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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 the visual inspection of Browns Reservoir Dam did not reveal conditions which constitute an immediate hazard to human life or property. However, the dam has some deficiencies which require further investigation and remedial action.		

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Using the Corps of Engineers "Screening Criteria" for the initial review of spillway adequacy, it has been determined that the embankment would be overtopped for all storms in excess of 38% of the PMF (Probable Maximum Flood). The spillway is, therefore, adjudged as "seriously inadequate", and the dam is assessed as unsafe, non-emergency.

The classification of "unsafe" applied to a dam because of a "seriously inadequate" spillway is not meant to connote the same degree of emergency as would be associated with an "unsafe" classification applied for a structural deficiency. It does mean that there appears to be a serious deficiency in the spillway capacity and if a severe storm were to occur, overtopping and failure of the dam could take place, significantly increasing the hazard to loss of life downstream of the dam.

It is, therefore, recommended that within 3 months of notification to the owner, detailed hydrologic/hydraulic investigations of the structure be undertaken to more accurately determine the site specific characteristics of the watershed and their affect upon the overtopping potential of the dam. The results of these investigations will determine the appropriate remedial measures which will be required to achieve a spillway capacity adequate to discharge the outflow from at least the 1/2 PMF. The investigations should be completed within 1 year and remedial measures completed during the following year. In the interim, a detailed emergency action plan must be developed and implemented during periods of unusually heavy precipitation. Also, around-the-clock surveillance of the structure must be provided during these periods.

In addition the dam has a number of problem areas, which if left uncorrected, have the potential for the development of potentially hazardous conditions, and must be corrected within 1 year. These areas are:

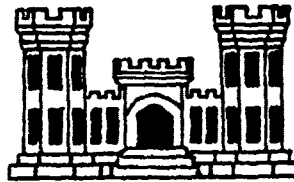
1. Monitor the seepage at the toe of slope below the outlet works, at bi-weekly intervals with the aid of weirs. Also monitor the soft wet area below the right spillway buttress.
2. Repair the deteriorated concrete of the spillway and spillway buttresses.
3. Remove the vegetation observed on the embankments and along the downstream channels. Provide a program of periodic cutting and mowing of these surfaces.
4. Repair the minor erosion observed on the downstream slopes of the embankments near the spillway buttresses.
5. Investigate the condition of the wet well and the valves within the gate house. Repair as required to return these valves to operational status. The valves in the gate house should be used for control instead of those in the outlet chamber to reduce the internal pressures within the pipe and embankment.
6. Provide a program of periodic inspection and maintenance of the dam and appurtenances, including yearly operation and lubrication of all valves. Document this information for future reference. The emergency action plan described in section 7.1d should be maintained and updated periodically during the life of the structure.

LONG ISLAND BASIN
BROWNS RESERVOIR DAM

WESTCHESTER COUNTY NEW YORK

INVENTORY NO. N.Y. 763

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM



NEW YORK DISTRICT CORPS OF ENGINEERS

JULY, 1980

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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.

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NATIONAL DAM SAFETY PROGRAM
BROWNS RESERVOIR DAM I.D. No. 763 Inventory Number II
DEC #232 BE-4367 LONG ISLAND BASIN, NY-3
WESTCHESTER COUNTY, NEW YORK

Number

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PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

Name of Dam	Browns Reservoir (I.D. No. NY 763)
State Located	New York
County Located	Westchester
Stream	Silver Mine River
Date of Inspection	July 9, 1980

ASSESSMENT

The examination of documents and the visual inspection of Browns Reservoir Dam did not reveal conditions which constitute an immediate hazard to human life or property. However, the dam has some deficiencies which require further investigation and remedial action.

Using the Corps of Engineers "Screening Criteria" for the initial review of spillway adequacy, it has been determined that the embankment would be overtopped for all storms in excess of 38% of the PMF (Probable Maximum Flood). The spillway is, therefore, adjudged as "seriously inadequate", and the dam is assessed as unsafe, non-emergency.

The classification of "unsafe" applied to a dam because of a "seriously inadequate" spillway is not meant to connote the same degree of emergency as would be associated with an "unsafe" classification applied for a structural deficiency. It does mean that there appears to be a serious deficiency in the spillway capacity and if a severe storm were to occur, overtopping and failure of the dam could take place, significantly increasing the hazard to loss of life downstream of the dam.

It is, therefore, recommended that within 3 months of notification to the owner, detailed hydrologic/hydraulic investigations of the structure be undertaken to more accurately determine the site specific characteristics of the watershed and their affect upon the overtopping potential of the dam. The results of these investigations will determine the appropriate remedial measures which will be required to achieve a spillway capacity adequate to discharge the outflow from at least the 1/2 PMF. The investigations should be completed within 1 year and remedial measures completed during the following year. In the interim, a detailed emergency action plan must be developed and implemented during periods of unusually heavy precipitation. Also, around-the-clock surveillance of the structure must be provided during these periods.

In addition the dam has a number of problem areas, which if left uncorrected, have the potential for the development of potentially hazardous conditions, and must be corrected within 1 year. These areas are:

1. Monitor the seepage at the toe of slope below the outlet works, at bi-weekly intervals with the aid of weirs. Also monitor the soft wet area below the right spillway buttress.
2. Repair the deteriorated concrete of the spillway and spillway buttresses.
3. Remove the vegetation observed on the embankments and along the downstream channels. Provide a program of periodic cutting and mowing of these surfaces.
4. Repair the minor erosion observed on the downstream slopes of the embankments near the spillway buttresses.
5. Investigate the condition of the wet well and the valves within the gate house. Repair as required to return these valves to operational status. The valves in the gate house should be used for control instead of those in the outlet chamber to reduce the internal pressures within the pipe and embankment.
6. Provide a program of periodic inspection and maintenance of the dam and appurtenances, including yearly operation and lubrication of all valves. Document this information for future reference. The emergency action plan described in section 7.1d should be maintained and updated periodically during the life of the structure.

George Koch

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Approved By:

W. M. Smith Jr.
Colonel W. M. Smith Jr.
New York District Engineer

Date:

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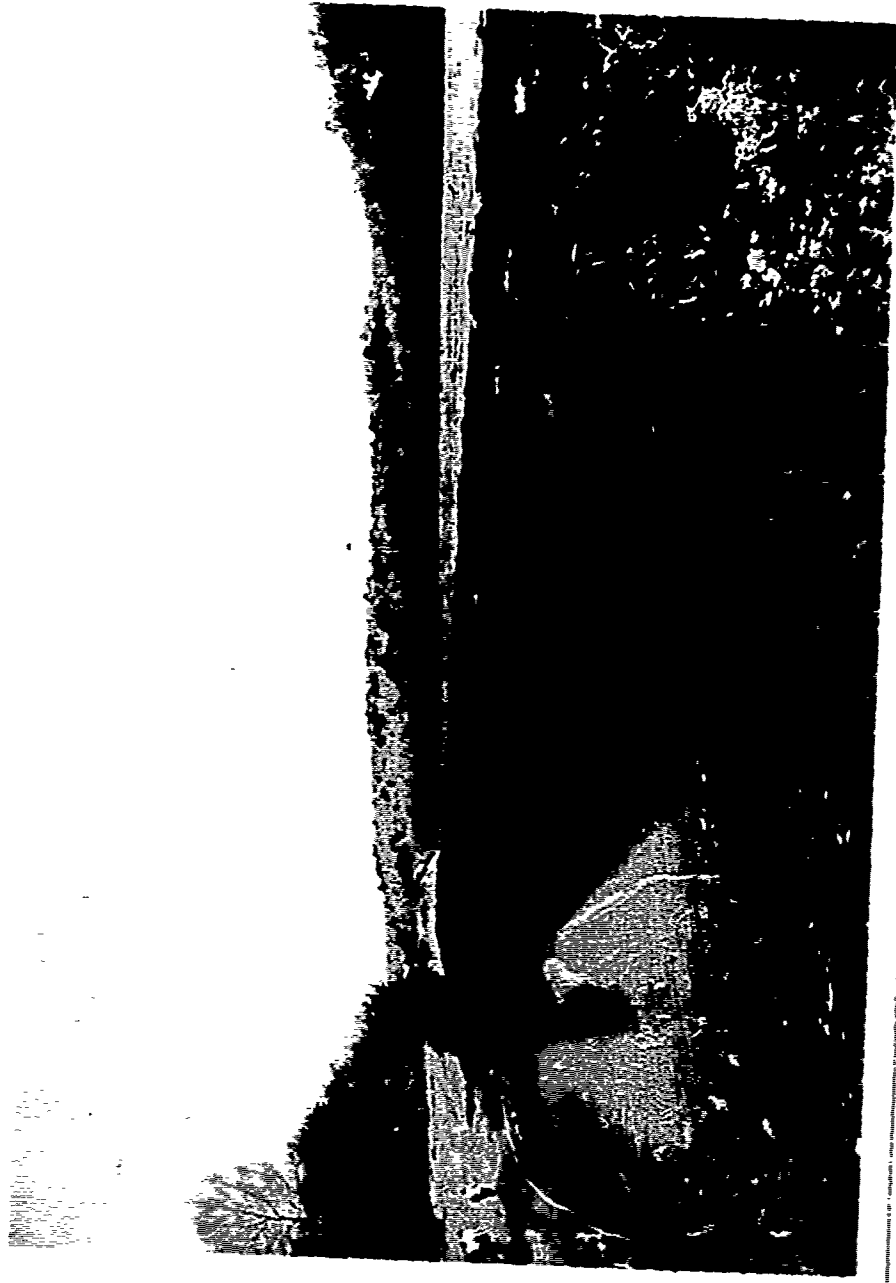


Photo #1 Overview of Brown's Reservoir Dam

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
BROWNS RESERVOIR DAM I.D. No. 763
DEC #232 BE-4361 LONG ISLAND BASIN
WESTCHESTER COUNTY, NEW YORK

SECTION 1: PROJECT INFORMATION

1.1 GENERAL

a. Authority

The Phase I inspection reported herein was authorized by the Department of the Army, New York District, Corps of Engineers, to fulfill the requirements of the National 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 measures where necessary.

1.2 DESCRIPTION OF PROJECT

a. Description of Dam and Appurtenances

Browns Reservoir Dam consists of a 175.5 feet long stepped concrete spillway constructed between 2 homogeneous earth embankments (left embankment length=200 feet, right embankment length=1000 feet), the maximum height of which is 48 feet. The upstream slopes of the earth embankments are 1 vertical on 2 horizontal, the downstream slopes are 1 on 1.5, and the crest of the dam is 14 feet wide. A concrete and cyclopean core wall, located along the centerline of the embankments, extends from 1.5 feet below the crest to a variable depth. Plans indicate that the core wall is 2 feet wide at the top and slopes outward at a rate of 3/4 inches per foot on both the upstream and downstream faces. A gate house and gate chamber located near the right abutment of the right embankment contains three gate valves which control the flow through a 6 inch, 16 inch and 30 inch pipe. The 6 inch pipe provides drainage within the well. The 16 and 30 inch pipes provide discharge from the reservoir to augment the capacity of the 2 downstream reservoirs, which supply water to the City of Norwalk, Connecticut. An outlet chamber at the downstream toe of the embankment also contains valves for the 16 and 30 inch pipes. These valves are currently used to control the downstream discharge.

b. Location

The dam is located on the Silver Mine River, approximately 6 miles north of the City of Norwalk, Connecticut.

c. Size

The dam is 48 feet high and impounds approximately 890 acre-feet. The dam is classified as "intermediate" in size (40 to 100 feet in height).

d. Hazard Classification

The dam is classified as "high" hazard due to the potential for a chain reaction failure situation of the dams within the Silver Mine River Basin which are above the City of Norwalk.

e. Ownership

The dam is owned and operated by the City of Norwalk, First Water District, Mr. William Leahy, Superintendent of Filter Plant & Watershed, 3 Beldon Avenue, Norwalk, Connecticut. Telephone: (203)966-1473.

f. Purpose of the Dam

The dam provides storage for the supply of water to the City of Norwalk, Connecticut.

g. Design and Construction

The dam was designed by Charles M. Wood, and was built in 1910 by the Jabson Hacker Co., New York, N.Y. The dam was raised in 1924 from elevation 414 to its present height at elevation 420, by Frank B. Hastings, contractor, the engineer was Samuel W. Hoyt Jr. Company Inc. All available information concerning the construction and reconstruction has been included in Appendix F. The dam is composed of a concrete spillway constructed between two earth embankments, the maximum height of which is 48 feet.

h. Normal Operating Procedures

All flows in excess of the demand for water by the City of Norwalk are discharged over the spillway.

1.3 PERTINENT DATA

a. <u>Drainage Area</u> (sq. mi.)	7.56
b. <u>Discharge at Dam</u> (cfs)	
Spillway at Maximum High Water	3931
Reservoir Drain at Normal Water Elevation	190
c. <u>Elevations</u> (USGS Datum)	
Top of Dam	436.
Spillway Crest	432.
Reservoir Drain Invert	390.
d. <u>Reservoir</u> (acres)	
Surface Area at Top of Dam	55.
Surface Area at Crest of Dam	44.
e. <u>Storage Capacity</u> (acre feet)	
Top of Dam	1067
Spillway Crest	891
f. <u>Dam</u>	
Type: Homogeneous Earth with cyclopean concrete core wall.	
Length (ft):	1200.
Slopes upstream	2:1
downstream	1 1/2:1
Crest Width (ft):	14'

g. Spillway

Type: Stepped concrete overflow structure.

Weir Length (ft):

175.5'

h. Reservoir Drain

Type: Two concrete encased pipes 16 & 30 inches.

Control: Manual control valves at the gate and toe of the dam.

SECTION 2: ENGINEERING DATA

2.1 GEOLOGY

Browns Reservoir Dam is located in the "New England Uplands" physiographic province of New York State. Maximum relief is in the Hudson Highlands, where elevations range from 800 feet below sea level (bedrock of the Hudson River Valley) to more than 1500 feet. Rocks in these uplands are either metamorphic or igneous, and land forms are closely related to their durability. Strong topographic linearity characterizes the Hudson Highlands; most of the ridges and valleys follow the northeast-southwest strike of the metamorphosed rocks.

The "Landforms and Bedrock Geology of New York State" prepared University of the State of New York indicates that the bedrock in the vicinity of the dam is the Hartland Formation - basal amphibolite overlain by pelitic schists. (Middle Ordovician through lower Cambrian rocks initially deformed by the Taconic Orogeny (435-455 million years ago) and subsequently by the Acadian Orogeny.) The "Generalized Tectonic-Metamorphic Map of New York", compiled by Fisher, Isachsen, and Richard (1971) indicates that the tectonic unit in the vicinity of the dam is "eugeosynclinal (rise-rock)" thrust sheets, intensely deformed with carbonate slivers along faults.

The "Preliminary Brittle Structures Map of New York" developed by Isachsen and McKendree (1977), does not indicate the presence of any faulting or other brittle deformations within the vicinity of the dam or impoundment. Several topographic linear features are present to the north and west, but are a significant distance from the dam.

2.2 SUBSURFACE INVESTIGATION

No subsurface investigation could be located for the dam. The "General Soil Map of New York State" prepared by Cornell University Agriculture Experiment Station, indicates that the surficial soils are Charlton Soils of glacial till origin. These soils are formed on unstratified variable glacial till and residuum predominantly from schists but in places including gneiss and granite. The soils are stony silt and sand with a trace of clay. In places ledge pieces and boulders are numerous. Rock outcrops are common, but the depth to rock is extremely variable. The overall drainage and permeability is good. The soil is also considered erodible due to the limited clay content.

2.3 DAM AND APPURTENANT STRUCTURES

The dam was built in 1910 by the Jabson Hooker Co., New York, N.Y.; the engineer was Charles M. Wood. The dam was raised in 1924 to its present height by the contractor Frank B. Hastings; the engineer was Samuel W. Hoyt Jr. Company, Inc. All available information concerning the construction and reconstruction has been included in Appendix F. The dam is composed of a concrete spillway and two earth embankments the maximum height of which is 48 feet.

2.4 CONSTRUCTION RECORDS

No construction records were located for the dam.

2.5 OPERATION RECORDS

All operation records are on file with the owner.

2.6 EVALUATION OF DATA

The data presented in this report has been, in part, compiled from information obtained from Mr. Robert Mercurio and Mr. Harry Everson of the City of Norwalk, Connecticut. This information appears adequate and reliable for Phase I inspection purposes.

SECTION 3: VISUAL INSPECTION

3.1 FINDINGS

a. General

Visual inspection of Browns Reservoir Dam was conducted on July 9, 1980. The weather was clear and the temperature ranged in the upper 60's. The water surface at the time of the inspection was just cresting the spillway.

b. Spillway

The concrete spillway located near the left abutment of the dam is stepped to dissipate the energy of the overflow. The construction joints are deteriorated and require repair. Spillway flow masked careful examination of the downstream face. No significant seepage was observed and no seepage was reported by the maintenance staff. (See Photo #1) The approach channel is riprapped and appears to be in good condition. A few stones have been displaced. (See Photo #2) Gravel and stone was noted at the base of the spillway. This area is in good condition. The top surfaces of the spillway buttresses are deteriorated (particularly the left buttress) and require repairs. (See Photos #1 & 2). The horizontal and vertical alignment of the spillway appears to be good.

c. Embankment

The embankment is divided into 2 sections by the spillway. The left embankment is in generally good condition. (See Photo #2) Some vegetation was observed on the upstream face near the water line (See Photo #4), and some slight erosion is present near the crest of the embankment left of the left spillway buttress (See Photo #3).

The right embankment is in good condition with the following exceptions:

1. Extensive tree and brush growth on the downstream slope. Some of the trees have been removed by maintenance forces in the vicinity of the spillway, and it was reported that this program would be instituted along the remainder of the embankment. (See Photos #4 & 5)
2. In the vicinity of the spillway approximately 50 feet beyond the toe of the embankment a soft wet area is present, with water seeking vegetation. Mowing equipment has rutted the surface and water is laying in this area. This area may be the result of the backwater at the base of the spillway. (See Photo #3) No evidence of active seepage was observed. Evidence of erosion of the downstream slope about 20 feet from the right spillway buttress was noted. (See Photo #6)
3. In the area adjacent to the downstream toe and slightly to the left of the gate house, seepage was evident at a rate of 5 to 10 gpm. (See Photo #10) The seepage appeared to be originating from an area downstream of the embankment, and was flowing toward the embankment and then turning to the right and flowing toward the outlet works for the gatehouse. No evidence of particle migration was noted.

4. On the left side of the concrete outlet structure, 5 separate and distinct areas were observed in which seepage was flowing toward the outlet structure. (See Photos #8 & 9) Some minor sediment was noted at several locations where the seepage was discharging into the backwater adjacent to the outlet structure. The flows appeared to be clear and no active particle migration was observed. Some of the flow appears to be originating from an elevated area of natural origin, left of the outlet structure. One of the flows originates on the right side near the embankment, flows parallel to the toe and emerges on the left side of the outlet structure. This seepage is being ponded by the irregular grade near the toe, and has a rusty appearance, but the flow is clear. The total quantity of seepage from all areas is estimated to be 20 to 30 gpm. It is possible that some of the flow is related to rains of the previous day. The maintenance staff reports that this seepage has been present for at least 6 years.

While the slopes of the right embankment appears to be steep, no evidence of sliding, sloughing, depressions, or seepage was observed on the slopes, along the crest or at the abutments.

d. Outlet Works

The 1909 plans indicate that the outlet works, located near the right abutment of the right earth embankment, consists of a masonry and concrete gatehouse atop a concrete gate chamber. Three gate valves controls, for a 6", 16", and 30" pipe, were observed in the gate house at the crest of the embankment. (See Photo #7) The outlet chamber (referred to as the "outlet parapet wall" in the 1909 plans) at the downstream toe of the embankment contains two valves (for 16 and 30 inch pipes). (See Photo #8) No valve was observed for the 6" pipe, which appears to be a drain for removal of water within the gate chamber. Maintenance forces were unaware of the existence of the valves within the gate chamber, indicating that these valves had not been operated for some time. Control of the outflow is provided by the downstream valves in the outlet chamber, which indicates that the upstream valves are open at least partially. All valves should be investigated and returned to operational status.

e. Downstream Channels

The downstream channel below the outlet chamber is heavily vegetated. (See Photo #9) The downstream channel below the spillway is also vegetated heavily. This vegetation should be removed to prevent blockage of the outflow.

f. Reservoir

There are no visible signs of instability or sedimentation problems within the reservoir area.

3.2 EVALUATION

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

1. The seepage observed along the toe of the dam requires monitoring at bi-weekly intervals with aid of weirs.

2. The soft wet area below the right spillway buttress requires monitoring.
3. The construction joints of the spillway and the spillway buttresses are deteriorated and require repair.
4. Extensive tree and brush growth was observed on the right embankment, the upstream slope of the left embankment and the downstream channels. This vegetation should be cut as soon as possible and a program of periodic cutting and mowing of these surfaces instituted.
5. Minor erosion was observed on the downstream slopes of the embankments near the spillway buttresses. Regrade and seed as required to restore these slopes to their original configuration.
6. Investigate the condition of all valves. Restore these valves, to operational status. Operate the 6 inch drain so that the water within the wet wall is removed and inspect the wall and appurtenances thoroughly. Initiate repairs as required. Use of the upstream valves for control of releases will reduce the internal pressure within the pipes.
7. Provide a program of periodic inspection and maintenance of the dam and appurtenances including yearly operation and lubrication of all valves. Document this information for future reference. Also develop an emergency action plan.

SECTION 4: OPERATION AND MAINTENANCE PROCEDURES

4.1 PROCEDURES

The normal water surface elevation is approximated by the crest of the spillway. Water can be released to the downstream channel by the outlet works via the 16 and 30 inch diameter pipes which are currently controlled by the valves in the outlet chamber. By using the valves in the gate house, instead of those in the outlet chamber, excess pressure within the pipe and the embankment will be eliminated. The invert elevation of these pipes within the gate house is 372. A 6 inch diameter pipe and valve located within the gate house may be used to drain the gate house wet wall.

4.2 MAINTENANCE OF THE DAM

Maintenance of the dam is not considered adequate as evidenced by the deterioration of the spillway, extensive vegetation on the embankment and the unoperated valves within the gate house.

4.3 WARNING SYSTEM

There is no warning system in effect or in preparation.

4.4 EVALUATION

The dam and appurtenances have not been maintained in satisfactory condition as noted in "Section 3: Visual Inspection."

