MIDDLESEX COUNTY
WESTFORD, MASSACHUSETTS

COMMODORE FOODS COMPANY DAM
MA-00131

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NATIONAL DAM INSPECTION PROGRAM
CORPS OF ENGINEERS

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS BEFORE COMPLETING FORM

1. REPORT NUMBER: MA 00131

2. GOVT ACCESSION NO.:

3. RECIPIENT'S CATALOG NUMBER:

4. TITLE (and Subtitle): Commodore Foods Company Dam

NATIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL DAMS

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NEW ENGLAND DIVISION

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9. PERFORMING ORGANIZATION NAME AND ADDRESS:

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11. CONTROLLING OFFICE NAME AND ADDRESS:
DEPT. OF THE ARMY, CORPS OF ENGINEERS
NEW ENGLAND DIVISION, NEDED
424 TRAPELO ROAD, WALTHAM, MA. 02254

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

19. KEY WORDS (Continue on reverse side if necessary and identify by block number):
DAMS, INSPECTION, DAM SAFETY,
Middlesex County
Westford, Mass.

20. ABSTRACT (Continue on reverse side if necessary and identify by block number):
It has been found to have a "low" hazard potential, The Commodore Foods Company Dam is of stone masonry construction, approximately 76.5 ft. in length and 16 ft. in height, with a 40 ft. wide overflow spillway. The peak failure outflow is estimated to be 3,300 cfs.

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

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24 May 1979
File No. 4270

New England Division
U.S. Army Corps of Engineers
424 Trapelo Road
Waltham, MA 02154

Attention: Mr. E.P. Gould, Project Manager

Subject: National Dam Inspection Program
Contract No. DACW33-79-C-0018, Item 4

Gentlemen:

The Commodore Foods Company Dam, Identification No. MA 00131, has been found to have a "low" hazard potential, as a result of the site visit conducted on 8 March 1979. This finding was brought to the attention of your Mr. Gary James of Project Management on 12 March 1979. At his request, this brief letter report documenting the "low" hazard potential classification of the dam is submitted in lieu of a complete Phase I Investigation report.

The dam is located across Stony Brook, adjacent to a Commodore Foods Company building in Westford, Massachusetts, Middlesex County, as shown on the Location Map, page A-1. A copy of the most recent available state inspection report, dated 9 October 1973, is included herein, page B-1. The Commodore Foods Company Dam is of stone masonry construction, approximately 76.5 ft. in length and 16 ft. in height, with a 40 ft. wide overflow spillway. Former outlet works gates and a pipe to the left and right of the spillway are no longer operative.

A "Site Sketch Plan", page C-1, shows the general configuration of the project and the direction of view of six photographs taken of the dam, Brookside Road Bridge and Stony Brook on 8 March 1979, pages C-2 through C-4. Measurements made at the dam site on the same day are given on pages D-1 and D-2.

