

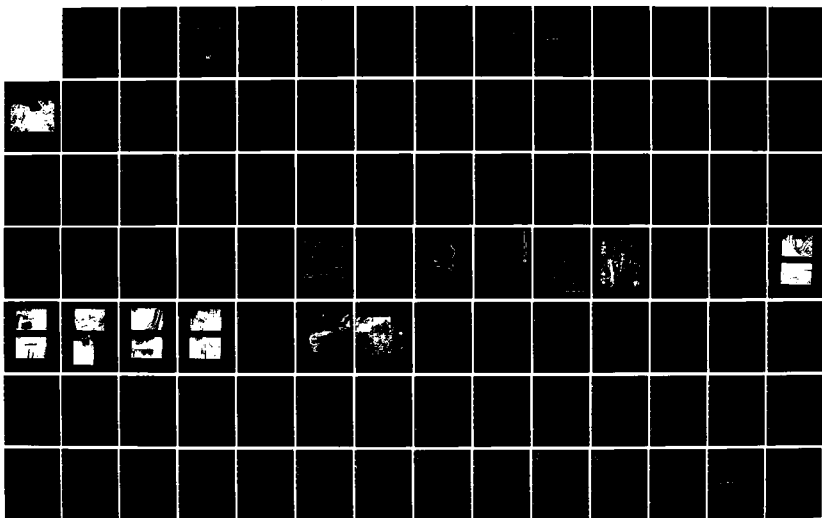
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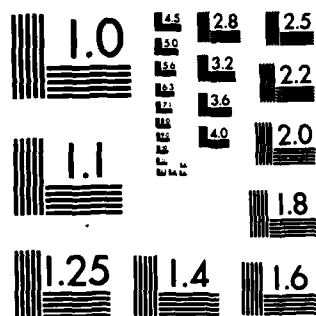
NATIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL DAMS
PAPER GOODS POND DAM. (U) CORPS OF ENGINEERS WALTHAM MA
NEW ENGLAND DIV MAR 81

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REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
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21. KEY WORDS (Continue on reverse side if necessary and identify by block number) DAMS, INSPECTION, DAM SAFETY, Conn. River Basin Berlin, Conn.		
22. ABSTRACT (Continue on reverse side if necessary and identify by block number) The Paper Goods Pond Dam is a concrete and masonry structure. It is approx. 70 ft. long, 30 ft. high and has an average top width of 4 ft. The Paper Goods Pond Dam is classified as SMALL in size and a HIGH hazard potential structure in accordance with the Recommended Guidelines for Safety Inspection of Dam. The test flood for this dam is 1/2 the Probable Maximum Flood (PMF). Based on visual inspection and past operational performance, the dam is judged to be in FAIR condition.		

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CONNECTICUT RIVER BASIN
BERLIN, CONNECTICUT

PAPER GOODS POND DAM

CT 00253

PHASE 1 INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM



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

MARCH, 1981

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NEW ENGLAND

WALTHAM, MASS.

REPLY TO
ATTENTION OF:
NEDED-E

MAY 06 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 Paper Goods Pond Dam (CT-00253) 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 Paper Goods Pond Dam would likely be exceeded by floods greater than 9 percent of the Probable Maximum Flood (PMF). 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.

U-E

Re: William A. O'Neill

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, Sherwood-Industries, Inc., 10 Main Street, Kensington, Connecticut 06037.

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,



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

CONNECTICUT RIVER BASIN

BERLIN, CONNECTICUT

PAPER GOODS POND DAM

CT 00253

PHASE 1 INSPECTION REPORT

NATIONAL DAM INSPECTION PROGRAM

SMALL DAM INSPECTION PROGRAM

PHASE I - INSPECTION REPORT

Identification:	CT 00253
Name of Dam:	Paper Goods Pond Dam
Town:	Berlin
County and State:	Hartford, Connecticut
Stream:	Mattabesset River
Date of Inspection:	November 12, 1980

BRIEF ASSESSMENT

The Paper Goods Pond Dam is a concrete and masonry structure. It is approximately 70 feet long, 30 feet high and has an average top width of 4 feet. The Paper Goods Pond Dam was probably constructed in 1920 with subsequent improvements in 1939.

The present owner and operator of the dam is Sherwood Industries, Inc., which uses the pond for industrial water supply.

Based on visual inspection and past operational performance, the dam is judged to be in FAIR condition. Seepage was noted through the southwest abutment and along the southern downstream channel wall. The 10 inch supply main presently has no control at the dam.

The dam is classified as SMALL in size and a HIGH hazard potential structure in accordance with the Recommended Guidelines for Safety Inspection of Dams, established by the Corps of Engineers. The impoundment storage at the top of the dam is 150 ac.-ft. and the maximum height of the dam is 30 feet. Failure of the dam would result in the loss of more than a few lives and damage to numerous homes and buildings. The depth of inundation at these homes and buildings would be 0 feet before and 1 to 3 feet after dam failure.

The test flood for this dam is 1/2 the Probable Maximum Flood (PMF). The test flood has an inflow equal to 6415 cfs and an outflow discharge equal to 6400 cfs with a stillwater elevation of 125.0 which will overtop the dam by 5.5 feet.

The maximum outflow capacity of the spillway with the water surface at the top of the dam is 1190 cfs, which is 19 percent of the test flood outflow.

It is recommended that the following items be studied further by a qualified registered engineer: The condition of the upstream face, the inability of the spillway to pass the test flood without overtopping the dam, seepage at the southwest abutment and southern downstream wall, and the lack of upstream control for the 10 inch supply main.

The following remedial measures should be taken by the owner: Clearing the downstream channel, repair washouts of stone walls along downstream channel, supplementing the existing emergency plan with a downstream warning plan and an annual technical inspection program.

Recommendations and remedial measures that should be implemented within one year of receipt of this Phase I Inspection Report are further described in Section 7.

JAMES P. PURCELL ASSOCIATES, INC.



Sudhir A. Shah

Sudhir A. Shah, P.E.
Director of Engineering
Connecticut P.E. No. 8012

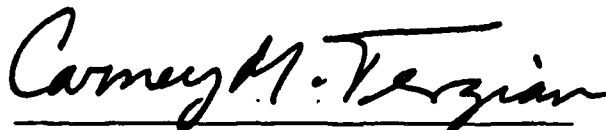
This Phase I Inspection Report on Paper Goods Pond Dam (CT-00253) has been reviewed by the undersigned Review Board members. In our opinion, the reported findings, conclusions, and recommendations are consistent with the Recommended Guidelines for Safety Inspection of Dams, and with good engineering judgement and practice, and is hereby submitted for approval.



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

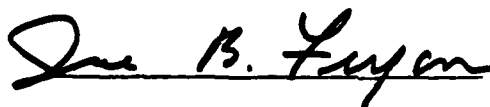


ARAMAST MAHTESIAN, MEMBER
Geotechnical Engineering Branch
Engineering Division



CARNEY M. TERZIAN, CHAIRMAN
Design Branch
Engineering Division

APPROVAL RECOMMENDED:



JOE B. FRYAR
Chief, Engineering Division

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I 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 need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and downstream damage potential.

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

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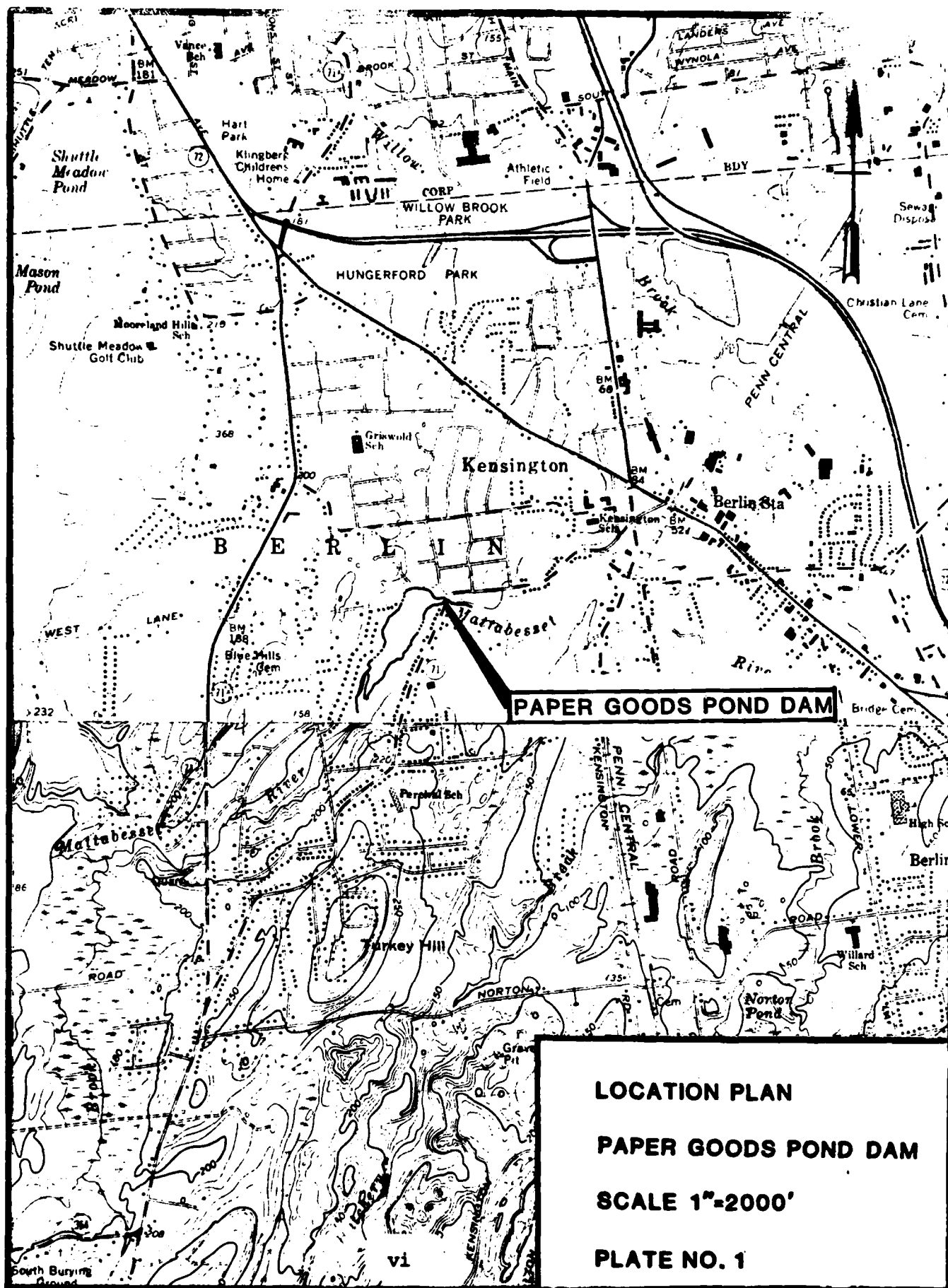
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OVERVIEW PHOTO - PAPER GOODS POND DAM

PHOTO TAKEN DECEMBER 15, 1980



NATIONAL DAM INSPECTION PROGRAM

PHASE I - INSPECTION REPORT

NAME OF DAM: PAPER GOODS POND DAM

SECTION 1

PROJECT INFORMATION

1.1 General:

a. Authority:

Public Law 92-367, August 8, 1972, authorized the Secretary of the Army through the Corps of Engineers, to initiate a national program of dam inspection throughout the United States. The New England Division of the Corps of Engineers has been assigned the responsibility of supervising the inspection of dams within the New England Region. James P. Purcell Associates, 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 was issued to James P. Purcell Associates, Inc., under a letter from William E. Hodgson, Jr., Colonel, Corps of Engineers. Contract No. DACW33-81-C-0009 has been assigned by the Corps of Engineers for this work.

b. Purpose:

1. Perform technical inspection and evaluation of non-Federal dams to identify conditions which threaten the public safety and thus permit correction in a timely manner by non-Federal interests.
2. Encourage and prepare the States to initiate quickly, effective dam safety programs for non-Federal dams.
3. To update, verify and complete the National Inventory of Dams.

1.2 Description of the Project:

a. Location:

The Paper Goods Pond Dam is located in the Town of Berlin, one half mile southwest of the Village of Kensington, at the intersection of Percival Avenue and Main Street, both Connecticut Route No. 71 (See Plate No. 1). The dam impounds

water from the Mattabesset River and is located approximately 11.5 miles above the confluence with the Connecticut River. The pond is situated in a northeast/southwest direction, with the dam at the northeast end. The latitude is 41°37'-49.2" and the longitude is 72°46'-47.8". All elevations used in this report are based on the National Geodetic Vertical Datum (NGVD).

b. Description of Dam and Appurtenances:

The Paper Goods Pond Dam is a stone masonry arch structure approximately 70 feet long, 30 feet high, with a top width of 4 feet. The downstream face is vertical and coated with gunite. In plan, the face is arched with a radius of approximately 50 feet.

The spillway is 58 feet long and extends the full length of the dam except for a 32 inch high step at the northeast end for the outlet work controls. The spillway crest is 4 feet wide and consists of large cut stones.

The outlet works consist of a 16 inch blow-off through the central portion of the dam and a 48 inch penstock at the northeastern end of the dam. Both outlets are regulated at the dam by hand operated controls on a platform at the northeast end of the dam.

A 10 inch supply main extends from the dam to a sealed terminus at the boiler house downstream of the dam. This pipe has no control at the dam and is under pressure until the terminus.

The bridge for Percival Avenue (Route 71) is located 25 feet upstream of the dam.

c. Size Classification:

The size classification of this dam is SMALL as per the criteria set forth in the Recommended Guidelines for Safety Inspection of Dams by the Corps of Engineers. The impoundment storage at the top of the dam is 150 ac.-ft. (within the range of 50 to 1000 ac.-ft.) and the maximum height of the dam is 30 feet (within the range of 25 to 40 feet). The size classification is based on both the height and storage criteria.

d. Hazard Classification:

The hazard classification of this dam is HIGH as per the criteria set forth in the Recommended Guidelines for Safety Inspection of Dams, by the Corps of Engineers. The dam is located upstream of numerous homes and buildings where failure discharge may cause the loss of more than a few lives and cause damage due to high velocity impact from debris and flooding. The estimated water depth due to the assumed dam failure may range from 30 feet at the dam to 0.6 feet, 6000 feet downstream at a large swampy area. The depth of inundation at the homes and buildings would be 0 feet before and 1 to 3 feet after dam failure.

e. Ownership:

The Paper Goods Pond Dam is presently owned and maintained by Sherwood Industries, Inc., 10 Main Street, Kensington, CT 06037.

f. Operator:

The person in charge of the operation of the dam is:

Mr. Sterling Gillette
Sherwood Industries, Inc.
10 Main Street
Kensington, CT 06037
Telephone: (203) 828-4161

g. Purpose:

The pond is presently used for industrial water supply by the owner of the dam. Water is withdrawn via an 8 inch pipe upstream of the dam. This pipe was not inspected. No water is withdrawn via the outlet works at the dam.

h. Design and Construction History:

The Paper Goods Pond Dam was probably constructed in 1920. The original dam was stone masonry with only the 48 inch penstock. In 1939, the entire dam was coated with reinforced gunite to limit leakage and the 16 inch blow-off and 10 inch supply pipe were installed.

i. Normal Operating Procedures:

All water is discharged over the spillway except that withdrawn via the upstream 8 inch pipe.

