AD-A105 773 NEW YORK STATE DEPT OF ENVIRONMENTAL CONSERVATION ALBANY F/G 13/13
NATIONAL DAM SAFETY PROGRAM. COBLESKILL UPPER RESERVOIR DAM NUM--ETC(U)
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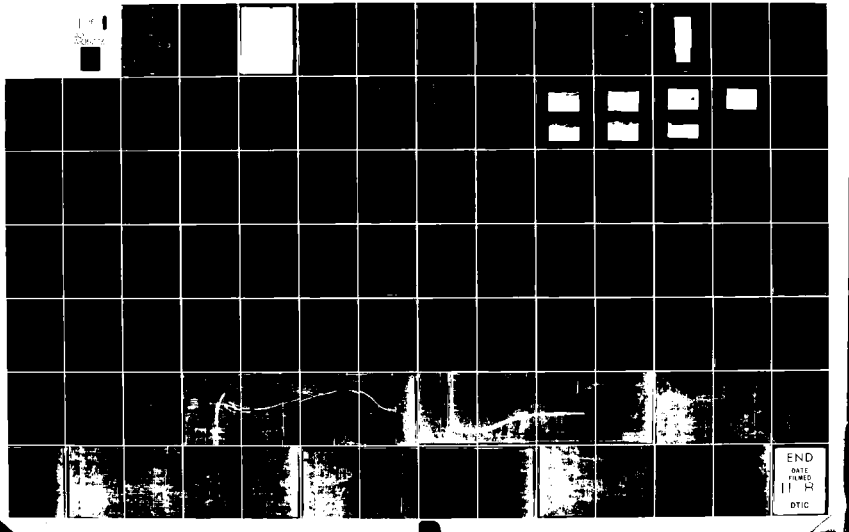

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

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READ INSTRUCTIONS BEFORE COMPLETING FORM

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DTIC ELECTE OCT 19 1981 S H

18. SUPPLEMENTARY NOTES

N. Y.

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

Dam Safety
National Dam Safety Program
Visual Inspection
Hydrology, Structural Stability
Cobleskill Reservoir Dam No.1
Schoharie County
Mohawk River Basin

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

This report provides information and analysis on the physical condition of the dam as of the report date. Information and analysis are based on visual inspection of the dam by the performing organization.

The examination of documents and visual inspection of the Cobleskill Upper Reservoir Dam and appurtenant structures did not reveal conditions which constitute a hazard to human life or property.

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The discharge capacity of the spillway is inadequate for all storms in excess of 57% of the Probable Maximum Flood. During the 1/2 PMF event, the maximum water surface elevation will be 0.33 feet below the top of dam. The dam will be overtopped by 0.28 feet during the full PMF; therefore, the spillway is assessed as "Inadequate".

PREFACE

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

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

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through frequent inspections can unsafe conditions be detected and only through continued care and maintenance can these conditions be prevented or corrected.

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.

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
COBLESKILL UPPER RESERVOIR DAM
I.D. No. NY 656 DEC No. 174A-3138B
MOHAWK RIVER BASIN
SCHOHARIE COUNTY, NEW YORK

TABLE OF CONTENTS

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

Name of Dam:	Cobleskill Upper Reservoir Dam
State Located:	New York
County:	Schoharie
Watershed:	Mohawk River Basin
Stream:	Smith Brook (tributary of Cobleskill Creek and Mohawk River)
Date of Inspection:	October 30, 1980

ASSESSMENT

The examination of documents and visual inspection of the Cobleskill Upper Reservoir Dam and appurtenant structures did not reveal conditions which constitute a hazard to human life or property.

The discharge capacity of the spillway is inadequate for all storms in excess of 57% of the Probable Maximum Flood. During the 1/2 PMF event, the maximum water surface elevation will be 0.33 feet below the top of dam. The dam will be overtopped by 0.28 feet during the full PMF; therefore, the spillway is assessed as "Inadequate".

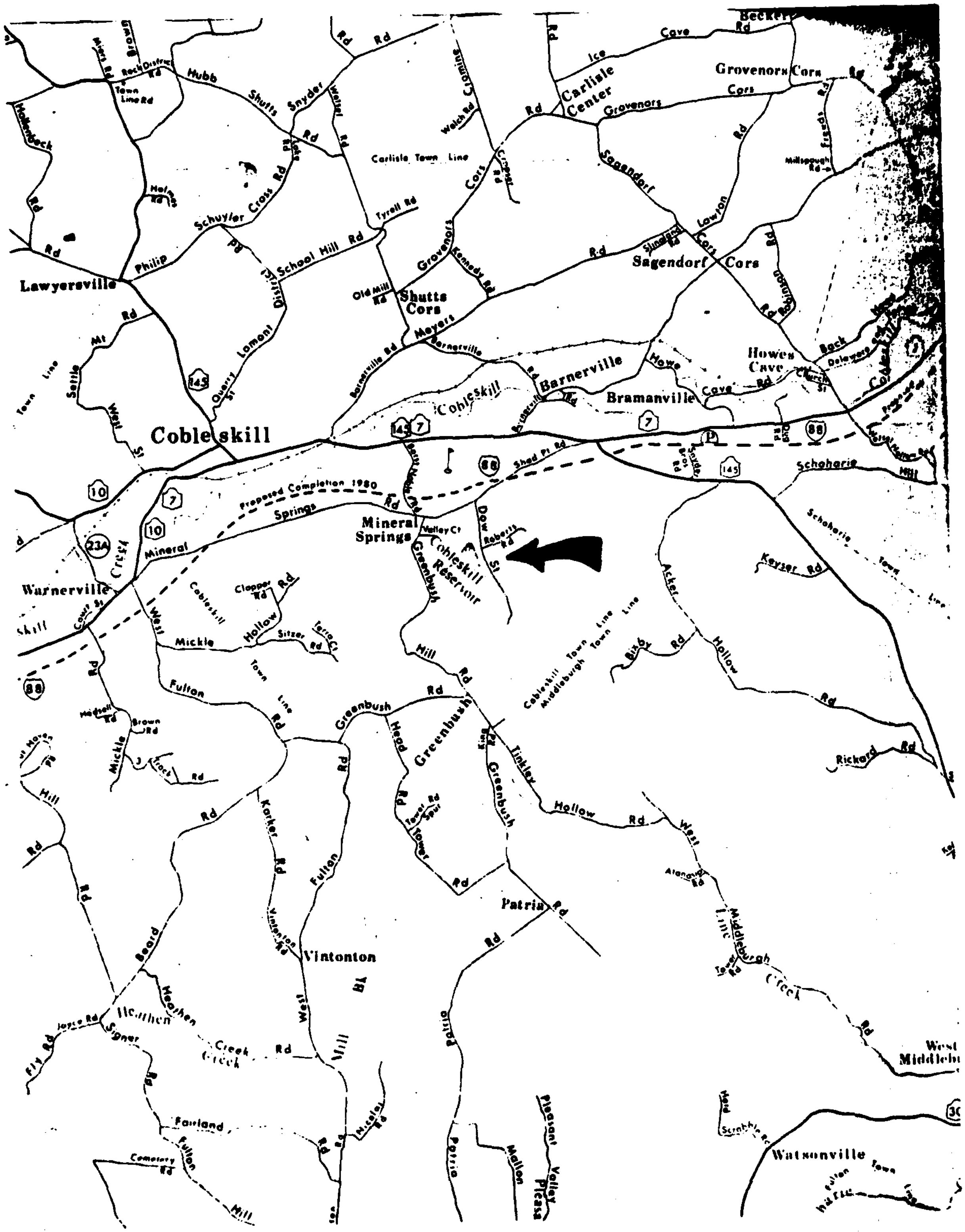
The following problems were observed which require remedial action within one year of notification to the owner:

1. Joints in the spillway must be cleaned and recaulked.
2. The voids under the riprap spillway channel must be investigated and backfilled or grouted.
3. Remove the trees and brush growth from the embankment and around the spillway. Provide a program of periodic cutting and mowing of these surfaces.
4. Provide a program of periodic inspection and maintenance of the dam and appurtenances. Document this information for future reference.
5. An emergency action plan must be developed.

George [illegible]
Chief, Dam Safety Section
New York State Department
of Environmental Conservation
NY Empire Plaza, 12237

Col. W. J. Smith, Jr.
New York District Engineer

JUL 2 8 1981



VICINITY MAP

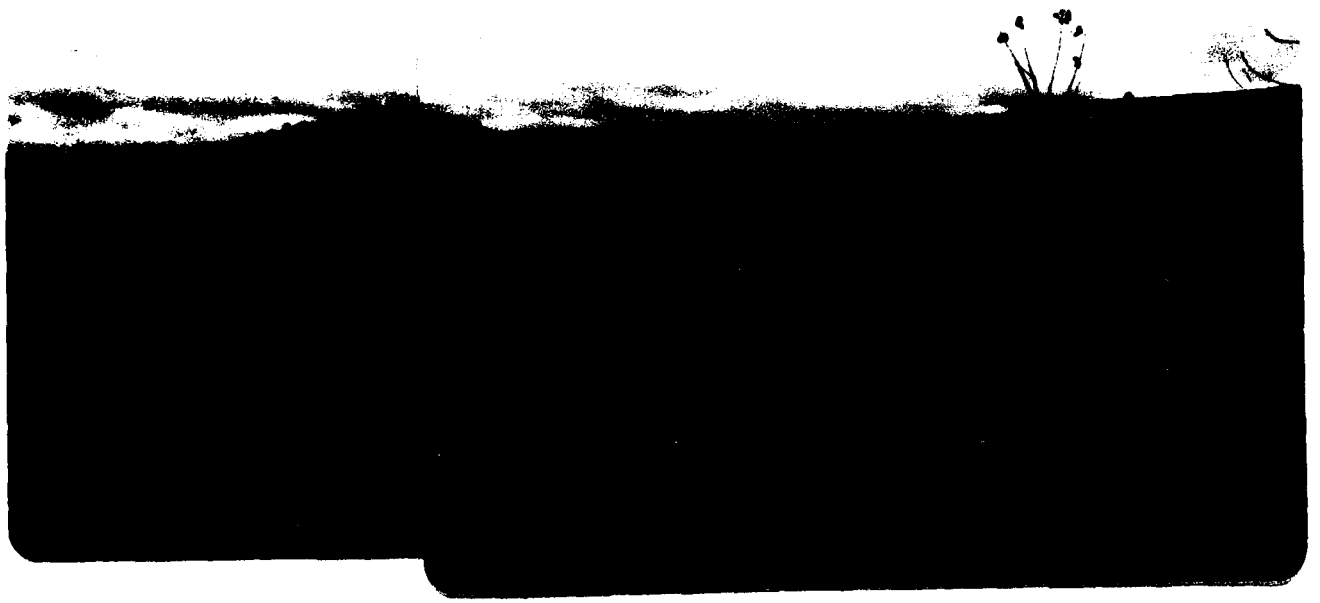


Photo # 1
Overview of Cobleskill Upper Reservoir Dam

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
COBLESKILL UPPER RESERVOIR DAM
I.D. No. NY 656 DEC No. 174A - 3138B
MOHAWK RIVER BASIN
SCHOHARIE COUNTY, NEW YORK

SECTION 1: PROJECT INFORMATION

1.1 GENERAL

a. Authority

The Phase I inspection reported herin was authorized by the Department of the Army, New York District, Corps of Engineers, to fulfill the requirements of the Nation Dam Inspection Act, Public Law 92-367.

b. Purpose of Inspection

Evaluation of the existing conditions of the subject dam to identify deficiencies and hazardous conditions, determine if they constitute hazards to human life and property and recommend remedial measures where necessary.

1.2 DESCRIPTION OF PROJECT

a. Description of Dam and Appurtenances

The Cobleskill Uper Reservoir Dam consists of a 2200 feet long homogenous earth embankment, with a compacted core trench to an impervious layer. One leg of the embankment follows the shore line of the Cobleskill Lower Reservoir with 90° bend around a water supply intake the other leg stretches across Smith Brook. The upstream slope of the embankment is protected with stone. The spillway is a concrete overflow section discharging onto a sloped concrete apron and riprapped channel. There is a 12" drain located through the highest portion of the embankment across Smith Brook. It is a cast iron pipe with a concrete gate tower at the dam crest just west of the spillway. The embankment is approximately 30 feet high at its highest point across Smith Brook.

b. Location

The dam is located on Smith Brook, a tributary of Cobleskill Creek and Mohawk River approximately 2.0 miles southeast of Cobleskill, New York.

c. Size

The dam is 30 feet high and impounds 239. acre feet at normal pool elevation. Therefore, it is classified as "small" in size (less than 40 feet in height.)

d. Hazard Classification

The dam is classified as high hazard due to its location above several homes in Mineral Springs, NY. The reservoir is also a major part of the Cobleskill, NY water supply system.

e. Ownership
The dam is owned and operated by the Village of Cobleskill, New York, 12093. Mr. John Barber, Water Supervisor, Village of Cobleskill, Cobleskill, New York, was the contact with the Village, he can be reached at (518) 234-2195.

f. Purpose of the Dam
The dam provides storage for the Cobleskill water supply.

g. Design and Construction History
The dam was constructed in 1967 according to the design of and under the direction of James S. Van Deusen, P.E. Cobleskill, New York. The original application for permit was filed in 1963 but funding held up start of construction 4 years.

h. Normal Operating Procedures
Water releases from the Cobleskill Upper Reservoir are normally through the intake and into the water supply either directly or through the lower reservoir. Any excess flow goes through the uncontrolled spillway.

1.3 PERTINENT DATA

a. Drainage Area (sq. mi.)	1.26
b. Height of Dam (ft.)	30.0
c. Discharge @ Dam Site (cfs.)	
Spillway at Top of Dam.	1195.
Reservoir Drain (Normal)	20.
12" Cast Iron Overflow to Lower Reservoir (Normal)	12.
d. Elevations (ft. I.S. G.S)	
Top of Dam	1184.5
Spillway Crest	1180.6
Reservoir Drain	1150.6
e. Reservoir (acres)	
Surface area of Top of Dam	
Surface Area of Spillway Crest.	
f. Storage (Acre feet)	
Top of Dam	353.
Spillway Crest	239.

g. Dam
Type: Homogeneous earth embankment with core trench. Upstream slope protected with rockfill.

Length (ft):	2200'
Upstream Slope:	14: L
Downstream Slope:	1: 3
Crest Width (ft):	15.

h. Spillway
Type: Concrete overflow section. Concrete apron and riprap discharge channel.

Weir length (ft): 41.0

i. Reservoir Drain

Type: 12" cast iron pipe, with gate tower at crest of dam.

Maximum Capacity (cfs). 20.00

SECTION 2: ENGINEERING DATA

2.1 GEOLOGY

The Cobleskill Upper Dam is located in the glaciated potrion of the Appalachian Uplands (northern extreme of the Appalachian Plateau) physiographic privince of New York State. These uplands were formed by the dissection of the uplifted but flat lying sandstones, siltstones and shales of the Lower and Middle Devonian Period (395 to 365 million years ago). The plateau surface is represented by flat-topped divides with drainage generally southward. Drainage in the vicinity of the dam is northward toward the Mohawk River.

Glacial covere is generally thin, the deposits of which have resulted from glaciations during the Wisconsin glaciation, approximately 11,000 years ago.

The "Preliminary Brittle Structures Map of New York" prepared by Yngvar W. Isochsen and William G. McKendree (dated 1977) indicates the presence of a subsurface fault, showing relative movement as inferred from drill hole data, and a topographic linear feature observed on one or more of the following: topographic map, Landsat (ERTS), Skylab, or U-2 photographic product, within the drainage area of the reservoir.

2.2 SUBSURFACE INVESTIGATION

Two borings were located for the design of the dam. These explorations indicate that the soils encountered are varying mixtures of clay, silt, sand, and gravel with boulders, of glacial till origin. No water table is indicated.

2.3 DAM AND APPURTENANT STRUCTURES

The dam was erected in 1967 under the supervision of James S. Van Deusen, P.E. Cobleskill, NY.

2.4 CONSTRUCTION RECORDS

No construction records are available.

2.5 OPERATION RECORDS

All operation records are maintained at the treatment plant below the Lower Dam.

2.6 EVALUATION

The data presented in this report has been compiled from information obtained from Mr. John Barber, Water Supervisor, Village of Cobleskill, NY, and the New York State DEC files. This information appears adequate and reliable for Phase I Inspection purposes.

SECTION 3: VISUAL INSPECTION

3.1 FINDINGS

a. General

Visual inspection of the Cobleskill Upper Reservoir Dam and watershed was conducted on October 30, 1980. The weather was cloudy and the temperatures ranged in the thirties. The reservoir level at the time of inspection was approximately 5. feet below the spillway crest.

b. Embankment

The embankment shows no signs of distress and appears to be in good condition. All slopes seem to be stable with no erosion or depressions. However, the embankment is in need of maintenance, there is tree and brush growth on both slopes. The upstream riprap is generally in good shape but the trees and brush will begin to displace it, if left unattended to. The crest is in good condition. No evidence of seepage was found on the embankment or beyond the downstream toe. Low reservoir elevation at the time of inspection may have reduced the possibility of finding seepage, however, there were no other factors pointing to seepage problems. The discharge channel of the reservoir drain is in need of small tree and brush removal.

c. Spillway

The concrete spillway is in good condition but also in need of some minor maintenance. All joints in walls and floor slabs must be cleaned out and recaulked.

d. Downstream Channel

The riprapped channel is in need of further investigation, several voids were found under the grouted stone in the lower end of the channel. See photo # 6. There is also some brush and tree growth along the channel which must be cleared.

e. Reservoirs

No sediment or problems were reported within the reservoir area.

f. Appurtenant Structures

Both the reservoir drain and the lines to the water system are all reported to be operational. The concrete intake wells appeared to be in very good condition.

3.2 EVALUATION OF OBSERVATIONS

The problem areas observed during the inspection and the recommended remedial measures are as follows:

1. Joints in the concrete spillway are full of debris and vegetation is growing in them. They must be cleaned out and recaulked.
2. There are voids under the rip rapped spillway channel. This problem must be investigated further to determine the extent of undermining and backfilled or regrouted.
3. Both the embankment and channel have tree and brush growth which must be removed. Provide a program of periodic cutting and mowing of the embankment and areas adjacent to the spillway.
4. Provide a program of periodic inspection and maintenance of the dam and appurtenences including yearly operation and lubrication of all gates and valves. Document this information for future reference.
5. Develop an emergency action plan for notification of downstream residents and the proper governmental authorities.

SECTION 4: OPERATION AND MAINTENANCE PROCEDURES

4.1 PROCEDURES

The normal water surface elevation is approximated by the crest of the spillway. Discharges can be to the treatment plant, lower reservoir, low level drain or over the spillway.

4.2 MAINTENANCE OF THE DAM

Maintenance of the dam is provided by the owner, the Village of Cobleskill, NY. Maintenance is not considered satisfactory as evidenced by the tree and brush growth on the embankment and deterioration of the spillway joints.

4.3 WARNING SYSTEM

There is no warning system in effect or in preparation.

4.4 EVALUATION

The dam and appurtenances are in need of maintenance. The areas sited are noted in "Section 3: Visual Inspection".

SECTION 5: HYDRAULIC/HYDROGOGIC

5.1 DRAINAGE AREA CHARACTERISTICS

The Cobleskill Upper Dam is located on Smith Brook, adjacent to the Lower Reservoir. Smith Brook has a drainage area of 1.26 square miles at the site and is a tributary of Cobleskill Creek and Mohawk River. The watershed is primarily wooded with some pasture in the lower, flatter portions. The cover is glacial till and generally thin.

5.2 ANALYSIS CRITERIA

The analysis of the spillwya capacity of the dam and storage of the reservoir was performed using the Corps of Engineers HEC-1 computer model. The unit hydrograph was defined by the Snyder Synthetic Unit Hydrograph method, and the Modified Puls routing procudure was incorporated. The Probable Maximum Precipitation (PMP) was 19.5 inches (24 hrs., 200 sq. miles) from Hydrometeorological Report #33 in accordance with the recommended guidelines of the Corps of Engineers. Several floods (%'s of the Probable Maximum Flood (PMF) were selected for analysis. The full (PMF) inflow of 2273. cfs was routed through the reservoir and found to produce an outflow of 2271 cfs.

5.3 SPILLWAY CAPACITY

The spillway is a 42.5 feet wide uncontrolled concrete section with a 1.5 feet thick pier leaving 41 feet of weir length. The crest elevation is 1180.55 U.S.G.S. with a maximum flow height of 4. feet before overtopping occurs. The maximum flow is 1195. cfs before overtopping.

5.4 RESERVOIR CAPACITY

The reservoir at the crest of the spillway, and at the top of the dam are 239. acre feet and 353 acre feet respectively. Surcharge, storage between spillway and top of dam is equivalent to 1.70 inches of runoff from the watershed area.

5.5 FLOODS OF RECORD

There are no gaging stations located on or near the dam site nor are there any accounts of high flows or levels.

5.6 OVERTOPPING POTENTIAL

The maximum capacity of the spillway before overtopping occurs is 1195 cfs, which is 57% of the routed PMF inflow of 2273 cfs. The dam is overtopped by 0.28 feet during the full PMF event.

5.7 EVALUATION

The spillway of the Cobleskill Upper Reservoir will handle 57% of the PMF. Based on the Corps of Engineers screening criteria it is considered inadequate.

SECTION 6: STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

a. Visual Observations

No signs of major distress were observed in connection with the earth embankment. The gate house and spillway both appeared to be in generally good condition.

b. Design and Construction Data

No information could be located concerning the structural stability of the embankment portion of the dam.

c. Post Construction Changes

No post construction changes have been initiated.

SECTION 7: ASSESSMENT/RECOMMENDATIONS

7.1 ASSESSMENT

a. Safety

The Phase I Inspection of the Cobleskill Upper Reservoir Dam revealed that the spillway is "Inadequate" based upon the Corps of Engineers screening criteria. The dam will be overtopped by all storms in excess of 57% of the PMF. The embankment appears stable with few minor maintenance problems.

b. Adequacy of Information

The information reviewed is considered adequate for Phase I Inspection purposes.

c. Need for Additional Investigation

The only additional investigation required is that of the voids under the spillway channel. Once the degree of undermining is determined the best solution can be applied.

d. Urgency

The areas listed below requiring remedial action should be initiated within 3 months and completed within 1 year of notification to the owner.

7.2 RECOMMENDATIONS

1. Clean out and recaulk the joints in the spillway.

2. The voids under the riprapped spillway channel must be investigated and repaired.

3. Remove the tree and brush growth from the embankment and around the spillway.

4. Provide a program of periodic inspection and maintenance of the dam and appurtenances. Document this information for future reference.

5. An emergency action plan must be developed.

APPENDIX A

PHOTOGRAPHS

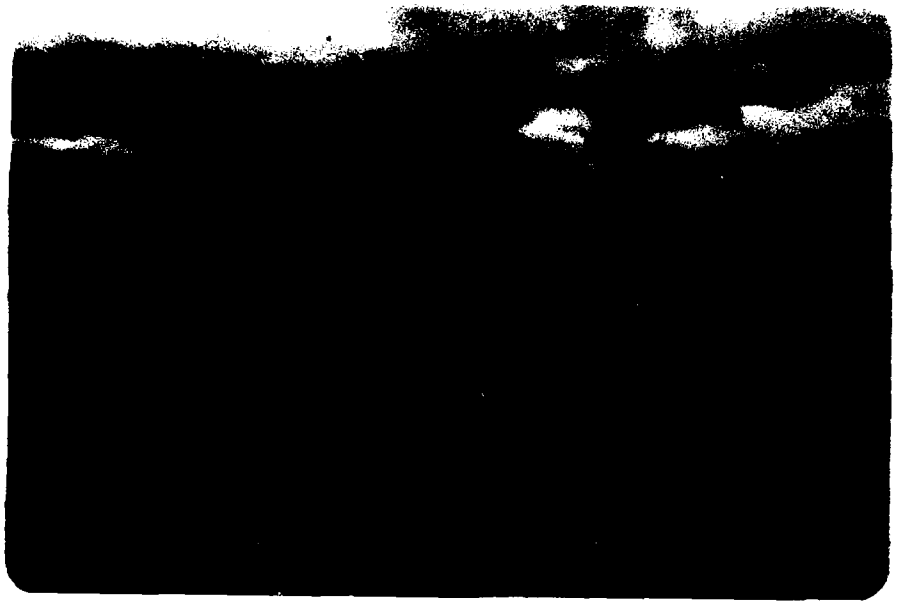


Photo # 2.
View from upper end of reservoir.
Note: Spillway on left and water supply intake in corner of reservoir, also tree growth.

