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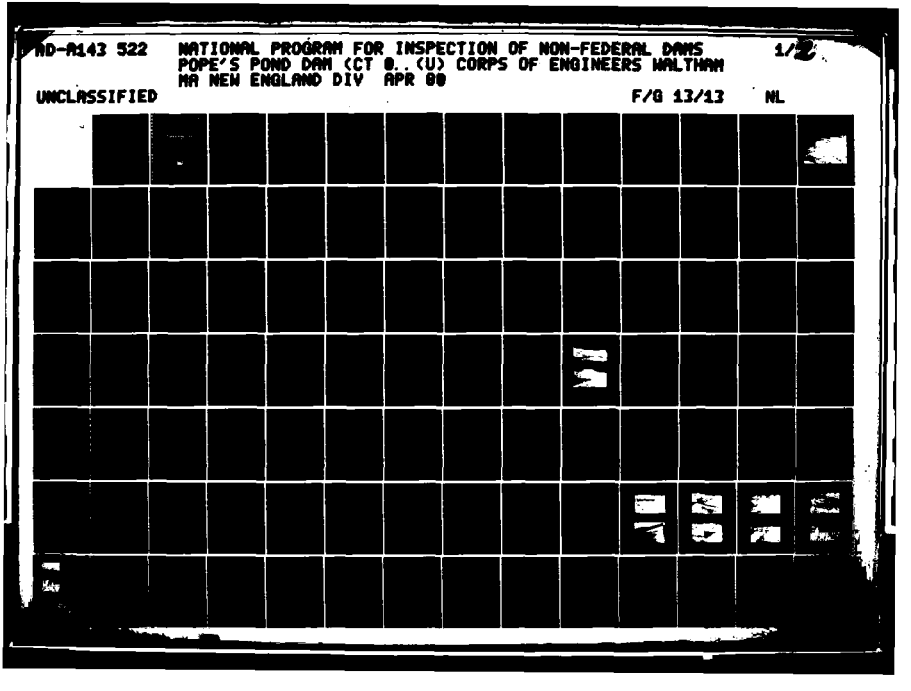

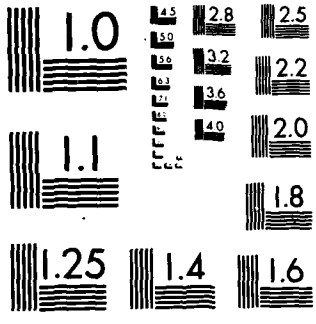

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SOUTHWESTERN COASTAL BASIN

WILTON, CONNECTICUT

POPE'S POND DAM
CT 00214

PHASE 1 INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

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

APRIL, 1980

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

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4. TITLE (and Subtitle) Pope's Pond Dam NATIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL DAMS		5. TYPE OF REPORT & PERIOD COVERED INSPECTION REPORT 6. PERFORMING ORG. REPORT NUMBER
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9. PERFORMING ORGANIZATION NAME AND ADDRESS		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
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18. SUPPLEMENTARY NOTES

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

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

DAMS, INSPECTION, DAM SAFETY,

Southwestern Coastal Basin
Wilton, Conn.
Pope's Pond Dam

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

This dam is an earth embankment structure with a steel sheet pile core. It is approx. 650 ft. long, 24 ft. high with a top width of 15 ft. and has centrally located 200 ft. long spillway. Based on the visual inspection, review of construction plans and past operational performance, the dam is judged to be in FAIR condition. This dam is classified as INTERMEDIATE in size and a HIGH hazard potential structure.

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

REPLY TO
ATTENTION OF:
NEDED

MAY 05 19[illegible]

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

Dear Governor Grasso.

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

A copy of this report has been forwarded to the Department of Environmental Protection, the cooperating agency for the State of Connecticut. In addition, a copy of the report has also bee: furnished the owner, Second Taxing District, City of Norwalk, 174 Water Street, South Norwalk, Connecticut 06850.

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

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

Sincerely,

MAX B. SCHEIDER
Colonel, Corps of Engineers
Division Engineer

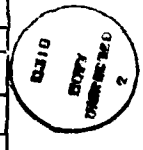
Incl
As stated

SOUTHWESTERN COASTAL BASIN

WILTON, CONNECTICUT

POPE'S POND DAM

CT 00214



PHASE I INSPECTION REPORT

NATIONAL DAM INSPECTION PROGRAM

NATIONAL DAM INSPECTION PROGRAM

PHASE I - INSPECTION REPORT

Identification No.:	CT 00214
Name of Dam:	Pope's Pond Dam
Town:	Wilton
County and State:	Fairfield County, Connecticut
Stream:	Barretts Brook
Date of Inspection:	November 15, 1979

BRIEF ASSESSMENT

This dam is an earth embankment structure with a steel sheet pile core. It is approximately 650 feet long, 24 feet high with a top width of 15 feet and has a centrally located 200 foot long spillway. The original dam was built about 1890 and was substantially expanded to its present configuration in 1965. The present dam is used for water supply by its present owner, the Second Taxing District of the City of Norwalk, Connecticut.

The official name of the impoundment created by the dam is Pope's Pond, although it is also known as Streets Pond as shown on the USGS maps.

Based on the visual inspection, review of construction plans and past operational performance, the dam is judged to be in FAIR condition. Minor seepage was noted on the downstream face of the east embankment. Some vegetation was noted in the joints of the spillway. The single control valve for the by-pass pipe is on the downstream side of the dam.

This dam is classified as INTERMEDIATE in size and a HIGH hazard potential structure in accordance with the Recommended Guideline for Safety Inspection of Dams, by the Corps of Engineers. The impoundment storage at the top of the dam is 1,460 ac.-ft. and the maximum height of the dam is 24 feet. Failure of the dam would result in the loss of more than a few lives and extensive economic damage to 4 - 6 residential homes and the Village of Wilton.

The test flood for this dam is the Probable Maximum Flood (PMF). The test flood has an inflow equal to 4575 cfs and an outflow discharge equal to 4475 cfs at a stillwater elevation of 371.5 which will not overtop the dam (1.5 feet freeboard). The maximum outflow capacity of the spillway under a stillwater condition is 7600 cfs, which is 170 percent of the test flood.

It is recommended that the following items be studied further: The seepage through the body of the dam on the downstream face, the possibility of providing a control valve for the 24 inch outlet pipe on the upstream side of the dam, and the possible settlement of the spillway slabs and the training walls.

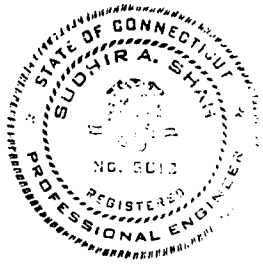
The following remedial measures should be taken: Brush and trees should be removed from the dam, grass should be kept at a low level on the embankments, missing joint material should be replaced, a downstream warning plan and an annual inspection program should be developed.

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.
Vice-President
Connecticut P.E. No. 8012



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

Carney M. Terzian

CARNEY M. TERZIAN, MEMBER
Design Branch
Engineering Division

Richard J. DiBuono

RICHARD DIBUONO, MEMBER
Water Control Branch
Engineering Division

ARAMAST MAHTESIAN, CHAIRMAN
Geotechnical Engineering Branch
Engineering Division

APPROVAL RECOMMENDED:

Joe B. Fryar

JOE B. FRYAR
Chief, Engineering Division

PREFACE

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

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

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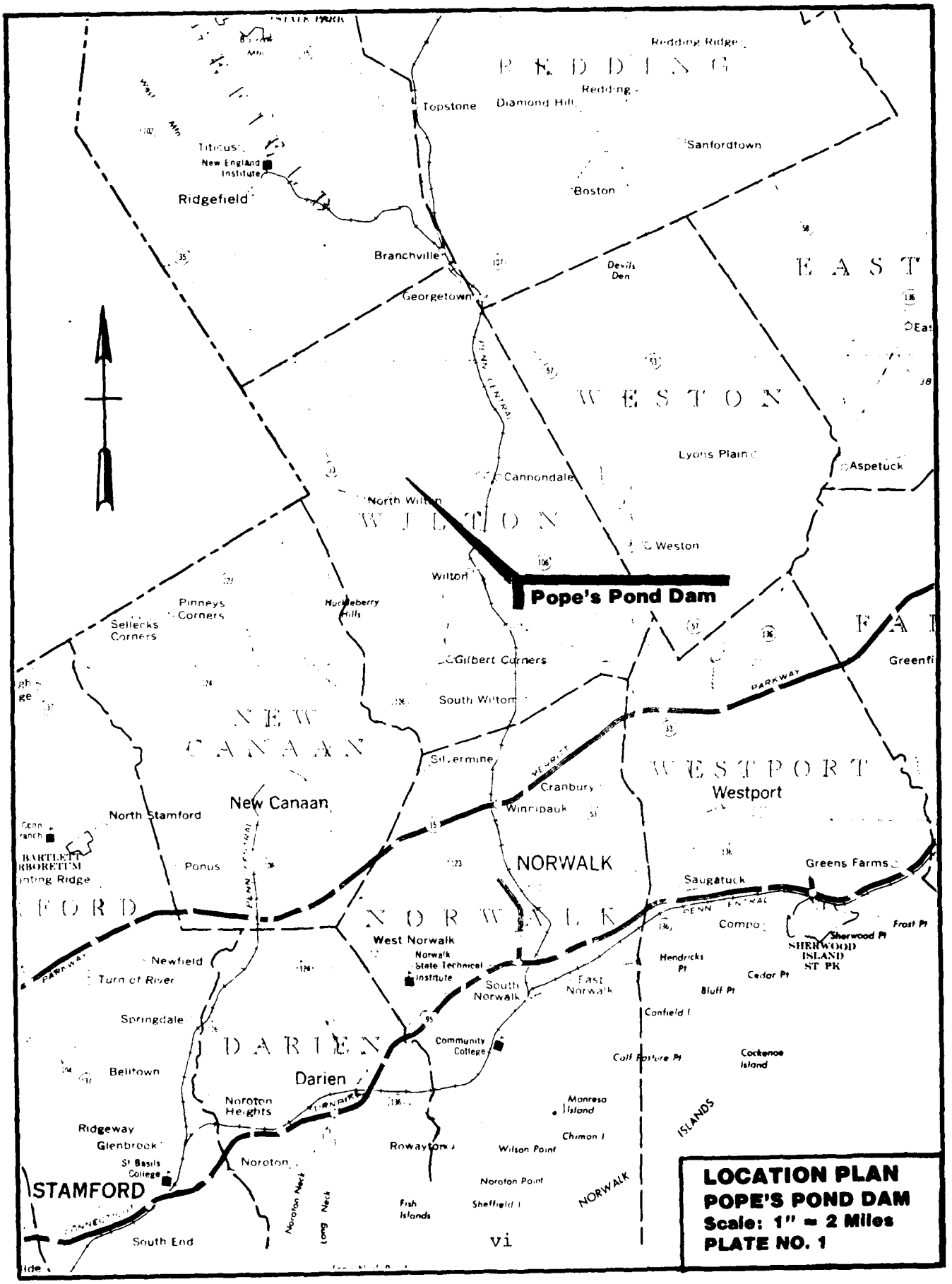
APPENDIXES

OVERVIEW PHOTO - POPE'S POND DAM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Diamond Hill
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Titicus
New England Institute
Ridgefield
Boston
Branchville
Devils Den
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WESTON
Lyons Plain
Aspetuck
Cannondale
North Wilton
WILTON
Weston
Wilton
Pope's Pond Dam
Pinneys Corners
Sellecks Corners
Huckleberry Hills
Gilbert Corners
Greenfi
South Wilton
PARKWAY
NEW CANAAN
Silvermine
WESTPORT
Cranbury
Westport
New Canaan
North Stamford
Winnipauk
BARTLETT ARBORETUM
Ponus
NORWALK
Greens Farms
Saugatuck
FORD
NORWALK
West Norwalk
Compo
Frost Pt
Sherwood Pt
SHERWOOD ISLAND ST PK
Norwalk State Technical Institute
Hendricks Pt
Newfield
Turn of River
South Norwalk
East Norwalk
Cedar Pt
Bluff Pt
Springdale
Canfield I
DARIEN
Community College
Calf Pasture Pt
Cockenoe Island
Belltown
Darien
Monroe Island
Noroton Heights
Ridgeway
Glenbrook
Chimon I
Rowayton
Wilson Point
St Basils College
Noroton
ISLANDS
STAMFORD
Noroton Point
Noroton Neck
Long Neck
Fish Islands
Sheffield I
NORWALK
South End
vi
LOCATION PLAN
POPE'S POND DAM
Scale: 1" = 2 Miles
PLATE NO. 1

NATIONAL DAM INSPECTION PROGRAM

PHASE I - INSPECTION REPORT

NAME OF DAM: POPE'S POND DAM

SECTION I

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. DACW33-80-C-0002 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 Project

a. Location: Pope's Pond Dam is located in the Town of Wilton, in Fairfield County, Connecticut, approximately 0.5 miles east of Route 33 at North Wilton and 500 feet north of Olmstead Hill Road (see Plate No. 1). The dam impounds water from Barretts Brook, Mullens Brook and other unnamed tributaries to Barretts

Brook. It is located 12,500 feet upstream of the confluence with the Norwalk River and the village of Wilton, Connecticut. The impoundment is situated in a north/south direction, with the dam at the south end. The latitude is 41°-13'-01" and the longitude is 73°-27'-19".

All elevations used in this report are based on the National Geodetic Vertical Datum (NGVD).

b. **Description of Dam and Appurtenances:** Pope's Pond Dam is a 650 foot long earth embankment at elevation 373.00 with a concrete spillway and training walls. The dam is 24 feet high and has a top width of 15 feet. The concrete spillway is located approximately in the center of the dam and has a length of 200.0 feet with a crest elevation of 368.0 feet. The spillway is a 1 foot thick concrete slab, supported by compacted earth fill, at a slope of 3H:IV. The spillway approach channel is riprap lined, extending 40 feet upstream of the spillway crest. The top of the spillway approach channel is a minimum of 3.0 feet below the spillway crest elevation at the crest and slopes down at 30H:IV as it extends upstream 40 feet. At the toe of the spillway, elevation 349.0, an energy dissipator extends, at a flat grade, for 17.7 feet. The invert transitions to an elevation of 351.75 feet (top of end sill) at the downstream extent of the energy dissipator. A riprap lined channel extends 40 feet downstream of energy dissipator for the entire spillway length. The earth spillway channel then discharges into the existing stream 350 feet downstream. Spillway training walls are concrete and extend 5.5 feet above the spillway invert. The elevation of the top of the training walls are 373.50 at the crest of the spillway, and follow the slope of the spillway to elevation 358.0, and then extend level to the downstream limit of the energy dissipator. Training walls for the spillway approach channel have a top of wall elevation of 373.50 extending across the top width of the dam, then transitions down to a top of wall elevation of 371.0 at a distance of 30 feet upstream from the crest of the spillway. The upstream and downstream face of the dam embankment is sloped at 3H:IV. The upstream face is riprapped from the top of the dam to the toe of the embankment. Along the centerline of the embankment, steel sheet piling is driven to a minimum depth of 8 feet below the undisturbed ground, acting as a cutoff to reduce horizontal seepage through the embankment. The elevation at the top of the sheet piling is 364+/- feet.

A 24 inch cast iron by-pass pipe extending from the locked open original valve at the old dam, through the embankment, is used to lower the water level in emergency situations and to provide flow in the stream during the summer. A 24 inch butterfly valve for the by-pass pipe is provided in the by-pass control manhole that is located at the toe of the downstream embankment. To dissipate energy and reduce velocity at the outfall, a concrete baffle is provided in the manhole. The by-pass pipe outfall discharges into the existing stream.

Toe drains are provided in the downstream embankment, drains are 6 inch diameter perforated pipe graded to drain to the spillway and the by-pass control manhole.

c. **Size Classification:** The size classification of this dam is INTERMEDIATE 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 crest of the dam is 1,460 acre-feet (range 1,000 to 5,000 ac.-ft.) and the maximum height of the dam is 24 feet (range 25 to 40 feet - small classification). The size classification of the dam is based on the impoundment 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. Four to six residential homes, four roads, and the village of Wilton would suffer excessive damage in addition to the loss of more than a few lives in the event of a dam failure. The downstream homes will be inundated by 5 to 9 feet.

e. **Ownership:** The Pope's Pond Dam is presently owned and maintained by the Second Taxing District, City of Norwalk, 174 Water Street, South Norwalk, CT 06850.

f. **Operator:** The person in charge of maintenance of the dam is:

Mr. James Sweet
Second District Water Department
164 Old Boston Road
Wilton, CT 06897
Tel. (203) 762-7884 Filtration Plant
(203) 866-4446 Main Office

g. **Purpose:** Pope's Pond Dam impounds water from Barretts Brook and is used for water storage by the Second District Water Department.

h. **Design and Construction History:** The original Pope's Pond Dam was constructed in 1890 and is located approximately 80 feet north of the centerline of the existing dam's east embankment. This dam was constructed of concrete and stone masonry, had total length of 130 feet with a 30 foot spillway. The spillway crest elevation of the original dam was 358.0 feet compared to 368.0 for the present dam, resulting in a storage capacity of only 27 percent of the present dam. The original dam was flooded when the present dam was constructed in 1965.

i. **Normal Operational Procedure:** Day-to-day operation of the dam is not required. Personnel from the Second District Water Department visit the dam weekly to gauge the water level. The by-pass pipe is normally closed except during months of June to December when it is opened to provide flow downstream.

1.3 Pertinent Data

a. **Drainage Area:** The Pope's Pond Dam drainage basin is generally oval in shape with a length of 2.8 miles and an average width of 1.0 mile, resulting in a total drainage area of 2.32 square miles (see drainage basin map in Appendix D). The topography is generally a moderate to steep terrain, with elevations ranging from a high of 610 feet to a low of 368 feet at the spillway crest. Stream and basin slopes are moderate to steep, 3 percent to 10 percent, respectively. The normal surface area of the pond is 87.5 acres which is approximately 5.9 percent of the watershed.

b. **Discharge at Dam Site:** There is no specific discharge records available for this dam. Listed below are calculated discharge values for the spillway and outlet works (24 inch by-pass pipe).

1. Outlet works: A 24 inch by-pass pipe with an intake at elevation 347.0 and a discharge capacity of 68 cfs at elevation 368.0.

2. Maximum known discharge at dam site: Calculated to have been 130 cfs based on a reported flow of 4 inches over the spillway.

3. Spillway capacity at top of dam: 7600 cfs at elevation 373.0.

4. Spillway capacity at test flood elevation: 4475 cfs at elevation 371.5.

5. Gated outlet capacity at normal pool elevation: 68 cfs at elevation 368.0.

6. Gated outlet capacity at test flood elevation: 73 cfs at elevation 371.5.

7. Gated outlet capacity at top of dam elevation: 76 cfs at elevation 373.0.

8. Total project discharge at top of dam: 7676 cfs at elevation 373.0.

9. Total project discharge at test flood elevation: 4550 cfs at elevation 371.5.

c. **Elevation (Feet Above NGVD)**

1. Streamed at toe of dam 349.0

2.	Bottom of cutoff	338+/-
3.	Maximum tailwater	Unknown
4.	Recreation pool	N/A
5.	Full flood control pool	N/A
6.	Spillway crest (Normal pool)	368.0
7.	Design surcharge (Original Design)	370.1
8.	Top of dam	373.0
9.	Test flood level	371.5

d. Reservoir (Length in feet)

1.	Normal pool	5500
2.	Flood control pool	N/A
3.	Spillway crest pool	5500
4.	Top of dam	6000
5.	Test flood pool	5800

e. Storage (acre-feet)

1.	Normal pool	980
2.	Flood control pool	N/A
3.	Spillway crest pool	980
4.	Top of dam	1460
5.	Test flood pool	1300

f. Reservoir Surface (acres)

1.	Normal pool	87.5

2.	Flood control pool	N/A
3.	Spillway crest	87.5
4.	Test flood pool	96.5
5.	Top of dam	100
g.	**Dam**	
1.	Type	Earth embankment
2.	Length	650 feet
3.	Height	24 feet
4.	Top width	15 feet
5.	Side slopes	3H:IV
6.	Zoning	Compacted earth fill
7.	Impervious core	None
8.	Cutoff	Steel sheet piling
9.	Grout curtain	None
h.	**Diversion and Regulating Tunnel**	**N/A**
i.	**Spillway**	
1.	Type	Overflow, ogee crested, uncontrolled weir.
2.	Length of weir	200 feet
3.	Crest elevation	368.0
4.	Gates	None
5.	U/S Channel	Riprap bed
6.	D/S Channel	Riprap and earth

j. **Regulating Outlets**

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

1.	Invert	347.0
2.	Size	24 inch
3.	Description	Cast iron pipe
4.	Control mechanism	Butterfly valve

SECTION 2

ENGINEERING DATA

2.1 Design

The available design data consists of the following documents and plans prepared by Buck, Seifert and Jost, consulting engineers.

a. "As-built" drawings of construction plans, Pope's Pond Dam, February 1965. Copies of these plans are included in Appendix B-3.

b. Drainage area map, Pope's Pond Dam, March 1965.

c. Stage-storage, stage-reservoir area, and stage-discharge curves.

d. Advertisement for bids for the construction of Pope's Pond Dam.

Refer to Appendix B-1 for the location of this material.

2.2 Construction

The construction of Pope's Pond Dam in 1965 completely replaced the original stone masonry dam built in 1890. Construction inspection reports and photographs by Joseph W. Cone are included in Appendix B-1 of this report.

2.3 Operation

No formal records of operation are kept for this facility. The dam is visited weekly by personnel from the Second District Water Department to gauge the level of the water.

2.4 Evaluation

a. **Availability**:All information concerning this dam was gathered by field investigation and meetings with officials of the Second District Water Department and from the files of the Department of Environmental Protection, Water and Related Resources Unit, Dam Safety Engineers, State Office Building, Hartford, Connecticut.

b. **Adequacy**:The information that was available complimented a complete visual inspection of this facility. The design assumptions were not apparent from the information available, however, from the visual signs noted, the information is adequate at this time.

c. **Validity**:The validity of the information available appears good but should be verified.

SECTION 3

VISUAL INSPECTION

3.1 Findings

a. General: The visual inspection of the Pope's Pond Dam was conducted on November 15, 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 was impounded by the dam.

2. Visual inspection of the face and top of the dam and spillway for cracks, settlement, leakage, 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 and aerial photographs were studied and reviewed.

b. Dam

1. Crest: The dam consists of an earth embankment with no evidence of misalignment or settlement. The top width is 15 feet and supports a grassed service road (Photos C-5, C-6).

2. Upstream Face: The upstream face of the dam consists of an earthen slope which was mostly under water and out of view. Grass, shrubs, and small trees are growing on the above water portion (Photo C-5).

3. Downstream Face: The downstream face is an earth embankment and exhibited some signs of moisture fairly high on the embankment. It appears possible that some seepage is coming over the top of the steel sheet piling. Two specific areas of moisture were noted and are graphically shown on the Photo Index (Appendix C). The seepage spots noted are not serious; however, because this is a relatively young dam, these areas should be monitored closely. The face of this dam is free from large trees but grass and wild shrubbery were waist high (Photo C-1). Toe drains were noted on the plans; however, were not visible. An animal hole was noted in the embankment below the dam's east crest (Photo C-10).

c. **Appurtenant Structures**

1. Spillway: The spillway is a 200 foot wide concrete ramp with a 3:1 slope and an energy dissipator at the bottom (Photo C-1, C-3, C-4). The alignment of construction joints seemed fair with some minor discrepancies and vegetation noted (Photo C-2). The concrete of the walls and slabs was in good condition with possible evidences of minor settlement at the contraction joints of the training walls (Photo C-9). Flow was observed through several of the energy dissipator drains.

2. 24 Inch By-Pass Outlet: The outlet is regulated by a butterfly valve which is located on the downstream side of the dam in a manhole at the toe of the dam at the location of the existing stream bed (Photo C-8). The outlet chamber has a baffle wall and a vertical stem operator which appeared to be in operable condition (Photo C-7). We were informed that this was the only valve which could lower the reservoir in case of emergency. There were no visible signs of distress noted around this structure.

d. **Reservoir Area**:Access to the area surrounding the reservoir is controlled but some recreation in the immediate area was noted (i.e. horseback riding). The area surrounding the dam was in a fairly natural state with gentle slopes, and no signs of erosion were noted. No geologic features were detected that could be expected to adversely effect the dam or its appurtenant structures. Trespassing on the slopes is not permitted; however, it was reported that it is hard to control.

e. **Downstream Channel**:The downstream spillway channel is very wide and expansive (Overview Photo). The area remains fairly wet and control of vegetation is difficult. The spillway channel joins the existing stream a short distance below the dam.

3.2 Evaluation

Based on the visual inspection, the Pope's 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:

The presence of seepage or wet spots fairly high up on the embankment of the dam.

There is only one controlling valve for the by-pass pipe for the lowering of water in the reservoir and it is located on the downstream side of the dam.

The trees on the upstream slope and shrubs on the downstream slopes.

The animal hole in the embankment.

Possible settlement of the spillway slabs and training walls.

SECTION 4

OPERATIONAL AND MAINTENANCE PROCEDURES

4.1 Operational Procedures

There are presently no formal operational procedures for the Pope's Pond Dam. The 24 inch by-pass pipe is usually partially opened from June to December to provide flow downstream.

4.2 Maintenance of the Dam

There is no regular maintenance schedule for this dam. Thick grass, brush and small trees are well established on the downstream embankment face and the crest of the dam. Joints between spillway panels display some vegetative growth. Upstream and downstream riprap channels are overgrown with brush.

4.3 Maintenance of the Operating Facilities

No maintenance of the outlet works is presently performed. Annual opening of the by-pass pipe butterfly valve to provide downstream flow during the months of June to December provide assurance that the valve is operational.

4.4 Description of Any Warning System in Effect

An emergency procedure has been implemented for the Second District Water Department, but not specifically for this dam. The procedure does not incorporate an established contingency plan, only emergency telephone numbers are available.

4.5 Evaluation

To insure the safety of the residents downstream, a regualr inspection and maintenance program, supplemented with a more complete emergency contingency plan should be implemented.

SECTION 5

EVALUATION OF HYDRAULIC/HYDROLOGIC FEATURES

5.1 General

The Pope's Pond Dam creates an impoundment with a total storage capacity of 980 ac.-ft. at elevation 368.0, the spillway crest elevation. Each foot of depth in the reservoir above the spillway crest can accommodate approximately 90 ac.-ft. The spillway is a concrete weir 200 feet in length and 5 feet below the top of the dam. The drainage area is 2.32 square miles and stream and basin slopes are moderate to steep, 3 percent to 10 percent, respectively.

5.2 Design Data

a. Limited specific design data is available for this watershed or the structures of the Pope's Pond Dam. To supplement and verify 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. Pond surface area and surcharge storage values were verified and taken from the original design data. Some of the pertinent hydraulic design data was obtained and/or confirmed by actual field measurements at the time of the visual inspection.

b. The original design discharge for the Pope's Pond Dam is 2010 cfs with a corresponding freeboard of 2.9 feet.

c. 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. The maximum discharge to date was calculated to be approximately 130 cfs corresponding to a reported water level of 4 inches over the spillway.