SECTION 5: HYDRAULIC/HYDROLOGIC

5.1 DRAINAGE AREA CHARACTERISTICS

Delineation of the watershed of Browns Reservoir was made using the USGS quadrangles for Peach Lake, Pound Ridge, New York and Bethel, Norwalk North Connecticut. The basin consists of woodlands and fields with many residences in the lower portion. Relief is moderate, with some upland storage in the form of swampy areas and small ponds. The total area is 7.56 square miles.

5.2 ANALYSIS CRITERIA

The analysis of the spillway 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 using the Snyder Synthetic Unit Hydrograph Method and the Modified Puls routing procedure was incorporated. The Probable Maximum Precipitation (PMP) used was 21.7 inches (24 hrs, 200 sq. mi) from Hydrometeorological Report No. 33. Several floods were selected (%s PMF) for analysis in accordance with recommended guidelines of the Corps of Engineers. The PMF inflow of 10,466 cfs, was routed through the reservoir and the peak outflow was determined to be 10,457 cfs.

5.3 SPILLWAY CAPACITY

A single stepped, masonry overflow spillway is located near the left abutment. It has a width of 175.5' and has a capacity of 3931. cfs at top of dam. Top of dam is 4 feet above spillway crest. There is no auxiliary or emergency spillway at Browns Reservoir.

5.4 RESERVOIR CAPACITY

Normal flood control storage capacity of the reservoir between the spillway crest and top of dam is 176. acre feet. This volume represents a total runoff of .44 inches from the basin.

5.5 FLOODS OF RECORD

Maximum flow observed in the spillway was about 1.5', resulting in an estimated flow of 860 cfs. This flow occurred during September 1975.

5.6 OVERTOPPING POTENTIAL

The maximum capacity of the spillway is 3931. cfs before overtopping would occur.

This capacity results in the ability to pass only 38% of the PMF with very little attenuation.

5.7 EVALUATION

The dam will be overtopped in all storms greater than 38% of the PMF. The spillway is, therefore, considered to be seriously 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 or the spillway section. However, seepage was observed at the toe of the right embankment near the gate house, and a soft wet area was noted below the right spillway buttress.

b. Design and Construction Data

No design or construction data could be located concerning the structural stability of the dam.

c. Post-Construction Changes

In 1924, the dam was raised from a crest elevation of 414 to elevation 420. (See Appendix F)

6.2 STABILITY ANALYSIS

A stability analysis was conducted for the concrete gravity spillway section. The results of the analysis are as follows:

<u>Case</u>	<u>Description of Loading Conditions</u>
1	Normal Operating conditions, reservoir at El. 416.5 (spillway crest), full uplift, no tailwater.
2	Same as Case 1, with 5.0 kips/l.f. ice load
3	Water at 1/2 PMF level (El. 420.8) uplift as in Case 1, tailwater = 4.3 feet
4	Water at PMF level (El. 421.6) uplift as in Case 1, tailwater = 5.1 feet
5	Normal conditions as in Case 1, with seismic forces: = 0.1 (seismic Zone 3)

Note: The bottom surface of the dam has been idealized to simplify the analysis. Compare the analyzed section (Appendix E) with the spillway section in Appendix F. Elevations are based on plan datum.

<u>Case</u>	<u>Factor of Safety Overturning</u>	<u>Location of Resultant from Toe</u>	<u>Factor of Safety Sliding</u>
1	3.20	8.8	3.31
2	1.73	5.4	1.41
3	2.30	8.5	1.80
4	2.19	8.4	1.67
5	2.39	7.5	2.06

Location of middle 1/3 is 5.0 to 10.0 feet from the toe.

These results indicate that the spillway portion analyzed has factors of safety in excess of that recommended by the Corps of Engineers. The spillway is, therefore, considered to have adequate factors of safety for stability.

SECTION 7: ASSESSMENT/RECOMMENDATIONS

7.1 ASSESSMENT

a. Safety

The Phase I Inspection of Browns Reservoir Dam revealed that the spillway is "seriously inadequate", based on the Corps of Engineers "screening criteria", and outflows from any storm in excess of 38% of the PMF will overtop the dam. This overtopping could cause breaching of the earth embankment and the resulting flood-wave would significantly increase the hazard to downstream residents. For these reasons the dam has been assessed as unsafe, non-emergency.

b. Adequacy of Information

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

c. Need for Additional Investigation

Since the spillway is considered to be seriously inadequate, additional hydrologic/hydraulic investigations are required to more accurately determine the site specific characteristics of the watershed. After these investigations have been completed, remedial measures must be initiated to provide spillway capacity sufficient to discharge the outflow from the 1/2 PMF event.

d. Urgency

The additional hydrologic/hydraulic investigations must be initiated within 3 months of notification to the owner. Within 1 year, remedial measures as a result of these investigations must be initiated, with completion of these measures during the following year. In the interim, develop an emergency action plan for the notification of downstream residents and the proper governmental authorities in the event of overtopping, and provide around-the-clock surveillance of the dam during periods of extreme run-off. The problem areas listed below must be corrected within 1 year of notification.

7.2 RECOMMENDED MEASURES

1. Monitor the seepage at the toe of slope below the outlet works, at bi-weekly intervals with the aid of weirs. Also monitor the soft wet area below the right spillway buttress.
2. Repair the deteriorated concrete of the spillway and spillway buttresses.
3. Remove the vegetation observed on the embankments and along the downstream channels. Provide a program of periodic cutting and mowing of these surfaces.
4. Repair the minor erosion observed on the downstream slopes of the embankments near the spillway buttresses.
5. Investigate the condition of the wet wall and the valves within the gate house. Repair the valves as required and return to operational status. The valves in the gate house should be used for control instead of those in the outlet chamber to reduce the internal pressures

within the pipe and embankment.

6. Provide a program of periodic inspection and maintenance of the dam and appurtenances, including yearly operation and lubrication of all valves. Document this information for future reference. The emergency action plan described in section 7.1d should be maintained and updated periodically during the life of the structure.

APPENDIX A
PHOTOGRAPHS



Photo #2 Spillway Looking at Left Embankment



Photo #3 Spillway Looking at Right Embankment

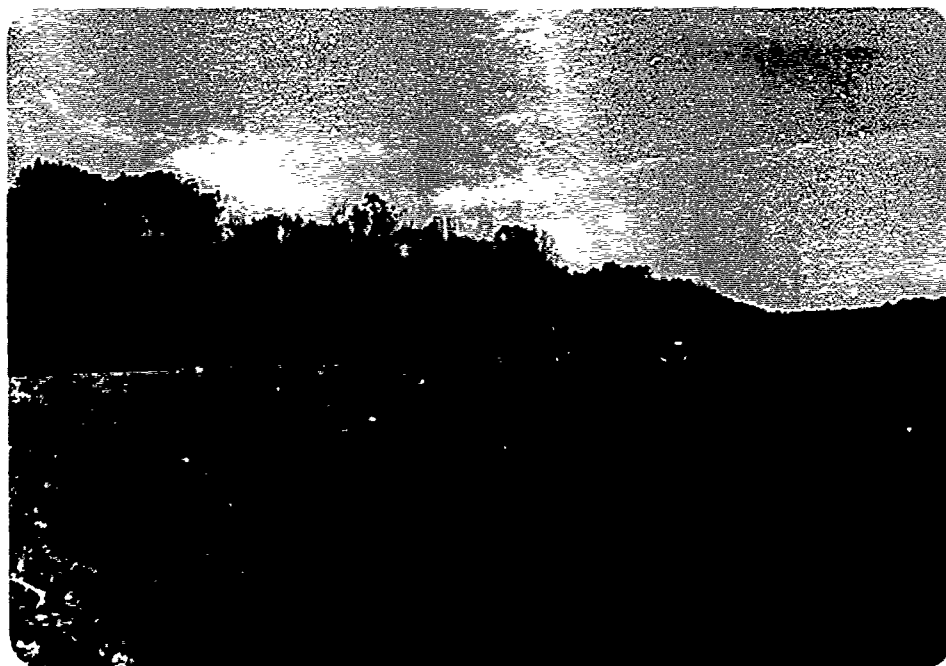


Photo #4 Upstream Face - Left Embankment



Photo #5 Crest - Right Embankment



Photo #6 Erosion of Right Embankment
near spillway



Photo #7 Valve Control in Gate House



Photo #8 Outlet Structure
note seepage in foreground

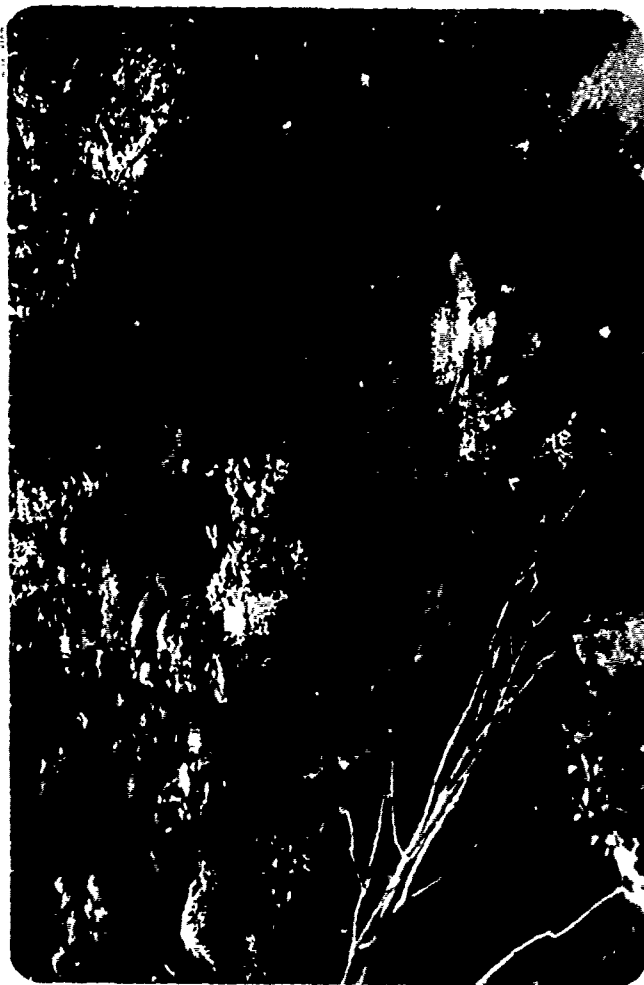


Photo #9 Seepage at Left of Outlet Structure



Photo #10 Seepage Left of Outlet Structure

APPENDIX B
VISUAL INSPECTION CHECKLIST

VISUAL INSPECTION CHECKLIST

1) Basic Data

a. General

Name of Dam Brown Reservoir
Fed. I.D. # NY 763 DEC Dam No. 232 BE -4361
River Basin Long Island
Location: Town Lewistown County Westchester
Stream Name Silvermine River
Tributary of Long Island Sound
Latitude (N) 41° 12.9' Longitude (W) 73° 29.6'
Type of Dam Homogeneous earth embankment w/ concrete spillway
Hazard Category "C" High
Date(s) of Inspection July 9, 1980
Weather Conditions Clear upper 60's
Reservoir Level at Time of Inspection approx. 14 spillway crest

b. Inspection Personnel Jamie C. Vetch Robert P. McCarty

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

Robert Mercuro, Harry Everson, Maintenance Division
Newark Water District, 3 Edison Ave., Newark Conn
(203) 966-1473 - Mr. William Leach, - Supv.
F. H. Plan & Associates

d. History:

Date Constructed 1910 Date(s) Reconstructed 1922 raise 6 ft
1924 raise 6 ft
Designer Chas. E. Jones (1910) S. W. H. H. Co., Inc.
Constructed By Wm. H. H. Co. (1910) Frank E. H. Co. (1922)
Owner C. E. Newark Conn.

2) Embankment

a. Characteristics

- (1) Embankment Material uniform
- (2) Cutoff Type concrete & cyclopaen masonry
- (3) Impervious Core same as (2)
- (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) 1:2
- (2) Undesirable Growth or Debris, Animal Burrows minimal
- (3) Sloughing, Subsidence or Depressions none

(4) Slope Protection riprap

(5) Surface Cracks or Movement at Toe _____

unobservable

d. Downstream Slope

(1) Slope (Estimate - V:H) 1 : 1.5

(2) Undesirable Growth or Debris, Animal Burrows _____

lots of vegetation

(3) Sloughing, Subsidence or Depressions none evident

(4) Surface Cracks or Movement at Toe none evident

(5) Seepage seepage in area surrounding outlet chamber below right embankment from 5 separate areas flowing into low area near outlet minor seepage in outlet pool. flow clear ~ 20 to 30 gpm. Some

(6) External Drainage System (Ditches, Trenches; Blanket) none

seepage coming from high water area near below

low of area. seepage reported to be there in a hole in ground

(7) Condition Around Outlet Structure _____

backwater from channel around outlet. concrete good.

(8) Seepage Beyond Toe see (5) above

e. Abutments - Embankment Contact

generally good contact

(1) Erosion at Contact slight erosion near spillway
on both sides requires berthing

(2) Seepage Along Contact none visible
scuff and mud began to flow in 1962
stuck in place below right spillway to rise

3) Drainage System

a. Description of System none

b. Condition of System

c. Discharge from Drainage System

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

none

5) Reservoir

- a. Slopes good condition
- b. Sedimentation no problems reported
- c. Unusual Conditions Which Affect Dam Scallops Res upstream on west branch Silvermine R.

6) Area Downstream of Dam

- a. Downstream Hazard (No. of Homes, Highways, etc.) 2 the water supply dams + city of Newark 5 mi
- b. Seepage, Unusual Growth heavily vegetated
see seepage @ 2.05
- c. Evidence of Movement Beyond Toe of Dam none
- d. Condition of Downstream Channel vegetated slight backwater

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

- a. General Spillway added in 1974 to increase
high flow capacity
- b. Condition of Service Spillway good
upstream of spillway there are some trees
which are being removed
to improve flow
at the spillway

c. Condition of Auxiliary Spillway _____

None

d. Condition of Discharge Conveyance Channel _____

Let vegetated access road = 100' down stream

8) Reservoir Drain/Outlet •

Type: Pipe ☒ Conduit _____ Other _____

Material: Concrete _____ Metal ☒ Other _____

Size: 6" diameter to 16" dia Length unknown

Invert Elevations: Entrance unknown Exit unknown

Physical Condition (Describe): Unobservable ☒

Material: _____

Joints: _____ Alignment _____

Structural Integrity: _____

Hydraulic Capability: _____

Means of Control: Gate _____ Valve ☒ Uncontrolled _____

Operation: Operable ☒ Inoperable ☒ Other _____

Present Condition (Describe): _____

Notes: Inlet valve closed since 1960, but
has been opened for many years

9) Structural

- a. Concrete Surfaces generally good condition
see deterioration of upper surfaces
a) buttresses / spillways
- b. Structural Cracking none of significance
- c. Movement - Horizontal & Vertical Alignment (Settlement) none such
- d. Junctions with Abutments or Embankments good condition
- e. Drains - Foundation, Joint, Face none
- f. Water Passages, Conduits, Sluices adequately repaired condition
- g. Seepage or Leakage none

h. Joints - Construction, etc. _____

deterioration of joints in spillway

i. Foundation _____

unobservable

j. Abutments _____

adequate

k. Control Gates _____

deterioration operation system not
operated for years

l. Approach & Outlet Channels _____

appear adequate

some process of riprap erosion

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

none

n. Intake Structures _____

misconception concrete gate house

near right abutment

good condition

2" erosion in gate house + valves in 10' & 30'

discuss ideas to supply flow maintenance the res.

o. Stability _____

appears secure

p. Miscellaneous _____

APPENDIX C
HYDROLOGIC/HYDRAULIC
ENGINEERING DATA AND COMPUTATIONS

CHECK LIST FOR DAMS
HYDROLOGIC AND HYDRAULIC
ENGINEERING DATA

1

AREA-CAPACITY DATA:

	<u>Elevation</u> (ft.)	<u>Surface Area</u> (acres)	<u>Storage Capacity</u> (acre-ft.)
1) Top of Dam	<u>436</u>	<u>55</u>	<u>1067</u>
2) Design High Water (Max. Design Pool)	<u>-</u>	<u>-</u>	<u>-</u>
3) Auxiliary Spillway Crest	<u>-</u>	<u>-</u>	<u>-</u>
4) Pool Level with Flashboards	<u>-</u>	<u>-</u>	<u>-</u>
5) Service Spillway Crest	<u>432</u>	<u>44</u>	<u>891</u>

DISCHARGES

	<u>Volume</u> (cfs)
1) Average Daily	<u>12.</u>
2) Spillway @ Maximum High Water - TOP OF DAM -	<u>3931.</u>
3) Spillway @ Design High Water	<u>-</u>
4) Spillway @ Auxiliary Spillway Crest Elevation	<u>-</u>
5) Low Level Outlet	<u>190.</u>
6) Total (of all facilities) @ Maximum High Water	<u>4121.</u>
7) Maximum Known Flood	<u>860.</u>
8) At Time of Inspection	<u>5-10 cfs.</u>

CREST:

ELEVATION: 436.0Type: homogeneous with 1/2 cypress concrete CORE WALLWidth: 14' Length: 1200'Spillover left center, STEPPED CONCRETE

Location _____

SPILLWAY:

SERVICE

AUXILIARY

432.0

Elevation

STEPPED CONCRETE OVERFLOW Type175.5'

Width

Type of Control

Uncontrolled

Controlled:

Type
(Flashboards; gate)

Number

Size/Length

Invert Material

Anticipated Length
of operating service

Chute Length

24 to 14 approach Height Between Spillway Crest
& Approach Channel Invert
(Weir Flow)

HYDROMETEOROLOGICAL GAGES:

Type : NONE

Location: —

Records:

Date - —

Max. Reading - —

FLOOD WATER CONTROL SYSTEM:

Warning System: NONE

Method of Controlled Releases (mechanisms):

16" x 30" RESERVOIR DRAIN
TO FEED LOWER WATER SUPPLY RESERVOIRS

DRAINAGE AREA: 7.56 SQ. MILES

DRAINAGE BASIN RUNOFF CHARACTERISTICS:

Land Use - Type: WOODED - some Residential
 Terrain - Relief: MODERATE slope - well defined drainage paths
 Surface - Soil: good permeability
 Runoff Potential (existing or planned extensive alterations to existing (surface or subsurface conditions)

NONE

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

NONE APPARENT

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

NO

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

Location: NONE
 Elevation: _____

Reservoir:

Length @ Maximum Pool 2500 ft. (Miles)

Length of Shoreline (@ Spillway Crest) 7000 ft. (Miles)

DEPT OF ENVIRONMENTAL CONSERVATION
FLOOD PROTECTION WORKS
FLORIDA STATE
PLANNING STAFF
TALLAHASSEE, FLORIDA

RESULTS OF ANALYSIS OF STREAM NETWORK CALCULATIONS
NUMBER OF STREAMS AT
POINT OF ANALYSIS IS
1

12779.

135-10000

 FROM: YOUNG STAFF
 TO: E. VAUGHAN
 SUBJECT: FUTURE OF THE

[illegible]

DATE	TIME	UNIT SPECIFICATION	NETFC	IPLT	IPRT	STATUS
26	13	IBM 9	0	6	5	0
		SUPER 5	0	0	0	0
		CRYPT	0	0	0	0
		TRACE	0	0	0	0

* MULTI-PLAS ANALYSES TO BE PERFORMED
KATICS= 0.20 0.40 0.50 0.60 0.80 1.00
TOTAL= 1 KATIO= 6 LATIO= 1

[illegible]

SUB-AREA RUFF COMPUTATIONS

INFLW FROM POSH	ICOMP	IFCMB	INTAPE	JPLT	JPRI	INALE	ISTAGE	INOUTC
1	0	0	0	2	0	1	0	0

NAME		TYPE		LINEA	SIMP	HYDROGRAPH DATA							
	1		1	7.56	0.	TRISA	7.56	G.	TRSPC	PATIE	ISNEW	ISSUE	LOCAL
										0.	0	0	0

THESE CIPHERS WERE OBTAINED BY THE PERSONS CONCERNED

SPF	P15	R6	P12	R24
15	21.70	111.00	123.00	133.00
15	0.00			

LEFT	STERR	CLTIP	RTIPL	LFAPR	STARS	RTIOK	STATL	CSSTL	ALSOX	RTIPL
	C.	C.	1.00	C.	0.	1.00	1.00	0.10	0.	C.
0		0.								

WILL HYDROGRAPH DATA
Tide 5.12 CP=0.63 HTA= C

APPROXIMATE CLARK COEFFICIENTS FROM GIVEN SENDER CP AND TO ARE TC=21.92 RTTR=1.00
 RESESSION DATA
 SISO= -2.10 QPC= -0.05
 UNIT RESESSION DATA

UNIT	HYDROG. PRESS.	TEMP.	PERIOD OF OBSERVATION	LAG	5.01 PULSES	CP = 6.03	WAVELENGTH
7.	27.	55.	126.	166.	205.	226.	206.
297.	444.	407.	525.	503.	604.	613.	531.
627.	612.	507.	527.	540.	642.	647.	626.
387.	502.	245.	326.	304.	376.	382.	403.
223.	201.	766.	175.	292.	161.	153.	137.
120.	123.	137.	105.	170.	54.	145.	137.
70.	72.	65.	61.	99.	54.	63.	56.
440.	628.	400.	30.	58.	55.	52.	47.
200.	250.	235.	21.	36.	32.	27.	27.
100.	140.	140.	12.	20.	15.	10.	14.
				12.	11.	10.	9.

1000, 1000, 1200.

