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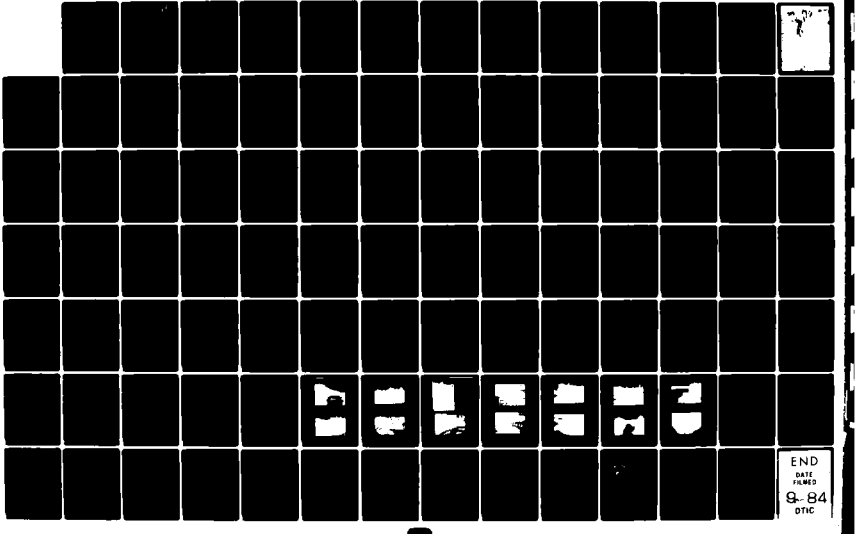

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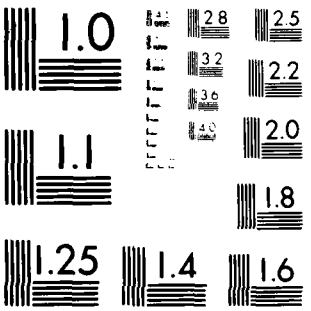

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AD-A145 069

CONNECTICUT RIVER BASIN

WESTFIELD, MASSACHUSETTS

STEVENS PAPER COMPANY

(LOWER DAM)

MA 00074

PHASE I INSPECTION REPORT

NATIONAL DAM INSPECTION PROGRAM

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DEPARTMENT OF THE ARMY

NEW ENGLAND DIVISION, CORPS OF ENGINEERS

WALTHAM, MASS. 02154

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

DAMS, INSPECTION, DAM SAFETY,
Connecticut River Basin
Westfield, Massachusetts

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

This dam generally consists of a 190 foot masonry spillway, an earthfill embankment and 2 outlet pipes. The visual inspection showed the dam to be in good condition. The dam has a size classification of intermediate and a hazard classification of low. The test flood is the ½ PMF.

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

REPLY TO
ATTENTION OF
NEDED

MAY 14 1979

Honorable Edward J. King
Governor of the Commonwealth of
Massachusetts
State House
Boston, Massachusetts 02133

Dear Governor King:

I am forwarding to you a copy of the Stevens Paper Company (Lower 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 Quality Engineering, the cooperating agency for the Commonwealth of Massachusetts. In addition, a copy of the report has also been furnished the owner, Stevens Paper Mills, Inc., 77 Mill Street, Westfield, Massachusetts 01085.

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 Quality Engineering for your cooperation in carrying out this program.

Sincerely yours,

JOHN P. CHANDLER
Colonel, Corps of Engineers
Division Engineer

Incl
As stated

NATIONAL DAM INSPECTION PROGRAM

PHASE I INVESTIGATION REPORT

BRIEF ASSESSMENT

Identification No.: MA 00539

Name of Dam: Stevens Paper Company - Lower

City: Westfield

County and State: Hampden County, Massachusetts

Stream: Little River

Date of Inspection: December 5, 1978

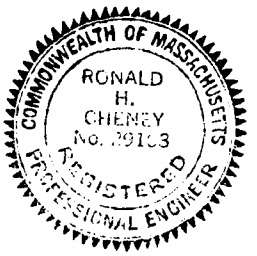
This dam generally consists of a 190 foot masonry spillway, an earthfill embankment and 2 outlet pipes. The dam was designed in 1955 by Stone and Webster Engineering Corporation to replace an earlier dam, which was damaged by the flood of that year. Construction which utilized portions of the original structure was completed in 1957. The major purpose of the dam is for water supply. The dam is owned, operated, and maintained by the Stevens Paper Mills, Inc. of Westfield, Massachusetts.

The visual inspection showed the dam to be in good condition. However, water passing over the spillway limited the inspection of the spillway.

The dam has a size classification of intermediate and a hazard classification of low. According to Corps guidelines, the test flood is the one half Probable Maximum Flood. The test flood outflow is 40,372 cfs. The spillway is capable of passing 96% of this outflow. The top of the embankment, elevation 175, would be overtopped by about 1 foot. However, failure

under this condition would only cause insignificant damage as the downstream flooding would have already occurred. Since indepth engineering data was not available, the adequacy of the dam was assessed primarily on visual inspection, past performance history and hydrologic and hydraulic assumptions.

The dam is generally in good condition. However, it is recommended that the owner repair the drawdown outlet, and operate it at least once yearly to insure continued adequacy. After this outlet is repaired, or during a period of low flow, the owner should engage a qualified engineer to inspect the spillway without water flowing over it. Also the erosion of a retaining wall downstream of the spillway on the right abutment side should be repaired. These actions should be implemented within two years after receipt of this Phase I Report by the owner.



Ronald H. Cheney

Ronald H. Cheney, P.E.
Associate

Hayden, Harding & Buchanan, Inc.
Boston, Massachusetts

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Stevens Paper Company

This Phase I Inspection Report on Stevens Paper Company 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.

Joseph W. Finegan

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

Joseph A. McElroy

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

Carney M. Terzian

CARNEY M. TERZIAN, CHAIRMAN
Chief, Structural Section
Design Branch
Engineering Division

APPROVAL RECOMMENDED:

Joe B. Fryar

JOE B. FRYAR
Chief, Engineering Division

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Inspections. 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.

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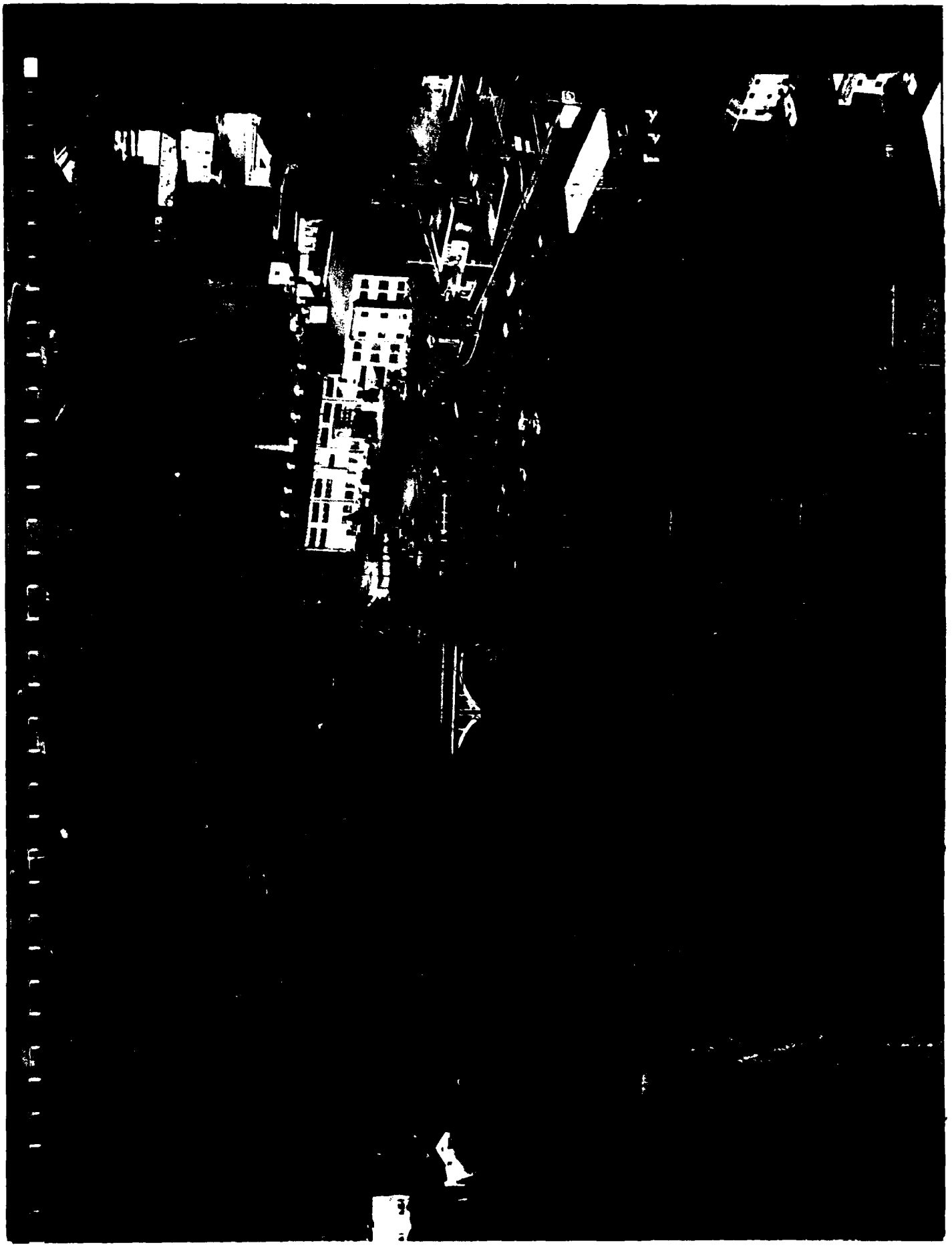

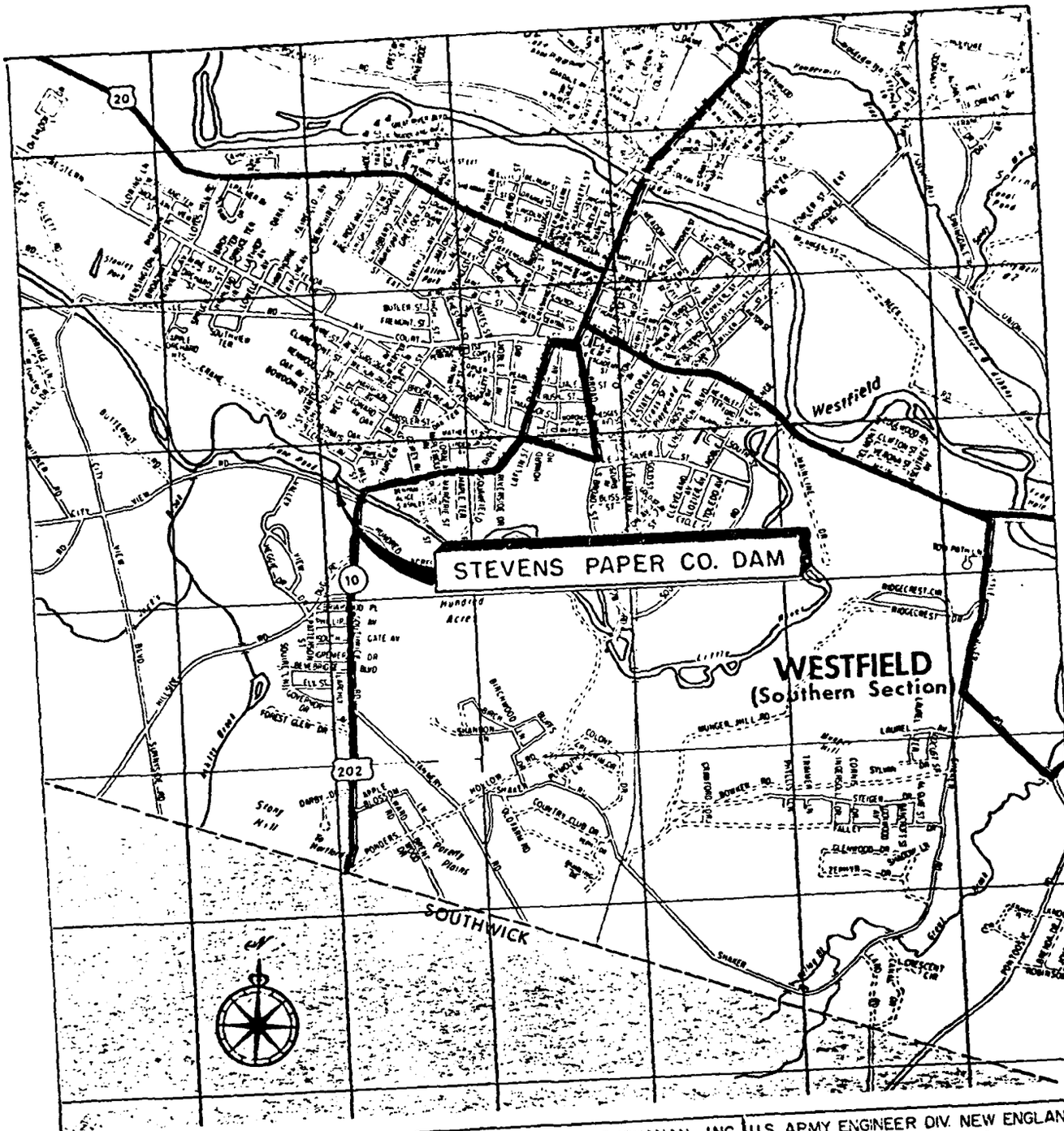

HAYDEN, HARDING & BUCHANAN, INC. CONSULTING ENGINEERS BOSTON, MASSACHUSETTS	U.S. ARMY ENGINEER DIV. NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS.

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

STEVENS PAPER CO. DAM (LOWER DAM)

WESTFIELD — MASSACHUSETTS

SCALE 1" = 5280'

DATE FEBRUARY, 1979.

PHASE I
NATIONAL DAM INSPECTION PROGRAM

NAME OF DAM: STEVENS PAPER COMPANY

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. Hayden, Harding & Buchanan, Inc. 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 Hayden, Harding & Buchanan, Inc. under a letter of 28 November 1978 from Max B. Scheider, Colonel, Corps of Engineers. Contract No. DACW 33-79-C-0012 has been assigned by the Corps of Engineers for this work.

b. Purpose

(1) Perform technical inspection and evaluation of non-Federal dams to identify conditions which threaten the public safety and thus permit correction in a timely manner by non-Federal interests.

(2) Encourage and assist the States to initiate quickly effective dam safety programs for non-Federal dams.

(3) To update, verify and complete the National Inventory of Dams.

1.2 Description of Project

a. Location

The Stevens Paper Company - Lower Dam is located in the City of Westfield in Hampden County, Massachusetts. The Pond is called Crane Pond and is on the Little River. The dam is located within the southwest part of Westfield approximately 400 feet west of where Route 202 and Route 10 intersect the Little River. The dam is shown on the Southwick Quadrangle, Massachusetts-Connecticut, with the approximate coordinates of North 42°06'42", West 72°46'00".

b. Description of Dam and Appurtenances

The dam consists of a masonry spillway, an earthfill embankment and two outlet pipes. The spillway has a height of about 12 feet, a crest width of about 190 feet and a crest

thickness of about 13 feet. It has a concrete cap and three concrete ice breakers located on the crest. The abutments are made of concrete, with portions comprised of masonry from a prior dam. The earthen embankment has a length of about 360 feet and contains a sheet pile cutoff wall. The upstream face of the embankment has a slope of 2 horizontal to 1.0 vertical and is lined with riprap. The downstream face also has a 2:1 slope and is turf lined. The outlets consist of a four foot diameter drawdown sluiceway and an 18 inch process water intake. The drawdown is located 9½ feet to the right of the spillways left abutment. It is hand operated by a series of shafts and gears. The process water intake is located within this same abutment and feeds water into the adjacent paper mill.

c. Size Classification

The dam is classified as intermediate due to its hydraulic height of 25 feet and storage capacity of 1591 a-f. The preceding being based on measurements to the top of embankment elevation 175.0.

d. Hazard Classification

The hazard potential from dam failure has been considered under two assumptions. One assumption is with water to the top of dam elevation 175.0. Under this condition, water passing the spillway section is such that major flooding has already occurred downstream and dam failure will not significantly increase damage. The second

condition is with water at crest of spillway. The outflow from this condition should be retained within the downstream channel. The hazard classification from dam failure therefore is low.

e. Ownership

The dam is owned by the Stevens Paper Mills, Inc., 77 Mill Street, Westfield, Massachusetts, 01085.

f. Operator

The caretaker of the dam is Mr. Robert Rea, of Stevens Paper Mills, Inc., 77 Mill Street, Westfield, Massachusetts, 01085. Telephone - 413-562-2315.

g. Purpose of Dam

The major purpose of the dam is for water supply for the adjacent mill. Formally the dam was used in power generation.

h. Design and Construction History

There are no plans available indicating when the original dam was constructed. It is assumed that the original dam was built around the turn of the century and was damaged by the flood of 1955. The original dam was then modified and rebuilt in 1957, resulting in the existing structure. The 1957 renovations were designed by Stone and Webster Engineering Corporation of Boston in 1955. This work consisted of lowering the spillway approximately five

feet, installing a concrete cap, a sheetpile cutoff wall within the upstream north embankment and repairing the northwesterly abutment. Portions of masonry from the original dam are incorporated into the existing structure.

i. Normal Operational Procedure

There is no formal operational procedure for the dam. The 18" supply pipe to the mill is operated periodically and was last operated in November, 1978; the drawdown has not been operated since 1957 and is in questionable condition.

1.3 Pertinent Data

a. Drainage Area

Drainage area (53,888. acres - 84.2 s.m.) is comprised of wooded, rolling hills (90 percent of area) and long, flat flood plains (10 percent of area). The major drainage paths area along the Little River (8.5 miles) and Munn Brook (10 mi.). There are numerous smaller brooks and several lakes and ponds within the drainage area.

A major portion of the drainage area (29,312 acres - 45.8 square miles) flows into Cobble Mountain Reservoir. Outflow from the reservoir is controlled (water supply and power) and the water level is usually well below the spillway crest. Its influence on the control of storm water runoff to the Little River is significant.

Development throughout the area is scattered and basically rural Urban development occurs to the north and east of the Little River in the City of Westfield.

Below the dam, to the northeast is the City of Westfield and a very large flood plain area. There are many structures adjacent to the flood plain. Three miles below the dam, the Little River flows into the Westfield River.

b. Discharge at the Dam Site

There are two outlet pipes at the dam. These are a 48" O.D. and an 18" I.D. pipe at elevation 149.8± and 153.3± , respectively. The 48" pipe extends through the dam and was used as a drain line. The 18" pipe is operated periodically and is used to bring water inside the adjacent mill for various uses.

The original dam, built prior to 1900, was damaged during the August 19, 1955 hurricane. At that time, estimates of the flood runoff at the dam were made. These vary from 21,700 to 23,100 cfs.

The existing ungated spillway has a capacity of approximately 39,000 cfs at the top of the dam, elevation 175. The flood of August 19, 1955 (23,100 cfs) peaked at elevation 170.5±. The spillway has a capacity of 39,000 cfs at elevation 175.0±.

c. Elevation (feet above MSL)

(1)	Streambed at centerline of dam	150 ±
(2)	Maximum tailwater . . . (Backwater condition)	175 ±
(3)	Upstream portal invert diversion tunnel	N/A
(4)	Recreation pool . . . (spillway crest)	159.8
(5)	Full flood control pool	N/A
(6)	Spillway crest (ungated)	159.8
(7)	Design Surcharge (1957 design)	172.5
(8)	Top Dam (South abutment)	176.0
	(North abutment)	175.0
(9)	Test flood design surcharge (1/2 PMF)	176.0

d. Reservoir

(1)	Length of maximum pool	7000'
(2)	Length of recreation pool	2000'
(3)	Length of flood control pool	N/A

e. Storage (acre-feet)

(1)	Recreation pool	276.0
(2)	Spillway crest pool	276.0
(3)	Top of Dam	1591.0
(4)	Flood control pool	N/A
(5)	Test flood pool	1732.0

f. Reservoir Surface (acres)

(1) Recreation Pool 50

(2) Spillway crest 50

(3) Top dam 137

(4) Flood-control pool . . . . . N/A

(5) Test flood pool 145

g. Dam

(1) Type . . gravity, stone masonry and concrete, earth embankment

(2) Length . . . . . 550'

(3) Height . . . 10' to 12 ' spillway, 30' earth embankment

(4) Top Width . . . . . embankment area . . . . . $20^{\pm}$

(5) Side Slopes . . . $2:1^{\pm}$ rip-rap U/S . . . . . $2:1^{\pm}$ D/S

(6) Zoning . . . class A & B fill material indicated,2 zones

(7) Impervious Core . . . indicated as Class A fill on dam

(8) Cutoff . . . . . sheetpiling in earth dam . . . . $350^{\pm}$

(9) Grout curtain . . . . . NONE

h. Diversion and Regulating Tunnel

None

i. Spillway

(1) Type . . . . . straight "broad crest"

(2) Length of weir . . 168' (main) . . . . 23.3'±(secondary)

(3) Crest elevation . . $159.8^{\pm}$ (main) . . $164.5^{\pm}$(secondary)

(4) Gates . . . . . one 48" Ø waste

(5) U/S Channel . . . . sloped concrete ($1:1\pm$) to river bed

(6) D/S Channel . . . . . vertical drop to river bed

j. Regulating Outlets

The dam has two manually controlled regulating outlets. These are sluice gates which are used to regulate flow through the 48 inch and 18 inch outlet pipes. The 48 inch pipe, invert 149.8±, extends through the spillway and was used as a drain. It has not been used since 1957. The 18 inch pipe, invert 153.3±, is in the spillways left abutment. It carries water into the manufacturing building (adjacent to the river and dam) for various uses. The gate for this pipe is operated periodically and was last operated in late November of 1978.

