AD-A143 340 NATIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL DAMS MERRIMAN POND DAM (CT.. (U) CORPS OF ENGINEERS WALTHAM MA NEW ENGLAND DIV JUN 80 1/2

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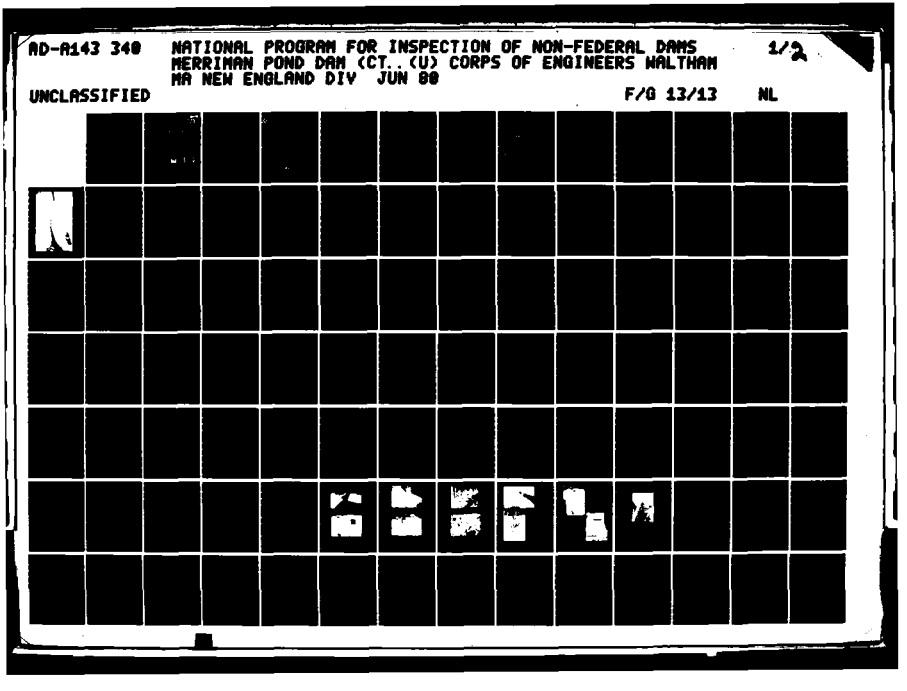

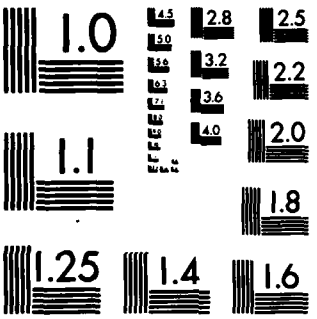

NAUGATUCK RIVER BASIN

WATERTOWN, CONNECTICUT

(1)

MERRIMAN POND DAM
CT 00128

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

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

JUNE 1980

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE *(When Data Entered)*

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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,

Naugatuck River Basin
Watertown, Conn.

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

The Merriman Pond Dam consists of an earth embankment with a maximum height of 16 ft., a top width that varies from 30 to 80 ft, and an overall length of 500 ft, including 12.5 ft. long overflow spillway located approx. 150 ft. from the right end of the dam. The dam is judged to be in poor condition.The dam is classified as small in size, with a high hazard potential.

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

REPLY TO
ATTENTION OF:

NEDED

JAN 07 1981

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

Dear Governor O'Neill

Inclosed is a copy of the Merriman Pond Dam (CT-00128) Phase I Inspection Report, which was prepared under the National Program for Inspection of Non-Federal Dams. This report is presented for your use and is based upon a visual inspection, a review of the past performance and a brief hydrological study of the dam. A brief assessment is included at the beginning of the report. I have approved the report and support the findings and recommendations described in Section 7 and ask that you keep me informed of the actions taken to implement them. This follow-up action is a vitally important part of this program.

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

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

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

Sincerely,

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

Incl
As stated

MERRIMAN POND DAM
CT 00128

NAUGATUCK RIVER BASIN
WATERTOWN, CONNECTICUT

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

NATIONAL DAM INSPECTION PROGRAM
PHASE I INSPECTION REPORT

IDENTIFICATION NO: CT 00128

NAME OF DAM: Merriman Pond Dam

TOWN: Watertown

COUNTY AND STATE: Litchfield County, Connecticut

STREAM: Unnamed tributary to Smith Pond Brook

DATE OF INSPECTION: May 2, 1980

BRIEF ASSESSMENT

The Merriman Pond Dam consists of an earth embankment with a maximum height of 16 feet, a top width that varies from 30 to 80 feet, and an overall length of 500 feet, including a 12.5 foot long overflow spillway located approximately 150 feet from the right end of the dam. A paved road extends the entire length of the dam with a steel beam and concrete bridge crossing the spillway discharge channel. The outlet works consist of an 8-inch low level outlet or blowoff located to the left of the spillway and controlled by a downstream valve.

The dam impounds Merriman Pond which is used as the water supply for turf irrigation of an adjacent golf course.

Based on the visual inspection, the dam is judged to be in poor condition. Features that could affect the future integrity of the dam are continued erosion of the upstream and downstream slopes, seepage through the embankment, the presence of trees, stumps and brush on the downstream slope and deterioration of the spillway wing walls.

The dam is classified as "Small" in size, with a "High" hazard potential. A Test Flood equal to the 1/2 PMF was selected in accordance with the Corps of Engineers' Recommended Guidelines for Safety Inspection of Dams. The Test Flood inflow of 680 cfs results in a routed outflow of 345 cfs that overtops the dam by 0.1 feet.

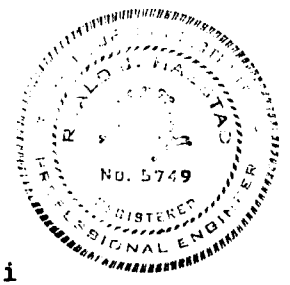
The spillway capacity with the water level at the top of the dam is 330 cfs and is equal to 96 percent of the Test Flood routed outflow.

It is recommended that a qualified, registered engineer be retained to investigate the erosion of the upstream and downstream slopes and design erosion protection where required; to investigate the seepage through the dam; to investigate the removal of trees from the downstream slopes; to evaluate the condition of the spillway wing wall, and the floor of the spillway discharge channel under a no-flow condition; and to evaluate the condition and safety of the existing piping with valves located downstream. In addition, the dam should be inspected annually by a qualified, registered engineer, an operations and maintenance manual should be prepared and a formal warning system put into effect.

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

Ronald G. Litke, P.E.
Project Engineer

Roald Haestad
President



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

ARAMAST MAHTESIAN, MEMBER
Geotechnical Engineering Branch
Engineering Division

CARNEY M. TERZIAN, MEMBER
Design Branch
Engineering Division

RICHARD DIBUONO, CHAIRMAN
Water Control Branch
Engineering Division

APPROVAL RECOMMENDED:

JOE B. FRYAR
Chief, Engineering Division

PREFACE

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

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

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the

condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

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

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

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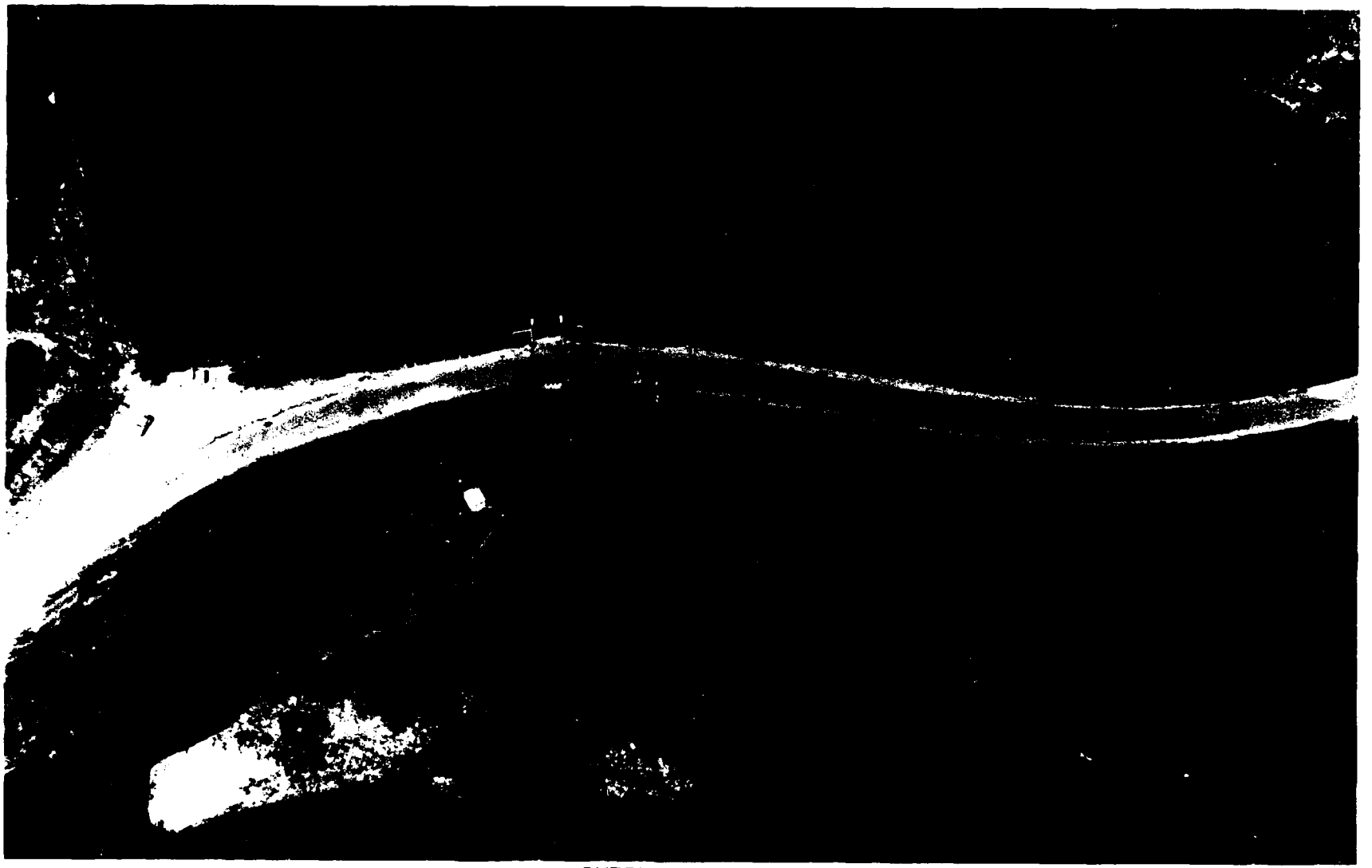
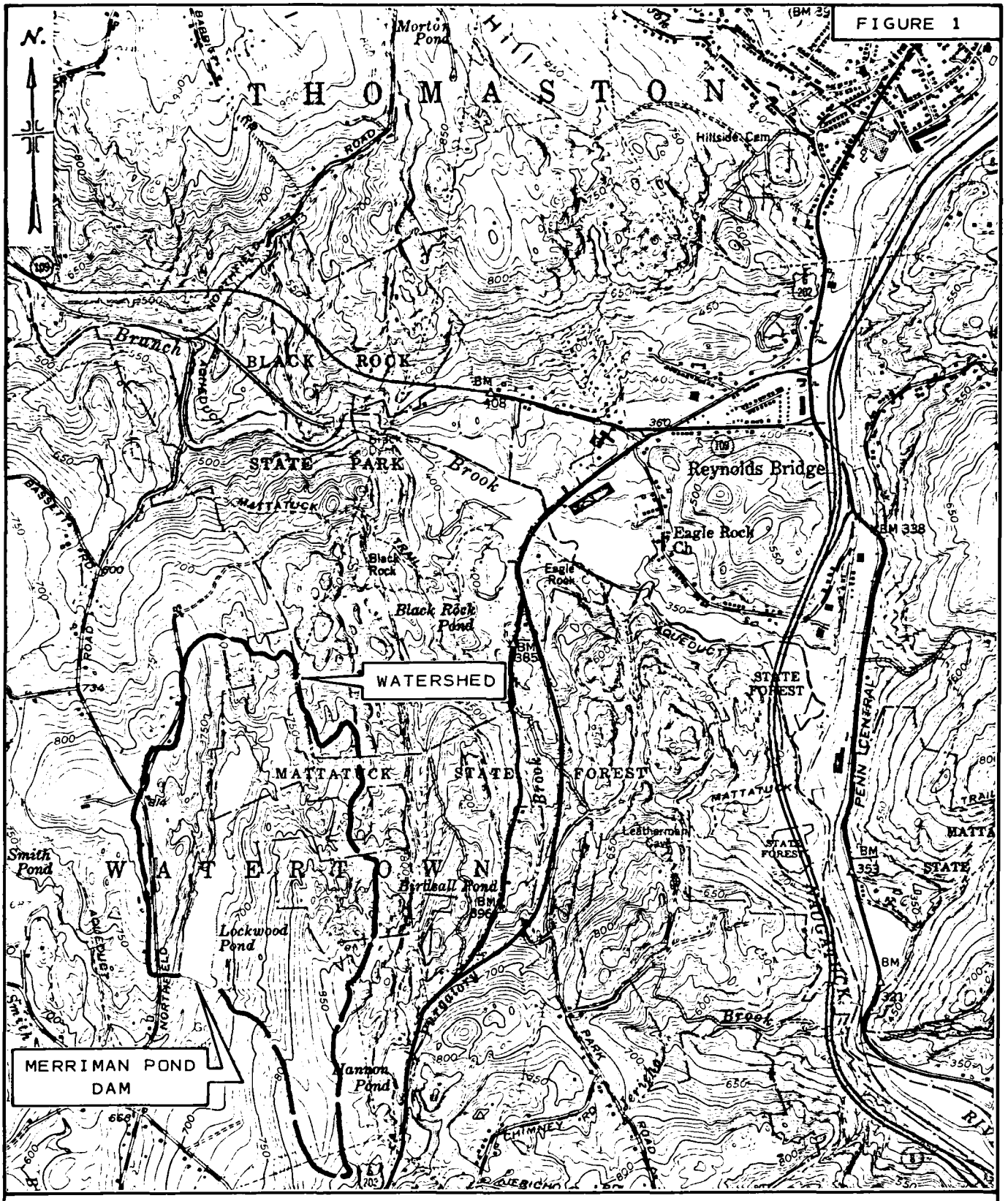


OVERVIEW PHOTO

U.S.ARMY ENGINEER DIV. NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASSACHUSETTS	NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS	MERRIMAN POND DAM - CT00128
ROALD HAESTAD, INC. CONSULTING ENGINEERS WATERBURY, CONNECTICUT		TRIBUTARY TO SMITH POND BROOK
		WATERTOWN, CONNECTICUT DATE: 19 APRIL '80

FIGURE 1



LOCATION PLAN

MERRIMAN POND DAM
WATERTOWN, CONNECTICUT

SCALE: 1" = 2000'

ROALD HAESTAD, INC. THOMASTON QUADRANGLE 1972

NATIONAL DAM INSPECTION PROGRAM
PHASE I INSPECTION REPORT

PROJECT INFORMATION
SECTION 1

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. Roald Haestad, Inc., has been retained by the New England Division to inspect and report on selected dams in the State of Connecticut. Authorization and notice to proceed were issued to Roald Haestad, Inc., under a letter of April 14, 1980, from William E. Hodgson, Jr., Colonel, Corps of Engineers. Contract No. DACW33-80-C-0048 has been assigned by the Corps of Engineers for this work.

b. Purpose of Inspection

The purposes of the program are to:

1. Perform technical inspection and evaluation of non-federal dams to identify conditions requiring correction in a timely manner by non-federal interest.
2. Encourage and prepare the States to quickly initiate effective dam inspection programs for non-federal dams.
3. To update, verify and complete the National Inventory of Dams.

1.2 Description of Project

a. Location

The Merriman Pond Dam is located off Northfield Road on an unnamed tributary to Smith Pond Brook in Watertown, Connecticut. The dam is shown on the Thomaston Quadrangle Map having coordinates of latitude N 41° 38.1', and longitude W 73° 06.9'. The impoundment is called Lockwood Pond on the U.S.G.S. Map.

b. Description of Dam and Appurtenances

The Merriman Pond Dam consists of an earth embankment with a maximum height of 16 feet and an overall length of 500 feet, including a 12.5 foot long overflow spillway located approximately 150 feet from the right end of the dam. A paved roadway extends the entire length of the dam. The top width varies from a minimum of 30 feet near the service bridge over the spillway discharge channel, to a maximum of 80 feet near the abutments. The upstream and downstream slopes are 2 horizontal to 1 vertical. The upstream slope is protected by stone riprap and the downstream slope is covered with grass, brush and small trees. The spillway consists of a concrete overflow section with upstream wingwalls on either side. The concrete and stone masonry training walls also serve as abutments for the service bridge. Approximately 6 feet below the service bridge is an old bridge slab indicating that the dam had been raised in the past, see Figure 2, page B-1 in Appendix B. The outlet works consist of an 8-inch cast iron low level outlet or blowoff located to the left of the spillway and controlled by a manually operated downstream gate valve. The discharge end of the blowoff is covered with a cast iron plug so that water may be diverted

through a 6-inch cast iron pipe to a downstream pump house, where it is pumped to irrigate the adjacent golf course. An additional valve is present at the downstream end of the spillway discharge channel, but its purpose is unknown. Another unknown valve was reported to exist near the left upstream end of the spillway.

c. Size Classification - "Small"

According to the Corps of Engineers' Recommended Guidelines for Safety Inspection of Dams, a dam is classified as "Small" in size if the height is between 25 feet and 40 feet, or the dam impounds between 50 Acre-Feet and 1,000 Acre-Feet. The dam has a maximum height of 16 feet and a maximum storage capacity of 328 Acre-Feet. Therefore, the dam is classified as "Small" in size.

d. Hazard Classification - "High"

Based on the Corps of Engineers' Recommended Guidelines for Safety Inspection of Dams, the hazard classification for the dam is "High". A dam failure analysis indicates that two (2) houses located downstream of the dam would be effected in the event of a dam breach, possibly resulting in the loss of more than a few lives.

The depth of flow in the brook in the area of the houses prior to dam breach would be 3 feet. The water level in the brook would rise to about 12 feet in this area as a result of the dam breach, and flood the houses to a depth of 2 - 3 feet above sill elevation.

e. Ownership

Former Owners: Princeton Knitting Mills
Burlington Mills
Hamilton and Main Corporation
Grossman Industrial Properties
Crestbrook Country Club, Inc.

Present Owner: Town of Watertown
James Troup, Town Manager
Town Hall Annex
Main Street
Watertown, Connecticut 06795
(203) 274-5411

f. Operator — George Christie, Golf Course Superintendent
Crestbrook Park Golf Club
Northfield Road
Watertown, Connecticut 06795
(203) 274-5411, ext. 317

g. Purpose of Dam

The dam impounds Merriman Pond which supplies water to Crestbrook Park Golf Club for turf irrigation.

h. Design and Construction History

No information was available on the original design and construction of the dam. It was reported that the dam was raised approximately 6 feet in 1941. In 1964 repairs were made to the dam to stop leakage occurring in the vicinity of the spillway. An area on the upstream slope of the dam in the vicinity of the spillway was excavated and repaired by compacting suitable material in shallow lifts. In addition, several holes were cut through the floor of the spillway discharge channel and concrete vibrated into voids under the slab. A new 5 inch thick reinforced concrete slab was then constructed over the existing channel floor. The 1964 repairs were made by National Enterprise, Landscape and Tree Service, as recommended by Clarke and Pearson, Civil Engineers, Ansonia, Connecticut.

i. Normal Operational Procedures

Merriman Pond supplies water to the Crestbrook Park Golf Club for turf irrigation. The low level outlet or blowoff is flushed out every spring prior to pumping operations. The intake line to the pump house is drained in the fall. Water is drawn from the pond as it is required for golf course turf irrigation.

1.3 Pertinent Data

a. Drainage Area

The drainage area consists of 0.64 square miles of "rolling" terrain, the majority of which is wooded. The only development is a Town-owned Park and Golf Club.

b. Discharge at Damsite

The discharge at the damsite is normally over a 12.5' long concrete overflow spillway.

1.	Outlet Works (conduits) Size:	8-inch
	Invert Elevation at Outlet:	663.1
	Discharge Capacity:	4 cfs
2.	Maximum Known Flood at Damsite:	Unknown
3.	Ungated Spillway Capacity at Top of Dam:	330 cfs
	Elevation:	679
4.	Ungated Spillway Capacity at Test Flood Elevation:	336 cfs
	Elevation:	679.1
5.	Gated Spillway Capacity at Normal Pool Elevation:	N/A
	Elevation:	N/A
6.	Gated Spillway Capacity at Test Flood Elevation:	N/A
	Elevation:	N/A
7.	Total Spillway Capacity at Test Flood Elevation:	336 cfs
	Elevation:	679.1
8.	Total Project Discharge at Top of Dam:	330 cfs
	Elevation:	679
9.	Total Project Discharge at Test Flood Elevation:	345 cfs
	Elevation:	679.1

c. Elevation - Feet Above Mean Sea Level (NGVD)

1. Streambed at Toe of Dam:	663
2. Bottom of Cutoff:	N/A
3. Maximum Tailwater:	N/A
4. Recreation Pool:	675
5. Full Flood Control Pool:	N/A
6. Spillway Crest:	675
7. Design Surcharge - Original Design:	Unknown
8. Top of Dam:	679
9. Test Flood Surcharge:	679.1

d. Reservoir - Length in Feet

1. Normal Pool:	4,000'
2. Flood Control Pool:	N/A
3. Spillway Crest Pool:	4,000'
4. Top of Dam:	4,000'
5. Test Flood Pool:	4,000'

e. Storage - Acre-feet

1. Normal Pool:	170 Acre-Feet
2. Flood Control Pool:	N/A
3. Spillway Crest Pool:	170 Acre-Feet
4. Top of Dam:	324 Acre-Feet
5. Test Flood Pool:	324 Acre-Feet

f. Reservoir Surface - Acres

1. Normal Pool:	34 Acres
2. Flood-Control Pool:	N/A
3. Spillway Crest:	34 Acres
4. Test Flood Pool:	45 Acres
5. Top of Dam:	45 Acres

g. Dam

1.	Type:	Earth Embankment
2.	Length:	500'
3.	Height:	16'
4.	Top Width:	Varies from 30' to 80'
5.	Side Slopes:	Upstream and Downstream 2 Horizontal to 1 Vertical
6.	Zoning:	Unknown
7.	Impervious Core:	Unknown
8.	Cutoff:	Unknown
9.	Grout Curtain:	Unknown
10.	Other:	

h. Diversion and Regulating Tunnel N/A

i. Spillway

1. Type:	Concrete Overflow
2. Length of Weir:	12.5'
3. Crest Elevation with Flashboards: without Flashboards:	 N/A 675
4. Gates:	N/A
5. Upstream Channel:	N/A
6. Downstream Channel:	Natural Streambed
7. General:	Provisions for flash boards are present. Flash boards are currently not in use.

j. Regulating Outlets

1. Invert:	663.1
2. Size:	8"
3. Description:	Cast iron low level outlet or blowoff. Plugged at downstream end. Flow normally discharges to downstream pump house.
4. Control Mechanism:	Manually operated downstream gate
5. Other:	Unknown gate present in spillway discharge channel. See Figure 2, page B-1 in Appendix B.