1.3 Pertinent Data:

a. Drainage Area:

The Paper Goods Pond Dam drainage basin is generally rectangular in shape with a length of 6.5 miles and an average width of 1.5 miles resulting in a total drainage area of 9.5 square miles (see drainage basin map in Appendix D). The topography is generally moderate to steep terrain, with elevations ranging from a high of 1044 feet to a low of 115.7 feet at the spillway crest. Stream and basin slopes are flat to steep, 0.1 to 10 percent and 2 to 50 percent respectively. The reservoir has a normal surface area of 12 acres which is 0.2 percent of the watershed.

b. Discharge at Dam Site:

There are no specific discharge records available for this dam. Listed below are calculated discharge values of the spillway and outlet works (16 inch blowoff pipe):

1. Outlet works: A 16 inch blow-off with an intake at approximately 100.7 and a discharge capacity of 30 cfs at elevation 119.5.
2. Maximum known flood at dam site: Unknown.
3. Ungated spillway capacity at top of dam: 1190 cfs at elevation 119.5.
4. Ungated Spillway capacity at test flood elevation: 4910 cfs at elevation 125.0
5. Gated spillway capacity at normal pool elevation: N/A
6. Gated spillway capacity at test flood elevation: N/A.
7. Total spillway capacity at test flood elevation: 4910 cfs at elevation 125.0.
8. Total project discharge at top of dam: 1220 cfs at elevation 119.5.
9. Total discharge at test flood level: 6400 cfs at elevation 125.0.

c. Elevation (Feet above NGVD):

- | | |
|---------------------------------------|---------|
| 1. Stream bed at toe of dam | 89.7 |
| 2. Bottom of cutoff | N/A |
| 3. Maximum tailwater | Unknown |
| 4. Normal Pool | 115.7 |
| 5. Full flood control pool | N/A |
| 6. Spillway crest | 115.7 |
| 7. Design surcharge (Original Design) | Unknown |
| 8. Top of dam | 119.5 |
| 9. Test flood level | 125.0 |

d. Reservoir (Length in feet):

1. Normal pool	2000
2. Flood control pool	N/A
3. Spillway crest pool	2000
4. Top of dam	2100
5. Test flood pool	2500

e. Storage (acre-feet):

1. Normal pool	77
2. Flood control pool	N/A
3. Spillway crest pool	77
4. Top of dam	150
5. Test flood pool	324

f. Reservoir Surface (acres):

1. Normal pool	12
2. Flood control pool	N/A
3. Spillway crest	12
4. Test flood pool	38
5. Top of dam	27

g. Dam:

1. Type	Stone masonry
2. Length	70 feet
3. Height	30 feet
4. Top width	4 feet
5. Side slopes	Upstream - unknown Downstream - vertical

- | | |
|--------------------|-------------------------------------|
| 6. Zoning | Unknown |
| 7. Impervious core | Masonry |
| 8. Cutoff | Unknown |
| 9. Grout curtain | Unknown |
| 10. Other | Faces coated with reinforced gunite |

h. Diversion and Regulating Tunnel: N/A

i. Spillway:

- | | |
|--------------------|--|
| 1. Type | Overflow, broad crested uncontrolled weir |
| 2. Length of weir | 58.0 feet |
| 3. Crest elevation | 115.7 |
| 4. Gates | None |
| 5. U/S Channel | Natural bed |
| 6. D/S Channel | Overgrown gravel and rock channel. Stone walls below power house |

7. General

j. Regulating Outlets:

Refer to Paragraph 1.2b - "Description of Dam and Appurtenances" for description of Outlet Works.

- | | |
|---------------------|--|
| 1. Inverts and size | 16 inch blowoff - 100.7 feet
48 inch penstock - 105.3 feet
10 inch main - 106.7 feet |
|---------------------|--|

2. Description

Metal pipes

3. Control Mechanisms

36 and 48 inch - valve or
gate at dam
10 inch - No control at
dam. Terminus at boiler
house sealed.

4. Other

SECTION 2

ENGINEERING DATA

2.1 Design:

There are limited available records presenting design information for the construction of the Paper Goods Pond Dam. A 1939 application to repair and modify the dam has been included in Appendix B of this report.

2.2 Construction:

There are no available records of the construction of this dam.

2.3 Operation:

No formal records of operation are kept for this facility.

2.4 Evaluation

a. Availability:

The information noted above for this facility is available in the files of the Department of Environmental Protection, Water Resources Unit, Dam Safety Engineers, State Office Building, Hartford, Connecticut, and Sherwood Industries, Inc., Kensington, Connecticut

b. Adequacy:

The lack of indepth engineering data did not allow a definitive review. Therefore, the adequacy of this dam could not be assessed from the standpoint of reviewing design and construction data alone, but is based primarily on the visual inspection, the dam's past performance, and sound engineering judgment.

c. Validity:

The validity of the limited information available could not be verified.

SECTION 3

VISUAL INSPECTION

3.1 Findings:

a. General:

The visual inspection of the Paper Goods Pond Dam was conducted on November 12, 1979 and a copy of the visual inspection check list is contained in Appendix A of this report.

The following procedure was used:

1. Inspection of the upstream area of the reservoir which is impounded by the dam.
2. Visual inspection of the face and top of the dam and spillways for cracks, loose stones, seepage, etc.
3. Inspection of the outlet works and other appurtenances as to their existence, location and operability.
4. Review of procedures that could be utilized in the event of an emergency situation.
5. A check of the downstream area for seepage, piping, boils or other indications of abnormal conditions. The downstream hazard potential in the event of dam failure was investigated.
6. Photographs of the general area of the dam and of specific items of note were taken and are included in Appendix C of this report.

Before the inspection, the available existing data was studied and reviewed.

b. Dam:

1. **Crest:** The top of the dam consists almost entirely of the spillway. At the southwest end, a 3.8 foot high concrete masonry wall extends 20 feet west from the spillway to natural ground (Photo C-4). At the northeast end, there is a 2.67 foot high step for the outlet works controls (Photo C-3). A 3.0 foot high wall extends 32 feet north to the Route 71 bridge wingwall. The top of the dam is 4 feet wide. The dam ties into rock on the southwest side and probably also on the northeast side.

2. **Upstream Face:** Water was flowing over the spillway on the day of the inspection and the upstream face was not visible. It reportedly was coated with reinforced gunite in 1939.
3. **Downstream Face:** The downstream face is stone masonry coated with reinforced gunite (Photo C-1). Much of the gunite is cracked and spalled (Photo C-6), and there is approximately 1/2 square foot of visible wire mesh reinforcing at the toe in the center of the spillway section. Seepage (2 gpm-clear) is occurring where the southwest abutment ties into the downstream face (Photo C-7). This has apparently existed for several years as indicated by correspondence in the Connecticut Department of Environmental Protection files.

c. Appurtenant Structures:

1. **Spillway:** The 58 foot long spillway comprises almost the entire top of the dam (Photo C-2) and is constructed with a 4 foot wide stone or concrete cap. At the southeast end, there is a concrete pad at the spillway level approximately 15 feet by 15 feet. The purpose of this pad is unknown, and its condition appears good.
2. **16 Inch Blowoff:** A 16 inch pipe extends through the dam (Photo C-6) and is controlled by the slanted valve stem (Photo C-5). A wrench is used to operate the valve which was last opened in October, 1980.
3. **48 Inch Penstock:** A 48 inch riveted steel penstock extends from the dam to an abandoned power house below the dam (Photo C-10). Flow into the penstock is controlled by the other two wheels on the top of the dam (Photo C-5). An attempt was made in 1974 to open the valve at which time several gear teeth broke. It is now believed to be inoperable. There is a vent for the pipe just below the dam, and the pipe is supported by concrete piers to the power house.
4. **10 Inch Supply Main:** A 10 inch pipe extends through the dam to a sealed terminus at the boiler house. The pipe exits in the center of the northern half of the downstream face and extends along the dam under a spalled and chipped gunite shelf (Photo C-6 and Page B-10). At one time this pipe extended to a water tower (via pump) and was used to supply water for fire protection. When the company switched to municipal water, the pipe was cut and sealed in the boiler house. Reportedly, there is no control at the dam and the pipe is under pressure to the boiler house.

d. Reservoir Area:

The pond is formed by flooding a portion of the Mattabesset River valley. The sides of the valley have gentle slopes bordering the reservoir.

no unusual geologic features were noted that could be expected to adversely affect the dam or appurtenant structures.

Trespassing is not permitted on the dam and the site is fenced.

In 1974, a new bridge for Route 71 was constructed 25 feet upstream of the dam (Photo C-8). There are several large willow trees overhanging the pond upstream of the Route 71 bridge. The riprap placed around the abutments of the Route 71 bridge is eroding, primarily on the upstream side.

e. Downstream Channel:

The downstream channel from the dam to the power house is a rock gorge, with numerous trees and rock overhanging the channel (Photo C-1).

Seepage (the flow rate could not be determined due to the areal extent) is occurring out of the rock along the south channel wall for a distance of approximately 50 feet downstream of the dam (Photo C-7). This seepage may be occurring along the bedding and joint planes of the rock upon which the abutment is founded.

Below the power house, there are stone walls lining the channel which have washed out in many places. Numerous trees and brush overhang this channel (Photo C-9).

3.2 Evaluation:

Based on the visual inspection, the Paper Goods Pond Dam appears to be in fair condition overall, and there were no major areas of distress noted. Specific areas of concern that were noted are:

- a. The condition of the stone walls and channel below the dam.
- b. The lack of control at the dam for the 10 inch supply main.
- c. The inoperability of the 48 inch penstock.
- d. The eroding of the riprap at the Route 71 bridge abutments.
- e. Seepage through the southwest abutment, possibly along bedding and joint planes of the bedrock. This has existed for several years, and although at present it does not appear to affect the adequacy of the dam, it should be corrected before further deterioration leads to a hazardous condition.

SECTION 4

OPERATIONAL AND MAINTENANCE PROCEDURES

4.1 Operational Procedures:

a. General:

The Paper Goods Pond Dam is used for industrial water supply. This water is withdrawn upstream of the dam. All other water is normally discharged over the spillway, and all other outlet works are normally closed.

b. Description of Any Warning System in Effect:

According to Mr. Varano, representative of the owner, there are personnel at the building adjacent to the dam 24 hours per day. There is a list of people to contact in the event of emergencies.

4.2 Maintenance Procedures:

a. General:

There is no regular maintenance schedule for the dam. Visual inspections of the dam and appurtenant structures are conducted twice a year. No records of these inspections are maintained.

b. Operating Facilities:

No regular maintenance of the outlet works was reported. The 16 inch blow-off is tested twice a year during the inspections and was last utilized in October, 1980.

4.3 Evaluation:

To insure the safety of the residents downstream, a regular technical inspection and maintenance program and a formal downstream warning plan should be developed and implemented.

SECTION 5

EVALUATION OF HYDRAULIC/HYDROLOGIC FEATURES

5.1 General:

The Paper Goods Pond Dam creates an impoundment with a total storage capacity of 77 ac.-ft. at elevation 115.67, the spillway crest elevation. Each foot of depth in the reservoir above the spillway crest can accommodate approximately 12 ac.-ft. The spillway is 58 feet long by 4 feet wide broad crested uncontrolled weir. Stream and basin slopes are flat to steep, 0.1 to 10 percent and 2 to 50 percent respectively.

5.2 Design Data:

- a. No specific design data is available for this watershed or the structures of the Paper Goods Pond Dam. In lieu of existing design information, USGS topographic maps (scale 1"-2000') were utilized to develop hydrologic parameters such as drainage area, basin length, time of concentration, and other runoff characteristics. Elevation-storage relations for the reservoir were approximated. Reservoir surface area and surcharge storage were computed using the USGS maps. Some of the pertinent hydraulic design data was obtained and/or confirmed by actual field measurements at the time of the visual inspection.
- b. Outflow values (routing procedures) and dam overtopping analyses were computed in accordance with the guidelines developed by the Corps of Engineers. Judgment was used in calculating final values outlined in this report, which are quite approximate and should not be considered a substitute for actual detailed analysis.

5.3 Experience Data:

Historical data for recorded discharges is not available for this dam.

5.4 Test Flood Analysis:

Recommended guidelines for the Safety Inspection of Dams by the Corps of Engineers were used for the selection of the "Test Flood". This dam is classified as a HIGH hazard and SMALL size structure. Guidelines indicate that a range of 1/2 times the Probable Maximum Flood (PMF) to the PMF be used as the "Test Flood" for these classifications. A test flood of 1/2 PMF was chosen due to the small size of the dam. The watershed has a total area of 9.5 square miles. Snyder's lag was calculated to be 5.0 hours and a Snyder peaking coefficient of 0.625 was used. The 200 square mile - 24 hour Probable Maximum Precipitation (PMP) is 21.5 inches. The flood hydrograph package, HEC-1 computer program developed by the Corps of Engineers was utilized to develop the inflow hydrograph, route the flood through the reservoir, and for the dam overtopping analysis. A test flood inflow equal to 1/2 PMF was calculated to be 6415 cfs (675 CSM).

The spillway capacity is hydraulically inadequate to pass the test flood (1/2 PMF) and overtopping of the dam will occur. The maximum outflow capacity of the spillway without overtopping the dam is 1190 cfs. This corresponds to approximately 19 percent of the test flood outflow and a storage above the primary spillway level of 73 ac.-ft. The maximum outflow discharge value for the test flood is 6400 cfs corresponding to a depth of flow over the top of the dam of 5.5 feet and a storage above the spillway level of 249 ac.-ft. A spillway rating curve, an outlet rating curve, and a reservoir stage-capacity curve, are included in Appendix D of this report.

At the spillway elevation of 115.7, the capacity of the 16 inch outlet structure is 25 cfs. It will require approximately 21 hours to lower the water level the first foot assuming a water surface area of 12 acres, normal inflow conditions, and use of the outlet works to regulate the water level for expected inflows.

5.5 Dam Failure Analysis:

This dam is classified as a high hazard structure. Failure discharge can cause the loss of more than a few lives and damage due to high velocities, impact from debris, and flooding to numerous homes and buildings along the downstream channel.

The calculated dam failure discharge is 6075 cfs due to an assumed breach width of 22 feet and a pre-failure pool level equal to the top of the dam. At this level the pre-failure flow in the downstream channel will be equal to the full spillway's capacity of 1190 cfs corresponding to a depth of flow of 0.4 to 2.0 feet. Failure will produce a water surface level of approximately 5 feet immediately downstream from the dam. More than 20 homes and 8 buildings may be inundated by 0 feet before and 1 to 3 feet after dam failure. The failure discharge will affect downstream areas for a distance of 6000 feet from the dam. At this distance, the water surface level will be approximately 0.6 feet above normal observations as it enters a large swampy area. Beyond 6000 feet, the effects of the failure discharge will be reduced as it enters the large swampy area. Water surface elevations due to the failure of the dam are listed on Page D-17. Probable consequences including the prime impact areas are listed on Page D-23.

EVALUATION OF STRUCTURAL STABILITY

6.1 Visual Observation:

The visual inspection revealed no signs of major physical distress in the structure. However, seepage is occurring through the southwest abutment and possibly along bedding and joint planes of the bedrock. This condition has apparently existed for several years and although at present it does not appear to affect the adequacy of the dam, it should be corrected before further deterioration leads to a hazardous condition.

The upstream face of the dam and the southwest abutment could not be inspected due to the pond level. The seepage may be occurring or enhanced due to defects in the upstream face of the dam or southwest abutment.

Approximately 1/2 square foot of wire mesh reinforcing was visible at the downstream toe in the center of the dam. This apparently is reinforcing for the gunite coating. This exposed wire mesh does not appear to affect the integrity of the dam.

6.2 Design and Construction Data:

There is insufficient design and construction data to permit a formal evaluation of stability.

6.3 Post-Construction Changes:

The entire dam was coated with reinforced gunite in 1939.