[illegible]

[illegible]

0-5072
0-5073
0-5074
0-5075
0-5076
0-5077
0-5078
0-5079
0-5080
0-5081
0-5082
0-5083
0-5084
0-5085
0-5086
0-5087
0-5088
0-5089
0-5090
0-5091
0-5092
0-5093
0-5094
0-5095
0-5096
0-5097
0-5098
0-5099

1944-1945

110-UF-4100 FURGRAPH-INT-1A743

[illegible]

STAPHANE									
3231.	3211.	321.	1022.	3926.	3921.	392.	3922.	3922.	3922.
3220.	3209.	320.	1021.	3921.	3922.	392.	3922.	3922.	3922.
3229.	3228.	322.	1020.	3916.	3917.	392.	3922.	3922.	3922.
3238.	3237.	323.	1019.	3911.	3912.	392.	3922.	3922.	3922.
3247.	3246.	324.	1018.	3906.	3907.	392.	3922.	3922.	3922.
3256.	3255.	325.	1017.	3901.	3902.	392.	3922.	3922.	3922.
3265.	3264.	326.	1016.	3896.	3897.	392.	3922.	3922.	3922.
3274.	3273.	327.	1015.	3891.	3892.	392.	3922.	3922.	3922.
3283.	3282.	328.	1014.	3886.	3887.	392.	3922.	3922.	3922.
3292.	3291.	329.	1013.	3881.	3882.	392.	3922.	3922.	3922.
3301.	3300.	330.	1012.	3876.	3877.	392.	3922.	3922.	3922.
3310.	3309.	331.	1011.	3871.	3872.	392.	3922.	3922.	3922.
3319.	3318.	332.	1010.	3866.	3867.	392.	3922.	3922.	3922.
3328.	3327.	333.	1009.	3861.	3862.	392.	3922.	3922.	3922.
3337.	3336.	334.	1008.	3856.	3857.	392.	3922.	3922.	3922.
3346.	3345.	335.	1007.	3851.	3852.	392.	3922.	3922.	3922.
3355.	3354.	336.	1006.	3846.	3847.	392.	3922.	3922.	3922.
3364.	3363.	337.	1005.	3841.	3842.	392.	3922.	3922.	3922.
3373.	3372.	338.	1004.	3836.	3837.	392.	3922.	3922.	3922.
3382.	3381.	339.	1003.	3831.	3832.	392.	3922.	3922.	3922.
3391.	3390.	340.	1002.	3826.	3827.	392.	3922.	3922.	3922.
3400.	3399.	341.	1001.	3821.	3822.	392.	3922.	3922.	3922.
3409.	3408.	342.	1000.	3816.	3817.	392.	3922.	3922.	3922.
3418.	3417.	343.	999.	3811.	3812.	392.	3922.	3922.	3922.
3427.	3426.	344.	998.	3806.	3807.	392.	3922.	3922.	3922.
3436.	3435.	345.	997.	3801.	3802.	392.	3922.	3922.	3922.
3445.	3444.	346.	996.	3796.	3797.	392.	3922.	3922.	3922.
3454.	3453.	347.	995.	3791.	3792.	392.	3922.	3922.	3922.
3463.	3462.	348.	994.	3786.	3787.	392.	3922.	3922.	3922.
3472.	3471.	349.	993.	3781.	3782.	392.	3922.	3922.	3922.
3481.	3480.	350.	992.	3776.	3777.	392.	3922.	3922.	3922.
3490.	3489.	351.	991.	3771.	3772.	392.	3922.	3922.	3922.
3499.	3498.	352.	990.	3766.	3767.	392.	3922.	3922.	3922.
3508.	3507.	353.	989.	3761.	3762.	392.	3922.	3922.	3922.
3517.	3516.	354.	988.	3756.	3757.	392.	3922.	3922.	3922.
3526.	3525.	355.	987.	3751.	3752.	392.	3922.	3922.	3922.
3535.	3534.	356.	986.	3746.	3747.	392.	3922.	3922.	3922.
3544.	3543.	357.	985.	3741.	3742.	392.	3922.	3922.	3922.
3553.	3552.	358.	984.	3736.	3737.	392.	3922.	3922.	3922.
3562.	3561.	359.	983.	3731.	3732.	392.	3922.	3922.	3922.
3571.	3570.	360.	982.	3726.	3727.	392.	3922.	3922.	3922.
3580.	3579.	361.	981.	3721.	3722.	392.	3922.	3922.	3922.
3589.	3588.	362.	980.	3716.	3717.	392.	3922.	3922.	3922.
3598.	3597.	363.	979.	3711.	3712.	392.	3922.	3922.	3922.
3607.	3606.	364.	978.	3706.	3707.	392.	3922.	3922.	3922.
3616.	3615.	365.	977.	3701.	3702.	392.	3922.	3922.	3922.
3625.	3624.	366.	976.	3696.	3697.	392.	3922.	3922.	3922.
3634.	3633.	367.	975.	3691.	3692.	392.	3922.	3922.	3922.
3643.	3642.	368.	974.	3686.	3687.	392.	3922.	3922.	3922.
3652.	3651.	369.	973.	3681.	3682.	392.	3922.	3922.	3922.
3661.	3660.	370.	972.	3676.	3677.	392.	3922.	3922.	3922.
3670.	3669.	371.	971.	3671.	3672.	392.	3922.	3922.	3922.
3679.	3678.	372.	970.	3666.	3667.	392.	3922.	3922.	3922.
3688.	3687.	373.	969.	3661.	3662.	392.	3922.	3922.	3922.
3697.	3696.	374.	968.	3656.	3657.	392.	3922.	3922.	3922.
3706.	3705.	375.	967.	3651.	3652.	392.	3922.	3922.	3922.
3715.	3714.	376.	966.	3646.	3647.	392.	3922.	3922.	3922.
3724.	3723.	377.	965.	3641.	3642.	392.	3922.	3922.	3922.
3733.	3732.	378.	964.	3636.	3637.	392.	3922.	3922.	3922.
3742.	3741.	379.	963.	3631.	3632.	392.	3922.	3922.	3922.
3751.	3750.	380.	962.	3626.	3627.	392.	3922.	3922.	3922.
3760.	3759.	381.	961.	3621.	3622.	392.	3922.	3922.	3922.
3769.	3768.	382.	960.	3616.	3617.	392.	3922.	3922.	3922.
3778.	3777.	383.	959.	3611.	3612.	392.	3922.	3922.	3922.
3787.	3786.	384.	958.	3606.	3607.	392.	3922.	3922.	3922.
3796.	3795.	385.	957.	3601.	3602.	392.	3922.	3922.	3922.
3805.	3804.	386.	956.	3596.	3597.	392.	3922.	3922.	3922.
3814.	3813.	387.	955.	3591.	3592.	392.	3922.	3922.	3922.
3823.	3822.	388.	954.	3586.	3587.	392.	3922.	3922.	3922.
3832.	3831.	389.	953.	3581.	3582.	392.	3922.	3922.	3922.
3841.	3840.	390.	952.	3576.	3577.	392.	3922.	3922.	3922.
3850.	3849.	391.	951.	3571.	3572.	392.	3922.	3922.	3922.
3859.	3858.	392.	950.	3566.	3567.	392.	3922.	3922.	3922.
3868.	3867.	393.	949.	3561.	3562.	392.	3922.	3922.	3922.
3877.	3876.	394.	948.	3556.	3557.	392.	3922.	3922.	3922.
3886.	3885.	395.	947.	3551.	3552.	392.	3922.	3922.	3922.
3895.	3894.	396.	946.	3546.	3547.	392.	3922.	3922.	3922.
3904.	3903.	397.	945.	3541.	3542.	392.	3922.	3922.	3922.
3913.	3912.	398.	944.	3536.	3537.	392.	3922.	3922.	3922.
3922.	3921.	399.	943.	3531.	3532.	392.	3922.	3922.	3922.
3931.	3930.	400.	942.	3526.	3527.	392.	3922.	3922.	3922.
3940.	3939.	401.	941.	3521.	3522.	392.	3922.	3922.	3922.
3949.	3948.	402.	940.	3516.	3517.	392.	3922.	3922.	3922.
3958.	3957.	403.	939.	3511.	3512.	392.	3922.	3922.	3922.
3967.	3966.	404.	938.	3506.	3507.	392.	3922.	3922.	3922.
3976.	3975.	405.	937.	3501.	3502.	392.	3922.	3922.	3922.
3985.	3984.	406.	936.	3496.	3497.	392.	3922.	3922.	3922.
3994.	3993.	407.	935.	3491.	3492.	392.	3922.	3922.	3922.
4003.	4002.	408.	934.	3486.	3487.	392.	3922.	3922.	3922.
4012.	4011.	409.	933.	3481.	3482.	392.	3922.	3922.	3922.
4021.	4020.	410.	932.	3476.	3477.	392.	3922.	3922.	3922.
4030.	4029.	411.	931.	3471.	3472.	392.	3922.	3922.	3922.
4039.	4038.	412.	930.	3466.	3467.	392.	3922.	3922.	3922.
4048.	4047.	413.	929.	3461.	3462.	392.	3922.	3922.	3922.
4057.	4056.	414.	928.	3456.	3457.	392.	3922.	3922.	3922.
4066.	4065.	415.	927.	3451.	3452.	392.	3922.	3922.	3922.
4075.	4074.	416.	926.	3446.	3447.	392.	3922.	3922.	3922.
4084.	4083.	417.	925.	3441.	3442.	392.	3922.	3922.	3922.
4093.	4092.	418.	924.	3436.	3437.	392.	3922.	3922.	3922.
4102.	4101.	419.	923.	3431.	3432.	392.	3922.	3922.	3922.
4111.	4110.	420.	922.	3426.	3427.	392.	3922.	3922.	3922.
4120.	4119.	421.	921.	3421.	3422.	392.	3922.	3922.	3922.
4129.	4128.	422.	920.	3416.	3417.	392.	3922.	3922.	3922.
4138.	4137.	423.	919.	3411.	3412.	392.	3922.	3922.	3922.
4147.	4146.	424.	918.	3406.	3407.	392.	3922.	3922.	3922.
4156.	4155.	425.	917.	3401.	3402.	392.	3922.	3922.	3922.
4165.	4164.	426.	916.	3396.	3397.	392.	3922.	3922.	3922.
4174.	4173.	427.	915.	3391.	3392.	392.	3922.	3922.	3922.
4183.	4182.	428.	914.	3386.	3387.	392.	3922.	3922.	3922.
4192.	4191.	429.	913.	3381.	3382.	392.	3922.	3922.	3922.
4201.	4200.	430.	912.	3376.	3377.	392.	3922.	3922.	3922.
4210.	4209.	431.	911.	3371.	3372.	392.	3922.	3922.	3922.
4219.	4218.	432.	910.	3366.	3367.	392.	3922.	3922.	3922.
4228.	4227.	433.	909.	3361.	3362.	392.	3922.	3922.	3922.
4237.	4236.	434.	908.	3356.	3357.	392.	3922.	3922.	3922.
4246.	4245.	435.	907.	3351.	3352.	392.	3922.	3922.	3922.
4255.	4254.	436.	906.	3346.	3347.	392.	3922.	3922.	3922.
4264.	4263.	437.	905.	3341.	3342.	392.	3922.	3922.	3922.
4273.	4272.	438.	904.	3336.	3337.	392.	3922.	3922.	3922.
4282.	4281.	439.	903.	3331.	3332.	392.	3922.	3922.	3922.
4291.	4290.	440.	902.	3326.	3327.	392.	3922.	3922.	3922.
4300.	4299.	441.	901.	3321.	3322.	392.	3922.	3922.	3922.
4309.	4308.	442.	900.	3316.	3317.	392.	3922.	3922.	3922.
4318.	4317.	443.	899.	3311.	3312.	392.	3922.	3922.	3922.
4327.	4326.	444.	898.	3306.	3307.	392.	3922.	3922.	3922.
4336.	4335.	445.	897.	3301.	3302.	392.	3922.	3922.	3922.
4345.	4344.	446.	896.	3296.	3297.	392.	3922.	3922.	3922.
4354.	4353.	447.	895.	3291.	3292.	392.	3922.	3922.	3922.
4363.	4362.	448.	894.	3286.	3287.	392.	3922.	3922.	3922.
4372.	4371.	449.	893.	3281.	3282.	392.	3922.	3922.	3922.
4381.	4380.	450.	892.	3276.	3277.	392.	3922.	3922.	3922.
4390.	4389.	451.	891.	3271.	3272.	392.	3922.	3922.	3922.
4399.	4398.	452.	890.	3266.	3267.	392.	3922.	3922.	3922.
4408.	4407.	453.	889.	3261.	3262.	392.	3922.	3922.	3922.
4417.	4416.	454.	888.	3256.	3257.	392.	3922.	3922.	3922.
4426.	4425.	455.	887.	3251.	3252.	39			

5160P	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	632.0	63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AVALANCHES TOP OF DARY RIVER. ELEVATION OF LOW-LEVEL OUTLET IS NOT WITHIN RANGE OF GIVEN ELEVATIONS IN STORAGE-ELEVATION DATA
 BOTTOM OF RESERVOIR ASSUMED TO BE AT 430.00
 STORAGE-ELEVATION DATA CALL OF EXTENDED ABOVE ELEVATION: 432.00

STATISTICAL PLAN OF FATIC 6

SALEMAN (RETRACTS)

OUTFELLOH									
2.	4.	5.	7.	8.	9.	10.	11.	12.	
12.	12.	12.	12.	12.	16.	16.	11.	12.	
13.	13.	13.	13.	13.	16.	16.	14.	13.	
14.	14.	14.	14.	14.	15.	15.	14.	14.	
15.	15.	15.	15.	15.	15.	15.	14.	15.	
16.	16.	16.	16.	16.	15.	15.	14.	15.	
17.	17.	17.	17.	17.	15.	15.	14.	15.	
18.	18.	18.	18.	18.	15.	15.	14.	15.	
19.	19.	19.	19.	19.	17.	17.	21.	24.	
20.	20.	20.	20.	20.	67.	67.	64.	61.	
21.	21.	21.	21.	21.	141.	141.	147.	141.	
22.	22.	22.	22.	22.	136.	136.	147.	141.	
23.	23.	23.	23.	23.	102.	102.	124.	126.	
24.	24.	24.	24.	24.	81.	81.	94.	94.	
25.	25.	25.	25.	25.	80.	80.	73.	78.	
26.	26.	26.	26.	26.	83.	83.	53.	53.	
27.	27.	27.	27.	27.	46.	46.	53.	112.	
28.	28.	28.	28.	28.	203.	203.	303.	312.	
29.	29.	29.	29.	29.	570.	570.	205.	212.	
30.	30.	30.	30.	30.	1371.	1371.	651.	612.	
31.	31.	31.	31.	31.	1371.	1371.	657.	612.	
32.	32.	32.	32.	32.	1515.	1515.	657.	612.	
33.	33.	33.	33.	33.	5067.	5067.	657.	612.	
34.	34.	34.	34.	34.	5071.	5071.	657.	612.	
35.	35.	35.	35.	35.	1037.	1037.	657.	612.	
36.	36.	36.	36.	36.	1037.	1037.	657.	612.	
37.	37.	37.	37.	37.	9027.	9027.	657.	612.	
38.	38.	38.	38.	38.	2532.	2532.	657.	612.	
39.	39.	39.	39.	39.	5361.	5361.	657.	612.	
40.	40.	40.	40.	40.	5361.	5361.	657.	612.	
41.	41.	41.	41.	41.	5361.	5361.	657.	612.	
42.	42.	42.	42.	42.	5361.	5361.	657.	612.	
43.	43.	43.	43.	43.	5361.	5361.	657.	612.	
44.	44.	44.	44.	44.	5361.	5361.	657.	612.	
45.	45.	45.	45.	45.	5361.	5361.	657.	612.	
46.	46.	46.	46.	46.	5361.	5361.	657.	612.	
47.	47.	47.	47.	47.	5361.	5361.	657.	612.	
48.	48.	48.	48.	48.	5361.	5361.	657.	612.	
49.	49.	49.	49.	49.	5361.	5361.	657.	612.	
50.	50.	50.	50.	50.	5361.	5361.	657.	612.	

STORAGE									
592.	562.	922.	892.	872.	852.	832.	812.	792.	52.
593.	563.	923.	893.	873.	853.	833.	813.	793.	53.
594.	564.	924.	894.	874.	854.	834.	814.	794.	54.
595.	565.	925.	895.	875.	855.	835.	815.	795.	55.
596.	566.	926.	896.	876.	856.	836.	816.	796.	56.
597.	567.	927.	897.	877.	857.	837.	817.	797.	57.
598.	568.	928.	898.	878.	858.	838.	818.	798.	58.
599.	569.	929.	899.	879.	859.	839.	819.	799.	59.
600.	570.	930.	900.	880.	860.	840.	820.	800.	60.
601.	571.	931.	901.	881.	861.	841.	821.	801.	61.
602.	572.	932.	902.	882.	862.	842.	822.	802.	62.
603.	573.	933.	903.	883.	863.	843.	823.	803.	63.
604.	574.	934.	904.	884.	864.	844.	824.	804.	64.
605.	575.	935.	905.	885.	865.	845.	825.	805.	65.
606.	576.	936.	906.	886.	866.	846.	826.	806.	66.
607.	577.	937.	907.	887.	867.	847.	827.	807.	67.
608.	578.	938.	908.	888.	868.	848.	828.	808.	68.
609.	579.	939.	909.	889.	869.	849.	829.	809.	69.
610.	580.	940.	910.	890.	870.	850.	830.	810.	70.
611.	581.	941.	911.	891.	871.	851.	831.	811.	71.
612.	582.	942.	912.	892.	872.	852.	832.	812.	72.
613.	583.	943.	913.	893.	873.	853.	833.	813.	73.
614.	584.	944.	914.	894.	874.	854.	834.	814.	74.
615.	585.	945.	915.	895.	875.	855.	835.	815.	75.
616.	586.	946.	916.	896.	876.	856.	836.	816.	76.
617.	587.	947.	917.	897.	877.	857.	837.	817.	77.
618.	588.	948.	918.	898.	878.	858.	838.	818.	78.
619.	589.	949.	919.	899.	879.	859.	839.	819.	79.
620.	590.	950.	920.	900.	880.	860.	840.	820.	80.
621.	591.	951.	921.	901.	881.	861.	841.	821.	81.
622.	592.	952.	922.	902.	882.	862.	842.	822.	82.
623.	593.	953.	923.	903.	883.	863.	843.	823.	83.
624.	594.	954.	924.	904.	884.	864.	844.	824.	84.
625.	595.	955.	925.	905.	885.	865.	845.	825.	85.
626.	596.	956.	926.	906.	886.	866.	846.	826.	86.
627.	597.	957.	927.	907.	887.	867.	847.	827.	87.
628.	598.	958.	928.	908.	888.	868.	848.	828.	88.
629.	599.	959.	929.	909.	889.	869.	849.	829.	89.
630.	600.	960.	930.	910.	890.	870.	850.	830.	90.
631.	601.	961.	931.	911.	891.	871.	851.	831.	91.
632.	602.	962.	932.	912.	892.	872.	852.	832.	92.
633.	603.	963.	933.	913.	893.	873.	853.	833.	93.
634.	604.	964.	934.	914.	894.	874.	854.	834.	94.
635.	605.	965.	935.	915.	895.	875.	855.	835.	95.
636.	606.	966.	936.	916.	896.	876.	856.	836.	96.
637.	607.	967.	937.	917.	897.	877.	857.	837.	97.
638.	608.	968.	938.	918.	898.	878.	858.	838.	98.
639.	609.	969.	939.	919.	899.	879.	859.	839.	99.
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PLANK FLUJ 5" STATION (CUBIC FEET) SURFACE PER MULTIPLE PLAN-RATEL POLY-IC COMPUTATIONS
 PLUS 10 CUBIC FEET PER SECOND (CUBIC FEET PER SECOND)
 AREA IN SQUARE FEET (SQUARE KILOMETERS)

OPERATION	STATION	AREA	PLAN	RATIO	2	3	4	5	6	7	8	9	10
PERIOD	1	7.00	1	2.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00
STATION	1	(27.00, 0.00)	(57.00)	(110.00)	(140.00)	(170.00)	(200.00)	(230.00)	(260.00)	(290.00)	(320.00)	(350.00)	(380.00)
	1	(27.00, 0.00)	(57.00)	(110.00)	(140.00)	(170.00)	(200.00)	(230.00)	(260.00)	(290.00)	(320.00)	(350.00)	(380.00)

...and the last supply is 1951

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APPENDIX D
REFERENCES

APPENDIX D

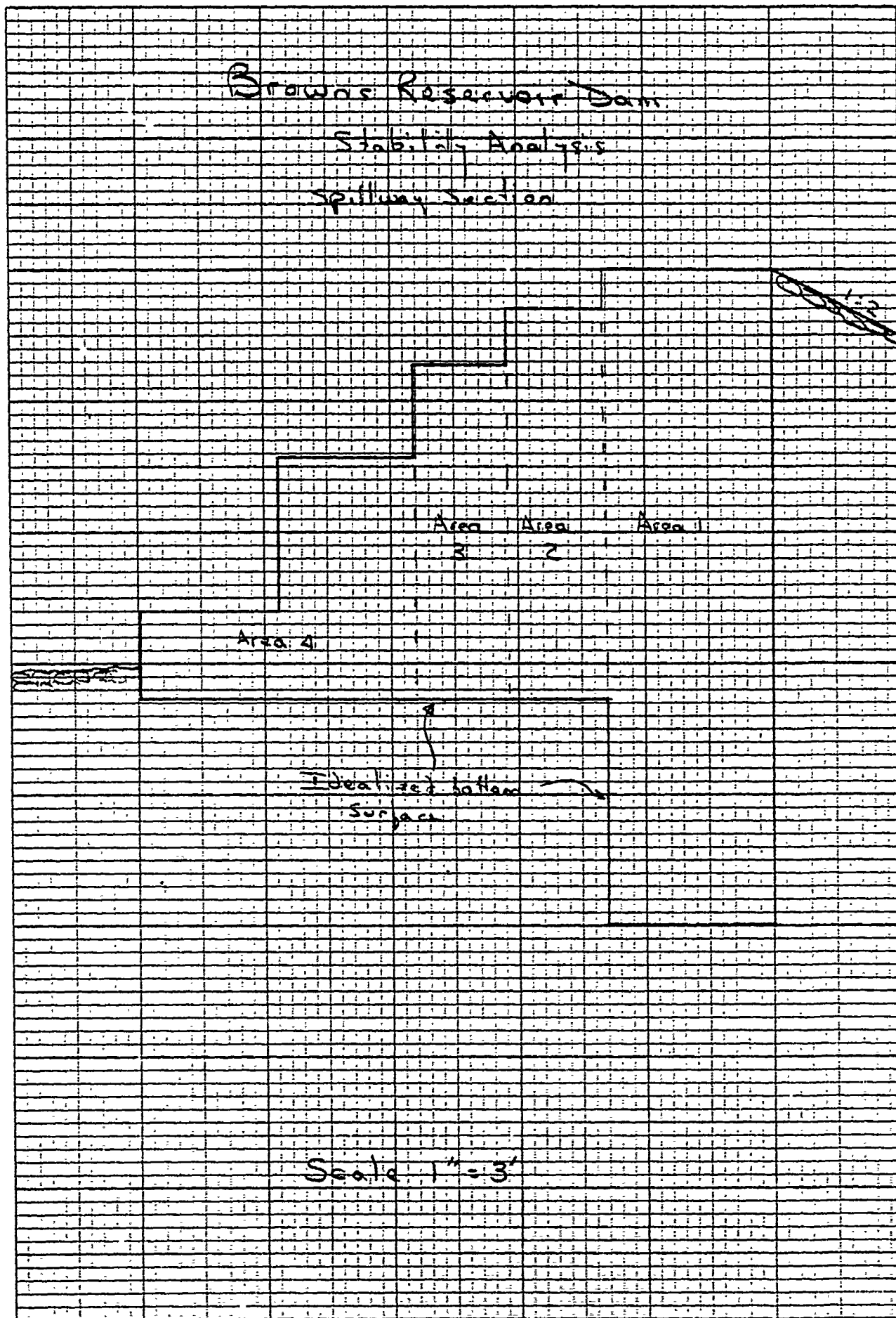
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APPENDIX E
STABILITY ANALYSIS

46 0782

K-E 10 X 10 TO THE INCH • 7 X 10 INCHES
KLUEPFEL & ESSER CO. MADE IN U.S.A.



