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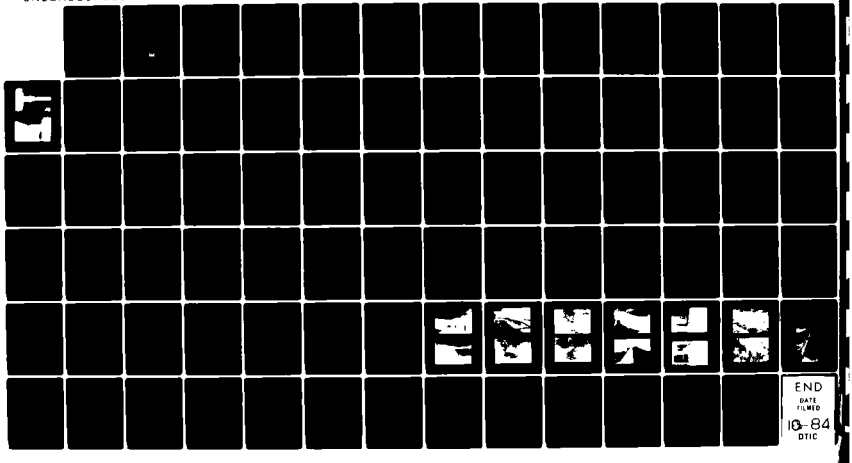

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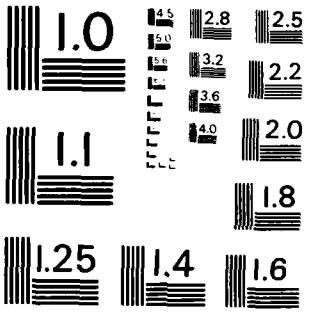

CONNECTICUT RIVER BASIN
HOLYOKE, MASSACHUSETTS

WHITING STREET POND DAM
MA 00070

PHASE 1 INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

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

AUGUST 1978

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

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4. TITLE (and Subtitle) Whiting Street 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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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,

Connecticut River Basin
Holyoke, Massachusetts

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

Whiting Street Pond Dam is an earth-buttressed stone masonry dam, 1900 feet long with a maximum height of about 19 feet. The project is considered to be in fair condition. The dam is classified as intermediate in size, with a high hazard potential, the test flood is the PMF.

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

NEDED-E

AUG 31 1979

Honorable Edward J. King
Governor of the Commonwealth of
Massachusetts
State House
Boston, Massachusetts

Dear Governor King:

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

The preliminary hydrologic analysis has indicated that the spillway capacity for the Whiting Street Pond Dam would likely be exceeded by floods greater than 3 percent of the Probable Maximum Flood (PMF), the test flood for spillway adequacy. Our screening criteria specifies that a dam of this class which does not have sufficient spillway capacity to discharge fifty (50) percent of the PMF, should be adjudged as having a seriously inadequate spillway and the dam assessed as unsafe, non- emergency, until more detailed studies prove otherwise or corrective measures are completed.

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

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

NADED-E
Honorable Edward J. King

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

A copy of this report has been forwarded to the Department of Environmental Quality Engineering, the cooperating agency for the Commonwealth of Massachusetts. This report has also been furnished to the owner of the project, City of Holyoke, Holyoke Water Works, Holyoke, Massachusetts 01040.

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

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

Sincerely,

MAX B. SCHEIDER
Colonel, Corps of Engineers
Division Engineer

WHITING STREET POND DAM
MA 00070

CONNECTICUT, RIVER BASIN
HOLYOKE, MASSACHUSETTS

PHASE 1 INSPECTION REPORT

NATIONAL DAM INSPECTION PROGRAM

PREFACE

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

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

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

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

This Phase I Inspection Report on Whiting Street 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.

CHARLES G. TIERSCH, Chairman
Chief, Foundation and Materials Branch
Engineering Division

FRED J. RAVENS, Jr., Member
Chief, Design Branch
Engineering Division

SAUL COOPER, Member
Chief, Water Control Branch
Engineering Division

APPROVAL RECOMMENDED:

JOE B. FRYAR
Chief, Engineering Division

CONNECTICUT RIVER BASIN
WHITING STREET POND DAM
INVENTORY NO. MA 00070
PHASE I INSPECTION REPORT

CONTENTS

PHASE I REPORT

NATIONAL DAM INSPECTION PROGRAM

Inventory No.:	MA 00070
Name of Dam:	WHITING STREET POND DAM
Town Located:	HOLYOKE
County Located:	HAMPDEN
Stated Located:	COMMONWEALTH OF MASSACHUSETTS
Date of Inspection:	2 AUGUST 1978

BRIEF ASSESSMENT

Whiting Street Pond Dam is an earth-buttressed stone masonry dam, 1900 feet long with a maximum height of about 19 feet. A two level stone masonry and concrete spillway is located about 70 feet from the dam's south abutment. A gatehouse and gate chamber are located at approximately the center of the dam and contain the operating mechanisms for controlling the outflows into the City's Water Supply and to the low level outlet. Discharges from the low level outlet and the spillway converge and flow into an unnamed creek before emptying into the Connecticut River.

Phase I inspection and evaluation of Whiting Street Pond Dam does not indicate conditions which would constitute an immediate hazard to human life or property. Based on engineering judgement and the performance of the dam and the outlet works, the project is considered to be in fair condition. The project, however, does have a number of deficiencies which, if not remedied, have the potential for developing into hazardous conditions.

Because there are no data on Probable Maximum Floods for a drainage area of 1.67 square miles, it was necessary to synthesize a test flood hydrograph for the contributing area. Since the dam is classified as intermediate in size, with a high hazard potential, the test flood, in accordance with Corps of Engineers guidelines, is the Probable Maximum Flood (PMF). The PMF yields an outflow of 8253 cfs which is greater than the maximum discharge capacity of the spillway of 215 cfs and would result in an overtopping of the dam by about 1.4 feet. (The discharge from the low level outlet could not be computed, however, it would be extremely small.) Since the dam will be overtopped by the test flood by a large amount, it is considered that the spillway is very inadequate from a hydraulic and hydrologic viewpoint. Furthermore, because of the anticipated overtopping there is a question of whether the dam would be stable under this condition. Therefore, a number of recom-

mendations are given for implementation by the owner, within 12 months of receipt of this Phase I Inspection Report, for providing adequate spillway capacity. This includes retaining a competent consulting engineer to conduct further hydraulic studies and in the interim period to maintain the reservoir at a lower level.

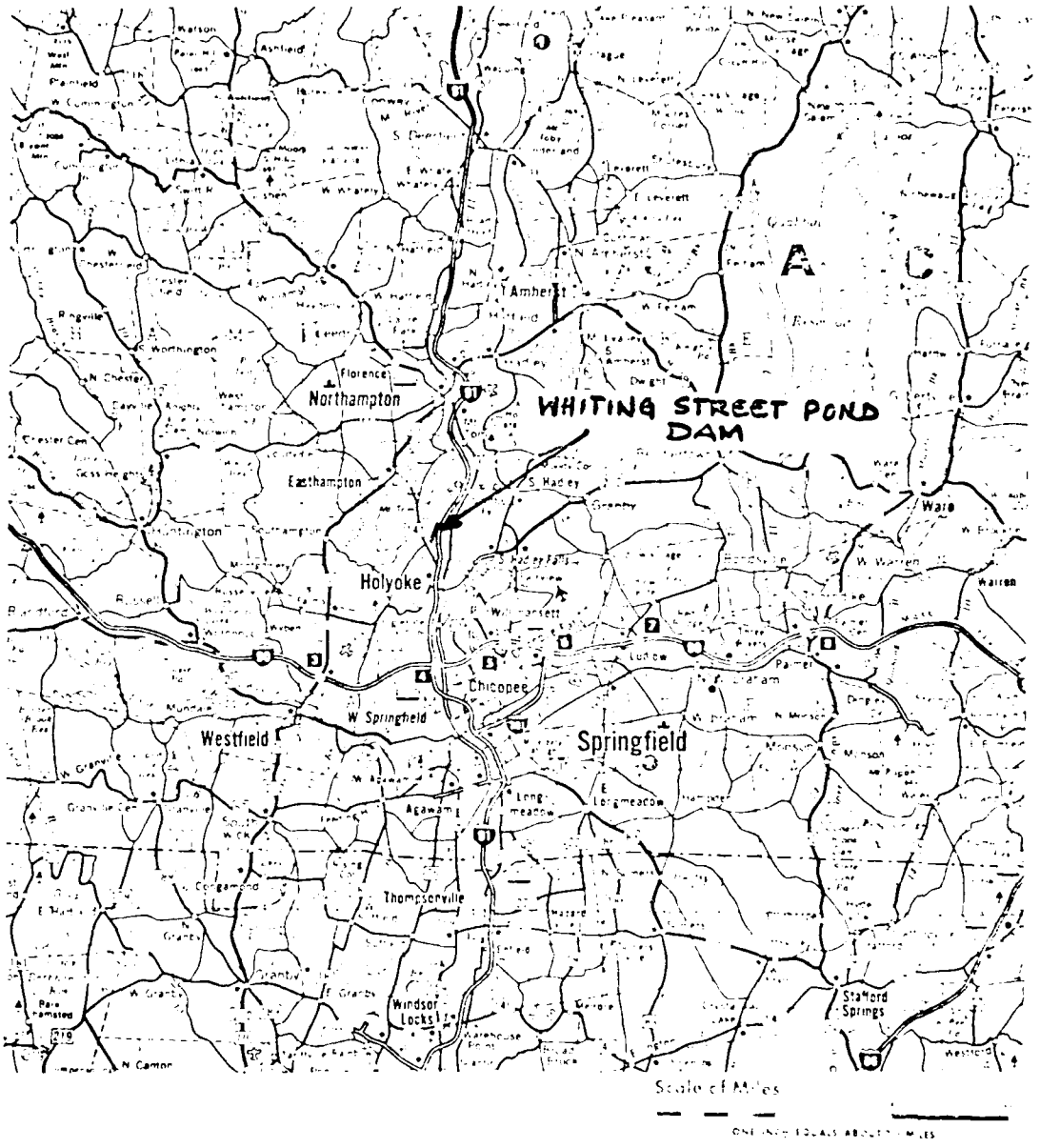
In addition, remedial measures are recommended for implementation by the owner within 24 months of receipt of this Phase I Inspection Report to improve overall conditions. These measures, in general, are as follows:

- Programs for observing and monitoring seepage
- Repairs to embankments and appurtenant structures
- Programs for operation, maintenance and inspection

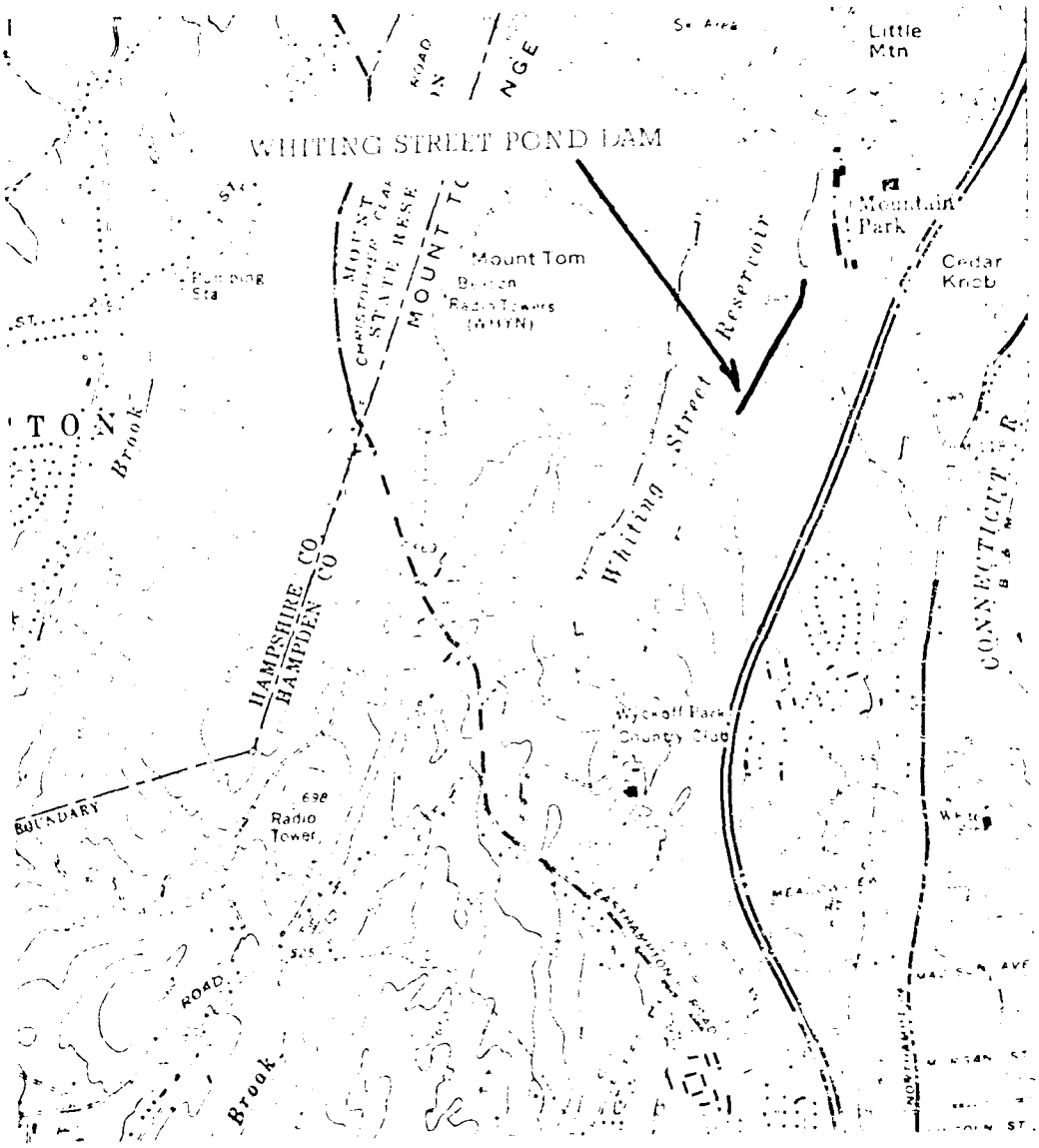
Eugene O'Brien, P.E.
New York No. 29823

1a. UPSTREAM SLOPE LOOKING SOUTH

1b. DOWNSTREAM SLOPE LOOKING NORTH
OVERVIEW OF DAM



VICINITY MAP
WHITING STREET POND DAM



TOPOGRAPHIC MAP
WHITING STREET POND DAM

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM
CONNECTICUT RIVER BASIN
INVENTORY NO. MA 00070
WHITING STREET POND DAM
CITY OF HOLYOKE
HAMPDEN COUNTY, COMMONWEALTH OF MASSACHUSETTS

SECTION 1 - PROJECT INFORMATION

1.1 GENERAL

a. Authority

Public Law 92-367, August 8, 1972, authorized the Secretary of the Army, through the Corps of Engineers, to initiate a national program of dam inspection throughout the United States. The New England Division of the Corps of Engineers has been assigned the responsibility of supervising the inspection of the dams within the New England Region. Tippetts-Abbett-McCarthy-Stratton has been retained by the New England Division to inspect and report on selected dams in the State of Massachusetts. Authorization and notice to proceed was issued to Tippetts-Abbett-McCarthy-Stratton under a letter of May 3, 1978, from Mr. Ralph T. Garver, Colonel, Corps of Engineers. Contract No. DACW 33-78-C-0298 has been assigned by the Corps of Engineers for this work.

b. Purpose

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

1.2 DESCRIPTION OF THE PROJECT

a. Description of Dam and Appurtenances

Whiting Street Pond Dam is an earth-buttressed stone masonry dam, 1900 feet long with a maximum height of about 19 feet. The earth buttress is continuous along the downstream side of the stone masonry section. The dam is straight, trending generally north-south except for about 240 feet at the north end, which is "doglegged" to the northwest about 115°. The stone masonry is 7 feet wide at crest level, the earth buttress is 10 feet wide. A

steel guard rail runs along the upstream side of the stone masonry crest.

The upstream slope of the stone masonry section varies from vertical at the foundation to El 367.7±; 1(V):0.08(H) from El367.7± to El382.7±; & 1 (V) : 0.25 (H) from El 382.7± to El 388.7±. The downstream slope of the stone masonry portion of the dam (which is also the upstream face of the earth buttress) varies from vertical at the foundation to El 367.7±; and 1 (V): 0.25 (H) from El 367.7± to 388.7±. The base width of the stone masonry section is 16 feet. The downstream slope of the earth buttress varies from 1 (V) : 1.25 (H) to 1 (V) : 2.5 (H). According to an available drawing there was to be a "3 inch sheet piling" cutoff wall, 5 feet long, penetrating into a "hard pan" and gravel foundation.