ENGINEERING DATA
SECTION 2

2.1 Design Data

There was no design data available for review on either the original design, the raising of the dam, or the 1964 repairs. A report on the dam prepared by Buck and Buck, Engineers, Hartford, Connecticut, for the Connecticut Water Resources Commission, was available and reviewed.

2.2 Construction Data

There was no construction data available for review for either the original construction or the raising of the dam in 1941. Various correspondence concerning the construction techniques used during the 1964 repairs were available and reviewed. The repairs were made by National Enterprises, Landscape and Tree Service, as recommended by Clarke and Pearson, Civil Engineers, Ansonia, Connecticut.

2.3 Operation Data

There was no operational data available on the dam.

2.4 Evaluation of Data

a. Availability

Existing data was available from the State of Connecticut, Department of Environmental Protection. The Town of Watertown, owner of the dam, did not have any information concerning the dam.

b. Adequacy

The information that was available along with the visual inspection, past performance history and the hydraulic and hydrologic calculations performed for this report were adequate to assess the condition of the dam.

c. Validity

Field inspections and surveys revealed that the dam is substantially as indicated in the Buck and Buck report. The spillway was measured to be 12.5 feet wide as opposed to 15.33 feet contained in the report.

VISUAL INSPECTION

SECTION 3

3.1 Findings

a. General

The visual inspection of the dam was conducted on May 2, 1980. At the time of inspection the water level was approximately 0.1 feet above spillway crest. The Watertown Fire Department was testing fire fighting equipment at the dam the day of the inspection, Photo 1. The general condition of the dam at the time of inspection was poor.

The dam consists of an earth embankment with an overflow concrete spillway located approximately 150 feet from the right end of the dam.

b. Dam

The upstream slope of the earth embankment is covered with riprap, brush and small saplings. Erosion resulting from wave action has occurred at many locations on the slope, Photo 2. Erosion has also occurred adjacent to the upstream left and right spillway wing walls, Photos 3 and 4, respectively. This erosion may be partially due to the testing of fire fighting equipment.

A paved roadway covers a portion of the crest, Photo 1. The remaining portion of the crest is grass-covered with numerous areas worn bare by vehicular traffic.

The surface of the downstream slope is somewhat uneven, apparently as a result of minor sloughing. The slope is covered with brush, decayed stumps, saplings and grass, Photo 5, and is difficult to traverse as a result of this vegetation. The toe of the slope to the left of the spillway channel is wet and soggy and is

covered with moisture-loving vegetation. Seepage was observed in the area of the 8-inch cast iron blowoff near the left spillway training wall, Photo 6. The flow was slightly rust-colored and free of sediment at the time of inspection. Due to extensive vegetation, it was not possible to define the lateral extent of the seepage along other portions of the toe and downstream of the dam. Water from an adjacent pond on the golf course, Overview Photo, page x, flows in a small brook parallel to the downstream toe and meets the toe of the embankment approximately 100 feet to the left of the spillway discharge channel. Some erosion of the toe of the slope is occurring at this location.

Erosion is also occurring adjacent to the spillway training walls, Photos 7 and 8. The water flowing in Photo 8 is the result of the testing of fire fighting equipment and is an indication of the cause of the erosion. An erosion gully 4 feet wide and up to 2 feet deep was also observed in the vicinity of the blowoff gate.

A 1.5 foot wide by 1 feet deep gully was also observed just upstream of the pump house near the toe of the right embankment.

c. Appurtenant Structures

The appurtenant structures consist of an overflow spillway, a service bridge over the spillway and the outlet works.

The spillway consists of a concrete overflow section with steel pipes extending from the crest to support flashboards, Photo 9. Flashboards were not in use at the time of the inspection. The upstream concrete wingwalls are deteriorated at the water line, with reinforcing steel exposed in one area, Photo 4. The upper portion of the training walls are concrete, Photo 10, with some cracks and

efflorescence observed. The lower portion of the training walls are stone masonry with mortar missing from several joints, and rust-colored staining present at the base of the right training wall, Photo 10. An old bridge slab is present under the upper bridge and above the spillway discharge channel, Photo 10. The service bridge is in good condition with some minor spalling of the concrete parapet walls.

The outlet works consist of an 8-inch cast iron low level outlet or blowoff located to the left of the spillway and controlled by a manually operated downstream gate valve. The outlet end is covered by a cast iron plug, Photo 6, so that water may be diverted through a 6-inch cast iron pipe, Photo 11, to a downstream pump house.

A 4 - 6 inch gate valve, partially buried and above the water line, was observed on the upstream slope to the right of the spillway. It was reported that the gate valve and associated piping was some type of suction line to the pump house. At the present time electrical conduits run through the pipe and gate valve to some type of aeration system in the pond.

An additional gate valve was observed near the end of the spillway discharge channel. Its use is unknown.

d. Reservoir Area

There are no indications of instability along the edges of the reservoir in the vicinity of the dam.

e. Downstream Channel

The downstream channel consists of a natural streambed. The channel bottom is covered with small boulders and gravel. A 6-inch cast iron intake pipe to the pump house crosses the channel just downstream of the spillway discharge channel, Photo 11.

3.2 Evaluation

On the basis of the visual inspection, the dam is judged to be in poor condition. The following conditions could affect the future integrity of the dam:

1. Continued erosion and displacement of the riprap on the upstream slope of the dam;

2. Continued erosion on the upstream and downstream slopes adjacent to the right and left spillway training walls could lead to a breach of the dam;

3. Continued seepage through the earth embankment, as evidenced by the rust-stained area adjacent to the blowoff and at the base of the right spillway training wall, and the existence of large areas of moisture-loving vegetation, could lead to internal erosion of the dam;

4. The root systems of the trees, stumps and brush growth on the downstream slope could provide pathways for future seepage through the dam;

5. Continued deterioration of the concrete wing walls could affect the stability of the dam; and

6. Additional undercutting of the downstream toe of the slope by the adjacent brook could jeopardize the stability of the downstream slope.

OPERATIONAL AND MAINTENANCE PROCEDURES

SECTION 4

4.1 Operational Procedures

a. General

During the golfing season, the discharge end of the low level outlet or blowoff is plugged and the gate valve left open to allow water to flow to the downstream pump house. Water is drawn as required for golf course turf irrigation.

b. Description of Any Warning System In Effect

There is no formal warning system in effect for the dam.

4.2 Maintenance Procedures

a. General

Normal maintenance procedures consist of mowing the grass on portions of the crest of the dam.

b. Operating Facilities

The low level outlet or blowoff line is flushed every spring prior to pumping. The intake pipe to the pump house is drained every fall.

4.3 Evaluation

Present operations and maintenance procedures are inadequate, as is evident by the heavy brush growth on the downstream slope and erosion of several areas of the dam. An operations and maintenance manual should be prepared for the dam and operating facilities. In addition, the dam should be inspected annually by a qualified, registered engineer. A formal warning system should also be put into effect.

EVALUATION OF HYDRAULIC/HYDROLOGIC FEATURES

SECTION 5

5.1 General

The spillway at Merriman Pond Dam consists of a 12.5 foot long concrete overflow section which discharges through a bridge opening located within the dam. The spillway crest is 4 feet below the top of the dam. Flashboards were previously used but have been removed. The spillway has a capacity of 330 cfs before overtopping the dam. The 8-inch low level outlet or blowoff has a capacity of 4 cfs.

The watershed area is 0.64 square miles of "rolling" terrain, mostly wooded, with the only development being a Town-owned park and golf club. Elevations range from 860 at the east side of the watershed to 675 at the spillway.

5.2 Design Data

No design data on the dam was available. An engineering report on the dam by Buck and Buck, Engineers, Hartford, Connecticut, for the Connecticut Water Resources Commission lists the spillway capacity as 230 cfs and the design discharge as 100 cfs. See Appendix B, pages B-9 and B-10.

5.3 Experience Data

There is no information available on maximum water levels or discharges.

5.4 Test Flood Analysis

The dam is classified as "Small" in size, with a "High" hazard potential. According to the Corps of Engineers' Recommended Guidelines for Safety Inspection of Dams, the Test Flood for a "Small", "High" hazard dam is in the range of the 1/2 Probable Maximum Flood

(1/2 PMF) to the Probable Maximum Flood (PMF), depending on the involved risk.

A Test Flood equal to the 1/2 PMF was selected because of the limited downstream development, the low hydraulic height and small storage capacity of the impoundment.

The Test Flood was calculated using a peak inflow for the PMF of 2,125 cubic feet per second per square mile (csm), from the minimum 2 square mile drainage area shown on the guide curves for "rolling" terrain supplied by the Corps of Engineers, and the 0.64 square mile watershed of Merriman Pond. The peak 1/2 PMF inflow was calculated to be 680 cfs and the routed outflow 345 cfs.

The Test Flood was routed through the impoundment in accordance with "Estimating Effect of Surcharge Storage on Probable Maximum Discharges" provided by the Corps of Engineers. The impoundment was assumed to be initially at spillway level. The routed outflow was calculated to be about 345 cfs and overtops the dam by 0.1 feet. The 330 cfs spillway capacity is capable of discharging 96 percent of the Test Flood routed outflow.

5.5 Dam Failure Analysis

A dam failure analysis was made using the "Rule of Thumb" guidance provided by the Corps of Engineers. Failure was assumed with the water level at the top of the dam.

The dam breach would release up to 12,000 cfs into the stream channel below the dam. The flood waters would overtop Northfield Road and Smith Pond Brook Road by about 6 feet and Cutler Street (U.S. Routes 6 and 202) by 2.2 feet. Two houses south of Cutler Street would be flooded to a depth of 2 - 3 feet above sill elevation before the flood waters reached Heminway Pond. Prior to dam

failure, the water depth in the brook near the houses would be about 3 feet. The depth of flow in the brook would rise to about 12 feet as a result of the dam breach.

The failure of Merriman Pond Dam could result in the loss of more than a few lives. Therefore, the dam is classified as "High" hazard potential.

EVALUATION OF STRUCTURAL STABILITY
SECTION 6

6.1 Visual Observations

The visual inspection did not disclose any indications of immediate structural instability.

6.2 Design and Construction Data

Design and construction data were not available for review on either the original construction or the 1941 raising. Various correspondence concerning work performed in 1964 to repair leakage in the vicinity of the spillway was available and reviewed.

6.3 Post-Construction Changes

In 1964 repairs were made to the dam to stop leakage occurring in the vicinity of the spillway. An area on the upstream slope of the dam was excavated and repaired by compacting suitable material in shallow lifts. In addition, several holes were cut through the floor of the spillway discharge channel and concrete vibrated into the voids under the slab. A new 5-inch thick reinforced concrete slab was then constructed over the existing channel floor.

6.4 Seismic Stability

The dam is located in Seismic Zone 1 and in accordance with the recommended Phase I Inspection Guidelines does not warrant seismic stability analysis.

ASSESSMENT, RECOMMENDATIONS, & REMEDIAL MEASURES
SECTION 7

7.1 Dam Assessment

a. Condition

On the basis of the visual inspection, the dam is judged to be in poor condition. The future integrity of the dam could be affected by: continued erosion and displacement of riprap on the upstream slope; continued erosion on the upstream and downstream slopes adjacent to the spillway training walls; continued seepage through the earth embankment; trees, stumps and extensive brush growth on the downstream slope; continued deterioration of the concrete in the spillway wingwalls; additional undercutting of the downstream toe by the adjacent brook; and possible leakage from the blow-off and unknown pipes which are constantly pressurized due to the downstream location of the control valves.

An evaluation of the hydraulic and hydrologic features of the dam indicate that the spillway is capable of passing 96 percent of the Test Flood (1/2 PMF) routed outflow.

b. Adequacy of Information

The information available was sufficient for performing a Phase I Inspection.

c. Urgency

The recommendations presented in Sections 7.2 and 7.3 should be carried out within one year of receipt of this report by the owner.

7.2 Recommendations

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

1. Additional erosion protection on the upstream slope of the earth embankment should be designed and constructed.

2. Erosion protection measures should be designed and constructed for the upstream and downstream slopes adjacent to the spillway training walls.

3. The seepage through the earth embankment adjacent to the blowoff should be investigated and seepage control measures should be designed and constructed.

4. The wet areas at and adjacent to the downstream toe of the earth embankment should be investigated. A program for monitoring the seepage should be established and seepage control measures designed and constructed as required.

5. The trees, stumps and brush growth on the earth embankment should be removed and the root zones backfilled with suitable material.

6. The condition of the concrete in the spillway wingwalls and floor of the spillway discharge channel should be evaluated under a no-flow condition and repairs made, as required.

7. The condition and safety of the existing low level outlet or blowoff pipe and the other unknown pipes through the dam with downstream valves should be evaluated and corrective measures designed and constructed.

8. The piping to the right of the spillway which contains electrical conduits should be investigated to determine if they may jeopardize the integrity of the dam.

The owner shall implement all recommendations made by the Engineer based on the findings of the above investigations.

7.3 Remedial Measures

a. Operation and Maintenance Procedures

1. A program of annual technical inspections by a qualified, registered engineer snould be instituted.

2. An operations and maintenance manual for the dam and operating facilities should be prepared.

3. A formal warning system should be put into effect and should include monitoring of the dam during heavy rains and procedures for notifying downstream authorities in the event of an emergency.

4. The downstream slopes should be properly maintained.

7.4 Alternatives

There are no practical alternatives to the above recommendations.

APPENDIX A

VISUAL CHECK LIST WITH COMMENTS

VISUAL INSPECTION CHECK LIST
PARTY ORGANIZATION

PROJECT: Merriman Pond Dam

DATE: 5/2/80 TIME: 2:00 p.m. 4:30 p.m. WEATHER: Sunny - 60°

W.S. ELEVATION: 675.1 U.S. N/A DN.S
0.1' above spillway

	PARTY	DISCIPLINE
1.	Ronald G. Litke, P.E. - Roald Haestad, Inc.	Civil Engineer
2.	Donald L. Smith, P.E. - Roald Haestad, Inc.	Civil/Hydrologist
3.	Richard Murdock, P.E. - Geotechnical Engineers, Inc.	Geotechnical Engineer
4.		
5.		
6.		

	PROJECT FEATURE	INSPECTED BY	REMARKS
1.	Dam Embankment	RGL, DLS, RM	Poor condition
2.	Outlet Works - Intakae Channel and Intake Structure		Unknown
3.	Outlet Works - Control Tower	RGL, DLS	No Control Tower - Manually operated buried valves
4.	Outlet Works - Transition and Conduit	RGL, DLS	Could not be observed
5.	Outlet Works - Outlet Structure and Outlet Channel	RGL, DLS	Cast Iron pipe at end of blowoff
6.	Outlet Works - Spillway Weir, Approach & Discharge Channel	RGL, DLS, RM	Fair condition
7.	Outlet Works - Service Bridge	RGL, DLS	Good condition
8.			
9.			
10.			
11.			
12.			

PERIODIC INSPECTION CHECK LIST

PROJECT: Merriman Pond Dam DATE: 5/2/80

PROJECT FEATURE: Dam Embankment NAME: RGL, DLS

DISCIPLINE: Civil and Geotechnical Engineers NAME: RM

AREA ELEVATION	CONDITIONS
DAM EMBANKMENT	
CREST ELEVATION	679
CURRENT POOL ELEVATION	675.1 (0.1' above spillway)
MAXIMUM IMPOUNDMENT TO DATE	Unknown
SURFACE CRACKS	None observed
PAVEMENT CONDITION	Asphalt paving with grassed shoulders in good condition
MOVEMENT OR SETTLEMENT OF CREST	None observed
LATERAL MOVEMENT	None
VERTICAL ALIGNMENT	Good
HORIZONTAL ALIGNMENT	Good
CONDITION AT ABUTMENT AND AT CONCRETE STRUCTURES	Erosion adjacent to spillway wingwalls and at the contract with right abutment
INDICATIONS OF MOVEMENT OF STRUCTURAL ITEMS ON SLOPES	None observed
TRESPASSING ON SLOPES	Bare path on downstream slope adjacent to pumphouse
VEGETATION ON SLOPES	Extensive trees and brush on downstream slope
SLOUGHING OR EROSION OF SLOPES OR ABUTMENTS	Sloughing and erosion evident at several locations on downstream slope
ROCK SLOPE PROTECTION - RIPRAP FAILURES	Many areas on the upstream slope where riprap is missing.
UNUSUAL MOVEMENT OR CRACKING AT OR NEAR TOES	Some slumping has occurred along downstream toe
UNUSUAL EMBANKMENT OR DOWNSTREAM SEEPAGE	Along edge of toe, particularly in the area of the blowoff near left spillway training wall
PIPING OR BOILS	None observed
FOUNDATION DRAINAGE FEATURES	None known
TOE DRAINS	None observed
INSTRUMENTATION SYSTEM	None known

PERIODIC INSPECTION CHECK LIST

PROJECT: Merriman Pond Dam DATE: 5/2/80

PROJECT FEATURE: Outlet Works - Intake Channel and Structure NAME: RGL

DISCIPLINE: Civil Engineers NAME: DLS

AREA EVALUATED	CONDITIONS
OUTLET WORKS - INTAKE CHANNEL AND INTAKE STRUCTURE	Unknown
A. APPROACH CHANNEL:	
SLOPE CONDITIONS	
BOTTOM CONDITIONS	
ROCK SLIDES OR FALLS	
LOG BOOM	
DEBRIS	
CONDITION OF CONCRETE LINING	
DRAINS OR WEEP HOLES	
B. INTAKE STRUCTURE:	
CONDITION OF CONCRETE	
STOP LOGS AND SLOTS	

PERIODIC INSPECTION CHECK LIST

PROJECT: Merriman Pond Dam DATE: 5/2/80

PROJECT FEATURE: Outlet Works - Control Tower NAME: RGL

DISCIPLINE: Civil Engineers NAME: DLS

AREA EVALUATED	CONDITIONS
OUTLET WORKS - CONTROL TOWER	No Control Tower Downstream Gate on blowoff near toe of dam
A. CONCRETE AND STRUCTURAL:	
GENERAL CONDITION	N/A
CONDITION OF JOINTS	N/A
SPALLING	N/A
VISIBLE REINFORCING	N/A
RUSTING OR STAINING OF CONCRETE	N/A
ANY SEEPAGE OR EFFLORESCENCE	N/A
JOINT ALIGNMENT	N/A
UNUSUAL SEEPAGE OR LEAKS IN GATE CHAMBER	N/A
CRACKS	N/A
RUSTING OR CORROSION OF STEEL	N/A
B. MECHANICAL AND ELECTRICAL:	
AIR VENTS	N/A
FLOAT WELLS	N/A
CRANE HOIST	N/A
ELEVATOR	N/A
HYDRAULIC SYSTEM	N/A
SERVICE GATES	Gate on blowoff reported to be operable.
EMERGENCY GATES	N/A
LIGHTNING PROTECTION SYSTEM	N/A
EMERGENCY POWER SYSTEM	N/A
WIRING AND LIGHTING SYSTEM IN GATE CHAMBER	N/A

PERIODIC INSPECTION CHECK LIST

PROJECT: Merriman Pond Dam DATE: 5/2/80

PROJECT FEATURE: Outlet Works - Transition & Conduit NAME: RGL

DISCIPLINE: Civil Engineers NAME: DLS

AREA EVALUATED	CONDITIONS
OUTLET WORKS - TRANSITION AND CONDUIT	Unknown piping
GENERAL CONDITION OF CONCRETE	
RUST OR STAINING ON CONCRETE	
SPALLING	
EROSION OR CAVITATION	
CRACKING	
ALIGNMENT OF MONOLITHS	
ALIGNMENT OF JOINTS	
NUMBERING OF MONOLITHS	

PERIODIC INSPECTION CHECK LIST

PROJECT: Merriman Pond Dam DATE: 5/2/80

PROJECT FEATURE: Outlet Works - Outlet Structure and Outlet Channel NAME: RGL

DISCIPLINE: Civil Engineers NAME: DSL

AREA EVALUATED	CONDITIONS
OUTLET WORKS - OUTLET STRUCTURE AND OUTLET CHANNEL	A cast iron plug is usually in place at the end of the blowoff, enabling water to flow to pumphouse
GENERAL CONDITION OF CONCRETE	N/A
RUST OR STAINING	N/A
SPALLING	N/A
EROSION OR CAVITATION	N/A
VISIBLE REINFORCING	N/A
ANY SEEPAGE OR EFFLORESCENCE	Some seepage in area of pipe
CONDITION AT JOINTS	N/A
DRAIN HOLES	N/A
CHANNEL	Natural streambed
LOOSE ROCK OR TREES OVERHANGING CHANNEL	Some overhanging trees
CONDITION OF DISCHARGE CHANNEL	Natural streambed

PERIODIC INSPECTION CHECK LIST

PROJECT: Merriman Pond Dam DATE: 5/2/80

PROJECT FEATURE: Outlet Works - Spillway Weir, Approach & Discharge Channel NAME: RGL, DLS

DISCIPLINE: Civil and Geotechnical Engineers NAME: RM

AREA EVALUATED	CONDITIONS
OUTLET WORKS - SPILLWAY WEIR, APPROACH AND DISCHARGE CHANNELS	
A. APPROACH CHANNEL:	Underneath surface of reservoir
GENERAL CONDITION	
LOOSE ROCK OVERHANGING CHANNEL	
TREES OVERHANGING CHANNEL	
FLOOR OF APPROACH CHANNEL	
B. WEIR AND TRAINING WALLS:	Lower portion of training walls - stone masonry. Upper portion - concrete
GENERAL CONDITION OF CONCRETE	Concrete cracked, some mortar missing from lower part of walls
RUST OR STAINING	Some staining at base of right training wall near downstream end
SPALLING	Surficial spalling
ANY VISIBLE REINFORCING	At upstream end of right spillway wall
ANY SEEPAGE OR EFFLORESCENCE	Staining of right wall may indicate seepage. Some efflorescence on walls
DRAIN HOLES	None observed
C. DISCHARGE CHANNEL:	Natural streambed
GENERAL CONDITION	Good
LOOSE ROCK OVERHANGING CHANNEL	None
TREES OVERHANGING CHANNEL	Some trees
FLOOR OF CHANNEL	Small boulders and gravel
OTHER OBSTRUCTIONS	6" C.I. intake pipe to pumphouse crosses stream.

COMMENTS: Old bridge remains in place approximately five feet below newer bridge and approximately three feet above discharge channel.

