deep) was discharging through the spillway. The 36" gate valve was partially open (as a test) and a small volume of water was being discharged. The downstream toe of slope was very wet and soggy. Areas of significant erosion were observed.

The dam had previously been inspected on December 4, 1978. The water level was approximately the same as on April 12, 1979. Several inches of snow cover obscured soils problems.

b. Dam

The dam consists of an earth embankment about 332 feet long with a concrete spillway near the left abutment and outlet works near the right abutment. Design drawings show a concrete core wall extending the length of the dam. The depth of the core wall is not shown on the drawing. The original dam was built in 1900.

Visual inspection of the dam indicated it is in poor condition due to the severe erosion at the spillway area.

primarily on the visual inspection, past performance history, and sound engineering judgement.

c. Validity

The visual inspection of this facility indicates that the external features substantially agree with those shown by the State Inspection Report sketches. There is a substantial disagreement between the existing facility and the proposed 1955 plans. The 1955 plans indicate the spillway to be constructed adjacent and to the left of the intake structure; having a silting basin and a downstream concrete apron.

SECTION 2

ENGINEERING DATA

2.1 Design

No original design data was discovered. Plans prepared by Durkee, White, and Towne, Civil Engineers of Springfield, Massachusetts outlining the 1955 repairs were found at the Hampshire County Commissioners Office.

2.2 Construction

Plans and Specifications for the 1955 repair work designed by Durkee, White, and Towne were obtained. No other construction data was found for this facility.

2.3 Operations

No engineering operational data was found.

2.4 Evaluation

a. Availability

Plans and specifications concerning the 1955 repairs and County Inspection Reports for 1965,1967 and1969 were made available at the Hampshire County Commissioners Office, Northhampton, Massachusetts. State Inspection Reports for 1973,1975 and 1977 were made available at the Department of Environmental Engineering, Division of Waterways Office, Boston, Massachusetts.

b. Adequacy

The lack of indepth engineering data does not allow for a definitive review. Therefore the adequacy of this dam structurally and hydraulically, can not be assessed from the standpoint of review of design calculations, but must be based

h. Diversion and Regulating Tunnel----------none

i. Spillway

(1) Type----------broad crested, concrete

(2) Length of weir----------10.85'

(3) Crest elevation----------134.5±

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

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

(6) D/S Channel concrete channel 3'high x 10.85'long

(7) General----provision for stop logs at upstream end

j. Regulating Outlets

The regulating outlets for this dam consist of a screened, 7.5' x 3', concrete drop inlet, a 36" diameter draw down pipe, a 48" diameter metal outlet pipe, and a 10'-10" x 3' concrete chute spillway. An old 2' x 3' intake exists just below the 7.5' x 3' inlet, at elevation 131±. This inlet was blocked off and does not appear to be functioning.

The 7.5' x 3' inlet has an invert elevation of 135. Water drops 14± feetto discharge into the 48" diameter outlet pipe. The 36" draw down pipe, located at the base of the drop inlet structure, is controlled by a 36" gate valve, and also discharges into the 48" outlet pipe. The control for the 36" gate valve is kept at an on-site storage building. Flow through the chute spillway and drop inlet can be varied by placing a 6" stop log across the spillway, raising the upstream water level to elevation 135, the invert elevation of the drop inlet.

e. Storage (acre feet)

(1) Recreation pool----------12±

(2) Spillway crest pool----------12±

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

(4) Top of dam----------21±

(5) Test flood pool----------24±

f. Reservoir Surface (acres)

(1) Recreation pool----------2.8±

(2) Spillway crest----------2.8±

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

(4) Top dam---------- 3.0±

(5) Test flood pool----------3.1±

g. Dam

(1) Type----------earth embankment, gravity

(2) Length----------332'±

(3) Height----------21'±

(4) Top Width----------18'±

(5) Side Slopes----------1½:1 Upstream and Downstream

(6) Zoning----------unknown

(7) Impervious Core----------concrete wall

(8) Cutoff----------unknown

(9) Grout curtain----------unknown

A 10'-10"x3' concrete chute spillway (photographs 4 & 11), is located at the left abutment of the dam. The spillway invert is approximately elevation 134.5±. It has provisions for one 6 inch stop log. The spillway has a maximum capacity of about 190 cfs, before water will begin to overtop the dam.

There are no known records of maximum impoundment or discharges at this site. Erosion of the spillway area indicates that its capacity may have been overtaxed in the past. Plans dated 1955 indicate overtopping occurred near the drop inlet structure.

The ½ PMF test flood will produce an inflow of 1380 cfs. The dam has very little storage capacity. Thus the outflow is 1380 cfs at elevation 139±.

c. Elevation (ft. above MSL)

(1) Streambed at centerline of dam ---------117±

(2) Maximum tailwater ---------- 126 ±

(3) Upstream portal drop invert----------135

(4) Recreation pool ----------134.5±

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

(6) Spillway crest----(ungated)----------134.5±

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

(8) Top Dam----------138

(9) Test flood design surcharge----------139 ±

d. Reservoir

(1) Length of maximum pool----------750'

(2) Length of recreation pool----------600'

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

i. Normal Operational Procedures

Apparently, there is no formal oeprational procedure for this dam. The caretaker reported that he lowers the water level twice a year to check the condition of the outlets. The 2' X 3' inlet is sealed. However, some leakage through this inlet was observed. The type of seal is unknown.

1.3 Pertinent Data

a. Drainage Area

The drainage area (588 acres - 0.92 square miles) is comprised of flat to rolling terrain. It is wood covered and sparsely developed in the eastern portions, and moderately to heavily developed in its west and southern portions. The main drainage path is a tributary to Buttery Brook.

Moderate residential and urban development, including an apartment complex, has occurred in the immediate vicinity of the dam site. Below the dam is the intersection of U.S. Route 202 and State Route 116. Near Route 116 industrial development has occurred along the outlet stream. Beyond this area is the central area of South Hadley Falls.

b. Discharge at Dam Site

This dam has a screened 7.5' x 3' concrete drop inlet structure with an inlet elevation of 135±. This inlet drops 21± feet to a 48" diameter metal outlet pipe. At the base of the concrete drop inlet, there is a 36" diameter pipe with an intake invert at elevation 126±'. The 48" diameter outlet pipe extends from the drop inlet structure to a point about 20' downstream of the dam crest Intake is controlled by a manually operated 36" diameter gate valve.

commercial) would be damaged by flood water.

e. Ownership

The dam is presently owned by the Theroux Brothers Realty Trust. The dam has been owned by the Theroux Family since at least 1955.

f. Operator

The dam is maintained by the Theroux Brothers Realty Trust, South Hadley, Massachusetts. Mr. Andre P. Theroux is the designated caretaker of the dam. The mailing address is Office #36, 30 Roosevelt Avenue, South Hadley, Massachusetts, 01075. (Telephone 413-534-7827)

g. Purpose of Dam

The purpose of this dam is for recreation. During the late 1960's the bathing house facilities at the site were dismantled.

h. Design and Construction History

No records were located indicating when the original dam was built. Design plans and specifications prepared by Durkee, White & Towne, Civil Engineers, Springfield, Massachusetts, for the replacement of a portion of the earth embankment and construction of concrete spillway in 1955 were found. Apparently, these plans were not exactly followed in the course of the construction work, and the new concrete spillway wasn't built according to these plans.

According to the State and County Inspection Reports, various minor repairs were made to the dam between 1970 and 1977.

grill weir inlet. The invert of this inlet is about 3' below the top of the dam. An approximate 2' wide by 3' high inlet is located within the intake structure with an invert approximately 6'-8" below the crest of the dam. No controls were observed for this inlet. It is sealed on the upstream face, although some leakage was observed. There is also a gated 36" diameter draw down pipe, located at the base of the drop inlet structure and extending into the upstream reservoir. The operating control for the gate is kept at an on-site storage building. The draw down exit pipe (Photograph 13) is a 48" diameter metal pipe exiting approximately 20 feet downstream of the dam crest. A 10'-10" long by 3' high concrete chute spillway is located at the left end of the dam. There is a grooved slot at the spillway to allow for a six inch stop log. The drawing in Appendix "B" of this report shows the layout and appurtenant structures of this dam.

c. Size Classification

The dam is classified as small based on its maximum hydraulic height of 21 feet and storage capacity of about 21 acre feet.

d. Hazard Classification

This dam has a high hazard potential classification due to the degree of urban development located downstream of this site and the high potential for loss of life. Flood stage would rise quickly, reaching depths of 2 to 13 feet in the downstream areas. At least 40 structures (homes, factories,

b. Purpose

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

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

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

1.2 Description of Project

a. Location

The dam, Hillside Beach, is located in the Town of South Hadley, in Hampshire County, Massachusetts. The dam is on a tributary stream to Buttery Brook near South Hadley Falls just southeast of the intersections of U.S. Route 202 and State Route 116. Hillside Beach is shown on the Springfield North, Massachusetts Quadrangle with the approximate coordinates of north 42° 13' 12", west 72° 35' 9".

b. Description of Dam and Appurtenances

Hillside Beach is a gravity, earth embankment structure with a concrete intake structure and an overflow spillway (see photograph 1). The dam has an overall length of about 332 feet, a maximum embankment height of approximately 21 feet, a crest width of 18' and sideslopes of 1.5H:1V on its upstream and downstream faces. It has a concrete wall for an impervious core. A drop inlet structure (photograph 2) located near the right abutment area contains a screened 7½'x3'

PHASE I
NATIONAL DAM INSPECTION PROGRAM

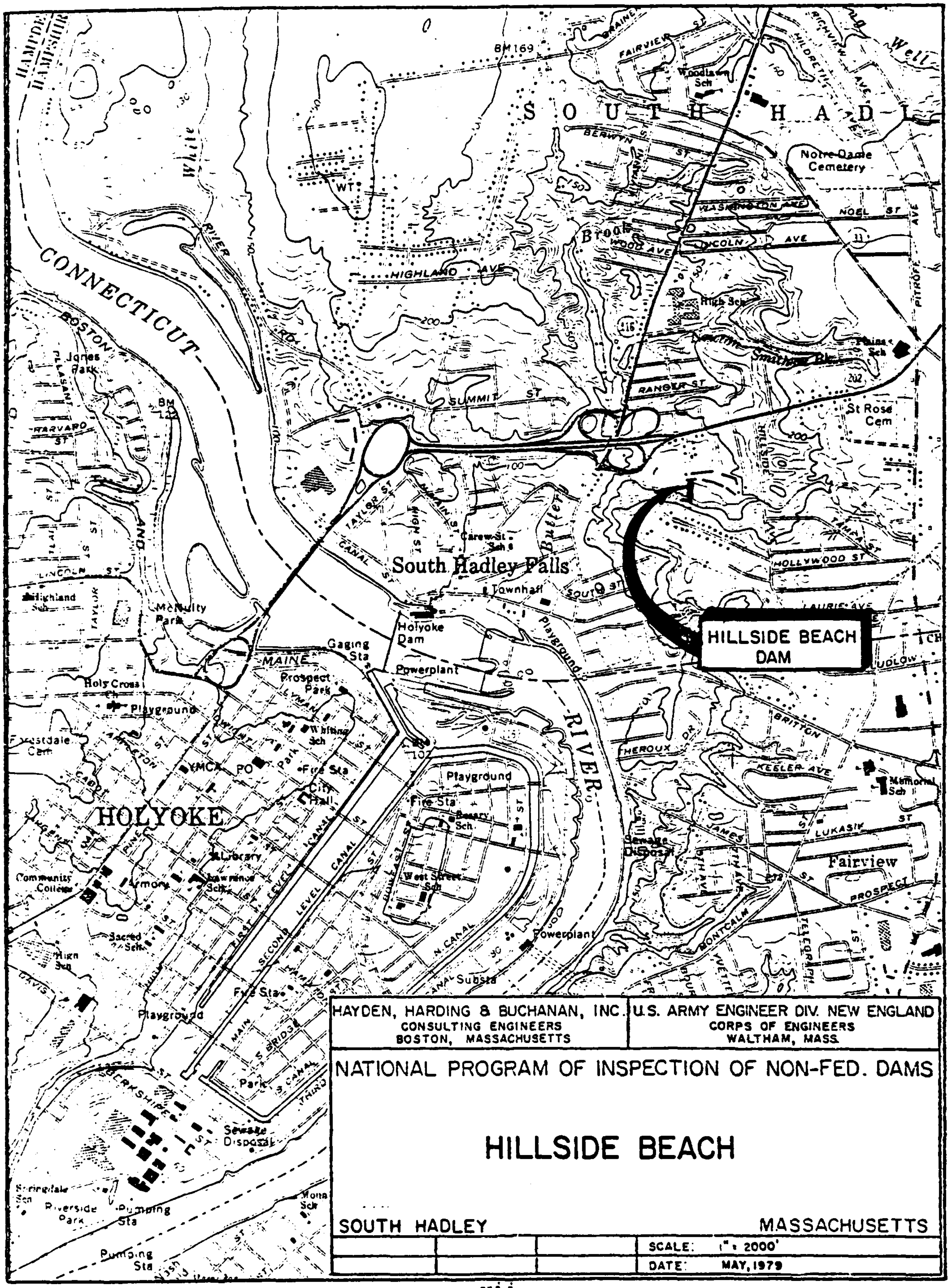
NAME OF DAM: HILLSIDE BEACH

SECTION 1
PROJECT INFORMATION

1.1 General

a. Authority

Public Law 92-367, August 8, 1972, authorized the Secretary of the Army, through the Corps of Engineers, to initiate a national program of dam inspection throughout the United States. The New England Division of the Corps of Engineers has been assigned the responsibility of supervising the inspection of dams within the New England Region. Hayden, Harding & Buchanan, Inc. has been retained by the New England Division to inspect and report on selected dams in the State of Massachusetts. Authorization and notice to proceed was issued Hayden, Harding & Buchanan, Inc. under a letter of 28 November 1978 from Max B. Scheider, Colonel, Corps of Engineers. Contract No. DACW 33-79-C-0012 has been assigned by the Corps of Engineers for this work.


HILLSIDE BEACH DAM
CONNECTICUT
RIVER
South Hadley Falls
HOLYOKE
Holyoke Dam
Gaging Sta
Powerplant
Notre Dame Cemetery
St Rose Cem
Fairview
HAYDEN, HARDING & BUCHANAN, INC.
CONSULTING ENGINEERS
BOSTON, MASSACHUSETTS
U.S. ARMY ENGINEER DIV. NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.
NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS
HILLSIDE BEACH
SOUTH HADLEY
MASSACHUSETTS
SCALE: 1" = 2000'
DATE: MAY, 1979

Upstream Slope

The top 3 feet of the upstream slope was above the reservoir level and available for inspection. Sketches of the dam in past inspection reports indicate the upstream slope to be 1.5H:1V. The visible portion of the slope was sloughing into the reservoir for most of its length, as shown in photograph 10. Erosion of several areas of the slope have caused localized undermining of the crest. The visible portion of the upstream slope was grass covered with patches of bare soil in several locations. No riprap was observed on the upstream slope. Below water level, the upstream slope appeared to be covered with silt.

Crest

The crest of the dam, which is about 18 feet wide is covered with sparse grass and has apparently been used as a footpath, photograph 1. No evidence of cracking or misalignment of the crest that could be attributed to embankment movement was observed. The crest appeared level.

Downstream Slope

The downstream slope is generally covered with sparse grass and inclines at varying angles, as shown in photograph 6. The downstream slope is very steep above the concrete headwall near the right abutment, as shown in photograph 14.

The portion of the embankment immediately downstream of the spillway discharge channel has been eroded as shown in photograph 6. This condition is discussed in more detail in

Section 3.1.c.

The discharge from the spillway has also eroded a portion of the downstream toe as shown in photograph 12. This eroded area was wet; however, it could not be determined if the wetness was due to seepage through the dam or water flowing in the spillway discharge channel or a combination of both.

The grassed area downstream of the toe near the center of the dam was soft, as judged by walking in the area. Snow had recently melted in this area and appears to have been the cause of this soft area.

c. Appurtenant Structures

Appurtenant structures include a drop inlet structure, a 48" diameter outlet pipe and a concrete spillway. section.

The drop inlet appeared to be in good structural condition. A metal grill covering the 7.5' x 3' inlet could reduce the inlet capacity due to its potential for blockage by debris. Water was observed leaking into the riser section of the structure at a 2' x 3' inlet (sealed off) just below the 7.5' x 3' inlet. The 36" gate valve for the main drain was functioning.

A 48" diameter pipe from the drop inlet structure, exits the downstream slope near the right abutment and is supported by a concrete headwall at its downstream end, photographs 13 and 14. The concrete headwall has several cracks and is spalling in several locations, including

around the periphery of the pipe. The headwall cuts into the downstream slope of the dam embankment, providing an area for slope erosion as shown in Photograph 14. A smaller corrugated metal pipe was discharging water into the outlet channel at the time of inspection. This pipe runs parallel to and downstream of the dam embankment. It is apparently a drain line serving the adjacent appartment complex area. The outlet discharge channel was lined with trees and brush and small amounts of dumped fill consisting mainly of bricks was observed on the channel sides and bottom. The 48" diameter pipe had a pool of water about two feet deep at the outlet, which could effect the stability of the soil embankment in this area.

The spillway consists of a concrete chute near the left abutment, as shown in Photograph 1. The spillway was not part of the original dam. A drawing, dated December 19, 1955, shows the proposed design of a spillway next to the location of the existing drop inlet. However, the chute spillway was not built according to the 1955 plans.

The condition of the dam adjacent to and downstream of the spillway is poor, Photographs 4 and 6. Erosion of the embankment and abutment has occurred during high water flows over the spillway. The discharge channel floor, embankment, and abutment are covered with a dumped fill consisting mainly of bricks and saw cut wood.