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 INTERMEDIATE size structure. Guidelines indicate that the Probable Maximum Flood (PMF) be used as the "Test Flood" for these classifications. The watershed has a total area of 2.32 square miles. Snyder's lag was calculated to be 2.9 hours and a Snyder peaking coefficient of 0.625 was used. The 200 square mile - 24 hour Probable Maximum Precipitation (PMP) is 22 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 the PMF was calculated to be 4575 cfs and 1/2 the PMF has an inflow value of 2290 cfs.

The spillway capacity is hydraulically adequate to pass the "Test Flood" (PMF) and overtopping of the dam will not occur. The maximum outflow capacity of the spillway without overtopping the dam is 7600 cfs. This corresponds to 170 percent of the test flood and a storage above the spillway crest of 480 ac.-ft. The maximum outflow discharge value for the "Test Flood" is 4475 cfs corresponding to a depth of flow over the spillway of 3.5 feet, a freeboard of 1.5 feet and a storage above the spillway level of 320 ac.-ft., 1/2 PMF has an outflow equal to 2180 cfs. A spillway rating curve, outlet rating curve and a reservoir surface area-capacity curve are included in Appendix D of this report.

At the spillway crest elevation of 368.0, the capacity of the 24 inch outlet structure is 68 cfs. It will require approximately 17 hours to lower the water level the first foot assuming a water surface area of 87.5 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 damage and the loss of more than a few lives due to high velocities, impact from debris, and flooding to 4 - 6 residential homes along and roads crossing the downstream channel and the Village of Wilton.

Calculated dam failure discharge is 24000 cfs at a pool level equal to the spillway crest. This pool level was chosen in lieu of the top of dam level because the full spillway discharge of 7600 cfs would have resulted in evacuation and/or a flood warning to the downstream area. Failure of the dam at normal pool level would catch the downstream area offguard and result in the greater hazard potential. It is assumed that normal flow in the downstream channel would be in existence at the time of failure. Failure will produce a water surface level approximately 5.9 feet immediately downstream from the dam. The failure discharge will effect downstream areas (homes inundated by 2-9 feet of water) for a distance of 12,500 feet from the dam. At this distance, the water surface level will be approximately 5.7 feet above normal observations as it enters the Norwalk River. Beyond 12,500 feet, the effects of the failure discharge will be reduced as it enters the Norwalk River. Water surface elevations due to the failure of the dam are listed in Appendix D. Probable consequences including the prime impact areas are also listed in Appendix D.

SECTION 6

EVALUATION OF STRUCTURAL STABILITY

6.1 Visual Observation

The visual inspection revealed no signs of major physical distress. There were no boils, bulges or other serious seepage problems noted. The soft, wet areas, above the cutoff noted in Section 3, were small and do not appear to be serious at this time; however, the limits should be defined so that future change can be monitored.

6.2 Design and Construction

The design information available consists of only the contract plans of the 1965 construction. Design calculations were not available. Construction inspection reports are included in Appendix B-1.

6.3 Post-Construction Changes

The 1965 reconstruction plans for the expansion of the Pope's Pond Dam indicate the extent of the change to the original facility. Since the completion of the 1965 project, no post-construction changes have occurred. There was minor settlement of the concrete panels and training walls noted in the spillway area.

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 Pope's 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:** The information available is such that the assessment of the safety of the dam should be based on the visual inspection results, the past operational performance of this structure, and those as-built plans that are available.

c. **Urgency:** The recommendations and remedial measures described below should be implemented by the owner within one year after receipt of this Phase I Inspection Report.

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. The limits of the wet and soft areas on the downstream face of the body of the dam should be definitively outlined, a monitoring program should be developed so that any future change in the seepage flow pattern can be detected, and plans should be developed for corrective actions.

b. An investigation of the possible settlement of the spillway slabs and training walls.

c. A further engineering study of ways to provide means of controlling flow in the by-pass line from the upstream side of the dam, and the possibility of providing a trash rack at the inlet to prevent clogging.

7.3 Remedial Measures

a. Operation and Maintenance Procedures

1. The grass and brush on the downstream face should be kept at a low level for monitoring of the face, especially where the soft or wet areas were noted.

2. The trees and brush on the upstream face should be removed and the animal hole filled.

3. Develop a downstream warning and surveillance plan, including round-the-clock monitoring during heavy precipitation.

4. Joint material should be replaced in open joints where it is missing.

5. Institute a program of annual periodic technical inspection.

7.4 Alternatives

None.

APPENDIX A

INSPECTION CHECK LIST

INSPECTION CHECK LIST

PARTY ORGANIZATION

PROJECT Pope's Pond Dam

DATE November 15, 1979

TIME 1:00-3:00 P.M.

WEATHER Clear

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

PARTY:

1. R. Johnston, JPPA
2. R. Lyon, JPPA
3. J. Chastanet, CWDD
4. _____
5. _____
6. J. Hiscock - Second District Water Department
7. _____
8. _____
9. _____
10. _____

	PROJECT FEATURE	INSPECTED BY	REMARKS
1.	Hydraulics	R. Johnston	
2.	Structural	R. Lyon	
3.	Geotechnical	J. Chastanet	
4.			
5.			
6.			
7.			
8.			
9.			
10.			

INSPECTION CHECK LIST

PROJECT Pope's Pond Dam DATE November 15, 1979

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

AREA EVALUATED		CONDITION
DAM EMBANKMENT		
Crest Elevation	373.0	Good - Grass covered service road on crest.
Current Pool Elevation	368.0	Spillway crest.
Maximum Impoundment to Date		4 inches over spillway.
Surface Cracks		None Observed
Pavement Condition		N/A
Movement or Settlement of Crest		None Observed
Lateral Movement		None Observed
Vertical Alignment		Good
Horizontal Alignment		Good
Condition at Abutment and at Concrete Structures		Good
Indications of Movement of Structural Items on Slopes		None Observed
Trespassing on Slopes		Not permitted, but occurs.
Vegetation on Slopes		Grass, brush, small trees
Sloughing or Erosion of Slopes or Abutments		None Observed
Rock Slope Protection - Riprap Failures		Rip-rap, Overgrown
Unusual Movement or Cracking at or near Toes		None Observed
Unusual Embankment or Downstream Seepage		Two wet spots and generally spongy ground on east downstream embankment.
Piping or Boils		None Observed
Foundation Drainage Features		None Observed
Toe Drains		See record drawings
Instrumentation System		None Observed

INSPECTION CHECK LIST

PROJECT Pope's Pond Dam DATE November 15, 1979

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITION
OUTLET WORKS - INTAKE CHANNEL AND INTAKE STRUCTURE	
a. Approach Channel	Entire pond bed - underwater
b. Intake Structure	A 24 inch valve at the old dam (now underwater) is locked in the open position.

INSPECTION CHECK LIST

PROJECT Pope's Pond Dam DATE November 15, 1979

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITION
OUTLET WORKS - TRANSITION AND CONDUIT	A 24 inch cast iron pipe extends from the inlet at the old dam, through the east embankment, to the by-pass control manhole. A 24 inch butterfly valve in the by-pass control manhole controls discharge from the 24 inch pipe. The valve is usually partially open from June to December, to provide flow downstream, and closed the rest of the year. Discharge from the pipe exits the manhole through a barred rectangular opening in the downstream face.

INSPECTION CHECK LIST

PROJECT Pope's Pond Dam DATE November 15, 1979

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITION
OUTLET WORKS - OUTLET STRUCTURE AND OUTLET CHANNEL	BY-PASS CONTROL MANHOLE
General Condition of Concrete	Good
Rust or Staining	Slight at outfall from box
Spalling	None Observed
Erosion or Cavitation	None Observed
Visible Reinforcing	None Observed
Any Seepage or Efflorescence	None Observed
Condition at Joints	Good
Drain holes	See record drawings
Channel	
Loose Rock or Trees Overhanging Channel	Trees along the channel
Condition of Discharge Channel	An overgrown rip-rap channel extends 6 feet from the manhole to a natural grassed channel which continues downstream.

INSPECTION CHECK LIST

PROJECT Pope's Pond Dam DATE November 15, 1979

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITION
OUTLET WORKS - SPILLWAY WEIR, APPROACH AND DISCHARGE CHANNELS	
a. Approach Channel	Formed by extension of spillway sidewalls 32 feet into the pond.
General Condition	Good.
Loose Rock Overhanging Channel	None Observed
Trees Overhanging Channel	None Observed
Floor of Approach Channel	Rip-rap
b. Weir and Training Walls	
General Condition of Concrete	Good
Rust or Staining	None Observed
Spalling	Downstream edges of slabs chipped
Any Visible Reinforcing	None Observed
Any Seepage or Efflorescence	None Observed
Drain Holes	4 inch pipes to drain energy dissipation apron
c. Discharge Channel	
General Condition	Overgrown with weeds
Loose Rock Overhanging Channel	None Observed
Trees Overhanging Channel	Trees along sides
Floor of Channel	40 feet of rip-rap then earth
Other Obstructions	None Observed.

APPENDIX B

ENGINEERING DATA

APPENDIX B-1

DESIGN, CONSTRUCTION AND MAINTENANCE RECORDS AND LOCATION

Mr. Victor J. Galgowski
Dam Safety Engineer
Water and Related Resources Unit
Department of Environmental Protection
State of Connecticut
State Office Building
Hartford, Connecticut 06115

Second Taxing District
City of Norwalk
164 Water Street
South Norwalk, Connecticut 06856

CONSTRUCTION INSPECTION REPORTS

(Present Pope's Pond Dam)

NEW YORK LICENSE 4755
CONNECTICUT REGISTRATION 4

JOSEPH W. CONE
CIVIL ENGINEER
124 HAVEMEYER PLACE
GREENWICH, CONNECTICUT

TELEPHONE
TOWNSEND 9-2152

March 18, 1965

Mr. William P. Sander
Water Resources Commission
223 State Office Building
Hartford 15, Conn.

Re: Dam #34-Wilton
Pope's (Streets) Pond
2nd Taxing Dist, Norwalk

Dear Mr. Sander:

Reference your letter of March 12, 1965. I have examined plans and contract documents for above captioned project. Also I telephoned Mr. Pulice for supplementary information. Basic data follows:-

Area of watershed 2.32 s.m. (1480 Ac)

" " present FL. 52 Ac

" " proposed FL. 87 Ac

Capacity present reservoir 85 m.g.

" proposed " 318 m.g.

Bed Brook El. 348 ±

Embankment crest El. 373

Spillway " El. 368

" length 200'

Q design H = 2.1 = 2010 cfs (C= 3.3)

Q with H = 4' - 5280 cfs (C= 3.3)

(Note my design Q does not agree with their graph, probably account of C value.)

Note that design Q is approximately 1000 cfs per square mile and that with H = 4' and 1' freeboard Q is approximately 2250 cfs per square mile. On acre basis values are H = 2.1

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CIVIL ENGINEER
124 HAVEMEYER PLACE
GREENWICH, CONNECTICUT

TELEPHONE
TOWNSEND 9-2152

Q is 1.36 ± cfs per acre and with H = 4' Q is 3.6 ± cfs per acre. Also note that ratio of area of proposed reservoir at flow line to area of watershed is favorable, about 1:17. Both factors indicate very safe design insofar as spillway capacity is involved.

Although boring logs show strata of fine and coarse sand and silt, I do not anticipate trouble from horizontal seepage because embankment slopes are flat, 1 on 3 or more, thereby providing a long creep line. Also old dam in deepest portion of valley and silt on bottom of present reservoir provide additional barrier against entrance of water that would induce underground horizontal flow.

Adequate cutoffs are provided for the spillway chute. There are no cutoffs on the cheek walls upstream from spillcrest. Although water head will be relatively low nevertheless percolating water will tend to concentrate in flow along the contact plane between smooth back of concrete cheek-walls and earth embankment. Cutoff walls should be provided at a favorable location upstream from line of spillcrest. Cutoffs may be either concrete or steel piling, either structurally tied to back of cheek wall and top of footing. If concrete, I suggest dimensions of 3'x1'x9'. This will involve only nominal extra cost but will provide additional safety.

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Connecticut Registration 4

JOSEPH W. CONE
CIVIL ENGINEER
124 HAVEMEYER PLACE
GREENWICH, CONNECTICUT

TELEPHONE
TOWNSEND 9-2152

Note that there is no trash-rack provided over intake of 24" CIP at old dam. Designer probably thought rack not essential. Again to install a rack old reservoir would have to be drawn down. Since this does not directly involve safety of dam, the question of whether or not to request a rack now is left to your office. An alternative would be to suggest that in the future when the reservoir is drawn down that a suitable rack be installed.

Steel sheet piling, about 130' in length and to a depth of about 11' below ground surface, is provided to increase creep line in the lowest portion of the valley just downstream from present dam, and an effective cutoff on 24" CIP.

Mr. Pulice was supposed to have a conference with me the afternoon of March 16th. He did not appear therefore the delay in this report.

Enclosed is a copy of basic data, graphs and map of watershed, furnished by Mr. Pulice, by mail, March 18, 1965.

Design is adequate therefore I recommend that plans be approved and Construction Permit issued but with the following stipulations:-

1. Although plans provide for pipe inserts to permit erection of future flashboards, it is to be understood that this Permit does not authorize erection of flashboards; a special permit is required.

New York License 4755
Connecticut Registration 4

JOSEPH W. CONE
CIVIL ENGINEER
124 HAVEMEYER PLACE
GREENWICH, CONNECTICUT

TELEPHONE
TOWNSEND 9-2152

2. Provide suitable cutoffs back of both cheek walls just upstream from line of spill-crest.

Yours very truly,

Joseph W. Cone

J. W. Cone

JWC/dr
Encl:

NEW YORK LICENSE 4755
CONNECTICUT REGISTRATION 4

JOSEPH W. CONE
CIVIL ENGINEER
124 HAVEMEYER PLACE
GREENWICH, CONNECTICUT
06830

TELEPHONE
TOWNSEND 9-2152

May 3, 1965

Mr. William P. Sander
Water Resources Commission
223 State Office Building
Hartford 15, Conn.

Re: Dam #34 - Wilton
Pope's (Street's) Pond

Dear Mr. Sander:

Enclosed are photographs, taken on April 24, 1965, showing certain features of the old dam that merit comment.

(1) Spill notch is 30'± x 3.1'. Flashboards are 1.3 leaving 1.8 to top of dam. Three supports are sturdy, approx. 2½" dia. galv. pipe; these with grooves in abutments give 4 panels approx. 7.5'± long.

In the past there has been a cat-walk on cross beams top of pipe supports.

(2) Note trees everywhere close to dam. This should never be permitted even though cement rubble masonry.

(3) This photo is particularly illuminating since it indicates lack of appreciation by supervisory personnel of potential hazard involved in permitting such a situation. Water on April 24th was within 0.4' of flowing around west or right wing wall. Flow has been over this area in the past as is evidenced by erosion below dam.

NEW YORK LICENSE 4755
CONNECTICUT REGISTRATION 4

JOSEPH W. CONE
CIVIL ENGINEER
124 HAVEMEYER PLACE
GREENWICH, CONNECTICUT
06830

TELEPHONE
TOWNSEND 9-2152

High ground is nearby and a maximum expenditure of $250 on a short and low earthen dike would have corrected the situation.

Conditions at this dam would seem to indicate that all dams supervised by this particular water company should be inspected periodically by one of your field inspectors.

Yours very truly,

J. W. Cone

JWC/dr
Enc: 3 photos

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CONNECTICUT REGISTRATION 4

JOSEPH W. CONE
CIVIL ENGINEER
124 HAVEMEYER PLACE
GREENWICH, CONNECTICUT
06830

TELEPHONE
TOWNSEND 9-2152

June 14, 1965

Mr. William P. Sander
Water Resources Commission
State Office Building
Hartford 15, Conn.

Re: Dam #34 Pope's Pond
Wilton

Dear Mr. Sander:

The site of this dam was visited on June 11th, in conjunction with inspection of Dam #36 Mather's Pond and Dam #29 Sherwood Pond.

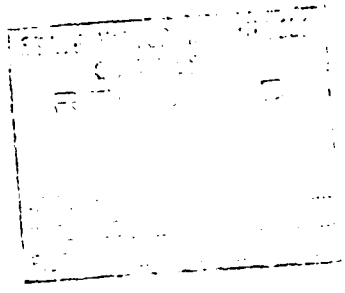
Clearing of trees, topsoil, etc. at the dam site is nearly completed. Some removal of trees in flooded area has been accomplished. Blow-off pipe is on the site.

I understand from the contractor that delivery of sheet piling for cut-off is delayed and is indefinite.

Yours very truly,

J. W. Cone

JWC/dr
Enc: Photo



NEW YORK LICENSE 4755
CONNECTICUT REGISTRATION 4

JOSEPH W. CONE
CIVIL ENGINEER
124 HAVEMEYER PLACE
GREENWICH, CONNECTICUT

TELEPHONE
TOWNSEND 9-2182

August 12, 1965

Mr. William P. Sander
Water Resources Commission
State Office Building
Hartford 15, Conn.

Re: Dam #34-Pope's Pond
Wilton

Dear Mr. Sander:

This dam was inspected on August 3, 1965. Four photos are enclosed.

1. Some compacted fill downstream from sheet piling and east of by-pass.

2. Considerable compacted fill upstream from sheet piling.

3. View in spill-chute excavation looking west. Excellent material for core in embankment.

4. Shows construction of 24"-C.I.P. By-Pass. This method merits no prize, not even a leather medal. Better method would have been to place compacted fill to at least center-line of pipe and dig trench with formed invert and bell-holes. But construction too far advanced to make a fuss.

Change in plans in that two bends in By-Pass are eliminated and straight pipe line with new dug channel intersecting brook farther downstream than shown on plans. This is a practical solution obtaining much better alignment than by original plan.

My report of June 14th mentioned delay in delivery of new sheet piling from mills. Had this prevailed dam could not have been completed this construction season. Engineers sensibly permitted used sheet piling of slightly heavier section.

Construction permit was not at the site. If the permit states any particular stipulations such as (a) pipe inserts for flashboards, (b) cut-offs on spillway cheek wall, (c) trash-rack at intake end of By-Pass, please inform me.

I suggest that your office go on record by writing the engineers that extraordinary care must be taken to thoroughly compact embankment fill under and around the By-Pass pipe.

Yours very truly,

J. W. Cone

JWC/dr
Enc: 4 photos

SHEET PILING - LOOKING UPSTREAM
AUGUST 3, 1965 PHOTO NO. 1

24 INCH BY-PASS PIPE
AUGUST 3, 1965 PHOTO NO. 4

STREETS POND DAM CONSTRUCTION PHOTOGRAPHS.
CONSTRUCTION INSPECTION REPORT OF AUGUST 12, 1965
JOSEPH W. CONE, CIVIL ENGINEER

NEW YORK LICENSE 4755
CONNECTICUT REGISTRATION 4

JOSEPH W. CONE
CIVIL ENGINEER
124 HAVEMEYER PLACE
GREENWICH, CONNECTICUT
06830

TELEPHONE
TOWNSEND 9-2152

December 2, 1965

Mr. William P. Sander
Water Resources Commission
State Office Building
Hartford 15, Conn.

Re: Dam #34 Pope's Pond
Wilton - Final Inspection

Dear Mr. Sander:

This project was inspected on November 28, 1965. Dam has been completed including seeding by the blown composite materials method. Seed has not sprouted as yet.

You will note from plans and in photos, that are of poor quality account of late afternoon exposure, that there is a 200' wide area newly graded and shaped below spillway. This is mentioned because if reservoir fills before turf is established and flow is over spillway, this fresh fill will be washed downstream causing complaints to your office by irate riparian owners.

Since this condition does not involve the safety of the dam I considered it in the past and also now as being none of my business.

Final as constructed plans should show revised location of bypass pipe.

Since the work has been constructed according to plans approved by the Commission, final Certificate of Approval should be granted when requested.

Yours very truly,

J. W. Cone

JWC/dr
Enc: 2 photos

APPENDIX B-2

COPIES OF PAST INSPECTION REPORTS

(Original Pope's Pond Dam)