PERIODIC INSPECTION CHECK LIST

PROJECT: Merriman Pond Dam DATE: 5/2/80

PROJECT FEATURE: Outlet Works - Service Bridge NAME: RGL

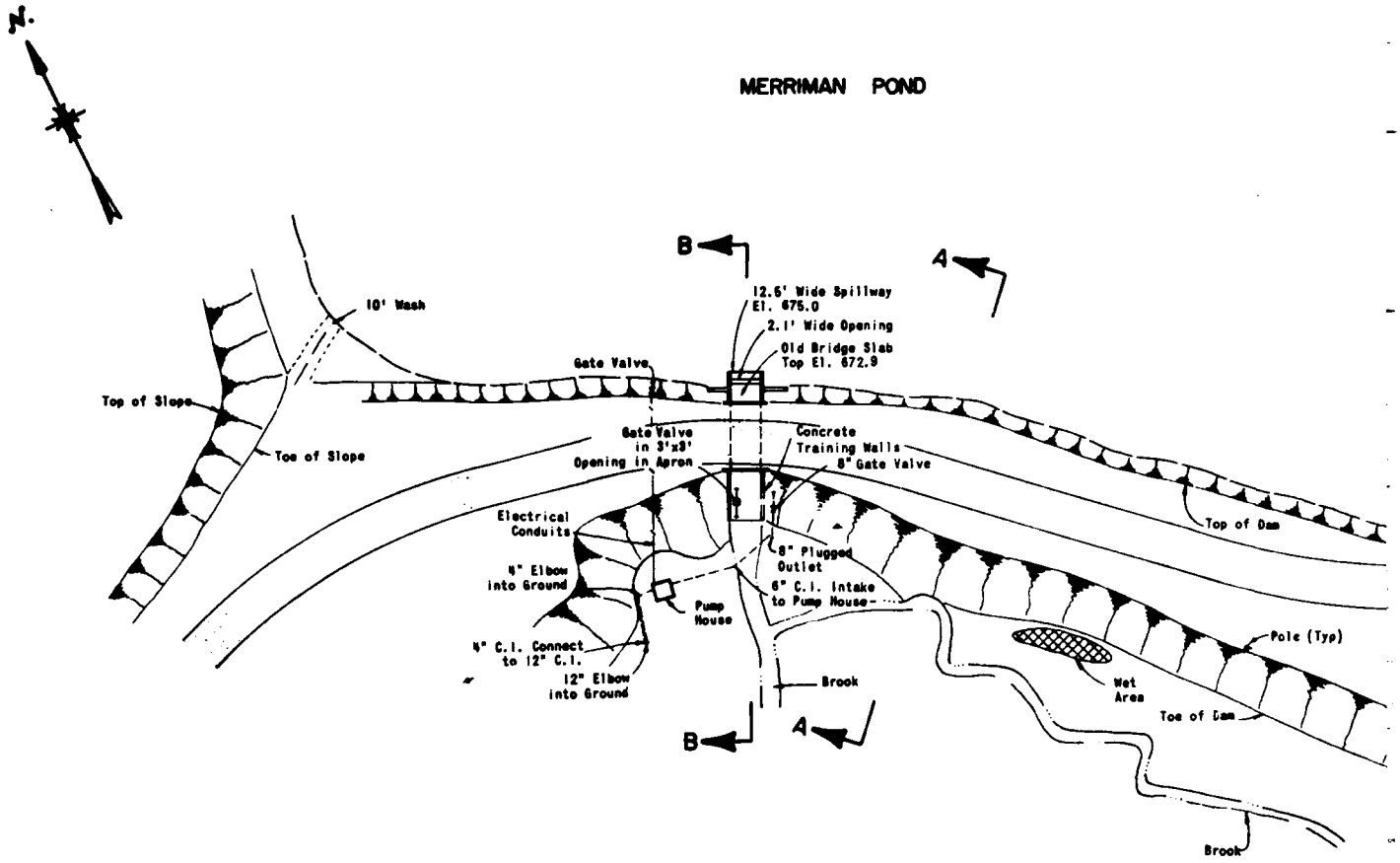
DISCIPLINE: Civil Engineers NAME: DLS

AREA EVALUATED	CONDITIONS
OUTLET WORKS - SERVICE BRIDGE	
A. SUPER STRUCTURE:	
BEARINGS	Good, no provisions for expansion
ANCHOR BOLTS	Good
BRIDGE SEAT	Good
LONGITUDINAL MEMBERS	Good
UNDER SIDE OF DECK	Good
SECONDARY BRACING	N/A
DECK	Good
DRAINAGE SYSTEM	N/A
RAILINGS	Fair
EXPANSION JOINTS	None observed
PAINT	Fair
B. ABUTMENT AND PIERS:	Good - Training walls
GENERAL CONDITION OF CONCRETE	Good - Some mortar missing in stone masonry portion, deterioration of parapet walls.
ALIGNMENT OF ABUTMENT	Good
APPROACH TO BRIDGE	Good - Some minor settlement on left side
CONDITION OF SEAT AND BACKWALL	Good

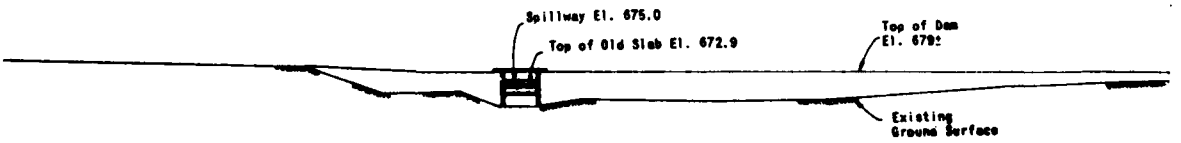
APPENDIX B

ENGINEERING DATA

MERRIMAN POND

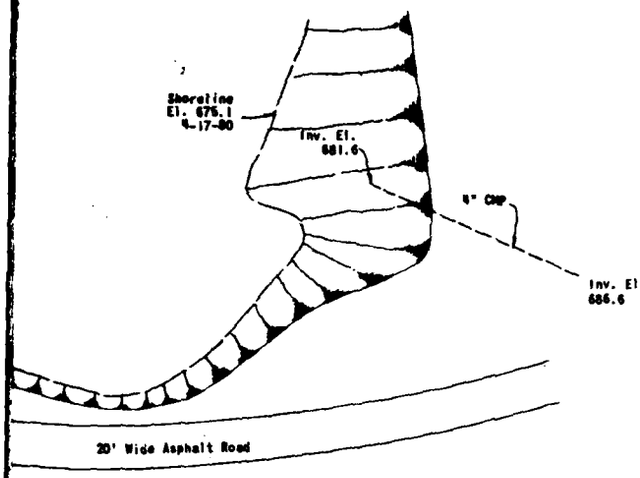


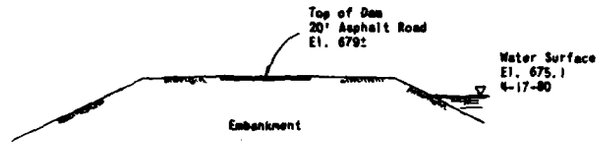
PLAN
Scale 1"=80'



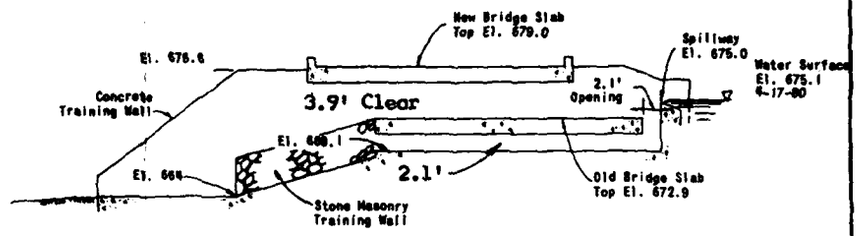
ELEVATION
Scale 1"=80'

FIGURE 2





SECTION A-A
Scale 1"=20'



SECTION B-B
Scale 1"=20'

ROALD HAESTAD, INC. *CONSULTING ENGINEERS* WATERBURY, CONNECTICUT	U.S. ARMY ENGINEER DIV. NEW ENGLAND *CORPS OF ENGINEERS* WALTHAM, MASS.

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

MERRIMAN POND DAM

DRAWN	CHECKED	APPROVED	SCALES AS NOTED	
JRS	RGL	RH	DATE JUNE 1980	PAGE B-1

LIST OF REFERENCES

The following references are all located at the State of Connecticut, Department of Environmental Protection, Office of the Superintendent of Dams, State Office Building, Hartford, Connecticut, 06115.

1. Miscellaneous correspondence concerning the leakage through the dam in the vicinity of the spillway, and the subsequent repairs.

2. Formal Report on Merriman Dam by Buck and Buck, Engineers, Hartford, Connecticut, for the Connecticut Water Resouces Commission, August 17, 1964.

3. Certificate of Approval for Repairs to Merriman Dam, December 22, 1964.

4. Letter from Buck and Buck, Engineers, to the Connecticut Water Resources Commission, dated May 14, 1964, concerning follow-up inspection of repairs.

5. Letters from State of Connecticut, Department of Environmental Protection to Crestbrook Country Club, Inc., dated May 6, 1977, requesting repairs by made to the dam.

July 28, 1964

ORDER

Crestbrook Country Club
Northfield Road
Watertown, Connecticut

Attention: Mr. Jack Brownstein, President

Gentlemen:

We have been informed that the so-called Merriman's Dam is now owned by the Crestbrook Country Club of Watertown.

According to evidence supplied to this Commission both by its consultant and others, the dam is in an unsafe condition because of large and dangerous leaks through the dam which places the structure in an unsafe category.

Section 25-110 of the 1958 Revision of the General Statutes places under the jurisdiction of this Commission all dams, "which by breaking away or otherwise, might endanger life or property." The Commission finds that the failure of this dam would endanger life or property.

FINDING

Based on the report of the Commission's consultant covering the inspection of this dam the Water Resources Commission finds the structure is in an unsafe condition. It also finds that certain repairs or alterations are necessary to place the structure in a safe condition.

The repairs or alterations to be made should include but are not necessarily limited to the following items:

1. Stop all leaks through the dam.
2. Carry out any other repairs or alterations found necessary.

ORDER

In accordance with Section 25-111 of the General Statutes you are hereby ordered to make the repairs or alterations necessary to place the structure in a safe condition or to remove the structure. The following procedures shall be followed:

1. Engage a qualified registered engineer to prepare a program covering all items necessary to place this structure in a safe condition. This plan shall be approve by the Commission's consultant before any further work, outside of immediate emergency measures, is carried out.

2. Submit to this office a report covering the repairss or alterations so that the necessary permits and certificate may be issued if the work has been found satisfactory.

The Commission shall be notified within two weeks what steps you have taken and plan to take in accordance with this Order. The work shall be completed by September 15, 1964.

Very truly yours,

William S. Wise
Director

WSW:dlp

BUCK & BUCK
ENGINEERS
71 CAPITOL AVENUE, HARTFORD 14, CONNECTICUT

HENRY WOLCOTT BUCK
RICHARD S. BUCK

CLIFFORD G. ENGSTROM
WILLIAM R. BOYENS
JAMES A. THOMPSON

COMM. 5513-33

AUGUST 17, 1964

WATER RESOURCES COMMISSION
STATE OFFICE BUILDING
HARTFORD 15, CONNECTICUT

GENTLEMEN:

THE FOLLOWING CONSTITUTES MY FORMAL REPORT ON MERRIMAN'S DAM IN WATERTOWN.

1. IDENTIFICATION

A. REFERENCE TO JOB ASSIGNMENT:

TELEPHONE CALL FROM MR. WISE, JULY 24, 1964

B. NAME OF DAM AND/OR POND:

DAM: NO NAME

POND: MERRIMAN'S POND

C. LOCATION - INDEX NUMBER, LATITUDE AND LONGITUDE, REFERENCE TO MAP FEATURES:

INDEX NUMBER: UNKNOWN

LATITUDE & LONGITUDE: LATITUDE 41°-38'-03" N

LONGITUDE 73°-06'-51" W

REFERENCE TO MAP FEATURES: LIES 600 FEET EAST OF NORTHFIELD ROAD OPPOSITE A POINT 2.02 MILES NORTH OF THE INTERSECTION OF ROUTES US6 AND CONNECTICUT 63 IN THE CENTER OF WATERTOWN AND 2150 FEET NORTH OF INTERSECTION 668, NORTHFIELD ROAD AND BUCKINGHAM STREET.

D. OWNER - NAME, ADDRESS, TELEPHONE:

NAME: CRESTBROOK COUNTRY CLUBM INC.

ADDRESS: NORTHFIELD ROAD
WATERTOWN, CONNECTICUT

TELEPHONE: 274-4555

E. IS THERE ANY QUESTION OF OWNERSHIP:

YES - THE CRESTBROOK COUNTRY CLUB, INC. BELIEVES THAT THE OBLIGATION FOR MAINTENANCE RESTS WITH

GROSSMAN INDUSTRIAL PROPERTIES
BRAINTREE 84
MASSACHUSETTS

THE CRESTBROOK COUNTRY CLUB INC. WIRED GROSSMAN INDUSTRIAL PROPERTIES REQUESTING REPAIRS AND GROSSMAN INDUSTRIAL PROPERTIES WIRED THE CRESTBROOK COUNTRY CLUB, INC. THAT THEY DENIED ANY SUCH OBLIGATION. COPIES OF THESE WIRES WERE EXHIBITED BY THE CREST-BROOK COUNTRY CLUB, INC..

2. FACTORS OF HAZARD:

A. TYPE, LOCATION, SERIOUSNESS OF DAMAGES:

a. IF DAM FAILED DURING FLOOD:

1. TYPE: WASHOUT

2. LOCATION: AT SPILLWAY

3. SERIOUSNESS: SERIOUS DAMAGE TO LOWER RIPARIAN PROPERTY. INCIDENTAL HAZARD TO LIFE.

b. IF DAM FAILED DURING ORDINARY FLOWS:

1. TYPE: WASHOUT

2. LOCATION: AT SPILLWAY

3. SERIOUSNESS: SERIOUS DAMAGE TO LOWER RIPARIAN PROPERTY. INCIDENTAL HAZARD TO LIFE.

B. SITE CONDITION AFFECTING HAZARD - AT DAM OR IMMEDIATELY UPSTREAM OR DOWNSTREAM:

AT DAM: SERIOUS LEAKS AT SPILLWAY

IMMEDIATELY UPSTREAM: NONE

IMMEDIATELY DOWNSTREAM: STREAM CROSSES SEVERAL ROADS, FLOWS THROUGH SEVERAL PONDS WITH DAMS UNABLE TO PASS WATER WHICH WOULD BE RELEASED AND HAS RECREATIONAL DEVELOPMENTS ALONG THE STREAM AND AT THE PONDS.

C. IS THE DAM, IN CONSULTANT'S OPINION, A STRUCTURE WHICH, BY BREAKING AWAY, MIGHT ENDANGER LIFE?

YES.

3. STRUCTURE:

A. CONSTRUCTION MATERIALS, SLOPES, DIMENSIONS:

CONSTRUCTION MATERIALS:

DAM: EARTHWORK WITH UPSTREAM FACE RIP-RAPPED.

SPILLWAY:

ORIGINAL STRUCTURE; RUBBLE MASONRY

ADDED STRUCTURE: CONCRETE

SLOPES:

UPSTREAM: 2:1

DOWNSTREAM: 2:1

DIMENSIONS:

DAM:

TOP WIDTH: 30 FEET

LENGTH: ABOUT 400 FEET

SPILLWAY:

WIDTH: 15'-4"

DEPTH OF WATER: 14'-6"

B. OBSERVATIONS ON PROBABLE FOUNDATION CONDITIONS:

HARDPAN

C. SPILLWAY - TYPE AND CAPACITY:

TYPE: CONCRETE OVERFLOW

CAPACITY: 230 C.F.S.

D. FREEBOARD - WHAT HAPPENS IF FREEBOARD IS NOT SUSTAINED:

FREEBOARD: 3 FEET

IF NOT SUSTAINED: DAM WILL BE SUBJECT TO WAVE ACTION AND OVERTOPPING.

E. LEAKS - SEEPAGE - CRACKS - DISPLACEMENT - EROSION OF ALL TYPES - DETERIORATION - CONDITIONS WHICH COULD RESULT IN SCOURING.

LEAKS: LARGE HOLE UPSTREAM OF EAST ABUTMENT TAKING WATER, SEVERAL FOUNTAINS IN TOP OF OLD MASONRY SPILLWAY, MANY LEAKS THROUGH OLD MASONRY ABUTMENTS AT TOP OF OLD SPILLWAY.

SEEPAGE - NONE

CRACKS - MANY IN OLD MASONRY

DISPLACEMENT: NONE

EROSION OF ALL TYPES: PROBABLE VOIDS IN OLD MASONRY

DETERIORATION: NONE

CONDITIONS WHICH COULD RESULT IN SCOURING:

WATER PASSING UNDER OLD SPILLWAY

4. HYDROLOGY:

A. DRAINAGE AREA

0.52 SQ. MI.

B. DESIGN DISCHARGE - METHOD

DESIGN DISCHARGE 100 C.F.S.

METHOD - OUTFLOW HYDROGRAPH - 10" IN 24 HOURS AT 60% RUN-OFF. AREA OF POND 10% OF WATERSHED. 3' OF STORAGE IN POND.

C. SPILLWAY CAPACITY - SURCHARGE:

SPILLWAY CAPACITY - 230 C.F.S.

SURCHARGE - 3 FEET

D. CONDITIONS UNDER WHICH CAPACITY WILL BE EXCEEDED

BLOCKAGE IN SPILLWAY
FLASHBOARD REDUCING CAPACITY

5. SAFETY:

A. IS THE DAM UNSAFE AT PRESENT TIME:

YES

B. HOW SERIOUS IS THE UNSAFE CONDITION:

POTENTIALLY SERIOUS

C. HOW IS THE DAM LIKELY TO FAIL:

COLLAPSE OF SPILLWAY

D. WILL THE DAM REQUIRE PERIODIC INSPECTION, PUBLIC ACT 271?

YES

6. REQUIREMENTS:

A. WHAT SPECIFIC WORK IS NECESSARY TO PUT DAM IN SAFE CONDITION:

STOP LEAKS AND FILL VOIDS UNDER OLD SPILLWAY

B. WHEN WOULD IT BE PRACTICAL TO COMPLETE SUCH WORK:

IMMEDIATELY

C. IS THERE ANY IMMEDIATE ACTION WHICH COULD BE TAKEN TO RELIEVE THE HAZARD - SHOULD IT BE TAKEN AND WHEN:

IMMEDIATE ACTION. LOWER WATER LEVEL

SHOULD IT BE TAKEN:- YES

WHEN: IMMEDIATELY

D. IS THERE ANY OTHER WORK' WHICH, ALTHOUGH IT IS NOT ABSOLUTELY NECESSARY AT PRESENT TIME, IS ADVISABLE:

No

7. SUMMARY OF FACTS:

RESTATEMENT OF MOST PERTINENT PARTS OF PARAGRAPHS 1, 2, 3, 4

DESIGN OF DAM IS SATISFACTORY

8. CONCLUSION:

RESTATEMENT OF MOST PERTINENT PARTS OF PARAGRAPHS 5 AND 6

STOP LEAKS AND FILL OPENINGS UNDER OLD SPILLWAY

9. RECOMMENDATION:

A. ORDER BE ISSUED:

YES

B. LETTER OF ADVICE BE SENT:

No

C. URGENCY OF ACTION:

IMMEDIATE

D. SUGGESTED TIME LIMIT FOR COMPLETION OF NESSARY WORK

SEPTEMBER 15, 1964

APPENDIX

IT IS ANTICIPATED THAT LEGAL ACTION WILL FOLLOW AND I AM THEREFORE RETAINING ALL PHOTOS AND COMPUTATIONS IN MY FILE.

VERY TRULY YOURS,

HENRY WOLCOTT BUCK

August 21, 1964

Mr. Jack Brownstein
P.O. Box 306
Watertown, Connecticut

Dear Mr. Brownstein: re. Dam at Crestbrook Country Club

On July 31, I met with Mr. Dayton and some of the Club personnel at the dam. The water level was down almost to the leak in the upstream face of the dam, which was partially blocked with a sandbag.

The situation with regard to the extent of repairs necessary seems to be a whole lot less than was anticipated at the time of my first inspection.

As the matter stands now, in my opinion, the area on the upstream face of the dam for a distance of at least 25 feet each way from the leak should be enclosed by an earth cofferdam, dewatered, the rip-rap removed, all material removed to a depth of not less than two feet, the area immediately around the leak filled with hardpan or clay which should be tamped by a mechanical tamper to fill the cavity with the greatest possible compaction, the entire area covered with hardpan or clay for a depth of not less than 18" and compacted, the area where the rip-rap was removed covered with a blanket not less than 6" in thickness of bank run gravel and the rip-rap replaced or renewed. Whether or not the cofferdam is removed is immaterial.

After the above work has been completed, the leaky spots in the masonry spillway will have to be opened up and pressure grouted to fill the cavity which must exist from the leak in the upstream face to the locations in the spillway where the geysers were active when I made my first inspection in connection with this matter.

Should you have any further questions regarding this matter, do not hesitate to call me.

Very truly yours,
CLARKE AND PEARSON

by _____
C. W. Pearson

CWP:O

cc: Mr. Henry Buck

AUG 28 '64 NLWR

COPY

November 27, 1964

Attorney Sherman L. Quinto
49 Leavenworth Street
Waterbury, Conn. 06702

Dear Mr. Quinto: re. Dam at Crestbrook Country Club

I made an inspection of the work under progress at the dam at the Crestbrook Country Club yesterday afternoon and talked with Mr. William Bedard last evening.

From information supplied by Mr. George Christie and the men who have worked on this project, which was started last week, a pocket of large stones was uncovered in the vicinity of the leak. These stones were removed and the excavation carried down to impervious hardpan and refilled with material taken from the bank located on the left side of the entrance to the property.

Mr. Bedard was advised that the work done appeared to be satisfactory but that the entire area disturned would have to be covered with at least 6" of coarse gravel and the area on the dam face of at least two feet above and below the high water mark covered with stone to minimize any damage to the structure by wave action. He was also advised that the leaks in the spillway where the geysers were located would have to be filled with grout under pressure. This grout should be under sufficient pressure to completely fill any further voids which may be present between the spillway and the area which has been repaired.

When this work is completed in a satisfactory manner, a final inspection can be made and approval given to the entire work of repairing the structure.

I would like to be advised prior to the time when the grouting is to be done so that an inspection may be made during the progress of this phase of the work. It would be advisable to call my office when this is scheduled rather than my home.

Very truly yours,
CLARKE AND PEARSON

by _____
C. W. Pearson

CWP:O

cc: Mr. Henry W. Buck

NOV 30 '64 H.W.I.

LANDSCAPE & TREE SERVICE

NATIONAL ENTERPRISE

December 9, 1964

William R Bedard
Contractor In Charge
74 East Farm Street
Waterbury , Connecticut

Re; Dam at Crestbrook Country Club

Dear Mr. Buck;

Under the authority vested in me by Jack Brownstein, and Sherman Quinto, President and Vice President of the Crestbrook Country Club, and the procedures set forth for work authorized by Clarke and Peerson, consulting engineers, I hereby give a full report of how the project was handled, completion of the work done, and continued maintenance planned for same.