INPUT FOR STABILITY ANALYSIS PROGRAM

<u>Input Location</u>	<u>Input Parameter Description</u>
0	Unit Weight of Dam (K/ft. ³)
1	Area of Segment #1 (ft. ²)
2	Location of Center of Gravity from toe (ft.) Segment #1
3	Area of Segment #2 (ft. ²)
4	Location of CG from toe, Seg. #2 (ft.)
5	Area of Segment #3 (ft. ²)
6	Location of CG from toe, Sg. #3 (ft.)
7	Total Base Width of Dam (ft.)
8	Height of Dam (ft.)
9	Ice Loading (K/L.F.)
10	Coefficient of Sliding
11	Unit Weight of Soil (K/ft. ³)
12	Coefficient of Active Soil Pressure - Ka
13	Coefficient of Passive Soil Pressure - Kp
14	Height of Water over Top of Dam (ft.)
15	Height of Soil for Active Pressure (ft.)
16	Height of Soil for Passive Pressure (ft.)
17	Height of Water in Tailrace Channel (ft.)
18	Unit Weight of Water (K/ft. ³)
19	Area of Segment #4 (ft. ²)
20	Location of CG from toe, Seg. #4 (ft.)
46	Height of Ice Load or Active Water
49	Location of Foundation Drains from Heel (ft.)
50	Seismic Coefficient (α).

Browns Reservoir Dam

Stability Analysis - Input Parameters

Input Location	Case I	Case II	Case III	Case IV	Case V
00	.15				
01	60				
02	13				
03	20.5				
04	99				
05	16.7				
06	7.6				
07	15				
08	9.8				
09	0	5	0	0	0
10	7				
11	06				
12	249				
13	2.1				
14	0	0	4.3	5.1	0
15	9.8				
16	5.9				
17	0	0	4.3	5.1	0
18	0624				
19	29.4				
20	3.3				
46	9.8				
50	0	0	0	0	0.1

46 0782

K&S 10 X 10 TO THE INCH. / X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

BROWNS RESERVOIR DAM
STABILITY ANALYSIS
SPILLWAY SECTION

Case I Normal Loading

- (a) 3.195850942
- (b) 8.84157392
- (c) 3.305328359

Case II Ice Loading

- (a) 1.732275324
- (b) 5.439646324
- (c) 1.408737341

Case III 1/2 PMF

- (a) 2.300161525
- (b) 8.49234380
- (c) 1.804041338

Case IV PMF

- (a) 2.191315294
- (b) 8.447680212
- (c) 1.670850056

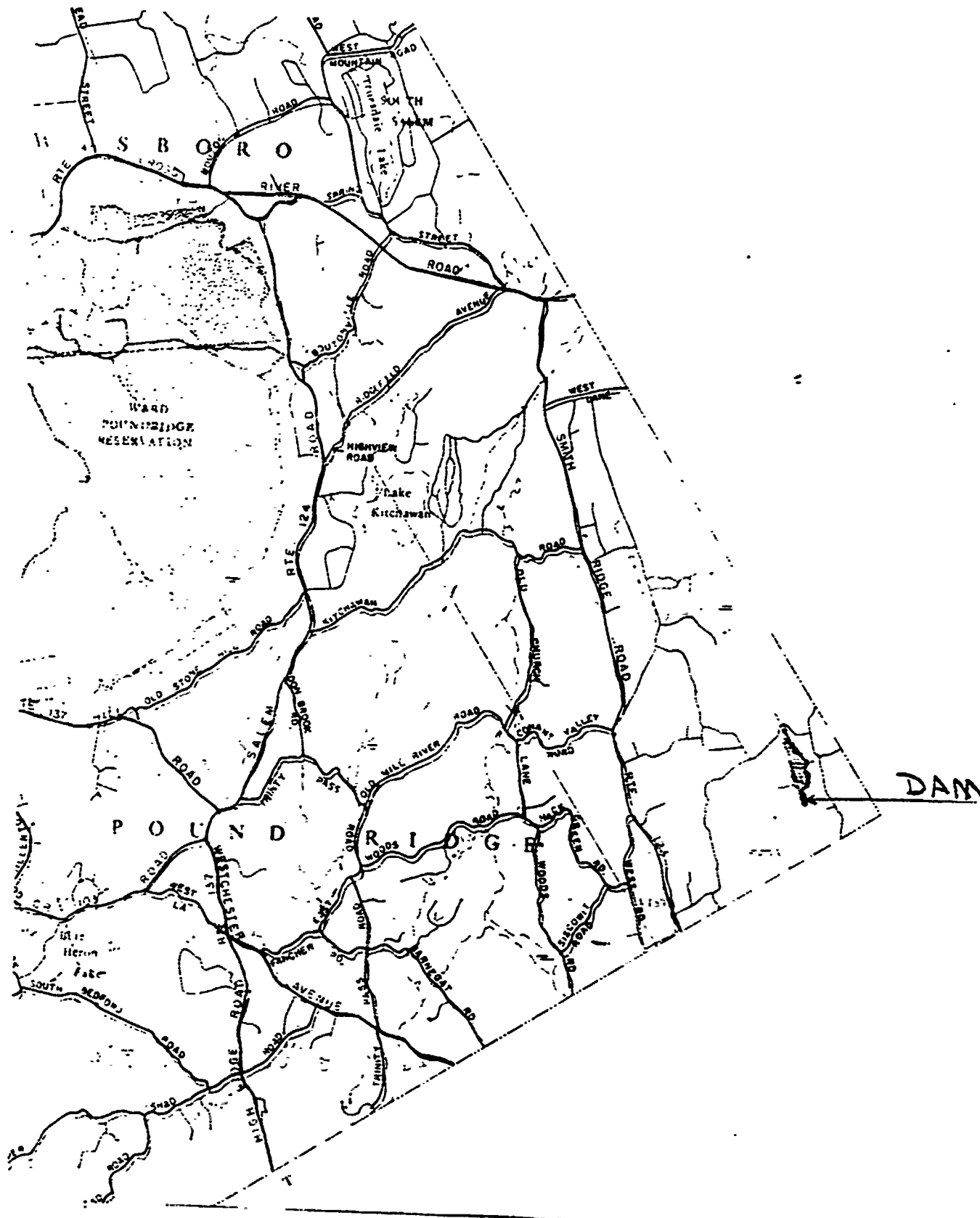
Case V Seismic Loading

- (a) 2.39459755
- (b) 7.494274656
- (c) 2.064795441

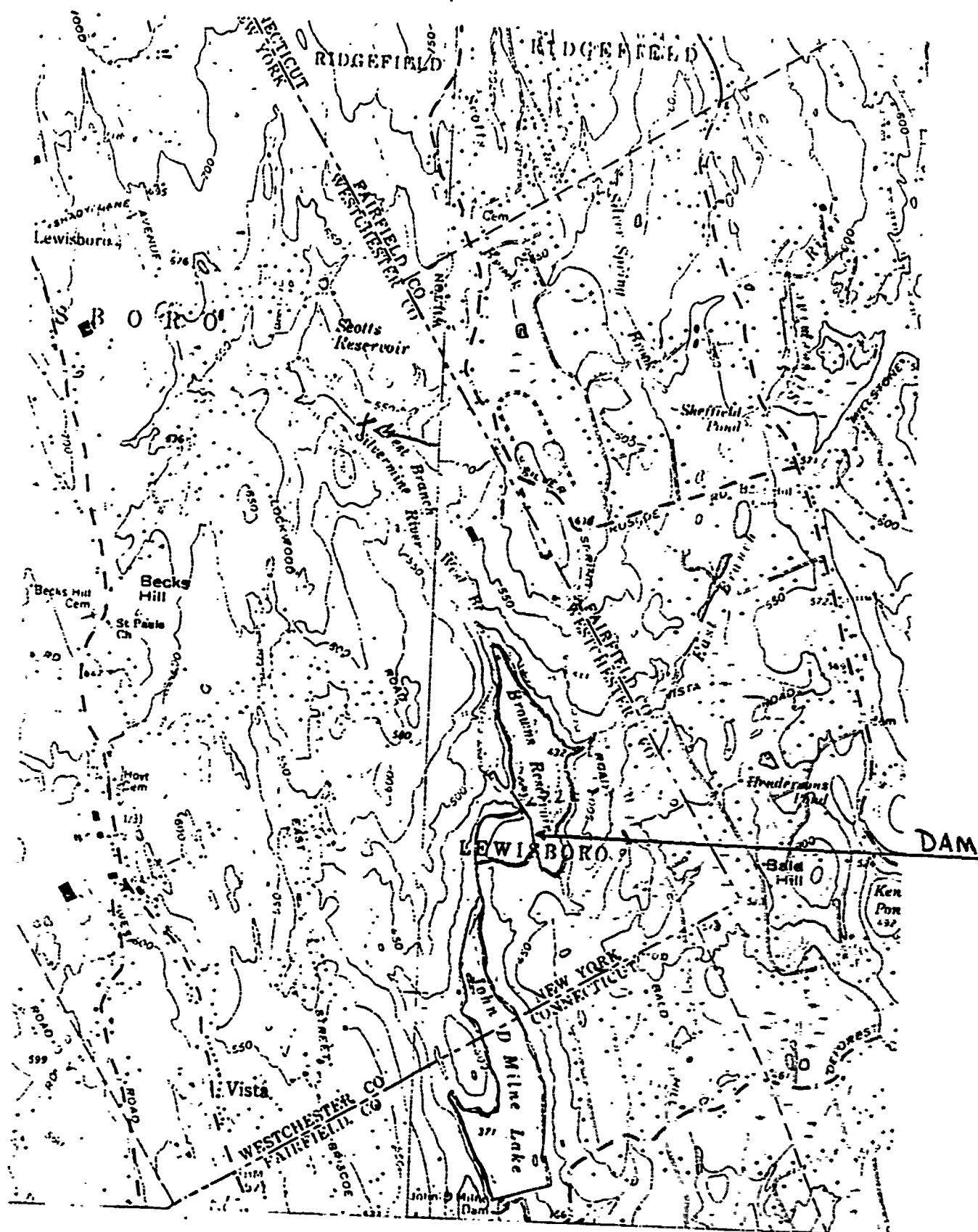
NOTE: (a) is the factor of safety for overturning;
(b) is the location of the resultant from the toe;
(c) is the factor of safety for sliding.

APPENDIX F

DRAWINGS



VICINITY MAP

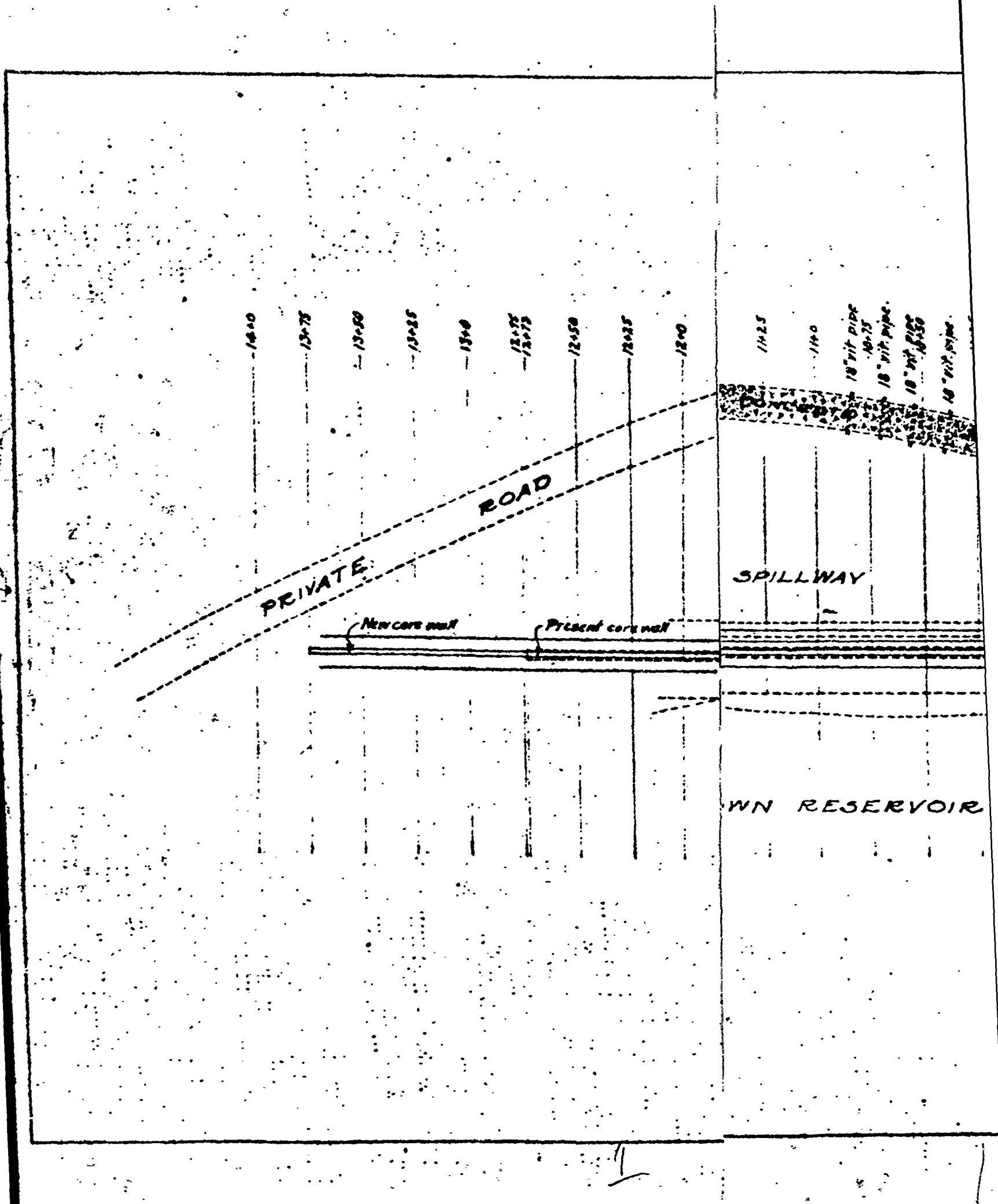


TOPOGRAPHIC MAP

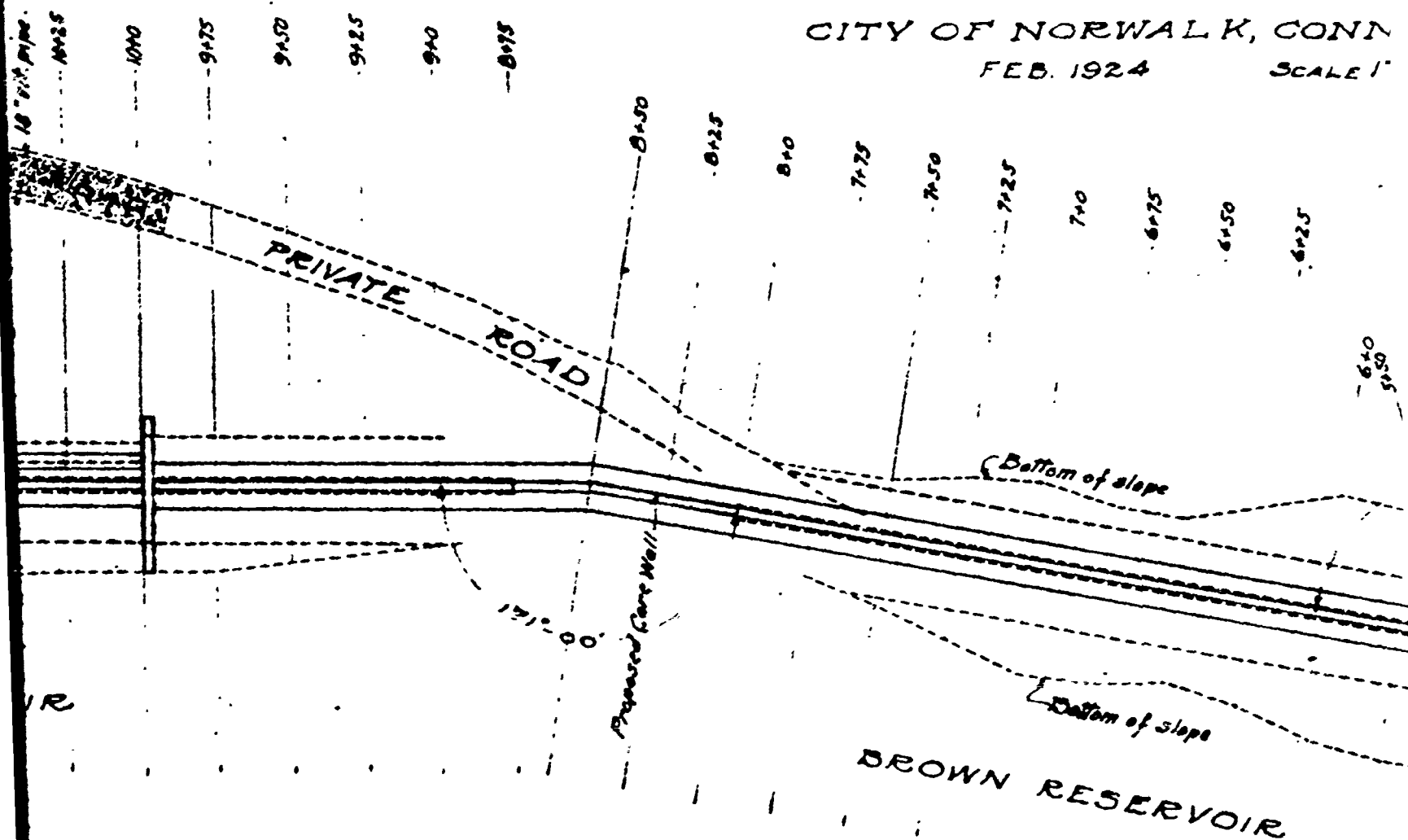
BROWNS RESERVOIR DAM

LIST OF DRAWINGS

<u>DESCRIPTION</u>	<u>DRAWING NUMBER</u>
GENERAL PLAN	
GATE CHAMBER and PIPE PLAN (1909)	Sheet No 7
GATE CHAMBER and PARAPET WALL DETAIL PLAN (1909)	Sheet No 8
PLAN (1924)	1
SECTIONS (1924)	2
SPILLWAY & GATEHOUSE WALL (1924)	3
SECTIONS (1924)	4



PLANS AND DETAILS
OF PROPOSED WORK AT
BROWN RESERVOIR
FOR THE
FIRST TAXING DISTRICT
OF THE
CITY OF NORWALK, CONN.
FEB. 1924 SCALE 1"



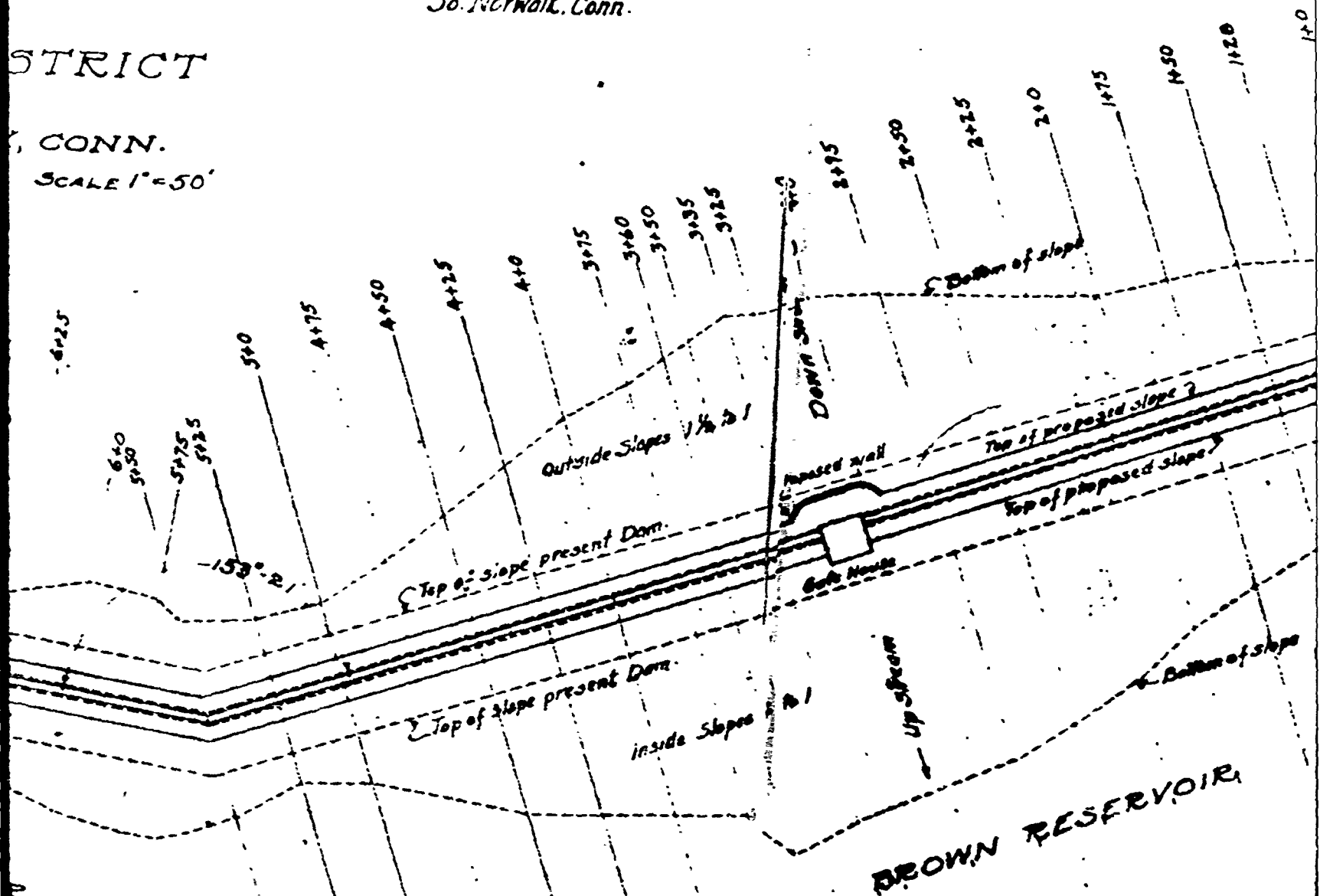
TAILS
AT
VOIR

The Samuel W Hoyt, Co., Inc. Engineers
So. Norwalk, Conn.

