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Indian Lake

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.

Examination of available documents and a visual inspection of the dam did not reveal conditions which constitute an immediate hazard to human life or property. However, the dam has some deficiencies which need to be evaluated and remedied.

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Additional hydrologic investigations are required to more accurately determine the site specific characteristics of the watershed. Using the Corps of Engineer's Screening Criteria for the initial review of spillway adequacy, it has been determined that the embankment would be overtopped by the outflows resulting from all storms exceeding 42% of the Probable Maximum Flood (PMF). A flood wave analysis, assuming a breaching of the dam, indicates that water surface levels downstream of the dam could reach depths which would pose significant danger to residents. 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 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.

Structural stability analyses based on available information, indicate that factors of safety against both overturning and sliding are less than desireable. When the dam is subjected to severe loading conditions (1/2 PMF, PMF, ice load) the safety factors fall to critical levels. Further investigation of the stability is needed including subsurface investigations and concrete coring. These studies should determine the condition of the dam and its foundation and develop accurate cross sections of the dam. This information should then be incorporated into a detailed stability evaluation. Appropriate modifications to the dam should then be made as required.

It is recommended that within 3 months of the date of final approval of this report, a hydrologic investigation of the structure should be undertaken. Investigation of the structural stability of the dam should be commenced within 6 months. Within 18 months of the final approval of this report, appropriate remedial measures for both the spillway inadequacy and the stability problems should be completed. In the interim, a detailed emergency operation plan and warning system should be developed and implemented.

There were several additional deficiencies which should also be corrected. The surface of the concrete on the dam, especially on the spillway section, was spalled and deteriorated. There were several cracks in the concrete sections, and there were leaks through the joints between sections of the spillway. A wet area was noted beyond the toe of the downstream slope on the eastern end of the dam. There were trees growing on the downstream slope of the embankment. These deficiencies should be corrected within 12 months of the date of final approval of this report.

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UPPER HUDSON RIVER BASIN

LAKE ADIRONDACK DAM

HAMILTON COUNTY, NEW YORK
INVENTORY NO. N.Y. 621

(6) **PHASE I INSPECTION REPORT**
NATIONAL DAM SAFETY PROGRAM.

Lake Adirondack Dam (Inventory Number NY 621),
Upper Hudson River Basin, ~~[illegible]~~
Hamilton County, New York. Phase I Inspection
Report.

(10) George / Koch

(11) 21 May 80

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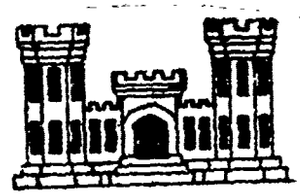

(15) DACW51-79-C-0001

NEW YORK DISTRICT CORPS OF ENGINEERS

JANUARY, 1980

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
LAKE ADIRONDACK DAM
I.D NO. N.Y. 621
#169-929
UPPER HUDSON RIVER BASIN
HAMILTON COUNTY, NEW YORK

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PHASE I REPORT
NATIONAL DAM SAFETY PROGRAM

Name of Dam:	Lake Adirondack Dam (I.D. N.Y. 621)
State Located:	New York
County:	Hamilton
Watershed:	Upper Hudson River Basin
Stream:	Carroll Brook
Date of Inspection:	October 18, 1979

ASSESSMENT

Examination of available documents and a visual inspection of the dam did not reveal conditions which constitute an immediate hazard to human life or property. However, the dam has some deficiencies which need to be evaluated and remedied.

Additional hydrologic investigations are required to more accurately determine the site specific characteristics of the watershed. Using the Corps of Engineer's Screening Criteria for the initial review of spillway adequacy, it has been determined that the embankment would be overtopped by the outflows resulting from all storms exceeding 42% of the Probable Maximum Flood (PMF). A flood wave analysis, assuming a breaching of the dam, indicates that water surface levels downstream of the dam could reach depths which would pose significant danger to residents. 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 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.

Structural stability analyses based on available information, indicate that factors of safety against both overturning and sliding are less than desireable. When the dam is subjected to severe loading conditions (1/2 PMF, PMF, ice load) the safety factors fall to critical levels. Further investigation of the stability is needed including subsurface investigations and concrete coring. These studies should determine the condition of the dam and its foundation and develop accurate cross sections of the dam. This information should then be incorporated into a detailed stability evaluation. Appropriate modifications to the dam should then be made as required.

It is recommended that within 3 months of the date of final approval of this report, a hydrologic investigation of the structure should be undertaken. Investigation of the structural stability of the dam should be commenced within 6 months. Within 18 months of the final approval of this report, appropriate remedial measures for both the spillway inadequacy and the stability problems

should be completed. In the interim, a detailed emergency operation plan and warning system should be developed and implemented.

There were several additional deficiencies which should also be corrected. The surface of the concrete on the dam, especially on the spillway section, was spalled and deteriorated. There were several cracks in the concrete sections, and there were leaks through the joints between sections of the spillway. A wet area was noted beyond the toe of the downstream slope on the eastern end of the dam. There were trees growing on the downstream slope of the embankment. These deficiencies should be corrected within 12 months of the date of final approval of this report.

George Koch

George Koch
Chief, Dam Safety Section
New York State Department
of Environmental Conservation
NY License No. 45937

Approved By:

Clark H. Benn

Col. Clark H. Benn
New York District Engineer

Date: 21 MAY 1980

OVERVIEW
LAKE ADIRONDACK DAM
I.D. No. NY 621

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
LAKE ADIRONDACK DAM
I.D. No. NY 621
#169-928
UPPER HUDSON RIVER BASIN
HAMILTON 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

This inspection was conducted to evaluate the existing conditions of the dam, to identify deficiencies and hazardous conditions, to determine if these deficiencies constitute hazards to life and property, and to recommend remedial measures where required.

1.2 DESCRIPTION OF PROJECT

a. Description of Dam

The Lake Adirondack Dam is composed of a concrete wall with earth fill both upstream and downstream of the wall. The spillway section, located near the center of the dam, is a masonry structure which has been covered with concrete.

The dam is 750 feet long and has a maximum height of 17.5 feet. The concrete wall extends about 3 feet above the earth fill and has a top width of 1.5 feet. The upstream slope of the earth fill is 1 vertical on 2 horizontal. The downstream slope is a 1 vertical on 2 1/2 horizontal.

The spillway is 99 feet long and consists of four adjacent sections. Three of the sections a total of 79 feet in length have crest elevations which are approximately one foot below the top of the dam. The crest of the remaining section, which is 20 feet long, is about one foot below the crest of the other sections. The crest of this lowest section is formed by a 3 1/2 inch timber fastened to the concrete.

A reservoir drain consisting of a 24 inch diameter gate valve and a 42 inch by 50 inch rectangular outlet conduit is located to the west of the spillway. The control for this gate valve is on the top of the dam.

b. Location

The dam is located in the Town of Indian Lake on N.Y. State Route 28. It is approximately one half mile east of the village of Indian Lake.

c. Size Classification

The dam is 17.5 feet high and the maximum storage capacity has been estimated to be 1182 acre-feet. Therefore, the dam is in the intermediate size category as defined by the Recommended Guidelines for Safety Inspection of Dams.

d. Hazard Classification

The dam is classified as "high" hazard due to the presence of a major state highway, four homes and the town's sewage disposal plant downstream of the dam.

e. Ownership

The dam is owned by the town of Indian Lake. The Town Supervisor is Richard Perdue. His phone number is (518) 648-5256.

f. Purpose of Dam

The dam is used to maintain the water surface of Adirondack Lake for recreational purposes.

g. Design and Construction History

No information was available about the original design of the dam. A portion of the dam was constructed in 1910. The height of the dam was increased in 1931. Plans for these modifications, prepared by C.S. Carroll were available and have been included in Appendix F.

h. Normal Operating Procedures

Water flows over an ungated spillway. There are no regular operating procedures. This year the drain was opened and the lake level lowered for the winter in an attempt to kill weeds in the lake.

1.3 PERTINENT DATA

a. Drainage Area (acres)	883
b. Discharge at Dam (cfs)	
Spillway Water Surface at elevation 1658.2	60
Spillway Water Surface at elevation 1659.0	338
Reservoir Drain-Water Surface at elevation 1659.0	94
c. Elevation (USGS Datum)	
Top of Dam	1659.0
First Step on Spillway (3 Sections)	1658.2
Lower Step on Spillway (1 Middle Section)	1657.25
Invert of Reservoir Drain	1645.0
d. Reservoir-Surface Area	(acres)
Top of Dam	186.6
Spillway Crest (Elevation 1657.25)	166.4
e. Storage Capacity	(acre-feet)
Top of Dam	1182
Spillway Crest (Elevation 1657.25)	874

f. Dam

Type: Concrete Wall with earth fill upstream and downstream.

Dam Length(ft.)		750
Crest Elevation		1659.0
Crest Width (Concrete Wall)(ft.)		1.5
Embankment Slopes (V:H)	Upstream	1 on 2
	Downstream	1 on 2 1/2

g. Spillway

Type: Ungated, four section concrete overflow with one 20 foot wide portion whose crest is 1 foot lower than the other 3 sections.

Length-Total (feet) 99

h. Reservoir Drain

Type: 24 inch diameter gate valve flowing into a 42 inch by 50 inch cast-in-place outlet conduit.

Control: Ludlow gate valve on top of dam.

SECTION 2: ENGINEERING DATA

2.1 GEOTECHNICAL DATA

a. Geology

The Lake Adirondack Dam is located in the Adirondack Highlands physiographic province of New York State. The original rock was sedimentary with large intrusions of igneous rocks (anorthosites, granites, gabbros). Much of this rock has been metamorphosed by heat, pressure, folding and faulting. Surface features of the rock reflects the effects of glaciation. A review of the "Brittle Structures Map of the State of New York" indicated that there are no faults in the immediate vicinity of the dam.

The surficial soils are the result of glaciations during the Cenozoic Era, the last of which was the Wisconsin glaciation.

b. Subsurface Investigations

The only subsurface information available was a general subsurface profile contained on the 1931 reconstruction plans. This profile indicated that the western end of the dam is founded on gravel while the rest of the structure is supported on ledge rock.

2.2 DESIGN RECORDS

No design records for the original construction of this dam were available. Plans prepared by C.S. Carroll for the modifications made in 1931 were available and have been included in Appendix F.

2.3 CONSTRUCTION RECORDS

No construction records were available.

2.4 OPERATION RECORDS

No operation records were available.

2.5 EVALUATION OF DATA

The data presented in this report was obtained from the Department of Environmental Conservation files. While the information was somewhat limited, it appears to be reliable and adequate for Phase I inspection purposes.

SECTION 3: VISUAL INSPECTION

3.1 FINDINGS

a. General

Visual inspection of the Lake Adirondack Dam was conducted on October 18, 1979. The weather was overcast and the temperature was in the fifties. The water surface at the time of the inspection was 1.7 feet below the spillway crest. The valve on the reservoir drain was partially opened on the date of the inspection.

b. Dam

The main dam generally appeared to be in satisfactory condition. There were, however, several deficiencies noted on the structure.

Surface deterioration of the concrete and cracks in the central wall at the western end of the dam were noted. The remaining sections of the wall which were exposed appeared to be in satisfactory condition. There were no indications of sloughing, subsidence, or movement of the fill on either the upstream or downstream slope. Some minor bank erosion had occurred on the upstream face at the western end of the dam. There were a number of trees growing on the downstream slope.

There was a wet area beyond the toe of the embankment section on the eastern end of the dam. This area extended for approximately 100 feet along the toe. Standing water was observed in the area, but no points of concentrated seepage were located. It was unclear whether the wet area was caused by seepage through the dam's foundation or springs from the hillside beyond the dam.

c. Spillway

Several deficiencies were noted on the spillway section of the dam. There was minor spalling and deterioration across the spillway. In some areas, the deterioration was more severe. The facing material was peeling off in sections on one of the channel walls beyond the base of the spillway. There were also several cracks in the concrete forming the spillway and downstream walls. One crack on the western wall downstream of the spillway extends across the entire width of the wall.

There were several leaks through the spillway section. The primary leaks were at the joints between the different sections of the spillway. Water was emerging on the downstream face at about mid-height of the spillway. The apron at the downstream toe of the western end of the spillway was very wet due to the seepage. Drain pipes have been installed in the wall at the downstream edge of this apron. Water was flowing from several of these pipes.

d. Reservoir Drain

Visual observations of the reservoir drain did not reveal any serious deficiencies. The gate valve control on the top of the dam appeared to be in good condition and operable. The condition of the cast-in place outlet conduit was satisfactory. There was one construction joint in the conduit which was not perfectly aligned. Concrete had been used to fill the separation.

e. Downstream Channel

Bedrock was exposed in the channel beyond the downstream toe of the spillway section. Concrete has been poured on the rock immediately downstream, to fill some surface irregularities. This concrete was deteriorated and had been removed in some spots. Beyond this area, outflows pass through a 72 inch corrugated metal pipe under Route 28. The condition of the channel in this section and beyond was generally satisfactory.

