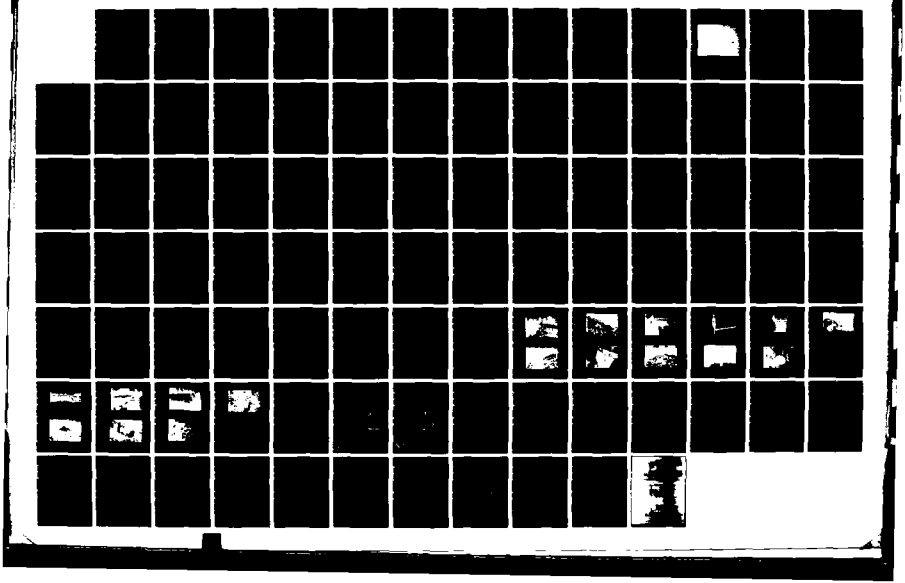
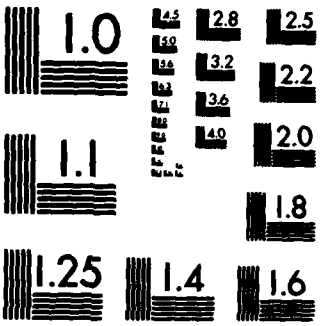
AD-A144 552 NTTIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL DAMS 1/1
HALLS POND DAM (CT 00.. (U) CORPS OF ENGINEERS WALTHAM
MA NEW ENGLAND DIV 1981

UNCLASSIFIED F/G 13/13 NL





THAMES RIVER BASIN

EASTFORD, CONNECTICUT

HALLS POND DAM

CT 00388

AND

CT 00598

1981

PHASE I INSPECTION REPORT

NATIONAL DAM INSPECTION PROGRAM

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER CT 00388 and CT 00598	2. GOVT ACCESSION NO. AD A144 55	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) Halls Pond Dam NATIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL DAMS		5. TYPE OF REPORT & PERIOD COVERED INSPECTION REPORT 6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) U.S. ARMY CORPS OF ENGINEERS NEW ENGLAND DIVISION		8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS DEPT. OF THE ARMY, CORPS OF ENGINEERS NEW ENGLAND DIVISION, NEDED 424 TRAPELO ROAD, WALTHAM, MA. 02254		12. REPORT DATE February 1981 13. NUMBER OF PAGES 85
14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office)		15. SECURITY CLASS. (of this report) UNCLASSIFIED 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

APPROVAL FOR PUBLIC RELEASE: DISTRIBUTION UNLIMITED

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

18. SUPPLEMENTARY NOTES

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

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

DAMS, INSPECTION, DAM SAFETY,

Thames River Basin
Eastford, Connecticut

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

Halls Pond Dam includes two dams, with the northerly dam including the spillway and outlet works. The southerly dam consists of a dike only, with no outlet. The north dam is 250 feet long with the original dam being earth fill with masonry faces. This dam has a maximum height of 23.5 feet and a spillway consisting of twin 9' x 3.3' box culberts. The south dam is a 250 foot long earth dike with a maximum height of 14 feet. Halls Pond Dam is classified as SMALL in size with a hazard classification of LOW. The dam is in fair condition with some seepage at the south dam.

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

NATIONAL DAM INSPECTION PROGRAM

PHASE I INSPECTION REPORT

Identification No.:	CT 00388 CT 00598
Name of Dam:	Halls Pond Dam
Town:	Eastford
County and State:	Windham, Connecticut
Stream:	Slovik Brook
Date of Inspection:	27 February, 1981

BRIEF ASSESSMENT

Halls Pond includes two dams, with the northerly dam including the spillway and outlet works. The southerly dam consists of a dike only, with no outlet. Both dams were rebuilt in 1968. This is a State of Connecticut owned pond used for recreation.

The north dam is 250 feet long with the original dam being earth fill with masonry faces. In 1968, an impervious core and pervious shell were added to the downstream face. This dam has a maximum height of 23.5 feet and a spillway consisting of twin 9' x 3.3' box culverts.

The south dam is a 250 foot long earth dike with a maximum height of 14 feet. In 1968, an impervious core with pervious shell was added to the downstream face.

Halls Pond is classified as SMALL in size with a hazard classification of LOW. The dam is in fair condition with some seepage at the south dam.

Corps of Engineers Guidelines recommend a test flood of from 50 to 100 year frequency for dams of this size and hazard classification. A 100 year storm was used with a peak inflow of 560 cfs and a peak outflow of 243 cfs. The spillway will pass this flow with a water surface elevation of 516.7 without the outlet works operating and elevation 516.3 with the outlet gate full open.

It is recommended that an engineer study the seepage at the south dam and that the owner perform any corrective measures required. This should be done within one year, and the remedial measures detailed in Section 7 should be accomplished within one year.

FUSS & O'NEILL, INC.

By: _____
Walter S. Fuss, P.E.
President

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.

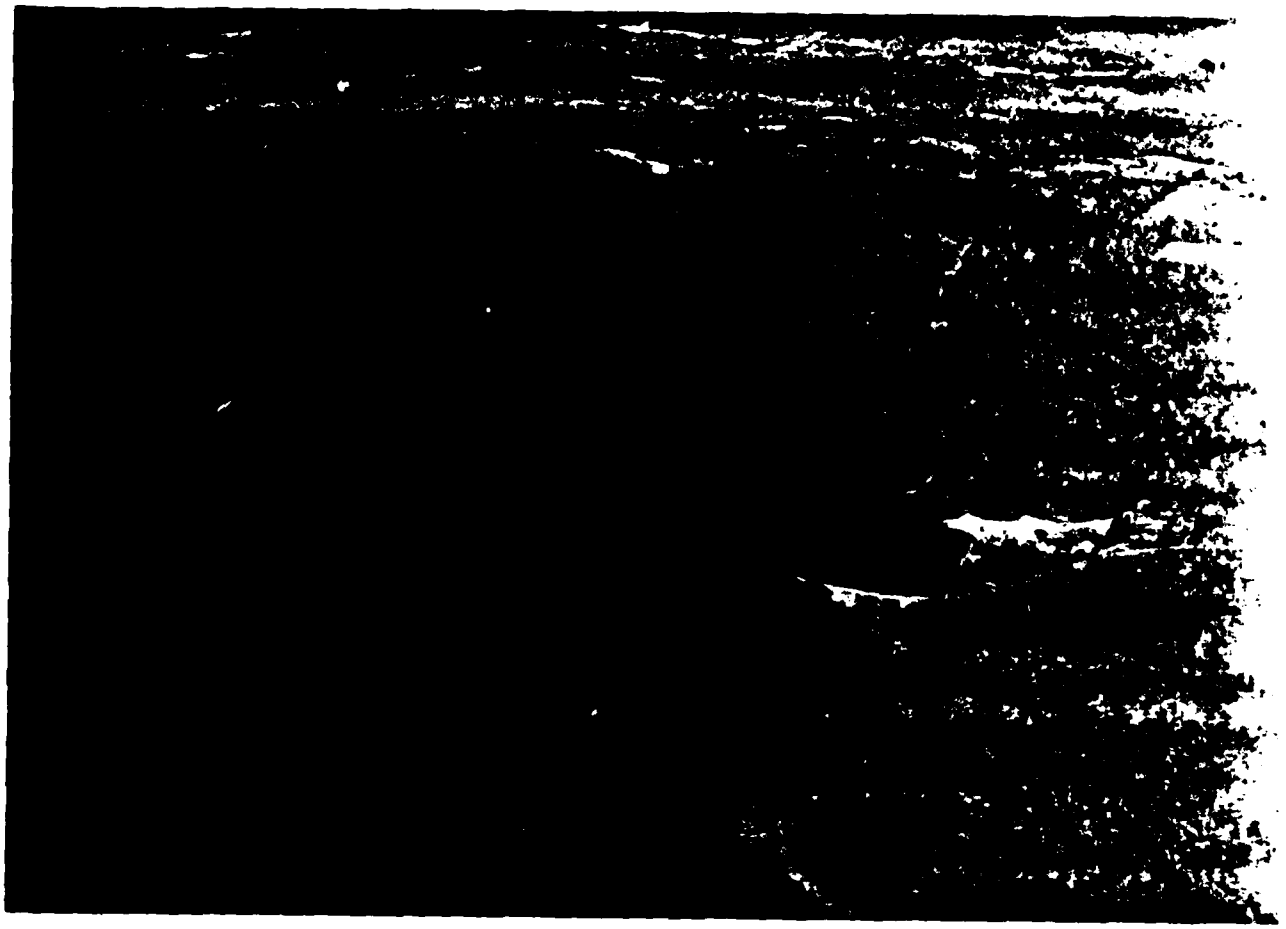
It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the

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

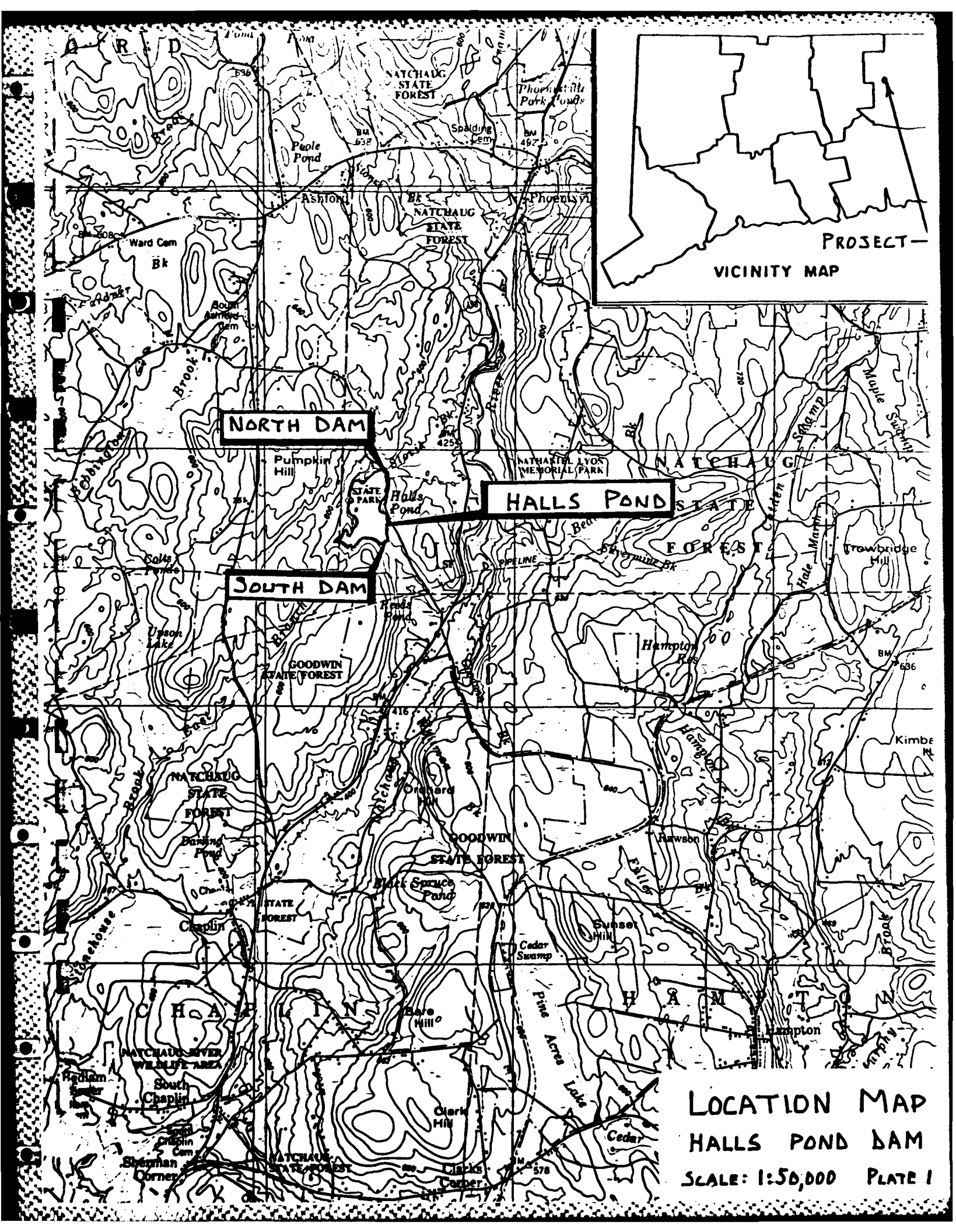
Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonbly possible storm runoff), or fractions thereof. Because 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-trepassing 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.