The 10 inch supply main was also added in 1939. This pipe is presently sealed downstream at the boiler house. There is no control on the upstream face and the entire pipe is under pressure. The pipe should be sealed on the upstream face to prevent a hazardous situation should the pipe rupture.

6.4 Seismic Stability:

The dam is in Seismic Zone 1 and hence does not require evaluation for seismic stability according to the Corps of Engineers Recommended Guidelines.

SECTION 7

ASSESSMENT, RECOMMENDATIONS AND REMEDIAL MEASURES

7.1 Dam Assessment:

a. Condition:

Based on the visual inspection, past performance and hydraulic/hydrologic evaluation, the Paper Goods Pond Dam and appurtenances are judged to be generally in FAIR condition. Items of concern that should be addressed as a result of this inspection are listed in Sections 7.2 and 7.3.

b. Adequacy of Information:

The limited engineering data did not allow for a definitive review. Therefore the adequacy of the dam is based on visual inspection, past performance history, and engineering judgment.

c. Urgency:

The recommendations and remedial measures described below should be implemented by the owner within one year after receipt of this Phase 1 Inspection Report, except as noted.

7.2 Recommendations:

It is recommended that the owner engage a qualified registered engineer to carry out the following actions and that his recommendations be implemented.

- a.** A detailed hydrologic/hydraulic investigation to determine the need for and means of increasing the discharge capacity of the project.
- b.** The upstream face be visually inspected.
- c.** The seepage at the southwest abutment and southern downstream channel wall be investigated and monitored, and repairs designed as necessary. This work should be done immediately upon receipt of this report.
- d.** The 10 inch supply main should be sealed on the upstream face of the dam.

7.3 Remedial Measures:

a. Operational and Maintenance Procedures:

- 1.** The downstream channel should be cleared and the trees overhanging the channel removed.

2. The stone walls below the power house should be repaired where they have washed out and the embankment filled and stabilized.
3. Supplement the existing emergency plan with a surveillance and downstream warning plan, including round-the-clock monitoring during heavy precipitation.
4. Institute a program of annual periodic technical inspection.

7.4 Alternatives:

There are no practical alternatives to the above stated recommendations.

APPENDIX A

INSPECTION CHECK LIST

INSPECTION CHECK LIST

PARTY ORGANIZATION

PROJECT Paper Goods Pond Dam DATE November 12, 1980

TIME 9:00 - 12:00 A.M.

WEATHER Partly Cloudy

W.S. ELEV. _____ U.S. _____ DN.S. _____

PARTY:

- | | |
|---|-------------------------------------|
| 1. <u>R. Johnston, JPPA</u> | 6. <u>R. Varano, G. Whitney,</u> |
| 2. <u>J. Hewes, JPPA</u> | 7. <u>Sherwood Industries, Inc.</u> |
| 3. <u>J. Walsh, Baystate</u> | 8. _____ |
| 4. <u>Environmental Consultants, Inc.</u> | 9. _____ |
| 5. _____ | 10. _____ |

PROJECT FEATURE	INSPFCTED BY	REMARKS
1. <u>Hydraulics</u>	<u>R. Johnston</u>	
2. <u>Structural</u>	<u>J. Hewes</u>	
3. <u>Geotechnical</u>	<u>J. Walsh</u>	
4. _____		
5. _____		
6. _____		
7. _____		
8. _____		
9. _____		
10. _____		

INSPECTION CHECK LIST

PROJECT Paper Goods Pond DamDATE November 12, 1980

PROJECT FEATURE _____

NAME _____

DISCIPLINE _____

NAME _____

AREA EVALUATED	CONDITION
<u>DAM EMBANKMENT</u>	
Crest Elevation 119.5	Good - Some spalling
Current Pool Elevation 115.7	Crest of Spillway
Maximum Impoundment to Date	Approximately 4 inches over Spillway
Surface Cracks	Yes - In gunite coating
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	Seepage through southwest abutment
Indications of Movement of Structural Items on Slopes	None Observed
Trespassing on Slopes	Not Permitted
Vegetation on Slopes	None Observed
Sloughing or Erosion of Slopes or Abutments	Spalling and cracking of gunite coating
Rock Slope Protection - Riprap Failures	Erosion of riprap at Route 71 bridge
Unusual Movement or Cracking at or near Toes	Yes - In gunite coating
Unusual Embankment or Downstream Seepage	Seepage at southwest abutment and along downstream south channel wall
Piping or Boils	None observed
Foundation Drainage Features	None Observed
Toe Drains	None observed
Instrumentation System	Non observed

INSPECTION CHECK LIST

PROJECT Paper Goods Pond Dam

DATE November 12, 1980

PROJECT FEATURE _____

NAME _____

DISCIPLINE _____

NAME _____

AREA EVALUATED

CONDITION

OUTLET WORKS - INTAKE CHANNEL AND INTAKE STRUCTURE

a. Approach Channel

Entire Pond Bed - Underwater

b. Intake Structures

16 inch blowoff

Assumed free intake

10 inch supply main

Assumed free intake

48 inch penstock

Assumed free intake. Protected
by bar rack.

INSPECTION CHECK LIST

PROJECT Paper Goods Pond Dam

DATE November 12, 1980

PROJECT FEATURE _____

NAME _____

DISCIPLINE _____

NAME _____

AREA EVALUATED

CONDITION

OUTLET WORKS - TRANSITION AND CONDUIT

16 Inch Blowoff

The slanted valve stem controls discharge into the pipe. Last operated in October, 1980.

10 Inch Supply Main

No control at dam. Pipe extends across downstream face of dam and then to the boiler house. Pipe was cut and sealed in the boiler house.

48 Inch penstock

The other two valves on the dam controls discharge into the pipe. An attempt was made to open the valve in 1974 at which time several gear teeth were broken. It is believed this valve is inoperable.

The pipe extends along the north-east side of the down stream channel to a turbine at the abandoned power house.

INSPECTION CHECK LIST

PROJECT Paper ods Pond Dam

DATE November 12, 1980

PROJECT FEATURE _____

NAME _____

DISCIPLINE _____

NAME _____

AREA EVALUATED	CONDITION
OUTLET WORKS - OUTLET STRUCTURE AND OUTLET CHANNEL 16 Inch Blowoff 10 Inch Supply 48 Inch Penstock	The pipe outlets at the downstream face of the dam. The pipe is sealed at the boiler house. The pipe outlets at the power house and then to the downstream channel

INSPECTION CHECK LIST

PROJECT Paper Goods Pond Dam

DATE November 12, 1980

PROJECT FEATURE _____

NAME _____

DISCIPLINE _____

NAME _____

AREA EVALUATED	CONDITION
<u>OUTLET WORKS-- SPILLWAY WEIR, APPROACH AND DISCHARGE CHANNELS</u>	
a. Approach Channel	Pond Bed - Underwater
General Condition	Underwater
Loose Rock Overhanging Channel	None Observed
Trees Overhanging Channel	Yes - Willow Trees
Floor of Approach Channel	Underwater
b. Weir and Training Walls	
General Condition of Concrete	Fair to Good
Rust or Staining	Yes - Due to fence posts
Spalling	Yes
Any Visible Reinforcing	None Observed
Any Seepage or Efflorescence	None Observed
Drain Holes	None Observed
c. Discharge Channel	
General Condition	Fair
Loose Rock Overhanging Channel	Yes
Trees Overhanging Channel	Yes
Floor of Channel	Rock and Gravel
Other Obstructions	Debris, trees and brush

APPENDIX B

ENGINEERING DATA

APPENDIX B-1

DESIGN, CONSTRUCTION AND MAINTENANCE RECORDS

<u>Location</u>	<u>Items</u>
Mr. Victor J. Galgowski Dam Safety Engineer Water Resources Unit Department of Environmental Protection State of Connecticut State Office Building Hartford, Connecticut 06115	• 1. State Inspection Reports • 2. Preliminary Application to Alter Dam (1939) * 3. State Order to Repair Dam
Sherwood Industries, Inc. 10 Main Street Kensington, Connecticut 06037	• 1. Plan Showing Dam and Buildings

* Indicates material contained in this Phase I Inspection Report.

APPENDIX B-2

COPIES OF PAST INSPECTION REPORTS

S. E. MINOR & CO., INC.
CIVIL ENGINEERS
161 MASON STREET
GREENWICH, CONNECTICUT 06830

August 8, 1975

State of Connecticut
Department of Environmental Protection
State Office Building
Hartford, Connecticut 06115

Attention: Mr. Victor F. Galgowski
Superintendent of Dam Maintenance
Water and Related Resources

Re: Railroad Pond Dam
Berlin, Connecticut

Dear Mr. Galgowski:

In accordance with your request, we have examined the subject dam in order to ascertain its structural soundness and stability. Prior to our visit to the site, we went to the Town Hall offices and attempted to obtain any structural drawings of the subject installation. We were advised that no plans were on file and that the Town officials had no knowledge whatsoever of the construction of the dam.

Upon visiting the site, we examined the structure which consists of a concrete dam approximately 70 feet long and 25 feet high. The shape of the dam and spillway together with the blow-off valve controls are as indicated on the enclosed sketch. While the dam itself appears to be structurally sound and stable, there are some maintenance steps that should be taken as soon as possible.

The spillway cap is badly deteriorated and washed out in the vicinity of the blow-off valves. The balance of the spillway cap is badly spalled, chipped, and cracked and should be repaired. The face of the dam itself should also be completely gone over and pointed up wherever cracks exist. There was no evidence of leaks on the face of the dam in spite of the various cracks and openings.

State of Connecticut
Page 2

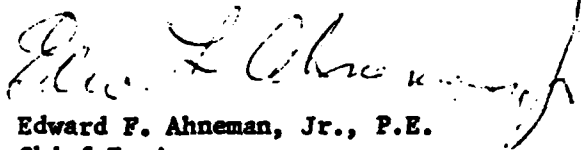
Re: Railroad Pond Dam

It is our considered opinion that if the above steps are taken to correct the minor deficiencies that the dam should remain serviceable for several years.

Should you have any questions concerning this report, feel free to contact me.

Respectfully submitted,

S. E. MINOR & CO., INC.



Edward F. Ahneman, Jr., P.E.
Chief Engineer

EFA:lb
Enclosure

No. _____

WATER RESOURCES UNIT
SUPERVISION OF DAMS
INVENTORY DATA

Inventoried

By _____

Lat: 41° 37.8'
Long: 72° 46.7'

Date _____

Name of Dam or Pond RAILROAD POND (PAPER GOODS POND)

Code No. _____

Nearest Street Location Percival Avenue

Town Berlin

U.S.G.S. Quad. New Britain

Name of Stream Mattabesset River

Owner Sherwood Industrial Park, Inc.

Address 10 Main Street

Kensington, CT

Pond Used For Recreation Drainage Area 10.5 sq. mi.

Dimensions of Pond: Width 500' Length 1500' Area 17 ac.

Total Length of Dam 71 feet Length of Spillway 53 feet

Location of Spillway Center of dam

Height of Pond Above Stream Bed 20'

Height of Embankment Above Spillway 4'

Type of Spillway Construction Concrete

Type of Dike Construction Masonry

Downstream Conditions Ravine

Summary of File Data _____

Remarks _____

Would Failure Cause Damage? YES Class 13

ARTHUR W. BACON
CIVIL ENGINEER AND SURVEYOR

*from Mr. Cadwell's
Office*

GATES BUILDING

NEW BRITAIN, CONN.

Nov. 3, 1939.

Mr. Wm. H. Cadwell,
c/o Beaton & Cadwell,
Main Street,
New Britain, Conn.

Dear Mr. Cadwell:-

Enclosed please find duplicate copies of the
Preliminary Application for permission to repair the dam of the
American Paper Goods Company, Kensington, Conn.

Very truly yours,

A. W. Bacon

FILE NO. 7-2-1

PRELIMINARY APPLICATION FOR
CONSTRUCTION, ALTERATION OR REPAIR OF DAM

DATE June 16, 1939 *June 10*

WATERSHED about 7.0 sq. miles of which about 2.25 miles is
tributary to two storage reservoirs.

RIVER OR BROOK Sebeth or Mill River

LOCATION at junction of Main Street and Percival Ave. Kensington.
Town of Berlin, Conn.

PURPOSE To stop leakage, install blow-off pipe and valve, new mill
supply pipe and general reconditioning.

GENERAL DIMENSIONS:

Length total length about 71 ft. Spillway length 58 ft.
Height of Spillway Above River Bottom max. about 20.5 ft.
Height - Top of Dam Above River Bottom " " 25.0 "

DEPTH OF WATER AT SPILLWAY ELEVATION:

Average Eleven Feet
Maximum Fifteen feet

APPROXIMATE AREA OF WATER SURFACE AT SPILLWAY ELEVATION 17 ACRES

KIND OF DAM (EARTH, MASONRY, ROCK, TIMBER, ETC.) Masonry dam
built on circular arc with down stream radius of about 58 ft.
Dam is four feet thick at spillway elevation.

REMARKS: The intention is to cut out all joints and disintegrated
rock. Fill all cavities and coat both up-stream and down-stream
faces with a layer of reinforced "Gunite"
Install new 16 inch blow-off pipe and valve also new 10 inch
mill supply pipe. Dredge out silt which now interferes with free
flow to penstock.

OWNER OR LESSEE - NAME AND ADDRESS The American Paper Goods Company
Kensington, Conn.