In mid October, Mr. Pearson and I reviewed the dam at the Merriman Pond and agreed that damages to said dam was due to a poor fill area in front of the dam, resulting in damages in the spillway within the dam.
We agreed to work and procedures to be taken, and after receiving a formal go ahead October 21st, I proceeded as follows.
I hired out a crane from Mr. Sam Marianno and a backhoe, dozer, and truck from Innes Bros. and we excavated a circular trench around the front of the dam,60' long, 12' deep, and eight feet wide; We found numerous boulders, logs, and a soft fill which had been used to fill the front of this dam.
We saw many holes obviously going directly to the face of the dam where water undoubtedly had found it's way to the spillway. We refilled all of this excavated area in six inch layers, tamping it as we refilled this hole and called the attention of this work in progress to Mr. Peerson.
On November 27th, I received his work approval and I continued to the next phase of work to be completed.
On December 8th, I hired the Wtby. foundation Co. to make six holes in the spillway so that we might fill in the voids with concrete utilizing a vibrating machine to insure proper fill in as had been advised by Mr.Peerson and Mr Buck. This was correctly done after I inspected the 4" holes in depth I found under the spillway, A total of seventeen cy. was utilized to fill this void and resurface the spillway with five inches of reinforced concrete.
The last phase included putting some gravel over our fill area in front of the dam and to put some rock on the edge of the pond. All this has been done

I have attatched all correspondence to this project, and the billing of all those having been affiliated with this work. I trust this will be of assistance to all who have been interested in having this work completed.

Very truly yours
William R Bedard

DEC 12 '64 H.W.B.

William R Bedard

74 EAST FARM STREET WATERBURY, CONNECTICUT TELEPHONE: PLAZA 3-709

BUCK & BUCK
ENGINEERS
71 CAPITOL AVENUE, HARTFORD 14, CONNECTICUT

HENRY WOLCOTT BUCK
RICHARD S. BUCK

CLIFFORD C. ENGSTROM
WILLIAM R. BOYENS
JAMES A. THOMPSON

COMM. 5713-33

DECEMBER 15, 1964

WATER RESOURCES COMMISSION
STATE OFFICE BUILDING
HARTFORD, CONNECTICUT 06115

RE: CRESTBROOK COUNTRY CLUB DAM
WATERTOWN, CONNECTICUT

GENTLEMEN:

I HAVE TODAY MADE A FINAL INSPECTION OF THE REPAIRS EFFECTED AT THIS STRUCTURE. THIS WORK HAS BEEN UNDER THE SUPERVISION OF MR. PEARSON, OF CLARKE AND PEARSON, WHO MADE FINAL INSPECTION AND APPROVED THE WORK YESTERDAY.

I FIND THAT THE WORK HAS BEEN SATISFACTORILY COMPLETED IN ACCORDANCE WITH MY INSTRUCTIONS TO THE OWNERS AND MR. PEARSON AND I RECOMMEND THAT A CERTIFICATE OF ACCEPTANCE BE ISSUED.

I ENCLOSE A FORM WHICH THE LAWYER FOR THE COUNTRY CLUB WOULD LIKE TO HAVE EXECUTED BY THE STATE OF CONNECTICUT, THE TOWN OF WATERTOWN, AND MR. PEARSON. I HAVE INDICATED THERE WAS SOME QUESTION AS TO WHETHER THE STATE WOULD GO FURTHER THAN ISSUING THE REGULAR CERTIFICATE OF APPROVAL BUT ENCLOSE THIS CERTIFICATE FOR YOUR INFORMATION.

SINCERELY YOURS,

BUCK & BUCK

HENRY WOLCOTT BUCK

ENCLS:

STATE OF CONNECTICUT

WATER RESOURCES COMMISSION

STATE OFFICE BUILDING · HARTFORD 15, CONNECTICUT

CERTIFICATE OF APPROVAL

December 22, 1964

Crestbrook Country Club, Inc.
P. O. Box 306
Northfield Road
Watertown, Connecticut

TOWN: Watertown
RIVER: Steel Brook
TRIBUTARY: unnamed
CODE NO.: N 18.6 S 6.6 U 0.7

Attention: Mr. Milton W. Kadish, Secretary

Gentlemen:

NAME AND LOCATION OF STRUCTURE:

Merriman's Dam, located on an unnamed tributary to Steel Brook in the Town of Watertown.

DESCRIPTION OF STRUCTURE AND WORK PERFORMED:

Repair of the dam as Ordered by the Water Resources Commission on July 28, 1964 in accordance with plans prepared by Clarke and Pearson, Civil Engineer.

CONSTRUCTION PERMIT ISSUED UNDER DATE OF: October, 1964.

This certifies that the work and construction included in the plans submitted, for the structure described above, has been completed to the satisfaction of this Commission and that this structure is hereby approved in accordance with Section 25-114 of the 1958 Revision of the General Statutes.

The owner is required by law to record this Certificate in the land records of the town or towns in which the structure is located.

WATER RESOURCES COMMISSION

BY: William S. Wise
William S. Wise, Director

cc: Sherman Quinto
Attorney-at-Law
49 Leavenworth St.
Waterbury, Conn.

COMM. 5713-33
WRC - MERRIMAN'S DAM

7/24/64 HWB AT REQUEST OF WISE WENT OUT AND INSPECTED MERRIMAN'S DAM. WATER HAS BEEN DRAWN DOWN ABOUT 2 FEET THROUGH THE DRAW OFF PIPE AND THE STOP PLANK HAS BEEN REMOVED. WATER WAS SPURTING UP THROUGH THE OLD SPILLWAY BOTTOM AT THE VERY TOP, IMMEDIATELY DOWN STREAM FROM THE NEW SPILLWAY WHICH WAS SIMILAR TO THE ONE WE SHOWED ON OUR PLANS. THERE WAS ALSO WATER COMING THROUGH THE SIDE OF THE OLD SPILLWAY WALLS. OBVIOUSLY THE CUT-OFF ON THE NEW SPILLWAY IS INSUFFICIENT AND THE CUT-OFF AT THE SIDES OF THE OLD SPILLWAY IS ALSO INADEQUATE. TO THE TOWN CLERK'S OFFICE BUT UNABLE TO GET ANY CONFIRMATION OF THE CHAIN OF TITLE ON WHO WAS PRESENT OWNER. BOTH INVOLVED ARE THE CRESTBROOK COUNTRY CLUB INC. OF WATERTOWN AND GROSSMAN INDUSTRIAL PROPERTIES, BRAINTREE 84, MASS.

FLEISHER CALLED. THE ~~CHANGE~~ CHAIN OF TITLE FOR THE PROPERTY ~~ARE~~ IS HAMILTON AND MAIN CORP. TO THE COUNTRY CLUB. HAMILTON AND MAIN HAD EXECUTED A WATER AGREEMENT WITH PRINCETON DATED JANUARY 24, 1961. PRINCETON CONVEYED THIS TO BURLINGTON MILLS WHO CONVEYED IT TO GROSSMAN. THE AGREEMENT PROVIDES THAT PRINCETON, BURLINGTON, GROSSMAN HAVE COMPLETE CONTROL OF THE WATER LEVEL IN THE POND AND ASSUMED THE MAINTENANCE OF THE DAM. THEY HAVE A RIGHT TO RELIEVE THEMSELVES OF THIS OBLIGATION AT ANY TIME BY WRITING TO THE COUNTRY CLUB AND SIMPLY STATING THAT THEY WANT TO. HOWEVER, ANYTHING WHICH HAS TRANSPIRED PRIOR TO THEIR SO WRITING MUST BE MADE GOOD BY THEM AS ~~OWNER-OF-THE~~ BENEFICIARY OF THE WATER RIGHT AGREEMENT. THEREFORE, GROSSMAN IS RESPONSIBLE FOR REPAIRING THE DAM AND CAN THEN, IF HE WISHES, TURN IT OVER TO THE COUNTRY CLUB. AT THE PRESENT TIME HE CLAIMS HE HAS NO CONCERN ABOUT THE DAM OR THE WATER RIGHTS AT ALL, HOWEVER THEY ARE HIS RESPONSIBILITY. TOLD FLEISHER THAT I WOULD REPORT THIS TO WRC AND RECOMMEND THAT THEY TAKE ACTION TO FORCE GROSSMAN TO REPAIR THE DAM. SUGGESTED THAT HE HAVE THE TOWN MANAGER TAKE SIMILAR ACTION. TOLD HIM THAT IF WE HAD ANYTHING TO DO WITH THE REPAIR WORK WE WOULD RECOMMEND FIRST THAT THE FILL BE PLACED UPSTREAM OF THE SPILLWAY. THIS COULD PROBABLY BE TAKEN FROM THE BOTTOM OF THE POND. IF THIS DOES NOT WORK THEN A TRENCH WILL HAVE TO BE CUT IMMEDIATELY DOWNSTREAM OF THE NEW SPILLWAY AND AN ADEQUATE CUT-OFF WALL INSTALLED. STRUCTURES WILL ALSO HAVE TO BE INSTALLED ON EITHER WING OF EITHER ABUTMENT TO PROVIDE CUT-OFF FOR THAT LOCATION. TOLD HIM I DID NOT THINK THIS WOULD INVOLVE DISTURBING THE ROAD IN ANY WAY BUT IT WOULD MEAN A DIFFICULT AND RATHER EXPENSIVE JOB.

7/27/64 RSB MR. SULLIVAN, TOWN MANAGER OF WATERTOWN, Tel 274-5411, CALLED REGARDING THE LEAK IN THE DAM. HE WAS OUT AT THE CRESTBROOK COUNTRY CLUB AND MR. JACK BROWNSTIEN, PRESIDENT OF THE CLUB, WAS THERE ALSO AND WAS VERY MUCH PERTURBED OVER LOWERING THE WATER IN THE POND TO THE EXTENT THAT THEY COULD NOT HAVE WATER FOR THEIR GREENS. MR. SULLIVAN SAID THEY HAD ~~UNCOVERED~~ LOWERED THE WATER TO THE LEVEL OF THE TOP OF THE SPILLWAY AND THEY HAD UNCOVERED A PIPE ABOUT 16 INCHES DIAMETER LEADING INTO THE DAM INTO WHICH A WHIRLPOOL OF WATER WAS FLOWING. HE SIAD THERE IS ALSO A FOUNTAIN OF WATER LEAKING FROM THE DAM. I ASKED HIM IF THE WATER COULD BE DRAINED FROM THE DAM FOR REPAIRS AND BROWNSTEIN SAID THIS WAS IMPOSSIBLE BECAUSE THEY HAVE NO WAY OF PUMPING THE WATER FROM THE BROOK IN ORDER TO WATER THEIR GREENS AND THERE ALSO WOULD NOT BE ENOUGH WATER LEFT IN THIS DRY SPELL TO GET ENOUGH FROM THE BROOK ANYWAY. THEY ARE VERY MUCH PERTURBED OVER THE WHOLE THING BECAUSE THE JOB HAS BEEN KICKED AROUND FOR SEVERAL WEEKS. IN THE MEANTIME THEY ARE LOSING THEIR WATER AND NOTHING IS BEING DONE, HE

WOULD LIKE VERY MUCH LIKE TO HAVE SOMEONE COME OUT AND SEE THE SITUATION AS IT IS TODAY. HE LEFT BOTH MR. SULLIVAN'S NUMBER AND MR. BROWNSTEIN'S NUMBER AND I SAID WE WOULD CALL SOMETIME TODAY AND TELL THEM WHAT WE PLANNED TO DO.

JUL 27 '64 H.W.B.

7 26/64 HWB CALL FROM JACK BROWNSTEIN, PRESIDENT OF THE COUNTRY CLUB. REVIEWED WITH HIM THE CONVERSATION I HAD HAD WITH MR. FLEISHER AND RECOMMENDED THAT HE CONTACT WRC.

JUL 30 '64 H.W.B.

7/27/64 HWB WISE CALLED AND ASKED THAT I GET IN TOUCH WITH JIM SULLIVAN, TOWN MANAGER OF WATERTOWN AND GO WITH HIM TO THE DAM AND WORK OUT WHAT WAS TO BE DONE.

FIELD INSPECTION. REVIEWED THE SITUATION AT THE DAM WITH JIM SULLIVAN & BROWNSTEIN. I CONCLUDED THAT WITH THE OPENING UP OF THE 2' DIAMETER HOLE IN THE EARTH IMMEDIATELY UPSTREAM OF THE EAST ABUTMENT THE INDICATIONS WERE SUFFICIENTLY STRONG OF THE DAM BEING IN A PERILOUS CONDITION TO REQUIRE IMMEDIATE ORDER FOR REPAIR. CALLED WISE AND HE ISSUED THE VERBAL ORDER REQUIRING THEM TO REPAIR THE DAM WHICH WILL BE CONFIRMED IN WRITING TOMORROW. BROWNSTEIN THEN CONTACTED PEARSON OF CLARK AND PEARSON AS THEIR ENGINEER AND FRANCIS ONEGLIA OF O & G CONSTRUCTION AS THEIR CONTRACTOR. MET WITH THESE GENTLEMEN AT THE DAM, REVIEWED THEIR PROPOSALS IN DETAIL. BASICALLY A COFFER DAM IN THE POND TO RETAIN AS MUCH WATER AS POSSIBLE, DEWATER THE FACE OF THE SPILLWAY, REMOVE THE OVERBURDEN, DETERMINE WHAT IS WRONG AND PLACE A CLAY BLANKET, WELL TAMPED IN PLACE, OVER THE REPAIRED AREA, COVER THIS WITH 12" OF GRAVEL AND THEN RIP RAP. FRANCIS IS GOING TO SUBMIT A WRITTEN PROPOSAL TO THEM FOR A TIME AND MATERIAL BASIS CONTRACT WHICH THEY WILL ACT ON AT A BOARD OF DIRECTORS MEETING TO BE CALLED TUESDAY NIGHT, IF POSSIBLE, AT WHICH THEY WISH ME TO BE PRESENT. IF IT IS THEN APPROVED FRANCIS THOUGHT HE COULD START WORK WEDNESDAY AND COMPLETE IT IN TWO WEEKS. BOTH CHARLIE PEARSON AND MYSELF ARE TO BE NOTIFIED WHEN THE WORK IS UNCOVERED SO WE CAN SEE WHAT THE FACE OF THE SPILLWAY STRUCTURE LOOKS LIKE AND TRY TO DETERMINE WHAT CAUSED THE TROUBLE.

JUL 30 '64 H.W.B.

7/28/64 HWB TWO CONFERENCES WITH WISE. OUTLINED THE REPAIR PROCEDURE WHICH MEETS WITH HIS APPROVAL, AND HE REVIEWED HIS ORDER WHICH WE MODIFIED SLIGHTLY AND WHICH WILL BE ISSUED TODAY. I AM CORRECT IN MY ASSUMPTION THAT THE STATE STATUTES REQUIRE THAT THE WRC TAKE ACTION AGAINST THE OWNER OF THE PROPERTY. IF THAT OWNER HAS AGREEMENTS WHICH WOULD FORCE SOMEBODY ELSE TO MAINTAIN A STRUCTURE IT IS THE OWNER'S RESPONSIBILITY TO HAVE THIS REPAIR WORK DONE BY SUCH A PARTY OR TO BACK CHARGE HIM OR DO WHATEVER HE PLEASES. THE STATE IS ONLY INTERESTED IN THE PROPERTY OWNER.

H.W.B. JUL 30 '64 H.W.B.

MET WITH COUNTRY CLUB DIRECTORS. THEY ASKED WHAT WOULD BE DONE IF THEY REFUSED TO OBEY THE ORDER AND I TOLD THEM I DID NOT KNOW BUT PROBABLY THE DAM WOULD BE DEWATERED EITHER BY LEAVING THE PIPES OPEN OR BY BREACHING IT. THEY ASKED APPROVAL OF A DECISION THEY MADE TO TABLE THE MATTER UNTIL NEXT MONDAY NIGHT SO THAT THEY CAN GET OTHER PRICES, INCLUDING ONE FROM INNES. BROS. AND INVESTIGATE THE LEGAL IMPLICATIONS OF THEIR ACTION. THEY WILL GET 100 SANDBAGS AND FILL THEM AND HAVE THEM AT THE DAM SO THAT THE HOLES CAN BE PLUGGED IF ANYTHING SERIOUS DEVELOPES AND THEY WILL HAVE THE DAM

JUL 30 '64 H.W.B.

WATCHED AT REGULAR INTERVALS.

AUG 30 '64 H.W.B.

7/29/64 HWB CALLED BILL WISE AND REPORTED CONFERENCE LAST NIGHT.

AUG 30 '64 H.W.B.

8/13/64 HWB JOB INSPECTION. NOTHING DONE. WATER IS WELL DOWN AND THE HOLE IS EXPOSED AND WATER RUNNING ACROSS THE BOTTOM OF IT.

AUG 17 '64 H.W.B.

8/15/64 HWB WROTE FORMAL REPORT

8/3/64 HWB CALLED BILL WISE. TOLD HIM I WAS CONCERNED BECAUSE WE HAD HAD NO WORD FROM THE PEOPLE AT MERRIMAN'S DAM AND ASKED THAT HE GIVE THEM A PUNCH UP. HE SAID HE WOULD WRITE THEM IMMEDIATELY REQUIRING AN IMMEDIATE ANSWER ON WHAT THEIR PROCEDURE WAS. OTHERWISE HE WOULD TURN IT OVER TO THE ATTORNEY GENERAL FOR MANDAMUS.

8/21/64 HWB CALLED JIM SULLIVAN, TOWN MANAGER. HE KNEW NOTHING ABOUT IT SINCE HE WAS OUT THERE WITH ME. CALLED JACK BROWNSTEIN, PRESIDENT OF THE CLUB. HE SAID GROSSMAN HAD SAID HE WOULD BE IN TOUCH WITH ME BEFORE THIS. I HAVE NOT HEARD FROM HIM. HE SAID HE HAD AN APPOINTMENT WITH GROSSMAN FOR NEXT WEDNESDAY AND THAT HE WOULD MAKE SURE THAT EITHER HE OR GROSSMAN OR BOTH CALLED ME AFTER THEIR CONFERENCE AND WOULD LET ME KNOW EXACTLY WHAT THEY WERE GOING TO DO. TOLD HIM IF WE DIDN'T GET ACTION VERY PROMPTLY WE WILL HAVE TO PULL THE STOPS. CALLED BILL SAUNDERS AND PASSED ON THE ABOVE.

SEP 28 '64 H.W.B.

9/24/64 HWB CALLED BILL WISE AND RECOMMENDED THAT ACTION BE STARTED IMMEDIATELY BY THE ATTORNEY GENERAL'S OFFICE TO BRING PRESSURE TO BEAR TO SEE THAT THE DAM WAS REPAIRED.

SEP 28 '64 H.W.B.

10/3/64 HWB SITE INSPECTION. NOTHING DONE AND THE WATER STILL DOWN AT THE ORIGINAL SPILLWAY LEVEL.

OCT - 6 '64 H.W.B.

10/2/64 HWB TO SITE. NO WORK STARTED. THERE IS A VERY DEEP POOL THE WEST EDGE OF WHI IS ON THE LINE OF THE SPILLWAY AND WHICH IS CONSIDERABLY DEEPER THAN THE REST OF THE POND. THE POND IS COMPLETELY DEWATERED. THE DRAW-OFF PIPE IS OPPOSITE A POINT 40' EAST OF THE CENTER LINE OF THE SPILLWAY AND RUNS FROM THERE TO DISCHARGE AT THE BASE OF THE SPILLWAY.

NOV - 6 '64 H.W.B.

11/2/64 HWB BEDARD, THE CONTRACTOR, CALLED FOR ADVICE ON WHERE HE COULD GET PRESSURE GROUTING EQUIPMENT. GAVE HIM THE NAMES OF DEW CONSTRUCTION KESSLER CONSTRUCTION AND INDUSTRIAL CONSTRUCTION AS BEING PEOPLE WHO MIGHT BE EQUIPPED WITH THE NECESSARY TOOLS FOR THIS OPERATION. IF HE CAN'T GET THEM THEN HE SHOULD GET IN TOUCH WITH PIERSON AND SEE IF PIERSON WILL APPROVE BREAKING OUT THE SPILLWAY AND FILLING THE HOLES AND THEN REBUILDING THE SPILLWAY. HE WILL LET ME KNOW WHEN IT IS TIME FOR ME TO VISIT THE JOB.

DEC -7 '64 H.W.B.

DEC -7 '64 H.W.B.

12/7/64 HWB BEDARD, THE CONTRACTOR IN WATERTOWN, CALLED ME. IN HIS REPAIR WORK TO THE DAKE HE DUG DOWN ABOUT 12' OUTSIDE OF EACH OF THE ABUTMENTS, FOUND THE CAVITIES AND BACKFILLED THEM CAREFULLY. HE IS NOW CONCERNED WITH THE CAVITIES UNDER THE SPILLWAY. HE HAS BEEN UNABLE TO LOCATE ANYBODY WHO DOES THIS WORK AND I HAVE A CALL IN FOR BOOTH KELLY TO SEE IF THEY CAN ADVISE US. HE ASKED IF HE COULD BREAK OUT SOME HOLES AND GROUT FROM THE TOP DOWN AND I SAID YES, PROVIDED HE COVERED THE WHOLE AREA THAT WAS HOLLOW AND USED A VIBRATOR WITH THE POURING. HE MUST GET APPROVAL FROM PEARSON, THE DESIGNING ENGINEER.

DEC -7 '64 H.W.B.

12/8/64 HWB TO JOB. CONTRACTOR'S AIR COMPRESSOR HAD JUST ARRIVED WHEN I DID. WAITED AROUND WITH MR. SHERMAN QUINTO WHO IS THE ATTORNEY FOR THE CLUB WITH OFFICES AT 49 LEAVENWORTH STREET, WATERBURY. AFTER AN HOUR IT APPEARED THAT THE CONTRACTOR WASN'T GOING TO ACCOMPLISH ENOUGH THIS AFTERNOON TO BE SIGNIFICANT SO I LEFT. QUINTO WILL CALL ME WHEN THEY HAVE SOMETHING DEFINITE THERE THAT CAN BE INSPECTED.

DEC -9 '64 H.W.B.

12/11/64 HWB CALL FROM QUINTO. CALLED BILL WISE AND CALLED QUINTO BACK. THE WRC IS MEETING ON THE 21ST. ARRANGED TO MEET QUINTO AT THE DAM ON THE 15TH AND TO REVIEW IT, (PRESUMABLY IT IS COMPLETED FROM QUINTO'S DESCRIPTION)AND ISSUE THE LETTER TO THE WRC AND THEN GET A CERTIFICATE FROM THE COMMISSION'S ACTION ON THE 21ST. HE WOULD LIKE A LETTER THIS P.M. [illegible] THAT HE CAN TAKE TO THE BOARD OF DIRECTOR'S WHO ARE MEETING ON THE 13TH TO SAY THAT SO FAR AS WE UNDERSTAND THE WORK HAS BEEN COMPLETED AND THE CERTIFICATE WILL BE FORTHCOMING.