SECTION 2

ENGINEERING DATA

2.1 Design

There were no plans discovered describing the original dam located at this site. This original structure was damaged by the flood of 1955. The existing dam utilized portions of the original dam. Plans outlining these repairs and remodeling, were provided by the Stevens Paper Company. The plans were prepared by Stone & Webster Engineering Corporation of Boston in 1955. No indepth design calculations were located for this dam, by the design Engineer. Limited information was provided by the owner.

2.2 Construction

No construction data was located for this dam.

2.3 Operation

No operational manual was located for this dam.

2.4 Evaluation

a. Availability

Plans outlining the 1957 renovations and a 1955 design sheet for flood discharge were made available by the Stevens Paper Company. State Inspection Reports from the years 1973, 1975, and 1976 along with some correspondence were located at the Department of Environmental Quality Engineering Division of Waterways, Boston Office.

b. Adequacy

The lack of indepth engineering data does not allow for a definitive review. Therefore the adequacy of this dam, structurally and hydraulically, can not be assessed from the standpoint of review of indepth design calculations, but must be based primarily on the visual inspection, past performance history, and hydrologic and hydraulic assumptions.

c. Validity

The field investigation indicates that the external features substantially agree with those shown on the furnished plan.

SECTION 3
VISUAL INSPECTION

3.1 Findings

a. General

The Stevens Paper Company Lower Dam was inspected on December 5, 1978. At that time, water was passing over the spillway approximately one inch deep. The upstream face of the dam could only be inspected above this water surface.

b. Dam

The dam consists of a masonry overflow spillway about 230 foot long with its right abutment founded on the right bank of the Little River. The left training wall is concrete and masonry structure which, is the retaining wall of an embankment section which continues about 360 feet to the left abutment. Photo 3 shows the embankment section of the dam. The maximum height of the embankment section is about 30 feet.

Visual inspection of the dam indicates it is in good condition.

Upstream Slope

The embankment was constructed with an upstream slope of 1V:2H. Riprap slope protection extends from the toe to the crest of the embankment as shown in Photos 5 and 6. Concrete has been placed on the riprap section from the left training wall towards the left abutment for a distance of about 150 feet. There were no visible slumps or evidence of sliding on the upstream face.

Crest

The crest of the embankment is of variable width due to topographic conditions at the site and is 20 feet wide at its narrowest point. The crest is shown in photo 4. It has good grass cover and no evidence of cracking or misalignment of the crest was observed.

Downstream Slope

The downstream face of the embankment was constructed on a slope of about 1V:2H and has a good grass cover.

The downstream slope is curved in plan view to meet a roadway passing at the toe of the embankment. The downstream face is shown in photos 3 and 7.

The water level in the reservoir was below or only slightly above the elevation of the downstream toe at the time of inspection.

c. Appurtenant Structures

The foundation of the masonry spillway could not be inspected because of flow over the spillway. The spillway appeared to be in good condition, true and straight, with no signs of misalignment. The right abutment of the spillway is founded on bedrock which can be seen in photo 8. The left abutment and training wall of the spillway is a concrete and masonry wall which forms a retaining wall for the embankment section. This wall is shown in photos 2 and 9. The embankment adjacent to this training wall shows no evidence of misalignment or movement.

The process water intake is located in the left abutment of the spillway. The intake gate was last operated in November of 1978.

The main drawdown pipe is located at the left end of the spillway approximately 4 feet above the river bottom. Water flowing over the spillway prevented unobstructed observation. According to the caretaker this outlet was last operated over 20 years ago. There is uncertainty regarding the condition of this facility and it was not operated during our inspection for fear of not being able to close it down once opened. Downstream of the right side of the spillway there is heavy erosion at the base of a concrete retaining wall, as shown in photo 14. This erosion is serious and could jeopardize the wall. The spillway would not be affected by failure of this wall. Failure could however, affect the roadway running parallel to and above this wall.

d. Reservoir Area

The surrounding area of the reservoir is tree lined and appears to be in general agreement with the U.S.G.S. map. A description of the drainage area is given in Section 1.3.a of this report. The amount of siltation in the reservoir is unknown.

e. Downstream Channel

The downstream channel is the natural river bed. No significant obstructions existed in the channel at the time of inspection. The slopes of the channel are relatively steep and contain riprap lining on the immediate left down-

stream area. There is a two span concrete arch bridge spanning the Little River an estimated 450 feet downstream of the dam. Photos 10 and 12 show the downstream channel.

3.2 Evaluation

Visual examination indicates that the embankment section of the dam is in good condition. The condition of the spillway appeared to be good, however, water passing over the spillway limited the inspection. The main drawdown appears to be inoperative and this condition should be corrected. The concrete retaining wall located downstream of the right side of the spillway is in poor condition. This wall will not effect the stability of the dam, however, failure of the wall could effect the adjacent roadway.

SECTION 4

OPERATIONAL PROCEDURES

4.1 Procedures

There is no formal operational procedure for the dam. The dam is used for water supply for the adjacent paper mill. The process water intake pipe is operated periodically and was last operated in November, 1978. The main 48 inch diameter drawdown for this facility has not been operated since 1957.

4.2 Maintenance of Dam

The dam is maintained by the Stevens Paper Mill, Inc., of Westfield, Massachusetts. There is no formal maintenance program for the dam. The owner is responsible for reviewing State Inspection Reports and instituting the necessary repairs. Recent maintenance has consisted of controlling upstream vegetation and repairing the control mechanism for the process water intake pipe.

4.3 Maintenance of Operating Facilities

There is no formal operational facility maintenance program. Stevens Paper Mill, Inc., has repaired the process water intake facility. They have not conformed to the States recommendations to insure the operation of the drawdown gate.

4.4 Description of Warning System

There are no warning systems in effect at this facility.

4.5 Evaluation

There are no formal maintenance programs outlined. Some of the recommended repairs have been followed. However, the drawdown gate has not been operated since 1957. Any repairs required should be made and the gate maintained in operable condition. The dam should be inspected every two years by qualified personnel who can identify conditions which if left unchecked could jeopardize the safety of the dam.

SECTION 5

HYDRAULIC/HYDROLOGIC

5.1 Evaluation of Features

a. General

The dam is a "run-of-the-river" type project. It was originally constructed about 1900 to provide power for the mill adjacent to the river. A section of the original gravity stone masonry dam was damaged during the August 19, 1955 flood. It was rebuilt in 1957. The spillway is founded on a rock outcrop and the spillway crest is capped with concrete. The earthen embankment contains a sheet piling cut-off wall and impervious fill material, with a riprapped upstream slope.

The Little River begins at the Cobble Mountain Reservoir. Above Cobble Mountain about 45 s.m. of land contributes runoff. There was either no discharge or controlled discharge of water from Cobble Mountain and several other reservoirs during the 1955 flood.

b. Design Data

The dam was originally built about 1900. The dam was "redesigned" by Stone & Webster and rebuilt in 1957.

c. Experience Data

Records indicate the August 19, 1955 flood produced about 21,700 to 23,100 cfs at the dam. The original dam spillway crest was at elevation $164.5^{\pm}$. The 1957 modifications lowered this to $160^{\pm}$. A 1955 design sheet for flood discharge

indicates that at elevation 175 a flow of 45,250 cfs could pass through the spillway.

d. Visual Observations

Visual observations indicate that backwater condition will exist due to bridges, railroad lines and the Westfield River.

e. Overtopping Potential

The total area which could drain into the Little River comprises 84.2 s.m. A test flood using 1/2 PMF criteria was used to evaluate the project. Due to the large urban area downstream of the dam, the 1/2 PMF for the entire drainage area was used. This would include flow out of any reservoir in the area. The record flood of 23,100 cfs and design flood of 34000 cfs were also investigated.

The test flood would flow one foot above (elev. 176) the crest of the earth embankment. A detailed analysis might show that the original engineers discharge curve is accurate, thus the spillway could pass the 1/2 PMF of 42,100 cfs without the one foot overtopping. Our calculations indicate a spillway capacity of approximately 39,000 cfs with water to dam crest (elevation 175).

Due to conditions downstream, a backwater condition would exist. Flooding would be influenced by the Westfield River. At 1/2 PMF, storage at elevation 176 would be 1456 a-f. The test flood outflow would be 40,372 cfs.

f. Dam Failure Analysis

With water at the top of the dam, elevation 175 to 176, (1/2 PMF condition) if the dam were to fail, the effects would not be significantly different from the 1/2 PMF tailwater and backwater conditions downstream. The flood plain below the dam would already be flooded by the 1/2 PMF outflow from the dam. The Town of Westfield would be flooded to approximately elevation 155. Several hundred structures would be damaged by floodwater. A detailed study would be required to determine the exact impact in this area due to the influence of the Westfield River. The August 19, 1955 flood is known to have reached elevation $150^{\pm}$ in Westfield. Extensive flood damage and possible loss of life could occur due to the flooding conditions but not dam failure.

Assuming the dam failed, with water at the spillway level, elevation $160^{\pm}$, the resulting outflow would be 7424 cfs. This flow should be retained within the river banks and adjacent low flood plains. Damage to homes and loss of life are not indicated.

SECTION 6
STRUCTURAL STABILITY

6.1 Evaluation of Structural Stability

a. Visual Observations

Visual observations did not disclose any immediate stability problems.

b. Design and Construction Data

The dam consists of a 230 foot long masonry spillway extending from the right bank of the river to a concrete and masonry training wall which forms the abutment for a 360 foot long embankment dam section extending to the left abutment.

Details of the embankment construction were not available with the exception of design drawings dated 1955 which indicate the embankment section has a sheet pile cut-off wal and a central core above the cut-off wall. The cut-off wall extends from the left training wall of the spillway to a point about 200 feet towards the left abutment.

c. Operating Records

There is no operational manual for this dam.

d. Post-Construction Changes

The available information indicates that the present embankment was reconstructed in about 1957 after extensive damage to the original dam due to flooding in 1955. The spillway was lowered by approximately 5 feet from the original and a concrete cap and icebreakers were constructed

atop the spillway crest.

e. Seismic Stability

The dam is located in Seismic Zone 2, and according to USCE guidelines, it is assumed that there is no hazard from earthquake loading.

SECTION 7
ASSESSMENT, RECOMMENDATIONS AND REMEDIAL MEASURES

7.1 Dam Assessment

a. Condition

The visual inspection indicates the embankment portion of the dam is in good condition. Close examination of the spillway was not possible due to water overflow. However, the spillway appeared to be true and straight with no signs of misalignment.

b. Adequacy of Information

The information made available along with the visual inspection is adequate for a Phase I Level investigation of the embankment section of this dam. The spillway section could not be thoroughly inspected at the time of this inspection.

c. Urgency

No action for the embankment section is required. However, the items outlined in Section 7.2 and 7.3 should be implemented by the owner within 2 years after receipt of this Phase I Report.

d. Need for Additional Investigation

The masonry spillway could not be evaluated during this inspection. The spillway should be inspected within the time frame established in Section 7.1.c.

7.2 Recommendations

1. The drawdown gate has not operated since 1957. The condition of this facility should be evaluated and

any necessary repairs made to assure the gate is operable.

2. Upon repair of the drawdown, or during a period of low flow , the owner should engage a qualified engineer to inspect the spillway section, without water flowing over it.

3. Although failure of the retaining wall downstream of the right side of the spillway would not affect the safety of the dam; the owner of this wall should be determined. The owner should then engage a qualified engineer to investigate the condition of the wall and recommend necessary repairs to assure the safety of the adjacent roadway.

7.3 Remedial Measures

a. Operational and Maintenance Procedures

1. The dam should be inspected every two years by qualified personnel who can identify conditons which if left unchecked could jeopardize the safety of the dam. Coordination should be made so that the spillway can be inspected without it being overtopped by water.

2. The drawdown gate should be operated yearly to insure continued adequacy.

7.4 Alternatives

Not applicable to this dam.

APPENDIX A

INSPECTION CHECKLIST

VISUAL INSPECTION CHECKLIST
PARTY ORGANIZATION

PROJECT Stevens Paper Co. - Lower Dam

DATE Dec. 5. 1978

TIME 1:30 p.m.

WEATHER Clear and cool, 45°

W.S. ELEV. 159.9± U.S. ____ DN.S.

PARTY:

1. Ronald H. Cheney, HH&B
2. David B. Vine, HH&B
3. Daniel P. LaGatta, GEI
4. Robert Rea, Stevens Paper
5. ____
6. ____
7. ____
8. ____
9. ____
10. ____

	PROJECT FEATURE	INSPECTED BY	REMARKS
1.	Embankment Dam	D. P. LaGatta	
2.	Spillway	R. H. Cheney	
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

PERIODIC INSPECTION CHECKLIST

PROJECT Stevens Paper Co. - Lower Dam DATE Dec. 5, 1978

PROJECT FEATURE Embankment Dam NAME D. P. LaGatta

DISCIPLINE Geotechnical engineers NAME R. H. Cheney

Structural Engineer

AREA EVALUATED	CONDITION
DAM EMBANKMENT	
Crest Elevation	175
Current Pool Elevation	159.9
Maximum Impoundment to Date	Unknown
Surface Cracks	None observed.
Pavement Condition	No pavement.
Movement or Settlement of Crest	None observed.
Lateral Movement	None observed.
Vertical Alignment	No misalignment observed.
Horizontal Alignment	
Condition at Abutment and at Concrete Structures	Good.
Indications of Movement of Structural Items on Slopes	None.
Trespassing on Slopes	None.
Sloughing or Erosion of Slopes or Abutments	None.
Rock Slope Protection - Riprap Failures	None.
Unusual Movement or Cracking at or Near Toe	None observed.
Unusual Embankment or Downstream Seepage	None observed.
Piping or Boils	None observed.
Foundation Drainage Features	None observed.
Toe Drains	None observed.
Instrumentation System	None.
Vegetation	Good grass cover on crest and d.s. slope

PERIODIC INSPECTION CHECK LIST

PROJECT Stevens Paper Co. - Lower Dam DATE Dec. 5. 1978

PROJECT FEATURE Intake Structure NAME D. P. LaGatta

DISCIPLINE Geotechnical Engineer NAME R. H. Cheney

Structural Engineer

AREA EVALUATED	CONDITIONS
OUTLET WORKS - INTAKE CHANNEL AND INTAKE STRUCTURE	There is no approach channel for this facility.
a. Approach Channel	
Slope Conditions	
Bottom Conditions	
Rock Slides or Falls	
Log Boom	
Debris	
Condition of Concrete Lining	
Drains or Weep Holes	
b. Intake Structure	An 18 inch water process inlet is located in the left abutment.* The above water portion of this abutment was observed to be in good condition. The facility was last operated Nov. of 1978. The 48 inch diameter drawdown inlet is located underwater and could not be visually observed. The facility has not been operated in over 20 years.
Condition of Concrete	
Stop Logs and Slots	* Abutment is left abutment of spillway

PERIODIC INSPECTION CHECK LIST

PROJECT Stevens Paper Co - Lower Dam DATE Dec. 5, 1978

PROJECT FEATURE Outlet-Inlet Controls NAME D. P. LaGatta

DISCIPLINE Geotechnical Engineer NAME R. H. Cheney

Structural Engineer

AREA EVALUATED	CONDITIONS
OUTLET WORKS - CONTROL TOWER	
a. Concrete and Structural General Condition Condition of Joints Spalling Visible Reinforcing Rusting or Staining of Concrete Any Seepage or Efflorescence Joint Alignment Unusual Seepage or Leaks in Gate Chamber Cracks Rusting or Corrosion of Steel	The upper portion of the left* abutment contains a fenced off area containing the inlet gate controls. Visual observation indicated the general area to be in good condition. * Abutment is left abutment of spillway
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 in Gate Chamber	The 18 inch water process inlet is manually controlled and operational. The 48 inch diameter drawdown pipe is manually operated through a system of shafts and gears. The drawdown has not been operated in over 20 years and believed inoperable.

PERIODIC INSPECTION CHECK LIST

PROJECT Stevens Paper Co. - Lower Dam DATE Dec. 5, 1978

PROJECT FEATURE Outlet Transition & Conduit NAME D. P. LaGatta

DISCIPLINE Geotechnical Engineer NAME R. H. Cheney

Structural Engineer

AREA EVALUATED	CONDITIONS
OUTLET WORKS - TRANSITION AND CONDUIT	
General Condition of Concrete	There is no standard transition and conduit for this facility. There is an 18 inch water process intake pipe supplying water to the mill, however, the entire conduit is underground and unable to be visually inspected.
Rust or Staining on Concrete	
Spalling	
Erosion or Cavitation	
Cracking	
Alignment of Monoliths	
Alignment of Joints	
Numbering of Monoliths	

PERIODIC INSPECTION CHECK LIST

PROJECT Stevens Paper Co. - Lower Dam DATE Dec. 5, 1978

PROJECT FEATURE Outlet Structure & Channel NAME D. P. LaGatta

DISCIPLINE Geotechnical Engineer NAME R. H. Cheney

Structrual Engineer

AREA EVALUATED	CONDITIONS
OUTLET WORKS - OUTLET STRUCTURE AND OUTLET CHANNEL	
General Condition of Concrete	The outlet structures are the same as the inlet structures for this facility. There is no outlet channel less the downstream channel of the spillway.
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 Stevens Paper Co. - Lower Dam DATE Dec. 5, 1978

PROJECT FEATURE Embankment Dam NAME D. P. LaGatta

DISCIPLINE Geotechnical Engineer NAME R. H. Cheney

Structural Engineer

AREA EVALUATED	CONDITIONS
OUTLET WORKS - SPILLWAY WEIR, APPROACH AND DISCHARGE CHANNELS	
a. Approach Channel	Run-of-river spillway
General Condition	Good.
Loose Rock Overhanging Channel	None.
Trees Overhanging Channel	None.
Floor of Approach Channel	Not visible.
b. Weir and Training Walls	Water passing over the spillway limited the visual inspection. The spillway appeared to be well aligned and true. The training walls of the spillway are the abutments. The abutments appear to be structurally sound with only minor waterwear.
General Condition of Concrete	
Rust or Staining	
Spalling	
Any Visible Reinforcing	
Any Seepage or Efflorescence	
Drain Holes	Not working at time of inspection.
c. Discharge Channel	Discharge directly into river channel.
General Condition	
Loose Rock Overhanging Channel	None.
Trees Overhanging Channel	None.
Floor of Channel	Not visible.
Other Obstructions	

PERIODIC INSPECTION CHECK LIST

PROJECT Stevens Paper Co. - Lower Dam DATE Dec. 5, 1978

PROJECT FEATURE Service Bridge NAME R. P. LaGatta

DISCIPLINE Geotechnical Engineer NAME R. H. Cheney

Structural Engineer

AREA EVALUATED	CONDITIONS
OUTLET WORKS - SERVICE BRIDGE	
a. Super Structure	There is no service bridge for this facility. There is a fenced in gate control area on the left abutment which was discussed on Page 4 of this section as the control tower.
Bearings	
Anchor Bolts	
Bridge Seat	
Longitudinal Members	
Under Side 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

LIST OF AVAILABLE ENGINEERING DATA

1. 1955 Plans outlining repairs and remodeling
2. Design folder covering 1955 Design

Location: Stevens Paper Mills, Inc.
77 Mill Street
Westfield, Massachusetts 01085

6/8/16

The Commonwealth of Massachusetts

EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL QUALITY ENGR.
DIVISION OF WATERWAYS

100 Nashua Street, Boston 02114

June 3, 1976

Stevens Paper Mill, Inc.
77 Mill Street
Westfield, Massachusetts

RE: Dam #2-7-329-5
Westfield
Stevens Paper Co. Lower Dam

Gentlemen:

On January 14, 1976, an Engineer from the Massachusetts Department of Public Works made a visual inspection of the above dam. Our records indicate the owner to be Stevens Paper Mill, Inc. If this information is incorrect will you please notify this office.