REFERRED TO _____ DATE _____

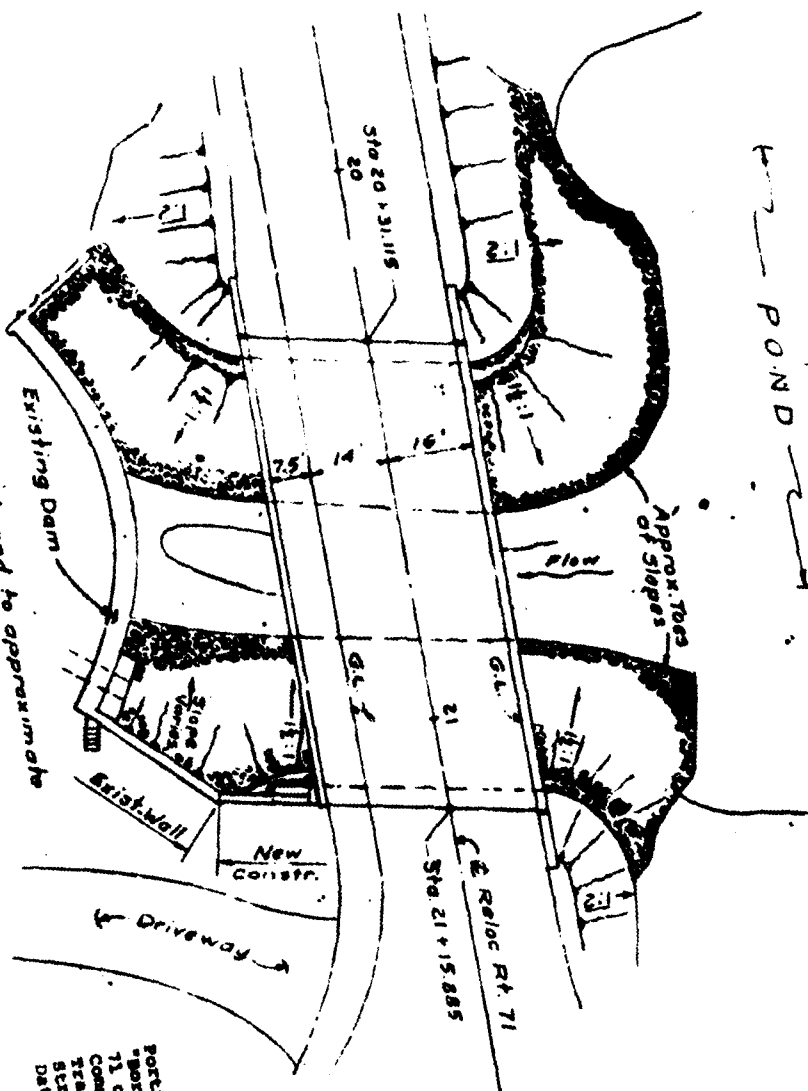
INSPECTED BY _____ DATE _____

COMMENTS: _____

APPENDIX B-3

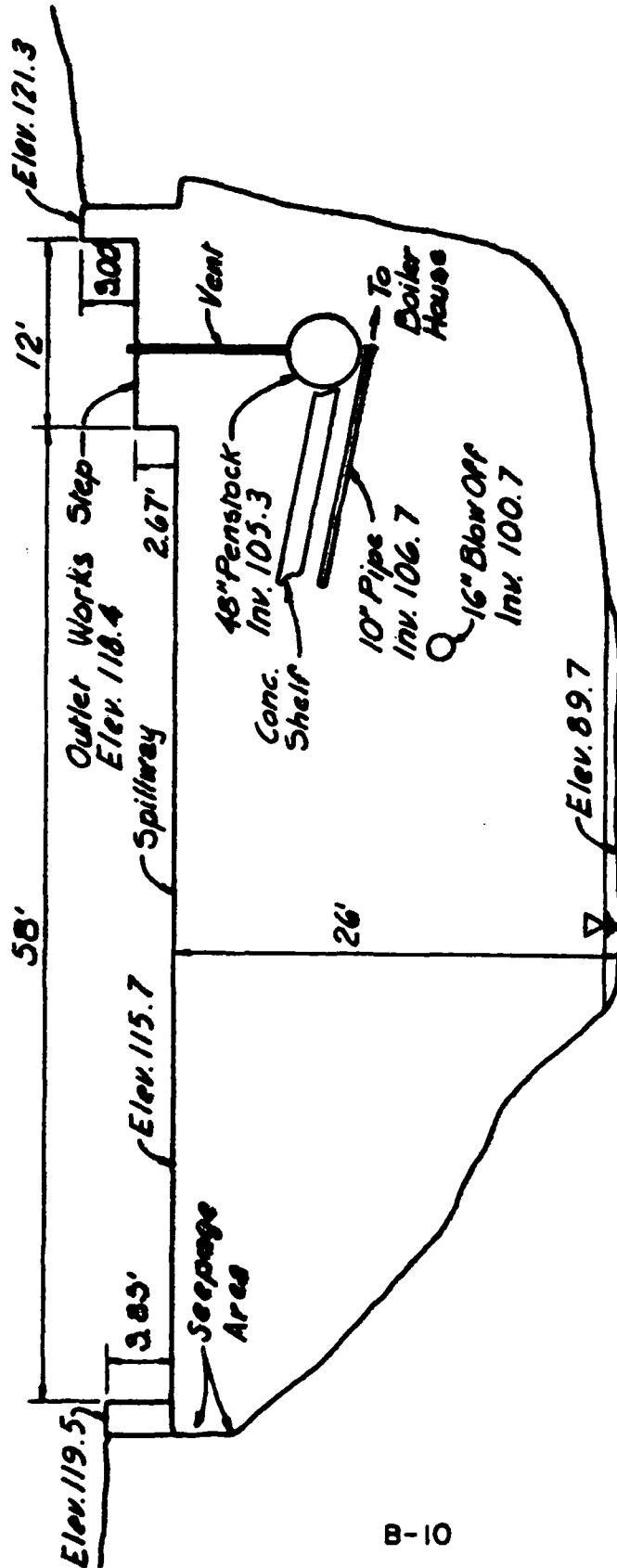
RECORD DRAWINGS AND SKETCHES

PLAN SHOWING RIPRAP LIMITS
SCALE 1"=20'



Note: Riprap to El. 119.3 and to approximate limits as shown above.

Portion of plan sheet No. 11 of 25
"Boring and Riprap Details, Route
71 over Santee River"
Connecticut Department of
Transportation 07-129-1
Structure No. 26, 1973
Date: December 26, 1973



B-10

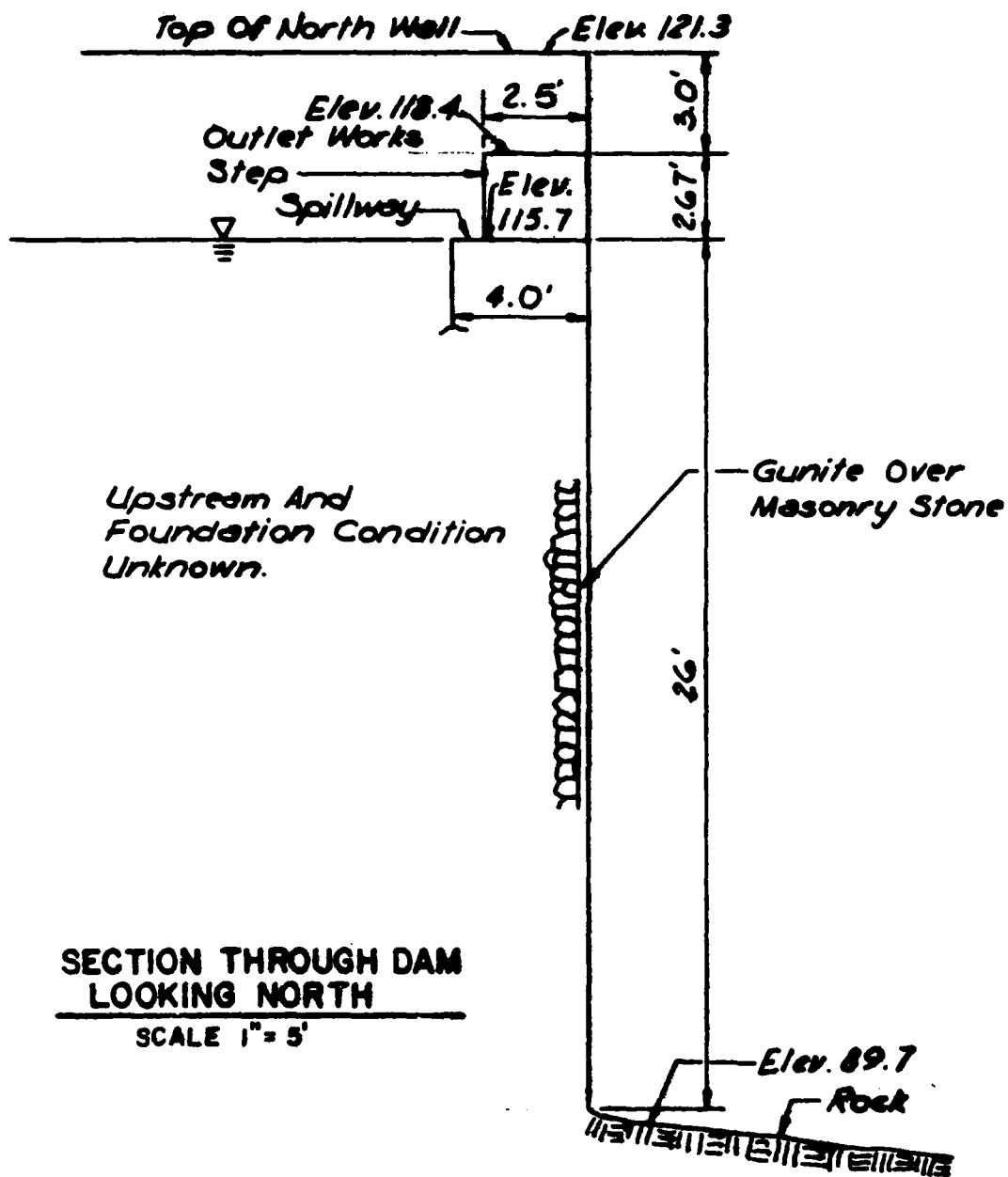
ELEVATION OF DAM - LOOKING UPSTREAM

SCALE 1" = 10'

PAPER GOODS POND DAM



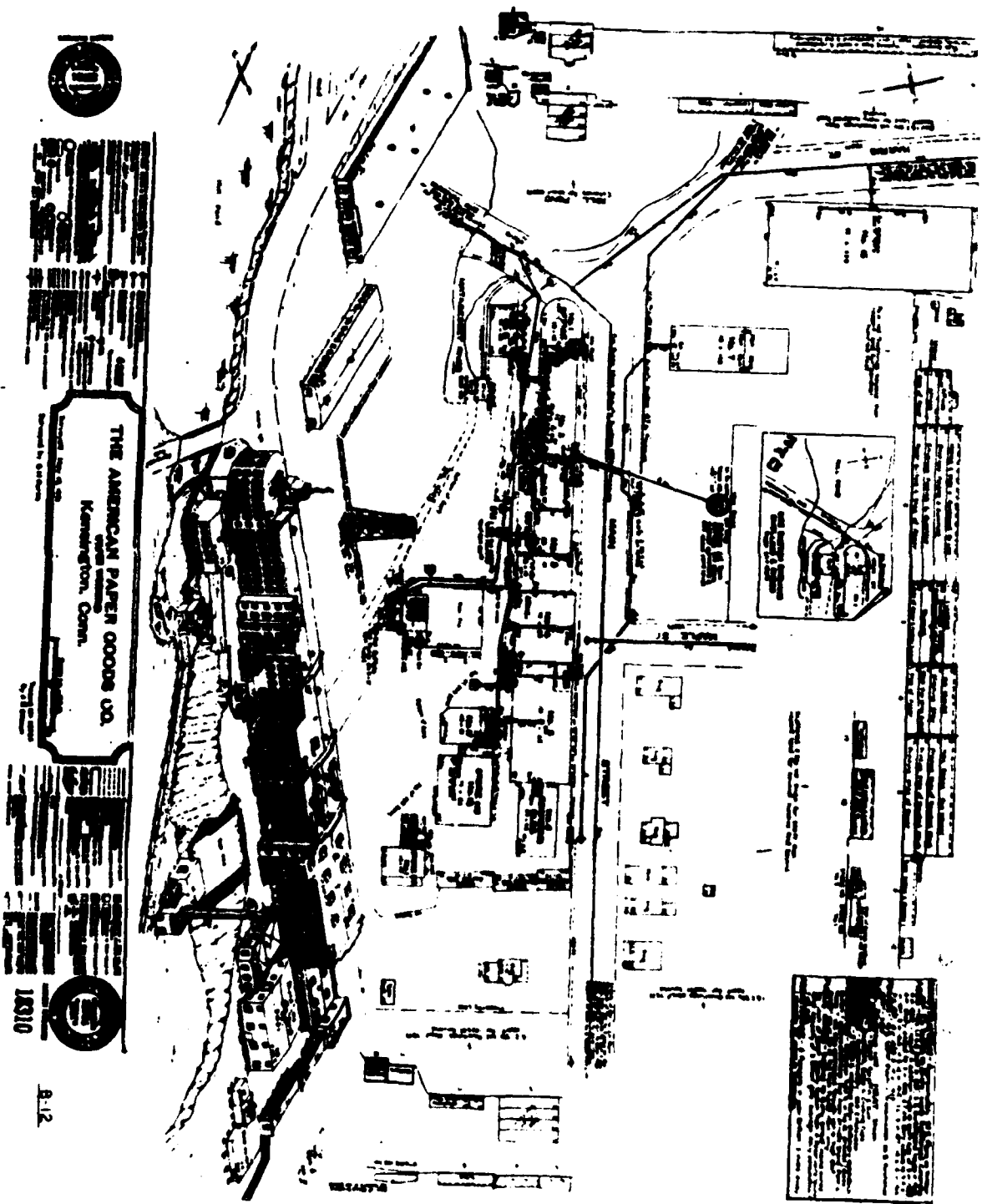
JAMES P. PURCELL ASSOCIATES, INC.
ENGINEERS • ARCHITECTS • PLANNERS



PAPER GOODS POND DAM

B-11

AMES P. PURCELL ASSOCIATES, INC.
ENGINEERS • ARCHITECTS • PLANNERS



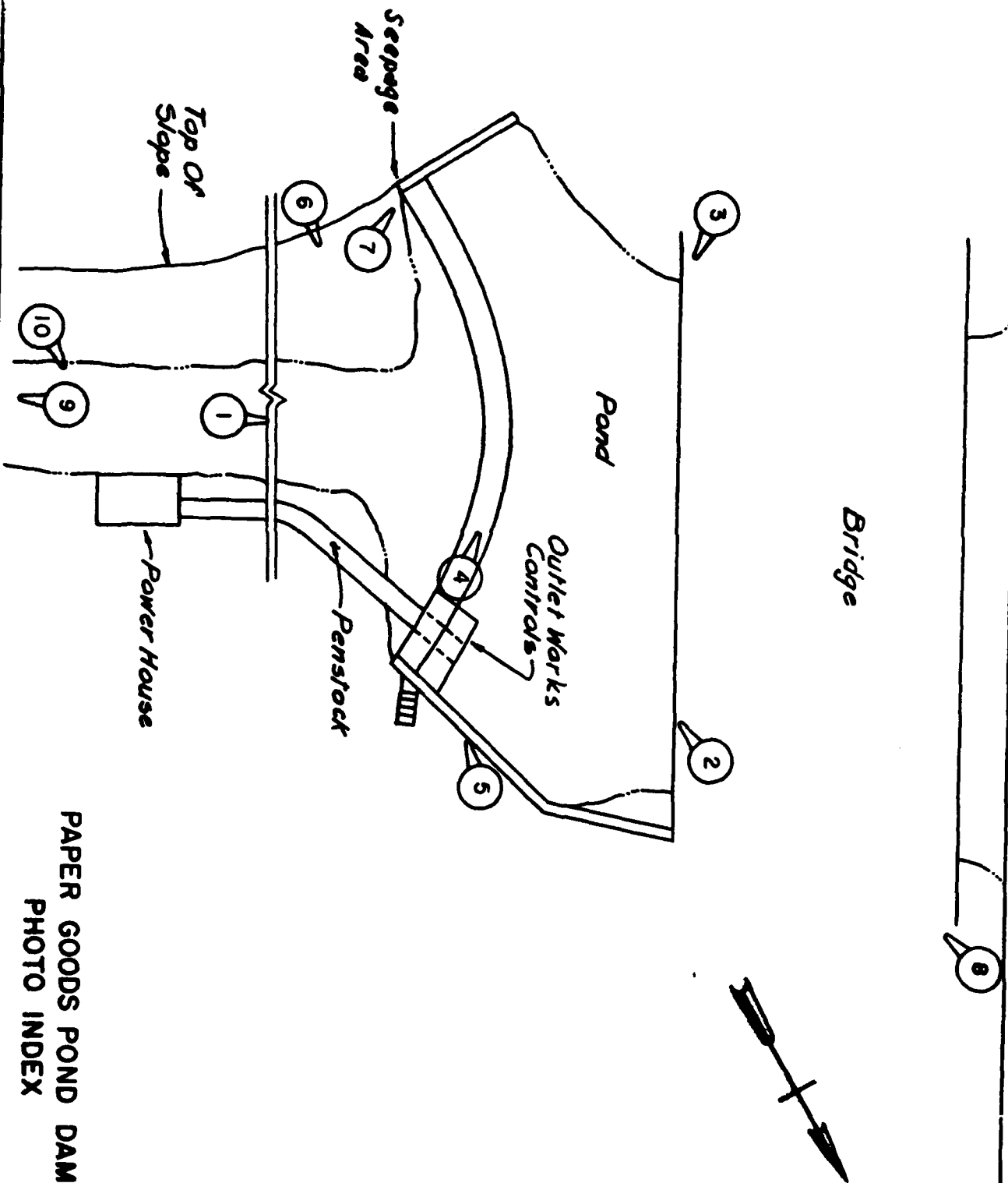
THE AMERICAN PAPER GOODS CO.
Kennerlyton, Conn.