No. WN 19

WATER RESOURCES COMMISSION
SUPERVISION OF DAMS
INVENTORY DATA

4
17-214

Inventoried By WWS

Date 7 AUGUST 1964

Name of Dam or Pond STREETS POND

Code No. NN 92 CS 20 BT 0 G

Nearest Street Location OLMSTEAD HILL ROAD

Town WILTON 13-27.2

U.S.G.S. Quad. NORWALK NORTH

Name of Stream BARRETTS BROOK Lat 11-13.0

Owner SECOND TAXING DISTRICT NORWALK

Address CITY HALL

SOUTH NORWALK

Pond Used For WATER STORAGE 2nd 2.565M

Dimensions of Pond: Width 600 FEET Length 3500 FEET Area 50.5A 52 ACRES

Total Length of Dam 616 112 FEET Length of Spillway 30 FEET 20.5

Location of Spillway EAST END OF DAM

Height of Pond Above Stream Bed 15 10 FEET

Height of Embankment Above Spillway 5 FEET

Type of Spillway Construction MASONRY, CONCRETE

Type of Dike Construction MASONRY

Downstream Conditions WOODS, CULVERT UNDER OLMSTEAD HILL ROAD

Summary of File Data APPLICATION TO INSTALL 12" WOOD FLASH BOARDS DATED 5-23-50

Remarks

BUILT 1870

F-15 Would Failure Cause Damage? YES Class B

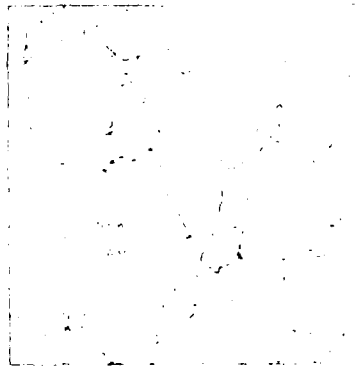
APPENDIX B-3

RECORD DRAWINGS AND SKETCHES

NORWALK,
SECOND TAXIN

POPE'S PO

196



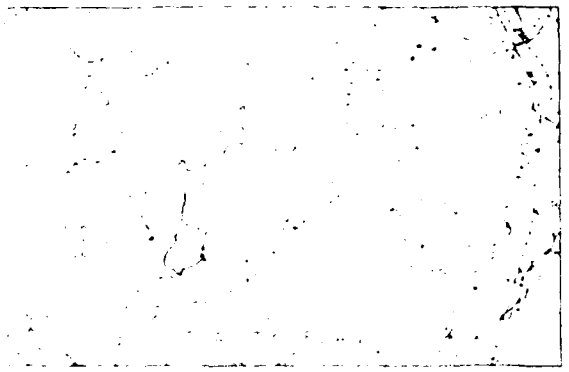
COMMISSIC

EDWARD F. HUNTINGTON
General Manager

)RWALK, CONN.
D TAXING DISTRICT

'S POND DAM

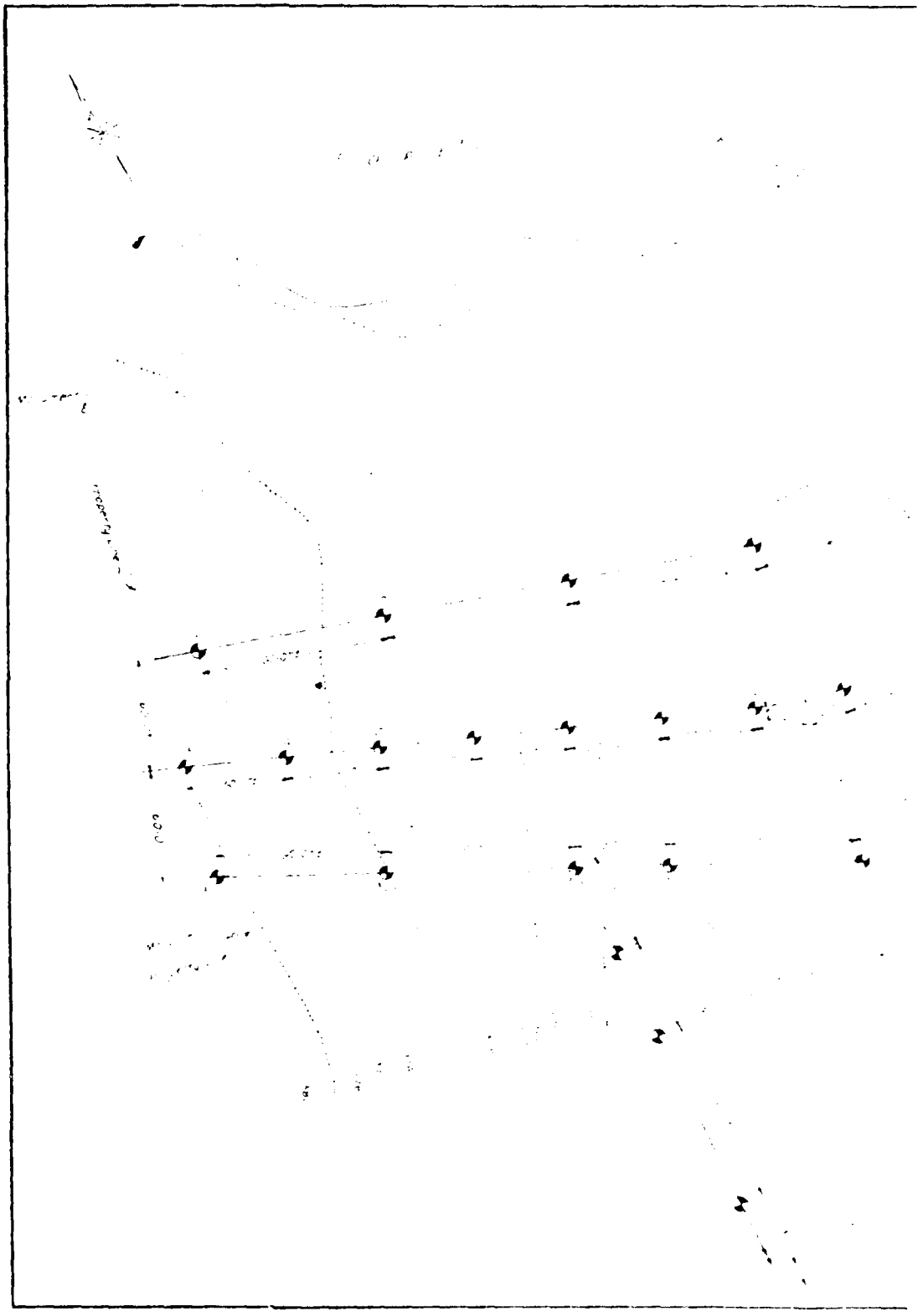
1965

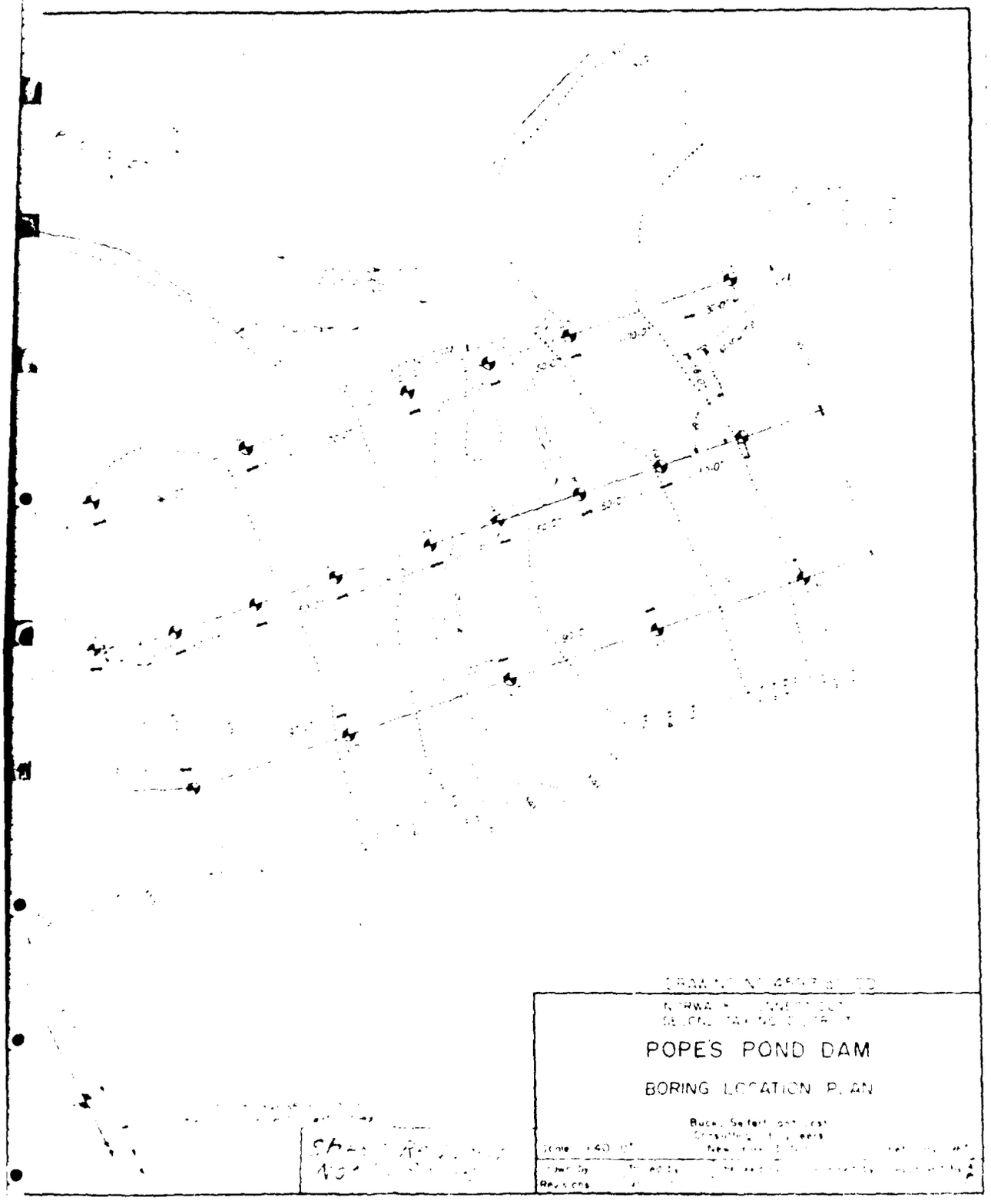


COMMISSIONERS

[illegible] JENNINGS
[illegible] DAVEY
[illegible] MESSY

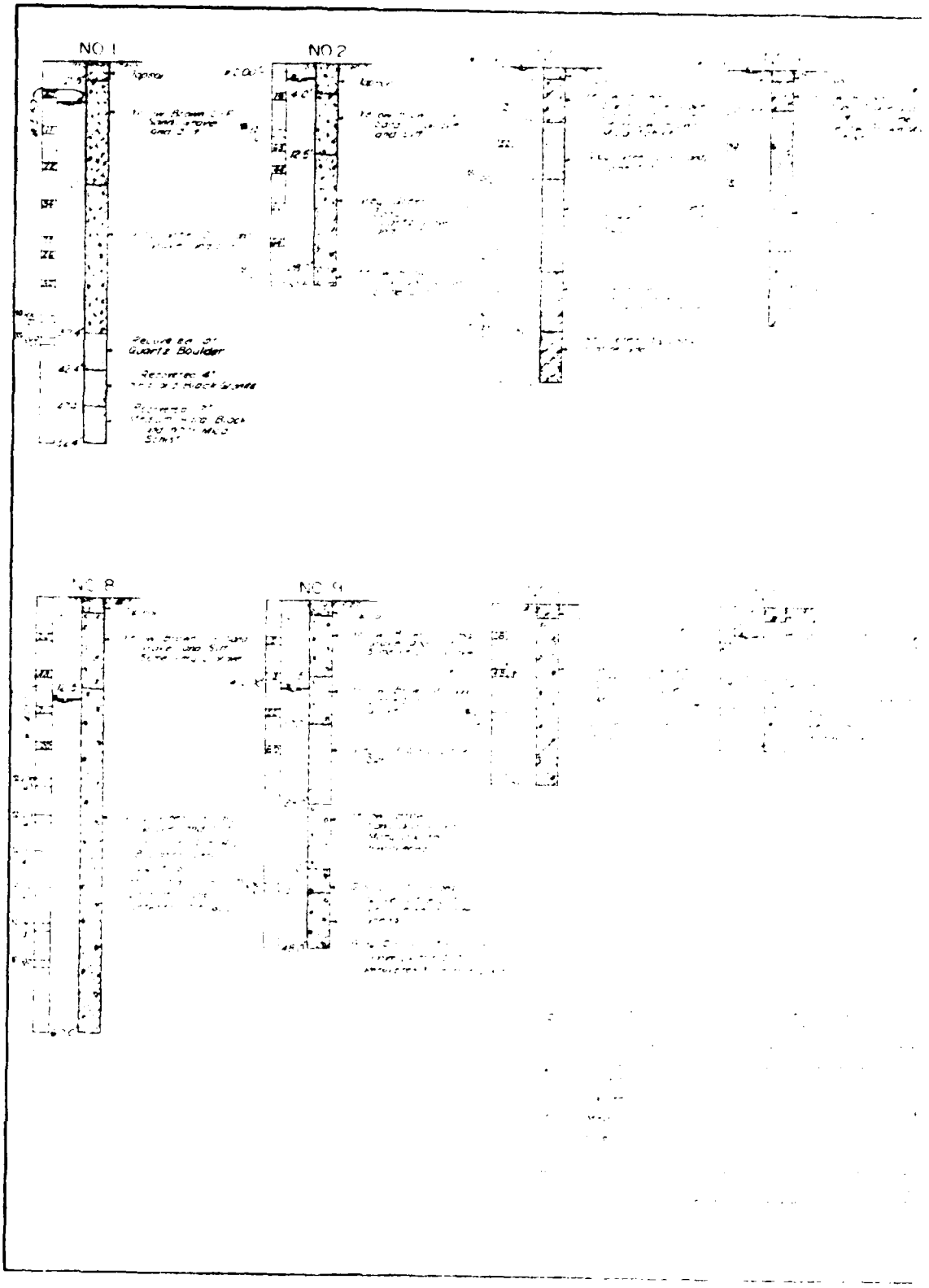
BUCK, SEIFERT AND JOST
Consulting Engineers
New York City

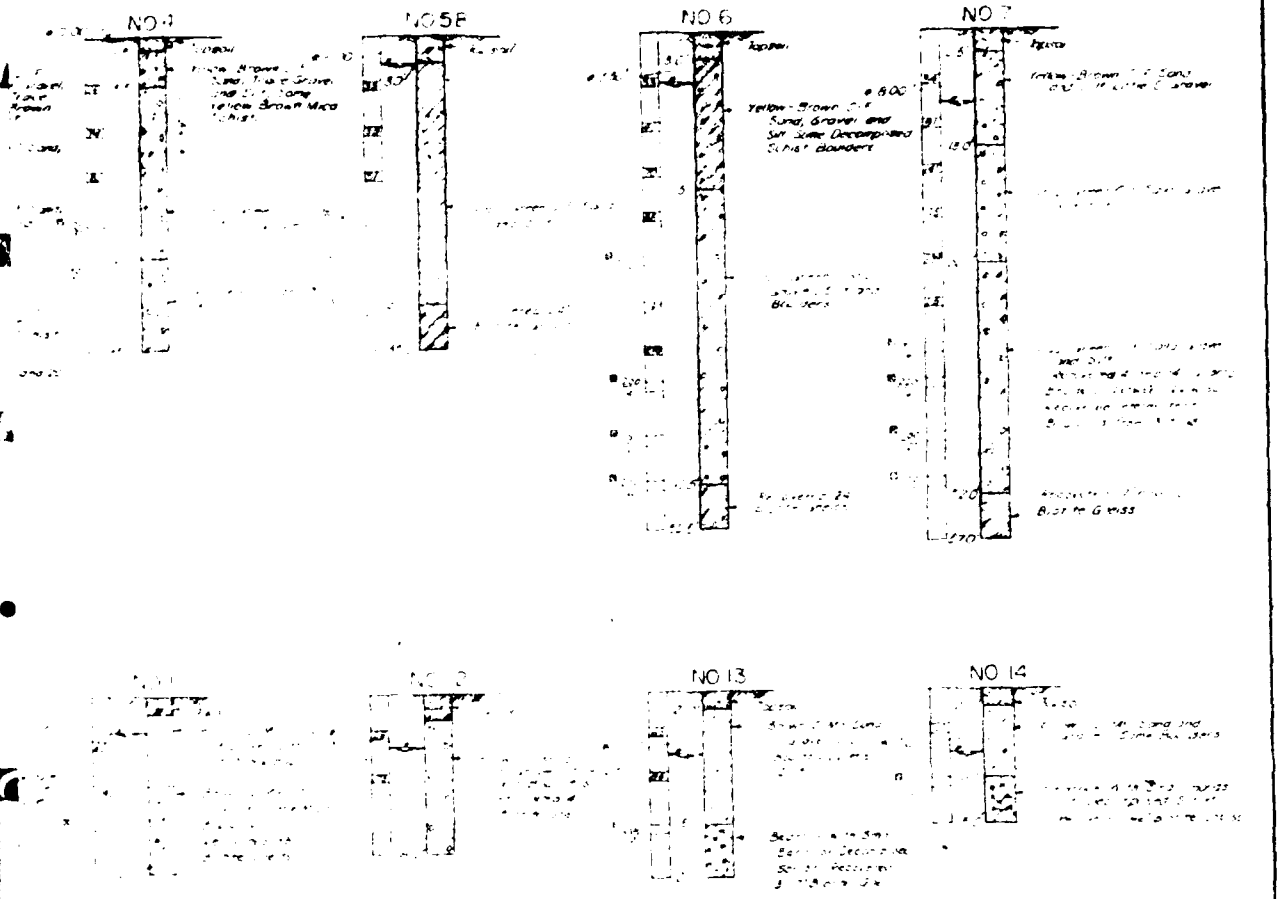




POPE'S POND DAM

BORING LOCATION PLAN


NO 1
NO 2
Quartz Boulder



NEW HAVEN, CONNECTICUT
HOUSING TAKING DISTRICT

POPE'S POND DAM

BORING LOGS

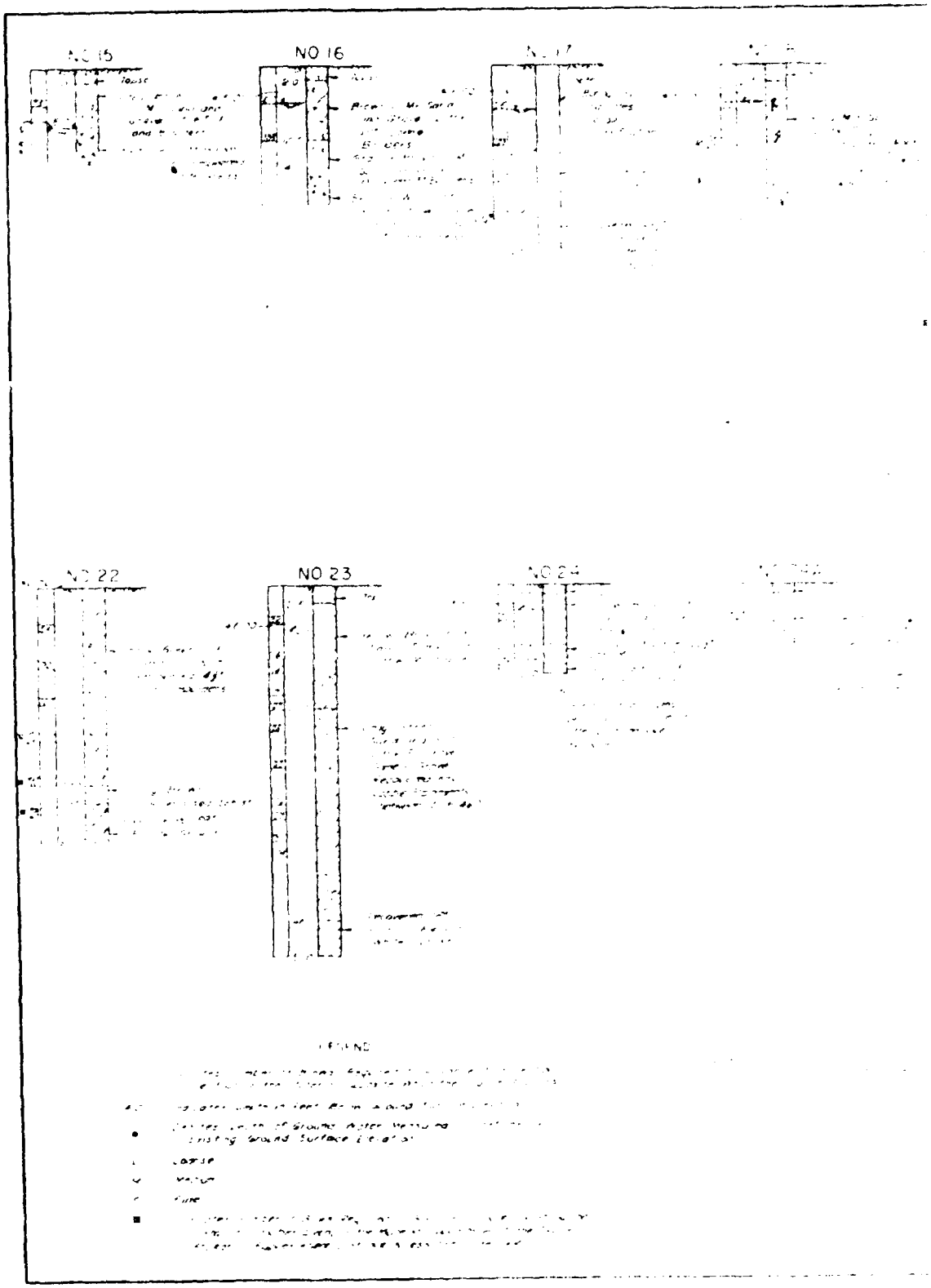
Scale 1 = 10.0"

Drawn by

Traced by

Revisions

2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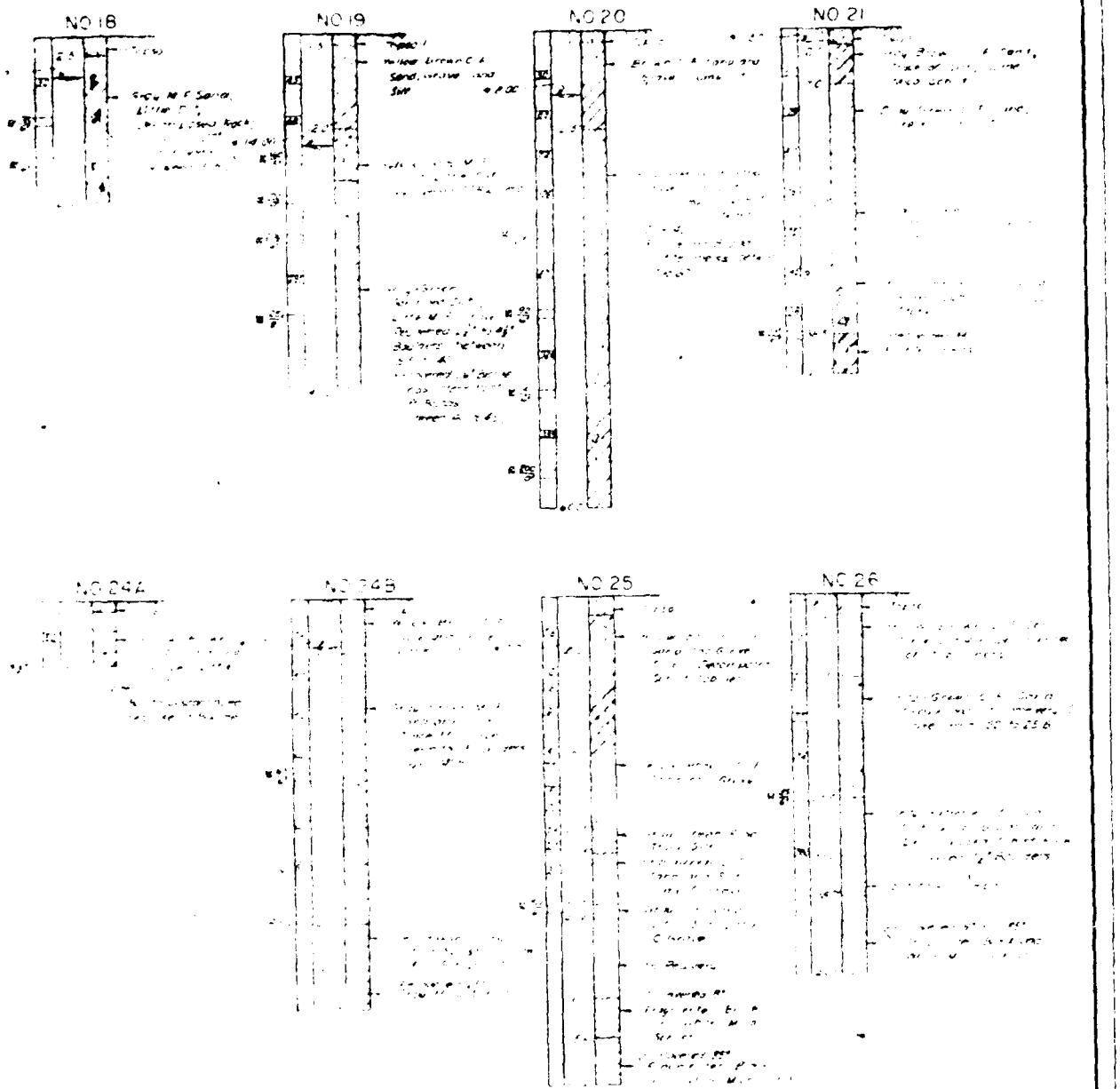
NO 22
NO 23



DRAWING NO 45-3[illegible] 102

NORWALK, CONNECTICUT
SECOND TAXING DISTRICT

POPE'S POND DAM

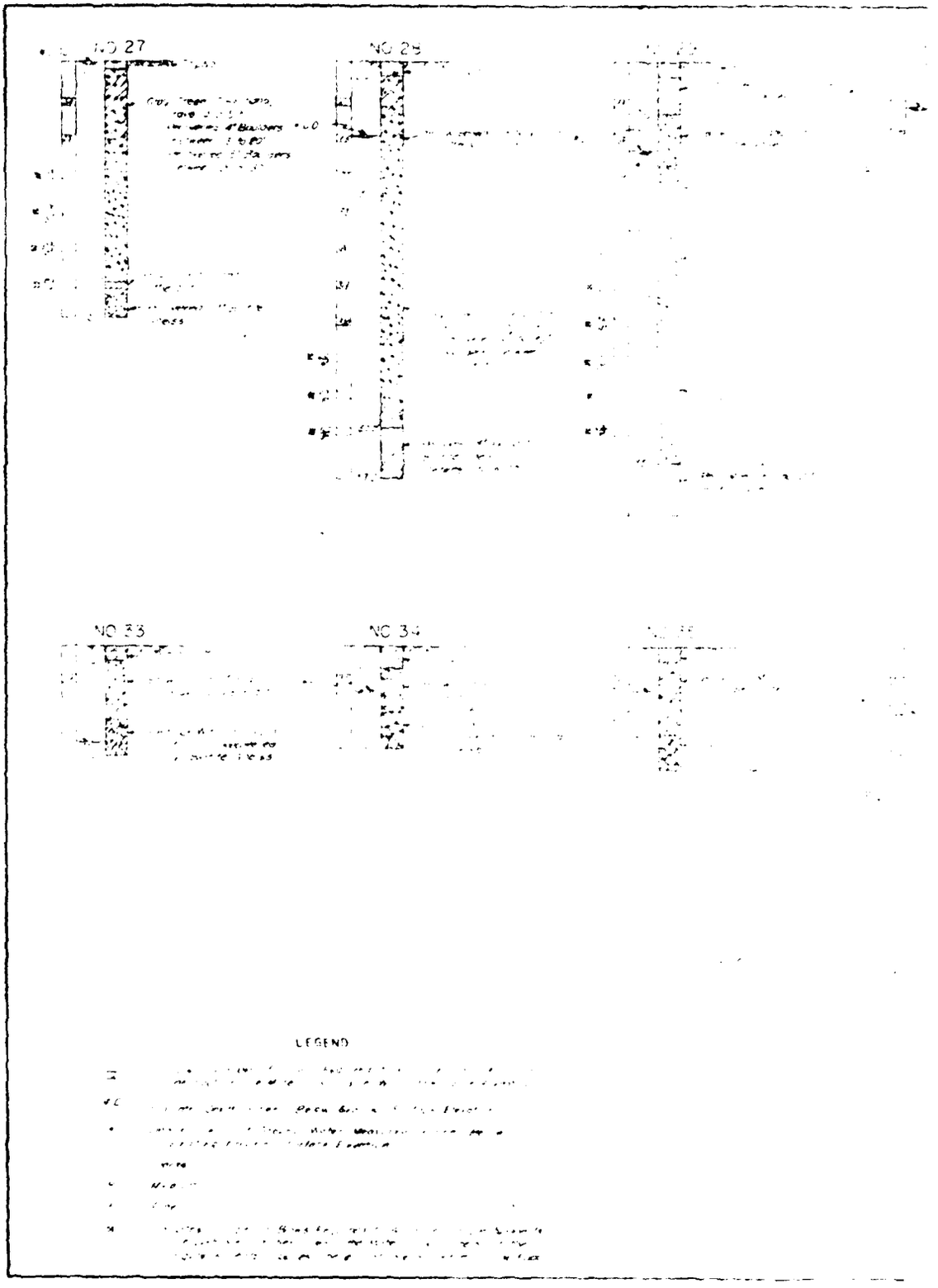
BORING LOGS

Hank, Seifert and Klar
Consulting Engineers
New York 3, N.Y.

Scale 1"=10'-0" February, 1955

Drawn by	Traced by	Checked by	Examined by	Approved by
Revisions	As Built			

Sheet No. 2 of 2 Sheets
Not to Scale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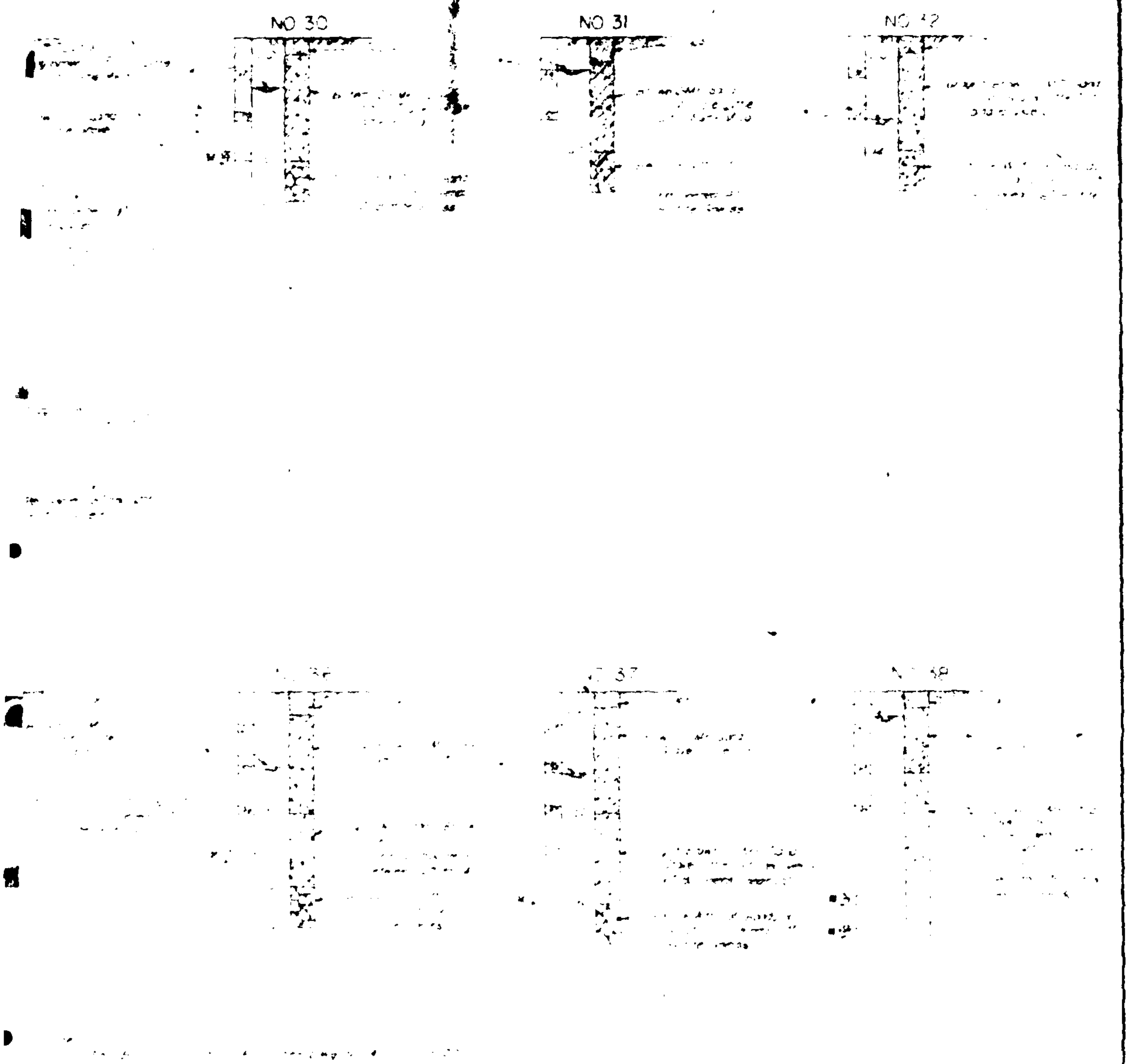
NO 28
NO 33
NO 34
LEGEND



