

HOUSATONIC RIVER BASIN
NEWTOWN, CONNECTICUT

ROCKY GLEN DAM
CT 00310

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

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

JANUARY 1980

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

REPLY TO
ATTENTION OF
NEDED-E

MAY 23 1980

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

Dear Governor Grasso:

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

The preliminary hydrologic analysis has indicated that the spillway capacity for the Rocky Glen Dam would likely be exceeded by floods greater than 7 percent of the Probable Maximum Flood (PMF), the test flood for spillway adequacy. Our screening criteria specifies that a dam of this class which does not have sufficient spillway capacity to discharge fifty percent of the PMF, should be adjudged as having a seriously inadequate spillway and the dam assessed as unsafe, non-emergency, until more detailed studies prove otherwise or corrective measures are completed.

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

It is recommended that within twelve months from the date of this report the owner of the dam engage the services of a professional or consulting engineer to determine by more sophisticated methods and procedures the magnitude of the spillway deficiency. Based on this determination, appropriate remedial mitigating measures should be designed and completed within 24 months of this date of notification. In the interim a detailed emergency operation plan and warning system should be promptly developed. During periods of unusually heavy precipitation, round-the-clock surveillance should be provided.

NEDED-E

Honorable Ella T. Grasso

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

A copy of this report has been forwarded to the Department of Environmental Protection, the cooperating agency for the State of Connecticut. This report has also been furnished to the owner of the project, the Newtown Mill Associates, Greenwich, Connecticut.

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

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

Sincerely,



MAX B. SCHEIDER

Colonel, Corps of Engineers
Division Engineer

ROCKY GLEN DAM
CT 00310

HOUSATONIC RIVER BASIN
NEWTOWN, CONNECTICUT

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

NATIONAL DAM INSPECTION PROGRAM
PHASE I INSPECTION REPORT

IDENTIFICATION NO: CT 00310
NAME OF DAM: Rocky Glen Dam
TOWN: Newtown
COUNTY AND STATE: Fairfield County, Connecticut
STREAM: Pootatuck River
DATE OF INSPECTION: November 27, 1979

BRIEF ASSESSMENT

The Rocky Glen Dam consists of a 100 foot long concrete ogee spillway section and a 30 foot long earth embankment section with an upstream concrete wall. The dam has a maximum height of 38 feet and appears to be founded on bedrock. A 48-inch diameter low level outlet or blowoff is located at the left end of the earth embankment and discharges through the right spillway training wall. An intake structure and canal are located at the right end of the dam and divert water from the impoundment to a downstream manufacturing plant where it was used to generate electricity and for manufacturing purposes. At the present time the manufacturing plant is not in operation.

The physical condition of the dam is judged to be good. Erosion at the base of the right training wall and trees growing on the downstream embankment at the top of this wall require further attention.

Based on the Corps of Engineers' Recommended Guidelines for Safety Inspection of Dams, the dam is classified as "Small" in size with a "High" hazard potential. A test flood equal to one-half of the probable maximum flood was selected in accordance with the Corps

of Engineers' Guidelines. Due to the small size of the impoundment, the test flood outflow was assumed to equal the test flood inflow of 17,500 cfs and would overtop the dam by 7-1/2 feet. The spillway capacity with the water level at the top of the dam is equal to 2,500 cfs or 14% of the test flood. Therefore, the overall condition of the dam is judged to be fair based on the inadequate spillway capacity.

It is recommended that the owner retain the services of a qualified registered engineer to evaluate the adequacy of the spillway discharge capacity; determine if the non-overflow section of the dam is capable of withstanding overtopping; evaluate the stability of the overflow section under increased loads; provide for increased spillway capacity if necessary; investigate the erosion at the base of the right training wall; and to inspect the spillway and downstream toe during a no flow condition.

The trees growing on the downstream slope next to the spillway wall should be removed. The bar screen for the power canal intake should be cleaned and the wood deck repaired. An operations and maintenance manual should be prepared for the dam and operating facilities. A program of technical inspections by a qualified registered engineer every two years should be instituted and a formal warning system put into effect.

The owner should implement the recommendations as described above and in greater detail in Section 7 of the Report within two years after the receipt of this Phase I Inspection Report. The

exception to this recommendation is that the investigations involving the inadequacy of the spillway should be carried out within one year after receipt of this Report.

Donald L. Smith

Donald L. Smith
Project Engineer

Roald Haestad

Roald Haestad
President



This Phase I Inspection Report on Rocky Glen 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

ARAMAST MAHTESIAN, MEMBER
Geotechnical Engineering Branch
Engineering Division

Carney M. Terzian

CARNEY M. TERZIAN, MEMBER
Design Branch
Engineering Division

Richard J. DiBuono

RICHARD DIBUONO, CHAIRMAN
Water Control Branch
Engineering Division

APPROVAL RECOMMENDED:

Joe B. Fryar

JOE B. FRYAR
Chief, Engineering Division

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed 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 to 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

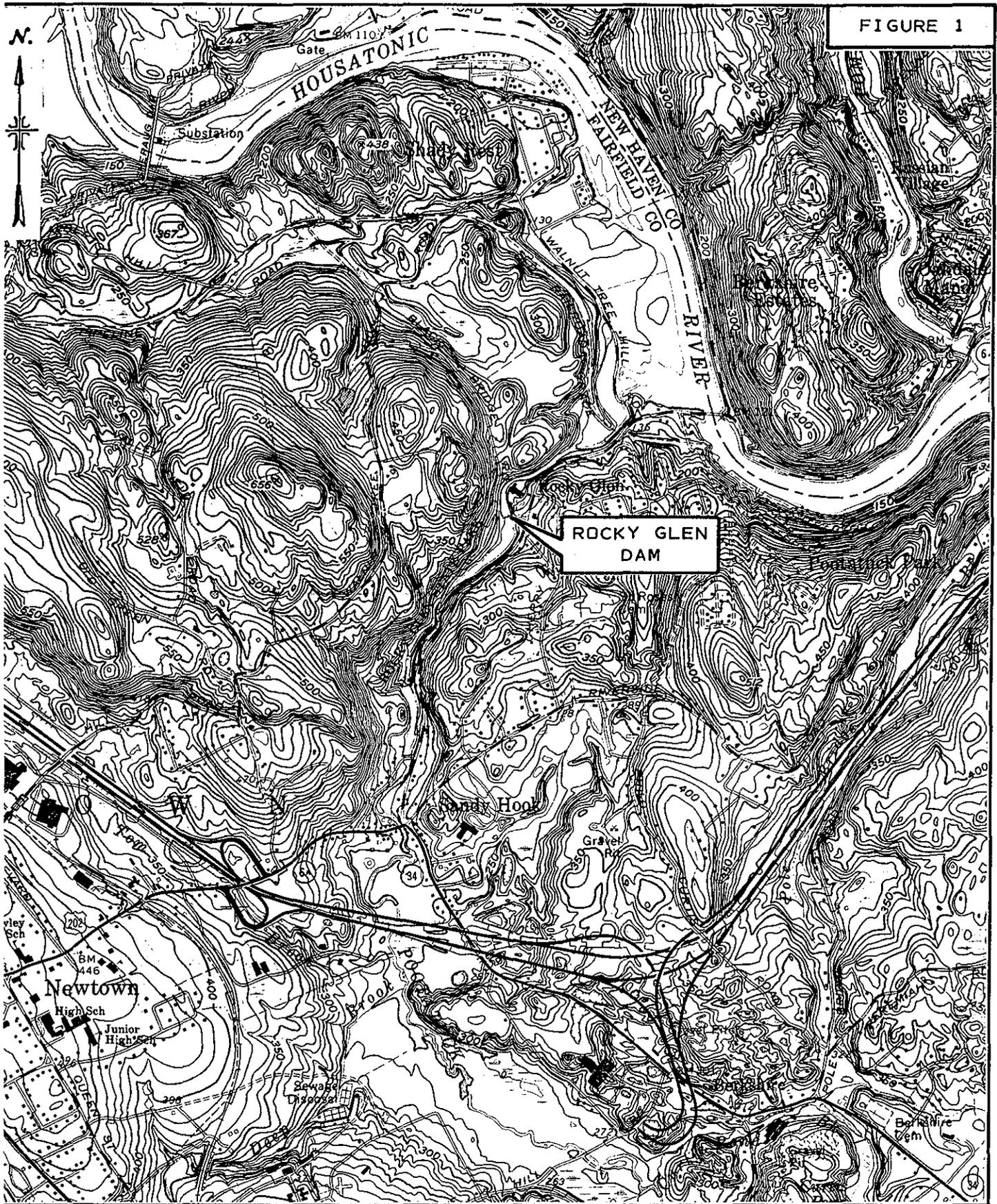
ROALD HAESTAD, INC.
 CONSULTING ENGINEERS
 WATERBURY, CONNECTICUT

ROCKY GLEN DAM - CT 00310

POOTATUCK RIVER

NEWTOWN, CONNECTICUT

DATE: 12 DEC '79



LOCATION PLAN

ROCKY GLEN DAM
NEWTOWN, CONNECTICUT

SCALE: 1" = 2000'

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 November 1, 1979, from William E. Hodgson, Jr., Colonel, Corps of Engineers. Contract No. DACW33-80-C-0015 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 indentify 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 dam is located on the Pootatuck River in the Town of Newtown, Connecticut, approximately one-half mile from the confluence with the Housatonic River. The dam is shown on the Newtown U.S.G.S. Quadrangle Map having coordinates of latitude N 41° 26.0' and longitude W 73° 16.6'.

b. Description

From left to right, the dam consists of a concrete ogee spillway section approximately 100 feet in length and an earth embankment section approximately 30 feet in length with an upstream concrete wall. The dam has a maximum height of 38 feet and appears to be founded on rock with the left abutment consisting of an almost vertical rock slope. The outlet works consist of a 48-inch diameter blowoff controlled by a manually operated gate located near the left end of the earth embankment and discharging through the right spillway training wall. A manually operated sluice gate approximately 6'-6" x 5'-0" located at the right abutment allows water to flow through a conduit and canal to a downstream building which houses a generator and manufacturing plant.