TABLE OF CONTENTS



OVERVIEW PHOTO


NORTH DAM
HALLS POND
SOUTH DAM
PROJECT
VICINITY MAP
LOCATION MAP
HALLS POND DAM
SCALE: 1:50,000 PLATE 1

NATIONAL DAM INSPECTION PROGRAM
PHASE I INSPECTION REPORT
HALLS POND DAM CT 00388 AND 00598

SECTION 1 - PROJECT INFORMATION

1.1 GENERAL:

a. Authority. Public Law 92-367, August 8, 1972, aurhorized the Secretary of the Army, through the Corps of Engineers, to initiate a national program of dam inspection through 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. Fuss & O'Neill, 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 Fuss & O'Neill, Inc. under a letter of 25 November, 1980 from William E. Hodgson, Jr., Colonel, Corps of Engineers. Contract No. DACW33-81-C-0020 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 assist 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

a. Location. Halls Pond Dam is located in the Town of Eastford, County of Windham, on the west side of Kennerson Reservoir Road about 0.9 miles northwest of Connecticut Route 198. The north dam is at latitude 41°-50.6' and longitude 72°-6.4' and the south dam is at latitude 41°-50.2' and longitude 72°-6.5'. Slovik Brook starts at Halls Pond Dam and joins the Natchaug River about 0.8 miles to the east. Natchaug River joins other streams about 11.5 miles downstream in Willimantic to form the Shetucket River. The watershed is rolling and contains 1.3 miles of mostly wooded area.

b. Description of Dam and Appurtenances. There are two dams impounding Halls Pond. The north dam is the main structure and includes outlet works with a gate house and 24 inch outlet pipe as well as a spillway consisting of twin 9 foot by 3.3 foot concrete box culverts. Kennerson Reservoir Road forms the crest of the dam. The north dam is shown in Photos C1-1 through C1-11. An original earth filled masonry faced dam was partially reconstructed in 1968 by adding an impervious core and pervious shell on the downstream slope. This dam has a length of 250 feet.

The south dam is 250 feet long and consists of an original earth dike with an impervious core and pervious shell added in 1968. There is no outlet at this dam which acts as a dike. The

crest consists of a 10 foot wide gravel roadway. Photos C2-1 through C2-7 show the south dam.

c. Size Classification. The north dam has a height of 23.5 feet and the south dam has a height of 14 feet. At top of dam level, the total storage volume is 890 acre-feet. The dam is therefore classified as a SMALL structure in accordance with the recommended guidelines of the Corps of Engineers which defines a small dam as one with a storage capacity of 50 to 1,000 acre-feet and a height of 25 or more but less than 40 feet.

d. Hazard Classification. This dam is classified as having a LOW hazard potential because no structures would be damaged and only the roadway forming the crest of the north dam would be damaged.

e. Ownership. Halls Pond Dams are owned by the State of Connecticut and are maintained by the Department of Environmental Protection.

f. Operator. Operating personnel are under the direction of:

Region Director
Department of Environmental Protection

g. Purpose of Dam. Halls Pond is a recreational lake used mainly for fishing.

h. Design and Construction History. The design and construction details for the original dam are unknown. Major repairs and reconstruction of both dams were undertaken in 1968. Impervious cores with pervious shells were added to the downstream faces of both dams and a new spillway and outlet works were constructed at the north dam. The construction plans were reviewed, but design calculations were not studied.

i. Normal Operating Procedures. No operating records are available. The outlet works normally remain closed.

1.3 PERTINENT DATA

a. Drainage Area. Halls Pond is located in northeast Connecticut and the watershed is rural and rolling in nature with only a few scattered homes. There are no significant storage areas to dampen the flows from the 1.3 square mile area.

b. Discharge at Dam Site. There is no history of discharge data available for this dam. The following discharge data have been calculated with the calculations included in Appendix D.

1.	Outlet Works 24" Concrete pipe, Invert Elev. 504.0		
	Top of dam elevation	518.0	40 cfs
	Test flood elevation	516.3	40 cfs
2.	Maximum known flood		Unknown

3.	Ungated spillway capacity Top of dam elevation 518.0	430 cfs
4.	Ungated spillway capacity Test flood elevation 516.3	200 cfs
5.	Gated spillway capacity Normal pool elevation	N/A
6.	Gated spillway capacity Test flood elevation 516.3	N/A
7.	Total spillway capacity Test flood elevation 516.3	200 cfs
8.	Total project discharge Top of dam elevation 518.0	470 cfs
9.	Total project discharge Test flood elevation 516.3	240 cfs

c. Elevation. (feet above NGVD)

NORTH DAM

1.	Streambed at toe of dam	501.0
2.	Bottom of cutoff	None
3.	Maximum tailwater	Unknown
4.	Normal pool	514.0
5.	Full flood control pool	N/A
6.	Spillway crest	514.0
7.	Design surcharge	517.0
8.	Top of dam	518.0
9.	Test flood surcharge	516.3

SOUTH DAM

1.	Streambed at toe of dam	503.5
2.	Bottom of cutoff	None
3.	Maximum tailwater	N/A
4.	Normal pool	514.0
5.	Full flood control pool	N/A
6.	Spillway crest	None
7.	Design surcharge	517.0
8.	Top of dam	517.5
9.	Test flood surcharge	516.3

d. Reservoir. (Length in feet)

1.	Normal pool	3,500
2.	Flood control pool	N/A
3.	Spillway crest pool	3,500
4.	Top of dam	3,500
5.	Test flood pool	3,500

e. Storage. (Acre-Feet)

1.	Normal pool	550
2.	Flood control pool	N/A
3.	Spillway crest pool	550
4.	Top of dam	890
5.	Test flood pool	750

f. Reservoir Surface. (Acres)

1.	Normal pool	82
2.	Flood control pool	N/A
3.	Spillway crest	82
4.	Test flood pool	84
5.	Top of dam	85

g. Dam.

NORTH DAM

1.	Type Original dam	Earth fill with masonry faces
	Added	Downstream impervious core and pervious shell
2.	Length	250'
3.	Height	23.5'
4.	Top width	30'
5.	Side slope	2H:1V
6.	Zoning	Impervious core added but does not meet requirements of Bureau of Reclamation for width to be considered a zoned structure
7.	Impervious core	Top width varies 5' to 8' with slopes 1H:2V
8.	Cutoff	Unknown
9.	Grout curtains	Unknown

SOUTH DAM

1.	Type Original	Earth dike
	Added	Downstream impervious core and pervious shell
2.	Length	250'
3.	Height	14'
4.	Top width	14'
5.	Side slopes	2H:1V
6.	Zoning	Impervious core added but does not meet requirements of Bureau of Reclamation for width to be considered a zoned structure
7.	Impervious core	Top width 4', U.S. slope negative 1H:2V and D.S. slope 1H:1V
8.	Cutoff	Unknown
9.	Grout curtains	Unknown

h. Diversion of Regulating Tunnel. N/A

i. Spillway.

1.	Type	Twin 9'x3.3' concrete box culvert
2.	Length of weir	18'
3.	Crest elevation	514.0
4.	Gates	None
5.	U/S Channel	Natural Bed
6.	D/S Channel	Concrete chute

j. Regulating Outlets.

1.	Invert	504.0
2.	Size	24"
3.	Description	Concrete pipe
4.	Control mechanism	Metal slide gate
5.	Other	Contained in brick gate house

SECTION 2 - ENGINEERING DATA

2.1 DESIGN

Design data for the original dam is not available. Design data for the 1968 construction was not reviewed.

2.2 CONSTRUCTION

No record of the original construction is available

2.3 OPERATION

No operating records are available.

2.4 EVALUATION

a. Availability. Construction plans for the 1968 construction were supplied. Original design data and construction plans are not available.

b. Adequacy. A definitive review was not made.

c. Validity. The validity of available data should be verified if a definitive review is to be performed.

SECTION 3 - VISUAL INSPECTION

3.1 FINDINGS

a. General. Based on visual inspection, the two Halls Pond Dams appear to be in fair condition.

b. Dams.

NORTH DAM

1. Upstream Face - The dumped rock fill is missing in some areas. There is minor brush growth, most of which has been trimmed as shown in Photos C1-1 and C1-6. There has been some erosion just south of the spillway, caused by storm runoff from the roadway.

2. Crest - The crest consists of Kennerson Reservoir Road which is an oiled gravel Town road. The road is in good condition, but the wire rope guide rail on the west side has been partially removed at the south end as shown in Photo C1-1.

3. Downstream Face - The downstream face is grass covered with some brush growth as shown in Photos C1-2 and C1-3. No seepage was observed.

SOUTH DAM

1. Upstream Face - The upstream face has dumped rock fill which is missing in some areas as shown in Photos C2-3 and C2-4. There is minor erosion from wave action.

2. Crest - The crest is a gravel road in good condition as shown in Photo C2-2.

3. Downstream Face - The downstream face is grass covered with some brush growth as shown in Photo C2-5. There is some seepage at the west end as shown in Photo C2-6. The seepage cannot be quantified without further investigation.

c. Appurtenant Structures.

1. Spillway - Twin 9'x3.3' cast-in-place concrete box culverts constructed in 1968 form the spillway with a concrete channel on a 2H:1V slope for an outlet channel. Photos C1-4 and C1-5 show the spillway and channel. The spillway is in good condition except for a crack at the wingwall at the northwest corner as shown in Photo C1-4. This crack should be investigated further.

2. Outlet Works - The outlet works consist of a 24 inch concrete pipe starting at the base of the upstream slope and running to a gate house just west of the road. A metal slide gate controls the flow and a 24 inch concrete outlet pipe discharges at the toe of slope at a concrete endwall. Photos C1-6, C1-7, C1-8, C1-9 and C1-10 show the outlet works are in good condition except that the gate house door hardware is badly rusted and the lock is inoperable. Since there is no lock on the control wheel, the operation of the outlet works

is susceptable to vandalism and unauthorized drawdown of the reservoir.

d. Reservoir Area.

No detrimental features in the reservoir area were observed during the visual inspection.

e. Downstream Channel.

At the north dam, the downstream channel is a natural stream called Slovik Brook as shown in Photo C1-11. At the south dam, an unnamed stream forms in a swampy area at the base of the dam as shown in Photo C2-7.

3.2 EVALUATION

Based on the visual inspection, the overall condition of Halls Pond Dams is fair with areas that require attention as outlined in Section 7.

SECTION 4 - OPERATIONAL AND MAINTENANCE PROCEDURES

4.1 OPERATIONAL PROCEDURES

a. General. This is a recreational pond that remains full during normal conditions. There is no other use of the water.

b. Description of Any Warning System in Effect. There is no formal downstream warning system in case of emergency at the dam.

4.2 MAINTENANCE PROCEDURES

a. General. This dam is checked for maintenance requirements two times per year by District maintenance personnel and any required work is done at that time. Maintenance appears to be limited mainly to removal and trimming of vegetation.

b. Operating Facilities. There does not appear to be any particular maintenance performed on the operating facilities.

4.3 EVALUATION

The existing maintenance schedule should be continued and expanded to include the outlet facilities and rock dam faces.

SECTION 5 - EVALUATION OF HYDRAULIC/HYDROLOGIC FEATURES

5.1 GENERAL The north dam at Halls Pond is 250 feet long with a maximum height of 23.5 feet. There is a spillway consisting of twin 9'x3.3' box culverts and a 24" concrete pipe outlet.

The 1.3 square mile watershed is rolling and mainly wooded as shown in the overview photo. There are no significant storage areas in the watershed.

5.2 DESIGN DATA

When the 1968 construction was under design, the engineer determined that the time of concentration for Halls Pond is 85 minutes and the runoff coefficient is 0.34.

5.3 EXPERIENCE DATA

No historical data for recorded discharges or water surface elevations is available for this dam or the watershed.

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". Halls Pond is classified as small in size with a low hazard potential. Guidelines for these classifications recommend an event equal in magnitude to a storm of 50 year to 100 year return frequency. A 100 year storm was chosen for the test flood. The rational method was used with data developed when the 1968 reconstruction was designed.

The test flood was calculated to be 560 cfs with a peak outflow of 240 cfs. This outflow results in a water surface elevation of 516.3 which is 1.7 feet below top of dam. The capacity of the spillway at top of dam elevation is 430 cfs.

5.5 DAM FAILURE ANALYSIS At the north dam, applying the calculated dam failure discharge of 14,200 cfs when the water surface elevation is 518 (top of dam) will produce an approximate water surface elevation of 505.6 just downstream of the dam. Depths of flow would range from 11.1 feet just below the dam to 16.2 feet 2,500 feet downstream of the dam to 8.6 feet where Slovik Brook joins the Natchaug River 3,700 feet downstream. The only damage that would be done is to the roadway on the crest of dam. No buildings would be affected.

At the south dam, applying the calculated dam failure discharge of 9,200 cfs with the pond at top dam elevation will produce an approximate water surface elevation of 514.7 just below the dam. Depths of flow would range from 11.2 feet just below the dam to 4.0 feet 2,500 feet downstream of the dam. No houses, other structures or roads would be damaged.

Halls Pond Dams are classified as having a low hazard because no structures would be damaged. Computations of water surface elevations and a map showing the limits of the impact area are included in Appendix D.

SECTION 6 - STRUCTURAL STABILITY

6.1 VISUAL OBSERVATION The field inspection did not reveal any stability problems.

6.2 DESIGN AND CONSTRUCTION DATA There is no design or construction information available for the original dam construction to permit a formal evaluation of the stability of the dam. Thus, the evaluation of stability is based solely on the visual inspection and the construction plans for the 1968 work.

6.3 POST CONSTRUCTION CHANGES There are no post construction changes apparent except for the 1968 construction.

6.4 SEISMIC STABILITY Halls Pond Dams are located in Seismic Zone 1 and in accordance with Corps of Engineers guidelines do not warrant further seismic analysis at this time.

SECTION 7 - ASSESSMENT, RECOMMENDATIONS AND REMEDIAL MEASURES

7.1 DAM ASSESSMENT

a. Condition. Based on the visual inspection, Halls Pond Dams appears to be in fair condition.

b. Adequacy of Information. The lack of in-depth engineering data did not allow for a definitive review. Therefore, the adequacy of these dams could not be assessed from the standpoint of reviewing design and construction data, but is based primarily on the visual inspection, plans for 1968 construction, past operational performance of the structure, and sound engineering judgement.

c. Urgency. The recommendations presented in Section 7.2 should be carried out within one year of receipt of this report by the Owner and the remedial measures presented in Section 7.3 within two years.

7.2 RECOMMENDATIONS

It is recommended that the Owner employ a qualified registered engineer to:

a. Investigate areas of seepage in the downstream face of the south dam to determine if repairs are warranted.

b. Investigate the crack in the box culvert spillway at the northwest corner to determine if repairs are warranted.

7.3 REMEDIAL MEASURES

a. Operation and Maintenance Procedures.