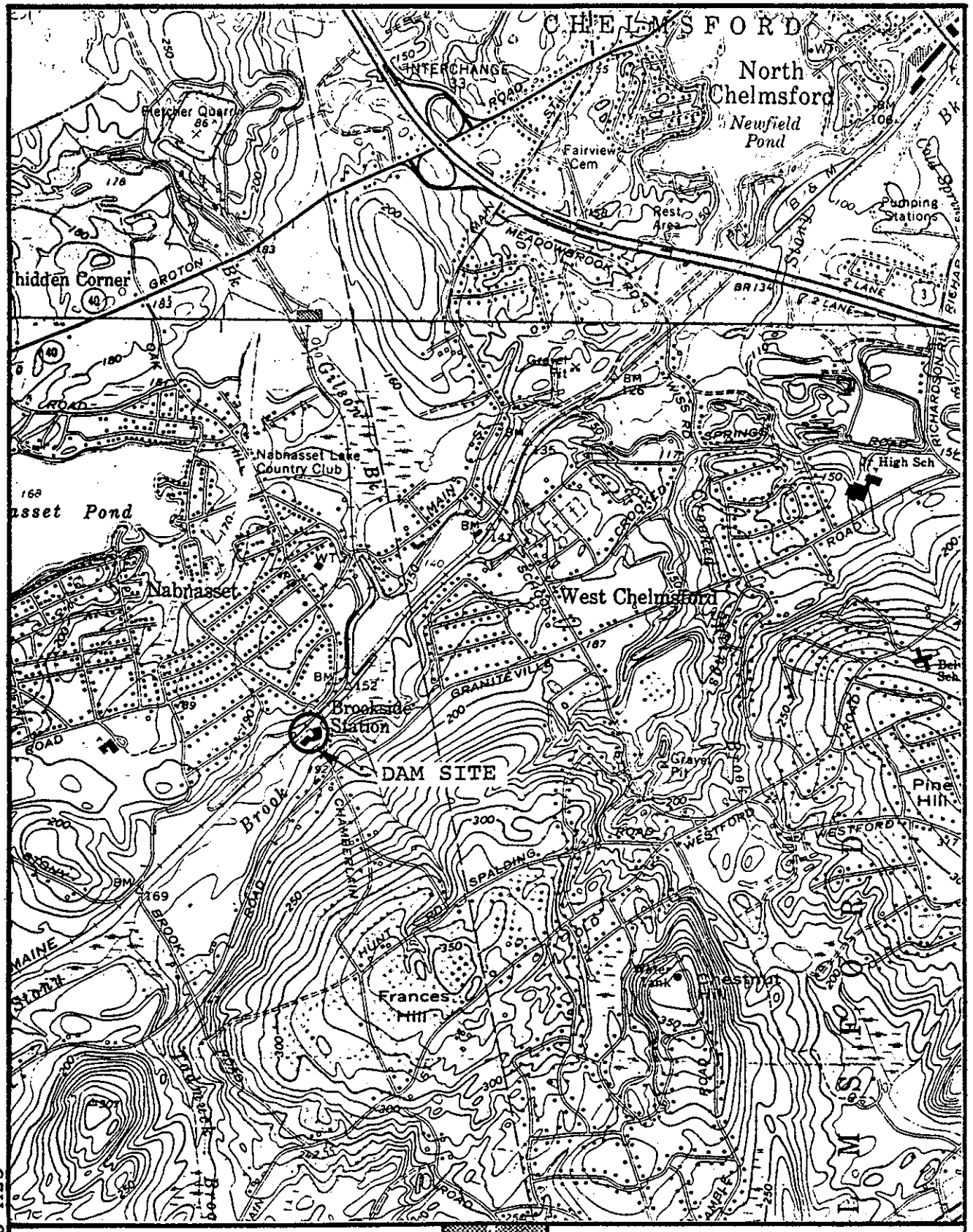
Based on Corps of Engineers Guidelines for Estimating Dam Failure Hydrographs, and assuming that a failure would occur along 40 percent of the length of the dam structure, the peak failure outflow is estimated to be 3,300 cfs. The downstream channel capacity, as shown in the attached computations, page D-3 and D-4, is more than adequate for this flow, and no flooding of the channel banks is expected to occur. A preliminary flood impact analysis of the effect on a pond located about 1,500 ft. downstream of the Brookside Road Bridge shows that the maximum increase in water surface level of the pond following entry of the failure flood waters would be about 3 ft. No dwellings are expected to be flooded as a result of the dam failure.

Therefore, it is considered that the hazard potential at the Commodore Food Company Dam site is low. Because of this finding, the Phase I assessment of the condition of the dam was not completed.

Very truly yours,
HALEY & ALDRICH, INC.

Peter L. LeCount
Vice President

PLL/bms
Enclosures



FILE NO. 4270 A25

DAM: COMMODORE FOODS CO.

IDENTIFICATION NO. MA 00131

N

LOCATION MAP

USGS QUADRANGLE

WESTFORD, MA

APPROX. SCALE: 1" = 2000'

January 15, 1974

Stuart Heywood, Plant Manager
Commodore Foods Company
645 Lawrence Street
Lowell, Massachusetts 01850

Re: Inspection-Dam #4-9-330-2
Westford
Commodore Foods Co. Dam

Dear Mr. Heywood:

An engineer from the Massachusetts Department of Public Works has inspected the above dam, owned by the Commodore Foods Company.

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. The controls for the five foot drain pipes are broken and need to be repaired or replaced as necessary.

2. Remove the growth from the joints of the masonry wall and repoint as needed.

3. Replace the missing masonry stones.

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

Very truly yours,

Fred. C. Schwelm

FRED. C. SCHWELM
Deputy Chief Engineer

LBA
LBA:rey
CC: C.F. Mistretta
L. LaBella

INSPECTION REPORT - DAMS AND RESERVOIRS

(1.) Location: ~~City~~/Town WESTFORD Dam No. 4-9-330-P

Name of Dam COMMODORE FOODS CO. DAM Inspected by A.Z. PIZANO, F.H. PARE

Date of Inspection 10-9-'73

(2) Owner: per: Assessors ✓ Prev. Inspection

Reg. of Deeds Rent. Contact

1. COMMODORE FOODS CO. 645 LAWRENCE ST. LOWELL, MASS 01850 (459-2551)

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.