A small hole was dug in the embankment about eight feet to the right of the right spillway wall to get an indication of the depth of dumped fill in the area. The location of the hole is shown in Photograph 4 (Left of Photo) and a close-

up view of the hole is shown in photograph 3. Bricks were observed to the bottom of the hole which was about 1.5 feet deep. The actual depth of fill is unknown.

Erosion along the left bank of the downstream channel immediately below the spillway, is shown in Photograph 5. Undermining of the left bank has occurred. Erosion of the embankment immediately downstream of the discharge channel is shown in Photos 4 and 6. The erosion of the embankment follows the course of the spillway discharge channel. The discharge channel curves to the right and flows adjacent to the embankment toe befcre it curves to the left and flows away from the dam. Erosion of the toe of the dam, photograph 12, was discussed in Section 3.1.b. Numerous voids were discovered in the embankment to the right of the spillway. A close-up view of one void is shown in photograph 8. A stick could easily be pushed 20 inches into the void. Water could be seen at the bottom of the void which was above the nearby stream level.

Erosion of soil adjacent to the left wall of the spillway is shown in photographs 4 and 9. Slumping of soil adjacent to this wall has occurred and a stick could be pushed 2 feet into the soil adjacent to the wall.

Past inspection reports indicate that erosion near the the spillway has been a long-standing problem. Below is a summary of selected spillway problems noted in past inspections:

1965: "...embankment repairs are needed adjacent to the side walls of the spillway structure."

1967: "Heavy stone fill is needed at the end of the spillway chute to prevent any further undermining of the soil in this general area."

1969: Recommended spillway be cleaned of debris and lumber, fill be placed behind left side wall of spillway, and riprap be added at end of spillway chute to prevent further erosion.

June 19, 1973:

Cavity noted under concrete floor of spillway. Grouted riprap at end of spillway chute broken up. "Wash into toe of embankment" to right of spillway.

June 18, 1975:

Repairs were made to cavity and to erosion of toe mentioned in 1973 report. Noted additional erosion next to both spillway walls.

March 29, 1977:

Minor erosion along chute sidewalls, extensive erosion of embankment on northerly side of chute covered with dumped brick, cavities in embankment near chute.

d. Reservoir Area

The area around the reservoir contains an apartment development along the north side and wooded, undeveloped land along the remaining sides. A detailed description of the

drainage area is contained in Section 1.3.b of this report.

e. Downstream Channel

The channel downstream of the spillway chute is shown in photograph 5. Several small tree-covered islands are in the channel. Numerous trees line the left bank of the channel and some of these trees have fallen into the channel as a result of erosion of the bank.

3.2 Evaluation

Visual examination indicates the dam is in poor condition with respect to the geotechnical aspects due to erosion at the spillway area.

Severe erosion of the embankment, in the immediate vicinity of the spillway discharge channel, has occurred. This erosion continues to the toe of the dam. This eroded area is covered with a loose dumped fill containing bricks and has numerous voids. Seepage from this eroded area was observed.

Erosion of soil adjacent to both walls of the spillway chute has occurred.

Severe erosion and undermining of the left bank immediately downstream of the spillway discharge channel has occurred.

Sloughing of at least the upper 3 feet of upstream slope along the length of the dam at its crest has occurred.

Erosion of the steep slope above the concrete headwall supporting the 48" outlet pipe from the drop inlet has occurred. Spalling and cracking of the concrete headwall was observed.

SECTION 4

OPERATIONAL PROCEDURES

4.1 Procdeures

There is no formal operational procedure for this dam. The caretaker indicated that he removes debris accumulated at outflow openings frequently, and lowers the water level to check the inlets two times annually. The spillway has provisions for raising the upstream water level with a 6" stop log.

4.2 Maintenance of Dam

The dam is maintained by Andre P. Theroux of Theroux Brothers Realty Trust. He reported that he makes frequent inspections of the dam, reviews State Inspection Reports, and is responsible for instituting necessary maintenance and repairs.

4.3 Maintenance of Operation Facilities

The owner reports that the outlet controls are used to lower the reservoir two times a year to check their operational status. A State Inspection Report noted that repairs were made to the concrete drop inlet and gate structure in 1971.

4.4 Description of Warning Systems

There are no warning systems associated with this dam.

4.5 Evaluation

The outlet facilities for this dam appear to be unable

to adequately pass high flows. As a result, the spillway and embankment require fairly periodic maintenance repairs. The dam should be inspected yearly by a qualified engineer who can identify any areas of concern which could in time lead to serious deficiencies.

SECTION 5

HYDRAULIC/HYDROLOGIC

5.1 Evaluation of Features

a. General

The Hillside Beach dam is an earth embankment gravity type structure with a concrete core wall. The pond behind the dam normally has little additional storage potential and siltation may have significantly reduced its volume. Due to the amount of the erosion observed around the spillway area, it is apparent that the spillway and drop inlet are not adequate to pass high flows. See photographs 1,4,5,6 and 11.

b. Design Data

No hydraulic computations for this dam were available.

c. Experience Data

Information on maximum impoundments and discharges has not been found for this dam. Overtopping near the drop inlet structure was noted on 1955 plans.

d. Visual Observations

Visual observations of the drainage area and general vicinity of the dam show them to be in general agreement with the U.S.G.S. map of the area. A description of the drainage area is given in Section 1.3 of this report.

About 2000 feet upstream was the site of Buttery Brook Reservoir. Recently, the reservoir was drained and the dam removed. It intercepted runoff from about 363 acres, about 60 percent Hillside Beach Dam's present 588 (0.92 s.m.) direct runoff drainage area.

e. Test Flood Analysis

This dam carries a small classification (21' height, 21 a-f storage capacity) for size and a high hazard potential due to the urban development just downstream of the dam and a high potential for loss of life. Based on Corps guidelines, the test flood range is 1/2 to full PMF. The test flood used is the 1/2 PMF. This test flood was computed by determining the watershed drainage area from the U.S.G.S. maps and using the Crops guide curves. A 1/2 PMF inflow of 1380 cfs was developed. The resulting overflow, due to the lack of storm water storage is 1380 cfs. This discharge would overtop the dam by about one foot, to elevation 139±. The spillway discharge is 190 cfs, or about 14 percent of the test flood outflow.

The 7.5' X 3' drop inlet is covered by a steel grill having 1" openings. Its capacity is about 95 cfs. Due to its potential for blockage, it was not considered as an outlet for test flood analysis.

f. Dam Failure Analysis

A number of roadway structures, commercial buildings and residences are located along this stream and Buttery Brook below the dam. Using the Corps guidelines, it was determined

that failure of the dam would result in an outflow of 7550 cfs. Downstream flooding would occur. A portion of the Route 202-116 interchange would be flooded by about 2.5 feet of water. Below this point, where the tributary joins Buttery Brook, several homes, commercial buildings and portions of Route 116 and Gaylord Road would be inundated by approximately one and a half feet. Four to five industrial buildings located downstream of Gaylord Road would undergo severe flooding. Here the stream channel is very narrow and there is significant industrial development. Just below Gaylord Road the ground elevation drops quickly resulting in a low area. Flood stage here could reach 13 feet. As the flooding passed through South Hadley Falls, at least six homes, 20 to 25 commercial buildings, and portions of Main and School Streets, would receive flood stage depths of three to six feet.

Just prior to dam failure, the outflow through the spillway and drop inlet would be 295 cfs. This discharge is not significant when compared to the failure outflow of 7550 cfs. This 295 cfs baseflow has no noticeable affect on the dam failure outflow flood stages.

SECTION 6

STRUCTURAL STABILITY

6.1 Evaluation of Structural Stability

a. Visual Examination

The visual examination did not disclose any immediate stability problems. However, the visual examination disclosed the following problems which, if allowed to continue, could lead to instability of the dam:

1. Severe erosion of the embankment and toe downstream and to the right of the spillway chute.
2. Severe erosion of the left abutment downstream of the spillway chute.
3. Erosion of soils adjacent to the spillway chute walls
4. Erosion channels on the downstream slope caused by water runoff
5. Sloughing of the upstream slope
6. Deterioration of the concrete headwall supporting the outlet pipe
7. Erosion of soil above the concrete headwall.

b. Design and Construction Data

Limited information on the design of the dam can be obtained from a drawing dated December 29, 1955, which shows a proposed design for the spillway (the spillway was not built according to the 1955 plans). The 1955 drawing shows a concrete core wall located at the approximate intersection of the crest and upstream slope. The composition of other parts of

the earth embankment were not included in the 1955 drawing.

c. Operating Records

Correspondence and design drawings do not indicate that the dam has ever been overtopped. However, on the 1955 design drawing the following note appears for the section of dam about 50 feet on both sides of the outlet pipe: "Overtopping in this area only." This note implies that overtopping may have occurred prior to 1955.

d. Post-Construction Changes

Post-construction changes include the construction of a a spillway at the left side of the dam and subsequent minor repairs to the drop inlet and dam at the spillway area. The construction date of the spillway is not known but is probably shortly after 1955.

e. Seismic Stability

The dam is located in Seismic Zone 2 and in accordance with the recommended Phase I guidelines does not warrant seismic analysis.

SECTION 7

ASSESSMENT, RECOMMENDATIONS, AND REMEDIAL MEASURES

7.1 Dam Assessment

a. Condition

The visual examination indicates that the dam is in fair condition with the exception of that portion of the dam in the spillway area which is in poor condition.

b. Adequacy of Information

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

c. Urgency

The recommendations and remedial measures should be implemented within one year after receipt of the report by the owner.

d. Need for Additional Investigation

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

7.2 Recommendations

The findings of the visual inspection indicate that the owner should engage a qualified engineer to design appropriate corrective measures to: 1) repair the eroded embankment adjacent to the spillway discharge channel, 2) repair the eroded downstream toe of the dam at the left end, 3) repair the eroded left bank area downstream of the spillway, 4) repair the eroded upstream slope and,5) prevent future erosion of the areas described in 1 through

LIST OF ENGINEERING DATA

1. Construction Plans dated 1955
2. Inspection Reports dated 1965,1967 and 1969
3. Inspection Reports dated 1973, 1975 and 1977

These items can be located at:

Item 1 and 2 Hampshire County Commisssioners Office, Northampton, Massachusetts

Item 3 Department of Environmental Engineering, Division of Waterways Office, Boston, Massachusetts

APPENDIX B

ENGINEERING DATA

PERIODIC INSPECTION CHECKLIST

Hillside Beach DATE April 12, 1979

:ATURE Service Bridge NAME Ron Cheney

: Structural Engineer NAME Dan LaGatta
Geotechnical Engineer

AREA EVALUATED	CONDITION
RKS - SERVICE BRIDGE	There is no service bridge.
Structure	
ings	
or Bolts	
ge Seat	
itudinal Members	
rside of Deck	
ndary Bracing	
nage System	
ings	
nsion Joints	
t	
ent & Piers	
ral Condition of Concrete	
nment of Abutment	
oach to Bridge	
ition of Seat & Backwall	

PERIODIC INSPECTION CHECKLIST

ECT Hillside Beach DATE April 12, 1979

ECT FEATURE Spillway NAME Ron Cheney

IPLINE Structural Engineer NAME Dan LaGatta
Geotechnical Engineer

AREA EVALUATED	CONDITION
ET WORKS - SPILLWAY WEIR, APPROACH ID DISCHARGE CHANNELS	
Approach Channel	There is no approach channel.
General Condition	
Loose Rock Overhanging Channel	
Trees Overhanging Channel	
Floor of Approach Channel	
Weir and Training Walls	
General Condition of Concrete	Generally Good
Rust or Staining	None observed
Spalling	Some observed along wingwalls & floor
Any Visible Reinforcing	None observed
Any Seepage or Efflorescence	None observed
Drain Holes	None
Discharge Channel	
General Condition	Poor-severe erosion of left abutment and downstream toe of embankment.
Loose Rock Overhanging Channel	None.
Trees Overhanging Channel	Several trees overhanging channel-predominantly on left abutment.
Floor of Channel	Miscellaneous brick fill on channel floor some decaying logs. Tree growth in downstream channel.
Other Obstructions	Island downstream of spillway.

PERIODIC INSPECTION CHECKLIST

CT Hillside Beach DATE April 12, 1979

CT FEATURE -Outlet Works NAME Ron Cheney

PLINE Structural Engineer NAME Dan LaGatta
Geotechnical Engineer

AREA EVALUATED	CONDITION
T WORKS - OUTLET STRUCTURE AND LET CHANNEL	
eral Condition of Concrete	There is no outlet structure. The condition of the exit of the outlet pipe is poor. Major Spalling & Disintergration of the concrete surrounding the pipe was noted. Major erosion was observed at the soil Interface.
t or Staining	
lling	
sion or Cavitation	
ible Reinforcing	
Seepage or Efflorescence	
dition at Joints	
in holes	None observed.
nnel	
oose Rock or Trees Overhanging Channel	Trees overhanging channel.
ondition of Discharge Channel	Some dumped fill in discharge channel.

PERIODIC INSPECTION CHECKLIST

PROJECT Hillside Beach DATE April 12, 1979

PROJECT FEATURE Transition & Conduit NAME Ron Cheney

DISCIPLINE Structural Engineer NAME Dan LaGatta
Geotechnical Engineer

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

PERIODIC INSPECTION CHECKLIST

OJECT Hillside Beach DATE April 12, 1979

OJECT FEATURE - Control Tower NAME Ron Cheney

SCIPLINE Structural Engineer NAME Dan LaGatta
Geotechnical Engineer

AREA EVALUATED	CONDITION
TLET WORKS - CONTROL TOWER	
Concrete and Structural	
General Condition	The drop Inlet structure contains the gate valve for the 36" Draw down pipe. The portion of this structure which could be observed appeared to be in good condition with no major spalling, cracking or misalignment of concrete.
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	
Mechanical and Electrical	All controls are manually operated. The 36 inch draw down gate was operated during the field Inspection.
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 Hillside Beach DATE April 12, 1979

PROJECT FEATURE Intake Structure NAME Ron Cheney

DISCIPLINE Structural Engineer NAME Dan LaGatta
Geotechnical Engineer

AREA EVALUATED	CONDITION
OUTLET WORKS - INTAKE CHANNEL AND INTAKE STRUCTURE	
a. Approach Channel	No approach channel
Slope Conditions	
Bottom Conditions	
Rock Slides or Falls	
Log Boom	
Debris	
Condition of Concrete Lining	
Drains or Weep Holes	
b. Intake Structure	
Condition of Concrete	Good Condition
Stop Logs and Slots	Some leakage through sealed 3'x2' sluice gate.

PERIODIC INSPECTION CHECKLIST

OJECT Hillside Beach DATE April 12, 1979

OJECT FEATURE Dam Embankment NAME Ron Cheney

SCIPLINE Structural Engineer NAME Dan LaGatta
Geotechnical Engineer

AREA EVALUATED	CONDITION
1 EMBANKMENT	
Crest Elevation	138 ±
Current Pool Elevation	134.5 ±
Maximum Impoundment to Date	Unknown
Surface Cracks	None observed.
Pavement Condition	No Pavement.
Movement or Settlement of Crest	None observed.
Lateral Movement	None observed.
Vertical Alignment	No vertical misalignment observed.
Horizontal Alignment	No horizontal misalignment observed.
Condition at Abutment and at Concrete Structures	Steep downstream slope at right abutment. Erosion of left abutment by spillway overflow.
Indications of Movement of Structural Items on Slopes	Cracks in concrete headwall for outlet pipe on downstream slope. See text.
Trespassing on Slopes	Path on crest. Dumped fill near spillway.
Sloughing or Erosion of Slopes or Abutments	Sloughing of upstream slope near crest and erosion around outlet pipe.
Rock Slope Protection - Riprap Failures	None.
Unusual Movement or Cracking at or Near Toes	Erosion of downstream toe to the right of the spillway channel. See text.
Unusual Embankment or Downstream Seepage	Several seeps observed through eroded areas of downstream toe near spillway.
Piping or Boils	None observed.
Foundation Drainage Features	None observed.
Toe Drains	None observed.
Instrumentation System	None observed.
Vegetation	Grass covered crest, upstream & Downstream slopes.

VISUAL INSPECTION CHECKLIST
PARTY ORGANIZATION

PROJECT Hillside Beach

DATE April 12, 1979 *

TIME 9:30 AM

WEATHER Partly Cloudy 45°

W.S. ELEV. 134.5+ U.S. _____ DN.S

PARTY:

1.	Ron Cheney HHB	6.	
2.	Mike Angieri HHB	7.	
3.	David Vine HHB	8.	
4.	Dan LaGatta GEI	9.	
5.	Tom Keller GEI	10.	

	PROJECT FEATURE	INSPECTED BY	REMARKS
1.	Dan Embankment	Dan LaGatta, Tom Keller	
2.	Spillway	Ron Cheney, Dave Vine, Mike Angieri	
3.	Intake Structure	Ron Cheney, Dave Vine, Mike Angieri	
4.	Hydraulic/Hydrologic	Mike Angieri	
5.			
6.			
7.			
8.			
9.			
10.			

* An earilier Inspection was performed on December 4, 1978, which was impeded by a snow cover on the embankment.

APPENDIX A

INSPECTION CHECKLIST

7.4 Alternatives

There are no practical alternatives for this dam.

7. It is also recommended that since there are areas of severe erosion at the spillway and a high potential for overtopping that the reservoir be drawn down until repairs to the eroded areas are made and increased spillway capacity provided as recommended above.