1. Repair guide rail at south end of north dam.

2. Construct paved ditch to carry road water at spillway.

3. Paint all steel in gate house and repair lock on door.

4. Repair riprap at both dams.

5. Check operation of gate on a regular basis.

7.4 ALTERNATIVES

There are no practical alternatives to the recommendations and remedial measures in Sections 7.2 and 7.3.

APPENDIX A

INSPECTION CHECK LIST

VISUAL INSPECTION CHECK LIST
PARTY ORGANIZATION

PROJECT Halls Pond North Dam

DATE 2/27/81

TIME 11:00 a.m.

WEATHER Clear - 45°

W.S.Elev. 514.0 U.S. 495.0 DN.S.

PARTY:

1. G. Mirtl, Hydrology & Hydraulics
2. E. Lang, Structural & Mechanical
3. S. Marniki, Soils & Geology
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

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

PERIODIC INSPECTION CHECK LIST

PROJECT Halls Pond - North DATE 2/27/81

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITION
DIKE EMBANKMENT	
Crest Elevation	518.0
Current Pool Elevation	514.0
Maximum Impoundment to Date	Unknown
Surface Cracks	None
Pavement Condition	Good
Movement or Settlement of Crest	None
Lateral Movement	None
Vertical Alignment	Good
Horizontal Alignment	Good
Condition at Abutment and at Concrete Structures	Some erosion S.W. side of inlet wingwall
Indications of Movement of Structural Items on Slopes	None

PERIODIC INSPECTION CHECK LIST

PROJECT Halls Pond - North DATE 2/27/81

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITION
DIKE EMBANKMENT (cont)	
Trespassing on Slopes	Fisherman use U.S. slope
Sloughing or Erosion of Slopes or Abutments	Minor from wave action and road runoff
Rock Slope Protection - Riprap Failures	Some stone missing
Unusual Movement or Cracking at or near Toes	None
Unusual Embankment or Downstream Seepage	None
Piping or Boils	None
Foundation Drainage Features	None
Toe Drains	None
Instrumentation System	None
Vegetation	Some small trees D.S. slope

PERIODIC INSPECTION CHECK LIST

PROJECT Halls Pond - North DATE 2/27/81

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITION
OUTLET WORKS - INTAKE CHANNEL AND INTAKE STRUCTURE	
a. Approach Channel	Pipe under water
Slope Conditions	
Bottom Conditions	
Rock Slides or Falls	
Log Boom	
Debris	
Condition of Concrete Lining	
Drains or Weep Holes	
b. Intake Structure	
Condition of Concrete	Good
Stop Logs and Slots	Good

PERIODIC INSPECTION CHECK LIST

PROJECT Halls Pond - North DATE 2/27/81

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITION
OUTLET WORKS - TRANSITION AND CONDUIT	Pipe
General Condition of Concrete	Good
Rust or Staining on Concrete	None
Spalling	None
Erosion or Cavitation	None
Cracking	None
Alignment of Monoliths	N/A
Alignment of Joints	N/A
Numbering of Monoliths	N/A

PERIODIC INSPECTION CHECK LIST

PROJECT Halls Pond - North DATE 2/27/81

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITION
OUTLET WORKS - CONTROL TOWER	
a. Concrete and Structural	
General Condition	Good
Condition of Joints	Good
Spalling	None
Visible Reinforcing	None
Rusting or Staining of Concrete	None
Any Seepage or Efflorescence	None
Joint Alignment	Good
Unusual Seepage or Leaks in Gate Chamber	None observed
Cracks	None observed
Rusting or Corrosion of Steel	Door hardware rusting

PERIODIC INSPECTION CHECK LIST

PROJECT Halls Pond - North DATE 2/27/81

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITION
OUTLET WORKS - CONTROL TOWER (cont)	
b. Mechanical and Electrical	No electrical
Air Vents	Good
Float Wells	N/A
Crane Hoist	N/A
Elevator	N/A
Hydraulic System	N/A
Service Gates	Some rusting of control wheel not secured from unauthorized use.
Emergency Gates	N/A
Lightning Protection System	N/A
Emergency Power System	N/A
Wiring and Lighting System	N/A

PERIODIC INSPECTION CHECK LIST

PROJECT Halls Pond - North DATE 2/27/81

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITION
OUTLET WORKS - OUTLET STRUCTURE AND OUTLET CHANNEL	Pipe
General Condition of Concrete	Good
Rust or Staining	None
Spalling	None
Erosion or Cavitation	None
Visible Reinforcing	None
Any Seepage or Efflorescence	None
Condition at Joints	Good
Drain Holes	None
Channel	Good
Loose Rock or Trees Overhanging Channel	None
Condition of Discharge Channel	Good

PERIODIC INSPECTION CHECK LIST

PROJECT Halls Pond - North DATE 2/27/81

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITION
OUTLET WORKS - SPILLWAY WEIR, APPROACH AND DISCHARGE CHANNELS	
a. Approach Channel	
General Condition	Good
Loose Rock Overhanging Channel	N/A
Trees Overhanging Channel	None
Floor of Approach Channel	Good
b. Weir and Training Walls	
General Condition of Concrete	Good
Rust of Staining	None
Spalling	None
Any Visible Reinforcing	None
Any Seepage or Efflorescence	None

PERIODIC INSPECTION CHECK LIST

PROJECT Halls Pond - North DATE 2/27/81

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITION
OUTLET WORKS - SPILLWAY WEIR, APPROACH AND DISCHARGE CHANNELS	
b. Weir and Training Walls	
Drain Holes	None
c. Discharge Channel	
General Condition	Good
Loose Rock Overhanging Channel	None
Trees Overhanging Channel	None
Floor of Channel	Good
Other Obstructions	Some debris at end of channel.

PERIODIC INSPECTION CHECK LIST

PROJECT Halls Pond - North DATE 2/27/81

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITION
OUTLET WORKS - SERVICE BRIDGE	N/A
a. Super Structure	
Bearings	
Anchor Bolts	
Bridge Seat	
Longitudinal Members	
Under Side of Deck	
Secondary Bracing	
Deck	
Drainage System	
Railings	
Expansion Joints	
Paint	

PERIODIC INSPECTION CHECK LIST

PROJECT Halls Pond - North DATE 2/27/81

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITION
OUTLET WORKS - SERVICE BRIDGE (cont)	N/A
b. Abutment & Piers	
General Condition of Concrete	
Alignment of Abutment	
Approach to Bridge	
Condition of Seat & Backwall	

VISUAL INSPECTION CHECK LIST
PARTY ORGANIZATION

PROJECT Halls Pond - South Dam DATE 2/27/81

TIME 10:00 a.m.

WEATHER Clear - windy - 40°

W.S.Elev. 514.0 U.S. None DN.S.

PARTY:

1. G. Mirtl, Hydrology & Hydraulics
2. E. Lang, Structural & Mechanical
3. S. Marniki, Soils & Geology
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

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

PERIODIC INSPECTION CHECK LIST

PROJECT Halls Pond - South DATE 2/27/81

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITION
DIKE EMBANKMENT	
Crest Elevation	517.5
Current Pool Elevation	514.0
Maximum Impoundment to Date	Unknown
Surface Cracks	None
Pavement Condition	Good
Movement or Settlement of Crest	None
Lateral Movement	None
Vertical Alignment	Good
Horizontal Alignment	Good
Condition at Abutment and at Concrete Structures	N/A
Indications of Movement of Structural Items on Slopes	N/A

PERIODIC INSPECTION CHECK LIST

PROJECT Halls Pond - South DATE 2/27/81

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITION
DIKE EMBANKMENT (cont)	
Trespassing on Slopes	Fisherman on U.S. slope
Sloughing or Erosion of Slopes or Abutments	Some erosion U.S. from wave acti
Rock Slope Protection - Riprap Failures	Some riprap missing above normal water level U.S.
Unusual Movement or Cracking at or near Toes	None
Unusual Embankment or Downstream Seepage	Some seepage west end at base of slope
Piping or Boils	None
Foundation Drainage Features	Toe Drain
Toe Drains	Appear to be operating
Instrumentation System	None
Vegetation	Small brush both sides

PERIODIC INSPECTION CHECK LIST

PROJECT Halls Pond - South DATE 2/27/81

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITION
OUTLET WORKS - INTAKE CHANNEL AND INTAKE STRUCTURE	N/A
a. Approach Channel	
Slope Conditions	
Bottom Conditions	
Rock Slides or Falls	
Log Boom	
Debris	
Condition of Concrete Lining	
Drains or Weep Holes	
b. Intake Structure	
Condition of Concrete	
Stop Logs and Slots	

PERIODIC INSPECTION CHECK LIST

PROJECT Halls Pond - South DATE 2/27/81

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITION
OUTLET WORKS - TRANSITION AND CONDUIT	N/A
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 Halls Pond - South DATE 2/27/81

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITION
OUTLET WORKS - CONTROL TOWER	N/A
a. Concrete and Structural	
General Condition	
Condition of Joints	
Spalling	
Visible Reinforcing	
Rusting or Staining of Concrete	
Any Seepage or Efflorescence	
Joint Alignment	
Unusual Seepage or Leaks in Gate Chamber	
Cracks	
Rusting or Corrosion of Steel	

PERIODIC INSPECTION CHECK LIST

PROJECT Halls Pond - South DATE 2/27/81

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITION
OUTLET WORKS - CONTROL TOWER (cont)	N/A
b. Mechanical and Electrical	
Air Vents	
Float Wells	
Crane Hoist	
Elevator	
Hydraulic System	
Service Gates	
Emergency Gates	
Lightning Protection System	
Emergency Power System	
Wiring and Lighting System	

PERIODIC INSPECTION CHECK LIST

PROJECT Halls Pond - South DATE 2/27/81

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITION
OUTLET WORKS - OUTLET STRUCTURE AND OUTLET CHANNEL	N/A
General Condition of Concrete	
Rust or Staining	
Spalling	
Erosion or Cavitation	
Visible Reinforcing	
Any Seepage or Efflorescence	
Condition at Joints	
Drain Holes	
Channel	
Loose Rock or Trees Overhanging Channel	
Condition of Discharge Channel	

PERIODIC INSPECTION CHECK LIST

PROJECT Halls Pond - South DATE 2/27/81

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITION
OUTLET WORKS - SPILLWAY WEIR, APPROACH AND DISCHARGE CHANNELS	N/A
a. Approach Channel	
General Condition	
Loose Rock Overhanging Channel	
Trees Overhanging Channel	
Floor of Approach Channel	
b. Weir and Training Walls	
General Condition of Concrete	
Rust of Staining	
Spalling	
Any Visible Reinforcing	
Any Seepage or Efflorescence	

PERIODIC INSPECTION CHECK LIST

PROJECT Halls Pond - South DATE 2/27/81

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITION
OUTLET WORKS - SPILLWAY WEIR, APPROACH AND DISCHARGE CHANNELS	N/A
b. Weir and Training Walls	
Drain Holes	
c. Discharge Channel	
General Condition	
Loose Rock Overhanging Channel	
Trees Overhanging Channel	
Floor of Channel	
Other Obstructions	

PERIODIC INSPECTION CHECK LIST

PROJECT Halls Pond - South DATE 2/27/81

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITION
OUTLET WORKS - SERVICE BRIDGE	N/A
a. Super Structure	
Bearings	
Anchor Bolts	
Bridge Seat	
Longitudinal Members	
Under Side of Deck	
Secondary Bracing	
Deck	
Drainage System	
Railings	
Expansion Joints	
Paint	

PERIODIC INSPECTION CHECK LIST

PROJECT Halls Pond - South DATE 2/27/81

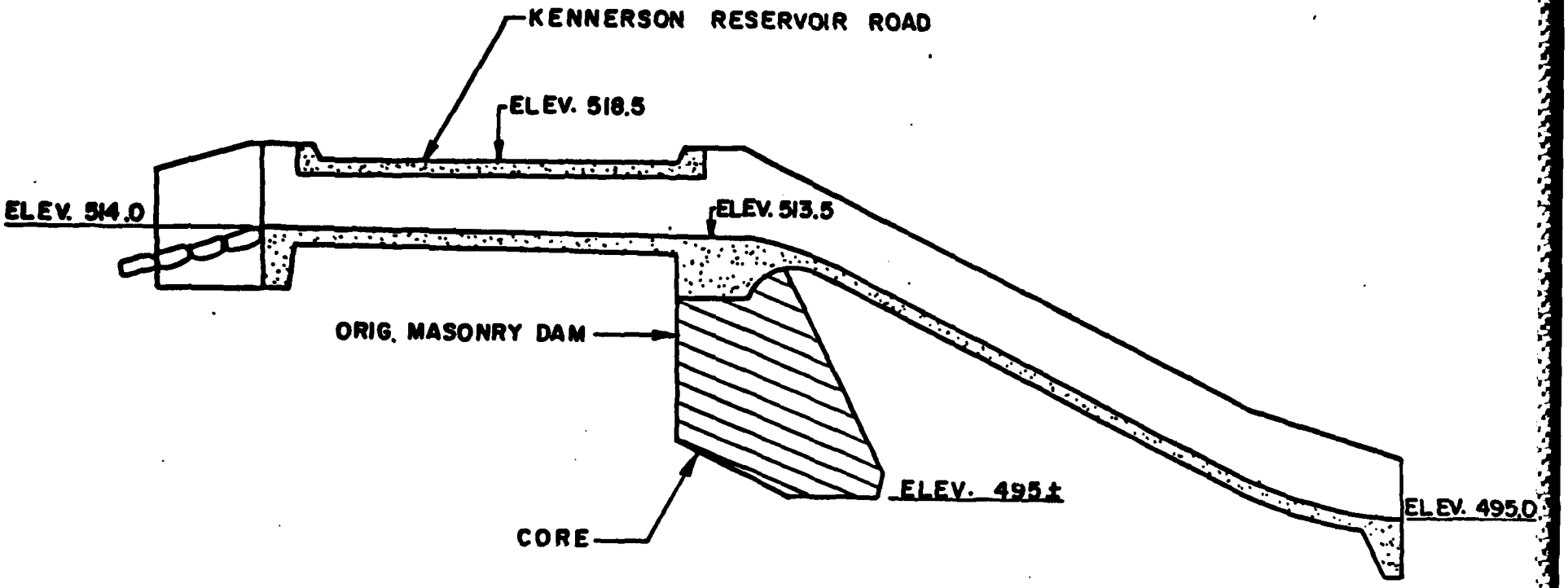
PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITION
OUTLET WORKS - SERVICE BRIDGE (cont)	N/A
b. Abutment & Piers	
General Condition of Concrete	
Alignment of Abutment	
Approach to Bridge	
Condition of Seat & Backwall	