STU. HEYWOOD, PLANT MGR. COMMODORE FOODS CO. 459-2551

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

(4) No. of Pictures taken 3

(5) Degree of Hazard: (if dam should fail completely)*

1. Minor ____ 2. Moderate ✓

3. Severe ____ 4. Disastrous ____

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

(6) Outlet Control: Automatic ✓ Manual ____

Operative ____ Yes: ____ ✓ no.

Comments: THE [redacted] CONTROLS FOR THE 5' EMERGENCY DRAIN PIPES ARE BROKEN, AND HAVE NOT BEEN REPAIRED. THE PIPE VALVES SHOULD BE REPAIRED (SEE NO. 12)

(7) Spillway - Name of Dam: Condition:

Good ✓ Minor Repairs ____

Major Repairs ____ Urgent Repairs ____

Comments: ____

DAM NO. 4-9-530-2

(8) Downstream Face of Dam: Condition: 1. Good ✓ 2 Minor Repairs ____

3. Major Repairs ____ 4 Urgent Repairs ____

Comments: ____

(9) Emergency Spillway: Condition: 1. Good ____ 2. Minor Repairs ____

3. Major Repairs ✓ 4. Urgent Repairs ____

Comments: SEE NO. 6

(10) Water level @ time of inspection ____ ft. above 0.5' below ____

top of dam ✓ Principal spillway ____

other ____

(11) Summary of Deficiencies Noted:

Growth (Trees and Brush) on Embankment ✓ (SEE PICTURES)

Animal Burrows and Washouts ____

Damage to slopes or top of dam ____

Cracked or Damaged Masonry ____

Evidence of Seepage ____

Evidence of Piping ____

Erosion ____

Leaks ____

Trash and/or debris impeding flow ____

Clogged or blocked spillway ✓

Other ____

DAM NO. 4-9-330-2

(12) Remarks & Recommendations: (Fully Explain)

URGENT REPAIRS ARE NEEDED TO OPEN THE 5' DIAMETER PIPES, SO THAT HOMES DO NOT HAVE WATER IN CELLARS, UPSTREAM, WHEN WATER RISES TO HIGHER THAN DESIGNED ELEVATION. THE [redacted] CONTROL IS RATCHET OPERATED.

(13) Overall Condition:

1. Safe ✓
2. Minor repairs needed ✓
3. Conditionally safe - major repairs needed _____
4. Unsafe _____
5. Reservoir impoundment no longer exists (explain)

Recommend removal from inspection list _____

DESCRIPTION OF DAM
DISTRICT #4

Submitted by FRANCIS H. PARE & ADAM Z. PIZAN
Date 10-4-73

Dam No. 4-9-330-2
City/Town WESTFORD
Name of Dam COMMODORE FOODS DAM

1. ~~Location: Topo Sheet No.~~ 75 C
~~Provide 8½" x 11" in clear copy of topo map with location of Dam clearly indicated.~~

2. Year built: UNKNOWN Year/s of subsequent repairs UNKNOWN

3. Purpose of Dam: Water Supply ____. Recreational ✓
Irrigation ____. Other ____

4. Drainage Area: 3.5 SQ. MI. 2,250 ACRES.

5. Normal Ponding Area: 75 acres; Ave Depth 4'
impoundment: 100 MIL. gals; 300 acre ft.

6. No. and type of dwellings located adjacent to pond or reservoir ____
i.e. summer homes etc. ____

7. Dimensions of Dam: Length 25' Max. Height 5' DEPTH @ DAM
Slopes: Upstream Face VERT.
Downstream Face VERT.
Width across top 5'

8. Classifications of Dam by Materials:
Earth ____. Conc. Masonary ✓. Stone Masonary ✓
Timber ____. Rockfill ____. Other ____

