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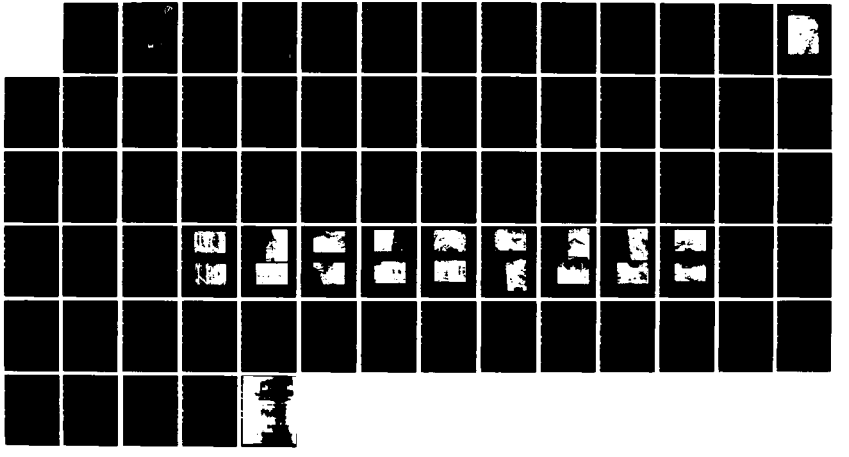

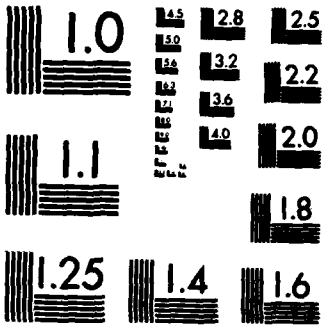

NAUGATUCK RIVER BASIN
WATERBURY, CONNECTICUT

BELLEVIEW LAKE DAM
CT 00642

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

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

MAY 1979

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER CT 00642	2. GOVT ACCESSION NO. AD-A144 567	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) Belleview Lake Dam NATIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL DAMS		5. TYPE OF REPORT & PERIOD COVERED INSPECTION REPORT 6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) U.S. ARMY CORPS OF ENGINEERS NEW ENGLAND DIVISION		8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS DEPT. OF THE ARMY, CORPS OF ENGINEERS NEW ENGLAND DIVISION, NEDED 424 TRAPELO ROAD, WALTHAM, MA. 02254		12. REPORT DATE May 1979 13. NUMBER OF PAGES 65
14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office)		15. SECURITY CLASS. (of this report) UNCLASSIFIED 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

APPROVAL FOR PUBLIC RELEASE: DISTRIBUTION UNLIMITED

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

18. SUPPLEMENTARY NOTES

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

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

DAMS, INSPECTION, DAM SAFETY,

Naugatuck River Basin
Waterbury, Connecticut

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

Belleview Lake Dam is a 229 foot long rubble masonry gravity dam and has a maximum height of 34 feet. The top width of the capstone section is 6 feet. The visual inspection indicated that the dam is in poor condition. Based on its small size and high hazard classification the test flood is equal to the PMF.

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BELLEVIEW LAKE DAM

CT 00642

NAUGATUCK RIVER BASIN

WATERBURY, CONNECTICUT

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

This Phase I Inspection Report on Belleview Lake 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 judgement and practice, and is hereby submitted for approval.

Joseph A. McElroy

JOSEPH A. MCELROY, MEMBER
Foundation & Materials Branch
Engineering Division

Carney M. Terzian

CARNEY M. TERZIAN, MEMBER
Design Branch
Engineering Division

Joseph W. Finegan, Jr.

JOSEPH W. FINEGAN, JR., CHAIRMAN
Chief, Reservoir Control Center
Water Control Branch
Engineering Division

APPROVAL RECOMMENDED:

Joe B. Fryar

JOE B. FRYAR
Chief, Engineering Division

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

REPLY TO
ATTENTION OF:
NEDED

OCT 15 1979

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

Dear Governor Grasso:

Inclosed is a copy of the Belleview Lake 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 been furnished the owner, Great Brook Realty, Inc., c/o Grun Brothers, 498 East Nepperham Avenue, Yonkers, New York 10701.

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

TABLE OF CONTENTS

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.

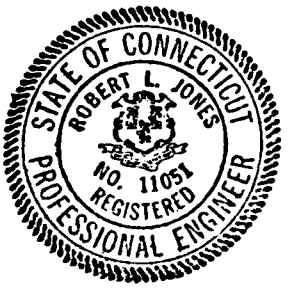
It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the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

Based on its small size and high hazard classification, and in accordance with the Corps guidelines, the test flood is equal to the Probable Maximum Flood. The spillway will discharge 95 cfs or 7% of the test flood with the pool level with the top of the dam. The test flood flow of 1430 cfs will overtop the dam by 1.5 feet. Also, the masonry construction of the dam would probably do some overtopping without significant damage.

Based on the findings of the visual inspection and hydrologic and hydraulic analysis, there is need for further engineering studies and for major alterations to the dam. Provisions should be made by the owner to have structural stability of the dam investigated by a professional engineer before any remedial work is undertaken. Erosion channels along the downstream toe and abutments should be repaired. All trees within 30 feet of the downstream face should be removed. The spillway channel should be cleared and eroded areas repaired. An operable outlet to the reservoir should be provided.

The recommendations and remedial measures are described in Section 7 and should be addressed within one year after receipt of this Phase I - Inspection Report by the owner.



Robert L. Jones, P.E.
Project Manager

Philip W. Genovese & Associates, Inc.
Hamden, Connecticut

NATIONAL DAM INSPECTION PROGRAM
PHASE I - INSPECTION REPORT
BRIEF ASSESSMENT

Identification No.: CT 00642

Name of Dam: Belleview Lake Dam

Town: Waterbury

County and State: Litchfield, Connecticut

Stream: Great Brook

Date of Inspection: December 20, 1978, January 4, January 16 and April 6, 1979

Belleview Lake Dam is a 229 foot long rubble masonry gravity dam and has a maximum height of 34 feet. The top width of the capstone section is 6 feet. The spillway is located on the right side of the embankment. This dam is also known as Great Brook Reservoir Dam.

Engineering data available consisted of two drawings dated 1899 showing plan, elevation and details of the dam. No construction specifications or design calculations were available.

The visual inspection of Belleview Lake Dam indicated that the dam is in poor condition. There are numerous instances where mortar has been removed from joints as seen in Photo 8. The inspection revealed that extensive seepage occurs across the entire downstream face of the dam as shown in Photos 1, 2, 7, 8, 10, 11 and 15. Erosion was observed on the left abutment as seen in Photo 4 and seepage was also seen above the elevation of the dam crest. Also, at the junction of the left abutment and the downstream face of the dam a 10 foot erosion channel is located which is filled with boulders, trees and rubbish as seen in Photos 3, 5, 6, 9, and 15. A similar erosion channel is located on the right side of the dam where seepage water flows down the slope as shown in Photos 16 and 18. Numerous trees up to one foot in diameter are found on both abutments and along the toe of the dam.

The spillway channel contains debris and trees and erosion has occurred to downstream channel walls as seen in Photos 12, 13 and 14. There is no apparent operable outlet to the reservoir.

U.S. ARMY ENGINEER DIV. NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS.	NATIONAL PROGRAM OF INSPECTION OF NON-FED DAMS	OVERVIEW PHOTO MARCH, 1979 BELLEVIEW LAKE DAM GREAT BROOK WATERBURY, CT.
PHILIP W. GENOVESE AND ASSOCIATES, INC. ENGINEERS–HAMDEN, CT.		

USGS QUAD.
WATERBURY, CT.

SCALE IN FEET

0 1000 2000 3000 4000

PHILIP W. GENOVESE AND ASSOCIATES, INC. ENGINEERS–HAMDEN, CT.	U.S. ARMY ENGINEER DIV. NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS.

NATIONAL PROGRAM OF INSPECTION OF NON-FED DAMS
LOCATION MAP

NATIONAL DAM INSPECTION PROGRAM
PHASE I INSPECTION REPORT

SECTION 1
PROJECT INFORMATION

1.1 General

a. Authority. Public Law 92-367, August 8, 1972, authorized the Secretary of the Army, through the Corps of Engineers, to initiate a National Program of Dam Inspection throughout the United States. The New England Division of the Corps of Engineers has been assigned the responsibility of supervising the inspection of dams within the New England Region. Philip W. Genovese and 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 were issued to Philip W. Genovese and Associates, Inc., under a letter of November 28, 1978 from Max B. Scheider, Colonel, Corps of Engineers. Contract No. DACW33-79-C0019 has been assigned by the Corps of Engineers for this work.

b. Purpose

(1) To 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) To 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. Belleview Lake Dam is located on Great Brook in the town of Waterbury, Connecticut. The dam is in the northeast portion of the metropolitan area of Waterbury, Connecticut with coordinates approximately N 41° 34.3', W 73° 01.4', Litchfield County, Connecticut. The location of the dam is shown on the Location Map immediately preceding this page.

b. Description of Dam and Appurtenances

Belleview Lake Dam consists of a rubble masonry gravity embankment section. The embankment is 229 feet long. The spillway is located in the right abutment.

The maximum structural height, according to existing plans is 34 feet. The existing plans indicate that the location of bedrock is unknown.

Appurtenant structures consist of a bedrock spillway, spillway channel and an outlet works structure. The spillway section consists of a 27.5 foot wide stone and I-Beam weir with crest elevation of 523 feet.

The outlet works according to plans, consisted of an intake chamber containing two 16 inch gate valves and two 16 inch outlet pipes. The outlet works at the downstream toe, which is seen in Photos 3, 7 and 9, has been sealed and is not accessible. It appears to be inoperable.

Figure 1, located in Appendix B shows the plan of the dam and its appurtenant structures. Photographs of each structure are shown in Appendix C. Sketches of the dam and its appurtenances are in Appendix D.

c. Size Classifications. Small (hydraulic height - 34 feet high, storage 150 acre-feet) based on storage and height ($\leq$1,000 to $>$50 acre-feet) as given in Recommended Guidelines for Safety Inspection of Dams.

d. Hazard Classification. The dam's potential for damage rates it as a high hazard classification. A major breach could result in discharge into a highly developed area of Waterbury.

About 450 feet downstream is a large outdoor athletic facility and immediately downstream from this are residential, industrial and commercial developments. Immediately upstream of the athletic facility the flow of Great Brook enters a 6 foot diameter culvert which contains the flow for approximately 800 feet. This condition would make the situation more severe in the event of dam failure because the culvert would probably accommodate a flow of less than 500 cfs. Furthermore, the inlet to the culvert would most likely be blocked with debris forced against the entrance.

e. Ownership. The dam is owned by the

Great Brook Realty, Inc.
c/o Grun Brothers
498 East Nepperham Avenue
Yonkers, New York

f. Operator. This dam is not maintained or operated.

g. Purpose of Dam. This dam has no current use.

h. Design and Construction History. There is no information available regarding the design and construction history of the dam. A drawing dated 1899 of "Proposed Masonry Dam at Great Brook Reservoir" was found in the Engineers office of the City of Waterbury. This drawing is (see Appendix B) in reasonable agreement with existing conditions. Another drawing was found dated November 1900 showing valve posts for 16 inch gates for Great Brook Masonry Dam.

i. Normal Operating Procedure. There are no normal operating procedures.