A stone masonry and concrete spillway structure is located about 70 feet from the south abutment. The concrete spillway sill is at two levels; El 387.0 and El 387.45, and is 16.5 and 17 feet long, 8.4 and 7.6 feet wide and 1.7 and 1.25 feet deep, respectively. The sill is notched to accommodate flashboards.

The downstream concrete training walls are 2 feet wide and are about 14 and 18 feet long. There are no upstream training walls.

The concrete lined spillway channel is 33.5 feet wide and narrows to 17 feet, 8.6 feet from the sill. The channel continues under a roadway bridge through three rectangular openings each 5 feet wide. The height of the openings is 1.8, 2.0 and 2.25 feet. The floor of the channel under and adjacent to the bridge is on bedrock. Downstream of the bridge, water discharge over the spillway flows in a natural channel.

A brick gatehouse, above a gate chamber, is located on the crest at approximately the center of the dam. In the upstream wall of, and entering directly into the gate chamber is a 4-foot square sluice way protected by a trash rack. A 10-inch diameter low level outlet pipe has its intake in the gate chamber, runs underground for 375 feet, and outfalls into the spillway channel. A 16-inch diameter pipe, which also starts in the gate chamber, joins the City's water supply system an unknown distance from the dam. A by-pass pipe and connection exists between the low level outlet and the water supply pipe. This connection facilitates repair work to the water supply valve.

Intakes through the 4-foot square sluiceway; the 16-inch supply pipe, the 10-inch low level outlet and the by-pass pipe are regulated by a sluice gate and gate valves, respectively. The operating mechanisms are all manually operated and are located in the gatehouse.

At the point where the low level outlet outfalls, the spillway channel divides into an open concrete-lined rectangular channel and an underground 36-inch diameter concrete pipe. The channel varies from 5 to 10 feet in width and 2 to 6 feet in height (See Photograph). The channel and pipe join at a natural channel in the vicinity of Interstate Highway 91 and then flow into the Connecticut River.

b. Location

The dam is located north of Holyoke, Massachusetts, about one half mile west of the Connecticut River and at the eastern foothills of Mount Tom.

c. Ownership

Whiting Street Pond Dam is owned by the City of Holyoke. The day-to-day operation and maintenance is managed by Holyoke Water Works, Holyoke, Massachusetts.

d. Purpose of Dam

The impoundment provided by the dam is a water storage reservoir for the City of Holyoke.

e. Design and Construction History

Original design and construction records are not available. It is reported that the dam was built about 1900. There are no records of whether the earth buttress section was part of the original construction or was added later.

f. Normal Operating Procedures

Normal water releases from the Whiting Street Pond are to supply the City of Holyoke with approximately 1.2 mgd. There are no other regulated releases.

g. Size Classification

The dam is less than forty feet high but has a maximum storage capacity of more than 1000 acre-feet. It is, therefore, classified as an "intermediate" size dam.

h. Hazard Classification

The dam is in the "high" hazard potential category because in the event of a dam failure substantial property damage with possible loss of life would result. Losses would include; a substantial portion of the City's water supply, a fluoridation and chloridation facility, a portion of Interstate Highway 91 and about 5 one family homes located between Northampton Street and Mountain Park Road.

For details on the selection of the hazard potential category see Section 5.6.

i. Operator

The person responsible for the day-to-day operation of the dam is:

Mr. Henry Seidel
Head Filter Plant Operator
985 Homstead Avenue
Holyoke, Massachusetts 01040
Phone: (Home) 413-532-6509
(Office) 413-442-8992

1.3 PERTINENT DATA

a. Drainage Area

The Whiting Street Pond is located on a tributary of the Connecticut River between Holyoke and Easthampton. The drainage basin which is located on the eastern slopes of the Mount Tom Range is steep and heavily forested except for the southeast quarter which has some urban development. The basin, which trends in a north-south direction, is approximately 3.2 miles long by 0.5 mile wide with an area of 1.67 square miles. The surface area of the reservoir, at spillway crest (102 acres), is about 10% of the total drainage area.

b. Discharges at Damsite

Discharges at the damsite are over an uncontrolled spillway, and through a low level outlet and the City's water supply system.

The concrete spillway sill is at two levels; El 387.0 and El 387.45 and is 16.5 and 17 feet long, 8.4 and 7.6 feet wide and 1.7 and 1.25 feet deep, respectively. The computed maximum discharge, with pond level at El 388.7 (top of dam), is 215 cfs.

The low level outlet is a 10-inch inside diameter cast iron pipe, 375 feet long, with unknown invert elevations at the intake and outlet ends. Maximum discharge through the pipe could not be computed.

There is no record of the maximum flood at the damsite but reportedly the dam has never been overtopped during a major flood.

c. Elevation (ft above MSL)

Top of dam	388.7
Maximum pool-design surcharge	Unknown
Maximum pool-test flood surcharge	390.1
Full flood control pool	Not Applicable
Recreation pool	387.0
Spillway crest (gated)	Not Applicable
Upstream portal invert diversion tunnel	Not Applicable
Downstream portal invert diversion tunnel	Not Applicable
Streambed at centerline of dam	Unknown
Maximum tailwater	Unknown

d. Reservoir (feet)

Length of maximum pool	3000
Length of recreation pool	3000
Length of flood control pool	Not Applicable

e. Storage (acre-feet)

Recreation pool	2005 (est.)
Flood control pool	Not Applicable
Design surcharge	Unknown
Test flood surcharge	352
Top of dam	2190

f. Reservoir Surface (acres)

Top of dam	113.5
Test flood pool	120
Flood-control pool	Not Applicable
Recreation pool	102
Spillway crest	102

g. Dam

Type	Earth buttressed stone masonry
Length, feet	1900
Height, feet	19.0
Top width, feet	17.0
Side slopes - Upstream	Varies - See Section 1.2a
Downstream	Varies - See Section 1.2a
Zoning	Unknown
Impervious core	Unknown
Cutoff	5 feet high, 3 inch sheet piling
Grout curtain	Unknown
Other	None

h. Diversion and Regulating Tunnel

Type	Not Applicable
Length	Not Applicable
Closure	Not Applicable
Access	Not Applicable
Regulating facilities	Not Applicable

i. Spillway

Type	Broad-crested, two levels
Length of weir, feet	33.5
Crest elevations, feet	387.0 and 387.45
Gates	None
Upstream channel	None
Downstream channel	For description, see Section 1.2a

j. Regulating Outlets

The regulating outlets consist of an uncontrolled spillway, a 16-inch diameter water supply line and 10-inch diameter low level outlet.

The concrete spillway sill is at two levels: El 387.0 and El 387.45 and is 16.5 and 17 feet long, 8.4 and 7.6 feet wide and 1.7 and 1.25 feet deep, respectively.

The water supply line is of unknown length, and the invert elevations of the 375-foot long low level outlet pipe, are also unknown. Discharges through the pipes are controlled by manually operated gate valves which are operable. The water supply line is operated as required to satisfy water supply demand. The low level outlet is reportedly operated only occasionally.

SECTION 2 - ENGINEERING DATA

2.1 DESIGN

Design data and specific memoranda are not available for the original construction of the dam. Two drawings were obtained from the owner; they show the cross section and centerline profile of the masonry portion of the dam. (See Appendix). One of the drawings shows a plan of a "waste way" which is not in accordance with the existing conditions. There are no drawings showing the earth buttress section.

The elevations shown in these drawings do not correspond to those shown on the USGS quadrangle sheet. All elevations referred to in this report are based on the reservoir level shown on the USGS sheet which is assumed to be the elevation of the spillway sill. Sketches of the dam and spillway, plans and sections were prepared on the basis of approximate field measurements made at the time of this visual inspection. (See Appendix).

There is no information available on subsurface conditions other than the reference to "hard pan" and gravel noted on one of the drawings.

2.2 CONSTRUCTION RECORDS

There are no construction records available.

2.3 OPERATION RECORDS

The operation of the sluice gate, low level and water supply system gate valves are recorded; readings of the pond level and rainfall are taken on a regular basis. These records are kept in the offices of the Holyoke Water Works, Holyoke, Massachusetts.

2.4 EVALUATION OF DATA

a. Availability

Existing information was made available by Holyoke Water Works, Holyoke, Massachusetts.

b. Adequacy

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

c. Validity

In general, the information obtained from the available drawings, with above noted exceptions, and personal interviews is consistent with observations made during the inspection and therefore considered reliable.

SECTION 3 - VISUAL INSPECTION

3.1 FINDINGS

a. General

A visual inspection of Whiting Street Pond Dam was made on 2 August 1978. The weather was cloudy, temperature between 70° and 75°F. The last rainfall, a heavy thunderstorm, occurred early that morning. At the time of inspection, the lake level was about 1.9 feet (El 385.1±) below spillway crest.

b. Dam

The dam appears to be in generally good condition. The horizontal and vertical alignment of the crest are good. The stone and grass surface at the crest are in good condition, however, at several locations there are saplings growing between the stone masonry joints (See Photograph No. 3). No longitudinal or transverse surface cracks were observed.

The downstream slope is completely covered with heavy ground cover, seedlings and shrubs and does not show any erosion, sloughing or signs of trespassing (See Photograph No. 2). It is reported that this slope has not been mowed for the past two years, but that the slope will be mowed later in the summer.

The upstream slope, which is stone masonry and almost vertical, appears above the water line to be in good condition, there are, however, a few missing stones at several locations and much of the mortar pointing is loose and/or missing (See Photograph No. 14). There is some vegetation growing through the open masonry joints.

There is evidence of seepage along the lower portion of the downstream face and toe of the embankment. A wet area apparently caused by seepage, is located between 420 and 640 feet north of the spillway and about 20 feet below the crest. The quantity of seepage could not be determined because of the heavy ground cover and vegetation. At about the same elevation and about 640 feet north of the spillway there is another wet area which extends 290 feet to the north. It was not possible, to determine whether this wet area is caused by seepage or surface runoff from the previous night's rain. (See Photograph No. 13).

A 14-inch diameter cast iron pipe outlet is located about 110 feet north of the spillway at the downstream toe of the dam. The pipe, which was not flowing, terminates at the spillway channel. The purpose, extent, limit and the location of the operating controls for the pipe are unknown. (See Photograph No. 12).

c. Appurtenant Structures

The stone masonry and concrete spillway is in generally good condition with some minor spalling at both crest levels. There is minor seepage at and above the contact of the downstream face of the spillway weir and floor. The concrete floor of the discharge channel, upstream of the bridge openings, is superficially spalled. There is vegetation growing and a leakage of about 5 gpm at the contact between the concrete spillway and the downstream wall of the north opening under the bridge. There is minor spalling of all training walls. (See Photograph Nos. 4 & 5).

d. Abutments

There were no signs of seepage or other unusual conditions at the abutments.

e. Downstream Channel

There is effectively only one downstream channel, the spillway channel. The natural portions of the channel are overgrown with heavy vegetation, there are overhanging trees and there is minor debris in the channel. At the time of inspection, flows in the channel did not appear to be impeded. The openings below the bridge, immediately downstream of the spillway, were clear and do not appear to restrict spillway discharges. The concrete lined portions of the channel are in poor condition with severe spalling and erosion along the base of most of the walls and there are two locations (about 400 feet downstream from the toe) where boils were noted flowing from holes in the concrete floor of the channel (See Photograph Nos 6-9).

f. Reservoir Area

In the vicinity of the dam, there is no evidence of sloughing, potentially unstable slopes or other unusual conditions which would adversely affect the dam.

3.2 EVALUATION OF OBSERVATIONS

Visual observations made during the course of the investigation revealed several deficiencies which at present do not adversely affect the adequacy of the dam. However, these deficiencies do require attention and should be corrected before further deterioration leads to a hazardous condition. Recommended measures to improve these conditions are given in Section 7.

SECTION 4 - OPERATION AND MAINTENANCE PROCEDURE

4.1 PROCEDURES

Operational procedures for the project are not formally established but are based on the experience of the operating personnel.

4.2 MAINTENANCE OF DAM

There is no formal maintenance manual for the project. Maintenance is carried out as needed. The mowing of grass and the cutting of vegetation is done as required and when time allows. There is no scheduled program of inspection by the Water Works personnel, however it is reported, there is a statewide program by the Department of Environmental Quality Engineering, Division of Waterways, Boston, Massachusetts.

4.3 MAINTENANCE OF OPERATING FACILITIES

There is no established maintenance program for the operating facilities. Maintenance is carried out as needed.

4.4 WARNING SYSTEM IN EFFECT

There is no warning system in effect nor one planned.

4.5 EVALUATION

The maintenance and operating procedures for the dam and appurtenant structures are considered inadequate. Measures to improve these deficiencies are given in Section 7.

SECTION 5 - HYDRAULIC/HYDROLOGIC

5.1 DRAINAGE BASIN CHARACTERISTICS

The Whiting Street Pond is located on a tributary of the Connecticut River between Holyoke and Easthampton. The drainage basin which is located on the eastern slopes of the Mount Tom Range is steep and heavily forested, except for the southeast quarter which has some urban development. The basin,which trends in a north-south direction, is approximately 3.2 miles long, 0.5 mile wide, with an area of 1.67 square miles. The surface area of the reservoir, at spillway crest (102 acres), is about 10% of the total drainage area.

5.2 SPILLWAY CAPACITY

The spillway of the Whiting Street Pond Dam is 33.5 feet in length and approximately 7.5 feet wide. The northern half of the spillway crest is 1.70 feet below the top of the dam, (El 387), while the other half is 0.45 feet higher (El 387.45). The maximum computed capacity of the spillway is 215 cfs with water level at the top of the dam (El 388.7) and is not restricted by the openings under the bridge located directly downstream.

5.3 RESERVOIR CAPACITY

The maximum capacity of the Whiting Street Pond is 2,190 acre-feet. It is estimated that the surcharge storage, between the spillway crest and the top of the dam is 185 acre-feet, which is equivalent to a depth of about 2.0 inches of runoff over the entire basin.

5.4 FLOODS OF RECORD

There are no records of flow from this small drainage area. However rainfall records of the hurricane floods of September 1938 at the dam site indicate that 10.53 inches of rain fell during the period 18-22 September inclusive, with 4.23 inches on September 21.[1]

5.5 DESIGN FLOOD

Because there are no data on Probable Maximum Floods for an area of 1.67 square miles it was necessary to synthesize a test flood hydrograph for the contributing area. Initially, a depth-duration relation for Probable Maximum Point rainfall for durations from 6 hours to 24 hours was taken from Weather Bureau Sources.[2] The distribution of the rainfall was

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[1] Hurricane Floods of September 1938, U.S. Geological Surveys W.S.P. #867, 1940.

[2] Seasonal Variation of the Probable Maximum Precipitation East of the 105 Meridian for Areas from 10 to 1,000 Square Miles and Durations of 6, 12, 24 and 48 hours. Hydrometeorological Report No. 33, 1956.

based on data in a publication of the World Meteorological Organization.[3/] Increments of depths from the depth duration relation, at 15 minute intervals, were arranged in the probable storm sequence as shown in the Appendix. The synthesized Probable Maximum Flood peak inflow discharge is 9029 cfs.

5.6 OVERTOPPING POTENTIAL

The adequacy of the Whiting Street Dam Spillway was tested by routing the Probable Maximum Flood, through the reservoir, using a computerized technique. The water level was assumed to be at El 387 (spillway crest elevation) at the start of the flood inflow. The routed flood raised the surface elevation of the reservoir 3.1 feet to an elevation of 390.1 (1.4 feet above the top of the dam). The peak outflow discharge was 8253 cfs, about 38 times the spillway capacity.

In order to estimate the downstream dam failure hydrograph, the U.S. Corps of Engineers "Rule of Thumb" guidance was used. The estimate assumes: (a) the reservoir surface is at the top of the dam at the time of the breach, (b) a breach of 40% of the dam length occurs (760 feet) and (c) the channel has an average roughness coefficient (n) of 0.07. It is estimated that at a selected section, 1700 feet downstream of the dam, the peak flood wave discharge is 93,310 cfs with a wave height of about 14 feet. The visual inspection revealed the existance of about 5 one family homes which are not shown on the U.S.G.S. Quadrangle sheet for Mount Tom, Mass. at or below about El 300. These houses would probably be destroyed or damaged by the estimated flood wave. In addition failure of the dam would destroy a substantial portion of the City's water supply, a fluoridation & chloridation facility and a portion of Interstate Highway 91.