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 38 feet and a maximum storage capacity of 70 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 residential development is under construction approximately 2,000 feet downstream of the dam. A dam failure after completion of the development could result in the loss of more than a few lives.

e. Ownership:

Former Owner: The Rubber Goods Manufacturing Company
Uniroyal, Inc. (formerly U.S. Rubber Company)

Present Owner: Newtown Mill Associates (c/o Weber and Doepke)
1 East Putnam Avenue
Greenwich, Connecticut
Frank Dean - (203) 661-3366

f. Operator: Louis Gillotti - (203) 426-8864
Fabric Fire Hose Company
Glen Road
Sandy Hook, Connecticut 06482

g. Purpose of Dam

The dam was formerly used to store water for generating electricity and for manufacturing purposes for a downstream manufacturing plant. The new owner is currently investigating the feasibility of using the generating plant.

h. Design and Construction History

No information on the design and construction of the dam was available. A plaque on the dam reads *Fred T. Ley and Company, Contractors, Springfield, Massachusetts*. A map dated 1905, found at the Newtown, Connecticut Town Hall indicates a dam at the Rocky Glen site. There appears to be remnants of a wood structure, possibly a log crib dam, immediately upstream of the present dam.

i. Normal Operational Procedures

The dam is presently not in use. The blowoff is normally left partially opened.

..3 Pertinent Data

a. Drainage Area

The drainage area consists of 25.5 square miles of rolling wooded terrain with scattered residential development.

b. Discharge at Damsite

Normally water discharges over the 100 foot long concrete overflow spillway and through the 48-inch diameter blowoff located to the right of the spillway. The blowoff is usually left slightly opened. The maximum known flood at the damsite occurred during the August 1955 Flood when the flow was 3.1 feet over the spillway with the blowoff fully opened for an estimated flow of 2,300 cfs.

1. Outlet Works (conduit) Size: 48-inch
Invert Elevation: 151.75
Discharge Capacity: 275 cfs
2. Maximum Known Flood at Damsite: 2,300 cfs, August 1955
3. Ungated Spillway Capacity
at Top of Dam: 2,500 cfs
Elevation: 173.5
4. Ungated Spillway Capacity
at Test Flood Elevation: 13,860 cfs
Elevation: 181.0
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: 13,860 cfs
Elevation: 181.0
8. Total Project Discharge
at Top of Dam: 2,775 cfs
Elevation: 173.5

9. Total Project Discharge	
at Test Flood Elevation:	17,500 cfs
Elevation:	181.0

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

1. Streambed at Toe of Dam:	135.0
2. Bottom of Cutoff:	Unknown
3. Maximum Tailwater:	N/A
4. Recreation Pool:	N/A
5. Full Flood Control Pool:	N/A
6. Spillway Crest:	170.0
7. Design Surcharge - Original Design:	Unknown
8. Top of Dam:	173.5
9. Test Flood Surcharge:	181.0

d. Reservoir - Length in Feet

1. Normal Pool:	1,500
2. Flood Control Pool:	N/A
3. Spillway Crest Pool:	1,500
4. Top of Dam:	1,500
5. Test Flood Pool:	1,500

e. Storage - Acre-feet

1. Normal Pool:	60 Ac.-Ft.
2. Flood Control Pool:	N/A
3. Spillway Crest Pool:	60 Ac.-Ft.
4. Top of Dam:	70 Ac.-Ft.
5. Test Flood Pool:	100 Ac.-Ft.

f. Reservoir Surface - Acres

- | | |
|------------------------|-----------|
| 1. Normal Pool: | 3.8 Acres |
| 2. Flood-Control Pool: | N/A |
| 3. Spillway Crest: | 3.8 Acres |
| 4. Test Flood Pool: | 5 Acres |
| 5. Top of Dam: | 3.8 Acres |

g. Dam

- | | |
|---------------------|--|
| 1. Type: | Gravity Concrete Overflow Section (100' long); Earth Embankment with upstream Concrete wall (30' long) |
| 2. Length: | 130' |
| 3. Height: | 38' |
| 4. Top Width: | N/A |
| 5. Side Slopes: | Unknown |
| 6. Zoning: | N/A |
| 7. Impervious Core: | N/A |
| 8. Cutoff: | Unknown |
| 9. Grout Curtain: | Unknown |
| 10. Other: | |

h. Diversion and Regulating Tunnel

1. Type: N/A
2. Length: N/A
3. Closure: N/A
4. Access: N/A
5. Regulating Facilities: N/A

i. Spillway

1. Type: Concrete Ogee
2. Length of Weir: 100'
3. Crest Elevation
with Flashboards: N/A
without Flashboards: 170
4. Gates: N/A
5. Upstream Channel: N/A
6. Downstream Channel: Natural Stream
7. General:

j. Regulating Outlets

1. Invert: 151.75
2. Size: 48-inch
3. Description: Conduit through end of earth embankment discharging through right training wall. Cap. 275 cfs
4. Control Mechanism: Manually Operated Upstream Gate
5. Other: Intake to power canal consists of intake structure with approximate 6'-6"x5'-0" sluice gate discharging through an unknown sized conduit. Invert Elev. 165.4

ENGINEERING DATA

SECTION 2

2.1 Design Data

There was no design data available for review.

2.2 Construction Data

The Rocky Glen Dam was constructed by Fred T. Ley and Company, Contractors, of Springfield, Massachusetts. Robert T. Ley, a retired employee of Fred T. Ley and Company, was contacted but did not have any recollection of the dam. The date of construction is unknown. There was no construction data available for review.

2.3 Operation Data

The maximum known flow over the dam occurred during the August 1955 Flood when the water level rose to 3.1 feet above spillway before the blowoff was fully opened.

2.4 Evaluation of Data

a. Availability

There was no design or construction data available from either the State of Connecticut, Department of Environmental Protection, the owner, or the contractor.

b. Adequacy

As no design or construction data was available, the assessment of the dam was based on the visual inspection, past performance history, and hydraulic and hydrologic calculations.

VISUAL INSPECTION

SECTION 3

3.1 Findings

a. General

The visual inspection of the dam was conducted on November 27, 1979. At the time of the inspection the water level was approximately 6 inches above spillway crest. The general condition of the dam at the time of inspection was good.

The dam consists of, from left to right, a concrete spillway, an earth dam with an upstream concrete wall, and an intake structure for a canal.

b. Dam

1. Embankment Section

The exposed portion of the upstream concrete wall is in good condition with minor cracking and efflorescence as shown in Photo 1. The crest and downstream slope are grass covered and show no signs of erosion. There are some bushes and small trees growing on the downstream-slope against the right spillway training wall. The downstream slope appears dry with no evidence of seepage. Some bushes are growing on the crest.

2. Spillway Section

The left abutment consists of a practically vertical rock cliff. Immediately downstream of the spillway, bedrock is exposed at the bottom of the channel and at the base of the right training wall. It was not possible to inspect the downstream toe because of water flowing over the spillway. The flow of water over the crest appears smooth, Photo 2,

indicating the concrete at the crest to be in good condition. The right training wall consists of a concrete section and a dry stone masonry section, Photo 3. The concrete shows some deterioration in the lower part of the wall, Photo 4. Some minor cracking and efflorescence is present near the outlet to the blowoff. Erosion has occurred at the base of both the concrete and dry stone masonry walls, as shown in Photo 5. Some seepage was observed from the cavity at the base of stone wall but no soil transport was apparent. Minor cracking and efflorescence is also present at the concrete wall which connects the spillway section to the left abutment.

c. Appurtenant Structures

The gate and the conduit of the blowoff could not be observed due to the flow of water through it. The manual operator located at the crest of the dam appeared to be in good condition.

The intake structure for the canal is located to the right of the dam. Water flows from the intake structure through a conduit under the access road and into the canal. The concrete and stone masonry intake structure appears to be in good condition but the wood deck is deteriorated and the bar screen clogged with debris, Photo 6. The manual operator that controls the 6'-6" x 5'-0" sluice gate is reported to be in working condition. The canal is formed by an earth dike at the left side and the abutment along the right side. The dike shows no apparent seepage. The downstream slope is covered with grass, bushes, and a few trees, Photo 7.

d. Reservoir Area

The reservoir is confined between the river banks. The very steep left bank shows no evidence of recent rock falls as indicated by trees growing on the cliff.

e. Downstream Channel

The downstream channel is the natural streambed, Photo 8, and shows no obstructions to flow in the vicinity of the dam.

3.2 Evaluation

On the basis of the visual inspection, the dam is judged to be in good condition. However, because of the flow of water at the time of inspection, the spillway and the downstream toe of the spillway could not be inspected.

The right training wall of the spillway has been undermined and could in the future collapse under further erosion. Trees growing on the downstream slope of the dam at the top of the training wall increase the pressure against the wall and could cause damage to it.

The deteriorated wood deck and clogged bar screen of the power canal intake structure could hamper its use.

OPERATIONAL AND MAINTENANCE PROCEDURES

SECTION 4

4.1 Operational Procedures

a) General

The Rocky Glen Dam was formerly used to store water for generating and manufacturing purposes for a downstream manufacturing plant. The generators have not been used for the past 25 - 30 years and the manufacturing plant has been closed for the past two years. No formal operational procedures for the dam and operating facilities exist. The caretaker at the dam indicated that the blowoff is normally left partially opened and is fully opened when the water level reaches the top of a bolt set in concrete (3.1 feet above spillway).

b) Description of Any Warning System in Effect

There is no formal warning system in effect. There is no development below the dam at this time.