7.3 Remedial Measures

a. Operating and Maitenance Procedures

1. The owner should establish a formal warning system to notify downstream areas in the event of an emergency. Around the clock monitoring of the facility should be provided during periods of intense rainfall.
2. This dam should be inspected once a year by a qualified engineer who can identify areas of concern which, if left unchecked could jeopardize the safety of the dam.
3. The owner should remove trees overhanging the spillway discharge channel and trees on the floor of the discharge channel. He should keep these areas free of future tree growth.
4. As noted elsewhere, additional spillway capacity is required to guard against overtopping. Should the existing spillway remain as part of the overall required capacity, the owner should repair all spalled and eroded concrete on the spillway wingwalls and floor.

4 above.

The above design should include measures to prevent erosion of the embankment adjacent to the spillway chute walls.

The spillway was found to be capable of passing only 14 percent of the test flood outflow. The potential for loss of life due to dam failure is high. The earth embankment of the dam is in some areas in poor condition as evidenced by erosion. The owner should engage the services of a qualified engineer to design improvements in the following areas based upon a detailed hydrologic/hydraulic study of the project:

1. Provide additional spillway capacity to guard against overtopping by storm runoff.
2. Improve spillway outlet channel to provide adequate capacity and prevent future erosion.
3. Improve spillway inlet area to prevent erosion between upstream embankment and spillway sidewalls during periods of high water.
4. Stop the leakage into the drop inlet intake structure.
5. Replace the existing headwall located at the outlet of the 48" diameter draw down with a new structure to prevent scour, settlement, and slope erosion.
6. Provide an adequate outlet channel at the exit of the 48" draw down to prevent soil erosion and "pooling water" at the toe of the dam.

November 7, 1969

H. Theroux & Sons, Inc.
31 Theroux Drive
Fairview, Massachusetts

Gentlemen:

Reference is made to the dam owned by you at Hillside Beach off of Granby Road in South Hadley, and the fact that an inspection has recently been made of this dam by the Engineering Consultant on dams for the Commissioners of Hampshire County.

The report on your dam submitted to our Board by the Engineer is as follows:

"The bathing facilities buildings have all been removed or town down. None are at the site any longer, other than the remains of the gatehouse super-structure. This building is about one-half town down.

"The dam embankment is in poor condition. All brush and tree growth should be cut from the embankment including the downstream slope and general toe area. The owner should be advised to develop a sod growth on this embankment.

"The spillway at the left [illegible]d should be cleared and cleaned of all debris and lumber. No flashboards were on the crest of the spillway and water level in storage was at the masonry crest elevation. Fill is needed behind the left side wall of the spillway. This fill should be placed in layers and compacted. Riprap should be added at the end of the spillway chute to prevent any further erosion in this area.

"To property control the gate facilities, the gatehouse over the vertical shaft spillway should be replaced with a suitable building or it should be entirely torn down and a platform type cover placed on the masonry portion of the gate and spillway facility. Necessary repairs should be made to the masonry of the gate and spillway structure."

This dam must be properly maintained if it is to continue in service. The recommendations of the engineer must be followed.

H. Theroux & Sons, Inc. November 7, 1969

It is important that all brush growth be cut from the embankment and that a good growth of turf be developed over the entire embankment. The spillway must be properly maintained and any erosion which may occur at the discharge end of the spillway must be properly controlled.

It is expected that the recommended maintenance and repairs will be completed by early spring of 1970 at the very latest.

If there is any question in connection with this matter, please call or write our Board.

Very truly yours,

_____

_____

_____

HAMPSHIRE COUNTY COMMISSIONERS

JHB:O

The Commonwealth of Massachusetts
Executive Office of Environmental Affairs
Department of Environmental Quality Engineering
Division of Waterways
100 Nashua Street, Boston 02114

January 19, 1978

Theroux Bros. Realty Trust
c/o Andre P. Theroux
30 Roosevelt Avenue
South Hadley, MA

Dear Sir:

re: Inspection Dam #2-8-275-13 - Hillside Beach Dam - South Hadley

On March 29, 1977, an Engineer from the Massachusetts Department of Public Works made a visual inspection of the above dam. Our records indicate the owner to be Theroux Bros. Realty Trust. If this information is incorrect, will you please notify this office.

The inspection was made in accordance with the provisions of Chapter 253 of the Massachusetts General Laws as amended (Dams-Safety Act). Chapter 706 of the Acts of 1975 transferred the jurisdiction of the so-called "Dams Safety Program" to the Commissioner of the Department of Environmental Quality Engineering.

The results of the inspection indicate that this dam is safe; however, the following conditions were noted that require attention: Many areas in need of attention and repairs were noted at this inspection. Upstream slope--from concrete D.I. structure southerly for approximately 50 feet, the top 2 feet of embankment is shearing and sliding into pond-sparse turf cover noted in some areas along top of embankment--condition of side chute concrete spillway noted as follows--12 feet ± from upstream end, northerly chute side wall cracked and broke in two crack 2 inches wide at base of wall-floor of spillway chute appears to have been constructed in layers and the top layer or veneer is peeling completely on the upstream portion of chute--downstream portion of chute shows minor spalling.

Downstream slope-sparse turf cover both sides of spillway chute structure, minor erosion occurring along sidewalls of chute, cavities noted in slope on northerly side of chute near outlet end, entire slope from end of concrete chute to toe of slope shows signs of extensive erosion which has been covered over with dumped brick, bed of brook downstream has large deposits of silt evident, assumed results of this erosion minor seepage and soft ground was noted in some areas along toe of slope on the northerly end of dam the concrete headwall at outlet end of 36 inch diameter drawdown pipe is badly cracked, spalled and broken, with a sizeable chunk of headwall displaced directly over top of pipe. Erosion of slope is occurring around headwall on both sides and slight seepage is evident in this area.

Although there appears to be many needed repairs, none of them appear to be of a major nature, therefore the Division rates this dam as condition 2, minor repairs needed.

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

Very truly yours,

JOHN J. HANNON, P.E.
Chief Engineer

A. Mc:i

cc: F. Hoey, DHE, District 2
Mr. Shumway, District 2

The Commonwealth of Massachusetts
Executive Office of Environmental Affairs
Department of Environmental Quality Engineering
Division of Waterways
100 Nashua Street, Boston 02114

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Although there appears to be many needed repairs, none of them appear to be of a major nature, therefore the Division rates this dam as condition 2, minor repairs needed.

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Very truly yours,

JOHN J. HANNON, P.E.
Chief Engineer

A. Mc:i

cc: F. Hoey, DHE, District 2
Mr. Shumway, District 2

INSPECTION REPORT - DAMS AND RESERVOIRS

1. LOCATION:

~~City~~/Town South Hadley. County Hampshire. Dam No. 2-8-275-13

Name of Dam Hillside Beach Dam.

Topo Sheet No. 123. Mass. Rect. Coordinates: N 446,400, E 305,900.

Inspected by: Harold T. Shumway, On 6/18/75. Date Last Inspection 6/19/73.

2. OWNER/S: As of June 18, 1975

per: Assessors____, Reg. of Deeds____, Prev. Insp. X, Per. Contact X.

	Name	St. & No.	City/Town	State	Tel. No.
1.	Theroux Bros. Realty Trust		South Hadley, Mass.		413-534-7827
2.					
3.					

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

Name	St. & No.	City/Town	State	Tel. No.
Andre P. Theroux	30 Roosevelt Avenue	South Hadley, Mass.		

4. DATA:

No. of Pictures Taken None. Sketches See description of Dam.
Plans, Where 1955 repairs plan in Hampshire County ~~Commissioner~~'s office files

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

1. Minor____.
2. Moderate____.
3. Severe X.
4. Disastrous____.

Comments: 8 million+ gallon capacity. Rtes 202 and 116 interchange downstream, large commercial development.

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

OUTLETS: OUTLET CONTROLS AND DRAWDOWN

No. 1 Location and Type: 30'± from north end of dam-conc. D.I. 7'x3' inlet opening with a drop of 26' to invert of 48" metal pipe outlet.

Controls None, TYPE: _____

Automatic ____. Manual ____. Operative Yes ____, No ____.

Comments: Steel grill over 7'x3' opening-cleaned of debris daily per caretaker.

No. 2 Location and Type: At base of conc. drop inlet - 36" dia. drawdown pipe

Controls Yes, Type: 36" gate valve

Automatic ____. Manual X. Operative Yes X, No ____.

Comments: Conc. D.I. and gate structure reconstructed in 1971.

No. 3 Location and Type: Southerly end of dam-10'-10"w x 3'h concrete chute spillway

Controls Yes, Type: 2"x8"x12' wood stop log.

Automatic ____. Manual X. Operative Yes X, No ____.

Comments: Stop log raises pond level to invert of conc. D.I. opening

Drawdown present Yes X, No ____. Operative Yes X, No ____.

Comments: See item #2 above

DAM UPSTREAM FACE: Slope 1½:1, Depth Water at Dam 18'+.

Material: Turf X. Brush & Trees ____. Rock fill ____. Masonry ____. Wood ____

Other ____.

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

2. Minor Repairs ____. 4. Urgent Repairs ____.

Comments: Well turfed over and stable.

DAM DOWNSTREAM FACE: Slope 1½:1.

Material: Turf X. Brush & Trees ____. Rock Fill ____. Masonry ____. Wood ____

Other ____.

Condition: 1. Good ____. 3. Major Repairs ____.

2. Minor Repairs X. 4. Urgent Repairs ____.

Comments: Light growth of brush and brambles, slope somewhat irregular in grade - eroded area both sides of chute spillway.

9. EMERGENCY SPILLWAY: Available Yes. Needed _____.

Height Above Normal Water 0 Ft.

Width 10' 10" Ft. Height 3' Ft. Material Concrete.

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

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

Comments: Some erosion of slope on each side of concrete structure which should be refilled, graded and turfed over.

10. WATER LEVEL AT TIME OF INSPECTION: 2½ Ft. Above _____. Below X.

Top Dam X F.L. Principal Spillway _____.

Other _____

Normal Freeboard 2½ Ft.

11. SUMMARY OF DEFICIENCIES NOTED:

Growth (Trees and Brush) on Embankment: Light brush and bramble growth on downstream slope.

Animal Burrows and Washouts: None evident

Damage to Slopes or Top of Dam: Yes, eroded area on both sides of chute spillway.

Cracked or Damaged Masonry: Yes, conc. header on outlet end of 48" dia. pipe is badly spalled and cracked.

Evidence of Seepage: Type of vegetation at toe of slope indicates some moisture, seepage also noted coming thru outlet header walls.

Evidence of Piping: None evident

Leaks: none evident

Erosion: Yes - see slope damage above

Trash and/or Debris Impeding Flow: None found

Clogged or Blocked Spillway: None found

Other _____

DAM NO. 2-8-275-13

VERALL CONDITION:

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

   Recommend removal from inspection list_____

REMARKS AND RECOMMENDATIONS: (Fully Explain)

The grade and alignment of top of dam and upstream slope appeared good. The grade of downstream slope is somewhat irregular. A light growth of brush and brambles was noted on downstream slope. The concrete header on outlet end of 48" pipe is badly cracked and spalled and seepage was noted coming through cracks in concrete. Some erosion of slope in area of header was also noted. The embankment was eroded to some extent on both sides of the chute spillway structure on southerly end of dam. The erosion and undercutting noted in previous reports has been repaired.

The caretaker, Mr. Andre Theroux, was present at inspection and the various maintenance repair needs were discussed with him. He stated the downstream slope is mowed off, once a year, in the fall. He said he would have the eroded areas regraded and reseeded and would investigate the existing condition around outlet end of 48" dia. pipe and make whatever repairs were necessary to correct existing conditions.

This dam, while in need of maintainance repairs, appears safe at this time.

HTS:ma

July 9, 1973

Theroux Bros. Realty Trust
Mr. Andre P. Theroux
30 Roosevelt Avenue
South Hadley, Massachusetts 01075

RE: Inspection-Dam #2-8-275-13
South Hadley
Hillside Beach Dam

Dear Mr. Theroux:

An engineer from the Massachusetts Department of Public Works has inspected the above dam, owned by the Theroux Brothers Realty Trust.

The inspection was made in accordance with Chapter 253 of the Massachusetts General Laws, as amended by Chapter 595 of the Acts of 1970.

The results of the inspection indicate that repairs are needed. The following conditions were noted that require attention.

1. Remove the growth of brush from the embankment.

2. Fill has been washed out from under the downstream end of the southerly spillway. The grouted riprap apron at the end of the spillway is broken. Fill the embankment with suitable material, properly compacted and graded. Restore the grouted riprap apron.

3.

3. The spillway proposed on the 1955 plans on file with the County Commissioners was never built. The flow from the spillway at this location has eroded part of the downstream slope. This should be corrected as needed.

The inspection report states that you were present during the inspection and that the above discrepancies were called to your attention. You indicated a definite action program.

We call these conditions to your attention now, before they become serious and more expensive to correct.

Very truly yours,

F. C. Schwelm

FRED. C. SCHWELM, P.E.
Deputy Chief Engineer

LFG

LFA/afs
cc: F. Hoey
R. Salls

INSPECTION REPORT - DAMS AND RESERVOIRS

LOCATION:

City/Town South Hadley. County Hampshire. Dam No. 2-8-275-13.

Name of Dam Hillside Beach Dam.

Topo Sheet No. 12B. Mass. Rect. Coordinates: N 446,400, E 305,900.

Inspected by: R. C. Salls, P.E., On June 19, 1973. Date Last Inspection Oct. 1969.

OWNER/S: As of June 19, 1973

per: Assessors ____, Reg. of Deeds ____, Prev. Insp. ____, Per. Contact X.

	Name	St. & No.	City/Town	State	Tel. No.
1.	Theroux Bros. Realty Trust	South Hadley, Mass.			413 - 534-7827
2.					
3.					

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

Name	St. & No.	City/Town	State	Tel. No.
Andre P. Theroux	30 Roosevelt Avenue	South Hadley, Mass.	01075	

DATA:

No. of Pictures Taken None. Sketches See description of Dam.
Plans, Where See Hampshire County Commissioners Office for 1955 repair.

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

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

Comments: Buttery Brook flows through Rte. 202 & Rte. 116 interchange and large commercial development under construction.

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

INSPECTION REPORT - DAMS AND RESERVOIRS

ATION:

y/Town South Hadley. County Hampshire. Dam No. 2-8-275-13

e of Dam Hillside Beach Dam.

Mass. Rect.

o Sheet No. 128. Coordinates: N 446,400, E 505,900.

Date

pected by: Harold T. Shumway, On March 29, 1977. Last Inspection 6-18-75

ER/S: As of March 29, 1977

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

Theroux Bros. Realty Trust, South Hadley, Mass. 413-534-7827

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

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

ndre P. Theroux, 30 Roosevelt Ave., South Hadley, Mass.

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

A:

No. of Pictures Taken None. Sketches See description of Dam.

Plans, Where 1955 repairs plan in Hampshire County Commissioners office fi

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REE OF HAZARD: (if dam should fail completely)*

1. Minor_____.
3. Severe X.
2. Moderate_____.
4. Disastrous_____.

Approx. 8 million gallons impoundment- Rtes. 202 and 116 interchange ments: downstream of dam, also large commercial development.

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

UTLETS: OUTLET CONTROLS AND DRAWDOWN

No. 1 Location and Type: 30'± from North end of dam-Concrete O.I. 9'X13'X26'deep 7'wideX3'high inlet opening with a drop of 26' to inver of 48" metal pipe outlet.

Controls None, TYPE: _____

Automatic _____. Manual _____. Operative Yes _____, No _____.

Comments: Steel grill over 7'X3' opening- minor spalling of concrete below water line.

No. 2 Location and Type: AT base of concrete drop inlet-36"diam. draw down pipe.

Controls Yes, Type: 36" gate valve

Automatic _____. Manual X. Operative Yes X, No _____.

Comments: Gate operable per word of caretaker.

No. 3 Location and Type: Southerly end of dam-10'-10"wide by 3' high concrete chute spillway.

Controls Yes, Type: 2"X8"X12' wood stoplog-not in place on day of inspection.

Automatic _____. Manual X. Operative Yes X, No _____.

Comments: Stoplog raises pond level to invert of concrete O.I. opening on northeast of dam. See remarks for condition of spillway chute.

Drawdown present Yes X, No _____, Operative Yes X, No _____.

Comments: See item #2 above

AM UPSTREAM FACE: Slope 1½:1. Depth Water at Dam 18' ±.

Material: Turf X, Brush & Trees _____, Rock fill _____, Concrete Masonry X, Wood Structures

Other _____.

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

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

Comments: Top 2' ± of slope breaking away or shearing off into pond on north end of pond for a distance of 50'±. Sparse turf cover in some areas along top of embankment.

AM DOWNSTREAM FACE: Slope 1½:1.

Material: Turf _____, Brush & Trees _____, Rock Fill _____, Concrete Masonry X, Wood Structures

Other _____.

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

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

Comments: Sparse turf cover, erosion, cavities, broken headwall, seepage, and spalling, cracks, and breaks in chute spillway. See remarks for details.