APPENDIX B

ENGINEERING DATA

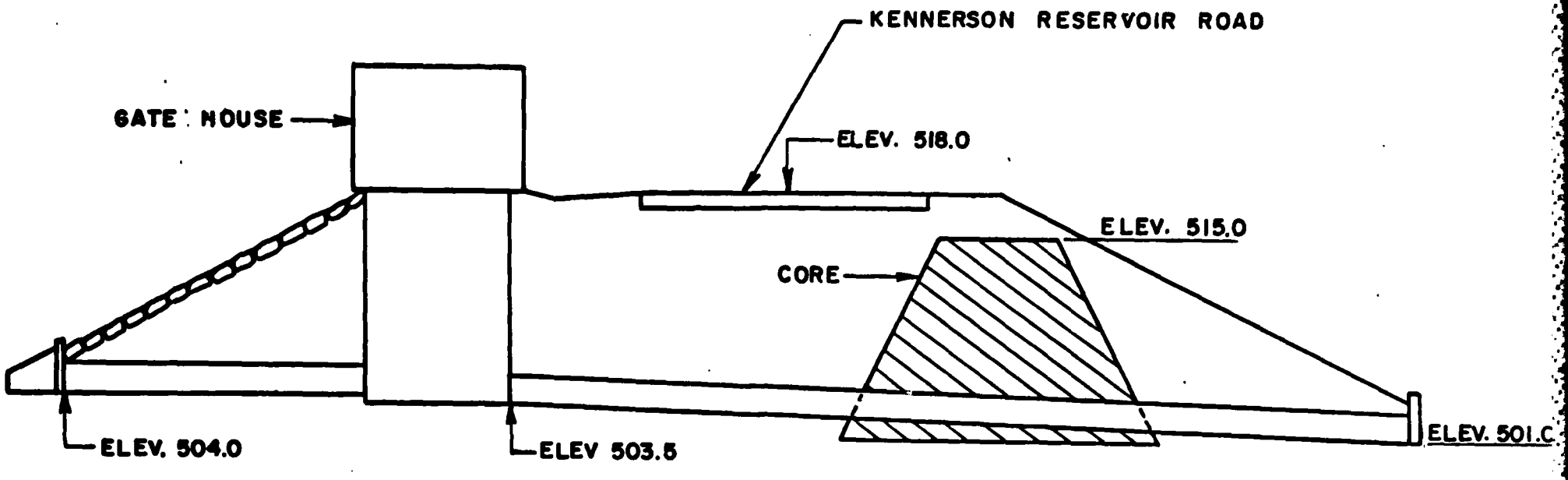


HALLS POND
NORTH DAM

SECTION AT SPILLWAY

SCALE: 1"= 10'

PLATE B-2

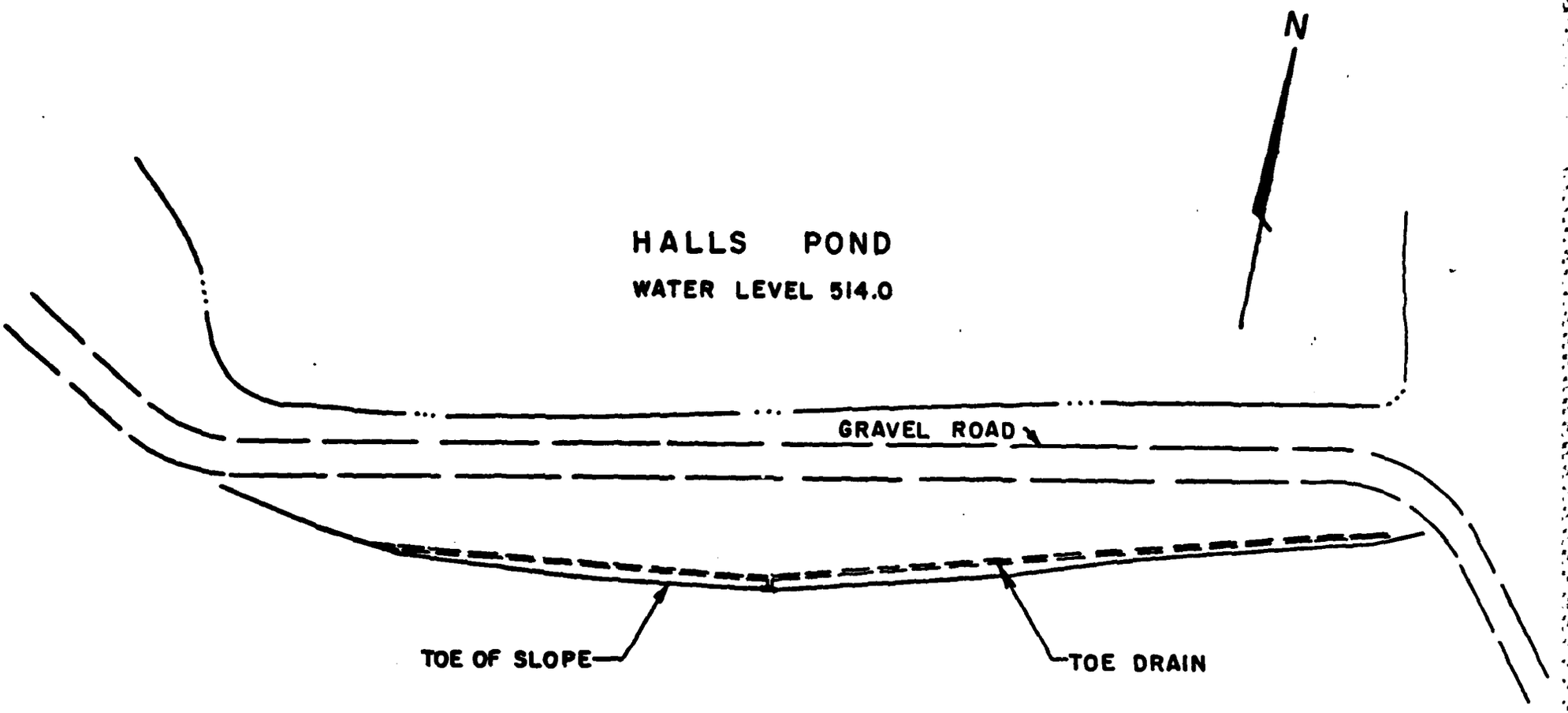


HALLS POND

SECTION AT OUTLET WORKS

SCALE: 1"= 10'

PLATE B-3



HALLS POND
SOUTH DAM

PLAN

SCALE: 1" = 40'

PLATE B-4

No. ——

Inventoried By _____

Date _____

WATER RESOURCES UNIT
SUPERVISION OF DAMS
INVENTORY DATA

north dam: Lat: 41° 50.6'
Long: 72° 6.4'
south dam: Lat: 41° 50.2'
Long: 72° 6.5'

Name of Dam or Pond HALLS POND (North Dam - (2) dams)

Code No. _____

Nearest Street Location _____

Town Eastford

U.S.G.S. Quad. Hampton

Name of Stream Slovik Branch

Owner State of Connecticut

Address DEP

rebuilt 1968 South Chaplin

Pond Used For _____ Drainage Area 1.23 sq.mi.

Dimensions of Pond: Width _____ Length _____ Area 82.3

Total Length of Dam n=400' s=450' Length of Spillway 19'

Location of Spillway _____

Height of Pond Above Stream Bed 16' north none=south

Height of Embankment Above Spillway 5' north

Type of Spillway Construction concrete (north)

Type of Dike Construction earth (s) earth cover with riprap (n)

Downstream Conditions woods, pond, road south
woods, farm, road north

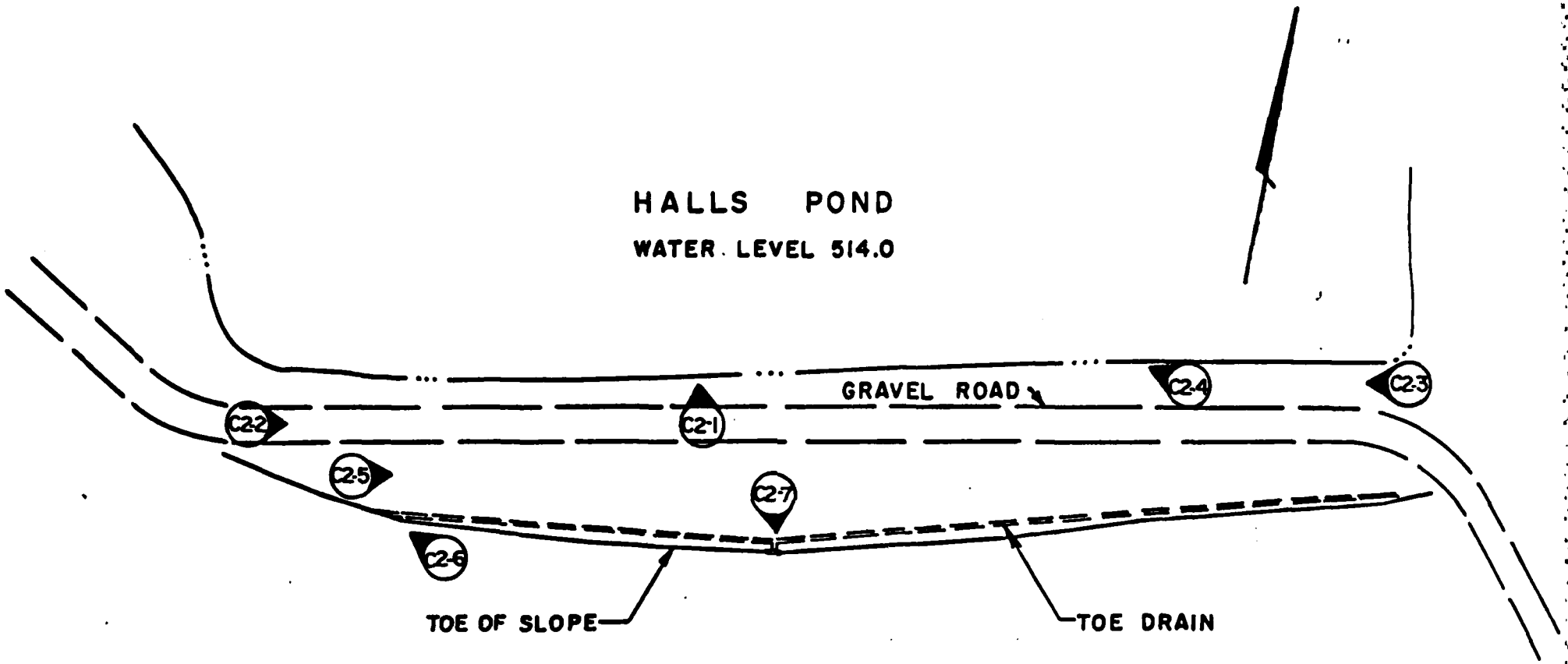
Summary of File Data F & G asked to repair leak Feb. 63; modifications under design March 62

Remarks 10/20/78 This dam appeared in good condition. The north dam is in good condition and is riprapped on the upstream face. Kennersen Road serves as the north dam and is in good condition. The concrete spillway is also in good condition. PB

Would Failure Cause Damage? YES Class C

APPENDIX C

PHOTOGRAPHS



HALLS POND
SOUTH DAM

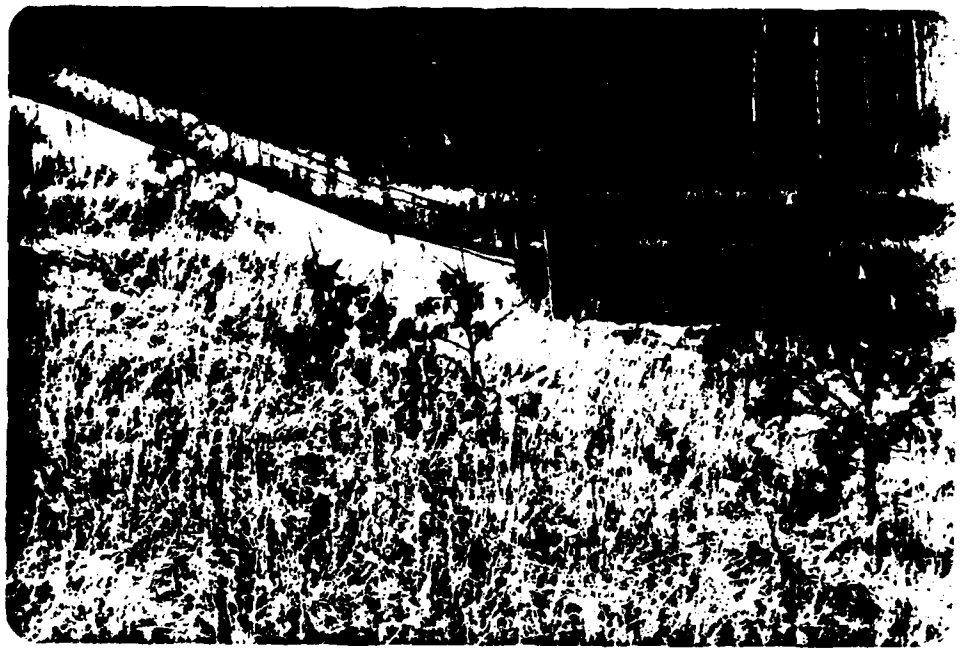
PLAN

SCALE: 1" = 40'