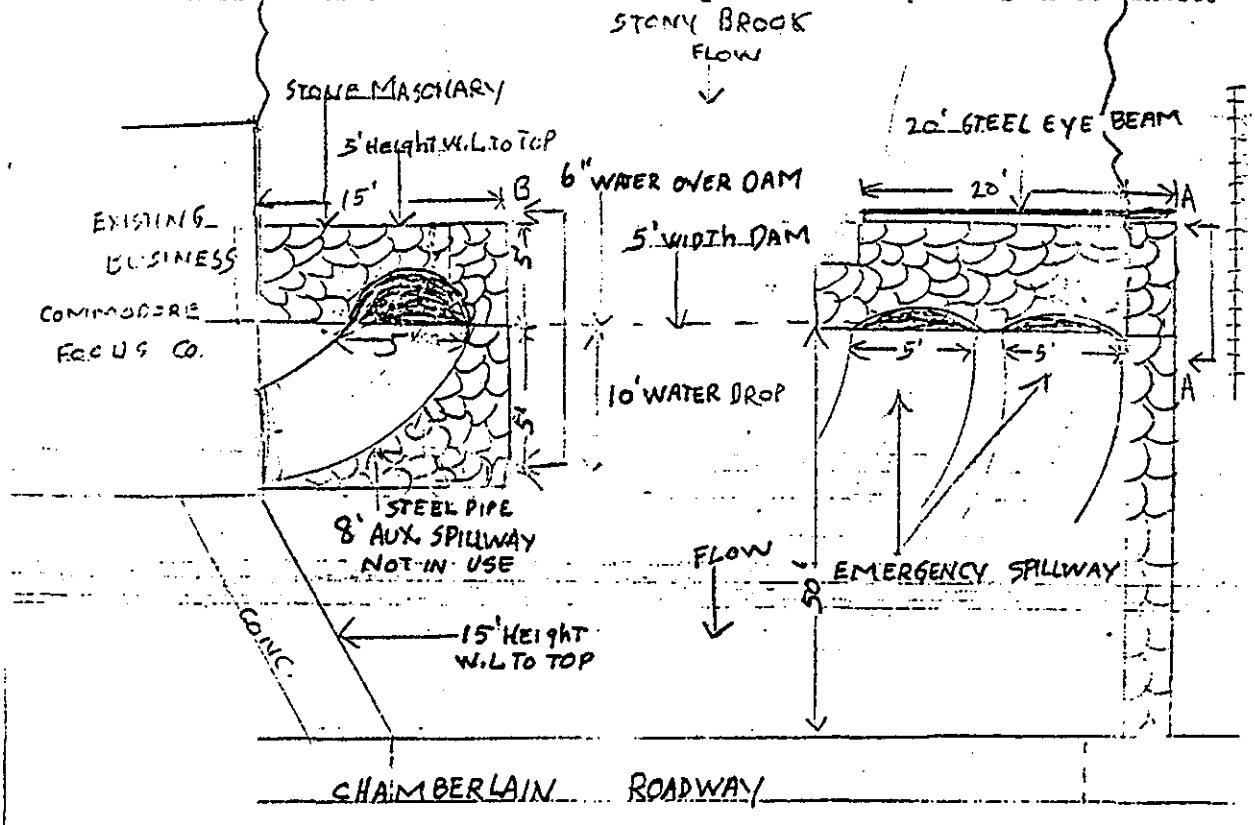
9. A. Description of present land usage downstream of dam: 80 % rural; 20 % urban
B. Is there a storage area or flood plain downstream of dam: which could accommodate the impoundment in the event of a complete dam failure
no ✓ yes ____.

DAM NO. 4-9-330-2

10. Risk to life and property in event of complete failure.

No. of people
No. of homes
No. of businesses 1 BUSINESS, COMMODORE FOODS CO. ADJ. TO DAM
No. of farms NONE
No. of utilities " Type
Railroads 1 OPERATING, ADJ. TO PLANT
Other dams NONE
Other