The inspection was made in accordance with the provisions of Chapter 253 of the Massachusetts General Laws as amended (Dams-Safety Act). Chapter 706 of the Acts of 1975 transferred the jurisdiction of the so-called "Dams Safety Program" to the Commissioner of the Department of Environmental Quality Engineering.

The results of the inspection indicate that this dam is safe; however the following conditions were noted that require attention:

1. A growth of brush was noted on the upstream face. This should be removed.

2. The drawdown gate is not operable and must be repaired.

We call these conditions to your attention before they become serious and more expensive to correct. With any correspondence please include the number of the Dam as indicated above.

Very truly yours,

DAVID STANDLEY
COMMISSIONER

A.Meich

INSPECTION REPORT - DAMS AND RESERVOIRS

1. LOCATION:

City/Town Westfield. County Hampden. Dam No. 2-7-329-5.

Name of Dam Stevens Paper Co. - Lower Dam.

Topo Sheet No. 9 D. Coordinates: Mass. Rect. N 407,500, E 256,300.

Inspected by: Harold T. Shumway, On Jan. 14, 1976. Date Last Inspection 12-3-73.

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2. OWNER/S: As of January 14, 1976

per: Assessors_____, Reg. of Deeds_____, Prev. Insp. X, Per. Contact X.

1. Stevens Paper Mills, Inc., 77 Mill St., Westfield, Mass.
Name | St. & No. | City/Town | State | Tel. No.

2.
Name | St. & No. | City/Town | State | Tel. No.

3.
Name | St. & No. | City/Town | State | Tel. No.

---

3. CARETAKER: (if any) e.g. superintendent, plant manager, appointed by absentee owner, appointed by multi owners.

Plant Engineer, Mr. Robert Ray,
Stevens Paper Mills, Inc., 77 Mill St., Westfield, Mass. 01085
Name | St. & No. | City/Town | State | Tel. No.

---

4. DATA:

No. of Pictures Taken none. Sketches See description of Dam.
Plans, Where In office files of Stevens Paper Mills, Inc. at 77 Mill St., Westfield, Mass. - Plans for 1955 remodeling of dam.

---

5. DEGREE OF HAZARD: (if dam should fail completely)*

1. Minor_____.
2. Moderate X.
3. Severe_____.
4. Disastrous_____.

Comments: 70 million gallons ± impoundment, flood plain downstream heavil developed.

*This rating may change as land use changes (future development).

6. OUTLETS: OUTLET CONTROLS AND DRAWDOWN

No. 1 Location and Type: Main Dam - conc. capped crest spillway - 168'W. 4.76'H. with stone masonry dropwall.

Controls none, TYPE: _____

Automatic ____. Manual ____. Operative Yes ____, No ____.

Comments: Ice breakers on crest - appear in good condition.

No. 2 Location and Type: Bottom of dropwall - 9.5' from south abut. - 48" dia. pipe drawdown.

Controls yes, Type: Sluice gate.

Automatic ____. Manual X. Operative Yes ____, No X.

Comments: Sluice gate operated by hand stand on north abut. thro a system of shafts and gears which activate a rack and pinion at gate. All mechanism is under water. First shaft rusted

No. 3 Location and Type: Near westerly end, north abut. - 18" dia. water int p

Controls yes, Type: 18" dia. gate operated from hand stand on

Automatic ____. Manual X. Operative Yes X, No ____.

Comments: Controls repaired since last inspection.

Drawdown present Yes X, No ____. Operative Yes ____, No X.
Comments: See #2 above.

---

7. DAM UPSTREAM FACE: Slope 1:1 on masonry spillway 3:1 on Embank. Depth Water at Dam 8' to 10'.

Material: Turf X. Brush ~~& Trees~~ X. Rock fill X. Stone Masonry x. Wood X.

Other Approx. 350' earth dike on northwesterly end of masonry. Rock paved slope with turf on upper 3' +.

Condition: 1. Good ____. 3. Major Repairs ____.

2. Minor Repairs X. 4. Urgent Repairs ____.

Comments: Small brush growth along water line on slope where stone fill paving is.

---

8. DAM DOWNSTREAM FACE: Slope Vertical on spillway dropwall 3:1 on embankment.

Material: Turf X. Brush & Trees ____. Rock Fill ____. Stone Masonry X. Wood X.

Other Concrete cap on crest.

Condition: 1. Good ____. 3. Major Repairs ____.

2. Minor Repairs X. 4. Urgent Repairs ____.

Comments: Small brush growth on westerly abut. retaining wall. Heavy overflow prevented close inspection of dropwall.

(9.) EMERGENCY SPILLWAY: Available yes. Needed _____.

Height Above Normal Water 4.76 Ft. above crest spillway.

Width 191.32 Ft. Height 10.4 Ft. Material Masonry.

Condition: 1. Good X, 3. Major Repairs _____.

2. Minor Repairs _____. 4. Urgent Repairs _____.

Comments: Additional capacity spillway from crest of original dam at elev. 164.56 to top of northwesterly abutment and embankment.

(10.) WATER LEVEL AT TIME OF INSPECTION: 1 Ft. Above X. Below _____.

Top Dam _____ F.L. Principal Spillway X.

Other _____.

Normal Freeboard 15.2 Ft. from spillway crest to top of northwester abutment.

(11.) SUMMARY OF DEFICIENCIES NOTED:

Growth (Trees and Brush) on Embankment yes - medium small brush growth.

Animal Burrows and Washouts None found.

Damage to Slopes or Top of Dam None found.

Cracked or Damaged Masonry None found.

Evidence of Seepage yes - minor seepage noted in westerly abut.

Evidence of Piping None found.

Leaks None found.

Erosion Minor water wear on abutment faces at crest.

Trash and/or Debris Impeding Flow None found.

Clogged or Blocked Spillway None found.

Other Drawdown gate does not operate.

(12.) OVERALL CONDITION:

1. Safe_____.
2. Minor repairs needed X
3. Conditionally safe - major repairs needed_____
4. Unsafe_____.
5. Reservoir impoundment no longer exists (explain)

   Recommend removal from inspection list_____

(13.) REMARKS AND RECOMMENDATIONS: (Fully Explain)

Water overflow at time of inspection was a foot deep which preve a close inspection of crest, dropwall face, or toe of dam. Condition appeared to be the same as when dam was last inspected on December 3,

A growth of brush was noted on upstream slope of earth embankmen at water line. Some of this brush has reached the small tree stage a has evidently been growing for more than two years.

Ice formation on the westerly abutment face seemed to indicate s slight seepage was occurring. However, this does not appear to be a problem at present time. Slight wear of abutment faces at crest of spillway was noted. This also does not appear to be a problem as yet and does not seem to have increased since last inspection.

The control mechanism for the 18" dia. pipe feeding processing w to the mill has been repaired and is in good working order now per Mr. Robert Ray, Plant Engineer.

The drawdown gate is not operable and the control shaft is rusto off. This situation was discussed with Mr. Ray who stated he did not when the company would be able to repair this control system due to p economic situation.

Dam appears to be basically sound and safe with only routine repai needed except for drawdown gate repairs.

HTS/bk

September 2, 1975

Mr. Earl Fuller
Plant Engineering Department
Stanley Home Products, Inc.
Easthampton, Mass. 01027

RE: Dam #2-7-329-5 and 6
Westfield
Crane Pond Lower and Upper Dams

Dear Mr. Fuller:

Reference is made to your letter dated August 28, 1975, wherein you have expressed an interest to know who would have the responsibility for the repair and maintenance of the above dams.

Chapter 253 of the Massachusetts General Laws, as amended by Chapter 595 of the Acts of 1970 (Dam-Safety Act) has placed the jurisdictional responsibility for dams with the Commissioner of the Massachusetts Department of Public Works. The Division of Waterways of the Department of Environmental Quality Engineering has been administering this program. A copy of Chapter 595 is enclosed for your information. Your attention is directed to Sections 46 through 49 which address the area of maintenance responsibility.

These dams were inspected in December of 1973 and appeared safe at that time with only routine deficiencies noted. Pursuant to Chapter 595 these dams are scheduled to be inspected in December of this year.

If we may be of future assistance, please do not hesitate to contact us. With any correspondence, please include the number/s of the dam/s as indicated above.

Very truly yours,

[illegible], P.E.
Chief Engineer

[illegible]
Encl.
cc: P. J. [illegible]
[illegible] Wills

January 30, 1973

Stevens Paper Mills Inc.
c/o Robert Ray, Plant Engineer
77 Mill Street
Westfield, Massachusetts 01085

RE: Inspection-Dam #2-7-329-5
Westfield
Stevens Paper Co. Lower Dam

Dear Mr. Ray:

On December 3, 1973 an engineer from the Massachusetts Department of Public Works inspected the above dam, owned by Stevens Paper Mills Inc.

The inspection was made in accordance with Chapter 253 of the Massachusetts General Laws, as amended by Chapter 595 of the Acts of 1970.

The results of the inspection indicate that this dam is safe; however, the following conditions were noted that require attention:

1. Installation of the gate for the intake pipe. You had indicated that this gate was removed for repairs.

2. Remove the minor growth of brush growing between the riprap.

3. Check the drawdown gate and make it operable, if necessary.

We call these conditions to your attention now, before they become serious and more expensive to correct.

Very truly yours,

F. C. Schweim

FRED C. SCHWEIM, P.E.
Deputy Chief Engineer

IRA:vlc
cc. F. J. Koey
R. Salls

INSPECTION REPORT - DAMS AND RESERVOIRS

(1.) LOCATION:

City/~~Town~~ Westfield. County Hampden. Dam No. 2-7-329-5.

Name of Dam Stevens Paper Co. - Lower Dam.

Mass. Rect.

Topo Sheet No. 99. Coordinates: N 407.500, E 256.300.

Inspected by: Russell C. Salls, P.E., On Dec. 3, 1973. Date Last Inspection June, 1970.

(2.) OWNER/S: As of December 3, 1973

per: Assessors X, Reg. of Deeds ____, Prev. Insp. ____, Per. Contact X.

	Name	St. & No.	City/Town	State	Tel. No.
1.	Stevens Paper Mills, Incorporated,		Windsor,	Connecticut	06095
2.					
3.					

(3.) CARETAKER: (if any) e.g. superintendent, plant manager, appointed by absentee owner, appointed by multi owners.

Name	St. & No.	City/Town	State	Tel. No.
Mr. Robert Ray, Plant Engineer, c/o Stevens Paper Mills, Incorporated,	77 Mill Street,	Westfield,	Ma.	01085 562-231

(4.) DATA:

No. of Pictures Taken None. Sketches See description of Dam.

Plans, Where In offices of Stevens Paper Mills, Incorporated, 77 Mill Street, Westfield, Ma. Plans for remodeling dam in 1957.

(5.) DEGREE OF HAZARD: (if dam should fail completely)*

1. Minor ____.
2. Moderate X.
3. Severe ____.
4. Disastrous ____.

Comments: Extensive development on flood plain easterly of junction of Little and Westfield Rivers could be effected.

*This rating may change as land use changes (future development).

2) OUTLETS: OUTLET CONTROLS AND DRAWDOWN

No. 1 Location and Type: 48" drawdown sluiceway - through bottom spillway wall 9.5' from south abutment.

Controls Yes, TYPE: Sluice gate.

Automatic ____. Manual X. Operative Yes ____, No ____. Unknown.

Comments: Sluice gate operated by hand stand on north abutment through a syste of shafts and gears which activate a rack and pinion at gate. All mechanism is under water. Information from company employee.

No. 2 Location and Type: 18" process water intake - near westerly end, north abutment.

Controls Yes, Type: 18" Gate operated from hand stand on abutment

Automatic ____. Manual X. Operative Yes ____, No X.

Comments: Operating shaft sheared off when operated in November, 1973. Pres operating devices removed for repairs - stop logs across inlet opening.

No. 3 Location and Type: 169' wide - 4.76' dropwall overflow spillway in main dam.

Controls None, Type: ____.

Automatic ____. Manual ____. Operative Yes ____, No ____.

Comments: Ice breakers on crest.

Drawdown present Yes X, No ____. Operative Yes ____, No ____. Unknown - Has been operated 1957.

Comments: See No. 1 Above.

---

3) DAM UPSTREAM FACE: Slope Approx. 1:1 on masonry spillway, 3:1 on embankment., Depth Water at Dam 6' to 7'.

Material: Turf ____. Brush & Trees ____. Embankment Rock fill ____. Stone Masonry ____. Spillway Wood ____.

Other Approx. 360' of earth dike on northwesterly end of masonry spillway dam.

Condition: 1. Good ____. 3. Major Repairs ____.

2. Minor Repairs X. 4. Urgent Repairs ____.

Comments: Some brush in riprap. Stone masonry under water.

---

3) DAM DOWNSTREAM FACE: Slope Spillway structure. Vertical embankment 3:1.

Material: Turf X. Brush & Trees ____. Rock Fill ____. Stone Masonry X. Spillway Wood ____.

Other Concrete cap on crest. Stone masonry wall appeared sound.

Condition: 1. Good X. 3. Major Repairs ____.

2. Minor Repairs ____. 4. Urgent Repairs ____.

Comments: ____

(9.) EMERGENCY SPILLWAY: Available Yes . Needed ____.

Height Above Normal Water 4.76 Ft. Above crest spillway.

Width 191.32 Ft. Height 10.4 Ft. Material Masonry .

Condition: 1. Good X . 3. Major Repairs ____.

2. Minor Repairs ____. 4. Urgent Repairs ____.

Comments: Additional capacity spillway from crest of original dam at EL. 164.56 to top of northwesterly abutment and embankment.

(10.) WATER LEVEL AT TIME OF INSPECTION: 1/4 Ft. Above X . Below ____.

Top Dam ____ F.L. Principal Spillway X .

Other ____.

Normal Freeboard 15.2 Ft. from spillway crest to top of northwesterly abutment.

(11.) SUMMARY OF DEFICIENCIES NOTED:

Growth (Trees and Brush) on Embankment Minor brush growth in riprap - upstream embankment slope.

Animal Burrows and Washouts None found .

Damage to Slopes or Top of Dam Very minor wear of abutment wall at spillway crest

Cracked or Damaged Masonry None noted. Water overtopping spillway masonry

Evidence of Seepage None found

Evidence of Piping None found

Leaks None found

Erosion None noted

Trash and/or Debris Impeding Flow One tree trunk caught on crest spillway

Clogged or Blocked Spillway No

Other Drawdown gate has not been opened since 1957 and inlet of drawdown could be covered by silt. Water at abutment 6' to 7' deep. Flow line drawdow 10' below crest. Gate operating mechanism for 18" gate for processing water 18" pipe to Mill broken November, 1973. Removed at time of inspection for repairs.

(12.) OVERALL CONDITION:

1. Safe_____.
2. Minor repairs needed X .
3. Conditionally safe - major repairs needed_____
4. Unsafe_____.
5. Reservoir impoundment no longer exists (explain)

   Recommend removal from inspection list_____

(13.) REMARKS AND RECOMMENDATIONS: (Fully Explain)

This is an old stone masonry spillway dam extensively rebuilt and remodeled in 1957 at which time the crest elevation of the spillway was lowered from elevation 164.56 to elevation 159.80 and a concrete cap installed on the crest. At the same time the northwesterly abutment was remodeled and the dike at the northeasterly side of the river was rebuilt.

At the time of the inspection water was flowing over the spillway about 3 to 4 in deep preventing a close examination of the spillway's toe face wall and crest. The portions of the masonry which could be seen appeared to be in satisfactory condition. There was slight wear in the northwest abutment wall where it found the spillway's crest and some of the joints in the stone masonry southeasterly abutment were deteriorating.

The downstream end of a 48 inch boiler plate drawdown conduit could be seen from shore. Its flow line was about 10 feet below the spillway crest. On the upstream end, the inlet and gate work are very likely to be covered with silt, as sounding at the abutment showed only 6 to 7 feet of water. The control gate for the drawdown is operated by a rack and pinion device operated from a hand stand on the abutment by means of a system of gears and shafts. Except for the hand stand all the gate operating mechanism is underwater and silt and its condition was not evaluated. Mr. Ray the Plant Engineer said that the drawdown had not been opened since 1957.

There is a rectangular niche in the northeasterly abutment which houses the gate for a 18" pipe feeding processing water to the Paper Mill. There are provisions for stop logs across this niche. At the time of this inspection the operating mechanism for the gate had been removed for repairs according to the Plant Engineer.

RCS/js/sd

13. REMARKS AND RECOMMENDATIONS (Continued)

The earth dike extending north, northwesterly from the end of the spillway was in satisfactory condition with a good growth of turf on its top and downstream slope. There were several small clumps of brush growing in the riprap on the downstream slope which could be removed. Two power poles on the dike do not effect the condition of the dike to any extent.

This dam appears to be in satisfactory condition. The inoperative gate for the intake pipe is being repaired and the only items which may require attention in the future are removal of the brush growing in the riprap and determining if the drawdown gate is functionable.

RCS/sd

DISTRICT II .

Submitted by Russell C. Salls, P. E. Dam No. 2-7-329-5

Date December 3 and 10, 1973 City/~~Town~~ Westfield

Name of Dam Stevens Paper Co. - Lower Dam

See also Dam Number 2-7-329-6

---

1. Location: Topo Sheet No. 9D Mass. Rect. Coordinates N 407.500 E 256.300

Provide 8½" x 11" in clear copy of topo map with location of Dam clearly indicated.

On Little River just west 500' of Routes 202 and 10, College Highway Bridge and 500' south of Jct. Mill Street and Crane Road.

---

2. Year built Unknown Year/s of subsequent repairs Remodeled in 1955

---

3. Purpose of Dam: Water Supply For Paper Mill Recreational _____

Flood Control _____ Irrigation _____ Other Also used formerly as power source.

---

4. Drainage Area: 48 sq. mi. _____ acres.

Type: City, Bus. & Ind. _____ Dense Res. _____ Suburban _____ Rural, Farm 10%

Wood & Scrub Land 90% Slope: Steep 20% Med. 60% Slight 20%.

---

5. Normal Ponding Area: 53 Acres; Ave. Depth 4'

Impoundment: 69.8 Million gals.; 212 acre ft.

Silted in: Yes X No _____ Approx. Amount Storage Area ¼

---

6. No. and type of dwellings located adjacent to pond or reservoir _____

i.e. summer homes etc. 6 - 7 Residences overlook pond.

---

7. Dimensions of Dam: Length 191.3' See Note Below Max. Height 13'±

Freeboard 15.2'

Slopes: Upstream Face 1:1 Masonry spillway wall - 3:1 Embankment

Downstream Face Vertical masonry spillway wall - 3:1 Embankment

Width across top 8' - 11" Concrete spillway crest
5' - 20' Earth dike

Also 360'± of earth dike on southeast bank.

Dam No. 2-7-329-5

8.

Classification of Dam by Material:

Earth Dike Conc. Masonry Cap Stone Masonry Wall

Timber _____ Rockfill _____ Other _____

8A.

Dam Type: Gravity X Straight X Curved, Arched _____ Other _____

Overflow Y Non-overflow _____

9.

A. Description of present land usage downstream of dam:

80 % rural; 20 % ~~urban~~ developed

B. Is there a storage area or flood plain downstream of dam which could accommodate the impoundment in the event of a complete dam failure? Yes X No _____

C. Character Downstream Valley: Narrow _____ Wide X Developed 20%

Rural 80% Urban _____

Flood plains have extensive industrial and commercial development.

10.

Risk to life and property in event of complete failure.

No. of people 4

No. of homes 4

No. of businesses 5 to 6

No. of industries 5 to 6 Type General manufacturing

No. of utilities 4 Type Sewer Lines, Water Lines, Electrical and Transmission Lines and Telephone

Railroads Not active.