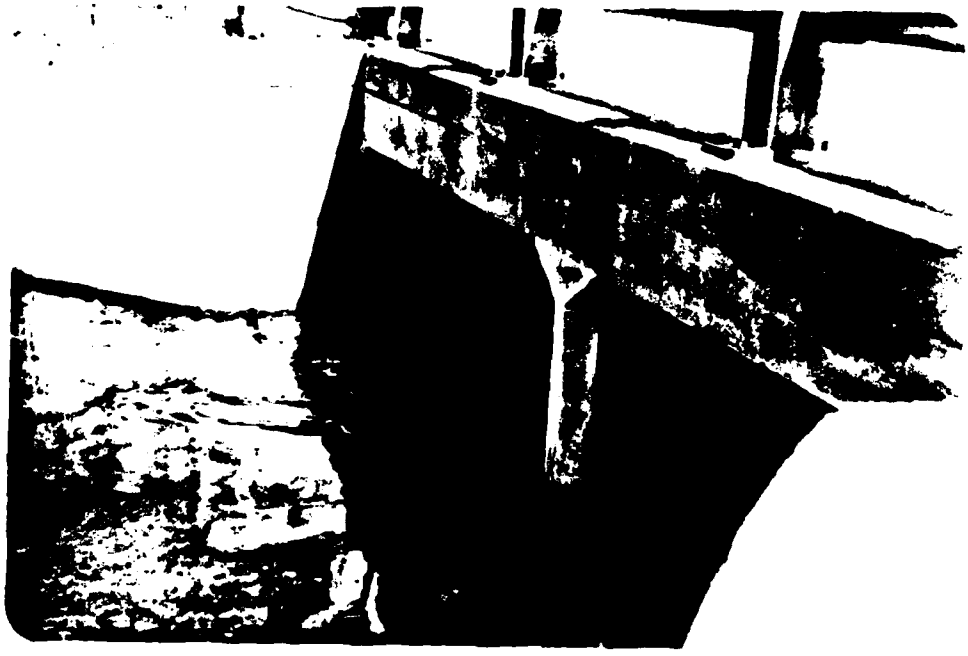
PHOTO INDEX

C1-1 UPSTREAM SLOPE

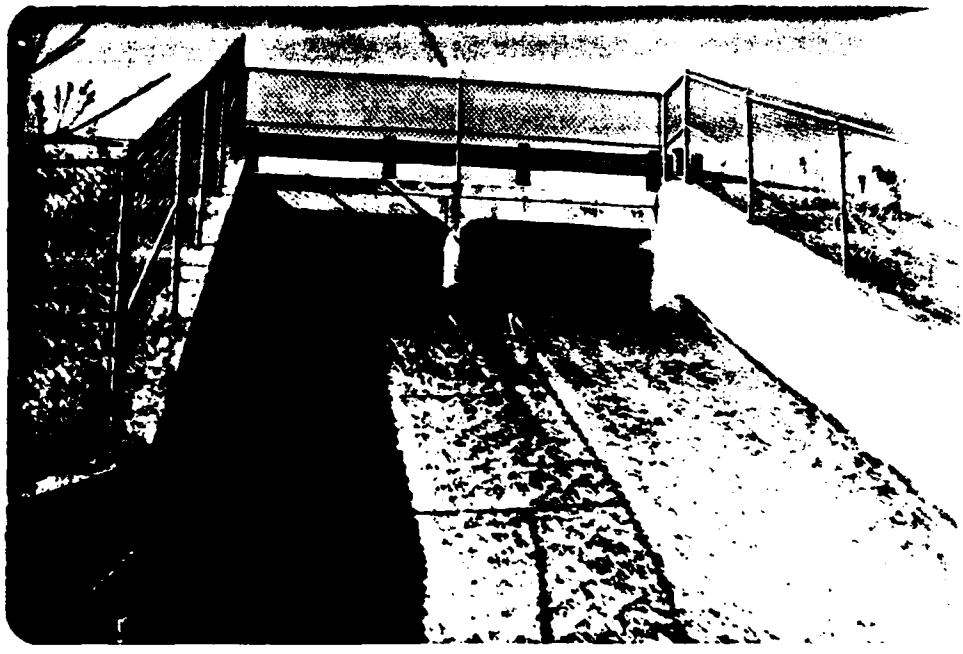
C1-2 DOWNSTREAM SLOPE



C1-3 DOWNSTREAM SLOPE AT SPILLWAY

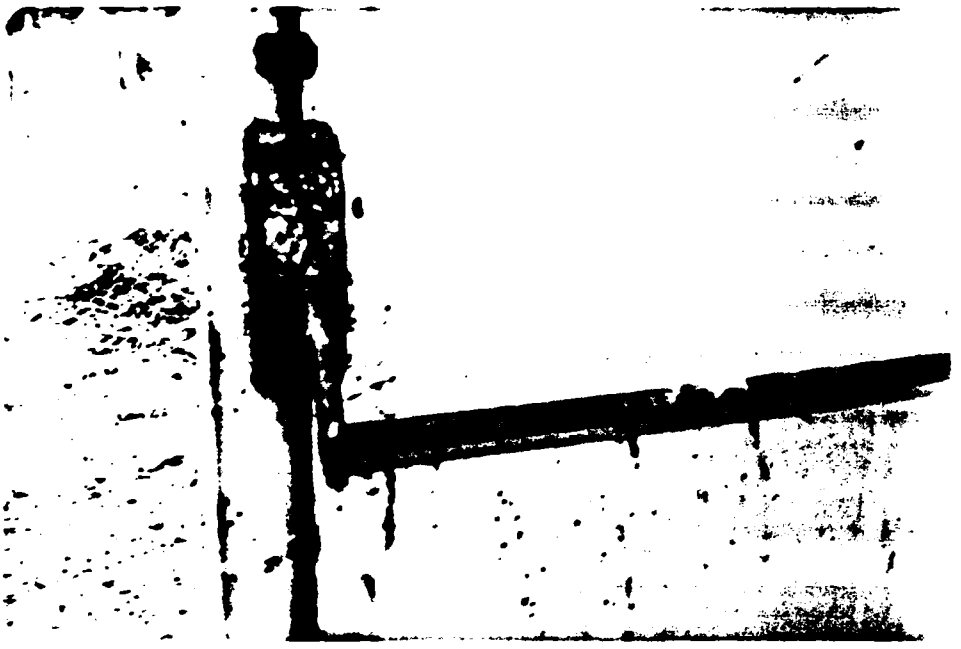


C1-4 UPSTREAM END OF SPILLWAY

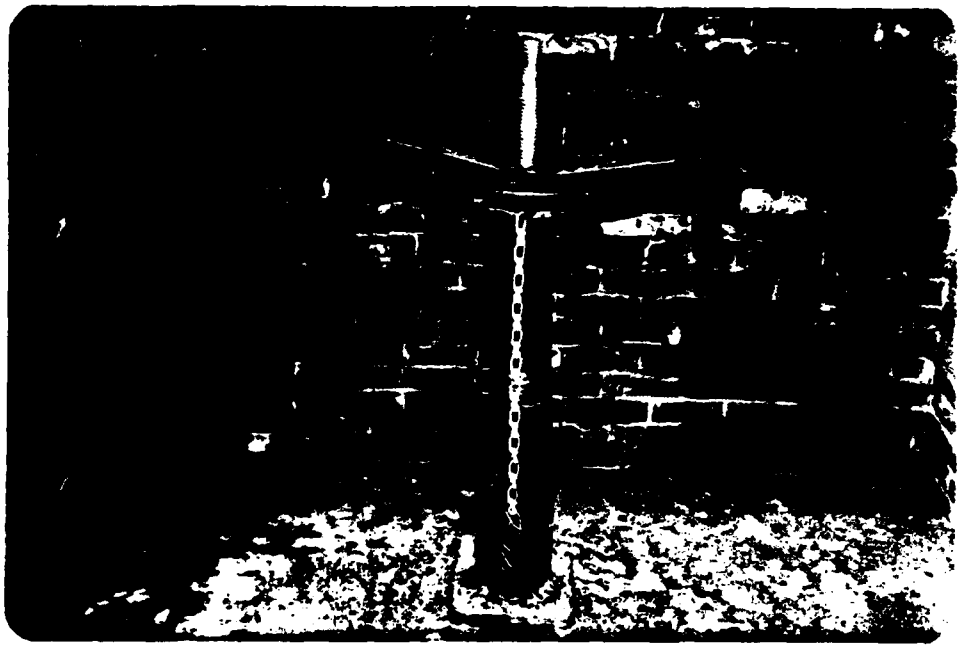


C1-5 DOWNSTREAM END OF SPILLWAY

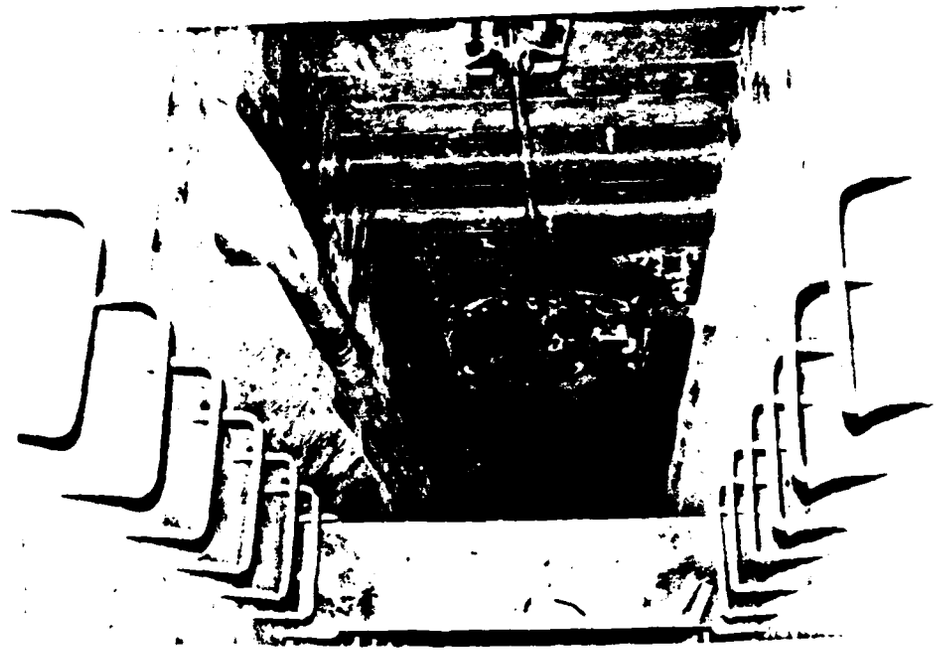
C1-6 GATEHOUSE



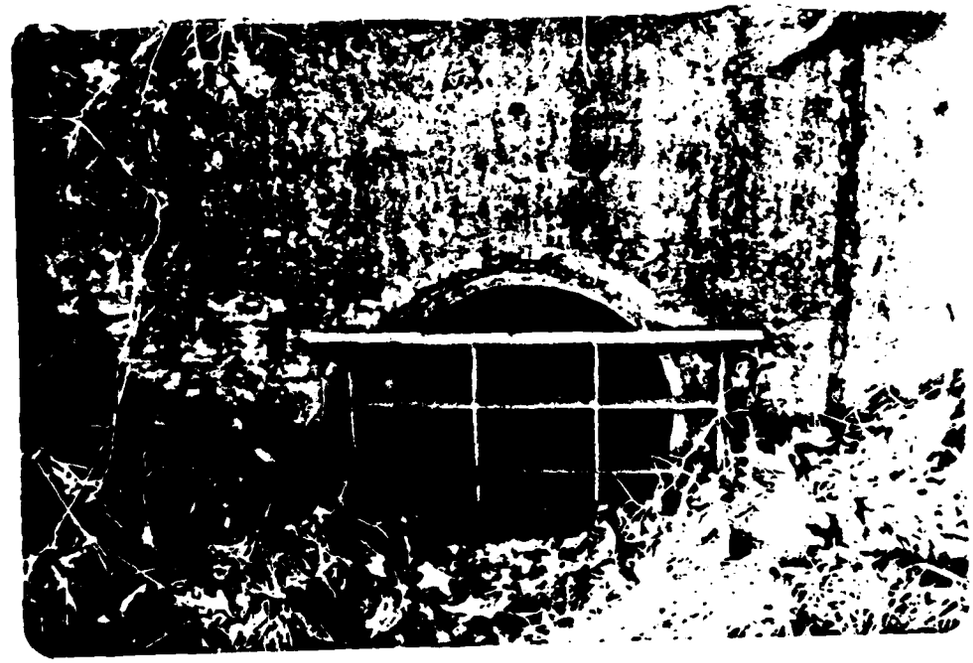
C1-7 GATEHOUSE DOOR LATCH



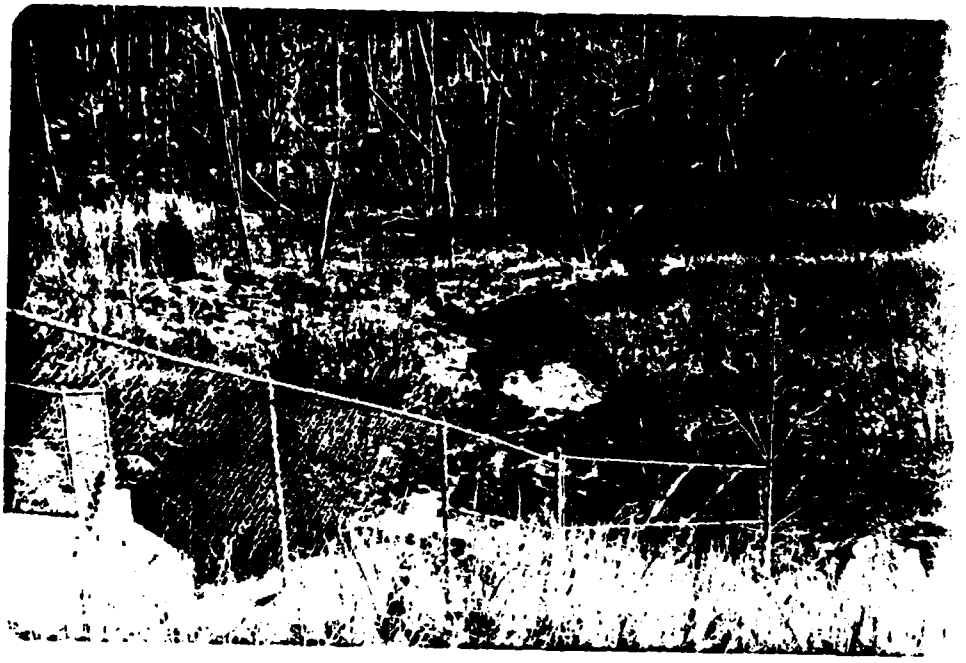
C1-8 GATE CONTROL WHEEL



C1-9 GATE PIT



C1-10 OUTLET CONDUIT



C1-11 DOWNSTREAM CHANNEL

C2-1 POND LOOKING NORTH

C2-2 DIKE CREST

C2-3 UPSTREAM FACE

C2-4 MISSING RIPRAP ON UPSTREAM FACE

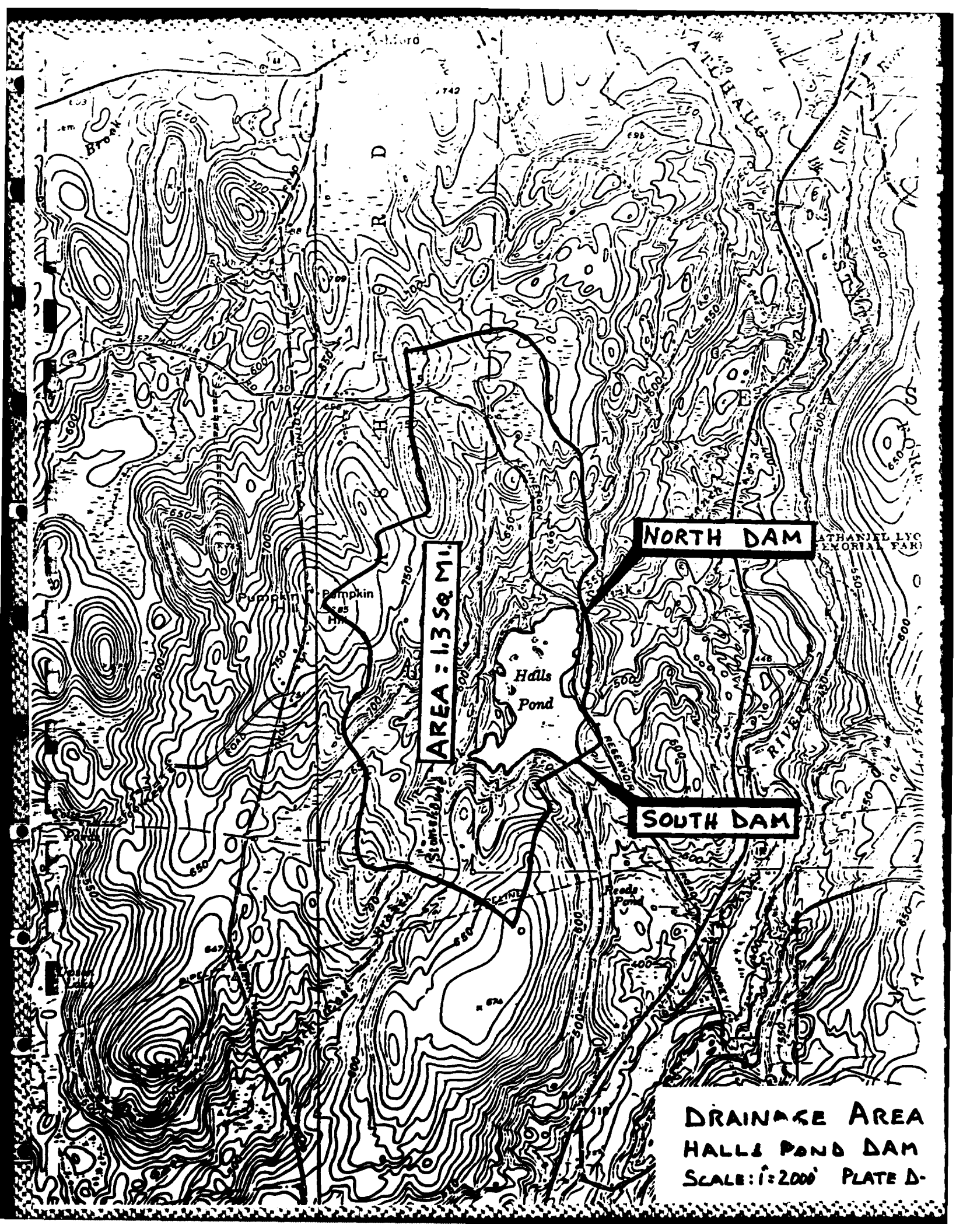
C2-5 DOWNSTREAM FACE

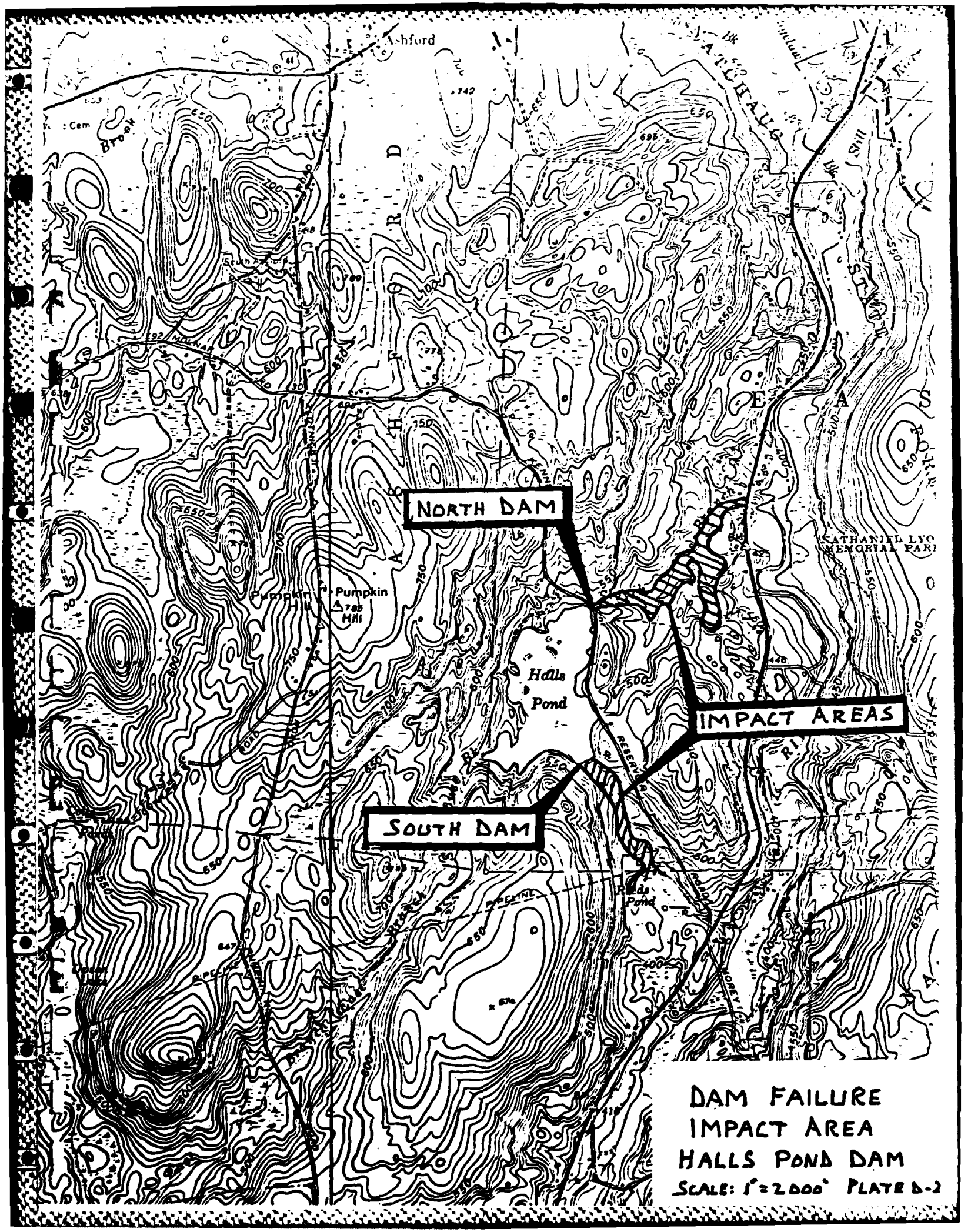
C2-6 SEEPAGE ON DOWNSTREAM FACE

C2-7 DOWNSTREAM CHANNEL

APPENDIX D

HYDROLOGIC AND HYDRAULIC COMPUTATIONS


NORTH DAM
SOUTH DAM
AREA = 1.3 Sq Mi.
Halls Pond
Pumpkin Hill
Reeds Pond
DRAINAGE AREA
HALLS POND DAM
SCALE: 1" = 2000' PLATE D-


NORTH DAM
SOUTH DAM
IMPACT AREAS
Halls Pond
Pumpkin Hill
Pumpkin Hill 785
Ashford
Halls Pond
DAM FAILURE
IMPACT AREA
HALLS POND DAM
SCALE: 1"=2000' PLATE D-2

FUSS&O'NEILL consulting engineers

PREPARED BY	DATE	CHECKED BY	DATE	PROJECT NO
GJM	4/13/81			80-157

SUBJECT: Hydrologic & Hydraulic Computations – Halls Pond

SHEET NO. 1 of 14

Watershed Slope – Rolling

Storage Volume:

Surface Area at Spillway Elev. = 82.3 Ac.
Ave. Depth = 6.7 Ft.
Volume = 82.3 x 6.7 = 550 Ac. Ft.

Depth from Spillway to Top of Dam = 4.0'
Volume = 85 x 4.5 = 340 Ac. Ft.

Total Storage = 890 Ac.-Ft.

Size Classification = Small