4.2 Maintenance Procedures

a) General

Maintenance of the dam consists of mowing the grass on the slope of the embankment and making necessary repairs.

b) Operating Facilities

Water has not been drawn from the impoundment for the past two years.. No maintenance has been performed on the canal intake structure during this period (Photo No. 6). The blowoff gate and operating stem were repaired approximately eight years ago after a log had jammed in the gate.

4.3 Evaluation

The present operational and maintenance procedures are inadequate as is evident from the erosion at the base of the right spillway training wall and the condition of the canal intake structure.

An operational and maintenance manual for the dam and operating facilities should be prepared. The dam should also be inspected once every two years by qualified registered engineers, and any problems such as the erosion at the base of the right spillway training wall corrected.

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

EVALUATION OF HYDRAULIC/HYDROLOGIC FEATURES

SECTION 5

5.1 General

The spillway for Rocky Glen Dam consists of a 100 foot long concrete gravity ogee section. The dam has a maximum height of 38 feet. The top of the dam is 3-1/2 feet above the spillway crest. Outlets include a 48-inch blowoff at the right end of the spillway and a 6'-6" x 5'-0" sluice gate to a diversion canal at the right abutment.

The dam is located in a narrow rock gorge. The impoundment is 1,500 feet long, but quite narrow with a normal surface area of 3.8 acres and a capacity at top of dam estimated at 70 Acre-Feet. The watershed area is 25.5 square miles of "rolling" terrain, mostly wooded with scattered residential development. Surface elevations range from approximately 700 for the higher hills to 170 at the dam site. The Sandy Hook Dam is located 3,000 feet upstream.

5.2 Design Data

No plans or design data were available.

5.3 Experience Data

During the August 1955 Flood, the water level reached 3.1 feet above spillway level. The 48-inch blowoff was then opened and the water level rose no further. Maximum discharge, including blowoff, would have been 2,300 cfs.

5.4 Test Flood Analysis

The dam is classified as "Small" in size with a "High" hazard potential. According to the Recommended Guidelines for Safety Inspection of Dams, the test flood for a "Small", "High" hazard dam is between 1/2 the Probable Maximum Flood (1/2 PMF) and the Probable Maximum Flood (PMF), depending on the risk to downstream development.

At present, there is no development downstream which would be affected by a dam failure. However, construction is underway for residential housing in an area that would be affected by a dam breach. For this reason a test flood equal to 1/2 PMF was selected.

The guide curve for "rolling" terrain, supplied by the Corps of Engineers, was used along with the watershed area of 25.5 square miles to arrive at the 1/2 PMF of 17,500 cfs. The impoundment is too small to affect the flood peak, and inflow is equal to outflow. The spillway capacity was calculated to be 2,500 cfs at the top of the dam. The 48-inch blowoff has an additional capacity of 275 cfs.

The spillway with the blowoff assumed closed has a capacity equal to 14% of the test flood. The non-overflow portion of the dam would overtop by 7-1/2 feet due to the test flood.

For comparison purposes, a flood equal to the 100 year flood was calculated, as detailed in Appendix D, using the Weiss Formula, developed by U.S.G.S. and approved for use with dams by the State of Connecticut. The spillway is capable of passing 46% of the 5,400 cfs outflow calculated for the 100 year flood.

The spillway capacity of this dam is judged to be inadequate. Overtopping of the dam could occur in the future. Further investigations are required to determine if the dam is capable of withstanding overtopping or if the spillway capacity must be increased.

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 when the water level reached the top of the dam.

The dam breach would release up to 20,500 cfs into the gorge below the dam. At present there are no homes or important roads which would be affected by a dam failure. However, residential construction is underway in an area 2,000 feet downstream that would be affected by a dam breach.

An elevation of 110 feet has been established by a flood insurance study as the height of the 100 year flood on the Housatonic River. Construction of houses will not be allowed below this elevation.

Flood routing showed the peak flood flow for the area under construction would be 9,350 cfs. This would produce a depth of flow of about 7.2 feet which would flood six of the houses proposed for the area. Depth of flow prior to the dam breach would have been 4.2 feet assuming a maximum spillway capacity flow of 2,500 cfs.

It should be noted that the information on the proposed residential construction came from subdivision plans on file with the Newtown Planning and Zoning Commission. These plans have not been approved as of the writing of this Report.

The Rocky Glen Dam has been classified as "High" potential hazard because of the construction under way downstream of the dam.

EVALUATION OF STRUCTURAL STABILITY

SECTION 6

6.1 Visual Observations

The visual inspection did not disclose any evidence of dam instability.

The evaluation of the hydraulic/hydrologic features indicate that the non-overflow portion of the dam would be overtopped by 7-1/2 feet as a result of the test flood. The overflow portion of the dam would be overtopped by 11 feet as opposed to the 3-1/2 feet it was probably designed for. Sufficient data is not available to evaluate the ability of the non-overflow section of the dam to withstand overtopping, and to evaluate the stability of the overflow section of the dam under the increased load.

6.2 Design and Construction Data

There was no design and construction data available.

6.3 Post-Construction Changes

No known post construction changes have been made which might jeopardize the safety of the dam.

6.4 Seismic Stability

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

ASSESSMENT, RECOMMENDATIONS, & REMEDIAL MEASURES
SECTION 7

7.1 Dam Assessment

a. Condition

On the basis of the visual inspection and past performance history, the dam is judged to be in good physical condition. However, as water was flowing over the spillway at the time of the inspection, the spillway and downstream toe could not be inspected. Therefore, this assessment is subject to verification pending a technical inspection of the spillway and downstream toe when there is no water flowing.

The future safety of the dam could be affected by further undermining of the right spillway training wall and by trees growing next to the top of this wall.

An evaluation of the hydraulic and hydrologic features of the dam determined that the spillway is capable of passing 14% of the test flood (1/2 PMF). Therefore, the overall condition of the dam is fair, based on inadequate spillway capacity.

b. Adequacy of Information

There was no design and construction information available and thus the assessment of the condition of the dam is based solely on the visual inspection and past performance history of the dam.

c. Urgency

The recommendations presented in Sections 7.2 and 7.3 should be carried out by the owner within two years of receipt of this Report. The exception to this recommendation is that the investigations concerning the inadequacy of the spillway capacity should be carried out within one year of receipt of this Report.

7.2 Recommendations

It is recommended that the owner retain the services of a qualified registered engineer to:

- a) Perform further studies to determine the adequacy of the spillway discharge capacity.
- b) Investigate the ability of the non-overflow section of the dam to withstand overtopping and evaluate the stability of the overflow section of the dam under increased loads; or to provide for additional spillway capacity if the studies performed under a) indicate that the spillway capacity is insufficient.
- c) Investigate the cause of the concrete erosion at the base of the right training wall and oversee repairs.
- d) Inspect the spillway and downstream toe during a no flow condition.

7.3 Remedial Measures

a) Operations and Maintenance Procedures

- 1) Trees growing on the downstream slope next to the right spillway training wall should be removed. The bar screen for the intake structure to the power canal should be cleaned and the wood deck repaired.
- 2) A program of technical inspections by qualified registered engineers once every two years should be instituted. Records of findings and recommendations should be maintained.
- 3) A formal operations and maintenance manual for the dam and operating facilities should be prepared.
- 4) A formal warning system should be put into effect, and should include monitoring of the dam during extremely heavy rains; and procedures for notifying downstream authorities in the event of an emergency.

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: Rocky Glen Dam
 DATE: 11/27/79 TIME: 1:30 p.m. to 3:30 p.m. WEATHER: Sunny - Approximately 50°
 I.S. ELEVATION: 170.5 U.S. N/A DN.S

<u>PARTY</u>	<u>DISCIPLINE</u>
<u>Donald L. Smith, P.E. - Roald Haestad, Inc.</u>	<u>Civil/Hydrologist</u>
<u>Ronald G. Litke, P.E. - Roald Haestad, Inc.</u>	<u>Civil Engineer</u>
<u>Gonzalo Castro, Ph.D., P.E. - Geotechnical Engineers, Inc.</u>	<u>Geotechnical Engineer</u>

<u>PROJECT FEATURE</u>	<u>INSPECTED BY</u>	<u>REMARKS</u>
<u>Upstream</u>		<u>Some trees</u>
<u>1. Dam Embankment-Concrete Face</u>	<u>GC</u>	<u>Good-on embankment</u>
<u>Intake Channel</u>		
<u>2. Outlet Works-and Structure</u>	<u>GC,RGL,DLS</u>	<u>Good</u>
<u>Transition</u>		<u>Could not</u>
<u>3. Outlet Works-and Conduit</u>	<u>GC,RGL,DLS</u>	<u>be observed</u>
<u>Outlet Structure</u>		
<u>1. Outlet Works-and Channel</u>	<u>GC,RGL,DLS</u>	<u>Good-natural streambed</u>
<u>Spillway Weir,</u>		<u>Good with some deterioration of concrete</u>
<u>2. Outlet Works-Appr. & Disch.</u>	<u>GC,RGL,DLS</u>	<u>at the base of right training wall. Water was going over spillway weir.</u>
<u>3. Dike Embankment</u>	<u>GC</u>	<u>Good</u>

PERIODIC INSPECTION CHECK LIST

PROJECT: Rocky Glen Dam DATE: 11/27/79
 PROJECT FEATURE: Upstream Dam Embankment - Concrete Face NAME: _____
 DISCIPLINE: Geotechnical Engineer NAME: GC