1.3 Pertinent Data

a. Drainage Area. The drainage area tributary to Belleview Lake Dam consists of approximately 1.47 square miles of terrain classed as more severe than flat and coastal. In addition to the reservoir, 10 percent of the basin is made up of lake and swamp area. Elevations in the basin range from about 525 feet to 900 feet MSL.

Immediately upstream of Great Brook Reservoir is another impoundment of water, Lakewood Dam. The two reservoirs are separated by an embankment with a City of Waterbury road running along the entire crest. The upstream reservoir has an outlet at elevation 530 feet. Storage of the upper reservoir was not considered the test flood evaluation of Belleview Dam.

The reservoir consists of about 12 acres at the normal (top of spillway) pool elevation. A few dwellings are located along the lake shores as can be seen in the overview photo.

b. Discharge at Dam Site

(1) The outlet works for the reservoir are not in service. The downstream outlet has been sealed and is not accessible.

(2) There are no records of maximum discharge at the dam site. However, it was reported that in 1955 a portion of the dam failed and the dam was overtopped. There are no records to substantiate this information.

(3) The spillway capacity with a water surface at the top of dam elevation 524.1 feet would be approximately 95 cfs.

(4) The total project discharge at the test flood elevation of 525.6 feet is 1430 cfs.

c. Elevation (feet above MSL)

(1) Streambed at centerline of dam - 490.1

(2) Maximum tailwater - N/A

(3) Upstream portal invert diversion tunnel - N/A

(4) Recreation pool - N/A

(5) Full flood control pool - N/A

(6) Spillway crest (permanent spillway) - 523

(7) Design surcharge - unknown

(8) Top dam - 524.1

(9) Test flood surcharge - 525.6

d. Reservoir (miles)

(1) Length of maximum pool - 0.4

(2) Length of recreational pool - N/A

(3) Length of flood control pool - N/A

e. Gross Storage (acre-feet)

(1) Recreation pool - N/A

(2) Flood control pool - N/A

(3) Spillway crest pool - 136

(4) Top of dam - 150

f. Reservoir Surface (acres)

(1) Recreation pool - N/A

(2) Flood control pool - N/A

(3) Spillway crest - 12

(4) Test flood pool - 14.3

(5) Top dam - 12.5

g. Dam

(1) Type - Rubble masonry gravity

(2) Length - 229 feet

(3) Height - 34 feet

(4) Top width - 6 feet

(5) Side slopes - Upstream: Batter 1 foot in 20
Downstream: Vertical at top to 1.5:1

(6) Zoning - N/A

(7) Impervious core - N/A

(8) Cutoff - Unknown

(9) Grout curtain - Unknown

(10) Other - Keyway according to plans

h. Diversion and Regulating Tunnel
N/A

i. Spillway

(1) Type - Steel I-Beam (5" x 13")

(2) Length of weir - 27.5 feet

(3) Crest elevation - 523 feet

(4) Gates - None

(5) Upstream channel - Underwater, not visible.

(6) Downstream channel - Bedrock with cement rubble masonry training walls.

j. Regulating Outlets. The reservoir cannot be drained, and needs an operable outlet.

SECTION 2
ENGINEERING DATA

2.1 Design

This dam was probably constructed in 1899 for water supply purposes. Two drawings dated 1899 and 1900 as prepared by R.A. Cairns, C.E. showing elevation, typical section and details are available at the office of the Waterbury City Engineer. No in-depth engineering data were found for this dam.

2.2 Construction

No construction records were available for use in evaluating the dam.

2.3 Operation

No engineering operational data were disclosed.

2.4 Evaluation

a. Availability. Other than the plans described above, no additional engineering data was found to be available.

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. The field investigation indicated that the external features of Belleview Lake Dam substantially agree with those on the available plans. The spillway location shown on the drawing is incorrect. It is located on the right side of the dam.

SECTION 3
VISUAL INSPECTION

3.1 Findings

a. General. The field inspection of the Belleview Lake Dam was made on December 20, 1978. The inspection team consisted of personnel from Philip W. Genovese & Associates, Inc. and Geotechnical Engineers, Inc. Representatives of the owner were not present. The dam was also inspected numerous times subsequent to the initial inspection by Genovese personnel and Waterbury officials. Inspection checklists, completed during the visual inspection, are included in Appendix A. At the time of the inspection, the water level was approximately 0.1 feet above the permanent spillway elevation. Water was passing over the spillway. The upstream face of the dam could only be inspected above this water level.

b. Dam. The dam consists of a rubble masonry gravity section about 229 feet long. The crest is at elevation 524.1 according to field surveys. Numerous areas were observed, especially in the upper portion, where mortar has been removed from joints. Water was observed seeping below the top granite blocks along the right side of the dam near the spillway as indicated in Photo 8. Extensive seepage occurs across the entire downstream surface of the dam as evidenced by the ice adhering to the granite blocks in Photo 5 and water on the downstream face as observed in Photos 1, 2, 10 and 11. The appearance of bedrock outcrops at several locations below the downstream toe and in the spillway channel indicates that part of the dam is located on bedrock.

Left Abutment. To the left of the dam, the left abutment slopes steeply upward. This area of the abutment is partially covered with grass and some large trees. As shown in Photo 6, soil is exposed in some areas, and erosion paths and zones are evident. A seepage zone was observed in this area of the abutment above the elevation of the crest of the dam, which is probably ground water and not related to the dam.

A large erosion channel about 10 feet wide has formed at the junction of the left abutment and the downstream face of the dam. Large stones up to about 4 feet in diameter are present in this channel (Photos 5, 6, and 15). There are also fallen trees and other rubbish in the channel. As shown in Photo 4, considerable seepage was observed at several locations on the slope of the left abutment downstream of the dam.

fallen trees and other debris and some trees are growing in the channel. At the base of the right abutment the downstream channel intersects a natural stream channel. Approximately 80 feet downstream of the dam the entire flow of the channel goes underground for about 20 feet before coming to the surface in several locations.

3.2 Evaluation

Visual examination indicates that the dam is in poor condition. Seepage in numerous areas and substantial erosion were observed. The inspection revealed the following:

a. Leakage through the mortar joints is of concern and needs to be reviewed in detail by a professional engineer.

b. Substantial erosion has occurred at the contact of the downstream wall of the dam and the left and right abutments. Water was observed flowing along this contact.

c. The trees growing on the left and right abutments near the downstream surface of the dam can create a future seepage problem. The tree roots provide seepage paths for the water if the trees are allowed to grow without limit.

d. Trees are growing and there is considerable debris in the downstream channel from the spillway. Some erosion has occurred in the left bank of the channel where soil is exposed.

e. There appears to be no operable outlet for the reservoir.

SECTION 4
OPERATIONAL PROCEDURES

4.1 Procedure

The dam creates an impoundment of the water which is not used at the present time.

4.2 Maintenance of Dam

There is no maintenance of the dam at this time.

4.3 Maintenance of Operating Facilities

There is no maintenance of operating facilities at this time.

4.4 Description of Warning Systems

There are no warning systems in effect at this facility.

4.5 Evaluation

There are no operating and maintenance procedures for the dam. Therefore, an evaluation is not applicable other than to say that the dam is greatly in need of operational procedures.

The City of Waterbury and the State of Connecticut have inspected the dam on numerous occasions. It was reported that the City made extensive observations of the dam subsequent to the 1955 storm of record.

SECTION 5
HYDROLOGY AND HYDRAULIC ANALYSIS

5.1 Evaluation of Features

Belleview Lake Dam consists of a 229 foot long rubble masonry gravity dam which also has a 27.5 foot long spillway. The maximum structural height of the dam is 34 feet and is classified as small. Appurtenant structures other than the spillway are sealed and inoperative at this time. The reservoir cannot be drawn down. The spillway crest is at elevation 523 feet. The spillway weir is a 5 inch x 13 inch steel I-Beam located on a capstone in the bedrock channel as seen in Photo 13.

Belleview Lake Dam has a maximum storage of 150 acre-feet.

a. Design Data. No hydrologic or hydraulic design data were disclosed for this dam.

b. Experience Data. The maximum discharge at this dam site is unknown.

c. Visual Observations. No evidence of damage to any portion of the project from overtopping was visible at the time of the inspection.

d. Test Flood Analysis. As no detailed design and operational information are available, hydrologic evaluation was performed using dam information gathered by field inspection, watershed size and an estimated test flood equal to the Probable Maximum Flood (PMF) as determined by guide curves issued by the Corps of Engineers. Based on a drainage area of 1.47 square miles, it was estimated that the test flood flow (inflow) at this dam would be 1470 cfs. Following the guidance for Estimating Effect of Surcharge Storage on Maximum Probable Discharges results in a test flood discharge of 1430 cfs. As the maximum spillway capacity at the top of the dam is 95 cfs, the spillway will not pass the test flood without overtopping the dam by 1.5 feet.

Table #3 of the Office of the Chief of Engineers Guidelines permits a choice of test flood ranging from 1/2 PMF to PMF for dams classified as small in size and high in hazard. Because of the potential impact on the highly developed areas immediately downstream of the dam, the higher range of the suggested "spillway design flood" was selected.

Immediately upstream of Belleview Lake Dam Reservoir is another impoundment, Lakewood Dam and Reservoir, separated by an embankment which also supports a City of Waterbury road. The

upstream reservoir has an outlet at 530 feet which is 7 feet higher than the Belleview spillway crest. Storage of the upper reservoir was not considered in the test flood evaluation of Belleview Dam.

e. Dam Failure Analysis. The impact of failure of the dam at maximum pool (top of dam) was assessed using the "Rule of Thumb" Guidance for Estimating Downstream Dam Failure Hydrographs issued by the Corps of Engineers.

A major breach of dam would result in a flood wave about 7 feet high for a distance of at least 800 feet downstream of the dam. The discharge would increase from the test flood peak outflow of 1,430 cfs to a breach discharge of 16,000 cfs (see Appendix D, p. 1). This area of the City of Waterbury is extensively developed and includes a large municipal athletic facility. Also, the entire flow of Great Brook passes into a 6 foot diameter culvert for a distance of 800 feet commencing at the upstream portion of the athletic field. This culvert would probably carry less than 500 cfs and furthermore would most likely be blocked by debris.

SECTION 6
STRUCTURAL STABILITY

6.1 Evaluation of Structural Stability

a. Visual Observations. The visual examination did not disclose any immediate stability problems. The water seepage through the joints of the rubble masonry gravity embankment downstream should be evaluated.

b. Design and Construction Data. Limited and inconsistent design drawings are available for the dam. They include general information regarding the overall dimensions of the dam and the appurtenances. This information is not sufficient to assess the stability of the dam and the safety must be judged primarily from visual observations. One obvious inconsistency is the size and location of the spillway. The drawing shows the spillway to be on the left and it is actually on the right. The size is also inconsistent.

c. Operating Records. No operating records pertinent to the structural stability of the dam were available.

d. Post Construction Changes. Since original construction was completed in about 1899, no known changes or additions have been made to the site.