DEC 11 '64

12/15/64 HWB MET WITH CONTRACTOR, AND LAWYER AND MADE INSPECTION OF FINAL CONSTRUCTION. PEARSON HAD BEEN ON THE JOB YESTERDAY AND APPROVED EVERYTHING EXCEPT THE ADDITIONAL FILL IN FRONT OF THE SPILLWAY WHICH THEY ARE PRESENTLY UNDERTAKING. EVERYTHING SEEMS IN GOOD SHAPE. REVIEWED IN DETAIL WITH THE CONTRACTOR EXACTLY WHAT HE HAD DONE THROUGHOUT THE CONSTRUCTION PERIOD. SAID I WOULD SEND THROUGH REQUISITION FOR APPROVAL.

DEC 16 '64 H.W.B.

5/13/65 HWB DAM INSPECTION. POND FILLED AND SPILLING. NO LEAKS IN SPILLWAY.

MAY 17 '65 H.W.B.

BUCK & BUCK
ENGINEERS
71 CAPITOL AVENUE, HARTFORD, CONNECTICUT 06103

HENRY WOLCOTT BUCK
RICHARD S. BUCK

CLIFFORD G. ENGSTROM
WILLIAM R. BOYENS
JAMES A. THOMPSON
ROBINSON W. BUCK

COMM. 5713-33

MAY 14, 1965

WATER RESOURCES COMMISSION
STATE OFFICE BUILDING
HARTFORD, CONNECTICUT 06115

RE: MERRIMAN'S DAM, WATERTOWN

GENTLEMEN:

I INSPECTED THIS DAM ON MAY 13, 1965 AND FOUND THE POND FILLED AND SPILLING. I CHECKED ALL POINTS AT WHICH LEAKS HAD OCCURRED LAST YEAR AS WELL AS MADE A GENERAL INSPECTION OF THE AREA AND FOUND NO INDICATION OF LEAKAGE.

SINCERELY YOURS,

HENRY WOLCOTT BUCK

STATE OF CONNECTICUT
DEPARTMENT OF ENVIRONMENTAL PROTECTION
STATE OFFICE BUILDING HARTFORD, CONNECTICUT 06115

6 May 1977

Crestbrook Country Club, Inc.
Northfield Road
Watertown, CT 06795

Re: Lochwood Pond (Merrimans Pond)
Watertown 10

Gentlemen:

According to records maintained in this office, the above-mentioned dam is under your ownership.

Section 25-110 (Public Law No. 571, 1975 Revision of the General Statutes), a copy of which is enclosed, places under the jurisdiction of this department all dams, which by breaking away or otherwise, might endanger life or property. It has been determined that this dam is under our jurisdiction.

In accordance with Section 25-111 (1975 Revision of the General Statutes) this dam has been inspected. In order to maintain your dam in a safe condition, the following maintenance work or deficiencies should receive attention:

1. Trees and brush growing on downstream slope should be cut and removed.

2. Upstream slope in the area of both spillway training walls that has eroded should be filled and protected with rip rap.

The Water Resources Unit of the Department of Environmental Protection shall be notified within two weeks as to what steps you plan to take to accomplish this work.

If you have any questions, please contact Victor Galgowski, Supt. of Dam Maintenance, at 566-7245.

Sincerely,

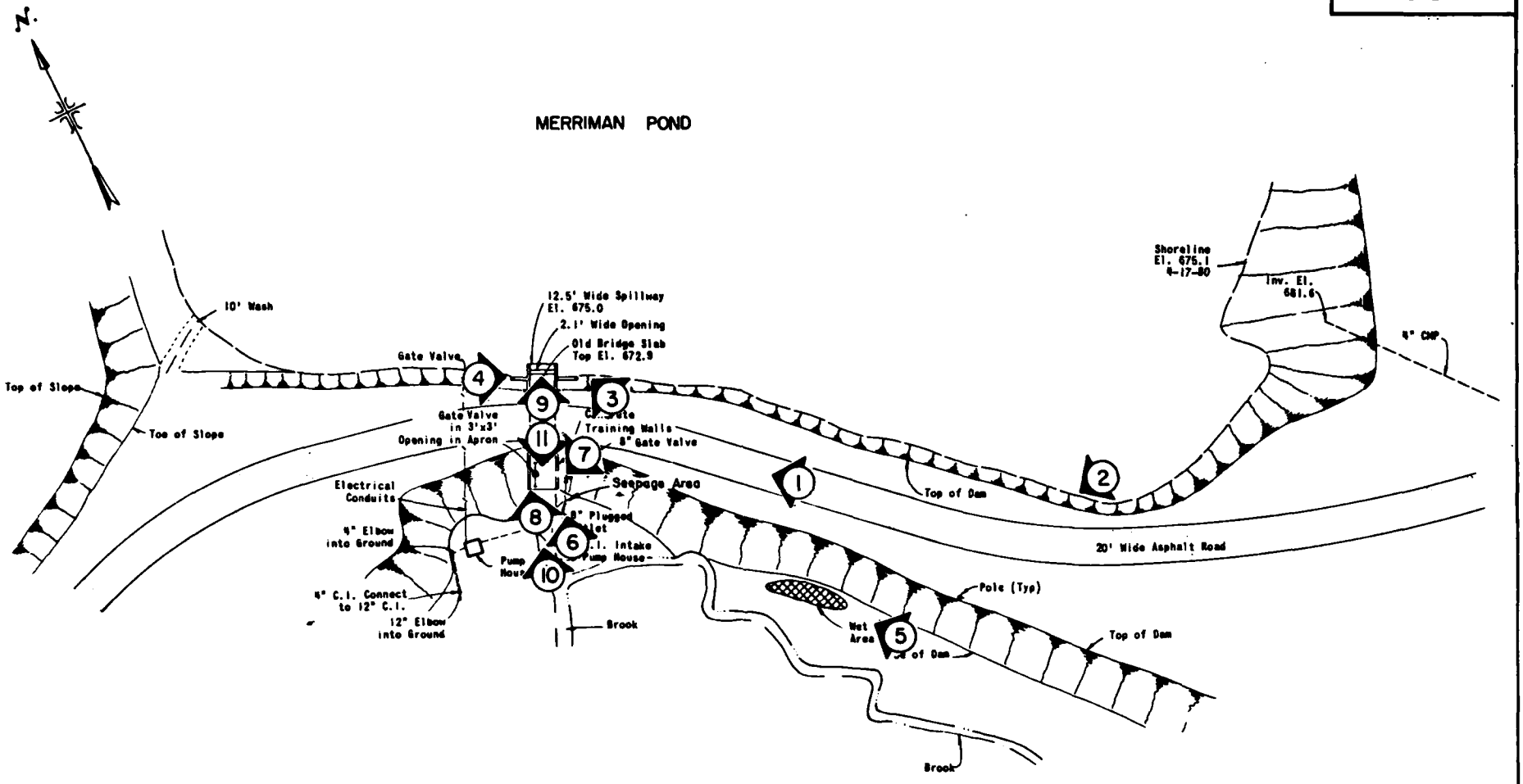
Edward J. Daly, Director
Water Resources Unit

EJD:ljk
Enclosure

APPENDIX C

PHOTOGRAPHS

FIGURE 3



Denotes photo number and direction in which photo was taken.

ROALD HAESTAD, INC. CONSULTING ENGINEERS WATERBURY, CONNECTICUT	U.S. ARMY ENGINEER DIV NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS.

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

PHOTO LOCATION PLAN

MERRIMAN POND DAM

WATERTOWN, CONNECTICUT

DRAWN	CHECKED	APPROVED	SCALE 1" = 80'	
JRS	RGL*	RH	DATE JUNE 1980	PAGE C-1

PHOTO NO. 1

DAM CREST LOOKING TOWARDS SERVICE BRIDGE OVER SPILLWAY. NOTE ROADWAY AND TESTING OF FIRE FIGHTING EQUIPMENT

PHOTO NO. 2

EROSION OF UPSTREAM SLOPE DUE TO WAVE ACTION

U.S ARMY ENGINEER DIV. NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASSACHUSETTS	NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS	MERRIMAN POND DAM TR. TO SMITH POND BROOK WATERTOWN, CT. CT00128 2 MAY '80
ROALD HAESTAD, INC. CONSULTING ENGINEERS WATERBURY, CONNECTICUT		

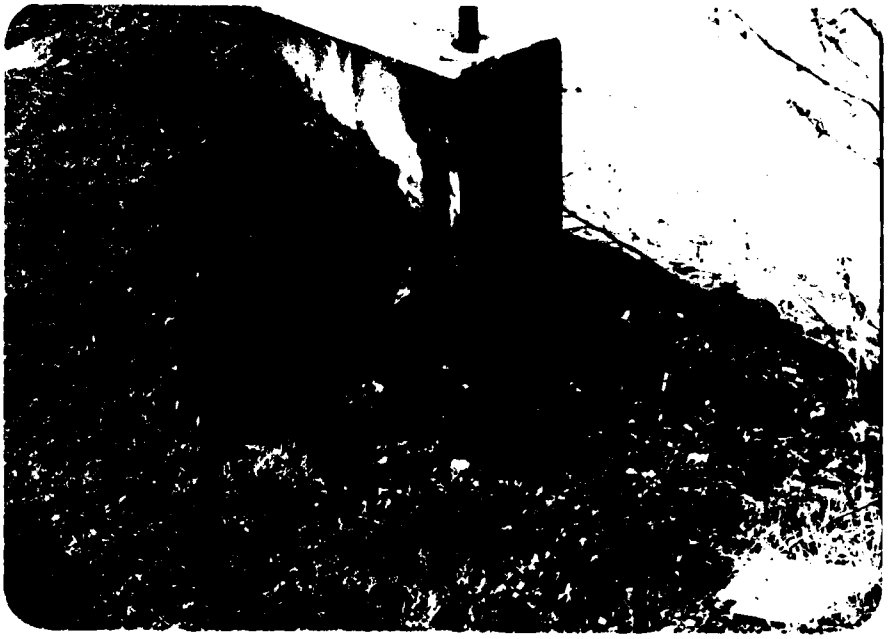


PHOTO NO. 3

EROSION AT UPSTREAM WINGWALL,
TO LEFT OF SPILLWAY

PHOTO NO. 4

EROSION AT UPSTREAM WINGWALL TO RIGHT OF
SPILLWAY. NOTE DETERIORATED CONCRETE
AND EXPOSED REINFORCING STEEL

U.S ARMY ENGINEER DIV. NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASSACHUSETTS	NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS	MERRIMAN POND DAM TR. TO SMITH POND BROOK WATERTOWN, CT. CT00128 2 MAY '80
ROALD HAESTAD, INC. CONSULTING ENGINEERS WATERBURY, CONNECTICUT		

PHOTO NO. 5

DOWNSTREAM SLOPE LOOKING TOWARD SPILLWAY.
NOTE EXTENSIVE VEGETATION IN FOREGROUND.

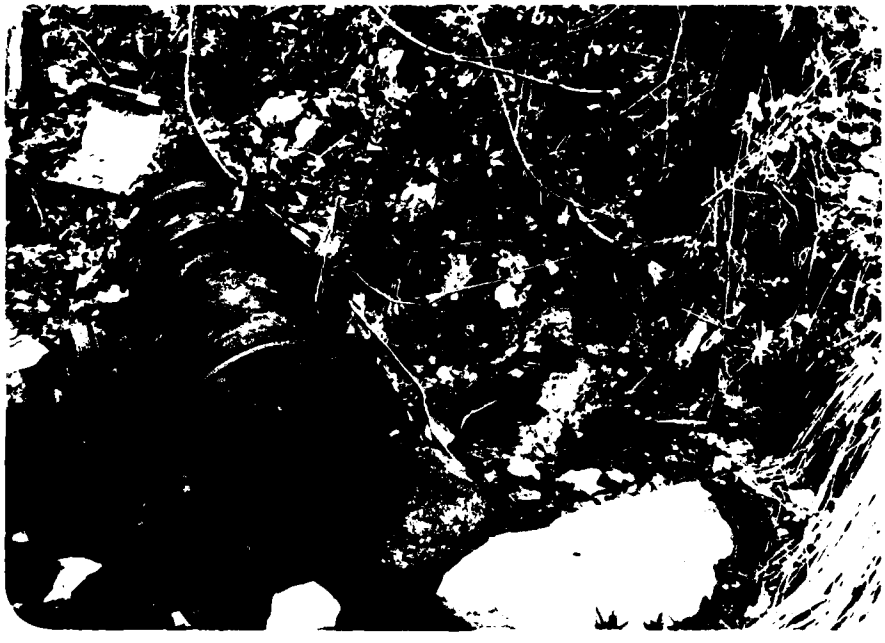


PHOTO NO. 6

SEEPAGE AT TOE OF SLOPE NEXT
TO 8-INCH PLUGGED BLOWOFF

U.S.ARMY ENGINEER DIV. NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASSACHUSETTS	NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS	MERRIMAN POND DAM TR. TO SMITH POND BROOK WATERTOWN, CT. CT00128 2 MAY '80
ROALD HAESTAD, INC. CONSULTING ENGINEERS WATERBURY, CONNECTICUT		

PHOTO NO. 7

EROSION ADJACENT TO LEFT SPILLWAY TRAINING WALL

PHOTO NO. 8

EROSION ADJACENT TO RIGHT SPILLWAY TRAINING WALL. NOTE RUNNING WATER FROM TEST OF FIRE FIGHTING EQUIPMENT.

U.S.ARMY ENGINEER DIV. NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASSACHUSETTS	NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS	MERRIMAN POND DAM TR. TO SMITH POND BROOK WATERTOWN, CT. CT00128 2 MAY '80
ROALD HAESTAD, INC. CONSULTING ENGINEERS WATERBURY, CONNECTICUT		

PHOTO NO. 9

SPILLWAY WEIR. NOTE PROVISIONS FOR FLASHBOARDS AND DETERIORATION OF CONCRETE TRAINING WALL.

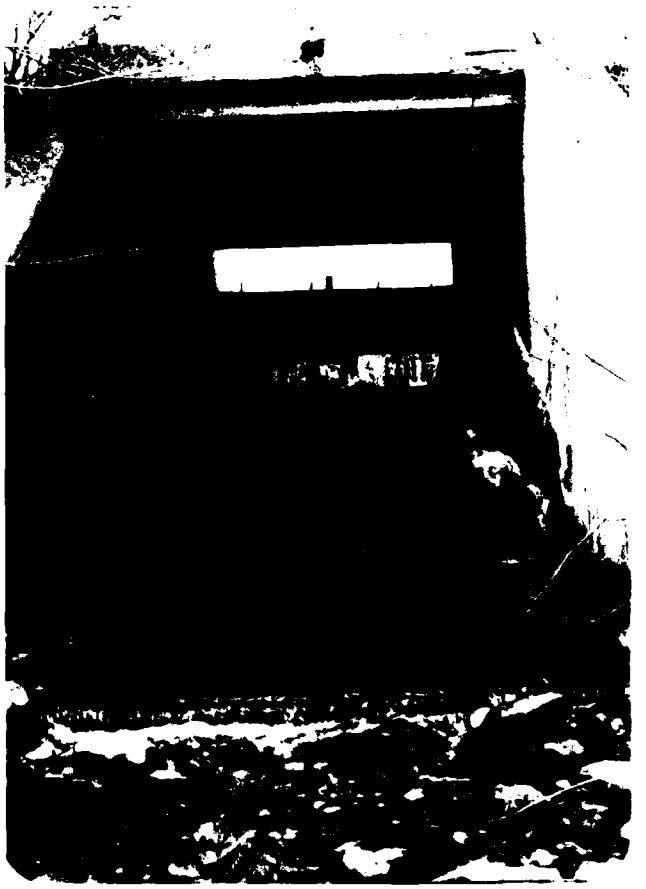


PHOTO NO. 10

SPILLWAY DISCHARGE CHANNEL, TRAINING WALLS AND SERVICE BRIDGE FROM DOWNSTREAM. NOTE STAINING AT BASE OF RIGHT TRAINING WALL AND THE PRESENCE OF EFFLORESCENCE.

U.S.ARMY ENGINEER DIV. NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASSACHUSETTS	NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS	MERRIMAN POND DAM TR. TO SMITH POND BROOK WATERTOWN, CT. CT00128 2 MAY '80
ROALD HAESTAD, INC. CONSULTING ENGINEERS WATERBURY, CONNECTICUT		

PHOTO NO. 11

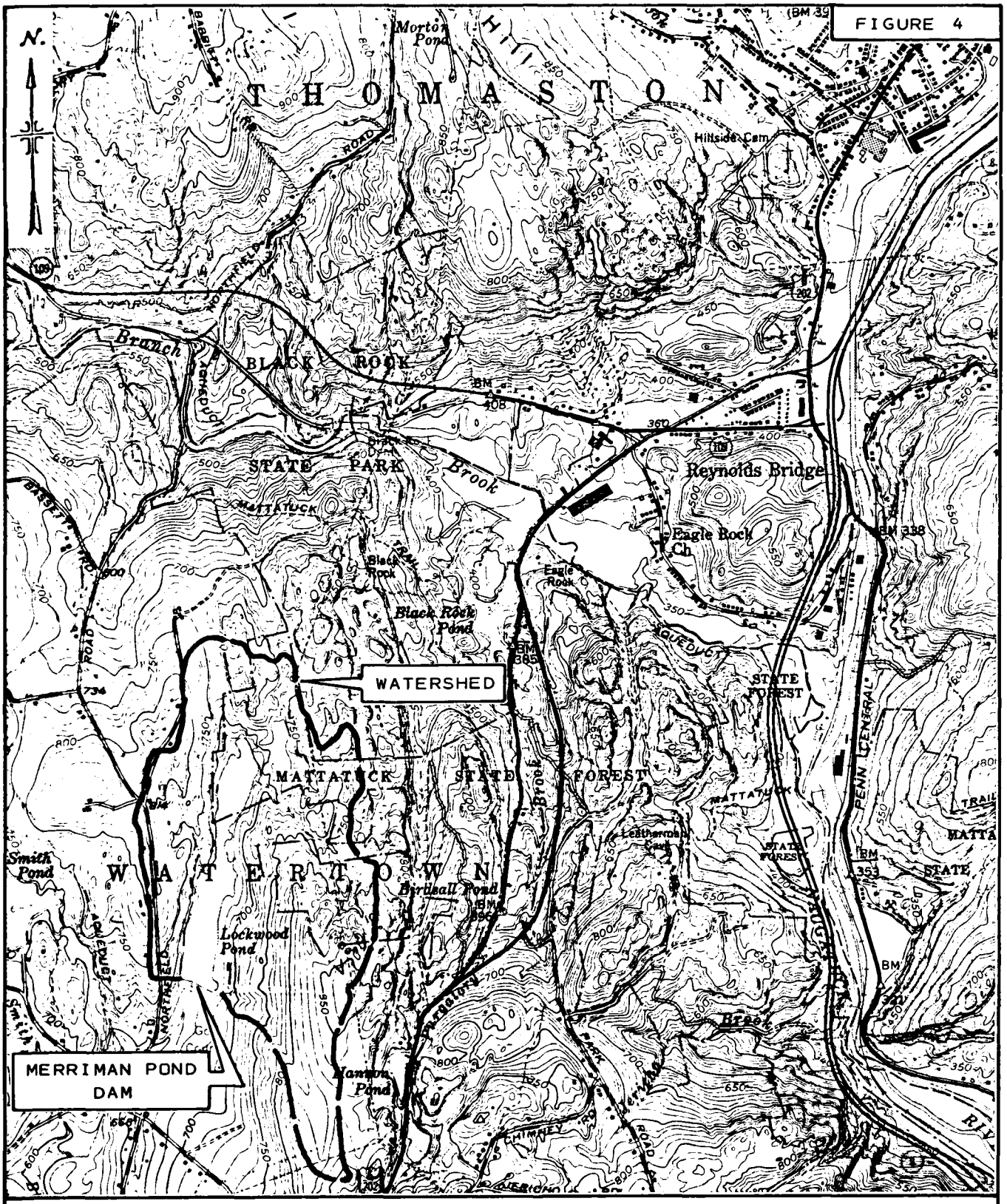
DOWNSTREAM CHANNEL FROM SERVICE BRIDGE.
PIPE IS INTAKE TO PUMPHOUSE.

U.S.ARMY ENGINEER DIV. NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASSACHUSETTS	NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS	MERRIMAN POND DAM TR. TO SMITH POND BROOK WATERTOWN, CT. CT00128 2 MAY '80
ROALD HAESTAD, INC. CONSULTING ENGINEERS WATERBURY, CONNECTICUT		

APPENDIX D

HYDROLOGIC AND HYDRAULIC COMPUTATIONS

FIGURE 4



WATERSHED MAP

MERRIMAN POND DAM
WATERTOWN, CONNECTICUT

SCALE: 1" = 2000'

ROALD HAESTAD, INC.

THOMASTON QUADRANGLE 1972

BY DLS DATE 4/24/80 **ROALD HAESTAD, INC.** SHEET NO 1 OF 2

CONSULTING ENGINEERS

CKD BY SAL DATE 5/12/80 37 Brookside Road - Waterbury, Conn. 06708 JOB NO 049-21

SUBJECT MERRIMAN POND DAM STORAGE CAPACITY

Planimeter 60272

WATERSHED AREA

THIRD	25.74	4.44 in^2	= 408 ACRES = 0.64 Sq. mi.
FIRST	16.85	4.42	
START	12.43		

WATER SURFACE AREA

SPILLWAY EL 675

THIRD	41.38	0.37 in^2	= 34 Acres
FIRST	40.63	0.37	
START	40.26		

Elev. 680

THIRD	42.84	0.49 in^2	= 45 ACRES
FIRST	41.87	0.49	
START	41.38		

STORAGE CAPACITY

ESTIMATE AVE. DEPTH AT SPILLWAY El. ≈ 5 feet

STORAGE AT SPILLWAY EL = 5' x 34Ac = 170Ac-FT.

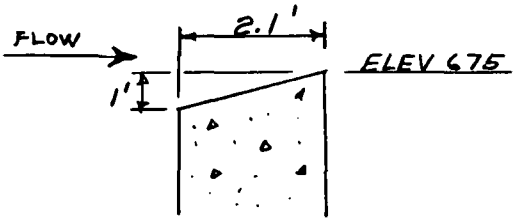
TOTAL STORAGE AT TOP OF DAM = 324 Ac-Ft.

BY SAL DATE 5/12/80 **ROALD HAESTAD, INC.** SHEET NO 2 OF 26

CONSULTING ENGINEERS

CKD BY DLS DATE 5/13/80 37 Brookside Road - Waterbury, Conn. 06708 JOB NO 049-21

SUBJECT MERRIMAN POND DAM - Discharge Capacity



SPILLWAY SECTION

SPILLWAY

Coefficient of discharge = 3.3

Length of weir = 12.5 Ft.

Freeboard = 4 FT

DAM

Coefficient of discharge = 2.5

Length = 440 FT.