COUNTY INSPECTION REPORT

1965

side Beach Dam

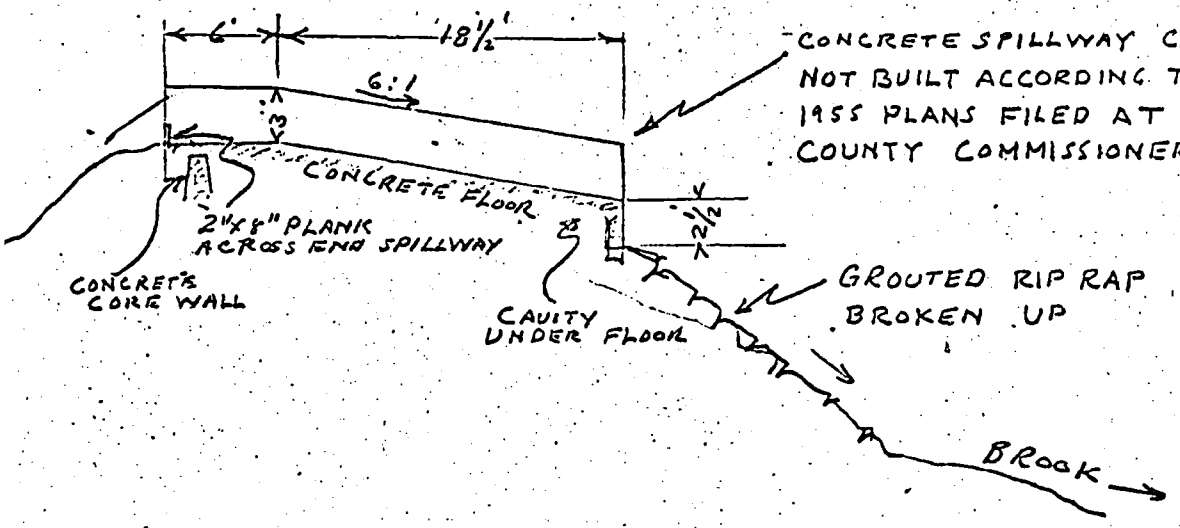
embankment of this dam is overgrown with brush and small trees. se should be removed and a good turf cover developed by placing n where necessary and seeding the embankment. At the time of ection, water level was at the crest of the shaft spillway.

overflow spillway at the left end of the embankment was found to atisfactory. However, embankment repairs are needed adjacent ne side walls of the spillway structure. This dam has received e maintenance over the past two years.

owner should be advised to properly maintain the dam by doing the k recommended hereinbefore.

SHEET NO 2 OF 2

DAM NO 2-8-275-13

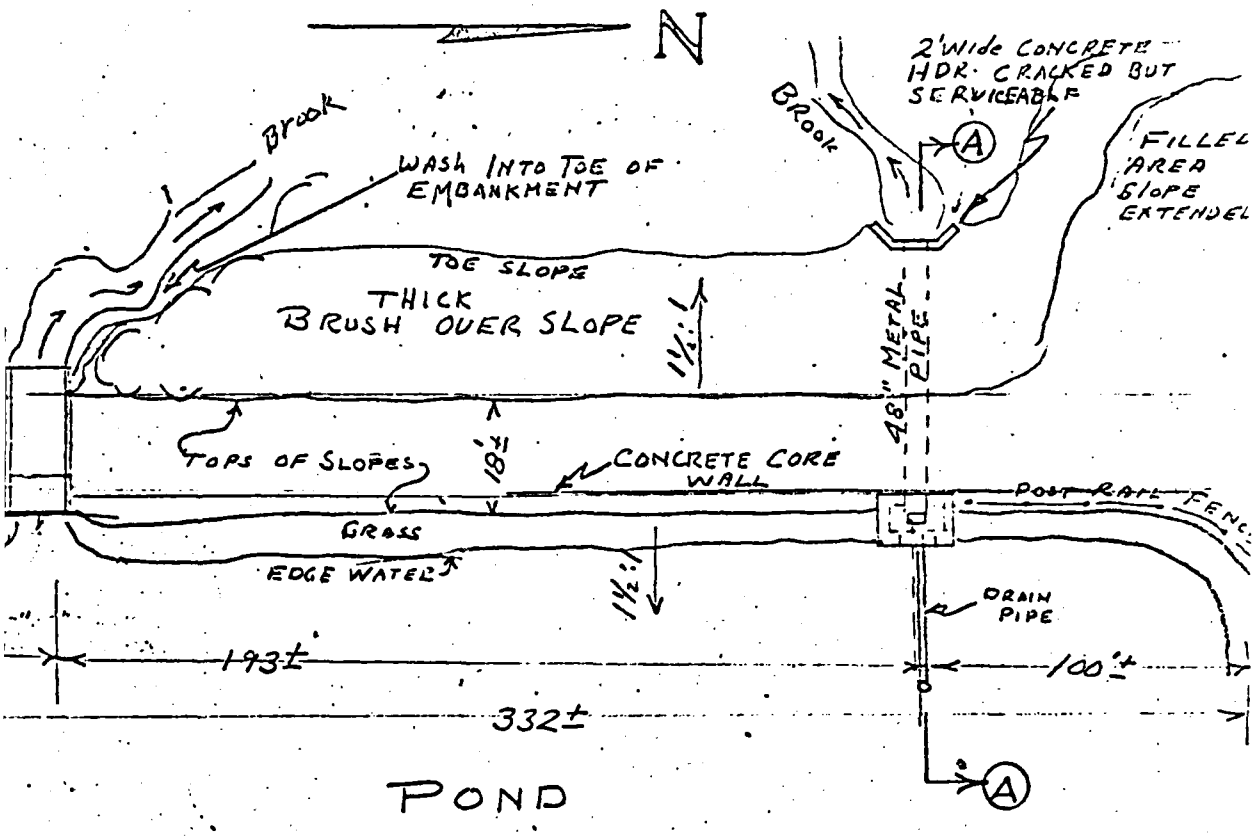


XX SECTION "BB".

OME INFO SHOWN OBTAINED FROM OWNER & FROM PLAN ON FILE IN OUNTY COMMISSIONERS OFFICE.

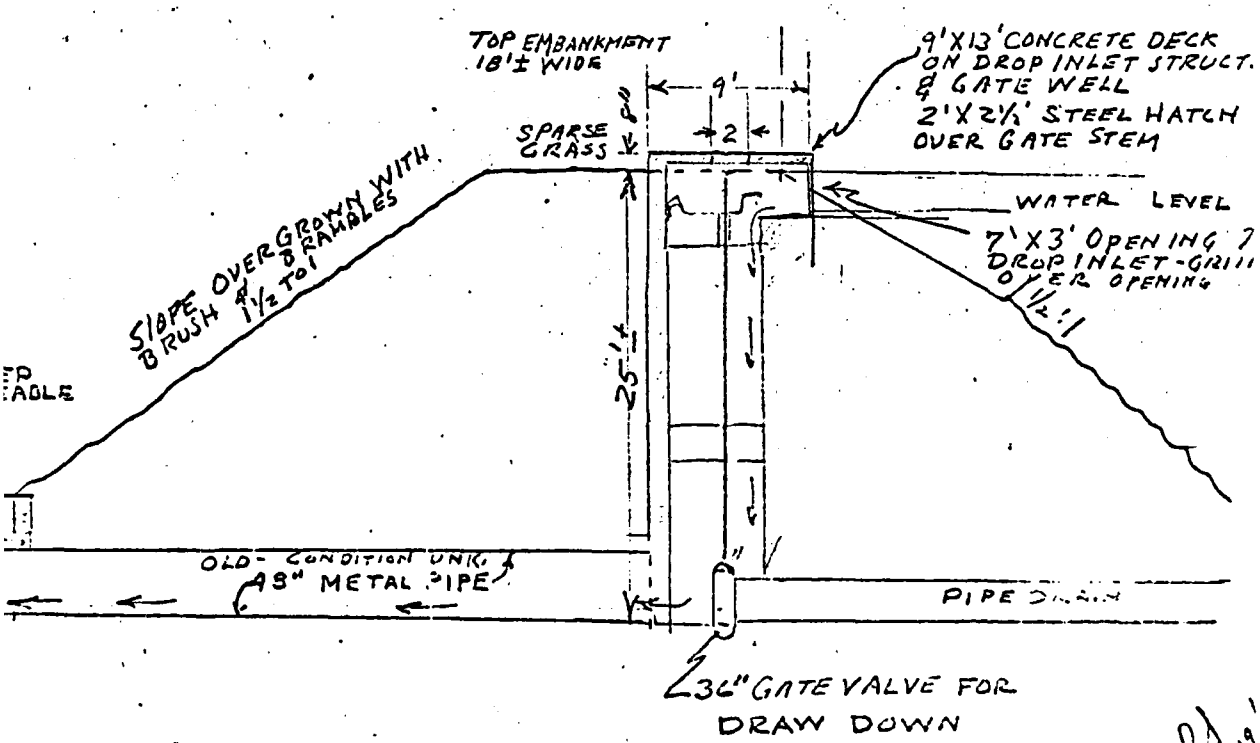
SKETCHES- NOT TO SCALE

HILLSIDE BEACH DAM



POND

PLAN VIEW-NOT TO SCALE



"XX SECTION AA"

RLS March 19

Dam No. 2-8-275-13

sification of Dam by Material:

Earth X Conc. Masonry Core wall Stone Masonry _____

Timber _____ Rockfill _____ Other _____

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

Overflow _____ Non-overflow _____

Description of present land usage downstream of dam:

_____% rural; 100 % urban

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

Character Downstream Valley: Narrow _____ Wide X Developed 60%

Rural 40% Urban _____

: to life and property in event of complete failure.

No. of people 25

No. of homes 5

No. of businesses 7 or 8. Commercial development being constructed.

No. of industries - - Type _____

No. of utilities 5 Type Interceptor sewer - water main - gas mains - electrical and telephone lines.

Railroads - -

Other dams Only breached LeGrand Ice Pond #2-8-275-14.

Other Brook flows under Route 202, 116 interchange and approach to old South Hadley - Holyoke Bridge.

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

3
lan
3

DESCRIPTION OF DAM

DISTRICT 2.

ed by R. C. Salls, P.E. Dam No. 2-8-275-13

June 19, 1973 ~~City~~/Town South Hadley

Name of Dam Hillside Beach Dam

n: Topo Sheet No. 12 B Mass. Rect. Coordinates N 446,400 E 305,900

ovide 8½" x 11" in clear copy of topo map with location of
m clearly indicated.

)n Buttery Brook at Hillcrest Apartments at end of Lawrence Avenue. Off

Granby Road, Route 202.

ilt Unknown Year/s of subsequent repairs 1955

Concrete work spillway dtd. 1971

of Dam: Water Supply _____ Recreational X

ood Control _____ Irrigation _____ Other Former Ice Pond

e Area: 1 1/10 sq. mi. _____ acres.

pe: City, Bus. & Ind. _____ Dense Res. 5% Suburban 60% Rural, Farm _____

Wood & Scrub Land 35% Slope: Steep _____ Med. _____ Slight X

Ponding Area: 4+ Acres; Ave. Depth 6 ft.

Impoundment: 7.8 million gals.; 24 acre ft.

lted in: Yes X No _____ Approx. Amount Storage Area 10%

type of dwellings located adjacent to pond or reservoir _____

mmer homes etc. Hillcrest Apartment Complex - 86 dwelling units

ons of Dam: Length 330'± Max. Height 19' to 20'

Freeboard 2'-4"

Slopes: Upstream Face 1½ to 1

Downstream Face 1½ to 1

Width across top 18'

DAM NO. 2-8-275-13

L CONDITION:

Safe_____.

Minor repairs needed_____.

Conditionally safe - major repairs needed X.

Unsafe_____.

Reservoir impoundment no longer exists (explain)

Recommend removal from inspection list_____.

KS AND RECOMMENDATIONS: (Fully Explain)

embankment dam has had some maintenance work done since the 1969 inspection by County Engineer, but several comments on that inspection are still pertinent. embankment's downstream slope and toe area is overgrown with brush and brambles ı should be cleared. The overflow spillway at the south end of the dam requires ıtion. Fill has been washed out from under the downstream end and there is a washed in the downstream slope on the north side of this spillway, and the ted riprap apron at the end of the spillway is broken. The proposed new concrete lway shown on the 1955 plans on file at the County Commissioners' Office was r built. The water flowing out of this spillway has washed away part of the stream slope of the embankment. This condition should be corrected.

drop inlet and gate well at the north end of the dam has been worked on. The gate house has been removed and a concrete deck built over the well with a steel ı allowing access to the gate stem. This structure appeared to be in good ıtion.

rial, apparently from the construction of the apartment complex, has been dumped he downstream slope west of the pipe spillway widening the top of the embankment to over fifty feet. This area has been graded and made into a lawn.

inspection results were discussed with Mr. Andre P. Theroux, caretaker of the dam, the discrepancies noted above called to his attention. He intends to cut brush repair the overflow spillway sometime this fall.

K

RGENCY SPILLWAY: Available Yes . Needed _____.

eight Above Normal Water Zero Ft.

idth 10' - 10" Ft. Height 3 Ft. Material Concrete .

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

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

omments: Lower end of concrete is undermined with large cavity under north sidewall and floor. Brook is meandering toward downstream toe of slope.

ER LEVEL AT TIME OF INSPECTION: 2 1/3 Ft. Above _____. Below X .

op Dam X F.L. Principal Spillway _____.

ther _____.

lormal Freeboard 2 1/3 Ft.

MARY OF DEFICIENCIES NOTED:

rowth (Trees and Brush) on Embankment Yes - on downstream slope .

nimal Burrows and Washouts None seen - growth of brush very thick .

)amage to Slopes or Top of Dam Yes - wash area along side of chute spillway .

racked or Damaged Masonry Yes - Hdr. at downstream end 48" pipe cracked .

vidence of Seepage None seen .

vidence of Piping None seen .

eaks None seen .

rosion Yes - on downstream slope near emergency spillway .

rash and/or Debris Impeding Flow No .

logged or Blocked Spillway No .

)ther _____.

TLETS: OUTLET CONTROLS AND DRAWDOWN

No. 1 Location and Type: 20 - 30 ft. from north end dam - 48" pipe from concrete drop inlet structure - 26' deep.

Controls Yes, TYPE: 36" gate valve for drawdown.

Automatic ____. Manual X. Operative Yes X, No ____.

Comments: Owner has operated 36" gate recently - concrete drop inlet and gate structure remodeled in 1971.

No. 2 Location and Type: About 50 - 70' from north end of dam - 10'-10" w x 3' high emergency concrete chute spillway.

Controls Yes, Type: 12" plank across inlet.

Automatic ____. Manual X. Operative Yes X, No ____.

Comments: ____.

No. 3 Location and Type: ____.

Controls ____, Type: ____.

Automatic ____. Manual ____. Operative Yes ____, No ____.

Comments: ____.

Drawdown present Yes X, No ____. Operative Yes X, No ____.
Comments: See Item 1 above - 36" valve to drawdown pipe.

AM UPSTREAM FACE: Slope 1½:1, Depth Water at Dam Say 15 to 20.

Material: Turf X. Brush & Trees ____. Rock fill ____. Masonry ____. Wood ____.

Other There is some ice and wave erosion at edge of water.

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

2. Minor Repairs ____. 4. Urgent Repairs ____.

Comments: ____.

AM DOWNSTREAM FACE: Slope 1½.

Material: Turf ____. Brush & Trees X. Rock Fill ____. Masonry ____. Wood ____.

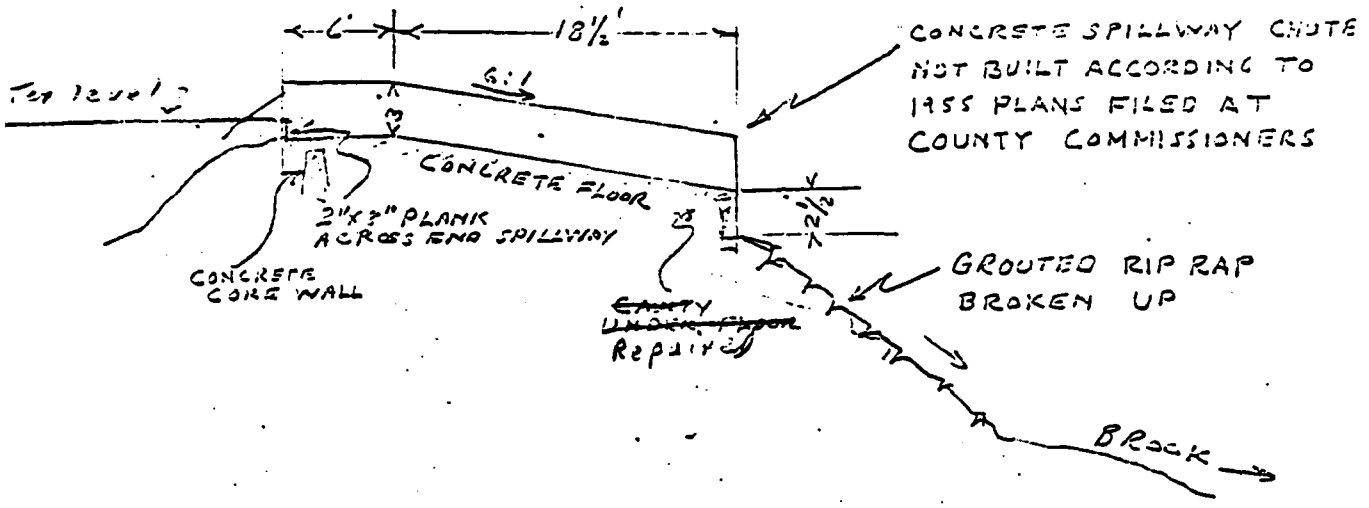
Other ____.