12310

APPENDIX C

PHOTOGRAPHS



PAPER GOODS POND DAM
PHOTO INDEX



C-1 DOWNSTREAM FACE OF DAM - LOOKING
NORTHWEST



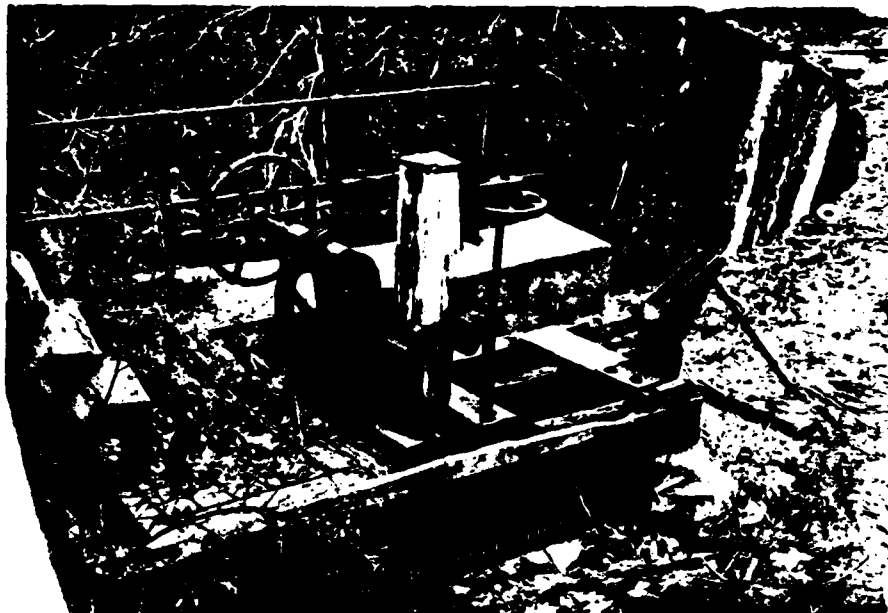
C-2 SPILLWAY - LOOKING SOUTH



C-3 NORTHEAST END OF SPILLWAY SHOWING
OUTLET WORK CONTROLS



C-4 SOUTHWEST END OF SPILLWAY



C-5 OUTLET WORK CONTROLS



C-6 DOWNSTREAM FACE OF
DAM SHOWING OUTLET
PIPES AND PENSTOCK
PIERS.



C-7 SEEPAGE AT SOUTHEAST END OF
SPILLWAY



C-8 ROUTE 71 BRIDGE JUST UPSTREAM OF
DAM - LOOKING DOWNSTREAM (SOUTHEAST)



C-9 DOWNSTREAM CHANNEL BELOW POWERHOUSE -
LOOKING DOWNSTREAM



C-10 POWERHOUSE AT END OF PENSTOCK -
LOOKING UPSTREAM

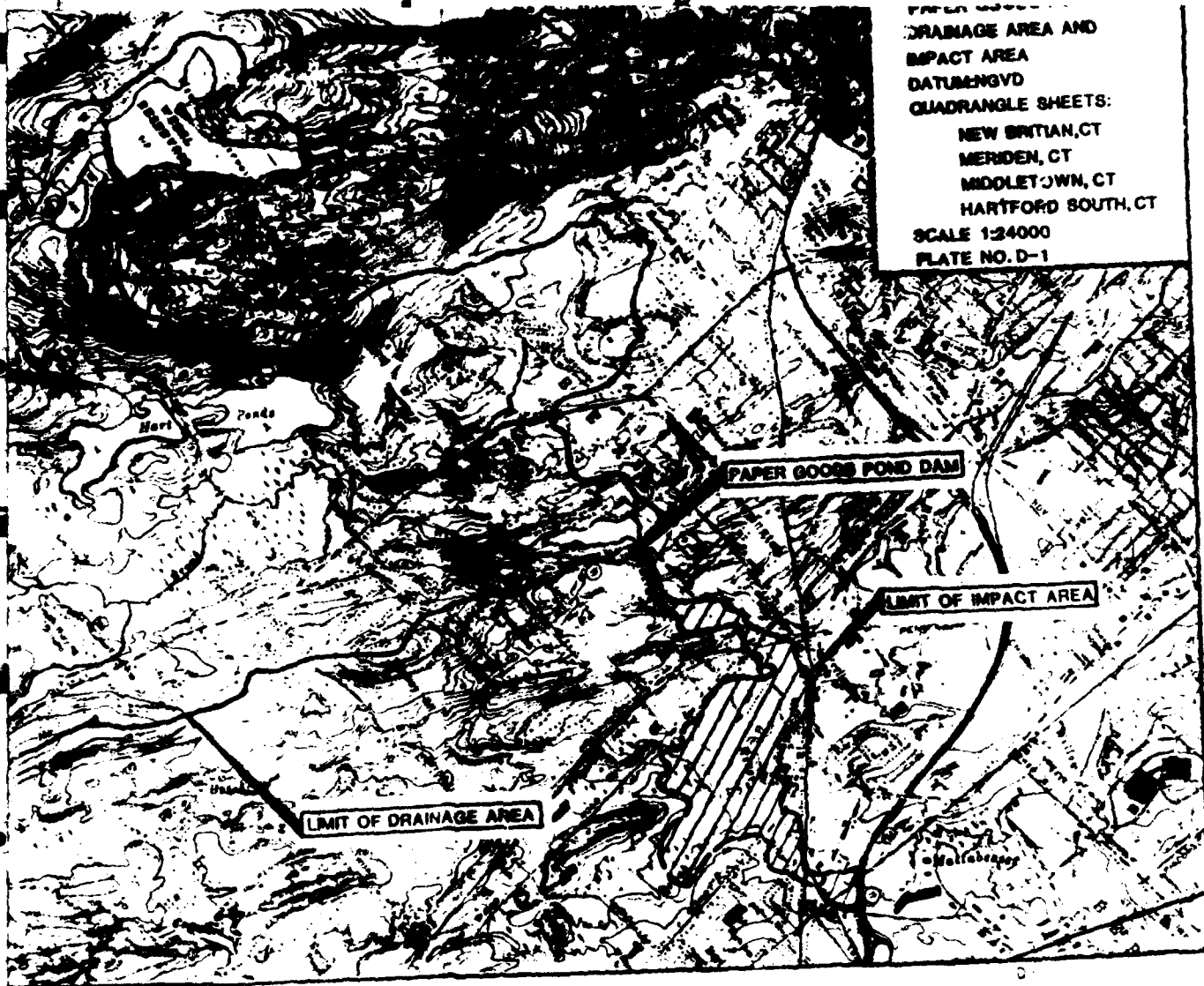
APPENDIX D

HYDROLOGIC AND HYDRAULIC COMPUTATIONS



D-1

1 of 2



2 of 2

HYDROLOGIC AND HYDRAULIC ANALYSIS
SUMMARY SHEET

Dam PAPER GOODS POND

Test Flood 1/2 PMF

INFLOW HYDROGRAPH DEVELOPMENT

Drainage Area 9.5 sq. mi.

Probable Maximum Precipitation
24 hour - 200 square mile PMP 21.5 inches

Initial Rainfall Loss 0 Inch
Uniform Rainfall Loss .1 Inch

Snyder's Lag 5.0 hours
Snyder's Peaking Coefficient .625

Test Flood Inflow 6,415 CFS

PMF Inflow 12,830 CFS

RESERVOIR ROUTING AND DAM OVERTOPPING

Test Flood Outflow 6400 CFS

Spillway Capacity at Top of Dam	<u>1190</u>	CFS
	<u>18.6</u>	% of Test Flood

Flow Over Spillway at Test Flood	<u>4910</u>	CFS
----------------------------------	-------------	-----

Spillway Crest Elevation	<u>115.67</u>	Feet
Top of Dam Elevation	<u>119.50</u>	Feet
Test Flood Elevation	<u>124.98</u>	Feet

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

FINAL

1 A1 DAM SAFETY ANALYSIS - JOB 40-100/01 FMJ
 2 A2 RAILROAD POND DAM - BERLIN, CT
 3 A3 12-12-80

4 R 75 1 0 0 0 0 0 0 0 0

5 A1 5

6 J 1 2 1

7 J1 .5 1.

8 K COMPUTATION OF PMF - DEVELOPMENT OF INFLOW HYDROGRAPH

9 M 1 1 9.5 9.5 1

10 P 21.5 110 124 133 142

11 T 21.5 110 124 133 142

12 W 5.01 0.625

13 X 1.9 0.04 2.0

14 K 1

15 K1 ROUTING INFLOW HYDROGRAPH THRU POND - OVERTOPPING ANALYSIS

16 Y 1

17 V1 1

18 SA 12 27 49

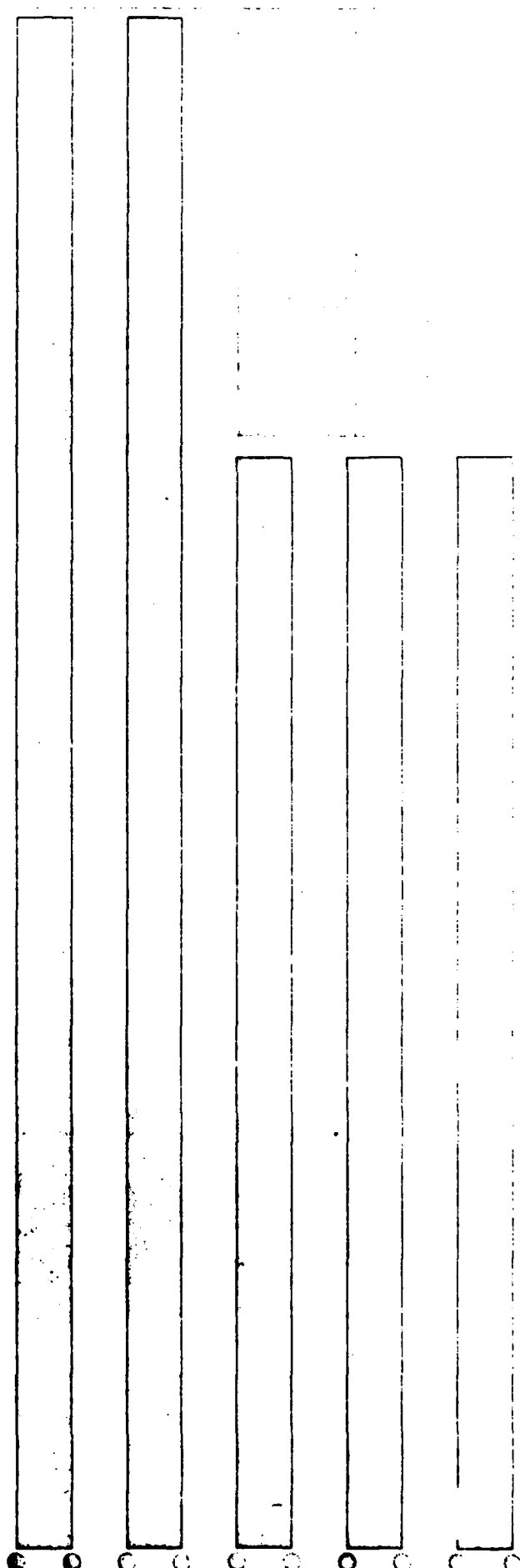
19 VE115.67 119.58 130.0

20 S115.67 58 2.65 1.5

21 S119.58 2.65 1.5 60

22 K 90

23



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

RUN DATE 12/12/80.
 TIME 07.46.25.

DAM SAFETY ANALYSIS - JOR 80-100/01 ERJ
 WATERLOO POND DAM - BERLIN, CT
 12-12-80

JOR SPECIFICATION
 NU NMR NMIN IDAY IMW IMIN METRC IPLT IPRT NSTAN
 75 1 0 0 0 0 0 2 0 0
 JOPER NWT LROPT TRACE
 5 0 0 0

MULTI-PLAN ANALYSES TO BE PERFORMED
 NPLAN= 1 NRTIO= 2 LRTIO= 1

RTIOSE .50 1.00

SUB-AREA RUNOFF COMPUTATION

COMPUTATION OF PMF - DEVELOPMENT OF INFLOW HYDROGRAPH

INSTQ	IComp	IECUN	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
1	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

INVOG	IUNG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	1	9.50	0.00	9.50	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R96
0.00	21.50	110.00	124.00	133.00	142.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS .800

LOSS DATA

LROPT	STRPR	DLTKH	RTIOL	ERAIN	STARKS	RTIUK	STRTL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	0.00	.10	0.00	0.00

UNIT HYDROGRAPH DATA
 TPE 5.01 CP= .63 NTA= 0

RECESSION DATA

STRTQE 1.90 QRESNE .05 RTIOPE 2.00
 APPROXIMATE CLARK COEFFICIENTS FROM GIVEN SWIPEH CP AND TP ARE TC= 5.82 AND R= 4.44 INTERVALS

UNIT HYDROGRAPH 27 FWD-OF-REF 100 UPLINATEFS. LAG= 4.08 HOURS. CP= .62 VOL= 1.00
 62. 224. 211. 144. 107. 761. 657. 522. 416. 332.
 245. 211. 144. 107. 761. 657. 522. 416. 332.