AREA ELEVATION	CONDITIONS
<u>DAM EMBANKMENT - UPSTREAM CONCRETE</u>	
<u>FACE</u>	
CREST ELEVATION	173.5
CURRENT POOL ELEVATION	170.5 (6" above spillway)
MAXIMUM IMPOUNDMENT TO DATE	173.1 (August 19, 1955)
SURFACE CRACKS	Minor on concrete face
PAVEMENT CONDITION	N/A
MOVEMENT OR SETTLEMENT OF CREST	None observed
LATERAL MOVEMENT	None observed
VERTICAL ALIGNMENT	Good
HORIZONTAL ALIGNMENT	Good
CONDITION AT ABUTMENT AND AT CONCRETE STRUCTURES	Good
INDICATIONS OF MOVEMENT OF STRUCTURAL ITEMS ON SLOPES	N/A
ENCROACHMENT OR ENCRUSTATION ON SLOPES	None of significance
VEGETATION ON SLOPES	Grass, some bushes and trees
SLoughING OR EROSION OF SLOPES OR ABUTMENTS	None observed
ROCK SLOPE PROTECTION -- RIPRAP FAILURES	N/A
UNUSUAL MOVEMENT OR CRACKING AT OR NEAR TOES	None observed
UNUSUAL EMBANKMENT OR DOWNSTREAM SEEPAGE	None observed, except through base of right training wall
PIPING OR BOILS	None observed
FOUNDATION DRAINAGE FEATURES	None known
TOE DRAINS	None known
INSTRUMENTATION SYSTEM	None known

PERIODIC INSPECTION CHECK LIST

PROJECT: Rocky Glen Dam DATE: 11/27/79
 PROJECT FEATURE: Intake Channel
Outlet Works - and Structure NAME: DLS, RGL
 DISCIPLINE: Civil - Geotechnical NAME: GC

AREA EVALUATED	CONDITIONS
OUTLET WORKS - INTAKE CHANNEL AND INTAKE STRUCTURE	
A. APPROACH CHANNEL:	No approach channel
SLOPE CONDITIONS	
BOTTOM CONDITIONS	
ROCK SLIDES OR FALLS	
LOG BOOM	
DEBRIS	
CONDITION OF CONCRETE LINING	
DRAINS OR WEEP HOLES	
B. INTAKE STRUCTURE:	
CONDITION OF CONCRETE	Good, as is stone masonry
STOP LOGS AND SLOTS	N/A - Bar Screen clogged

COMMENTS: Wood deck of intake structure deteriorated.

PERIODIC INSPECTION CHECK LIST

PROJECT: Rocky Glen Dam DATE: 11/27/79
 PROJECT FEATURE: Outlet Works - and Conduit ^{Transition} NAME: DLS
 DISCIPLINE: Civil Engineer NAME: RGL

AREA EVALUATED	CONDITIONS
OUTLET WORKS - TRANSITION AND CONDUIT	Conduit could not be observed.
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: Rocky Glen Dam DATE: 11/27/79
 PROJECT FEATURE: Outlet Structure
Outlet Works -and Channel NAME: RGL,DLS
 DISCIPLINE: Civil - Geotechnical NAME: GC

AREA EVALUATED	CONDITIONS
OUTLET WORKS - OUTLET STRUCTURE AND OUTLET CHANNEL	Outlet channel for blowoff is same as spillway channel
GENERAL CONDITION OF CONCRETE	Good
RUST OR STAINING	None observed
SPALLING	Minor spalling except at base of right training wall, which is severe
EROSION OR CAVITATION	None observed
VISIBLE REINFORCING	None observed
ANY SEEPAGE OR EFFLORESCENCE	Efflorescence at right training wall near outlet
CONDITION AT JOINTS	None observed
DRAIN HOLES	None observed
CHANNEL	Natural streambed
LOOSE ROCK OR TREES OVERHANGING CHANNEL	None of significance
CONDITION OF DISCHARGE CHANNEL	Good

PERIODIC INSPECTION CHECK LIST

PROJECT: Rocky Glen Dam DATE: 11/27/79
 PROJECT FEATURE: Spillway Weir, Outlet Works - Appr. & Disch. NAME: GC
 DISCIPLINE: Geotechnical - Civil NAME: RGL,DLS

AREA EVALUATED	CONDITIONS
<u>OUTLET WORKS - SPILLWAY WEIR, APPROACH AND DISCHARGE CHANNELS</u>	
A. <u>APPROACH CHANNEL:</u>	No approach channel
<u>GENERAL CONDITION:</u>	
<u>LOOSE ROCK OVERHANGING CHANNEL</u>	
<u>TREES OVERHANGING CHANNEL</u>	
<u>FLOOR OF APPROACH CHANNEL</u>	
B. <u>WEIR AND TRAINING WALLS:</u>	
<u>GENERAL CONDITION OF CONCRETE</u>	Water flowing - appears to be smooth
<u>RUST OR STAINING</u>	None observed
<u>SPALLING</u>	Present at bottom of right training wall
<u>ANY VISIBLE REINFORCING</u>	None observed
<u>ANY SEEPAGE OR EFFLORESCENCE</u>	Minor efflorescence at outlet pipe and at left abutment
<u>DRAIN HOLES</u>	None observed
C. <u>DISCHARGE CHANNEL:</u>	Natural streambed
<u>GENERAL CONDITION</u>	Good
<u>LOOSE ROCK OVERHANGING CHANNEL</u>	None of significance
<u>TREES OVERHANGING CHANNEL</u>	None of significance
<u>FLOOR OF CHANNEL</u>	Bedrock, boulders
<u>OTHER OBSTRUCTIONS</u>	None

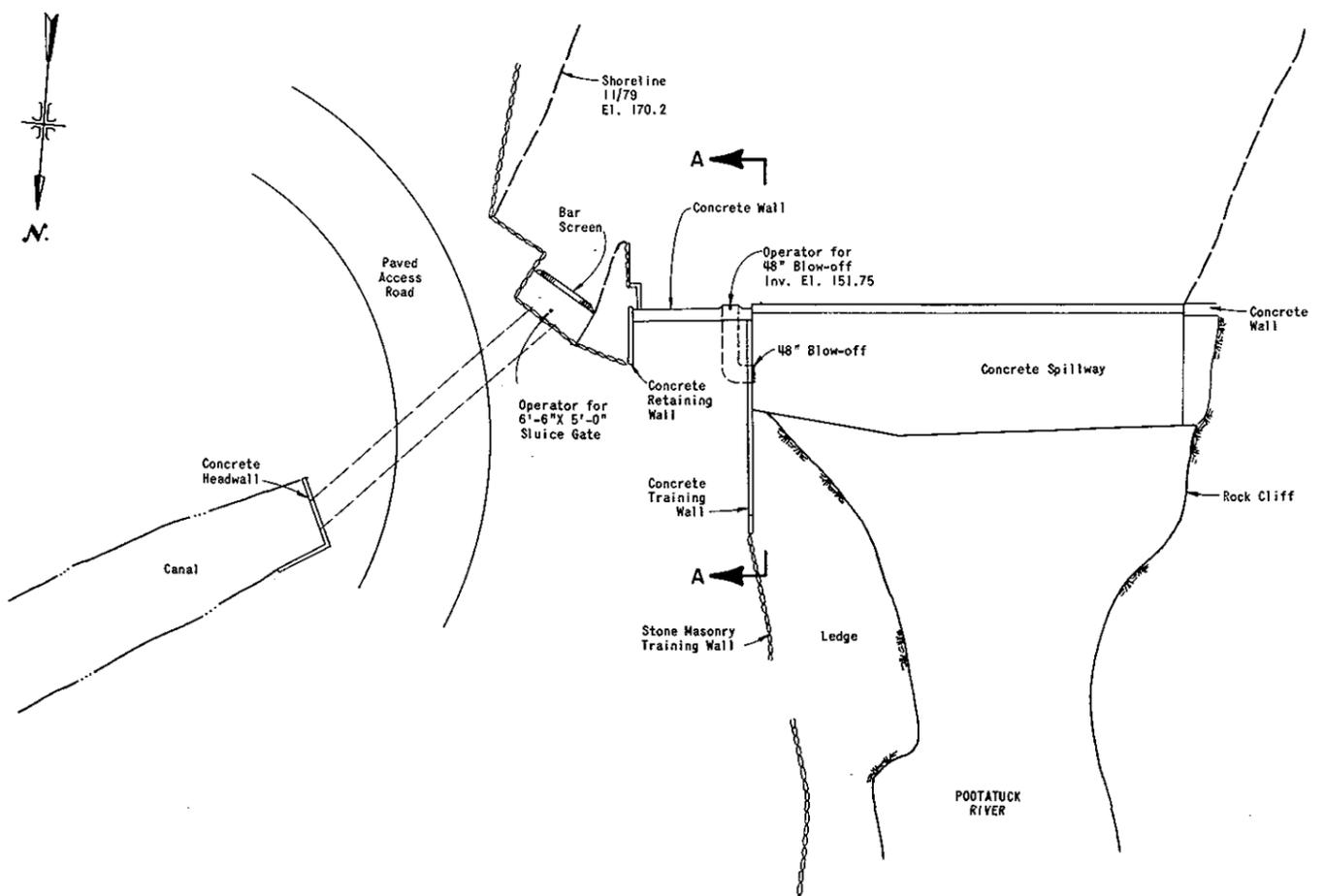
PERIODIC INSPECTION CHECK LIST

PROJECT: Rocky Glen Dam DATE: 11/27/79
 PROJECT FEATURE: Outlet Works - Dike Embankment NAME: _____
 DISCIPLINE: Geotechnical NAME: GC