NORWALK CONNECTICUT
SECOND TAXING DISTRICT

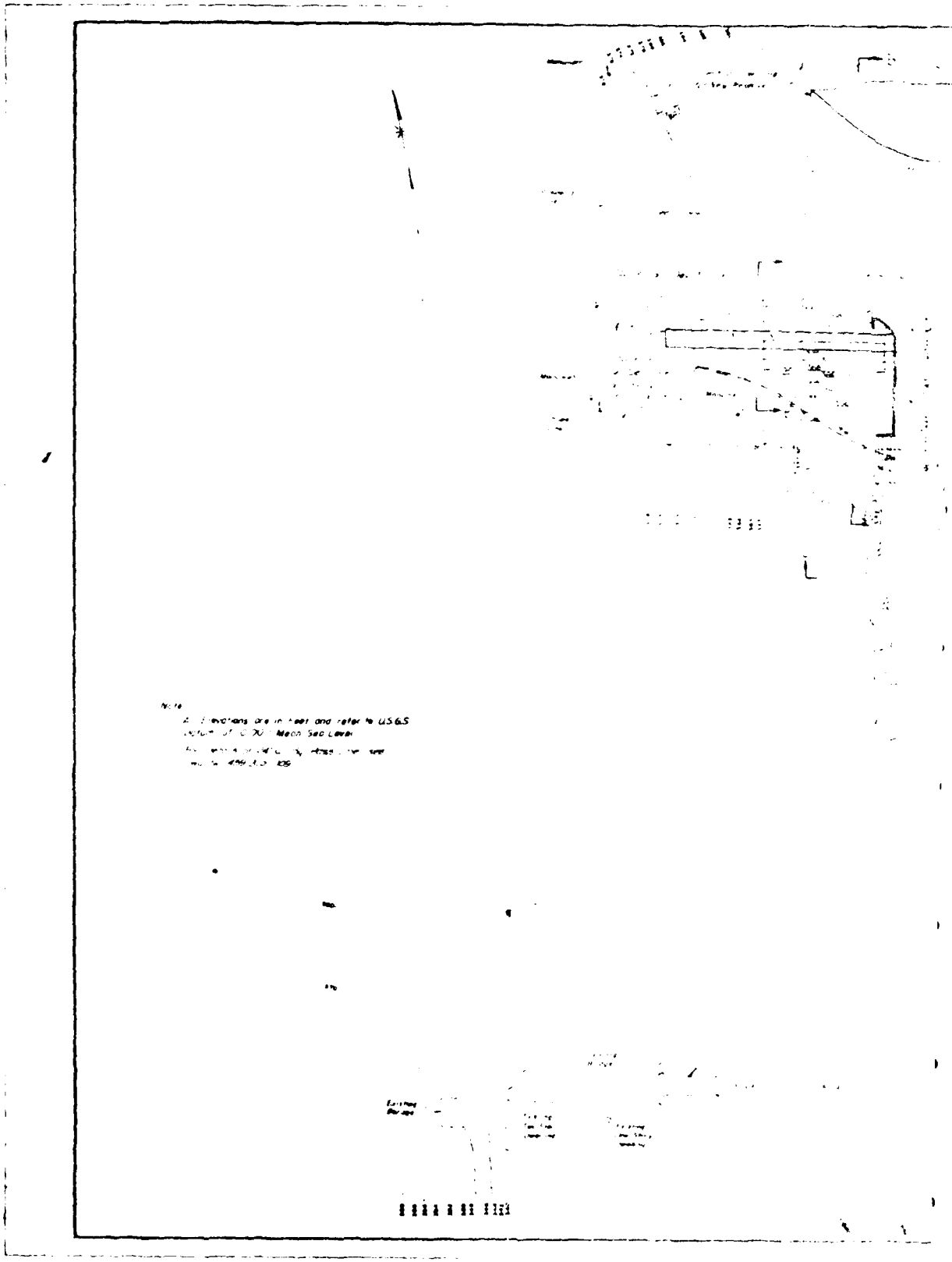
POPE'S POND DAM

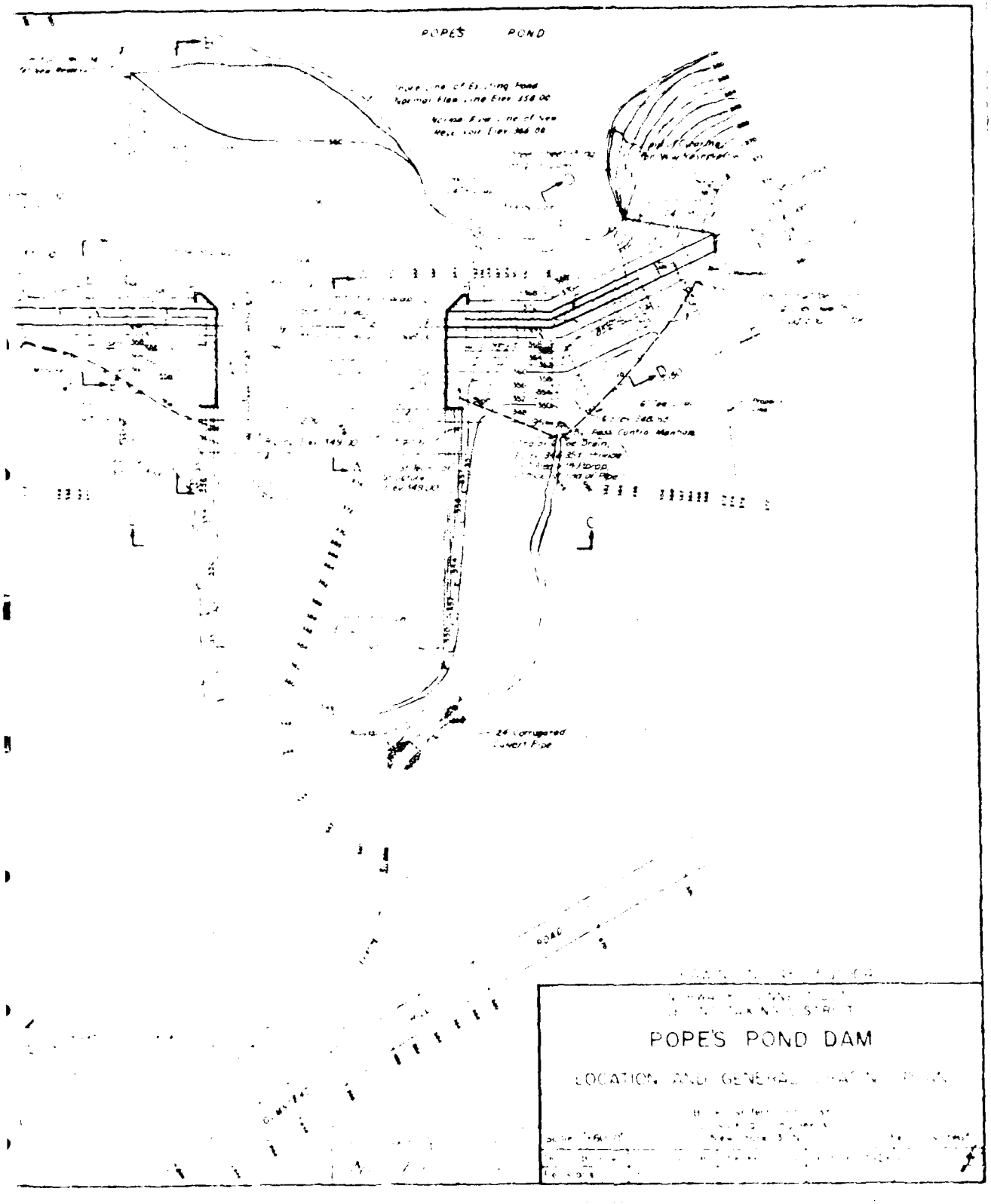
BORING LOGS

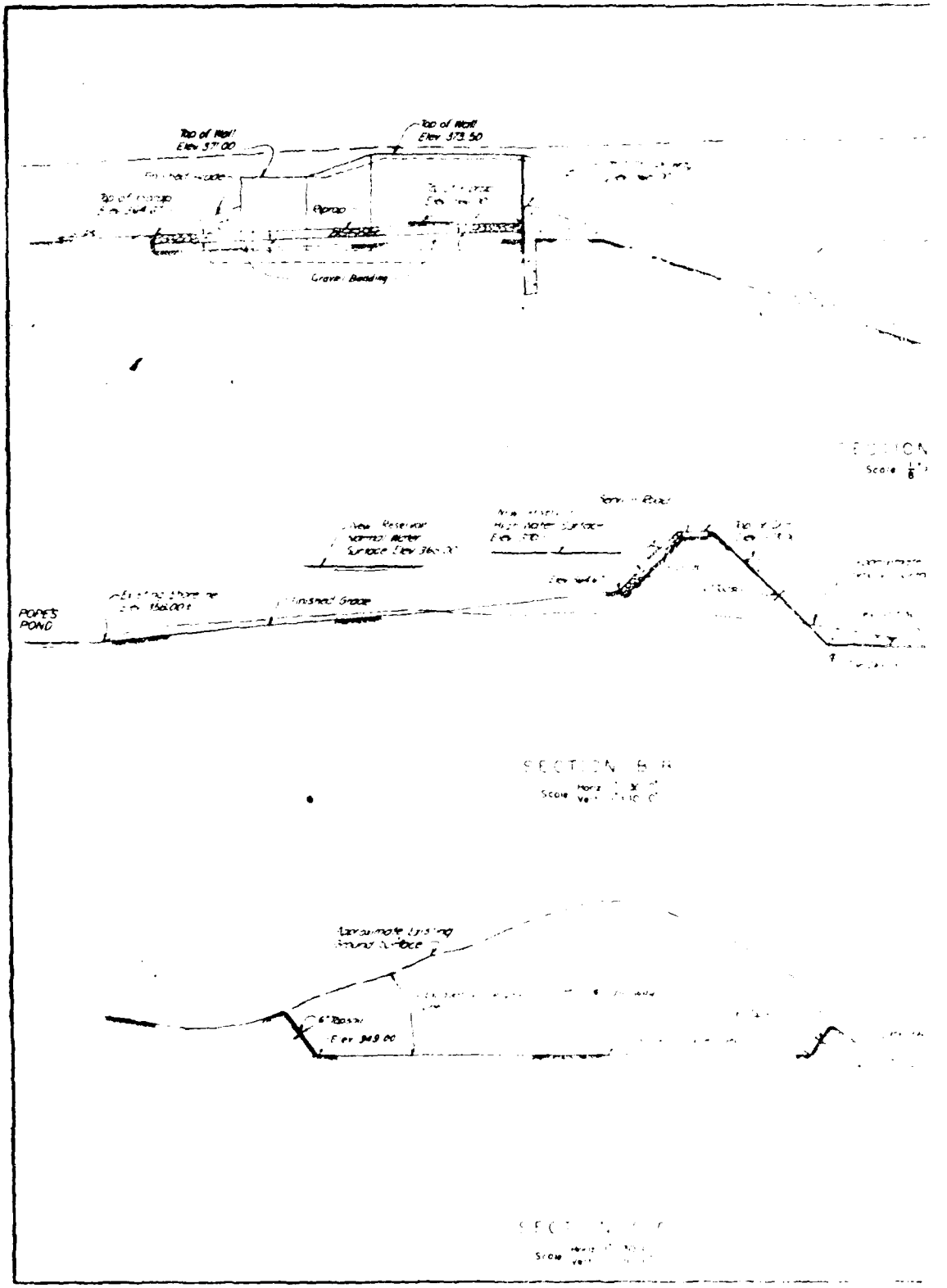
Buck Seifert and Jost
Consulting Engineers
New York 3 N.Y.

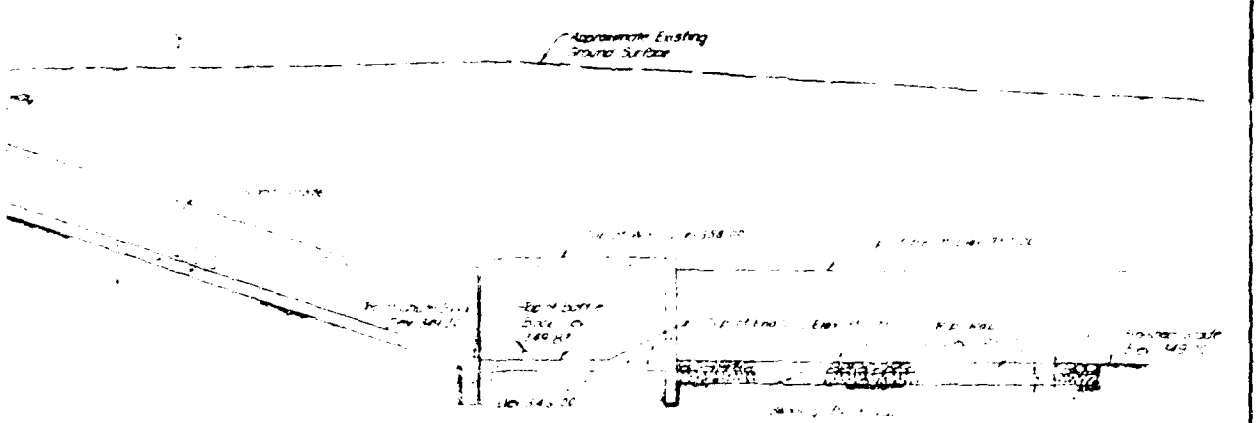
Drawn by	Traced by	Checked by	Examined by	Approved by
Revisions				

2 B-21

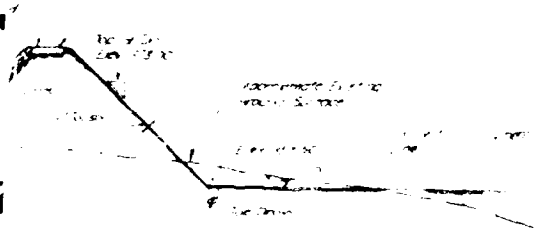



POPES POND
POPE'S POND DAM


Top of Wall
Elev 377.00
Top of Wall
Elev 373.50
Grave Bedding
POPES
POND
Finished Grade



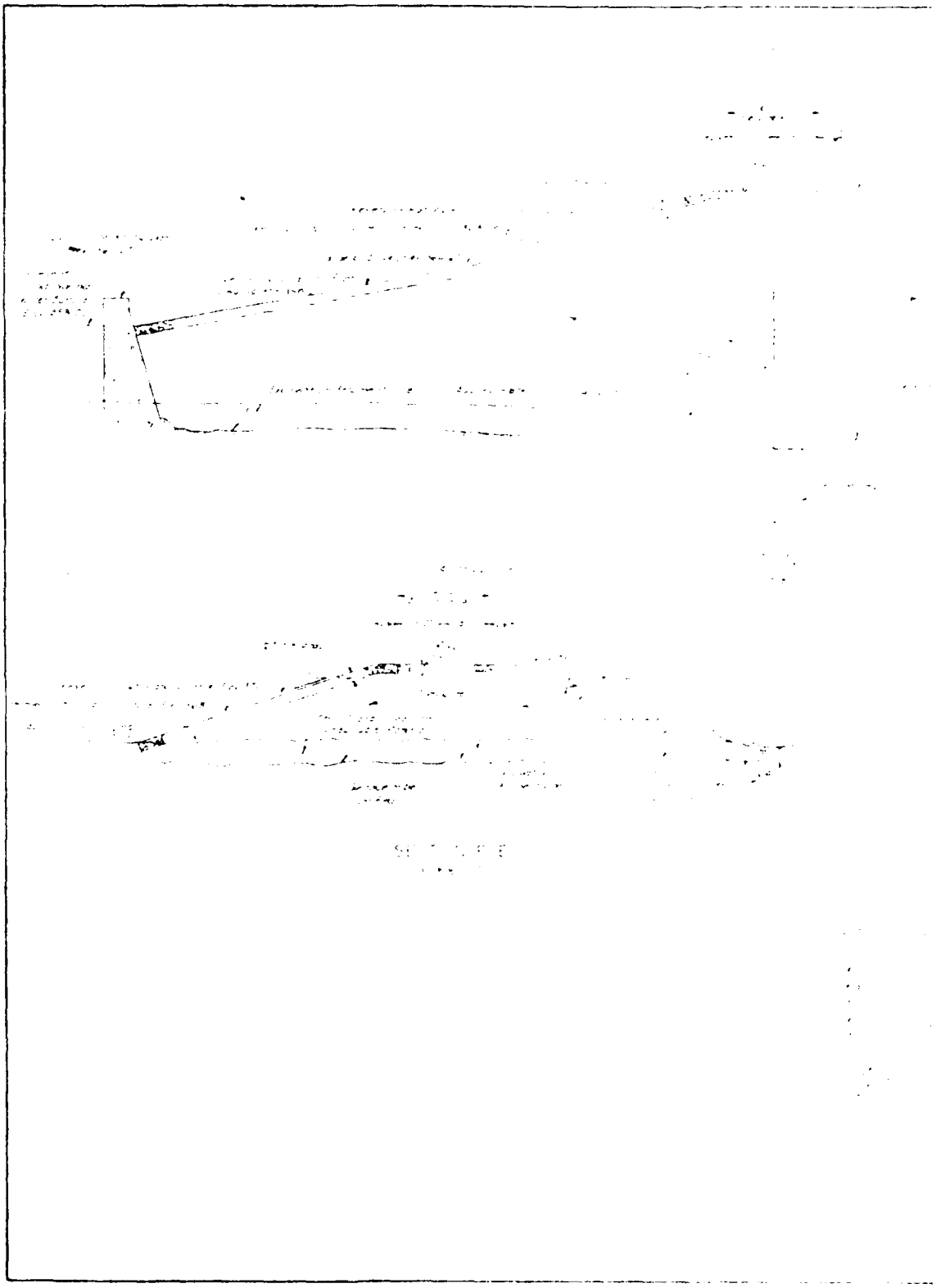
SECTION A-A
Scale $\frac{1}{8}$" = 1'-0"

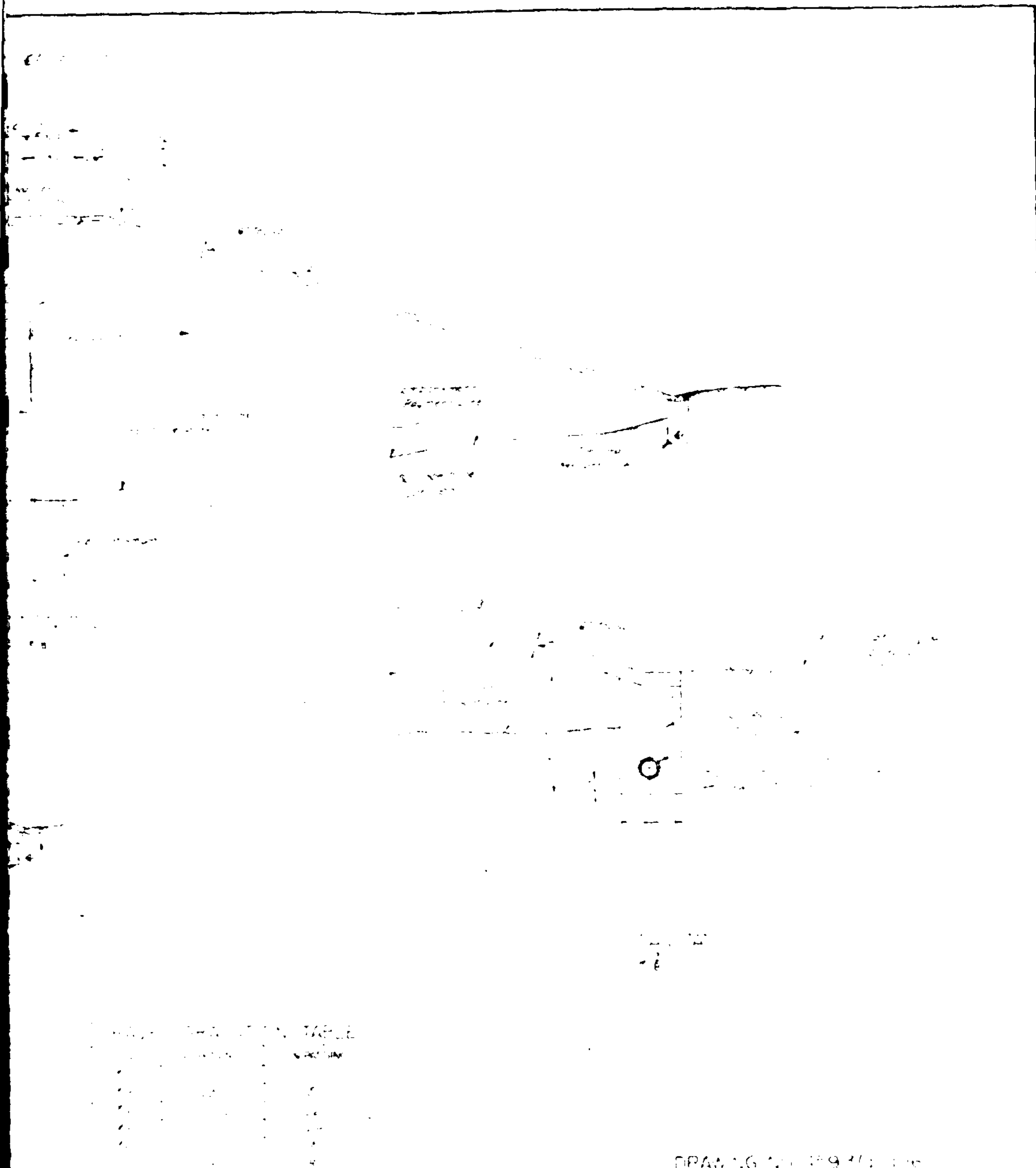


POPE'S POND DAM

SECTIONS A-A, B AND C

Scale As Shown





DRAWING NO. [illegible]

NORWALK, CONNECTICUT
SECOND TAXING DISTRICT

POPE'S POND DAM

SECTIONS D-D, E-E AND
MISCELLANEOUS DETAILS

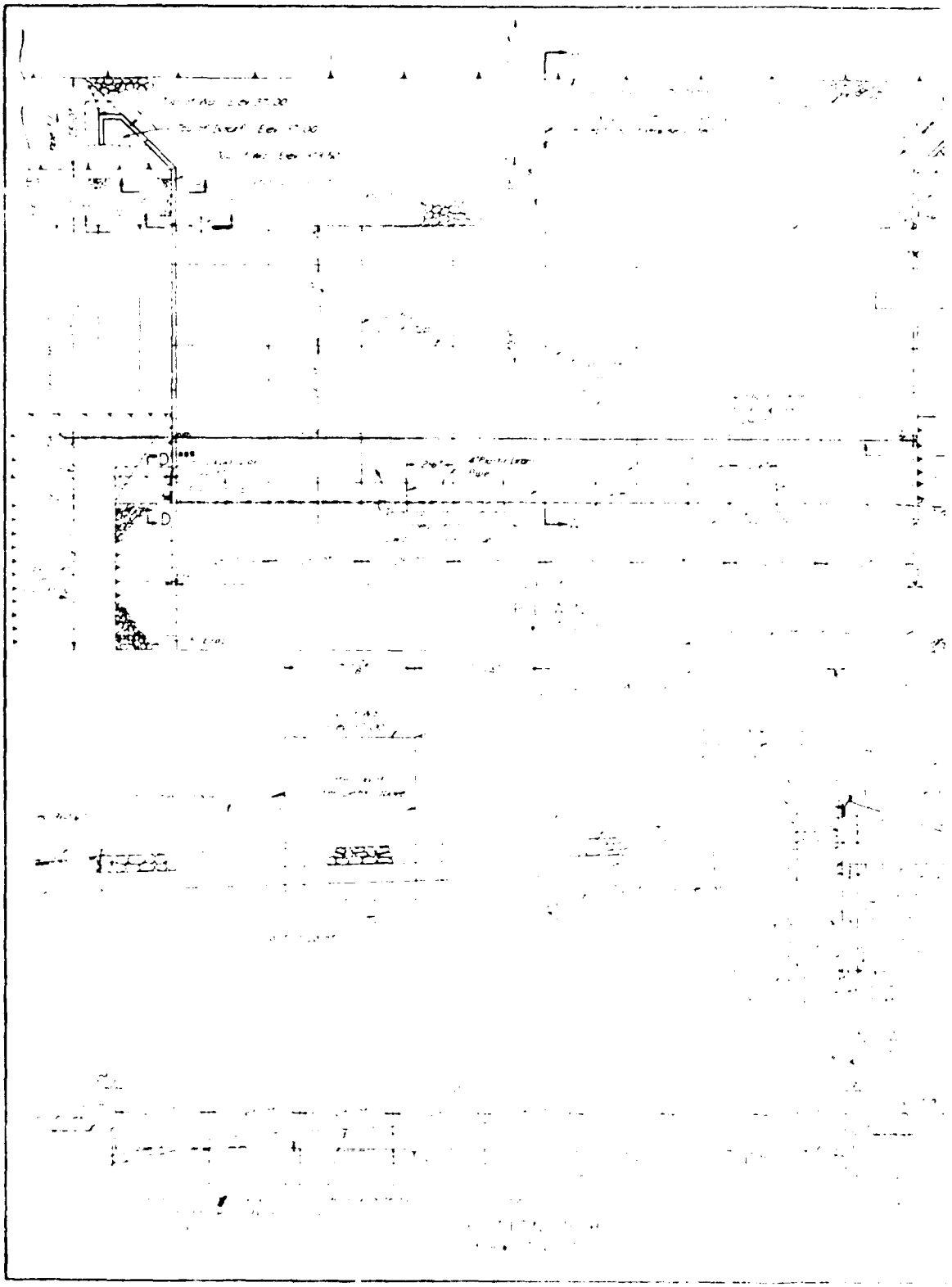
Buck, Seifert and Jost
Consulting Engineers
New York 3, N.Y.