Spillway Capacity (Top of Dam) $= CLH^{3/2}$
$= 3.3(12.5)(4)^{3/2}$
$= 330$ cfs

Elevation (Ft)	Spillway Discharge Capacity (cfs)	Dam Discharge Capacity (cfs)	Total Discharge Capacity (cfs)
675	0	0	0
676	41	0	41
677	117	0	117
678	214	0	214
679	330	0	330
680	461	1,100	1,561

Surface Area @ Elev 675 = 34 acres
" " " " 680 = 45 acres

Surcharge Storage = $5' \times ((34+45)/2)$

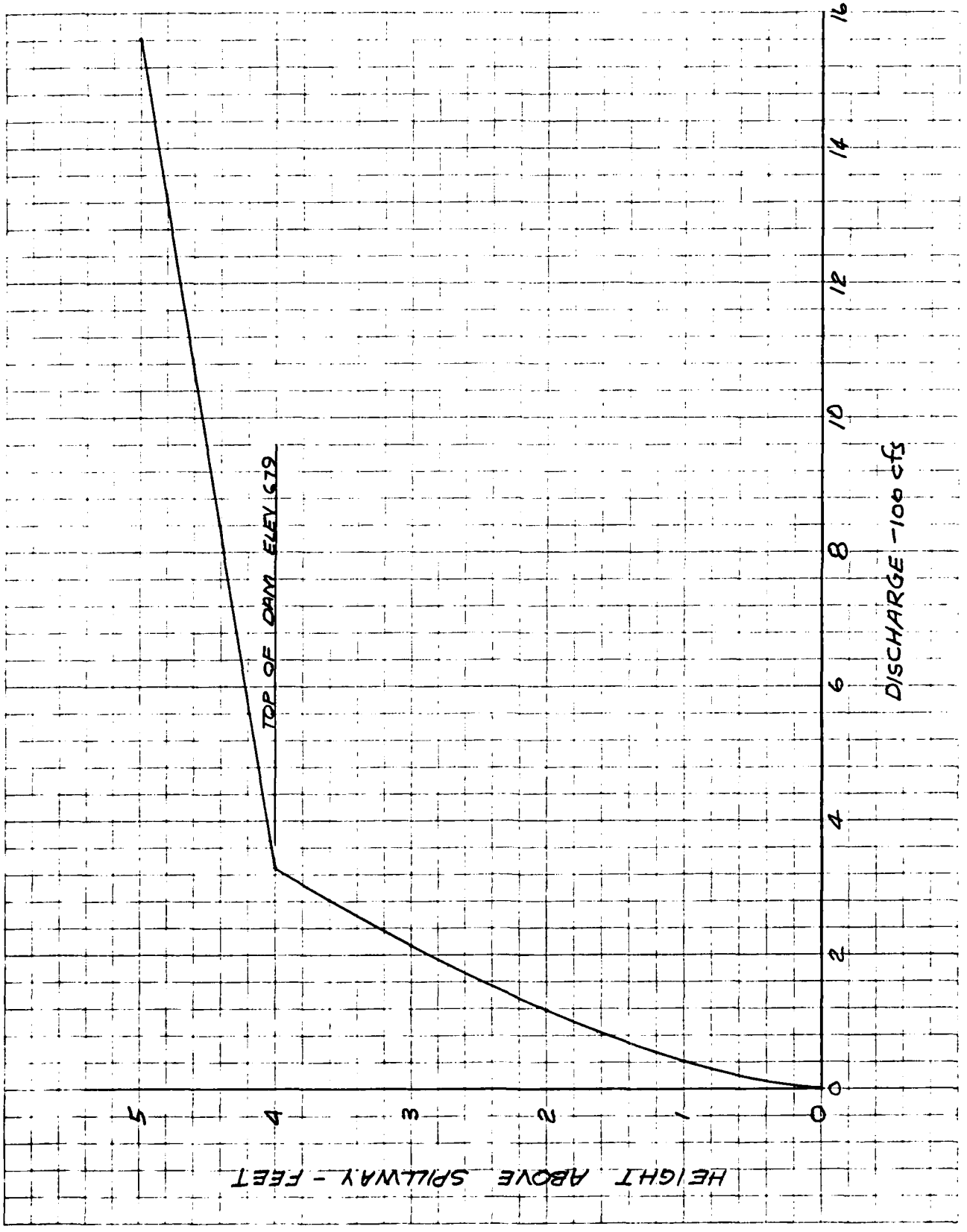
= 197.5 Ac-Ft.

BY SAL DATE 5/12/80 **ROALD HAESTAD, INC.** SHEET NO 3 OF 26

CONSULTING ENGINEERS

CKD BY DLS DATE 5/13/80 37 Brookside Road - Waterbury, Conn. 06708 JOB NO 049-21

SUBJECT MERRIMAN POND DAM - Discharge Capacity Curve



BY SAL DATE 5/19/80. **ROALD HAESTAD, INC.** SHEET NO 4 OF 26

CONSULTING ENGINEERS

CKD BY DLS DATE 5/23/80. 37 Brookside Road - Waterbury, Conn. 06708 JOB NO 49-021

SUBJECT MERRIMAN POND DAM - Dam Storage Capacity

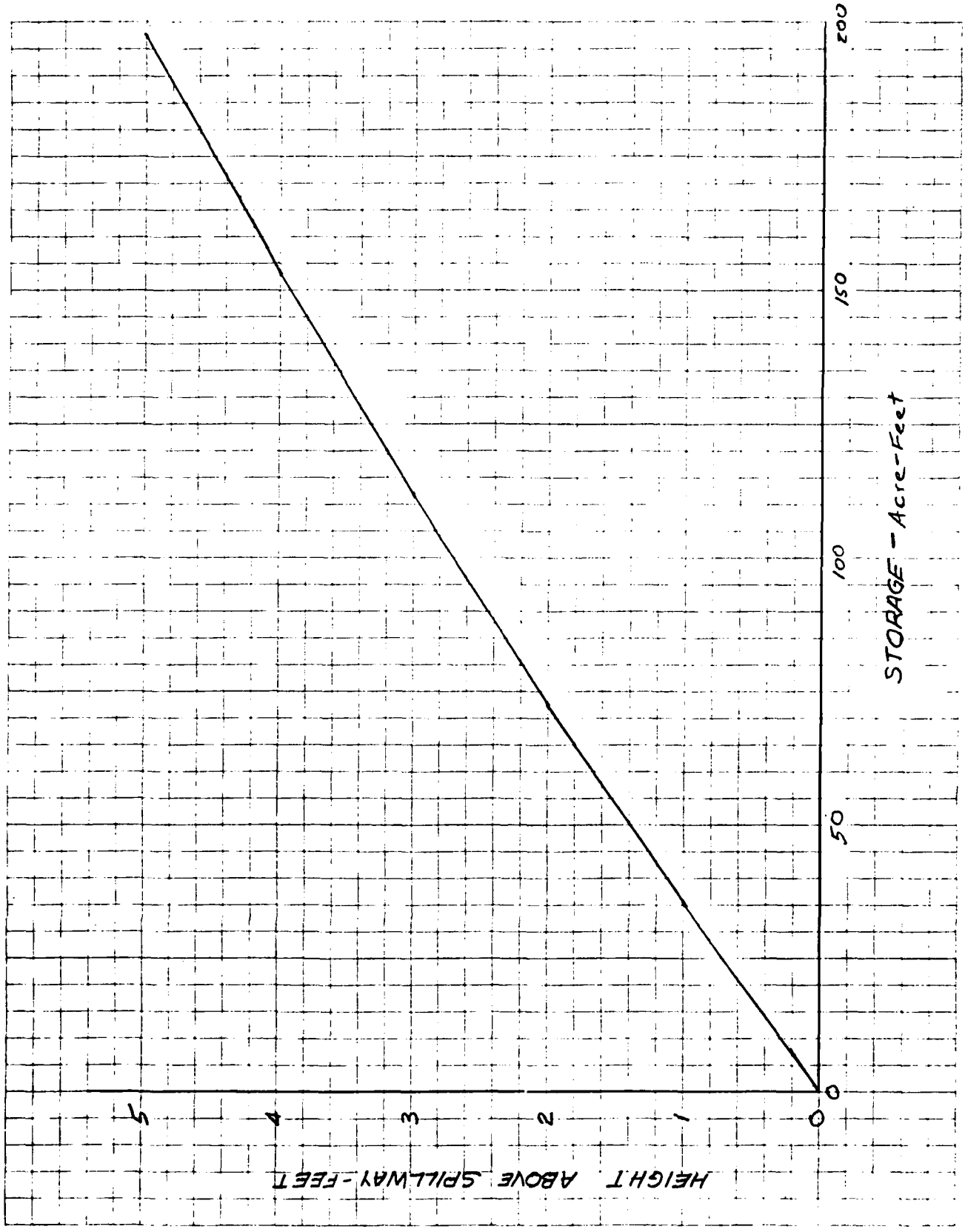
Height Above Spillway (ft)	Surface Area (Acres)	Average Surface Area (Acres)	Storage Capacity (Acre-feet)
0	34.0		0
		35.1	
1	36.2		35.1
		37.3	
2	38.4		72.4
		39.5	
3	40.6		111.9
		41.7	
4	42.8		153.6
		43.9	
5	45.0		197.5

BY SAL DATE 5/12/80 **ROALD HAESTAD, INC.** SHEET NO 5 OF 26

CONSULTING ENGINEERS

CKD BY DLS DATE 5/13/80 37 Brookside Road - Waterbury, Conn. 06708 JOB NO 049-21

SUBJECT MERRIMAN POND DAM - Surcharge Storage Capacity Curve



TEST FLOOD ½ PMF

DRAINAGE AREA = 0.64 Sq. Mi.

FROM CORPS OF ENGINEERS CHART FOR "ROLLING" TERRAIN

MPF = 2125 csm (2.0 sq. mi. minimum)

PMF = 2125 csm x 0.64 sq. mi. = 1360 cfs

½ PMF = ½ (1360) = 680 cfs

Q_{p1} = 680 cfs

H_1 = 4.3 ft. above spillway, from discharge curve

$STOR_1$ = 168 Ac-Ft., from storage capacity curve

= 4.9" runoff from 0.64 sq. mi.

MPF runoff in New England equals about 19"

½ MPF runoff equals ½ (19") = 9.5"

$$Q_{p2} = Q_{p1}\left(1 - \frac{STOR_1}{9.5}\right) = 680\left(1 - \frac{4.9}{9.5}\right) = 329 \text{ cfs}$$

H_2 = 4.0 ft. $STOR_2$ = 154 Ac-Ft.

$STOR_{AVE} = (168+154)\,½ = 161$ Ac-Ft. = 4.7"

$$Q_{p3} = 680 \text{ cfs}\left(1 - \frac{4.7"}{9.5"}\right) = 344 \text{ cfs}$$

USE 345 cfs

SPILLWAY CAPACITY

$$\text{SPILLWAY CAPACITY} = CLH^{3/2}$$
$$= 3.3(12.5)(4.0)^{3/2}$$
$$= 330 \text{ cfs}$$

TEST FLOOD - ½ PMF ROUTED OUTFLOW = 345 cfs

$$\% \text{ of TEST FLOOD} = \frac{330}{345} \times 100 = \underline{96\%}$$

SPILLWAY CAN PASS 96% of TEST FLOOD

DEPTH OF FLOW AT TEST FLOOD

$$345 \text{ cfs} = \underset{\text{SPILLWAY}}{C_s L_s H_s^{3/2}} + \underset{\text{DAM}}{C_D L_D H_D^{3/2}} \qquad H_s = 4.0 + H_D$$

$$345 \text{ cfs} = 3.3(12.5)(4.0+H_D)^{3/2} + (2.5)(440)(H_D)^{3/2}$$

$$H_D = 0.05 \text{ ft.}$$

DEPTH OF FLOW AT TEST FLOOD = 4.05'

USE 4.1 feet

S = storage at time of failure = 328 ac-ft
(See Computation Sheet No. 1 of 27)

Q_{PI} = Peak Failure Outflow = $8/27\ W_b \sqrt{g}\ Y_o^{3/2}$

W_b = Breach Width - 40% of dam length across river at mid height = 0.4(254) = 101.6 ft

Y_o = Total height from river bed to pool level at time of failure = 17ft.

$Q_{PI} = 8/27\ (101.6)(\sqrt{32.2})(17)^{3/2}$

$Q_{PI} = 11,974$ cfs

SECTION NUMBER 1

H	W	A	R	S	V	Q
1.0	24	12	.50	.0200	2.64	32
2.0	48	48	1.00	.0200	4.19	201
3.0	72	108	1.49	.0200	5.49	593
4.0	96	192	1.99	.0200	6.66	1278
5.0	120	300	2.49	.0200	7.72	2317
6.0	145	432	2.99	.0200	8.72	3768
7.0	169	588	3.49	.0200	9.67	5684
8.0	193	768	3.99	.0200	10.57	8115
9.0	217	972	4.48	.0200	11.43	11109
10.0	241	1200	4.98	.0200	12.26	14713

MANNING COEFFICIENT=N=.0500
STORAGE AT TIME OF FAILURE=S= 328 AC. FT.
LENGHT OF REACH=L= 2000 FT.

INFLOW INTO REACH=QP1=11974 CFS
DEPTH OF FLOW=H1= 9.3 FT.
CROSS SECTIONAL AREA=A1= 1028 SQ. FT.
STORAGE IN REACH=V1= 47.2 AC. FT.

TRIAL REACH OUTFLOW=QP(TRIAL)=10251 CFS
TRIAL DEPTH OF FLOW=H(TRIAL)= 8.7 FT.
TRIAL CROSS SECTIONAL AREA=A(TRIAL)= 915 SQ. FT.
TRIAL STORAGE IN REACH=V(TRIAL)= 42.0 AC. FT.

REACH OUTFLOW=QP2=10345 CFS
DEPTH OF FLOW=H2= 8.8 FT.

BY SAL DATE 5/19/80 **ROALD HAESTAD, INC.** SHEET NO 10 OF 26

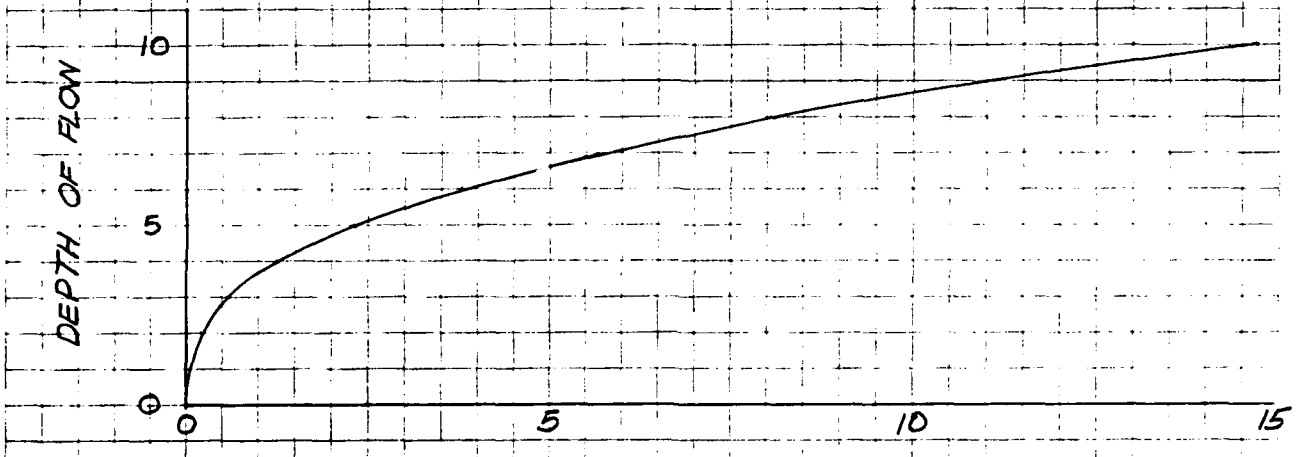
CONSULTING ENGINEERS

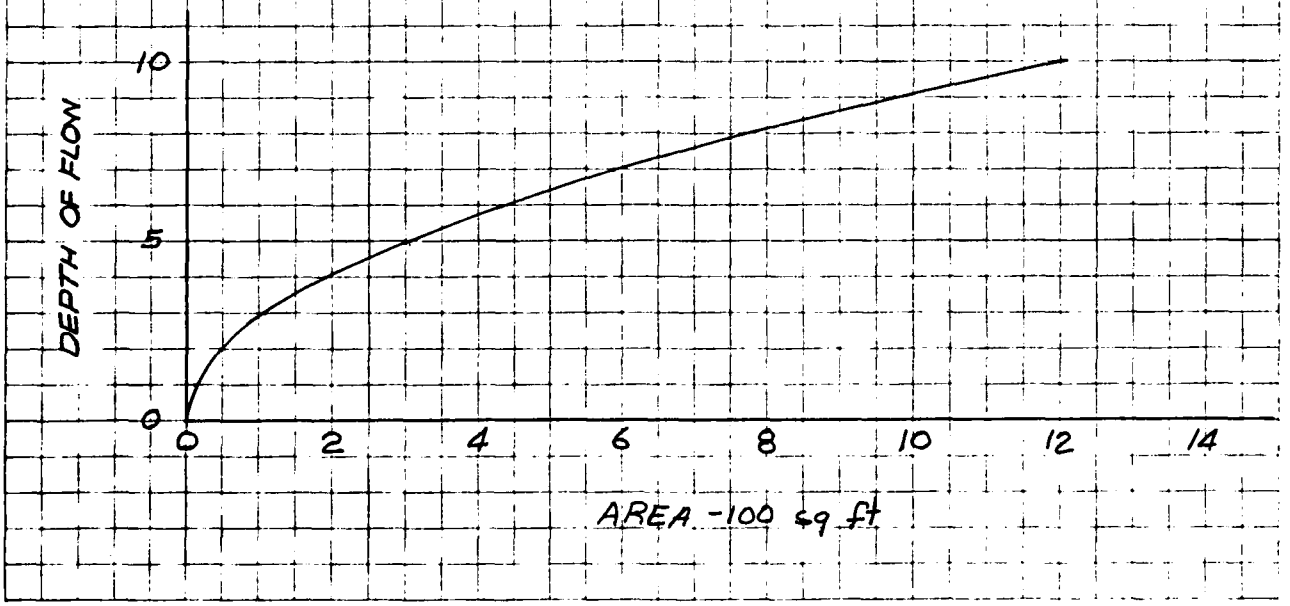
CKD BY DLS DATE 5/23/80 37 Brookside Road - Waterbury, Conn. 06708 JOB NO 49-021

SUBJECT MERRIMAN POND DAM - Flood Routing

SECTION NO 1 (See Figure 5) Scale: 1" = 100' Horiz. 1" = 20' Vert

L = 2,000'
S = 0.02
n = 0.05





SECTION NUMBER 2A

(MAIN CHANNEL)

H	W	A	R	S	V	Q
1.0	15	12	.78	.0130	3.59	42
2.0	20	28	1.43	.0130	5.38	153
3.0	26	50	1.92	.0130	6.55	327
4.0	31	76	2.44	.0130	7.69	583
5.0	33	104	3.14	.0130	9.09	944
6.0	35	132	3.76	.0130	10.25	1352
7.0	37	160	4.32	.0130	11.23	1795
8.0	39	188	4.81	.0130	12.07	2269
9.0	41	216	5.26	.0130	12.81	2766
10.0	43	244	5.67	.0130	13.46	3284
11.0	45	272	6.04	.0130	14.04	3819
12.0	47	300	6.38	.0130	14.56	4368
13.0	49	328	6.69	.0130	15.03	4931
14.0	51	356	6.97	.0130	15.46	5504
15.0	53	384	7.24	.0130	15.85	6087

MANNING COEFFICIENT=N=.0400

SECTION NUMBER 2B

(LEFT OVERBANK)

H	W	A	R	S	V	Q
3.0	14	7	.46	.0130	1.45	9
4.0	31	28	.89	.0130	2.23	61
5.0	36	58	1.63	.0130	3.35	195
6.0	40	93	2.29	.0130	4.21	389
7.0	44	130	2.97	.0130	5.00	648
8.0	47	169	3.60	.0130	5.68	958
9.0	50	210	4.19	.0130	6.29	1317
10.0	53	253	4.74	.0130	6.83	1724
11.0	56	297	5.33	.0130	7.39	2194
12.0	60	344	5.74	.0130	7.76	2665
13.0	63	393	6.22	.0130	8.19	3214
14.0	66	443	6.76	.0130	8.66	3835
15.0	71	496	7.02	.0130	8.88	4403

MANNING COEFFICIENT=N=.0700

SECTION NUMBER 2C

(RIGHT OVERBANK)

H	W	A	R	S	V	Q
5.0	35	17	.49	.0130	1.50	25
6.0	50	58	1.16	.0130	2.67	155
7.0	63	112	1.78	.0130	3.55	397
8.0	75	178	2.36	.0130	4.29	762
9.0	81	251	3.09	.0130	5.13	1289
10.0	90	331	3.67	.0130	5.75	1905
11.0	108	424	3.91	.0130	6.01	2544
12.0	118	529	4.47	.0130	6.57	3474
13.0	125	642	5.12	.0130	7.19	4615
14.0	134	762	5.70	.0130	7.73	5884
15.0	142	888	6.27	.0130	8.23	7310

MANNING COEFFICIENT=N=.0700

SECTION NUMBER 2

(TOTAL SECTION)

H	A-1	A-2	A-3	A-T	Q-1	Q-2	Q-3	Q-T
1.0	12	0	0	12	42	0	0	42
2.0	28	0	0	28	153	0	0	153
3.0	50	7	0	56	327	9	0	336
4.0	76	28	0	103	583	61	0	645
5.0	104	58	17	179	944	195	25	1165
6.0	132	93	58	282	1352	389	155	1896
7.0	160	130	112	401	1795	648	397	2841
8.0	188	169	178	534	2269	958	762	3989
9.0	216	210	251	676	2766	1317	1289	5372
10.0	244	253	331	827	3284	1724	1905	6913
11.0	272	297	424	992	3819	2194	2544	8557
12.0	300	344	529	1173	4368	2665	3474	10507
13.0	328	393	642	1363	4931	3214	4615	12759
14.0	356	443	762	1561	5504	3835	5884	15222
15.0	384	496	888	1768	6087	4403	7310	17799

STORAGE AT TIME OF FAILURE=S= 328 AC. FT.
LENGHT OF REACH=L= 5000 FT.

INFLOW INTO REACH=QP1=10345 CFS
DEPTH OF FLOW=H1= 11.9 FT.
CROSS SECTIONAL AREA=A1= 1158 SQ. FT.
STORAGE IN REACH=V1=132.9 AC. FT.

TRIAL REACH OUTFLOW=QP(TRIAL)= 6153 CFS
TRIAL DEPTH OF FLOW=H(TRIAL)= 9.5 FT.
TRIAL CROSS SECTIONAL AREA=A(TRIAL)= 754 SQ. FT.
TRIAL STORAGE IN REACH=V(TRIAL)= 86.6 AC. FT.

REACH OUTFLOW=QP2= 6884 CFS
DEPTH OF FLOW=H2= 10.0 FT.