5.7 EVALUATION

The spillway of the Whiting Street Pond Dam, with a computed capacity of 215 cfs, (which is 2.6% of the test flood outflow) cannot pass the estimated Probable Maximum Flood, and therefore is considered to be inadequate from a hydraulic and hydrologic standpoint.

3/ Manual for Estimation of Probable Maximum Precipitation, World Meteorological Organization, Operational Hydrology Report No. 1973.

SECTION 6 - STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

a. Visual Observations

Visual observations did not indicate any serious structural problems with the embankment, spillway, sluice gate, water supply line or low level outlet. The deficiencies described in Section 3 require attention and measures to improve these deficiencies are given in Section 7.

b. Design and Construction Data

No design computations or other data pertaining to the structural stability of the dam have been located.

On the basis of the performance experience, the visual inspection, as well as engineering judgment, the dam at present appears to be structurally adequate.

c. Operating Records

There are operating records available at the offices of the Holyoke Water Works, Holyoke, Massachusetts. There are no records or reports of operational problems which would affect the stability of the dam.

d. Post-Construction Changes

It is reported that the dam was built around 1900. There are no records of any construction changes even though the present dam, which includes an earth buttress section, varies from the sections shown in the drawings. (See Appendix).

e. Seismic Stability

The dam is located in Seismic Zone 2 and in accordance with recommended Phase I guidelines does not warrant seismic analysis.

SECTION 7 - ASSESSMENT, RECOMMENDATIONS & REMEDIAL MEASURES

7.1 DAM ASSESSMENT

a. Condition

Phase I investigation of Whiting Street Pond Dam does not indicate conditions which would constitute an immediate hazard to human life or property. Based on engineering judgement and the performance of the dam and the outlet works, the project appears to be in fair condition. The project, however, does have inadequacies and deficiencies which, if not remedied, have the potential for developing into hazardous conditions.

Because there are no data on Probable Maximum Floods for an area of 1.67 square miles, it was necessary to synthesize a test flood hydrograph for the contributing area. Increments of depths from a depth duration relation, at 15 minute intervals, were arranged in the probable storm sequence. The synthesized Probable Maximum Flood (PMF) peak inflow discharge was 9029 cfs.

The adequacy of the Whiting Street Pond Dam spillway was tested by routing the Probable Maximum Flood through the reservoir, using a computerized technique. The water level was assumed to be at the spillway crest elevation at the start of the flood inflow. The routed flood raised the surface elevation of the reservoir 3.1 feet or 1.4 feet above the top of the dam. The peak outflow discharge was 8253 cfs, about 38 times the spillway capacity. Since the spillway of the Whiting Street Pond Dam, with a computed capacity of 215 cfs, cannot pass the estimated Probable Maximum Flood, it is considered to be very inadequate from a hydraulic and hydrologic standpoint. Furthermore, as a result of the anticipated overtopping it is questionable whether the earth buttress portion of the dam could withstand the overtopping and whether the stone masonry portion could stand without the buttress.

b. Adequacy of Information

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

c. Urgency

The recommendations and remedial measures described in subsequent paragraphs should be undertaken by the owner within 12 months after receipt of this Phase I Inspection Report.

d. Need for Additional Investigations

Additional investigations to assess the adequacy of the dam and appurtenant structures do appear necessary and are enumerated in the following paragraph.

7.2 RECOMMENDATIONS

It is recommended that the following measures be undertaken by the owner within 12 months after receipt of this Phase I Inspection Report.

1) A competent consulting engineer should be retained to conduct further detailed hydraulic studies to determine what measures are necessary to improve discharge capacities.

2) To prevent possible overtopping in the period before receipt of the detailed hydraulic report, the reservior should be maintained at a lower level to provide additional flood surcharge storage. The level should be lowered about 2 to 3 feet and a monthly elevation rule curve should be established.

7.3 REMEDIAL MEASURES

a. Alternatives

The results of the additional investigations recommended above may indicate alternatives which will be needed to provide discharge adequacy under flood conditions. These alternatives can only be determined after completion and evaluation of the additional investigations.

b. Operating and Maintenance Procedures

It is recommended that the following measures be undertaken by the owner within 24 months after receipt of this Phase I Inspection Report.

1. Establish a systematic program of observation and monitoring of changes in pattern and quantity of seepage. Observations can be accomplished by the installation of piezometers.
2. Establish a formal program of operation and maintenance to include periodic inspections on a bi-annual basis.
3. Round the clock surveillance should be provided by the owner during periods of unusually heavy precipitation.
4. The owner should develop a formal warning system with local officials for alerting downstream residents in case of emergency.
5. The missing stones in the masonry portion of the dam should be replaced and all joints repointed.
6. Debris and overhanging trees should be removed and hauled away from the downstream channels
7. Vegetation growing from the joints in the stone masonry should be removed.
8. Vegetation on the downstream slope and area adjacent to downstream toe should be cut regularly.
9. Concrete walls and floor of downstream channel should be repaired.

VISUAL INSPECTION CHECKLIST

APPENDIX A

VISUAL INSPECTION CHECK LIST
PARTY ORGANIZATION

PROJECT WHITING STREET POND DAM DATE 8-5-78

TIME 11.00 AM

WEATHER Overcast 75°-80°

W.S. ELEV. 387.0 *

PARTY:

1. Harvey S Feldman
2. Jyotindra H Patel
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

	PROJECT FEATURE	INSPECTED BY	REMARKS
1.	All project features are inspected by above party members		
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

* Lake level taken from U.S.G.S. topographic sheet which indicates EL. 387.0. It is assumed that this elevation is also spillway s.l.

PERIODIC INSPECTION CHECK LIST

PROJECT WHITING STREET POND DAM DATE 8-4-78

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

DAM EMBANKMENT

Crest Elevation 388.7 [1.7 ft above spillway sill)

Current Pool Elevation 387.0 (See Note on front page of check list)

Maximum Impoundment to Date Unknown

Surface Cracks None visible

Pavement Condition No pavement

Movement or Settlement of Crest None observed

Lateral Movement None observed

Vertical Alignment Generally good

Horizontal Alignment Generally Good

Condition at Abutment and at Concrete Structures Generally good

Indications of Movement of Structural Items on Slopes None observed

Trespassing on Slopes None

Sloughing or Erosion of Slopes or Abutments None

Rock Slope Protection - Riprap Failures No riprap - Stone masonry U/S slope See comments regarding stone.

Unusual Movement or Cracking at or near Toes None observed

Unusual Embankment or Downstream Seepage Two wet areas at lower portion of the downstream face and toe of the embankment One is located 610 ft to 640 feet north of the spillway and about 20 feet below crest The source of seepage could not be determined because of heavy ground cover and vegetation. At about same elevation and about 640 feet north of the west the area extends 290 ft. to the North. It was not possible to determine if seepage is surface

Piping or Boils None

Foundation Drainage Features None

Toe Drains None

Instrumentation System None

Miscellaneous At crest, the stone and grass surface are in good condition, however there are several areas where saplings growing between the stone masonry joints.

The downstream slope is completely covered with heavy ground cover, seedlings and shrubs. It is reported that this slope has not been mowed for the past two years, but that the slope will be mowed later in summer

The upstream slope appears above water line in good condition, however there are a few missing stones at several locations and much of the mortar pointing is loose and or missing. Also some vegetation growing through the open masonry joints

PERIODIC INSPECTION CHECK LIST

PROJECT WHITING STREET POND DAM DATE 8-2-78

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

OUTLET WORKS - INTAKE CHANNEL AND INTAKE STRUCTURE

There is no intake channel and intake structure. The gate chamber has a 4 ft square sluiceway opening protected by trash rack.

a. Approach Channel

Slope Conditions Could not observe condition, submerged.

Bottom Conditions _____

Rock Slides or Falls _____

Log Boom _____

Debris _____

Condition of Concrete Lining _____

Drains or Weep Holes _____

b. Intake Structure

Condition of Concrete _____

Stop Logs and Slots _____

PERIODIC INSPECTION CHECK LIST

PROJECT Whiting Street Pond Dam DATE 8-2-78

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

OUTLET WORKS - CONTROL TOWER

a. Brick, Concrete and Structural

~~General Condition~~ The gate house located at crest, approximately middle of dam, is of brick. Also under house is a gate chamber, full of water. Controls for water supply system and low level outlet are located in the gate house

General condition & Condition of Joints Gate house general condition and condition of joints are good Gate chamber submerged in water

Spalling None in Gate house

Visible Reinforcing None in Gate house

Rusting or Staining of Concrete None in Gate house

Any Seepage or Efflorescence None in Gate house; Gate chamber submerged in water

Joint Alignment _____

Unusual Seepage or Leaks in Gate Chamber Gate chamber submerged in water, therefore not inspected

Cracks None in Gate house

Rusting or Corrosion of Steel None in Gate house

b. Mechanical and Electrical

Air Vents None

Float Wells None

Crane Hoist None

Elevator None

Hydraulic System None

Service Gates See Misc

Emergency Gates

Lightning Protection System None

Emergency Power System None

Wiring and Lighting System None

Misc: Operating controls for spillway, low level outlet, water supply line and by-pass valve are in good condition.

PERIODIC INSPECTION CHECK LIST

PROJECT WHITING STREET POND DAM DATE 8-2-78

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

OUTLET WORKS - TRANSITION AND CONDUIT Outlet to low level outlet and water supply pipe lines are located in gate chamber.

General Condition of Concrete No Concrete (See Comments below)

Rust or Staining of Concrete —

Spalling —

Erosion or Cavitation —

Cracking —

Alignment of Monoliths —

Alignment of Joints —

Numbering of Monoliths —

low level Outlet pipe and water supply pipe lines are underground therefore not inspected. However, low level outlet where it empties into the spillway, is in good condition

Also there is a 14-inch diameter cast iron pipe located about 110 feet north of the spillway at downstream toe of dam the pipe, which was not flowing, terminates at the spillway channel the pipe [illegible] and the location of the [illegible] pipe are unknown.

PERIODIC INSPECTION CHECK LIST

PROJECT WHITING STREET POND DAM DATE 8-2-78

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

OUTLET WORKS - OUTLET STRUCTURE AND OUTLET CHANNEL

There is effectively only one downstream channel, the Spillway channel. (See Spillway Discharge Channel comment)

General Condition of Concrete _____

Rust or Staining _____

Spalling _____

Erosion or Cavitation _____

Visible Reinforcing _____

Any Seepage or Efflorescence _____

Condition at Joints _____

Drain Holes _____

Channel _____

Loose Rock or Trees Overhanging Channel _____

Condition of Discharge Channel _____

PERIODIC INSPECTION CHECK LIST

PROJECT WHITING STREET POND DAM DATE 8-2-78

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

OUTLET WORKS - SPILLWAY WEIR, APPROACH AND DISCHARGE CHANNELS

a. Approach Channel None

General Condition _____

Loose Rock Overhanging Channel _____

Trees Overhanging Channel _____

Floor of Approach Channel _____

b. Weir and Training Walls Stone Masonry &

General Condition of Concrete Weir & training walls are in good condition

Rust or Staining None

Spalling minor spalling at crest level of Spillway and training walls

Any Visible Reinforcing None observed

Any Seepage or Efflorescence Minor seepage at and above contact of downstream face of weir and floor

Drain Holes None

c. Discharge Channel

General Condition Fair to poor

Loose Rock Overhanging Channel None observed

Trees Overhanging Channel There are trees overhanging channel with some fallen trees in channel

Floor of Channel Concrete floor of channel is poor condition with severe spalling and erosion along the base of most of the flaming walls. (see misc. comments.)

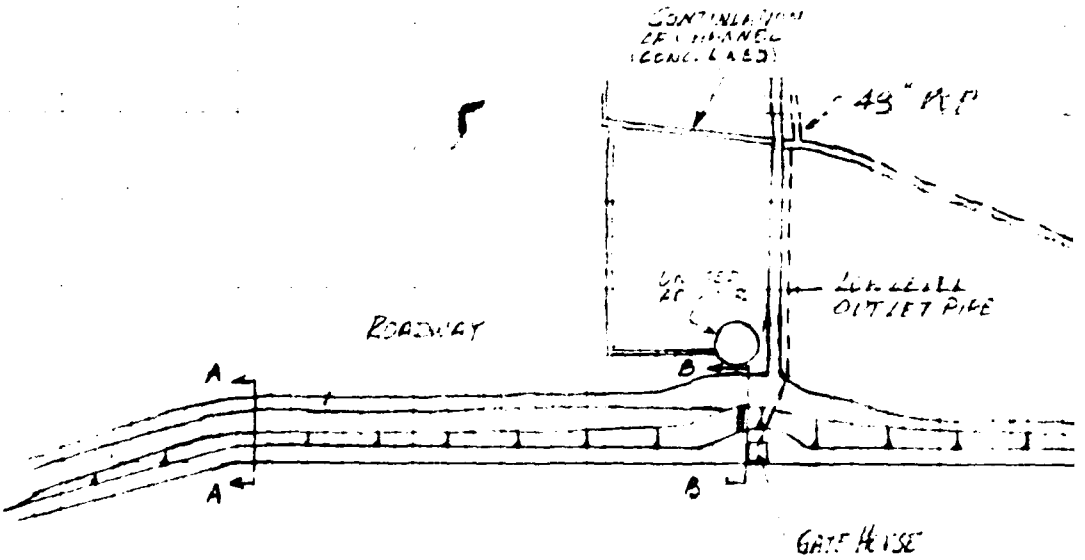
Other Obstructions There is minor debris and natural portions of the channel are overgrown with heavy vegetation, but does not impede flow in the channel.

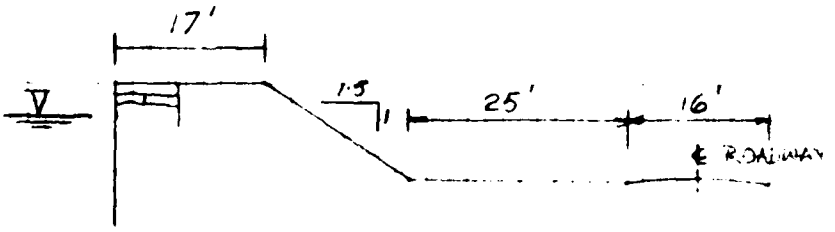
Miscellaneous. There was no water flowing over the spillway

The concrete floor of discharge channel, upstream of the bridge opening is superficially spalled. There is vegetation growing and a leakage of about 5 gpm at the contact between the concrete spillway floor downstream wall of the north opening under the bridge