Use 100 yr. Frequency Storm For Test Flood

Following Information Developed For 1968 Reconstruction of Dam:

Drainage Area = 820. Ac.
Time of Concentration = 85 Min.
Runoff Coefficient = 0.34

From Conn. D.O.T. Drainage Manual

100 yr. Rainfall = 2.0"/hr.

Q_{100} = 820 x 0.34 x 2.0

= 560 c.f.s.

Effect of Surcharge Storage

Ungated Spillway = Twin 9' Wide Box Culvert with Height = 4.3' at Entrance

Use Inlet Control For Capacity with Invert = Elev. 514.

Gated Outlet = 24" RCP with "U" Endwall
Invert = 504.0 at Intake

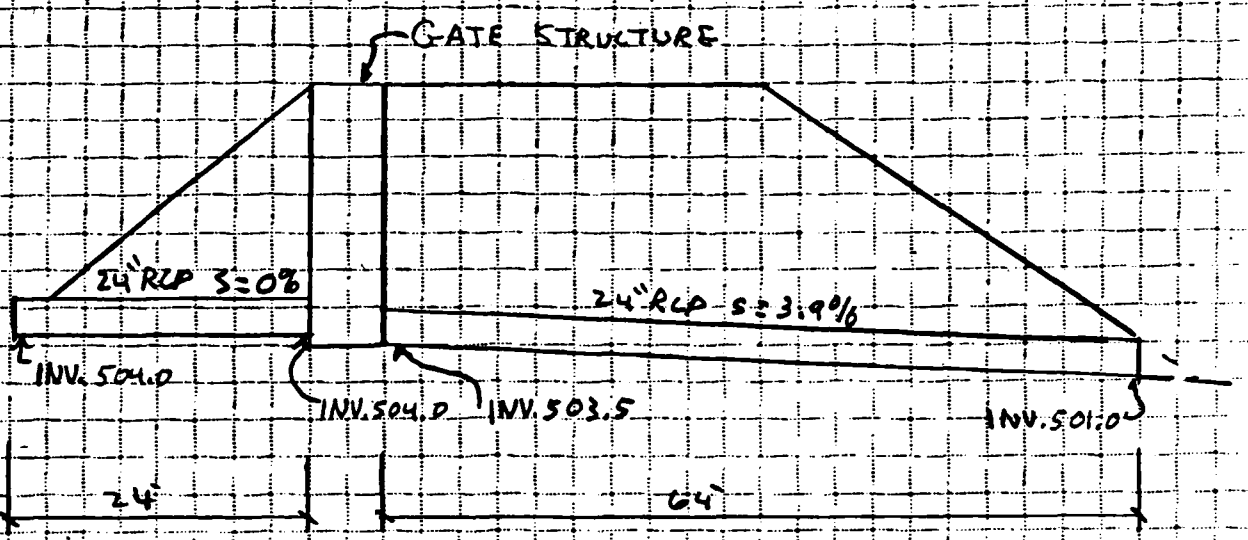
Invert = 503.5 at Outlet from Gate Structure

FUSS&O'NEILL consulting engineers

PREPARED BY	DATE	CHECKED BY	DATE	PROJECT NO.
GJM	4/13/81			80-157

SUBJECT: Hydrologic & Hydraulic Computations – Halls Pond

SHEET NO. 2 of 14



For Capacity use Orifice Equation for Inlet from Lake with coefficient as developed in King & Brater's Handbook of Hydraulics Page 4-23. Use Inlet Control for outlet pipe from Gate Structure.

At Elev. 517.5, the south dike will be topped at Elev. 518.0 the north dike will be topped

South Dike Length = 250' C = 2.60

$Q = CLH^{3/2} = 250 \times 2.60 \times H^{3/2} = 650 H^{3/2}$

North Dike Length = 250' C = 2.40 (Fence obstructions)

$Q = 600 H^{3/2}$

Summary of Discharge Flows

ELEV	Ungated Structure	Gated Structure	South Dike Overflow	North Dike Overflow	Total
516.0	170 cfs	40	0	0	210
517.0	280	40	0	0	320
518.0	430	40	230	0	700
518.5	500	50	650	210	1410
519.0	560	50	1190	600	2400

Q_{P_1} = 560 cfs

Surcharge Height to pass Q_{P_1} = 517.6 (3.6')

Volume of Surcharge = $STOR_1$ = 85 Ac. x 3.6 = 306.0 Ac. Ft.