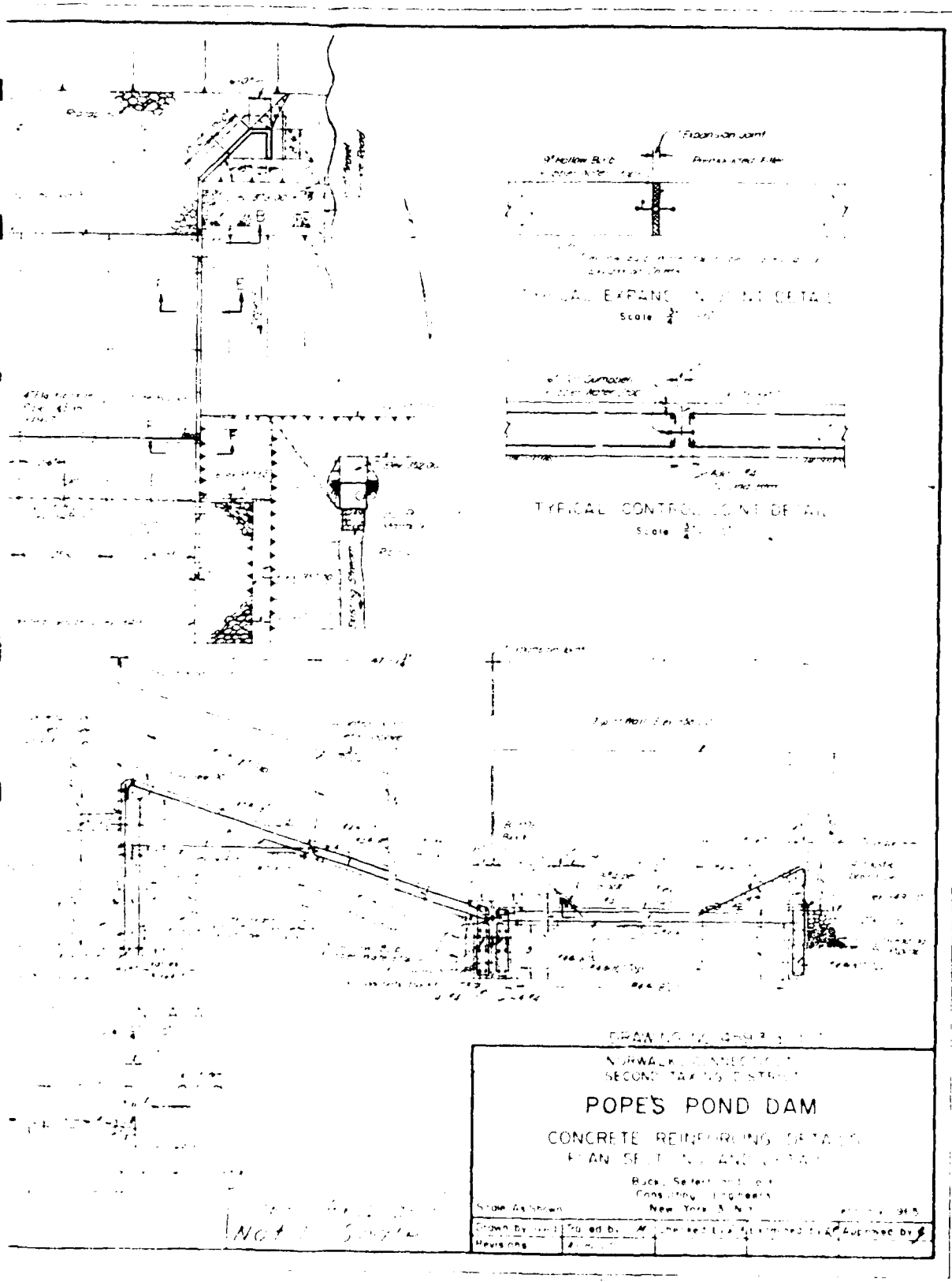
Scale As Shown

February 1965

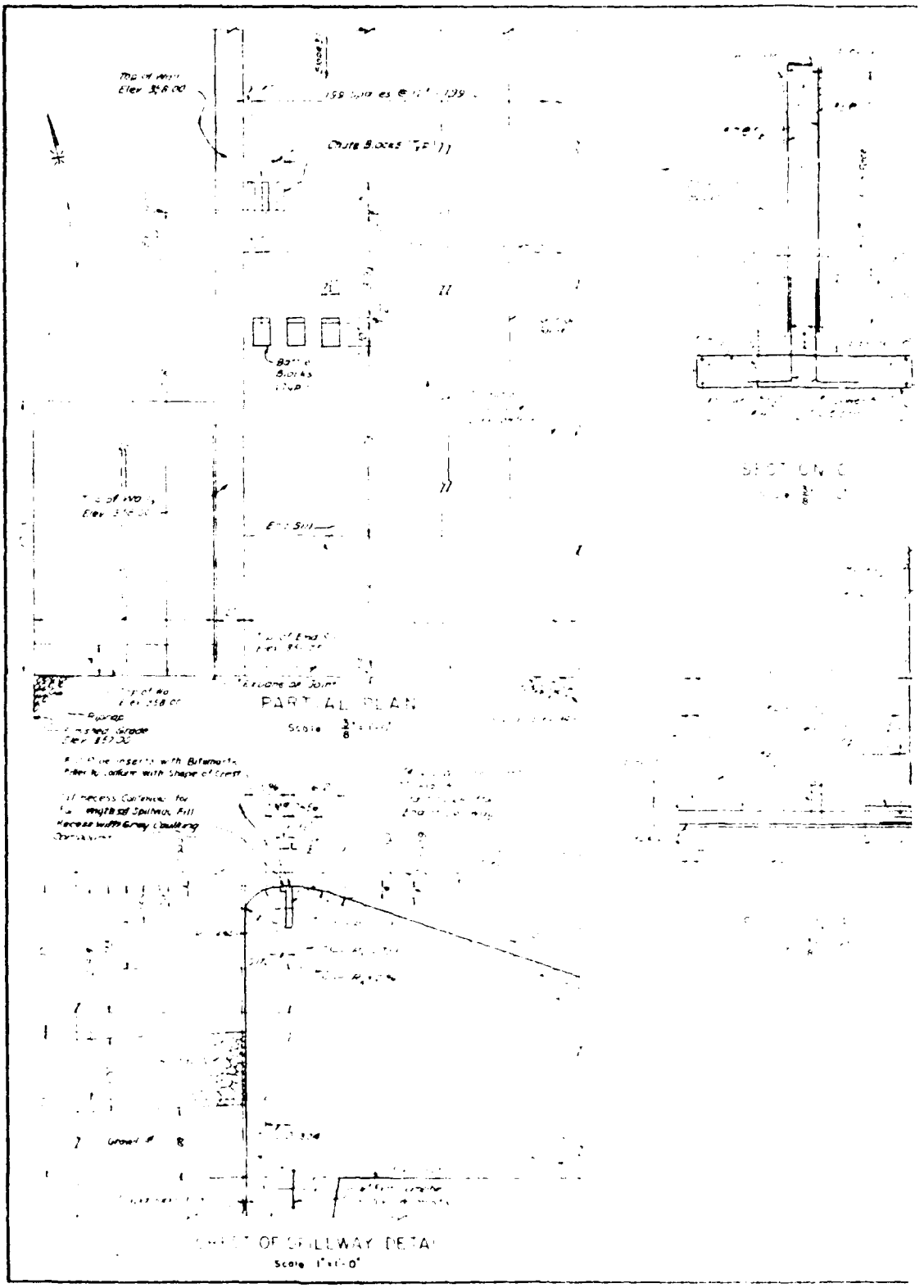
Drawn by	Traced by	Checked by	Examined by	Approved by
Revisions				

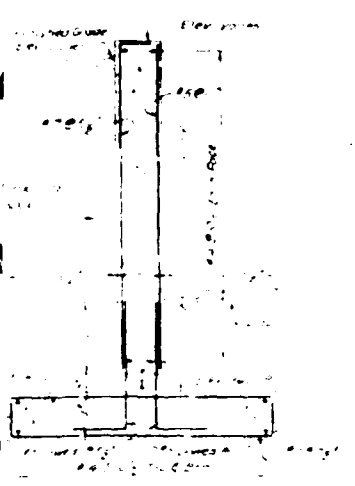
2 B-24



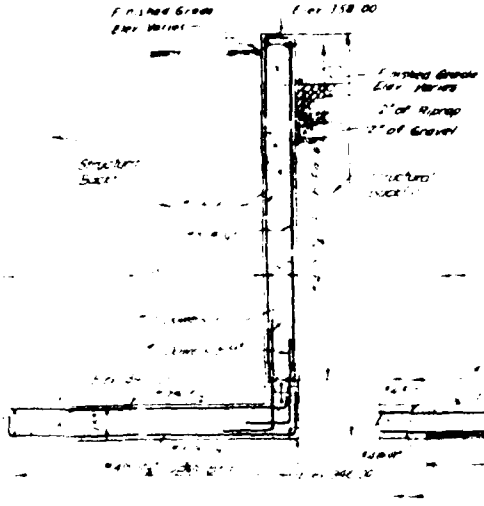


2 B-25


PARTIAL PLAN
Scale 3/8
SECTION C
Scale 1"=1'-0"



SECTION C-C



SECTION D-D
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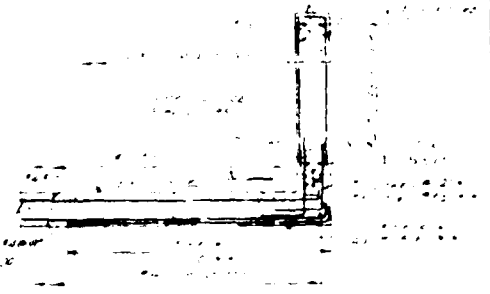

SECTION E-E
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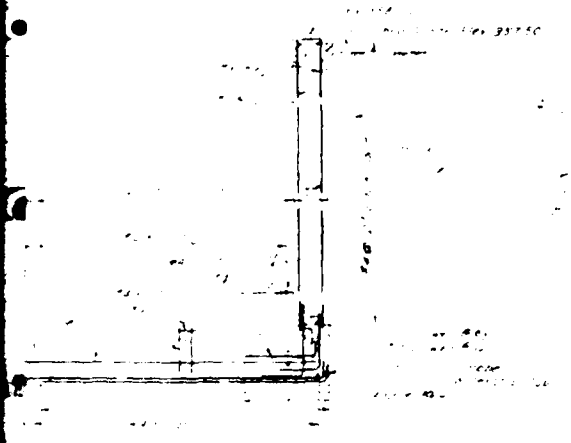
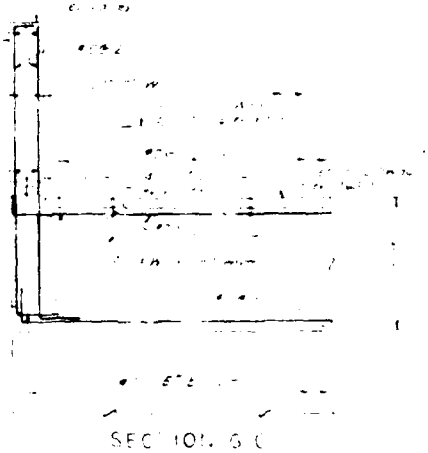


SECTION F-F



SECTION G-G
Scale $\frac{3}{8}$"

POPE'S POND DAM

CONCRETE REINFORCING DETAILS

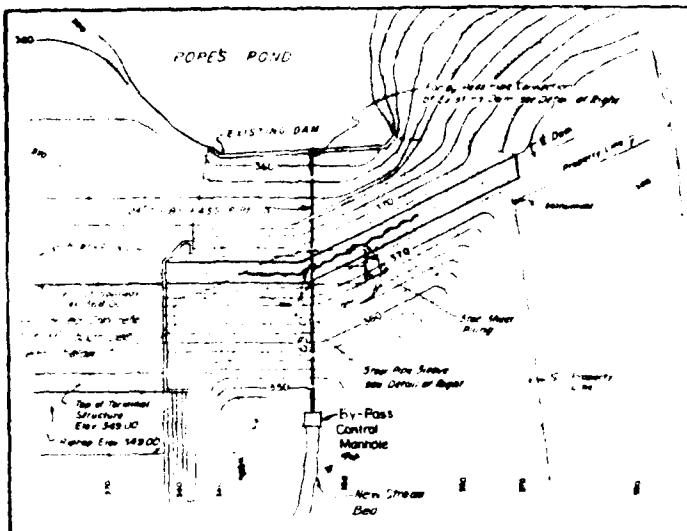
PARTIAL PLAN SECTIONS AND DETAILS

Scale As Shown

Traced By

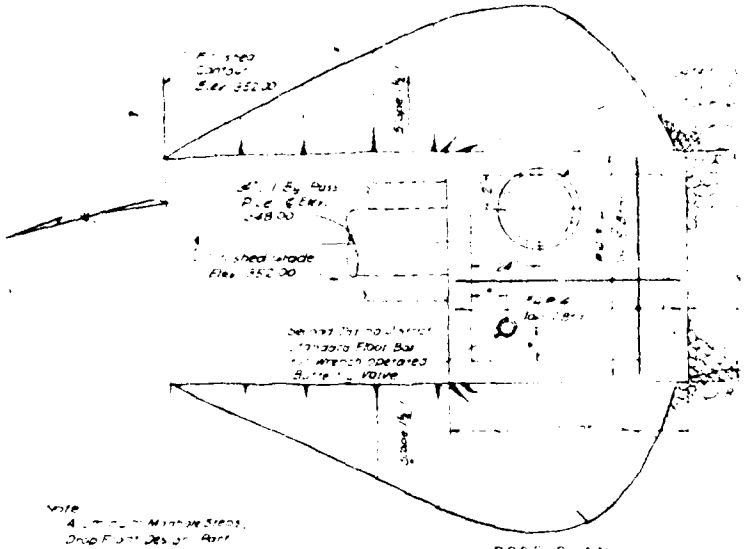
Revisions

2 B-26



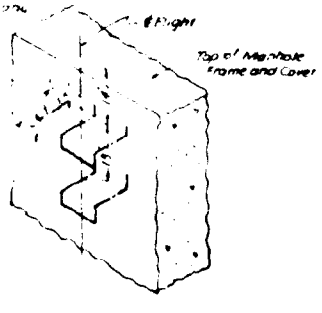
LOCATION PLAN

Scale 1" = 60'-0"



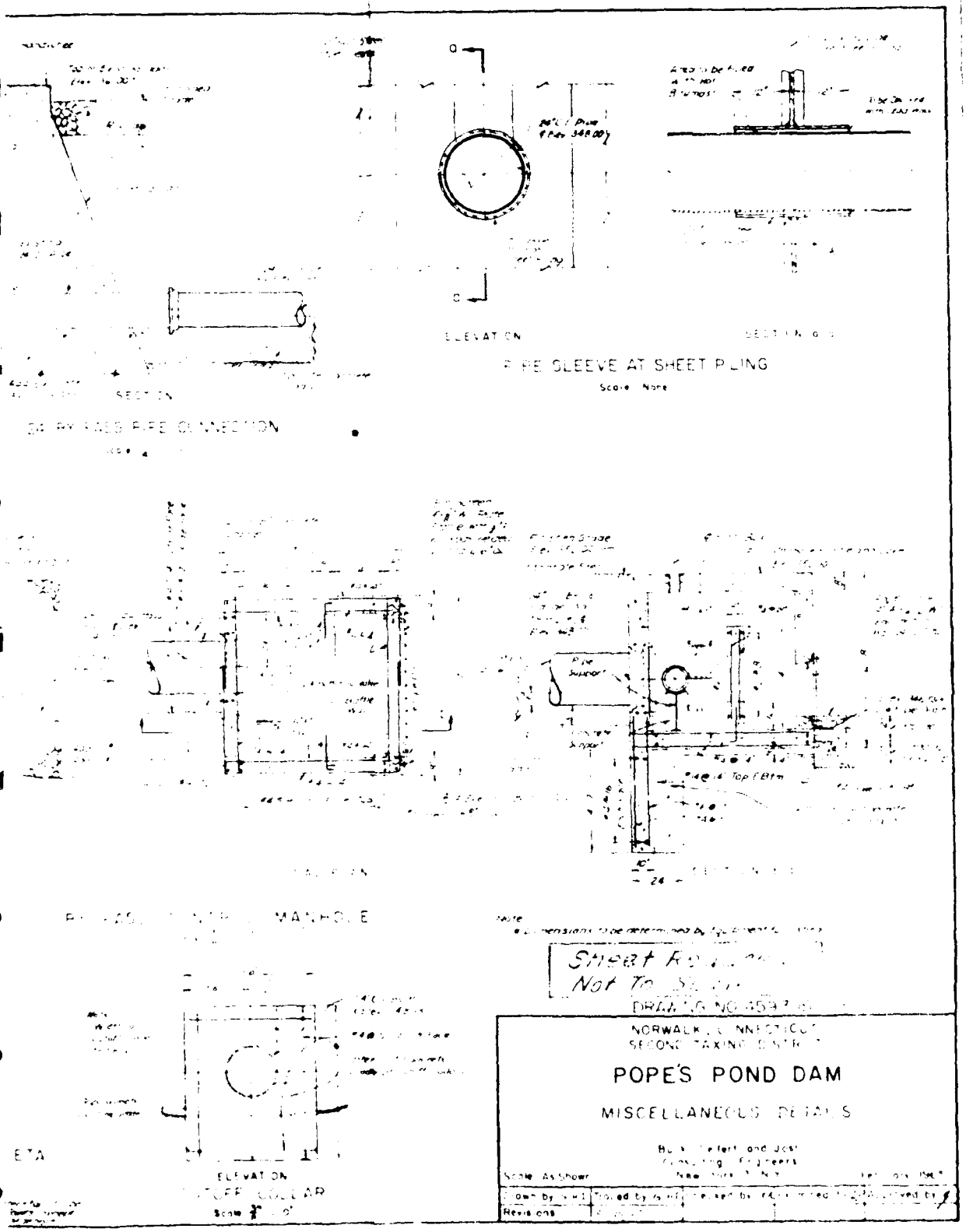
ROOF PLAN

Note



ALUMINUM MANHOLE STEPS

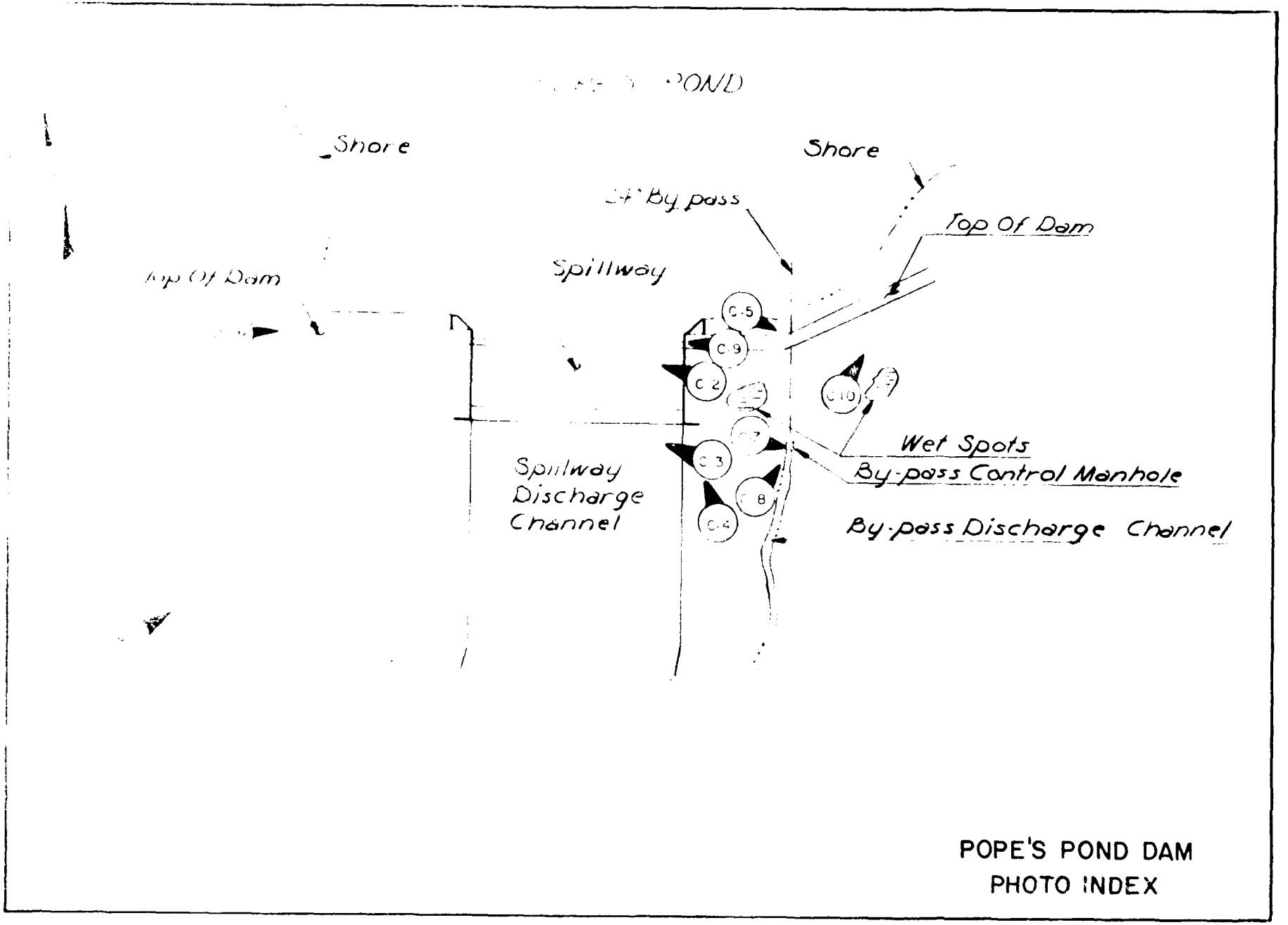
Scale None


ELEVATION
PIPE SLEEVE AT SHEET PILING
Scale None
SECTION
MANHOLE
ELEVATION
STEP COLLAR
Scale
Street
Not To
DRWG NO.
NORWALK, CONNECTICUT
SEWER TAXING DISTRICT
POPE'S POND DAM
MISCELLANEOUS DETAILS
Scale As Shown
Revisions

2 B-27

APPENDIX C

PHOTOGRAPHS

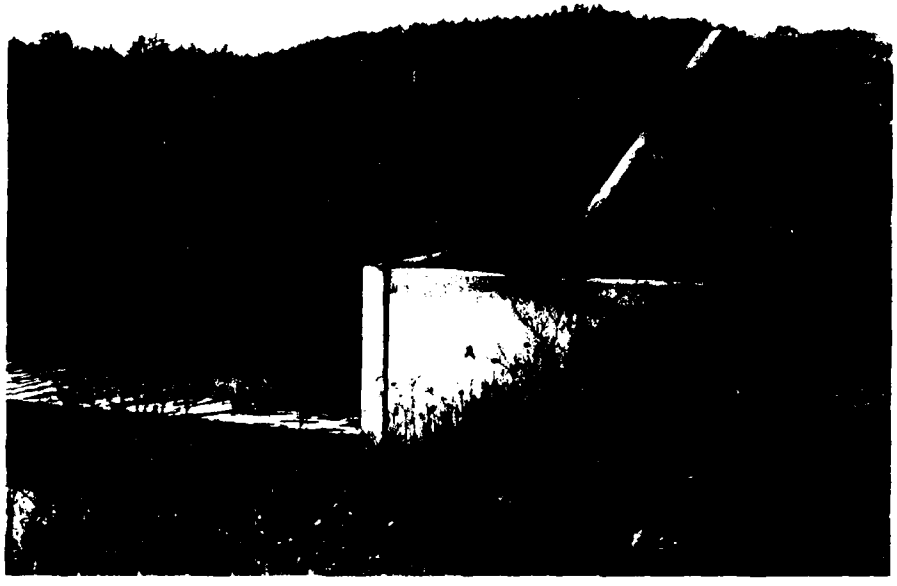


POPE'S POND DAM
PHOTO INDEX

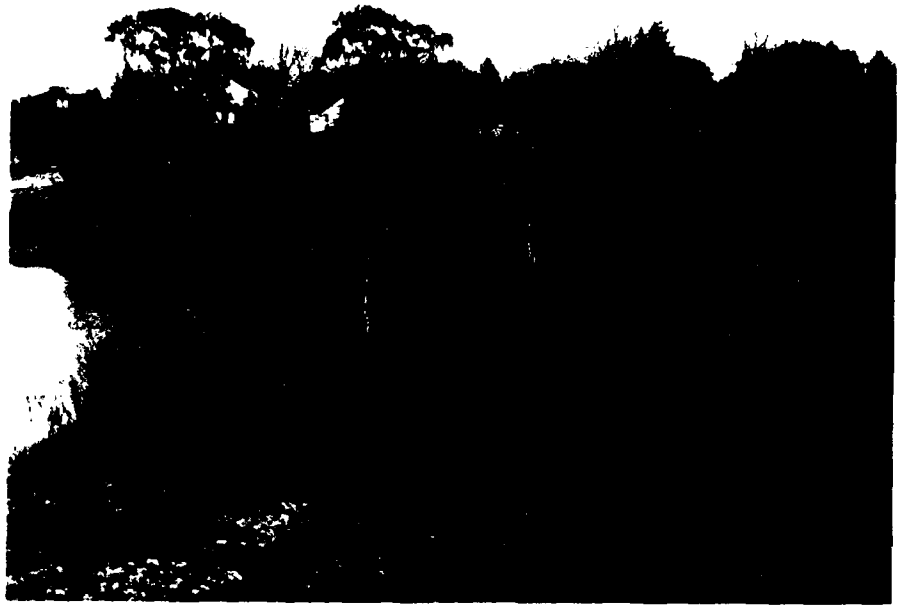
C-1 DAM AND SPILLWAY - LOOKING EAST

C-2 SPILLWAY SHOWING VEGETATION IN JOINTS - LOOKING WEST

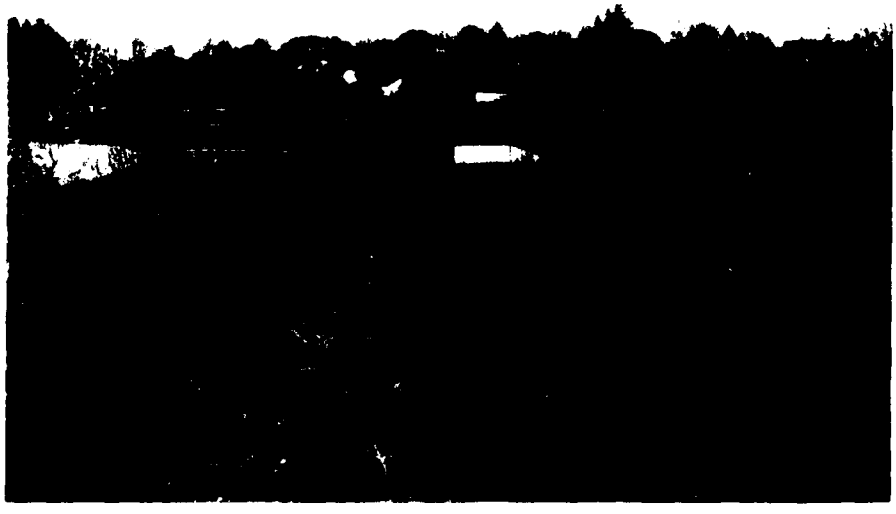
C-3 SPILLWAY - LOOKING AT WESTERN END



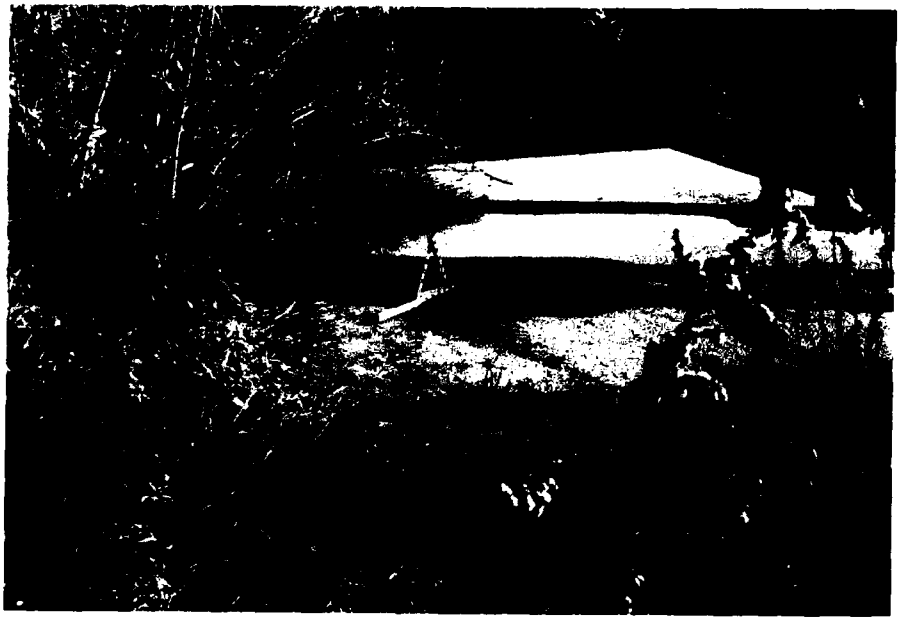
C-4 SPILLWAY AT EASTERN END



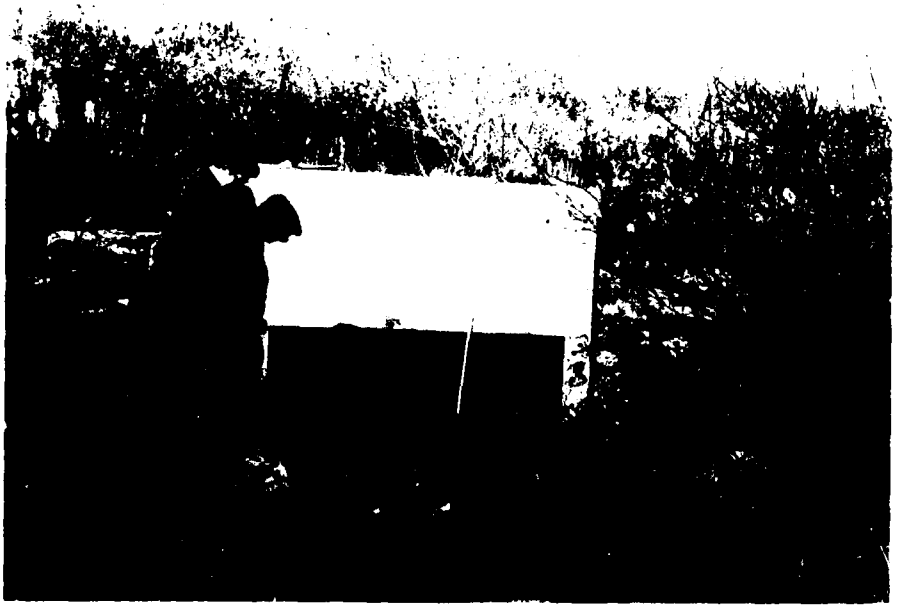
C-5 EASTERN TOP OF DAM EMBANKMENT - LOOKING EAST