BY SAL DATE 5/12/80 **ROALD HAESTAD, INC.** SHEET NO 14 OF 26

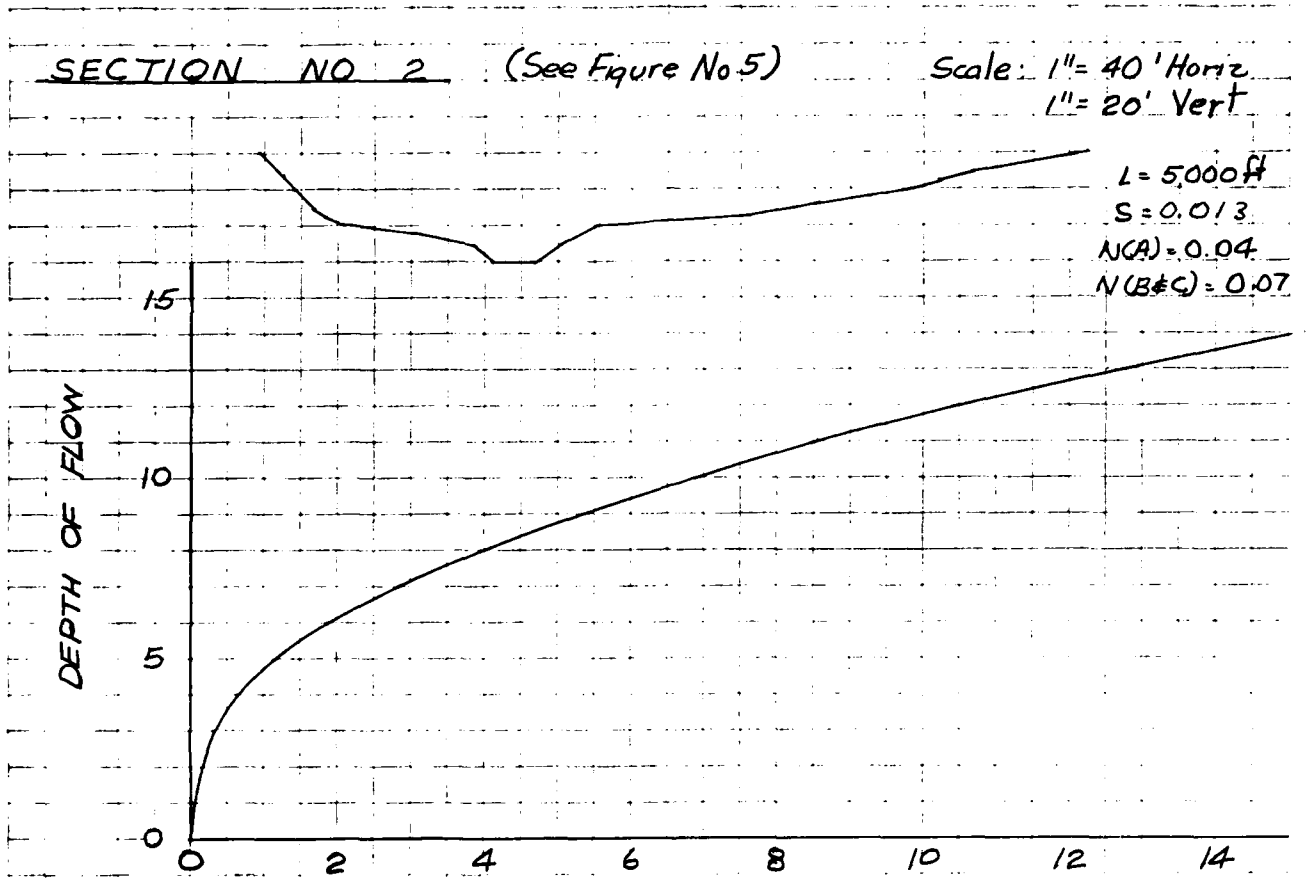
CONSULTING ENGINEERS

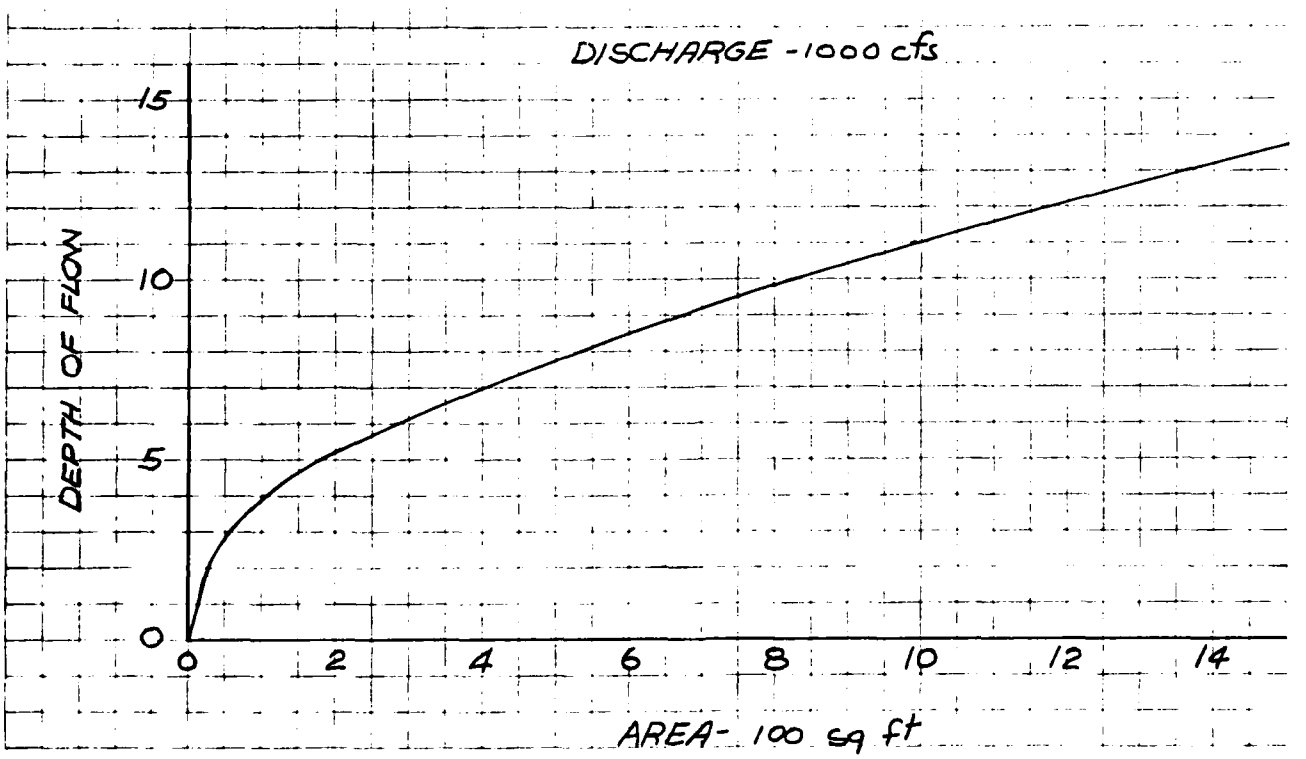
CKD BY DLS DATE 5/23/80 37 Brookside Road - Waterbury, Conn. 06708 JOB NO 49-021

SUBJECT MERRIMAN POND DAM - Flood Routing

SECTION NO 2 (See Figure No 5) Scale: 1" = 40' Horiz
1" = 20' Vert

L = 5,000 ft
S = 0.013
N(A) = 0.04
N(B&C) = 0.07





SECTION NUMBER 3A

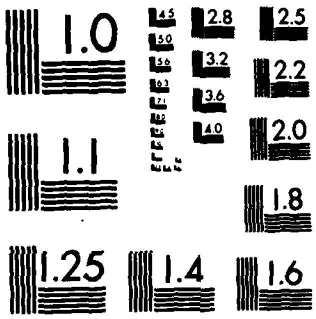
(MAIN CHANNEL)

H	W	A	R	S	V	Q
1.0	35	27	.77	.0150	3.06	83
2.0	41	65	1.57	.0150	4.92	320
3.0	49	109	2.25	.0150	6.25	682
4.0	51	156	3.09	.0150	7.72	1206
5.0	53	203	3.87	.0150	8.97	1822
6.0	55	250	4.59	.0150	10.05	2514
7.0	57	297	5.26	.0150	11.00	3270
8.0	59	344	5.88	.0150	11.86	4081

MANNING COEFFICIENT=N=.0500

AD-A143 340 NATIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL DAMS 2/2
MERRIMAN POND DAM (CT.. (U) CORPS OF ENGINEERS WALTHAM
MA NEW ENGLAND DIV JUN 80

UNCLASSIFIED F/G 13/13 NL



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

SECTION NUMBER 3B

(LEFT OVERBANK)

H	W	A	R	S	V	Q
3.0	19	9	.47	.0150	1.58	14
4.0	74	54	.73	.0150	2.11	114
5.0	82	130	1.58	.0150	3.52	456
6.0	91	213	2.33	.0150	4.57	971
7.0	97	302	3.10	.0150	5.53	1671
8.0	102	396	3.87	.0150	6.41	2537

MANNING COEFFICIENT=N=.0700

SECTION NUMBER 3C

(RIGHT OVERBANK)

H	W	A	R	S	V	Q
4.0	57	28	.49	.0150	1.62	45
5.0	79	95	1.20	.0150	2.93	277
6.0	90	177	1.96	.0150	4.07	719
7.0	97	267	2.74	.0150	5.09	1358
8.0	103	362	3.51	.0150	6.00	2172

MANNING COEFFICIENT=N=.0700

SECTION NUMBER 3

(TOTAL SECTION)

H	A-1	A-2	A-3	A-T	Q-1	Q-2	Q-3	Q-T
1.0	27	0	0	27	83	0	0	83
2.0	65	0	0	65	320	0	0	320
3.0	109	9	0	118	682	14	0	696
4.0	156	54	28	238	1206	114	45	1365
5.0	203	130	95	427	1822	456	277	2555
6.0	250	213	177	639	2514	971	719	4204
7.0	297	302	267	866	3270	1671	1358	6299
8.0	344	396	362	1102	4081	2537	2172	8790

STORAGE AT TIME OF FAILURE=S= 328 AC. FT.
LENGHT OF REACH=L= 2500 FT.

INFLOW INTO REACH=QP1= 6884 CFS
DEPTH OF FLOW=H1= 7.2 FT.
CROSS SECTIONAL AREA=A1= 924 SQ. FT.
STORAGE IN REACH=V1= 53.0 AC. FT.

TRIAL REACH OUTFLOW=QP(TRIAL)= 5771 CFS
TRIAL DEPTH OF FLOW=H(TRIAL)= 6.8 FT.
TRIAL CROSS SECTIONAL AREA=A(TRIAL)= 811 SQ. FT.
TRIAL STORAGE IN REACH=V(TRIAL)= 46.6 AC. FT.

REACH OUTFLOW=QP2= 5839 CFS
DEPTH OF FLOW=H2= 6.8 FT.

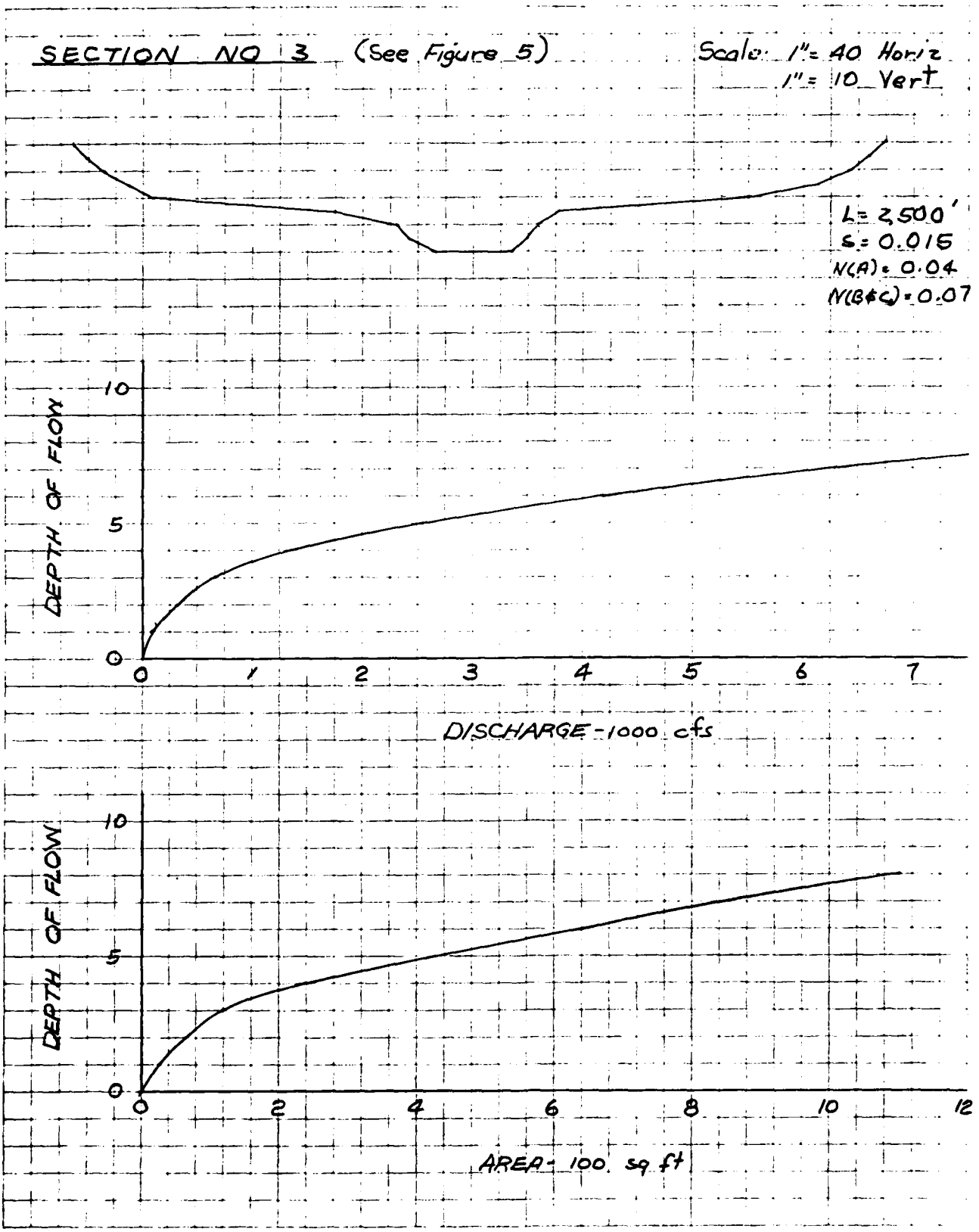
BY S.A.L. DATE 5/19/80 **ROALD HAESTAD, INC.** SHEET NO 18 OF 26

CONSULTING ENGINEERS

CKD BY D.L.S. DATE 5/23/80 37 Brookside Road - Waterbury, Conn. 06708 JOB NO 49-021

SUBJECT MERRIMAN POND DAM - Flood Routing

SECTION NO 3 (See Figure 5) Scale: 1" = 40 Horiz
1" = 10 Vert



SECTION NUMBER 4A

(MAIN CHANNEL)

H	W	A	R	S	V	Q
1.0	28	14	.50	.0140	2.76	39
2.0	38	47	1.23	.0140	5.04	237
3.0	46	89	1.94	.0140	6.84	606
4.0	51	136	2.67	.0140	8.47	1147
5.0	53	185	3.50	.0140	10.14	1870
6.0	55	234	4.27	.0140	11.57	2702
7.0	57	283	4.98	.0140	12.83	3623
8.0	59	332	5.65	.0140	13.94	4622
9.0	61	381	6.27	.0140	14.95	5688
10.0	63	430	6.85	.0140	15.86	6812

MANNING COEFFICIENT=N=.0400

SECTION NUMBER 4B

(LEFT OVERBANK)

H	W	A	R	S	V	Q
4.0	24	12	.48	.0140	1.54	18
5.0	49	47	.95	.0140	2.42	113
6.0	58	98	1.68	.0140	3.55	346
7.0	66	156	2.36	.0140	4.45	694
8.0	73	221	3.02	.0140	5.24	1159
9.0	80	292	3.63	.0140	5.94	1734
10.0	88	370	4.18	.0140	6.52	2408

MANNING COEFFICIENT=N=.0700

SECTION NUMBER 4C

(RIGHT OVERBANK)

H	W	A	R	S	V	Q
5.0	139	76	.55	.0140	1.68	128
6.0	147	218	1.48	.0140	3.26	710
7.0	159	368	2.31	.0140	4.39	1617
8.0	167	528	3.16	.0140	5.40	2851
9.0	174	694	3.98	.0140	6.31	4376
10.0	182	866	4.75	.0140	7.10	6147

MANNING COEFFICIENT=N=.0700

SECTION NUMBER 4

(TOTAL SECTION)

H	A-1	A-2	A-3	A-T	Q-1	Q-2	Q-3	Q-T
1.0	14	0	0	14	39	0	0	39
2.0	47	0	0	47	237	0	0	237
3.0	89	0	0	89	606	0	0	606
4.0	136	12	0	147	1147	18	0	1165
5.0	185	47	76	307	1870	113	128	2111
6.0	234	98	218	549	2702	346	710	3757
7.0	283	156	368	807	3623	694	1617	5935
8.0	332	221	528	1080	4622	1159	2851	8633
9.0	381	292	694	1366	5688	1734	4376	11798
10.0	430	370	866	1665	6812	2408	6147	15368

STORAGE AT TIME OF FAILURE=S= 328 AC. FT.
LENGHT OF REACH=L= 1700 FT.

INFLOW INTO REACH=QP1= 5839 CFS
DEPTH OF FLOW=H1= 7.0 FT.
CROSS SECTIONAL AREA=A1= 796 SQ. FT.
STORAGE IN REACH=V1= 31.1 AC. FT.

TRIAL REACH OUTFLOW=QP(TRIAL)= 5286 CFS
TRIAL DEPTH OF FLOW=H(TRIAL)= 6.7 FT.
TRIAL CROSS SECTIONAL AREA=A(TRIAL)= 734 SQ. FT.
TRIAL STORAGE IN REACH=V(TRIAL)= 28.6 AC. FT.

REACH OUTFLOW=QP2= 5308 CFS
DEPTH OF FLOW=H2= 6.7 FT.

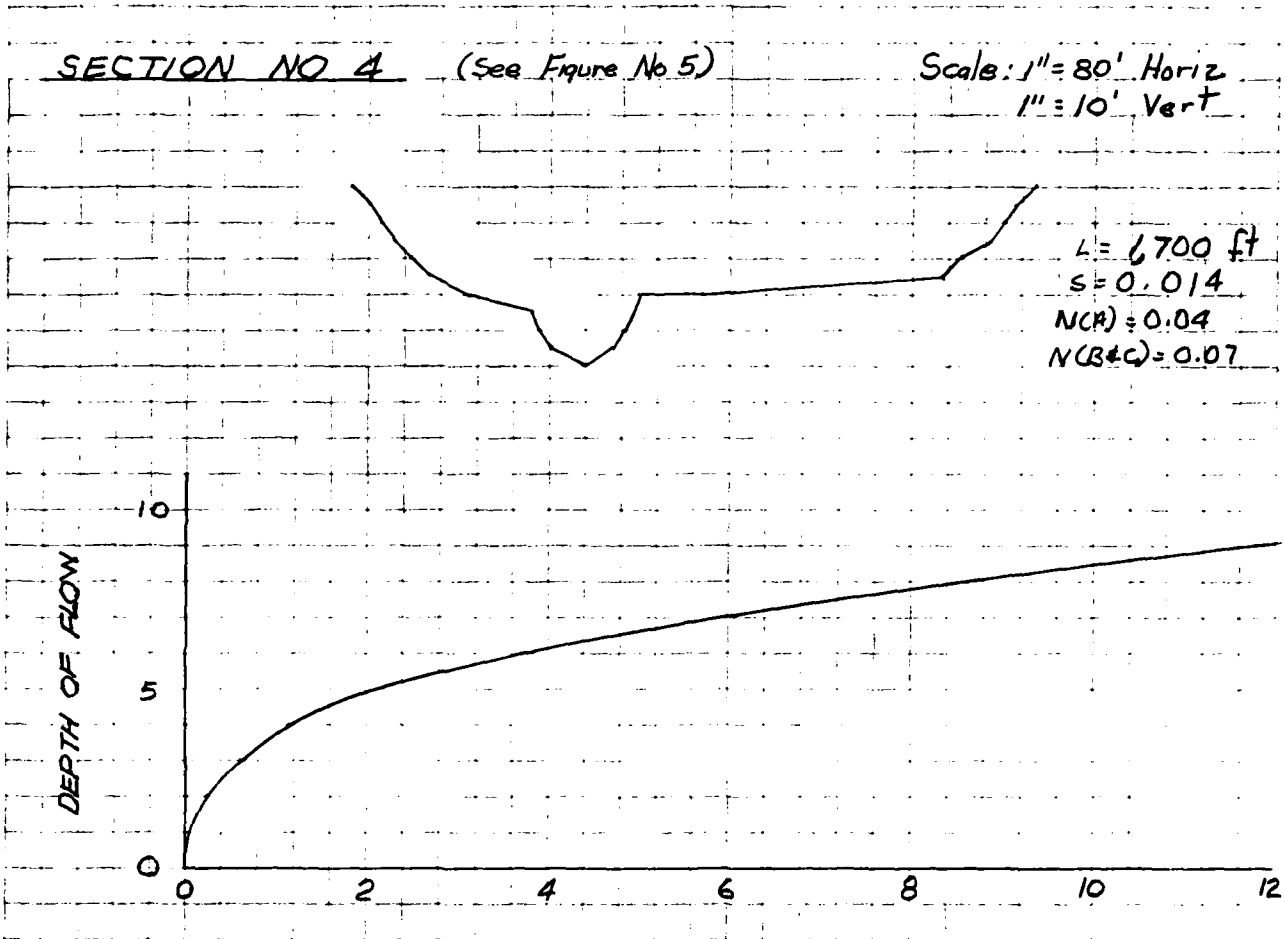
BY SAL DATE 5/19/80 **ROALD HAESTAD, INC.** SHEET NO 22 OF 26