3.2 Evaluation of Observations

Visual inspection revealed several deficiencies on this structure. The following items were noted:

1. Surface deterioration of the concrete and cracks in the central wall at the western end of the dam.

2. A wet area beyond the toe of the embankment at the eastern end of the dam.

3. Deterioration of concrete on the spillway.

4. Leaks through construction joints on the spillway.

5. Trees growing on the downstream slope of the earth fill.

SECTION 4: OPERATION AND MAINTENANCE PROCEDURE

4.1 PROCEDURES

There are no regular operation procedures for this dam. This year, the valve on the reservoir drain was partially opened in September. This action was taken in an attempt to kill some of the weeds in the lake.

4.2 MAINTENANCE OF DAM

Routine maintenance on the dam is performed by the Town of Indian Lake.

4.3 WARNING SYSTEM IN EFFECT

No apparent warning system is present.

4.4 EVALUATION

The operation and maintenance procedures for this dam appear to be generally satisfactory. Increased maintenance efforts are required to correct the deficiencies which exist.

SECTION 5: HYDROLOGIC/HYDRAULIC

5.1 DRAINAGE AREA CHARACTERISTICS

Delineation of the watershed draining into the reservoir pool area was made using the USGS 15 minute quadrangles for Blue Mountain and Newcomb, New York. The drainage area is 883 acres and consists of wooded lands and the village of Indian Lake. Relief in the drainage area is moderate to steep with slopes ranging from 2 per cent in the western portion of the drainage area to 12 percent to the north of the reservoir.

5.2 ANALYSIS CRITERIA

The analysis of the floodwater retarding capability of this dam was performed using the Corps of Engineers HEC-1 computer program, Dam Safety version. This program uses the Clark Unit hydrograph method and the "Modified Puls" flood routing procedure. The spillway design flood selected for analysis was the PMF in accordance with the recommended guidelines for the U.S. Army Corps of Engineers.

5.3 SPILLWAY CAPACITY

The dam has an ungated spillway which is composed of four adjacent sections. The total length of the spillway is 99 feet. The spillway operates under weir flow conditions and was analyzed as a trapezoidal weir having a discharge coefficient which varied according to head. Coefficients used ranged from 3.09 to 3.51. The computed spillway capacity when the water surface is at the top-of-dam is 338 cfs.

5.4 RESERVOIR CAPACITY

Normal storage capacity of the reservoir between the spillway crest (elevation 1657.25) and the top of the dam (elevation 1659.0) is 20.2 acre feet which is equivalent to a runoff depth of 0.27 inches over the drainage area. Total storage capacity of the dam is estimated to be 1182 acre-feet.

5.5 FLOODS OF RECORD

No information was available regarding the occurence of the maximum known flood.

5.6 OVERTOPPING POTENTIAL

Analysis using the Probable Maximum Flood (PMF) and one-half the PMF indicates that the dam does not have sufficient spillway capacity. For a PMF peak outflow of 1970 cfs, the dam would be overtopped to a computed depth of 0.77 feet. For the peak outflow from one-half the PMF, (Q=564 cfs), the depth of overtopping would be 0.19 feet. The dam would be overtopped by all storms exceeding 42% of the PMF inflow. Overtopping might result in the earth fill downstream of the concrete wall being eroded and creating an unstable condition.

5.7 Evaluation

Using the Corps of Engineers screening criteria for initial review of spillway adequacy, it has been determined that the dam would be overtopped by all storms exceeding 42% of the PMF inflow. A flood wave analysis, assuming a breaching of the dam, indicates that the water surface levels downstream of the dam could reach depths which pose a significant danger to residents.

The spillway is, therefore, adjudged to be seriously inadequate and the dam is assessed as unsafe, non-emergency.

SECTION 6: STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

a. Visual Observations

Visual inspection of the dam revealed some deterioration and cracking on the spillway section. In addition, cracks were noted in the top of the concrete wall which extends for the length of the dam. There was a wet area beyond the downstream toe on the eastern end of the dam.

b. Data Review and Stability Evaluation

Information used to perform the stability analysis was obtained from the 1931 reconstruction plans. However, some of the dimensions shown on the plans did not agree with actual measurements made at the time of inspection. The most serious discrepencies were on the spillway section. Dimensions used for the analysis were estimated based on all available data. More accurate information will be required in the future to perform additional stability analyses.

Stability analyses which were done studied two sections of the dam. Analyses were performed for the concrete wall with earth fill which comprises most of the dam, and for one portion of the spillway section. The section which was analyzed may not be the most critical section. However, there was not enough information available to analyze each portion of the spillway. The following conditions were analyzed for each case:

a. Normal conditions with the reservoir level at spillway crest (elevation 1657.25);
b. Reservoir level at spillway crest with an ice load of 10,000 lb.;
c. One-half PMF, water flowing over the top of dam to a depth of 0.23 feet;
d. PMF, water flowing over the top of dam to a depth of 0.83 feet;

The analyses performed (See Appendix D) indicate that the factors of safety against overturning and sliding for each of the sections are as follows:

Concrete Wall Section	Factors of Safety	
Case	Overturning	Sliding
a. Reservoir level at ele. 1657.25	1.57	2.13
b. Same as (a) plus an ice load of 10,000 lb/ft	.64	1.11
c. One-half PMF, water flowing .23 feet over top of dam	.77	.42
d. PMF, water flowing .83 feet overt top of dam	.73	.40

Spillway Section	Factors of Safety	
Case	Overturning	Sliding
a. Reservoir level at elevation 1657.25	1.24	1.40
b. Same as (a) plus an ice load of 10,000 lb/ft	.37	.62
c. One-half PMF, water flowing .23 feet over top of dam	1.00	1.12
d. PMF, water flowing .83 feet over top of dam	.94	1.05

The stability analyses indicate that the stability of each section is deficient. The safety factors of the concrete wall section fall to unacceptable levels under flood flow conditions since the overtopping of the dam might result in the earth fill downstream of the wall being eroded. This removal would reduce the passive force acting on the wall. The safety factors of both sections are unacceptable when subjected to ice loading.

Further investigations and studies are required to better assess the stability of the structure. A series of subsurface explorations, including several through the earth fill downstream of the wall, and concrete cores should be taken to provide additional data concerning the dam. Information concerning the condition of the reinforcement within the dam should also be obtained. Field surveys should then be made and accurate cross sections of the dam should be developed. Stability analyses should then be performed using this data. Based on the results of these analyses, required modifications to the structure should be designed and implemented.

d. Seismic Stability

This dam is located in Seismic Zone 2. Due to the location, a seismic stability analysis was performed in accordance with Corps of Engineers guidelines. The seismic analysis was performed for normal conditions with the water level at the spillway crest (elevation 1657.25). For the concrete wall section, the safety factor against overturning with seismic considerations included is 1.47 and against sliding is 1.92. For the spillway section analyzed, the safety factor against overturning is 1.15 and against sliding is 1.24.

SECTION 7: ASSESSMENT/RECOMMENDATIONS

7.1 Assessment

a. Safety

The Phase I inspection ofthe Lake Adirondack Dam revealed that the spillway is seriously inadequate and outflows from the one-half the PMF event might overtop the dam. This overtopping would result in the earth fill downstream of the concrete wall being eroded and create an unstable condition. This instability could cause breaching of the dam and the resulting floodwave would significantly increase the hazard to downstream residents. For this reason, the dam has been assessed as unsafe, non-emergency.

In addition to the spillway inadequacy, analyses indicate that the stability of the structure is questionable. The factors of safety fall to critical levels under extreme loading conditions (one-half PMF, PMF, ice loading). Other deficiencies noted on this structure, such as deterioration of concrete, leaks in the spillway section, and a wet area beyond the downstream toe on the eastern end of the dam could present a hazard unless appropriate repairs are made.

b. Adequacy of Information

The information which was available for the preparation of this report was somewhat limited. Plans for the modifications to the dam made in 1931 were used, but some of the dimensions shown on the plans did not agree with measurements made at the time of the inspection. No information concerning the reservoir capacity was available. Since some information was not available, certain assumptions had to be made to perform the analyses for this report.

c. Need for Additional Investigations

Since the spillway has been assessed as seriously inadequate, additional detailed hydrologic and hydraulic investigations are required to more accurately determine the site specific characteristics of the watershed.

Further investigation of the structural stability of the dam is also required. Each portion of the spillway section should be analyzed as well as the concrete wall with earth fill which comprises most of the dam. These studies should include subsurface and structural investigations to obtain information about the condition of the structure and its foundation. Accurate cross sections of the dam should be developed. This information should then be incorporated into a detailed stability evaluation.

The wet area beyond the toe of the embankment on the eastern end of the dam should be investigated. Attempts should be made to determine the source of the water which ponds in this area and a method to either eliminate the seepage or treat the area should be advised.

d. Urgency

The additional hydrologic and hydraulic investigations which are needed should be commenced within 3 months of the date of final approval of this report. Investigations of the structural stability of the dam should be commenced within 6 months.

Mitigating measures deemed necessary as a result of the investigation and repairs required should be completed within 18 months of the date of final approval of this report.

7.2 RECOMMENDED MEASURES

a. After the hydrological investigation has been completed, mitigating measures dealing with the seriously inadequate spillway capacity should be determined.

b. After the structural stability analysis has been completed, appropriate remedial work should be undertaken.

c. The surface deterioration and cracks in the concrete on both the main dam and spillway sections should be repaired.

d. Leaks through the joints on the spillway should be repaired.

e. Based on the findings concerning the wet area, required treatments should be undertaken.

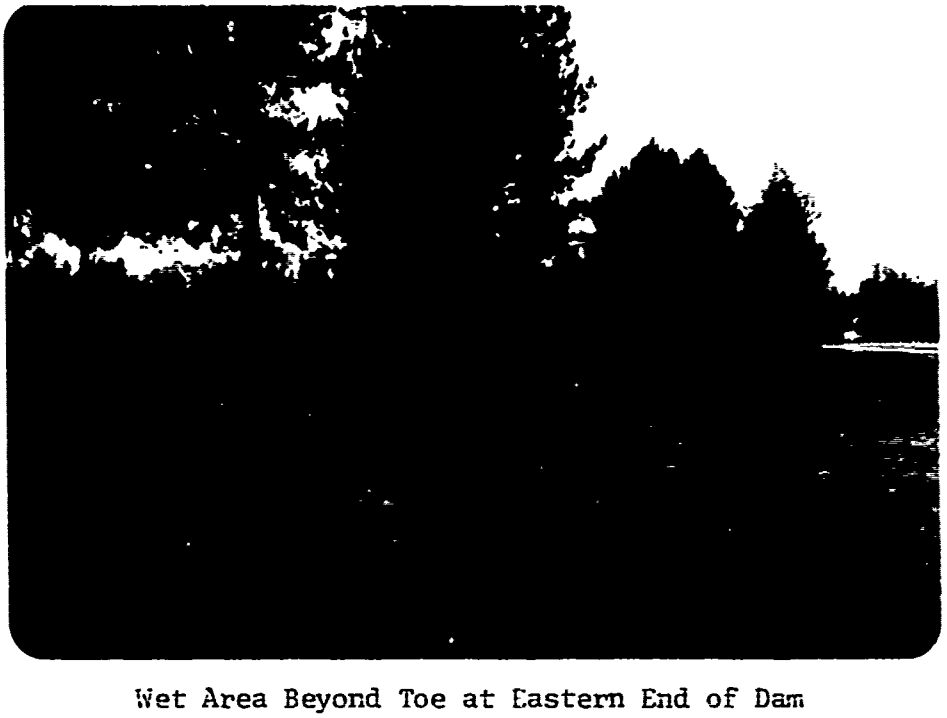
f. Trees growing on the downstream slope of the earth fill should be cut.