Photo # 3.
Relative location of Cobleskill Upper and Lower Reservoirs.

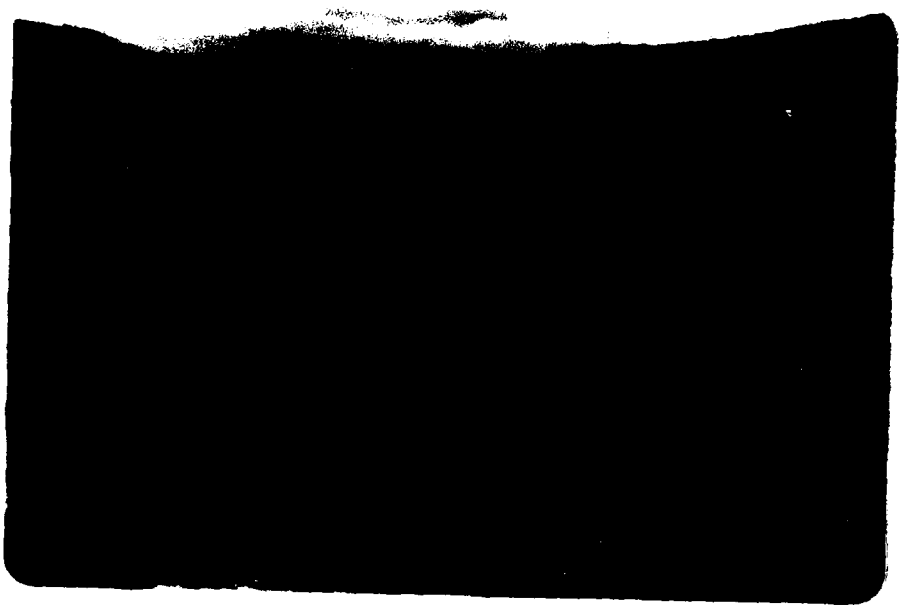


Photo # 4.
Spillway Crest.

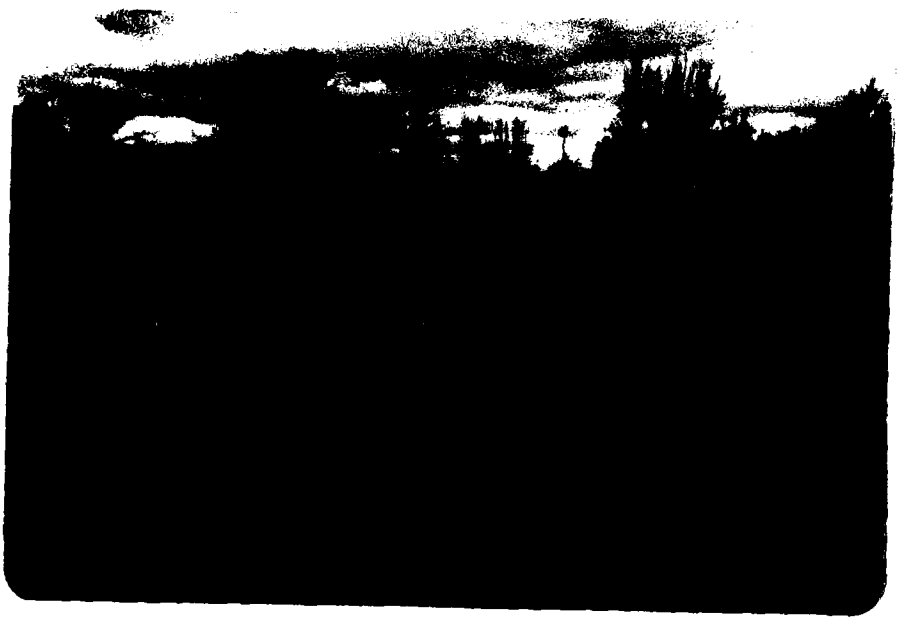


Photo #5

Spillway apron and downstream channel.

Photo # 6.
Opening to larger void under spillway channel.

Photo # 7.
Reservoir drain control. Note: trees and brush.

Photo # 8.
Reservoir drain outlet. Note: trees and brush.

APPENDIX B

VISUAL INSPECTION CHECKLIST

93-15-3(9/80)

VISUAL INSPECTION CHECKLIST

1) **Basic Data**

a. General

Name of Dam Cobleskill Upper Reservoir Dam

Fed. I.D. # NY 656 DEC Dam No. 174A - 313E B

River Basin Mohawk River Basin

Location: Town Cobleskill County Schoharie

Stream Name Smith Brook

Tributary of Cobleskill Creek

Latitude (N) 42°40.0' Longitude (W) 74°27.0'

Type of Dam homogeneous earthfill

Hazard Category high (c)

Date(s) of Inspection ~~Oct~~ Oct. 30, 1980

Weather Conditions cloudy - 30's

Reservoir Level at Time of Inspection 5 feet below spillcrest

b. Inspection Personnel F McCann J Leitch

c. Persons Contacted (Including Address & Phone No.)

John Barker

Water Superviser

Village of Cobleskill

NY 12043 (518) 234-2195

d. History:

Date Constructed 1961 Date(s) Reconstructed

Designer James S. Lyon Design

Constructed By —

Owner Village of Cobleskill

2) Embankment

a. Characteristics

(1) Embankment Material [illegible] earth

(2) Cutoff Type compacted earth trench

(3) Impervious Core none

(4) Internal Drainage System none

(5) Miscellaneous —

b. Crest

(1) Vertical Alignment good

(2) Horizontal Alignment good

(3) Surface Cracks none

(4) Miscellaneous —

c. Upstream Slope

(1) Slope (Estimate) (V:H) 1:3

(2) Undesirable Growth or Debris, Animal Burrows tree and brush growth

(3) Sloughing, Subsidence or Depressions none

(4) Slope Protection Upstream - steel sheet pile on steel reinforcing

(5) Surface Cracks or Movement at Toe None

d. Downstream Slope

(1) Slope (Estimate - V:H) 1:3

(2) Undesirable Growth or Debris, Animal Burrows Tree and brush growth

(3) Sloughing, Subsidence or Depressions None

(4) Surface Cracks or Movement at Toe None

(5) Seepage None

(6) External Drainage System (Ditches, Trenches; Blanket)

(7) Condition Around Outlet Structure good - ends Ends spillway channel

(8) Seepage Beyond Toe None

e. Abutments - Embankment Contact

good

(1) Erosion at Contact None

(2) Seepage Along Contact None.

3) Drainage System

a. Description of System None.

b. Condition of System —

c. Discharge from Drainage System —

4) Instrumentation (Momumentation/Surveys, Observation Wells, Weirs, Piezometers, Etc.)

None

93-15-3(9/80)

5) **Reservoir**

a. Slopes Shallow - no problem

b. Sedimentation Little or no problem

c. Unusual Conditions Which Affect Dam None

6) **Area Downstream of Dam**

a. Downstream Hazard (No. of Homes, Highways, etc.) Several homes in Wind Springs

b. Seepage, Unusual Growth No seepage or associated growth

c. Evidence of Movement Beyond Toe of Dam None

d. Condition of Downstream Channel Trash trees must be cleared

7) **Spillway(s) (Including Discharge Conveyance Channel)**

Good condition generally - joints need cleaning & repointing

a. General

b. Condition of Service Spillway good

c. Condition of Auxiliary Spillway none

d. Condition of Discharge Conveyance Channel 16105 eroded; grated riprap - must be investigated generally good

8) Reservoir Drain/Outlet

Type: Pipe ✓ Conduit _____ Other _____

Material: Concrete _____ Metal C.I. Other _____

Size: 12" Length _____

Invert Elevations: Entrance _____ Exit _____

Physical Condition (Describe): operable Unobservable _____

Material: C.I.

Joints: — Alignment —

Structural Integrity: appeared good

Hydraulic Capability: 20 cfs

Means of Control: Gate _____ Valve ✓ Uncontrolled _____

Operation: Operable ✓ Inoperable _____ Other _____

Present Condition (Describe): good

9) Structural

a. Concrete Surfaces good

b. Structural Cracking minor surface

c. Movement - Horizontal & Vertical Alignment (Settlement) none

d. Junctions with Abutments or Embankments good

e. Drains - Foundation, Joint, Face none

f. Water Passages, Conduits, Sluices —

g. Seepage or Leakage none

h. Joints - Construction, etc. Good condition

i. Foundation apparently good

j. Abutments good

k. Control Gates good

l. Approach & Outlet Channels good

m. Energy Dissipators (Plunge Pool, etc.) —

n. Intake Structures good condition

o. Stability No problem

p. Miscellaneous —

10) Appurtenant Structures (Power House, Lock, Gatehouse, Other)

a. Description and Condition Water Tower & Grain Tower good condition

11) Operation Procedures (Lake Level Regulation):

water supply - checked daily

APPENDIX C

HYDROLOGIC / HYDRAULIC

ENGINEERING DATA AND COMPUTATIONS

CHECK LIST FOR DAMS
HYDROLOGIC AND HYDRAULIC
ENGINEERING DATA

AREA-CAPACITY DATA:

	Elevation (ft.)	Surface Area (acres)	Storage Capacity (acre-ft.)
1) Top of Dam	1184.55	32	353
2) Design High Water (Max. Design Pool)	—	—	—
3) Auxiliary Spillway Crest	—	—	—
4) Pool Level with Flashboards	—	—	—
5) Service Spillway Crest	1180.55	25	239

DISCHARGES

	Volume (cfs)
1) Average Daily	1.
2) Spillway @ Maximum High Water	1135
3) Spillway @ Design High Water	—
4) Spillway @ Auxiliary Spillway Crest Elevation	—
5) Low Level Outlet	20
6) Total (of all facilities) @ Maximum High Water	1227
7) Maximum Known Flood	—
8) At Time of Inspection	0.

CREST: **ELEVATION:** 1154.55

Type: Uncontrolled Embankment w/ Labyrinth

Width: 15' **Length:** 2200'

Spillover —

Location —

SPILLWAY:

SERVICE		AUXILIARY
1150.55	Elevation	—
Uncontrolled overflow section	Type	—
43.5'	Width	—
	Type of Control	
✓	Uncontrolled	—
	Controlled:	
—	Type (Flashboards; gate)	—
—	Number	—
—	Size/Length	—
	Invert Material	—
	Anticipated Length of operating service	—
30'	Chute Length	—
1:3 slope	Height Between Spillway Crest & Approach Channel Invert (Weir Flow)	—

HYDROMETEROLOGICAL GAGES:

Type : None

Location: —

Records:

Date - —

Max. Reading - —

FLOOD WATER CONTROL SYSTEM:

Warning System: None

Method of Controlled Releases (mechanisms):

12" C.I. reservoir drain to stream

12" C.I pipe to lower reservoir

DRAINAGE AREA: 1.26 Square miles

DRAINAGE BASIN RUNOFF CHARACTERISTICS:

Land Use - Type: Primarily wooded, 3% agricultural

Terrain - Relief: Moderately steep, rocky, typical terrain

Surface - Soil: Thin fill overlying rock

Runoff Potential (existing or planned extensive alterations to existing (surface or subsurface conditions)

No alterations made or to be made to basin

Potential Sedimentation problem areas (natural or man-made; present or future)

Fine silt during at time of injection

Potential Backwater problem areas for levels at maximum storage capacity including surcharge storage:

Secondary road, possibly

Dikes - Floodwalls (overflow & non-overflow) - Low reaches along the Reservoir perimeter:

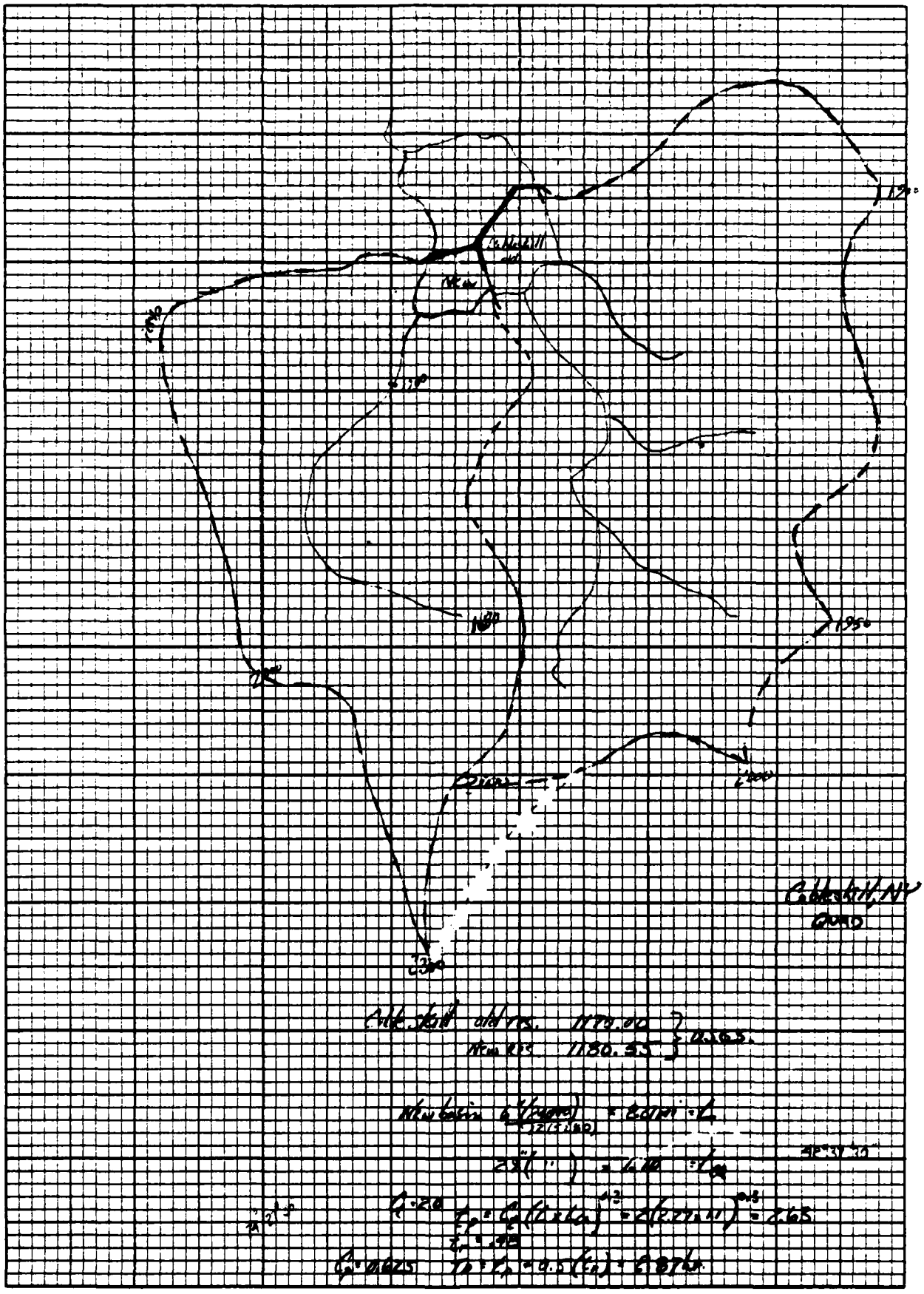
Location: None.

Elevation:

Reservoir:

Length @ Maximum Pool 1200 ft. ~~(Miles)~~

Length of Shoreline (@ Spillway Crest) 2500 ft. (Miles)



Cobleskill (New Reservoir) No data unnamed trib or Cobleskill Creek.

Planimetered Area: 8.80 sq. in. $\left(\frac{2400^2}{144(93560)}\right)$ = 808.1 acres
{Smith Brook new / Dow Brook old} = 1.26 mi.^{2}

Reservoir Capacity / Spillway Capacity

41' long 4.0' d C=3.5
crest el 1180.55
Top of Dam 1184.55
L_{DAM} = 966+1200 = 2166.' C=3.0

Storage Capacity

El. as per plan	USGS El	Area	$\overline{Area}$	ΔVol. (Ac-Ft.)	Σ Vol.
1126	1156.55	0	0	0	0
1130	1160.55	.22	.11	.44	.44
1136	1166.55	4.2	2.21	13.3	13.7
1140	1170.55	6.6	5.40	21.6	35.3
1146	1176.55				122.
1150	1180.55	25.	14.4	149.0	267.

Spillway Cap. L = 41' 2% pier reduction

Spillway El.	H.	C	Q
1180.55	0.0	—	—
1181.00	0.45	3.2	39
1181.55	1.00	3.4	136
1182.00	1.45	3.5	244
1182.55	2.00	3.6	407
1183.55	3.00	3.8	790
1184.55	4.00	3.8	1216
1185.55	5.00	3.8	1700
1187.55	7.00	3.8	

PRECIP. ΣPMP = 19.5"

Durn	6	12	24	48
%	111	123	133	142

TOP OF DAM C = 3. L = 2166.'

SCS UNIT HYDROGRAPH

A = 1.26 mi.^{2} L = 8000' ΔH = 1840 - 1160 = 680'

$T_c = \left(\frac{11.9 L^3}{H}\right)^{0.385} = \left(\frac{11.9(1.515)^3}{680}\right)^{.385}$ = .34 hr = 20 MIN.

D = .25 hr

Q = 1.0"

$T_p = D/2 + 0.6\, T_c$ = .125 + .6(.34) = 0.33 hr = 20 MIN.

$q_p = \frac{484 AQ}{T_p} = \frac{484(1.26)\,1.''}{.33}$ = 1898. cfs

D = .50 hr

T_p = .704 hr = 42. MIN

q_p = 871 cfs.

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FLOOD HYDROGRAPH PACKAGE (HEC-1)                    NEW YORK STATE
FEB. 1974 VERSION      JULY 1973                    DEPT OF ENVIRONMENTAL CONSERVATION
LAST MODIFICATION 26 FEB 7                          FLOOD PROTECTION BUREAU
RUN DATED 26 FEB EVAFALL APP 79
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```
    1  A1   COPLES-HILL NEW RESERVOIR DAM
    2  A2   SMITH BROOK
    3  A3   SEPT 19-1
    4  B    200       C       15       C        0        0        C        C        0        0
    5  B1     5
    6  J      1        6        1
    7  J1    .2       .4       .5       .6       .8       1
    8  K                1                         2                1
    9  K1   INFLOW FROM SUB-BASIN
   10  M      1        1     1,26
   11  P             19,5      111      123      133      142
   12  T                                                        1,0      0,1
   13  W    2,87    0,625
   14  X     -2        2        1
   15  K      1        1                                         1
   16  K1   ROUTE TOTAL RUNOFF THROUGH LOWER RESERVOIR
   17  Y                                  1        1
   18  Y1     1                                              -1180,55      -1
   19  Y41180,6  1181,0 1181,55 1182,00 1182,55 1183,55 1184,55 1185,55
   20  Y5              39      136      244      407      790     1216     1700
   21  S5             ,44     13,7     35,3      122,     267,
   22  SE1156,5 1150,55 1166,55 1170,55 1176,55 1181,55
   23  S51180,6
   24  SC1184,5        3      1,5     2166
   25  K      99
   26  A
   27  A
   28  A
   29  A
   30  A
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PREVIEW OF SEQUENCE OF STREAM NETWORK CALCULATIONS

RUNOFF HYDROGRAPH AT	1
ROUTE HYDROGRAPH TO	1

END OF NETWORK

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FLOOD HYDROGRAPH PACKAGE (HEC-1)
LATEST VERSION     JULY 1978
  LAST MODIFICATION  20 FEB 79
    UPDATED FOR REVIEW-FALL APR 79
*****************************

RUN DATE 02/04/81

                    COBLESKILL NEW RESERVOIR DAM
                    SMITH BROCK
                    3FEE1981

                                  NEW YORK STATE
                                  DEPT OF ENVIRONMENTAL CONSERVATION
                                  FLOOD PROTECTION BUREAU

                                  *********************************

                                  JOB SPECIFICATION
      NC      NHR     NMIN     IDAY      IHR     IMIN    METRC     IPLT     JPRT    NSTAN
     200        0       15        0        0        0        0        0        0        0
                                JOPER      NWT   LROPT    TRACE
                                    5        0        0        0


                                  MULTI-PLAN ANALYSES TO BE PERFORMED
                                  NPLAN= 1  NRTIO= 6  LRTIO= 1
                    RTIOS=   0.20   0.40   0.50   0.60   0.80   1.00

**********          **********          **********          **********          **********

                                  SUB-AREA RUNOFF COMPUTATION

                    INFLOW FROM SUB-BASIN
                                 ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                                     1       0       0       0       2       0       1       0       0

                                  HYDROGRAPH DATA
                    IHYDG     IUHG    TAREA     SNAP   TRSDA   TRSPC   RATIO   ISNOW   ISAME   LOCAL
                        1        1     1.26       0.     1.26      0.      0.       0       0       0

                                  PRECIP DATA
                              SPFE      PMS       R6      R12      R24      R48      R72      R96
                                0.    19.50  111.00   123.00   133.00   142.00     0.       0.
TRSPC COMPUTED BY THE PROGRAM IS 0.500

                                  LOSS DATA
                    LROPT   STRKR   DLTKR   RTIOL   ERAIN   STRKS   RTIOK   STRTL   CNSTL   ALSMX   RTIMP
                        0      0.      0.    1.00      0.      0.    1.00    1.00     0.10      0.      0.

                                  UNIT HYDROGRAPH DATA
                                TP=  2.87    CP=0.63    NTA=  0

                                  RECESSION DATA
                                STRTQ=   -2.00    QRCSN=    2.00    RTIOR= 1.00
APPROXIMATE CLARK COEFFICIENTS FROM GIVEN SNYDER CP AND TP ARE TC=12.79 AND R=10.46 INTERVALS

                    UNIT HYDROGRAPH 63 END-OF-PERIOD ORDINATES, LAG=  2.85 HOURS, CP= 0.63  VOL= 1.00
      5.      17.      35.      55.      78.     101.     125.     147.     163.     175.
    182.     184.     176.     165.     150.     136.     124.     112.     102.      93.
     84.      77.      70.      63.      58.      52.      48.      43.      39.      36.
     32.      29.      27.      24.      22.      20.      18.      17.      15.      14.
     12.      11.      10.       9.       8.       8.       7.       6.       6.       5.
      5.       4.       4.       4.       3.       3.       3.       2.       2.       2.
      2.       2.       2.