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

SECTION 7
ASSESSMENT, RECOMMENDATIONS AND REMEDIAL MEASURES

7.1 Dam Assessment

a. Condition. The visual examination indicates that the dam is in poor condition. The inspection revealed:

1. Extensive seepage across the entire downstream face of the dam.

2. Substantial erosion channels at the junction of the downstream face of the dam and both abutments.

3. Large trees growing on the abutments adjacent to the toe of the downstream face of the dam.

4. The spillway channel floor contains trees, blocks of rock and debris.

5. There appears to be no operable outlet for the reservoir.

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. This dam is in poor condition. The recommendations and remedial measures described in Sections 7.2 and 7.3 should be accomplished within one year after receipt of this Phase I Inspection Report by the owner.

d. Need for Additional Investigation. The findings of this inspection indicate that there is need for additional investigations.

7.2 Recommendations

Based on the findings of the visual inspection and hydrologic and hydraulic analysis, there is need for further engineering studies or for major alterations to the dam.

1. The findings of the visual inspection indicate that the owner should engage a professional engineer to investigate the structural stability of this dam and spillway adequacy and determine the maximum height that water should be allowed to run over the dam.

The leaks along the downstream face should not be repaired until the investigation has been completed and a method of repair is established.

2. The debris should be cleared along the erosion channels at the junction of the downstream face of the dam and the abutments and in the area at the base of the abutments. The erosion channels should be repaired and suitable slope protection placed to prevent erosion due to seepage and surface runoff water flowing along the abutments.

3. The trees growing on the abutments within 30 feet of the downstream surface of the dam should be cut, their stumps removed, and the slope repaired.

4. Seepage at the downstream toe of the dam should be monitored on a regular basis. Records of the quantity of seepage, its color and solids content, the location of the primary exit points as well as color photographs should be included in the monitoring program.

7.3 Remedial Measures

1. The spillway channel should be cleared of trees and debris and protected against erosion. The spillway surface should be repaired.

2. The owner should maintain the area free of trees within 30 feet of the dam.

3. Provisions should be taken to prevent trespassing on the abutments.

4. An operational procedure and formal warning system for emergency conditions should be established.

5. An annual technical inspection program should be developed.

6. The outlet should be restored to an operable condition.

7.4 Alternatives

There are no practical alternatives to the recommendations in Sections 7.2 and 7.3 other than breaching of the dam.

Environmental consideration must be given if breaching of the dam is alternative.

APPENDIX A

INSPECTION CHECKLIST

VISUAL INSPECTION CHECKLIST
PARTY ORGANIZATION

PROJECT Belleview Lake Dam

DATE December 20, 1978

TIME 1300

WEATHER 30°- Cloudy

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

PARTY

1.	Bob Jones	Party Chief	
2.	Don Ballou	Hydraulics/Hydrology	
3.	Dick Murdock	Geotechnical	
4.	Steve Whiteside	"	

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

PERIODIC INSPECTION CHECKLIST

PROJECT: Belleview Lake Dam DATE December 20, 1978

PROJECT FEATURE Stone Masonry Dam NAME

DISCIPLINE NAME

	AREA EVALUATED	CONDITION
	STONE MASONRY DAM	
	Crest Elevation	
	Current Pool Elevation	
	Maximum Impoundment to Date	
GEI	Surface Cracks	None observed
GEI	Pavement Condition	No pavement on crest
GEI	Movement or Settlement of Crest	None observed
GEI	Lateral Movement	None observed
GEI	Vertical Alignment	Good
GEI	Horizontal Alignment	Good
GEI	Condition at Abutment and at Concrete Structures	Erosion channels on abutments at junction of left and right abutments with downstream of dam.
GEI	Indications of Movement of Structural Items on Slopes	None observed
GEI	Trespassing on Slopes	No trespassing on dam. Pedestrian paths on abutments.
GEI	Sloughing or Erosion of Slopes or Abutments.	Erosion on abutments as noted above.
GEI	Rock Slope Protection-Riprap Failures	No riprap observed.
GEI	Unusual Movement or Cracking at or Near Toe	None observed
GEI	Unusual Embankment or Downstream Seepage	Water seeping through masonry dam over entire section of dam.
GEI	Piping or Boils	None observed
GEI	Foundation Drainage Features	None observed
GEI	Toe Drains	None observed
GEI	Instrumentation System	None observed
GEI	Vegetation	Trees, bushes, some grass on abutments.

PERIODIC INSPECTION CHECKLIST

PROJECT: Belleview Lake Dam DATE December 20, 1978

PROJECT FEATURE Dike Embankment NAME

DISCIPLINE NAME

	AREA EVALUATED	CONDITION
	DIKE EMBANKMENT	
	Crest Elevation	Not applicable
	Current Pool Elevation	
	Maximum Impoundment to Date	
GEI	Surface Cracks	
GEI	Pavement Condition	
GEI	Movement or Settlement of Crest	
GEI	Lateral Movement	
GEI	Vertical Alignment	
GEI	Horizontal Alignment	
GEI	Condition at Abutment and at Concrete Structures	
GEI	Indications of Movement of Structural Items on Slopes	
GEI	Trespassing on Slopes	
GEI	Sloughing or Erosion of Slopes or Abutments	
GEI	Rock Slope Protection-Riprap Failures	
GEI	Unusual Movement or Cracking at or Near Toes	
GEI	Unusual Embankment or Downstream Seepage	
GEI	Piping or Boils	
GEI	Foundation Drainage Features	
GEI	Toe Drains	
GEI	Instrumentation System	
GEI	Vegetation	

PERIODIC INSPECTION CHECKLIST

PROJECT: Belleview Lake Dam DATE December 20, 1978

PROJECT FEATURE Outlet Works - Intake NAME

DISCIPLINE NAME

AREA EVALUATED	CONDITION
OUTLET WORKS- INTAKE CHANNEL AND INTAKE STRUCTURE	
a. Approach Channel	Underwater, not observed
GEI Slope Conditions	
GEI Bottom Conditions	
GEI Rock Slides or Falls	
Log Boom	
Debris	
Condition of Concrete Lining	
GEI Drains or Weep Holes	
b. Intake Structure	
Condition of Concrete	
Stop Logs and Slots	

PERIODIC INSPECTION CHECKLIST

PROJECT: Belleview Lake Dam DATE December 20, 1978

PROJECT FEATURE Outlet Works- Control Tower NAME

DISCIPLINE NAME

AREA EVALUATED	CONDITION
OUTLET WORKS- CONTROL TOWER	
a. Concrete and Structural	N/A
General Condition	
Condition of Joints	
Spalling	
Visible Reinforcing	
Rusting or Staining of Concrete	
Any Seepage or Efflorescence	
Joint Alignment	
Unusual Seepage or Leaks in Gate Chamber	
Cracks	
Rusting or Corrosion of Steel	
b. Mechanical and Electrical	
Air Vents	
Float Wells	
Crane Hoist	
Elevator	
Hydraulic System	
Service Gates	
Emergency Gates	
Lightning Protection System	
Emergency Power System	
Wiring and Lighting System	

PERIODIC INSPECTION CHECKLIST

PROJECT: Belleview Lake Dam DATE December 20, 1978

PROJECT FEATURE Outlet Works- Transition NAME

DISCIPLINE NAME

AREA EVALUATED	CONDITION
OUTLET WORKS- TRANSITION AND CONDUIT	N/A
General Condition of Concrete	
Rust or Staining on Concrete	
Spalling	
Erosion or Cavitation	
Cracking	
Alignment of Monoliths	
Alignment of Joints	
Numbering of Monoliths	

PERIODIC INSPECTION CHECKLIST

PROJECT: Belleview Lake Dam DATE December 20, 1978

PROJECT FEATURE Outlet Works-Structure & Channel NAME

DISCIPLINE NAME

	AREA EVALUATED	CONDITION
	OUTLET WORKS- OUTLET STRUCTURE AND OUTLET CHANNEL	
	General Condition of Concrete	No outlet observed
	Rust of Staining	
	Spalling	
	Erosion or Cavitation	
	Visible Reinforcing	
	Any Seepage or Efflorescence	
	Condition at Joints	
GEI	Drain Holes	
GEI	Channel	
GEI	Loose Rock or Trees Overhanging Channel	
GEI	Condition of Discharge Channel	

PERIODIC INSPECTION CHECKLIST

PROJECT: Belleview Lake Dam DATE December 20, 1978

PROJECT FEATURE Outlet Works- Spillway NAME

DISCIPLINE NAME

	AREA EVALUATED	CONDITION
	OUTLET WORKS- SPILLWAY WEIR, APPROACH, AND DISCHARGE CHANNELS	
	a. Approach Channel	Underwater, not observed
GEI	General Condition	
GEI	Loose Rock Overhanging Channel	
GEI	Trees Overhanging Channel	
GEI	Floor of Approach Channel	
	b. Weir and Training Walls	
	General Condition of Concrete	
	Rust or Staining	
	Spalling	
	Any Visible Reinforcing	
	Any Seepage or Efflorescence	
GEI	Drain Holes	None observed
	c. Discharge Channel	
GEI	General Condition	Fair
GEI	Loose Rock Overhanging Channel	Yes
GEI	Trees Overhanging Channel	Yes
GEI	Floor of Channel	Predominately bedrock, some loose rock, fallen trees and debris in channel.
GEI	Other Obstructions	