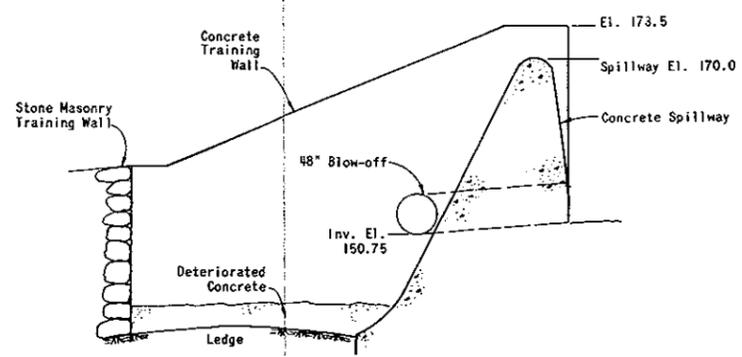
AREA EVALUATED	CONDITIONS
<u>DIKE EMBANKMENT</u>	
<u>CREST ELEVATION</u>	N/A
<u>CURRENT POOL ELEVATION</u>	N/A
<u>MAXIMUM IMPOUNDMENT TO DATE</u>	N/A
<u>SURFACE CRACKS</u>	None observed
<u>PAVEMENT CONDITION</u>	N/A
<u>MOVEMENT OR SETTLEMENT OF CREST</u>	None observed
<u>LATERAL MOVEMENT</u>	None observed
<u>VERTICAL ALIGNMENT</u>	Too irregular to judge
<u>HORIZONTAL ALIGNMENT</u>	Too irregular to judge
<u>CONDITIONS AT ABUTMENT AND AT CONCRETE STRUCTURES</u>	Good
<u>INDICATIONS OF MOVEMENT OF STRUCTURAL ITEMS ON SLOPES</u>	N/A
<u>TRESPASSING ON SLOPES</u>	None of significance
<u>VEGETATION ON SLOPES</u>	Grass, bushes, a few trees on the downstream slope
<u>SLOUGHING OR EROSION OF SLOPES OR ABUTMENTS</u>	None observed
<u>ROCK SLOPE PROTECTION - RIPRAP FAILURE</u>	N/A
<u>UNUSUAL MOVEMENT OR CRACKING AT OR NEAR TOES</u>	None observed
<u>UNUSUAL EMBANKMENT OR DOWNSTREAM SEEPAGE</u>	None observed
<u>PIPING OR BOILS</u>	None known
<u>FOUNDATION DRAINAGE FEATURES</u>	None known
<u>TOE DRAINS</u>	None known
<u>INSTRUMENTATION SYSTEM</u>	None known

APPENDIX B

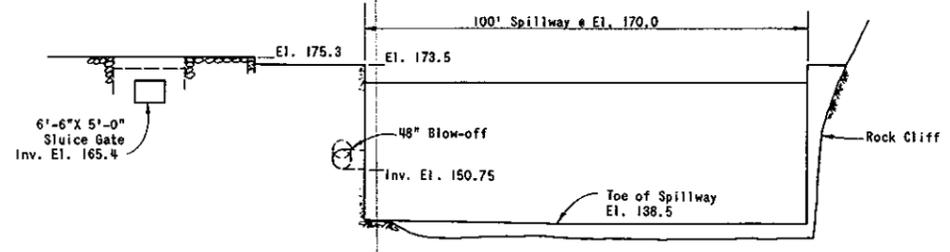
ENGINEERING DATA



PLAN
Scale 1"=40'



SECTION A-A
Scale 1"=20'



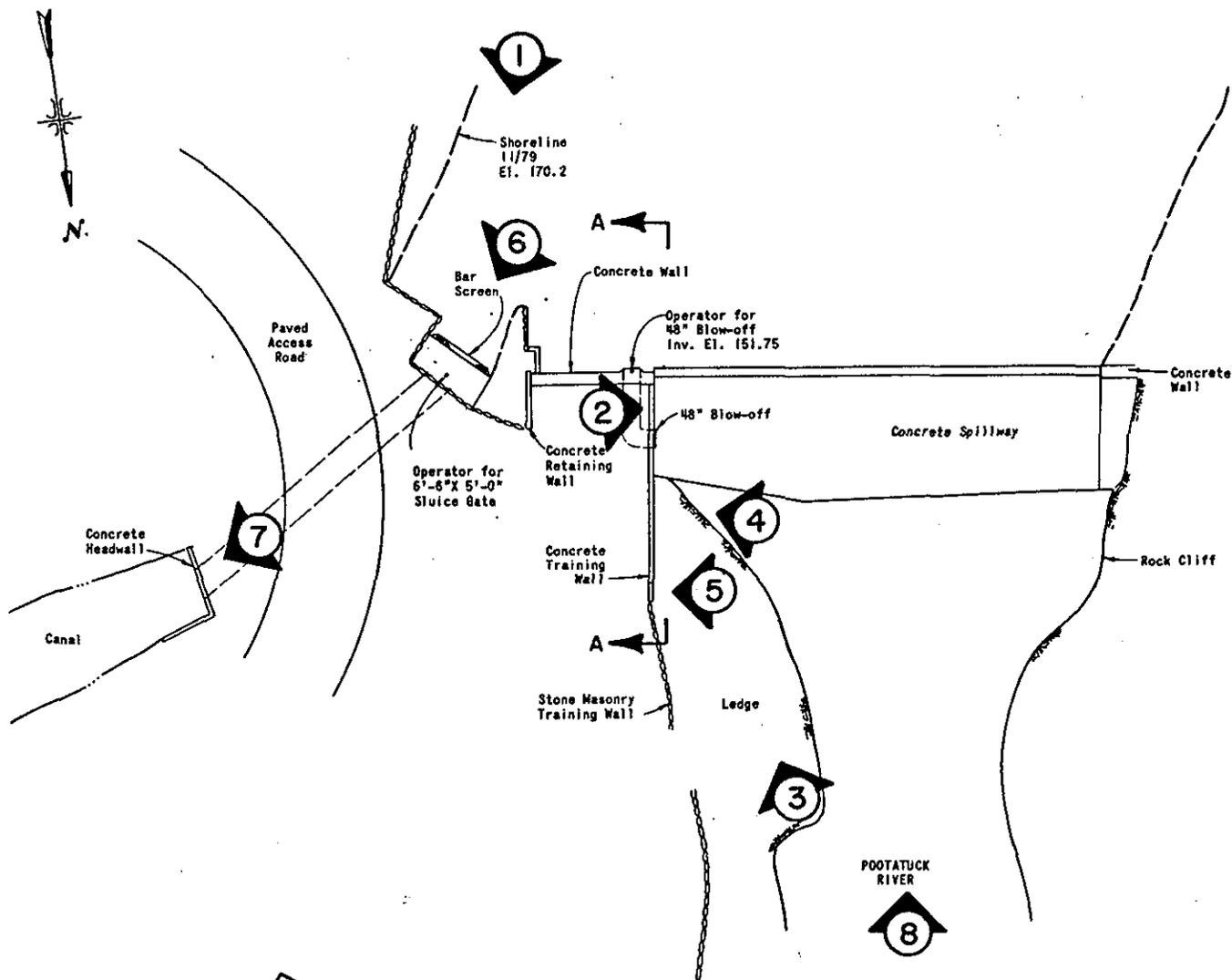
ELEVATION
Scale 1"=40'

Note: Spillway Elevations estimated from USGS Quadrangle.

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			
ROCKY GLEN DAM			
DRAWN	CHECKED	APPROVED	SCALES AS NOTED
JRS	DLS		DATE DEC. 1979 PAGE B-1

APPENDIX C

PHOTOGRAPHS



DENOTES PHOTO NUMBER AND DIRECTION IN WHICH PHOTO WAS TAKEN

PHOTO LOCATION PLAN

ROCKY GLEN DAM
 NEWTOWN, CONNECTICUT

SCALE: 1" = 40'



PHOTO NO. 1

BLOWOFF INLET ON THE LEFT, CANAL INLET ON THE RIGHT
UPSTREAM CONCRETE FACE OF DAM



PHOTO NO. 2

SPILLWAY FROM RIGHT
TRAINING WALL

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

ROALD HAESTAD, INC.
CONSULTING ENGINEERS
WATERBURY, CONNECTICUT

NATIONAL PROGRAM OF
INSPECTION OF
NON-FED. DAMS

ROCKY GLEN DAM
POOTATUCK RIVER
NEWTOWN, CONNECTICUT
CT 00310
27 NOV '79



PHOTO NO. 3
 RIGHT TRAINING WALL



PHOTO NO. 4
 CONCRETE EROSION
 AT BASE OF RIGHT
 TRAINING WALL

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

ROALD HAESTAD, INC.
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NATIONAL PROGRAM OF
 INSPECTION OF
 NON-FED. DAMS

ROCKY GLEN DAM
 POOTATUCK RIVER
 NEWTOWN, CONNECTICUT
 CT 00310
 19 NOV '79



PHOTO NO. 5

UNDERMINING AT BASE
OF RIGHT TRAINING
WALL



PHOTO NO. 6

INTAKE STRUCTURE
TO POWER CANAL

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

ROALD HAESTAD, INC.
CONSULTING ENGINEERS
WATERBURY, CONNECTICUT

NATIONAL PROGRAM OF
INSPECTION OF
NON-FED. DAMS

ROCKY GLEN DAM
POOTATUCK RIVER
NEWTOWN, CONNECTICUT

CT 00310

19 NOV '79



PHOTO NO. 7
CANAL FROM ACCESS ROAD



PHOTO NO. 8
SPILLWAY AND CHANNEL
FROM DOWNSTREAM

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

ROALD HAESTAD, INC.
CONSULTING ENGINEERS
WATERBURY, CONNECTICUT

NATIONAL PROGRAM OF
INSPECTION OF
NON-FED. DAMS

ROCKY GLEN DAM
POOTATUCK RIVER
NEWTOWN, CONNECTICUT
CT 00310
27 NOV '79

APPENDIX D

HYDROLOGIC AND HYDRAULIC COMPUTATIONS

WATERSHED AREA = 25.5 sq. mi.