                                  END-OF-PERIOD FLOW
```

1.01	1.00	4	0.00	0.	0.00	3.	1.02	1.45	103	0.03	0.00	0.03	5.
1.01	1.15	5	0.00	0.	0.00	3.	1.02	2.00	104	0.03	0.00	0.03	5.
1.01	1.30	6	0.00	0.	0.00	3.	1.02	2.15	105	0.03	0.00	0.03	5.
1.01	1.45	7	0.00	0.	0.00	3.	1.02	2.30	106	0.03	0.00	0.03	5.
1.01	2.00	8	0.00	0.	0.00	3.	1.02	2.45	107	0.03	0.00	0.03	5.
1.01	2.15	9	0.00	0.	0.00	3.	1.02	3.00	108	0.03	0.00	0.03	5.
1.01	2.30	10	0.00	0.	0.00	3.	1.02	3.15	109	0.03	0.00	0.03	5.
1.01	2.45	11	0.00	0.	0.00	3.	1.02	3.30	110	0.03	0.00	0.03	5.
1.01	3.00	12	0.00	0.	0.00	3.	1.02	3.45	111	0.03	0.00	0.03	5.
1.01	3.15	13	0.00	0.	0.00	3.	1.02	4.00	112	0.03	0.00	0.03	5.
1.01	3.30	14	0.00	0.	0.00	3.	1.02	4.15	113	0.03	0.00	0.03	5.
1.01	3.45	15	0.00	0.	0.00	3.	1.02	4.30	114	0.03	0.00	0.03	5.
1.01	4.00	16	0.00	0.	0.00	3.	1.02	4.45	115	0.03	0.00	0.03	5.
1.01	4.15	17	0.00	0.	0.00	3.	1.02	5.00	116	0.03	0.00	0.03	5.
1.01	4.30	18	0.00	0.	0.00	3.	1.02	5.15	117	0.03	0.00	0.03	6.
1.01	4.45	19	0.00	0.	0.00	3.	1.02	5.30	118	0.03	0.00	0.03	6.
1.01	5.00	20	0.00	0.	0.00	3.	1.02	5.45	119	0.03	0.00	0.03	6.
1.01	5.15	21	0.00	0.	0.00	3.	1.02	6.00	120	0.03	0.00	0.03	6.
1.01	5.30	22	0.00	0.	0.00	3.	1.02	6.15	121	0.04	0.05	0.03	6.
1.01	5.45	23	0.00	0.	0.00	3.	1.02	6.30	122	0.04	0.05	0.03	7.
1.01	6.00	24	0.00	0.	0.00	3.	1.02	6.45	123	0.04	0.05	0.03	9.
1.01	6.15	25	0.01	0.	0.01	3.	1.02	7.00	124	0.03	0.05	0.03	11.
1.01	6.30	26	0.01	0.	0.01	3.	1.02	7.15	125	0.04	0.05	0.03	16.
1.01	6.45	27	0.01	0.	0.01	3.	1.02	7.30	126	0.05	0.05	0.03	21.
1.01	7.00	28	0.01	0.	0.01	3.	1.02	7.45	127	0.01	0.05	0.02	27.
1.01	7.15	29	0.01	0.	0.01	3.	1.02	8.00	128	0.04	0.05	0.03	35.
1.01	7.30	30	0.01	0.	0.01	3.	1.02	8.15	129	0.03	0.05	0.03	43.
1.01	7.45	31	0.01	0.	0.01	3.	1.02	8.30	130	0.04	0.05	0.03	52.
1.01	8.00	32	0.01	0.	0.01	3.	1.02	8.45	131	0.04	0.05	0.03	62.
1.01	8.15	33	0.01	0.	0.01	3.	1.02	9.00	132	0.04	0.05	0.03	71.
1.01	8.30	34	0.01	0.	0.01	3.	1.02	9.15	133	0.04	0.05	0.03	81.
1.01	8.45	35	0.01	0.	0.01	3.	1.02	9.30	134	0.04	0.05	0.03	89.
1.01	9.00	36	0.01	0.	0.01	3.	1.02	9.45	135	0.04	0.05	0.03	97.
1.01	9.15	37	0.01	0.	0.01	3.	1.02	10.00	136	0.04	0.05	0.03	104.
1.01	9.30	38	0.01	0.	0.01	3.	1.02	10.15	137	0.04	0.05	0.03	111.
1.01	9.45	39	0.01	0.	0.01	3.	1.02	10.30	138	0.04	0.05	0.03	118.
1.01	10.00	40	0.01	0.	0.01	3.	1.02	10.45	139	0.04	0.05	0.03	124.
1.01	10.15	41	0.01	0.	0.01	3.	1.02	11.00	140	0.04	0.05	0.03	127.
1.01	10.30	42	0.01	0.	0.01	3.	1.02	11.15	141	0.04	0.05	0.03	131.
1.01	10.45	43	0.01	0.	0.01	3.	1.02	11.30	142	0.04	0.05	0.03	135.
1.01	11.00	44	0.01	0.	0.01	3.	1.02	11.45	143	0.04	0.05	0.03	139.
1.01	11.15	45	0.01	0.	0.01	3.	1.02	12.00	144	0.01	0.05	0.03	142.
1.01	11.30	46	0.01	0.	0.01	3.	1.02	12.15	145	0.43	0.41	0.02	147.
1.01	11.45	47	0.01	0.	0.01	3.	1.02	12.30	146	0.43	0.41	0.02	159.
1.01	12.00	48	0.01	0.	0.01	3.	1.02	12.45	147	0.43	0.41	0.02	170.
1.01	12.15	49	0.03	0.	0.03	3.	1.02	13.00	148	0.43	0.41	0.02	192.
1.01	12.30	50	0.03	0.	0.03	3.	1.02	13.15	149	0.52	0.49	0.02	222.
1.01	12.45	51	0.03	0.	0.03	3.	1.02	13.30	150	0.52	0.49	0.02	261.
1.01	13.00	52	0.03	0.	0.03	3.	1.02	13.45	151	0.52	0.49	0.02	311.
1.01	13.15	53	0.04	0.	0.04	3.	1.02	14.00	152	0.52	0.49	0.02	369.
1.01	13.30	54	0.04	0.	0.04	3.	1.02	14.15	153	0.65	0.62	0.02	435.
1.01	13.45	55	0.04	0.	0.04	3.	1.02	14.30	154	0.65	0.62	0.02	510.
1.01	14.00	56	0.04	0.	0.04	3.	1.02	14.45	155	0.65	0.62	0.02	591.
1.01	14.15	57	0.04	0.	0.04	3.	1.02	15.00	156	0.65	0.62	0.02	677.
1.01	14.30	58	0.04	0.	0.04	3.	1.02	15.15	157	0.66	0.63	0.02	766.
1.01	14.45	59	0.04	0.	0.04	3.	1.02	15.30	158	1.32	1.29	0.03	858.
1.01	15.00	60	0.04	0.	0.04	3.	1.02	15.45	159	3.68	3.66	0.03	965.
1.01	15.15	61	0.04	0.	0.04	3.	1.02	16.00	160	0.92	0.90	0.02	1100.
1.01	15.30	62	0.09	0.	0.09	3.	1.02	16.15	161	0.61	0.58	0.02	1252.
1.01	15.45	63	0.25	0.	0.25	3.	1.02	16.30	162	0.61	0.58	0.02	1411.
							1.02	16.45	163	0.61	0.58	0.02	1572.
									164	0.61	0.58	0.02	1733.

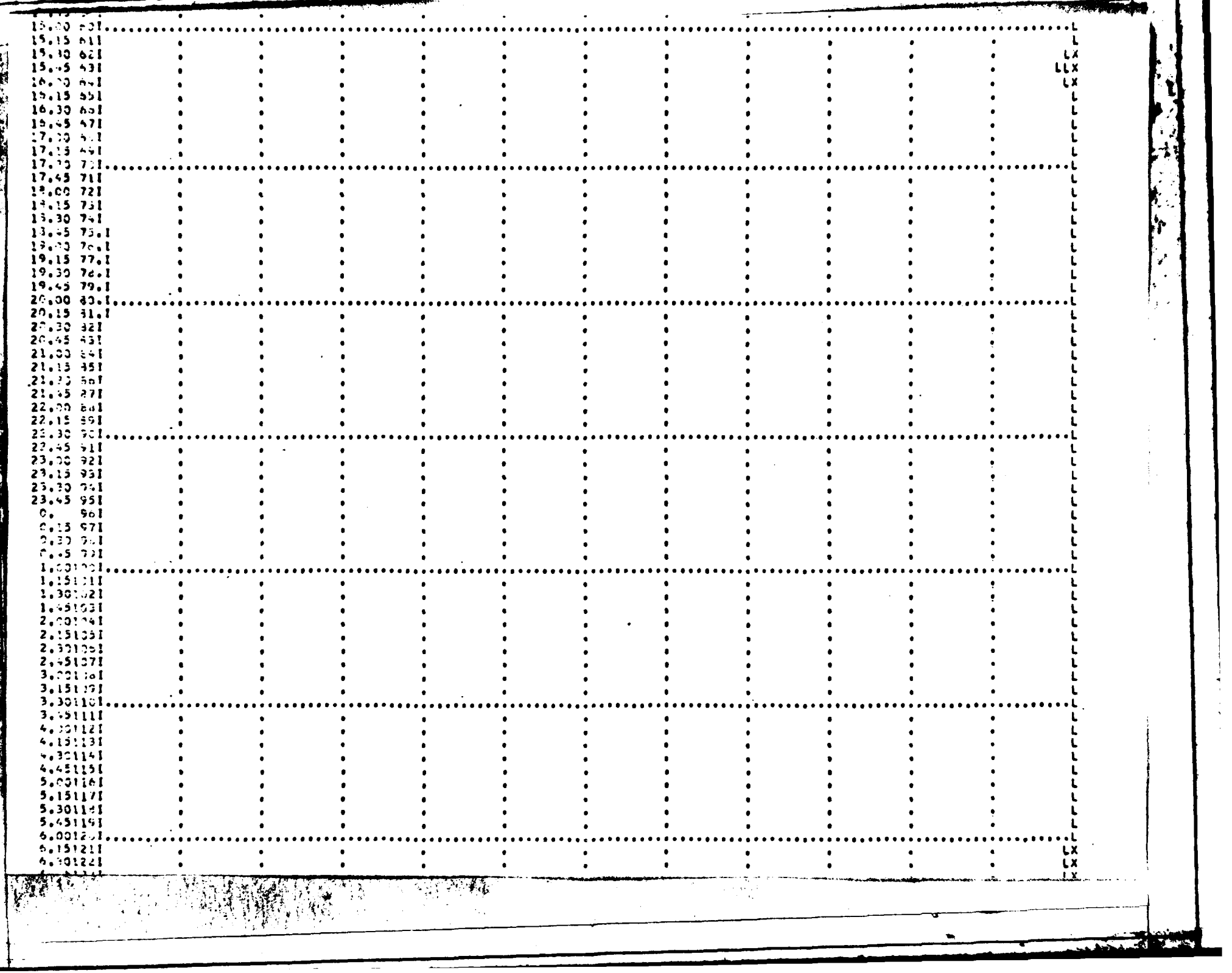
1.01	17.15	69	0.03	0.01	0.03	8.	1.02	18.15	169	0.04	0.01	0.03	2259.
1.01	17.30	70	0.03	0.01	0.03	11.	1.02	18.30	170	0.04	0.01	0.03	2273.
1.01	17.45	71	0.03	0.01	0.03	13.	1.02	18.45	171	0.04	0.01	0.03	2244.
1.01	18.00	72	0.03	0.01	0.03	15.	1.02	19.00	172	0.04	0.01	0.03	2175.
1.01	18.15	73	0.00	0.	0.00	17.	1.02	19.15	173	0.04	0.01	0.03	2084.
1.01	18.30	74	0.00	0.	0.00	19.	1.02	19.30	174	0.04	0.01	0.03	1983.
1.01	18.45	75	0.00	0.	0.00	21.	1.02	19.45	175	0.04	0.01	0.03	1874.
1.01	19.00	76	0.00	0.	0.00	22.	1.02	20.00	176	0.04	0.01	0.03	1758.
1.01	19.15	77	0.00	0.	0.00	23.	1.02	20.15	177	0.04	0.01	0.03	1639.
1.01	19.30	78	0.00	0.	0.00	23.	1.02	20.30	178	0.04	0.01	0.03	1518.
1.01	19.45	79	0.00	0.	0.00	22.	1.02	20.45	179	0.04	0.01	0.03	1396.
1.01	20.00	80	0.00	0.	0.00	21.	1.02	21.00	180	0.04	0.01	0.03	1281.
1.01	20.15	81	0.00	0.	0.00	20.	1.02	21.15	181	0.04	0.01	0.03	1170.
1.01	20.30	82	0.00	0.	0.00	19.	1.02	21.30	182	0.04	0.01	0.03	1067.
1.01	20.45	83	0.00	0.	0.00	18.	1.02	21.45	183	0.04	0.01	0.03	974.
1.01	21.00	84	0.00	0.	0.00	16.	1.02	22.00	184	0.04	0.01	0.03	890.
1.01	21.15	85	0.00	0.	0.00	15.	1.02	22.15	185	0.04	0.01	0.03	813.
1.01	21.30	86	0.00	0.	0.00	14.	1.02	22.30	186	0.04	0.01	0.03	743.
1.01	21.45	87	0.00	0.	0.00	13.	1.02	22.45	187	0.04	0.01	0.03	680.
1.01	22.00	88	0.00	0.	0.00	12.	1.02	23.00	188	0.04	0.01	0.03	622.
1.01	22.15	89	0.00	0.	0.00	11.	1.02	23.15	189	0.04	0.01	0.03	570.
1.01	22.30	90	0.00	0.	0.00	10.	1.02	23.30	190	0.04	0.01	0.03	522.
1.01	22.45	91	0.00	0.	0.00	10.	1.02	23.45	191	0.04	0.01	0.03	479.
1.01	23.00	92	0.00	0.	0.00	9.	1.03	0.	192	0.04	0.01	0.03	439.
1.01	23.15	93	0.00	0.	0.00	8.	1.03	0.15	193	0.	0.	0.	403.
1.01	23.30	94	0.00	0.	0.00	8.	1.03	0.30	194	0.	0.	0.	371.
1.01	23.45	95	0.00	0.	0.00	7.	1.03	0.45	195	0.	0.	0.	341.
1.02	0.	96	0.00	0.	0.00	7.	1.03	1.00	196	0.	0.	0.	313.
1.02	0.15	97	0.03	0.00	0.03	7.	1.03	1.15	197	0.	0.	0.	288.
1.02	0.30	98	0.03	0.00	0.03	6.	1.03	1.30	198	0.	0.	0.	264.
1.02	0.45	99	0.03	0.00	0.03	6.	1.03	1.45	199	0.	0.	0.	242.
1.02	1.00	100	0.03	0.00	0.03	6.	1.03	2.00	200	0.	0.	0.	222.
									SUM	22.15	18.47	3.68	58346.
										(563.)	(469.)	(94.)	(1652.17)

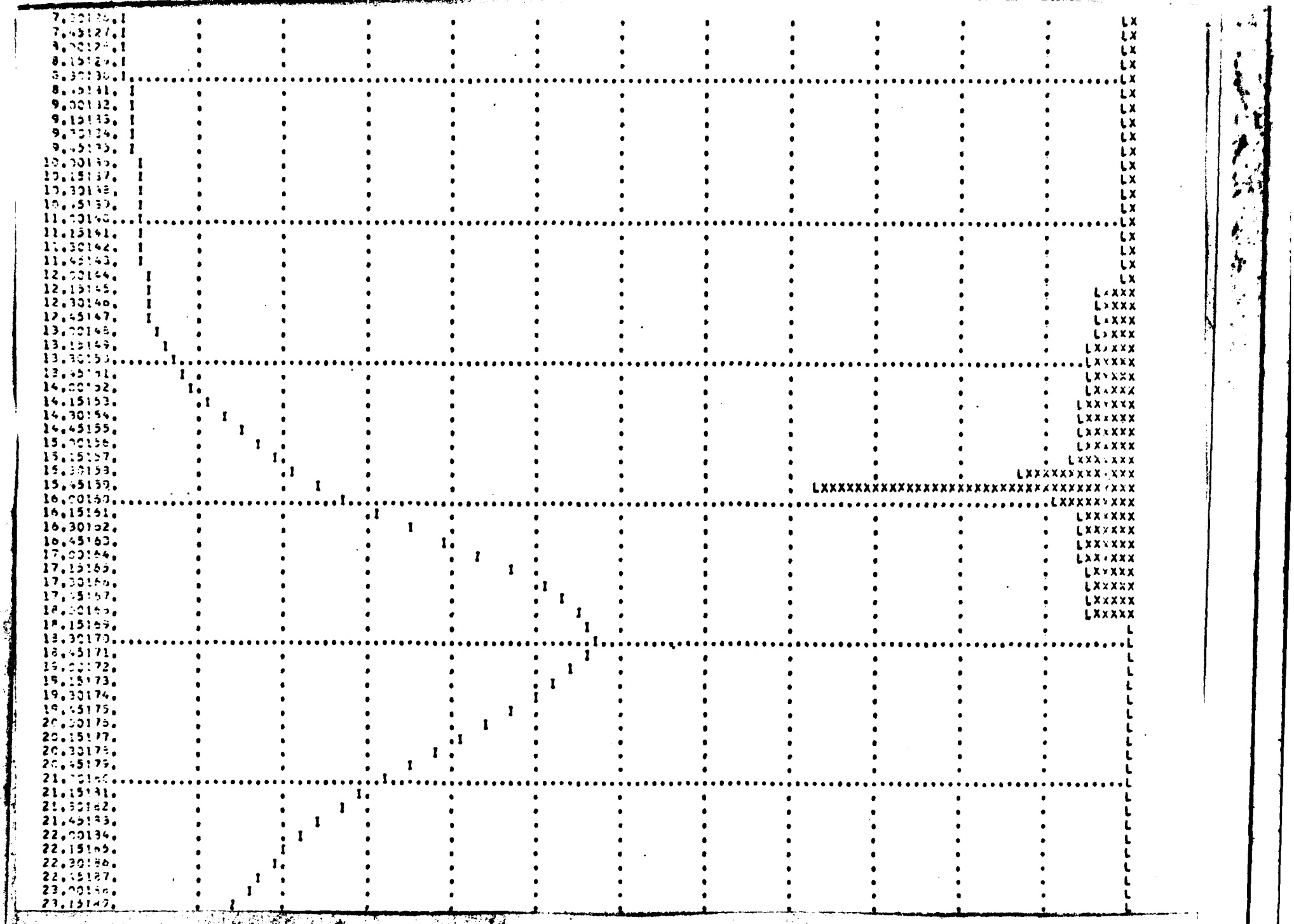
	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	2273.	1709.	600.	291.	58204.
CMS	64.	48.	17.	8.	1648.
INCHES		12.61	17.71	17.90	17.90
MM		320.39	449.82	454.78	454.78
AC-FT		847.	1189.	1203.	1203.
THOLS CU M		1045.	1467.	1483.	1483.

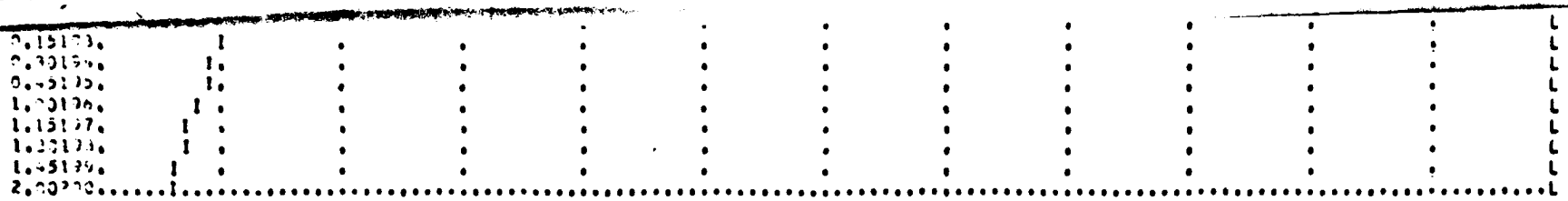
STATION 1

INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)

	0.	400.	800.	1200.	1600.	2000.	2400.	0.	0.	0.	0.	0.	0.
	0.	0.	0.	0.	0.	0.	0.	0.	4.	3.	PRECIP(L) AND EXCESS(X) 2.	1.	0.
0.15	1I												L
0.30	2I												L
0.45	3I												L
1.00	4I												L
1.15	5I												L
1.30	6I												L
1.45	7I												L
2.00	8I												L
2.15	9I												L
2.30	10I												L
2.45	11I												L
3.00	12I												L
3.15	13I												L
3.30	14I												L
3.45	15I												L
4.00	16I												L
4.15	17I												L
4.30	18I												L
4.45	19I												L
5.00	20I												L
5.15	21I												L
5.30	22I												L
5.45	23I												L
6.00	24I												L
6.15	25I												L
6.30	26I												L
6.45	27I												L
7.00	28I												L
7.15	29I												L
7.30	30I												L
7.45	31I												L
8.00	32I												L
8.15	33I												L
8.30	34I												L
8.45	35I												L
9.00	36I												L
9.15	37I												L
9.30	38I												L
9.45	39I												L
10.00	40I												L
10.15	41I												L
10.30	42I												L
10.45	43I												L
11.00	44I												L
11.15	45I												L
11.30	46I												L
11.45	47I												L
12.00	48I												L
12.15	49I												L
12.30	50I												L
12.45	51I												L
13.00	52I												L
13.15	53I												L







HYDROGRAPH AT STA 1 FOR PLAN 1, RTIC 1

1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	2.	2.
3.	3.	3.	4.	4.	4.	5.	5.	4.	4.
4.	4.	4.	3.	3.	3.	3.	2.	2.	2.
2.	2.	2.	2.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	2.	2.	3.	4.	5.	7.	9.	10.
12.	14.	16.	18.	19.	21.	22.	23.	24.	25.
25.	27.	28.	28.	29.	31.	34.	36.	44.	52.
62.	74.	87.	102.	118.	135.	153.	171.	193.	220.
250.	282.	314.	347.	377.	404.	426.	442.	452.	455.
449.	435.	417.	397.	375.	352.	328.	304.	280.	256.
234.	213.	195.	178.	163.	149.	136.	124.	114.	104.
96.	88.	81.	74.	68.	63.	58.	53.	48.	44.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	455.	342.	120.	58.	11641.
CMS	13.	10.	3.	2.	330.
INCHES		2.52	3.54	3.58	3.58
MM		64.08	89.96	90.96	90.96
AC-FT		169.	238.	241.	241.
THOUS CU M		209.	293.	297.	297.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIC 2

1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	2.	2.	3.	3.	4.
5.	6.	7.	8.	8.	9.	9.	9.	9.	8.
8.	8.	7.	7.	6.	6.	5.	5.	4.	4.
4.	4.	3.	3.	3.	3.	3.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	3.	3.	5.	6.	8.	11.	14.	17.	21.
25.	29.	32.	36.	39.	42.	44.	47.	49.	51.
52.	54.	55.	57.	59.	62.	68.	77.	89.	105.
124.	148.	174.	204.	236.	271.	306.	343.	386.	440.
501.	564.	629.	693.	755.	808.	852.	884.	904.	909.
898.	870.	834.	793.	750.	703.	655.	607.	559.	512.
466.	427.	390.	356.	325.	297.	272.	249.	228.	209.
191.	176.	161.	148.	136.	125.	115.	106.	97.	89.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	909.	683.	240.	116.	23282.
CMS	26.	19.	7.	3.	659.
INCHES		5.05	7.08	7.16	7.16
MM		126.16	179.93	181.91	181.91
AC-FT		339.	476.	481.	481.

SUMMARY OF

1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	2.	2.	3.	3.	4.	5.
6.	8.	9.	10.	11.	11.	11.	11.	11.	11.
10.	9.	9.	8.	8.	7.	6.	6.	6.	5.
5.	4.	4.	4.	4.	3.	3.	3.	3.	3.
3.	3.	3.	3.	3.	3.	3.	3.	3.	2.
3.	3.	3.	3.	3.	3.	3.	3.	3.	3.
3.	3.	4.	6.	8.	10.	14.	17.	22.	26.
31.	36.	40.	45.	49.	52.	55.	59.	61.	63.
66.	68.	69.	71.	73.	78.	85.	96.	111.	131.
155.	184.	218.	255.	296.	339.	383.	428.	482.	550.
626.	705.	786.	866.	943.	1011.	1064.	1104.	1129.	1137.
1122.	1088.	1042.	992.	937.	879.	819.	759.	699.	640.
585.	534.	487.	445.	406.	372.	340.	311.	285.	261.
239.	220.	202.	185.	170.	157.	144.	132.	121.	111.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1137.	854.	300.	146.	25102.
CMS	32.	24.	8.	4.	824.
INCHES		6.31	8.85	8.95	8.95
MM		160.20	224.91	227.39	227.39
AC-FT		424.	595.	601.	601.
THOUS CU M		523.	734.	742.	742.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIC 4

2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	4.	5.	6.
8.	9.	10.	12.	13.	13.	14.	14.	13.	13.
12.	11.	11.	10.	9.	8.	8.	7.	7.	6.
6.	5.	5.	5.	4.	4.	4.	4.	4.	3.
3.	3.	3.	3.	3.	3.	3.	3.	3.	3.
3.	3.	3.	3.	3.	3.	3.	3.	3.	3.
4.	4.	5.	7.	9.	12.	16.	21.	26.	31.
37.	43.	48.	54.	58.	63.	66.	70.	73.	76.
79.	81.	83.	85.	88.	93.	102.	115.	133.	157.
186.	221.	261.	306.	355.	406.	459.	514.	579.	660.
751.	847.	943.	1040.	1132.	1213.	1277.	1325.	1355.	1364.
1347.	1305.	1250.	1190.	1124.	1055.	983.	911.	839.	768.
702.	640.	585.	534.	488.	446.	408.	373.	342.	313.
287.	264.	242.	222.	204.	188.	173.	158.	145.	133.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1364.	1025.	360.	175.	34922.
CMS	39.	29.	10.	5.	989.
INCHES		7.57	10.63	10.74	10.74
MM		192.24	269.89	272.87	272.87
AC-FT		508.	714.	722.	722.
THOUS CU M		627.	880.	890.	890.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIC 5

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2.	2.	2.

SUMMARY OF DAM SAFETY ANALYSIS

2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	3.	4.	5.	7.	8.
10.	12.	14.	16.	17.	18.	18.	18.	18.	17.
16.	15.	14.	13.	12.	11.	10.	10.	9.	8.
8.	7.	7.	6.	6.	6.	5.	5.	5.	5.
4.	4.	4.	4.	4.	4.	4.	4.	4.	4.
4.	4.	4.	4.	4.	4.	4.	4.	4.	4.
5.	5.	7.	9.	12.	17.	22.	28.	35.	42.
50.	57.	65.	71.	79.	83.	88.	93.	97.	101.
105.	108.	111.	114.	117.	124.	136.	154.	171.	209.
248.	295.	349.	409.	473.	542.	612.	685.	772.	880.
1001.	1125.	1255.	1386.	1509.	1617.	1703.	1767.	1807.	1819.
1795.	1740.	1667.	1587.	1499.	1407.	1311.	1214.	1110.	1025.
936.	854.	780.	712.	650.	595.	544.	491.	456.	418.
383.	351.	323.	297.	273.	250.	230.	211.	194.	177.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1819.	1367.	480.	233.	46563.
CMS	51.	39.	14.	7.	1319.
INCHES		10.09	14.17	14.32	14.32
MM		256.32	359.85	363.82	363.82
AC-FT		678.	952.	962.	962.
THOUS CU M		836.	1174.	1187.	1187.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 6

3.	3.	3.	3.	3.	3.	3.	3.	3.	3.
3.	3.	3.	3.	3.	3.	3.	3.	3.	3.
3.	3.	3.	3.	3.	3.	3.	3.	3.	3.
3.	3.	3.	3.	3.	3.	3.	3.	3.	3.
3.	3.	3.	3.	3.	3.	3.	3.	3.	3.
3.	3.	3.	3.	3.	3.	3.	3.	3.	3.
3.	3.	3.	3.	3.	4.	5.	7.	8.	11.
13.	15.	17.	19.	21.	22.	23.	23.	22.	21.
20.	19.	18.	16.	15.	14.	13.	12.	11.	10.
10.	9.	8.	8.	7.	7.	7.	6.	6.	6.
5.	5.	5.	5.	5.	5.	5.	5.	5.	5.
5.	5.	5.	5.	5.	5.	6.	6.	6.	6.
6.	7.	9.	11.	16.	21.	27.	35.	43.	52.
62.	71.	81.	89.	97.	104.	111.	116.	122.	127.
131.	135.	139.	142.	147.	155.	170.	192.	222.	261.
311.	369.	436.	510.	591.	677.	766.	856.	965.	1100.
1252.	1411.	1572.	1733.	1886.	2021.	2129.	2209.	2259.	2273.
2264.	2175.	2084.	1993.	1874.	1758.	1639.	1516.	1398.	1281.
1170.	1067.	974.	890.	813.	743.	680.	622.	570.	522.
479.	439.	403.	371.	341.	313.	288.	264.	242.	222.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	2273.	1709.	600.	291.	58204.
CMS	64.	48.	17.	8.	1648.
INCHES		12.61	17.71	17.90	17.90
MM		320.39	449.82	454.78	454.78
AC-FT		847.	1189.	1203.	1203.
THOUS CU M		1045.	1467.	1483.	1483.

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1	ELEVATION	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
		1180.55	1180.66	1184.50

2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	3.	4.	5.	7.	8.
10.	12.	14.	16.	17.	18.	18.	19.	18.	17.
16.	15.	14.	13.	12.	11.	10.	10.	9.	8.
8.	7.	7.	6.	6.	6.	5.	5.	5.	5.
4.	4.	4.	4.	4.	4.	4.	4.	4.	4.
4.	4.	4.	4.	4.	4.	4.	4.	4.	4.
5.	5.	7.	9.	12.	17.	22.	28.	35.	42.
50.	59.	65.	71.	79.	83.	88.	93.	97.	101.
105.	108.	111.	114.	117.	124.	136.	154.	178.	209.
248.	295.	349.	409.	473.	542.	612.	685.	772.	880.
1001.	1125.	1258.	1386.	1503.	1617.	1703.	1767.	1807.	1819.
1795.	1740.	1667.	1587.	1499.	1407.	1311.	1214.	1118.	1025.
936.	854.	780.	712.	650.	595.	544.	494.	456.	418.
383.	351.	323.	297.	273.	250.	230.	211.	194.	177.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1819.	1367.	480.	233.	46563.
CMS	51.	39.	14.	7.	1319.
INCHES		10.09	14.17	14.32	14.32
MM		256.32	359.85	363.82	363.82
AC-FT		676.	952.	962.	962.
THOUS CU M		836.	1174.	1187.	1187.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 6

3.	3.	3.	3.	3.	3.	3.	3.	3.	3.
3.	3.	3.	3.	3.	3.	3.	3.	3.	3.
3.	3.	3.	3.	3.	3.	3.	3.	3.	3.
3.	3.	3.	3.	3.	3.	3.	3.	3.	3.
3.	3.	3.	3.	3.	3.	3.	3.	3.	3.
3.	3.	3.	3.	3.	3.	3.	3.	3.	3.
3.	3.	3.	3.	3.	4.	5.	7.	8.	11.
13.	15.	17.	19.	21.	22.	23.	23.	22.	21.
20.	19.	18.	16.	15.	14.	13.	12.	11.	10.
10.	9.	8.	8.	7.	7.	7.	6.	6.	6.
5.	5.	5.	5.	5.	5.	5.	5.	5.	5.
5.	5.	5.	5.	5.	5.	6.	6.	6.	6.
6.	7.	9.	11.	16.	21.	27.	35.	43.	52.
62.	71.	81.	89.	97.	104.	111.	116.	122.	127.
131.	135.	139.	142.	147.	155.	170.	192.	222.	261.
311.	369.	436.	510.	591.	677.	766.	856.	965.	1100.
1252.	1411.	1572.	1733.	1886.	2021.	2129.	2209.	2259.	2273.
2244.	2175.	2084.	1983.	1874.	1758.	1639.	1518.	1398.	1281.
1170.	1067.	974.	890.	813.	743.	680.	622.	570.	522.
479.	439.	403.	371.	341.	313.	288.	264.	242.	222.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	2273.	1709.	600.	291.	58204.
CMS	64.	48.	17.	8.	1648.
INCHES		12.61	17.71	17.90	17.90
MM		320.39	449.82	454.78	454.78
AC-FT		847.	1189.	1203.	1203.
THOUS CU M		1045.	1467.	1483.	1483.

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1160.55	1180.46	1184.50

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              CLOSS    CLOSS      AVG     IRFS   ISAME    IOPT    IPMP              LSTR
                 0.       0.       0.        1       1       0       0                 0

                       NSTPS    NSTOL      LAG   AMSKK       X      TSK   STORA   ISPRAT
                           1        0        0      0.      0.       0.  -1181.       -1

   STAGE    1180.60    1181.00    1181.55    1182.00    1182.55    1183.55    1184.55    1185.55

    FLOW         0.      39.00     136.00     244.00     407.00     790.00    1216.00    1700.00

   CAPACITY=        0.        0.       14.       35.      122.      267.

  ELEVATION=     1157.     1161.     1167.     1171.     1177.     1182.

                      CREL    SPWID     COQW     EXPW    ELEVL     COOL    CAREA     EXPL
                    1160.6       0.       0.       0.       0.       0.       0.       0.

                                             DAM DATA
                                      TOPEL    COQD    EXPD  DAMWID
                                     1184.5     3.0     1.5   2166.

WARNING *** TOP OF DAM, BOTTOM OF BREACH, OR LOW-LEVEL OUTLET IS NOT WITHIN RANGE OF GIVEN ELEVATIONS IN STORAGE-ELEVATION DATA
        BOTTOM OF RESERVOIR ASSUMED TO BE AT 1156.50
        STORAGE-ELEVATION DATA WILL BE EXTRAPOLATED ABOVE ELEVATION 1181.55

                                       STATION      1, PLAN 1, RATIO 1

                                    END-OF-PERIOD HYDROGRAPH ORDINATES

                                                 OUTFLOW
            0.          0.          0.          0.          0.          0.          0.          0.          0.          0.
            0.          0.          0.          0.          0.          0.          0.          0.          0.          0.
            0.          0.          0.          0.          0.          0.          0.          0.          0.          0.
            0.          0.          0.          0.          0.          0.          0.          0.          0.          0.
            0.          0.          0.          0.          0.          0.          0.          0.          0.          0.
            0.          0.          0.          0.          0.          0.          0.          0.          0.          0.
            0.          0.          0.          0.          0.          0.          0.          0.          0.          0.
            0.          0.          0.          0.          0.          0.          0.          0.          0.          0.
            1.          1.          1.          1.          1.          1.          2.          2.          2.          2.
            2.          2.          2.          2.          2.          2.          2.          2.          2.          2.
            2.          2.          1.          1.          1.          1.          1.          1.          1.          1.
            1.          1.          1.          1.          1.          1.          1.          1.          1.          1.
            1.          1.          1.          1.          1.          2.          2.          2.          2.          3.
            3.          4.          5.          6.          7.          7.          8.          9.         10.         11.
           12.         13.         14.         15.         16.         17.         18.         19.         21.         23.
           25.         28.         31.         36.         42.         52.         63.         75.         87.        101.
          117.        135.        160.        187.        214.        242.        275.        305.        332.        355.
          374.        387.        394.        397.        395.        389.        379.        367.        353.        336.
          319.        301.        282.        264.        246.        232.        217.        204.        190.        178.
          165.        154.        143.        133.        126.        119.        112.        105.         99.         93.

                                                 STORAGE
          238.        238.        238.        238.        233.        238.        238.        238.        238.        238.
          238.        238.        238.        238.        238.        238.        232.        232.        238.        238.
          238.        233.        238.        238.        233.        238.        238.        238.        238.        238.
          239.        233.        238.        232.        233.        238.        239.        232.        238.        238.
          236.        238.        238.        238.        233.        238.        238.        231.        238.        239.
                                239.                    239.        239.        239.        239.        239.        239.
                                                                                235.        239.        239.        239.
                                                                                                                    235.
             1182.2      1182.3      1182.6      1182.4      1182.5      1184.3      1186.8      1186.1      1186.0      1186.2

                                      SUMMARY OF DAM SAFETY ANALYSIS

     PLAN  1 ...............
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   243.      243.      244.      244.      244.      245.      245.      245.      246.      246.
   247.      248.      249.      250.      252.      253.      255.      257.      259.      261.
   264.      267.      270.      273.      275.      280.      283.      286.      289.      291.
   293.      294.      295.      295.      295.      294.      293.      292.      291.      289.
   287.      286.      284.      282.      280.      279.      277.      275.      274.      272.
   271.      269.      268.      267.      265.      264.      263.      262.      261.      260.

                                            STAGE
 1180.5    1180.5    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6
 1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6
 1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6
 1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6
 1180.5    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6
 1180.6    1180.6    1180.6    1180.6    1180.5    1180.6    1180.6    1180.6    1180.6    1180.6
 1180.6    1180.6    1180.6    1180.5    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6
 1180.6    1180.6    1180.6    1180.5    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6
 1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6
 1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6
 1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6
 1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6
 1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6
 1180.5    1180.6    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7
 1180.7    1180.7    1180.7    1180.8    1180.8    1180.8    1180.8    1180.8    1180.8    1180.8
 1180.9    1180.9    1180.9    1181.0    1181.0    1181.1    1181.1    1181.2    1181.3    1181.4
 1181.4    1181.5    1181.7    1181.8    1181.9    1182.0    1182.1    1182.2    1182.3    1182.4
 1182.4    1182.5    1182.5    1182.5    1182.5    1182.5    1182.5    1182.4    1182.4    1182.3
 1182.3    1182.2    1182.1    1182.1    1182.0    1181.9    1181.9    1181.8    1181.8    1181.7
 1181.7    1181.6    1181.6    1181.5    1181.5    1181.5    1181.4    1181.4    1181.3    1181.3

PEAK OUTFLOW IS      397. AT TIME  43.50 HOURS

                                    PEAK    6-HOUR    24-HOUR   72-HOUR    TOTAL VOLUME
                          CFS       397.      315.       110.       53.          10582.
                          CMS        11.        9.         3.        1.            300.
                       INCHES                2.32       3.24      3.26            3.26
                           MM               59.00      82.41     82.68           82.68
                        AC-FT                156.       218.      219.            219.
                    THOUS CU M               192.       269.      270.            270.

WARNING *** TOP OF DAM, BOTTOM OF BREACH, OR LOW-LEVEL OUTLET IS NOT WITHIN RANGE OF GIVEN ELEVATIONS IN STORAGE-ELEVATION DATA
            BOTTOM OF RESERVOIR ASSUMED TO BE AT 1156.50
            STORAGE-ELEVATION DATA WILL BE EXTRAPOLATED ABOVE ELEVATION 1181.55

                                       STATION      1, PLAN 1, RATIO 2

                                       END-OF-PERIOD HYDROGRAPH ORDINATES

                                              OUTFLOW
     0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
     0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
     0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
     0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
     0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
     0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
     0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
 1183.3    1183.4    1183.2    1183.1    1183.0    1182.9    1182.8    1182.7    1182.6    1182.5

                                       SUMMARY OF DAM SAFETY ANALYSIS

     PLAN  1 ...............
                                  ELEVATION          INITIAL VALUE      SPILLWAY CREST      TOP OF DAM
                                                        1180.55            1180.60            1184.50
                                  STORAGE                 235.               235.
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   [illegible] [illegible] [illegible] [illegible] [illegible]   772.  [illegible]   733.     697.     658.
    616.     577.     536.     497.     460.     424.     394.     368.     344.     320.
    297.     275.     255.     237.     222.     206.     194.     181.     168.     156.

                                      STORAGE
    238.     238.     238.     238.     238.     238.     238.     238.     238.     238.
    238.     238.     238.     238.     238.     238.     238.     238.     238.     238.
    238.     238.     238.     238.     239.     239.     239.     239.     239.     239.
    239.     239.     239.     239.     239.     239.     239.     239.     239.     239.
    239.     239.     239.     239.     239.     239.     239.     239.     239.     239.
    239.     239.     239.     239.     239.     239.     239.     239.     239.     239.
    239.     239.     239.     239.     239.     239.     239.     239.     240.     240.
    240.     240.     240.     240.     240.     240.     240.     240.     241.     241.
    241.     241.     241.     241.     241.     241.     241.     241.     241.     241.
    241.     241.     241.     241.     241.     241.     241.     241.     241.     241.
    241.     241.     241.     241.     240.     240.     240.     240.     240.     240.
    240.     240.     240.     240.     240.     240.     240.     240.     240.     240.
    240.     240.     240.     240.     240.     240.     241.     241.     241.     241.
    242.     242.     242.     243.     243.     244.     244.     245.     246.     246.
    247.     247.     248.     248.     249.     250.     250.     251.     252.     253.
    254.     255.     257.     260.     262.     265.     268.     272.     275.     279.
    284.     288.     293.     298.     304.     309.     313.     318.     321.     324.
    326.     328.     329.     328.     327.     325.     323.     321.     318.     315.
    312.     309.     306.     303.     300.     297.     295.     292.     290.     287.
    285.     283.     281.     279.     277.     276.     274.     272.     271.     269.

                                       STAGE
  1180.6   1180.6   1180.6   1180.6   1180.6   1180.6   1180.6   1180.6   1180.6   1180.6
  1180.6   1180.6   1180.6   1180.6   1180.6   1180.6   1180.6   1180.6   1180.6   1180.6
  1180.6   1180.6   1180.6   1180.6   1180.6   1180.6   1180.6   1180.6   1180.6   1180.6
  1180.6   1180.6   1180.6   1180.6   1180.6   1180.6   1180.6   1180.6   1180.6   1180.6
  1180.6   1180.6   1180.6   1180.6   1180.6   1180.6   1180.6   1180.6   1180.6   1180.6
  1180.6   1180.6   1180.6   1180.6   1180.6   1180.6   1180.6   1180.6   1180.6   1180.6
  1180.6   1180.6   1180.6   1180.6   1180.6   1180.6   1180.6   1180.6   1180.6   1180.6
  1180.6   1180.6   1180.6   1180.6   1180.6   1180.6   1180.6   1180.6   1180.6   1180.6
  1180.6   1180.6   1180.6   1180.7   1180.7   1180.7   1180.7   1180.7   1180.7   1180.7
  1180.7   1180.7   1180.6   1180.6   1180.6   1180.6   1180.6   1180.6   1180.6   1180.6
  1180.6   1180.6   1180.6   1180.6   1180.6   1180.6   1180.6   1180.6   1180.6   1180.6
  1180.6   1180.6   1180.6   1180.6   1180.6   1180.6   1180.6   1180.6   1180.6   1180.6
  1180.6   1180.6   1180.6   1180.6   1180.6   1180.6   1180.6   1180.6   1180.7   1180.7
  1180.7   1180.7   1180.7   1180.7   1180.7   1180.8   1180.8   1180.8   1180.8   1180.8
  1180.9   1180.9   1180.9   1180.9   1180.9   1180.9   1181.0   1181.0   1181.0   1181.1
  1181.1   1181.2   1181.2   1181.3   1181.4   1181.5   1181.6   1181.7   1181.8   1182.0
  1182.1   1182.3   1182.5   1182.6   1182.8   1183.0   1183.1   1183.3   1183.4   1183.5
  1183.6   1183.6   1183.7   1183.6   1183.6   1183.6   1183.5   1183.4   1183.3   1183.2
  1183.1   1183.0   1182.9   1182.8   1182.7   1182.6   1182.5   1182.4   1182.3   1182.3
  1182.2   1182.1   1182.0   1182.0   1181.9   1181.8   1181.8   1181.7   1181.7   1181.6

PEAK OUTFLOW IS       836. AT TIME  43.25 HOURS

                                 PEAK     6-HOUR    24-HOUR    72-HOUR    TOTAL VOLUME
                         CFS     836.      651.       225.       109.          21760.
                         CMS      24.       18.         6.         3.            616.
                      INCHES               4.81       6.65       6.69           6.69
                          MM             122.13     168.98     170.02         170.02
                       AC-FT               323.       447.       450.           450.
                 THOUS CU M                398.       551.       555.           555.

WARNING *** TOP OF DAM, BOTTOM OF BREACH, OR LOW-LEVEL OUTLET IS NOT WITHIN RANGE OF GIVEN ELEVATIONS IN STORAGE-ELEVATION DATA
            BOTTOM OF RESERVOIR ASSUMED TO BE AT 1156.50
            STORAGE-ELEVATION DATA WILL BE EXTRAPOLATED ABOVE ELEVATION 1181.55

                                       STATION     1, PLAN 1, RATIO 3
```

```
                                          OUTFLOW
      0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
      0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
      0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
      0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
      0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
      0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
      0.        0.        1.        1.        1.        1.        1.        1.        1.        1.
      2.        2.        2.        3.        3.        4.        4.        5.        5.        6.
      6.        6.        6.        7.        7.        7.        7.        7.        7.        7.
      6.        6.        6.        6.        6.        6.        6.        5.        5.        5.
      5.        5.        5.        4.        4.        4.        4.        4.        4.        4.
      4.        4.        4.        4.        4.        3.        3.        3.        3.        3.
      3.        3.        3.        3.        4.        4.        5.        5.        6.        7.
      9.       10.       12.       14.       17.       19.       21.       24.       26.       28.
     31.       33.       36.       38.       41.       45.       49.       54.       60.       67.
     76.       87.      101.      117.      135.      164.      195.      223.      269.      315.
    367.      425.      505.      582.      660.      736.      810.      862.      944.      994.
   1030.     1045.     1052.     1043.     1022.      992.      955.      911.      863.      812.
    762.      713.      665.      617.      571.      527.      486.      443.      412.      384.
    359.      334.      310.      288.      267.      247.      231.      217.      202.      185.

                                          STORAGE
    238.      238.      238.      238.      238.      238.      238.      238.      238.      238.
    238.      238.      238.      238.      238.      238.      238.      238.      238.      239.
    239.      239.      239.      239.      239.      239.      239.      239.      239.      239.
    239.      239.      239.      239.      239.      239.      239.      239.      239.      239.
    239.      239.      239.      239.      239.      239.      239.      239.      239.      239.
    239.      239.      239.      239.      239.      239.      239.      240.      240.      240.
    240.      240.      240.      240.      240.      240.      240.      240.      240.      240.
    240.      240.      240.      240.      240.      241.      241.      241.      241.      241.
    241.      241.      241.      241.      241.      241.      241.      241.      241.      241.
    241.      241.      241.      241.      241.      241.      241.      241.      241.      241.
    241.      241.      241.      241.      241.      241.      241.      241.      241.      241.
    241.      241.      241.      241.      240.      240.      240.      240.      240.      240.
    240.      240.      240.      240.      241.      241.      241.      241.      241.      242.
    242.      243.      243.      244.      244.      245.      246.      246.      247.      248.
    249.      249.      250.      251.      251.      252.      253.      254.      255.      256.
    257.      259.      261.      264.      267.      270.      274.      279.      282.      287.
    292.      298.      303.      309.      315.      321.      326.      331.      335.      339.
    341.      342.      343.      342.      341.      339.      336.      333.      330.      326.
    323.      319.      316.      312.      308.      305.      302.      299.      296.      294.
    291.      289.      287.      284.      282.      280.      279.      277.      275.      273.

                                          STAGE
  1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6
  1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6
  1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6
  1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6
  1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6
  1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6
  1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6
  1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.7    1180.7
  1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7
  1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7
  1180.7    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6
  1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6
  1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.7    1180.7    1180.7
  1180.7    1180.7    1180.7    1180.7    1180.8    1180.8    1180.8    1180.8    1180.9    1180.9
  1180.9    1180.9    1181.0    1181.0    1181.0    1181.0    1181.1    1181.1    1181.1    1181.2
  1181.2    1181.3    1181.4    1181.4    1181.5    1181.7    1181.8    1181.9    1182.1    1182.2
  1182.4    1182.6    1182.8    1183.0    1183.2    1183.4    1183.6    1183.8    1183.9    1184.0
  1184.1    1184.2    1184.2    1184.1    1184.1    1184.0    1183.9    1183.8    1183.7    1183.6
```