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

2. Minor Repairs ____. 4. Urgent Repairs ____.

Comments: Cover of brush and brambles so thick slope could not be examined fully. Slope irregular. There is a washed area along side of emergency chute spillway

DAM NO 2-3-275-12



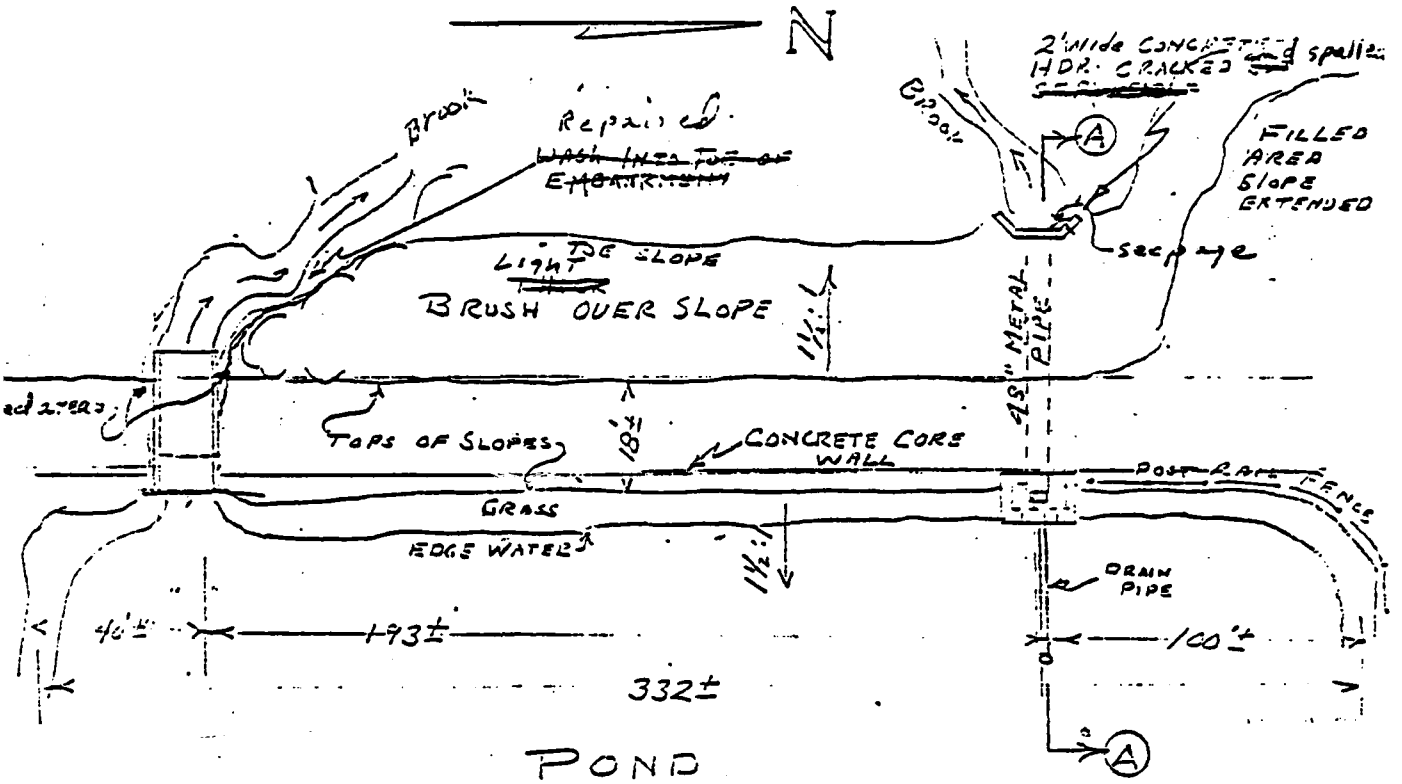
XX SECTION "BB".

OTE SOME INFO SHOWN OBTAINED FROM OWNER & FROM PLAN ON FILE IN COUNTY COMMISSIONERS OFFICE.

SHEET #1 OF 2
DAM NO 2-3-275-13
HILLSIDE BEACH DAM

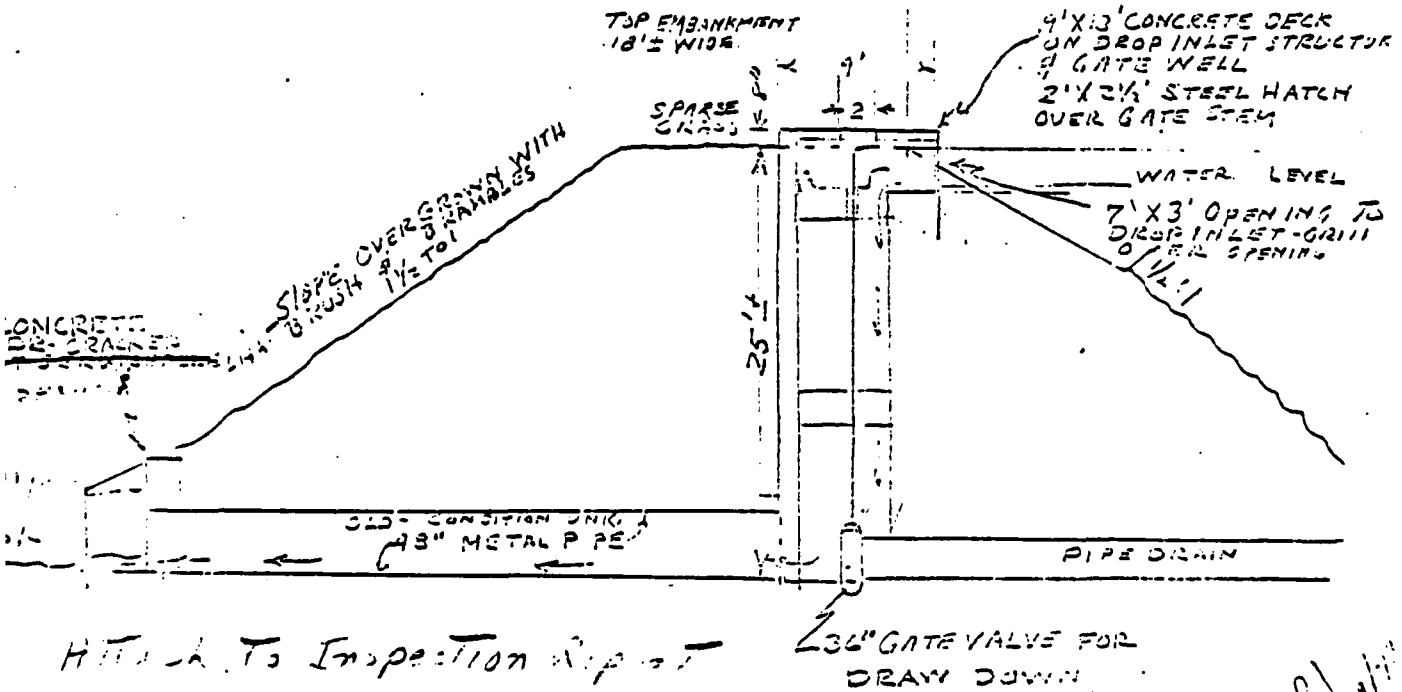
SKETCHES- NOT TO SCALE

Notations in red as of 6-18-75 (H.T.S.)



POND

PLAN VIEW-NOT TO SCALE



Attach To Inspection Report

"XX SECTION AA"

We mention the above conditions only to confirm the inspection knowing that you have attended to similar matters in the past and have indicated that you will continue to do so in the future. With any correspondence, please include the number of the dam as indicated above.

Very truly yours,

ROBERT T. TIERNEY, P.E.
Chief Engineer

LRA:jmp
cc: P. J. Hoey
R. Salls

September 26, 1975

Theroux Bros. Realty Trust
c/o Mr. Andre P. Theroux
30 Roosevelt Avenue
South Hadley, Massachusetts 01075

RE: Inspection - Dam #2-8-275-13
South Hadley
Hillside Beach Dam

Dear Mr. Theroux:

On June 18, 1975, an engineer from the Massachusetts Department of Public Works made a visual inspection of the above dam. Our records indicate that this dam is owned by the Theroux Bros. Realty Trust and that you are the designated caretaker. Will you please notify this office if this information is not current.

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

The results of the inspection indicate that this dam is safe and that deficiencies noted in a letter dated, July 9, 1973, have been attended to. You were present during the inspection and the following conditions were noted:

1. The concrete headwall is badly cracked and spalled with some seepage coming through the cracks.

2. Erosion adjacent to the headwall and chute spillway were noted.

3. There is a light growth of brush and brambles on the downstream slope.

(12) OVERALL CONDITION:

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

   Recommend removal from inspection list_____

(13) REMARKS AND RECOMMENDATIONS: (Fully Explain)

Many areas in need of attention and repairs were noted at this inspection. Upstream slope-from concrete O.I. structure southerly for approximately 50 feet, the top 2 feet of embankment is shearing and sliding into pond-sparse turf cover noted in some areas along top of embankment-condition of side chute concrete spillway noted as follows-12'± from upstream end, northerly chute side wall cracked and broke in two crack 2" wide at base of wall-Floor of spillway chute appears to have been constructed in layers and the top layer or veneer is peeling completely on the upstream portion of chute-downstream portion of chute shows minor spalling.

Downstream slope-sparse turf cover both sides of spillway chute structure, minor erosion occurring along sidewalls of chute, cavities noted in slope on northerly side of chute near outlet end, entire slope from end of concrete chute to toe of slope shows signs of extensive erosion which has been covered over with dumped brick, bed of brook downstream has large deposits of silt evident,assumed results of this erosion minor seepage and soft ground was noted in some areas along toe of slope on the northerly end of dam the concrete headwall at outlet end of 36" diameter drawdown pipe is badly cracked, spalled and broken, with a sizeable chunk of headwall displaced directly over top of pipe. Erosion of slope is occurring around headwall on both sides and slight seepage is evident in this area.

Although there appears to be many needed repairs, none of them appear to be of a major nature, therefore the District rates this dam as condition 2, minor repairs needed.

HTS/at

(9) EMERGENCY SPILLWAY: Available Yes. Needed _____.

Height Above Normal Water 0 Ft.

Width 10' - 10" Ft. Height 3 Ft. Material concrete.

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

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

Comments: Poor turf cover and erosion of slopes both sides of spillway-ground cavities in slope at end of spillway chute, and erosion of brook bed down stream of spillway chute.

(10) WATER LEVEL AT TIME OF INSPECTION: 3 Ft. Above _____. Below X.

Top Dam X F.L. Principal Spillway _____.

Other _____.

Normal Freeboard 2½ Ft.

(11) SUMMARY OF DEFICIENCIES NOTED:

Growth (Trees and Brush) on Embankment None found.

Animal Burrows and Washouts See erosion below.

Damage to Slopes or Top of Dam Sparse turf cover, cavities, and erosion of down-stream slope, upstream slope shows shearing action on

Cracked or Damaged Masonry Concrete headwall cracked, northerly end. spalled and broken-side chute spillway cracked and spalled.

Evidence of Seepage Minor seepage noted along toe of slope.

Evidence of Piping None found.

Leaks None found.

Erosion Erosion of upstream slope and downstream slope noted-see remarks.

Trash and/or Debris Impeding Flow None found.

Clogged or Blocked Spillway None found.

Other _____.

COUNTY INSPECTION REPORT

1968

Hillside Beach Dam (now H. Theroux & Sons, Inc.)

The bathing facilities buildings have all been removed or torn down. None are at the site any longer, other than the remains of the gate-house super-structure. This building is about one-half torn down.

The dam embankment is in poor condition. All brush and tree growth should be cut from the embankment including the downstream slope and general toe area. The owner should be advised to develop a sod growth on this embankment.

The spillway at the left end should be cleared and cleaned of all debris and lumber. No flashboards were on the crest of the spillway and water level in storage was at the masonry crest elevation. Fill is needed behind the left side wall of the spillway. This fill should be placed in layers and compacted. Riprap should be added at the end of the spillway chute to prevent any further erosion in this area.

To properly control the gate facilities, the gatehouse over the vertical shaft spillway, should be replaced with a suitable building or it should be entirely torn down and a platform type cover placed on the masonry portion of the gate and spillway facility. Necessary repairs should be made to the masonry of the gate and spillway structure.

COUNTY INSPECTION REPORT

1967

Hillside Beach Dam

The embankment of this dam has been fairly well maintained on the top and the water slope surfaces. Some brush and small tree growth is taking place on the downstream slope and this growth should be cut down.

Flashboards were in place on the overflow spillway located to the left of the embankment on the day of inspection. These flashboards should be removed and kept off of the spillway crest until after the spring run-off.

Heavy stone fill is needed at the end of the spillway chute to prevent any further undermining of the soil in this general area.

Water level was at its normal height and was passing from the pond through the gatehouse structure and into the conduit under the embank-ment.

October 28, 1965

Hillside Beach, Inc.
Lawrence Avenue
South Hadley Falls, Mass.

Attention: Mr. Arthur Heroux

Gentlemen:

Your dam at the site of your bathing beach in South Hadley, has been recently inspected by our engineering consultant on dams and his report to our Board is as follows:

> "The embankment of this dam is overgrown with brush and small trees. These should be removed and a good turf cover developed by placing loam where necessary and seeding the embankment. At the time of inspection, water level was at the crest of the shaft spillway.
>
> The overflow spillway at the left end of the embankment was found to be satisfactory. However, embankment repairs are needed adjacent to the side walls of the spillway structure. This dam has received little maintenance over the past two years.
>
> The owner should be advised to properly maintain the dam by doing the work recommended hereinbefore."

It is recommended that you take the necessary steps to properly maintain your dam as outlined in the rpport of the Engineer.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS

_____

_____

_____

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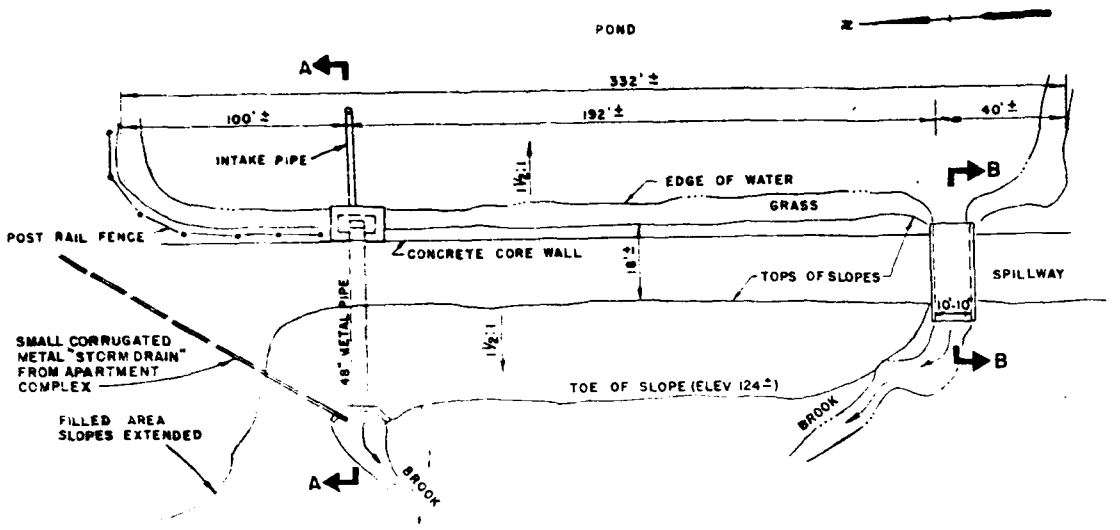
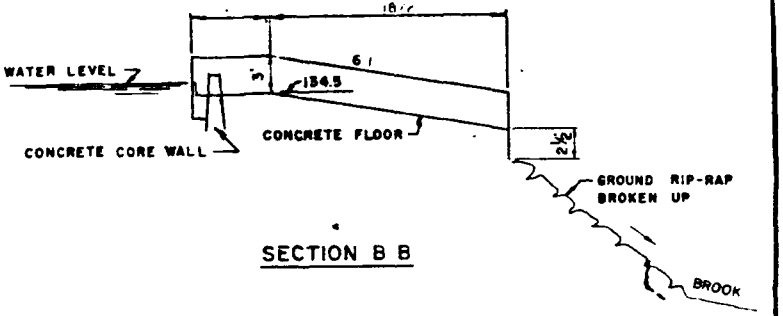
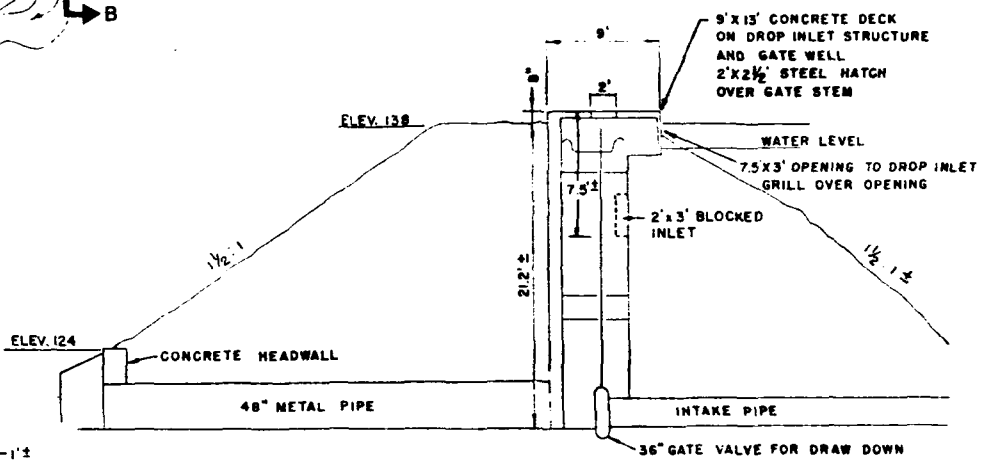