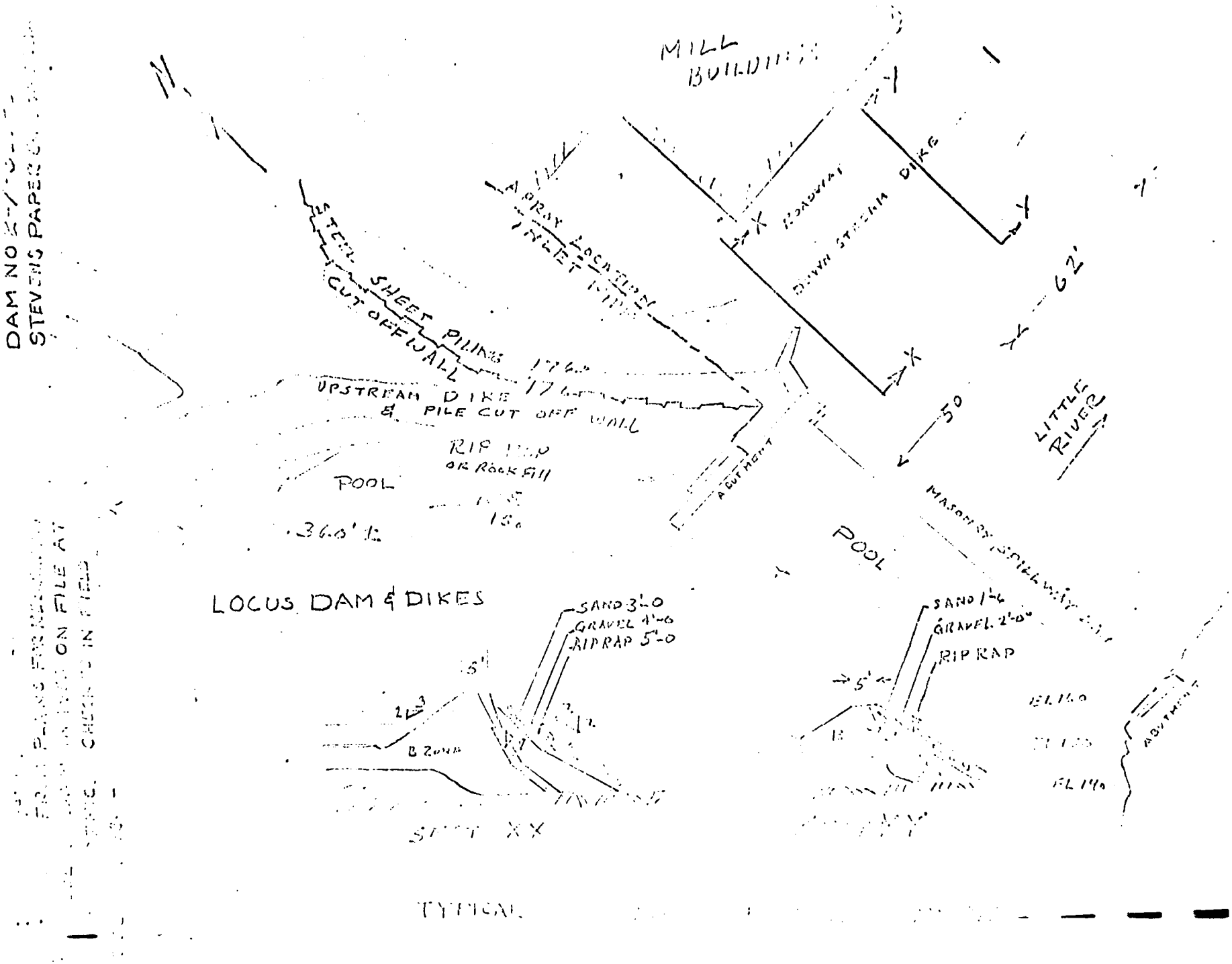
Other dams On Little River only Brush Dam breached.

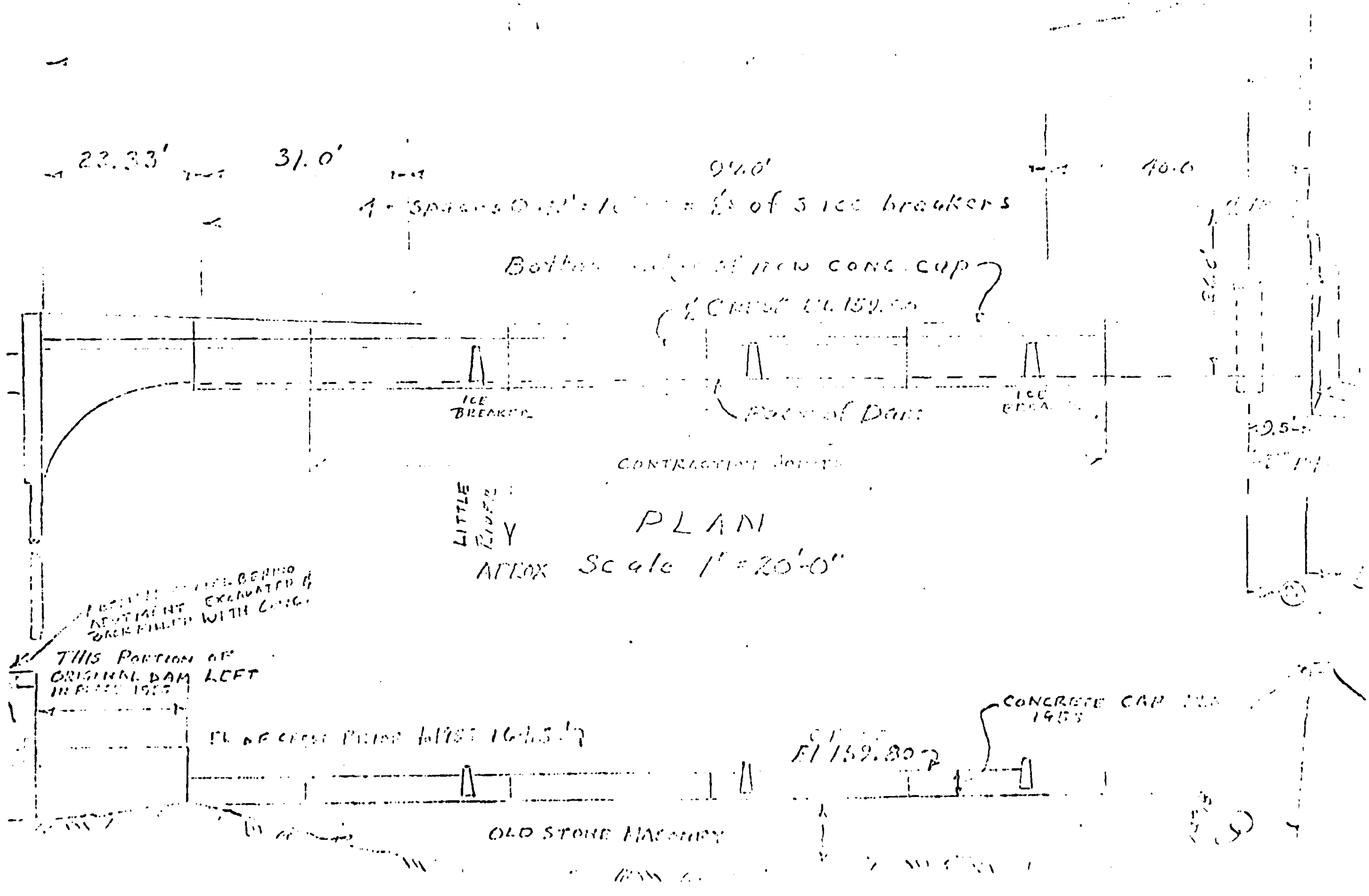
Other Increasing development of flood plain areas below dam. Westfield R in flood stage backs up Little River so flood plain is flooded befo flood crest of Little River reaches area.

11.

Attach Sketch of dam to this form showing section and plan on 8½" x 11" sheet.

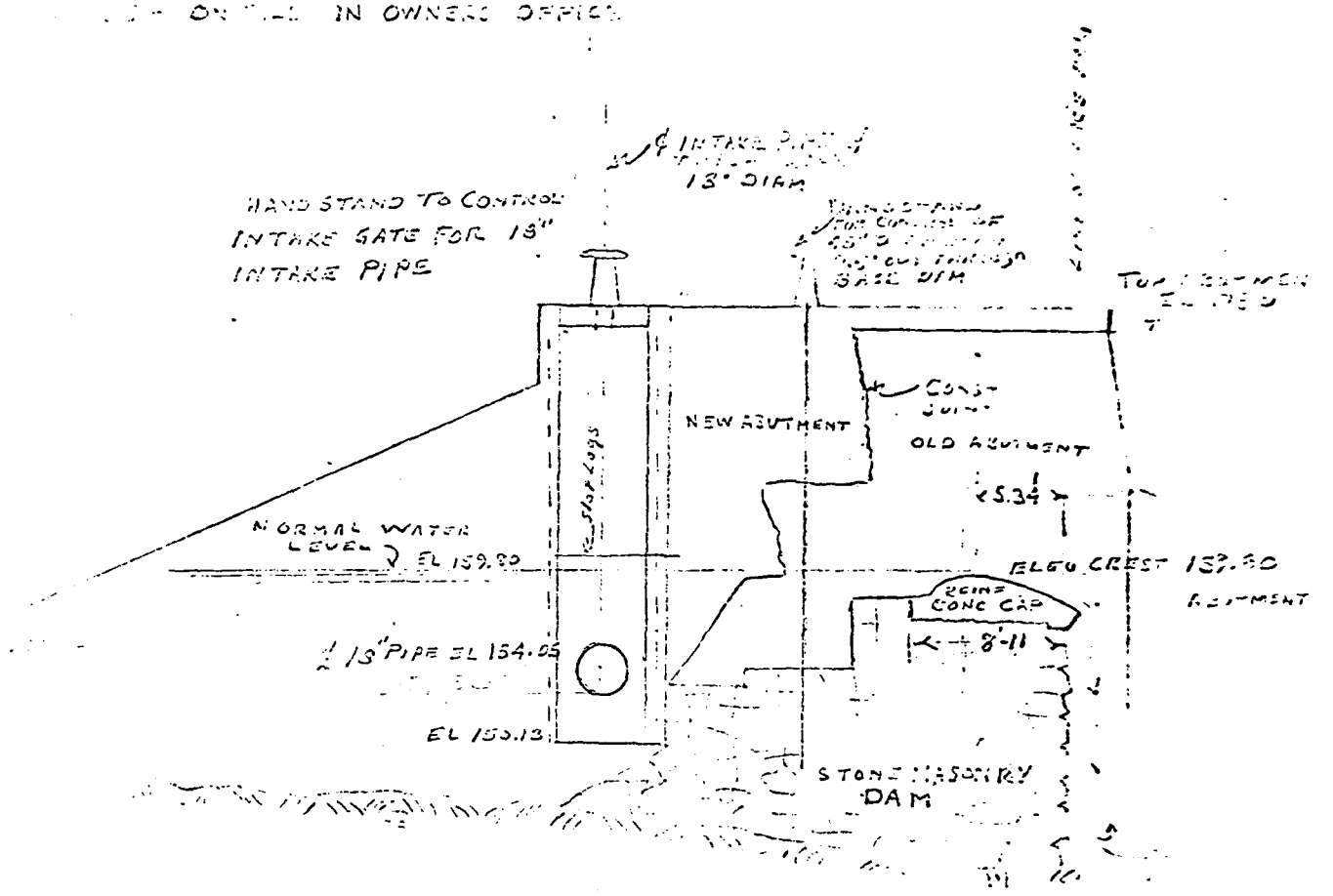
RCS/vk /sd
Attachments
Locus Plan
Sketches


DAM NO
STEVENS PAPER CO
MILL BUILDING
ROADWAY
DOWN STREAM DIKE
62'
50
LITTLE RIVER
STEEL SHEET PILING CUT OFF WALL
UPSTREAM DIKE & PILE CUT OFF WALL
RIP RAP OR ROCK FILL
POOL
ABUTMENT
MASONRY SPILLWAY
LOCUS DAM & DIKES
SAND 3'-0
GRAVEL 4'-6
RIPRAP 5'-0
B ZONE
SAND 1'-6
GRAVEL 2'-0"
RIP RAP
EL 140
EL 140
TYPICAL

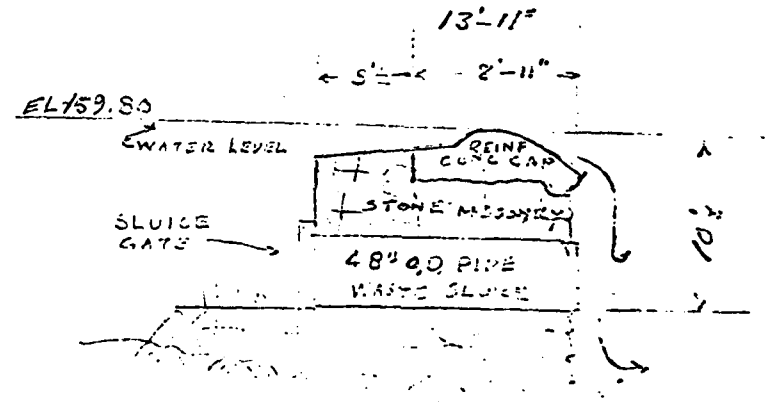


23.33'
31.0'
94.0'
40.0
of 3 ice breakers
of new conc cap
ICE BREAKER
Face of Dam
CONTRACTION JOINTS
LITTLE RIVER
PLAN
APPROX Scale 1" = 20'-0"
THIS PORTION OF ORIGINAL DAM LEFT
WITH CONC.
CONCRETE CAP
1955
El 159.80
OLD STONE MASONRY