PERIODIC INSPECTION CHECKLIST

PROJECT: Belleview Lake Dam DATE December 20, 1978

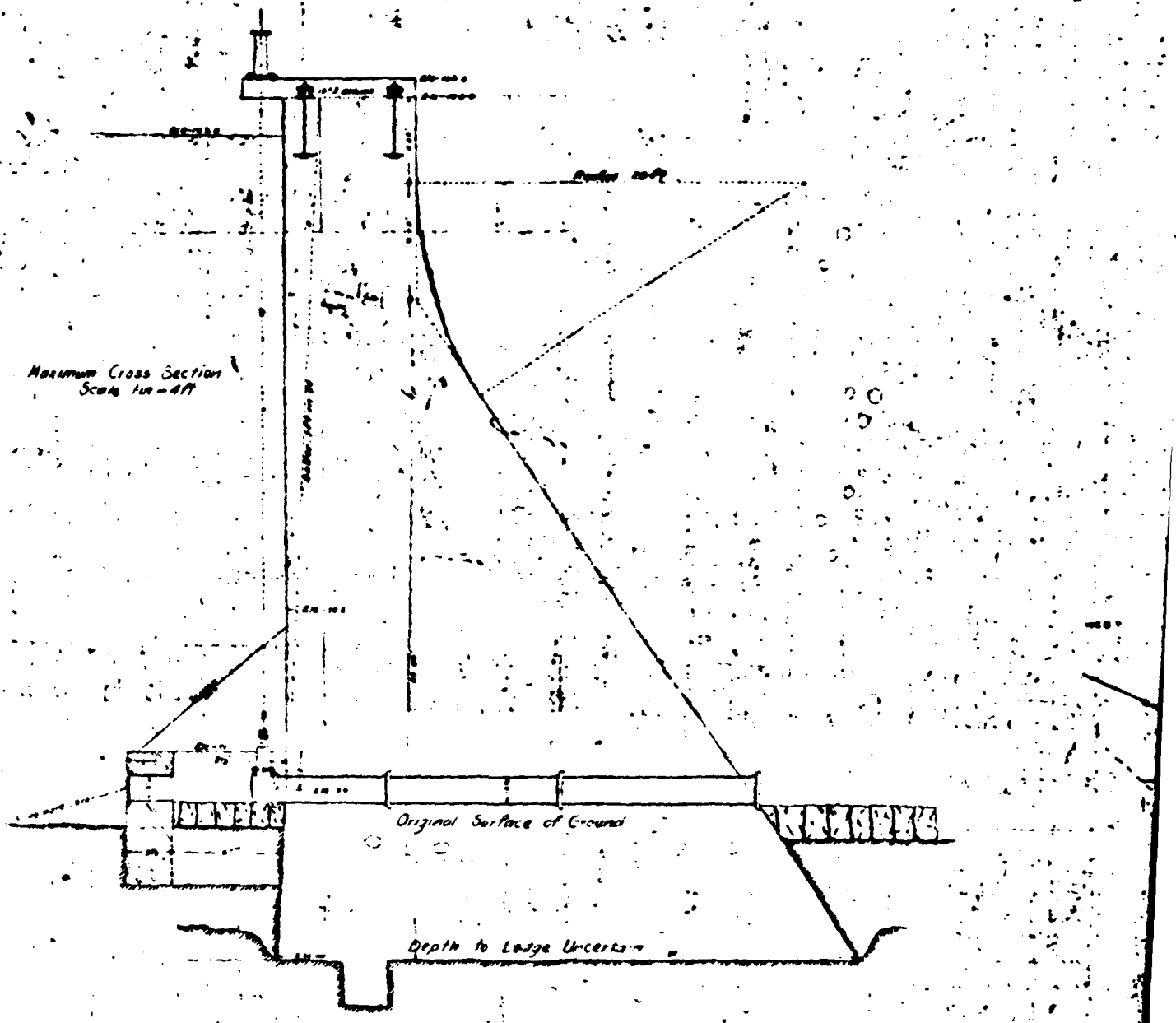
PROJECT FEATURE Outlet Works - Service Bridge NAME

DISCIPLINE NAME

AREA EVALUATED	CONDITION
OUTLET WORKS - SERVICE BRIDGE	
a. Super Structure	N/A
Bearings	
Anchor Bolts	
Bridge Seat	
Longitudinal Members	
Underside of Deck	
Secondary Bracing	
Deck	
Drainage System	
Railings	
Expansion Joints	
Paint	
b. Abutment and Piers	
General Condition of Concrete	
Alignment of Abutment	
Approach to Bridge	
Condition of Seat and Backwall	

APPENDIX B

ENGINEERING DATA


Maximum Cross Section
Scale 1in = 40ft
Original Surface of Ground
Depth to Large Uncertain

PROPOSED MASONRY DAM

— AT —

— Great Brook Reservoir —

WATERBURY CONN

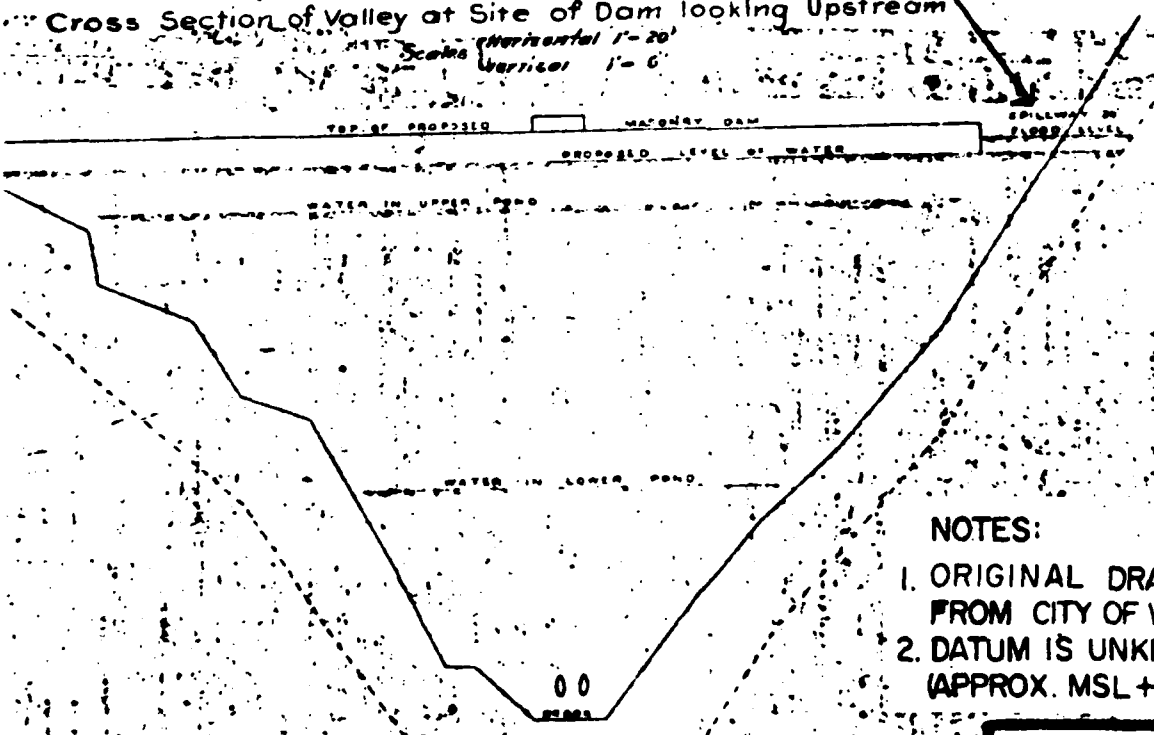
— 1899 —

R.A CAIRNS C-E-

SPILLWAY IS INCORRECT AS SHOWN.
SEE SKETCH IN APPENDIX D FOR
ACTUAL CONDITIONS.

Cross Section of Valley at Site of Dam looking Upstream

Scales (Horizontal 1"=20'
Vertical 1"=6'



NOTES:

1. ORIGINAL DRAWING OBTAINED FROM CITY OF WATERBURY.
2. DATUM IS UNKNOWN (APPROX. MSL+420)

PHILIP W. GENOVESE & ASSOCIATES, INC. ENGINEERS HAMDEN, CONNECTICUT	U.S. ARMY ENGINEER DIV. NEW ENGLAND CORP OF ENGINEERS WALTHAM, MASS.

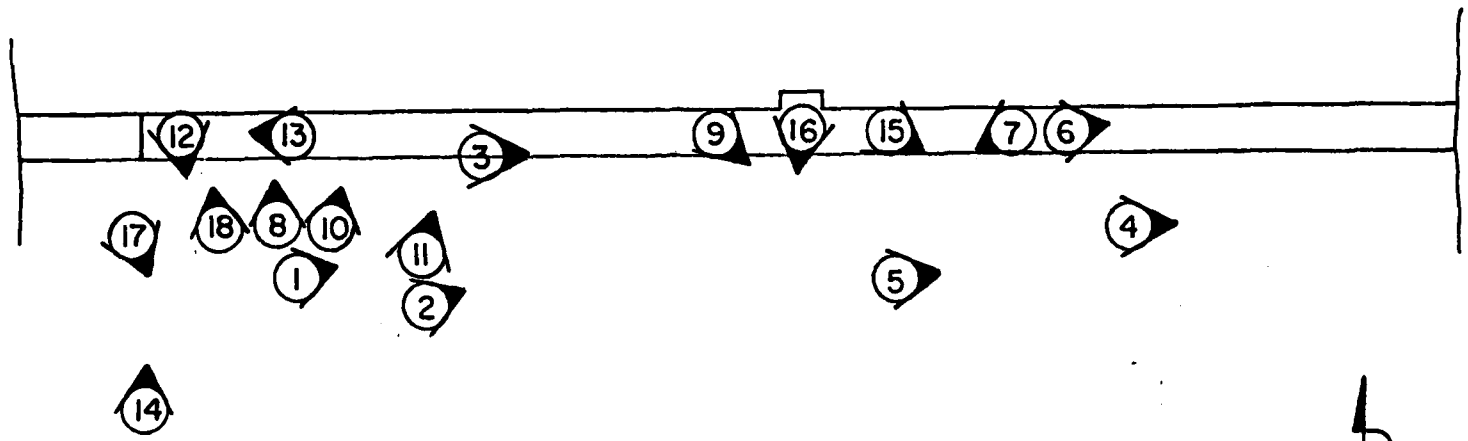
NATIONAL PROGRAM OF INSPECTION OF NON-FED DAMS

BELLEVIEW LAKE DAM

DWN BY	CHD BY	APP BY	DATE	SCALE (HORZ.)
				1" = 40

APPENDIX C

PHOTOGRAPHS



PHILIP W. GENOVESE & ASSOCIATES, INC. ENGINEERS HAMDEN, CONNECTICUT	U.S. ARMY ENGINEER DIV. NEW ENGLAND CORP OF ENGINEERS WALTHAM, MASS.

NATIONAL PROGRAM OF INSPECTION OF NON-FED DAMS

BELLEVIEW LAKE DAM

DWN. BY	CKD. BY	APP. BY	DATE	SCALE
MJS	NRS	RLJ	2/21/79	N.T.S.

LEGEND

(4) NUMBER REFERS TO CAPTION. ARROW INDICATES DIRECTION OF PHOTOGRAPH.

PHOTO NO. 1 - Downstream face looking left (east) from point 30 feet downstream of crest 20 feet left (east) of spillway channel showing large trees at toe.

PHOTO NO. 2 - Same as above except 40 feet left (east) of spillway channel.

PHOTO NO. 3
Downstream face from crest looking left (east) from about 60 feet left (east) of spillway showing large trees at toe.

PHOTO NO. 4 - Looking left (east) to abutment from 50 feet right (west) of left (east) abutment at downstream toe, considerable seepage from slope.

PHOTO NO. 5 - Looking left (east) toward abutment from 100 feet right (west) of left (east) abutment at a point 10' downstream of toe, considerable erosion at toe of dam.

PHOTO NO. 6 - Looking left (east) to abutment from a point 50' right (west) of left (east) abutment on crest, erosion at toe of dam.

PHOTO NO. 7 - Looking at downstream toe and face from crest at a point 60 feet right (west) of left (east) abutment, erosion, tree and brush growth at toe and downstream of toe.

PHOTO NO. 8 - Downstream face below capstone of crest at point 10 feet left (east) of spillway, seepage through disintegrated joints.