TERRAIN - "ROLLING"

FROM GRAPH · MAXIMUM PROBABLE FLOOD = 1370 cfs/sq. mi.

$$PMF = 25.5 \text{ sq. mi.} \times 1370 \text{ cfs/sq. mi.}$$

$$PMF = 34,935 \text{ cfs} \quad \text{SAY } 35,000 \text{ cfs}$$

TEST FLOOD FOR "SMALL-SIGNIFICANT" DAM

100 YEAR TO 1/2 PMF

$$1/2 \text{ PMF} = 35,000 / 2 = 17,500 \text{ cfs}$$

100 YEAR FLOOD (CONNECTICUT FORMULA)

$$Q_{100} = \frac{5.0 A^{1.18} R_{24,100}^{1.45}}{(L/\sqrt{S})^{0.5}}$$

$$Q_{100} = \frac{5.0 (25.5)^{1.18} (10)^{1.45}}{(8.5 / \sqrt{35.3})^{0.5}}$$

$$Q_{100} = 5382 \text{ cfs}$$

$$\text{SAY } Q_{100} = 5400 \text{ cfs}$$

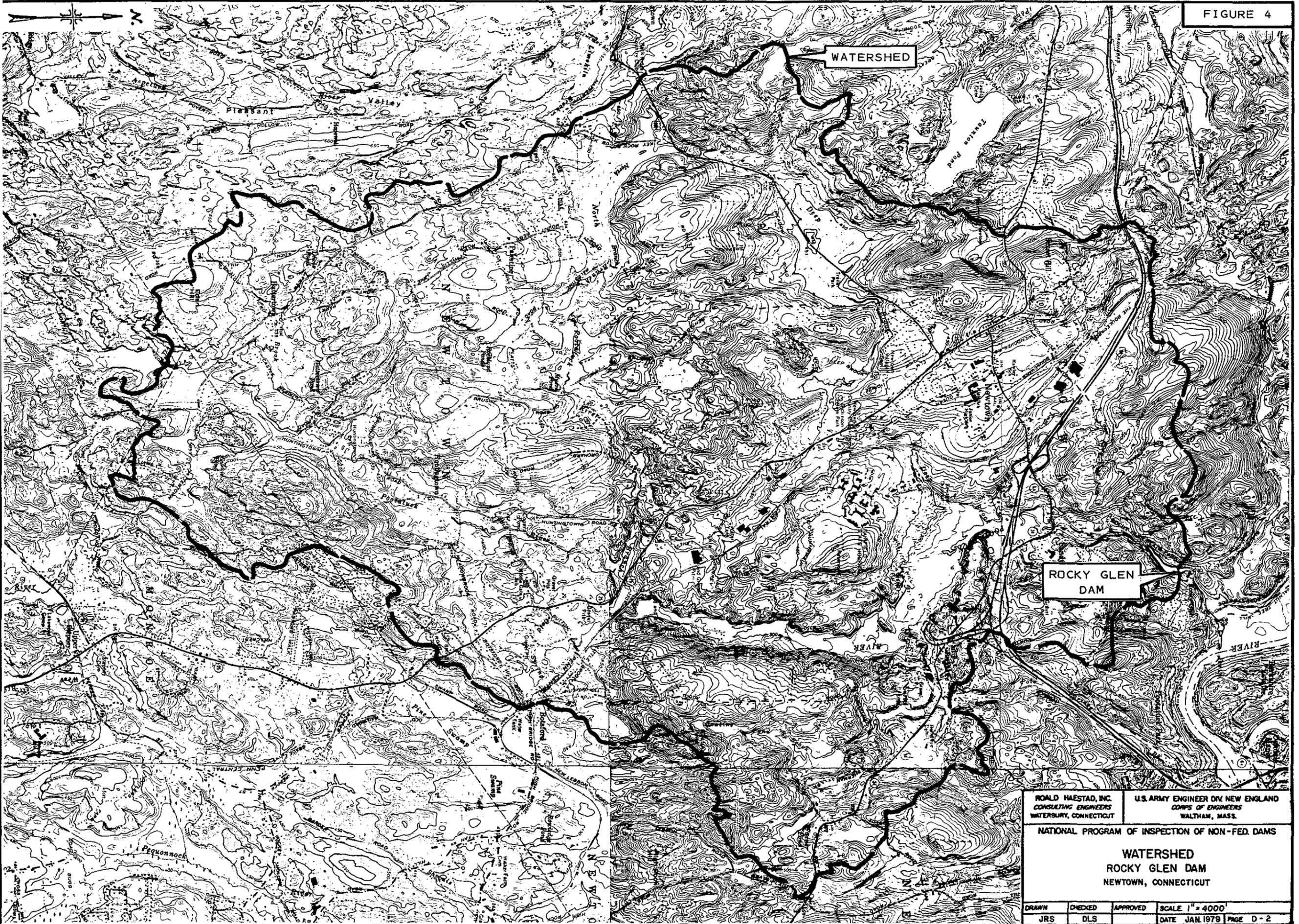
A = drainage area, sq. mi.

R_{24,100} = Rainfall, inches
24 hour - 100 year

L = main channel length, miles

S = main channel slope (ft/mi)

FIGURE 4



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			
WATERSHED ROCKY GLEN DAM NEWTOWN, CONNECTICUT			
DRAWN	CHECKED	APPROVED	SCALE 1" = 4000'
JRS	DLS		DATE JAN. 1979 PAGE D-2

BY...DLS... DATE...12/2/79... ROALD HAESTAD, INC. SHEET NO...2... OF...7...
CONSULTING ENGINEERS
CKD BY...SL... DATE...12/31/79... 37 Brookside Road - Waterbury, Conn. 06708 JOB NO...049-05...
SUBJECT...ROCKY GLEN DAM... - FLOOD ROUTING...

SPILLWAY CAPACITY

$$\text{LENGTH} = 100'$$

$$\text{HEIGHT} = 3.5'$$

$$\text{COEF.} = 3.8$$

$$Q = CLH^{3/2} = 3.8(100)(3.5)^{3/2} = 2488 \text{ CFS}$$

STORAGE CAPACITY

$$\text{SURFACE AREA AT SPILLWAY ELEV.} = 3.8 \text{ ACRES}$$

$$\text{LENGTH OF POND} = 1500'$$

$$\text{DEPTH AT SPILLWAY} \approx 30'$$

$$\text{ASSUME AVERAGE DEPTH} = 15'$$

$$\text{VOLUME AT SPILLWAY ELEV.} \approx 60 \text{ AC}\cdot\text{FT.}$$

$$\text{VOLUME AT DAM CREST} \approx 70 \text{ AC}\cdot\text{FT.}$$

DAM FAILURE PEAK DISCHARGE

$$Q_{PI} = 8/27 W_b \sqrt{g} y_0^{3/2}$$

$$\begin{aligned} W_b &= \text{breach width} = 40\% \text{ of dam width at mid height} \\ &= 0.40(130') = 52' \end{aligned}$$

$$\begin{aligned} y_0 &= \text{Hydraulic Height, River bed to Crest} \\ &= 38' \end{aligned}$$

$$Q_{PI} = 8/27 (52) (\sqrt{32.2}) (38)^{3/2} = 20,500 \text{ CFS}$$

BY DLS DATE 12-6-79

ROALD HAESTAD, INC. SHEET NO 3 OF 7

CONSULTING ENGINEERS

CKD BY SL DATE 12/31/79

37 Brookside Road - Waterbury, Conn. 06708

JOB NO 049-05

SUBJECT ROCKY GLEN DAM - SPILLWAY CAPACITY

<u>SPILLWAY</u>	<u>MAIN</u>	<u>ABUTMENTS</u>	<u>OVERBANK</u>	
			<u>1</u>	<u>2</u>
LENGTH	100'	35'	40'	50'
ELEVATION	170	173.5	175.3	180
COEFF.	3.8	2.7	2.7	2.7

<u>DEPTH OF FLOW</u>	<u>MAIN</u>	<u>DISCHARGE ABUTMENT</u>	<u>CAPACITY - CFS</u>		<u>TOTAL</u>
			<u>O.B. 1</u>	<u>O.B. 2</u>	
1	380	0	0	0	380
2	1075	0	0	0	1075
3	1975	0	0	0	1975
3.5	2488	0	0	0	2488
4	3040	33	0	0	3073
5	4249	174	0	0	4423
5.3	4637	228	0	0	4865
6	5585	374	63	0	6022
7	7038	619	239	0	7896
8	8598	902	479	0	9979
9	10,260	1219	769	0	12,248
10	12,017	1566	1100	0	14,683
11	13,863	1941	1470	135	17,409
12	15,796	2342	1873	382	20,393