APPENDIX A

PHOTOGRAPHS

Western End of Dam - Erosion Has Exposed a Portion of Concrete Wall

Concrete Wall on Eastern End of Dam - Note Trees on Downstream Slope



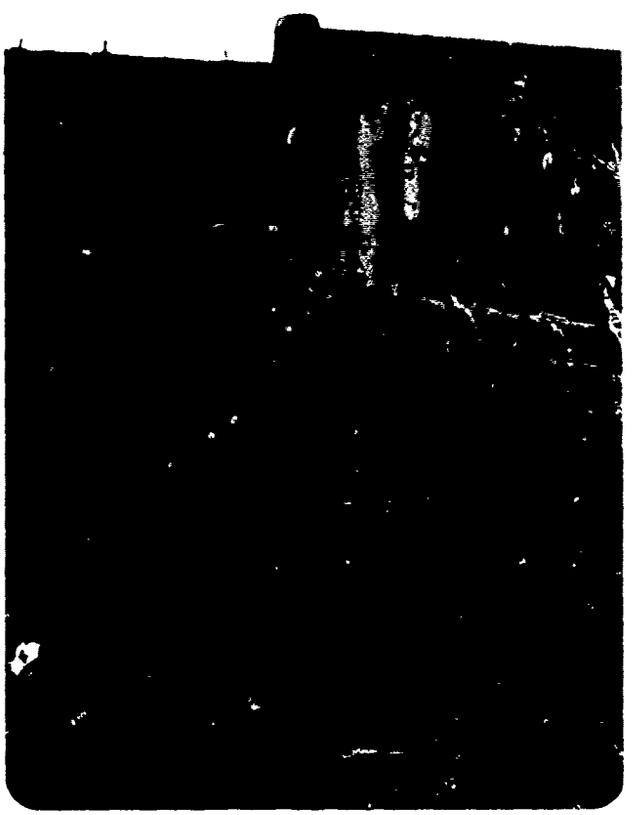
Wet Area Beyond Toe at Eastern End of Dam

Standing Water in Wet Area on Eastern End of Dam

Spillway Section of Dam

Reservoir Drain - Control on Top of Dam; Outlet Near Center of Picture

Spillway Looking in Easterly Direction - Note Four Sections on Spillway



Seepage Through Joint Between Two of the Sections of Spillway

Western End of Spillway - Note Cracks on Wingwalls and Spillway Section

Flowing Drain Pipe - Located in Wall Below Apron Shown in Picture Above

Loose Facing Material on Spillway Wingwall

Area on Wingwall Where Facing Material Has Been Removed

APPENDIX B

VISUAL INSPECTION CHECKLIST

VISUAL INSPECTION CHECKLIST

1) Basic Data

a. General

Name of Dam ADIRONDACK LAKE DAM

Fed. I.D. # 621 DEC Dam No. 169-928

River Basin UPPER HUDSON

Location: Town INDIAN LAKE County HAMILTON

Stream Name CARROLL BROOK

Tributary of INDIAN RIVER

Latitude (N) 43° 46.8' Longitude (W) 74° 15.4'

Type of Dam CONCRETE WALL WITH EARTH FILL UPSTREAM & DOWNSTREAM

Hazard Category C

Date(s) of Inspection 10/18/79

Weather Conditions OVERCAST · 50°

Reservoir Level at Time of Inspection 1.7' ± BELOW SPILLWAY CREST

b. Inspection Personnel R. WARRENDER, W. LYNICK

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

d. History:

Date Constructed 1910 Date(s) Reconstructed 1936

Designer

Constructed By PWA

Owner

2) Embankment

a. Characteristics

(1) Embankment Material GRANULAR FILL ON EITHER SIDE OF WALL.

(2) Cutoff Type CONCRETE WALL - SOME SURFACE DETERIORATION & CRACKS THROUGH WALL ESP. ON WESTERN END

(3) Impervious Core - CONCRETE CUTOFF WALL

(4) Internal Drainage System NONE

(5) Miscellaneous

b. Crest

(1) Vertical Alignment SATISFACTORY

(2) Horizontal Alignment SATISFACTORY

(3) Surface Cracks ~~NOT APPLICABLE~~ NONE APPARENT

(4) Miscellaneous

c. Upstream Slope

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

(2) Undesirable Growth or Debris, Animal Burrows NONE

(3) Sloughing, Subsidence or Depressions SOME EROSION & SLOUGHING ON WESTERN END NEAR BEACH

(4) Slope Protection RIPRAP ONLY ON WESTERN END

(5) Surface Cracks or Movement at Toe NONE

d. Downstream Slope

(1) Slope (Estimate - V:H) 1.1 ON WESTERN END 1:2 ON EASTERN END

(2) Undesirable Growth or Debris, Animal Burrows TREES ON DOWNSTREAM SLOPE ON EITHER END.

(3) Sloughing, Subsidence or Depressions NONE

(4) Surface Cracks or Movement at Toe NONE

(5) Seepage SOME ON SPILLWAY SEE SEC. 9. WET AREA BEYOND TOE AT EASTERN END - POSSIBLY SEEPAGE

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

(7) Condition Around Outlet Structure SATISFACTORY

(8) Seepage Beyond Toe WET AREA AT EASTERN END - COULD BE SEEPAGE OR MIGHT BE HILLSIDE SPRINGS

e. Abutments - Embankment Contact

(1) Erosion at Contact NONE

(2) Seepage Along Contact No

3) Drainage System

a. Description of System SEVERAL DRAINAGE PIPES IN CONCRETE SPILLWAY SECTION

b. Condition of System SATISFACTORY

c. Discharge from Drainage System SLIGHT DISCHARGE FROM SEVERAL OF THE PIPES.

4) Instrumentation (Momumentation/Surveys, Observation Wells, Weirs, Piezometers, Etc.) NONE

5) Reservoir

a. Slopes FLAT

b. Sedimentation NONE APPARENT

c. Unusual Conditions Which Affect Dam NONE

6) Area Downstream of Dam

a. Downstream Hazard (No. of Homes, Highways, etc.) RTE. 28
4 HOMES SEWAGE PLANT

b. Seepage, Unusual Growth NONE

c. Evidence of Movement Beyond Toe of Dam NONE

d. Condition of Downstream Channel RTE 28 - 72"CSP

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

GRAVITY & BUTTRESS- CONCRETE UNGATED CREST - 4 SECTIONS

a. General MINOR CONCRETE SPALLING & DETERIORATION - MAINLY AT JOINTS

b. Condition of Service Spillway DETERIORATION AT CONCRETE JOINTS
SURFACE DETERIORATION SPALLED CONCRETE SURFACE
COVERINGS- SEEPAGE THROUGH SOME JOINTS

c. Condition of Auxiliary Spillway _____

d. Condition of Discharge Conveyance Channel NATURAL BEDROCK WITH CONCRETE AREAS OVER ROCK IRREGULARITIES - CONCRETE PATCHES REMOVED IN SPOTS - ROCK RUBBLE - SATISFACTORY WALLS ON WEST SIDE OF CHANNEL - GOOD CONDITION

8) Reservoir Drain/Outlet

Type: Pipe _____ Conduit X Other _____

Material: Concrete X Metal _____ Other _____

Size: 42" WIDE x 50" HIGH Length 20' ± INCLINED sect. up to valve

Invert Elevations: Entrance 1645.0 Exit _____

Physical Condition (Describe): Unobservable _____

Material: CONCRETE - CAST-IN-PLACE

Joints: OKAY Alignment SLIGHT MISALIGN OR COULD BE EXCESS CONC. PROJECTING AT JOINT

Structural Integrity: SATISFACTORY

Hydraulic Capability: SATISFACTORY - No BLOCKAGE

Means of Control: Gate _____ Valve 24" X Uncontrolled _____

Operation: Operable X Inoperable _____ Other _____

Present Condition (Describe): SATISFACTORY

9) Structural

a. Concrete Surfaces MINOR SPALLING & DETERICRATION - WATER FLOW DETERICRATES ON PLUNGE APRON BELOW ~~EL~~ LOW SPILL. SECTION WEST APRON FASCIA - 2'x3' AREA WHERE CONCRETE FACING IS BROKEN FROM THE WALL ITSELF.

b. Structural Cracking ON DOWNSTREAM ABUTMENT WALL AT ℄ WEST END OF SPILLWAY THRU ENTIRE WALL THICKNESS & DOWN INTO WALL 6' ±

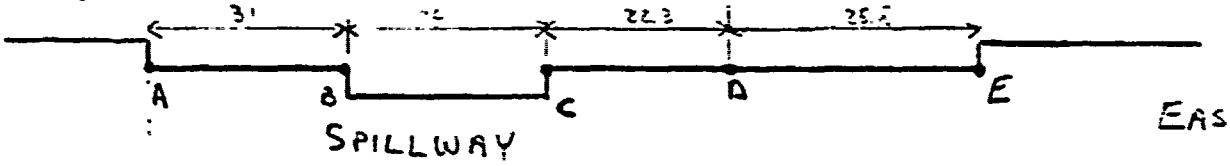
c. Movement - Horizontal & Vertical Alignment (Settlement) NONE APPARENT

d. Junctions with Abutments or Embankments JOINTS - CRACK AT WEST END OF SPILLWAY IN WINGWALL

e. Drains - ~~Foundation~~, ~~Joint~~, Face MIDDLE OF SPILLWAY - ~~A~~ PIPE COMING OUT - NO DISCHARGE BUT WET INSIDE
PIPES ON WALL NEAR WESTERN END ON APRON - BOTH DISCHARGING.

f. Water Passages, Conduits, Sluices RES. DRAIN CONDUIT - SIDEWALL JOINT DISPLACEMENT (<1")

g. Seepage or Leakage (SEE DIAGRAM BELOW) ½ LENGTH OF ABUTMENT WALL AT A HAS SEEPAGE COMING THROUGH. APRON BELOW SECTION AB HAD PIPE DRAINS & SURFACE SEEPAGE - THIS SECTION HAD THE MOST SEEPAGE OBSERVED. BOTH JOINTS B & C HAD SOME SEEPAGE. JOINT AT D HAD APPROXIMATELY 1gpm FLOW EXITING AT POINT ABOUT 6' ABOVE THE APRON.



h. Joints - Construction, etc. CONCRETE DETERIORATION AT SEVERAL JOINTS

i. Foundation BEDROCK

j. Abutments

k. Control Gates GATE & MECHANISM ON DRAIN APPEARS GOOD

l. ~~Approach~~ & Outlet Channels SATISFACTORY

m. Energy Dissipators (Plunge Pool, etc.) NATURAL BEDROCK - SATISFACTORY

n. Intake Structures

o. Stability

p. Miscellaneous

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	1659.0	186.6	1182
2) Design High Water (Max. Design Pool)			
3) ~~Auxiliary~~ Spillway Crest (1st Step)	1658.2		
4) Pool Level with Flashboards			
5) ~~Service~~ Spillway Crest (2nd Step) (Top of 3½' Timber)	1657.25	166.4	874

DISCHARGES

	Volume (cfs)
1) Average Daily	
2) Spillway @ Maximum High Water - W.S. at 1659.0	338
3) Spillway @ Design High Water	
4) Spillway @ ~~Auxiliary~~ Spillway Crest Elevation (1st Step) W.S. at 1658.2	59.9
5) Low Level Outlet - W.S. at 1659	94.3
6) Total (of all facilities) @ Maximum High Water	432.3
7) Maximum Known Flood	

CREST: ELEVATION: 1659.0

Type: CONCRETE WALL

Width: 1.25 ft. Length: 750 ft

Spillover FOUR SECTION SPILLWAY

Location NEAR CENTER OF DAM

SPILLWAY:

1ST STEP ~~PRINCIPAL~~		2ND STEP ~~EMERGENCY~~
1658.2	Elevation	1657.25
OVERFLOW	Type	OVERFLOW
79.1'	Width	20.1'
	Type of Control	
✓	Uncontrolled	✓
	Controlled:	
	Type (Flashboards; gate)	
	Number	
	Size/Length	
	Invert Material	
	Anticipated Length of operating service	
	Chute Length	
	Height Between Spillway Crest & Approach Channel Invert (Weir Flow)	

OUTLET STRUCTURES/EMERGENCY DRAWDOWN FACILITIES:

Type: Gate √ Sluice _____ Conduit √ Penstock _____

Shape : CIRCULAR GATE - RECTANGULAR CONDUIT

Size: 24" 42" WIDE X 50" HIGH

Elevations: Entrance Invert 1645.0

Exit Invert 1635.2 - ESTIMATED

Tailrace Channel: Elevation _____

HYDROMETEROLOGICAL GAGES:

Type : NONE

Location: _____

Records:

Date - _____

Max. Reading - _____

FLOOD WATER CONTROL SYSTEM:

Warning System: NONE

_____

Method of Controlled Releases (mechanisms):

24" DIAMETER GATE

_____

DRAINAGE AREA: 1.38 SQ MI - 883.2 ACRES

DRAINAGE BASIN RUNOFF CHARACTERISTICS:

Land Use - Type: MOSTLY WOODS - PART SWAMP & VILLAGE

Terrain - Relief: MODERATE TO STEEP

Surface - Soil: GRAVEL & GLACIAL TILL

Runoff Potential (existing or planned extensive alterations to existing (surface or subsurface cond'tions)