1.01	2.00	2	.01	0.00	.01	1.02	15.00	39	2.74	.10	2599.
1.01	3.00	3	.01	0.00	.01	1.02	16.00	40	7.19	.10	4221.
1.01	4.00	4	.01	0.00	.01	1.02	17.00	41	2.65	.10	6629.
1.01	5.00	5	.01	0.00	.01	1.02	18.00	42	2.08	.10	9339.
1.01	6.00	6	.01	0.00	.01	1.02	19.00	43	.15	.05	11621.
1.01	7.00	7	.03	0.00	.03	1.02	20.00	44	.15	.05	12829.
1.01	8.00	8	.03	0.00	.03	1.02	21.00	45	.15	.05	12686.
1.01	9.00	9	.03	0.00	.03	1.02	22.00	46	.15	.05	11379.
1.01	10.00	10	.03	0.00	.03	1.02	23.00	47	.15	.05	9557.
1.01	11.00	11	.03	0.00	.03	1.03	0.00	48	.15	.05	7781.
1.01	12.00	12	.03	0.00	.03	1.03	1.00	49	0.00	0.00	6271.
1.01	13.00	13	.13	.03	.10	1.03	2.00	50	0.00	0.00	5057.
1.01	14.00	14	.15	.05	.10	1.03	3.00	51	0.00	0.00	4075.
1.01	15.00	15	.19	.09	.10	1.03	4.00	52	0.00	0.00	3275.
1.01	16.00	16	.49	.39	.10	1.03	5.00	53	0.00	0.00	2623.
1.01	17.00	17	.14	.08	.10	1.03	6.00	54	0.00	0.00	2095.
1.01	18.00	18	.14	.04	.10	1.03	7.00	55	0.00	0.00	1671.
1.01	19.00	19	.01	0.00	.01	1.03	8.00	56	0.00	0.00	1333.
1.01	20.00	20	.01	0.00	.01	1.03	9.00	57	0.00	0.00	1063.
1.01	21.00	21	.01	0.00	.01	1.03	10.00	58	0.00	0.00	847.
1.01	22.00	22	.01	0.00	.01	1.03	11.00	59	0.00	0.00	674.
1.01	23.00	23	.01	0.00	.01	1.03	12.00	60	0.00	0.00	536.
1.02	0.00	24	.01	0.00	.01	1.03	13.00	61	0.00	0.00	426.
1.02	1.00	25	.10	.00	.10	1.03	14.00	62	0.00	0.00	338.
1.02	2.00	26	.10	.00	.10	1.03	15.00	63	0.00	0.00	268.
1.02	3.00	27	.10	.00	.10	1.03	16.00	64	0.00	0.00	203.
1.02	4.00	28	.10	.00	.10	1.03	17.00	65	0.00	0.00	150.
1.02	5.00	29	.10	.00	.10	1.03	18.00	66	0.00	0.00	104.
1.02	6.00	30	.10	.00	.10	1.03	19.00	67	0.00	0.00	43.
1.02	7.00	31	.40	.30	.10	1.03	20.00	68	0.00	0.00	20.
1.02	8.00	32	.40	.30	.10	1.03	21.00	69	0.00	0.00	4.
1.02	9.00	33	.40	.30	.10	1.03	22.00	70	0.00	0.00	3.
1.02	10.00	34	.40	.30	.10	1.03	23.00	71	0.00	0.00	2.
1.02	11.00	35	.40	.30	.10	1.04	0.00	72	0.00	0.00	2.
1.02	12.00	36	.40	.30	.10	1.04	1.00	73	0.00	0.00	1.
1.02	13.00	37	1.09	1.79	.10	1.04	2.00	74	0.00	0.00	0.
						1.04	3.00	75	0.00	0.00	0.
SUM 24.42 21.16 3.27 129067.											
(620.) (537.) (83.) (3654.77)											

PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
12829.	11105.	5059.	1793.	129067.
CFS	314.	143.	51.	3655.
CMS	10.87	19.81	21.06	21.06
INCHES	276.20	503.26	535.01	535.02
MM	5507.	10034.	10667.	10667.
AC-FT	6792.	12376.	13157.	13157.
THOUS CU M				

STATION 1

[illegible]

01.00 59.1
02.00 60.1
03.00 61.1
04.00 62.1
05.00 63.1
06.00 64.1
07.00 65.1
08.00 66.1
09.00 67.1
10.00 68.1
11.00 69.1
12.00 70.1
13.00 71.1
14.00 72.1
15.00 73.1
16.00 74.1
17.00 75.1

115.7 50.0 2.7 1.5 0.0 0.0 0.0 0.0

DAM DATA
TOPEL FORD FAPU DAMWID
119.5 2.7 1.5 60.

STATION 1. PLAN 1. RAYIN 1

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW									
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	1.	1.	4.	16.	47.	102.	163.	213.	0.
235.	228.	200.	167.	135.	109.	89.	60.	50.	0.
45.	54.	88.	157.	256.	368.	494.	1007.	1652.	0.
2782.	4138.	5401.	6224.	6403.	5954.	5123.	4220.	3421.	2767.
2241.	1415.	1470.	1195.	945.	791.	631.	503.	401.	320.
255.	204.	163.	124.	99.	74.	49.	28.	14.	9.
6.	4.	3.	2.	2.					

STORAGE									
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	1.	3.	6.	10.	14.	17.	0.
19.	18.	17.	14.	12.	11.	9.	7.	6.	0.
6.	6.	9.	14.	20.	27.	34.	45.	64.	95.
136.	180.	219.	249.	236.	210.	183.	157.	136.	0.
117.	102.	88.	75.	63.	52.	42.	29.	24.	0.
20.	17.	14.	12.	10.	8.	6.	4.	3.	2.
1.	1.	1.	1.						

STAGE									
115.7	115.7	115.7	115.7	115.7	115.7	115.7	115.7	115.7	115.7
115.7	115.7	115.7	115.8	115.9	116.1	116.4	116.7	116.9	116.9
117.0	117.0	116.9	116.7	116.6	116.5	116.4	116.3	116.2	116.1
116.1	116.2	116.4	116.7	117.1	117.5	117.8	119.2	120.3	120.3
121.7	123.0	124.2	124.8	125.0	124.6	123.9	123.1	122.4	121.7
121.1	120.5	120.0	119.6	119.1	118.7	118.2	117.9	117.6	117.3
117.1	116.9	116.7	116.6	116.4	116.3	116.1	116.0	115.9	115.8
115.8	115.8	115.7	115.7						

PEAK OUTFLOW IS 6403. AT TIME 45.00 HOURS

PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
6403.	5547.	2927.	1946.	64528.
181.	157.	12.	25.	1827.
CFS	INCHES	MM	AC-FY	THOUS CB M
5.43	137.97	251.34	10.53	10.53
2751.	5012.	5333.	267.48	267.48
3393.	6142.	6774.	5333.	5333.
			6574.	6574.

STATION 1

[illegible]

63.00 61.10
64.00 62.1
65.00 63.10
66.00 64.1
67.00 65.1
68.00 66.1
69.00 67.1
70.00 68.1
71.00 69.1
72.00 70.1
73.00 71.1
74.00 72.1
75.00 73.1
76.00 74.1
77.00 75.1

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FOUNTS

STATION 1, PLAN 1, RATIO 2
END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW									
0.	0.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	3.	10.	37.	107.	218.	339.	433.	
474.	456.	394.	329.	266.	215.	171.	141.	116.	97.
MM.	109.	143.	326.	524.	743.	990.	1385.	2168.	3534.
5496.	8357.	10836.	12456.	12407.	11904.	10227.	8407.	6797.	5484.
4829.	3574.	2877.	2312.	1854.	1496.	1212.	998.	801.	638.
507.	403.	321.	252.	192.	142.	91.	50.	26.	14.
9.	6.	4.	3.	2.					

STORAGE									
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	1.	7.	5.	10.	18.	25.	31.	
33.	32.	29.	25.	21.	18.	15.	13.	11.	10.
9.	11.	16.	24.	36.	49.	63.	84.	115.	161.
224.	307.	380.	428.	434.	411.	362.	308.	261.	221.
189.	162.	139.	120.	103.	89.	76.	64.	52.	43.
35.	29.	24.	20.	16.	13.	9.	6.	4.	3.
2.	1.	1.							

STAGE									
115.7	115.7	115.7	115.7	115.7	115.7	115.7	115.7	115.7	115.7
115.7	115.7	115.7	115.7	115.7	115.7	115.7	115.7	115.7	115.7
117.8	117.7	117.6	117.3	117.1	116.9	116.8	116.5	116.4	
116.4	116.5	116.8	117.3	117.9	118.5	119.1	119.9	121.0	122.5
124.4	126.5	128.2	129.2	129.4	128.9	127.8	126.5	125.3	124.2
123.3	122.5	121.8	121.2	120.6	120.1	119.5	119.1	118.7	118.3
117.8	117.6	117.3	117.1	116.8	116.6	116.4	116.1	116.0	115.9
115.8	115.8	115.8	115.7	115.7					

PEAK OUTFLOW IS 12807.4 AT TIME 45.00 HOURS

PEAK				TOTAL VOLUME			
CFS	12807.	6-HOUR	11102.	24-HOUR	5054.	72-HOUR	1793.
CMS	363.		314.		143.		51.
INCHES				TOTAL VOLUME			
MM	276.13	10.87	19.80	507.81	21.06	534.99	21.06
AC-FT	5505.	276.13	507.81	10025.	10666.	10666.	10666.
THOUS CU YD	6791.	12365.	13156.				13157.

[illegible]

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

RATIOS APPLIED TO FLOWS

OPERATION STATION AREA PLAN RATIO 1 RATIO 2
 .50 1.00

HYDROGRAPH AT 1 9.50 1 6414. 12829.
 (24.60) (181.63) (363.26) (

ROUTED TO 1 9.50 1 6403. 12807.
 (24.60) (181.32) (362.65) (

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1

ELEVATION STORAGE
 INITIAL VALUE 115.67
 SPILLWAY CREST 115.67
 TOP OF DAM 119.50
 0.
 73.
 1152.

RATIO OF PMF	MAXIMUM RESERVOIR W-S-ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CF>	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
.50	124.98	5.48	249.	6403.	15.00	45.00	0.00
1.00	129.42	9.92	438.	12807.	20.00	45.00	0.00

PAPER GOODS POND DAM

Dam Failure Analysis

1. Failure discharge with pool at top of dam (elev. 119.50) = 6075 CFS
2. Depth of water in reservoir at time of failure = 30 ft.
3. Maximum depth of flow downstream of dam = 30 ft.
4. Water surface elevation just downstream
of dam at time of failure) = 119.50

The failure discharge of 6075 CFS will enter and flow downstream 6000 feet until the brook enters a large swampy area. Valley storage in this 6000 feet length of brook is significant in reducing the discharge. Also due to roughness characteristics, obstructions and frictional losses, it is very likely that the unsteady dam failure flow will dissipate its wave and kinetic energy and thus convert to steady and uniform flow obeying Manning's formulae 6000 feet downstream. The failure profile will have the following hydraulic characteristics:

DISTANCE FROM THE DAM	WATER SURFACE ELEVATION	DEPTH (ft.)	REMARKS
0	119.5	30.0	At Dam
800	84.7	4.7	
2300	68.7	1.7	Pond
4200	51.4	1.4	
6000	40.6	0.6	Swampy Area

NOTES: The impact area has been extended through the swampy area to Route 72, 11000 feet downstream.

"Rule of Thumb" Guidance for Estimating
Downstream Dam Failure Analysis

DATA

Name of Dam PAPER GOODS POND DAM
Location BERLIN, CONNECTICUT
Drainage Area 9.5 sq. mi., Top of Dam 119.50
Spillway Type broad-overflow, Crest of Spillway 115.67
Surface Area @ Crest Elev. 12 Acres = 0.02 sq. mi.
Pool Bottom Near Dam = 89.5
Assumed Side Slopes of Embankments = 2:1
Depth of Pool at Dam (Y_o) = 30 Feet
Mid-Height Elev. 104.5
Length of Dam at Crest = 70 Feet
Length of Dam at Mid-Height = 55 Feet
40% of Dam Length at Mid-Height = W_b = 22 Feet

Step 1

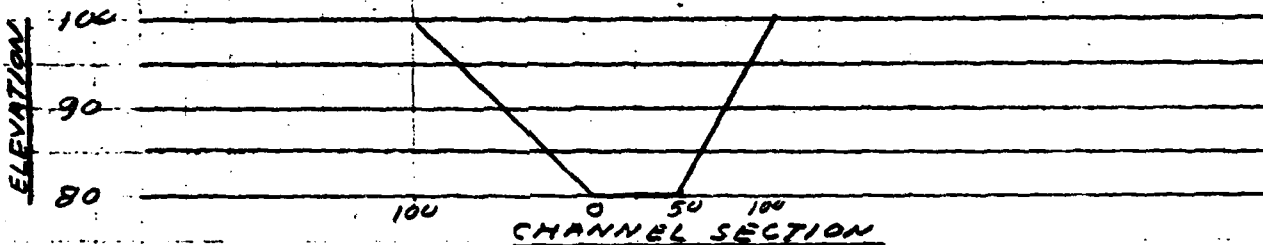
Storage (S) at time of failure 150 Ac-FT
(Equal to top of dam)

Step 2

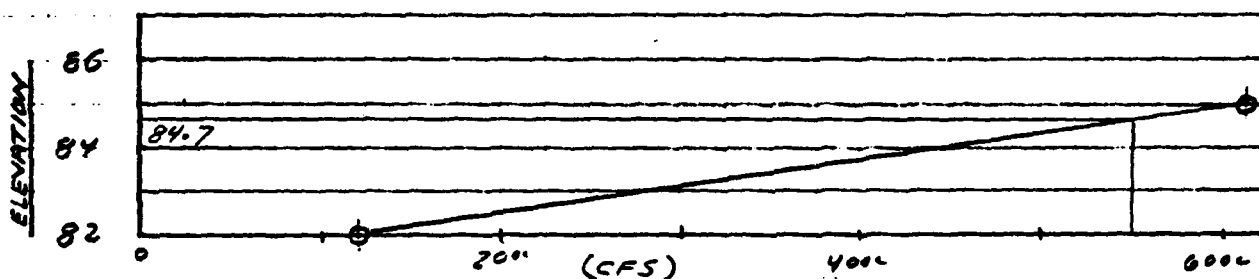
$$\begin{aligned} &\text{Peak Failure Discharge} \\ Q_{pl} &= 8/27 W_b \sqrt{g} Y_o^{3/2} \\ &= (1.68) (W_b) (Y_o)^{3/2} = \underline{6075} \text{ cfs} \end{aligned}$$

Failure is assumed to coincide with pool elevation at top of dam.

NOTES:

BY JR DATE 12/1/81SUBJECT DAM INSPECTION STUDYSHEET NO. 1 OF 1CHKD. BY ERT DATE 2/10/81JOB NO. 80-100/01DAM FAILURE ANALYSISPURCELL ASSOCIATES
ENGINEERS + ARCHITECTS + PLANNERSDAM PAPER GOODS PONDSECTION 800' DOWNSTREAMUSING $Q = \frac{1.486}{n} A R^{2/3} S^{1/2}$ $n = .03$ SLOPE (S) = .02 '1 $Q_p = 6075$ CFSFULL SPILLWAY $Q_s = 1190$ CFSTOTAL STORAGE (S) = 150 AC-FT

ELEV	AREA	WP	R	Q	DEPTH
85	350	90	3.9	6100	5
82	110	60	1.8	1200	2



$$V_1 = \left(\frac{30.0 + 5.0}{2} \right) \left(\frac{22}{1} + \frac{90 + 50}{2} \right) \left(\frac{800}{43560} \right) \left(\frac{1}{2} \right) = 14.8 \text{ AC-FT}$$

$$Q_{P2} = Q_p (1 - V_1/S) = 5500 \text{ CFS} \quad V_{AVG} = 14.8$$

$$V_2 = \left(\frac{30.0 + 4.7}{2} \right) (.85) = 14.7 \text{ AC-FT}$$

$$Q_{P2} = Q_p (1 - V_{AVG}/S) = 5500 \text{ CFS} \quad \text{ELEV} = 84.7$$

DEPTH = 4.7FULL SPILLWAY: DEPTH = 2.0INCREASE DUE TO DAM FAILURE = 2.7

BY JR DATE 12/1/88 SUBJECT DAM INSPECTION STUDY
 CHKD. BY ERT DATE 2/19/89 FAILURE ANALYSIS

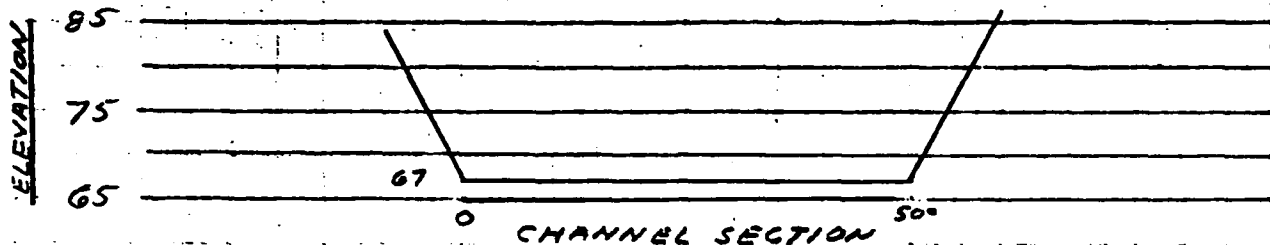
SHEET NO. 4 OF 7
 JOB NO. 80-100/01

PURCELL ASSOCIATES
 ENGINEERS • ARCHITECTS • PLANNERS

DAM PAPER GOODS POND

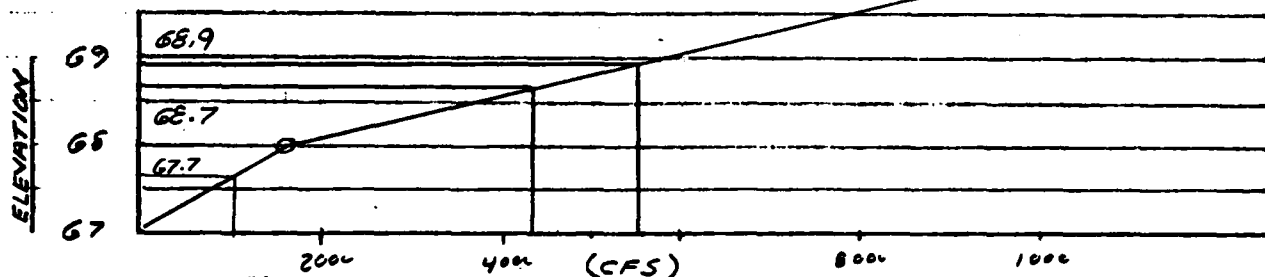
SECTION 2300' DOWNSTREAM AT POND

USING $Q = \frac{1.486}{n} A R^{2/3} S_L^{1/2}$ $n = .03$ SLOPE (S_L) = .004 $1'$