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



FRONT VIEW
SKETCH NOT TO SCALE

DAM NO. 4-9-330-2

10. Risk to life and property in event of complete failure.

No. of people _____

No. of homes _____

No. of businesses 1 [illegible] ADJ. TO DAM

No. of industries NONE Type _____

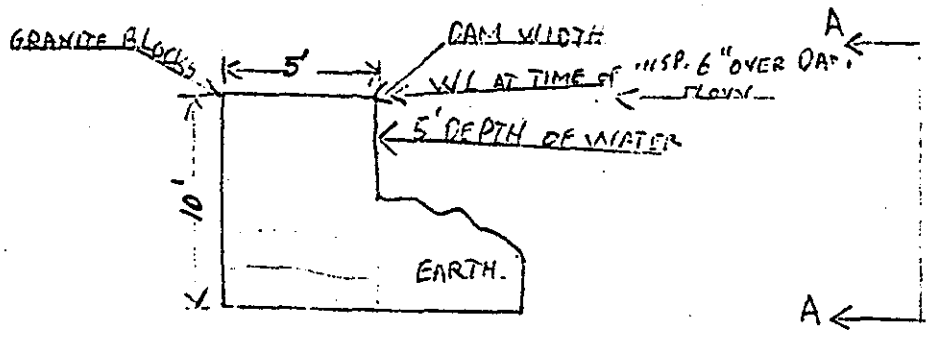
No. of utilities " " Type _____

Railroads 1 OPERATING ADJ. TO PLANT DAM

Other dams NONE

Other _____

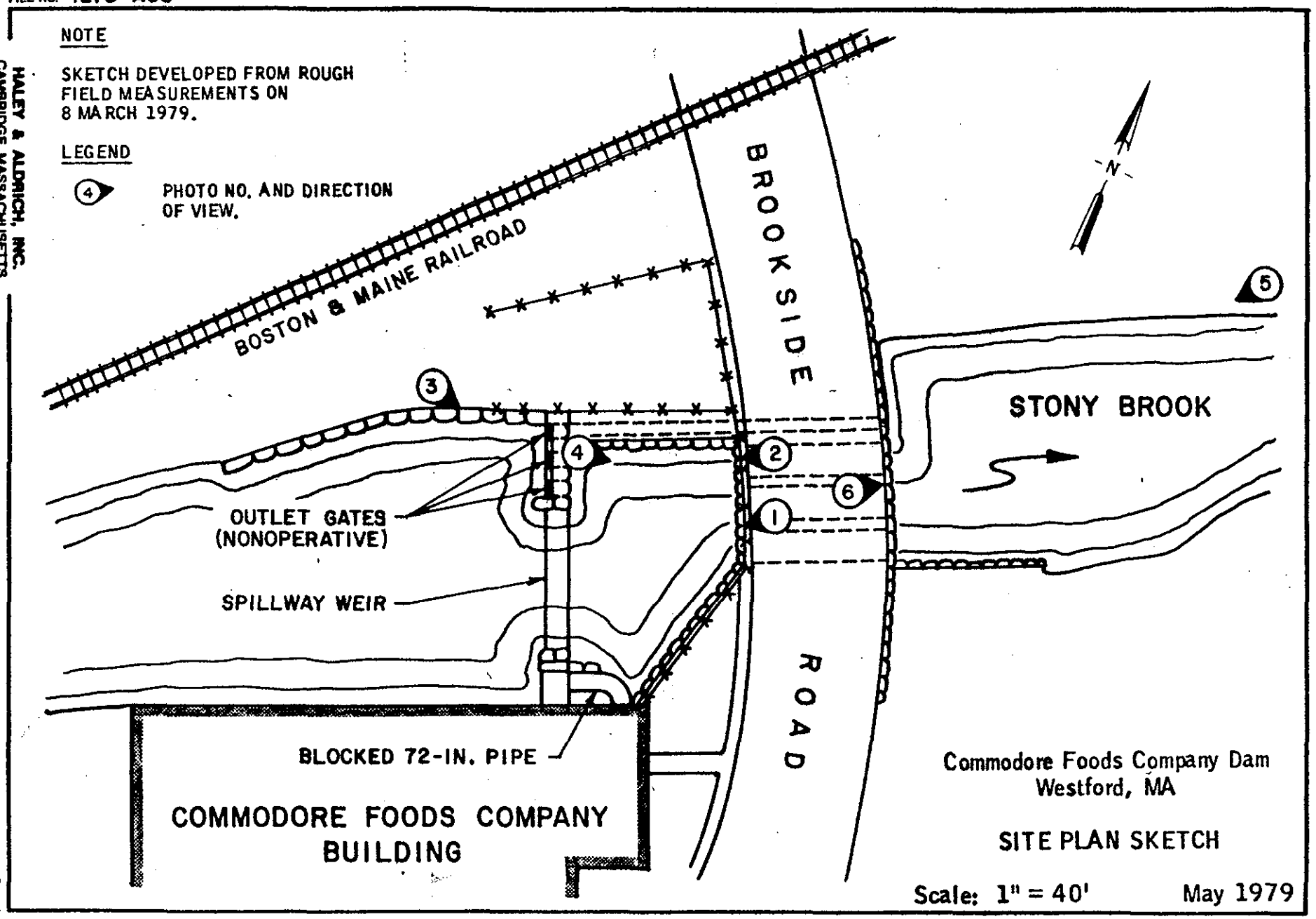
11. Attach sketch of dam to this form showing section and plan 8½" x 11" Sheet.