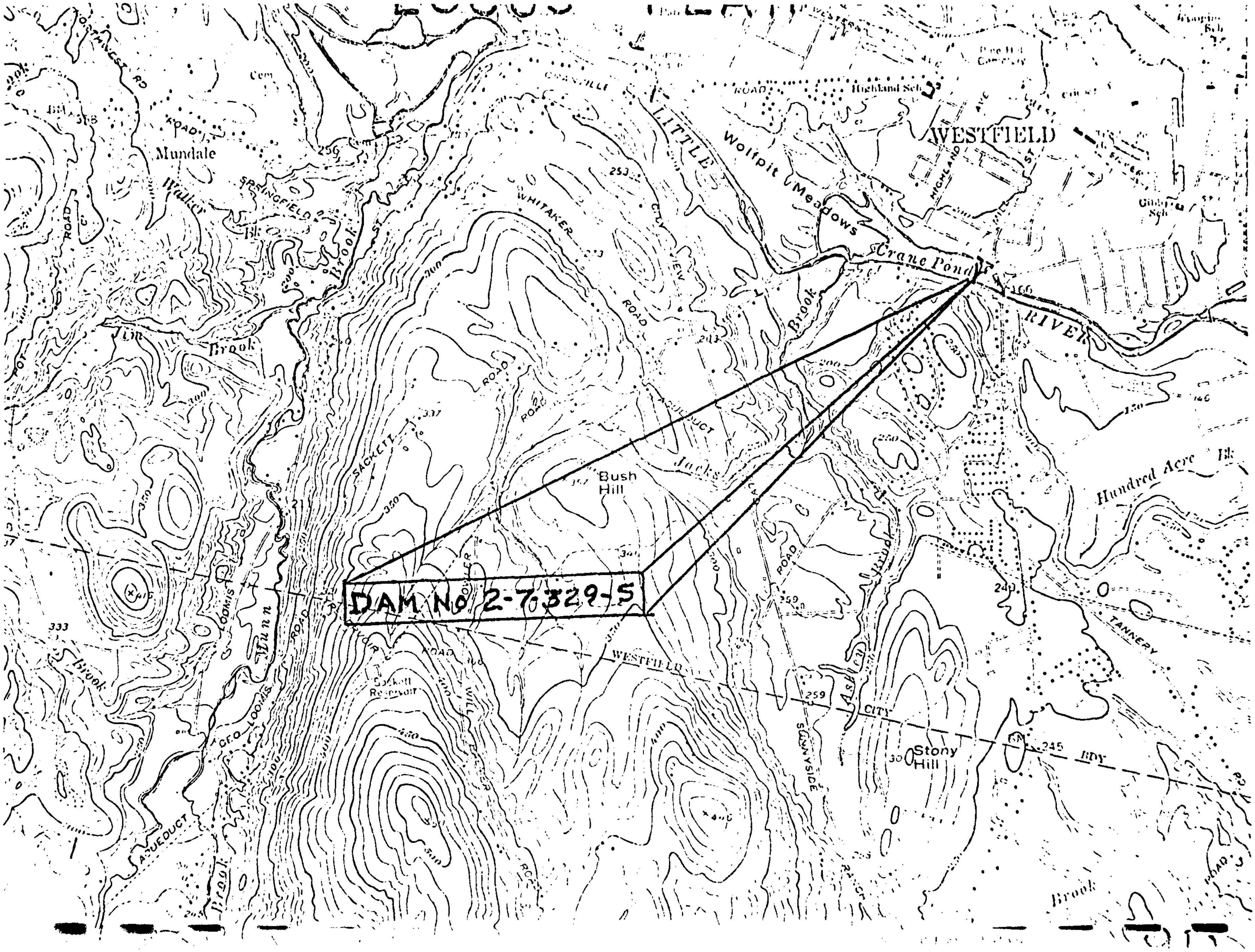
... ON FILE IN OWNERS OFFICE

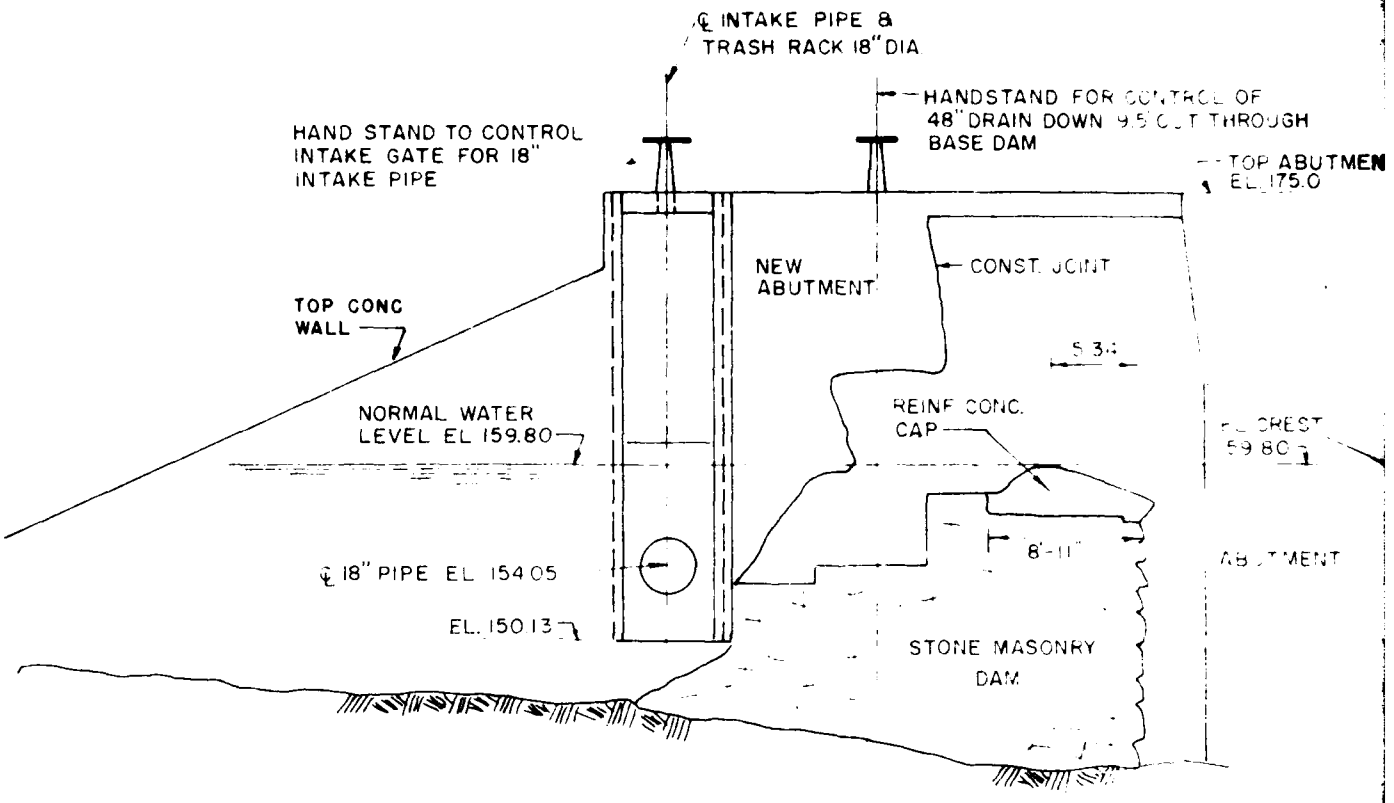


X SECTION AA

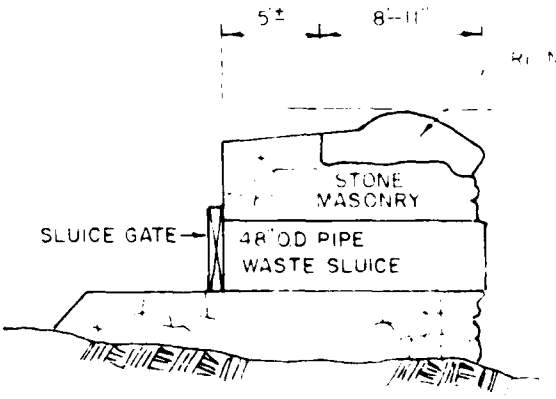


X SECTION BB

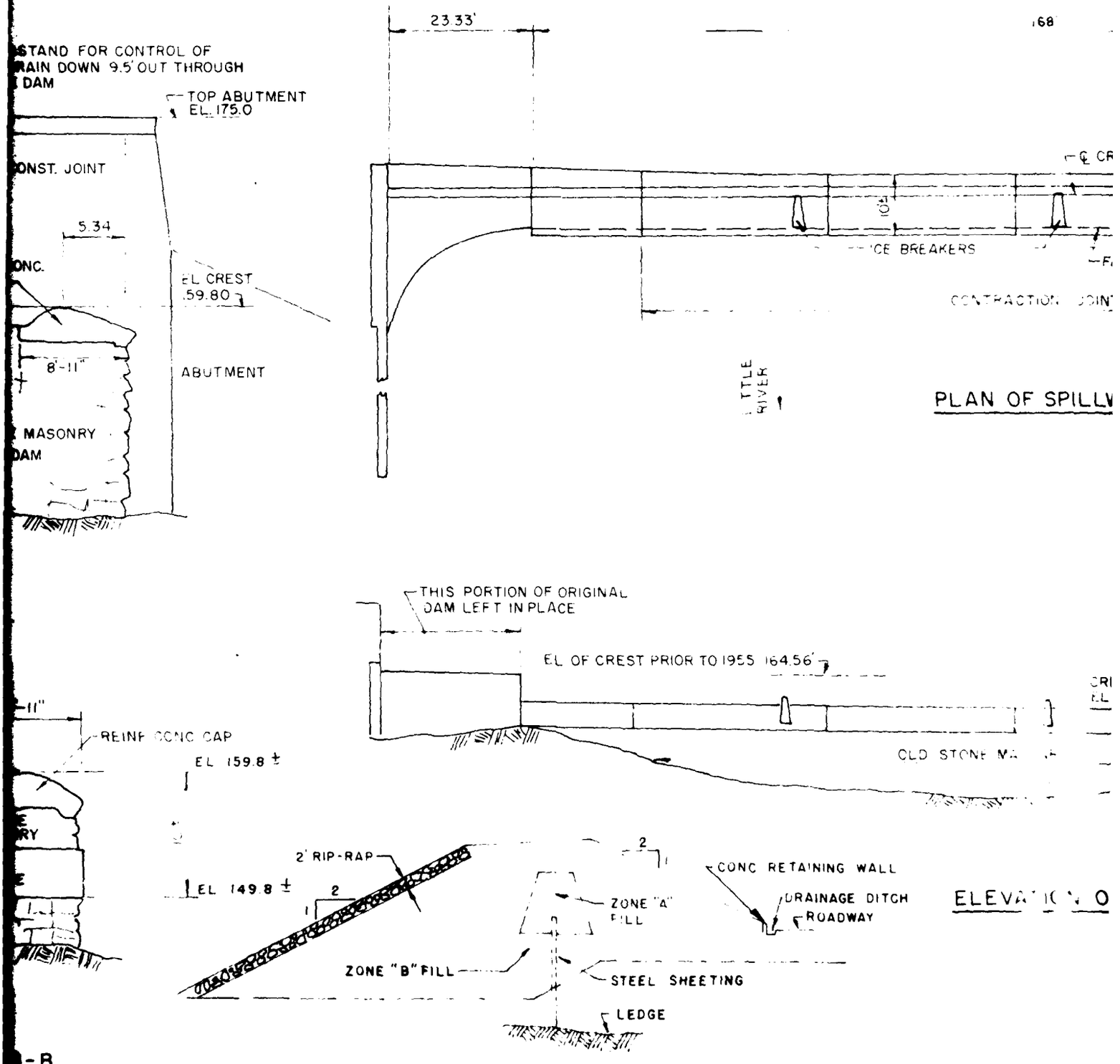

DAM No 2-7329-5
WESTFIELD
Crane Pond
Wolfpit Meadows
LITTLE
RIVER
Bush Hill
Stony Hill
Mundale
Munn Brook
Jacks Brook
Ashley Brook
Hundred Acre Bk
Sackett Reservoir
SACKETT ROAD
WHITAKER ROAD
CITY VIEW ROAD
SPRINGFIELD RD
TANNERY
AQUEDUCT
WESTFIELD CITY BDY
Highland Sch
HIGHLAND AVE



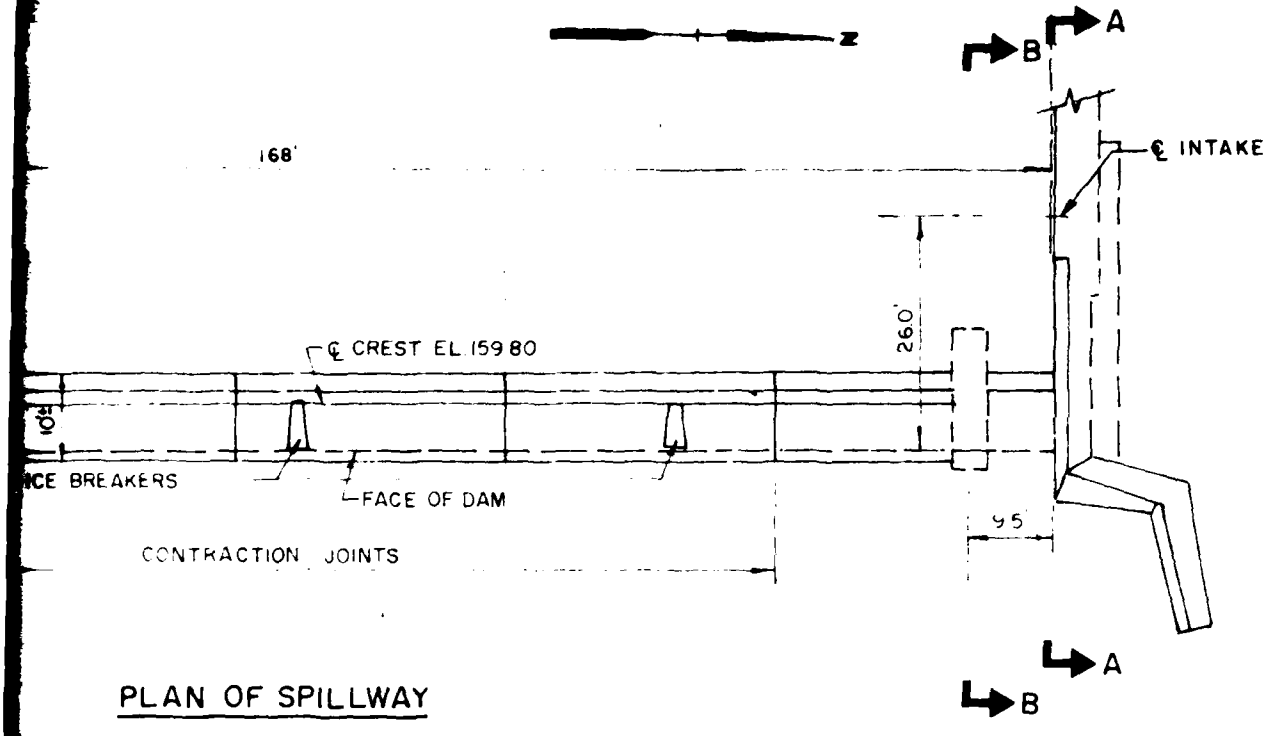
SECTION A-A



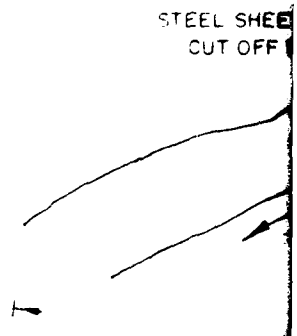
SECTION B-B

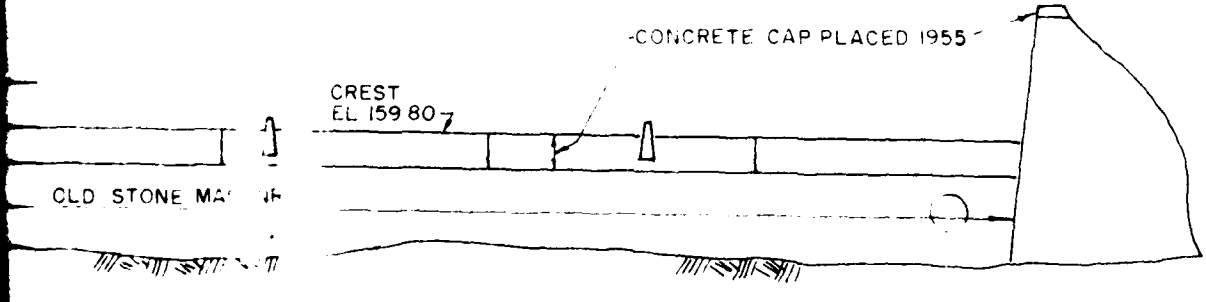

STAND FOR CONTROL OF
RAIN DOWN 9.5' OUT THROUGH
DAM
TOP ABUTMENT
EL. 175.0
ONST. JOINT
5.34
ONC.
EL CREST
159.80
8'-11"
ABUTMENT
MASONRY
DAM
23.33'
168'
ICE BREAKERS
CONTRACTION JOINT
TTLE
IVER
PLAN OF SPILLW
THIS PORTION OF ORIGINAL
DAM LEFT IN PLACE
EL OF CREST PRIOR TO 1955 164.56'
OLD STONE MA
11"
REINF CONC CAP
EL 159.8 ±
RY
2' RIP-RAP
EL 149.8 ±
2
1
2
1
CONC RETAINING WALL
ZONE "A"
FILL
DRAINAGE DITCH
ROADWAY
ELEVATION O
ZONE "B" FILL
STEEL SHEETING
LEDGE
-B
SECTION E-E

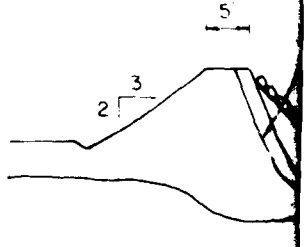
2



PLAN OF SPILLWAY



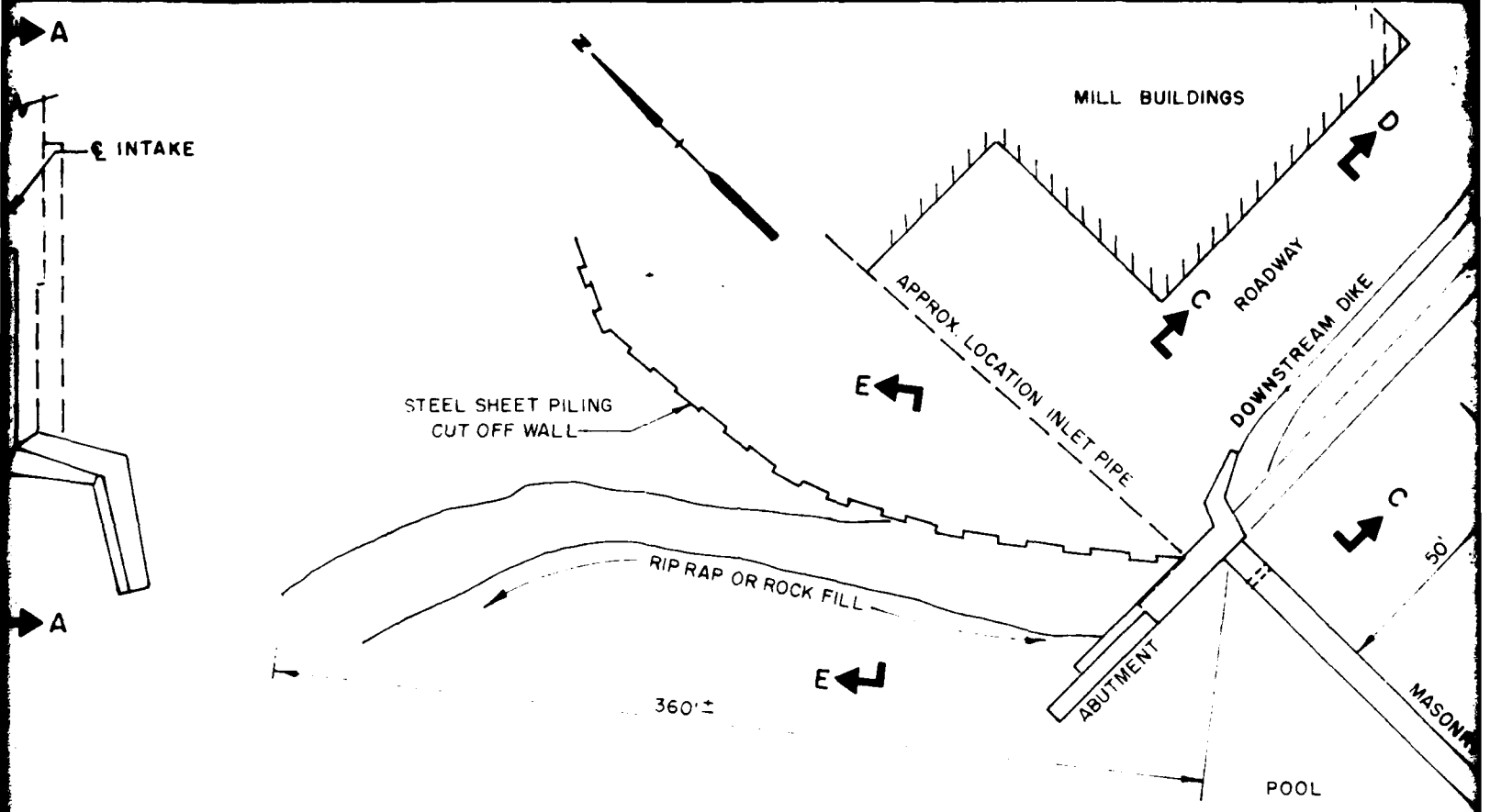




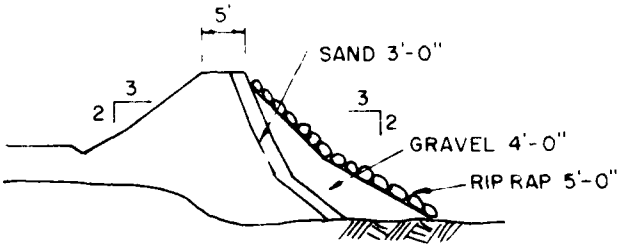
SECTION C

ELEVATION OF SPILLWAY

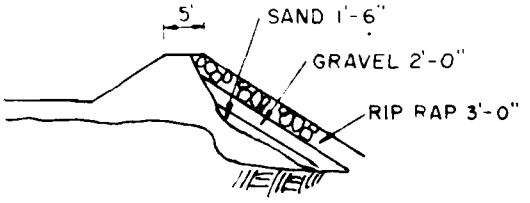
3



PLAN DAM & DIKE



SECTION C-C



SECTION D-D

HAYDEN, HARDING & BUCHANAN, INC
CONSULTING ENGINEERS
BOSTON, MASSACHUSETTS

U S AR

NATIONAL PROGRAM OF INSPECTI

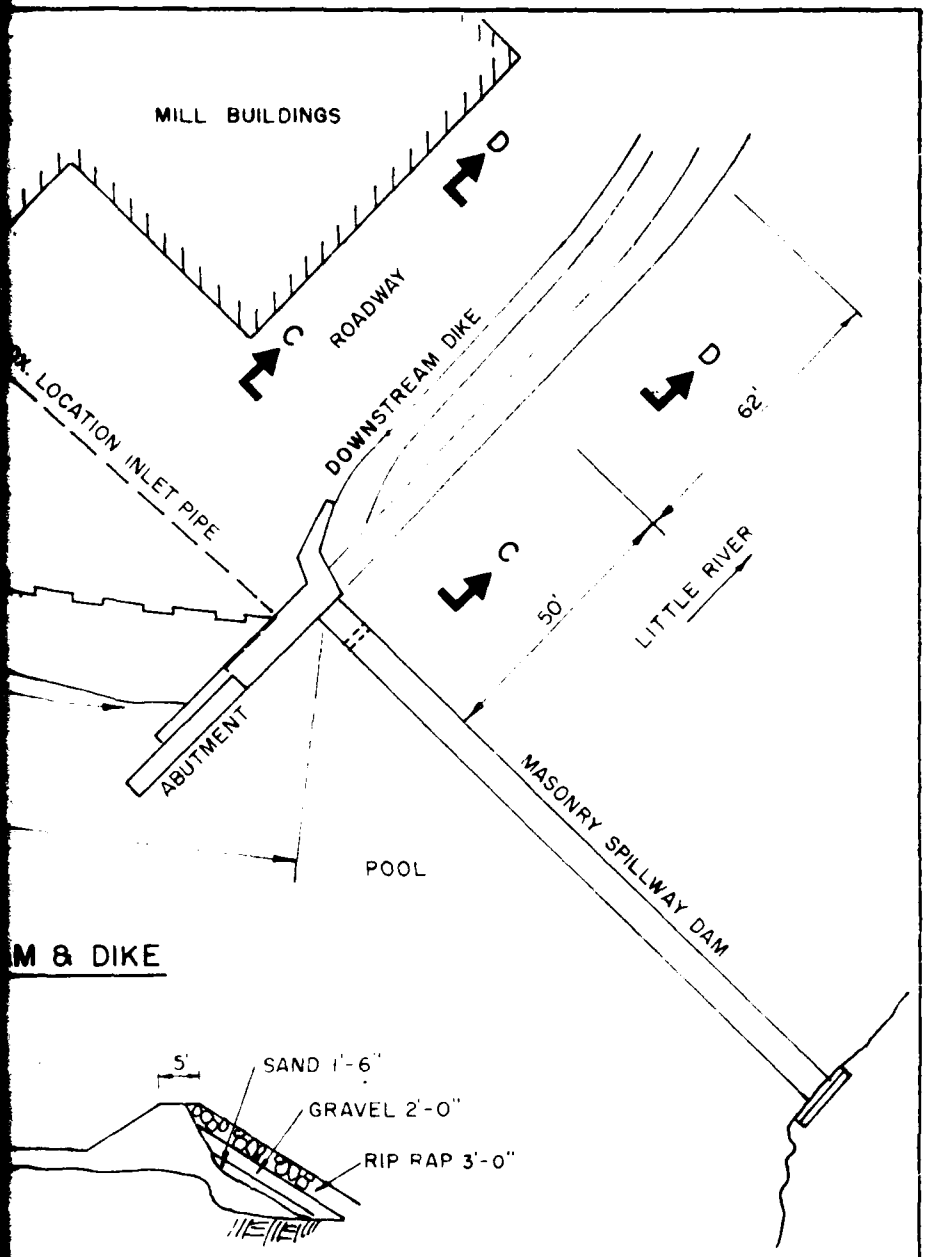
STEVENS PAPER

WESTFIELD

SCAL
DATE

TAKEN FROM: STONE & WEBSTER ENGINEERING CORPORATION 1955 DESIGN PLAN AND STATE 1973 INSPECTION REPORT SKETCHES

4



M & DIKE

SECTION D-D

HAYDEN, HARDING & BUCHANAN, INC •CONSULTING ENGINEERS BOSTON, MASSACHUSETTS	U S ARMY ENGINEER DIV NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS.