PEAK OUTFLOW IS 1052. AT TIME 43.25 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1052.	820.	293.	137.	27386.
CMS	30.	23.	8.	4.	775.
INCHES		6.06	8.37	8.42	8.42
MM		153.84	212.54	213.98	213.98
AC-FT		407.	562.	566.	566.
THOUS CU M		502.	693.	698.	698.

WARNING *** TOP OF DAM, BOTTOM OF BREACH, OR LOW-LEVEL OUTLET IS NOT WITHIN RANGE OF GIVEN ELEVATIONS IN STORAGE-ELEVATION DATA
BOTTOM OF RESERVOIR ASSUMED TO BE AT 1156.50
STORAGE-ELEVATION DATA WILL BE EXTRAPOLATED ABOVE ELEVATION 1181.55

STATION 1, PLAN 1, RATIO 4

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	2.	2.
2.	3.	3.	4.	4.	5.	5.	6.	6.	7.
7.	8.	8.	8.	8.	8.	8.	8.	8.	8.
8.	8.	7.	7.	7.	7.	7.	7.	6.	6.
6.	6.	6.	5.	5.	5.	5.	5.	5.	5.
5.	4.	4.	4.	4.	4.	4.	4.	4.	4.
4.	4.	4.	4.	4.	5.	5.	6.	7.	9.
11.	13.	15.	17.	20.	23.	25.	28.	31.	34.
37.	40.	45.	50.	54.	59.	63.	69.	75.	83.
94.	107.	123.	144.	173.	206.	241.	283.	337.	391.
462.	543.	628.	715.	805.	902.	992.	1074.	1144.	1207.
1342.	1329.	1286.	1227.	1169.	1163.	1125.	1078.	1024.	966.
905.	844.	783.	730.	677.	627.	579.	533.	491.	452.
415.	387.	361.	337.	313.	291.	270.	250.	233.	219.