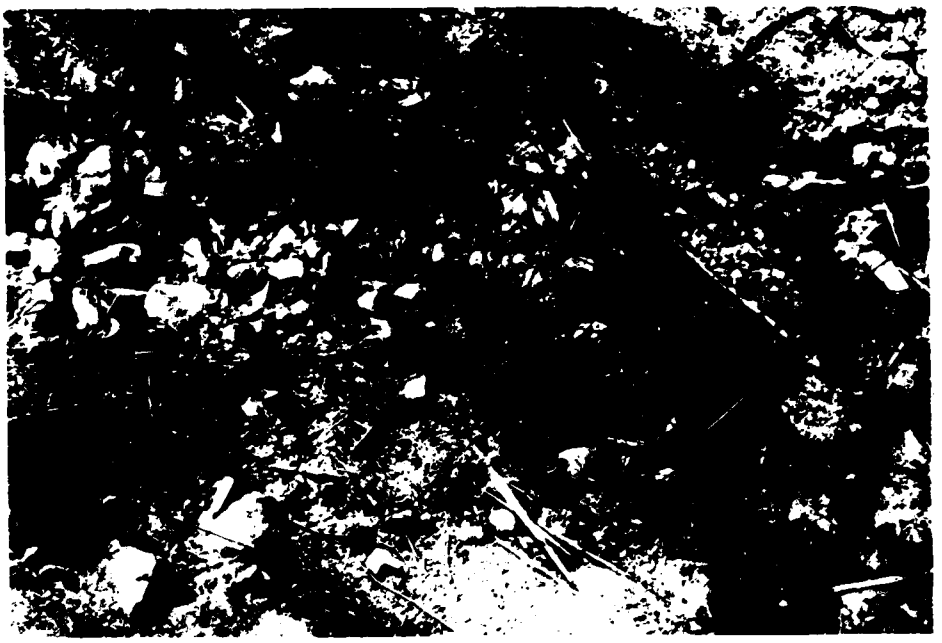


PHOTO NO. 9 - Downstream toe adjacent to blow-off pipe cover from crest.

PHOTO NO. 10-Downstream face 30 feet left (east) of spillway showing seepage and disintegrated joints.

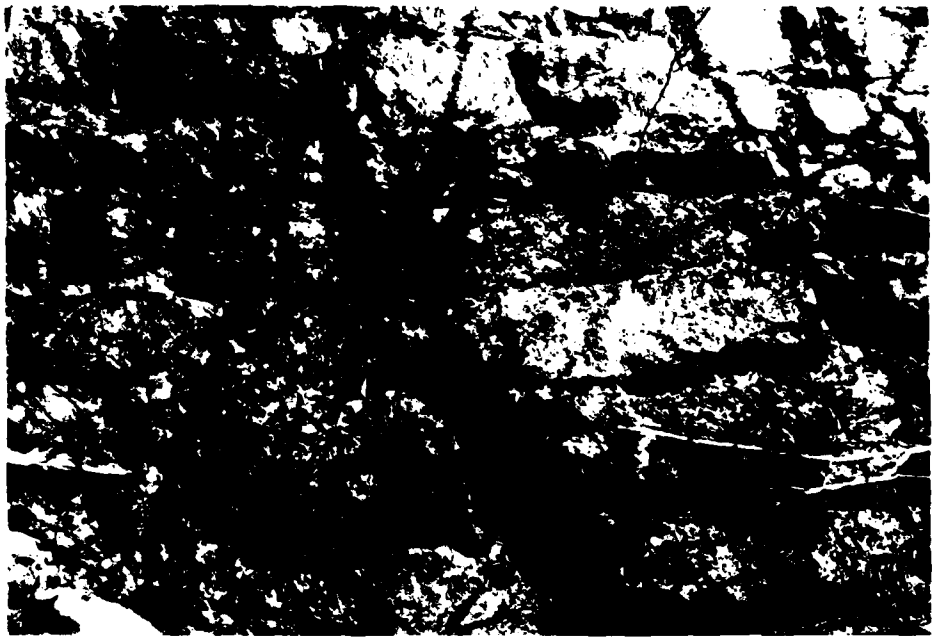


PHOTO NO. 11 - Downstream face about 50 feet left (east) of spillway showing seepage, possible settlement and disintegrated joints.

PHOTO NO. 12
Spillway channel and downstream channel from crest at left (east) training wall showing rocks, trees and debris in channel.

PHOTO NO. 13
Spillway from crest looking to right (west) abutment showing angle iron attached to spillway crest and debris in spillway.

PHOTO 14 - Spillway channel and crest from point 40 feet downstream of crest.

PHOTO NO. 15
Downstream toe of left (east) side of embankment from crest about 110 feet right (west) of left (east) embankment showing erosion at toe of dam.

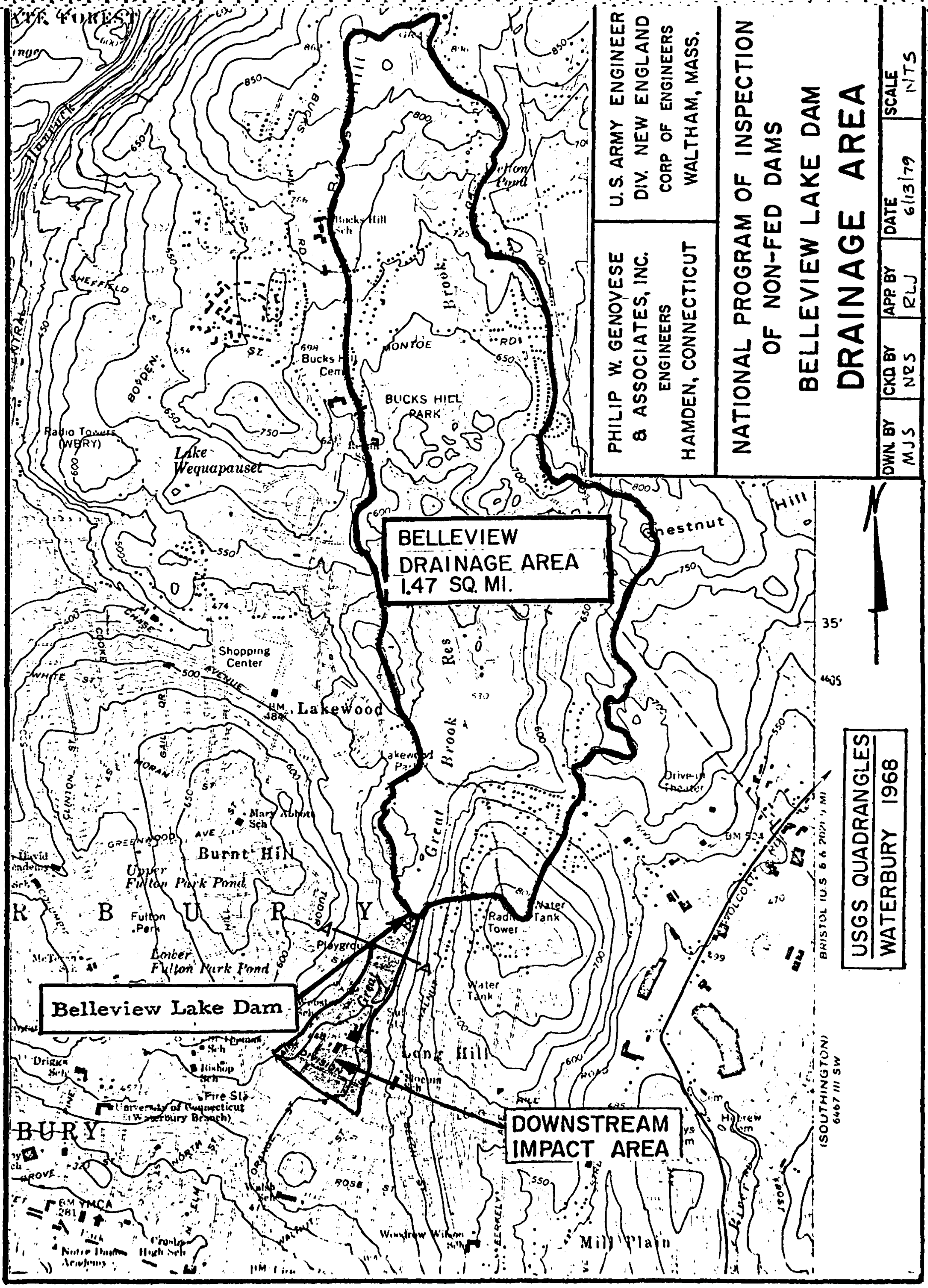
PHOTO NO. 16 - Downstream from crest showing downstream spillway discharge at right (west) joining seepage flow in center foreground.

PHOTO NO. 17 - Looking downstream from spillway channel to downstream channel.

PHOTO NO. 18 - Looking at downstream face immediately left (east) of spillway showing erosion and brush at toe of dam.

APPENDIX D

HYDROLOGIC AND HYDRAULIC COMPUTATIONS


U.S. ARMY ENGINEER DIV. NEW ENGLAND CORP OF ENGINEERS WALTHAM, MASS.
PHILIP W. GENOVESE & ASSOCIATES, INC. ENGINEERS HAMDEN, CONNECTICUT
NATIONAL PROGRAM OF INSPECTION OF NON-FED DAMS
BELLEVIEW LAKE DAM
DRAINAGE AREA
SCALE NTS
DATE 6/13/79
APP. BY RLJ
CKD BY NRS
DWN. BY MJS
BELLEVIEW DRAINAGE AREA 1.47 SQ. MI.
Belleview Lake Dam
DOWNSTREAM IMPACT AREA
USGS QUADRANGLES WATERBURY 1968
Bucks Hill Park
Lake Wequapauset
Lakewood
Burnt Hill
Upper Fulton Park Pond
Lower Fulton Park Pond
Long Hill
Mill Plain
Chestnut Hill
Shopping Center
Great Brook
Brook Res

Name	Belleview Lake Dam
Location	Waterbury, Conn
Drainage Area	1.47 sq-miles / 944 acres
Spillway Crest	Elevation 523.0
Top of Dam	Elev 524.1
Dam Height	34 feet
Spillway Storage	14 Ac-Ft (no freeboard)
Total Storage	150 Ac-Ft (no freeboard)
Size & Hazard	Small & High
Test Flood (TF)	PMF
TF Runoff	19 inches
TF Peak Inflow	1,470 cfs
TF Volume	1,489 Ac-Ft
TF Peak Outflow	1,430 cfs
Stage @ Q_{TF} Outflow	Elev 525.6
Spillway Type	5"x13" steel I-beam
Breaching Discharge	16,000 cfs
Reach Outflow	13,653 cfs (800' downstream)
Reach Outflow Flood Stage	Elev 461.6 (6.6' depth)

Evaluate the size of dam and the hazard classification in order to ascertain the magnitude of the "Spillway Design Storm" that is to be utilized for the "Test Flood"

Tables # 1, 2, & 3 of the D.O.A. OCE. guidelines, dated Nov. 1976 will be used in making evaluations as to size & hazard classifications.

Size Classification

Top of Dam = Elev 524.1 (USGS)
Low Point = Elev 490.1
Dam Height = 34.0

Reservoir area @ spillway crest = 12 acres, & estimated volume below the spwy crest = $\frac{1}{3}bh = \frac{1}{3} \times 12 \times 34 = 136$ Ac-Ft

Volume between spwy crest & top of dam = 14 Ac-Ft

Total Storage = 136 + 14 = 150 Ac-Ft

Hence, from Table # 1 of OCE guides a size classification of "Small" is required.

Determine Hazard Classification

In view of the fact that this dam is in the northeast quadrant of the metropolitan portion of the City of Waterbury it would appear that a classification of "High" would be mandatory.

Within several hundred feet downstream of the dam residential housing, commercial & industrial development abounds.