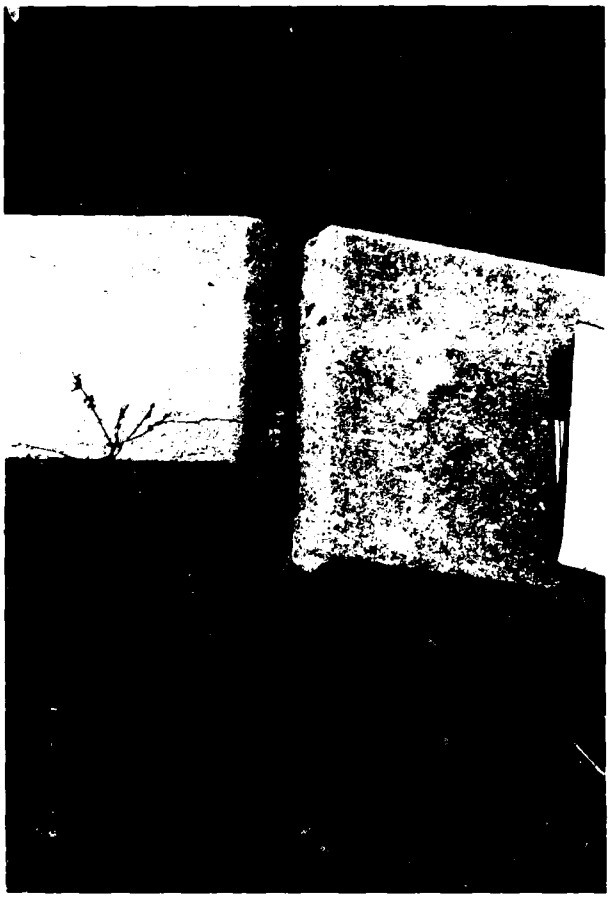
C-6 WESTERN TOP OF DAM EMBANKMENT - LOOKING EAST



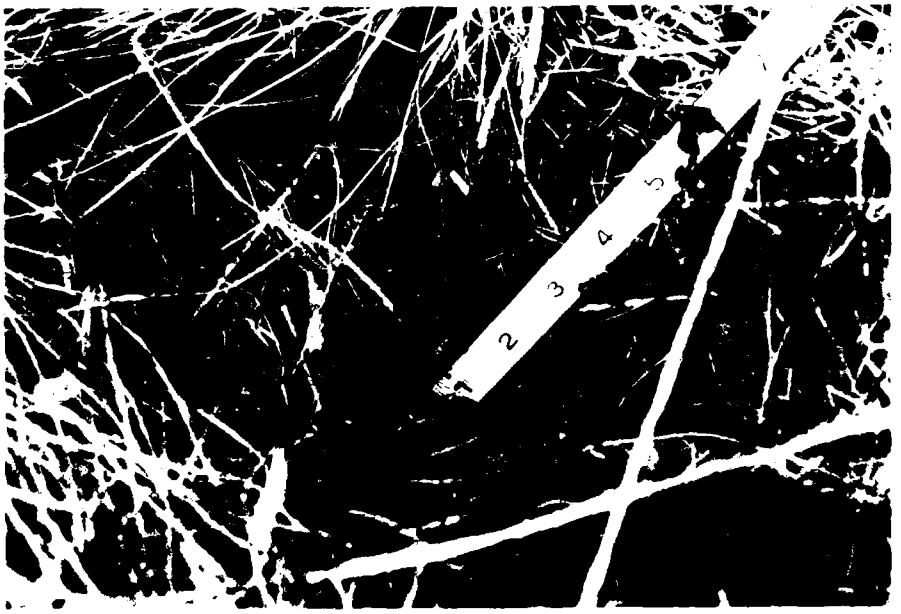
C-7 BY-PASS CONTROL MANHOLE



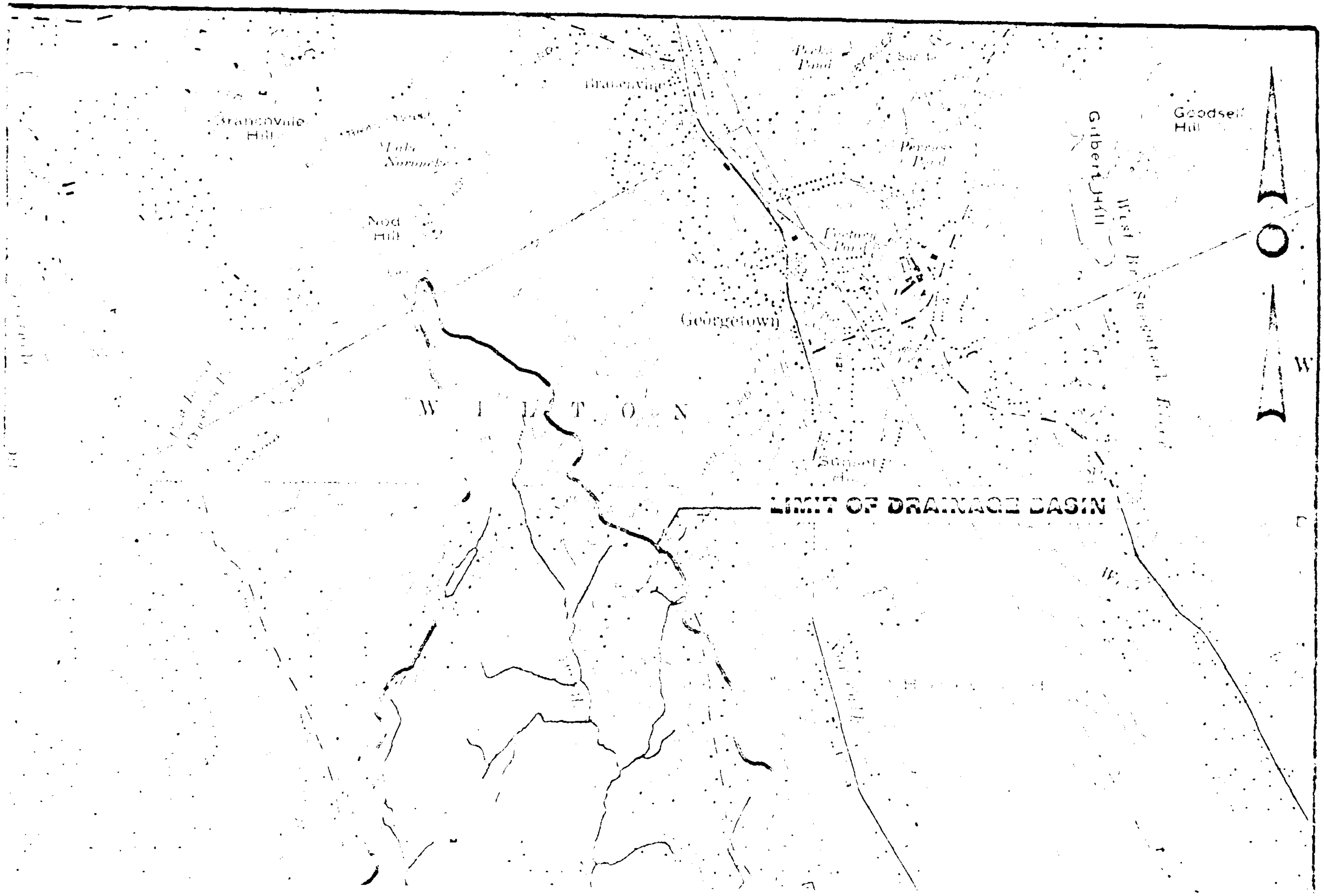
C-8 OUTFALL FROM BY-PASS CONTROL MANHOLE - LOOKING NORTH

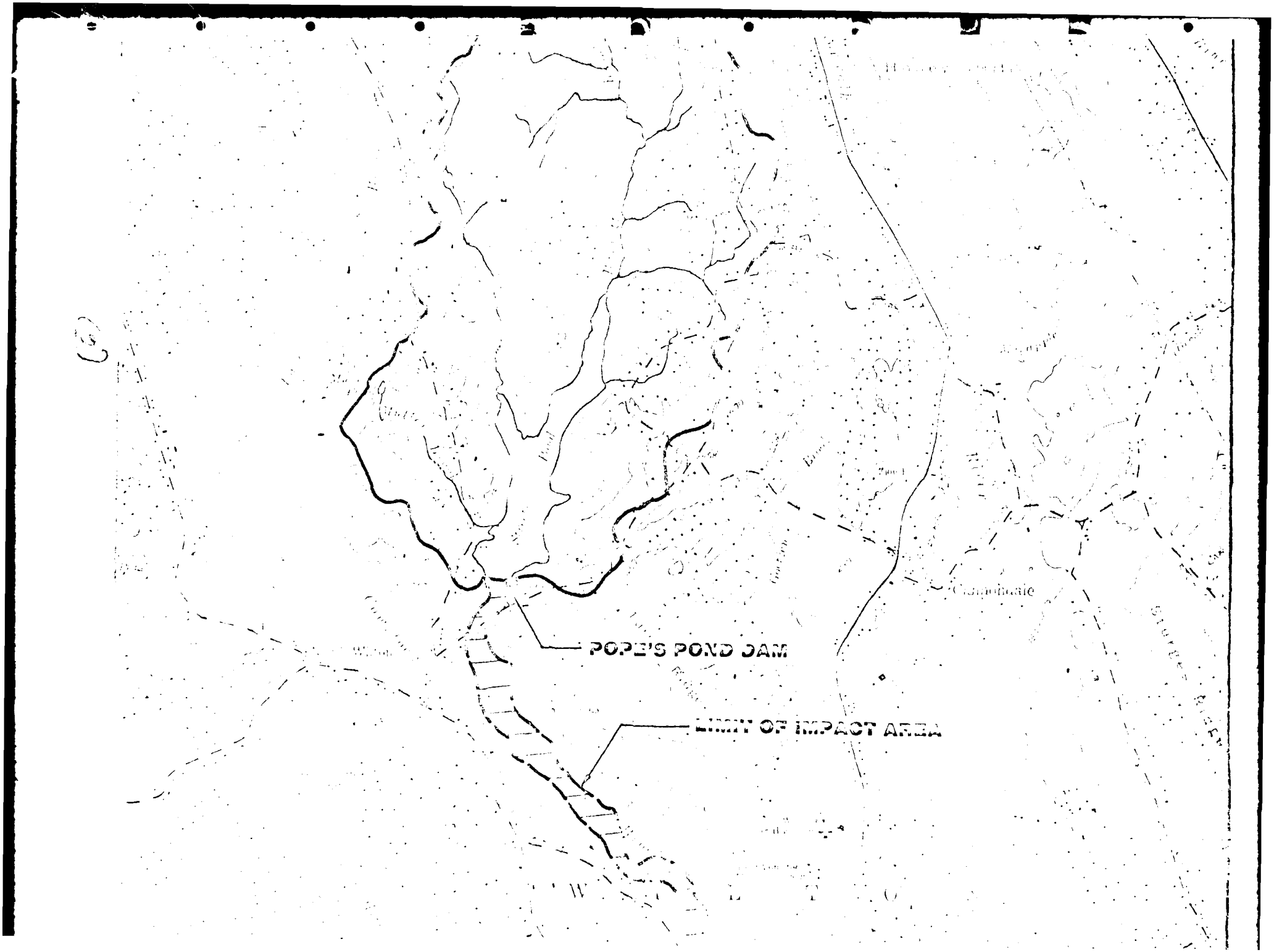


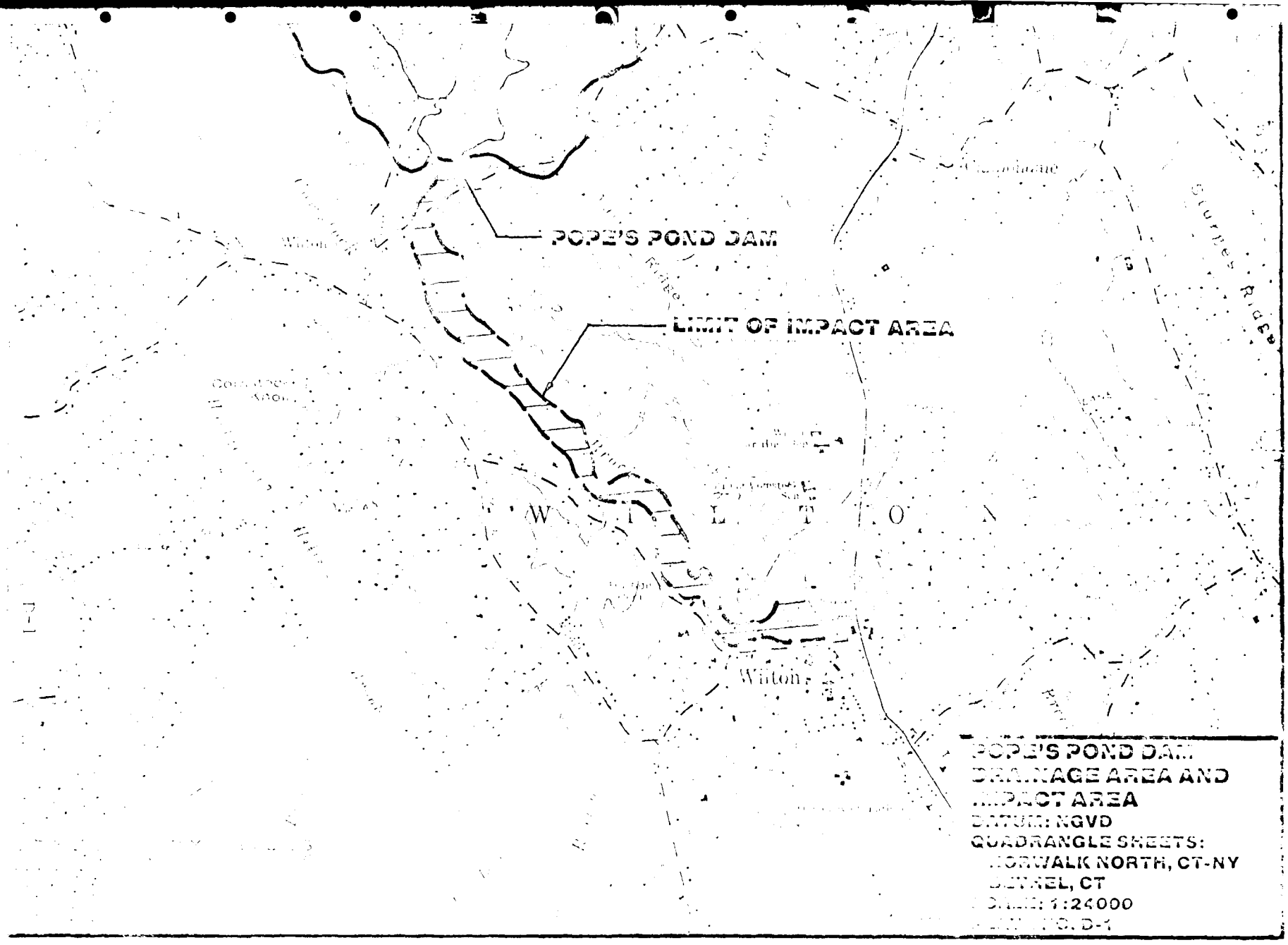
C-9 OPEN JOINT IN SPILLWAY WALL AT EASTERN EDGE



C-10 ANIMAL HOLE ON EASTERN DOWNSTREAM EMBANKMENT


LIMIT OF DRAINAGE BASIN
W I L T O N
Georgetown
Goodsell Hill
Gilbert Hill
Nod Hill
Branchville Hill
Branchville
Sunset Hill


POPE'S POND DAM
LIMIT OF IMPACT AREA


POPE'S POND DAM
LIMIT OF IMPACT AREA
POPE'S POND DAM
DRAINAGE AREA AND
IMPACT AREA
DATUM: NGVD
QUADRANGLE SHEETS:
NORWALK NORTH, CT-NY
DANBURY, CT
SCALE: 1:24000
FIG. D-1

APPENDIX D

HYDROLOGIC AND HYDRAULIC COMPUTATIONS

HYDROLOGIC AND HYDRAULIC ANALYSIS
SUMMARY SHEET

Dam Pope's Pond Dam

Test Flood PMF

INFLOW HYDROGRAPH DEVELOPMENT

Drainage Area 2.32 sq. mi.

Probable Maximum Precipation
24 hour - 200 square mile PMP 22 inches

Initial Railfall Loss 0 Inch
Uniform Railfall loss .1 Inch

Snyder's Lag 2.9 hours
Snyder's Peaking Coefficient .625

Test Flood Inflow 4575 CFS

PMF Inflow 4575 CFS

RESERVOIR ROUTING AND DAM OVERTOPPING

Test Flood Outflow 4475 CFS

Spillway Capacity at Top of Dam 7600 CFS
more than 100 % of Test Flood

Flow Over Spillway at Test Flood 4475 CFS

Spillway Crest Elevation 368.0 Feet
Top of Dam Elevation 373.0 Feet
Test Flood Elevation 371.5 Feet

DAM SAFETY VERSION [illegible]

LAST MODIFICATION 26 FEB 79

```
    1                A1      DAM SAFETY ANALYSIS-JOB NO. 79-905/08 ERJ
    2                A2      POPES POND DAM - WILTON CONNECTICUT
    3                A3      I=25-80
    4                P    75       1       0       0       0       0       0       2       0       0
    5                M1    5
    6                J     1       2       1
    7                JI   .5      1.      0.      0.      0.      0.      0.      0.      0.0
    8                K     0       1       0       0       0       0       1       0
    9                K1       COMPUTATION OF PMF - DEVELOPMENT OF INFLOW HYDROGRAPH
   10                M     1       1      2.3      0      2.3      0       0       0       1
   11                P     0      22      110     124     133     142
   12                T     0       0       0       0       0       0       0      .1
   13                W    2.9    .625
   14                X   1.82    .05     2.0
   15                S     1       1       0       0       0       0       1
   16                K1       ROUTING INFLOW HYDROGRAPH THRU LAKE - OVERTOPPING ANALYSIS
   17                Y     0       0       0       1       1
   18                YI    1       0       0       0       0       0      -1
   19                $A   87.5    91.0    98.0   100.0
   20                $E   368     370     372     373
   21                $$   368     200     3.4     1.5
   22                $D   373     2.7     1.5     450
   24                K    99
```

[illegible]
LAST MODIFICATION 26 FEB 79

RUN DATE= 01/28/80.
TIME= 14.51.13.

DAM SAFETY ANALYSIS-JOB NO. 79-905/08 EHJ
POPES POND DAM - WILTON CONNECTICUT
1-25-80

JOB SPECIFICATION

IO	NHR	NMIN	IDAY	IHR	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
RTIOS= .50 1.00

****

SUB-AREA RUNOFF COMPUTATION

COMPUTATION OF PMF - DEVELOPMENT OF INFLOW HYDROGRAPH

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
1	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	1	2.30	0.00	2.30	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	22.00	110.00	124.00	133.00	142.00	0.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS .800

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	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
TP= 2.90 CP= .63 NTA= 0

RECESSION DATA
STRTQ= 1.42 QRCSN= .05 RTIOR= 2.00
APPROXIMATE CLARK COEFFICIENTS FROM GIVEN SNYDER CP AND TP ARE TC= 3.57 AND R= 2.32 INTERVALS

UNIT HYDROGRAPH 15 END-OF-PERIOD ORDINATES, LAG= 2.88 HOURS, CP= .62 VOL= 1.00

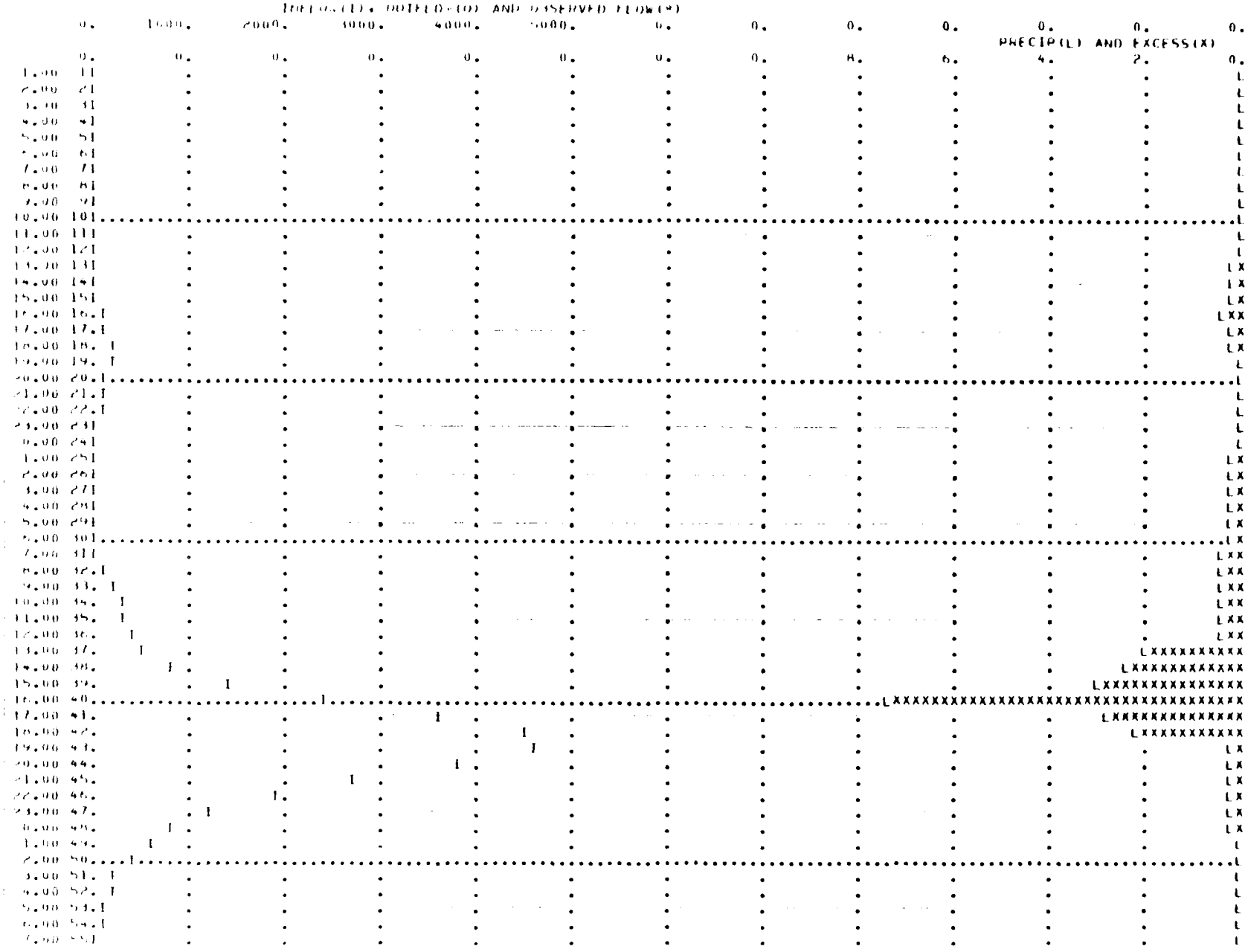
55.	191.	307.	307.	221.	143.	92.	59.	38.	25.
16.	10.	7.	4.	3.					

END-OF-PERIOD FLOW

MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q

1.01	[illegible]		.01	0.00	.01	1.	1.02	18.00	42	.16	.06	.10	4529.
1.01	6.00	6	.01	0.00	.01	1.	1.02	19.00	43	.16	.06	.10	4574.
1.01	7.00	7	.01	0.00	.01	1.	1.02	20.00	44	.16	.06	.10	3791.
1.01	8.00	8	.01	0.00	.01	1.	1.02	21.00	45	.16	.06	.10	2750.
1.01	9.00	9	.01	0.00	.01	1.	1.02	22.00	46	.16	.06	.10	1850.
1.01	10.00	10	.01	0.00	.01	1.	1.02	23.00	47	.16	.06	.10	1224.
1.01	11.00	11	.01	0.00	.01	1.	1.03	0.00	48	.16	.06	.10	819.
1.01	12.00	12	.01	0.00	.01	1.	1.03	1.00	49	0.00	0.00	0.00	555.
1.01	13.00	13	.13	.03	.10	2.	1.03	2.00	50	0.00	0.00	0.00	376.
1.01	14.00	14	.16	.06	.10	10.	1.03	3.00	51	0.00	0.00	0.00	250.
1.01	15.00	15	.20	.10	.10	26.	1.03	4.00	52	0.00	0.00	0.00	159.
1.01	16.00	16	.50	.40	.10	68.	1.03	5.00	53	0.00	0.00	0.00	99.
1.01	17.00	17	.18	.08	.10	135.	1.03	6.00	54	0.00	0.00	0.00	59.
1.01	18.00	18	.14	.04	.10	188.	1.03	7.00	55	0.00	0.00	0.00	25.
1.01	19.00	19	.01	0.00	.01	189.	1.03	8.00	56	0.00	0.00	0.00	11.
1.01	20.00	20	.01	0.00	.01	149.	1.03	9.00	57	0.00	0.00	0.00	4.
1.01	21.00	21	.01	0.00	.01	103.	1.03	10.00	58	0.00	0.00	0.00	2.
1.01	22.00	22	.01	0.00	.01	67.	1.03	11.00	59	0.00	0.00	0.00	1.
1.01	23.00	23	.01	0.00	.01	44.	1.03	12.00	60	0.00	0.00	0.00	1.
1.02	0.00	24	.01	0.00	.01	28.	1.03	13.00	61	0.00	0.00	0.00	0.
1.02	1.00	25	.11	.01	.10	19.	1.03	14.00	62	0.00	0.00	0.00	0.
1.02	2.00	26	.11	.01	.10	13.	1.03	15.00	63	0.00	0.00	0.00	0.
1.02	3.00	27	.11	.01	.10	11.	1.03	16.00	64	0.00	0.00	0.00	0.
1.02	4.00	28	.11	.01	.10	10.	1.03	17.00	65	0.00	0.00	0.00	0.
1.02	5.00	29	.11	.01	.10	9.	1.03	18.00	66	0.00	0.00	0.00	0.
1.02	6.00	30	.11	.01	.10	9.	1.03	19.00	67	0.00	0.00	0.00	0.
1.02	7.00	31	.41	.31	.10	25.	1.03	20.00	68	0.00	0.00	0.00	0.
1.02	8.00	32	.41	.31	.10	83.	1.03	21.00	69	0.00	0.00	0.00	0.
1.02	9.00	33	.41	.31	.10	177.	1.03	22.00	70	0.00	0.00	0.00	0.
1.02	10.00	34	.41	.31	.10	271.	1.03	23.00	71	0.00	0.00	0.00	0.
1.02	11.00	35	.41	.31	.10	338.	1.04	0.00	72	0.00	0.00	0.00	0.
1.02	12.00	36	.41	.31	.10	382.	1.04	1.00	73	0.00	0.00	0.00	0.
1.02	13.00	37	1.94	1.84	.10	494.	1.04	2.00	74	0.00	0.00	0.00	0.
							1.04	3.00	75	0.00	0.00	0.00	0.
									SUM	24.99	21.72	3.27	32133.
										(635.)	(552.)	(83.)	(909.91)

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	4574.	3557.	1291.	446.	32135.
CMS	130.	101.	37.	13.	910.
INCHES		14.39	20.89	21.66	21.66
MM		365.44	530.70	550.20	550.20
AC-FT		1764.	2562.	2656.	2656.
THOUS CU M		2176.	3160.	3276.	3276.