NORMAL POTENTIAL

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

NONE

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

NONE

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

Location: NONE

Elevation: -

Reservoir:

Length @ Maximum Pool _____ (Miles)

Length of Shoreline (@ Spillway Crest) _____ (Miles)

00-15-1 (3/78)
Formerly GA-17

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PROJECT GRID

JOB	SHEET NO.	CHECKED BY	DATE
LAKE ADIRONDACK DAM	2		
SUBJECT		**COMPUTED BY**	**DATE**
HYDROLOGY COMPUTATIONS		RLW	1/2/80

CLARK UNIT HYDROGRAPH:

L = 1.86 mi. $S_{10/85}$ = 14.336 10% at 982' E_{10} = 1660

85% at 8348' E_{85} = 1680

$$R = \frac{(176)(1.86)^{.339}(.5)^{.258}}{(14.336)^{.86}} = 1.8$$

S_1 = 0.5

T_c → From other computations = 2.3

PRECIPITATION:

TP-40 - 6 hr - 10 sq mi → 20.5 in

HR-33 - 24 hr - 200 sq mi → 17.5 in → 6 hr Fraction is 130%

Use TP40 Rain for 6 hr As 100% and adjust the other percentages accordingly

12 hr 107.7%

24 hr 113%

48 hr 125%

$$TRSPC = 1 - \frac{.3048}{(1.38)^{.1774}} = .716$$

Loss Data: 1.0" Continuous = .1"

Base Flow = 2 cfs/sq mi 2(1.38) = 2.76

00-15-1 (3/78)
Formerly GA-17

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PROJECT GRID

JOB	SHEET NO.	CHECKED BY	DATE
LAKE ADIRONDACK DAM	1		
SUBJECT		**COMPUTED BY**	**DATE**
HYDROLOGY COMPUTATIONS		RLW	1/2/80

ELEVATIONS OF DAM

TOP OF DAM	1659.0
FIRST STEP ON SPILLWAY	1658.2
LOWER STEP ON SPILLWAY	1657.25

DRAINAGE AREA - PLANIMETERED FROM 15 MINUTE QUADS

FROM BLUE MOUNTAIN QUAD - 1.31 SQ MI.

FROM NEWCOMB QUAD - .07 SQ. MI.

1.38 SQ. MI. = 883.2 ACRES

SURFACE AREA - PLANIMETERED FROM 15 MINUTE QUAD

LAKE ON QUAD (STATED ELEVATION 1660) — 166.4 ACRES

1680 CONTOUR — 396.8 ACRES

RELATIVE DISTANCE BETWEEN NORMAL LAKE LEVEL AND

TOP OF DAM = 1659.0 − 1657.25 = 1.75'

$$\frac{(396.8 - 166.4)\ \text{ACRES}}{X\ \text{ACRES}} = \frac{20\ ft}{1.75\ ft}$$

X = 20.16 ACRES

ASSUME SURFACE AREA AT ELEVATION 1657.25 = 166.4 ACRES

SURFACE AREA AT ELEVATION 1659.0 = 186.6 ACRES

SURFACE AREA AT 1659.0 − 17.5 = 1641.5 = 0 ACRES

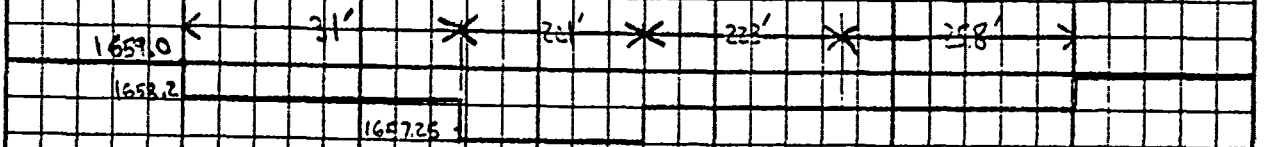
00-15-1 (3/78)
Formerly GA-17

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PROJECT GRID

JOB	SHEET NO.	CHECKED BY	DATE
LAKE ADIRONDACK DAM	3		
SUBJECT: HYDRAULIC COMPUTATIONS		COMPUTED BY: RLW	DATE: 12/28/79

SPILLWAY CAPACITY COMPUTATIONS



FOR 'C' VALUES IN WEIR FORMULA USE TABLE 5-9 KING & BRATER

FOR TRAPEZOIDAL SECTION WITH VERTICAL UPSTREAM FACE

WATER SURFACE AT ELEVATION 1658.2

$Q = cLH^{3/2} = (3.22)(20.1)(.95)^{3/2} = 59.93 \text{ cfs}$

WATER SURFACE AT ELEVATION 1659.0

$Q = (3.51)(20.1)(1.75)^{3/2} + (3.09)(79)(.8)^{3/2} = 163.3 + 174.7 = 338.0 \text{ cfs}$

RESERVOIR DRAIN CAPACITY - WATER SURFACE AT TOP OF DAM

$Q = A\sqrt{2gH} = 3.14\sqrt{2(32.2)(14)} = 94.3 \text{ cfs}$

```
**********
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION      JULY 1978
  LAST MODIFICATION  26 FEB 79
  MODIFIED FOR HONEYWELL APR 79
**********
```

```
**********
NEW YORK STATE
DEPT OF ENVIRONMENTAL CONSERVATION
FLOOD PROTECTION BUREAU
**********
```

```
    1  A1 LAKE ADIRONDACK DAM
    2  A PMF WITH RATIOS = ANALYSIS
    3  A3 DATE
    4  B    200       0      15       C       0       0       0       0       0       0
    5  B1     5
    6  J      1       3       1
    7  J1   .42      .5     1.0
    8  K      0       1                                               1
    9  K1                                  INFLOW HYDROGRAPH
   10  M      1       0    1.38                       .716                       1
   11  P      0    17.5     111     123     132     142
   12  T                                                       1      .1
   13  V    2.3     1.8
   14  X    2.8     2.8       1
   15  K      1       1                                               1
   16  K1 ROUTED HYDROGRAPH AT DAM  NO BREACH
   17  Y                               1       1
   18  Y1     1                                       -657.25      -1
   19  Y4657.25   658.2     659
   20  Y5     0      60     338
   21  $A     0   166.4   186.6
   22  $E 641.5  657.25   659.0
   23  $$657.25
   24  $D   659     3.0     1.5     672
   25  K      1    1000                                            1
   26  K1  LOCATION TOE OF DAM
   27  Y                               1       1
   28  Y1     1
   29  Y6   .05     .05     .05     639     662      20     .99
   30  Y7     0     662     125     650     240     642     240     639     265     639
   31  Y7   265     642     450     650     580     660
```

```
32          K       1     1100
33          K1 LOCATION  ROUTE  28
34          Y                                  1       1
35          Y1      1
36          Y6    .05     .05     .05    638.9     662     100    .CC1
37          Y7      0     670      60     658     235     648     235   638.9     242   638.9
38          Y7    243     648     345     652    1000     670
39          K       1     1600
40          K1  LOCATION  SEWAGE PLANT
41          Y                                  1       1
42          Y1      1
43          Y6    .05     .05     .05     615     700     500    .C64
44          Y7      0     700     690     660    1450     620    1450     615    1460     615
45          Y7   1460     620    1950     640    2200     680
46          K      99
47          A
48          A
49          A
50          A
91          A
```

****
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION JULY 1978
LAST MODIFICATION 26 FEB 79
MODIFIED FOR HONEYWELL APR 79
****

****
NEW YORK STATE
DEPT OF ENVIRONMENTAL CONSERVATION
FLOOD PROTECTION BUREAU
****

RUN DATE 03/20/80

LAKE ADIRONDACK DAM
PMF WITH RATIOS - ANALYSIS
DATE

JOB SPECIFICATION

NO	NHR	NMIN	IDAY	IHR	IMIN	METRC	IPLT	IPRT	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= 3 LRTIO= 1
RTIOS= 0.42 0.50 1.00

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

SUB-AREA RUNOFF COMPUTATION

INFLOW HYDROGRAPH

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
1	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	0	1.38	0.	1.38	0.72	0.	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.	17.50	111.00	123.00	132.00	142.00	0.	0.

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
TC= 2.30 R= 1.80 NTA= 0

RECESSION DATA
STRTQ= 2.80 QRCSN= 2.80 RTIOR= 1.00

UNIT HYDROGRAPH 44 END-OF-PERIOD ORDINATES, LAG= 2.03 HOURS, CP= 0.64 VOL= 1.00

12.	43.	87.	136.	188.	234.	266.	283.	284.	262.
229.	199.	174.	151.	131.	114.	99.	87.	75.	65.
57.	50.	43.	38.	33.	28.	25.	22.	19.	16.
14.	12.	11.	9.	8.	7.	6.	5.	5.	4.
4.	3.	3.	2.						

0 END-OF-PERIOD FLOW

MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q
1.01	0.15	1	0.00	0.	0.00	3.	1.02	1.15	101	0.02	0.	0.02	3.
1.01	0.30	2	0.00	0.	0.00	3.	1.02	1.30	102	0.02	0.	0.02	3.
1.01	0.45	3	0.00	0.	0.00	3.	1.02	1.45	103	0.02	0.	0.02	3.
1.01	1.00	4	0.00	0.	0.00	3.	1.02	2.00	104	0.02	0.	0.02	3.
1.01	1.15	5	0.00	0.	0.00	3.							