STORAGE

233.	235.	238.	238.	238.	238.	238.	238.	238.	238.
238.	238.	238.	239.	238.	238.	239.	239.	239.	239.
239.	239.	239.	239.	239.	239.	239.	239.	239.	239.
239.	239.	239.	239.	239.	239.	239.	239.	239.	239.
239.	239.	239.	239.	239.	239.	239.	239.	240.	240.
240.	240.	240.	240.	240.	240.	240.	240.	240.	240.
240.	240.	240.	240.	240.	240.	240.	240.	240.	240.
240.	240.	240.	241.	241.	241.	241.	241.	241.	241.
[illegible]	[illegible]	242.	242.	242.	242.	242.	242.	242.	242.
1180.7	1180.7	1180.6	1180.6	1180.6	1180.6	1180.7	1180.7	1180.6	1180.6
1181.0	1181.0	1180.8	1180.8	1180.8	1180.8	1180.9	1180.9	1180.7	1180.7
1181.3	1181.4	1181.0	1181.1	1181.1	1181.1	1181.1	1181.2	1180.9	1180.9
1182.7	1182.9	1181.5	1181.6	1181.7	1181.8	1182.0	1182.1	1181.2	1181.3
1184.6	1184.6	1183.1	1183.4	1183.6	1183.8	1184.0	1184.2	1182.3	1182.5
1183.8	1183.7	1184.5	1184.5	1184.5	1184.4	1184.3	1184.2	1184.4	1184.5
1182.6	1182.5	1183.5	1183.4	1183.3	1183.1	1183.0	1182.9	1184.1	1184.0
		1182.4	1182.3	1182.2	1182.2	1182.1	1182.0	1182.8	1182.7
								1182.0	1181.9

PEAK OUTFLOW IS 1342. AT TIME 42.75 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	[illegible]
CFS	1342				

```
         1180.5    1180.6    1180.5    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6
         1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6
         1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6
         1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6
         1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6
         1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6
         1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.7    1180.7    1180.7    1180.7
         1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7
         1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7
         1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.6    1180.6    1180.6
         1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6
         1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.7    1180.7    1180.7    1180.7
         1180.7    1180.7    1180.8    1180.8    1180.8    1180.8    1180.9    1180.9    1180.9    1180.9
         1181.0    1181.0    1181.0    1181.1    1181.1    1181.1    1181.1    1181.2    1181.2    1181.3
         1181.3    1181.4    1181.5    1181.6    1181.7    1181.8    1182.0    1182.1    1182.3    1182.5
         1182.7    1182.9    1183.1    1183.4    1183.6    1183.8    1184.0    1184.2    1184.4    1184.5
         1184.6    1184.6    1184.5    1184.5    1184.5    1184.4    1184.3    1184.2    1184.1    1184.0
         1183.8    1183.7    1183.5    1183.4    1183.3    1183.1    1183.0    1182.9    1182.8    1182.7
         1182.6    1182.5    1182.4    1182.3    1182.2    1182.2    1182.1    1182.0    1182.0    1181.9

PEAK OUTFLOW IS     1342. AT TIME  42.75 HOURS

                                    PEAK    6-HOUR    24-HOUR    72-HOUR    TOTAL VOLUME
                          CFS      1342.      989.       342.       165.          33049.
                          CMS        38.       28.        10.         5.            936.
                       INCHES                 7.30      10.09      10.17           10.17
                           MM               185.49     256.40     258.23          258.23
                        AC-FT                 491.       678.       683.            683.
                    THOUS CU M                605.       836.       842.            842.

WARNING *** TOP OF DAM, BOTTOM OF BREACH, OR LOW-LEVEL OUTLET IS NOT WITHIN RANGE OF GIVEN ELEVATIONS IN STORAGE-ELEVATION DATA
            BOTTOM OF RESERVOIR ASSUMED TO BE AT 1156.50
            STORAGE-ELEVATION DATA WILL BE EXTRAPOLATED ABOVE ELEVATION 1181.55

                                          STATION       1, PLAN 1, RATIO 5

                                        END-OF-PERIOD HYDROGRAPH ORDINATES

                                                  OUTFLOW
            0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
            0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
            0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
            0.        0.        0.        0.        0.        0.        0.        0.        1.        1.
            1.        1.        1.        1.        1.        1.        1.        1.        1.        1.
            1.        1.        1.        1.        2.        2.        2.        2.        2.        2.
            2.        2.        2.        2.        2.        2.        2.        2.        2.        3.
            3.        4.        4.        5.        6.        7.        7.        8.        9.        9.
           10.       10.       10.       11.       11.       11.       11.       11.       11.       11.
           10.       10.       10.       10.        9.        9.        9.        9.        8.        8.
            8.        8.        7.        7.        7.        7.        7.        6.        6.        6.
            6.        6.        6.        6.        6.        6.        5.        5.        5.        5.
            5.        5.        5.        5.        6.        6.        7.        8.       10.       12.
           14.       17.       20.       23.       25.       30.       34.       38.       43.       50.
           56.       62.       66.       73.       73.       83.       89.       95.      104.      114.
          128.      148.      175.      207.      244.      294.      348.      406.      483.      565.
          655.      754.      866.      986.     1108.     1297.     1708.     1738.     1792.     1815.
         1606.     1784.     1698.     1623.     1529.     1443.     1352.     1263.     1193.     1161.
         1113.     1058.      993.      928.      863.      799.      743.      690.      639.      590.
          545.      502.      462.      426.      395.      369.      345.      321.      298.      277.

                                                  STORAGE
          238.      238.      238.      238.      238.      238.      238.      238.      238.      238.
          239.      239.      239.      239.      239.      239.      239.      239.      239.      239.
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      240.      240.      240.      240.      240.      240.      240.      240.      240.      240.
      240.      240.      240.      240.      240.      240.      240.      240.      240.      240.
      240.      240.      240.      240.      240.      240.      240.      240.      240.      240.
      240.      241.      241.      241.      241.      241.      242.      242.      242.      242.
      242.      242.      243.      243.      243.      243.      243.      243.      243.      243.
      243.      242.      242.      242.      242.      242.      242.      242.      242.      242.
      242.      242.      242.      242.      242.      241.      241.      241.      241.      241.
      241.      241.      241.      241.      241.      241.      241.      241.      241.      241.
      241.      241.      241.      241.      241.      241.      242.      242.      242.      243.
      244.      244.      245.      246.      247.      248.      250.      251.      252.      253.
      254.      255.      256.      257.      257.      258.      259.      260.      262.      263.
      265.      267.      272.      276.      280.      285.      290.      295.      302.      308.
      315.      322.      330.      338.      347.      354.      357.      358.      358.      358.
      353.      353.      357.      357.      356.      355.      355.      354.      352.      350.
      347.      343.      339.      334.      330.      326.      321.      317.      314.      310.
      306.      303.      300.      297.      295.      292.      290.      288.      285.      283.

                                                  STAGE
    1180.6    1180.5    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6
    1180.6    1180.5    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6
    1180.6    1180.6    1180.6    1180.6    1180.6    1180.5    1180.6    1180.6    1180.6    1180.6
    1180.6    1180.5    1180.6    1180.5    1180.6    1180.5    1180.6    1180.6    1180.6    1180.6
    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6
    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6
    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6
    1180.6    1180.6    1180.6    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7
    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7
    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7
    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7
    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7
    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7
    1180.7    1180.8    1180.8    1180.8    1180.9    1180.9    1180.9    1181.0    1181.0    1181.1
    1181.1    1181.1    1181.2    1181.2    1181.2    1181.3    1181.3    1181.3    1181.4    1181.4
    1181.5    1181.6    1181.7    1181.8    1182.0    1182.2    1182.4    1182.5    1182.7    1183.0
    1183.2    1183.5    1183.7    1184.0    1184.3    1184.6    1184.7    1184.7    1184.7    1184.7
    1184.7    1184.7    1184.7    1184.6    1184.6    1184.6    1184.6    1184.5    1184.5    1184.4
    1184.3    1184.2    1184.0    1183.9    1183.7    1183.6    1183.4    1183.3    1183.2    1183.0
    1182.9    1182.8    1182.7    1182.6    1182.5    1182.4    1182.3    1182.3    1182.2    1182.1

PEAK OUTFLOW IS      1815. AT TIME  42.50 HOURS

                                    PEAK    6-HOUR    24-HOUR    72-HOUR    TOTAL VOLUME
                          CFS      1815.     1326.       459.       222.          44385.
                          CMS        51.       38.        13.         6.           1257.
                       INCHES                 9.60      13.55      13.65          13.65
                           MM               249.01     344.18     346.80         346.30
                        AC-FT                 658.       910.       917.           917.
                    THOUS CU M                812.      1123.      1131.          1131.

WARNING *** TOP OF DAM, BOTTOM OF BREACH, OR LOW-LEVEL OUTLET IS NOT WITHIN RANGE OF GIVEN ELEVATIONS IN STORAGE-ELEVATION DATA
            BOTTOM OF RESERVOIR ASSUMED TO BE AT 1156.50
            STORAGE-ELEVATION DATA WILL BE EXTRAPOLATED ABOVE ELEVATION 1181.55

                                    STATION      1, PLAN 1, RATIO 6

                                END-OF-PERIOD HYDROGRAPH ORDINATES

                                                 OUTFLOW
        0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
        0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
        0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
        0.        1.        1.        1.        1.        1.        1.        1.        1.        1.
        1.        2.        2.        2.        2.        2.        2.        2.        2.        2.
```

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        4.        5.        6.        6.        7.        8.        9.       10.       11.       12.
       12.       13.       13.       13.       14.       14.       14.       14.       13.       13.
       13.       13.       12.       12.       12.       12.       11.       11.       11.       10.
       10.       10.        9.        9.        9.        9.        8.        8.        8.        8.
        8.        7.        7.        7.        7.        7.        7.        7.        7.        7.
        7.        7.        7.        7.        7.        8.        9.       11.       12.       15.
       18.       21.       25.       29.       33.       38.       45.       53.       61.       68.
       75.       82.       89.       95.      101.      107.      113.      121.      131.      147.
      167.      195.      223.      272.      323.      384.      455.      544.      632.      726.
      840.      969.     1107.     1357.     1891.     1963.     2108.     2181.     2245.     2271.
     2256.     2200.     2115.     2019.     1914.     1791.     1677.     1559.     1443.     1331.
     1231.     1175.     1137.     1083.     1022.      958.      893.      829.      770.      716.
      664.      615.      568.      525.      484.      446.      411.      385.      359.      335.

                                                STORAGE
      238.      238.      238.      238.      238.      238.      238.      239.      238.      239.
      239.      239.      239.      239.      239.      239.      239.      239.      239.      239.
      239.      239.      239.      239.      239.      239.      239.      239.      240.      240.
      240.      240.      240.      240.      240.      240.      240.      240.      240.      240.
      240.      240.      240.      240.      240.      240.      240.      240.      240.      240.
      240.      240.      240.      240.      240.      240.      240.      240.      240.      240.
      240.      240.      240.      240.      240.      240.      240.      240.      240.      240.
      241.      241.      241.      241.      242.      242.      242.      242.      243.      243.
      243.      243.      243.      243.      243.      243.      243.      243.      243.      243.
      243.      243.      243.      243.      243.      243.      243.      243.      243.      242.
      242.      242.      242.      242.      242.      242.      242.      242.      242.      242.
      242.      242.      242.      242.      242.      242.      241.      241.      241.      241.
      241.      241.      241.      241.      242.      242.      242.      243.      243.      244.
      245.      246.      247.      248.      249.      251.      252.      253.      255.      256.
      257.      258.      259.      260.      261.      262.      263.      265.      266.      268.
      271.      274.      278.      283.      289.      294.      300.      306.      313.      320.
      328.      337.      347.      355.      358.      359.      360.      360.      360.      361.
      360.      360.      360.      359.      359.      358.      357.      356.      355.      354.
      353.      351.      349.      345.      341.      336.      332.      328.      323.      319.
      315.      312.      308.      305.      302.      299.      296.      294.      291.      289.

                                                 STAGE
    1180.5    1180.6    1180.6    1180.5    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6
    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6
    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6
    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6
    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6
    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6
    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6    1180.6
    1180.6    1180.6    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7
    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7
    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7
    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7
    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7
    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.7    1180.8
    1180.8    1180.8    1180.9    1180.9    1180.9    1181.0    1181.0    1181.1    1181.1    1181.2
    1181.2    1181.2    1181.3    1181.3    1181.3    1181.4    1181.4    1181.5    1181.5    1181.6
    1181.7    1181.8    1181.9    1182.1    1182.3    1182.5    1182.7    1182.9    1183.1    1183.4
    1183.7    1184.0    1184.3    1184.6    1184.7    1184.7    1184.7    1184.6    1184.8    1184.8
    1184.5    1184.8    1184.7    1184.7    1184.7    1184.7    1184.7    1184.6    1184.6    1184.6
    1184.5    1184.5    1184.4    1184.2    1184.1    1183.9    1183.8    1183.6    1183.5    1183.4
    1183.2    1183.1    1183.0    1182.9    1182.8    1182.7    1182.6    1182.5    1182.4    1182.3