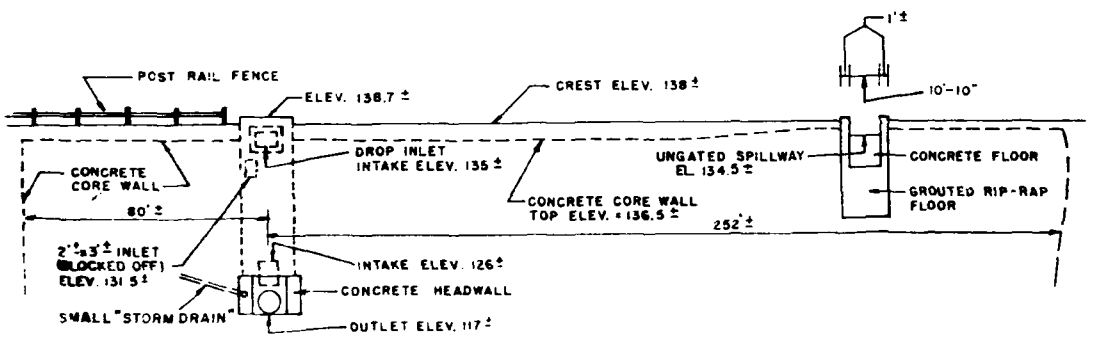
PLAN



SECTION B B



SECTION A A



DOWNSTREAM ELEVATION

TAKEN FROM 1973 STATE INSPECTION REPORT SKETCHES AND FIELD

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

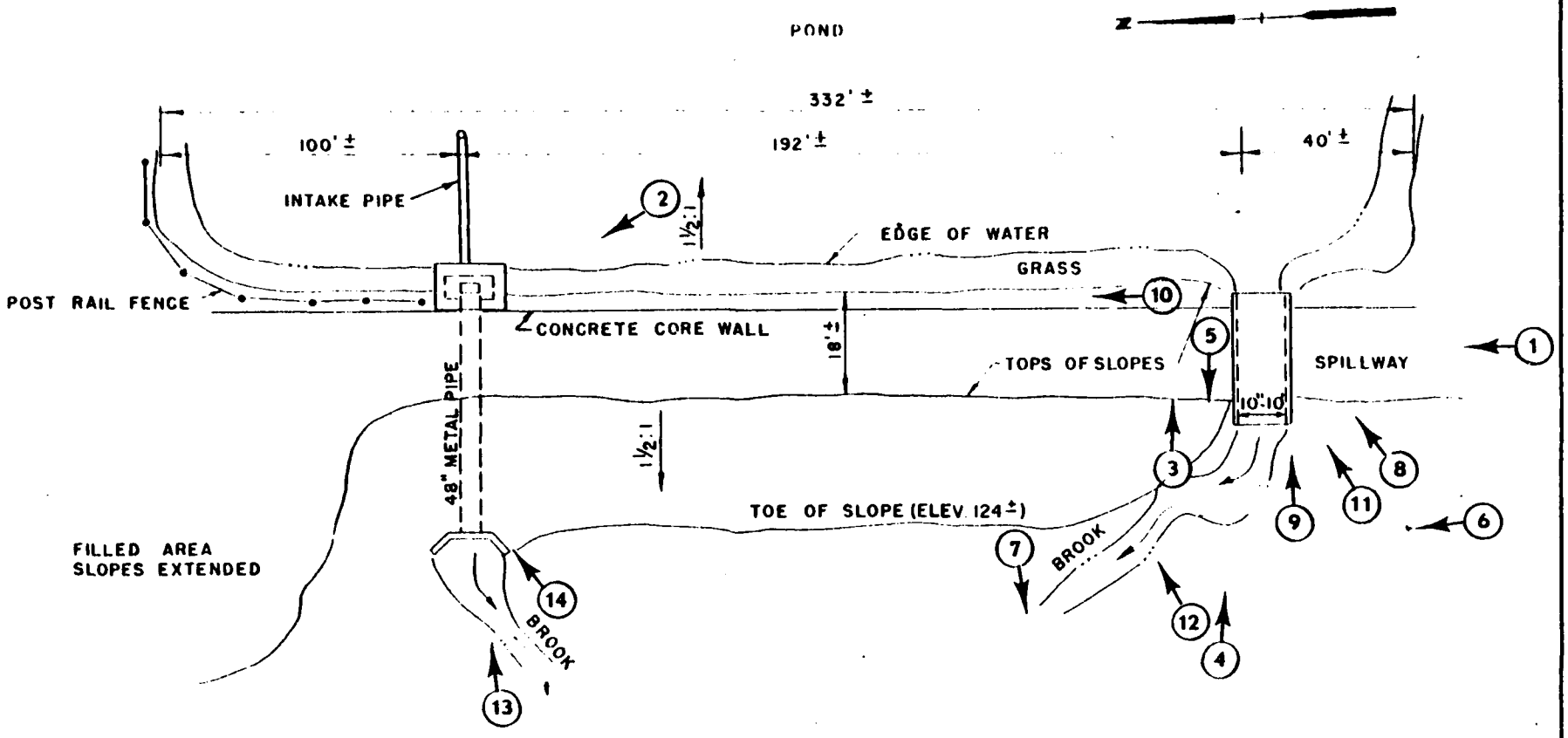
NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

HILLSIDE BEACH

SOUTH HADLEY — MASSACHUSETTS

APPENDIX C

PHOTOGRAPHS



PLAN

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

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

LOCATION OF PHOTOGRAPHS
HILLSIDE BEACH

SOUTH HADLEY — MASSACHUSETTS

SCALE: NOT TO SCALE

DATE: MAY 19, 1979

PHOTO NO. 1 - Crest of dam viewed from left abutment; spillway chute in foreground.

PHOTO NO. 2 - View of right side of upstream slope showing drop inlet structure.

PHOTO NO. 3 - Close-up view of test hole made in brick rubble fill to right of right spillway chute wall; See PHOTO NO. 4

PHOTO NO. 4 - Panoramic view of spillway chute area downstream of dam. The location of the small test hole shown in PHOTO NO. 3 can be seen at the left in this photo.

PHOTO NO. 5 - View of downstream channel from the spillway chute showing island in channel.

PHOTO NO. 6 - View of eroded embankment to the right of the spillway chute; erosion of embankment toe has occurred.

PHOTO NO. 7 - View of outlet channel just downstream of PHOTO NOS. 5 and 6.

PHOTO NO. 8 - One of several voids observed in eroded area of embankment to right of the spillway; stick was pushed into void about 20 inches. Water was seen at the bottom of the void.

PHOTO NO. 9 - Close-up view of loose, steep sloped, slumping soil adjacent to left wall of spillway chute. A stick was pushed two feet into the soil next to the wall. Scale open to one foot.

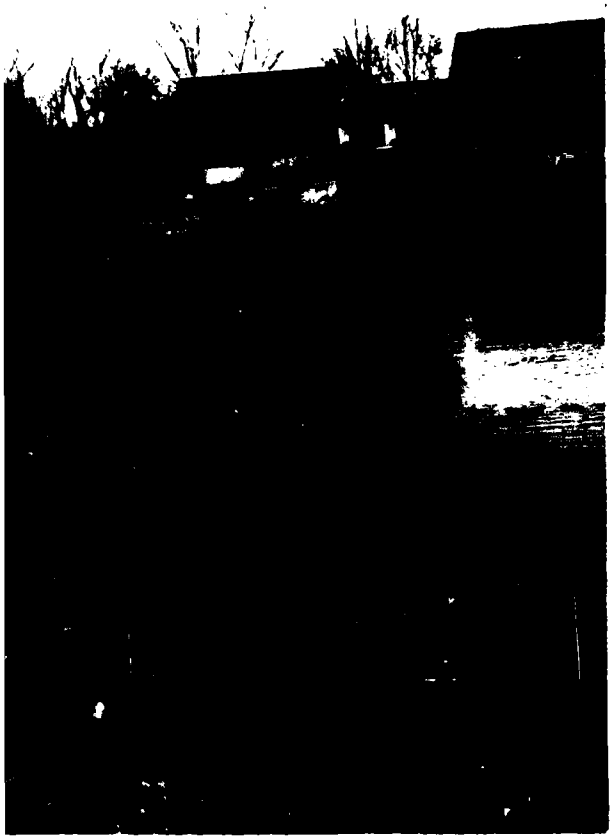


PHOTO NO. 10 - View of upstream slope from spillway chute area. Note sloughing and absence of slope protection.

PHOTO NO. 11 - View upstream showing spillway.

PHOTO NO. 12 - View of eroded area of downstream toe caused by water flow in downstream channel.

PHOTO NO. 13 - View of outlet pipe showing erosion around pipe and cracks in headwall.

PHOTO NO. 14 - View of steep slope above headwall shown in PHOTO NO. 13.

APPENDIX D

HYDROLOGIC AND HYDRAULIC COMPUTATIONS

AD-A156 159 NATIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL DAMS HILLSIDE BEACH (MA 00.. (U) CORPS OF ENGINEERS WALTHAM MA NEW ENGLAND DIV JUN 79 2/2

UNCLASSIFIED F/G 13/13 NL

END

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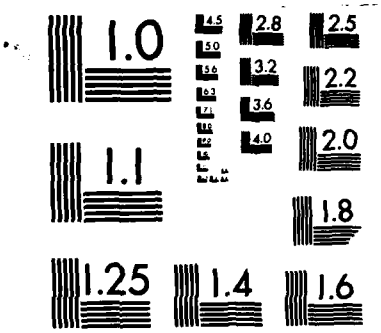


MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

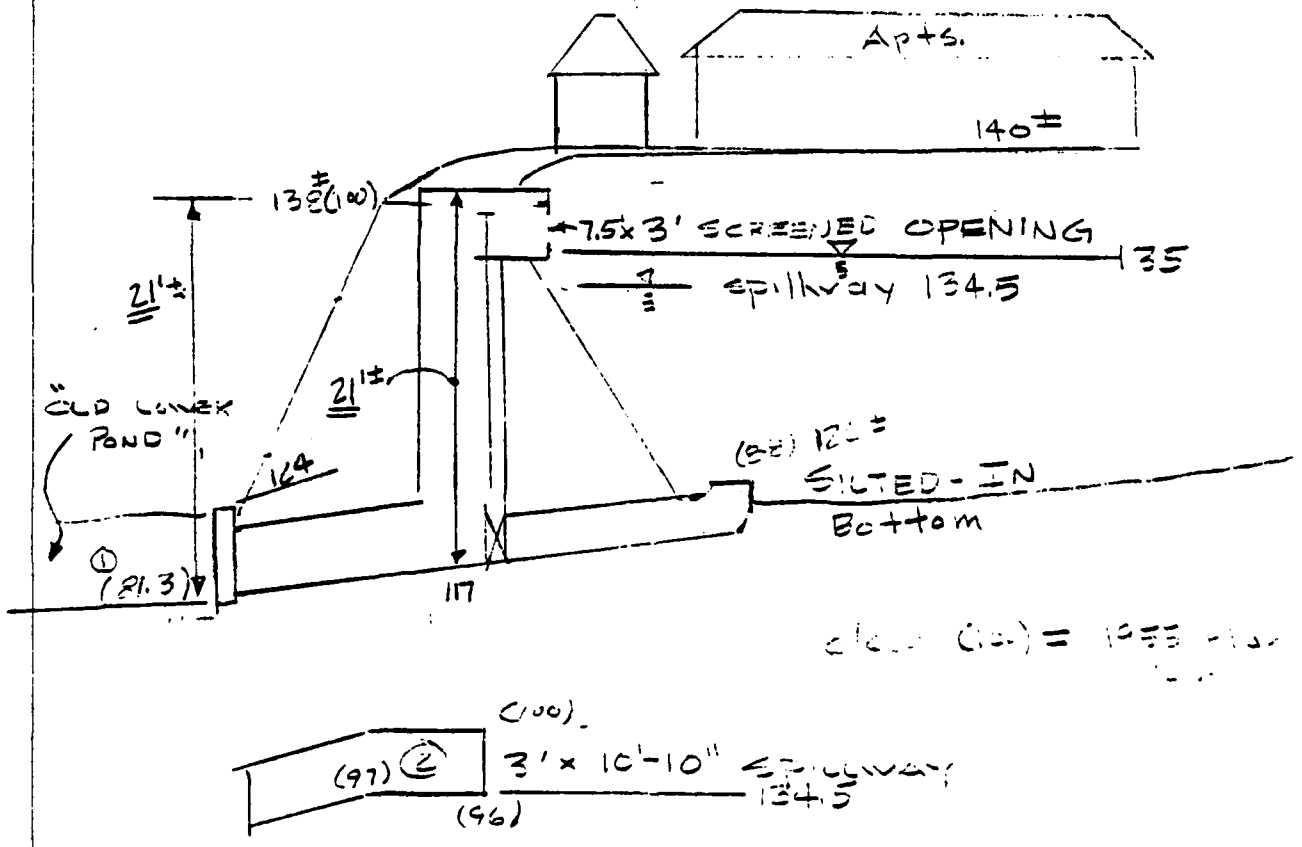
Built about 1900, purpose unknown. Revisions in 1955.
Hydraulic Height ± 21' ±
Stor ± 21 a-f ±

Size Class = small
Hazard Potential = High; urban development

Test Flood: 1/2 PMF to PMF range

Use 1/2 PMF Test Flood.

Drainage Area = 588 a. or 0.92 s.m.
$Q = \frac{1}{2} \times 3000 \times 0.92 = 1380$ cfs inflow from test fld.



3.24.1
7/79
A
DD 2/6/79

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

SHEET NO. 2
JOB Dams
SUBJECT Hinsdale
CLIENT Corps

1955 Revisions by Durkee, White, Towne (Springfield Mass)
(100) = measured elevations

Outlets

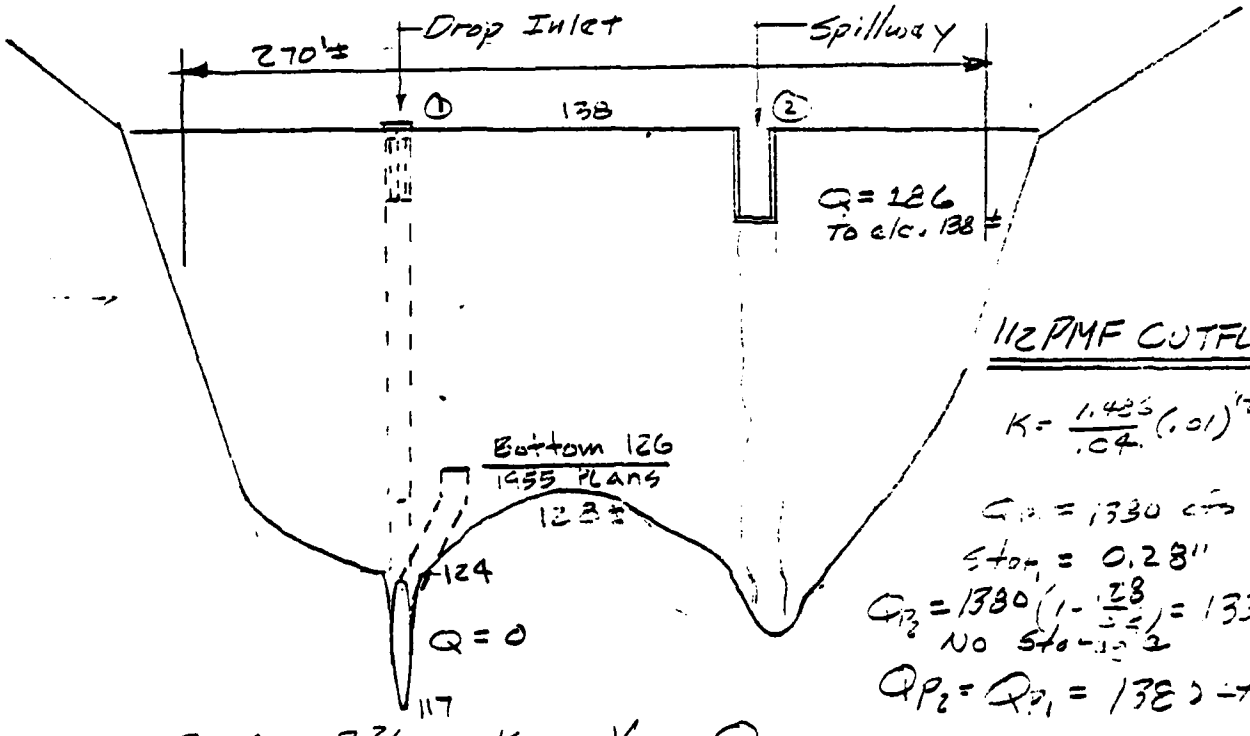
$Q = CA\sqrt{2gH}$ (012.6)

1 $Q = 0.73 \times 7.06 \sqrt{2915.7} = 164$ cfs (No allowance for screen)
$V = 31.8$ fps
$H = 15.72'$.

2 $Q = CLH^{3/2}$

$Q = 3.31 \times 10.85 \times (3^{3/2}) = 186$ cfs (1/2 PMF outflow)

Total Capacity = 190 cfs. [at elev 139 = our calcs - page 10]
Assumed Screen Inlet Closed
Q over dam = 1380 - 190 = 1,190. cfs



1/2 PMF CUTFLOW

$K = \frac{1.486}{.04}(.01)^{1/2}$

$Q_{P_1} = 1330$ cfs
$Sto_1 = 0.28''$
$Q_{P_2} = 1380\left(1 - \frac{.28}{3.67}\right) = 1337$
No Sto-2
$Q_{P_2} = Q_{P_1} = 1383$ cfs

D	WP	A	$R^{2/3}$	K	V	Q
1	310	305	0.989	3.715	3.67	1121 cfs ✓
1.5	320	460	1.27	"	4.74	2180 cfs

1/2 PMF Outflow = 1,380. cfs. El = 131±

79.244.1
1/17/79
W.F
FDD 2/6/79

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BOSTON, MASSACHUSETTS

SHEET NO. 21
JOB Dam
SUBJECT Alsace
CLIENT Corps

Storage

	Elev	Area	D	Ave Area	Stor	Cumm Stor
Bottom	127 (88')	0.34	0	0	0	0
Water	135 (96')	2.75	8	1.54	12.36	12.36
Top	138 (100')	3.00	3	2.87	8.61	20.97 a-f

Dam Failure

$H = 138 - 126 = 12'$

$$Q = \frac{8}{27} \times 0.4(270) \times \sqrt{32.2} \times (12.)^{1.5} = 755 \pm \text{cfs}$$

This outflow will over-flow remains of old dam below and flow over land across rtes 202 & 116 interchang At rte 202 & 116 twin 6x10 picks-up 0.85 s.m. drainage area Q = 1275 cfs. Assume 12x10 Accmp full therefore all 755C flow is overland to Gaylord Str where "deep channel" begins, near Scott Graphics Co.