Also, about 450 feet downstream is a rather large athletic field, which could very well be occupied @ a time of dam failure. Immediately upstream of the athletic field the flow from Great Brook enters a 6' diameter culvert & remains culverted for about 800 feet. It would therefore be a more severe situation under dam failure as the culvert would probably carry less than 500 cfs & most likely end up blocked due to large debris forced against the inlet to the culvert.

Consequently a <u>hazard classification of High</u> is quite justified.

Test Flood

From table #3 of O.C.E. guides utilizing a size classification of "small" & a hazard classification of "High" the "Spillway Design Flood" required ranges from ½ PMF to PMF. This is called the "Test Flood" when final selection is made.

The watershed area = 1.47 sq-miles
= 944 acres

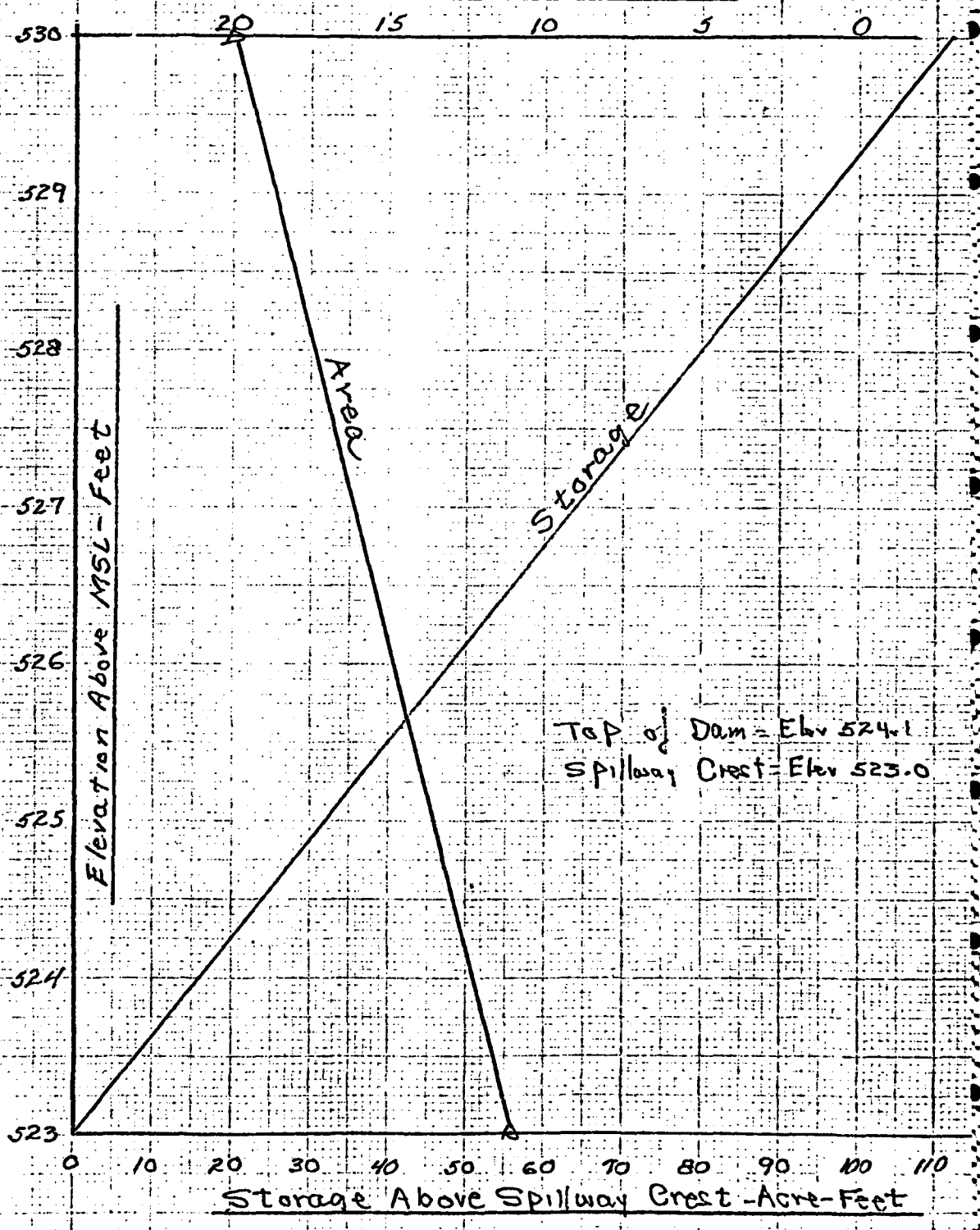
Using data for peak flow rates furnished by the Corp, N.E.D. & extrapolating the data a value of 1000 cfs/sq-mile will be utilized. This represents a terrain considered to be a bit more severe than flat & coastal.

In view of the situation stated on page 3 as regards to the impact area downstream of the dam the higher range of the suggested "Spillway Design Flood" will be selected. Therefore use the PMF as the Test Flood

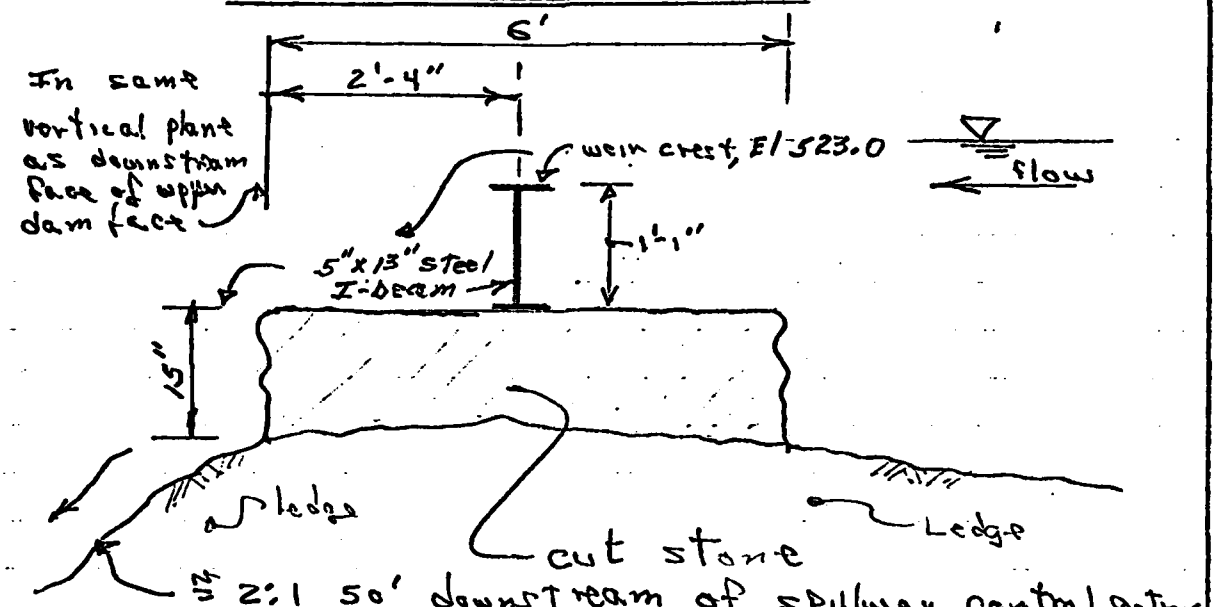
Hence, the Test Flood = 1000 cfs/mi² x 1.47 mi² = 1,470 cfs

Volume of the PMF = 533 x 1.47 x 19" = 1489 Ac-Ft
Note that only 14 ac-ft exists as surcharge storage available between spwy crest & top of dam.