PEAK OUTFLOW IS     2271. AT TIME  42.50 HOURS

                             PEAK    6-HOUR   24-HOUR   72-HOUR   TOTAL VOLUME
                     CFS    2271.     1670.      576.      275.        55749.
                     CMS      64.       47.       16.        8.         1579.
                  INCHES               12.33     17.02     17.15         17.15
```

TPCCS C. M	1021.	1410.	1421.	1421.

**********	**********	**********	**********	**********

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

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO FLOWS					
				RATIO 1	RATIO 2	RATIO 3	RATIO 4	RATIO 5	RATIO 6
				0.20	0.40	0.50	0.60	0.80	1.00
HYDROGRAPH AT	1	1.26	1	455.	909.	1137.	1364.	1819.	2273.
		(5821.00)		(12.87)(	25.75)(	32.19)(	38.62)(	51.50)(	64.37)(
ROUTED TO	1	1.26	1	397.	836.	1052.	1262.	1815.	2271.
		(5821.00)		(11.23)(	23.67)(	29.80)(	38.00)(	51.40)(	64.30)(

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1180.55	1180.60	1184.50
STORAGE	238.	239.	353.
OUTFLOW	0.	0.	1195.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
0.20	1182.51	0.	295.	397.	0.	43.50	0.
0.40	1183.66	0.	328.	836.	0.	43.25	0.
0.50	1184.17	0.	343.	1052.	0.	43.25	0.
0.60	1184.57	0.07	355.	1342.	1.25	42.75	0.
0.80	1184.69	0.19	358.	1815.	3.25	42.50	0.
1.00	1184.78	0.28	361.	2271.	4.50	42.50	0.

APPENDIX D

REFERENCES

APPENDIX D

REFERENCES

1) U.S. Department of Commerce, Technical Paper No. 40, Rainfall Frequency Atlas of the United States, May 1961.

2) U.S. Department of Commerce, Hydrometeorological Report No. 33, Seasonal Variation of the Probable Maximum Precipitation East of the 105th Meridian for Areas from 10 to 1,000 Square Miles and Durations of 6, 12, 24, and 48 Hours; April 1956.