X SECTION A

SKETCH NOT TO SCALE

FILE NO. 4270 A36

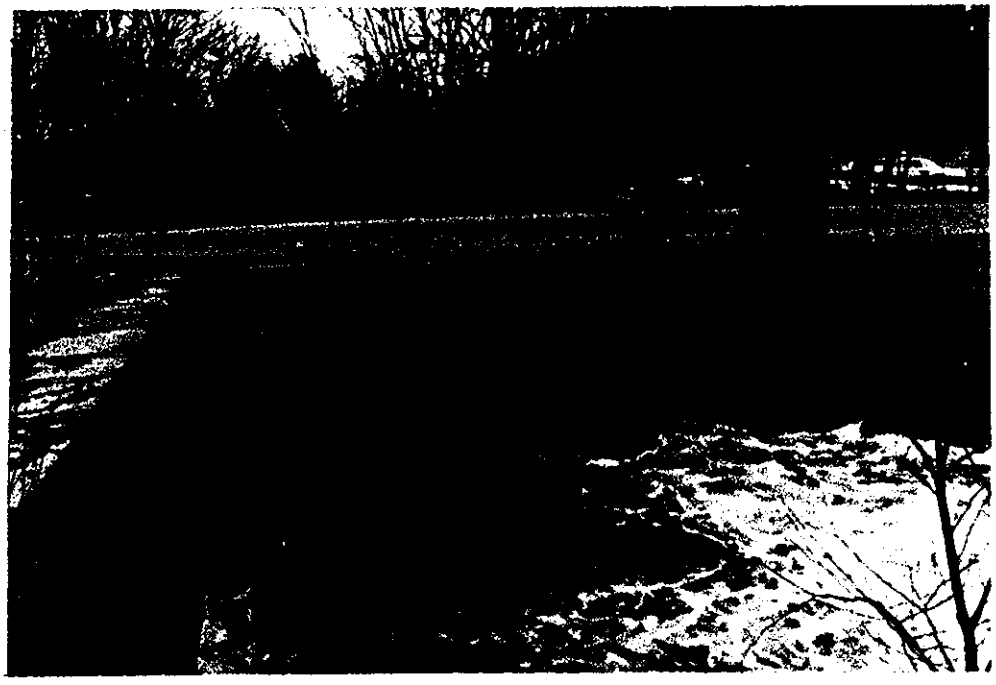


HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

1. Overview of Commodore Foods Company Dam and Stony Brook upstream of dam

2. Left side of dam, showing two inoperative 48-in. diameter outlets

3. Stems of three inoperative gates left of spillway



4. Upstream side of Brookside Road Bridge

5. Downstream side of Brookside Road Bridge

6. Stony Brook channel downstream of Brookside Road

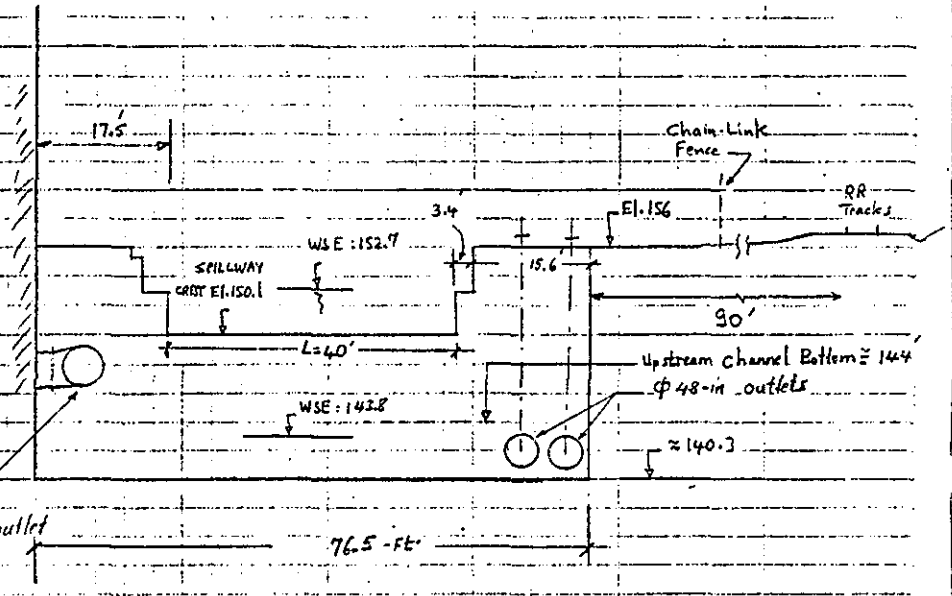
CAMP DRESSER & McKEE
Environmental Engineers
Boston, Mass.