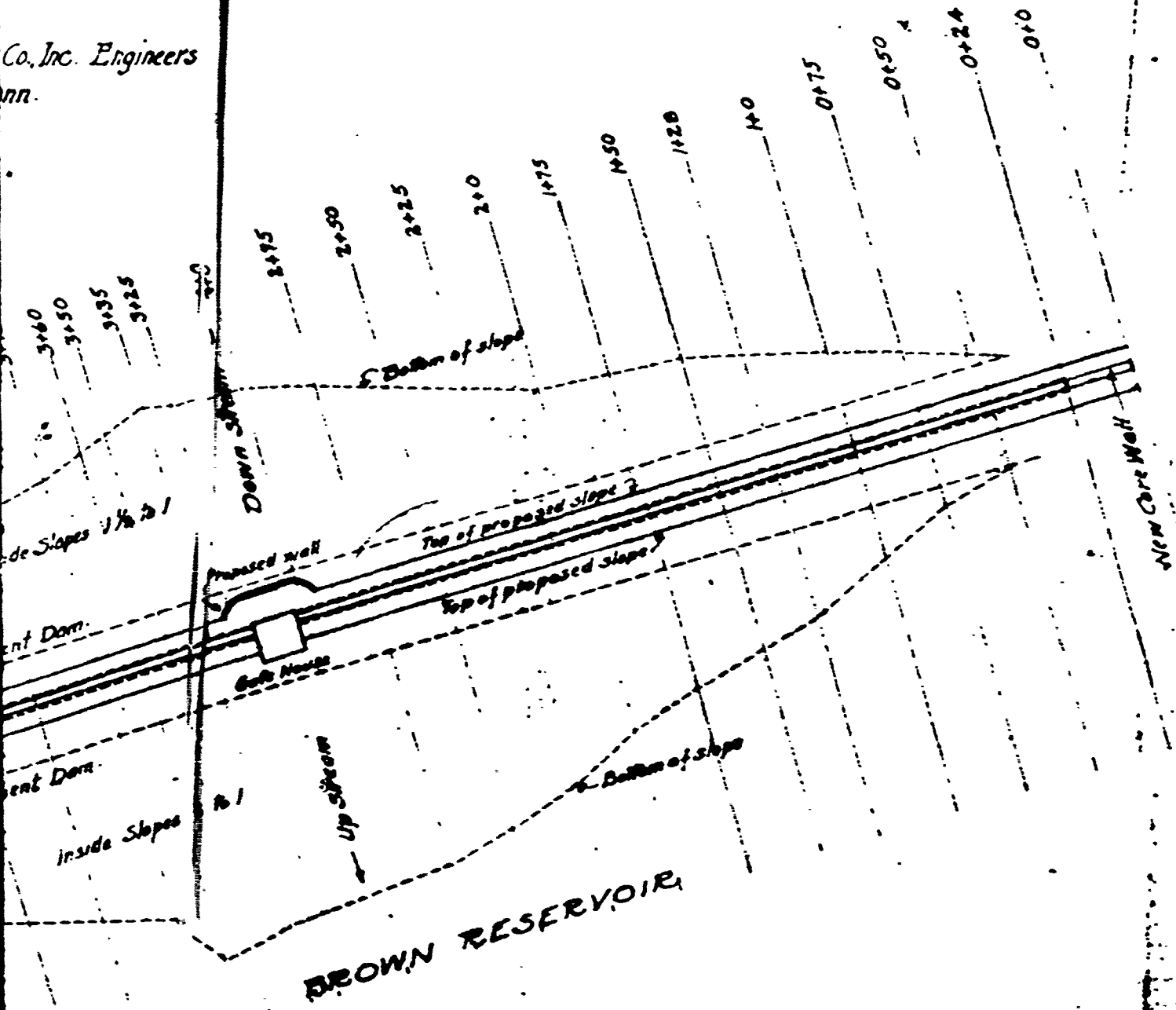
STRICT

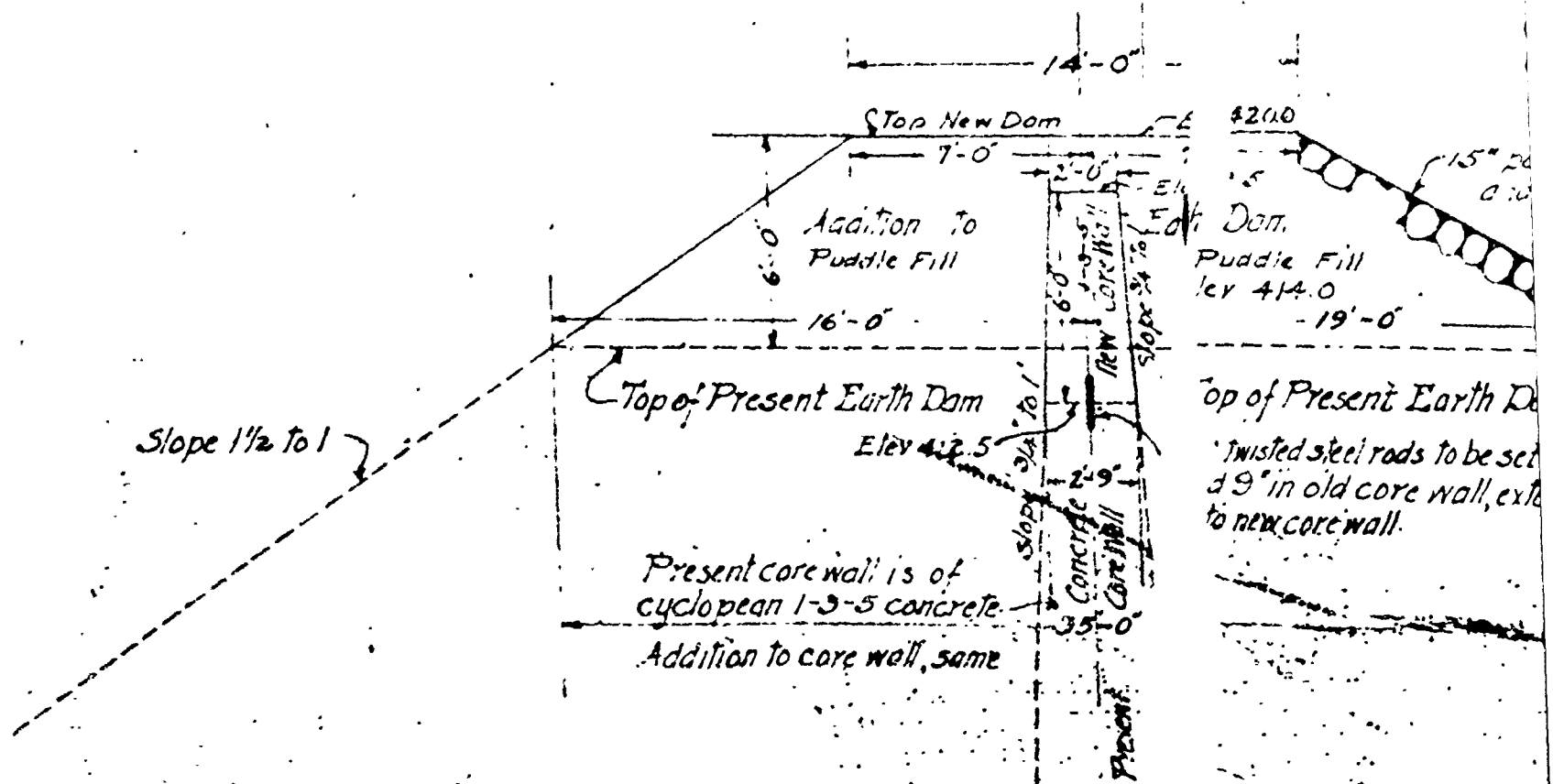
CONN.

SCALE 1"=50'



Co., Inc. Engineers
nn.





SECTION THRU PRESENT DAM SHOWING CONDITIONS

~ Notice ~

After completing these plans it was decided to substitute common embankment for puddle fill on the down stream side of core wall and to also substitute sand and gravel joints for cement grout in paving work on up stream slope of dam.

SCALE

District
John D.
Edward
Wallace

5" paving rammed 3" into fill.
also grouted with 1-3-5 Concrete

Proposed Flow Line Elev 416.5

Present surface
of ground

th Dam.

be set 6 ft apart.
ll, extending 9'

slope 2 to 1

Present Flow Line Elev. 410.5

PLANS AND DETAILS
OF PROPOSED WORK AT

DAM

BROWN RESERVOIR

FOR THE

FIRST TAXING DISTRICT

OF THE

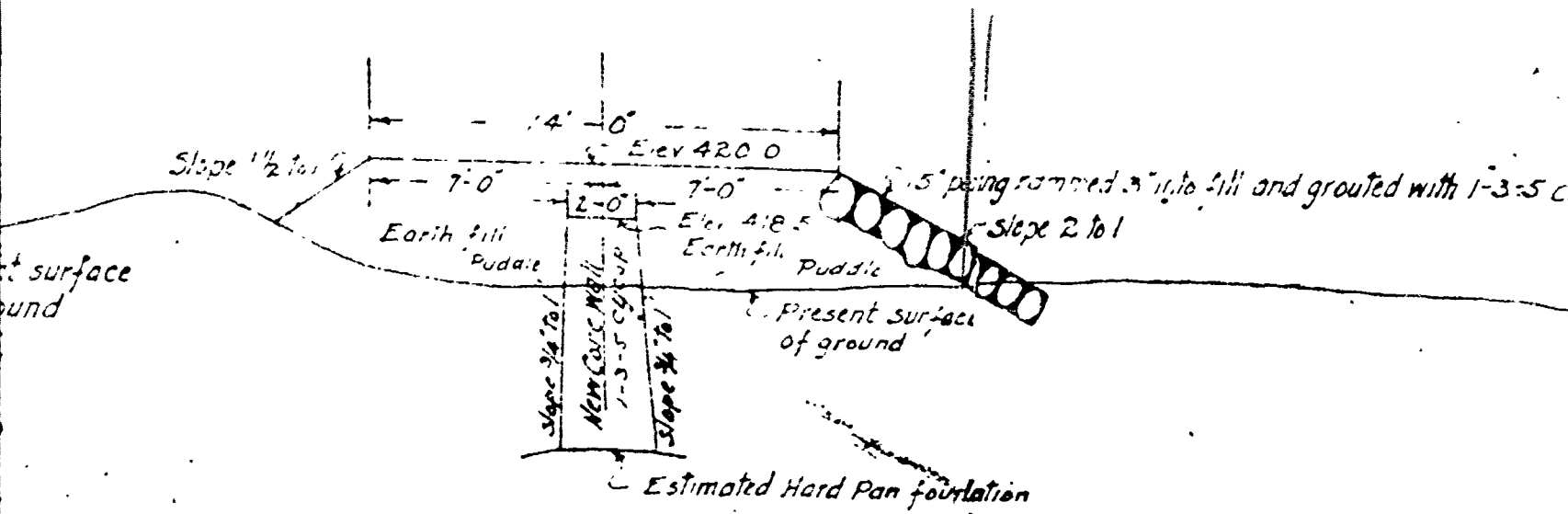
CITY OF NORWALK, CONN.

strict Commissioners
n D. Milne
ward J. Finnegan
lace Dann.

SCALES
as noted

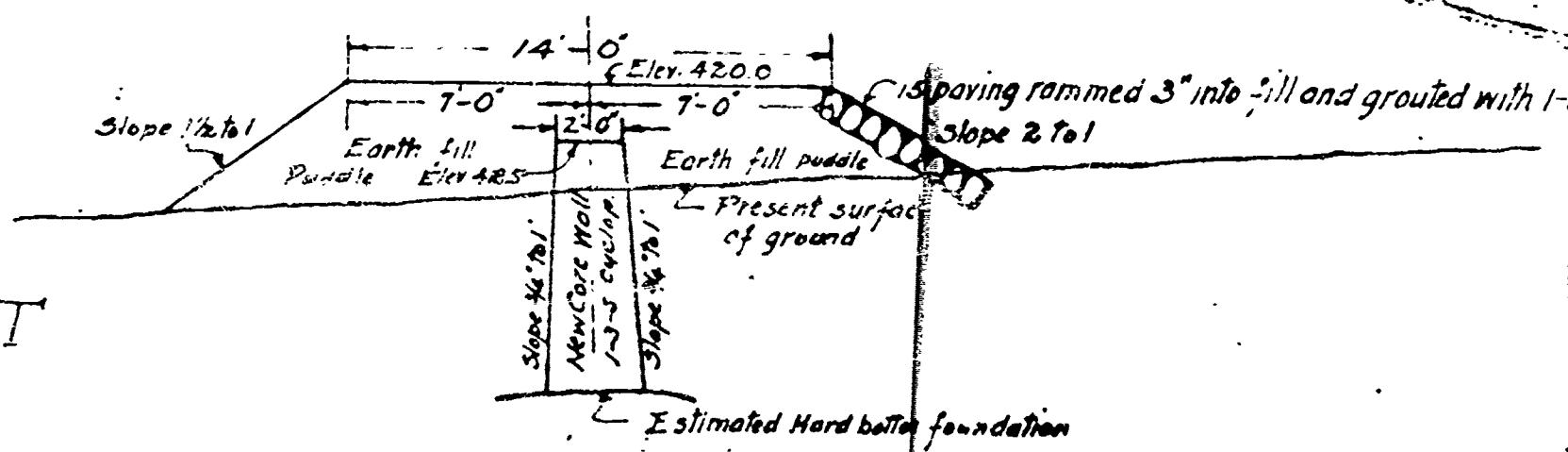
FEB. 1924.

The Samuel W. Hoyt, Jr.,
Engineers.



SECTION THRU STA. 8+25 SCALE 1"=5'

SHOWING NEW DAM



SECTION THRU STA 13+00 Scale 1"=5'

SHOWING NEW DAM.

(FOR OTHER SECTIONS SEE SHEET NO. 4.)

gt. Jr. Co. Inc.

3

Elev 420.0

7'-0"

Elev. 418.5

Earth fill puddle

5' paving rammed 3" into fill and grouted with 1-3-5 concrete

Slope 2 to 1

Present surface of ground

Proposed Flow Line, Elev 416.5

Estimated Hard Pan foundation

RU STA. 8+25 SCALE 1"=5'

NEW DAM

Elev. 420.0

7'-0"

Earth fill puddle

5' paving rammed 3" into fill and grouted with 1-3-5 concrete

Slope 2 to 1

Present surface of ground

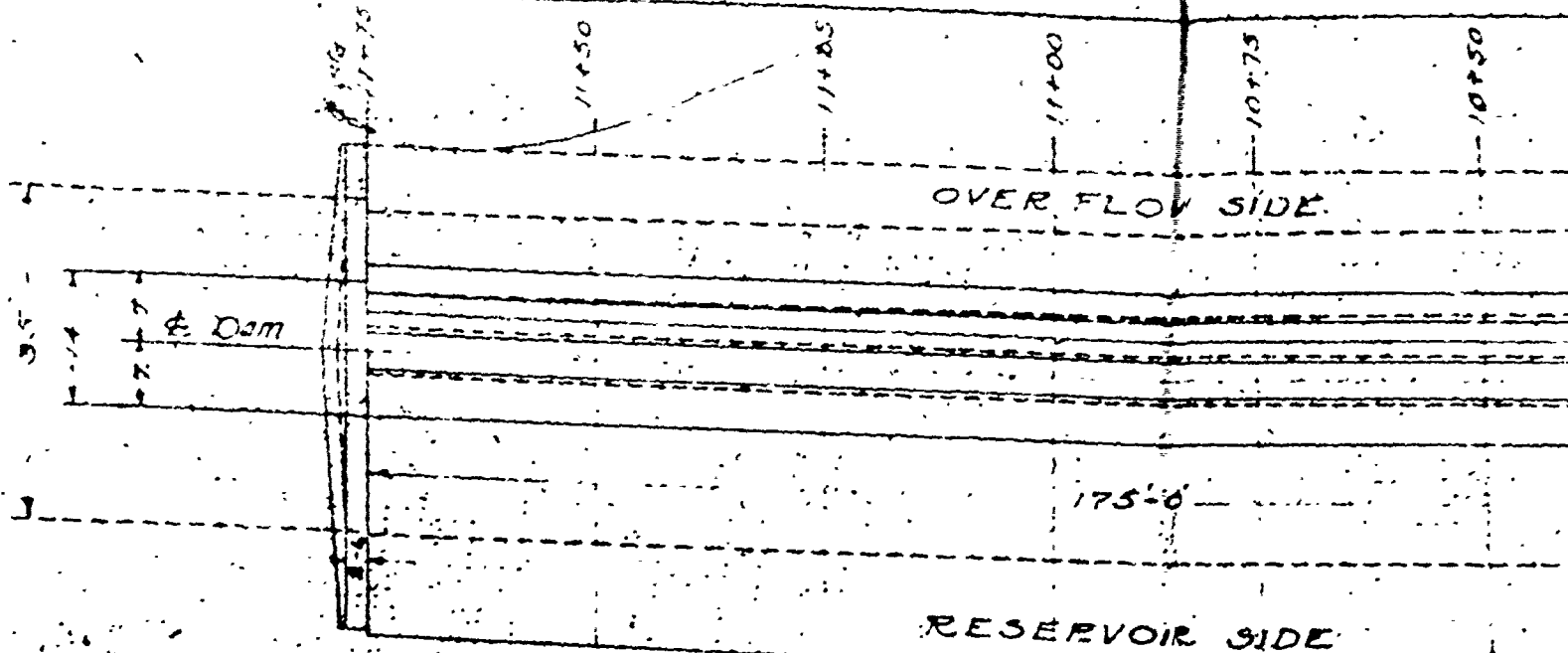
Estimated Hard bottom foundation

RU STA 13+00 Scale 1"=5'

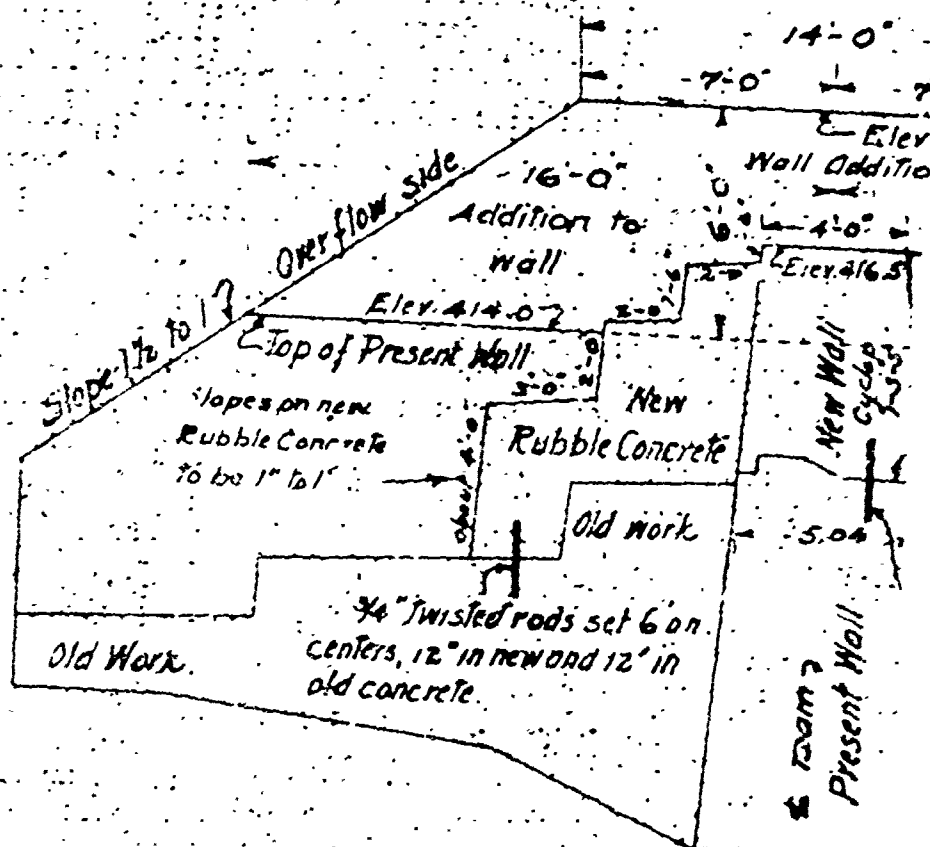
NEW DAM.

SEE SECTIONS SEE SHEET N° 4.)