1.01	1.15	5	0.00	0.	0.00	3.	1.02	2.15	105	0.02	0.	0.02	3.
1.01	1.30	6	0.00	0.	0.00	3.	1.02	2.30	106	0.02	0.	0.02	3.
1.01	1.45	7	0.00	0.	0.00	3.	1.02	2.45	107	0.02	0.	0.02	3.
1.01	2.00	8	0.00	0.	0.00	3.	1.02	3.00	108	0.02	0.	0.02	3.
1.01	2.15	9	0.00	0.	0.00	3.	1.02	3.15	109	0.02	0.	0.02	3.
1.01	2.30	10	0.00	0.	0.00	3.	1.02	3.30	110	0.02	0.	0.02	3.
1.01	2.45	11	0.00	0.	0.00	3.	1.02	3.45	111	0.02	0.	0.02	3.
1.01	3.00	12	0.00	0.	0.00	3.	1.02	4.00	112	0.02	0.	0.02	3.
1.01	3.15	13	0.00	0.	0.00	3.	1.02	4.15	113	0.02	0.	0.02	3.
1.01	3.30	14	0.00	0.	0.00	3.	1.02	4.30	114	0.02	0.	0.02	3.
1.01	3.45	15	0.00	0.	0.00	3.	1.02	4.45	115	0.02	0.	0.02	3.
1.01	4.00	16	0.00	0.	0.00	3.	1.02	5.00	116	0.02	0.	0.02	3.
1.01	4.15	17	0.00	0.	0.00	3.	1.02	5.15	117	0.02	0.	0.02	3.
1.01	4.30	18	0.00	0.	0.00	3.	1.02	5.30	118	0.02	0.	0.02	3.
1.01	4.45	19	0.00	0.	0.00	3.	1.02	5.45	119	0.02	0.	0.02	3.
1.01	5.00	20	0.00	0.	0.00	3.	1.02	6.00	120	0.02	0.	0.02	3.
1.01	5.15	21	0.00	0.	0.00	3.	1.02	6.15	121	0.06	0.04	0.03	3.
1.01	5.30	22	0.00	0.	0.00	3.	1.02	6.30	122	0.06	0.04	0.03	5.
1.01	5.45	23	0.00	0.	0.00	3.	1.02	6.45	123	0.06	0.04	0.03	8.
1.01	6.00	24	0.00	0.	0.00	3.	1.02	7.00	124	0.06	0.04	0.03	13.
1.01	6.15	25	0.00	0.	0.00	3.	1.02	7.15	125	0.06	0.04	0.03	20.
1.01	6.30	26	0.00	0.	0.00	3.	1.02	7.30	126	0.06	0.04	0.03	29.
1.01	6.45	27	0.00	0.	0.00	3.	1.02	7.45	127	0.06	0.04	0.03	39.
1.01	7.00	28	0.00	0.	0.00	3.	1.02	8.00	128	0.06	0.04	0.03	50.
1.01	7.15	29	0.00	0.	0.00	3.	1.02	8.15	129	0.06	0.04	0.03	61.
1.01	7.30	30	0.00	0.	0.00	3.	1.02	8.30	130	0.06	0.04	0.03	70.
1.01	7.45	31	0.00	0.	0.00	3.	1.02	8.45	131	0.06	0.04	0.03	79.
1.01	8.00	32	0.00	0.	0.00	3.	1.02	9.00	132	0.06	0.04	0.03	87.
1.01	8.15	33	0.00	0.	0.00	3.	1.02	9.15	133	0.06	0.04	0.03	93.
1.01	8.30	34	0.00	0.	0.00	3.	1.02	9.30	134	0.06	0.04	0.03	99.
1.01	8.45	35	0.00	0.	0.00	3.	1.02	9.45	135	0.06	0.04	0.03	104.
1.01	9.00	36	0.00	0.	0.00	3.	1.02	10.00	136	0.06	0.04	0.03	108.
1.01	9.15	37	0.00	0.	0.00	3.	1.02	10.15	137	0.06	0.04	0.03	112.
1.01	9.30	38	0.00	0.	0.00	3.	1.02	10.30	138	0.06	0.04	0.03	115.
1.01	9.45	39	0.00	0.	0.00	3.	1.02	10.45	139	0.06	0.04	0.03	118.
1.01	10.00	40	0.00	0.	0.00	3.	1.02	11.00	140	0.06	0.04	0.03	120.
1.01	10.15	41	0.00	0.	0.00	3.	1.02	11.15	141	0.06	0.04	0.03	122.
1.01	10.30	42	0.00	0.	0.00	3.	1.02	11.30	142	0.06	0.04	0.03	124.
1.01	10.45	43	0.00	0.	0.00	3.	1.02	11.45	143	0.06	0.04	0.03	126.
1.01	11.00	44	0.00	0.	0.00	3.	1.02	12.00	144	0.06	0.04	0.03	127.
1.01	11.15	45	0.00	0.	0.00	3.	1.02	12.15	145	0.35	0.32	0.02	132.
1.01	11.30	46	0.00	0.	0.00	3.	1.02	12.30	146	0.35	0.32	0.02	145.
1.01	11.45	47	0.00	0.	0.00	3.	1.02	12.45	147	0.35	0.32	0.02	171.
1.01	12.00	48	0.00	0.	0.00	3.	1.02	13.00	148	0.35	0.32	0.02	211.
1.01	12.15	49	0.03	0.	0.03	3.	1.02	13.15	149	0.42	0.39	0.02	266.
1.01	12.30	50	0.03	0.	0.03	3.	1.02	13.30	150	0.42	0.39	0.02	336.
1.01	12.45	51	0.03	0.	0.03	3.	1.02	13.45	151	0.42	0.39	0.02	419.
1.01	13.00	52	0.03	0.	0.03	3.	1.02	14.00	152	0.42	0.39	0.02	509.
1.01	13.15	53	0.03	0.	0.03	3.	1.02	14.15	153	0.52	0.50	0.02	605.
1.01	13.30	54	0.03	0.	0.03	3.	1.02	14.30	154	0.52	0.50	0.02	701.
1.01	13.45	55	0.03	0.	0.03	3.	1.02	14.45	155	0.52	0.50	0.02	794.
1.01	14.00	56	0.03	0.	0.03	3.	1.02	15.00	156	0.52	0.50	0.02	885.
1.01	14.15	57	0.04	0.	0.04	3.	1.02	15.15	157	0.53	0.50	0.02	974.
1.01	14.30	58	0.04	0.	0.04	3.	1.02	15.30	158	1.06	1.03	0.03	1066.
1.01	14.45	59	0.04	0.	0.04	3.	1.02	15.45	159	2.96	2.93	0.03	1194.
1.01	15.00	60	0.04	0.	0.04	3.	1.02	16.00	160	0.74	0.71	0.02	1373.
1.01	15.15	61	0.04	0.	0.04	3.	1.02	16.15	161	0.49	0.46	0.02	1583.
1.01	15.30	62	0.08	0.	0.08	3.	1.02	16.30	162	0.49	0.46	0.02	1802.
1.01	15.45	63	0.22	0.	0.22	3.	1.02	16.45	163	0.49	0.46	0.02	2015.
1.01	16.00	64	0.06	0.	0.06	3.	1.02	17.00	164	0.49	0.46	0.02	2199.
1.01	16.15	65	0.04	0.	0.04	3.	1.02	17.15	165	0.38	0.36	0.02	2330.
1.01	16.30	66	0.04	0.00	0.03	3.	1.02	17.30	166	0.38	0.36	0.02	2404.
1.01	16.45	67	0.04	0.01	0.03	3.	1.02	17.45	167	0.38	0.36	0.02	2408.
1.01	17.00	68	0.04	0.01	0.03	4.	1.02	18.00	168	0.38	0.36	0.02	2341.
1.01	17.15	69	0.03	0.00	0.03	5.	1.02	18.15	169	0.03	0.00	0.03	2230.
1.01	17.30	70	0.03	0.00	0.03	6.	1.02	18.30	170	0.03	0.00	0.03	2100.

1.01	17.45	71	0.03	0.00	0.03	8.	1.02	18.45	171	0.03	0.00	0.03	1977.
1.01	18.00	72	0.03	0.00	0.03	10.	1.02	19.00	172	0.03	0.00	0.03	1837.
1.01	18.15	73	0.00	0.	0.00	12.	1.02	19.15	173	0.03	0.00	0.03	1686.
1.01	18.30	74	0.00	0.	0.00	13.	1.02	19.30	174	0.03	0.00	0.03	1529.
1.01	18.45	75	0.00	0.	0.00	14.	1.02	19.45	175	0.03	0.00	0.03	1369.
1.01	19.00	76	0.00	0.	0.00	14.	1.02	20.00	176	0.03	0.00	0.03	1212.
1.01	19.15	77	0.00	0.	0.00	14.	1.02	20.15	177	0.03	0.00	0.03	1062.
1.01	19.30	78	0.00	0.	0.00	13.	1.02	20.30	178	0.03	0.00	0.03	926.
1.01	19.45	79	0.00	0.	0.00	12.	1.02	20.45	179	0.03	0.00	0.03	804.
1.01	20.00	80	0.00	0.	0.00	11.	1.02	21.00	180	0.03	0.00	0.03	705.
1.01	20.15	81	0.00	0.	0.00	10.	1.02	21.15	181	0.03	0.00	0.03	619.
1.01	20.30	82	0.00	0.	0.00	9.	1.02	21.30	182	0.03	0.00	0.03	537.
1.01	20.45	83	0.00	0.	0.00	8.	1.02	21.45	183	0.03	0.00	0.03	469.
1.01	21.00	84	0.00	0.	0.00	8.	1.02	22.00	184	0.03	0.00	0.03	410.
1.01	21.15	85	0.00	0.	0.00	7.	1.02	22.15	185	0.03	0.00	0.03	358.
1.01	21.30	86	0.00	0.	0.00	6.	1.02	22.30	186	0.03	0.00	0.03	314.
1.01	21.45	87	0.00	0.	0.00	6.	1.02	22.45	187	0.03	0.00	0.03	275.
1.01	22.00	88	0.00	0.	0.00	6.	1.02	23.00	188	0.03	0.00	0.03	241.
1.01	22.15	89	0.00	0.	0.00	5.	1.02	23.15	189	0.03	0.00	0.03	211.
1.01	22.30	90	0.00	0.	0.00	5.	1.02	23.30	190	0.03	0.00	0.03	184.
1.01	22.45	91	0.00	0.	0.00	5.	1.02	23.45	191	0.03	0.00	0.03	162.
1.01	23.00	92	0.00	0.	0.00	4.	1.03	0.	192	0.03	0.00	0.03	142.
1.01	23.15	93	0.00	0.	0.00	4.	1.03	0.15	193	0.	0.	0.	124.
1.01	23.30	94	0.00	0.	0.00	4.	1.03	0.30	194	0.	0.	0.	109.
1.01	23.45	95	0.00	0.	0.00	4.	1.03	0.45	195	0.	0.	0.	96.
1.02	0.	96	0.00	0.	0.00	4.	1.03	1.00	196	0.	0.	0.	84.
1.02	0.15	97	0.02	0.	0.02	4.	1.03	1.15	197	0.	0.	0.	73.
1.02	0.30	98	0.02	0.	0.02	3.	1.03	1.30	198	0.	0.	0.	64.
1.02	0.45	99	0.02	0.	0.02	3.	1.03	1.45	199	0.	0.	0.	55.
1.02	1.00	100	0.02	0.	0.02	3.	1.03	2.00	200	0.	0.	0.	47.
									SUM	17.79	14.33	3.46	51217.
										(452.)(364.)(88.)(1450.3C)			

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	2408.	1638.	528.	256.	51174.
CMS	68.	46.	15.	7.	1449.
INCHES		11.04	14.25	14.37	14.37
MM		280.42	361.93	365.07	365.07
AC-FT		812.	1048.	1057.	1057.
THOUS CU M		1002.	1293.	1304.	1304.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 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.	4.	5.	5.	6.	6.	6.	5.	5.	5.
4.	4.	3.	3.	3.	3.	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.
1.	2.	3.	6.	9.	12.	16.	21.	25.	3C.
33.	36.	39.	41.	44.	45.	47.	48.	49.	51.
51.	52.	53.	53.	55.	61.	72.	88.	112.	141.
176.	214.	254.	294.	333.	372.	409.	448.	501.	577.
665.	757.	846.	923.	979.	1009.	1011.	963.	936.	885.
830.	771.	708.	642.	575.	509.	446.	389.	339.	296.
258.	225.	197.	172.	150.	132.	115.	101.	88.	77.
68.	60.	52.	46.	40.	35.	31.	27.	23.	2C.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME

CFS	1011.	608.	222.	107.	21443.
CMS	29.	17.	6.	3.	609.
INCHES		4.64	5.98	6.04	6.04
MM		117.78	152.01	153.33	153.33
AC-FT		341.	440.	444.	444.
THOUS CU M		421.	543.	548.	548.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 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.	1.	2.	2.	2.	3.
4.	5.	6.	6.	7.	7.	7.	6.	6.	6.
5.	5.	4.	4.	3.	3.	3.	3.	3.	2.
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.
2.	2.	4.	7.	10.	15.	20.	25.	30.	35.
40.	43.	47.	49.	52.	54.	56.	58.	59.	60.
61.	62.	63.	64.	66.	73.	86.	105.	133.	168.
209.	255.	302.	350.	397.	442.	487.	533.	597.	687.
791.	901.	1007.	1099.	1165.	1201.	1204.	1170.	1115.	1054.
989.	918.	843.	764.	685.	606.	531.	463.	404.	352.
307.	268.	234.	205.	179.	157.	137.	120.	105.	92.
81.	71.	62.	55.	48.	42.	37.	32.	27.	24.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1204.	819.	264.	128.	25567.
CMS	34.	23.	7.	4.	725.
INCHES		5.52	7.12	7.19	7.19
MM		140.21	180.96	182.54	182.54
AC-FT		406.	524.	529.	529.
THOUS CU M		501.	646.	652.	652.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 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.	3.	3.	3.	4.	5.	6.
8.	10.	12.	13.	14.	14.	14.	13.	12.	11.
10.	9.	8.	8.	7.	6.	6.	6.	5.	5.
5.	4.	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.	3.	3.
3.	5.	8.	13.	20.	29.	39.	50.	61.	70.
77.	87.	93.	99.	104.	108.	112.	115.	118.	120.
127.	124.	126.	127.	132.	145.	171.	211.	266.	336.
419.	509.	605.	701.	794.	885.	974.	1066.	1194.	1373.
1503.	1882.	2015.	2199.	2330.	2402.	2408.	2341.	2230.	2108.
1977.	1837.	1686.	1529.	1369.	1212.	1062.	926.	808.	709.
615.	537.	469.	410.	358.	314.	275.	241.	211.	184.
162.	142.	124.	109.	96.	84.	73.	64.	55.	47.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	2408.	1638.	528.	256.	51174.
CMS	68.	46.	15.	7.	1449.
INCHES		11.04	14.25	14.37	14.37
MM		280.42	361.93	365.07	365.07

THOUS CU M	1002.	1293.	1304.	1304.	

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HYDROGRAPH ROUTING

ROUTED HYDROGRAPH AT DAM NO BREACH

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
1	1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	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.	-657.	-1

STAGE	657.29	658.20	659.00
FLOW	0.	60.00	338.00
SURFACE AREA=	0.	166.	187.
CAPACITY=	0.	874.	1182.
ELEVATION=	642.	657.	659.

CREL	SPWID	COQW	EXPW	ELEVL	CCCL	CAREA	EXPL
657.3	0.	0.	0.	0.	0.	0.	0.

DAM DATA

TOPEL	COQD	EXPD	DAMWIC
659.0	3.0	1.5	672.

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.	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.
2.	2.	3.	3.	3.	4.	4.	4.	5.	5.
5.	6.	6.	6.	7.	7.	8.	8.	9.	10.
11.	12.	14.	16.	18.	21.	24.	27.	30.	34.
38.	43.	49.	55.	70.	106.	142.	175.	205.	233.
257.	277.	295.	309.	320.	329.	334.	337.	338.	337.
335.	332.	327.	322.	316.	309.	302.	295.	288.	280.
272.	264.	256.	248.	241.	233.	225.	218.	210.	203.