BY *D.S.* DATE *12-6-79*

ROALD HAESTAD, INC. SHEET NO. *4* OF *7*

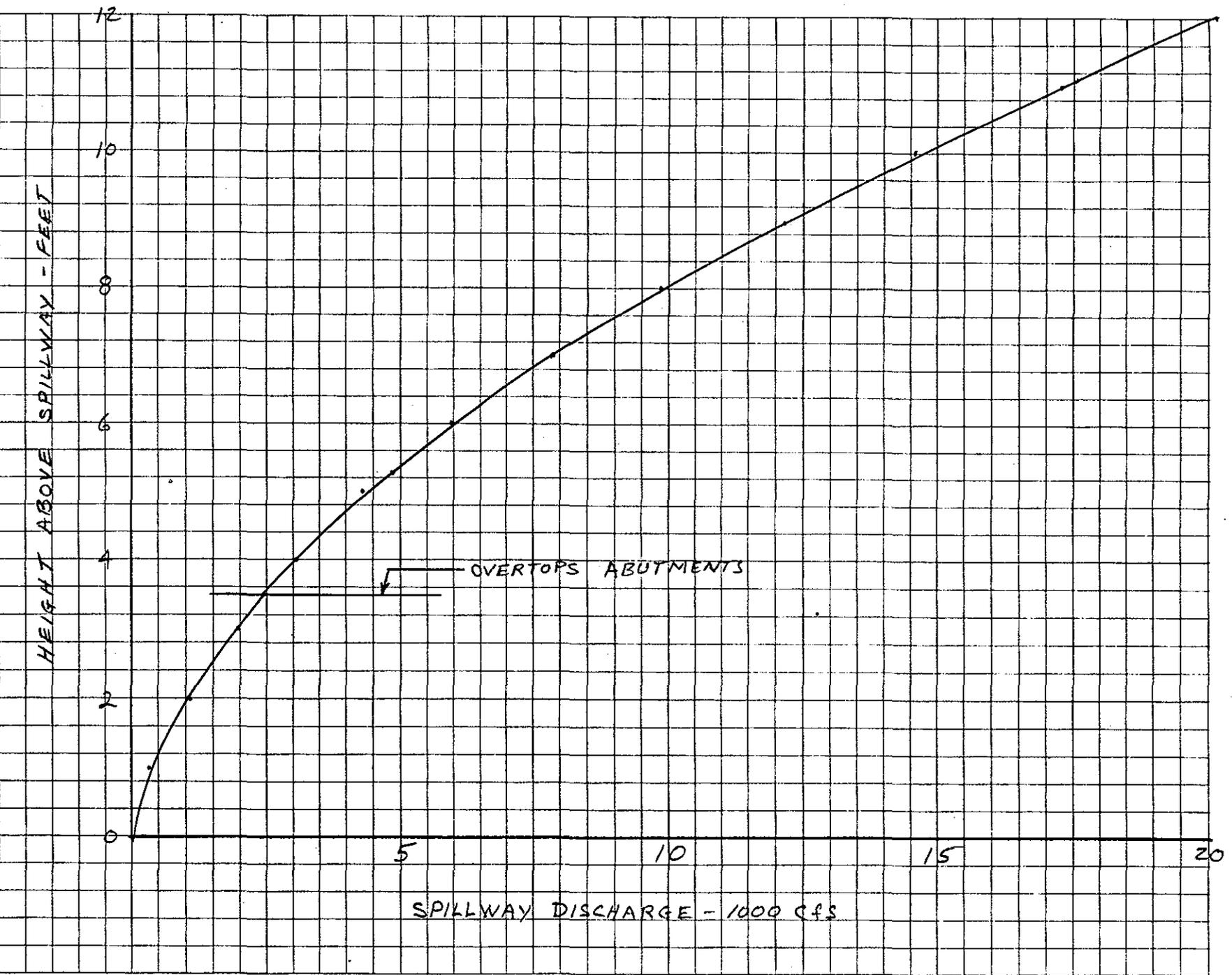
CONSULTING ENGINEERS

CKD BY *S.K.* DATE *12/31/79*

37 Brookside Road - Waterbury, Conn. 06708

JOB NO. *047-05*

SUBJECT *ROCKY GLEN DAM - SPILLWAY CAPACITY CURVE*



D-5

SECTION 1 Reach Length = 1400'
(SEE FIGURE 5)

$$Q_{P1} = 20,500 \text{ CFS} \quad \text{STORAGE} = 70 \text{ AC-Ft.}$$

$$H_1 = 22' \quad A_1 = 1100^{\text{sq}}$$

$$V_1 = 1100^{\text{sq}} \times 1400' / 43560 = 35 \text{ AC-Ft.}$$

$$Q_{P2 \text{ TRIAL}} = Q_{P1} \left(1 - \frac{V}{S}\right) = 20,500 \left(1 - \frac{35}{70}\right) = 10,250 \text{ CFS}$$

$$H_{2 \text{ TRIAL}} = 13' \quad A_{2 \text{ TRIAL}} = 650^{\text{sq}}$$

$$V_{2 \text{ TRIAL}} = 650^{\text{sq}} \times 1400' / 43560 = 21 \text{ AC-Ft.}$$

$$V_{\text{AVE.}} = \frac{35 + 21}{2} = 28 \text{ AC-Ft.}$$

$$Q_{P2} = 20,500 \left(1 - \frac{28}{70}\right) = 12,300 \text{ CFS}$$

$$H = 15' \\ A = 750 \text{ ft}^2$$

SECTION 2 REACH LENGTH = 700'

$$Q_{P2} = 12,300 \text{ CFS}$$

$$H_2 = 7.5' \quad A_2 = 1100^{\text{sq}}$$

$$V_2 = 1100 \times 700' / 43560 = 17.7 \text{ AC-Ft.}$$

$$Q_{P3 \text{ TRIAL}} = 12,300 \left(1 - \frac{17.7}{70}\right) = 9190 \text{ CFS}$$

$$H_{2 \text{ TRIAL}} = 7.1' \quad A_{2 \text{ TRIAL}} = 1000^{\text{sq}}$$

$$V_{2 \text{ TRIAL}} = 1000 \times 700 / 43560 = 16 \text{ AC-Ft.}$$

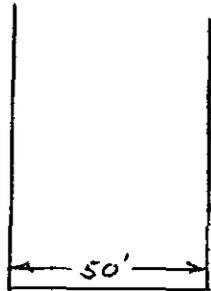
$$V_{\text{AVE.}} = \frac{17.7 + 16}{2} = 16.8 \text{ AC-Ft.}$$

$$Q_{P3} = 12,300 \left(1 - \frac{16.8}{70}\right) = 9,348 \text{ CFS}$$

$$H_3 = 7.2 \text{ ft.}$$

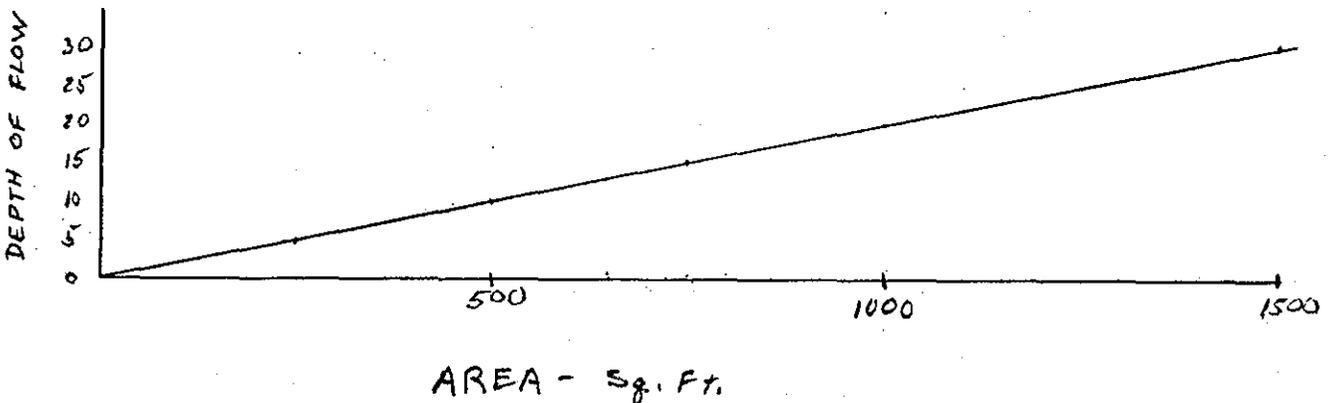
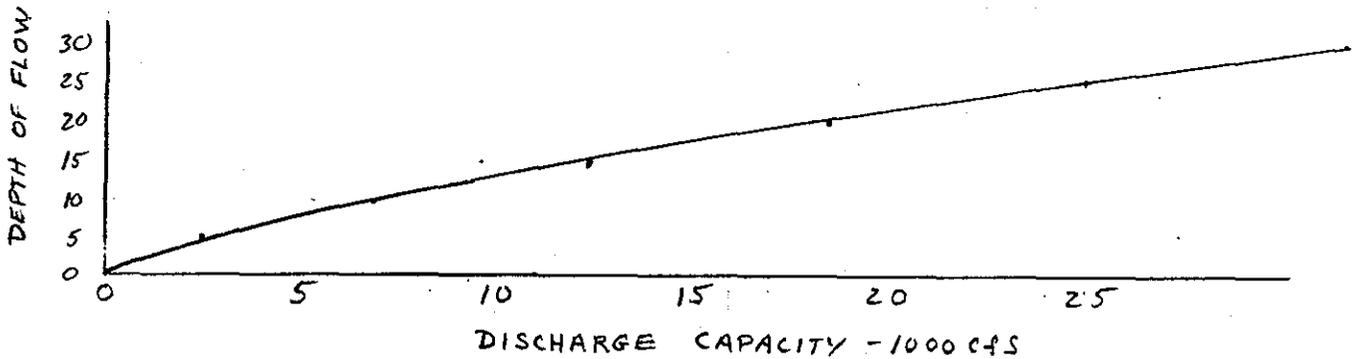
SECTIONS - 1 (SEE FIGURE 5)

CHANNEL - VERTICAL
SIDED GORGE
50' WIDE ON THE
BOTTOM



$S = 0.010$
 $n = 0.04$
 $L = 1400'$

<u>D</u>	<u>Wp</u>	<u>A</u>	<u>R</u>	<u>S</u>	<u>V</u>	<u>Q</u>
5	60	250	4.17	0.010	9.6	2400
10	70	500	7.14	0.010	13.8	6900
15	80	750	9.38	0.010	16.5	12,375
20	90	1000	11.11	0.010	18.5	18,500
25	100	1250	12.50	0.010	20.0	25,000
30	110	1500	13.64	0.010	21.2	31,800