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

STEVENS PAPER COMPANY

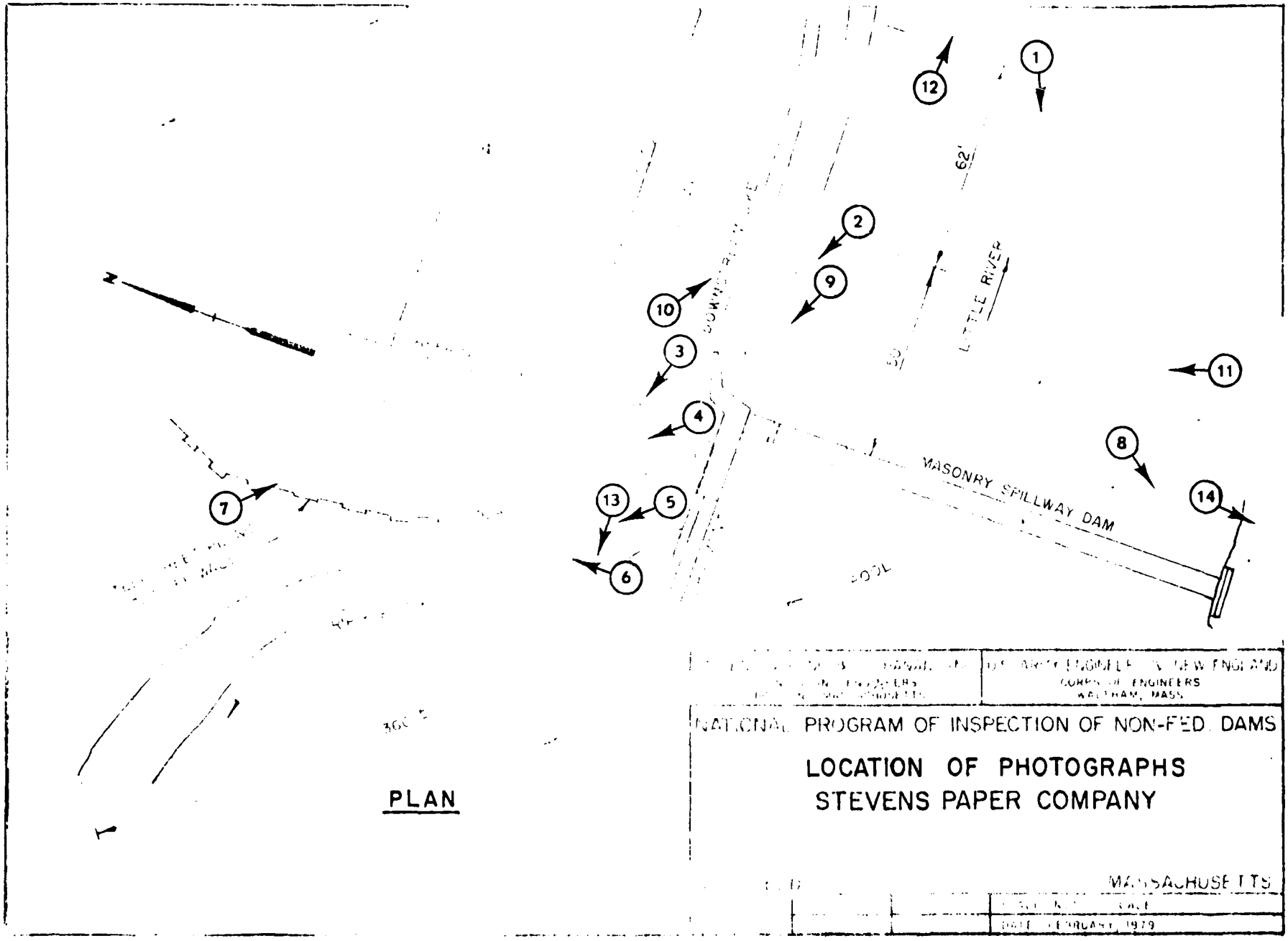
WESTFIELD MASSACHUSETTS

			SCALE NOT TO SCALE
			DATE FEBRUARY, 1979

5

APPENDIX C

PHOTOGRAPHS



U.S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

LOCATION OF PHOTOGRAPHS
STEVENS PAPER COMPANY

MASSACHUSETTS

			SCALE
			DATE FEBRUARY 1979

PHOTO NO. 1 - Downstream face of spillway section.

PHOTO NO. 2 - Left training wall of spillway.

PHOTO NO. 3 - Downstream face of embankment section from spillway towards left abutment.

PHOTO NO. 4 - Crest of embankment viewed from spillway training wall toward left abutment.

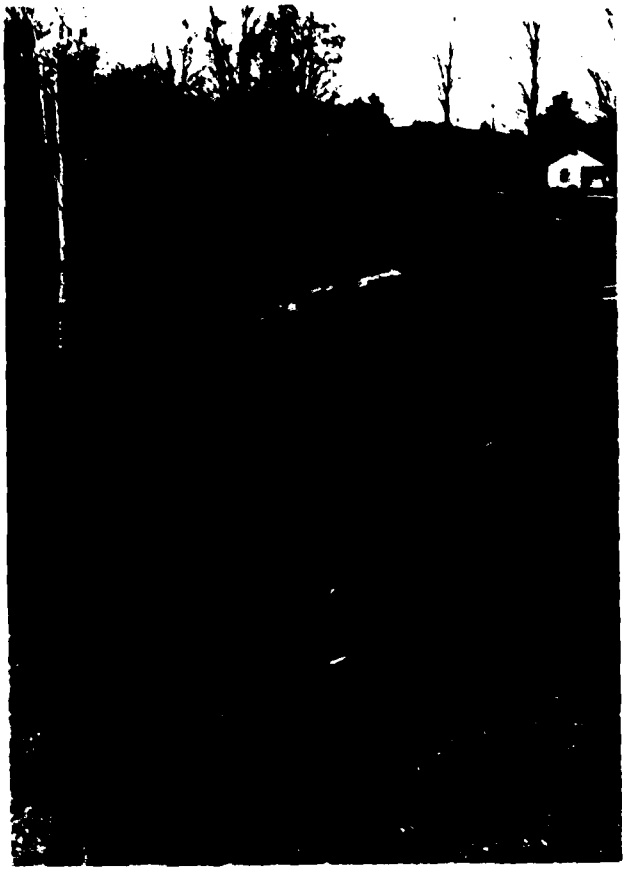


PHOTO NO. 5 - Upstream face of embankment viewed from spillway training wall toward left abutment.

PHOTO NO. 6 - Upstream face of embankment viewed from a point about 200 feet from spillway training wall toward the left abutment.

PHOTO NO. 7 - Downstream toe of embankment section.

PHOTO NO. 8 - Downstream face of spillway section and right training wall of spillway. Note bedrock outcrop at right end of spillway.

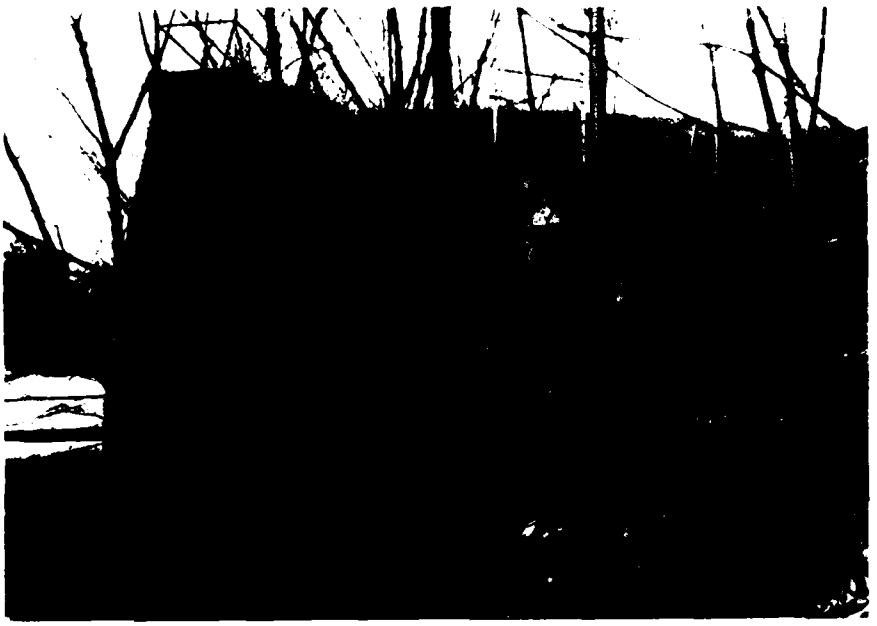


PHOTO NO. 9 - Left training wall of spillway viewed from bank of river channel downstream of spillway.

PHOTO NO. 10 - Downstream channel.

PHOTO NO. 11 - Left spillway abutment and mill complex.

PHOTO NO. 12 - Downstream channel from bridge shown in photo no. 10.

PHOTO NO. 13 - Upstream channel.

PHOTO NO. 14 - Erosion of downstream retaining wall at right abutment of spillway.

APPENDIX D

HYDROLOGIC AND HYDRAULIC COMPUTATIONS

	78.:44.1
	12-28-78
	1.1A
BY	FDD 1/2/79

HH&B HAYDEN, HARDING & BUCHANAN, INC
CONSULTING ENGINEERS
BOSTON, MASSACHUSETTS

SHEET NO. 1 of
JOB Dams
SUBJECT Stevens
CLIENT Corps
"Little River"

Dam rebuilt 1957 to replace earlier dam damaged by 1955 Flood. Calculations by Stone & Webster show peak flow Aug. 1955 = 23,100 cfs. New dam designed for 34,000 cfs @ Elev. 172.4 - See Stage discharge diagrams. No other calcs were located.

Hydraulic height ≈ 25'
Normal Storage ≈ 210 a-f
Max. Storage ≈ 800 a-f
Size Classification = Intermediate
Hazard Potential = High (Initial Assumption - lowered Pg 4
Test Fld = 1/2 PMF (max. Known flood of 23,100 cfs Aug. 19, 1955
storm of record

Test Fld = 1250 × 38.4 = 48,000. cfs (PMF on lower drainage area)
Drainage Area above Cobble Mtn. Reservoir not included (additional 45.8± sq. mi.) as Reservoir Level is below Spillway Elev. for normal operation.

With this area considered:
Test Fld = 1000 × 84.2 = 84,200. cfs

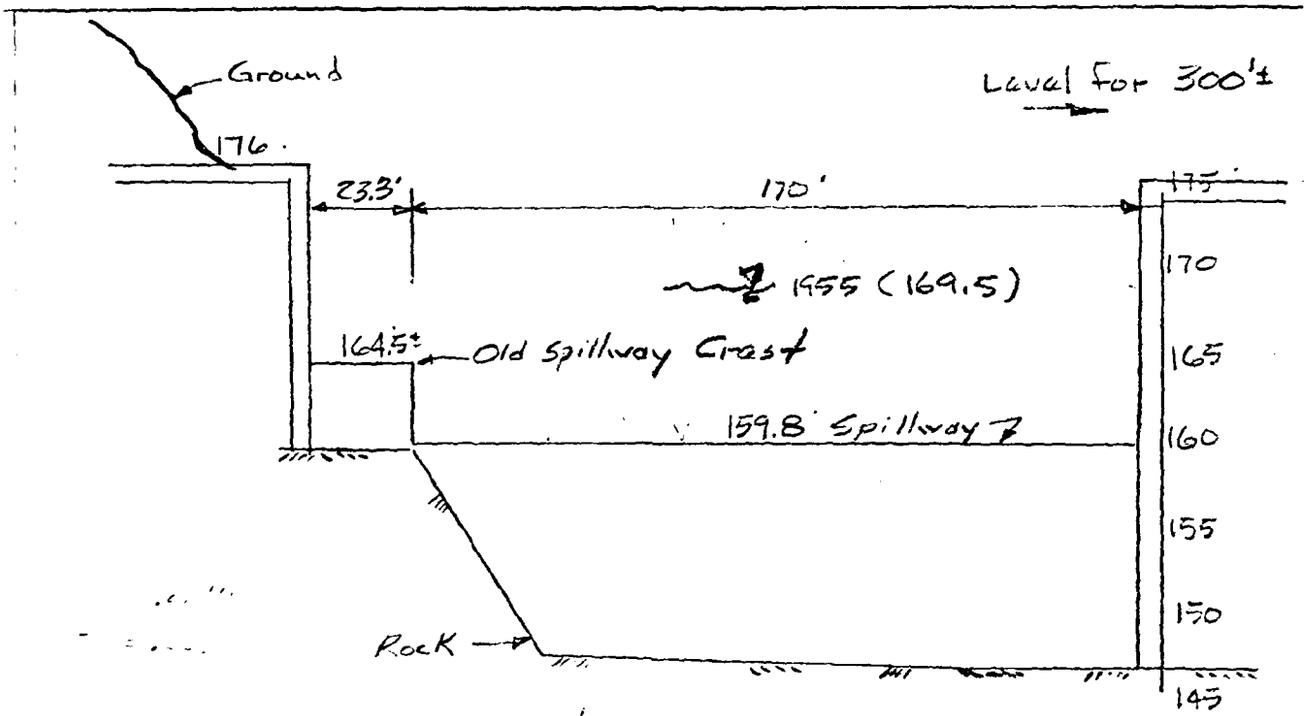
Neither case accounts for influence of other reservoirs & dams on storm runoff.

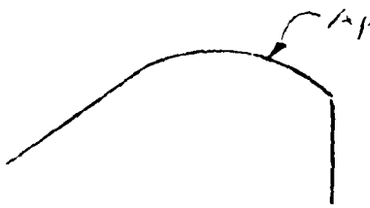
Since Au 1955 flood flow = 23,100. cfs and design 1957 for 34,000. cfs, verify 34000 cfs and 1/2 PMF of 42,100 cfs.
(Not very different from PMF over 38.4 s.m. = 48,000 cfs).
USGS Circular 377 & WSP 1420 Aug 19, 1955 flood 21,700 cfs at dam - calculated. Drainage area 77.7 sq. mi., "no flow" from Cobble Mtn.

12-26-78
FEW

HAYDEN, HARDING & BUCHANAN, INC
CONSULTING ENGINEERS
BOSTON MASSACHUSETTS

JOB Adams
SUBJECT Stevens
CLIENT Corps





$Q = CLH^{3/2}$

L	L	C	H	$H^{3/2}$	Q cfs	D'	L'	C'	$H^{3/2}$	Q'	Q_T
1	170'	3.28	1.0	1	558.	\					558
2	"	3.32	2.0	2.83	1597.	\					1597
3	"	3.46	3.0	5.2	3059.	\					3059
4	"	3.59	4.0	8.	4882.	\					4882
4.5	170	3.62	4.5	9.55	5877.	0'	23.3	—	—	0	5877
5	170	3.65	5	11.18	6937.	0.5	"	3.28	.35	27.	6964
8	"	"	—	—	—	—	—				—
10	"	"	10	31.62	19620.	5.5	"	3.65	12.9	1097	20717
12	"	"	—	—	—	—	—				
15	170	"	15	58.09	36045.	10.5	"	3.65	34.02	2894	38938

L	A	WP	$R^{2/3}$	$\frac{1.486}{0.05}(0.5)^{1/2}$	Q	
1	495.3	330'	1.31	4.2	2712.	} Flow over top of dam.
1.5	750	345	1.68	"	5300.	

Spillway between elev 160 and 175 has maximum capacity of about 39,000 cfs. This will be adequate for 23,100 cfs max. Known Flood and 34,000 cfs design flood. The 1/2 PMF of 42100 cfs will over-top the dam by about 1 foot to elev. 176±. A more detailed study may indicate that the 1/2 PMF passes the spillway w/o over-topping the dam.

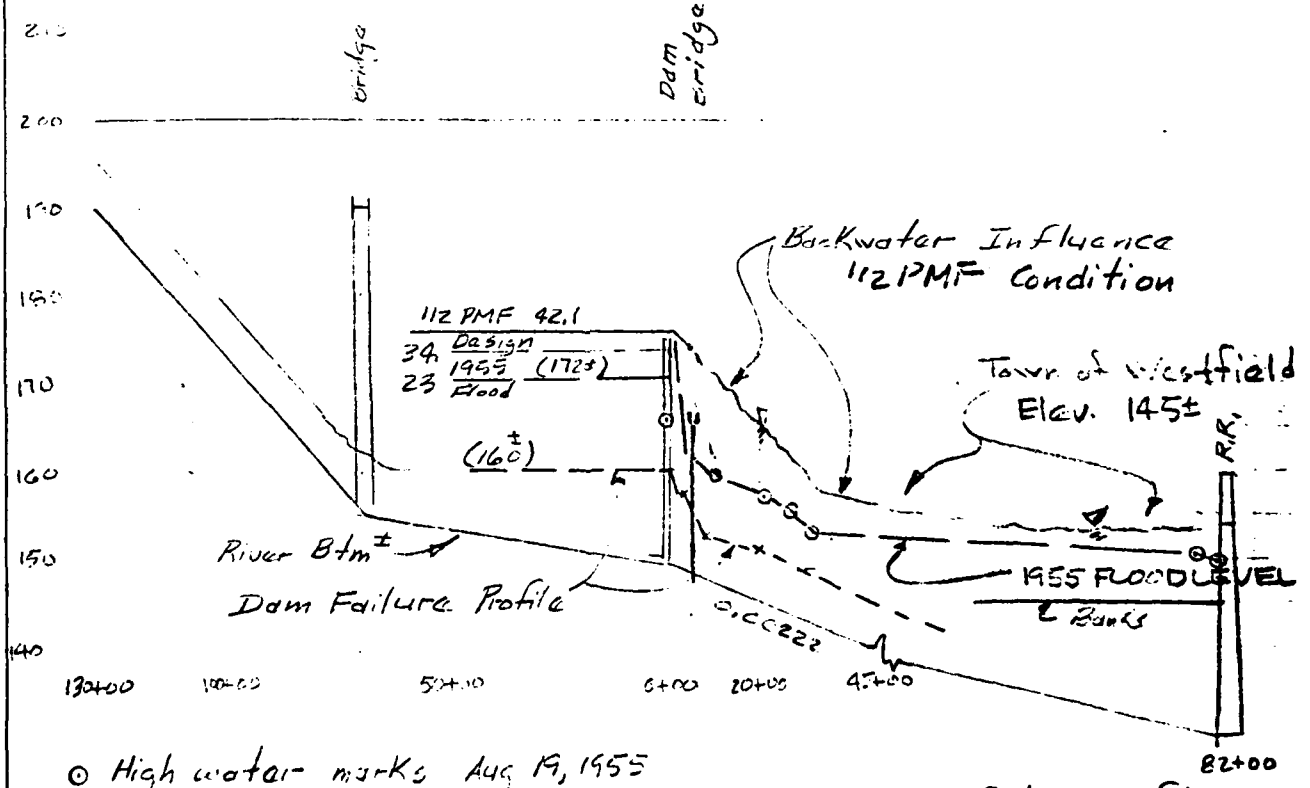
Qp_1 = 42100 cfs Stor = 1456 a-f or 0.4" +unoff

$Q_{1/2} = 42100\left(1 - \frac{0.4}{9.5}\right) = 40322$ cfs $El_{1/2} = 175.25$

$Qp_3 = 42100(1 - .39/9.5) = 40372$ $Stor_2 = 0.38$

Since Stor ≃ 0.4", $Qp_1 \cong Qp_2$ for practical purposes.

Flood Profiles - Various Flows



⊙ High water marks Aug 19, 1955
USGS WSP 1420 Peak Flow at dam 21,700 cfs calculated.

--x-- dam failure profile

78264.1
12-28-78
MH
FCO

HH&B HAYDEN, HARDING & BUCHANAN, INC.
CONSULTING ENGINEERS
BOSTON, MASSACHUSETTS

SHEET NO. 4
JOB Dams
SUBJECT Stevens
CLIENT Corps

Dam Failure

with water at top of dam elev 175 to 176

$$Q_F = 8/27 \times (76) \times \sqrt{32.2} \times (31)^{1.5} = 22100 \text{ cfs}$$

at this level there is major flooding d.s. due to flood flow - dam failure will not be significant as flow from normal spillage is 40,000 cfs ±

Assuming water level at elev. 160±, top of spillway the failure flow is

$$Q_F = 8/27 \times (76) \times \sqrt{32.2} \times (15)^{1.5} = 7424 \text{ cfs}$$

Since there is no spillage to cause d.s. flooding at elev 160±, this flow is significant. The capacity of the river channel to dissipate the failure flow should confine flooding to w/in river channel and certain low flood plain areas - damage to homes and loss of life is not evident. Hazard potential from dam failure is Low). Test flood would become 100 yr to 1/2 pmf. Ability of dam to stor storm runoff is very small therefore, $Q_{in} \simeq Q_{out}$ for practical purposes.