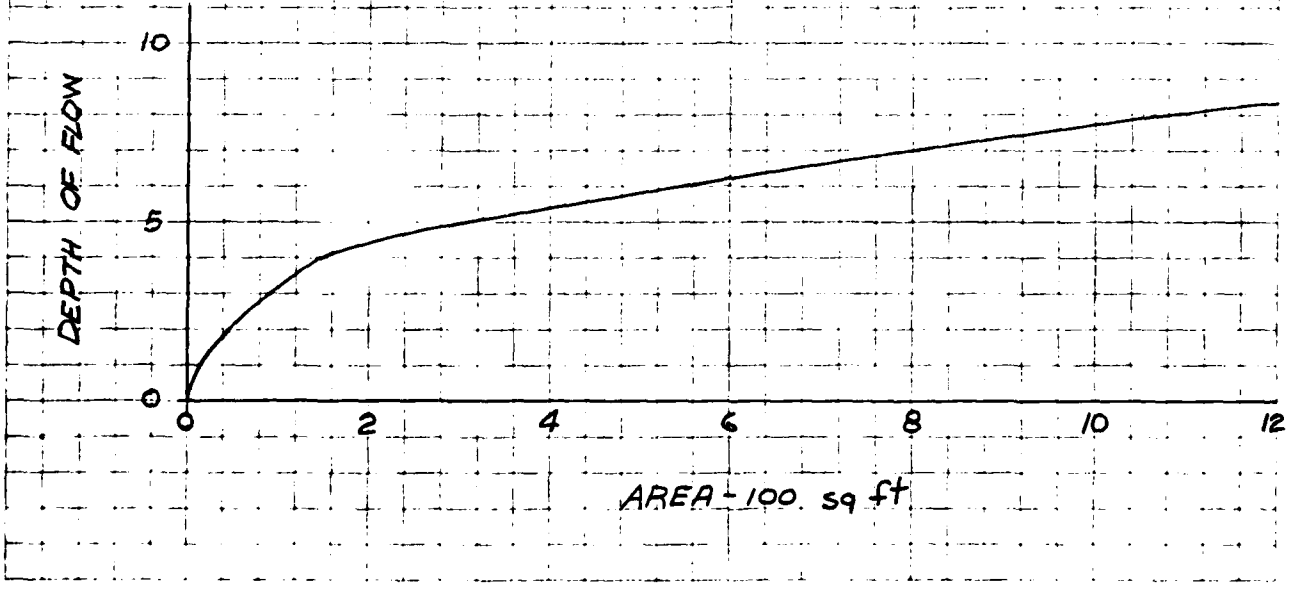
CONSULTING ENGINEERS

CKD BY DLS DATE 5/23/80 37 Brookside Road - Waterbury, Conn. 06708 JOB NO 49-021

SUBJECT MERRIMAN POND DAM - Flood Routing

SECTION NO 4 (See Figure No 5) Scale: 1" = 80' Horiz
1" = 10' Vert



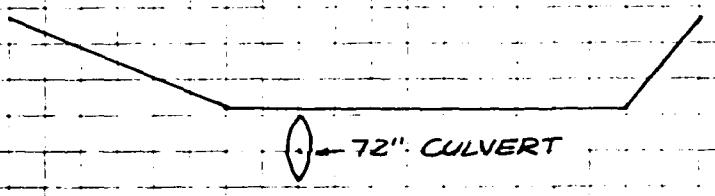


SUBJECT MERRIMAN POND DAM - Flood Routing

NORTHFIELD ROAD

Scale: 1" = 100' Horiz
1" = 20' Vert

Assume Inlet Control



Q(culvert) = 300 cfs at roadway level

Flow over road = 11,975 - 300 = 11,675 cfs

C = 2.8 L = 300 ft

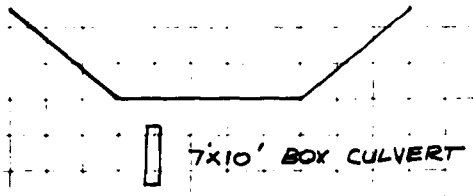
$Q = CLH^{3/2} = 11,675$ cfs

$11,675 \text{ cfs} = 2.8(300)H^{3/2}$

H = 5.8' above pavement

SMITH POND BROOK ROAD

Assume Inlet Control



Q(culvert) = 800 cfs at roadway level

Flow over road = 10,345 - 800 = 9,545 cfs

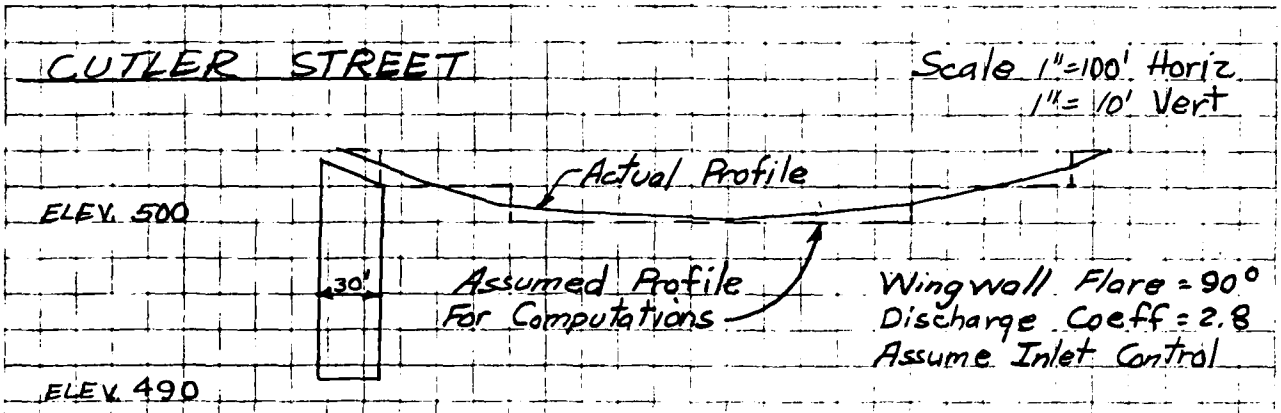
C = 2.8 L = 200ft

$Q = CLH^{3/2} = 9,545$ cfs

$9,545 \text{ cfs} = 2.8(200)H^{3/2}$

H = 6.6 ft above pavement

SUBJECT MERRIMAN POND DAM - Discharge Capacity



Height Above Invert - Feet		Q-culvert (cfs)	Q-road (cfs)	Q-TOTAL (cfs)
EL				
491	0	0	0	0
	3	420	0	420
	5	840	0	840
	7	1,350	0	1,350
500	9	2,100	0	2,100
	11	2,850	1,132	3,982
503	12	3,150	2,883	6,033
	13	3,600	5,300	8,900

$Q = 5,300$ cfs (from Section 4)

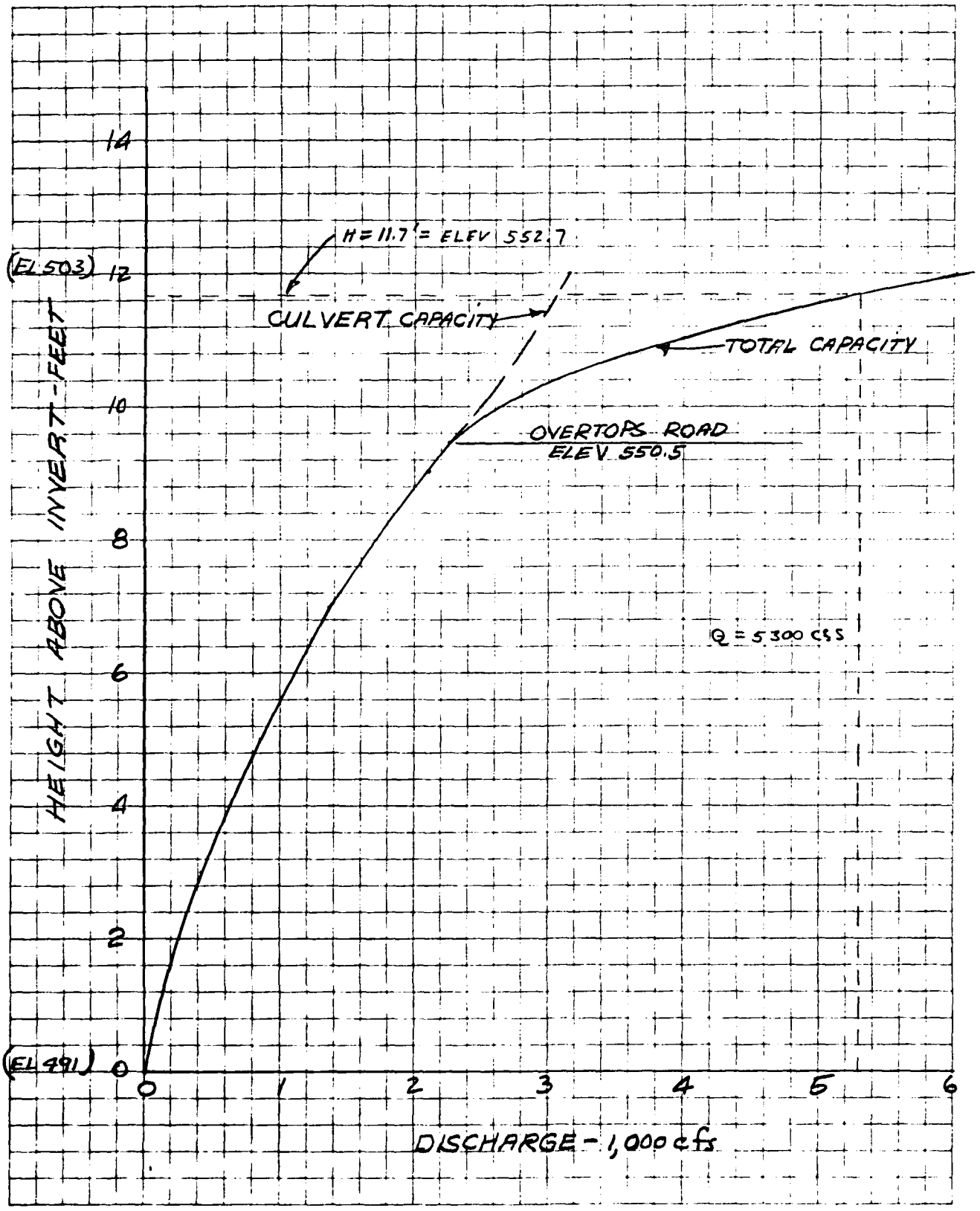
∴ Depth of water over Cutler Street is approximately 2.2 feet. (taken from discharge capacity curve)

BY S.A.L. DATE 6/11/80 **ROALD HAESTAD, INC.** SHEET NO 25 OF 36

CONSULTING ENGINEERS

CKD BY D.L.S. DATE 6/12/80 37 Brookside Road - Waterbury, Conn. 06708 JOB NO 49-021

SUBJECT MERRIMAN POND DAM - Cutler St. Discharge Capacity Curve

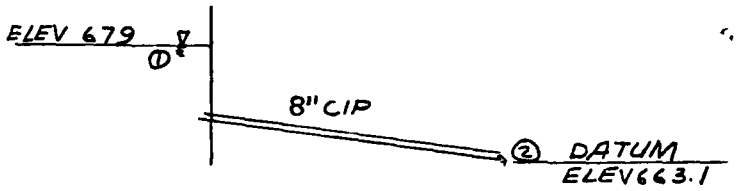


SUBJECT MERRIMAN POND DAM - Blowoff Capacity

Data: 1) Blowoff is 8" CIP
2) Length = 100 ft (Estimated)
3) Downstream Invert is equal to Elev. 663.1
4) Upstream Invert is approx. at Elev. 668 (Estimated)
5) Gate Valve on Line.

Note: The estimated values above could not be field checked and no plans are available.

Capacity at Top of Dam:



C. Bernoulli Equation

$\therefore + \cancel{p_1}^{0} + V_1^2/2g^{0} = \cancel{z_2}^{0} + \cancel{p_2}^{0} + V_2^2/2g + H_{L1-2}$

$z_1 = V_2^2/2g + H_{L1-2}$

Head loss: 1) Entrance = $K\, V_2^2/2g$ (1.0 projecting connection)
2) Friction = $f(L/D)\, V_2^2/2g$
3) Gate Valve = $K\, V_2^2/2g$ (0.25)

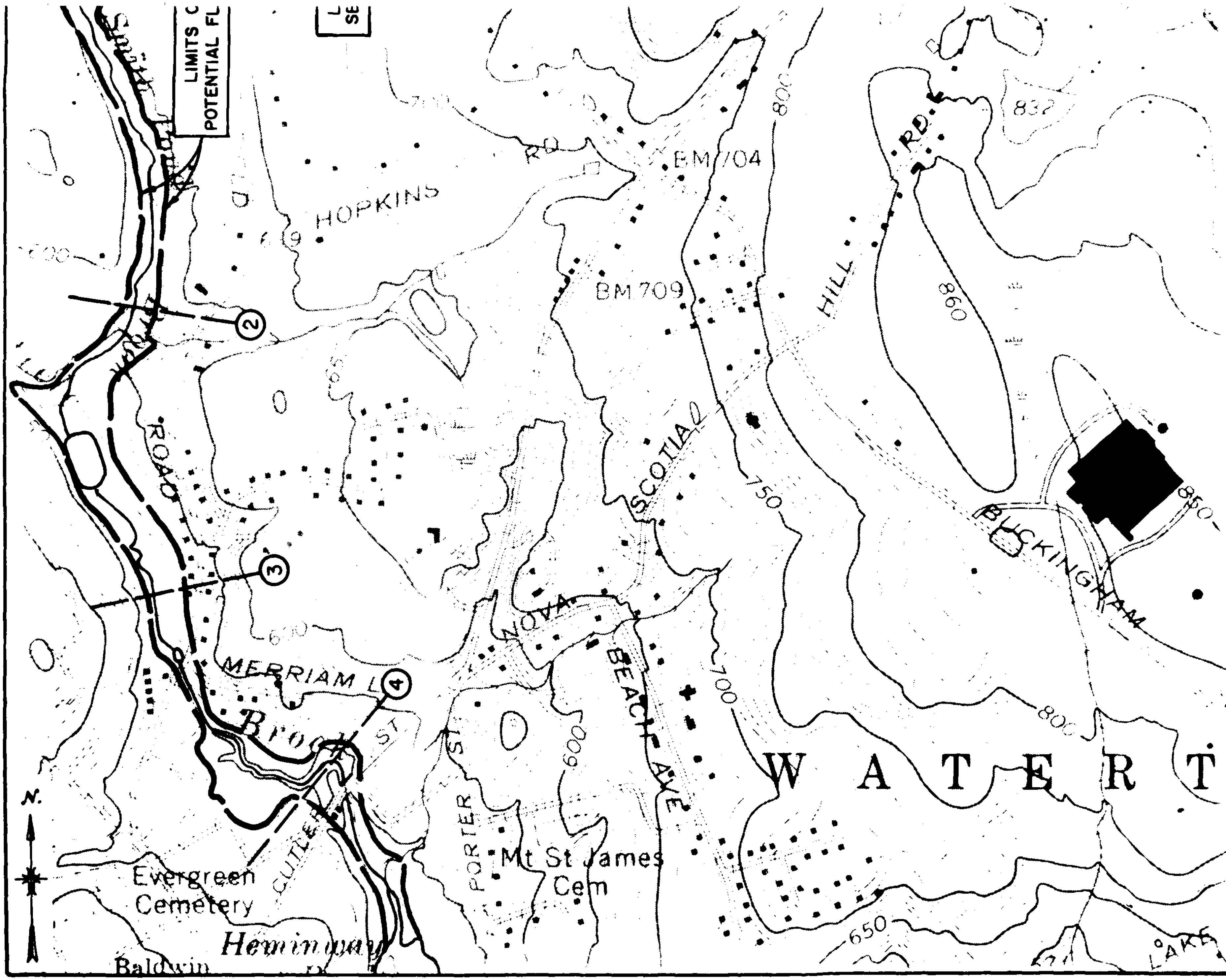
$z_1 = (1 + 1 + 0.25 + 160f)\, V_2^2/2g$

Use trial & error solution:

$z_1 = 15.9$ V_2 (assumed) = 15 ft/sec $\longrightarrow$ $f = 0.037$ $\longrightarrow$ $V_2 = 11.5$ ft/sec
V_2 (assumed) = 11 ft/sec $\longrightarrow$ $f = 0.0374$ $\longrightarrow$ $V_2 = 11.4$ ft/sec

$\therefore Q = V_2 A = 11.4 \text{ ft/sec} \times 0.349 \text{ ft}^2$

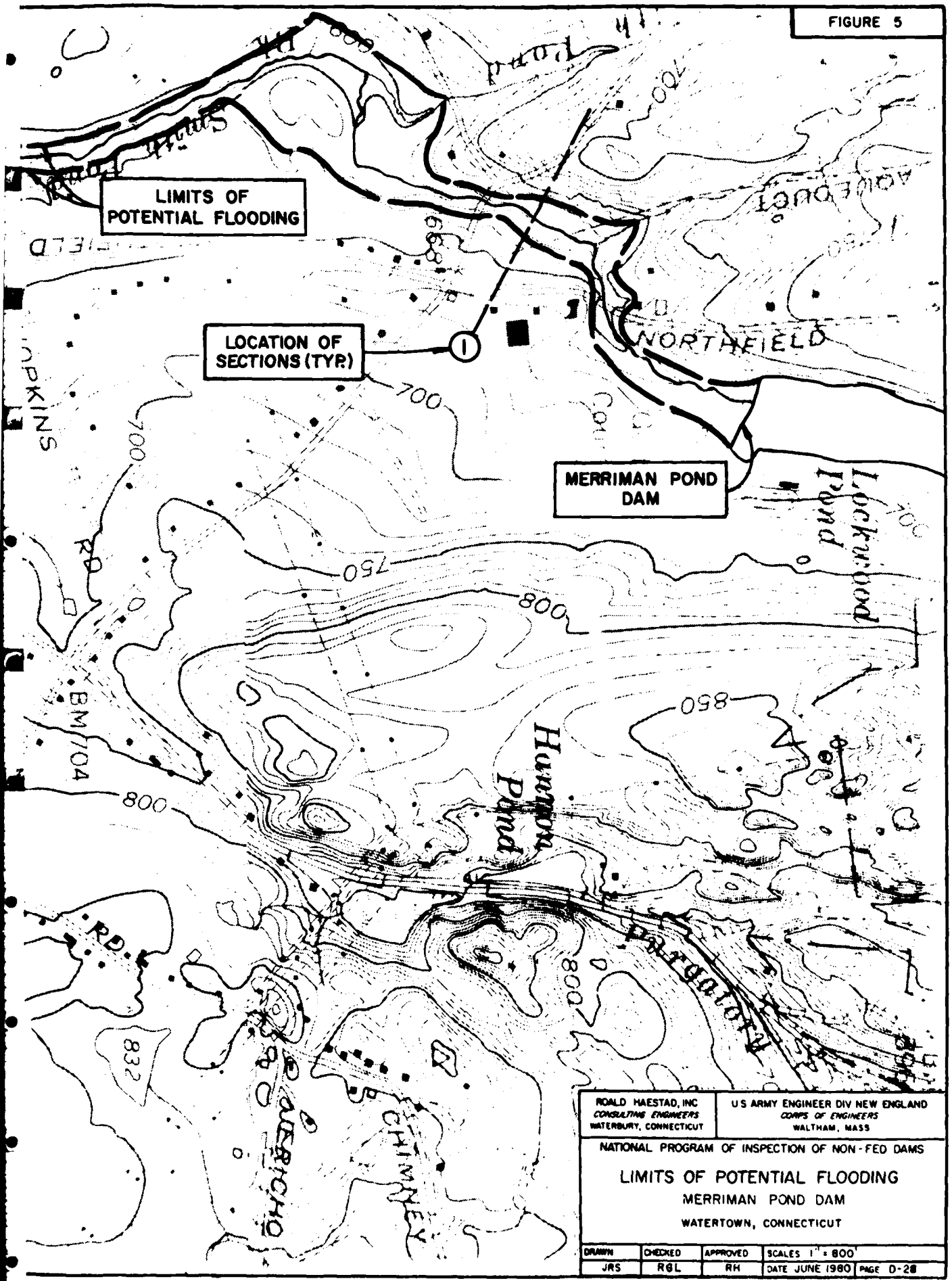
$Q = 3.98$ use 4cfs



LIMITS O
POTENTIAL FL
HOPKINS
RD
BM 704
BM 709
800
832
860
HILL
RD
ROAD
SCOTIA
NOVA
750
700
600
650
MERRIAM L
BEACH AVE
PORTER ST
CUTLER ST
Mt St James
Cem
Evergreen
Cemetery
Hemingway
Baldwin
BUCKINGHAM
WATERT
LAKE
N.
2
3
4

1

FIGURE 5



ROALD HAESTAD, INC
CONSULTING ENGINEERS
WATERBURY, CONNECTICUT

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

NATIONAL PROGRAM OF INSPECTION OF NON-FED DAMS

LIMITS OF POTENTIAL FLOODING

MERRIMAN POND DAM

WATERTOWN, CONNECTICUT

DRAWN	CHECKED	APPROVED	SCALES 1" = 800'
JRS	RGL	RH	DATE JUNE 1980 PAGE D-28

2

APPENDIX E

INFORMATION AS CONTAINED IN

THE NATIONAL INVENTORY OF DAMS

INVENTORY OF DAMS IN THE UNITED STATES

STATE	IDENTITY NUMBER	DIVISION	STATE	COUNTY	CONGR DIST.	STATE	COUNTY	CONGR DIST.	NAME	LATITUDE (NORTH)	LONGITUDE (WEST)	REPORT DATE DAY	MO	YR
CT	128	NED	CT	005	06				MERRIMAN POND DAM	[illegible]	73[illegible].9	16	JUN	80

POPULAR NAME	NAME OF IMPOUNDMENT
	MERRIMAN POND

REGION	BASIN	RIVER OR STREAM	NEAREST DOWNSTREAM CITY–TOWN–VILLAGE	DIST FROM DAM (MI.)	POPULATION
01	10	TR-SMITH POND BROOK	WATERTOWN	2	19200

TYPE OF DAM	YEAR COMPLETED	PURPOSES	STRUCTURAL HEIGHT (FT.)	HYDRAULIC HEIGHT (FT.)	IMPOUNDING CAPACITIES MAXIMUM (ACRE-FT.)	IMPOUNDING CAPACITIES NORMAL (ACRE-FT.)
PE	1941	I	15	14	325	170

DIST	OWN	FED R	PRV/FED	SCS A	VER/DATE
NED	N	N	N	N	16JUN80

REMARKS
20ESTIMATE 22DAM RAISED APPROX 6FT

D/S HAS	SPILLWAY CREST LENGTH	SPILLWAY TYPE	SPILLWAY WIDTH (FT.)	MAXIMUM DISCHARGE (FT.)	VOLUME OF DAM (CY)	POWER CAPACITY INSTALLED (MW)	POWER CAPACITY PROPOSED (MW)	NO	NAVIGATION LOCKS LENGTH (FT.)	WIDTH (FT.)	LENGTH (FT.)	WIDTH (FT.)	LENGTH (FT.)	WIDTH (FT.)	LENGTH (FT.)	WIDTH (FT.)
Y	500	U	13	330	20000											

OWNER	ENGINEERING BY	CONSTRUCTION BY
TOWN OF WATERTOWN		

REGULATORY AGENCY			
DESIGN	CONSTRUCTION	OPERATION	MAINTENANCE
CT DEP	CT DEP	CT DEP	CT DEP

INSPECTION BY	INSPECTION DATE DAY | MO | YR	AUTHORITY FOR INSPECTION
DONALD HAESTAD INC	07NOV79	PL 92-367

REMARKS

END

FILMED

9-84

DTIC