$Q_P = 5500$ CFS FULL SPILLWAY $Q_S = 1190$ CFS
 TOTAL STORAGE (S) = 150 AC-FT

ELEV	AREA	WP	R	Q	DEPTH
68	500	500	1	1600	1
70	1560	540	2.9	9900	3



$$V_1 = \left(\frac{4.7 + 1.9}{2} \right) \left(\frac{90+50}{2} + \frac{500+500}{2} \right) \left(\frac{1500}{43560} \right) \left(\frac{1}{2} \right) = 33.5 \text{ AC-FT}$$

$$Q_{P2} = Q_P (1 - V_1/S) = 4300 \text{ CFS} \quad V_{AVG} = 32.9$$

$$V_2 = \left(\frac{4.7 + 1.7}{2} \right) (10.1) = 32.3 \text{ AC-FT}$$

$$Q_{P2} = Q_P (1 - V_{AVG}/S) = 4300 \text{ CFS} \quad \text{ELEV} = 68.7$$

$$\text{DEPTH} = 1.7$$

FULL SPILLWAY: DEPTH = 0.7

INCREASE DUE TO DAM FAILURE = 1.0

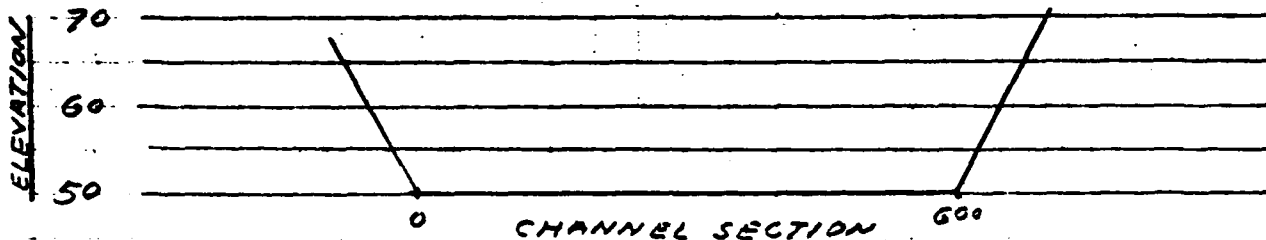
BY JR DATE 12/4/86 SUBJECT DAM INSPECTION STUDY
 CHKD. BY ERT DATE 2/10/87 DAM FAILURE ANALYSIS

SHEET NO. 2 OF 2
 JOB NO. 80-100/01
 PURCELL ASSOCIATES
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DAM PAPER GOODS POND

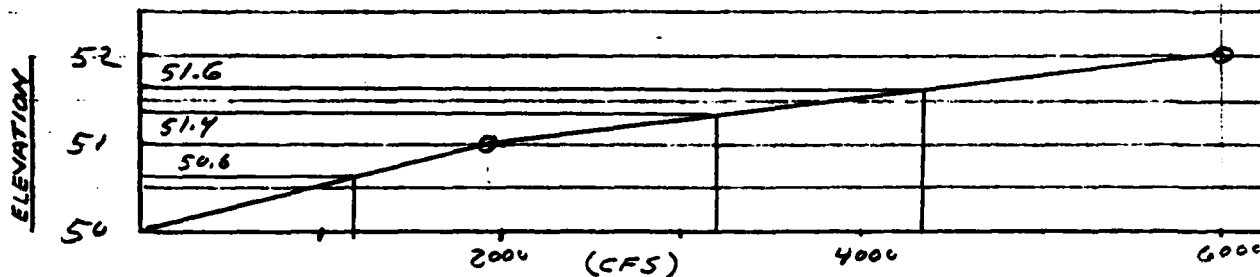
SECTION 4200' DOWNSTREAM

USING $Q = \frac{1.486}{n} A R^{2/3} S^{1/2}$ $n = \underline{.03}$ SLOPE (S_L) = .004 $1'$



$Q_p = \underline{4300}$ CFS FULL SPILLWAY $Q_s = \underline{1190}$ CFS
 TOTAL STORAGE (S) = 150 AC-FT

ELEV	AREA	WP	R	Q	DEPTH
51	600	600	1	1900	1
52	1200	600	2	6000	2



$$V_1 = \left(\frac{1.7 + 1.6}{2} \right) \left(\frac{500}{1} + \frac{600}{1} \right) \left(\frac{1900}{43560} \right) \left(\frac{1}{2} \right) = \underline{40} \text{ AC-FT}$$

$$Q_{P2} = Q_p (1 - V_1/S) = \underline{3200} \text{ CFS} \quad V_{AVG} = \underline{38.5}$$

$$V_2 = \left(\frac{1.7 + 1.4}{2} \right) (24) = \underline{37} \text{ AC-FT}$$

$$Q_{P2} = Q_p (1 - V_{AVG}/S) = \underline{3200} \text{ CFS} \quad \text{ELEV} = \underline{51.4}$$

$$\text{DEPTH} = \underline{1.4}$$

FULL SPILLWAY: DEPTH = 0.6

INCREASE DUE TO DAM FAILURE = 0.8

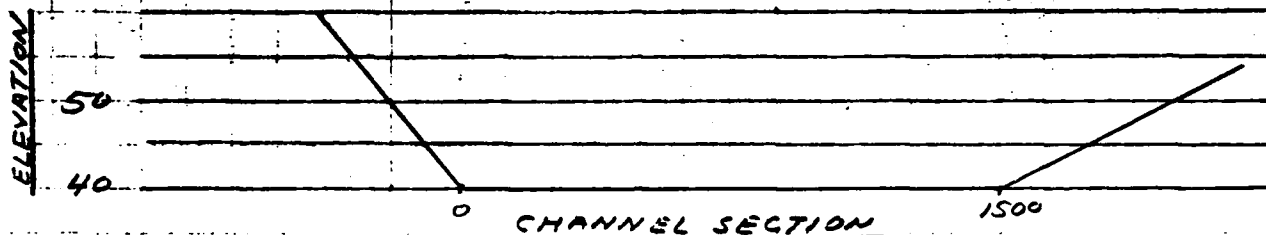
BY JR DATE 12/4/88 SUBJECT DAM INSPECTION STUDY
 CHKD. BY ERT DATE 2/10/89 DAM FAILURE ANALYSIS

SHEET NO. 7 OF 7
 JOB NO. 80-100/01
 PURCELL ASSOCIATES
 ENGINEERS • ARCHITECTS • PLANNERS

DAM PAPER GOODS POND

SECTION 6000' DOWNSTREAM - SWAMP AREA

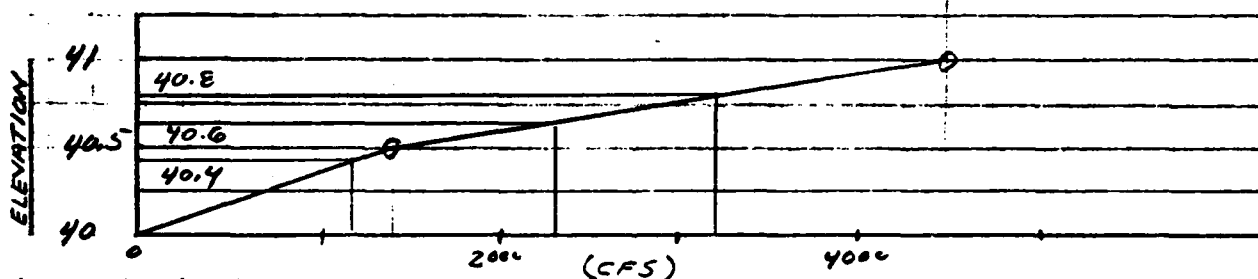
USING $Q = \frac{1.486}{n} A R^{2/3} S_L^{1/2}$ $n = .03$ SLOPE (S_L) = .0036'



$Q_p = 3200$ CFS

FULL SPILLWAY $Q_s = 1190$ CFS
 TOTAL STORAGE (S) = 150 AC-FT

ELEV	AREA	WP	R	Q	DEPTH
41	1500	1500	1	4470	1
40.5	750	1500	.5	1400	.5



$$V_1 = \left(\frac{1.4 + 0.8}{2} \right) \left(\frac{600}{1} + \frac{1500}{1} \right) \left(\frac{1800}{43560} \right) \left(\frac{1}{2} \right) = 48 \text{ AC-FT}$$

$$Q_{P2} = Q_p (1 - V_1/S) = 2200 \text{ CFS} \quad V_{AVG} = 46$$

$$V_2 = \left(\frac{1.4 + 0.6}{2} \right) (43) = 43 \text{ AC-FT}$$

$$Q_{P2} = Q_p (1 - V_{AVG}/S) = 2200 \text{ CFS} \quad \text{ELEV} = 40.6$$

$$\text{DEPTH} = 0.6$$

FULL SPILLWAY: DEPTH = 0.4

INCREASE DUE TO DAM FAILURE = 0.2

PAPER GOODS POND DAM

A. Size Classification

Height of dam = 30 ft.; hence small

Storage capacity at top of dam (elev. 119.50) = 150 AC-FT.; hence small

Adopted size classification: small

B.i) Hazard Potential

Failure of the dam will result in damage to numerous homes
and buildings between the dam and Route 72. The potential
exists for the loss of more than a few lives.

Adopted hazard classification: High

ii) Impact of Failure of Dam with pool at top of dam.

It is estimated from the "rule of thumb" failure hydrograph, that the following adverse impacts are a possibility by the failure of this dam.

- a) Loss of homes 20+;
- b) Loss of buildings 8+;
- c) Loss of highways or roads 0;
- d) Loss of bridges 0;

The failure profile can affect a distance of 14,500 feet from the dam.

C. Hazard Potential Classifications

<u>HAZARD</u>	<u>SIZE</u>	<u>TEST FLOOD RANGE</u>
<u>High</u>	<u>Small</u>	<u>1/2 PMF to PMF</u>
Adopted Test Flood = <u>1/2 MPF</u>		= <u>675</u> CSM
		= <u>6415</u> CFS

D. Overtopping Potential

Drainage Area ----- = 9.5 sq. miles

Spillway crest elevation = 115.67

-Top of Dam Elevation = 119.50

Maximum spillway discharge

Capacity without overtopping of dam = 1190 CFS
 "test flood" inflow discharge = 6415 CFS
 "test flood" outflow discharge = 6400 CFS