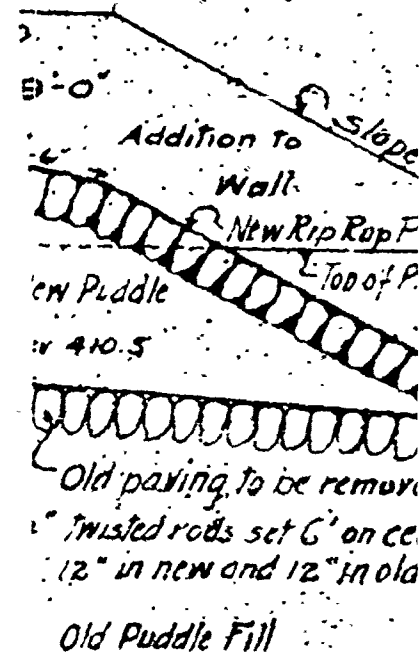
2



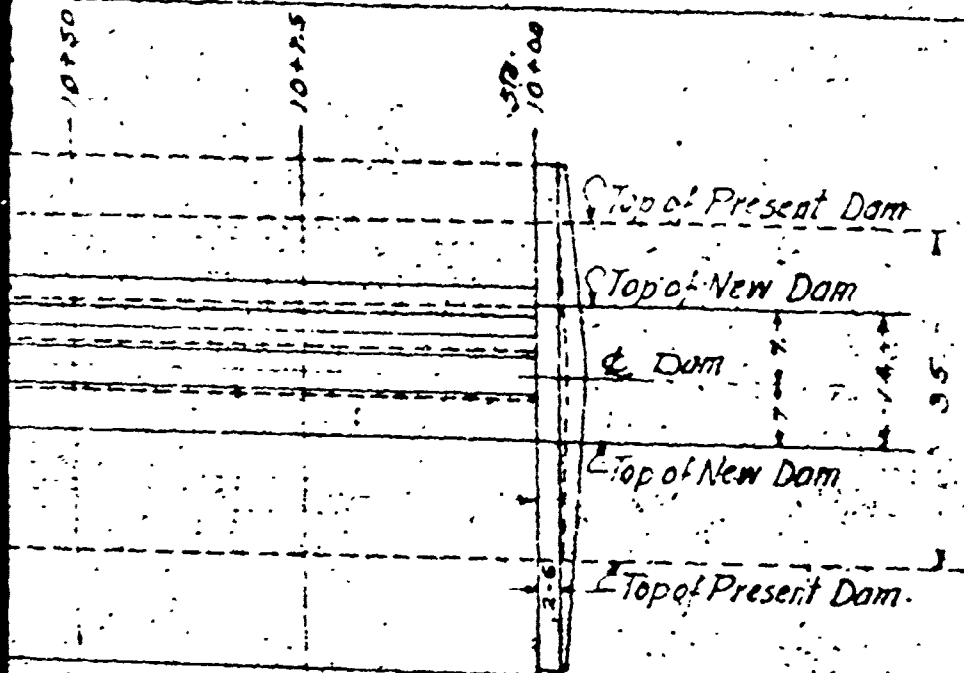
PLAN OF SPILLWAY



SECTION OF AT NORTH WALL



SECTION OF SOUTH WALL



PLAN AND DETAILS OF PROPOSED WORK AT BROWN RESERVOIR FOR THE FIRST TAXING DISTRICT OF THE CITY OF NORWALK, CT

FEB 1924

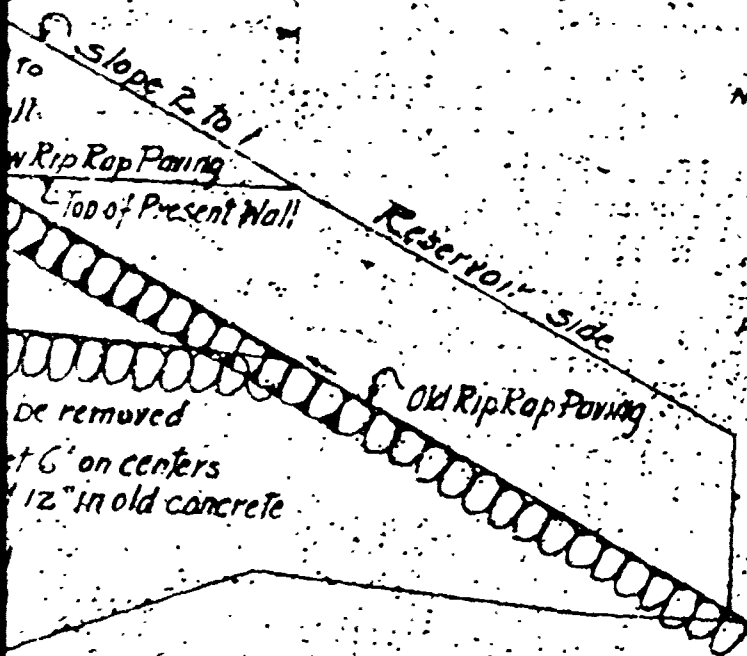
SCALES
as noted

The Samuel W Hoyt

SCALE 1"=20'

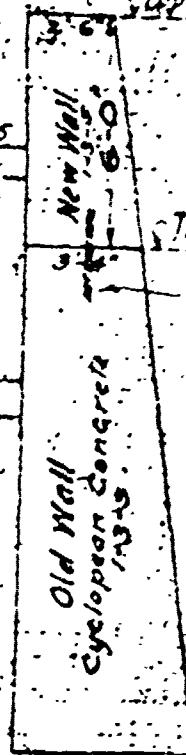
District Commissioners
John D. Milne
Edward J. Finnegan
Wallace Dann

Top of New Dam Elev 420



New Spillway Elev 416.5

Present Spillway Elev 410.5



Top of Present Dam Elev 414

3/4" rods set 6'-0" on centers

SECTION OF WING WALL
THRU & OF DAM SCALE 1"=5'

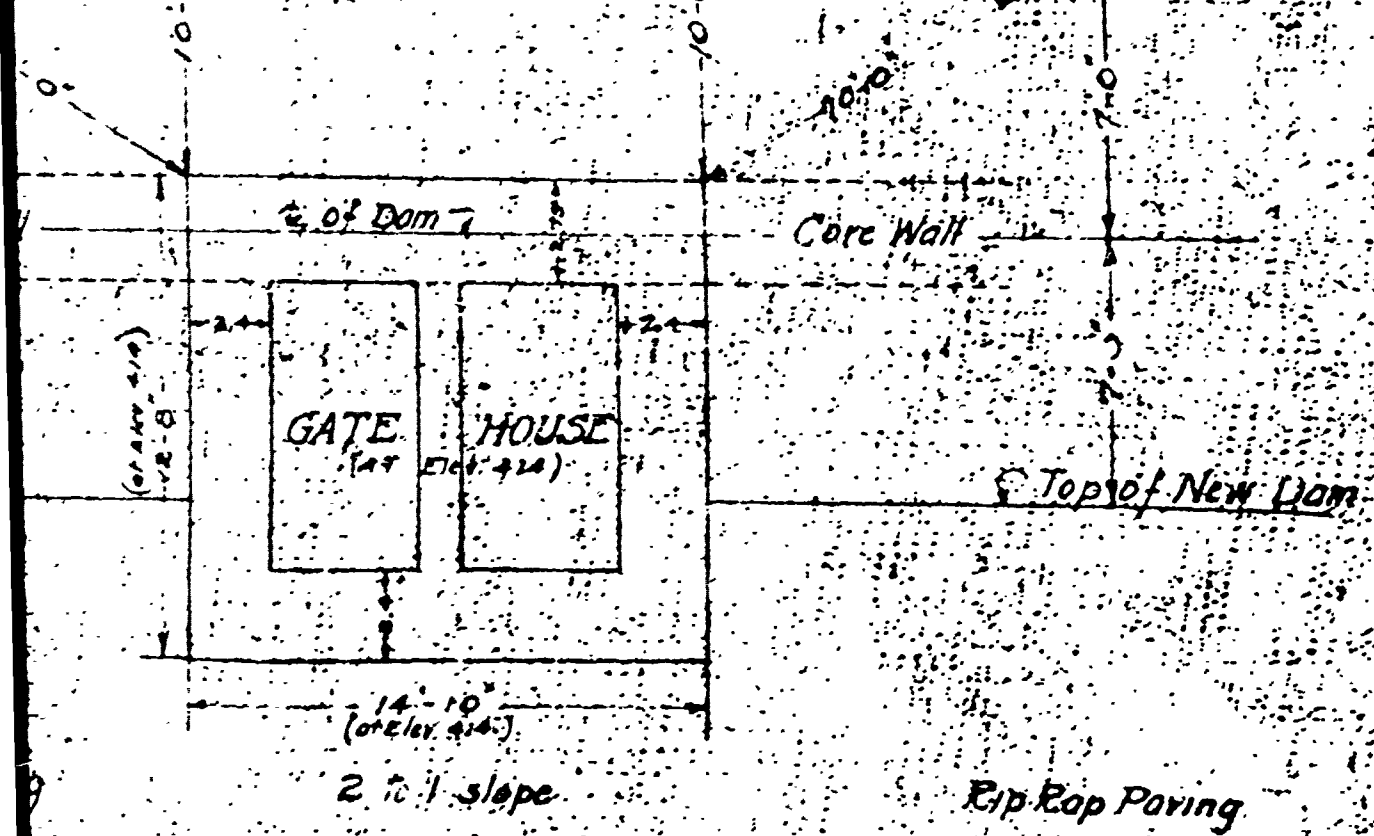
SCALE 1"=5'

414
ters



PLAN SHOWING
GATE HOUSE & WALL
(FOR SECTION
SEE SHEET 4) SCALE

Top of Present Dam



Present Dam

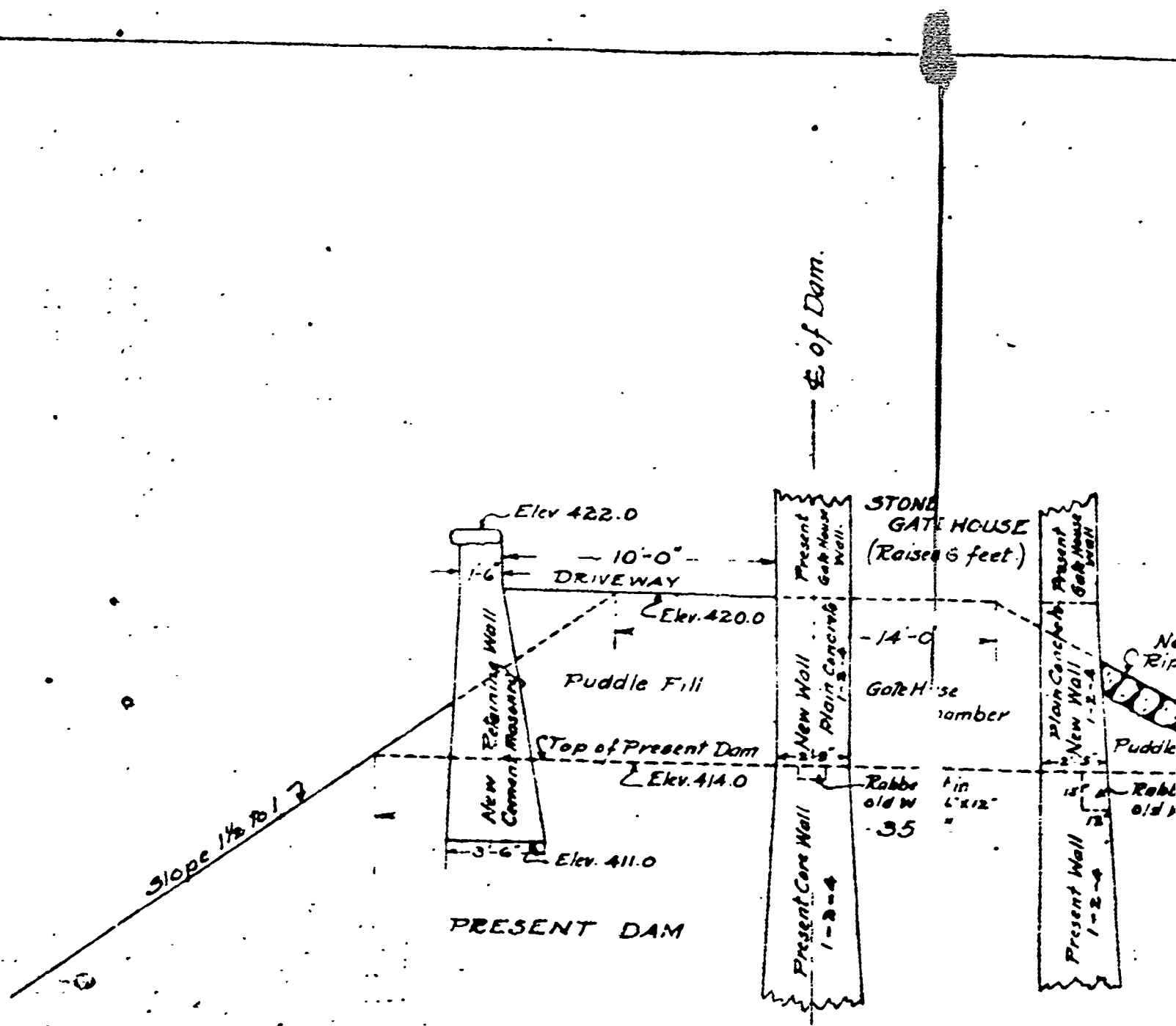
RESERVOIR SIDE

PLAN SHOWING
GATE HOUSE & WALL
(FOR SECTION
SEE SHEET 4)

SCALE 1" = 5'

3

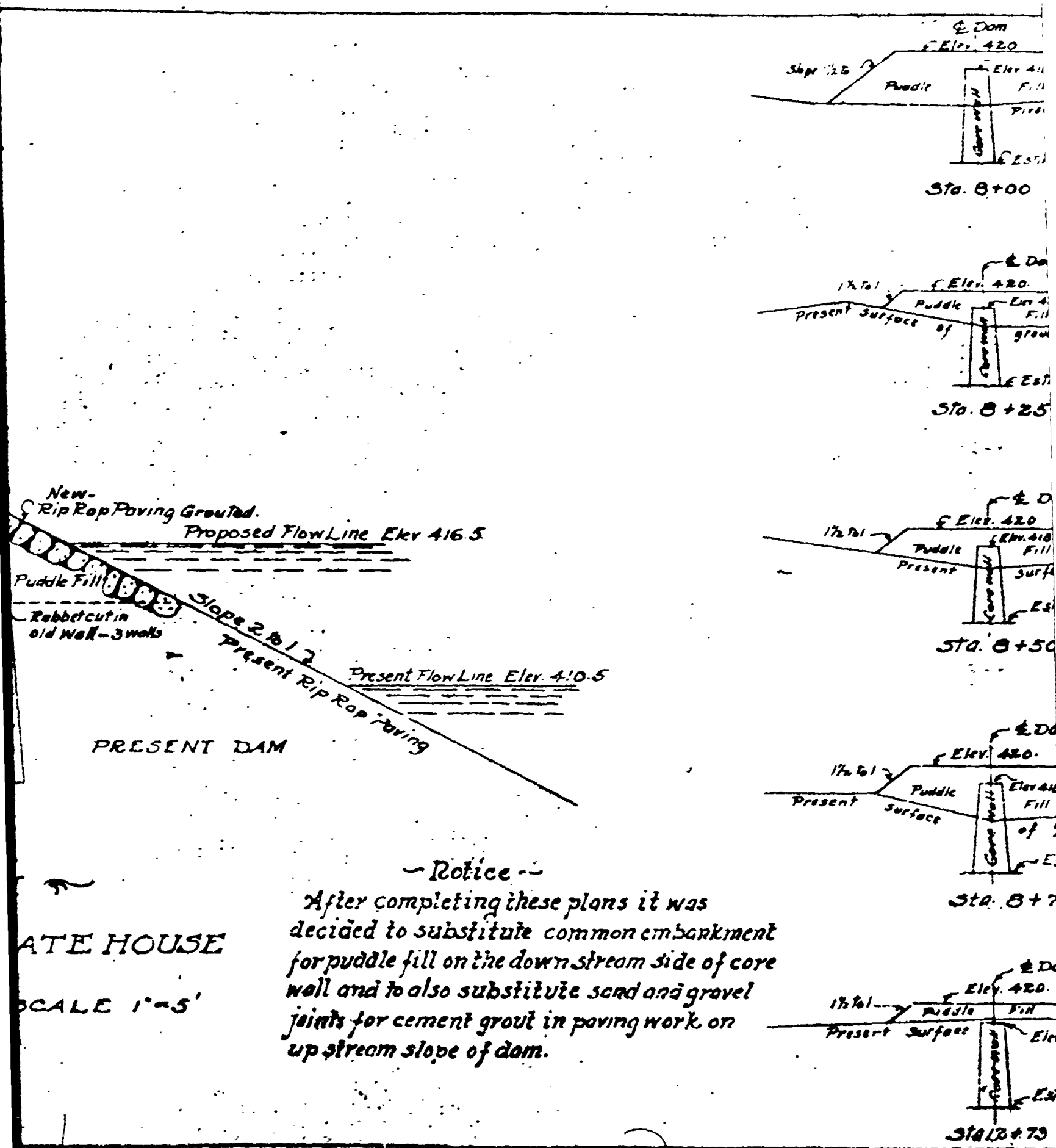
4



SECTION F DAM
THRU CENT. OF GAT.

JCA

1



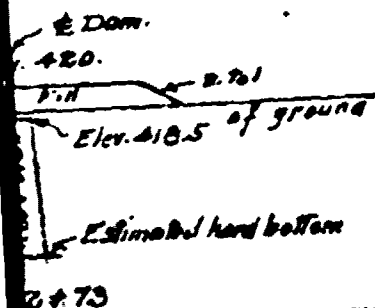
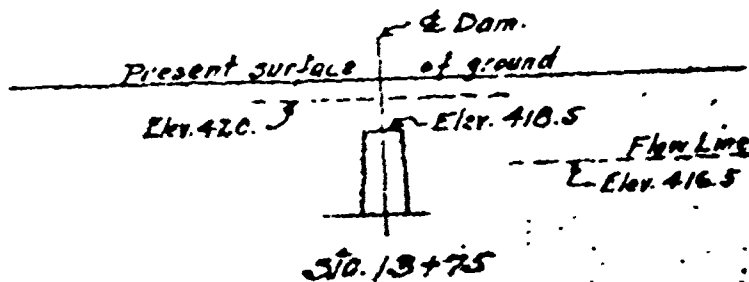
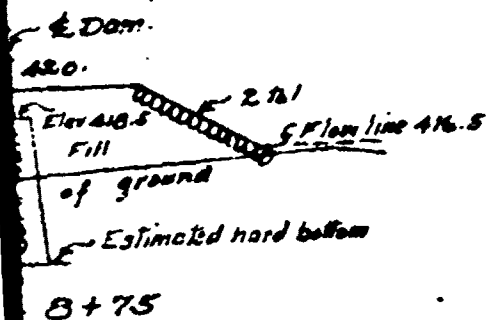
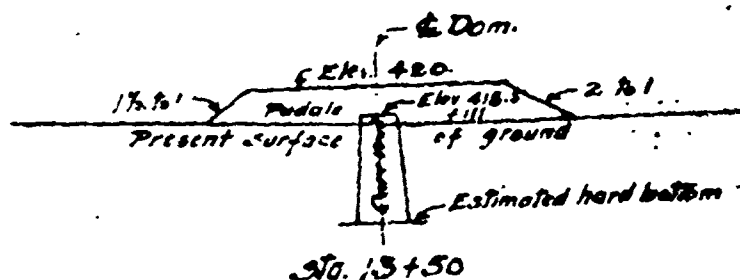
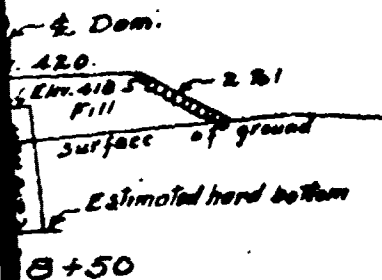
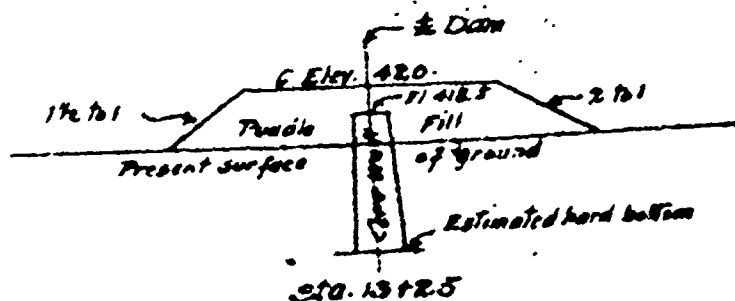
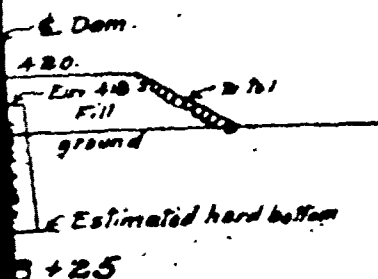
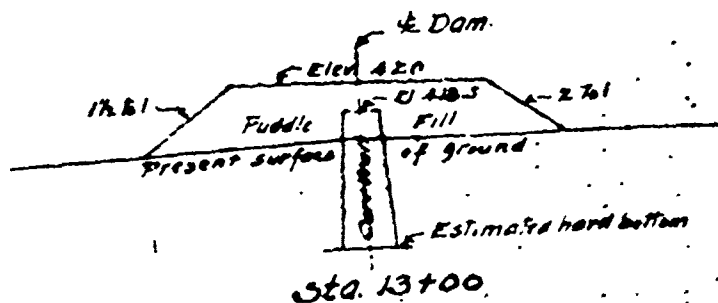
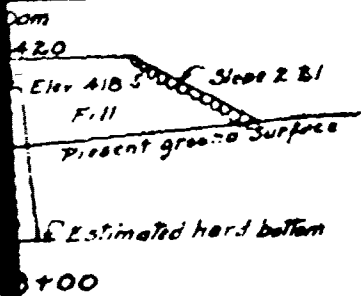
- Notice -

After completing these plans it was decided to substitute common embankment for puddle fill on the down stream side of core wall and to also substitute sand and gravel joints for cement grout in paving work on up stream slope of dam.

ATE HOUSE

SCALE 1"=5'

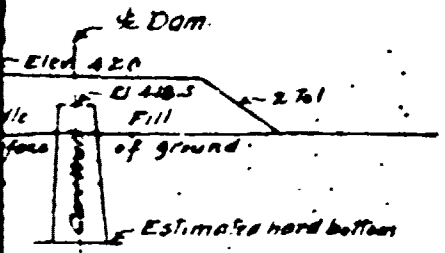
2



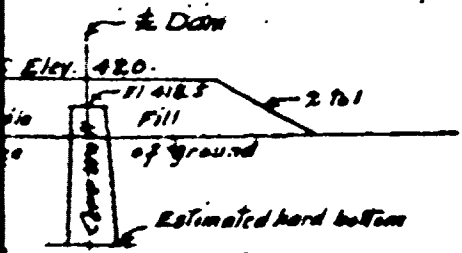
SECTIONS OF NEW WORK
 SCALE 1"=10'

PLAN
 OF
 BROWN
 FIRST T
 CITY OF

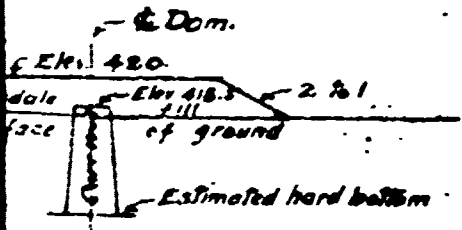
SCALES
 as noted



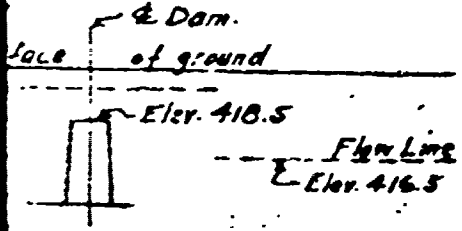
Sta. 13+00



Sta. 13+25



Sta. 13+50



Sta. 13+75

PLANS AND DETAILS OF PROPOSED WORK AT BROWN RESERVOIR FOR THE FIRST TAXING DISTRICT OF THE CITY OF NORWALK, CONN.