Drainage Area = 1.3 Sq. Mi. = 830 Ac.

306 ÷ 830 x 12 = 4.4 in. Runoff

100 Year Runoff = 5.2"

$Q_{P_2} = 560\left(1 - \frac{4.4}{5.2}\right) = 90$ cfs

Surcharge Height to pass Q_{P_2} = 514.9 (0.9')

Volume of Surcharge = $STOR_2$ = 85 x 0.9 = 76.5 Ac. Ft.

76.5 ÷ 830 x 12 = 1.1" Runoff

Ave. $STOR_1$ & $STOR_2$ = (306 + 76.5) ÷ 2 = 191 Ac. Ft.

Surcharge = 2.3' (Elev. 516.3)

Q_{P_3} = 243 cfs

FUSS&O'NEILL consulting engineers

PREPARED BY	DATE	CHECKED BY	DATE	PROJECT NO.
GSM	3/28/81			80-157

SUBJECT: Dam Failure Hydrograph - Halls Pond South

STAGE - DISCHARGE

STATION	SLOPE	n	ELEVATION	AREA	Q
1+0	1.0%	.100	510	650	2,100
			515	1960	9,600
			520	3910	24,800
5+0	6.7%	.100	500	620	3,800
			505	2320	30,600
10+0	2.6%	.100	475	650	4,400
			480	1450	14,100
15+0	3.1%	.100	460	270	900
			465	1370	11,000
20+0	2.6%	.100	440	300	950
			445	1800	11,900
25+0	0.8%	.060	426	240	500
			430	2200	10,600

FUSS&O'NEILL consulting engineers

PREPARED BY	DATE	CHECKED BY	DATE	PROJECT #
GJM	3/27/81			80-15

SUBJECT: Dam Failure Hydrograph – Halls Pond South

SHEET NO. 5 of 14

Storage = S = 550 Ac.Ft

Top of Dam Elev. = 517.5

Riverbed Elev. at Sta. 1+0 = 503.5 ℄ Dam = 0+0

Dam Length at Mid-Height = 260'

260 x .40 = 104' = Breach Width = W_b

Y_o = 14'

$Q_{p_1} = 8/27\ W_b \sqrt{g}\ Y_o^{3/2}$

= 9,200 cfs

STA. 1+00

Stage = 514.7

Area = 1890 S.F.

Vol = 4 Ac.Ft.

Q_{p_2} Trial = $9200\left(1-\frac{4}{550}\right)$ = 9,100 c.f.s.

Stage = 514.7

Area = 1870 S.F.

Vol = 4 Ac.Ft.

Q_{p_2} = 9,100 cfs

Stage = 514.7

Depth = 11.2'

STA. 5+0

Q_{p2} = 9,100 cfs
Streambed Elev. = 496
S = 550 - 4 = 546 Ac.Ft

Stage = 501.0
Area = 960 S.F.
Vol. = 9 Ac.Ft.

Q_{p3} Trial: $9{,}100\left(1-\frac{9}{546}\right) = 9{,}000$ cfs

Stage = 501.0
Area = 950
Vol. = 9 Ac.Ft

Q_{p3} = 9000 cfs

Stage = 501.0

Depth = 5.0'

STA. 10+0

Q_{p3} = 9,000 cfs
Streambed Elev = 468
S = 546 - 9 = 537 Ac.Ft

Stage = 477.4
Area = 1030 S.F.
Vol = 12 Ac.Ft

Q_{p4} Trial: $9{,}000\left(1-\frac{12}{537}\right) = 8{,}800$ cfs

Stage = 477.3
Area = 1019 S.F.
Vol. = 12 Ac.Ft

Q_{p4} = 8,800 cfs

Stage = 477.3

Depth = 9.3'

FUSS&O'NEILL consulting engineers

PREPARED BY	DATE	CHECKED BY	DATE	PROJECT
GJM	3/22/01			80-15

SUBJECT: Dam Failure Hydrography - Halls Pond South

SHEET N 7 of 1

STA. 15+0

Q_{P4} = 8800 cfs
Streambed Elev. = 457
S = 537 - 12 = 525 Ac. Ft.

Stage = 463.9
Area = 1130 S.F.
Vol. = 13 Ac. Ft.

Q_{P5} Trial = $8800\left(1-\frac{13}{525}\right)$ = 8600 cfs

Stage = 463.8
Area = 1110 S.F.
Vol. = 13 Ac.

Q_{P5} = 8,600 cfs
Stage = 463.8

Depth = 6.8'

STA. 20+0

Q_{P5} = 8,600 cfs
Streambed Elev = 437
S = 525 - 13 = 512 Ac. Ft.

Stage = 443.5
Area = 1350 S.F.
Vol = 15 Ac. Ft.

Q_{P6} Trial = $8600\left(1-\frac{15}{512}\right)$ = 8300 cfs

Stage = 443.4
Area = 1310 S.F.
Vol. = 15 Ac. Ft.

Q_{P6} = 8,300 cfs

Stage = 443.4'

Depth = 6.4'

FUSS&O'NEILL consulting engineers

PREPARED BY	DATE	CHECKED BY	DATE	PROJECT
GJM	3/23/81			80-157

SUBJECT: Dam Failure Hydrograph - Halls Pond South

SHEET NO 8 of 14

STA. 25+0

Q_{P6} = 8,300 cfs
Streambed Elev. = 425
S = 512 - 15 = 497 Ac. Ft

Stage = 429.1
Area = 1750 S.F.
Vol. = 20 Ac. Ft

Q_{P7} Trial = $8300\left(1-\frac{20}{497}\right)$ = 8000 cfs

Stage = 429.0
Area = 1700 S.F.
Vol. = 20 Ac. Ft.

Q_{P7} = 8000 cfs

Stage = 429.0

Depth = 4.0' < 5'

FUSS&O'NEILL consulting engineers

PREPARED BY	DATE	CHECKED BY	DATE	PROJECT NO
GJM	3/30/81			80-157

SUBJECT: Dam Failure Hydrograph - Halls Pond North

STAGE - DISCHARGE

STATION	SLOPE	n	ELEVATION	AREA	Q
0+70	1.375%	.100	505	1930	12,000
			510	3510	28,700
5+0	5.0%	.100	485	450	3,400
			490	1260	14,400
10+0	2.6%	.100	465	1350	12,400
			470	3880	36,800
15+0	0.66%	.100	455	1200	3,900
			460	2880	13,100
			465	5130	29,600
20+0	0.66%	.100	450	560	1,200
			455	1920	7,700
			460	3720	20,100
25+0	0.66%	.100	450	670	2,200
			455	1520	7,400
			460	2540	15,600
30+0	2.0%	.100	440	350	1,700
			445	1100	7,300
			450	2350	19,700
35+0	6.7%	.080	420	450	5,900
			425	1100	19,300
37+0	2.6%	.040	410	120	800
			415	860	13,800

FUSS&O'NEILL consulting engineers

PREPARED BY	DATE	CHECKED BY	DATE	PROJECT NO
GJM	3/18/81			80-157

SUBJECT: Dam Failure Hydrograph - Halls Pond North

SHEET NO. 10 of 14

Storage: S = 550 Ac.Ft.

Top of Dam Elev. = 518.0

Riverbed Elev. at Sta. 0+70 (& Dam = 0+0) = 494.5

Dam Length at Mid-Height = 185'

185 x .40 = 74' = Breach Width = W_b

Y_o = 23.5'

$Q_{p1} = 8/27\ W_b \sqrt{g}\ Y_o^{3/2}$

= 14,200 cfs

STA. 0+70

Stage = 505.7

Area = 2140 S.F.

Vol. = 3 Ac. Ft.

Q_{p2} Trial = $14,200 \left(1 - \frac{3}{550}\right)$ = 14,100 cfs

Stage = 505.6

Area = 2130 S.F.

Vol. = 3 Ac. Ft.

$Q_{p2} = 14,200 \left(1 - \frac{3}{550}\right)$ = 14,100 cfs

Stage = 505.6

Depth = 11.1'

FUSS&O'NEILL consulting engineers

PREPARED BY	DATE	CHECKED BY	DATE	PROJECT
GJM	3/31/81			80-15

SUBJECT: Dam Failure Hydrograph - Halls Pond North

SHEET N 11 of 1

STA. 5+0

$Q_{p2} = 14,100$ cfs
Streambed Elev. = 480
S = 550 - 3 = 547 Ac. Ft.

Stage = 489.9
Area = 1240 S.F.
Vol. = 12 Ac. Ft.

Q_{p3} Trial $= 14,100 \left(1 - \frac{12}{547}\right) = 13,800$ cfs

Stage = 489.7
Area = 1220 S.F.
Vol. = 13 Ac. Ft.

$Q_{p3} = 14,100 \left(1 - \frac{13}{547}\right) = 13,800$

Stage = 489.7

Depth = 9.7'

STA. 10+0

$Q_{p3} = 13,800$ cfs
Streambed Elev. = 456
S = 547 - 13 = 534 Ac. Ft.

Stage = 465.3
Area = 1870 S.F.
Vol = 21 Ac. Ft.

Q_{p4} Trial $= 13,800 \left(1 - \frac{21}{534}\right) = 13,300$ cfs

Stage = 465.2
Area = 1830 S.F.
Vol. = 21 Ac. Ft.

$Q_{p4} = 13,300$ cfs

Stage = 465.2

Depth = 9.2'

FUSS&O'NEILL consulting engineers

PREPARED BY	DATE	CHECKED BY	DATE	PROJECT
GJM	3/30/81			80-15

SUBJECT: Dam Failure Hydrography - Halls Pond North

SHEET NO 12 of 14

STA. 15+0

Q_{P4} = 13,300 cfs
Streambed Elev. = 448
S = 539 - 21 = 513 Ac. Ft.

Stage = 460.1
Area = 2910
Vol. = 33 Ac. Ft.

Q_{P5} Trial: $13,300\left(1-\frac{33}{513}\right) = 12,400$ cfs

Stage = 459.6
Area = 2750 S.F.
Vol. = 32 Ac. Ft.

$Q_{P5} = 13,300\left(1-\frac{33}{513}\right) = 12,400$ cfs

Stage = 459.6

Depth = 11.6'

STA. 20+0

Q_{P5} = 12,400 cfs
Streambed Elev. = 445
S = 513 - 33 = 480 Ac. Ft.

Stage = 456.9
Area = 2600 S.F.
Vol = 30 Ac. Ft.

Q_{P6} Trial: $12,400\left(1-\frac{30}{480}\right) = 11,600$ cfs

Stage = 456.6
Area = 2499 S.F.
Vol. = 29 Ac. Ft.

Q_{P6} = 11,600 cfs

Stage = 456.6

Depth = 11.6'

FUSS&O'NEILL consulting engineers

PREPARED BY	DATE	CHECKED BY	DATE	PROJECT
GJM	3/30/81			80-157

SUBJECT: Dam Failure Hydrography - Halls Pond North

SHEET NO 13 of 14

STA. 25+0

Q_{P6} = 11,600 cfs
Streambed Elev. = 441
S = 480 - 30 = 450

Stage = 457.6
Area = 2050 S.F.
Vol. = 24 Ac.Ft.

Q_{P7} Trial = $11{,}600\left(1-\frac{24}{450}\right)$ = 11,000 cfs

Stage = 457.2
Area = 1980 S.F.
Vol. = 23 Ac.Ft.

Q_{P7} = 11,000 cfs

Stage = 457.2

Depth = 16.2'

STA. 30+0

Q_{P7} = 11,000 cfs
Streambed Elev. = 433
S = 450 - 24 = 426 Ac.Ft.

Stage = 446.5
Area = 1470 S.F.
Vol = 17 Ac.Ft.

Q_{P8} Trial = $11{,}000\left(1-\frac{17}{426}\right)$ = 10,600 cfs

Stage = 446.3
Area = 1430 S.F.
Vol. = 16 Ac.

Q_{P8} = 10,600 cfs

Stage = 446.3

Depth = 13.3'

FUSS&O'NEILL consulting engineers

PREPARED BY	DATE	CHECKED BY	DATE	PROJECT
GJM	3/30/81			80-157

SUBJECT: Dam Failure Hydrograph - Halls Pond North

STA. 35+0

Q_{pq} = 10,600 cfs
Streambed Elev. = 411
S = 420.17 = 409 Ac.Ft

Stage = 421.8
Area = 680 S.F.
Vol. = 8 Ac.Ft.

Q_{pq} Trial = $10,600\left(1-\frac{8}{409}\right)$ = 10,400 cfs

Stage = 421.7
Area = 670 S.F.
Vol. = 8 Ac.Ft

Q_{pq} = 10,400 cfs

Stage = 421.7

Depth = 10.7'

STA. 37+0

Q_{pq} = 10,400 cfs
Streambed Elev. = 405
S = 409.8 = 401 Ac.Ft

Stage = 413.7
Area = 670 S.F.
Vol = 3 Ac.Ft.