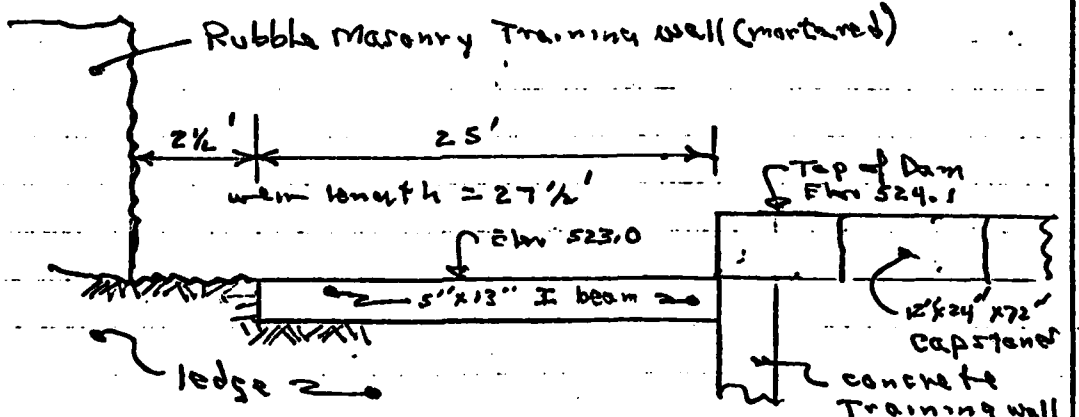
Bellevieu Lake Dam



SERVICE SPILLWAY



SECTIONAL ℄ PROFILE



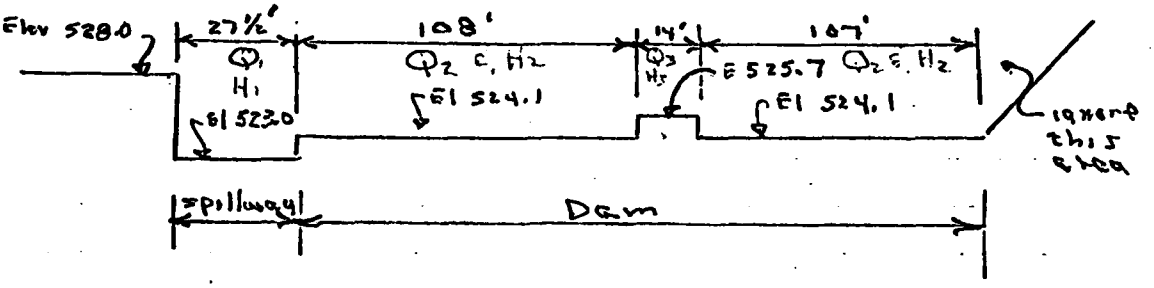
VERTICAL SECTION LOOKING UPSTREAM

Belleview Lake Dam

June 1979

By: D T Ballou

Establish rating curve for spillway flow and flow over the dam



Elevation View
Looking Upstream

$Q_1 = C_L H_1^{3/2} = 3.0 \times 27.5\, H_1^{3/2} = 82.5\, H_1^{3/2}$

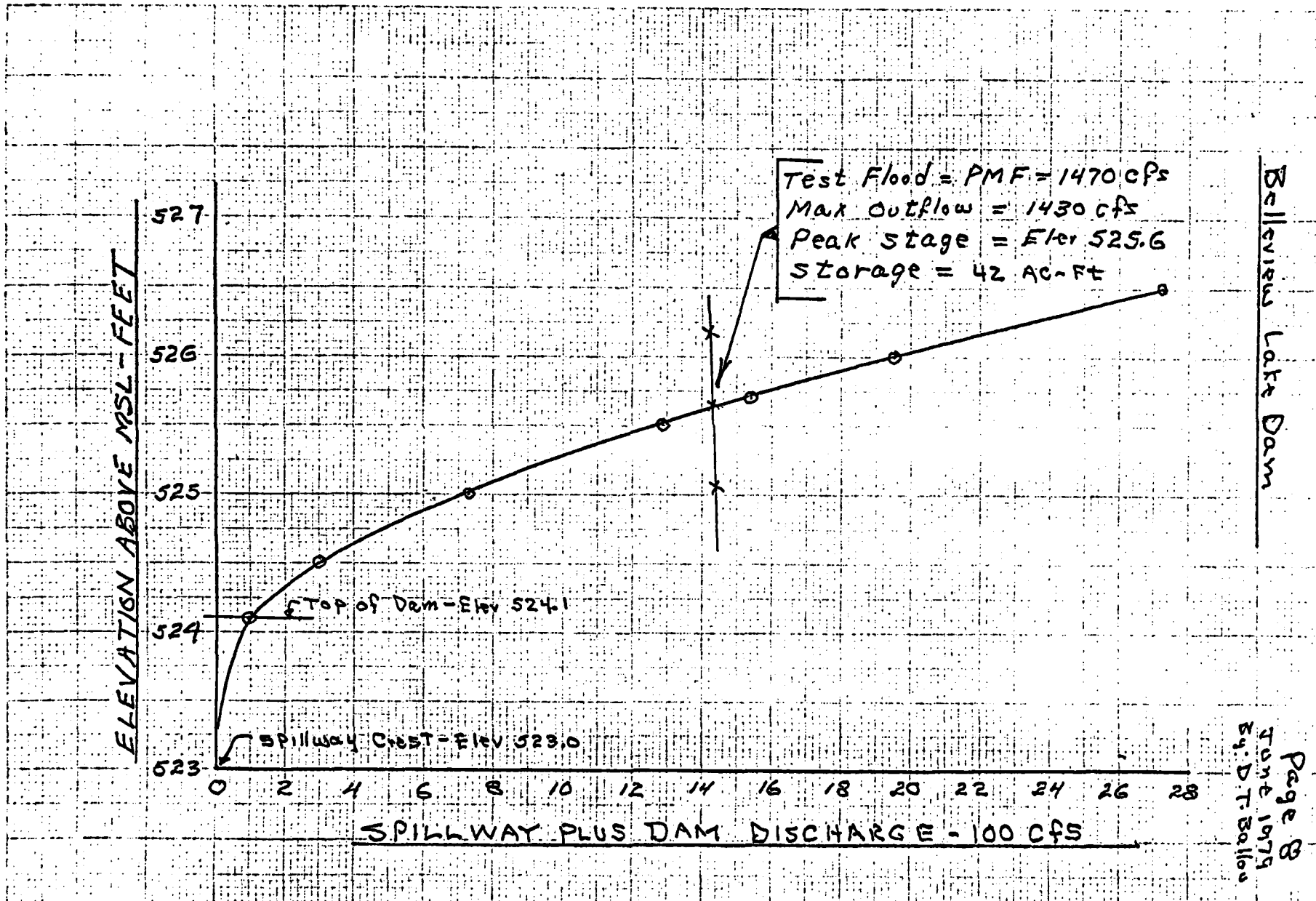
$Q_2 = C_L H_2^{3/2} = 2.7 \times (108+107) H_2^{3/2} = 580.5\, H_2^{3/2}$

$Q_3 = C_L H_3^{3/2} = 2.7 \times 14 \times H_3^{3/2} = 37.8\, H_3^{3/2}$

Elev ft	H_1 ft	H_2 ft	H_3 ft	Q_1 cfs	Q_2 cfs	Q_3 cfs	ΣQ cfs
*523.0	—	—	—	—	—	—	—
**524.1	1.1	—	—	95	—	—	95
524.5	1.5	0.4	—	152	147	—	299
525.0	2.0	0.9	—	233	496	—	729
525.5	2.5	1.4	—	326	962	—	1,288
***525.7	2.7	1.6	—	366	1175	—	1,541
526.0	3.0	1.9	0.3	429	1520	6	1955
526.5	3.5	2.4	0.8	570	2158	27	2,725
527.0	4.0	2.9	1.3	660	2867	56	3,583

* spillway crest
** Top of Dam
*** Top of gate platform

see plot of data on next page


Test Flood = PMF = 1470 cfs
Max Outflow = 1430 cfs
Peak Stage = Elev 525.6
Storage = 42 AC-Ft
℄ Top of Dam - Elev 524.1
Spillway Crest - Elev 523.0
ELEVATION ABOVE MSL - FEET
527
526
525
524
523
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
SPILLWAY PLUS DAM DISCHARGE - 100 cfs
Ballview Lake Dam
Page 8
June 1979
By D.T. Ballou

Short-cut routing of Test Flood (PMF = 1470 cfs)

1. Select surcharge storage associated with the discharge of 1,470 cfs; which = Q_{P_1}
2. From stage-discharge curve (page 8) for Q_{P_1} of 1,470 cfs we obtain Elev 525.65
3. From the stage-storage curve (page 5) we obtain 42.5 Ac-Ft @ Elev 525.65

$$\frac{42.5 \text{ Ac-Ft}}{944 \text{ Acres}} \times 12 \text{"/ft} = 0.54 \text{ inches of R.O.} = \text{Stor}(i)$$

$$Q_{P_i} = Q_{P_1}\left(1 - \frac{\text{Stor}(i)}{19"}\right)$$

(Stor(i): inches; 19": R.O. from PMF)

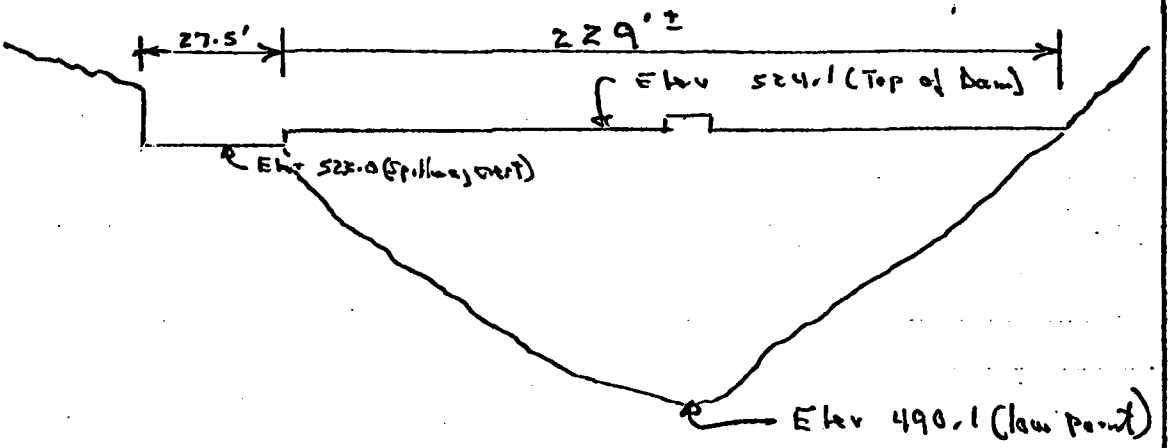
① Stor(i) inches	② $\left(1 - \frac{\text{Stor}(i)}{19"}\right)$	③ Stor(i) Ac-Ft ① × Area	④ $Q_{P(i)}$ cfs ② × 1470 cfs	⑤ Elev From page 5 for Col ③
0.54	0.972	42.5	1,428	525.65
0.65	0.966	51.1	1420	526.17
0.42	0.978	33.0	1438	525.06

Plots of Columns ④ & ⑤ may be viewed on page 8

Note that Test Flood overtopped the dam by 1.5 feet. (see page 8)
The ½PMF would have also overtopped the dam by about 0.9 feet.

Bellview Lake Dam

Estimate Dam Breaching Peak Discharge



VERTICAL SECTION
LOOKING UPSTREAM

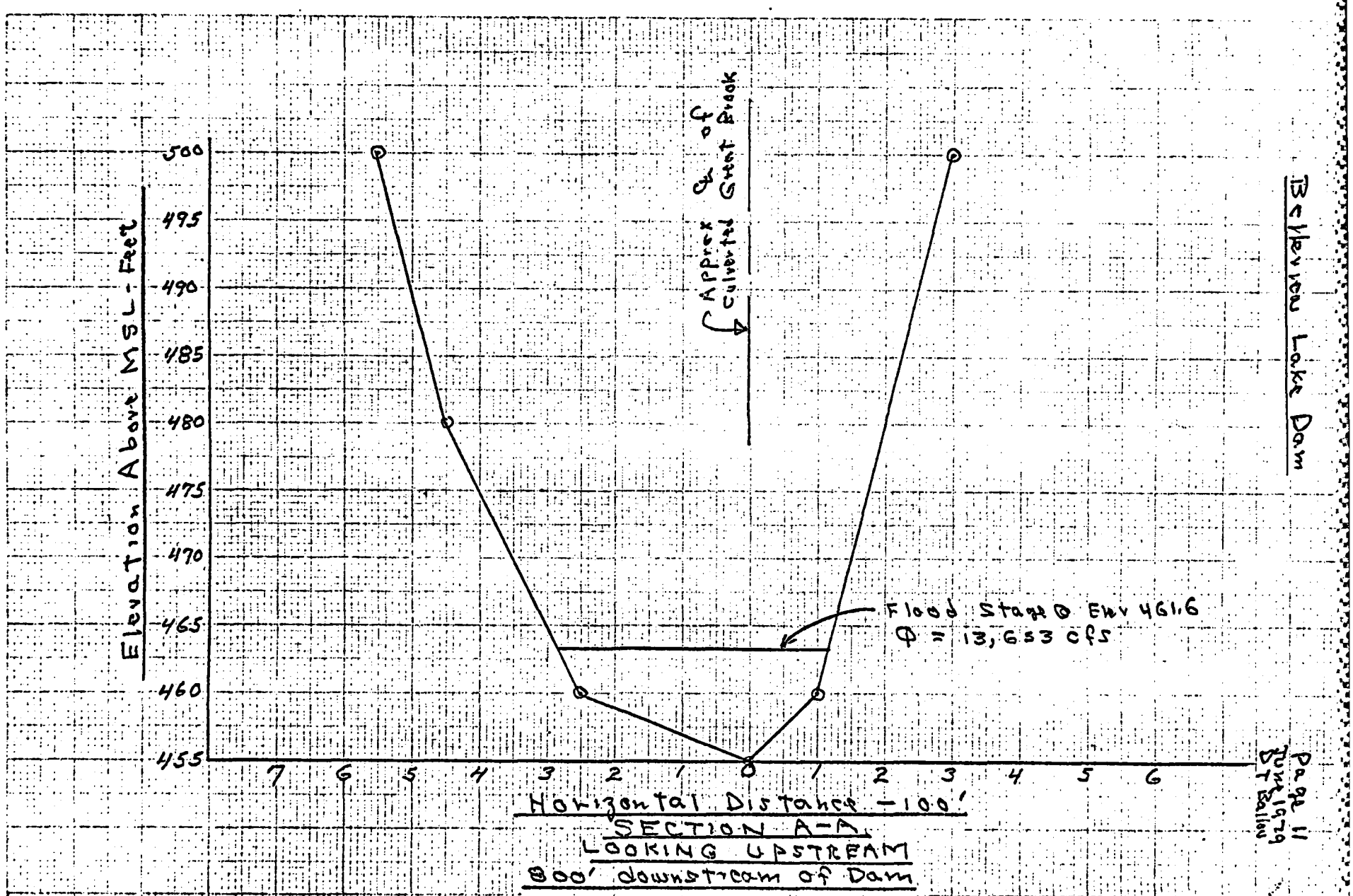
Dam width @ mid-height ≅ 120'
Failure width = 40% x 120 = 48' = Wb
Y_o = elev 524.1 − 490.1 = 34'