Damage Analysis

Sta	Fld Stage	Elev	Items
0+00 to 10+00	11' to 2'	126.5±	old Dam, Rte 202 Ramps
10+00 to 20+00	2' to 13'	95.0±	2 homes, 2 Busi Bldgs, [illegible]
20+00 to 24+00	13'±	93.0±	Gaylord Rd
to 30+00	13'±	93 to 82	Scott Graphic & all Ind. Bldg along stream (4 to ±)
to 35+00	13+6'	72.5±	6 homes, school Str
30 to 45+00	6'-3'	71±	Main Str. 20± to 25± Busi Bldgs.

Dry weather flow not significantly different from above damage analysis for "wet" conditions. Culvert inlet has 4' wall around and location does not indicate water would flow towards the inlet, due to grades.

No.	15,644
	1/17/79
	N/A
By	FDD 2/6/79

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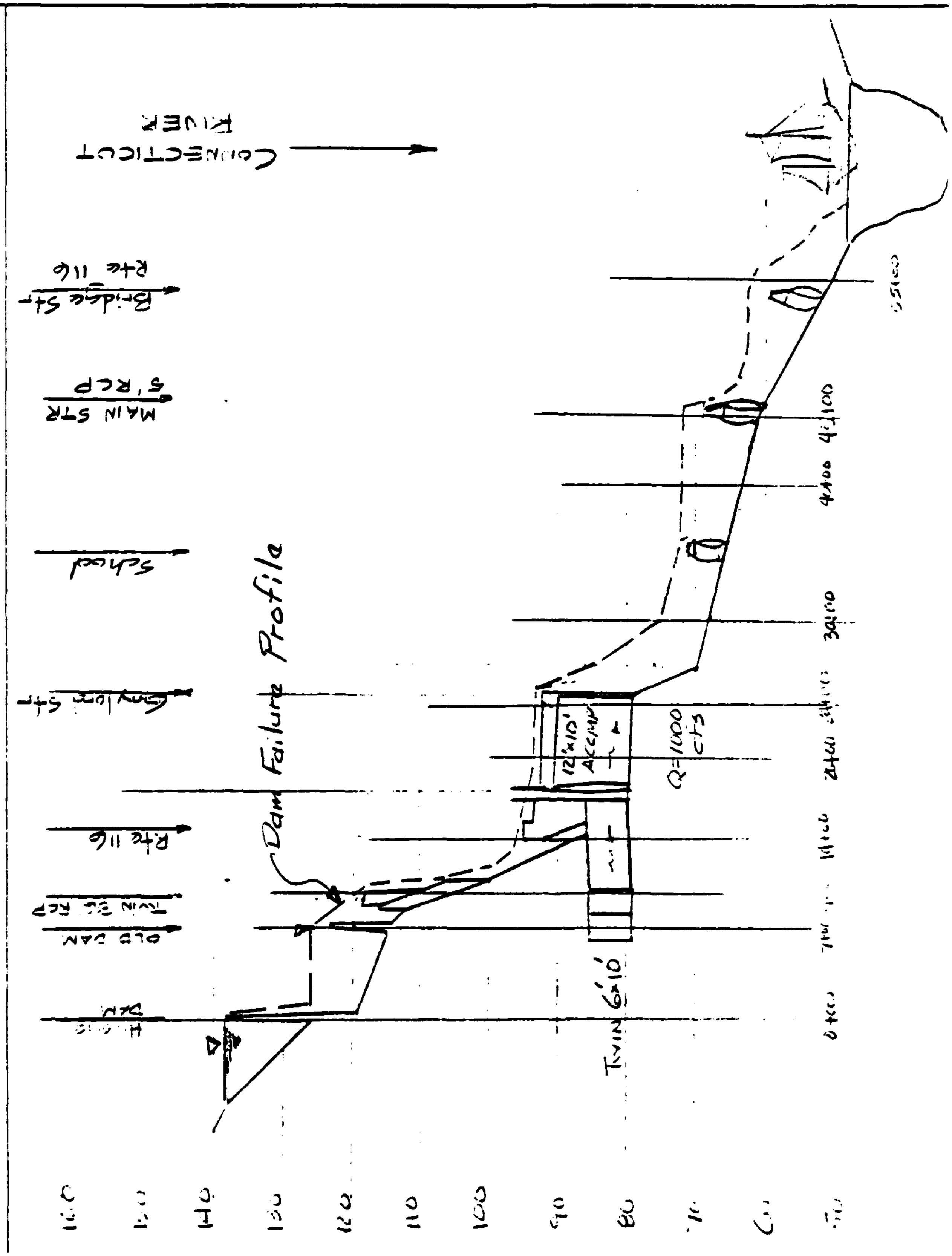
SHEET NO. 7
JOB [illegible]
SUBJECT [illegible]
CLIENT [illegible]

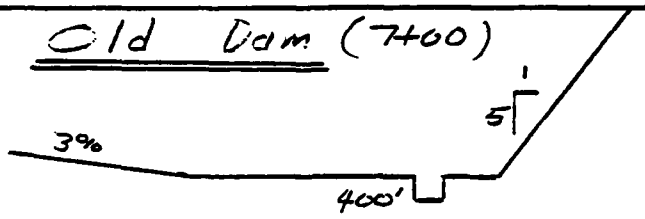


11/7/79
MA
FDD 2/6/79

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

JOB Dams
SUBJECT Hilliard
CLIENT Corps

Old Dam (7+00)

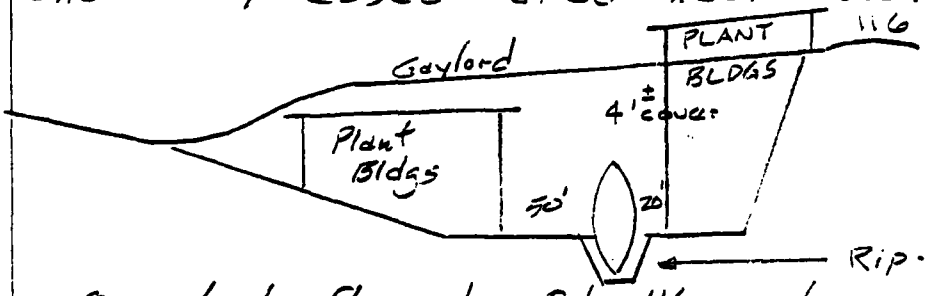


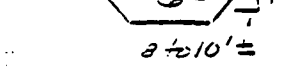
D	A	WP	$R^{2/3}$	K	V	Q
3'	1350	475'	2.01	3.715	7.5	10,100
2	975	450	1.68	"	6.2	6,080

D = 2.35' (126) Q ≈ 7500

Gaylord Str @ Scott Graphics (24+00)

Between Rte 116 & Gaylord land has been regraded irregularly ∴ assume all flow towards Gaylord and depressed area near Scott Graphics





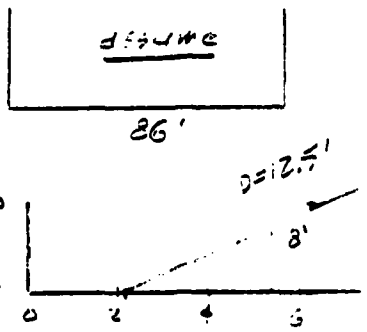
Overland flow to Rte 116 and then overland flow to Gaylord 2' deep otherwise can't determine accurately. Heavy development at Scott Graphics Channel will not carry flow of 7500 cfs, must lower bridges & restrictions.

$$V = \frac{1.486}{0.04}(.01)^{1/2}\left[\frac{96}{27}\right]^{2/3} = (3.1)(2.34)(37.15) = 8.7.$$

Q = 835 cfs overflow 7965 cfs.

$$K = \frac{1.486}{0.15}(.03)^{1/2} = 1.8.$$

D	A	WP	$R^{2/3}$	K	V	Q
5'	430	96	2.73	1.8	4.9	2112
10'	860	106	4.07	"	7.3	6300
12.5	1075			"		



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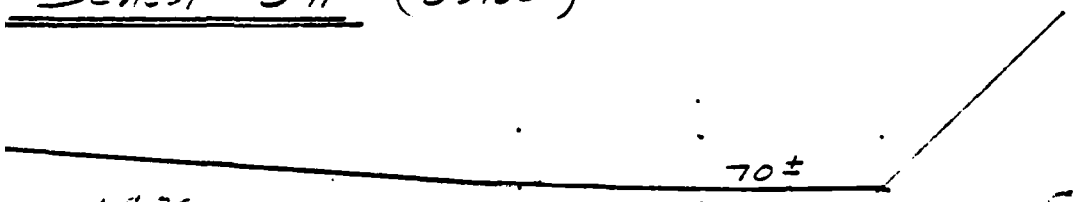
CONSULTING ENGINEERS
BOSTON, MASSACHUSETTS

SHEET NO. 6
JOB [illegible]
SUBJECT Hillside
CLIENT [illegible]

School Str (35+00)



$K = \frac{1.486}{.05}(.004)^{1/2} = 1.88$

$Q_{pipe} \approx 300$ cfs

$S = 0.004$ 20 ↑ 100 →

@ 23+00

$Q = 8800$ Str = 21 a-f

$Vol = 1171 \times 300 \div 43560 = 8.06$ a-f

7500+1300 bank = 8800

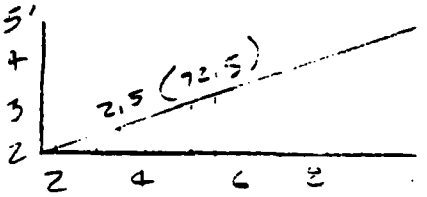
$Q_{P_2} = 8800\left(1 - \frac{8.06}{21}\right) = 5400$ cfs $D = 8'$ $Str_{P_2} = \frac{784 - 1}{43560} = 5.4$ a-f

$Str_{ave} = 6.7$ a-f

$Q_{P_3} = 8800\left(1 - \frac{6.7}{21}\right) = 6000$ cfs

@ 35+00 $Q = 3600 - 300 = 3300$ cfs (see Sht 7)

D	A	WP	$R^{2/3}$	K	V	Q
2	760	550	1.24	1.88	2.33	1774
5	2625	850	2.13	"	4	10,500



@ 27+00

$Q = 6000$, $Str_{P_1} = \frac{1020 \times 300}{43560} \approx 7$ a-f

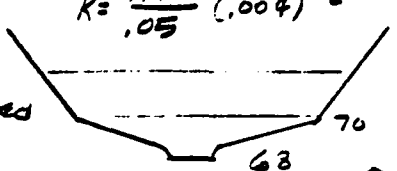
$Q_2 = 6000\left(1 - \frac{7.0}{21}\right) = 4000$ a-f $D = 2.5'$

$Str_{P_2} = \frac{741 \times 300}{43560} = 5.1$ a-f $Str_{ave} = 6$

$Q_{P_3} = 6000\left(1 - \frac{6}{21}\right) \approx 4300$ cfs.

@ 30+00

$K = \frac{1.486}{.05}(.004)^{1/2}$

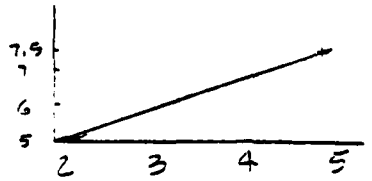


$Q = 4300$ cfs + 300 add. area = 4600 cfs

$S = 0.004$

10 ↑ 100 →

D	A	WP	$R^{2/3}$	K	V	Q
5.0	470	150	2.15	1.88	4	1900
7.5	920	200	2.78	"	5.23	4800 OK



8.244.1
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NA
FDD 2/6/79

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CONSULTING ENGINEERS
BOSTON, MASSACHUSETTS

SHEET NO. 7
JOB Dams
SUBJECT Hillside
CLIENT Corps

30+00

$stor = \frac{970 \times 300}{43560} = 6.7$

$Q_2 = 4600\left(1 - \frac{6.7}{21}\right) = 3137.$ cfs

$D_2 = 6'$ $stor_2 = \frac{770 \times 300}{43560} = 5.3$ a-f (elev 75.5)

$Q_3 = 4600\left(1 - \frac{6}{21}\right) = 3286.$ cfs

35+00 See Sht 6 $Q = 3300 +$ (add area) $= 3600$

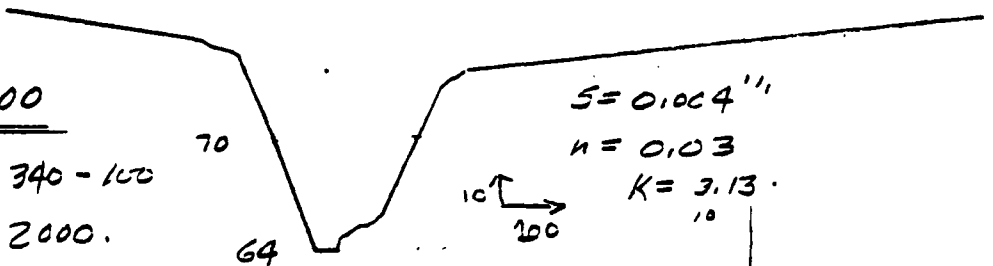
$D = 2.5$ (elev 72.5) $\frac{1070+920}{2} = 995.$

$Q_1 = 3300$ $stor = \frac{995 \times 500}{43560} = 11.0$ K

$Q_{P_2} = 3300\left(1 - \frac{11}{21}\right) = 1505.$ cfs $D = 2'$

$Q_{P_3} = 3300\left(1 - \frac{9.8}{21}\right) = 1760.$ cfs $stor = \frac{760(500)}{43560} = 8.6$

38+00

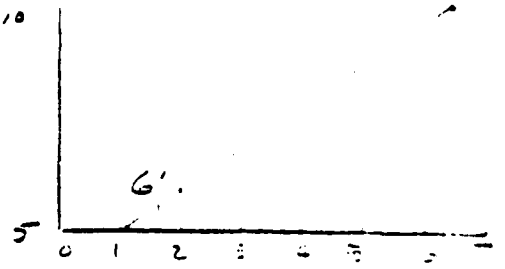


$S = 0.004$
$n = 0.03$
$K = 3.13$

1760 + 340 − 100

$Q = 2000.$

D	A	WP	$R^{.25}$	K	V	Q
10'	725	150	2.87.	3.13.	9.	6521.
5'	175	65	1.92.	"	6.08.	1063.



$stor = \frac{920+225}{2} \times \frac{300}{43560} = 4$ a-f

$Q_{P_2} = 2000\left(1 - \frac{4}{21}\right) = 1620.$ $stor = \frac{560 \times 300}{43560} = 4.5.$

$Q_{P_3} = 2000\left(1 - \frac{3.92}{21}\right) = 1626.$ cfs $L = 6'$

4.1
9

3/6/79

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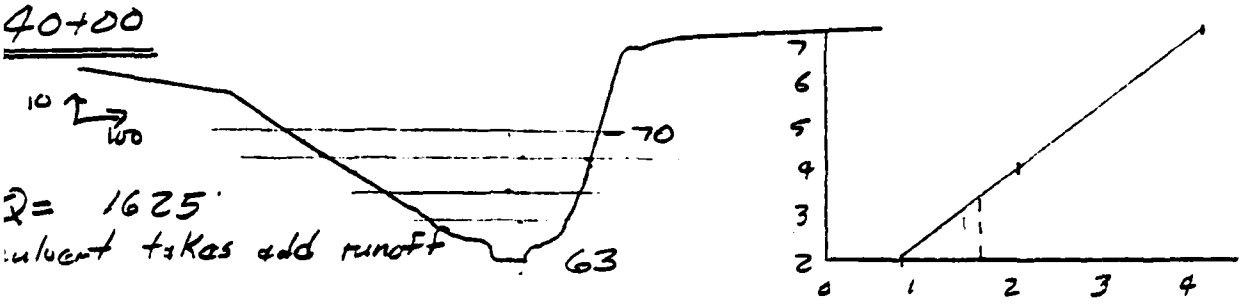
BOSTON, MASSACHUSETTS

SHEET NO. 8
JOB Dams
SUBJECT Hillside
CLIENT Corps

40+00



Q = 1625
Inlucent takes add runoff

D	A	WP	$R^{2/3}$	K	V	Q
7'	595	180	2.27	3.13	7	4149
4'	340	120	2.	"	6.29	2138
2'	170	80	1.67	"	5.2	882

1627 D = 3.25 (66.25)

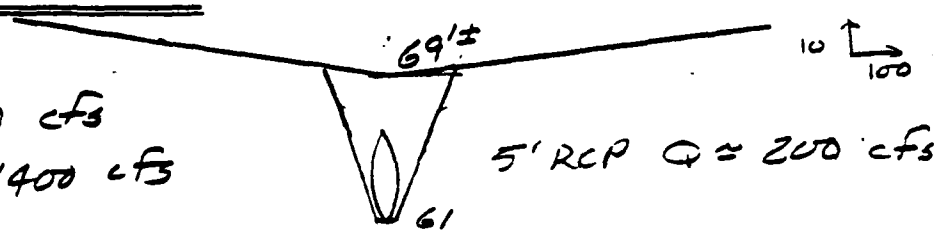
$$Stor_1 = \frac{\frac{225+300}{2} \times 200}{43560} = 1.2 \text{ a-f}$$

$$Q_2 = 1625\left(1 - \frac{1.2}{21}\right) = 1532 \text{ cfs} \qquad D = 3'$$

$$Stor_2 = \frac{250 \times 200}{43560} = 1.15 \text{ a-f}$$

$$Q_3 = 1625\left(1 - \frac{1.175}{21}\right) = 1534 \text{ cfs}$$

15+00 Main Str



Q = 1600 cfs
Proad = 1400 cfs

5' RCP Q ≈ 200 cfs

D	A	WP	$R^{2/3}$	K	V	Q
2'	270	270	1.0	3.13	3.1	837
4'	540	540	1.0	"	3.1	1690

Stor = 4.1 a-f
D = 3.3' (72.3')

$$Q_2 = 1400\left(1 - \frac{4.1}{21}\right) = 1127 \text{ cfs} \qquad Stor = 3.3 \text{ a-f}$$

$Q_3 = 1400\left(1 - \frac{3.7}{21}\right) = 1153$ cfs to wooded flood plain beyond.