3) Soil Conservation Service, National Engineering Handbook, Section 4, Hydrology, August 1972 (U.S. Department of Agriculture).

4) H.W. King and E.F. Brater, Handbook of Hydraulics, 5th edition, McGraw-Hill, 1963.

5) T.W. Lambe and R.V. Whitman, Soil Mechanics, John Wiley and Sons, 1965.

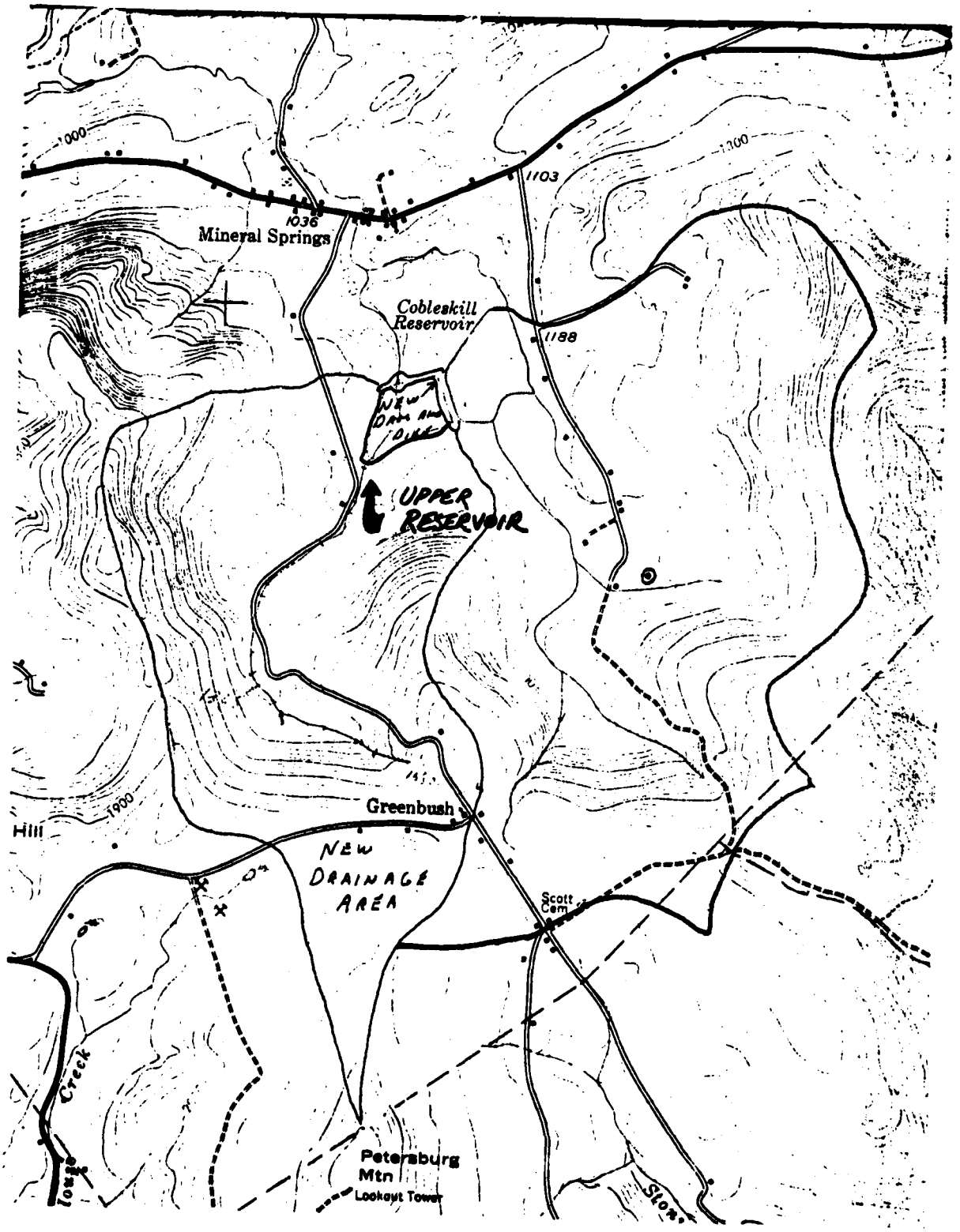
6) W.D. Thornbury, Principles of Geomorphology, John Wiley and Sons, 1969.

7) University of the State of New York, Geology of New York, Education Leaflet 20, Reprinted 1973.

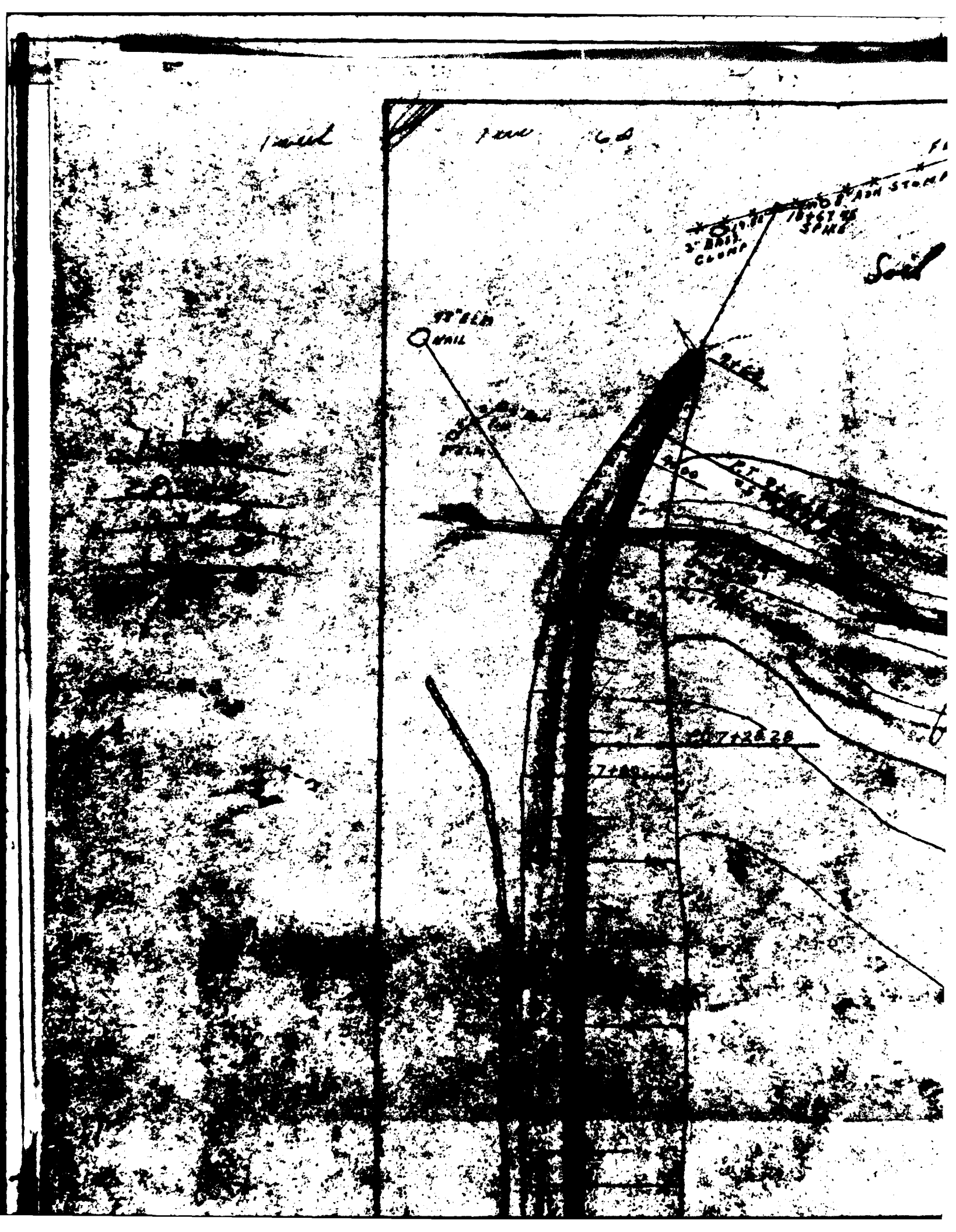
8) Cornell University Agriculture Experiment Station (compiled by M.G. Cline and R.L. Marshall), General Soil Map of New York State and Soils of New York Landscapes, Information Bulletin 119, 1977.

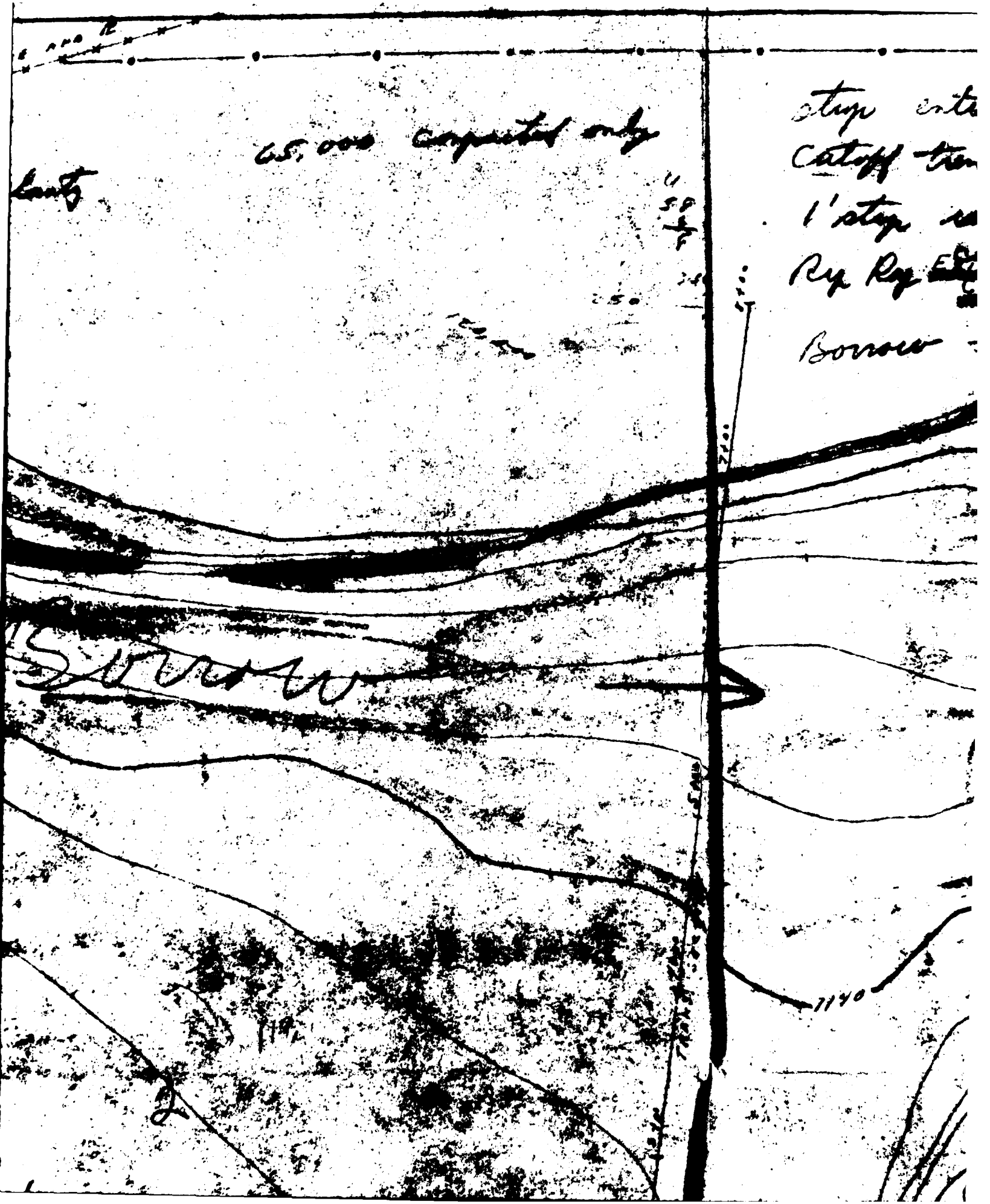
APPENDIX E

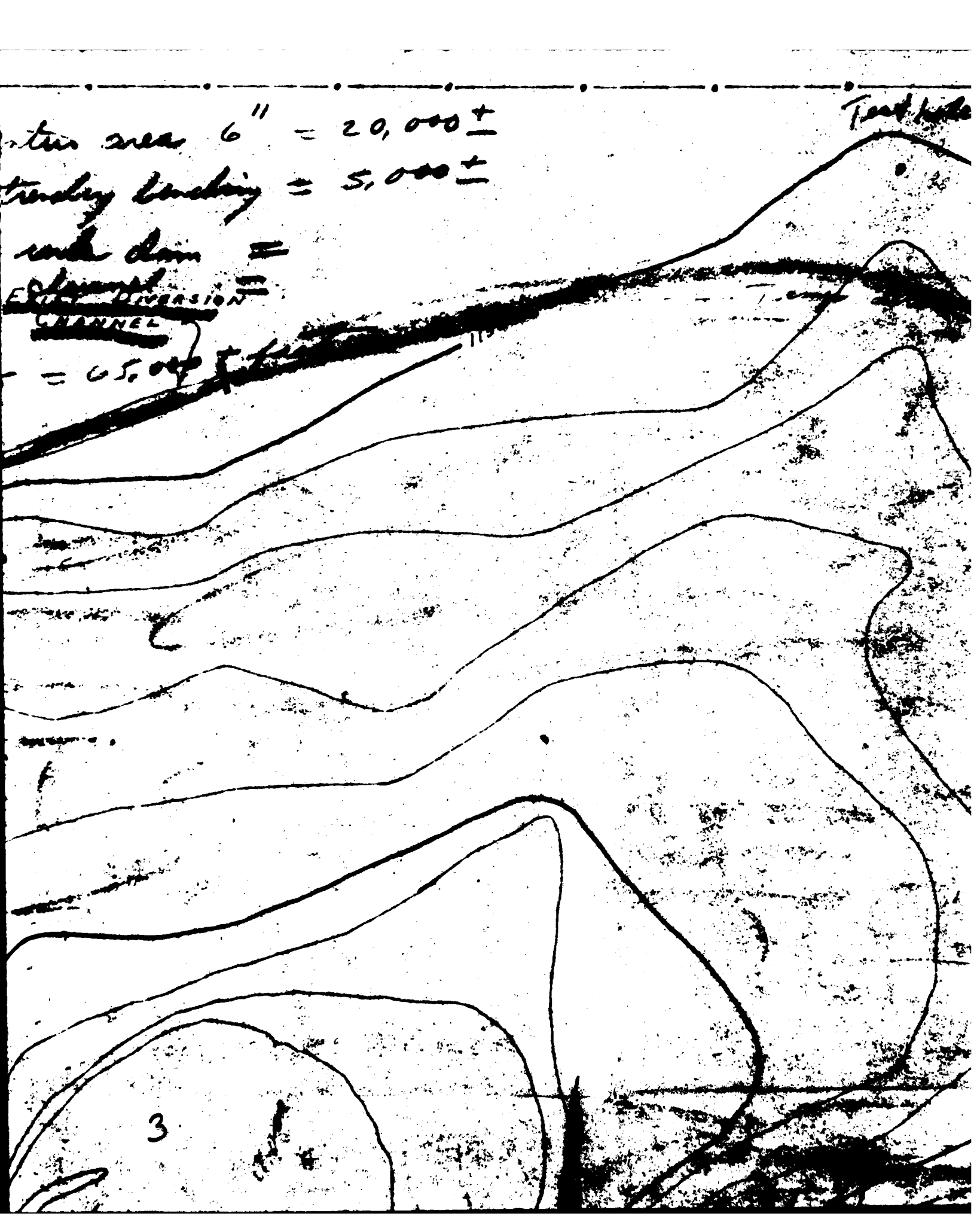
DRAWINGS

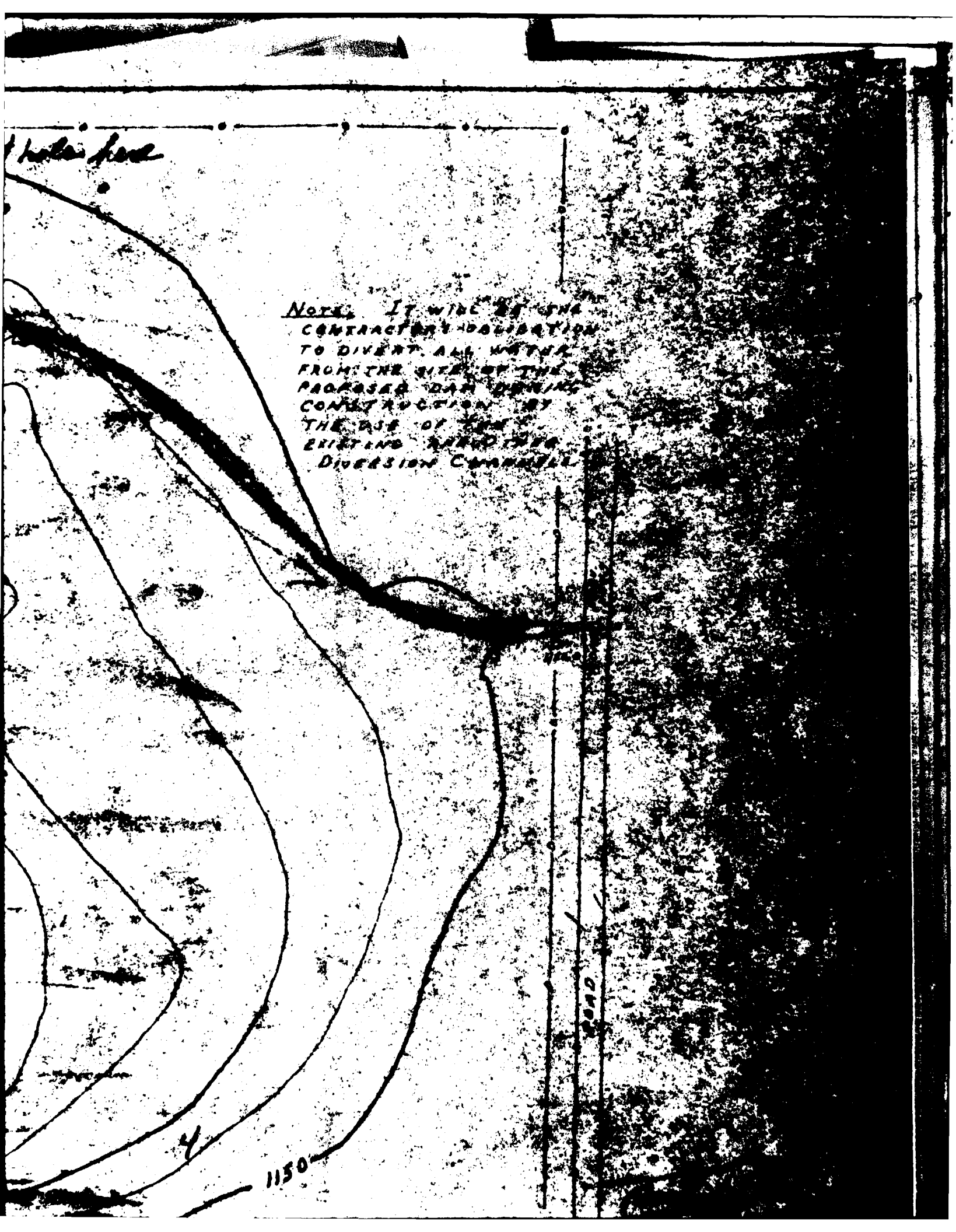


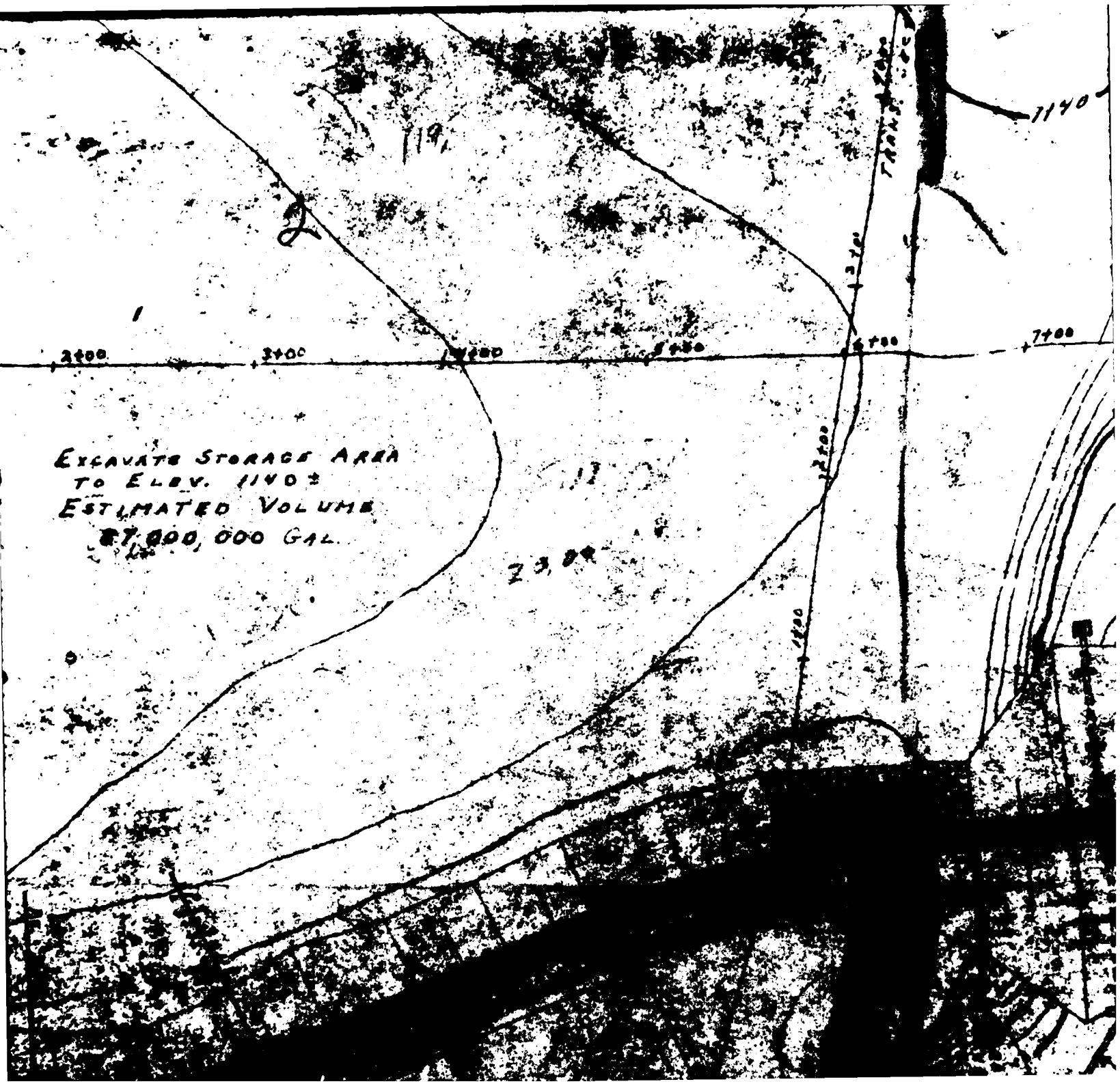
TOPOGRAPHIC MAP

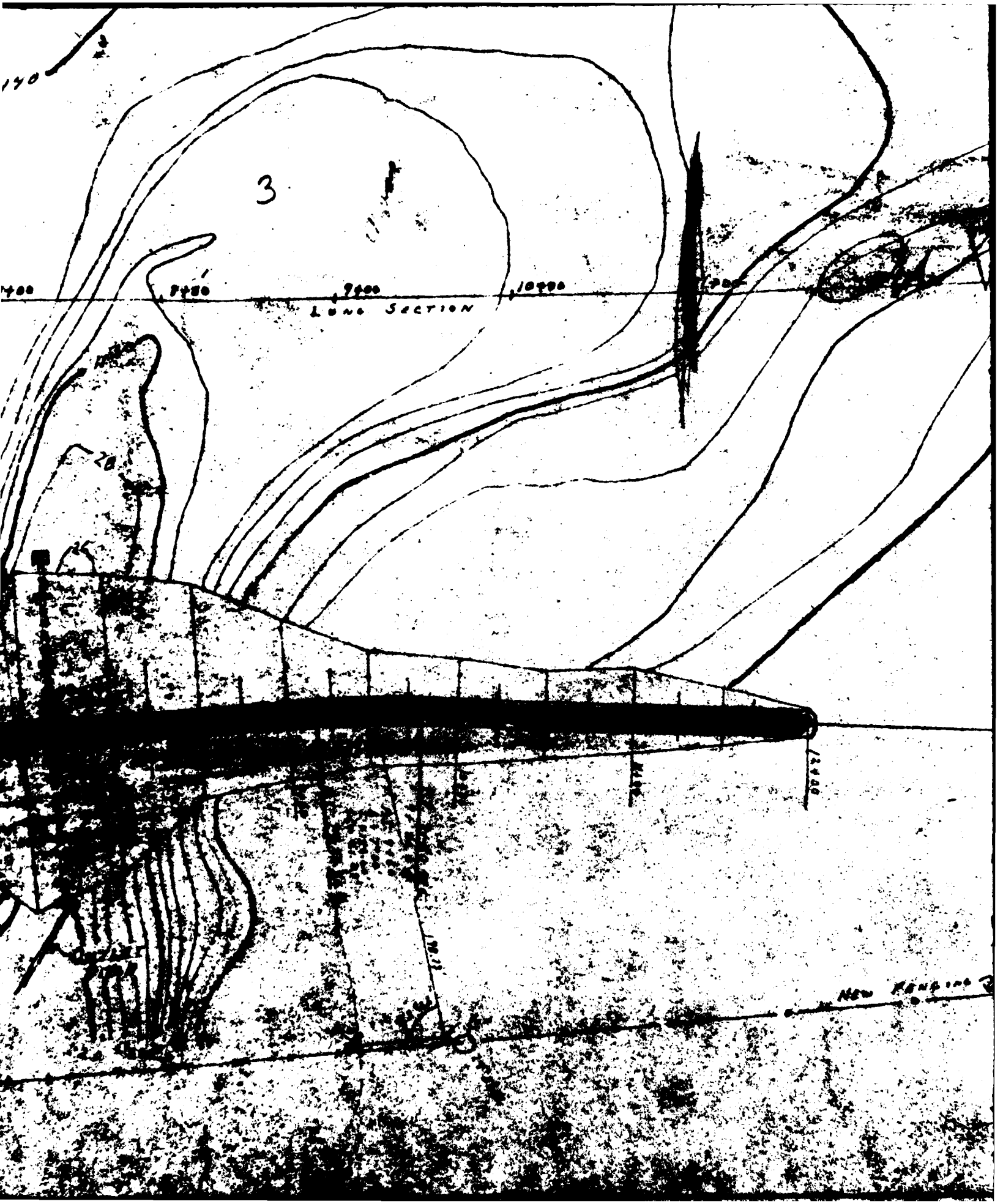

3" RAIL CLAMP
Soil
NAIL
7+28.28

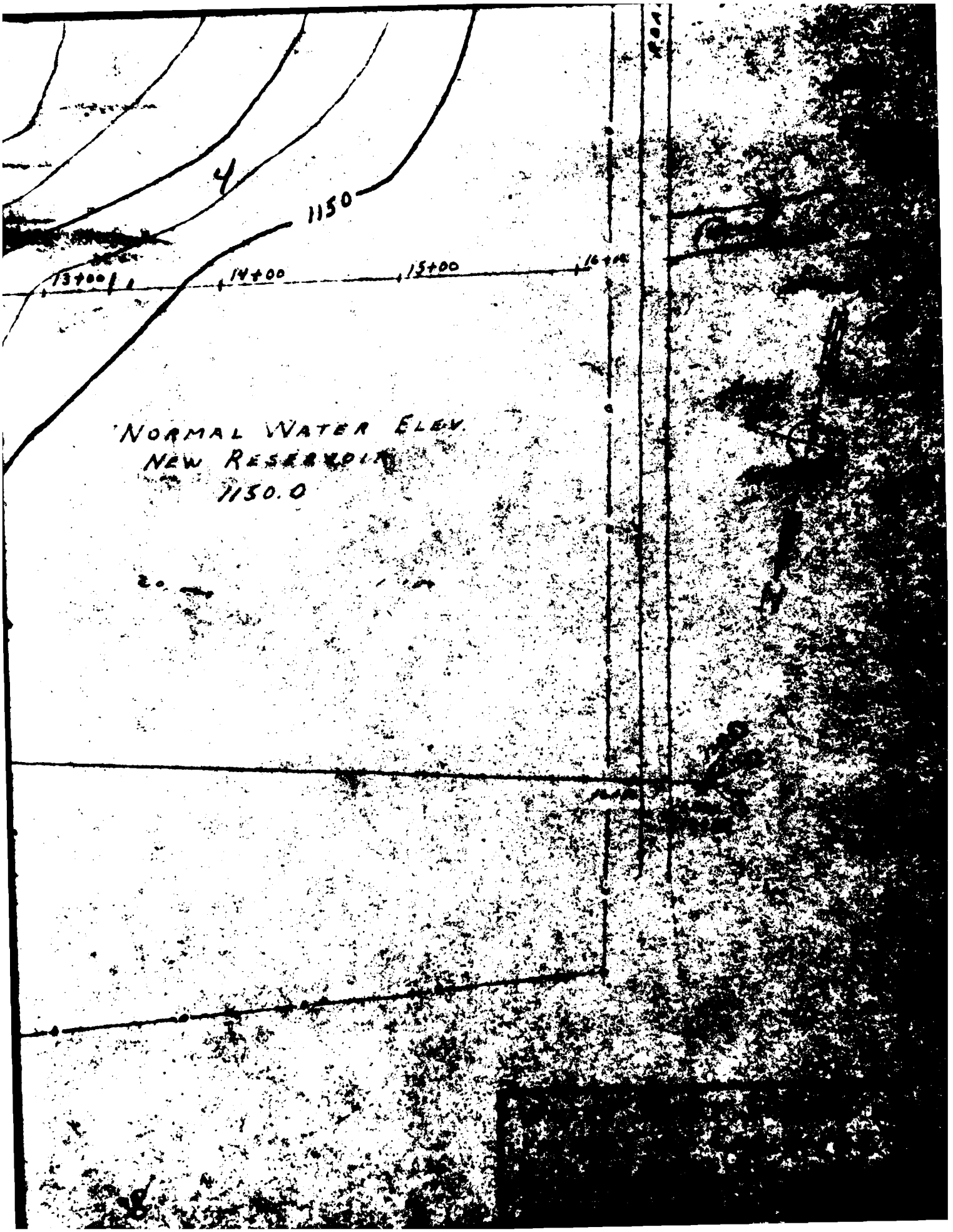

65,000 Capacity only
Sluices
1140

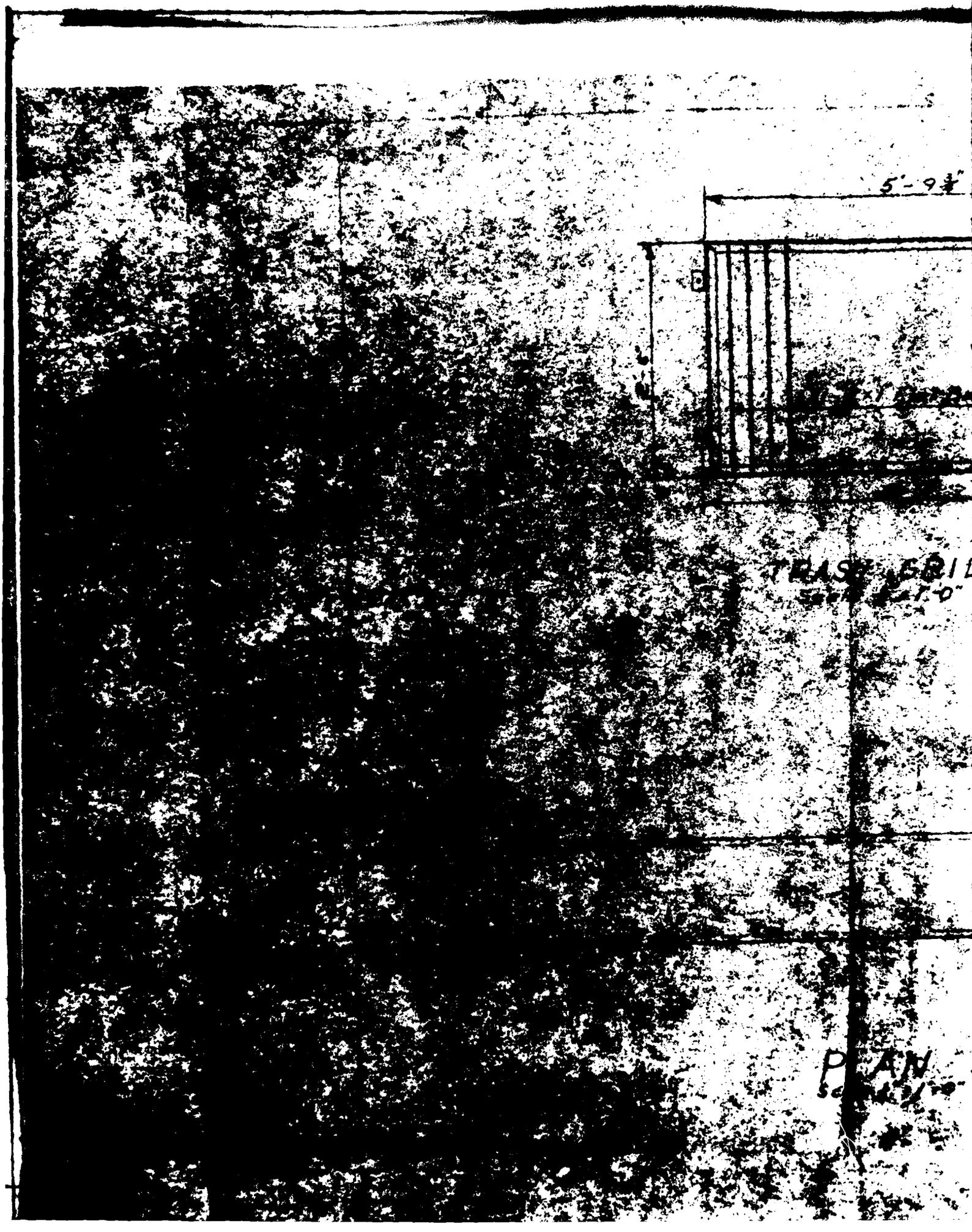

tion area 6" = 20,000±
ntinuing leading = 5,000±
ench dam =
Slurry trench =
EROSION CHANNEL
= 65,000±
Test hole
3

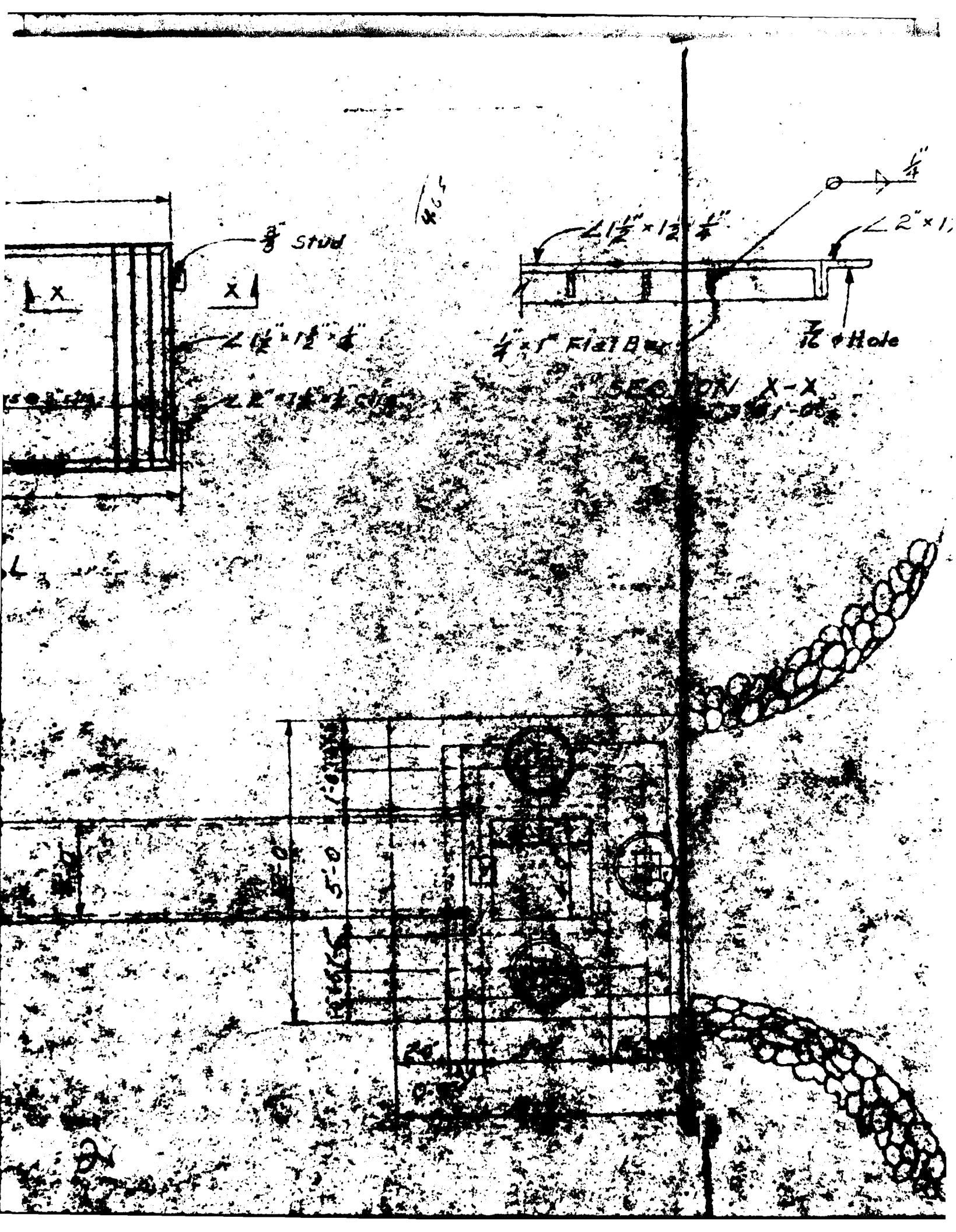

Note: It will be the
contractor's obligation
to divert all water
from the site of the
proposed dam during
construction by
the use of the
existing Naked Tree
Diversion Channel.
1150


1140
2+00
3+00
7+00
EXCAVATE STORAGE AREA
TO ELEV. 1140 ±
ESTIMATED VOLUME
±7,000,000 GAL.

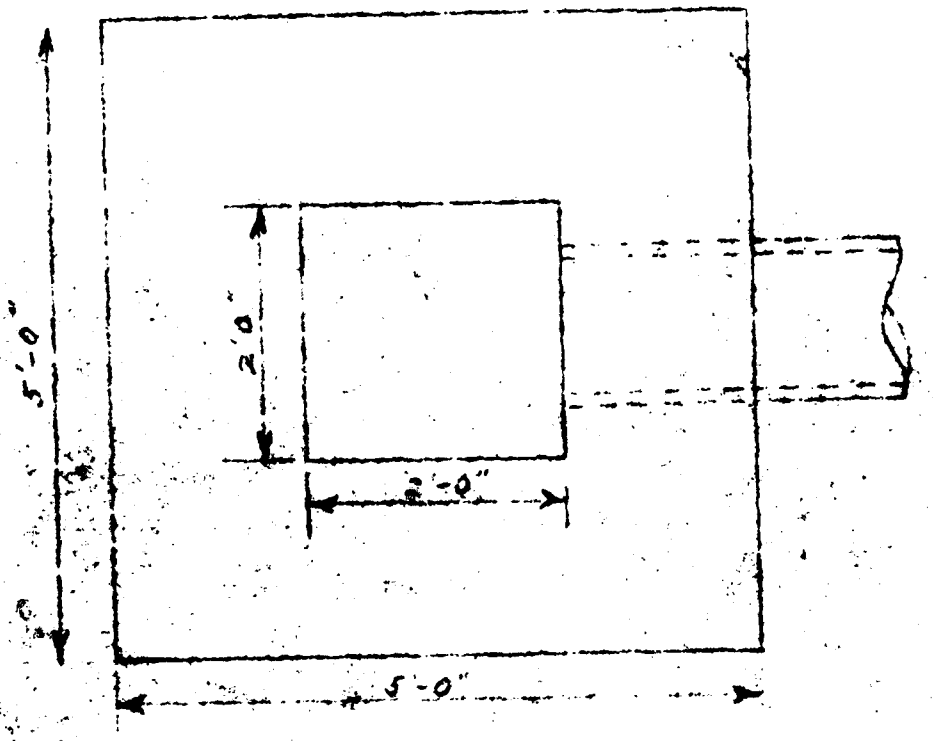

3
LONG SECTION

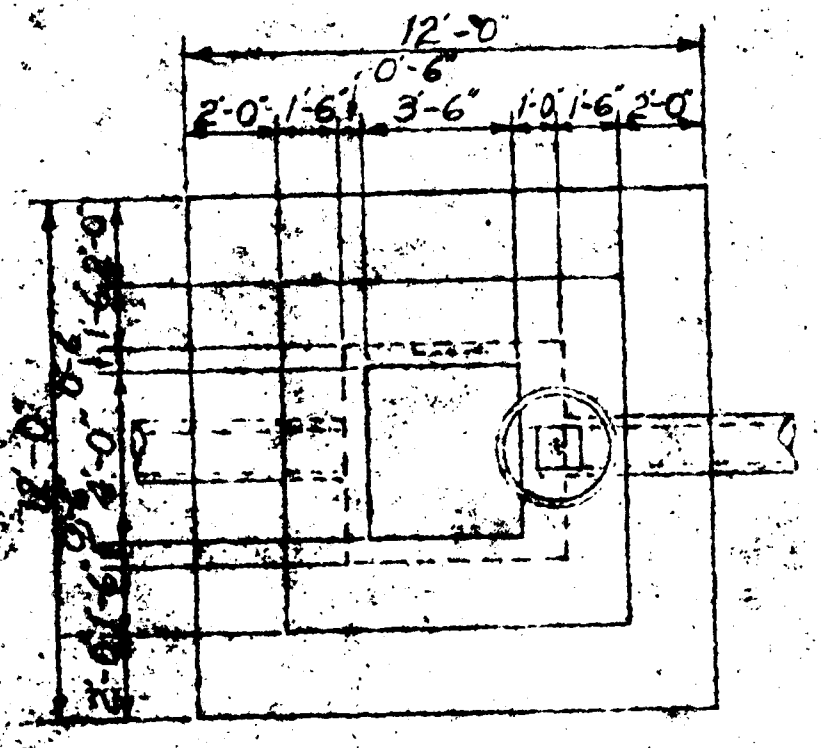

1150
13+00
14+00
15+00
NORMAL WATER ELEV.
NEW RESERVOIR
1150.0


5'-9"
PLAN


X
X
⅜" Stud
4'-0"
5'-0"
SECTION X-X

2" × 1½" × ¼ Clip