PRECIP(L) AND EXCESS(X)
0.
2.
4.
6.
8.
0.
1000.
2000.
3000.
4000.
5000.
6000.
7000.

1.	1.	1.	1.	1.	1.	1.	1.	0.	0.
0.	0.	1.	5.	13.	34.	68.	94.	94.	74.
51.	34.	22.	14.	9.	7.	5.	5.	5.	4.
12.	42.	88.	135.	169.	191.	247.	412.	705.	1181.
1797.	2365.	2287.	1796.	1375.	925.	612.	410.	278.	188.
125.	80.	49.	29.	12.	6.	2.	1.	1.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.					

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	2287.	1779.	646.	223.	16067.
CMS	65.	50.	18.	6.	455.
INCHES		7.19	10.45	10.83	10.83
MM		182.72	265.35	275.10	275.10
AC-FT		882.	1281.	1328.	1328.
THOUS CU M		1088.	1580.	1638.	1638.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 2

2.	2.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	2.	10.	26.	68.	135.	188.	189.	149.
103.	67.	44.	28.	19.	13.	11.	10.	9.	9.
25.	83.	177.	271.	338.	382.	494.	824.	1411.	2362.
3593.	4529.	4574.	3791.	2750.	1850.	1224.	819.	555.	376.
250.	159.	99.	59.	25.	11.	4.	2.	1.	1.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.					

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	4574.	3557.	1291.	446.	32135.
CMS	130.	101.	37.	13.	910.
INCHES		14.39	20.89	21.66	21.66
MM		365.44	530.70	550.20	550.20
AC-FT		1764.	2562.	2656.	2656.
THOUS CU M		2176.	3160.	3276.	3276.

HYDROGRAPH ROUTING

ROUTING INFLOW HYDROGRAPH THRU LAKE - OVERTOPPING ANALYSIS

ISTAO	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
1	1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	-1.	0

SURFACE AREA=	88.	93.	98.	100.
CAPACITY=	0.	160.	371.	470.

TOPEL	COQD	EXPD	DAMWID
373.0	2.7	1.5	450.

STATION 1, PLAN 1, RATIO 1

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	1.	4.	14.	31.	51.	62.
63.	56.	46.	38.	30.	24.	19.	16.	13.	11.
11.	14.	28.	54.	90.	127.	168.	246.	415.	738.
1254.	1836.	2182.	2110.	1739.	1299.	926.	653.	465.	334.
241.	174.	125.	90.	64.	45.	33.	24.	18.	14.
11.	9.	7.	6.	5.	4.	3.	3.	3.	2.
2.	2.	2.	1.	1.					

STORAGE

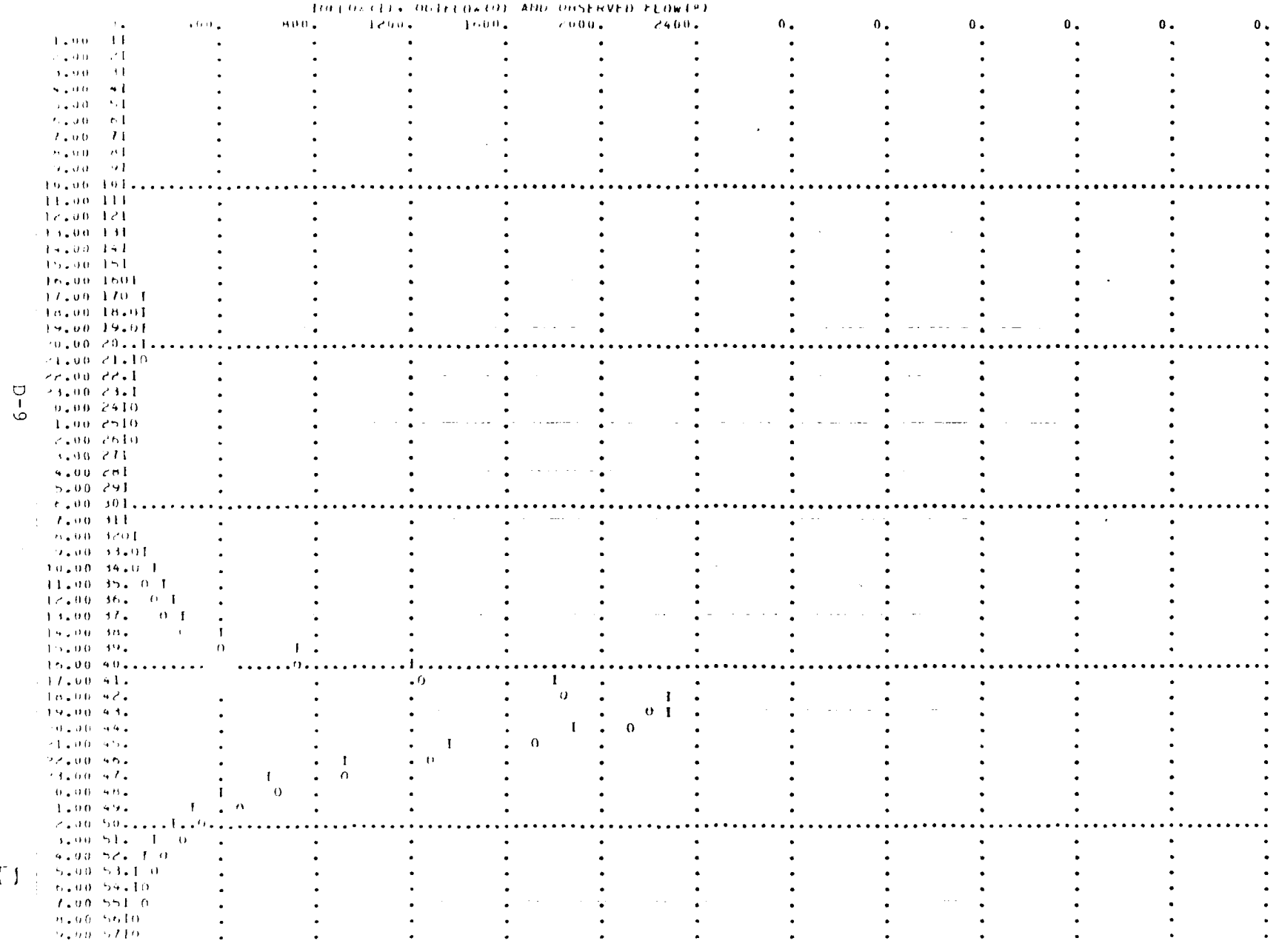
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	1.	1.	3.	6.	11.	16.	18.
18.	17.	15.	13.	11.	9.	8.	7.	6.	6.
6.	7.	10.	16.	23.	29.	35.	45.	64.	94.
135.	175.	197.	192.	168.	136.	110.	86.	69.	55.
44.	35.	28.	23.	18.	14.	12.	9.	8.	7.
6.	5.	4.	4.	3.	3.	3.	2.	2.	2.
2.	2.	2.	1.	1.					

STAGE

368.0	368.0	368.0	368.0	368.0	368.0	368.0	368.0	368.0	368.0
368.0	368.0	368.0	368.0	368.0	368.0	368.1	368.1	368.2	368.2
368.2	368.2	368.2	368.1	368.1	368.1	368.1	368.1	368.1	368.1
368.1	368.1	368.1	368.2	368.3	368.3	368.4	368.5	368.7	369.1
369.5	369.9	370.2	370.1	369.9	369.5	369.2	369.0	368.8	368.6
368.5	368.4	368.3	368.3	368.2	368.2	368.1	368.1	368.1	368.1
368.1	368.1	368.0	368.0	368.0	368.0	368.0	368.0	368.0	368.0
368.0	368.0	368.0	368.0	368.0					

PEAK OUTFLOW IS 2182. AT TIME 43.00 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	2182.	1709.	642.	223.	16060.
CMS	62.	48.	18.	6.	455.
INCHES		6.91	10.38	10.83	10.83
MM		175.60	263.76	274.97	274.97
AC-FT		848.	1273.	1327.	1327.
THOUS CU M		1045.	1570.	1637.	1637.


[O]=CALC. OUTFLOW(CFS) AND [I]=OBSERVED FLOW(CFS)
0. 400. 800. 1200. 1600. 2000. 2400. 0. 0. 0. 0. 0. 0.
1.00 11
2.00 21
3.00 31
4.00 41
5.00 51
6.00 61
7.00 71
8.00 81
9.00 91
10.00 101
11.00 111
12.00 121
13.00 131
14.00 141
15.00 151
16.00 160I
17.00 170 I
18.00 18.0I
19.00 19.0I
20.00 20.1
21.00 21.10
22.00 22.I
23.00 23.I
0.00 2410
1.00 2510
2.00 2610
3.00 27I
4.00 28I
5.00 29I
6.00 301
7.00 31I
8.00 320I
9.00 33.0I
10.00 34.0 I
11.00 35. 0 I
12.00 36. 0 I
13.00 37. 0 I
14.00 38. I
15.00 39. 0 I
16.00 40 0 I
17.00 41. 0 I
18.00 42. 0 I
19.00 43. 0 I
20.00 44. I 0
21.00 45. I 0
22.00 46. I 0
23.00 47. I 0
0.00 48. I 0
1.00 49. I 0
2.00 50. I 0
3.00 51. I 0
4.00 52. I 0
5.00 53.I 0
6.00 54.10
7.00 551 0
8.00 5610
9.00 5710

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

0.	0.	0.	0.	0.	0.	0.	0.	1.	1.
1.	1.	1.	1.	3.	12.	36.	79.	123.	143.
139.	114.	91.	70.	54.	42.	33.	26.	22.	19.
18.	28.	60.	124.	206.	284.	367.	537.	910.	1613.
2898.	3864.	4475.	4213.	3387.	2474.	1731.	1204.	846.	601.
429.	304.	215.	151.	104.	71.	49.	35.	25.	19.
15.	12.	9.	7.	6.	5.	4.	4.	3.	3.
2.	2.	2.	2.	1.					

STORAGE

0.	0.	0.	0.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	3.	6.	12.	21.	28.	31.
30.	27.	23.	19.	16.	14.	12.	10.	9.	8.
9.	10.	17.	28.	40.	49.	59.	76.	108.	160.
220.	292.	324.	311.	267.	215.	168.	131.	103.	82.
65.	52.	41.	32.	25.	19.	15.	12.	10.	8.
7.	6.	5.	4.	4.	3.	3.	3.	2.	2.
2.	2.	2.	2.	1.					

STAGE

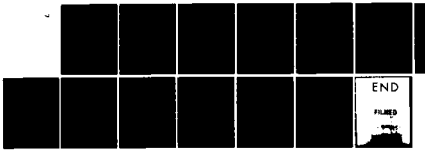
368.0	368.0	368.0	368.0	368.0	368.0	368.0	368.0	368.0	368.0
368.0	368.0	368.0	368.0	368.0	368.1	368.1	368.2	368.3	368.4
368.3	368.3	368.3	368.2	368.2	368.2	368.1	368.1	368.1	368.1
368.1	368.1	368.2	368.3	368.5	368.6	368.7	368.9	369.2	369.8
370.5	371.2	371.5	371.4	370.9	370.4	369.9	369.5	369.2	368.9
368.7	368.6	368.5	368.4	368.3	368.2	368.2	368.1	368.1	368.1
368.1	368.1	368.1	368.0	368.0	368.0	368.0	368.0	368.0	368.0
368.0	368.0	368.0	368.0	368.0					

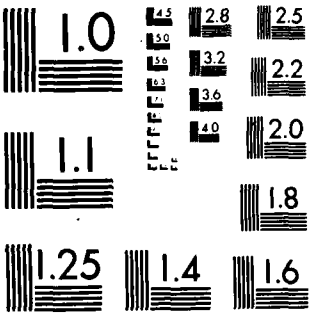
PEAK OUTFLOW IS 4475. AT TIME 43.00 HOURS

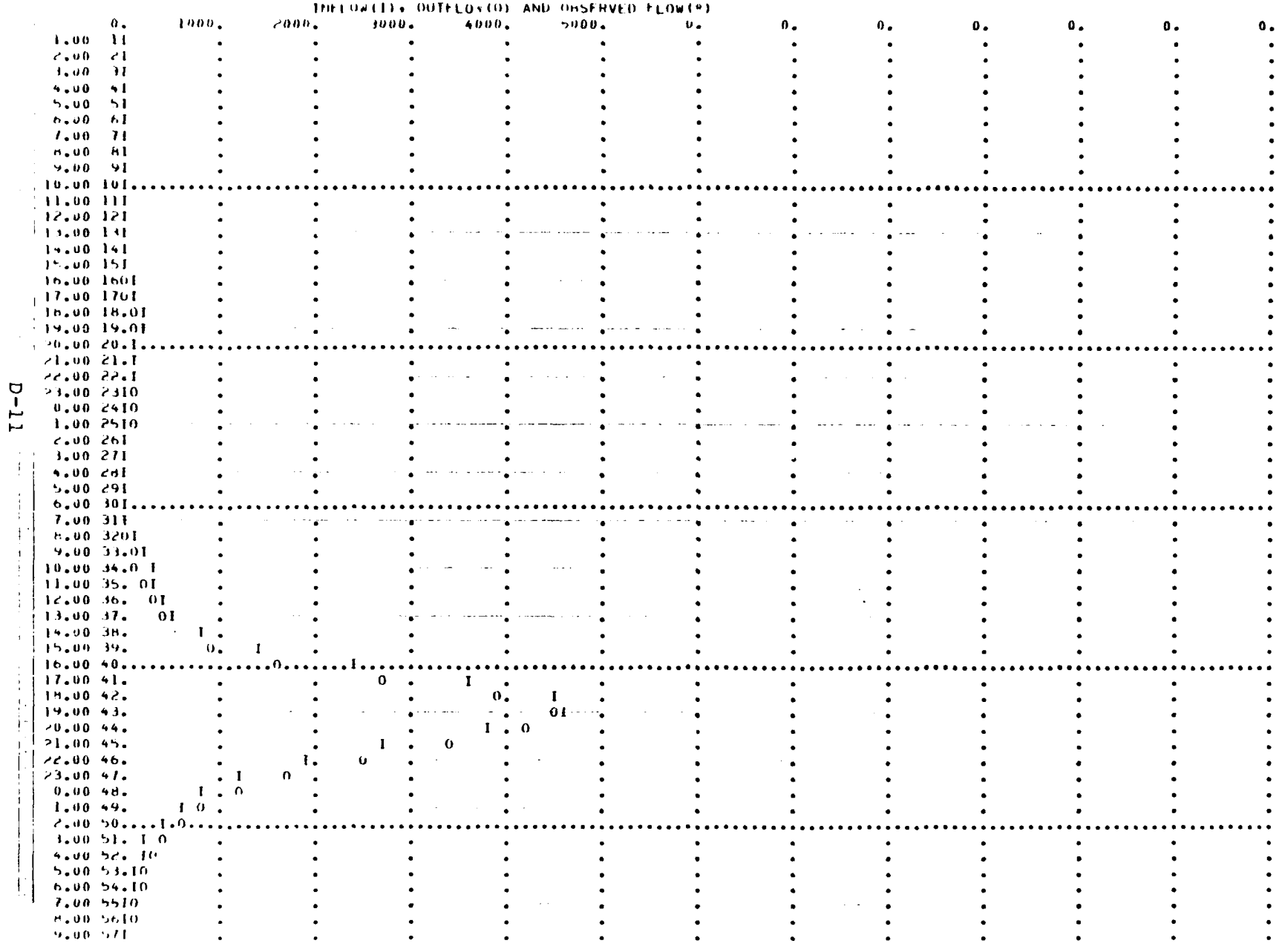
	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	4475.	3447.	1286.	446.	32129.
CMS	127.	98.	36.	13.	910.
INCHES		13.94	20.81	21.66	21.66
MM		354.11	528.47	550.09	550.10
AC-FT		1709.	2551.	2655.	2655.
THOUS CU M		2108.	3146.	3275.	3275.

AD-A143 522 NATIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL DAMS 2/2
POPE'S POND DAM (CT 0..(U) CORPS OF ENGINEERS WALTHAM
MA NEW ENGLAND DIV APR 80

UNCLASSIFIED F/G 13/13 NL






INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)
0. 1000. 2000. 3000. 4000. 5000. 0. 0. 0. 0. 0. 0. 0.
1.00 11
2.00 21
3.00 31
4.00 41
5.00 51
6.00 61
7.00 71
8.00 81
9.00 91
10.00 101
11.00 111
12.00 121
13.00 131
14.00 141
15.00 151
16.00 160I
17.00 170I
18.00 18.0I
19.00 19.0I
20.00 20.I
21.00 21.I
22.00 22.I
23.00 2310
0.00 2410
1.00 2510
2.00 261
3.00 271
4.00 281
5.00 291
6.00 301
7.00 311
8.00 320I
9.00 33.0I
10.00 34.0 I
11.00 35. 0I
12.00 36. 0I
13.00 37. 0I
14.00 38. I
15.00 39. 0. I
16.00 40. 0. I
17.00 41. 0 I
18.00 42. 0. I
19.00 43. 0I
20.00 44. I . 0
21.00 45. I 0
22.00 46. I. 0
23.00 47. I 0
0.00 48. I . 0
1.00 49. I 0
2.00 50. I 0
3.00 51. I 0
4.00 52. I0
5.00 53.I0
6.00 54.I0
7.00 5510
8.00 5610
9.00 571

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

OPERATION	STATION	AREA	PLAN	RATIO APPLIED TO FLOWS	
				RATIO 1 .50	RATIO 2 1.00
HYDROGRAPH AT	1	2.30	1	2287.	4574.
	(	5.96)	(	64.76)(	129.51)(
ROUTED TO	1	2.30	1	2182.	4475.
	(	5.96)	(	61.79)(	126.73)(

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	368.00	368.00	373.00
STORAGE	0.	0.	470.
OUTFLOW	0.	0.	7603.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
.50	370.18	0.00	197.	2182.	0.00	43.00	0.00
1.00	371.51	0.00	324.	4475.	0.00	43.00	0.00

POPE'S POND DAM

A. Size Classification

Height of dam = 24 ft.; hence small

Storage capacity at top of dam (elev. 373.0) = 1,460 AC-FT.; hence intermediate

Adopted size classification intermediate

B.i) Hazard Potential

Failure of the dam will result in damage to numerous buildings and homes between the dam and the village of Wilton.

ii) Impact of Failure of Dam at normal Pool (spillway crest)

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 more than 4;
b) Loss of buildings several;
c) Loss of highways or roads 4;
d) Loss of bridges 4;

The failure profile can affect a distance of 12,500 feet from the dam.

C. Hazard Potential Classifications

HAZARD	SIZE	TEST FLOOD RANGE
High	Intermediate	PMF

Adopted Test Flood = PMF = 1950 CSM

= 4475 CFS

D. Overtopping Potential

Drainage Area 1,472 acres = 2.3 sq. miles

Spillway crest elevation = 368 NGVD

Top of Dam Elevation = 373 NGVD

Maximum spillway discharge

Capacity without overtopping of dam = 7,600 CFS
"test flood" inflow discharge = 4,475 CFS
"test flood" outflow discharge = 4,475 CFS

POPE'S POND DAM
Dam Failure Analysis

1. Failure discharge with pool at spillway (elev. 368.0) = 24000 CFS
2. Depth of water in reservoir at time of failure = 20 ft.
3. Maximum depth of flow downstream of dam = 4.6 ft.
4. Water surface elevation just downstream of dam at time of failure) = 352.6 NGVD

The failure discharge of 24000 CFS will enter and flow downstream 12,500 feet until the brook enters the Norwalk River. Valley storage in this 12,500 feet length of brook is substantial 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 12,500 feet downstream. The failure profile will have the following hydraulic characteristics:

DISTANCE FROM THE DAM	WATER SURFACE ELEVATION NGVD	REMARKS
0	368.0	Upstream of Dam
0	352.6	Downstream of Dam
1000'	338.9	@ Olmstead Hill Rd.
5000'	326.0	
11,000'	342.4	@ Wilton
12,500'	192.9	@ Norwalk River

Beyond 12500 feet, and until South Wilton, the failure discharge will flow in the below given channel.

Q = 12000 CFS; S = .002 FT/FT

n = 0.05; b = 500; d = 4.9

Side slopes = 1V on 2H.

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

DATA

Name of Dam POPE'S POND DAM

Location Town of Wilton, Connecticut

Drainage Area 2.41 sq. mi., Top of Dam 373.0 NGVD

Spillway Type Overflow - OGEE, Crest of Spillway 368.0 NGVD

Surface Area @ Crest Elev. 87.5 Acres = 0.14 sq. mi.

Pool Bottom Near Dam = 349 NGVD

Assumed Side Slopes of Embankments = 2:1

Depth of Pool at Dam (Yo) = 20 Feet

Mid-Height Elev. 360.5 NGVD

Length of Dam at Crest = 642 Feet

Length of Dam at Mid-Height = 642 Feet

25% of Dam Length at Mid-Height = W_b = 160 Feet

Step 1

Storage (S) at time of failure 980 Ac-FT
(Equal to spillway crest)

Step 2

Peak Failure Discharge

$Q_{pl} = 8/27\ W_b \sqrt{g}\ Yo^{3/2}$

$= 1.68\ W_b\ Yo^{3/2} =$ 24000 cfs

Failure is assumed to coincide with pool elevation at spillway crest.

The Norwalk River is located 12,500 feet downstream of the Pope's Pond dam. There is a 160 foot drop into the Norwalk River which will cause the dissipation of wave and kinetic energy of the failure discharge. Approximately, the water surface elevations between the Pope's Pond dam and the Norwalk River will be as given on Dam Failure Analysis. The increase of depth in the Norwalk River due to failure of the Pope's Pond dam is estimated to be 4.9 feet.