STORAGE

874.	874.	874.	874.	874.	874.	874.	874.	874.	874.
874.	874.	874.	874.	874.	874.	874.	874.	874.	874.

874.	874.	874.	875.	875.	875.	875.	875.	875.	875.
875.	875.	875.	875.	875.	875.	875.	875.	875.	875.
875.	875.	875.	875.	875.	875.	875.	875.	875.	875.
875.	875.	875.	875.	875.	875.	876.	876.	876.	876.
876.	876.	876.	876.	876.	876.	876.	876.	876.	876.
876.	876.	876.	876.	876.	876.	876.	876.	876.	876.
876.	876.	876.	876.	876.	876.	876.	876.	876.	876.
875.	875.	876.	876.	876.	876.	876.	876.	876.	876.
876.	876.	877.	877.	877.	877.	877.	878.	878.	879.
879.	880.	881.	881.	882.	883.	884.	885.	886.	887.
884.	888.	889.	890.	891.	892.	894.	895.	897.	899.
903.	906.	911.	916.	922.	929.	937.	945.	954.	965.
977.	991.	1006.	1023.	1042.	1060.	1079.	1096.	1112.	1126.
1137.	1150.	1159.	1167.	1173.	1177.	1180.	1182.	1182.	1182.
1181.	1179.	1177.	1174.	1170.	1167.	1163.	1159.	1155.	1151.
1147.	1143.	1139.	1135.	1130.	1126.	1122.	1118.	1115.	1111.

STAGE

657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3
657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3
657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3
657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3
657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3
657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3
657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3
657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3
657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3
657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3
657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3
657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3
657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3
657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3
657.3	657.3	657.3	657.4	657.4	657.4	657.4	657.4	657.4	657.4
657.4	657.4	657.5	657.5	657.5	657.6	657.6	657.7	657.7	657.8
657.9	657.9	658.0	658.1	658.2	658.3	658.4	658.5	658.6	658.7
658.8	658.8	658.9	658.9	658.9	659.0	659.0	659.0	659.0	659.0
659.0	659.0	659.0	659.0	658.9	658.9	658.9	658.9	658.9	658.8
658.8	658.8	658.8	658.7	658.7	658.7	658.7	658.7	658.6	658.6

PEAK OUTFLOW IS 338. AT TIME 44.75 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	338.	303.	104.	50.	10019.
CMS	10.	9.	3.	1.	284.
INCHES		2.04	2.80	2.81	2.81
MM		51.08	71.12	71.47	71.47
AC-FT		150.	206.	207.	207.
THOUS CU M		185.	254.	255.	255.

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.	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.	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.
2.	3.	3.	3.	4.	4.	5.	5.	5.	6.
6.	7.	7.	8.	8.	8.	9.	10.	11.	12.
13.	15.	17.	19.	22.	25.	28.	32.	36.	40.
46.	51.	58.	89.	130.	171.	211.	249.	283.	313.
341.	400.	463.	514.	547.	563.	564.	553.	534.	509.
483.	455.	427.	402.	378.	357.	341.	332.	324.	316.
307.	298.	290.	281.	272.	264.	255.	247.	239.	230.

STORAGE

874.	874.	874.	874.	874.	874.	874.	874.	874.	874.
874.	874.	874.	874.	874.	874.	874.	874.	874.	874.
874.	874.	874.	874.	874.	874.	874.	874.	874.	874.
874.	874.	874.	874.	874.	875.	875.	875.	875.	875.
875.	875.	875.	875.	875.	875.	875.	875.	875.	875.
875.	875.	875.	875.	875.	875.	875.	875.	875.	875.
875.	875.	875.	875.	875.	875.	875.	875.	875.	875.
875.	875.	875.	876.	876.	876.	876.	876.	876.	876.
876.	876.	876.	877.	877.	877.	877.	877.	877.	877.
877.	877.	877.	877.	877.	877.	877.	877.	877.	877.
877.	877.	877.	877.	877.	877.	877.	877.	877.	877.
877.	877.	877.	877.	877.	877.	877.	877.	877.	877.
877.	877.	877.	877.	877.	878.	878.	878.	879.	879.
880.	881.	882.	883.	884.	885.	886.	887.	888.	889.
890.	891.	892.	894.	895.	896.	898.	899.	902.	904.
909.	913.	918.	924.	932.	940.	949.	959.	970.	982.
997.	1013.	1032.	1052.	1073.	1094.	1115.	1135.	1153.	1169.
1183.	1196.	1205.	1211.	1215.	1217.	1217.	1216.	1214.	1211.
1207.	1204.	1200.	1196.	1192.	1188.	1183.	1179.	1175.	1170.
1166.	1161.	1156.	1152.	1147.	1143.	1138.	1134.	1129.	1125.

STAGE

657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3
657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3
657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3
657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.2
657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3
657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3
657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3
657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3
657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3
657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3
657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3
657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3
657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3
657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3
657.3	657.4	657.4	657.4	657.4	657.4	657.4	657.4	657.4	657.4
657.5	657.5	657.5	657.6	657.6	657.6	657.7	657.8	657.8	657.9
658.0	658.1	658.2	658.3	658.4	658.5	658.6	658.7	658.8	658.9
659.0	659.1	659.1	659.2	659.2	659.2	659.2	659.2	659.2	659.2
659.1	659.1	659.1	659.1	659.1	659.0	659.0	659.0	659.0	658.9
658.9	658.9	658.9	658.8	658.8	658.8	658.8	658.7	658.7	658.7

PEAK OUTFLOW IS 564. AT TIME 44.25 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	564.	417.	139.	67.	13441.
CMS	16.	12.	4.	2.	381.
INCHES		2.81	3.76	3.78	3.78
MM		71.40	95.47	95.89	95.89
AC-FT		207.	276.	278.	278.
THOUS CU M		255.	341.	343.	343.

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 0.42	RATIO 2 0.50	RATIO 3 1.00
HYDROGRAPH AT	1	1.38 (0.30E 19)	1	1011. 28.64)(	1204. 34.09)(	2408. 68.18)(
ROUTED TO	1	1.38 (0.30E 19)	1	338. 9.58)(	564. 15.90)(	1970. 55.79)(
ROUTED TO	1000	1.38 (0.23E 18)	1	338. 9.58)(	564. 15.97)(	1970. 55.79)(
ROUTED TO	1100	1.38 (0.23E 18)	1	338. 9.58)(	564. 15.98)(	1969. 55.76)(
ROUTED TO	1600	1.38 (0.23E 18)	1	338. 9.58)(	564. 15.98)(	1969. 55.76)(

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	657.25	657.25	659.00
STORAGE	874.	874.	1182.
OUTFLOW	0.	0.	338.

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
0.42	659.00	0.00	1182.	338.	0.25	44.75	0.
0.50	659.19	0.19	1217.	564.	4.25	44.25	0.
1.00	659.77	0.77	1330.	1970.	7.50	42.75	0.

PLAN 1 STATION 10CC

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
0.42	338.	639.4	44.75
0.50	564.	639.7	44.25
1.00	1970.	640.8	42.75

PLAN 1 STATION 11CC

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
0.42	338.	650.4	44.75
0.50	564.	651.4	44.25
1.00	1969.	654.2	42.75

PLAN 1 STATION 16CC

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
0.42	338.	617.5	44.75
0.50	564.	619.2	44.25
1.00	1969.	620.6	42.75

```
**********************************                    **********************************
FLOOD HYDROGRAPH PACKAGE (HEC-1)                       NEW YORK STATE
DAM SAFETY VERSION      JULY 1978                      DEPT OF ENVIRONMENTAL CONSERVATION
 LAST MODIFICATION  26 FEB 79                          FLOOD PROTECTION BUREAU
  MODIFIED FOR HONEYWELL APR 79
**********************************                    **********************************
A1 LAKE ADIRONDACK DAM
A PMF WITH RATIOS - ANALYSIS
A3 DATE
B     200       0      15       0       0       0       0       0       0       0
B1      5
J       1       3       1
J1    .43      .5     1.0
K       0       1                                       1
K1                            INFLOW HYDROGRAPH
M       1       0    1.38                    .716                       1
P       0    17.5     111     123     132     142
T                                                       1      .1
V     2.3     1.8
X     2.8     2.8       1
K       1       1                                       1
K1 ROUTED HYDROGRAPH AT DAM  NO BREACH
Y                               1       1
Y1      1                                       -657.25      -1
Y4657.25   658.2     659
Y5      0      60     338
$A      0   166.4   186.6
$E  641.5  657.25   659.0
$$657.25
$D    659     3.0     1.5     672
$B     20       0   644.5      .5  657.25   659.1
K       1    1000                                       1
K1  LOCATION TOE OF DAM
Y                               1       1
Y1      1
Y6    .05     .05     .05     639     662      20     .99
Y7      0     662     125     650     240     642     240     639     265     639
```