Q_{p10} Trial = $10,400\left(1-\frac{3}{401}\right)$ = 10,300 cfs

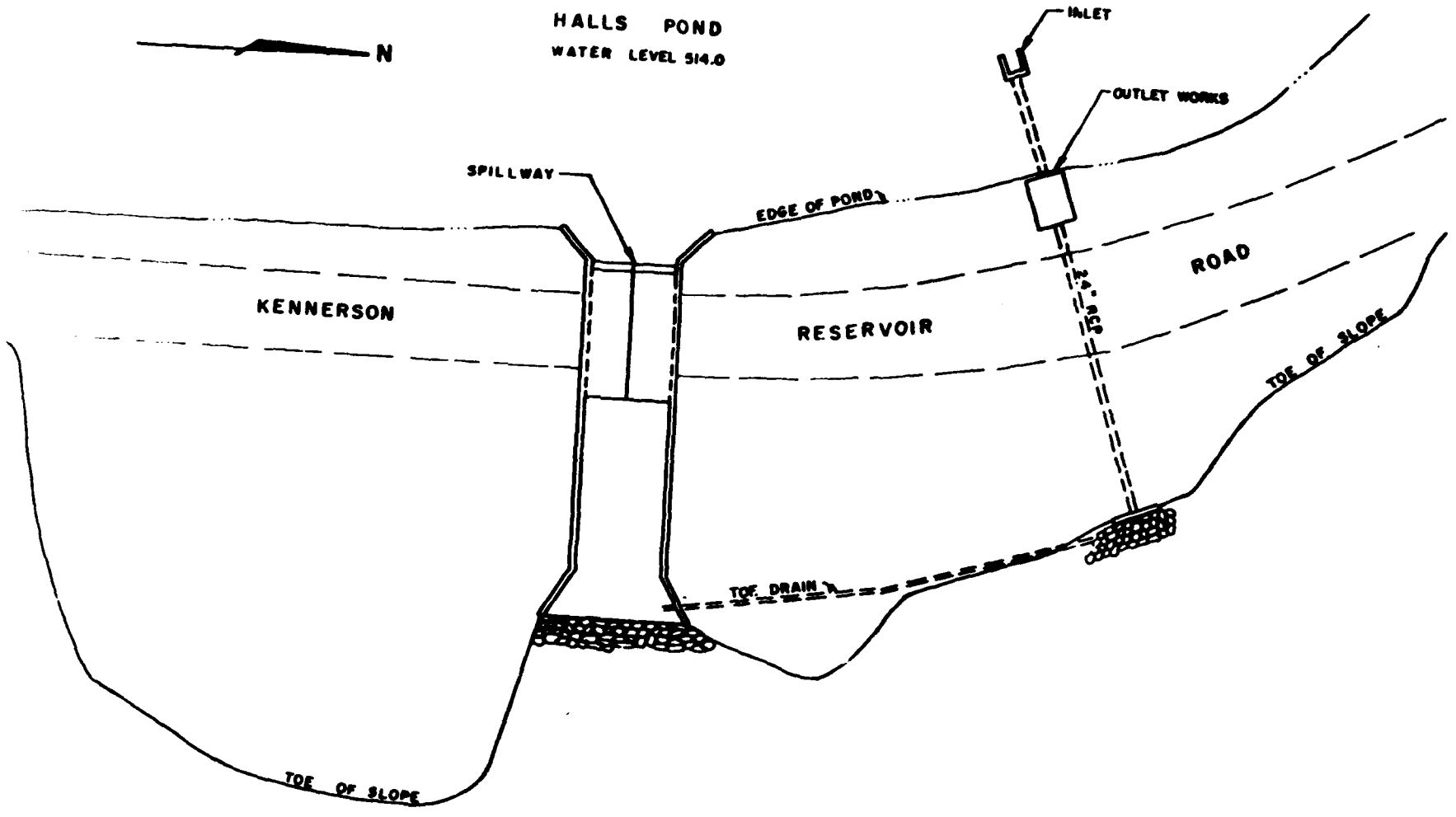
Stage = 413.6
Area = 660 S.F.
Vol. = 3 Ac.Ft.

Q_{p10} = 10,300 cfs

Stage = 413.6

Depth = 8.6'

Slovik Brook joins Natchaug River and discharges



HALLS POND
NORTH DAM

PLAN

SCALE 1"= 20' PLATE B-1

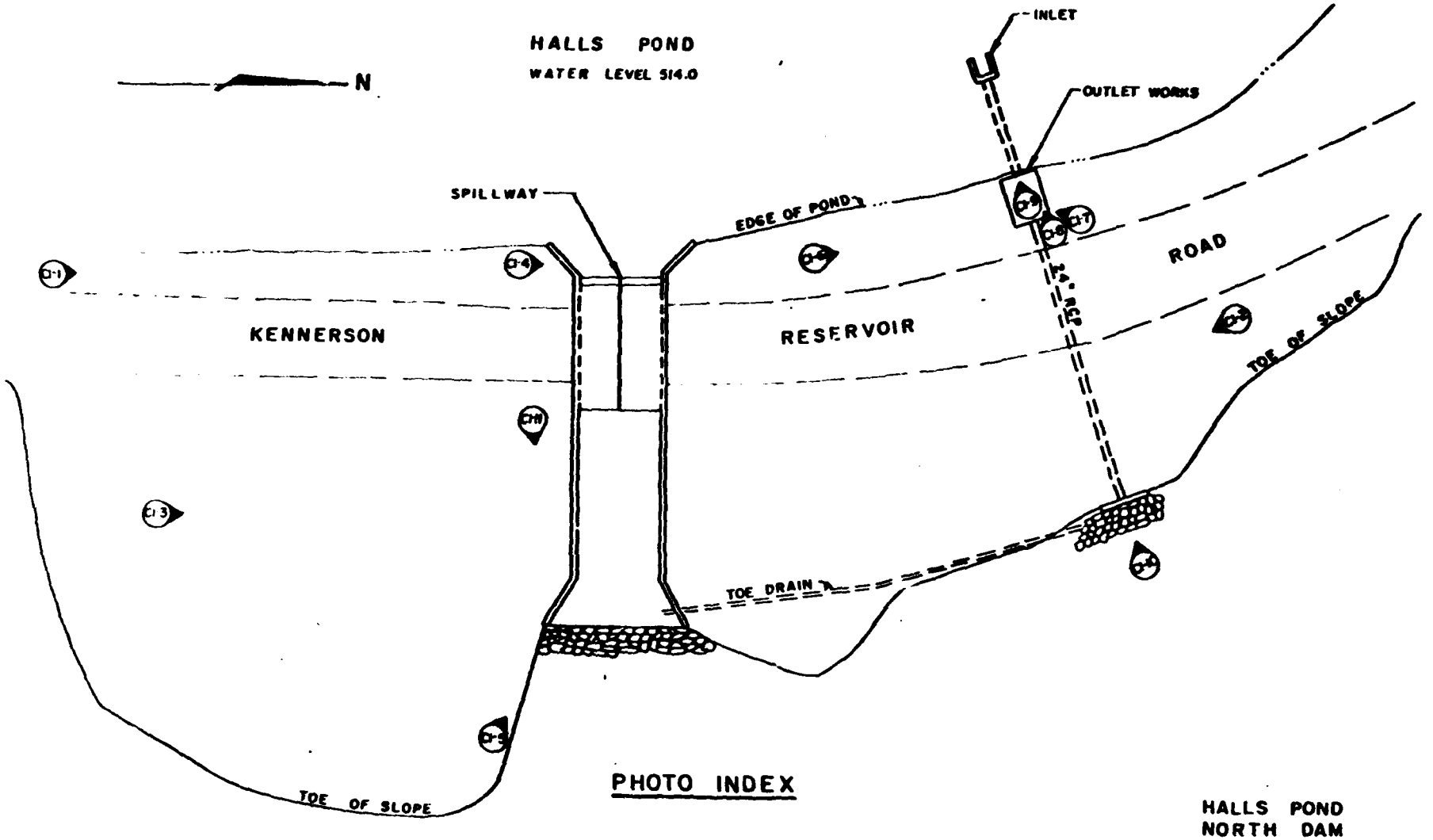
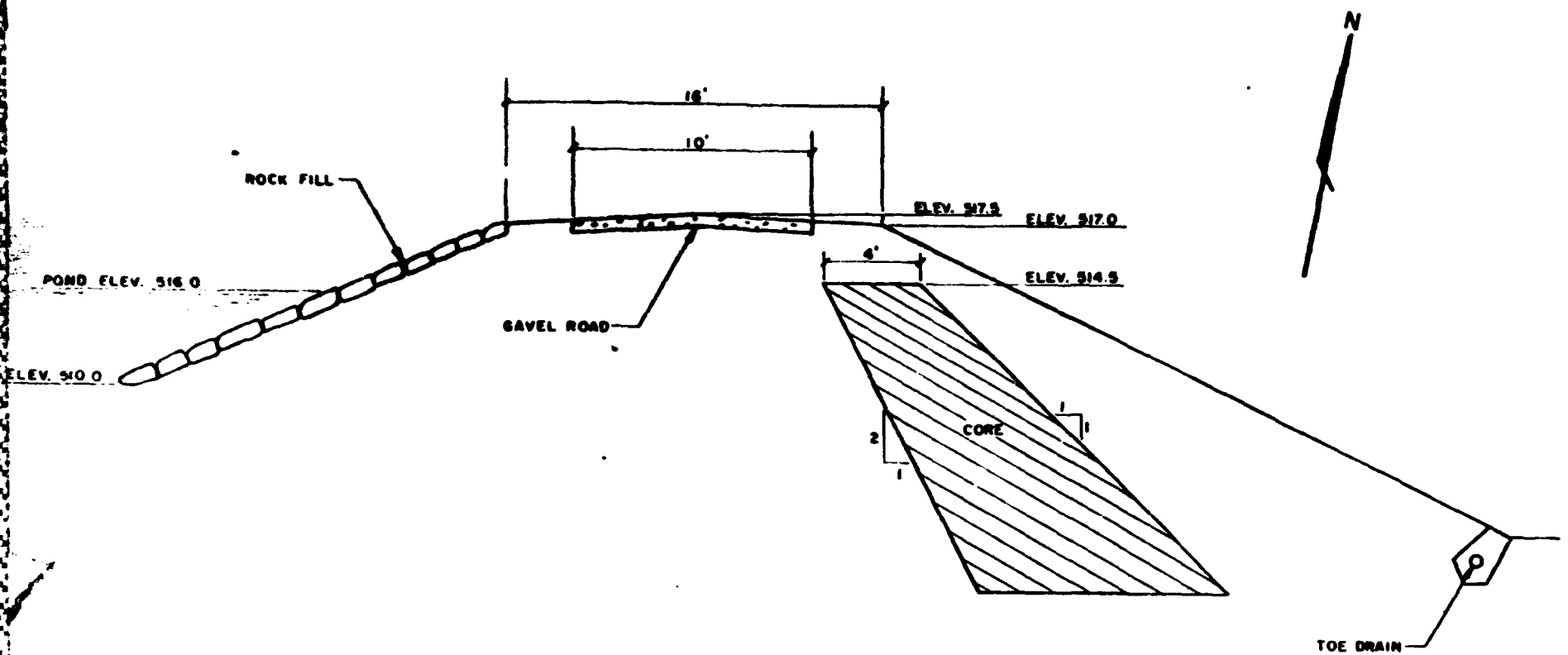


PHOTO INDEX

HALLS POND
NORTH DAM

PLAN

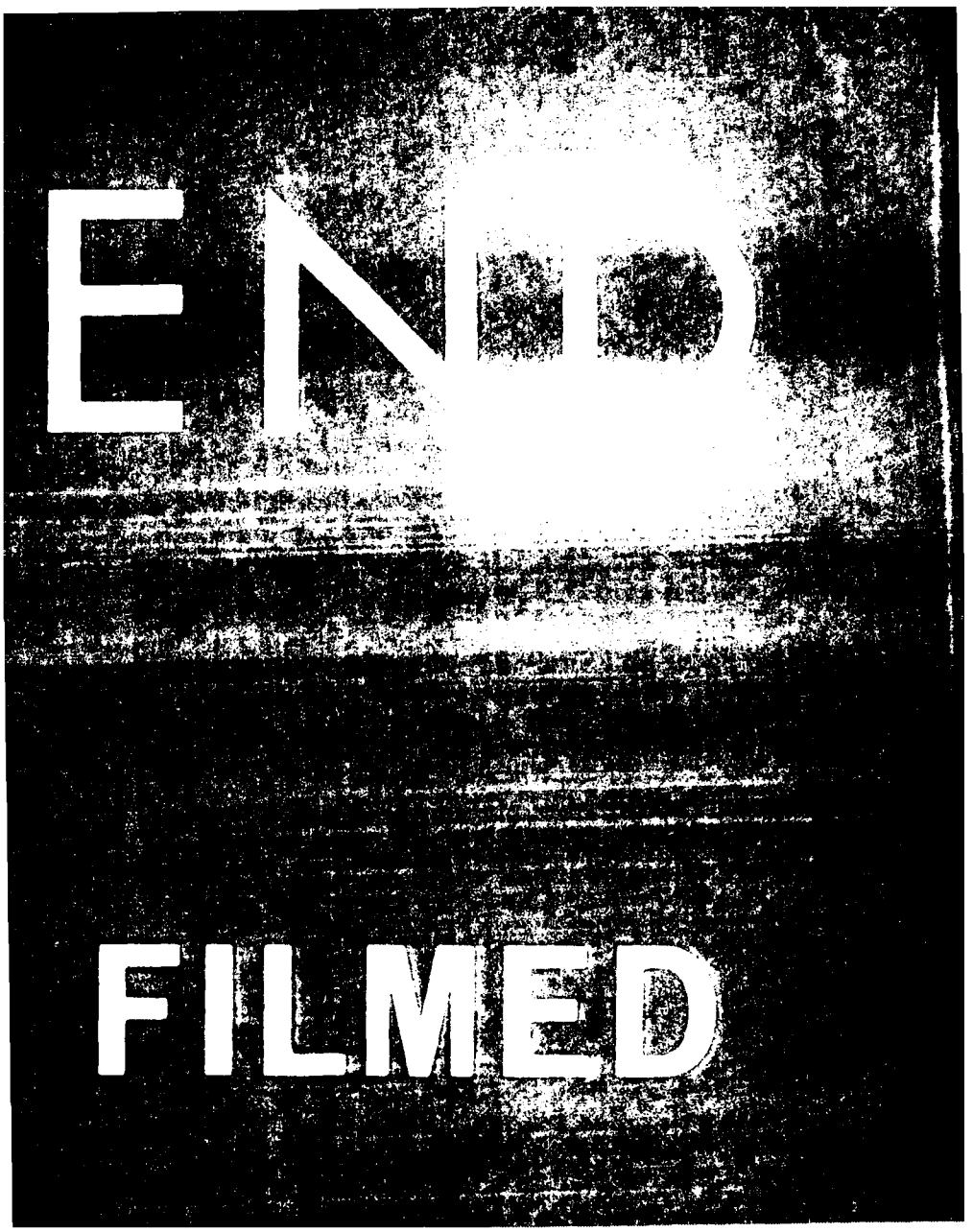
SCALE 1" = 20'



HALLS POND
SOUTH DAM

TYPICAL SECTION

SCALE 1/4"=1'-0" PLATE B-5


END
FILMED