Peak Failure Outflow = $\frac{8}{27} \times Wb \times g^{1/2} \times Y_o^{3/2} = Q_{P_1}$

$Q_{P_1} = \frac{8}{27} \times 48 \times 32.2^{1/2} \times 34^{3/2} = 16{,}000$ cfs

Failure wave @ dam has height ≅ $\frac{2}{3} Y_o \cong 22'$

Perform downstream routing of wave:



SECTION A-A
LOOKING UPSTREAM
800' downstream of Dam

Belleview Lake Dam

Page 11
June 1979
DT Ballou

Work up rating curve for Section A-A which is 800' downstream of the dam

Use $Q = A \frac{1.49}{n} R^{2/3} S^{1/2}$

where $n = 0.060$

$S = (490-450)/1100 = 0.0364$

$S^{1/2} = 0.191$

and:

$$Q = A \frac{1.49}{.060} \times R^{2/3} \times 0.191 = 4.74 A R^{2/3}$$

Elev	Area ft^2	WP ft	R ft	$R^{2/3}$	Q cfs
455	—	—	—	—	—
460	875	360	2.43	1.81	7,497
465	2825	450	6.28	3.40	45,527
462.5	1800	405	4.44	2.70	23,061

Belleview Lake Dam

Page 13
June 1979
D.T. Ballou

Routing of flood wave by short-cut method from Dam → Section A-A

From page 10, Q_{p_1} = 16,000 cfs
Storage @ time of breach = 150 Ac-ft

From page 13 for Q_{p_1} we obtain Elev 462.0 and 1600 ft² of flow area

Reach length = 800 feet ∴ volume V_1 in the reach = 800 x 1600 ft²/43560 = 29 acres

Trial $Q_{p_2} = Q_{p_1}\left(1 - \frac{V_1}{5}\right)$ = 16000 cfs $\left(1 - \frac{29}{150}\right)$ = 6,720 cfs

Utilizing Q_{p_2} & backtracking to page 13 we obtain elev 459.75 & 820 ft²
∴ V_2 = 800 x 820/43560 = 15 Ac-Ft

Re Computed $Q_{p_2} = 16000\left[1 - \frac{(29+15)/2}{150}\right]$ = 13,653 cfs

and flood Stage = Elev 461.6

This represents a depth of ≅ 7 feet and has stored in the 1st 800' about 15% of the 150 Ac-ft. The valley downstream of Section A-A retains essentially the same cross-sectional shape as A-A and increases in area about 1000' downstream of A-A. Therefore the flood wave will decrease in depth from the 7' @ Section A-A and there would consequently be no reason to continue the short-cut routing procedure.

Comments

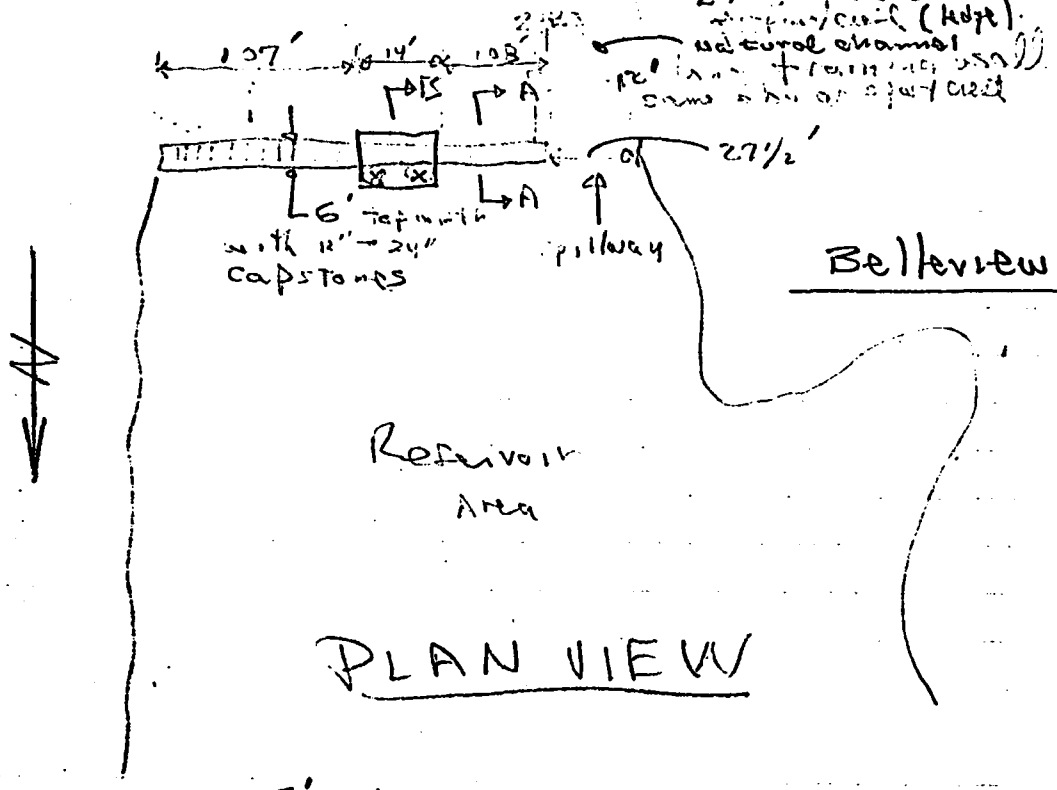
Section A-A was taken across the Athletic field. Without question there could be numerous deaths should the dam fail during use of the field by athletic activities and by spectators.

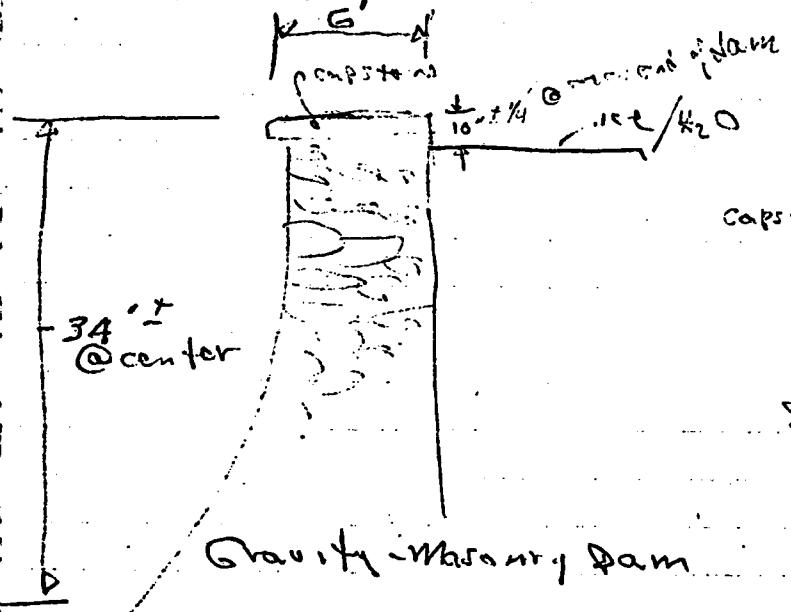
Further downstream of the athletic field (about 800') lies a heavily developed area as regards to commercial, industrial and residential buildings

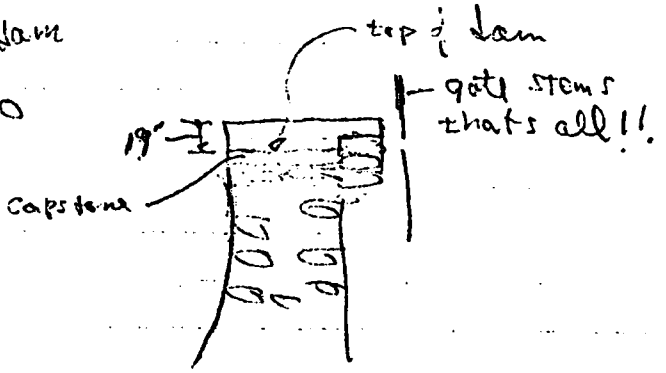
As indicated on page 2 a hazard classification of "high" was initially selected. There appears no reason to alter the initial selection.

12/20/78
Bellview Dam
Waterbury Ct
12:30pm → 2:15pm
D.T. Fallon

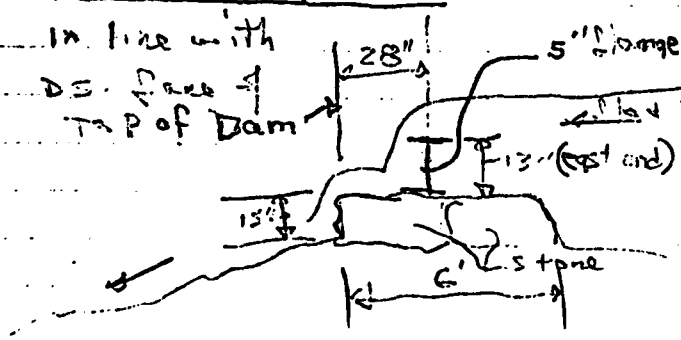
Bellview Lake Dam







SECTION 'A-A'



Note: top of weir crest to Dam top = 13"

Note west end of weir appears to be about 1" higher than east end.

Note: ≅ 400' DS of Dam, outfall → 6'Ø RCP

2' steps in ditch

APPENDIX E

INFORMATION AS CONTAINED IN THE 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
CT	682	NED	CT	005	05				BELLEVIEW LAKE DAM	4134.3	7301.4	11JUL79

POPULAR NAME	NAME OF IMPOUNDMENT
	BELLEVIEW LAKE

REGION	BASIN	RIVER OR STREAM	NEAREST DOWNSTREAM CITY–TOWN–VILLAGE	DIST FROM DAM (MI.)	POPULATION
01	07	GREAT BROOK	WATERBURY	0	108033

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
GRPG	1899	0	34	34	150	136	NED	N	N	N	N	

REMARKS
23=NONE

D/S NAS	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	229	U	28	95												

OWNER	ENGINEERING BY	CONSTRUCTION BY
GREAT BROOK REALTY INC	RA CAIRNS CE	

REGULATORY AGENCY			
DESIGN	CONSTRUCTION	OPERATION	MAINTENANCE
CT WATER RESOURCES	CT W R	CT W R	CT W R

INSPECTION BY	INSPECTION DATE DAY | MO | YR	AUTHORITY FOR INSPECTION
PHILIP W GENOVESE AND ASSOC.	20DEC78	PUBLIC LAW 92-367 8AUG1972

REMARKS


FILMED