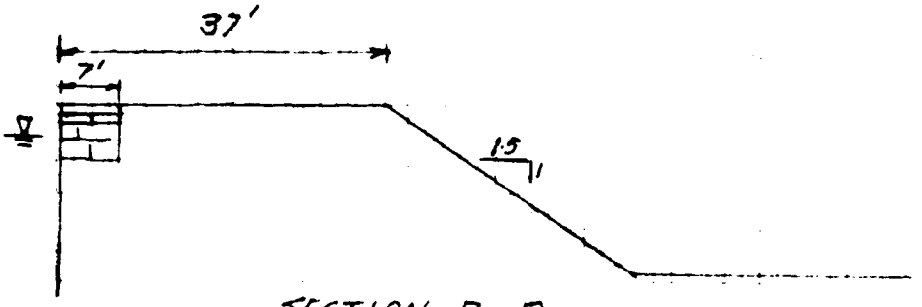
DRAWINGS

APPENDIX B

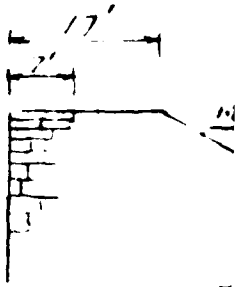




SECTION A-A

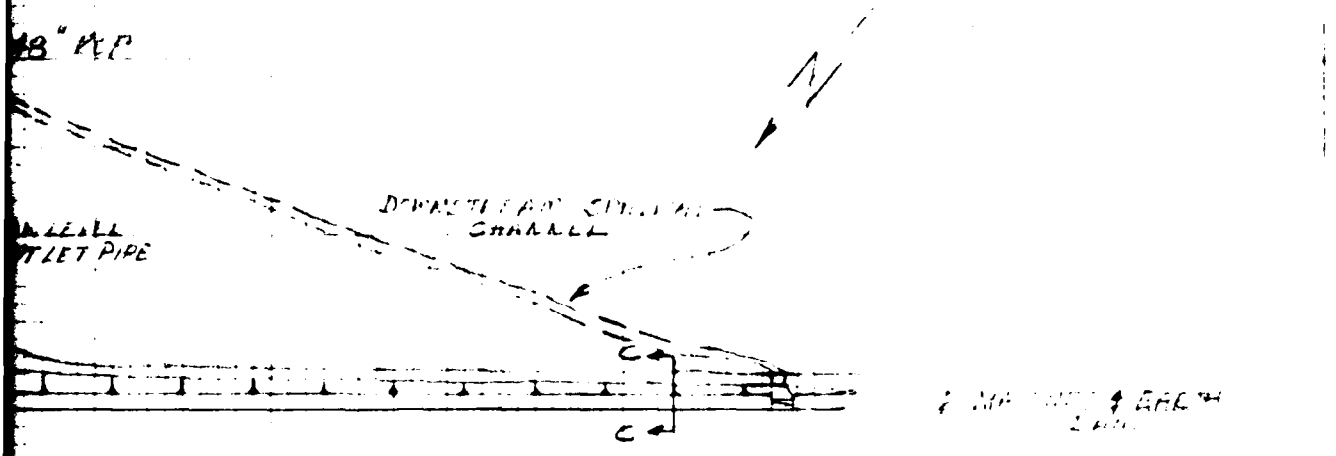


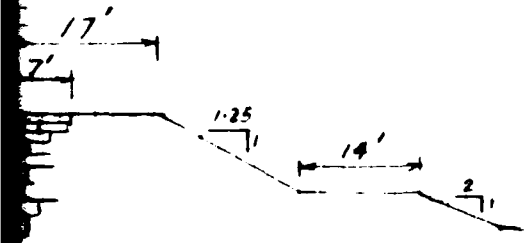
SECTION B-B



SECTI

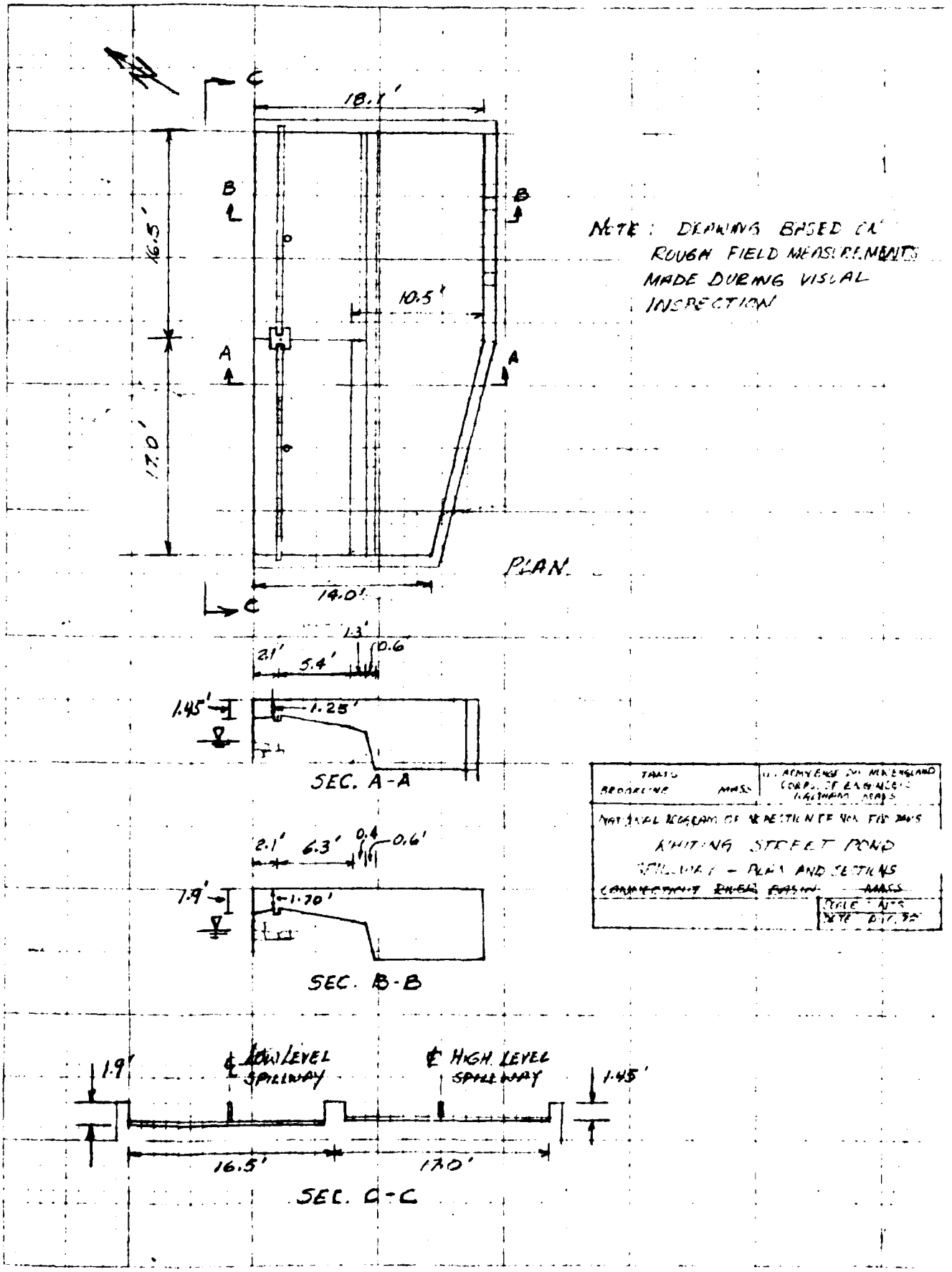
NOTE: DRAWING BASED ON ROUGH FIELD MEASUREMENTS MADE DURING VISUAL INSPECTION





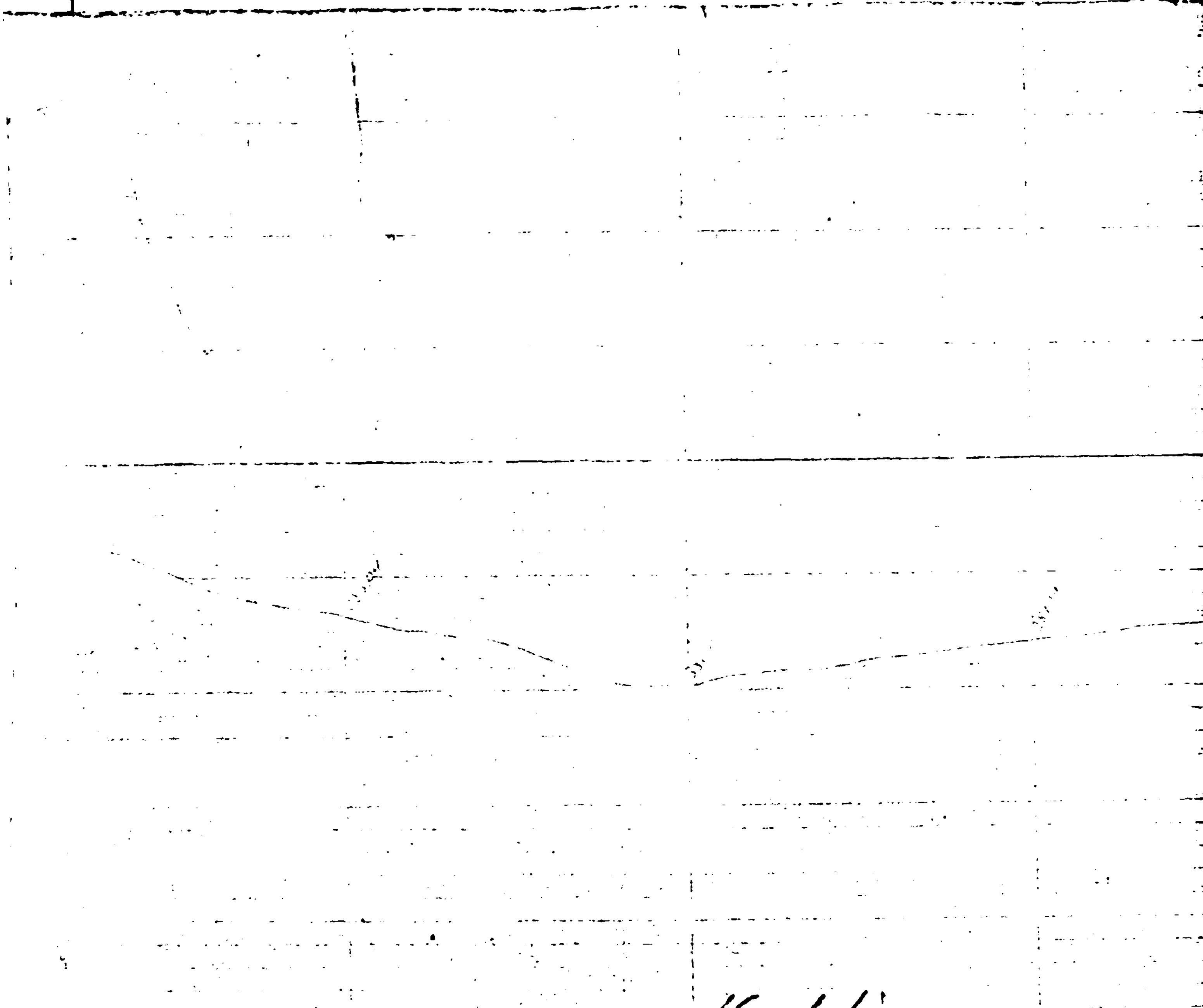
SECTION C-C

TAMS BROOKLINE MASS	NEW ENGLAND DIVISION CORPS OF ENGINEERS WALTHAM MASS
NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS	
WHITING STREET POND PLAN AND SECTION CONNECTICUT RIVER BASIN MASS	
	SCALE 1/2" DATE: AUG 79



NOTE: DRAWING BASED ON ROUGH FIELD MEASUREMENTS MADE DURING VISUAL INSPECTION

TOWN BROOKLINE MASS.	U.S. ARMY ENGINEER DIVISION NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS.
NATIONAL PROGRAM OF INSPECTION OF NON-FED DAMS	
WINTHROP STREET POND SPILLWAY - PLAN AND SECTIONS	
~~COMMONWEALTH RIVER BASIN~~	~~MASS~~
	SCALE: NTS DATE: OCT. 72



Hampshire ss

The foregoing is a true cop

of the Whiting Street Brook Dam

filed with the County Commission

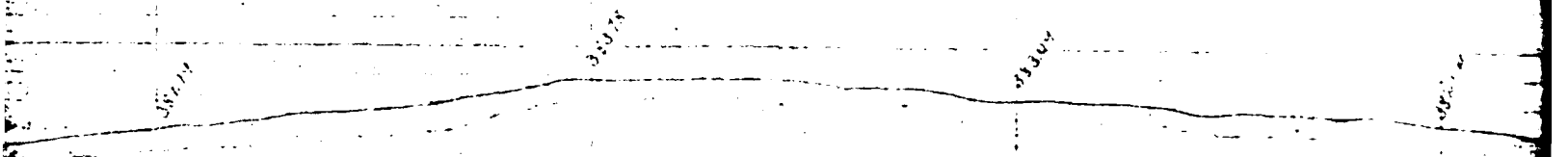
July 25. 1938

Witness my hand this

W. H. Ca

Profile of Stone Dam
for
Reservoir at Whiting Street
Holyoke Mass.

July 1888. for Holyoke



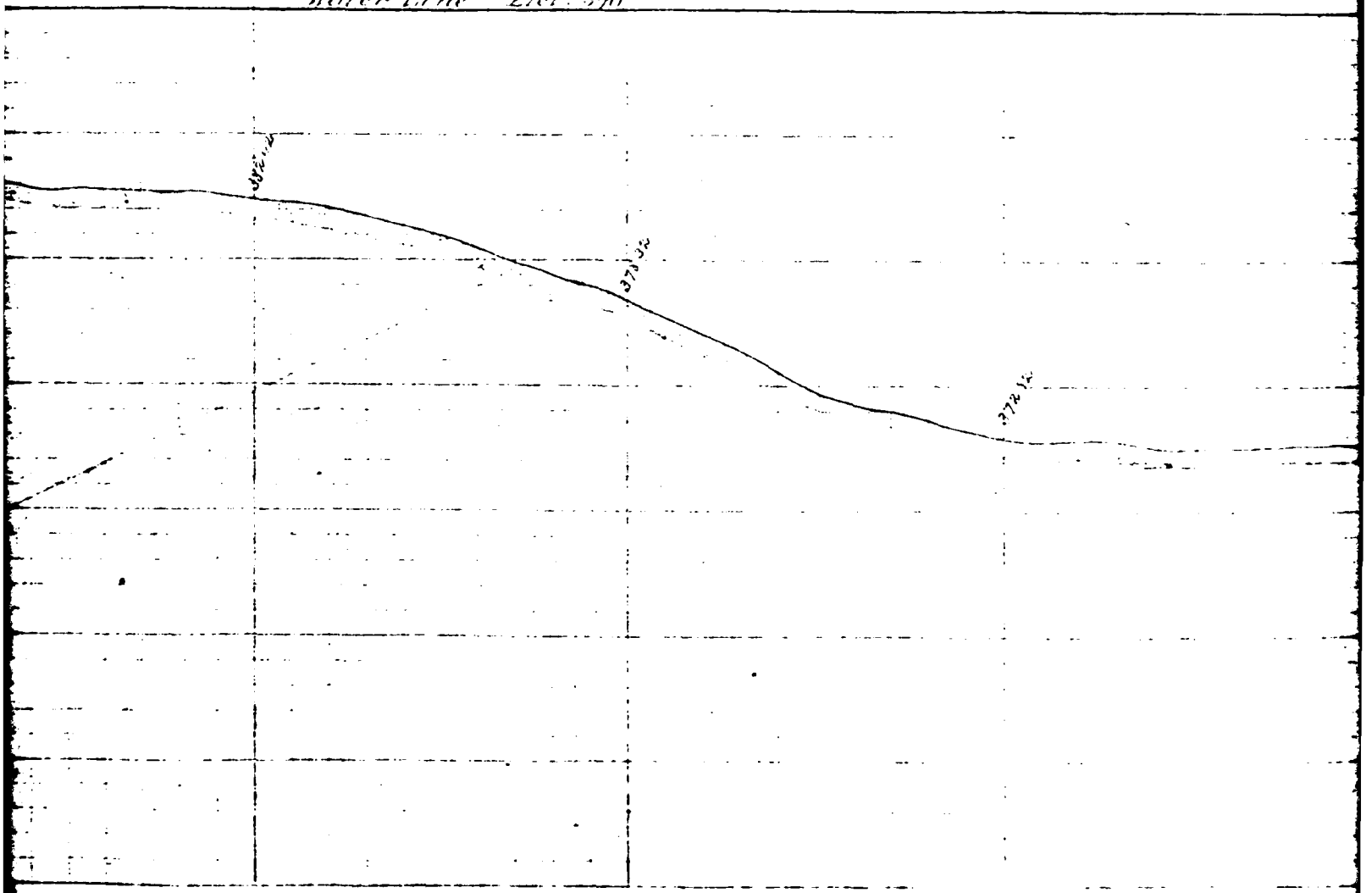
as
going is a true copy of the plan
West Brook Dam Reservoir
County Commissioners on