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32          Y7   265     642     450     650     580     660
33          K      1    1100
34          K1 L'CATION  ROUTE  28
35          Y                              1       1
36          Y1     1
37          Y6  .05     .05     .05    638,9     662     100    .CC1
38          Y7     0     670      60     658     235     648     235   638,9     242   638,9
39          Y7   243     648     345     652    1300     670
40          K      1    1600
41          K1  LOCATION  SEWAGE PLANT
42          Y                              1       1
43          Y1     1
44          Y6  .05     .05     .05     615     700     500    .064
45          Y7     0     700     690     660    1450     620    145C     615    1460     615
46          Y7  1460     620    1950     640    2200     680
47          K     99
48          A
49          A
50          A
51          A
52          A
```

STATION 1, PLAN 1, RATIO 3

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.	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.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	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.	4.	4.
5.	6.	6.	7.	8.	8.	9.	10.	11.	12.
12.	13.	14.	15.	16.	17.	18.	19.	21.	23.
26.	29.	33.	38.	43.	49.	55.	74.	115.	161.
212.	262.	331.	531.	850.	1182.	1478.	1707.	1860.	1943.
1970.	1953.	1901.	1922.	1724.	1611.	1491.	1369.	1248.	1134.
1023.	931.	842.	762.	690.	627.	570.	520.	476.	437.
404.	375.	352.	337.	328.	319.	310.	301.	292.	283.

STORAGE

874.	874.	874.	874.	874.	874.	874.	874.	874.	874.
874.	874.	874.	874.	874.	874.	875.	875.	875.	875.
875.	875.	875.	875.	875.	875.	875.	875.	875.	875.
875.	875.	875.	875.	875.	875.	875.	875.	876.	876.
876.	876.	876.	876.	876.	876.	876.	876.	876.	876.
876.	876.	876.	876.	876.	876.	876.	876.	876.	876.
876.	876.	876.	877.	877.	877.	877.	877.	877.	877.
877.	877.	877.	878.	878.	878.	878.	879.	879.	879.
879.	879.	879.	880.	880.	880.	880.	880.	880.	880.
880.	880.	880.	880.	880.	880.	880.	880.	880.	880.
880.	880.	880.	880.	880.	880.	880.	880.	880.	880.
880.	880.	880.	880.	880.	880.	880.	880.	880.	880.
880.	880.	881.	881.	881.	881.	882.	883.	884.	885.
887.	888.	890.	892.	894.	896.	898.	900.	902.	904.
907.	909.	911.	914.	916.	919.	921.	925.	929.	935.
942.	952.	962.	975.	990.	1006.	1024.	1044.	1065.	1085.
1116.	1146.	1179.	1213.	1246.	1274.	1296.	1312.	1322.	1328.
1330.	1329.	1325.	1320.	1313.	1306.	1297.	1288.	1279.	1270.
1261.	1253.	1245.	1238.	1231.	1224.	1216.	1212.	1206.	1201.
1196.	1191.	1186.	1182.	1177.	1172.	1168.	1163.	1158.	1153.

STAGE

657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3
657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3
657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3
657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3
657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3
657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3
657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3
657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3
657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3
657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3
657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3
657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3
657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3	657.3
657.3	657.3	657.3	657.4	657.4	657.4	657.4	657.4	657.4	657.4
657.4	657.5	657.5	657.5	657.5	657.5	657.5	657.6	657.6	657.6
657.7	657.7	657.8	657.8	657.9	658.0	658.1	658.2	658.4	658.5
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

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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 0.43	RATIO 2 0.50	RATIO 3 1.00
HYDROGRAPH AT	1	1.38 (0.30E 19)	1	1035. (29.32)(	1204. (34.09)(	2408. (68.18)(
ROUTED TO	1	1.38 (0.30E 19)	1	359. (10.18)(	3665. (103.77)(	4084. (115.65)(
ROUTED TO	1000	1.38 (0.23E 18)	1	359. (10.18)(	3665. (103.77)(	4084. (115.64)(
ROUTED TO	1100	1.38 (0.23E 18)	1	359. (10.17)(	3608. (102.18)(	4035. (114.24)(
ROUTED TO	1600	1.38 (0.23E 18)	1	359. (10.17)(	3583. (101.45)(	3954. (111.96)(

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 ....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	657.25	657.25	659.00
STORAGE	874.	874.	1182.
OUTFLOW	0.	0.	338.

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
0.43	659.03	0.03	1188.	359.	1.75	44.75	0.
0.50	659.13	0.13	1207.	3665.	1.15	43.75	43.25
1.00	659.29	0.29	1236.	4084.	1.00	41.50	41.00

PLAN 1 STATION 1000

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
0.43	359.	639.5	44.75
0.50	3665.	641.8	43.75
1.00	4084.	642.?	41.50

PLAN 1 STATION 1100

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
0.43	359.	650.5	44.75
0.50	3608.	655.9	43.75
1.00	4039.	656.2	41.50

PLAN 1 STATION 1600

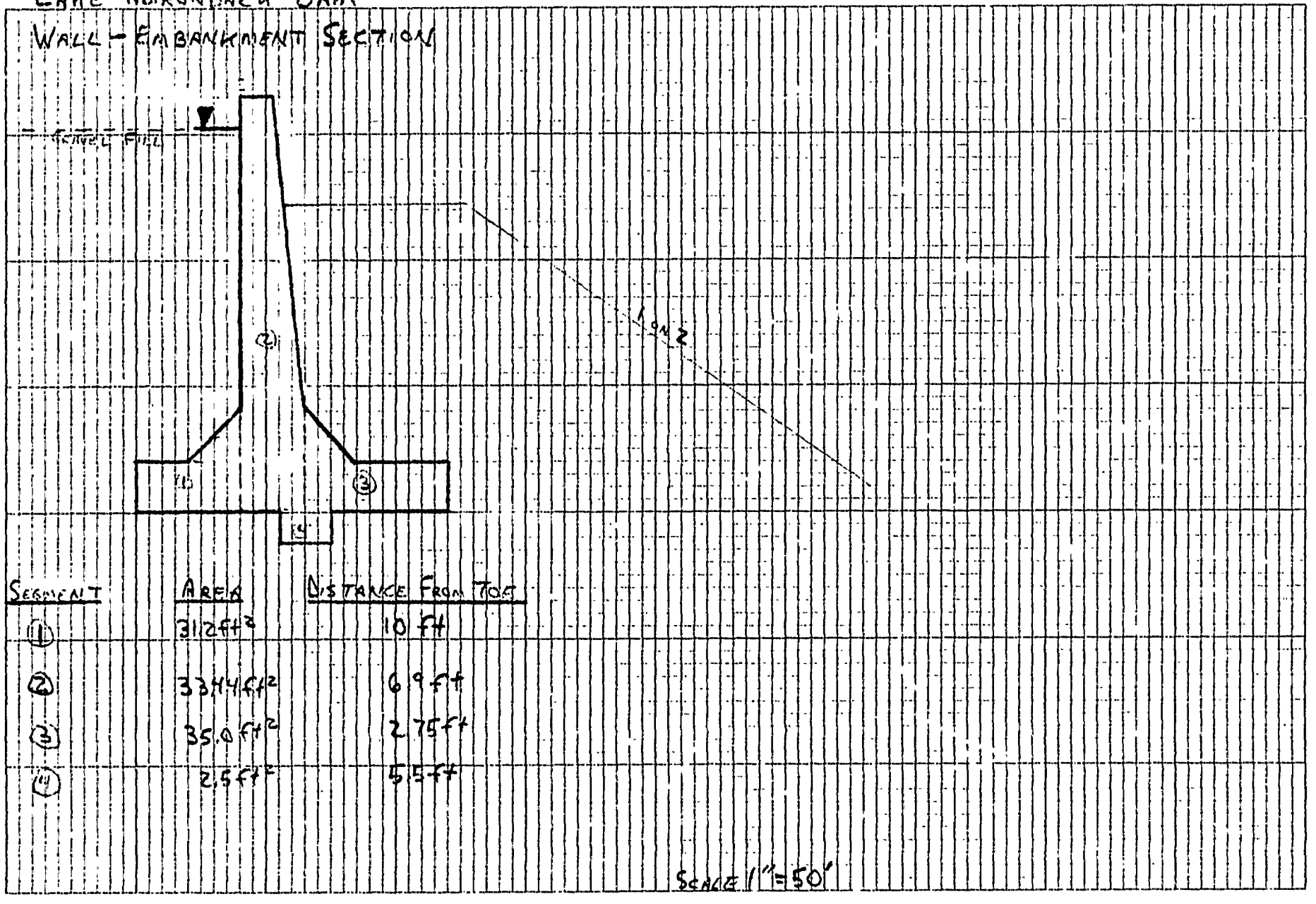
RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
0.43	359.	617.7	44.75
0.50	3583.	622.0	44.00
1.00	3954.	622.3	41.50

APPENDIX D

STABILITY COMPUTATIONS

LAKE ADIRONDACK DAM

WALL - EMBANKMENT SECTION

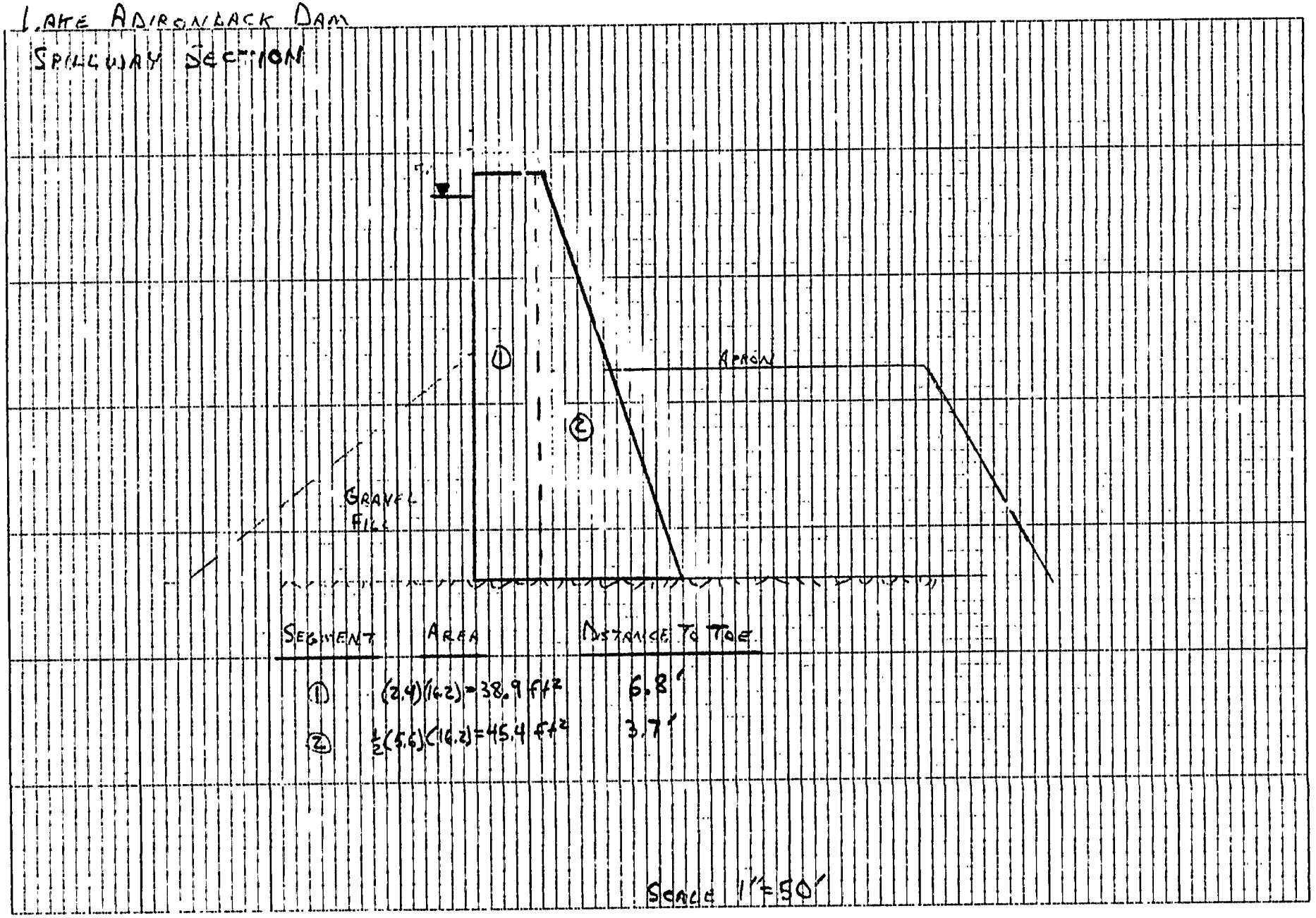


SEGMENT	AREA	DISTANCE FROM TOE
(1)	312 ft²	10 ft
(2)	334 ft²	6.9 ft
(3)	35.0 ft²	2.75 ft
(4)	2.5 ft²	5.5 ft

SCALE 1" = 50'

LAKE ADIRONDACK DAM

SPILLWAY SECTION



SEGMENT	AREA	DISTANCE TO TOE
1	$(2.4)(16.2) = 38.9\ ft^2$	6.8'
2	$\frac{1}{2}(5.6)(16.2) = 45.4\ ft^2$	3.7'

SCALE 1" = 50'

INPUT TO STABILITY ANALYSIS PROGRAM

INPUT ENTRY	PROGRAM No.
Unit Weight of Dam (K/ft^3)	0
Area of Segment No. 1 (ft^2)	1
Distance from Center of Gravity of Segment No. 1 to Downstream Toe (ft)	2
Area of Segment No. 2 (ft^2)	3
Distance from Center of Gravity of Segment No. 2 to Downstream Toe (ft)	4
Area of Segment No. 3 (ft^2)	5