CLIENT: HVA
PROJECT: COE Dam Inspection
DETAIL: Commodore Foods Co. Dam

JOB NO: 561-9-Rf-4
DATE CHECKED: 5/17/
CHECKED BY:

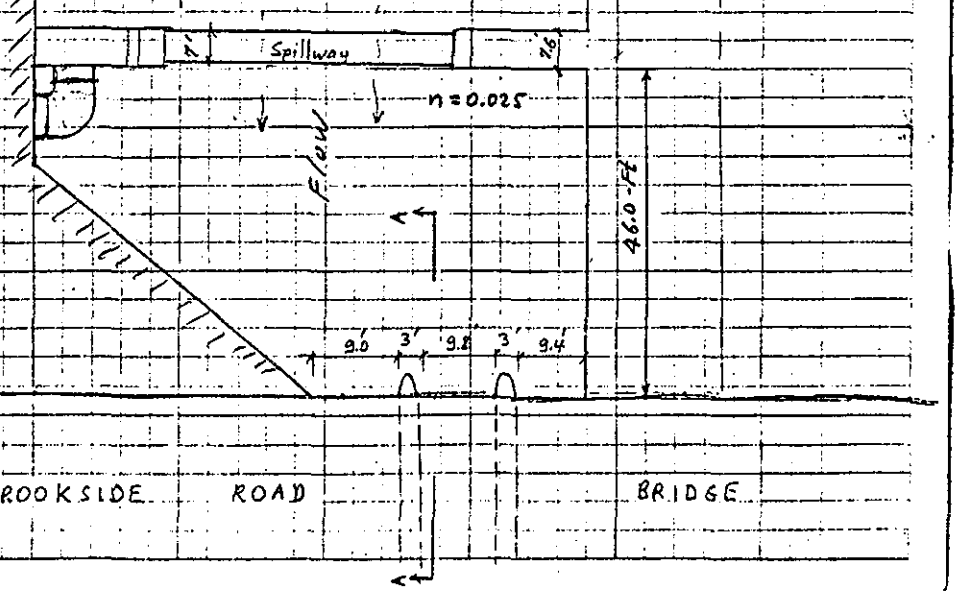
PAGE: 3
DATE: 3/22/79
COMPUTED BY: AHL

SPILLWAY ℄ DAM - FRONT ELEVATION



(Looking Upstream)

PLAN



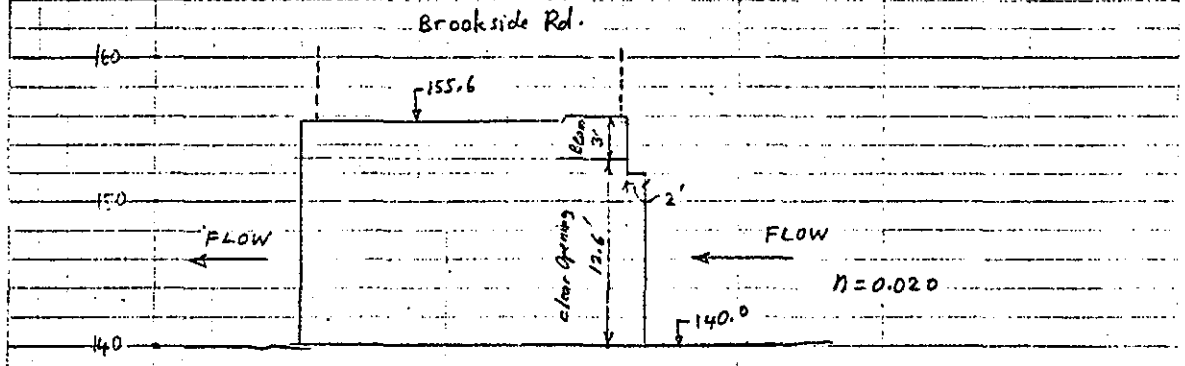
CAMP DRESSER & McKEE
Environmental Engineers
Boston, Mass.