[redacted] 3rd 1892

W. H. Capp Clerk.

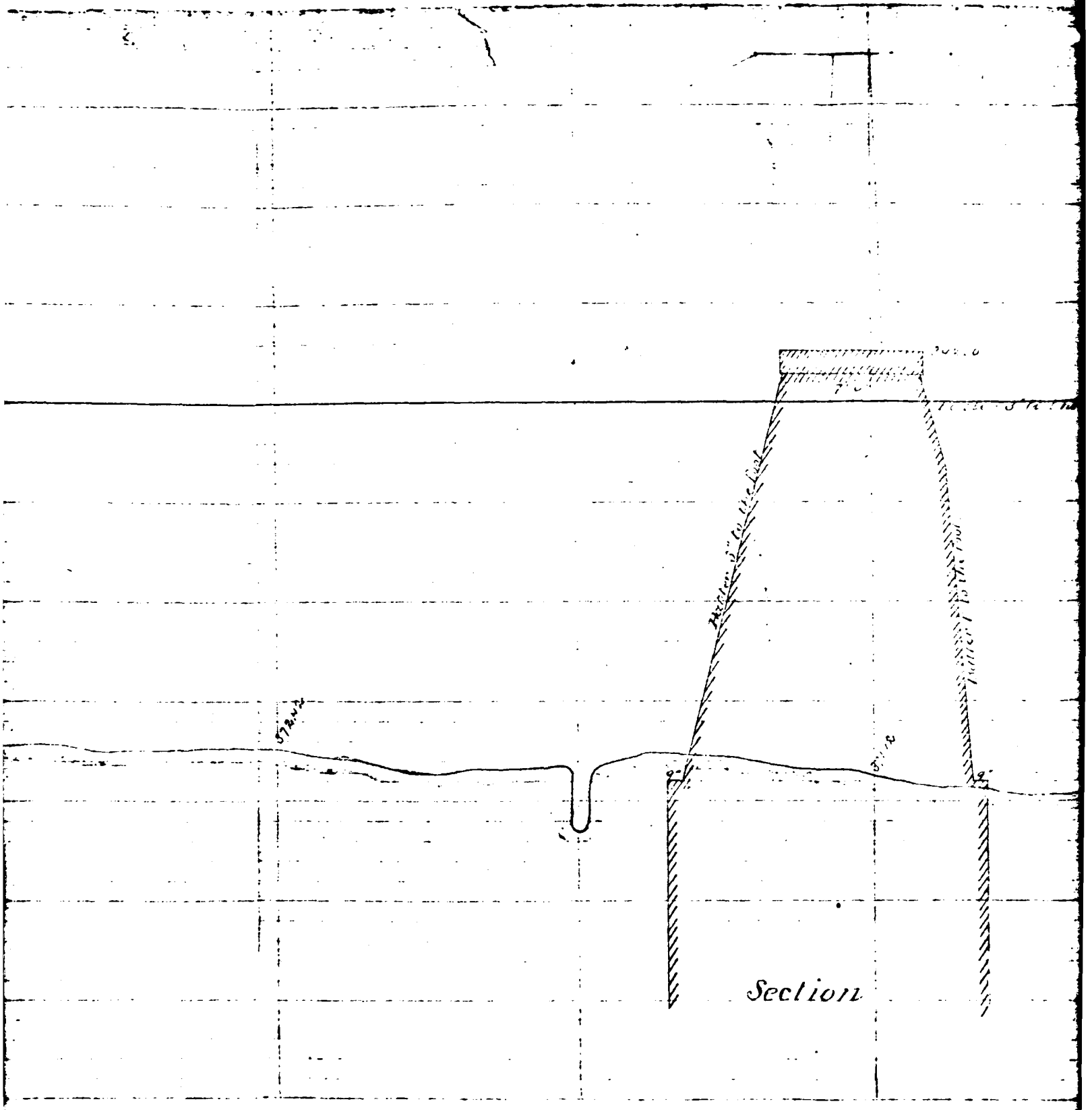
of Stone Dam
for
uiting Street Brook
yoke Mass.

for Holyoke Water Works.



STANDARD PROFILE PAPER
No 84 4 B 4 4X30

3



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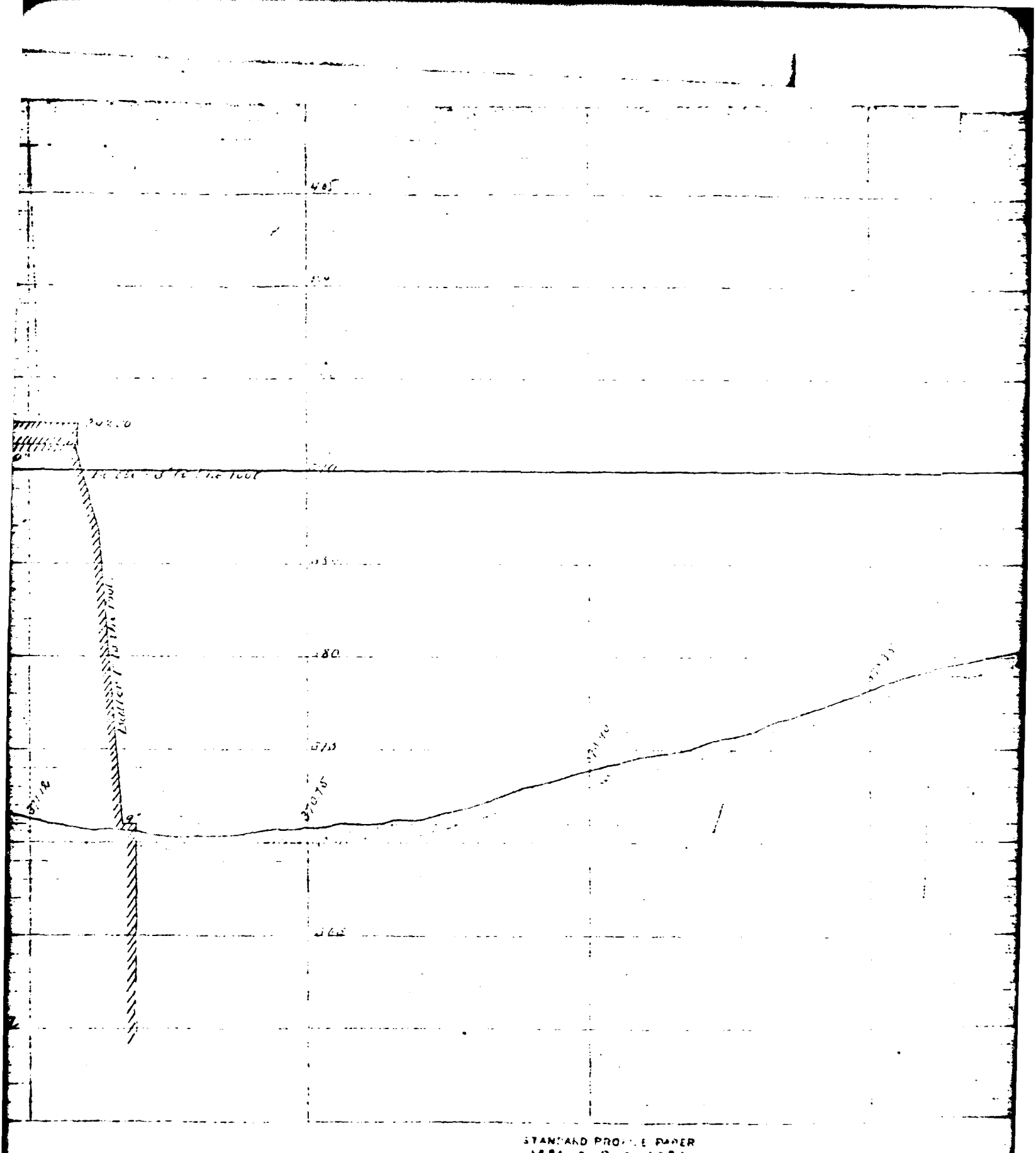
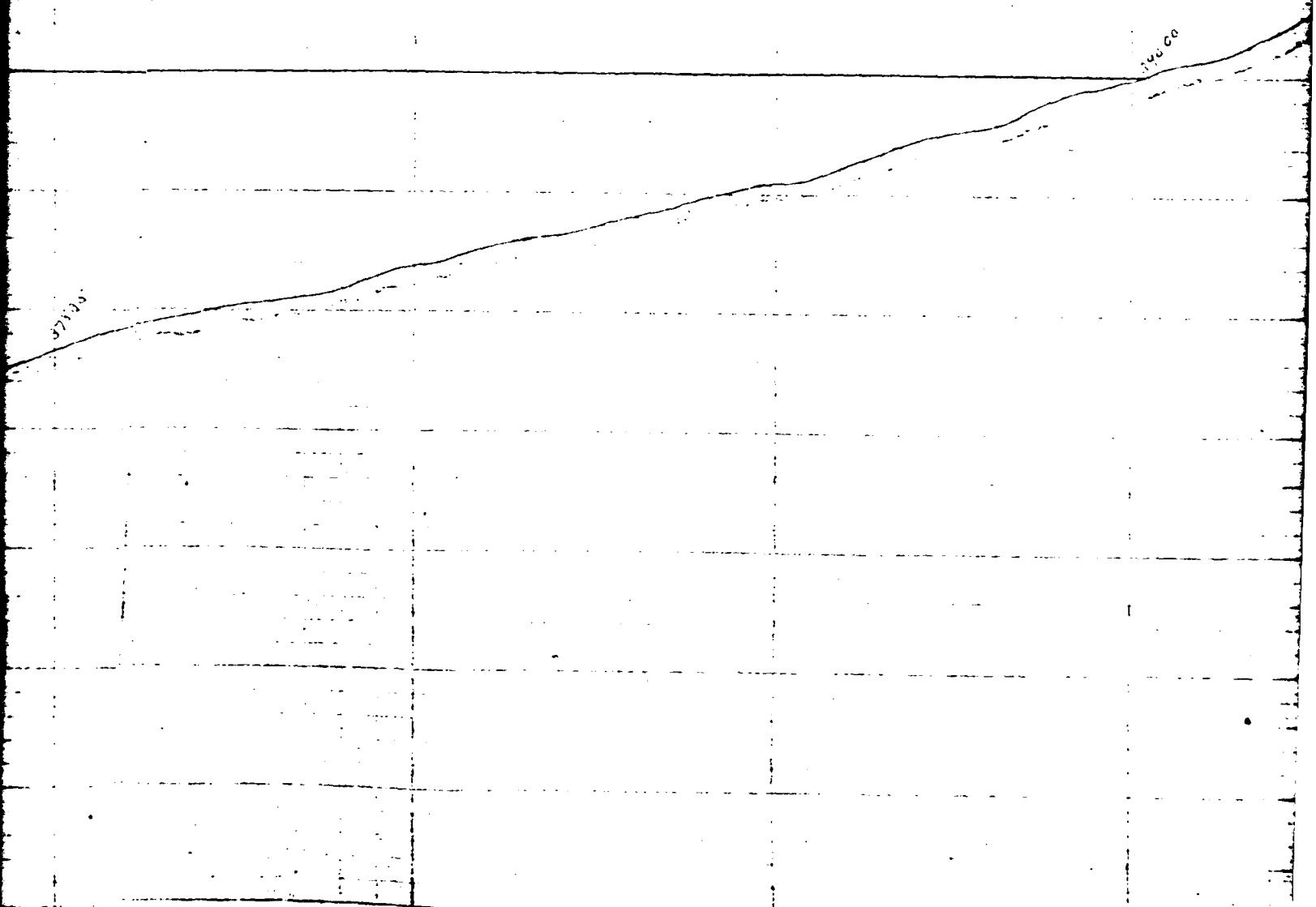