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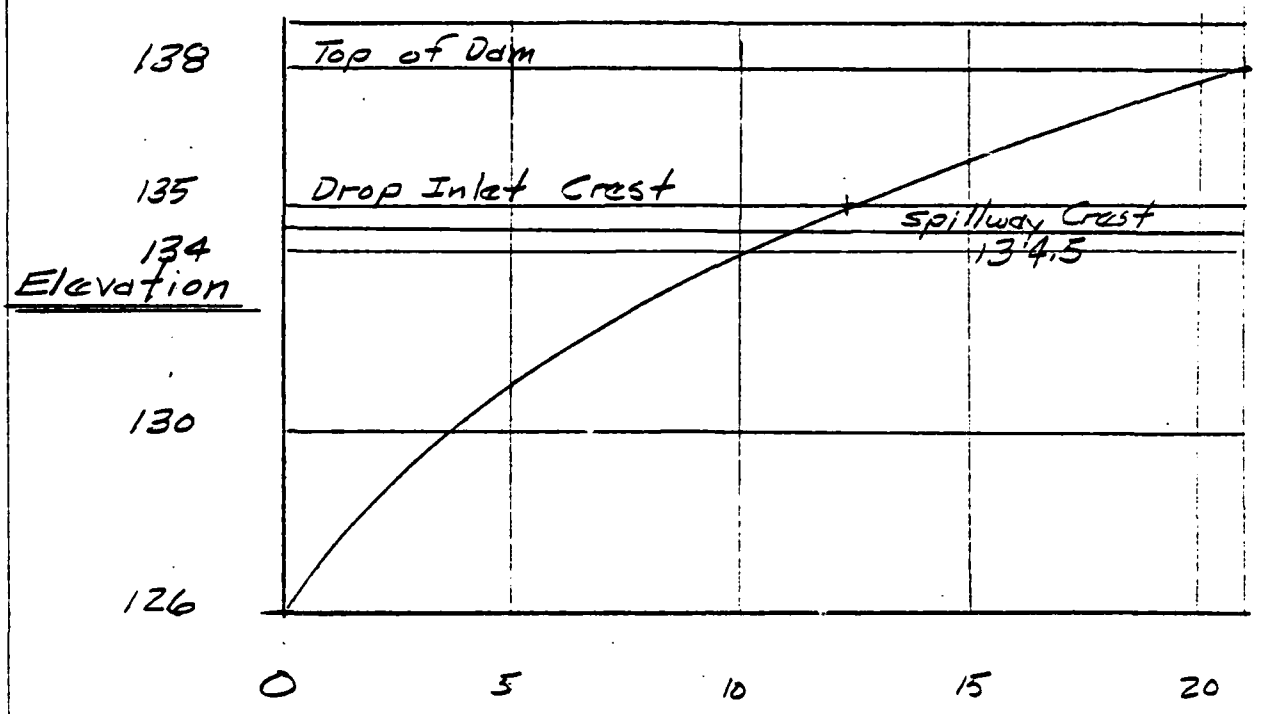
HH&B HAYDEN, HARDING & BUCHANAN, INC.
CONSULTING ENGINEERS
BOSTON, MASSACHUSETTS

SHEET NO. 9
JOB Dams
SUBJECT Hillside
CLIENT Corps



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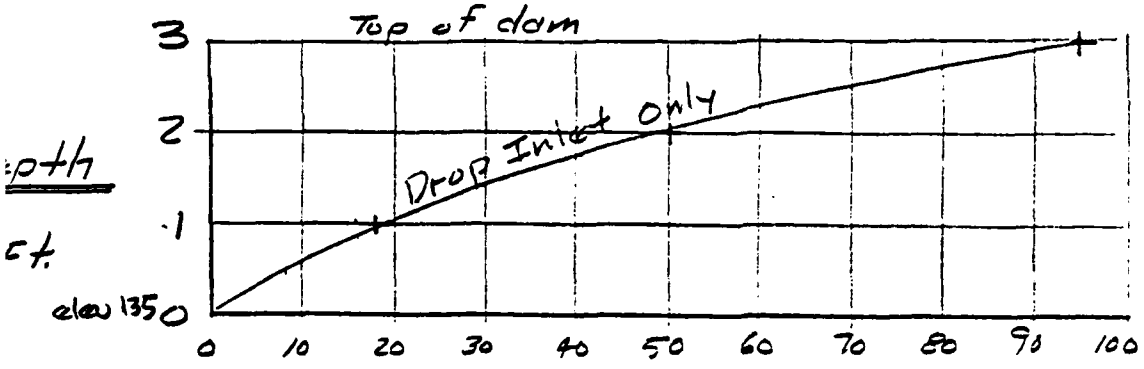
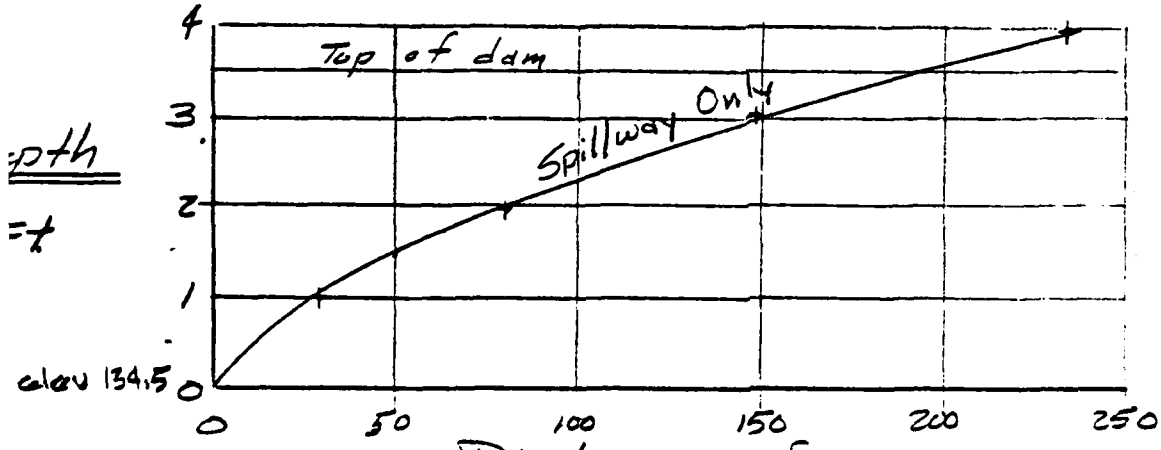
BOSTON, MASSACHUSETTS

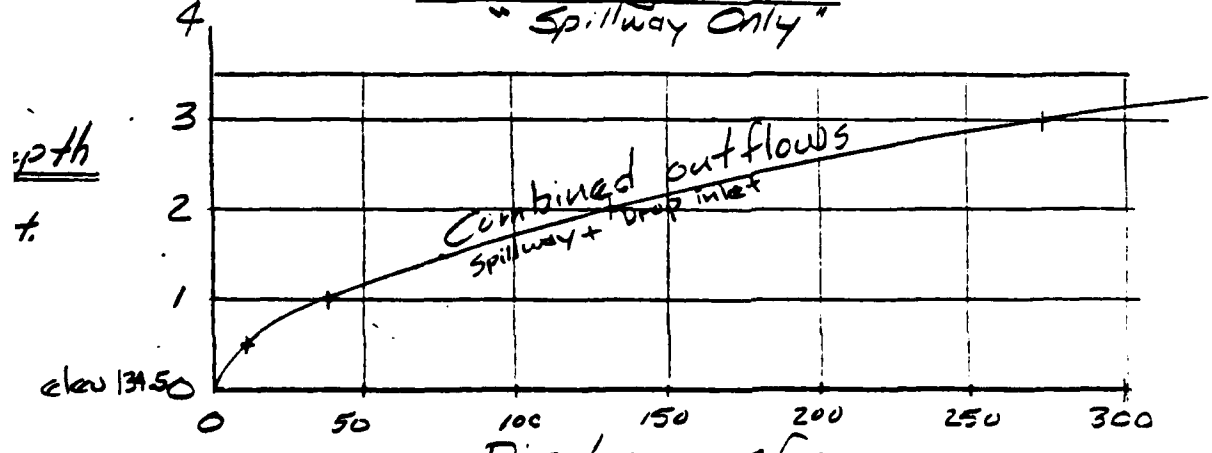
JOB Dams
SUBJECT Hillside
CLIENT Corps



Discharge - cfs
"Drop Inlet Only"



Discharge - cfs
"Spillway Only"



Discharg - cfs

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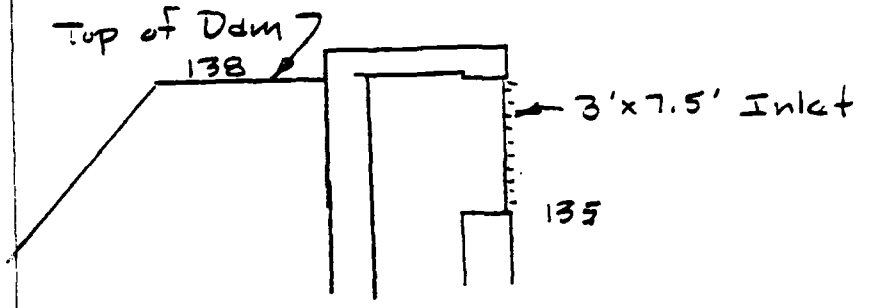
CONSULTING ENGINEERS
BOSTON MASSACHUSETTS

SHEET NO. 11
JOB Dams
SUBJECT Hillside
CLIENT Corps

Discharge Thru drop inlet & Spillway



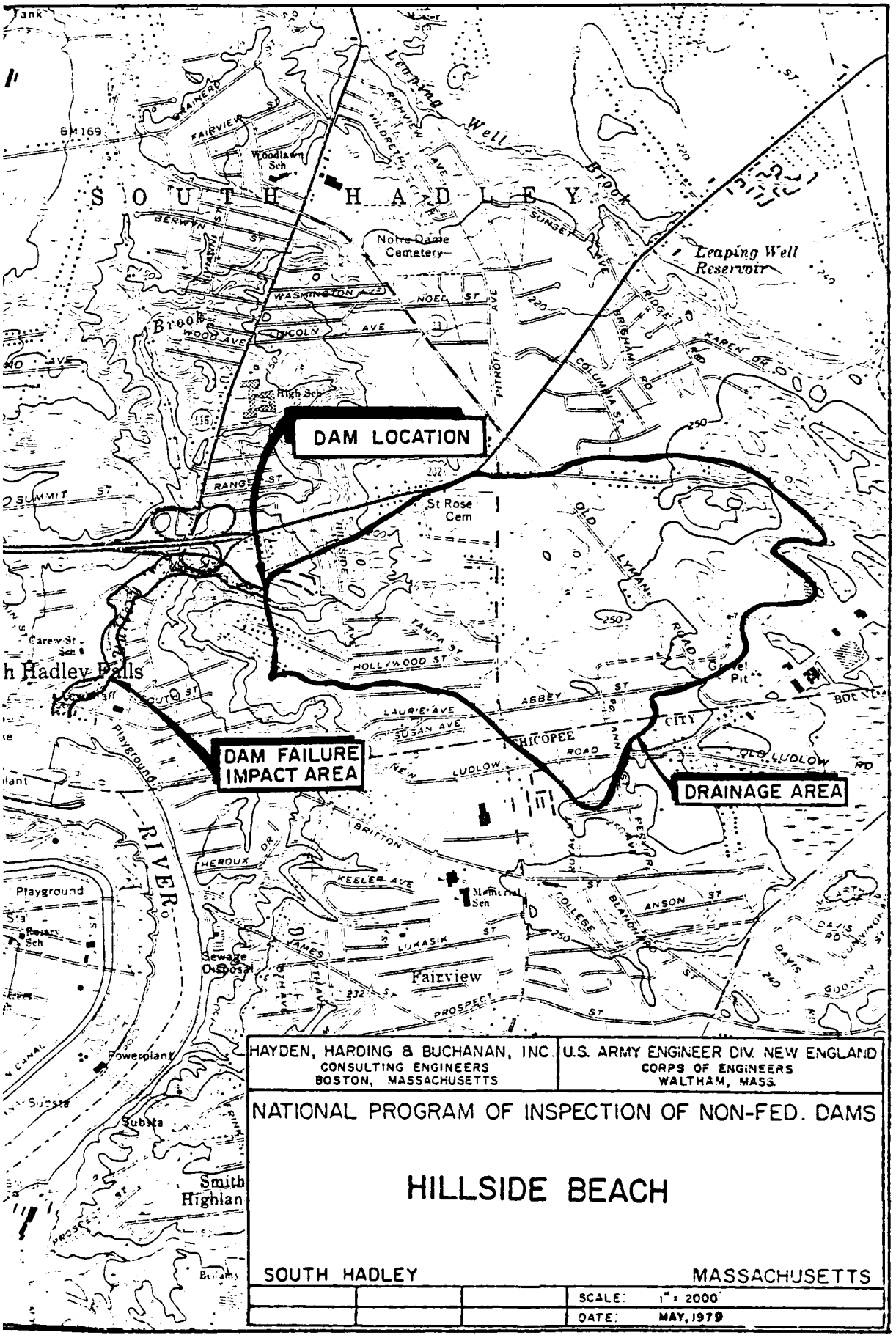
Weir

$Q = CLH^{3/2}$ "reduced for spill"

Elev	D	C	L	Q	Q^T
97	0	—	7.5	0	0
98	1	2.83	"	21	18
99	2	2.82	"	60	50
100	3	2.82	"	110	95

Spillway 134.5

D	C	L	$H^{3/2}$	Q
1	2.68	10.83	1	29
2	2.65	"	2.83	81
3	2.66	"	5.2	149
4	2.70	"	8	234



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

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

HILLSIDE BEACH

SOUTH HADLEY MASSACHUSETTS

			SCALE: 1" = 2000'
			DATE: MAY, 1979

APPENDIX E

INFORMATION AS CONTAINED IN THE NATIONAL INVENTORY OF DAMS

INVENTORY OF DAMS IN THE UNITED STATES

① STATE	② IDENTITY NUMBER	③ DIVISION	④ STATE	⑤ COUNTY	⑥ CONGR DIST.	⑦ STATE	⑧ COUNTY	⑨ CONGR DIST.	⑩ NAME	⑪ LATITUDE (NORTH)	⑫ LONGITUDE (WEST)	⑬ REPORT DATE DAY	MO	YR
MA	600	NED	25	015	01				HILLSIDE BEACH DAM	4215.2	7235.1	25	MAY	79

⑭ POPULAR NAME	⑮ NAME OF IMPOUNDMENT
	TRIB TO BUTTERY BROOK

⑯ REGION	⑰ BASIN	⑱ RIVER OR STREAM	⑲ NEAREST DOWNSTREAM CITY–TOWN–VILLAGE	⑳ DIST FROM DAM (MI.)	㉑ POPULATION
01	06	TRIB TO BUTTERY BROOK	SOUTH HADLEY	0	17000

㉒ TYPE OF DAM	㉓ YEAR COMPLETED	㉔ PURPOSES	㉕ STRUCTURAL HEIGHT (FT.)	㉖ HYDRAULIC HEIGHT (FT.)	㉗ IMPOUNDING CAPACITIES MAXIMUM (ACRE–FT.)	NORMAL (ACRE–FT.)	DIST	OWN	FED R	PRV/FED	SCS A	VER/DATE
REPCOT	1900	R	25	22	21	12	NED	N	N	N	N	25MAY79

㉘ REMARKS
21 CONCRETE CORE WALL

㉙ D/S HAS	㉚ SPILLWAY CREST LENGTH	㉛ TYPE	㉜ WIDTH (FT.)	㉝ MAXIMUM DISCHARGE (FT.)	㉞ VOLUME OF DAM (CY)	㉟ POWER CAPACITY INSTALLED (MW)	㊱ PROPOSED (MW)	㊲ NAVIGATION LOCKS NO.	LENGTH (FT.)	WIDTH (FT.)	LENGTH (FT.)	WIDTH (FT.)	LENGTH (FT.)	WIDTH (FT.)	LENGTH (FT.)	WIDTH (FT.)
1	332	C	11	190												

㊳ OWNER	㊴ ENGINEERING BY	㊵ CONSTRUCTION BY
THEROUX BROS REALTY		

㊶ REGULATORY AGENCY DESIGN	CONSTRUCTION	OPERATION	MAINTENANCE

㊷ INSPECTION BY	㊸ INSPECTION DATE DAY | MO | YR	㊹ AUTHORITY FOR INSPECTION
HAYDEN HARDING + BUCHANAN, INC	12APR79	PL 92-367

㊺ REMARKS
31-PROVISIONS FOR 6 IN STOPLOGS

END

FILMED

8-85

DTIC