BY FCB DATE 1/22/79 SUBJECT DAM INSPECTION SHEET NO 1 OF 5
CHKD. BY RCA DATE 1-21-80 STUDIES JOB NO 79-905/06

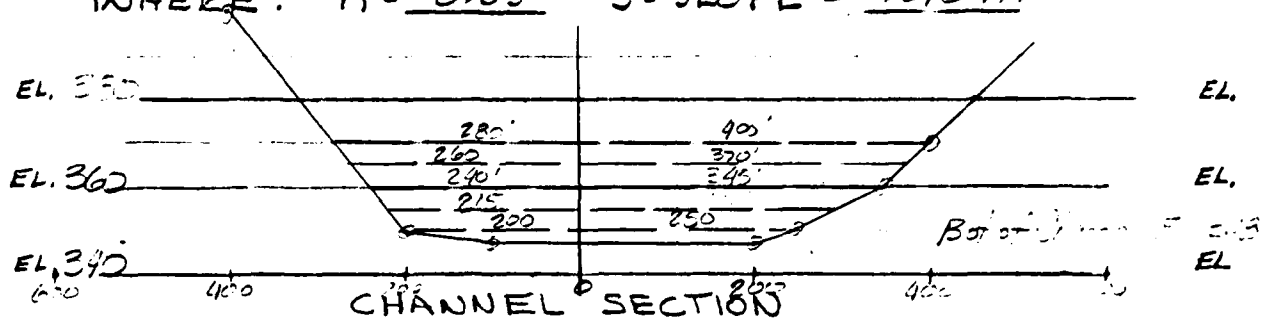
DOWNSTREAM W.S.EL. COMPUTATIONS

NAME OF DAM: Str-2

SECTION LOCATION: Fig 2 DOWNSTREAM OF DAM

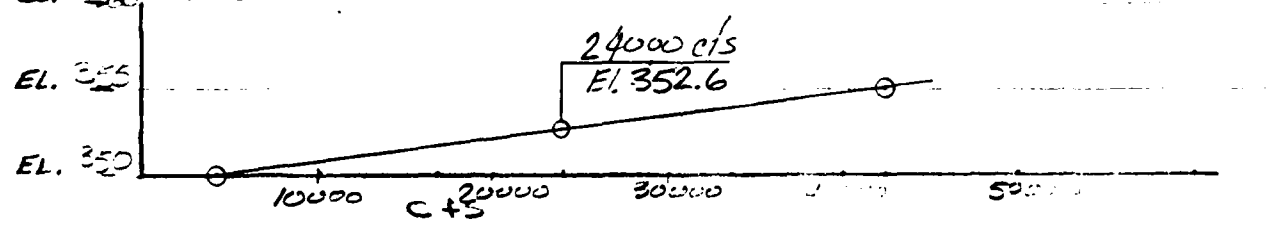
USING: $Q = 1.486/n \, A \, R^{2/3} \, S^{1/2}$

WHERE: n = 0.05 S = SLOPE = .018 ft/ft



Q_{P_1} = 24000 cfs STORAGE (S) 980 Ac-ft

ELEV	AREA	WP	R	$R^{2/3}$	$S^{1/2}$	1.486/n	Q	DEPTH
360	6210	585	10.61	4.93	.134	29.72	119451	12
355	9243	630	14.63	5.99	.134	29.72	220612	17
350	750	450	1.67	1.40	.134	29.72	4182	2
EL 352.6	3138	505	6.21	3.38	.134	29.72	42240	7



V_1 = (½ × ÷43,560) 1/2 = _____ Ac-ft

$Q_{P_2} = Q_{P_1} (1 - V_1/S)$ = _____ cfs

V_2 = = _____ Ac-ft V_{AVE} = _____ Ac-ft

$Q_{P_2} = Q_{P_1} (1 - V_{AVE}/S)$ = _____ cfs

STAGE DISCHARGE 24000 ELEV 3526 OR A D 4.6 ft

NEXT DOWNSTREAM SECTION _____ ft

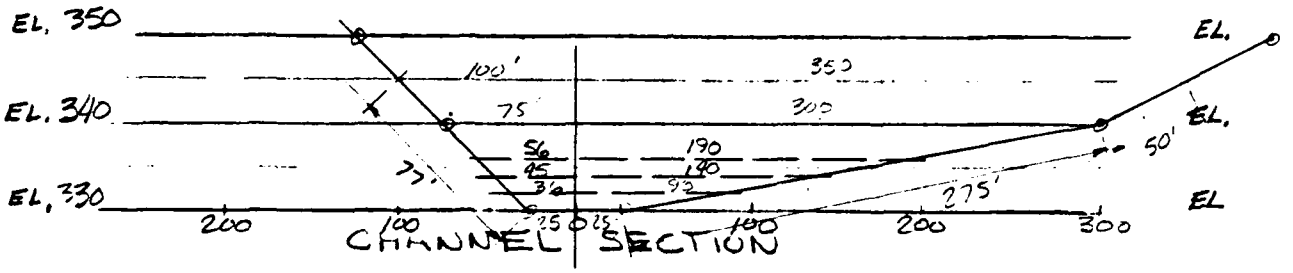
DOWNSTREAM W.S.EL. COMPUTATIONS

NAME OF DAM: Strools Pond Dam

SECTION LOCATION: 1000' DOWNSTREAM OF DAM

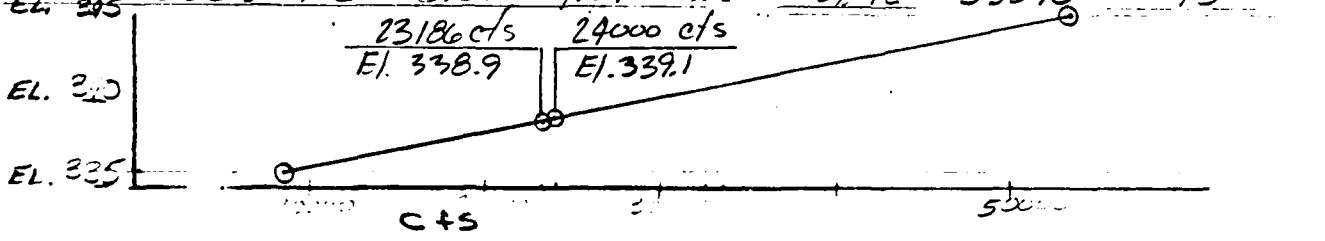
USING: $Q = 1.486/n \, A \, R^{2/3} \, S^{1/2}$

WHERE: n = 0.05 S = SLOPE = .019'/'



Q_{P_1} = 24000 cfs STORAGE (S) 980 Ac-ft

ELEV.	AREA	WP	R	$R^{2/3}$	$S^{1/2}$	1.486/n	Q	DEPTH
332	176	126	1.40	1.25	.134	29.72	873	2'
334	487	185	2.63	1.91	.134	29.72	3690	4'
336	918	246	3.73	2.40	.134	29.72	8742	6'
345	3305	402	8.22	4.07	.134	29.72	53370	15'



$V_1 = \frac{4.6+9.1}{2} \times \left(\frac{505+340}{2} \times 1000 \div 43{,}560\right)^{1/2}$ = 33.2 Ac-ft

$Q_{P_2} = Q_{P_1}(1 - V_1/S)$ = 23186 cfs

$V_2 = \frac{4.6+8.9}{2} \times 9.7 \times 1/2$ = 32.7 Ac-ft V_{AVE} 33 Ac-ft.

$Q_{P_2} = Q_{P_1}(1 - V_{AVE}/S)$ 23193 cfs

STAGE DISCHAR. 23193 → ELEV 338.9 OR A D = 8.9 FT

NEXT DOWNSTREAM SECTION 1000 ft.

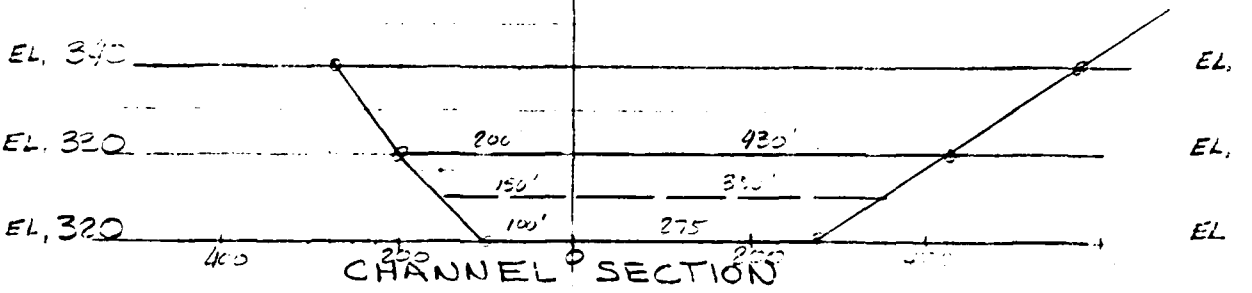
DOWNSTREAM W.S. EL. COMPUTATIONS

NAME OF DAM: Streets [illegible]

SECTION LOCATION: 5000' DOWNSTREAM OF DAM

USING: $Q = 1.486/n \, A \, R^{2/3} \, S^{1/2}$

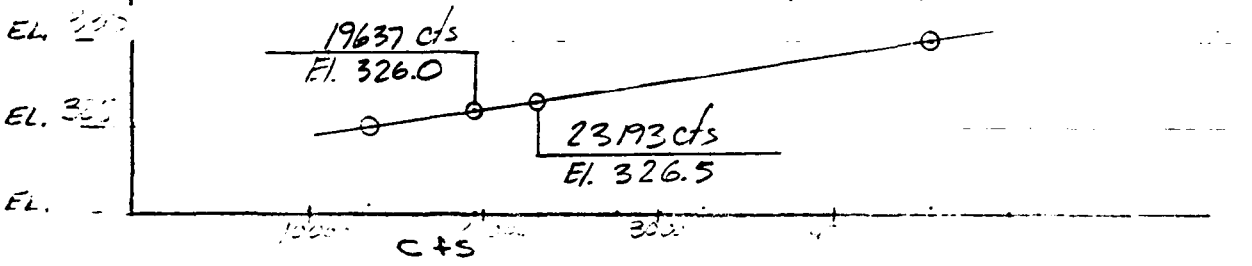
WHERE: n = 0.05 | S = SLOPE = .0016 ft/ft



CHANNEL SECTION

Q_{P1} = 23193 cfs STORAGE (S) = 980 Ac-ft

ELEV	AREA	WP	R	$R^{2/3}$	$S^{1/2}$	1.486/n	Q	DEPTH
325	2198	500	4.37	2.67	.077	29.72	13367	5'
330	5013	630	7.96	3.98	.077	29.72	[illegible]	
					.077	29.72		



$V_1 = \frac{8.9+6.5}{2} \times \left(\frac{330+520}{2} \times 4000 \div 43{,}560\right) 1/2$ = 150.3 Ac-ft

$Q_{P2} = Q_{P1}(1 - V_1/S)$ = 19637 cfs

$V_2 = \frac{8.9+6.0}{2} \times 39.0 \times 1/2$ = 145.3 Ac-ft V_{AVE} 147.9 ft

$Q_{P2} = Q_{P1}(1 - V_{AVE}/S)$ 19695 cfs

STAGE. DISCHARGE = 19695 cfs ELEV = 326.0 OR A D = 6.0 ft

[illegible] DOWNSTREAM SECTION [illegible] ft.

BY FCR DATE 1-27-79 SUBJECT: DAM INSPECTION SHEET NO 4 OF 5
CHKD. BY [illegible] DATE 1-27-80 STUDIES JOB NO 79-905/08

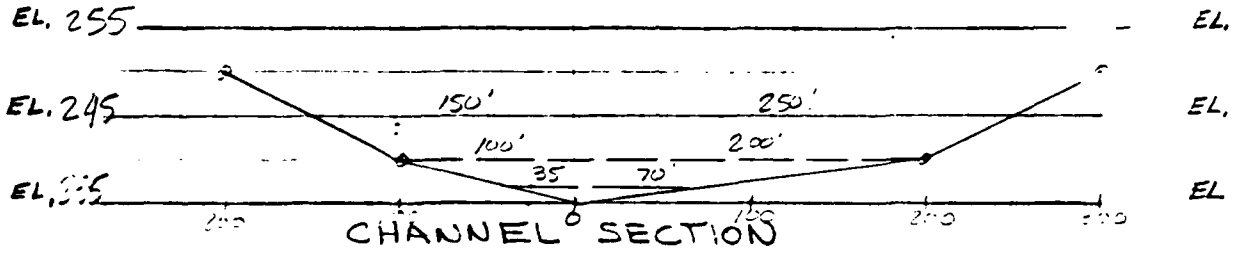
DOWNSTREAM W.S.EL. COMPUTATIONS

NAME OF DAM: Stra[illegible]

SECTION LOCATION: 1[illegible] DOWNSTREAM OF DAM

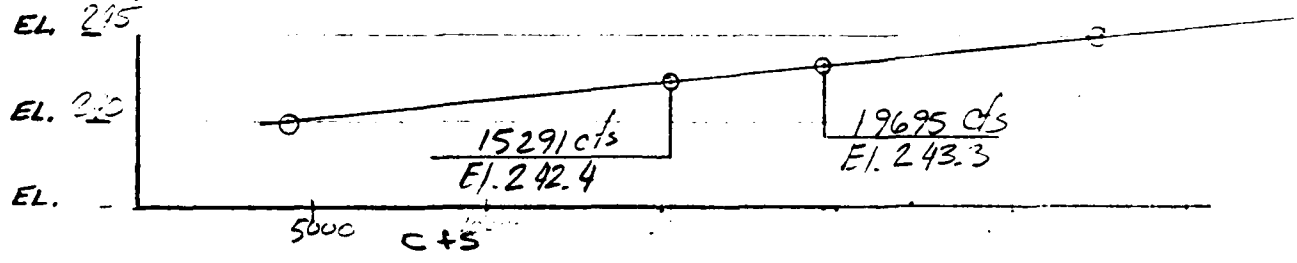
USING: $Q = 1.486/n \, A \, R^{2/3} \, S^{1/2}$

WHERE: n = 0.05 S = SLOPE = .0125 ft/ft



Q_{P1} = 19695 cfs STORAGE (S) 980 Ac-ft

ELEV	AREA	WP	R	$R^{2/3}$	$S^{1/2}$	$1.486/n$	Q	DEPTH
237	105	105	1	1	.112	29.72	350	2'
240	712	300	2.37	1.73	.112	29.72	4219	5
245	2462	400	6.16	3.36	.112	29.72	27535	10'



$V_1 = \frac{6.0+8.3}{2} \times \left(\frac{530+360}{2} \times [illegible] \div 43,560\right) 1/2$ = 219.1 Ac-ft

$Q_{P2} = Q_{P1}(1 - V_1/S)$ = 15291 cfs

$V_2 = \frac{6.0+7.4}{2} \times \frac{530+360}{2}$ [illegible] $1/2$ = 205.3 Ac-ft V_{AVE} [illegible] Ac-ft

$Q_{P2} = Q_{P1}(1 - V_{AVE}/S)$ = 15430 cfs

STAGE DISCHARGE = 15430 cfs ELEV = 247.4 OR A D = 7.4 ft

NEXT DOWNSTREAM SECTION [illegible] ft.

PURCELL ASSOCIATES

BY FSC DATE 11-27-79 SUBJECT DAM INSPECTION SHEET NO 5 OF 5
CHKD BY COE DATE 11-27-80 STUDIES JOB NO 79-905/08

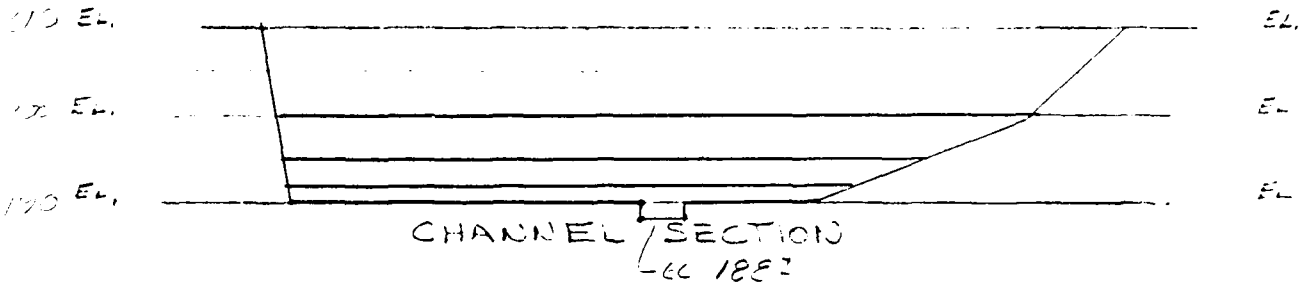
DOWNSTREAM W.S.EL. SUMMARY

NAME OF DAM: STREETS POND

SECTION LOCATION: 12500 DOWNSTREAM OF DAM

USING: $Q = 1.486/n A R^{2/3} S^{1/2}$

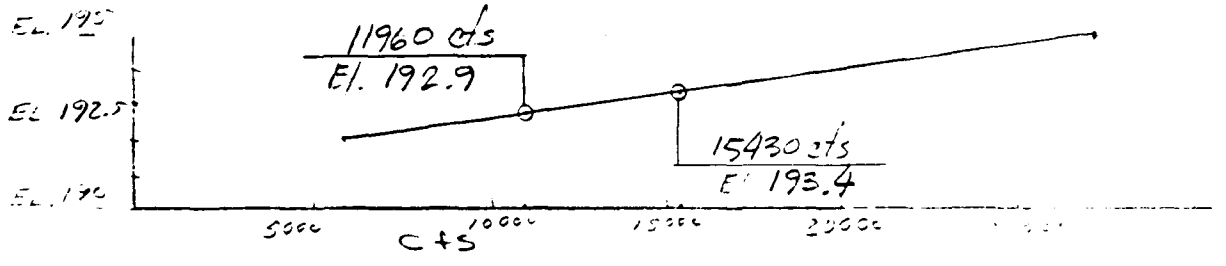
WHERE: n = 0.05 S = SLOPE = .01 FT/FT



CHANNEL SECTION
-cc 18E2

Q_{P1} = 15430 cfs STORAGE (S) 980 Ac-ft

E.El	AREA	WP	R	$R^{2/3}$	S =	1.486/n	Q	DEPTH
200	7200	860	8.5	4.2	.01	29.72	91120	12
193	3000	740	4.5	2.7	.01	29.72	27240	7
192	1250	650	1.9	1.5	.01	29.72	5760	4



$V_1 = \frac{7.4+5.4}{2} \times \frac{360+640}{2} \times 6000 \div 43{,}560)$ = 220.4 Ac-ft

$Q_{P2} = Q_{P1}(1 - V_1/V_2)$ = 11960 cfs

$V_2 = \frac{7.4+4.9}{2} \times 680 \times 1/2$ = 211.9 Ac-ft Use 2½ ft

$Q_{P2} = Q_{P1}(1 - V_1/V_2)$ = 12027 cfs

12027 cfs 192.9 ft +1.9 ft

N/A

D-22

RATING CURVE DEVELOPMENT

Pope's Pond Dam

Spillway

$Q = C\ L\ H^{3/2}$

$C = 3.4$

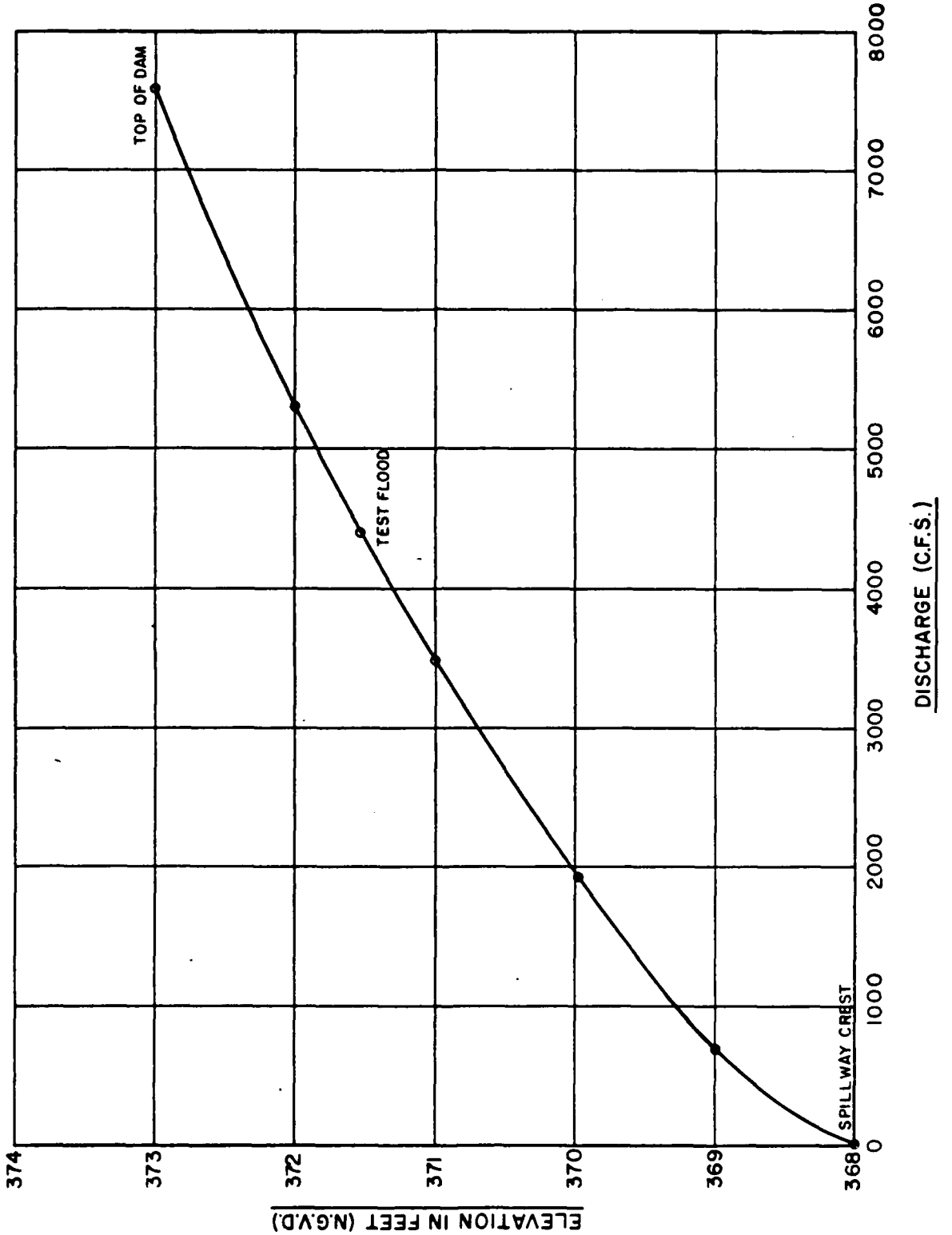
$L = 200$ feet

24 Inch By-Pass

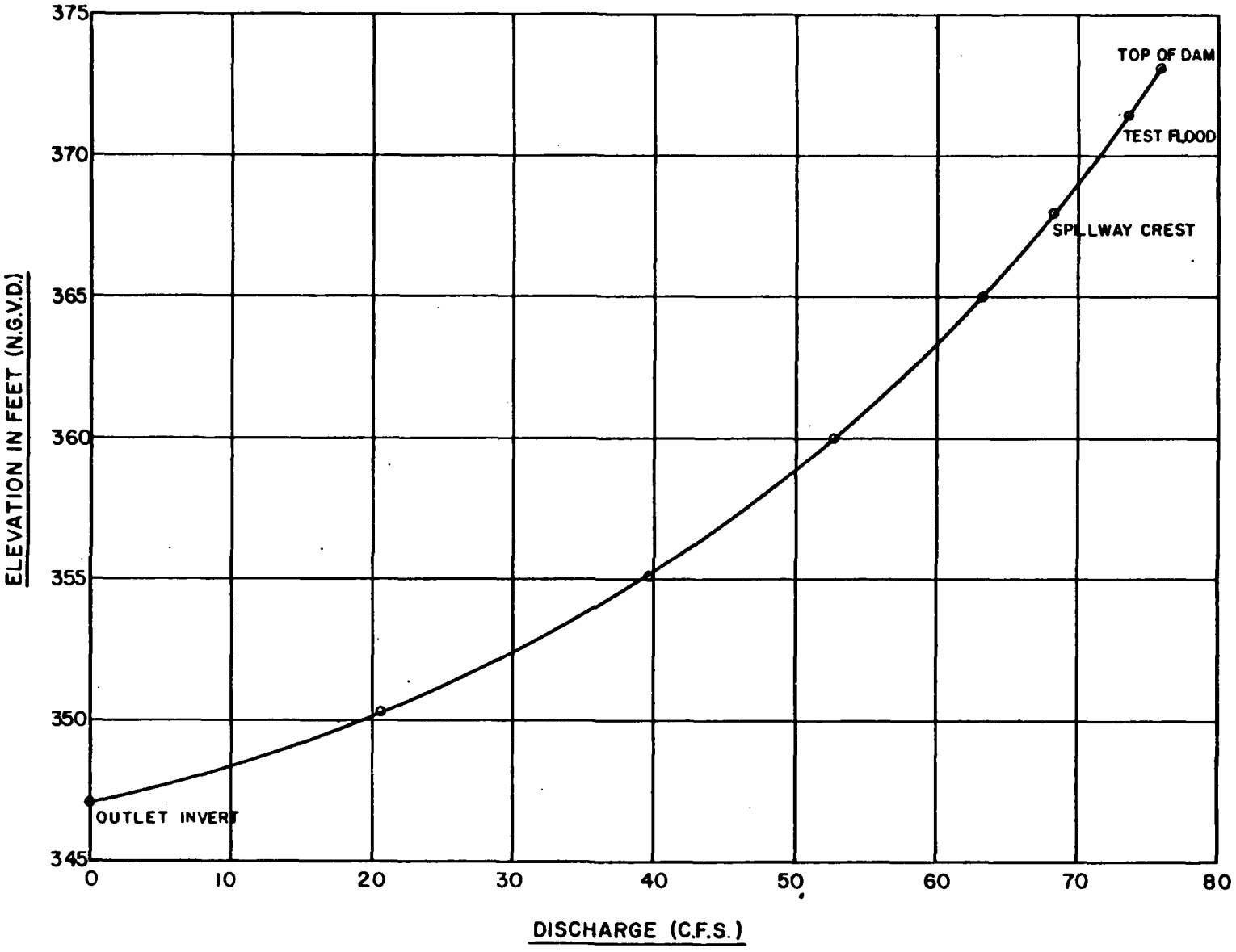
$Q = c\ a\ (2gh)^{1/2}$

$c = .6$

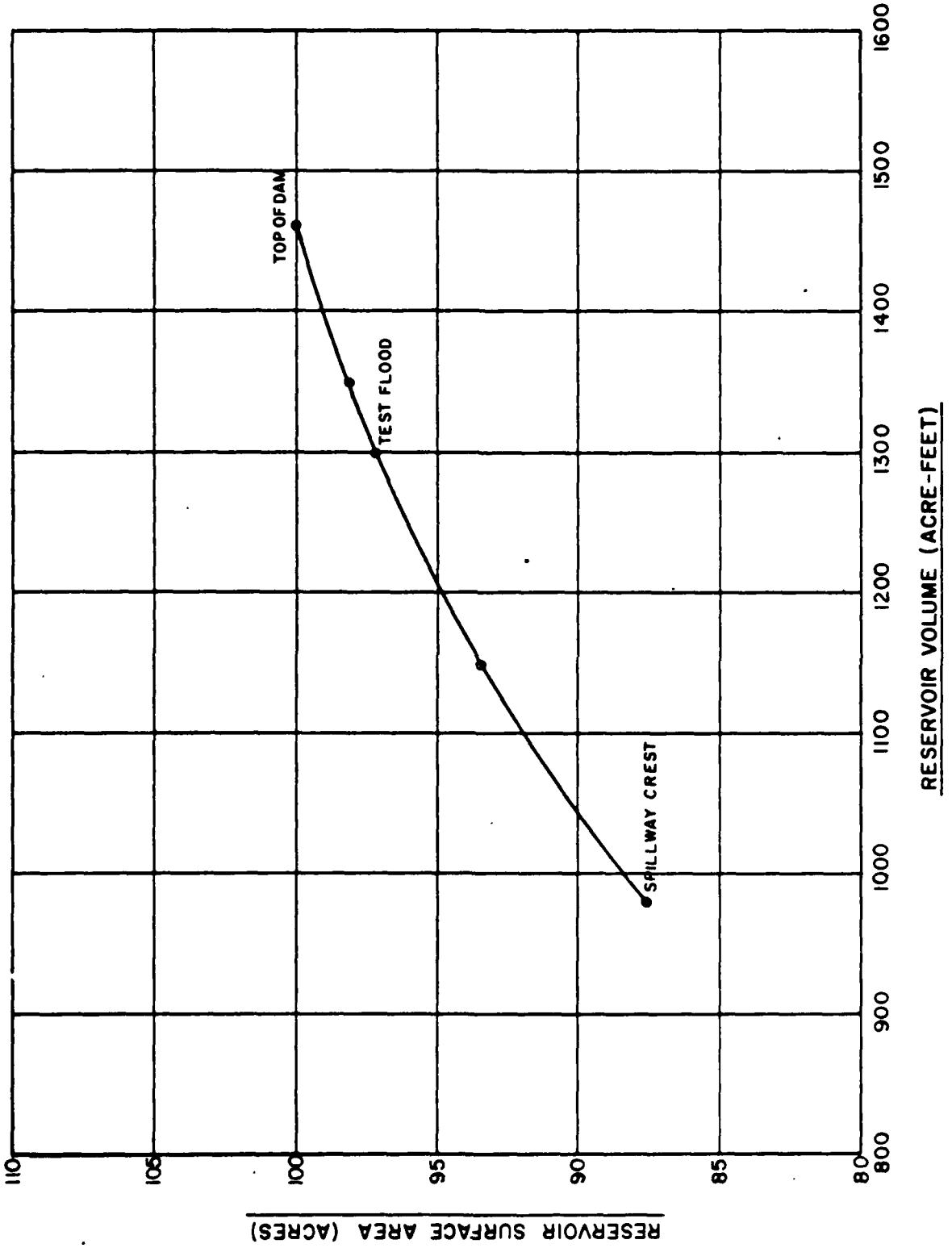
$a = 3.14$ square feet



POPE'S POND DAM
SPILLWAY RATING CURVE



POPE'S POND DAM
24 INCH BY-PASS
OUTLET WORKS RATING CURVE



POPE'S POND DAM
RESERVOIR AREA-CAPACITY CURVE

APPENDIX E

INFORMATION AS CONTAINED IN THE

NATIONAL INVENTORY OF DAMS

NOT AVAILABLE AT THIS TIME

END

FILMED

8-84

DTIC