STANDARD PROFILE PAPER
No 84 x 8 x 4 x 30

5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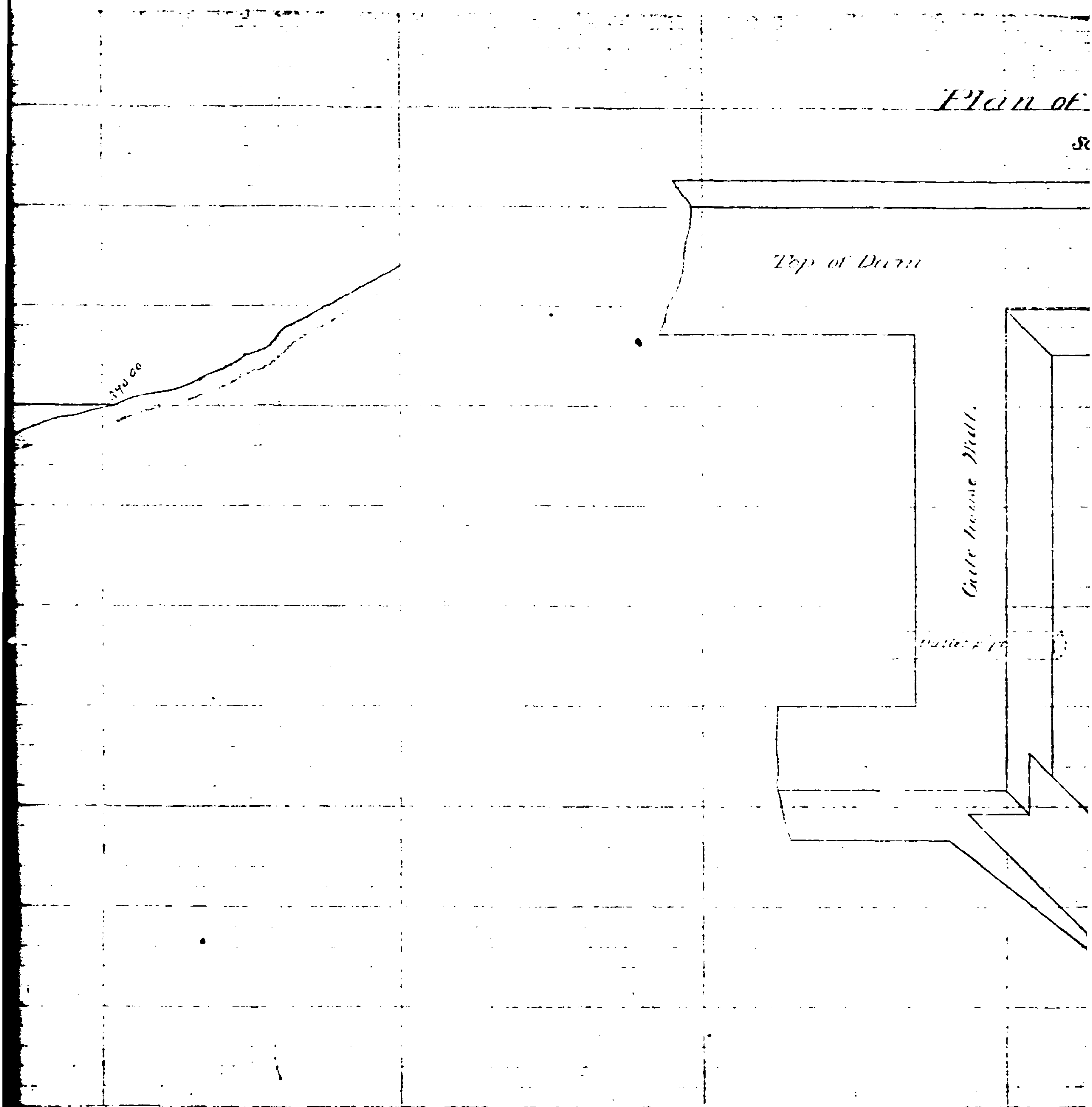
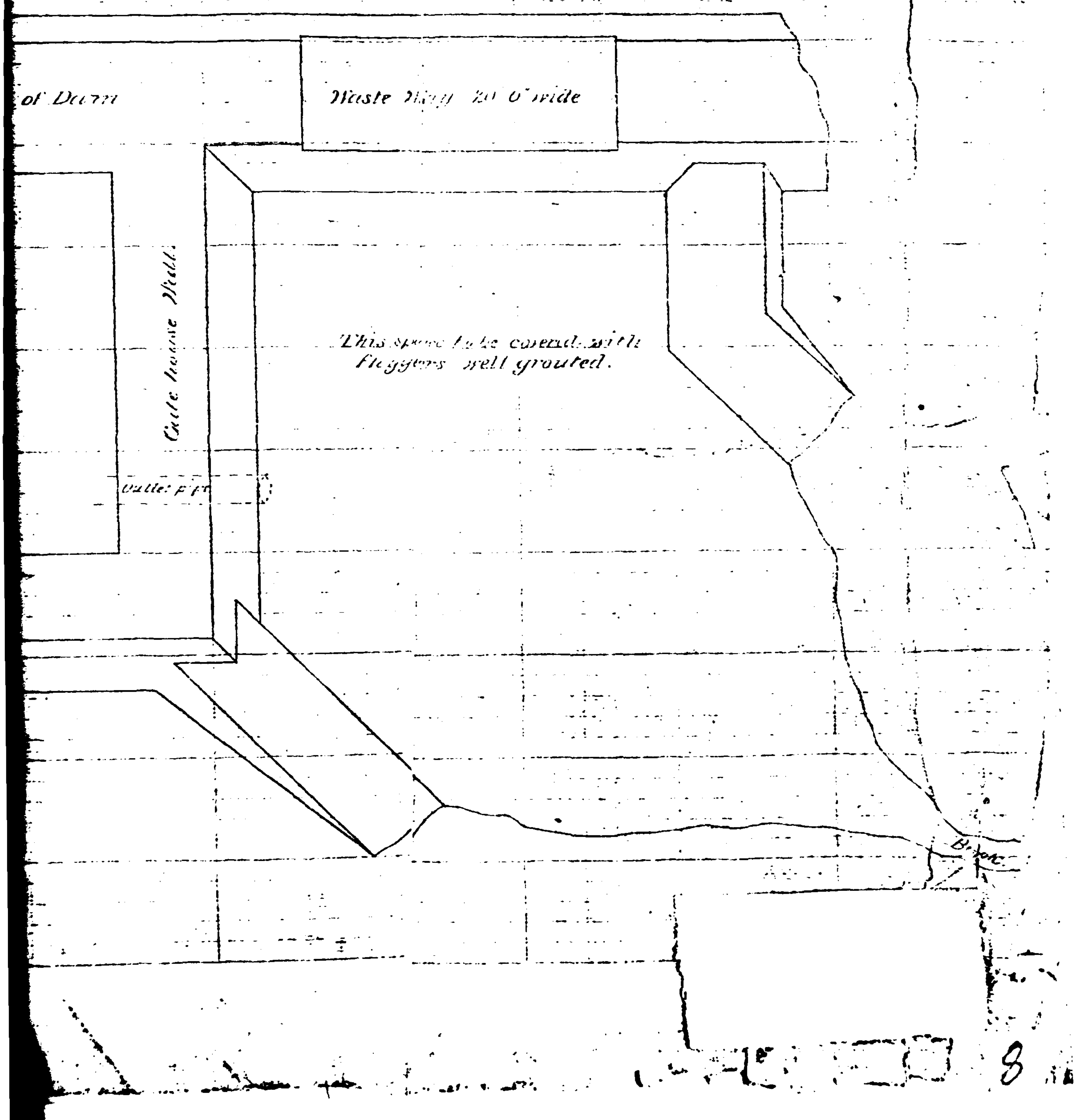
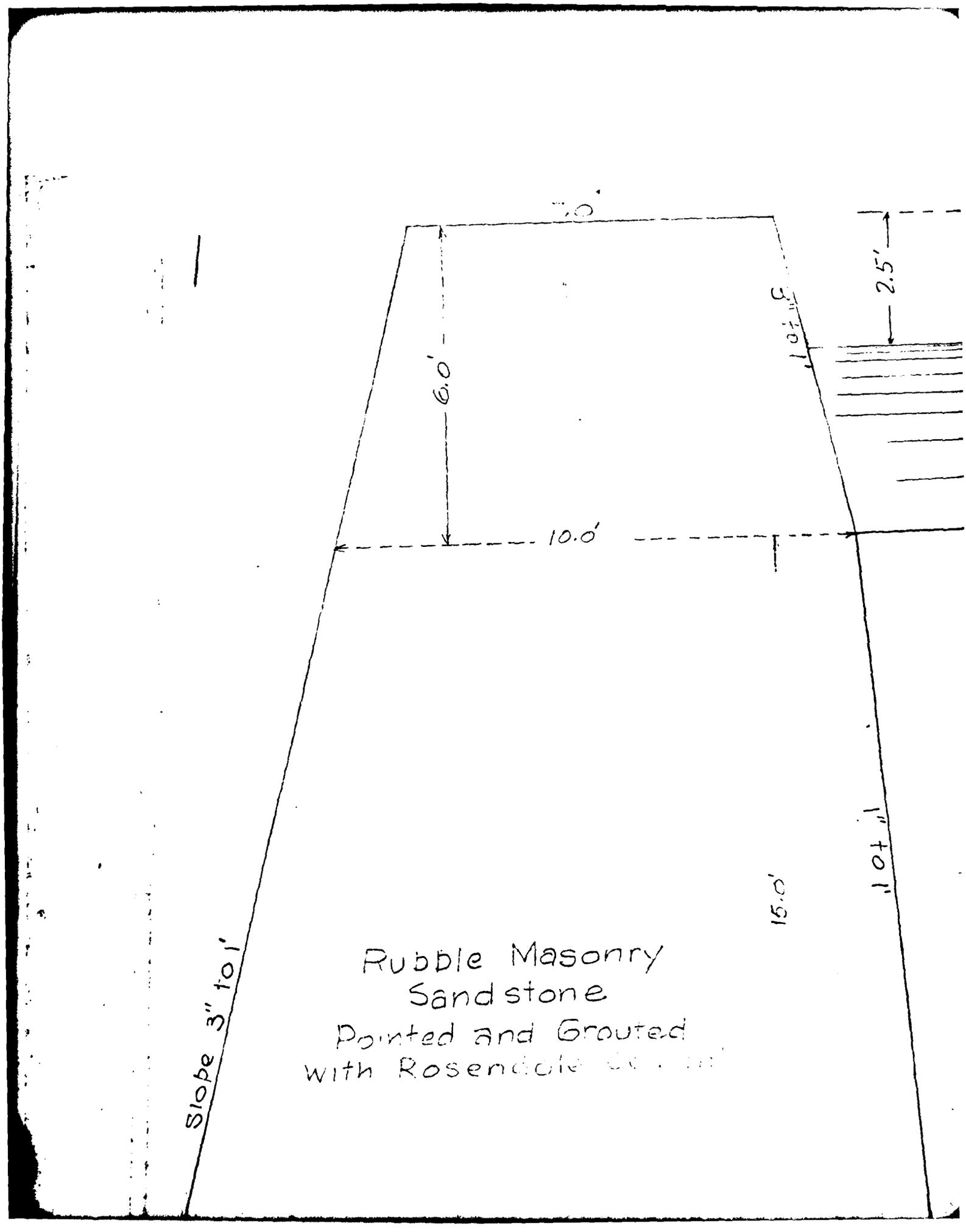
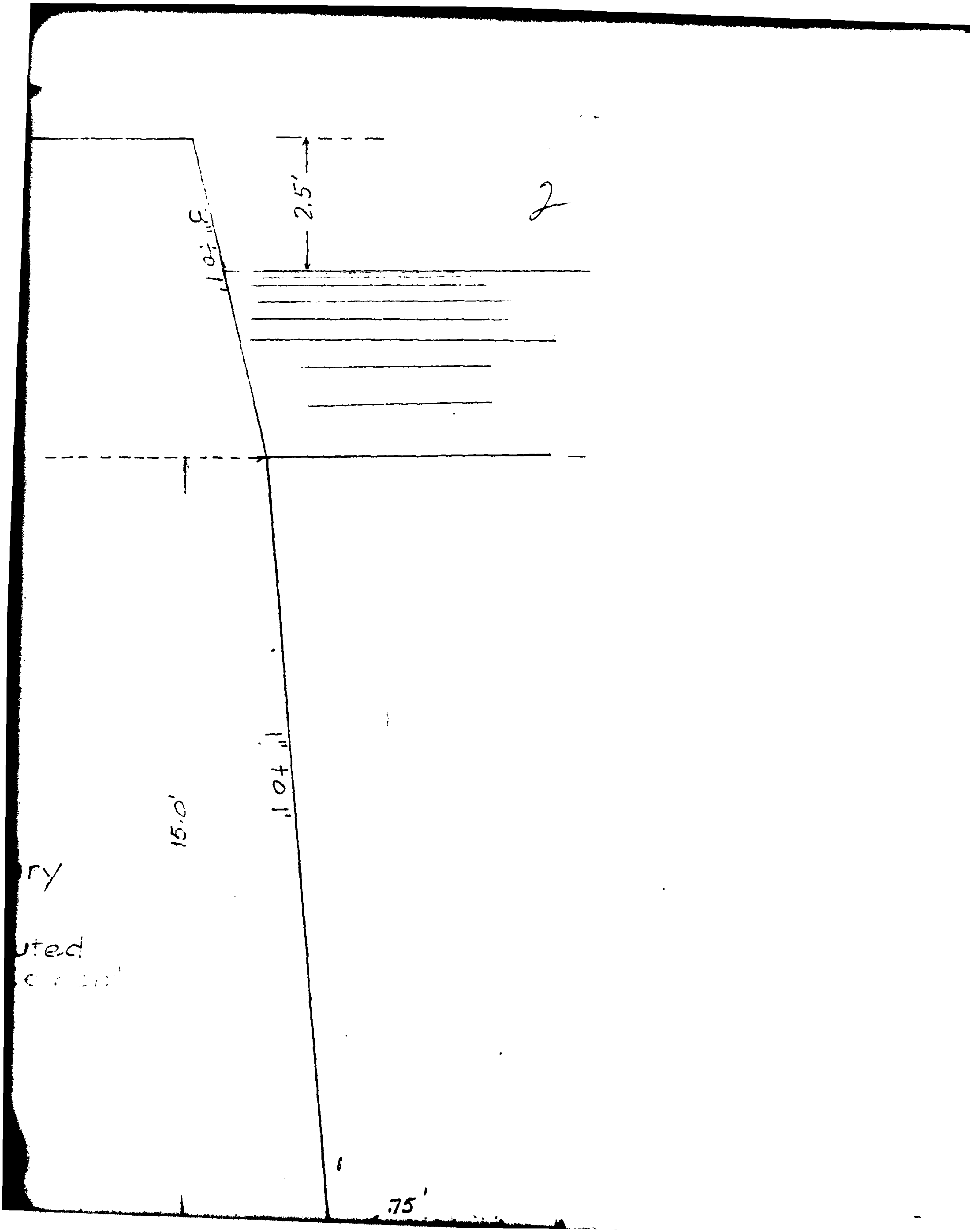


Plan of Waste Way Walls

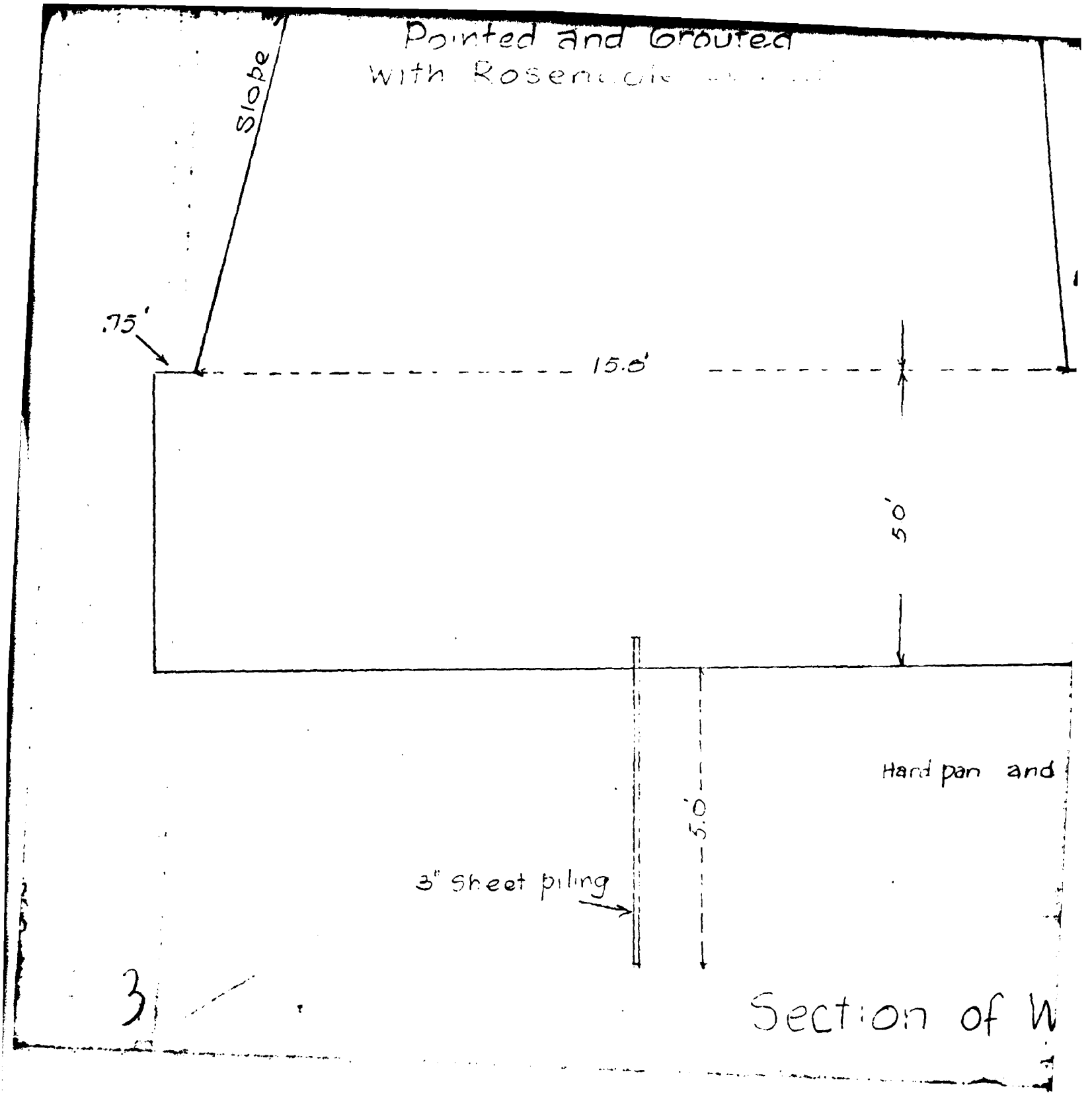
Scale 1/8 in. - 1 ft.

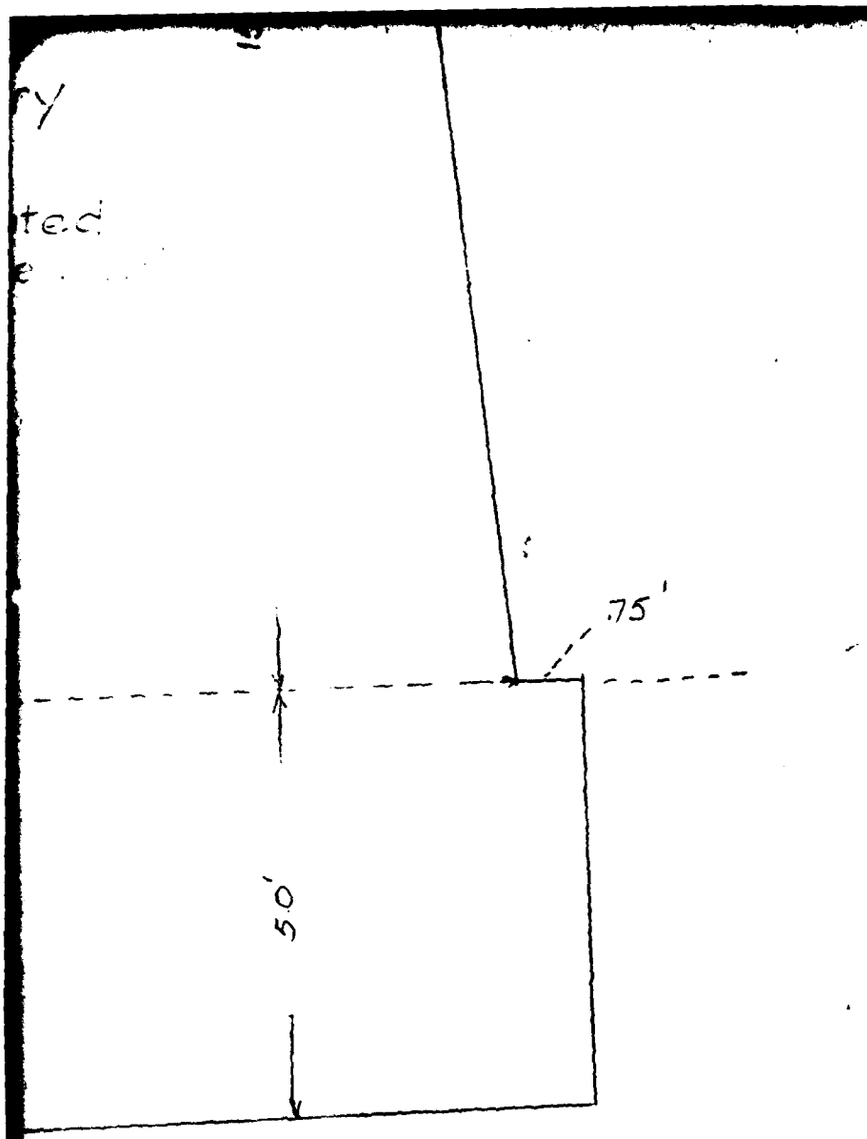



2.5'
6.0'
10.0'
15.0'
Slope 3" to 1'
Rubble Masonry
Sandstone
Pointed and Grouted



2.5'
2
15.0'
.75'


Pointed and Grouted
With Rosendale
Slope
.75'
15.0'
5.0'
Hard pan and
5.0'
3" Sheet piling
3
Section of W