CLIENT H&A
PROJECT COE Dam Inspection
DETAIL Commodore Foods Co. Dam

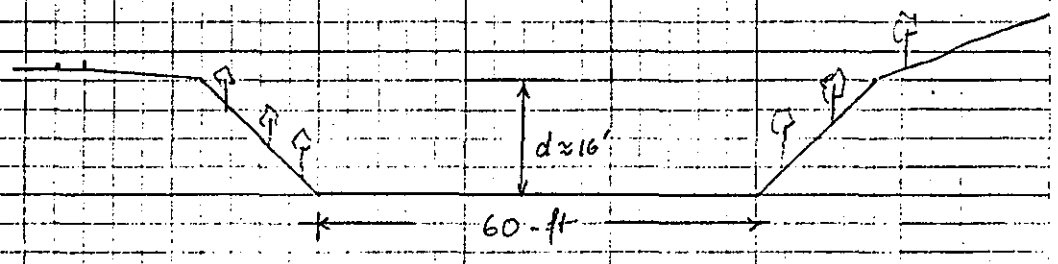
JOB NO 561-9-Rt-4
DATE CHECKED
CHECKED BY

PAGE 4
DATE 3/22/79
COMPUTED BY AHG

SECTION A-A @ BRIDGE



DOWNSTREAM CHANNEL SECTION : Below the Bridge



n=0.030

Size Classification

Storage Volume: Normally no ponding exists behind the dam. (No ponding is shown upstream of the Commodore Foods Company dam on USGS map). The pond shown on the left bank, upstream of the dam, has no connection to Stony Brook; the WSE in Stony Brook, during the inspection, was about 4.2 feet lower than the level in the pond. The storage volume at the top of the dam was estimated from the USGS as follows:

$$V = \frac{3000\text{-ft} \times 300\text{-ft} \times 12/2}{43{,}560} = 124 \text{ ac-ft} < 1000 \text{ ac-ft}$$

Dam Height: $H = 156.0 - 140.3 = 15.7 \approx 16\text{-ft} < 40\text{-ft}$.

SIZE: SMALL

Hazard Potential: requires checking of downstream channel hydraulics for the dam failure flood:

$$Q_{P_1} = \frac{8}{27} \times 0.4 \times 76.5 \times 5.67 \times 16^{3/2} = \underline{3{,}300 \text{ cfs}}$$

Channel Reach upstream of the bridge on Brookside Road:

Channel Capacity: 1. $A = 10 \times 76.5 = 765\ \square'$ $R^{2/3} = 3.98$ $n = 0.025$

(See page 3.) $S = 0.005$ $Q_{max} = \frac{1.49}{0.025} 765 \times 3.98 \times 0.07 = 12{,}700$ cfs.

Capacity of the Bridge openings: 3 - 9.5 × 12.6 (h) openings

(See pages 3 & 4)

$A_1 = 9.5 \times 12 = 114\ \square'$ $R_1^{2/3} = 2.26$ $n = 0.02$

$S = 0.005$ $\sqrt{S} = 0.07$ $q = \frac{1.49}{0.02} \times 114 \times 2.26 \times 0.07 \approx 1{,}350$ cfs.

$\Sigma Q = 3 \times 1{,}350 = 4{,}050$ cfs.

Downstream channel below the bridge: (See page 4)

Flow Capacity: $A = 16 \times \frac{60+90}{2} = 1{,}200\ \square'$ $n = 0.03$

$R^{2/3} = 5.1$ $S = \frac{143.3-140}{1500} = 0.0022$

$Q = \frac{1.49}{0.03}\ 1200 \times 5.1 \times 0.047 = 14{,}250$ cfs

Flow capacity of the downstream channel and the bridge is more than the failure flood flow of 3300 cfs, therefore no overtopping of the stream banks is expected.

Failure Flood Impact in the Pond between Brookside and West Chelmsford:

Normal Pond Area $\approx$ 21 acres + 10.3 (Swamps) = 31.3 acres

Channel storage during the failure flood: $80 \times \frac{16+8}{2} \times 1500 \times \frac{1}{43{,}560} = 33$ ac-ft

Storage volume above the dam: 124 ac-ft @ El. 156.0 (top of dam)

Net Flow into the downstream Pond: 124 − 33 = 91 ac-ft

Assuming no outflow from the downstream pond:

$h_w = \frac{91}{31.3} = 2.9$ ft. WSE in the downstream pond would rise by about 3.0 feet to El. 143.0

With exception of one plant building on the right bank near the outlet of the downstream pond no dwellings can be seen below 150 contour on USGS map.

Conclusion: Hazard Potential is LOW