BY D.A.S. DATE 1/16/80

ROALD HAESTAD, INC. SHEET NO. 7 OF 7

CONSULTING ENGINEERS

CKD BY S.L. DATE 1/18/80

37 Brookside Road - Waterbury, Conn. 06708

JOB NO. 049-05

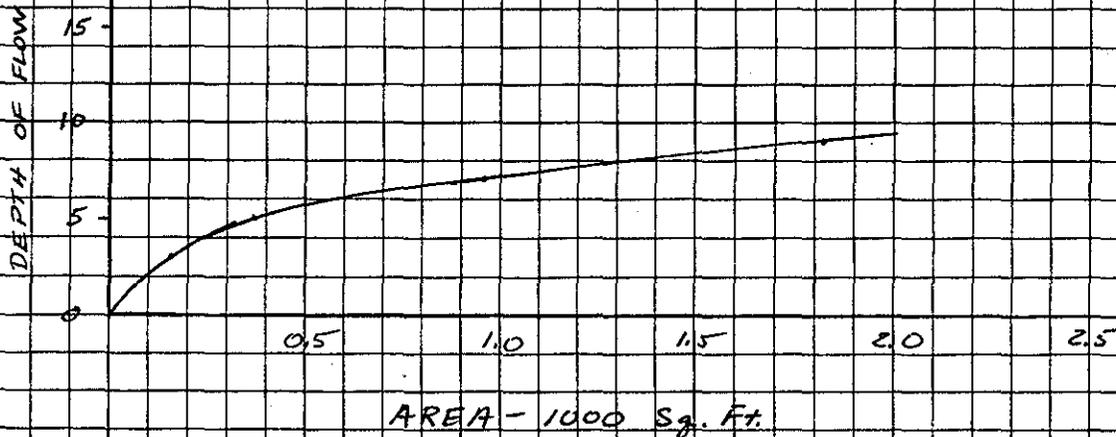
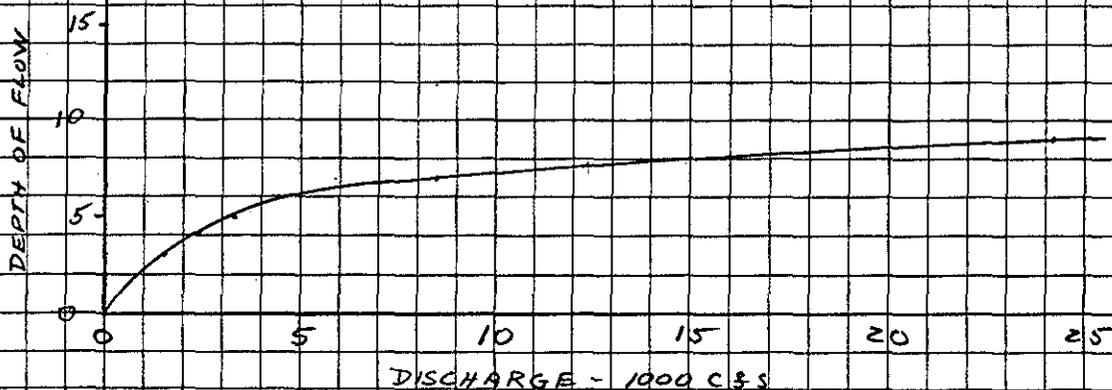
SUBJECT ROCKY GLEN DAM - DAM FAILURE FLOOD ROUTING

SECTION 2 CONTOURS FROM SUBDIVISION MAP "BRIDGE END FARM WEST" DATED NOV. 1979, SCALE 1"=100' HORZ. 1"=20' VERT.

$n = 0.04$
 $s = 0.020$



ELEV.	D	W _D	A	R	S	V	Q
116	3	60	160	2.67	0.020	10.1	1616
118	5	170	375	2.21	0.020	8.9	3338
120	7	430	755	2.22	0.020	8.9	8500
122	9	450	1815	4.03	0.020	13.3	24,140



AREA OF FUTURE
RESIDENTIAL DEVELOPMENT

RAILROAD EMBANKMENT
REMOVED

SECTION LINES
(TYPICAL)

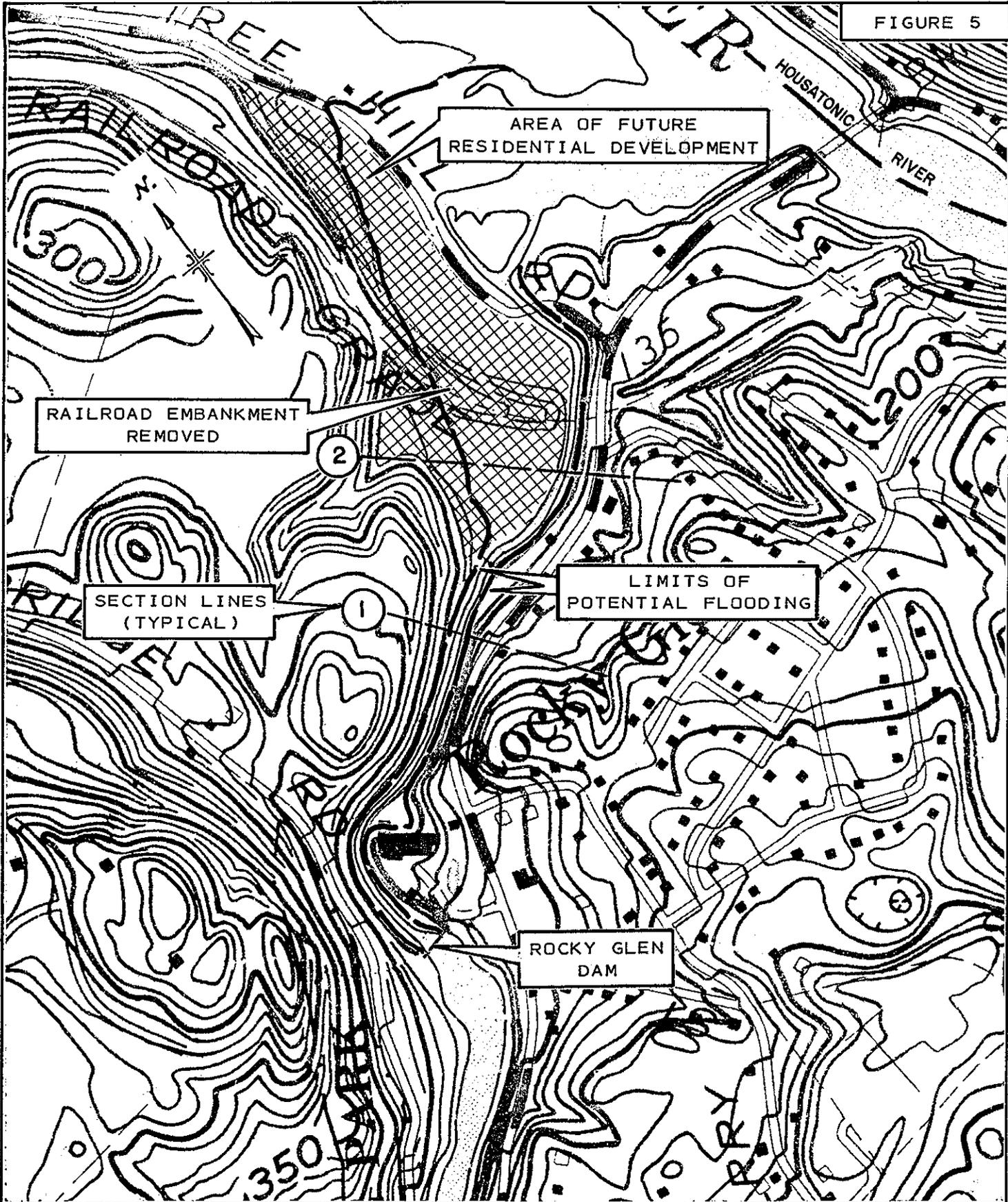
LIMITS OF
POTENTIAL FLOODING

ROCKY GLEN DAM

LIMITS OF POTENTIAL FLOODING

ROCKY GLEN DAM
NEWTOWN, CONNECTICUT

SCALE: 1" = 500'



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		
CT	310	NED	CT	001	06				ROCKY GLEN DAM	4126.0	7316.6	DAY	MO	YR
												04	JAN	80

POPULAR NAME	NAME OF IMPOUNDMENT
	POOTATUCK RIVER

REGION	BASIN	RIVER OR STREAM	NEAREST DOWNSTREAM CITY-TOWN-VILLAGE	DIST FROM DAM (MI.)	POPULATION
01	07	POOTATUCK RIVER	ROCKY GLEN	1	1000

TYPE OF DAM	YEAR COMPLETED	PURPOSES	STRUC. HEIGHT (FT.)	HYDRAU. HEIGHT (FT.)	IMPOUNDING CAPACITIES		DIST	OWN	FED	R	PRV/FED	SCS	A	VER/DATE
					MAXIMUM (ACRE-FT.)	NORMAL (ACRE-FT.)								
PGCT	1905	HS	38	38	70	60	NED	N	N	N	N	N	N	N

REMARKS
23-SUPPLY FOR MANUFACTURING PURPOSES 22-EST

D/S HAS	SPILLWAY			MAXIMUM DISCHARGE (FT.)	VOLUME OF DAM (CY)	POWER CAPACITY		NAVIGATION LOCKS																			
	CRCS	TYPE	WIDTH (FT.)			INSTALLED (MW)	PROPOSED (MW)	NO.	LENGTH (FT.)	WIDTH (FT.)																	
1	130	U	100	2500	2350	.1																					

OWNER	ENGINEERING BY	CONSTRUCTION BY
NEWTON HILL ASSOCIATES		FRED T LEV + CO

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

INSPECTION BY	INSPECTION DATE	AUTHORITY FOR INSPECTION
	DAY MO YR	
ROALD HAESTAD INC	27NOV79	PL92-367

REMARKS
34-ESTIMATED, SPILLWAY SECTION ONLY