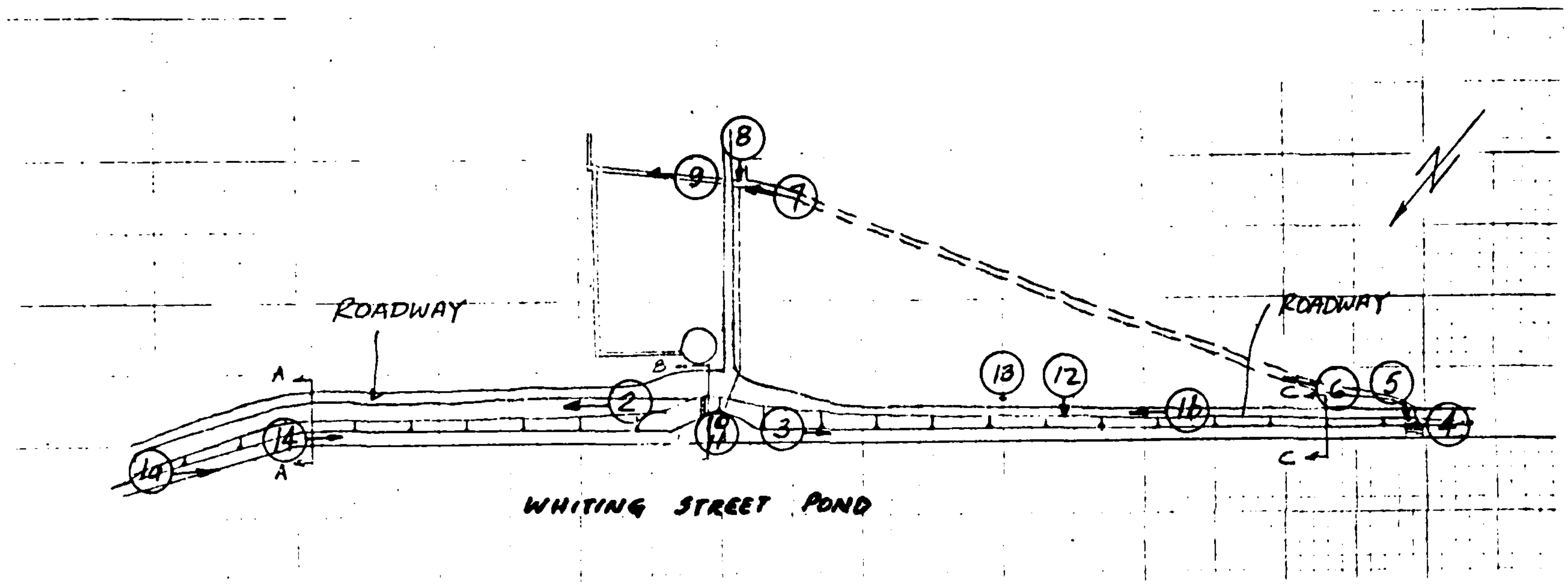


Hard pan and Gravel

Section of Whiting St.

PHOTOGRAPHS

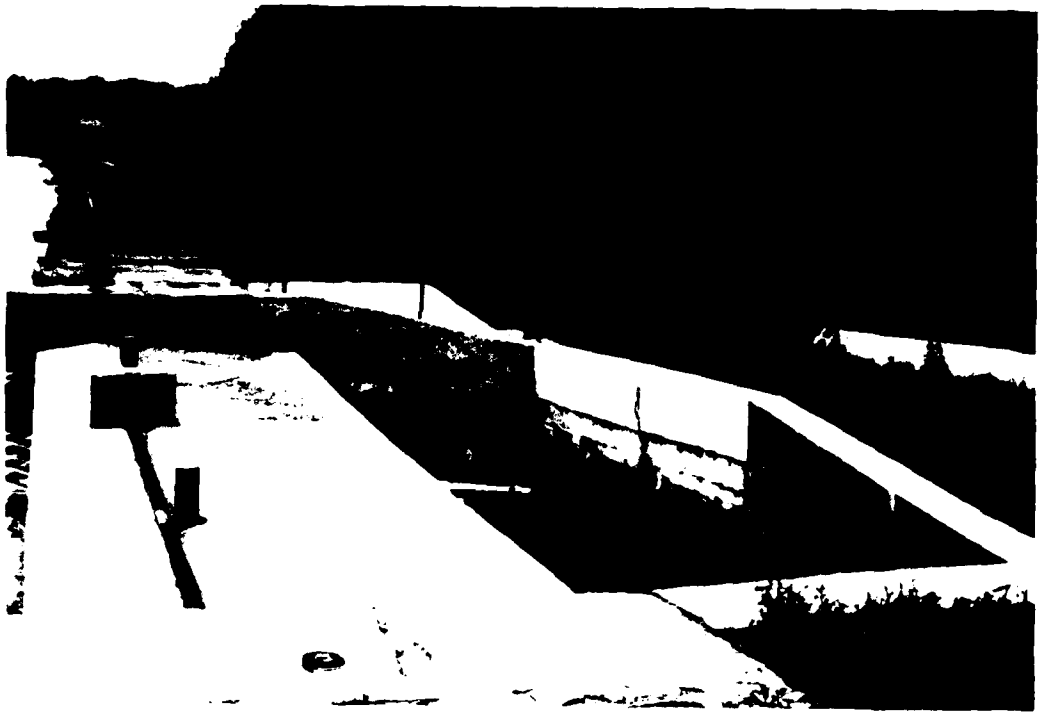
APPENDIX C



TAMS BROOKLINE MASS		U.S. ARMY ENGR DIV NEW ENGLAND CORPS OF ENGINEERS WALTHAM MASS
NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAM		
WHITING STREET POND		
PHOTOGRAPH LOCATION GUIDE		
CONNECTICUT RIVER BASIN MASS		
		SCALE: NTS
		DATE: AUG 78

2. VIEW OF DOWNSTREAM SLOPE NORTH OF GATE HOUSE.

3. VIEW ALONG CREST LOOKING SOUTH.
NOTE COMBINED STONE AND EARTH CREST.



4. VIEW OF SPILLWAY LOOKING NORTH. NOTE CONDITION OF CONCRETE

5. VIEW OF ROADWAY BRIDGE OVER SPILLWAY CHANNEL LOOKING UPSTREAM
NOTE VEGETATION, DEBRIS AND CONDITION OF CONCRETE

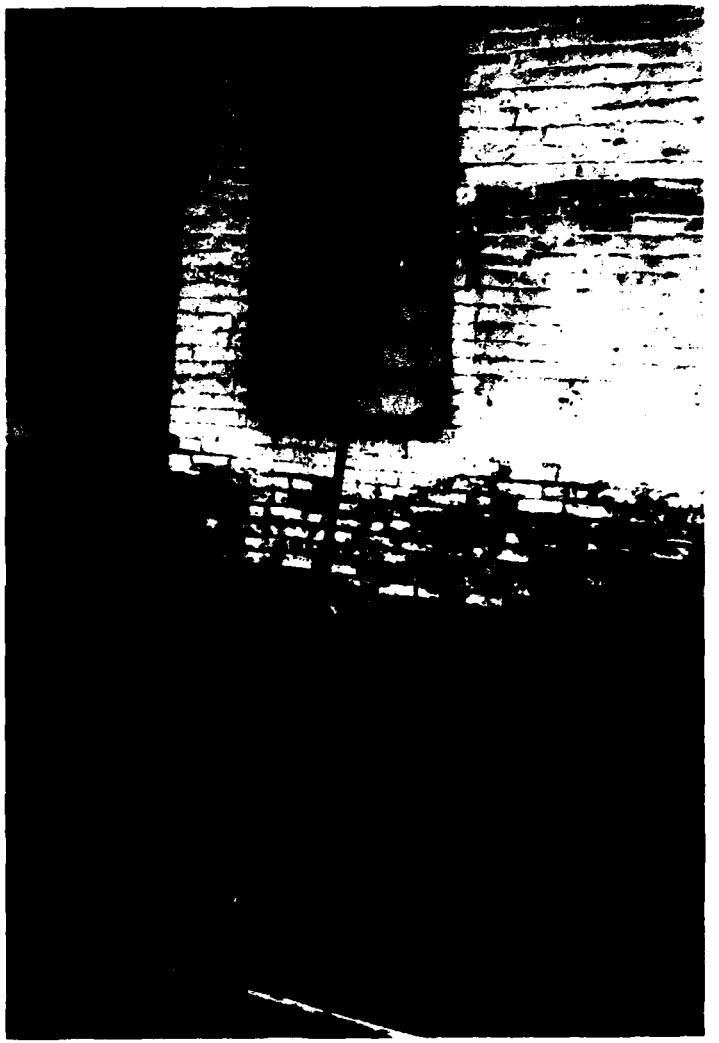
6. VIEW OF NATURAL SPILLWAY CHANNEL LOOKING DOWNSTREAM.

7. VIEW OF SPILLWAY CHANNEL LOOKING DOWNSTREAM. NOTE LOW LEVEL OUTLET LEFT SIDE, 48-INCH DIAMETER INLET RIGHT SIDE AND CONTINUATION UNDER BRIDGE.

8. VIEW OF LOW LEVEL OUTLET PIPE OUT FALLING INTO SPILLWAY CHANNEL
NOTE CONDITIONS OF CONCRETE AND STONE MASONRY

9. DOWNSTREAM VIEW OF CONCRETE LINED SPILLWAY CHANNEL
NOTE DETERIORATION OF CONCRETE AT BASE OF WALL

10. VIEW INSIDE GATE HOUSE.
NOTE SLUICEGATE OPERATING STAND
AND LOW LEVEL OUTLET GATE VALVE STEM.



11. VIEW INSIDE GATE HOUSE.
NOTE OPERATING STAND FOR 16 INCH
WATER SUPPLY LINE AND STEM FOR BY PASS
GATE VALVE.

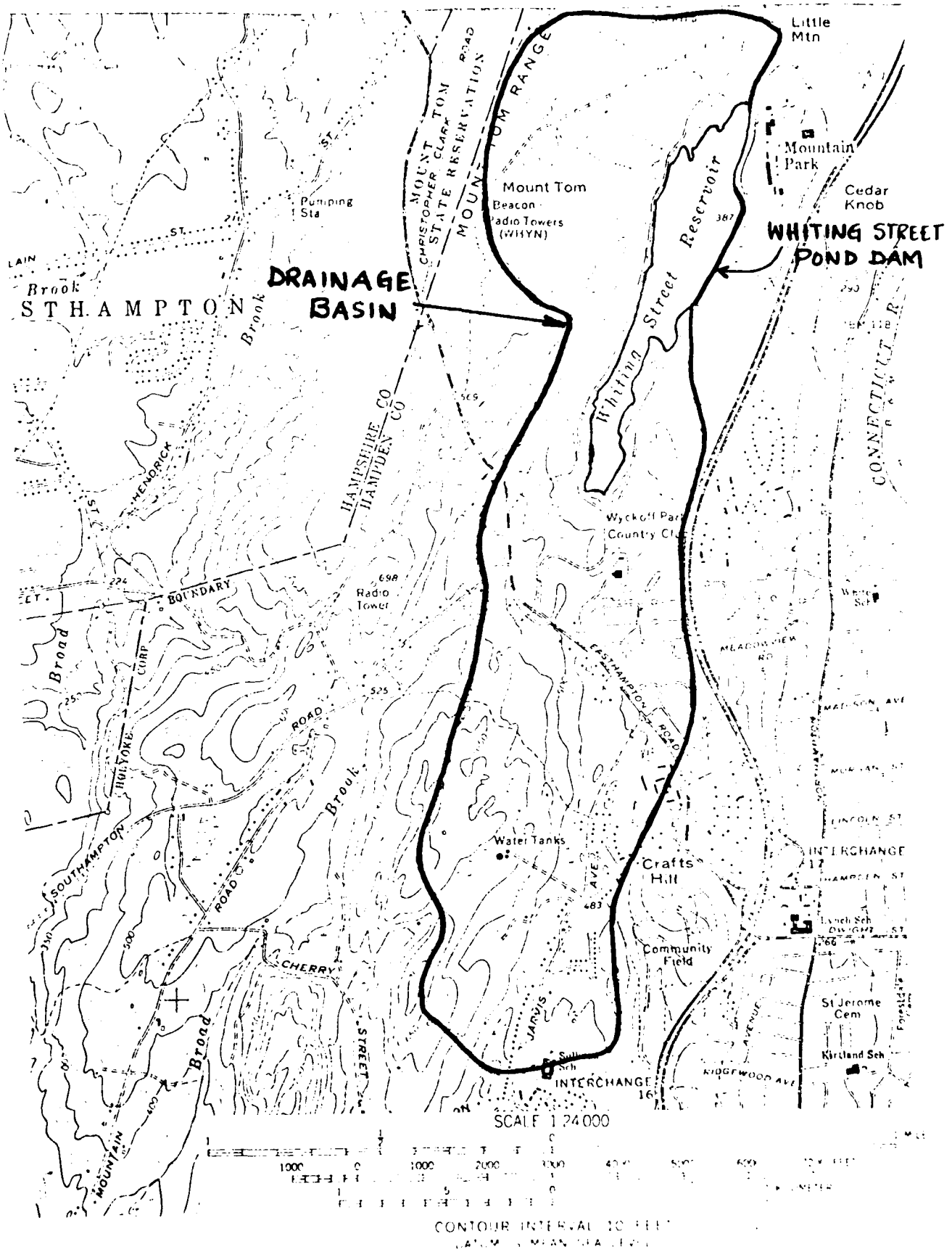
12. VIEW OF OUTLET PIPE AT DOWNSTREAM TOE OF DAM
INLET AND CONTROLS ARE UNKNOWN

13. VIEW OF SEEPAGE AT DOWNSTREAM TOE OF DAM

14. CLOSE UP VIEW OF POINTING ON UPSTREAM STONE MASONRY FACE NOTE MISSING MORTAR AND VEGETATION IN JOINTS

HYDROLOGIC DATA AND COMPUTATIONS

APPENDIX D


DRAINAGE BASIN
WHITING STREET POND DAM
Little Mtn
Mountain Park
Cedar Knob
Mount Tom
Beacon
Radio Towers (WHYN)
Pumping Sta
Whiting Street Reservoir
Wyckoff Park
Country Club
Radio Tower
Water Tanks
Crafts Hill
Community Field
St Jerome Cem
Kirtland Sch
INTERCHANGE 17
INTERCHANGE 16
Broad Brook
SCALE 1:24000
CONTOUR INTERVAL 20 FEET

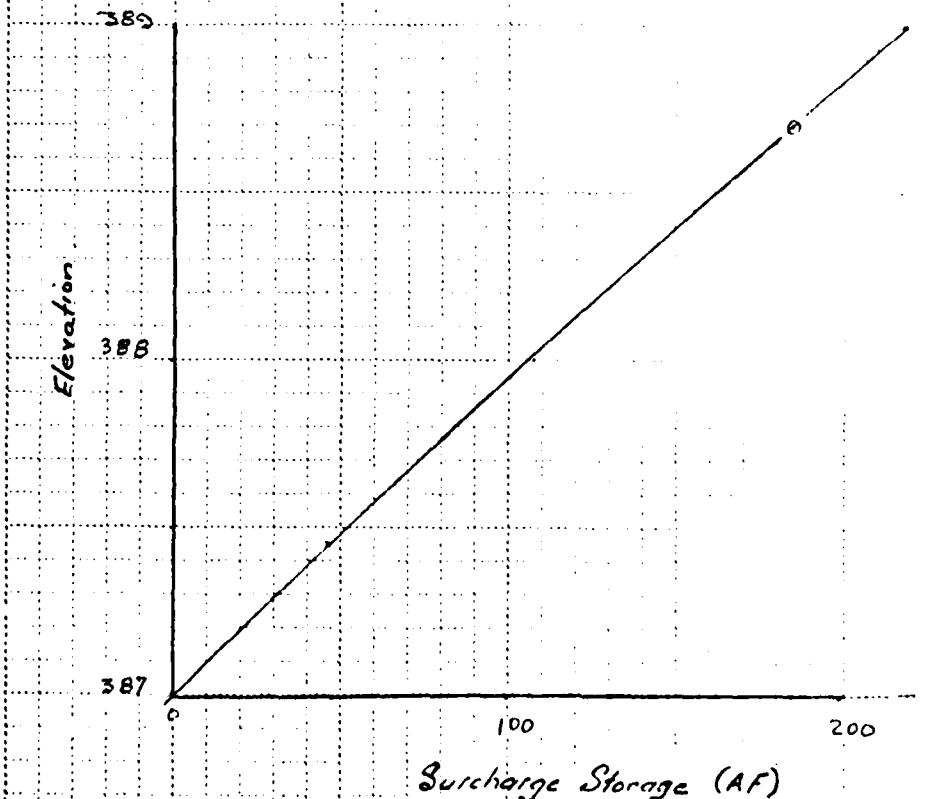
Job No. 1497-03 TIPPETTS-ABBETT-McCARTHY-STRATTON ENGINEERS AND ARCHITECTS NEW YORK Sheet 1 of 9

Project DAM INSPECTION Date 7/31/7

Subject WHITING STREET RESEVOIR By M.G.