JOB NO. _____ SHEET NO. 1
DATE 12/29/78
BY MA
CHKD BY FOD

HAYDEN, HARDING & BUCHANAN, INC
CONSULTING ENGINEERS
BOSTON, MASSACHUSETTS

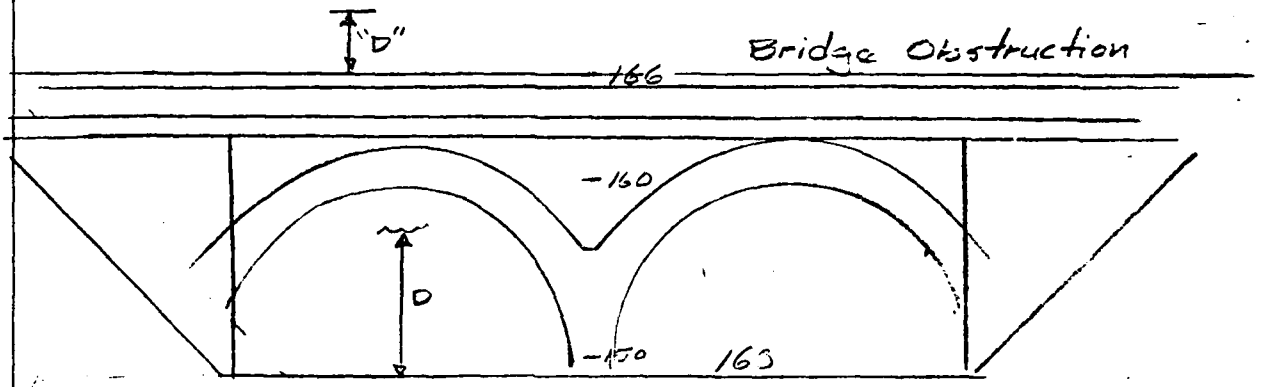
JOB Dams
SUBJECT Stevens
CLIENT Corps

Std 5+00 (downstream)

$S = 0.00222$ ft/ft

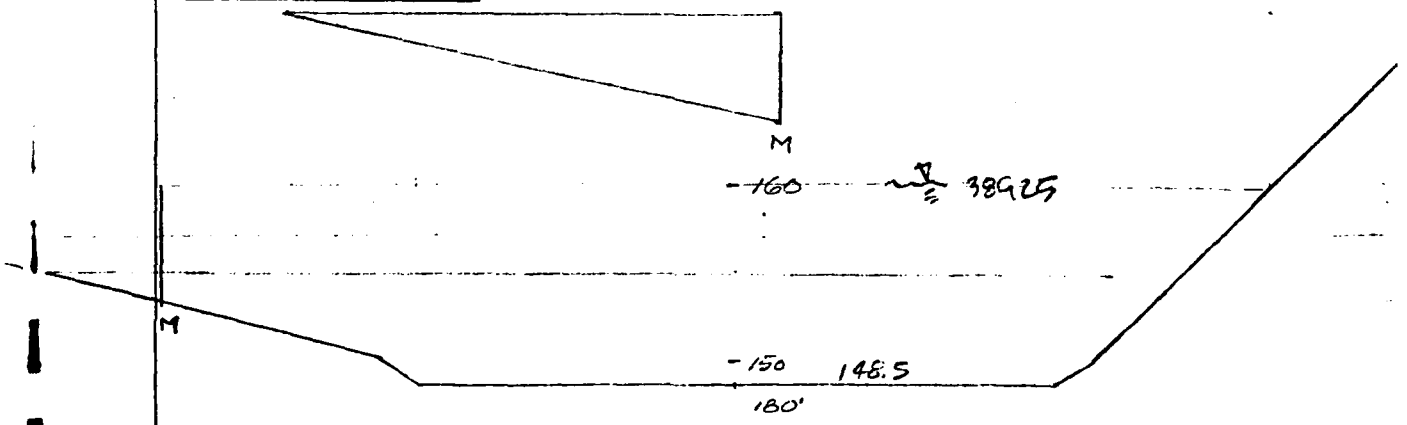
$n = 0.03$ river
0.05 at bridge

$K = \frac{1.486}{.03}(.00222)^{1/2} = 2.33$



D	A	WP	$R^{2/3}$	K	V	Q	Q_T
11	1760	182	4.6	2.33	10.7	19000	19000
12	1920	184	4.8	2.33	11.19	21500	21500 ✓
"4"	2800±	700±	2.53	1.4	3.54	10,000	31500
"9"	6000±	800±	3.86	1.4	5.4	32400	54,000
5	800	170	2.8	2.33	6.6	5300	5300

Sta 7+00 d.s. elev. 148.5±



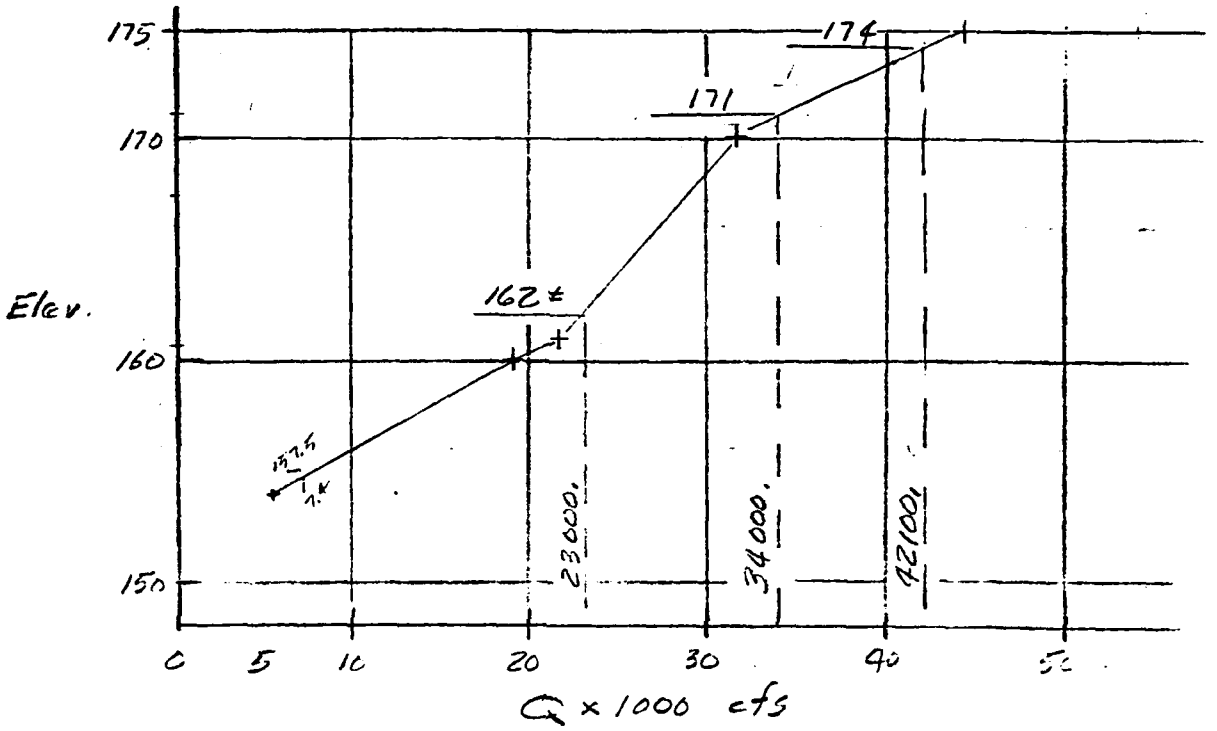
D	A	WP	$R^{2/3}$	K	V	Q	Elev	
11.5	4145	500	4.13	2.28	9.4	39,000	160	39925
12.5	4600	525	4.28	"	9.8	44,900	161	
7.5	1840	340	3.1	"	7.07	13,000		
9.5	2520	400	3.43	"	7.83	19,700		

DATE 12/29/78
BY MA
CH'D BY FDD

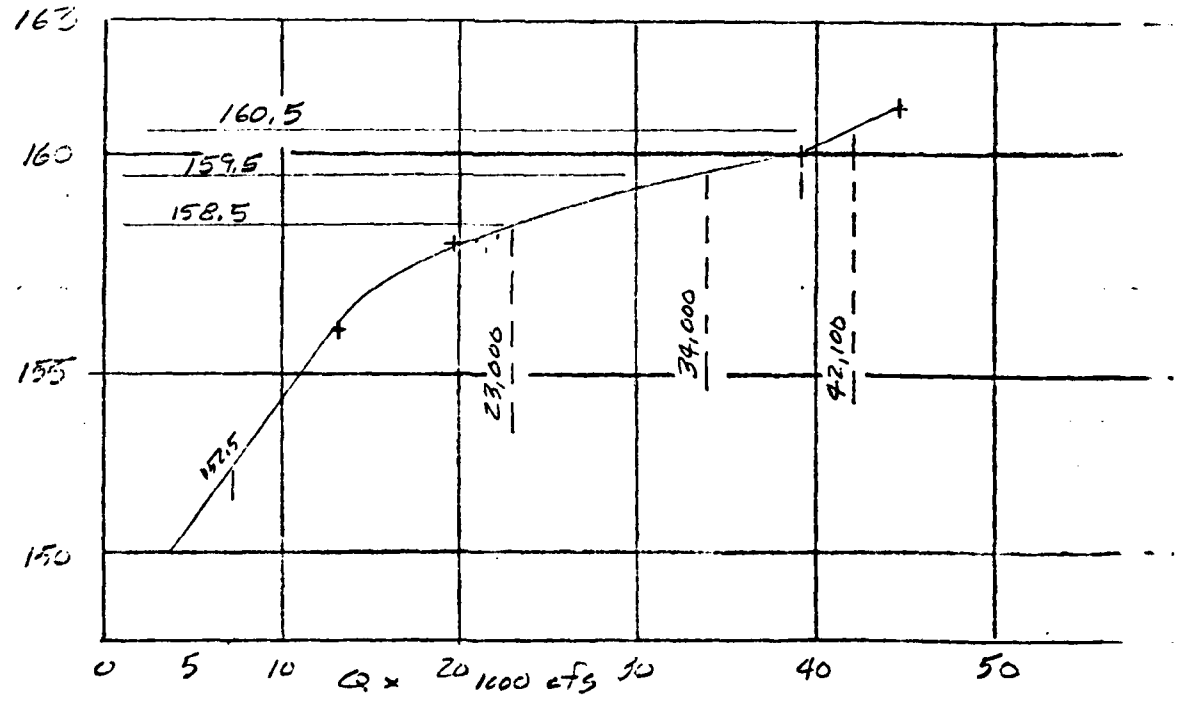
HAYDEN, HARDING & BUCHANAN, INC
CONSULTING ENGINEERS
BOSTON, MASSACHUSETTS

JOB Dams
SUBJECT Stevens
CLIENT Corps

Sta Str d.s. (bridge)



Sta. 7+00 d.s.



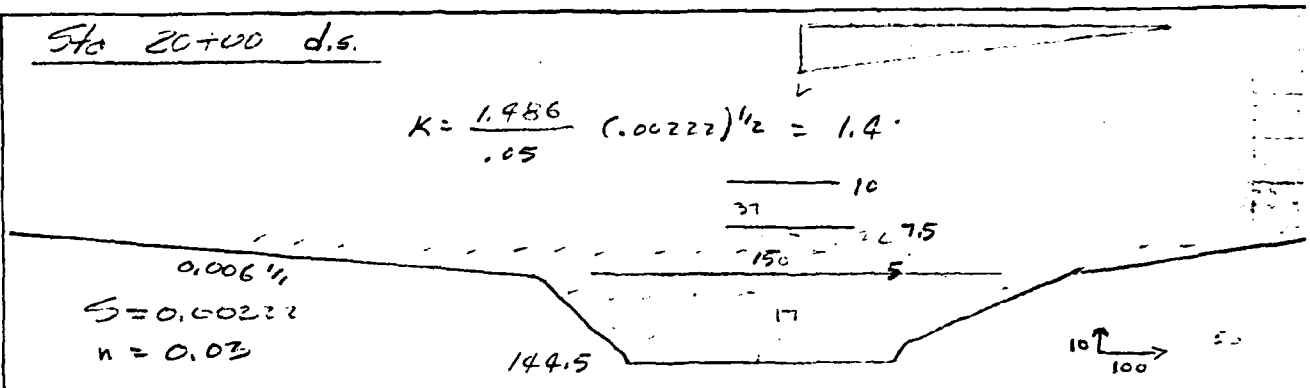
78.244.1
MA
FDD

HH&B HAYDEN, HARDING & BUCHANAN, INC.
CONSULTING ENGINEERS
BOSTON, MASSACHUSETTS

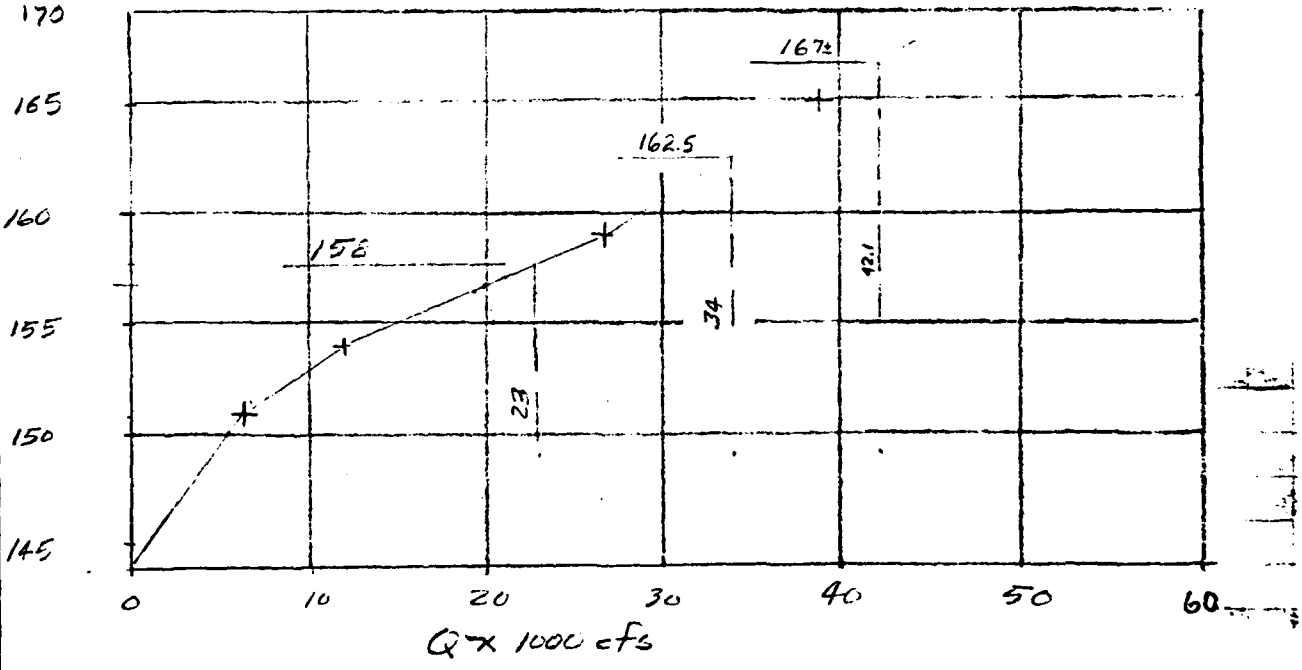
SHEET NO. 7
JOB Dams
SUBJECT Stevens
CLIENT Corps

Sta 20+00 d.s.

$K = \frac{1.486}{.05}(.00222)^{1/2} = 1.4$



D	A	WP	$R^{2/3}$	K	V	Q	
7.5'	1950	800	1.81	1.4	2.54	5000 ±	
10,	3800	1150	2.23	"	3.12	12000 ±	
15,	7100	1550	2.77	"	3.88	27,500 ±	✓
20	14000	5000	1.99	"	2.79	39,000 ±	elev 164.5 for ½ PMF



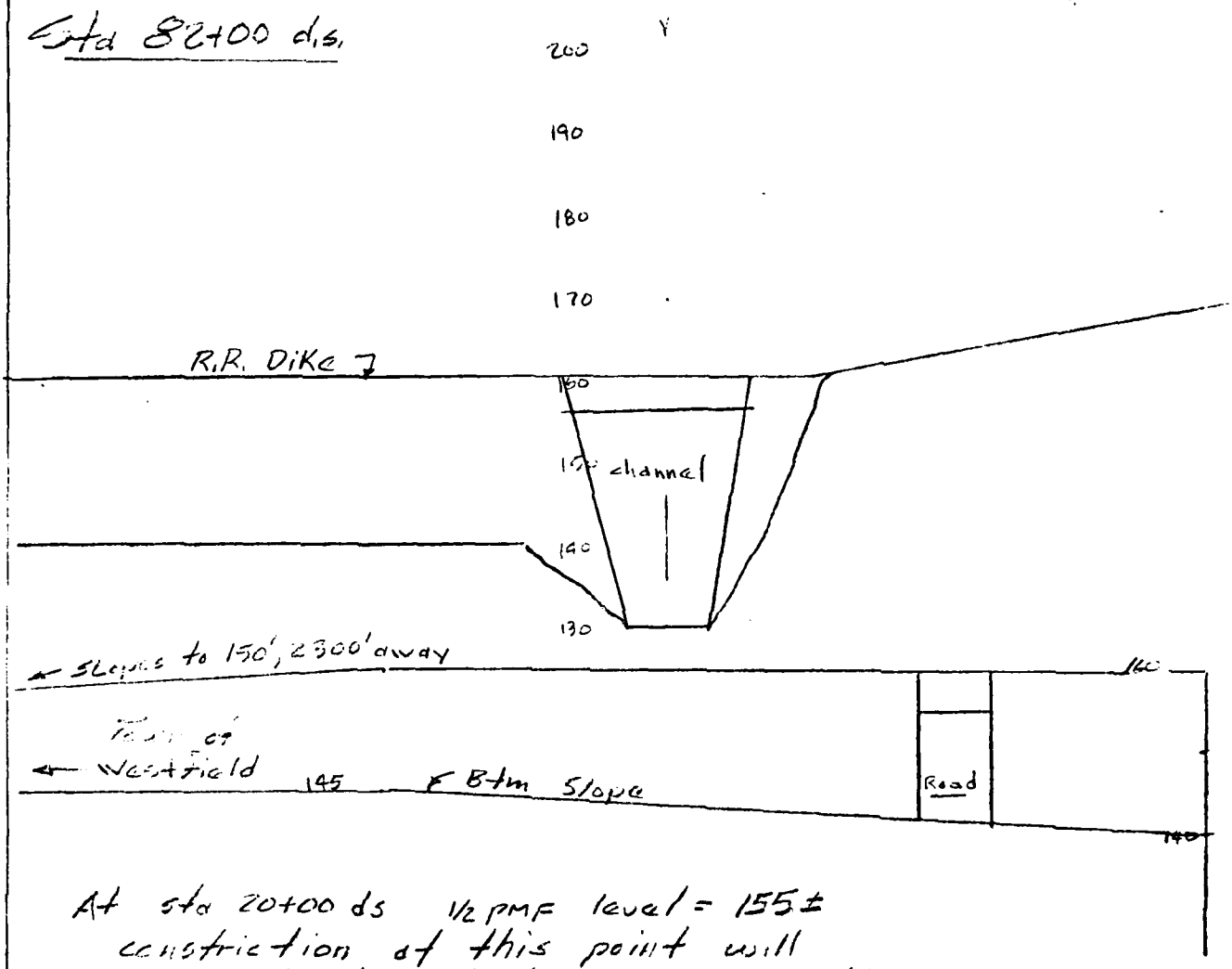
78.2791
12-28-78
MA
FDD

HH&B HAYDEN, HARDING & BUCHANAN, INC.
CONSULTING ENGINEERS
BOSTON, MASSACHUSETTS

SHEET NO. 8
JOB Dams
SUBJECT Stevens
CLIENT Corps

20 ↑ → 200

Sta 82+00 d.s.