RATING CURVE DEVELOPMENT

PAPER GOODS POND DAM

Spillway

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

$$C = 2.65$$

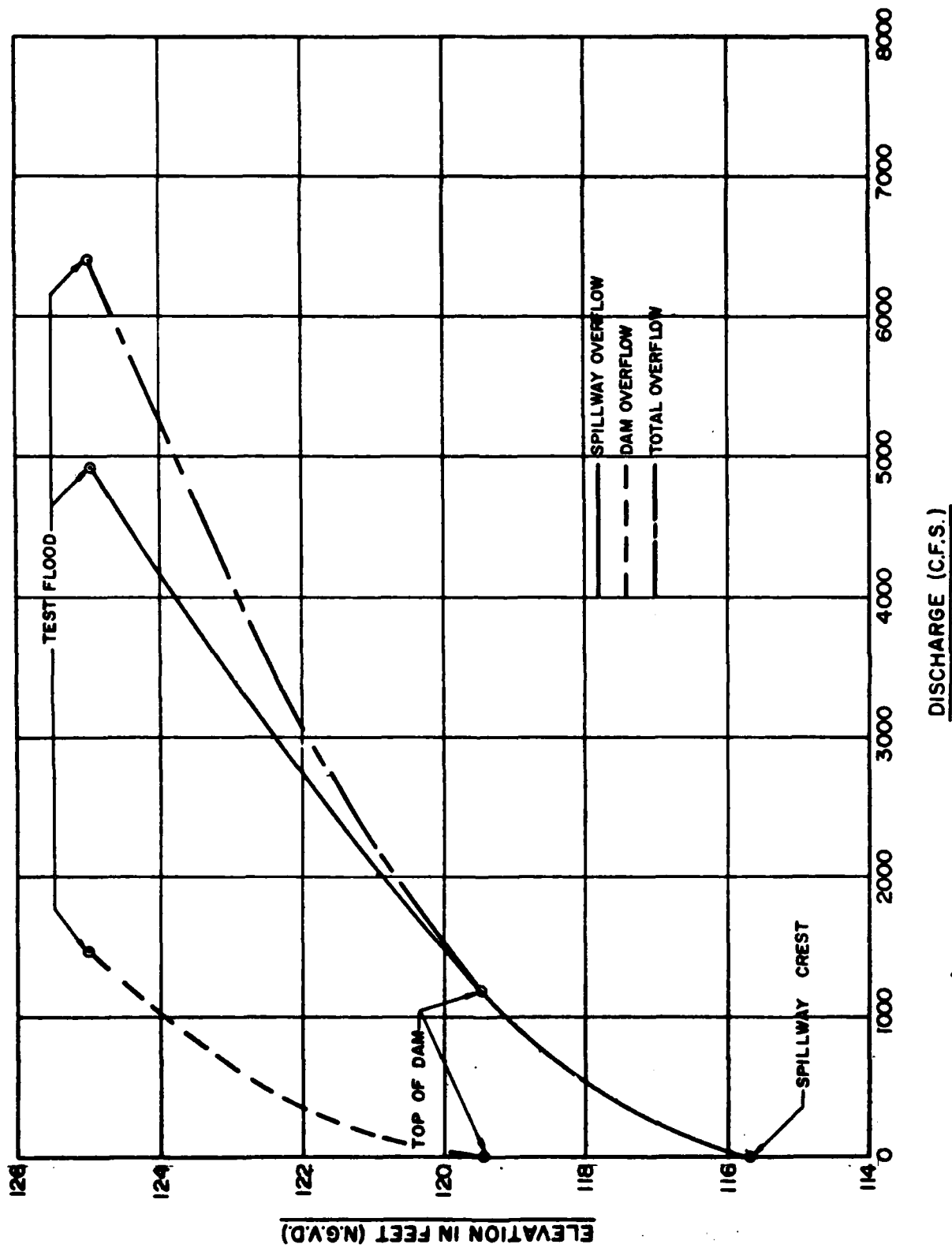
$$L = 58 \text{ Feet}$$

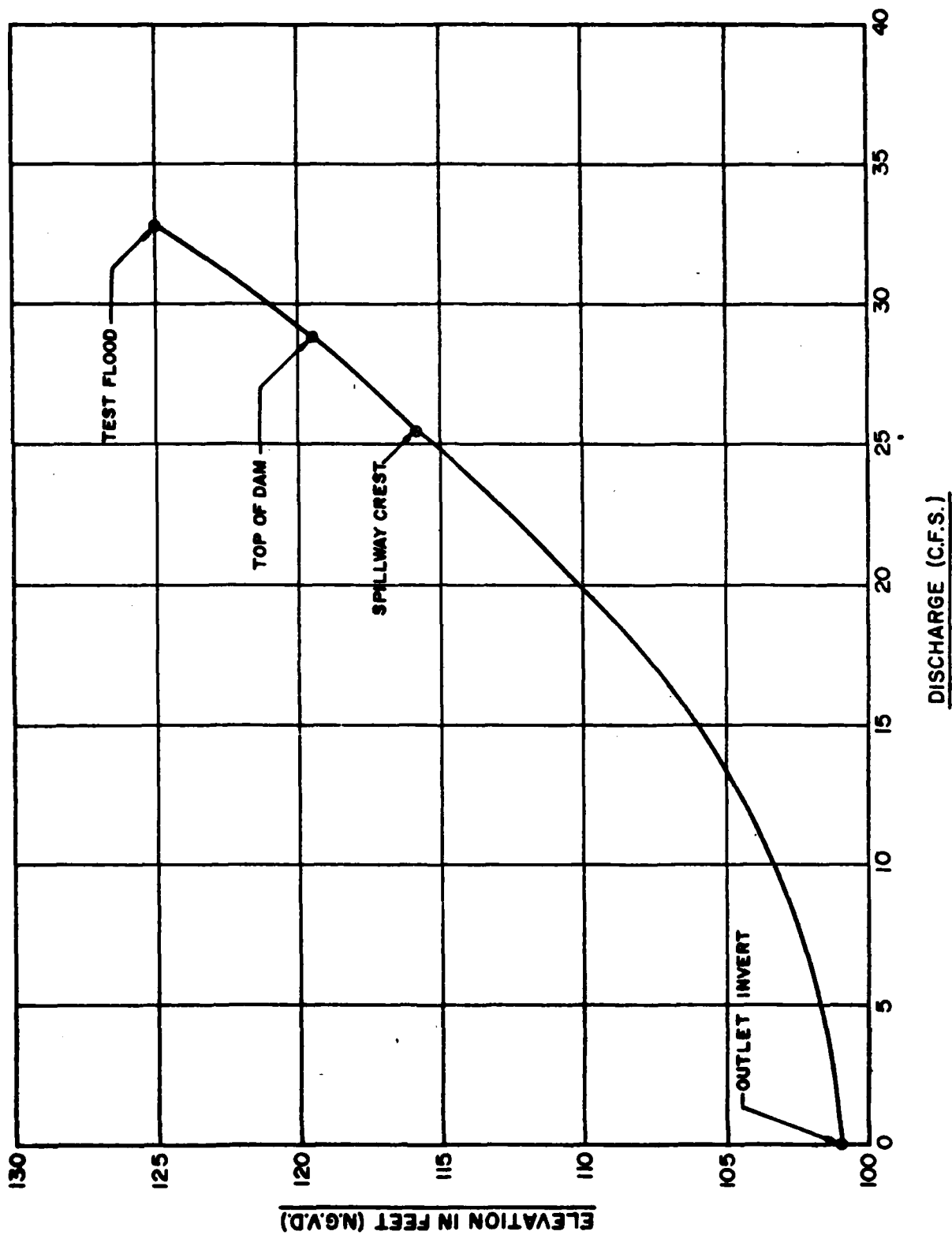
16 Inch Blowoff

$$Q = (c) (a) (2gh)^{1/2}$$

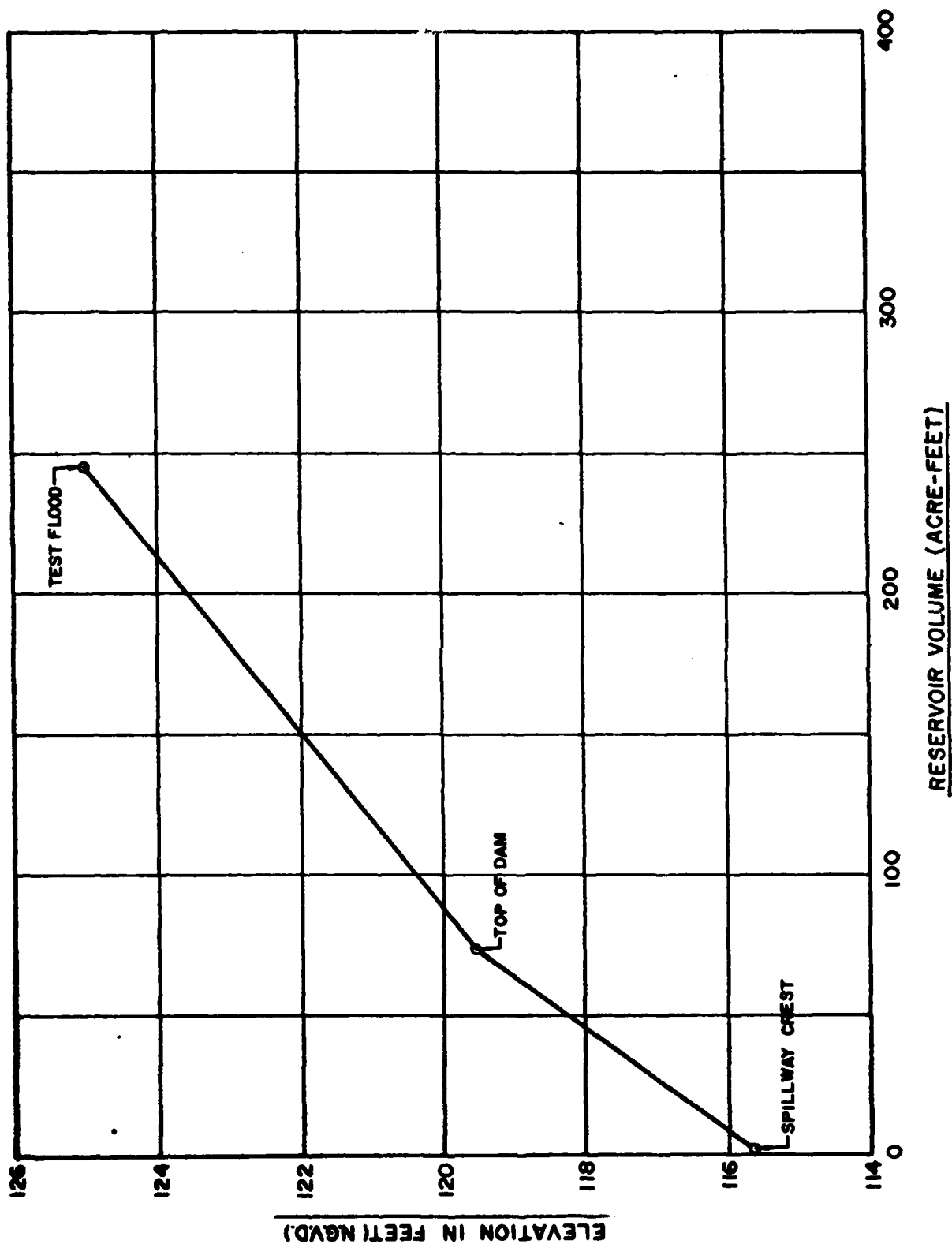
$$C = 0.6$$

$$a = 1.40 \text{ Square Feet}$$





PAPER GOODS POND DAM
16 INCH BLOWOFF
OUTLET WORKS RATING CURVE



APPENDIX E

**INFORMATION AS CONTAINED IN THE
NATIONAL INVENTORY OF DAMS**

NOT AVAILABLE AT THIS TIME



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

REPLY TO
ATTENTION OF:
NEDED-E

MAY 06 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 Paper Goods Pond Dam (CT-00253) 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 Paper Goods Pond Dam would likely be exceeded by floods greater than 9 percent of the Probable Maximum Flood (PMF). 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 William A. O'Neill

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, Sherwood-Industries, Inc., 10 Main Street, Kensington, Connecticut 06037.

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,

A handwritten signature in dark ink, appearing to read "C.E. Edgar, III". The signature is stylized with a large, sweeping "E" and a distinct "III" at the end.

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



U.S. ARMY
CORPS OF ENGINEERS
3700 ROAD
WALTON, MASSACHUSETTS 02254

REPLY TO
ATTENTION OF:
NEDED-E

MAY 06 1981

Sherwood-Industries, Inc.
10 Main Street
Kensington, Connecticut 06037

Gentlemen:

Forwarded herewith for your information and use is a copy of the Phase I Inspection Report on the Paper Goods Pond Dam (CT-00253). This inspection was made under the authority of Public Law 92-367 by the firm of James P. Purcell Associates, Inc., under the direction and supervision of the Corps of Engineers. Copies of the finished report have been forwarded to the Governor and the Department of Environmental Protection, the cooperating agency for the State of Connecticut.

The preliminary hydrological analysis contained in Appendix D of this report indicates that the spillway capacity for this dam is insufficient to discharge fifty percent of the Probable Maximum Flood. A storm that would cause a flood of this magnitude could result in overtopping and possible failure of the dam. As a result the dam is adjudged as having a seriously inadequate spillway and is assessed as unsafe non-emergency.

The Governor and the Department of Environmental Protection have each been notified of the dam's spillway inadequacy. We have also advised them of the report's recommendations for steps to be taken to eliminate this problem.

Section 7 of the report contains an evaluation and recommendations, including the one mentioned. If you have any questions concerning this report, we suggest that you contact the Department of Environmental Protection first. Then, if there are further questions, contact the Project Management Branch, Engineering Division, of this office.

We thank you for your cooperation and assistance in carrying out this program.

Sincerely,

Joe B. Fryar

JOE B. FRYAR
Chief, Engineering Division

Incl
As stated



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

REPLY TO
ATTENTION OF:
NEDED-E

MAY 06 1981

Mr. Stanley J. Pac, Commissioner
Department of Environmental Protection
State of Connecticut
Hartford, Connecticut 06115

Dear Commissioner Pac:

Forwarded herewith for your information and use is a copy of the Phase I Inspection Report on Paper Goods Pond Dam (CT-00253). This inspection was performed in accordance with Public Law 92-367 under the direction of the Corps of Engineers.

The preliminary hydrological analysis contained in Appendix D of this report indicates that the spillway capacity for this dam is insufficient to discharge fifty percent of the Probable Maximum Flood. A storm that would cause a flood of this magnitude could possibly cause overtopping and possible failure of the dam. As a result the dam is adjudged as having a seriously inadequate spillway and is assessed as unsafe non-emergency.

The Governor and the owner have each been forwarded a copy of the report and their attention has been called to the problem concerning the adequacy of the spillway.

We thank you for your cooperation and assistance in carrying out this program and hope this report will help you to develop an effective dam safety program.

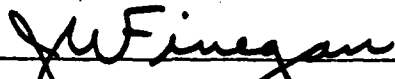
Sincerely,

JOE B. FRYAR
Chief, Engineering Division

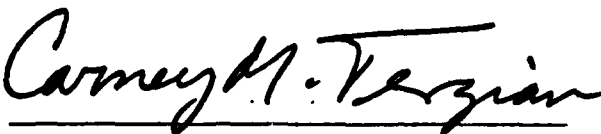
Incl
As stated

NOT AVAILABLE AT THIS TIME

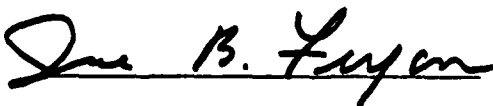
This Phase I Inspection Report on Paper Goods Pond Dam (CT-00253) has been reviewed by the undersigned Review Board members. In our opinion, the reported findings, conclusions, and recommendations are consistent with the Recommended Guidelines for Safety Inspection of Dams, and with good engineering judgement and practice, and is hereby submitted for approval.


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


ARAMAST MAHTESIAN, MEMBER
Geotechnical Engineering Branch
Engineering Division


CARNEY M. TERZIAN, CHAIRMAN
Design Branch
Engineering Division

APPROVAL RECOMMENDED:


JOE B. FRYAR
Chief, Engineering Division

DISPOSITION FORM

For use of this form, see AR 340-15; the proponent agency is The Adjutant General's Office.

REFERENCE OR OFFICE SYMBOL

NEDED-E

SUBJECT

DAM INSPECTION FINAL REPORT

TO

FROM

DATE

CMT 1

Chief, Design Branch
Chief, Geotechnical Engineering Branch
Chief, Water Control Branch

Chairman,
Dam Safety Review Board

10 March 1981

1. Attached is a single copy of the final report for

Paper Goods Pond Dam

Dam, Identity No.

CT-00253

2. Please ascertain that the report is acceptable in accordance with your Branch comments or instructions given to the Architect-Engineer at the Review Board

meeting on 5 February 1981

3. If the report requires further work or corrections, notify the Project Management Branch as soon as the determination is made.

4. The review period of two weeks for this report expires on 24 March 1981

5. The cost code for this review is ABA01 0701 00000.

Terzian
TERZIAN

DA FORM 2496
1 FEB 62

REPLACES DD FORM 98, EXISTING SUPPLIES OF WHICH WILL BE
ISSUED AND USED UNTIL 1 FEB 83 UNLESS SOONER EXHAUSTED.

☆ U.S. G.

1-555-130/8050

AD-A143 306

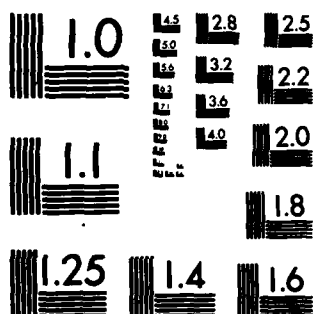
NATIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL DAMS
PAPER GOODS POND DAM. (U) CORPS OF ENGINEERS WALTHAM MA
NEW ENGLAND DIV MAR 81

2/2

UNCLASSIFIED

F/G 13/13 NL





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

DETERMINATION OF LETTER TYPE

1CT00253 Name: PAPER Goods Pond Dam

Hazard (a) High Condition Fair

Height 30 ft Length 20 ft Top Width 4 ft

Max Storage (top of dam) 150 A-F

Test Flood 1/2 PMF

1/2 PMF Overtopping (e) 5.5 ft

Spillway Capacity 99% PMF

Increased D/S Hazard (b) YES

Duration of Overtopping Not Known

Type of Dam Concrete & masonry

History of Overtopping Unknown

Major Problems None

Recommended Letter Type: STANDARD

INSUFFICIENT
SPILLWAY

SPECIAL

Remarks _____

DISPOSITION FORM

For use of this form, see AR 340-15; the proponent agency is The Adjutant General's Office.

REFERENCE OR OFFICE SYMBOL

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SUBJECT

DAM INSPECTION FINAL REPORT

TO

FROM

DATE

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Chief, Design Branch

Chairman,

10 March 1981

Chief, Geotechnical Engineering Branch

Dam Safety Review Board

Chief, ~~Water Control Branch~~

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3. If the report requires further work or corrections, notify the Project Management Branch as soon as the determination is made.

4. The review period of two weeks for this report expires on 24 March 1981.

5. The cost code for this review is ABA01 0701 00000.

*My comments have been satisfactorily
taken care of - JTFinegan 3/11/81
Terzian
TERZIAN*

*However - look at the assessment
(page 2) and the reference to further
H/H studies. I don't like this wording
concerning the test flood
It is not consistent with Section 7.
JTF*

DA FORM 2496
1 FEB 82

REPLACES DD FORM 98
ISSUED AND USED UNTIL

ING SUPPLIES OF WHICH WILL BE
3 UNLESS SOONER EXHAUSTED.

☆ U.S. GPO: 1974-555-430/0039

END

FILMED

9-84

DTIC