SCALES
as noted

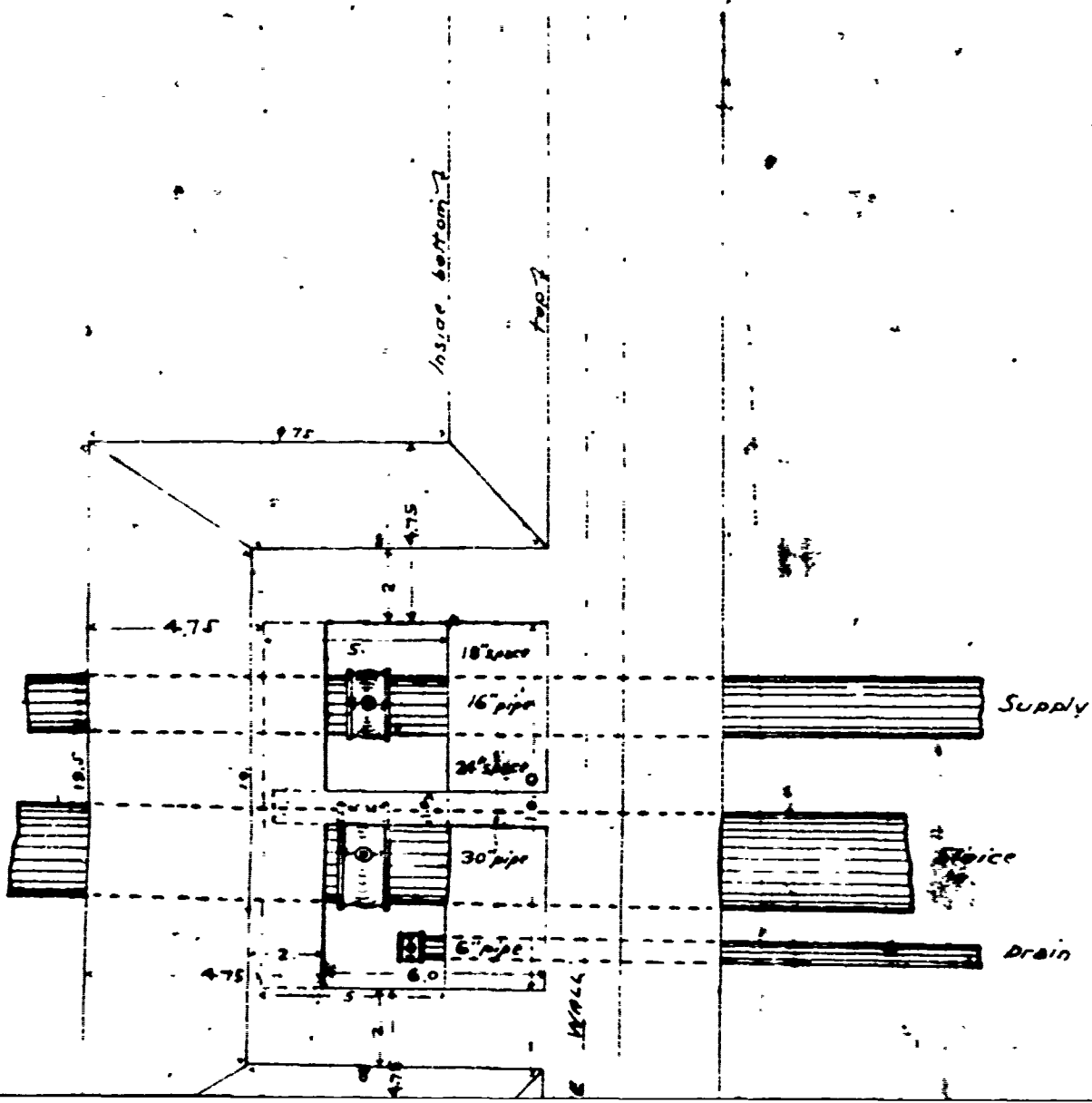
FEB. 1924.

The Samuel W. Hoyt & Co. Inc.
Engineers

District Commissioners
John D. Milne
Edward J. Finnegan
Wallace Donn

SECTIONS OF NEW WORK
SCALE 1"=10'

4



SHEET NO EIGHT

GATE CHAMBER AND PAVEMENT

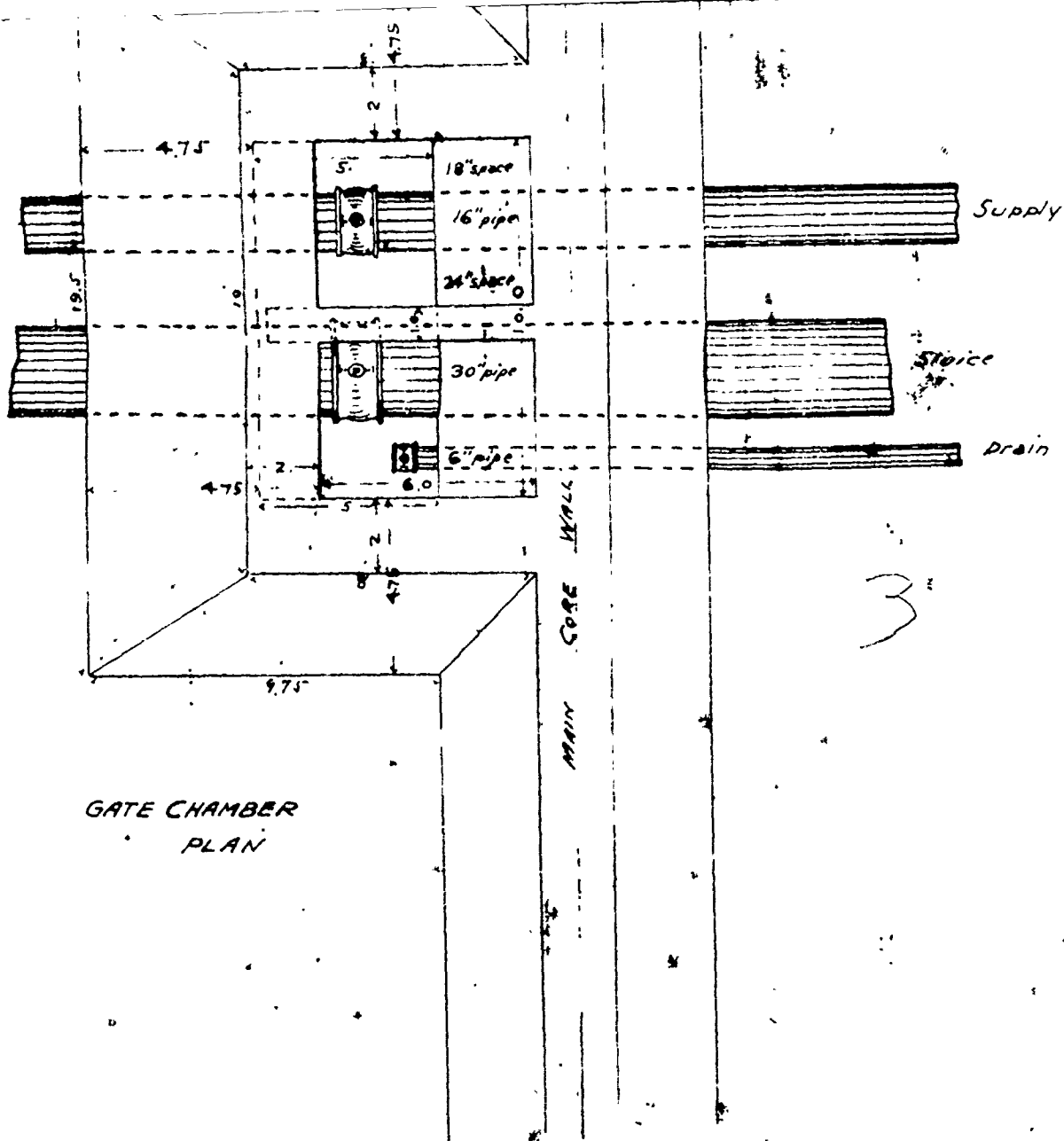
SCALE ONE INCH = FOUR FEET

C.N. WOOD C.E.

1909

OUTLET PAVEMENT

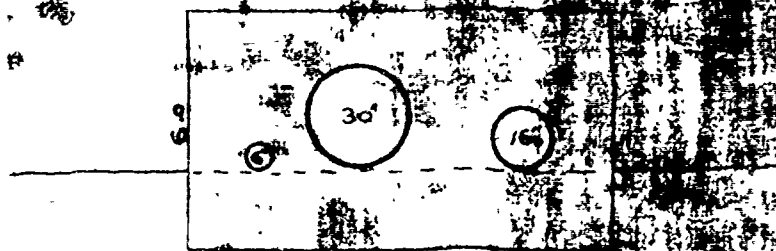




GATE CHAMBER
PLAN

CHAMBER UP TO 414 ELE WITH THE EXCEPTION THAT THE NORTH OR INSIDE WALL AND THE TWO SIDE WALLS
UMB. UPON THE INSIDE OF THE WELL. MAKING MORE ROOM AT THE TOP.

OUTLET PRESET

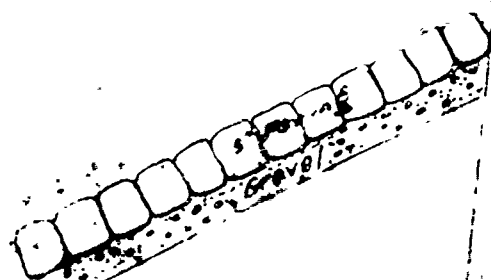


10.5
FRONT



AND THE TWO SIDE

UPSTREAM
NORTH



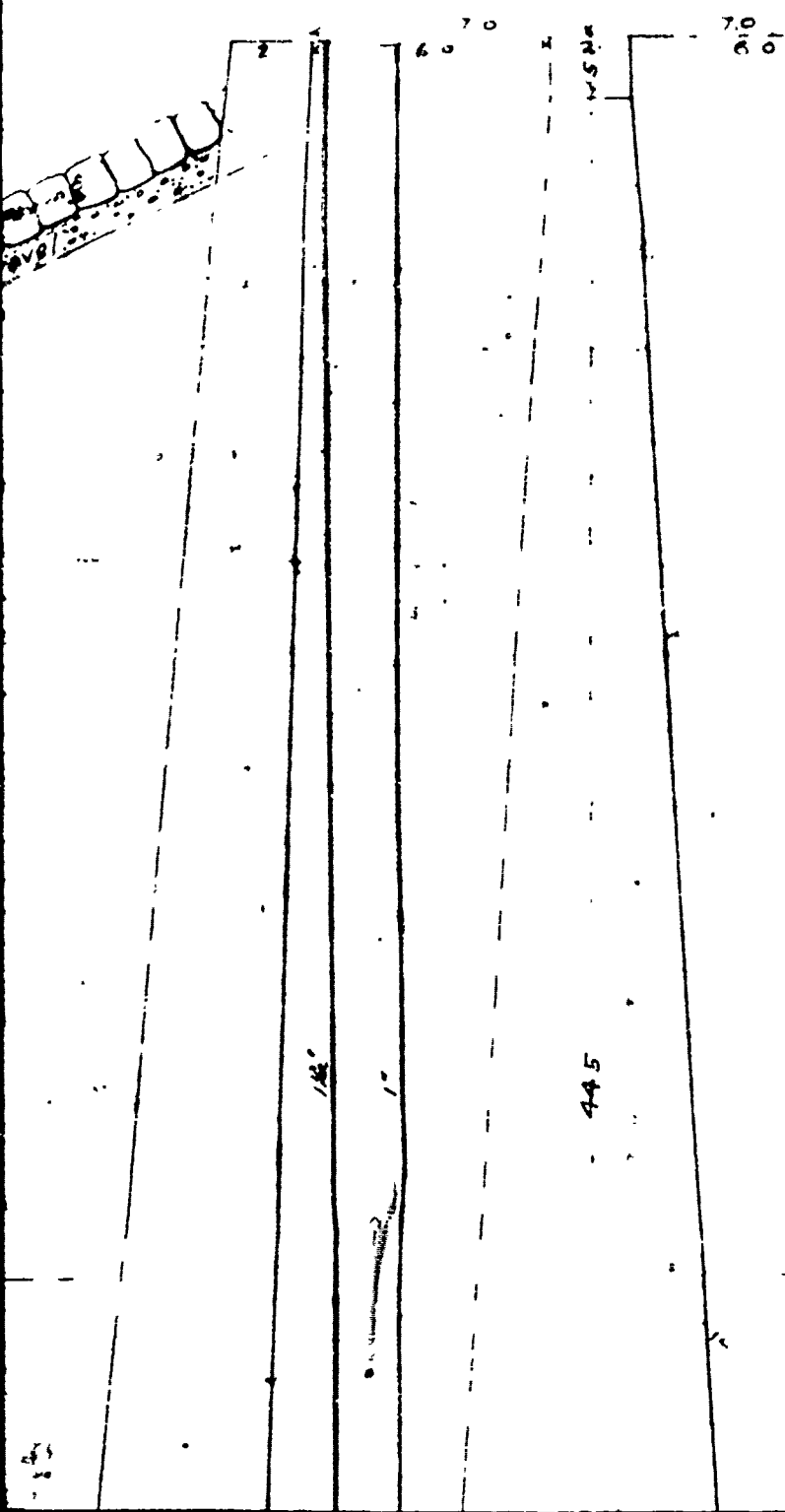
144'

2

445

4524

70
01

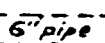


1/4 to 1 - Slope

DOWN STREAM
SOUTH

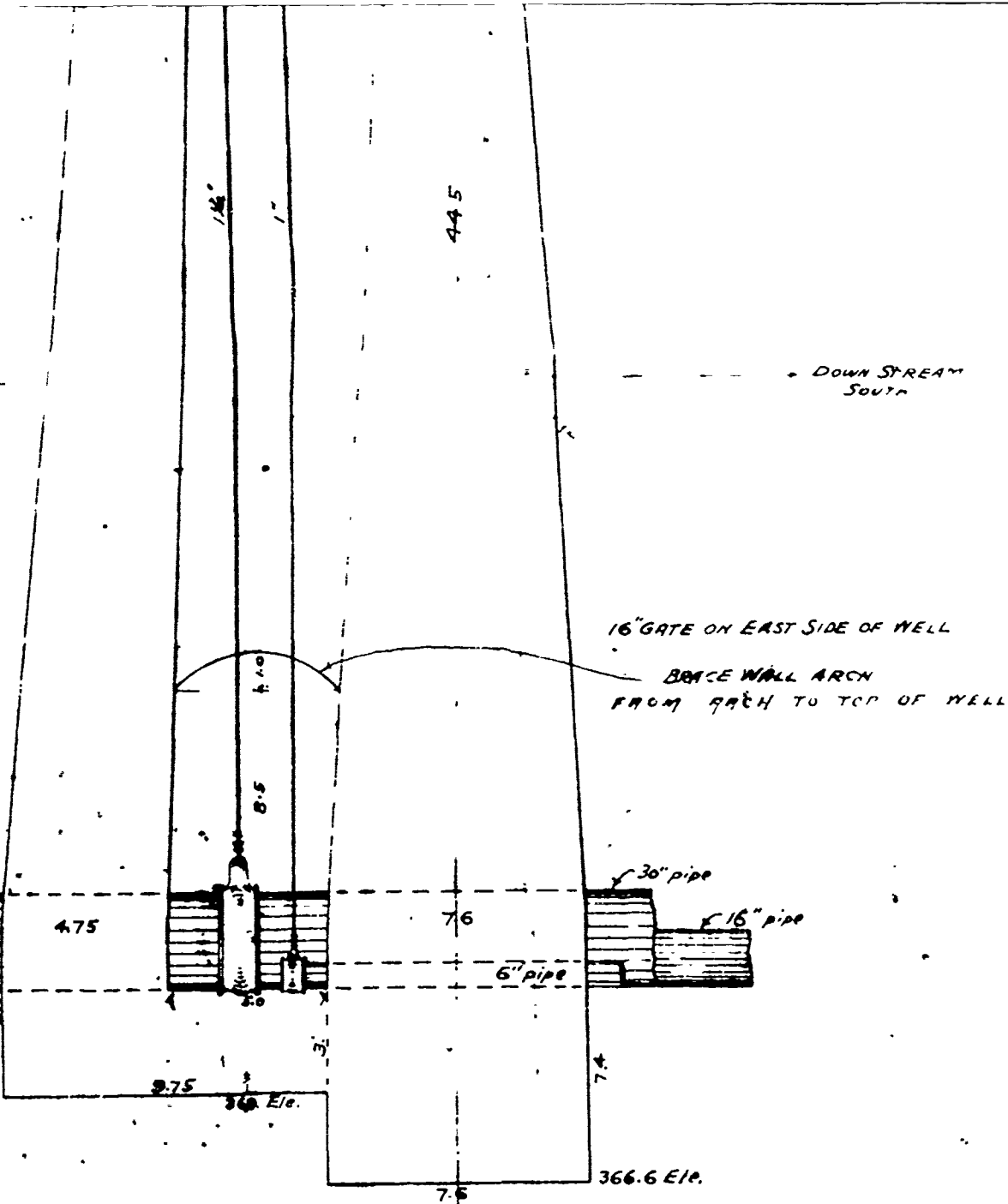
1000

三



36 E/c.

3

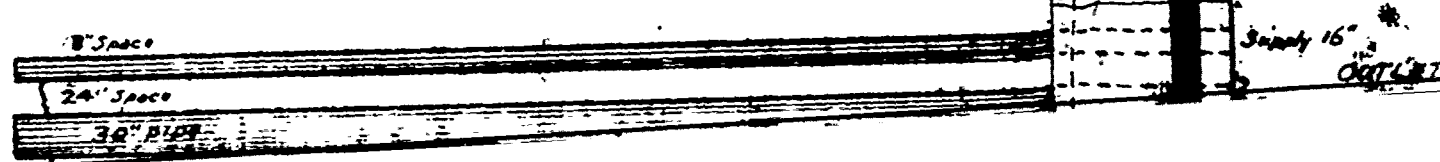
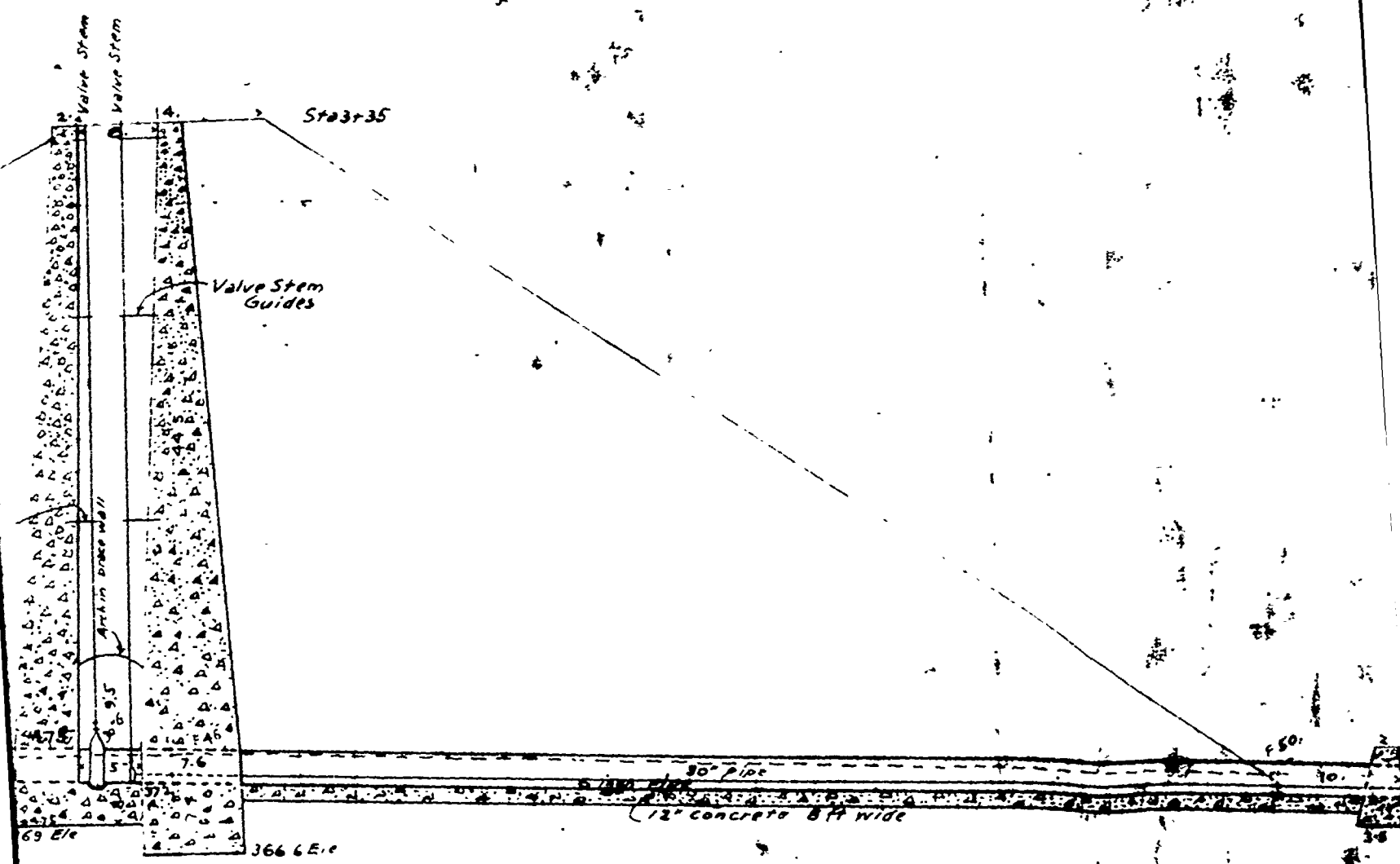


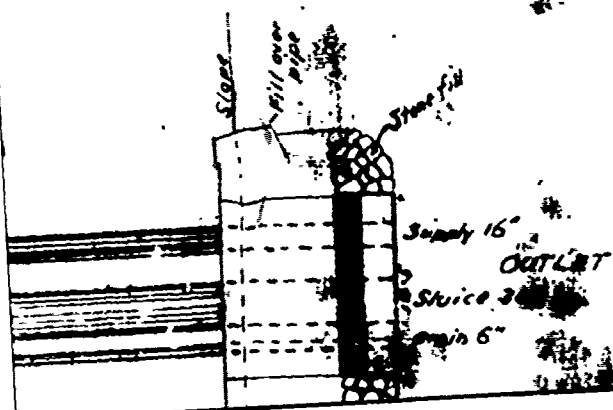
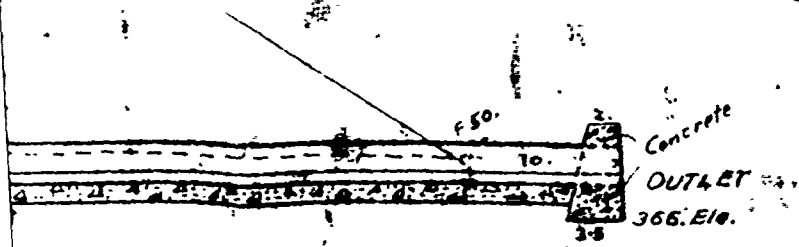
GATE CHAMBER ELE.