At sta 20+00 ds 1/2 PMF level = 155±
constriction at this point will cause flood pool to be over the top of R.R. dike, this should occur near East Silver Str, West Hampton.
Influence of Westfield River will also cause backwater condition.
Flooding will occur between elev. 145 and 155, in the Town of West Hampton, for 1/2 PMF

Dam failure flood should be confined to river banks & adjacent low-flood plains below elev. 140±

78.244.1
12/19/78
M/-
FDD

HH&B HAYDEN, HARDING & BUCHANAN, INC.
CONSULTING ENGINEERS
BOSTON MASSACHUSETTS

SHEET NO. 9
JOB Dam
SUBJECT Stor. [illegible]
CLIENT Corps

Elev	Depth (ft)	Area (a.)	Ave Area	Stor (a-ft)	Accum Stor (a-ft.)
150	—	5.5	5.5	—	—
160	10.	49.6	27.6	276.	276.
164.5	4.5 (4.62)	70.7	60.2	271.	547.
170	5.5	96.4	83.6	460.	1007.
175	5.0	137.0	116.7	584.	1591.
176	1.0	145.11	141.1	141.	1732.
180	4.0	177.5	161.3	645.	2377.

Dam Failure Q-22100 cfs @ elev 175 to 176
(see ps 3,4) Q=7424 cfs @ elev 160± (spillway level)

5+00 $Q_{P_2} = 22100 \times (1 - \frac{22}{1732}) = 21520$
$El = 170^{\pm}$ Stor = 18 a-f
Ave Stor = 20
$Q_{P_3} = 22100 \times (1 - \frac{20}{1732}) = 21{,}844.$ cfs (7338)

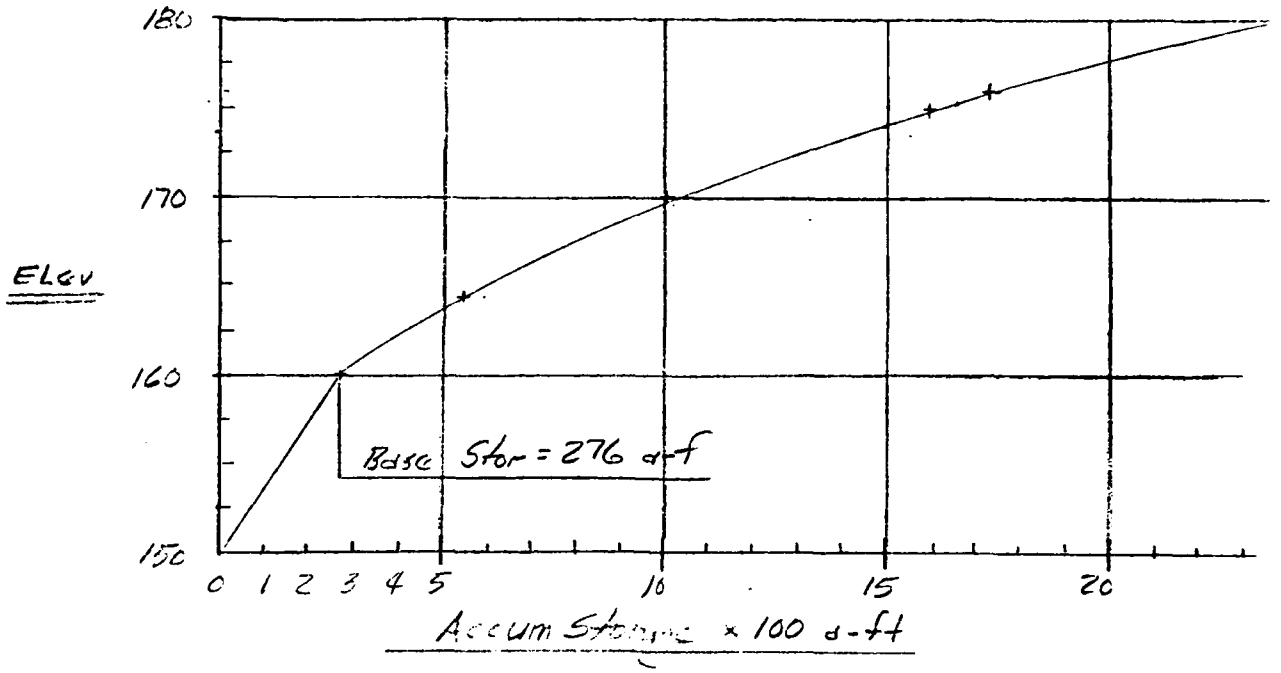
7+00 $Q_{P_1} = 21800$
El_1 158.25
$Q_{P_2} = 21800 \times (1 - \frac{15.6}{1732}) = 21{,}604.$ cfs
$El_2 = 158$ $Stor_2 = 14$
Ave S = 14.8
$Q_{P_3} = 21800 (1 - \frac{14.8}{1732}) = 21{,}614.$ cfs (7279)

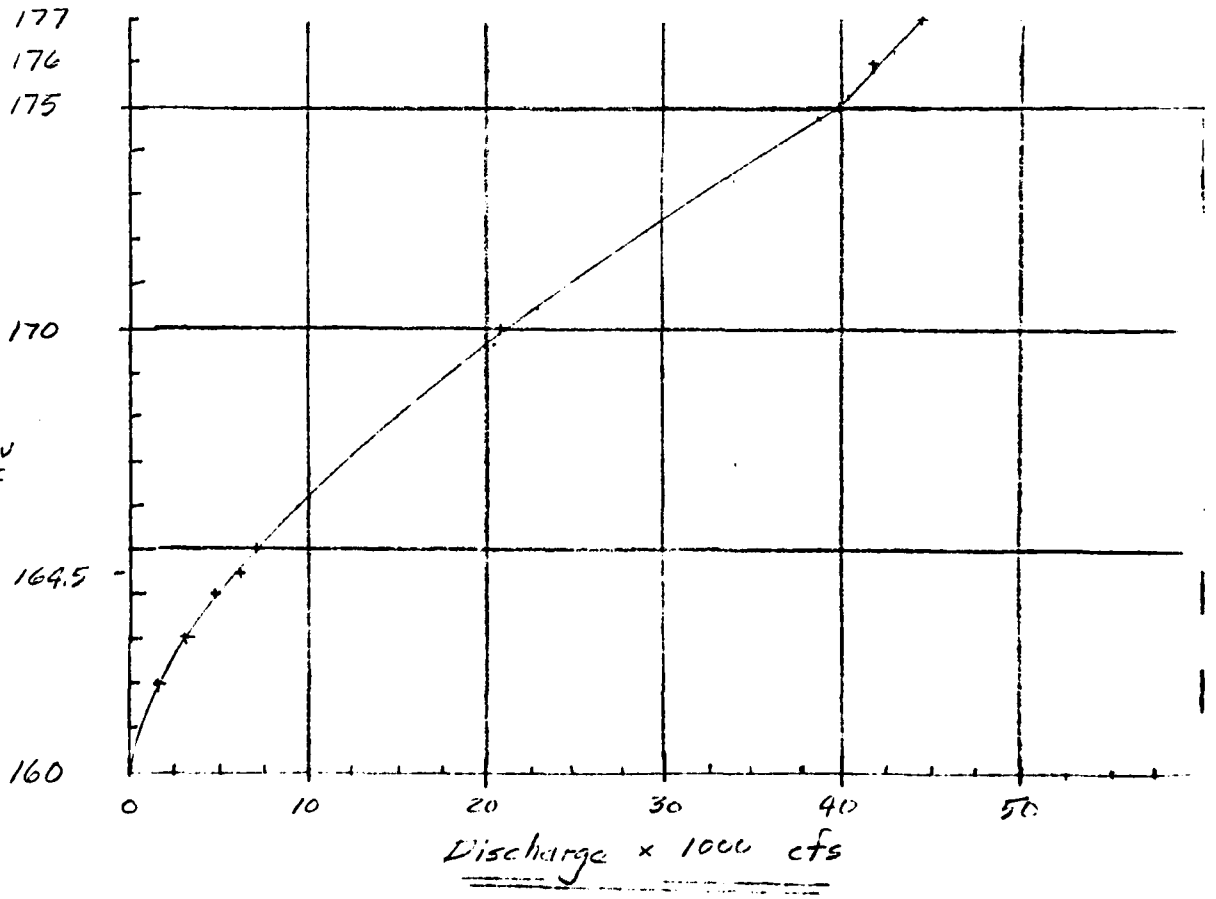
20+00 $Q_{P_1} = 21614$ $El_1 = 157$
$Q_{P_2} = 21614 (1 - \frac{146}{1732}) = 19789$ cfs
$El_2 = 156$ Stor 107
Ave = 127
$Q_{P_3} = 21614 (1 - \frac{127}{1732}) = 20{,}030.$ (6732) 156.5

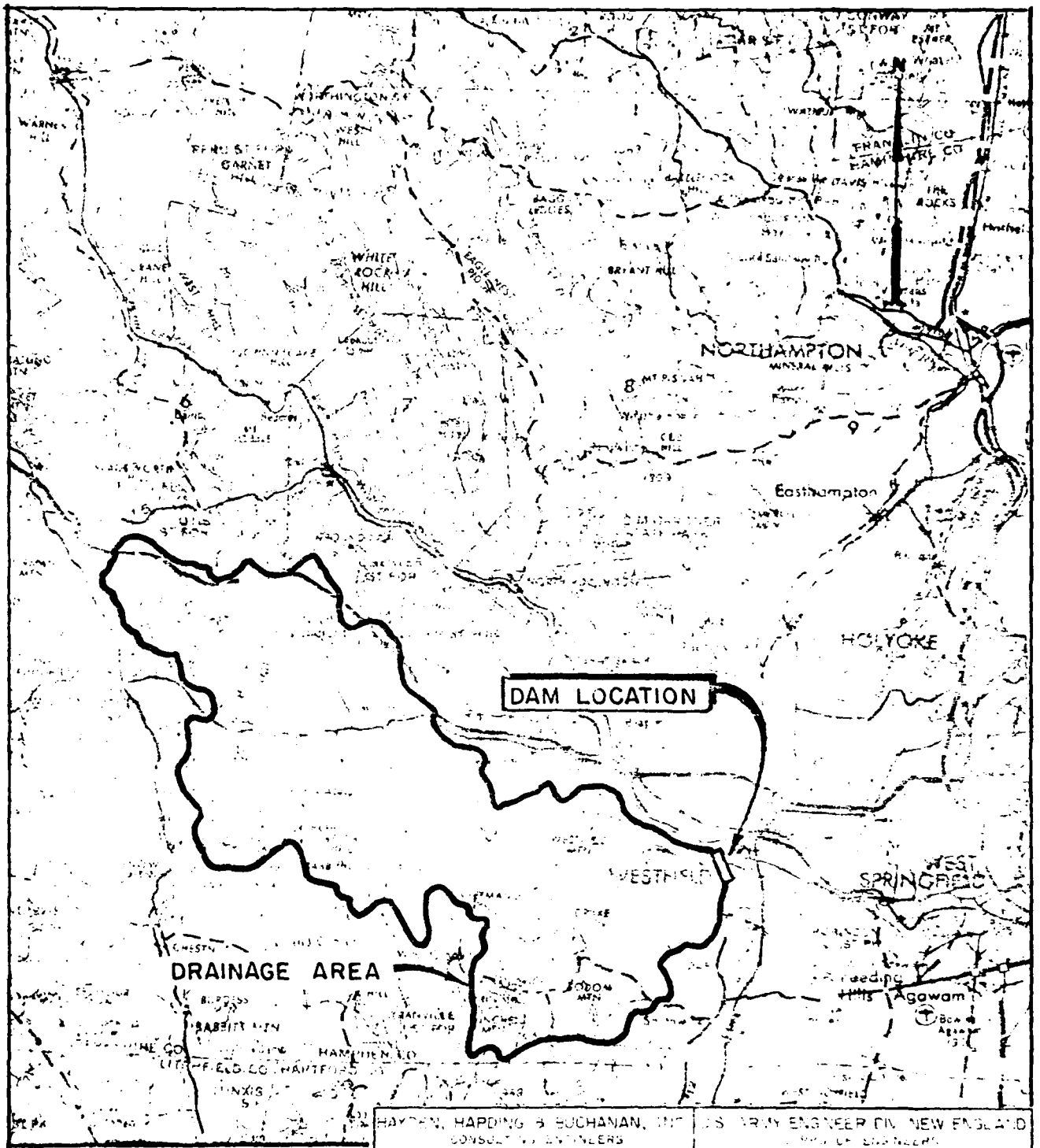
12/29/78
MA
by FDD

HAYDEN, HARDING & BUCHANAN, INC.
CONSULTING ENGINEERS
BOSTON, MASSACHUSETTS

SHEET NO. 14
JOB Dams
SUBJECT Stevens
CLIENT Corps







HAYDEN, HARDING & BUCHANAN, INC.
CONSULTING ENGINEERS
BOSTON, MASSACHUSETTS

U.S. ARMY ENGINEER DIV. NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.

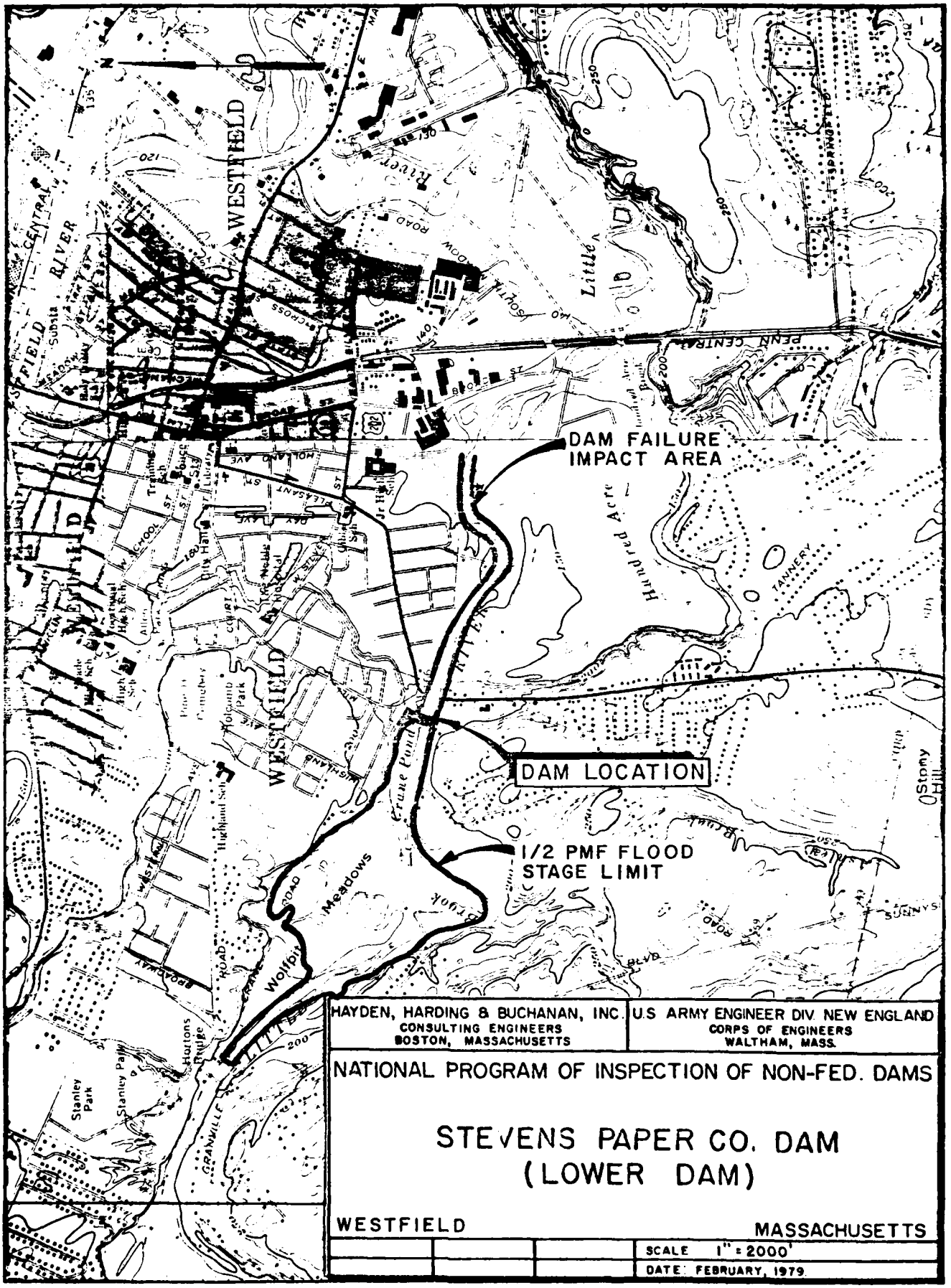
NATIONAL PROGRAM OF INSPECTION OF NON-FED DAMS

STEVENS PAPER CO. DAM
(LOWER DAM)

WESTFIELD MASSACHUSETTS

SCALE 1" = 250,000"

DEC. FEBRUARY 1973



HAYDEN, HARDING & BUCHANAN, INC. CONSULTING ENGINEERS BOSTON, MASSACHUSETTS	U.S. ARMY ENGINEER DIV. NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS.

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

STEVENS PAPER CO. DAM
(LOWER DAM)

WESTFIELD MASSACHUSETTS

SCALE 1" = 2000'

DATE: FEBRUARY, 1979

APPENDIX E

INFORMATION AS CONTAINED IN THE NATIONAL INVENTORY OF DAMS

INVENTORY OF DAMS IN THE UNITED STATES

(1) STATE	(2) IDENTITY NUMBER	(3) (4) (5) (6) (7) (8) (9) NAME	(10) LATITUDE (NORTH)	(11) LONGITUDE (WEST)	(12) REPORT DATE DAY | MO | YR
MA	74	STEVENS PAPER CO.LOWER DAM	4206.7	7246.0	23FEB79

(13) POPULAR NAME	(14) NAME OF IMPOUNDMENT
LOWER MILL DAM	CRANE POND

(15) REGION	(16) BASIN	(17) RIVER OR STREAM	(18) NEAREST DOWNSTREAM CITY–TOWN–VILLAGE	(19) DIST FROM DAM (MI.)	(20) POPULATION
01	6A	LITTLE RIVER	WESTFIELD	0	31433

(21) TYPE OF DAM	(22) YEAR COMPLETED	(23) PURPOSES	(24) STRUCTURAL HEIGHT (FT.)	(25) HYDRAULIC HEIGHT (FT.)	(26) (27) IMPOUNDING CAPACITIES MAXIMUM (ACRE-FT.)	NORMAL (ACRE-FT.)	DIST	OWN	FED R	PRV/FED	SCS A	VER/DATE
RE.GRCTPG	1900	S	30	25	1591	276	NED	N	N	N	N	07MAR79

(28) REMARKS

(29) O/S HAS	(30) (31) (32) SPILLWAY CREST LENGTH	TYPE	WIDTH (FT.)	(33) MAXIMUM DISCHARGE (FT.)	(34) VOLUME OF DAM (CY)	(35) (36) POWER CAPACITY INSTALLED (MW)	PROPOSED (MW)	(37) (38) (39) (40) (41) (42) (43) (44) (45) NAVIGATION LOCKS NO	LENGTH (FT.)	WIDTH (FT.)	LENGTH (FT.)	WIDTH (FT.)	LENGTH (FT.)	WIDTH (FT.)	LENGTH (FT.)	WIDTH (FT.)
Y	550	U	168	59000												

(46) OWNER	(47) ENGINEERING BY	(48) CONSTRUCTION BY
STEVENS PAPER MILL, INC	1955-STONE + WEBSTER	

(49) (50) (51) (52) REGULATORY AGENCY DESIGN	CONSTRUCTION	OPERATION	MAINTENANCE
NONE	NONE	NONE	NONE

(53) INSPECTION BY	(54) INSPECTION DATE DAY | MO | YR	(55) AUTHORITY FOR INSPECTION
HAYDEN HARDING + BUCHANAN, INC	05DEC78	PUBLIC LAW 92-367

(56) REMARKS

(Not very different from PMF over 50 s.m. = 40,000 cfs)
USGS Circular 377 & WSP 1420 Aug 19, 1955
Flood 21,700 cfs at dam - calculated. Drainage
area 77.7 sq.mi.; "no flow" from Cobble Mtn.

END

DATE
FILMED

9-84

DTIC