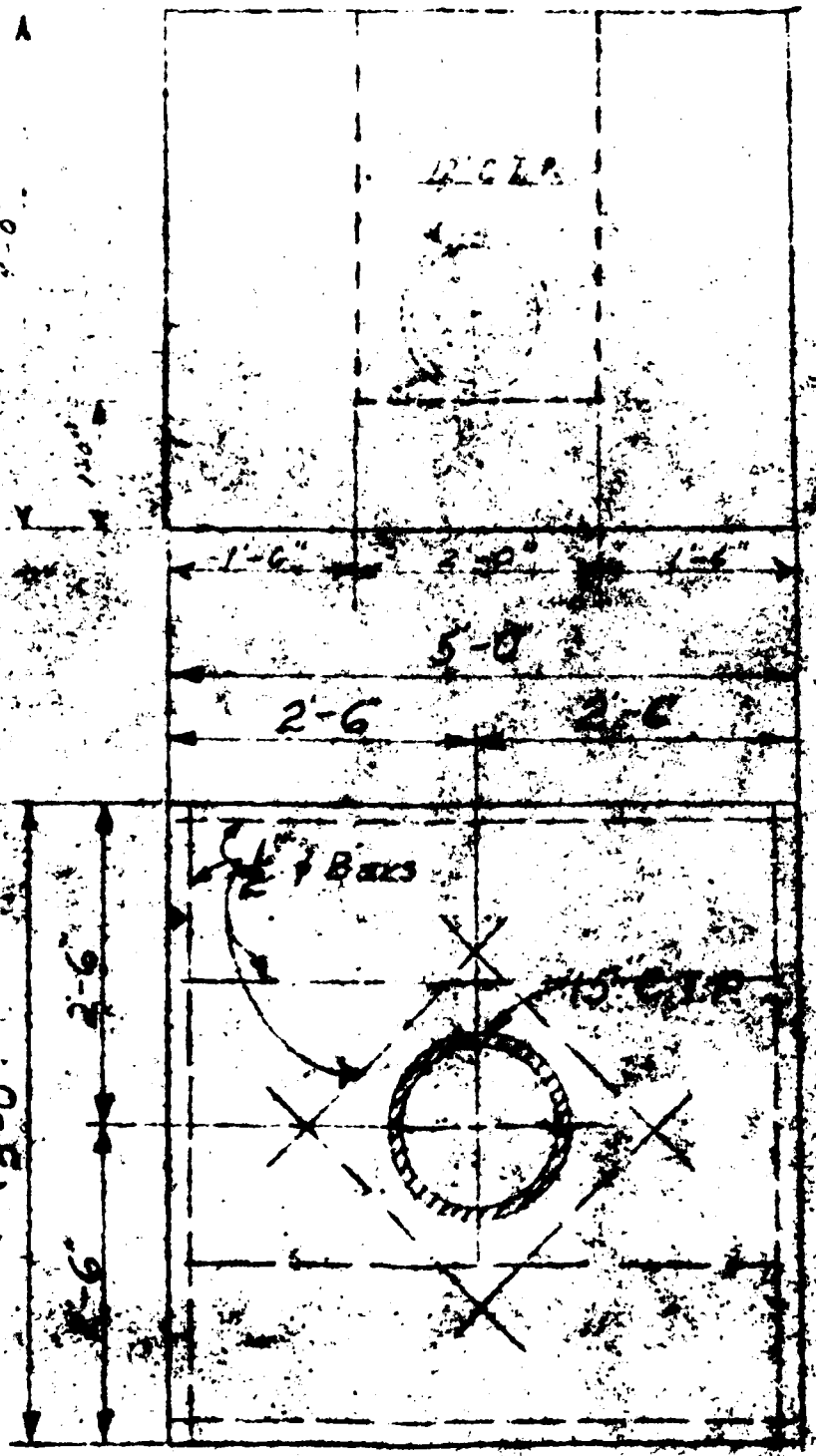




PLAN

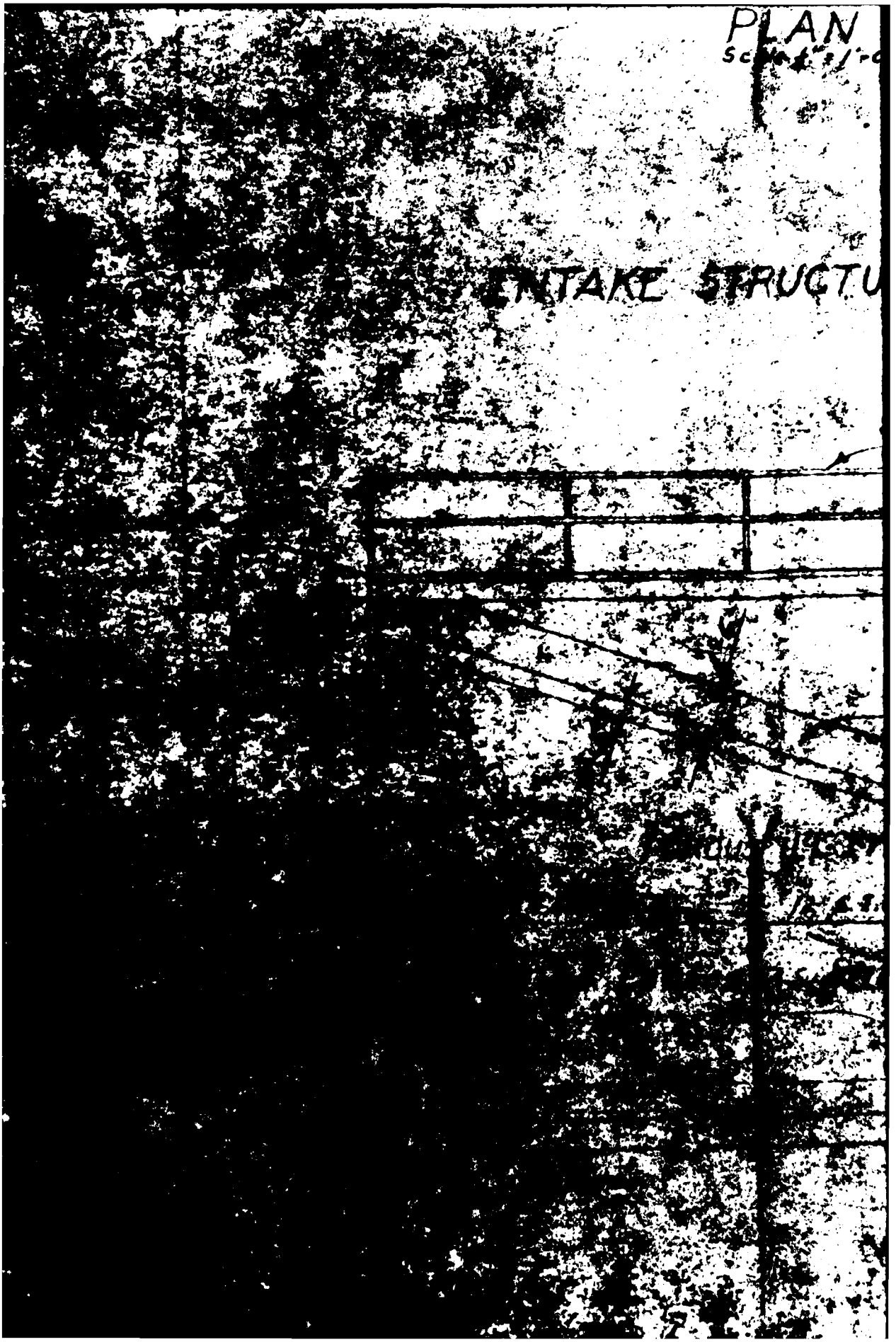
Scale ½" = 1'-0"

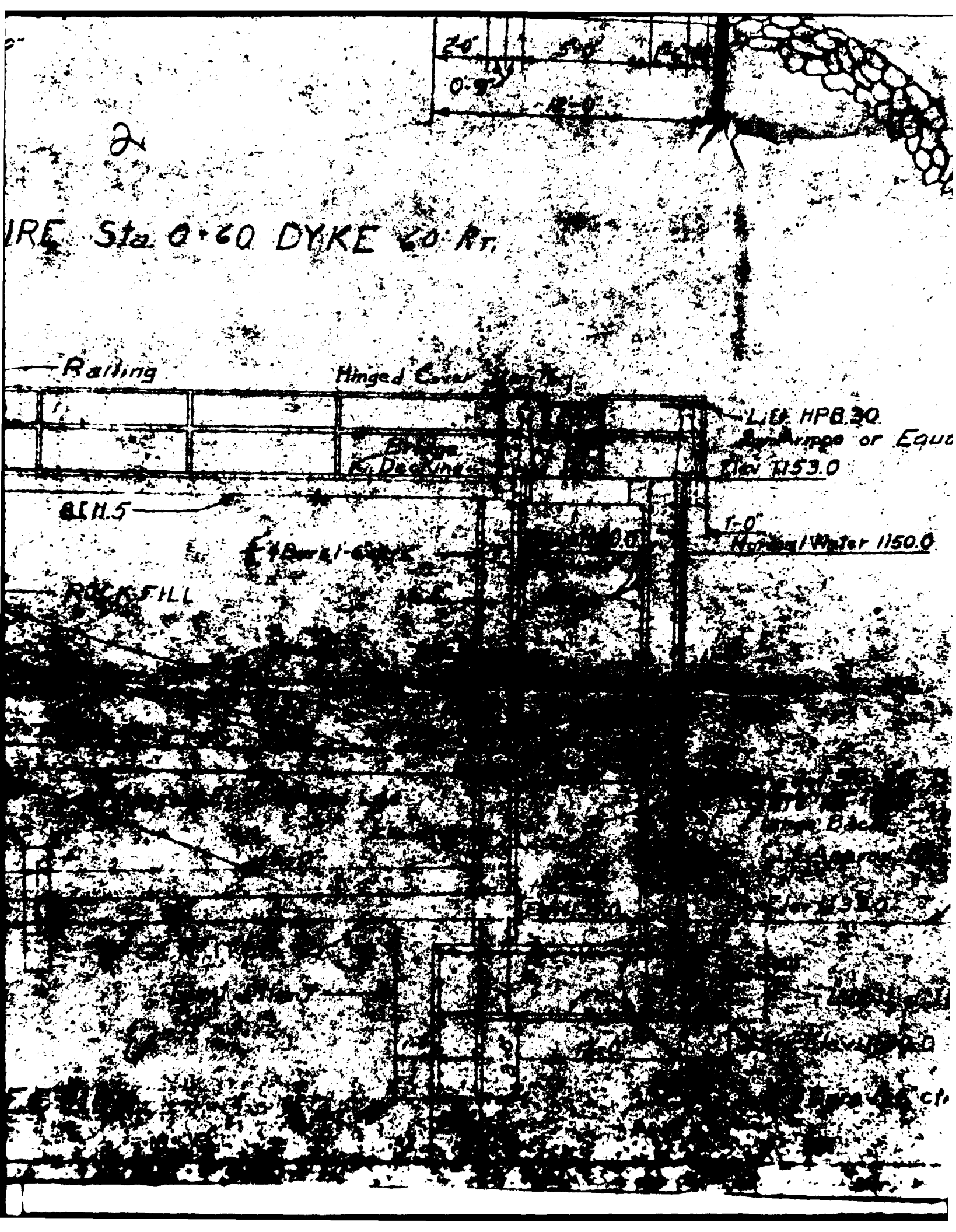
ELEVATION, C.E



SECTION A-A

4


PLAN
INTAKE STRUCTU

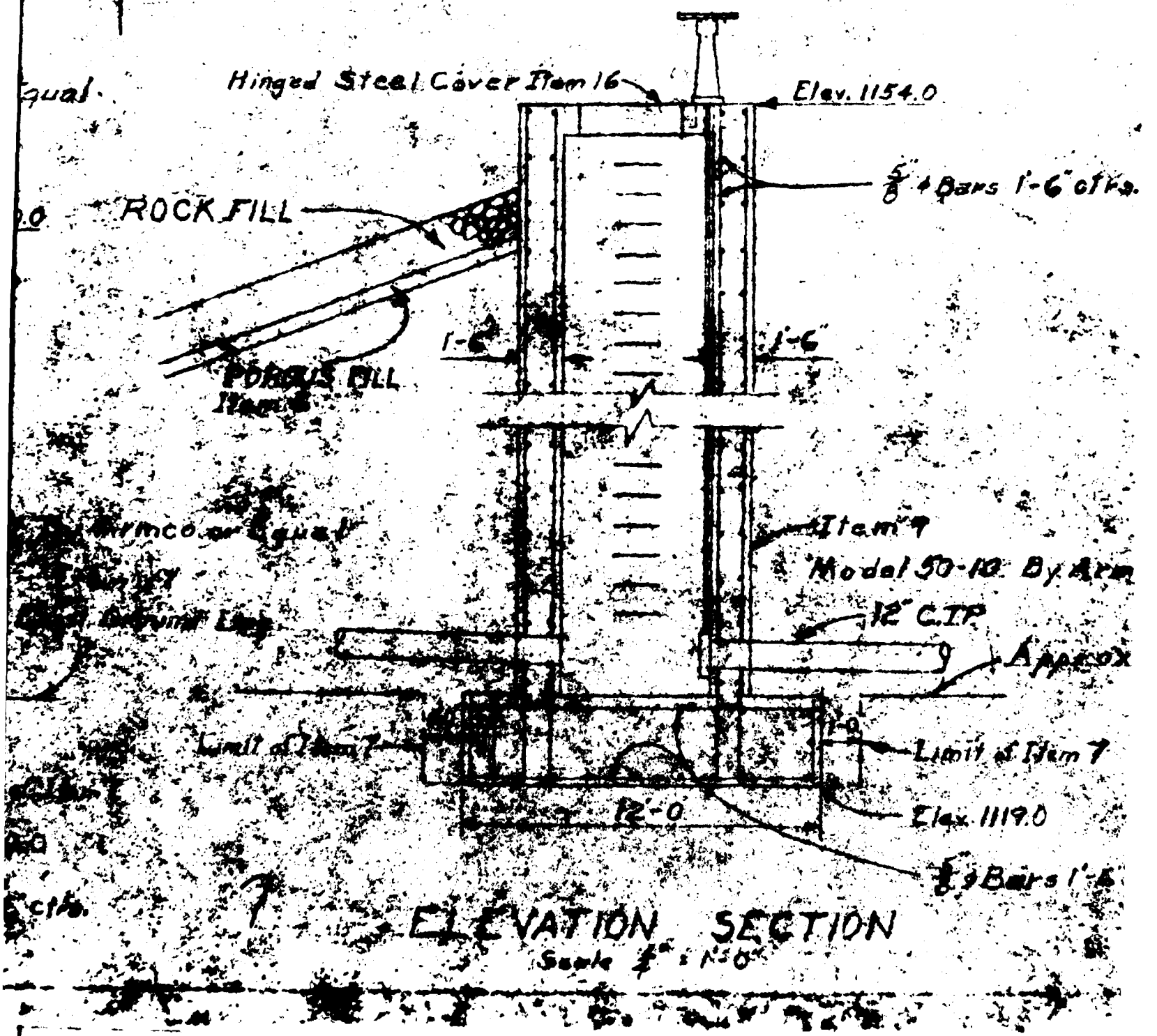

IRE Sta. 0+60 DYKE 60' Rt.
Railing
Hinged Cover
Bridge Rt. Decking
EL 11.5
ROCKFILL
Lt. HP8.30
or Equ
Elev 1153.0
1'-0"
Normal Water 1150.0

3

PLAN

Scale $\frac{1}{4}$" = 1'-0"

TOWER FOR DRAIN Sta. 7+65 DAM ℄



ELEVATION SECTION

Scale $\frac{1}{4}$" = 1'-0"

SECTION A-A

Scale 1" = 1'-0"

KEYWAY DETAIL

Scale 3" = 1'-0"

Notes)

1. Location of Intake Structure may have to be moved to ... due to foundation conditions.
2. Cat Walk, Wall Covers, ... and Trash Grill for Intake ... with by-pass forces. Miss ...

By Areas ... Left Bank

Approx. Existing Ground

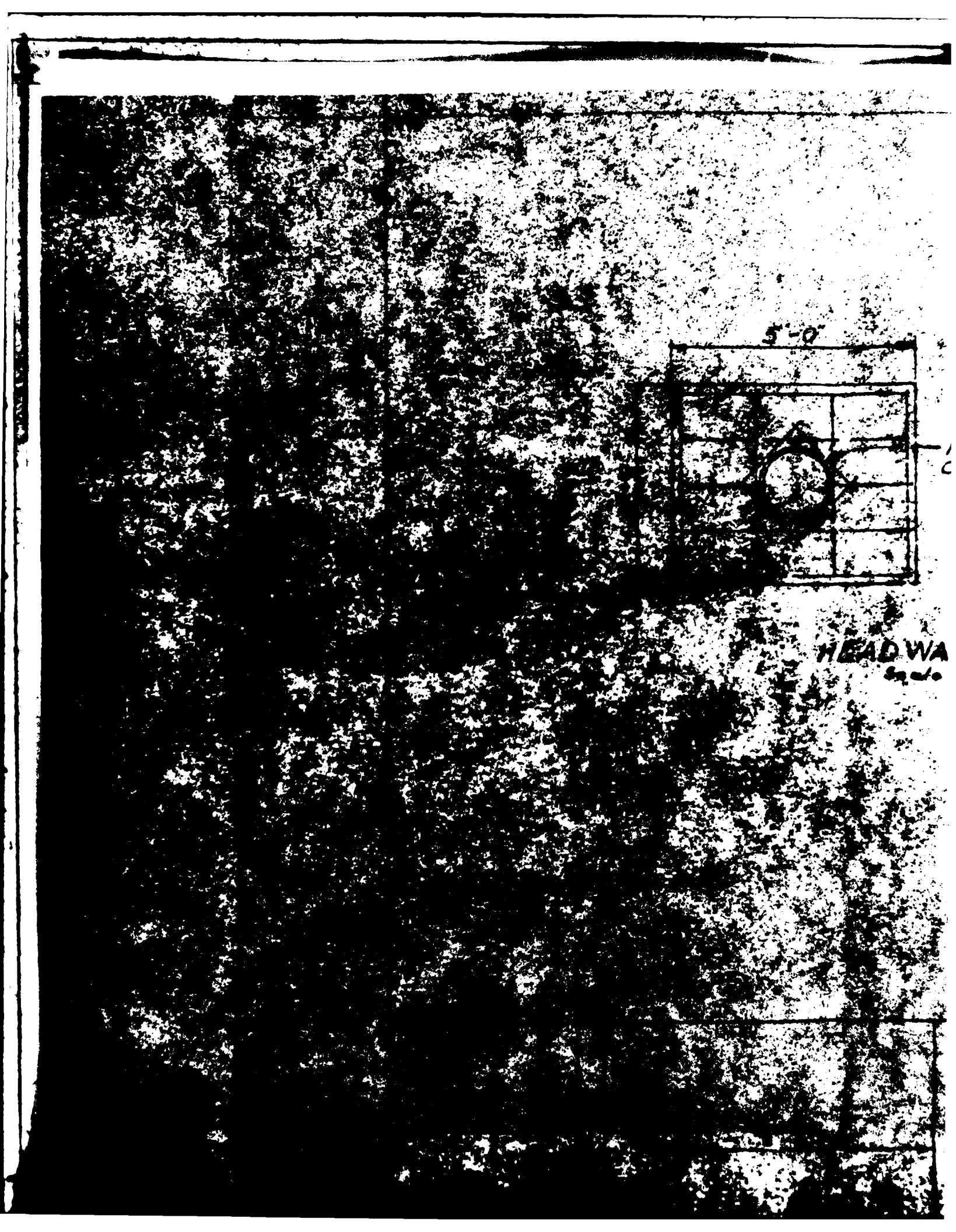
Item 7

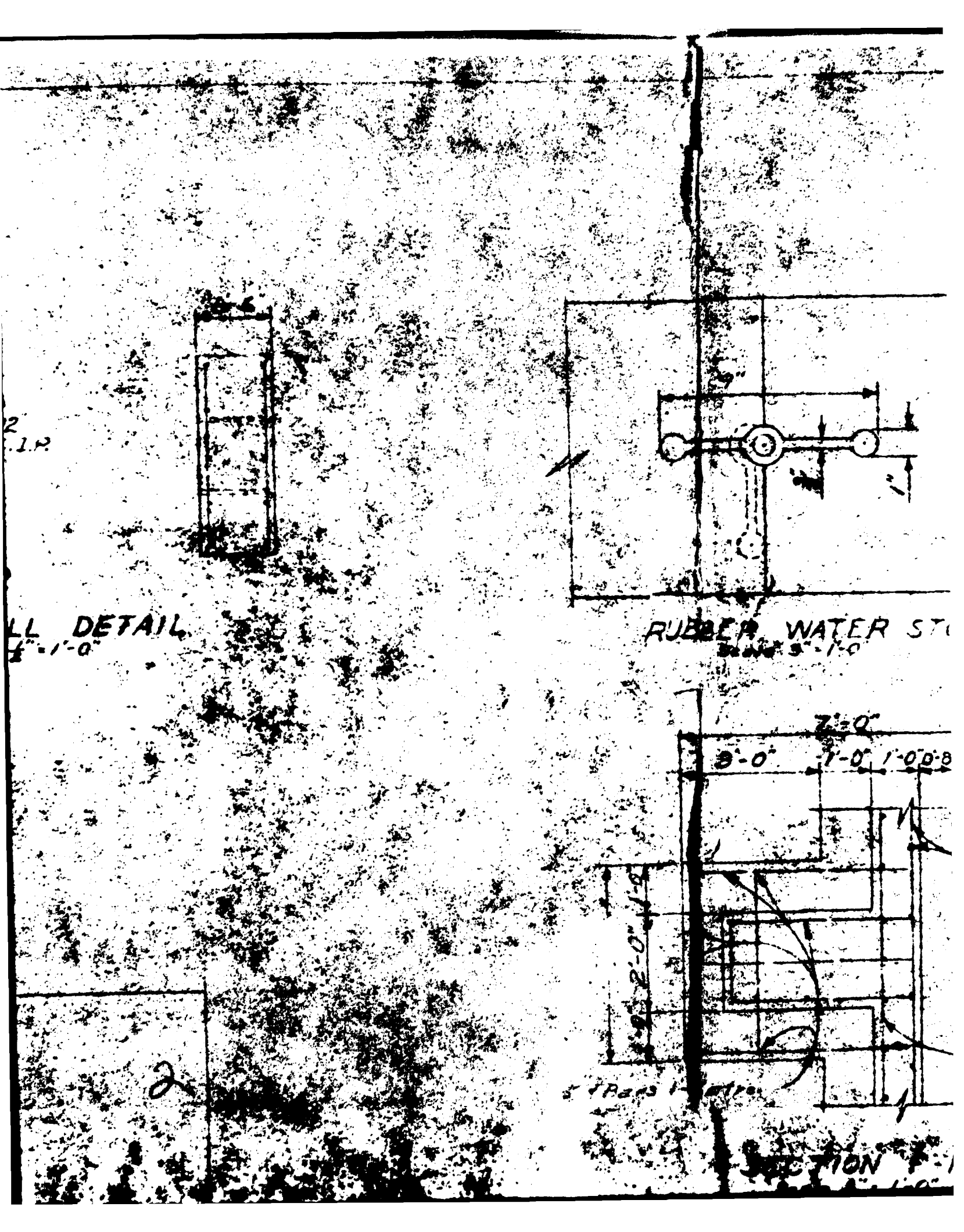
9.0

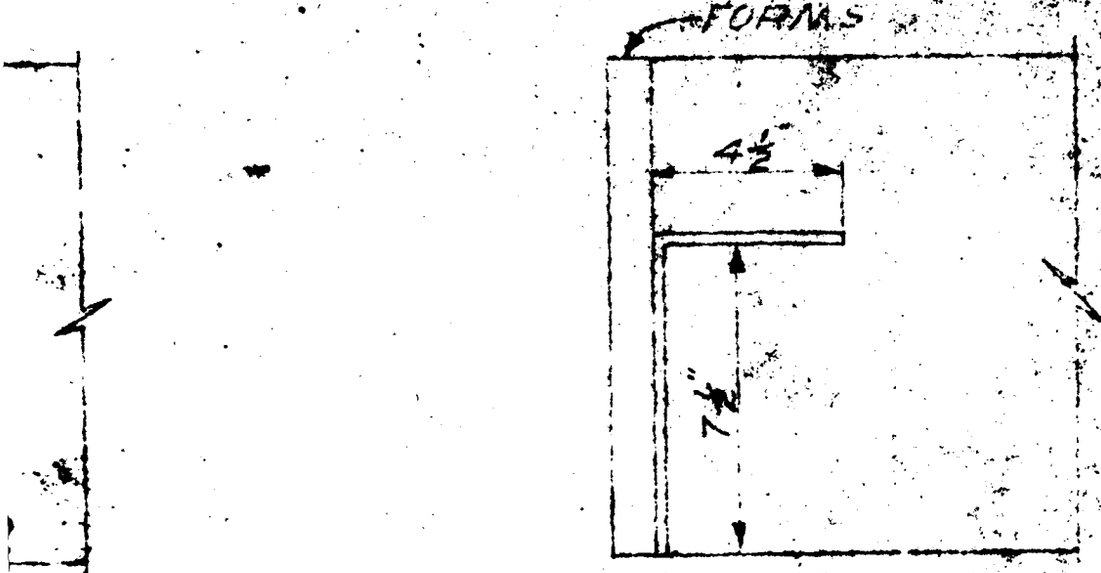
...rs 1'-6" Clrs.

WATER SUPPLY ... VILLAGE ... COBLE ... INTAKE and ...

8


5'-0"
HEADWA


RUBBER WATER ST
3'-0"
1'-0"
1'-0"
1'-0"
2'-0"



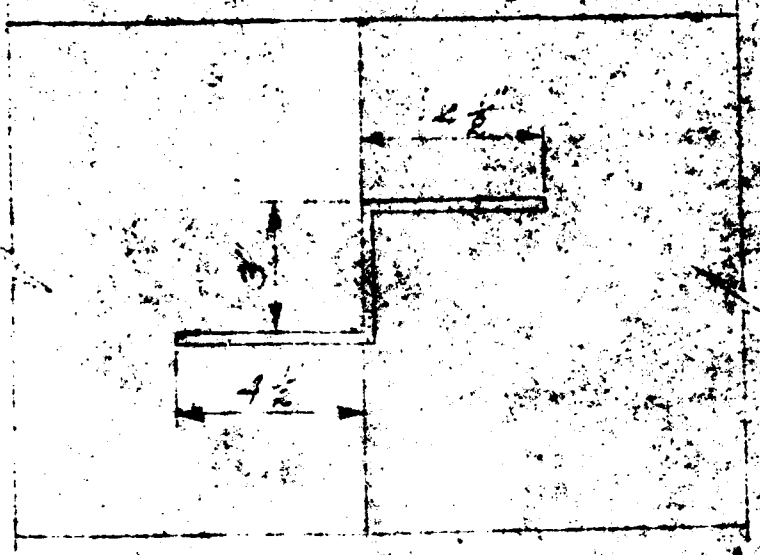
METAL WATER ST
Scale 3"=1'-0"

8" 1'-6"

⅝" ϕ Bars 1'-0" ctrs.

¾" ϕ Bars 1'-0" ctrs.

1'-6"



TER STOP
1'-1-0"

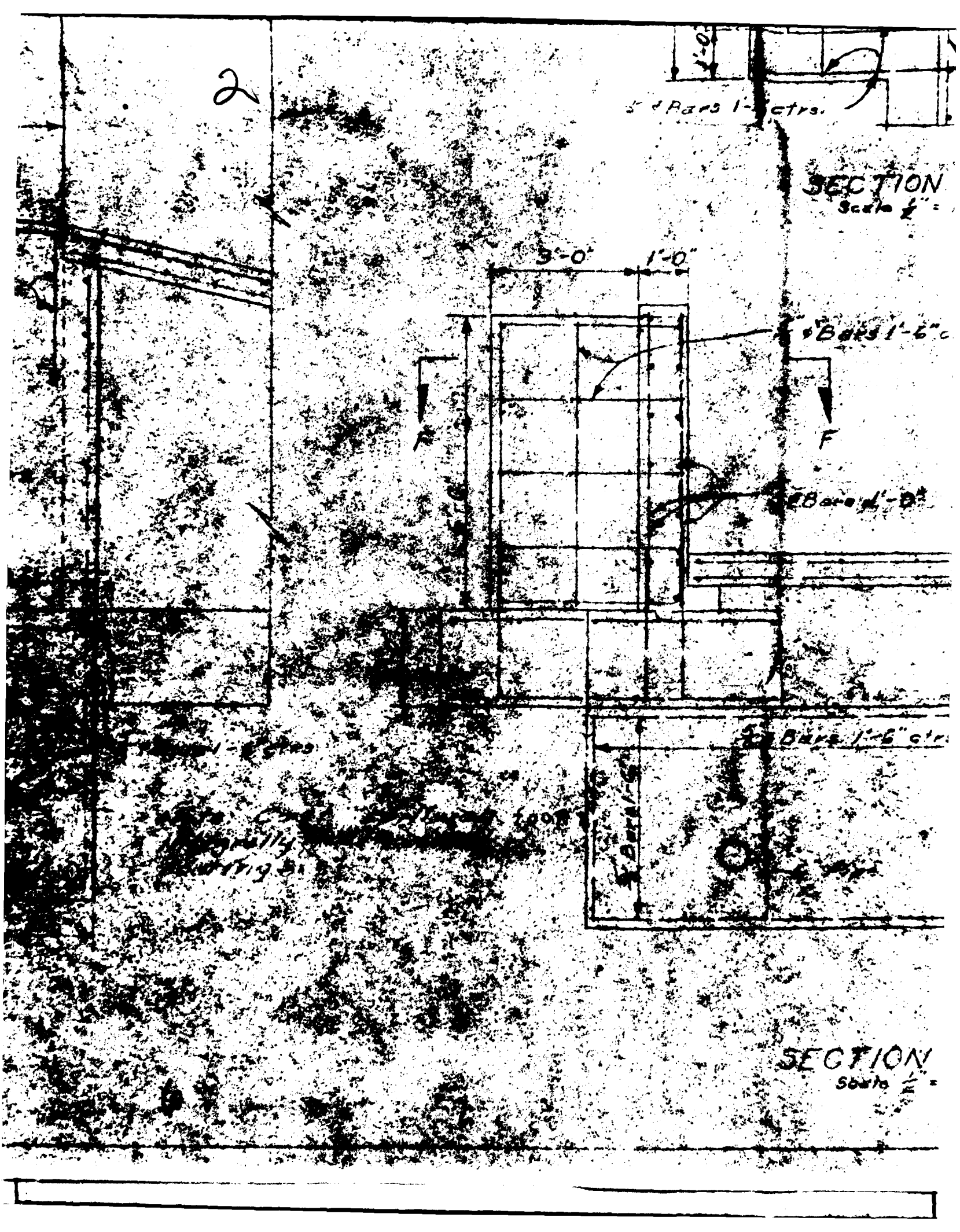
1'-6" o. Rio R.F.

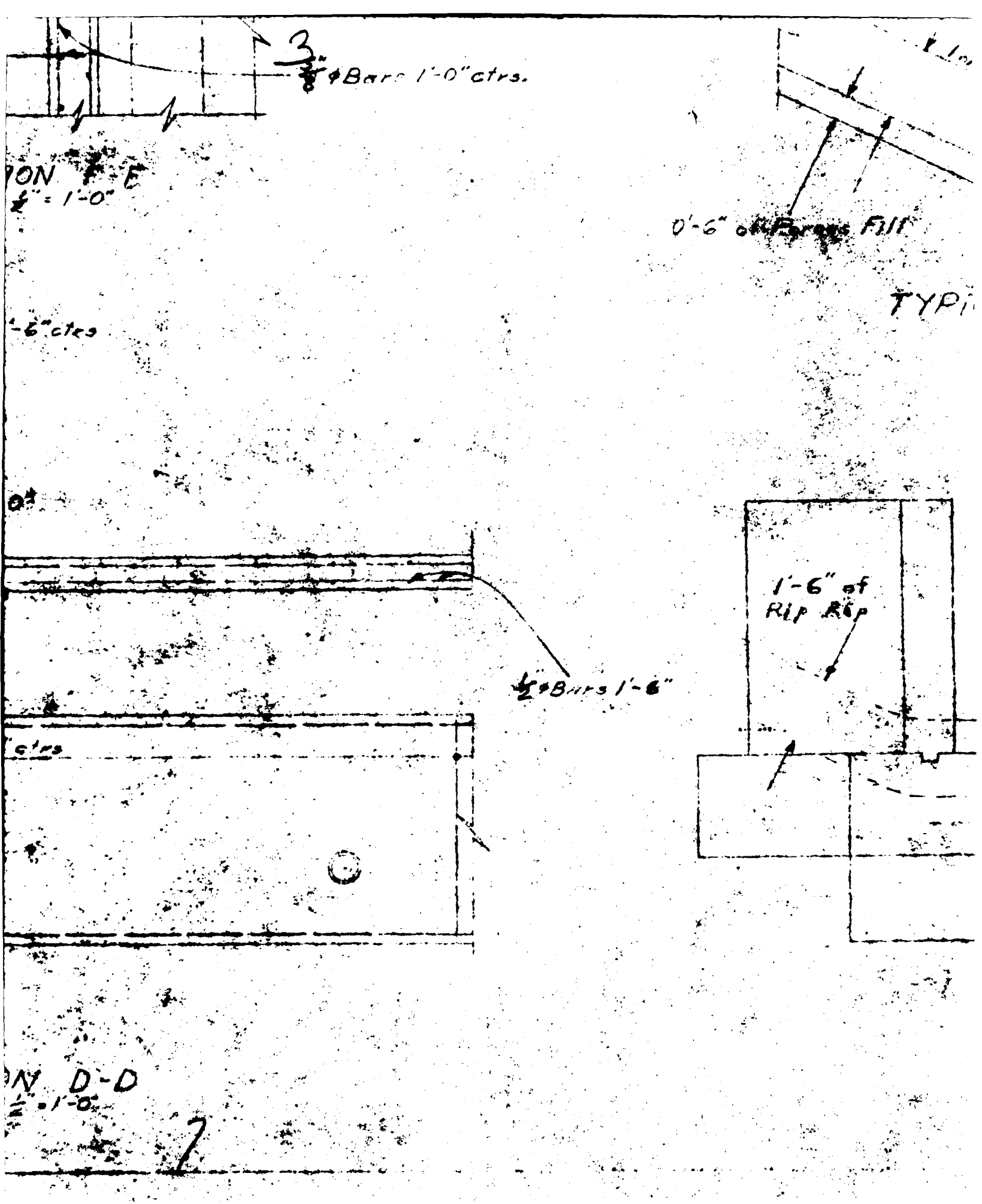
41'-0"

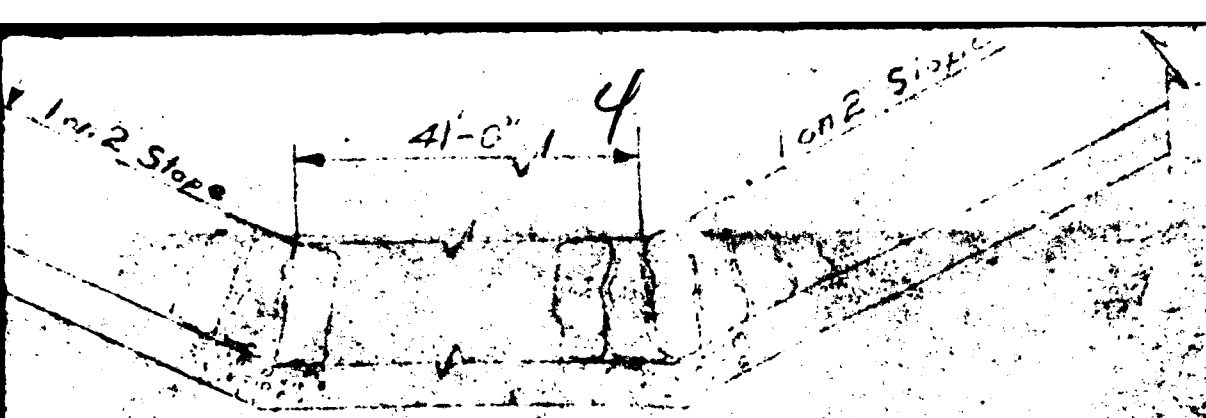
4

1 on 2 Slope

1 on 2 Slope

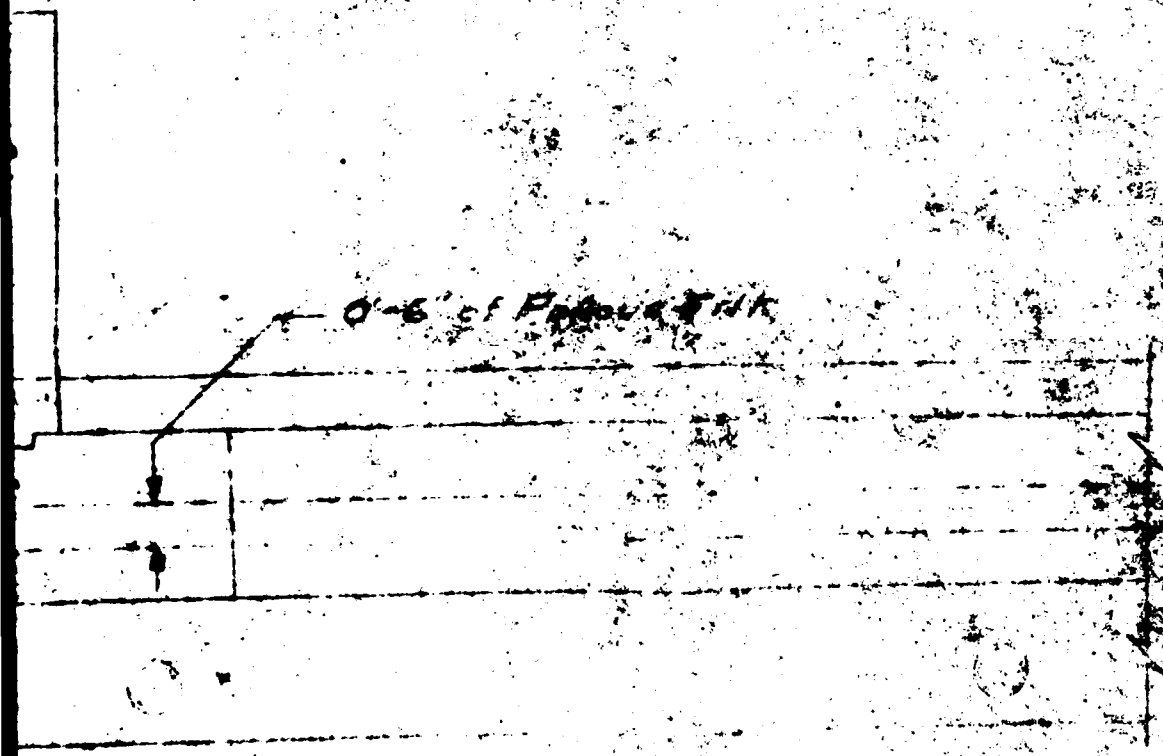

2
SECTION
3'-0"
1'-0"
F
F
SECTION


3/8" ϕ Bars 1'-0" ctrs.
ON E
1" = 1'-0"
0'-6" of Broken Fill
TYPI
-6" ctrs
1'-6" of
Rip Rap
1/2" ϕ Bars 1'-6"
ctrs
N D-D
= 1'-0"



4

YPICAL SECTION of DOWNSTREAM CHANNEL



WATER SUPPLY SYSTEM
VILLAGE of COBLESKILL
DETAIL of SPILLWAY

SECTION

Scale

8

END

DATE
FILMED
11-8

DTIC