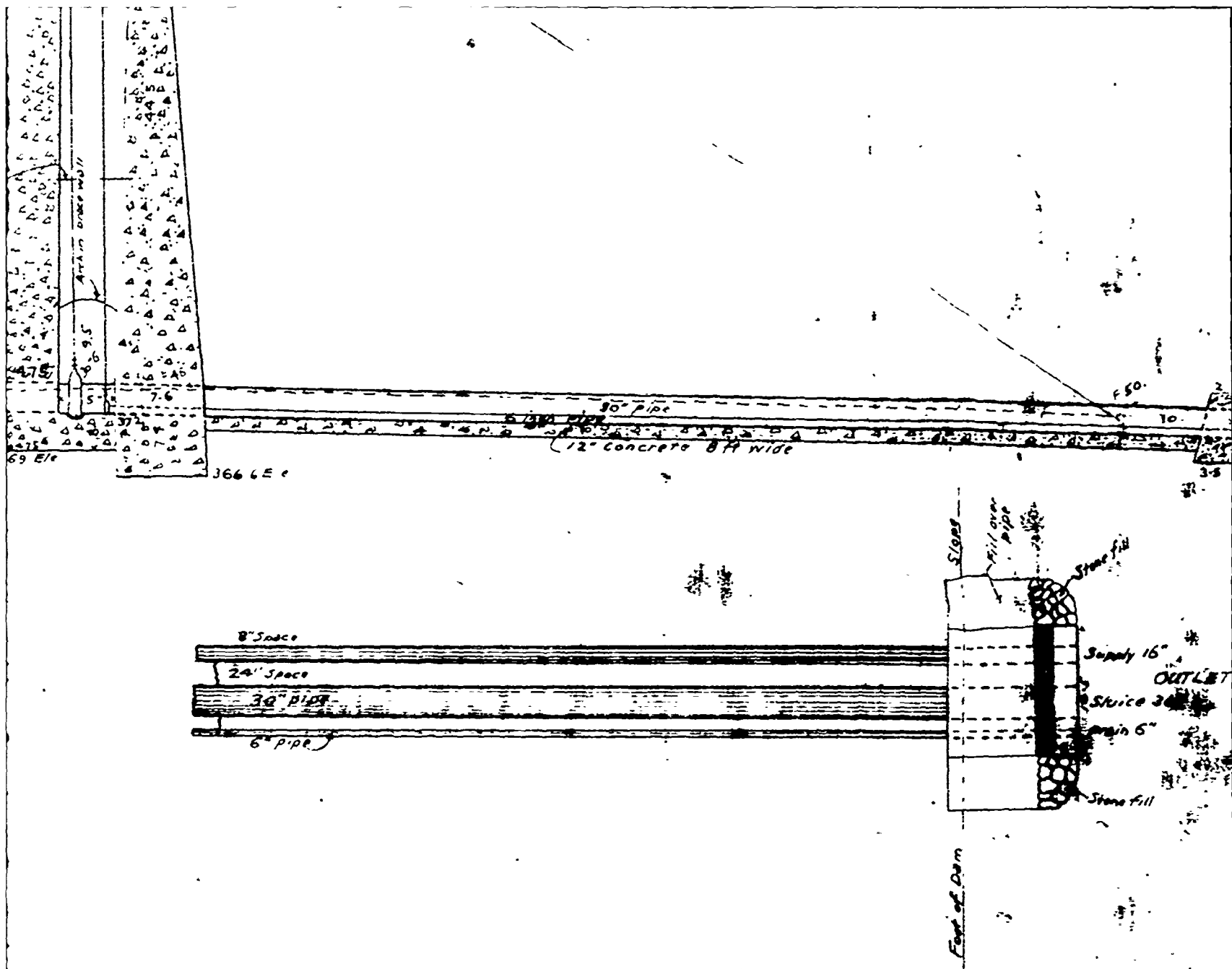
TH.
BU

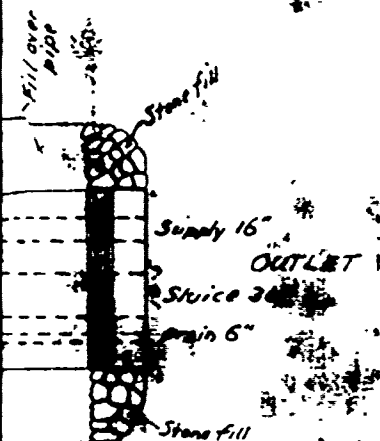
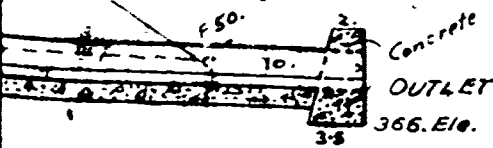
4

7







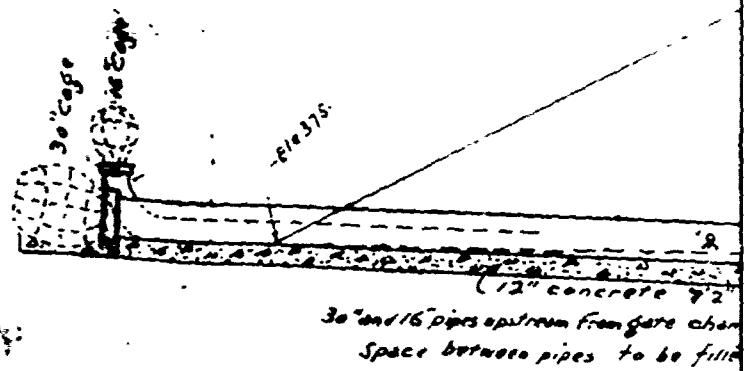


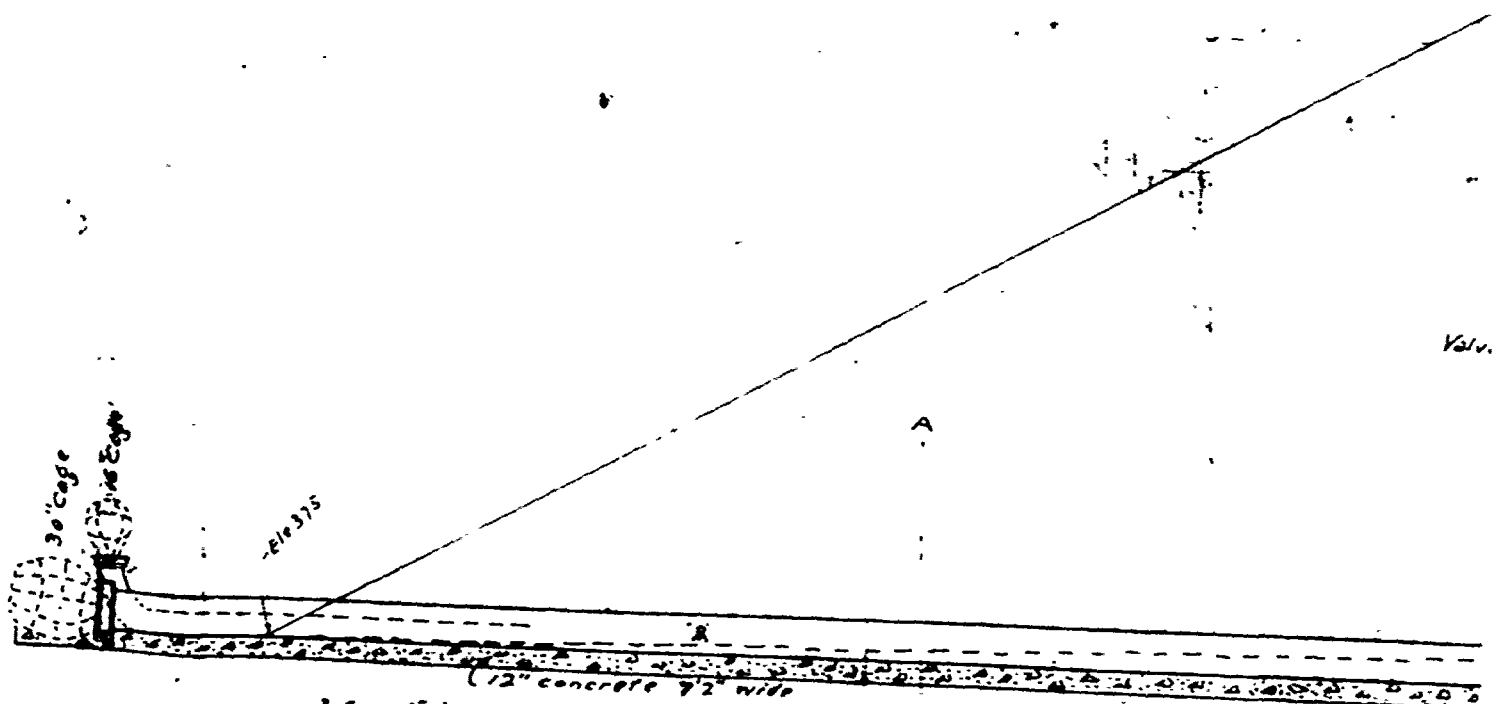
SHEET NO SEVEN
GATE CHAMBER AND PIPE PLAN

SCALE ONE INCH = TEN FEET

C.N. WOOD, C.E.

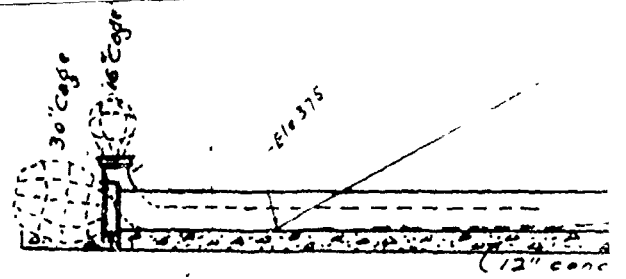
1909.



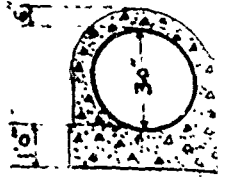


30" and 16" pipes upstream from gate chamber to be covered with 6 inches in thickness of concrete
 Space between pipes to be filled to an elevation 6 inches above the 16 inch pipe





30" and 16" pipes upstream from
Space between pipes

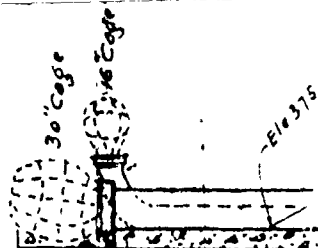


SECTION
SCALE 1"

BROWN'S RESERVOIR

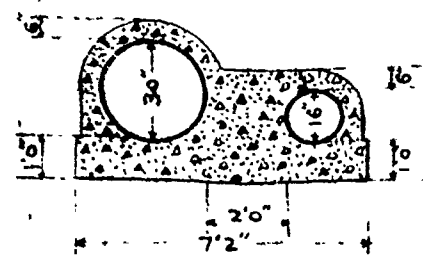
3

Sheet No. 1



30" and 16" pipes upstream from gate chamber to be covered with 6 inches in thickness of concrete
 Space between pipes to be filled to an elevation 6 inches above the 16 inch pipe

B



SECTION A-B
 SCALE 1" = 4'

VOIR

4

SCOTT'S RESERVOIR

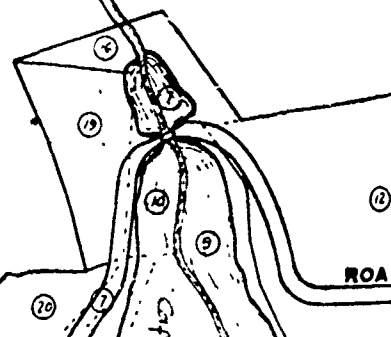
SECTION 15 20

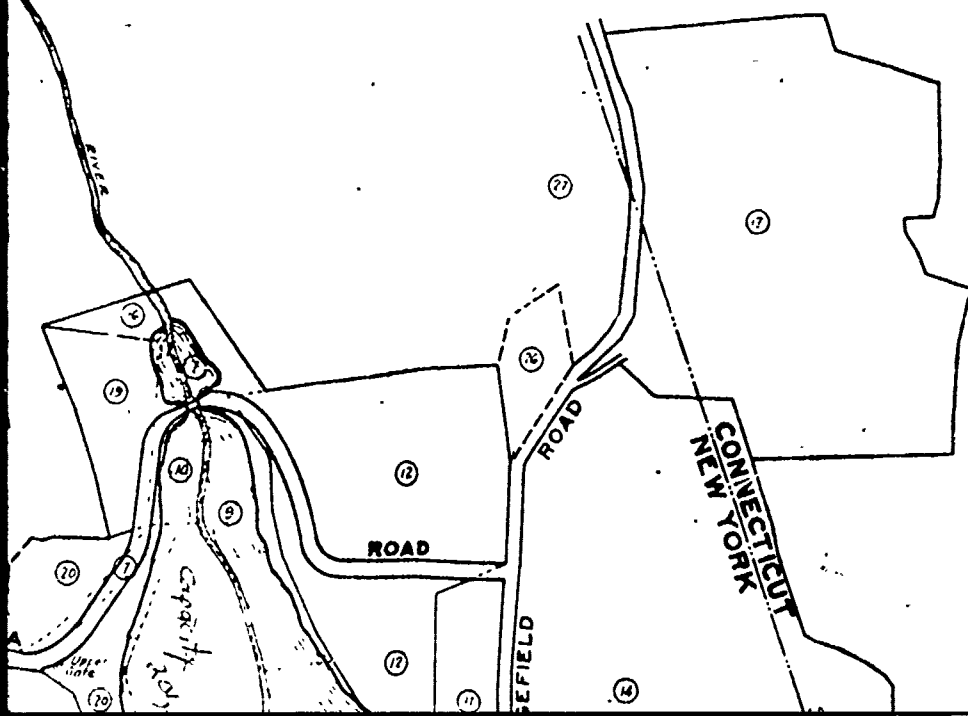
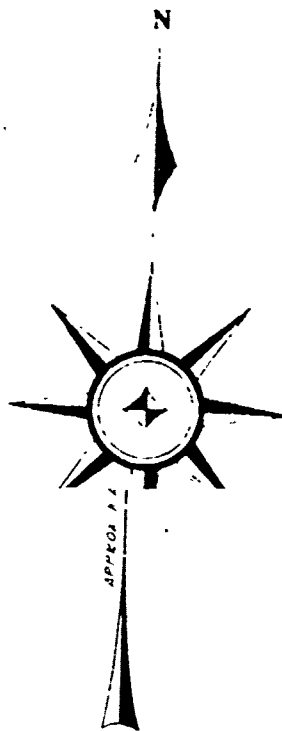
SECTION 23

SECTION 2

TOWN

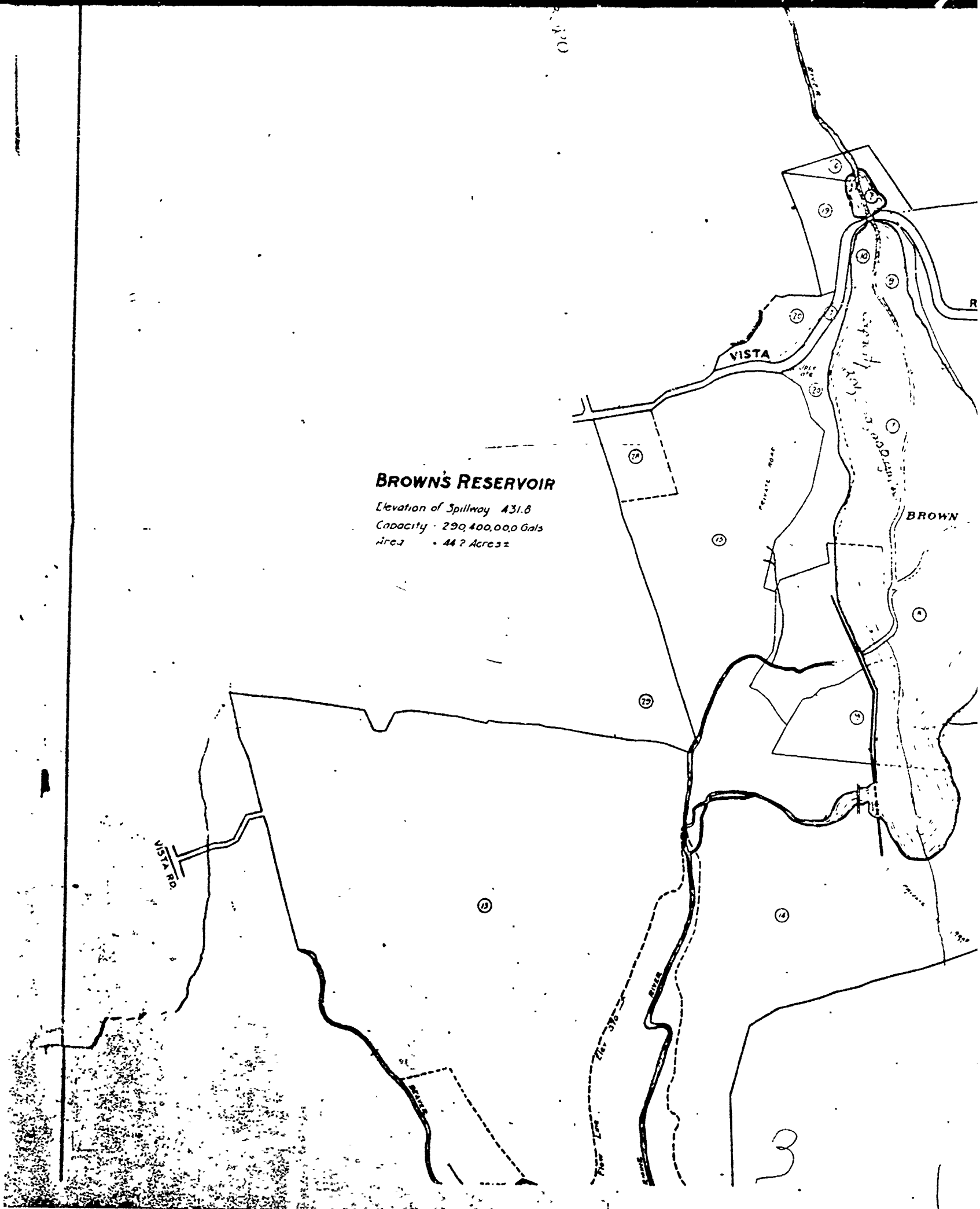
LEWISBORO

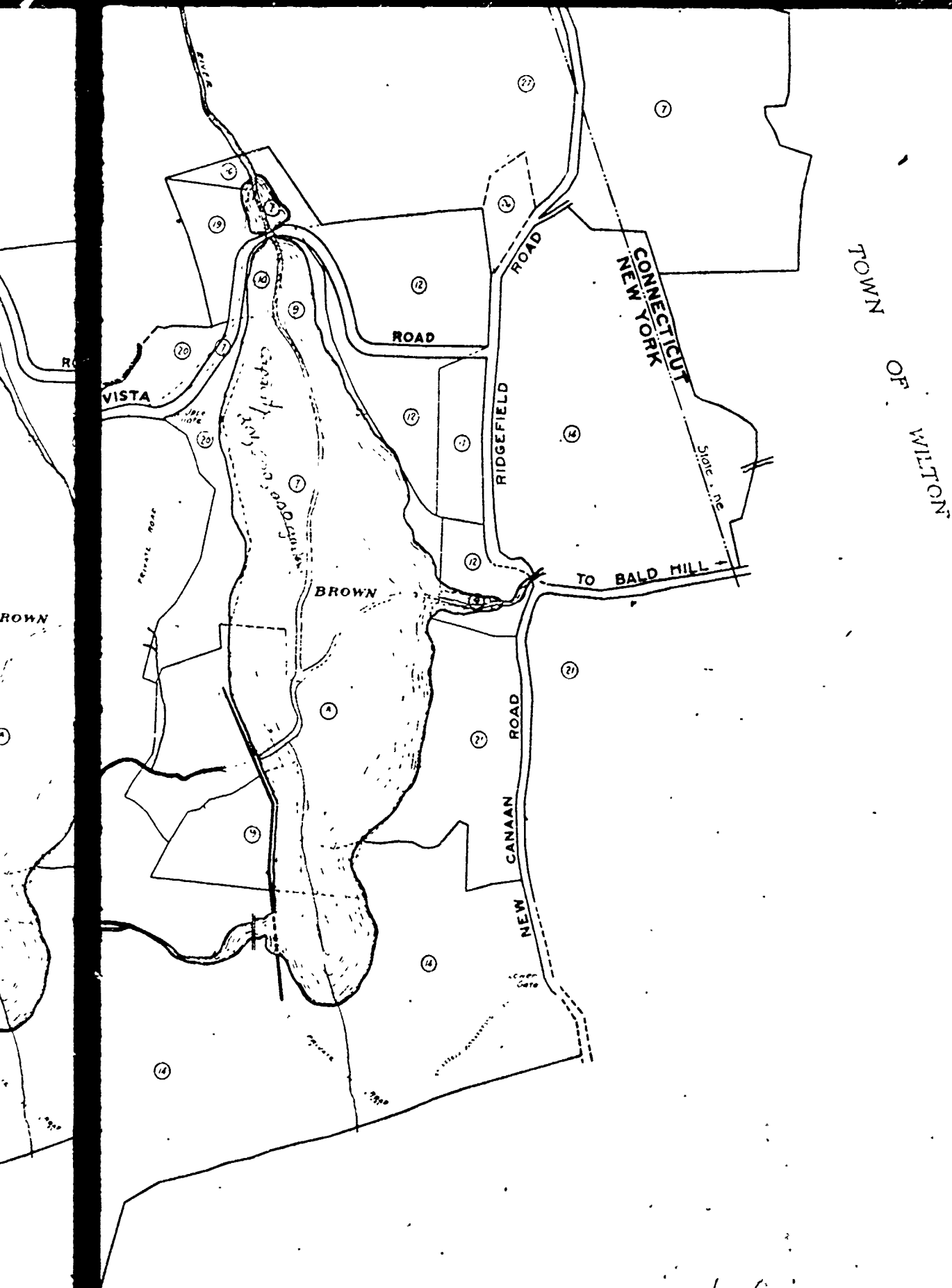




BROWN'S RESERVOIR

Elevation of Spillway 431.8
Capacity - 290,400,000 Gals
Area - 447 Acres





4
Total Acreage 158. 1/10