SURCHARGE STORAGE CAL. Chk. by

ELEV. (Ft)	AREA (ACRES)	$\overline{\text{AREA}}$ (ACRES)	ΔVOLUME (AF)	SURCHARGE VOL. (AF)
387	102			0
		106	106	
388	109			106
		112	112	
389	115			218
		118	118	
390	120			336
		122	122	
391	123			458
		125	125	
392	127			583



TAMS

Job No. 1497-03 Sheet 2 of 9

Project INSPECTION WHITING STREET DAM. Date AUG 14, 78

Subject P.M.F inflow computation. By D.L.C.

Chk. by

Incremental depth of Probable Maximum Precipitation in Inches at 15 min. interval:

TOTAL AREA = 1.67 sq mi (1069 acres)

Time (hours	Total Precipitation		Lake Runoff (cfs)	Basin Runoff (CFS)	Total Inflow (PMF)
0.00		0	0	0	
.25		0.373	182	554	736
1.50		0.373	182	1381	1563
.75		0.391	191	1412	1603
1.00	1.56	0.426	208	1518	1726
.25		0.817	399	2279	2678
.50		0.941	459	3491	3950
.75		0.941	459	3809	4268
2.00	3.77	1.066	520	4024	4544
.25		1.225	598	4652	5250
.50		1.670	815	5787	6602
.75		2.255	1100	7929	9029
3.00	6.57	1.421	693	7997	8690
.25		0.853	416	4887	5303
.50		0.728	355	3219	3574
.75		0.657	321	2777	3098
4.00	2.81	0.568	277	2442	2719
.25		0.498	243	2094	2337
.50		0.444	217	1823	2040
.75		0.444	217	1685	1902
5.00	1.79	0.408	199	1623	1822
.25		0.337	164	1408	1572
.50		0.320	156	1198	1354
.75		0.319	156	1165	1321
6.00	1.26	0.285	139	1092	1231

PMF

LAKE AREA 102 acres (0.16 sq mi) NO LOSSES

BASIN AREA 947 acres (1.48 sq mi) 0.2 inch loss/hour

TAMS

Job No. 1497-03 Sheet 3 of 9

Project INSPECTION WHITING STREET DAM Date AUG 14, 78

Subject Computation of Inflow for overland sub-basin By D L C

ANCAS Ch'k. by

Excess Rainfall	Sub-basin x(640x4)	Sub-basin x(420x4)	Total	1/2 PMF cfs
0	—	—	0	0
0.323	-	554	554	368
0.323	827	554	1381	181
0.341	827	585	1412	802
.376	873	645	1518	863
.767	963	1316	2279	1339
.891	1963	1528	3491	1915
.891	2281	1528	3809	2134
1.016	2281	1743	4024	2272
1.175	2601	2015	4652	2625
1.620	3008	2779	5787	3301
2.205	4147	3782	7929	4515
1.371	5645	2352	7997	4345
.803	3510	1377	4887	2652
.678	2056	1163	3219	1787
.607	1736	1041	2777	1549
.518	1554	888	2442	1360
.448	1326	768	2094	1164
.394	1147	676	1823	1020
.394	1009	676	1685	951
.358	1009	614	1623	911
.287	916	492	1408	786
.270	735	463	1198	677
.269	704	461	1165	661
.235	689	403	1092	616

TAMS

Job No. _____ Sheet 4 of 9

Project INSPECTION WHITING STREET RESERVOIR Date AUG 14, 78

Subject SPILLWAY HEAD – DISCHARGE RATING By DLC

Ch'k. by _____

Spillway Crest AT Two Levels
Low side assumed to be at elevation 387.0'

'High' Side at Elevation 387.45

$Q = CLH^{3/2}$

	Low Side (L = 16.5)			High Side (L = 17.0)			
Elev	H	C	Q_1	H	C	Q_2	Total Q
387.	0	0	0				0
387.45	.45	3.58	17.8	0	0	0	18
387.95	.95	3.57	54.5	.50	3.55	21.5	76.
388.45	1.45	3.57	102.8	1.00	3.57	60.7	164
388.7	1.70	3.56	130.2	1.25	3.57	84.8	215
389.0							834
390.0							7360

N.B. above El 388.7 it is assumed that flow will occur over the entire 1,880 feet length of the dam.

TAMS

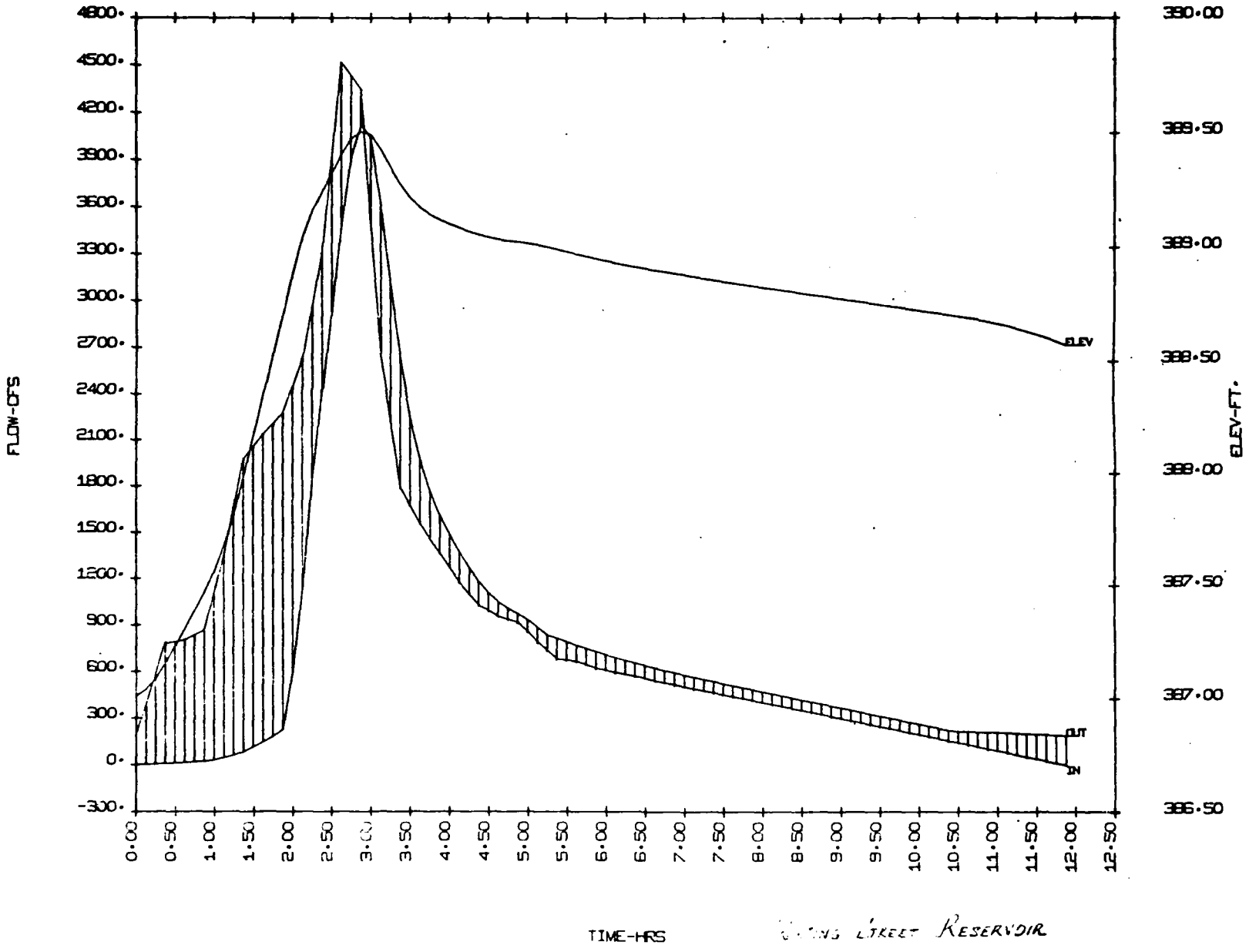
Job No. 1497-03 Sheet 5 of 9

Project INSPECTION WHITING STREET RESEVOIR Date AUG 14 78

Subject INPUT FOR ROUTING By D L C

Ch'k. by

ELEVATION	OUTFLOW (CFS)	STORAGE (AF)	
387.0	0	0	
387.45	18	47	
387.95	76	100	
388.45	164	155	
388.70	215.	185	TOP OF DAM
389	830	218	
390	7360	336	



King Street Reservoir

6 of 9

1497-03
WHITING STREET DAM
DAM INSPECTION
INFLOW HYDROGRAPH PMF

INPUT PARAMETERS

STARTING ELEV (FT.)	TIME INTERVAL (HOURS)	STARTING TIME (HOURS)	ENDING TIME (HOURS)	PRINT INTERVAL	GATE OPTION	PLOT OPTION	STORAGE COEF.	OUTFLOW COEF.	INFLOW COEF.	TIME COEF.	BREAK TIME
387.00	0.25	0.00	6.25	1	NO	YES	1.000	1.000	1.000	1.000	0.000

RESERVOIR ELEV. (FT.)	RESERVOIR STORAGE (ACFT)	RESERVOIR OUTFLOW (CFS)
387.00	0.0000	0.00
387.45	47.0000	18.00
387.95	100.0000	76.00
388.45	155.0000	164.00
388.70	185.0000	215.00
389.00	218.0000	830.00
390.00	336.0000	7360.00

TIME (HRS)	INFLOW (CFS)	OUTFLOW (CFS)	STORAGE (ACFT)	ELEVATION (FT.)
0.00	0.00		0.0000	387.00
0.25	736.00	2.90	7.5733	387.07
0.50	1563.00	11.93	31.1698	387.29
0.75	1603.00	36.01	63.4577	387.60
1.00	1726.00	72.41	96.7267	387.91
1.25	2678.00	140.05	140.0351	388.31
1.50	3950.00	557.19	203.3616	388.86
1.75	4268.00	2735.94	252.4412	389.29
2.00	4544.00	3850.92	272.5895	389.46
2.25	5250.00	4549.32	285.2098	389.56
2.50	6602.00	5468.43	301.8186	389.71
2.75	9029.00	7035.41	330.1346	389.95
3.00	8690.00	8253.23	352.1411	390.13
3.25	5303.00	7414.19	336.9794	390.00
3.50	3574.00	5427.52	301.0793	389.70
3.75	3098.00	4031.15	275.8463	389.49
4.00	2719.00	3281.63	262.3021	389.37
4.25	2337.00	2778.48	253.2099	389.29
4.50	2040.00	2384.59	246.0921	389.23
4.75	1902.00	2108.46	241.1024	389.19
5.00	1822.00	1943.91	238.1289	389.17
5.25	1572.00	1779.06	235.1500	389.14
5.50	1354.00	1565.04	231.3369	389.11
5.75	1321.00	1414.12	228.5554	389.09
6.00	1321.00	1321.00	226.4990	389.07
6.25	0.00	535.37	218.0971	389.00
MAX. VALUES	9029.00	8253.23		390.13
MIN. VALUES	0.00	0.00		387.00

TIME (HRS)	INFLOW (CFS)	OUTFLOW (CFS)	STORAGE (ACFT)	ELEVATION (FT.)
6.13	603.16	702.92	211.1816	396.93
6.25	590.33	684.33	210.1838	396.92
6.38	577.50	666.74	209.2402	396.92
6.50	564.66	649.99	208.3412	396.91
6.63	551.83	633.92	207.4791	396.90
6.75	539.00	618.42	206.6473	396.89
6.88	526.16	603.39	205.8406	396.88
7.00	513.33	588.74	205.0546	396.88
7.13	500.50	574.41	204.2857	396.87
7.25	487.66	560.34	203.5308	396.86
7.38	474.83	546.49	202.7875	396.86
7.50	462.00	532.82	202.0538	396.85
7.63	449.16	519.29	201.3280	396.84
7.75	436.33	505.89	200.6087	396.84
7.88	423.50	492.58	199.8946	396.83
8.00	410.66	479.36	199.1853	396.82
8.13	397.83	466.20	198.4794	396.82
8.25	385.00	453.11	197.7766	396.81
8.38	372.16	440.05	197.0763	396.80
8.50	359.33	427.04	196.3750	396.80
8.63	346.50	414.06	195.6814	396.79
8.75	333.66	401.10	194.9862	396.79
8.88	320.83	388.17	194.2922	396.78
9.00	308.00	375.25	193.5991	396.77
9.13	295.16	362.35	192.9068	396.77
9.25	282.33	349.46	192.2152	396.76
9.38	269.50	336.58	191.5240	396.75
9.50	256.66	323.71	190.8333	396.75
9.63	243.83	310.84	190.1430	396.74
9.75	231.00	297.98	189.4530	396.74
9.88	218.16	285.13	188.7632	396.73
10.00	205.33	272.28	188.0736	396.72
10.13	192.50	259.43	187.3842	396.72
10.25	179.66	246.58	186.6949	396.71
10.38	166.83	233.74	186.0056	396.70
10.50	154.00	220.90	185.3167	396.70
10.63	141.16	214.33	184.6117	396.69
10.75	128.33	212.95	183.7967	396.68
10.88	115.50	211.34	182.9844	396.68
11.00	102.66	209.56	182.1770	396.67
11.13	89.83	207.61	181.3763	396.66
11.25	77.00	205.45	180.5845	396.65
11.38	64.16	203.10	179.8033	396.64
11.50	51.33	200.57	179.0348	396.62
11.63	38.50	197.85	178.2808	396.61
11.75	25.66	194.97	177.5431	396.60
11.88	12.83	191.92	176.8235	396.59
12.00	0.00	188.69	176.1239	396.57
MAX. VALUES	4515.00	4120.98		396.50
MIN. VALUES	0.00	0.00		396.00

APPENDIX E

INFORMATION AS CONTAINED IN

THE NATIONAL INVENTORY OF DAMS

INVENTORY OF DAMS IN THE UNITED STATES

STATE	IDENTITY NUMBER	DIVISION	STATE	COUNTY	CONGR DIST.	STATE	COUNTY	CONGR DIST.	NAME	LATITUDE (NORTH)	LONGITUDE (WEST)	REPORT DATE DAY | MO | YR
MA	70	NED	MA	013	01				WHITING STREET POND DAM	4214.4	7238.1	08SEP78

POPULAR NAME	NAME OF IMPOUNDMENT
	WHITING STREET RESERVOIR

REGION	BASIN	RIVER OR STREAM	NEAREST DOWNSTREAM CITY-TOWN-VILLAGE	DIST FROM DAM (MI.)	POPULATION
01	08	TR-CONNECTICUT	HOLYOKE	0	50100

TYPE OF DAM	YEAR COMPLETED	PURPOSES	STRUCTURAL HEIGHT (FT.)	HYDRAULIC HEIGHT (FT.)	IMPOUNDING CAPACITIES MAXIMUM (ACRE-FT.)	IMPOUNDING CAPACITIES NORMAL (ACRE-FT.)	DIST	OWN	FED R	PRV/FED	SCS A	VER/DATE
RE GRVS	1900	S	19	17	2190	2005	NED	N	N	N	N	31AUG78

REMARKS

D/S HAS	SPILLWAY CREST LENGTH	SPILLWAY TYPE	SPILLWAY WIDTH (FT.)	MAXIMUM DISCHARGE (FT.)	VOLUME OF DAM (CY)	POWER CAPACITY INSTALLED (MW)	POWER CAPACITY PROPOSED (MW)	NAVIGATION LOCKS NO.	LENGTH (FT.)	WIDTH (FT.)	LENGTH (FT.)	WIDTH (FT.)	LENGTH (FT.)	WIDTH (FT.)	LENGTH (FT.)	WIDTH (FT.)
1	1900	U	34	215												

OWNER	ENGINEERING BY	CONSTRUCTION BY
CITY OF HOLYOKE		

REGULATORY AGENCY			
DESIGN	CONSTRUCTION	OPERATION	MAINTENANCE
NONE	NONE	NONE	NONE

INSPECTION BY	INSPECTION DATE DAY | MO | YR	AUTHORITY FOR INSPECTION
TIPPETTS-ABBETT-MCCARTHY-STRATTON		PL 92-367

REMARKS


DATE:
ILME