Distance from Center of Gravity of Segment No. 3 to Downstream Tow (ft)	6
Base Width of Dam (Total) (ft)	7
Height of Dam (ft)	8
Ice Loading (K/L ft.)	9
Coefficient of Sliding	10
Unit Weight of Soil (K/ft^3)	11
Active Soil Coefficient - Ka	12
Passive Soil Coefficient - Kp	13
Height of Water over Top of Dam or Spillway (ft)	14
Height of Soil for Active Pressure (ft)	15
Height of Soil for Passive Pressure (ft)	16
Height of Water in Tailrace Channel (ft)	17
Weight of Water (K/ft^3)	18
Area of Segment No. 4 (ft^2)	19
Distance from Center of Gravity of Segment No. 4 to Downstream Toe (ft)	20
Height of Ice Load or Active Water (ft)	46

WALL SECTION
NORMAL LOADING

[illegible]	RCL 1
[illegible]	RCL 2
[illegible]	RCL 3
[illegible]	RCL 4
[illegible]	RCL 5
[illegible]	RCL 6
[illegible]	RCL 7
[illegible]	RCL 8
[illegible]	RCL 9
0.	RCL 10
0.6	RCL 11
0.06	RCL 12
0.3	RCL 13
3.3	RCL 14
0.	RCL 15
16.5	RCL 16
13.5	RCL 17
0.	RCL 18
0.0624	RCL 19
2.5	RCL 20
5.5	RCL 46
16.5	

F.S. VS. OVERTURNING

1.5[illegible]

[illegible]

F.S. - SLIDING

2.1[illegible]

WALL SECTION
ICE LOADING

0.15	RCL 1
31.2	RCL 2
10.	RCL 3
33.44	RCL 4
6.9	RCL 5
35.	RCL 6
2.75	RCL 7
12.	RCL 8
7.25	RCL 9
10.	RCL 10
0.6	RCL 11
0.06	RCL 12
0.3	RCL 13
3.3	RCL 14
0.	RCL 15
16.5	RCL 16
13.5	RCL 17
0.	RCL 18
0.0624	RCL 19
2.5	RCL 20
5.5	RCL 46
16.5	

.641[illegible]

-11.2[illegible]

1.1 5[illegible]

WALL SECTION ½ PMF		WALL SECTION PMF	
0.15	RCL 1	0.15	RCL 1
31.1 / 31.1	RCL 2	31.1 / 31.1	RCL 2
10. / 10.	RCL 3	10. / 10.	RCL 3
13.44 / 13.44	RCL 4	13.44 / 13.44	RCL 4
6.4 / 6.4	RCL 5	6.4 / 6.4	RCL 5
35. / 35.	RCL 6	35. / 35.	RCL 6
2.75 / 2.75	RCL 7	2.75 / 2.75	RCL 7
12. / 12.	RCL 8	12. / 12.	RCL 8
17.25 / 17.25	RCL 9	17.25 / 17.25	RCL 9
0. / 0.	RCL 10	0. / 0.	RCL 10
0.6 / 0.6	RCL 11	0.6 / 0.6	RCL 11
0.06 / 0.06	RCL 12	0.06 / 0.06	RCL 12
0.3 / 0.3	RCL 13	0.3 / 0.3	RCL 13
3.3 / 3.3	RCL 14	3.3 / 3.3	RCL 14
1.43 / 1.43	RCL 15	2.08 / 2.08	RCL 15
16.5 / 16.5	RCL 16	16.5 / 16.5	RCL 16
0. / 0.	RCL 17	0. / 0.	RCL 17
0. / 0.	RCL 18	0. / 0.	RCL 18
0.0624 / 0.0624	RCL 19	0.0624 / 0.0624	RCL 19
2.5 / 2.5	RCL 20	2.5 / 2.5	RCL 20
5.5 / 5.5	RCL 46	5.5 / 5.5	RCL 46
16.5		16.5	

Handwritten note (½ PMF, beside RCL 16–17): No Passive [illegible] Due To Scour [illegible] Resulting From [illegible] Dam

Handwritten note (PMF, beside RCL 16): No Passive Due To [illegible] [illegible] [illegible] Dam

½ PMF		PMF
[illegible]	F.S. OVERTURNING	[illegible]
[illegible]		[illegible]
.424131658	F.S. SLIDING	[illegible]

SEISMIC ANALYSIS
WALL SECTION

10.	2
10.	RCL 3
33.44	
33.44	RCL 4
6.9	
6.9	RCL 5
35.	
35.	RCL 6
2.75	
2.75	RCL 7
12.	
12.	RCL 8
17.25	
17.25	RCL 9
0.	
0.	RCL 10
0.6	
0.6	RCL 11
0.06	
0.06	RCL 12
0.3	
0.3	RCL 13
3.3	
3.3	RCL 14
0.	
0.	RCL 15
16.5	
16.5	RCL 16
13.5	
13.5	RCL 17
0.	
0.	RCL 18
0.0624	
0.0624	RCL 19
2.5	
2.5	RCL 20
5.5	
5.5	RCL 46
16.5	
16.5	RCL 50
0.05	
1.57128062	
7.347454472	
2.134443485	

SEISMIC ANALYSIS

F.S. OVERTURNING 1.468184354

6.444825587

F.S. SLIDING 1.917688659

Spillway Section
Normal Loading

0.15	RCL 1
21.5 38.5	RCL 2
6.5 6.5	RCL 3
45.4 45.4	RCL 4
3.7 3.7	RCL 5
0. 0.	RCL 6
0. 0.	RCL 7
8. 8.	RCL 8
16.2 16.2	RCL 9
0. 0.	RCL 10
0.65 0.65	RCL 11
0.06 0.06	RCL 12
0.3 0.3	RCL 13
3. 3.	RCL 14
0. 0.	RCL 15
9. 9.	RCL 16
8. 8.	RCL 17
2. 2.	RCL 18
0.0624 0.0624	RCL 19
0. 0.	RCL 20
0. 0.	RCL 21
15.23	

Spillway Section
Ice Loading

0.15	RCL 1
38.5 38.5	RCL 2
6.5 6.5	RCL 3
45.4 45.4	RCL 4
3.7 3.7	RCL 5
0. 0.	RCL 6
0. 0.	RCL 7
8. 8.	RCL 8
16.2 16.2	RCL 9
10. 10.	RCL 10
0.65 0.65	RCL 11
0.06 0.06	RCL 12
0.3 0.3	RCL 13
3. 3.	RCL 14
0. 0.	RCL 15
9. 9.	RCL 16
8. 8.	RCL 17
2. 2.	RCL 18
0.0624 0.0624	RCL 19
0. 0.	RCL 20
0. 0.	RCL 21
.5	

1.24 F.S. OVERUERTURNING

1.98

1.39 F.S. SLIDING

.37

-16.8

.62003

Spillway Section
½ PMF

0.	RCL 1
[illegible]	RCL 2
[illegible]	RCL 3
45. [illegible]	RCL 4
[illegible]	RCL 5
[illegible]	RCL 6
[illegible]	RCL 7
[illegible]	RCL 8
16. [illegible]	RCL 9
[illegible]	RCL 10
0.65	RCL 11
0.06	RCL 12
0. [illegible]	RCL 13
[illegible]	RCL 14
[illegible]	RCL 15
[illegible]	RCL 16
[illegible]	RCL 17
[illegible]	RCL 18
0.06 [illegible]	RCL 19
[illegible]	RCL 20
[illegible]	RCL 46
15. [illegible]	

[illegible] F.S. OVERTURNING

[illegible]

1.116636509 F.S. SLIDING

Spillway Section
PMF

0. [illegible]	RCL 1
38. [illegible]	RCL 2
6. [illegible]	RCL 3
45. [illegible]	RCL 4
3. [illegible]	RCL 5
0. 0	RCL 6
0. 0	RCL 7
8. 8.	RCL 8
16. [illegible]	RCL 9
- 0. 0.	RCL 10
0.65 0.65	RCL 11
0.06 0.06	RCL 12
0. 3 0. 3	RCL 13
3. 3.	RCL 14
2.53 2.53	RCL 15
9. 9.	RCL 16
8. 8.	RCL 17
2. 2.	RCL 18
0.0624 0.0624	RCL 19
0. 0.	RCL 20
0. 0.	RCL 46
15.25	

.9405917263

[illegible]

1.052700283

SPILLWAY SECTION
SEISMIC ANALYSIS

38.9	
38.9	RCL 2
6.8	
6.8	RCL 3
45.4	
45.4	RCL 4
3.7	
3.7	RCL 5
0.	
0.	RCL 6
0.	
0.	RCL 7
8.	
8.	RCL 8
16.2	
16.2	RCL 9
0.	
0.	RCL 10
0.65	
0.65	RCL 11
0.05	
0.05	RCL 12
0.3	
0.3	RCL 13
3.	
3.	RCL 14
0.	
0.	RCL 15
9.	
9.	RCL 16
8.	
8.	RCL 17
2.	
2.	RCL 18
0.0624	
0.0624	RCL 19
0.	
0.	RCL 20
0.	
0.	RCL 46
15.25	
15.25	RCL 50
0.05	
1.24978196	
1.981223804	
1.396537486	
1.147997302	F.S. OVERTURNING
1.277967182	F.S. SLIDING

SEISMIC ANALYSIS

APPENDIX E

REFERENCES

APPENDIX E

REFERENCES

1) U.S. Department of Commerce; Weather Bureau; 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.

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

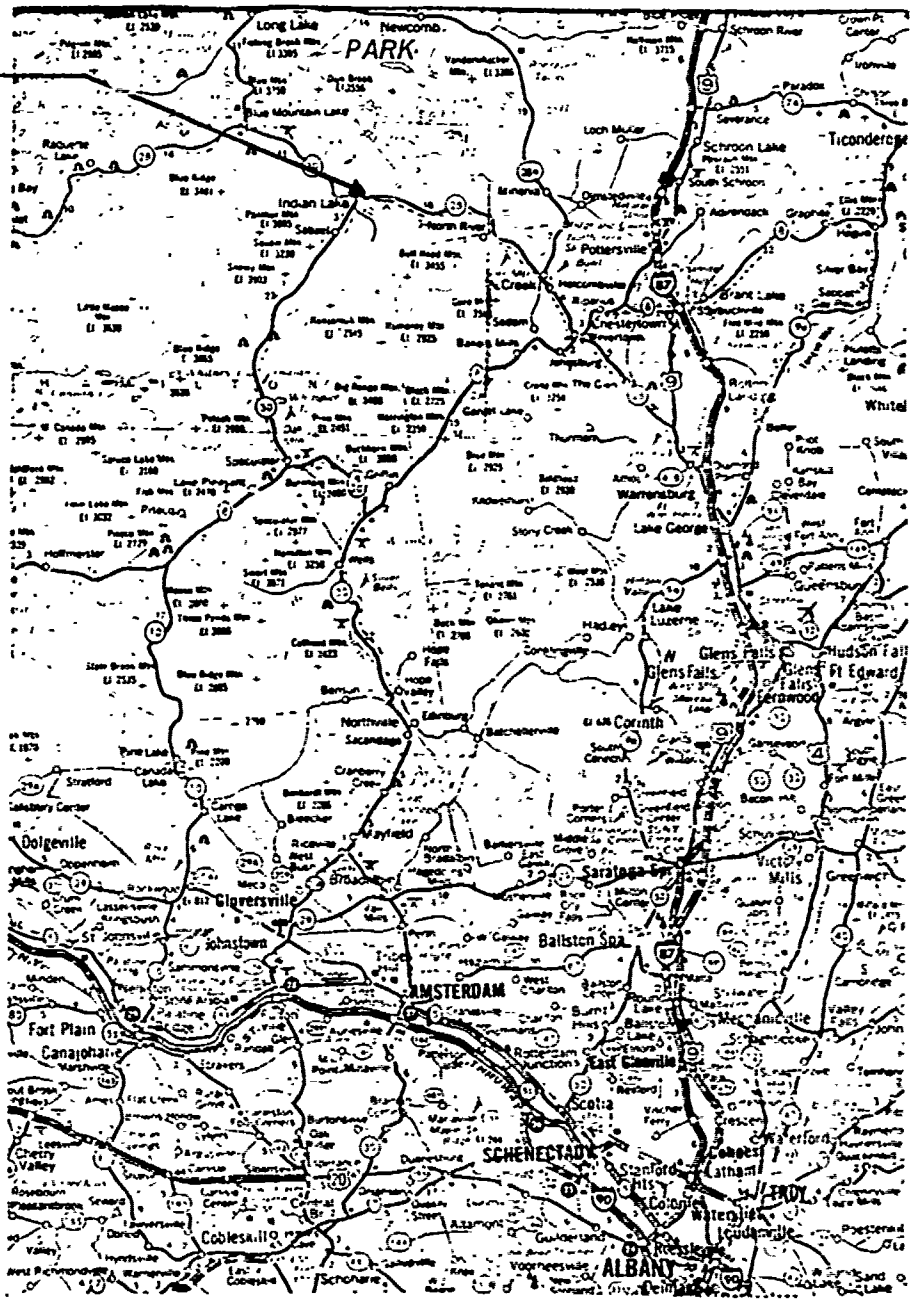
3) University of the State of New York, Geology of New York, Education Leaflet 20, Reprinted 1973.

4) Elwyn E. Seelye, Design, 3rd edition, John Wiley and Sons, Inc., 1960.

5) U.S. Department of the Interior, Bureau of Reclamations; Design of Small Dams, 2nd edition (rev. reprint), 1977.

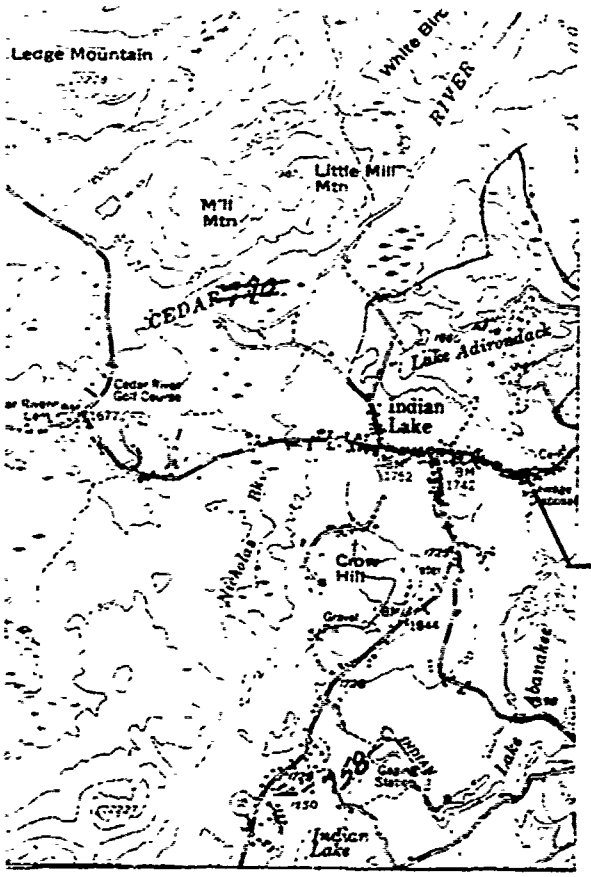
APPENDIX F

DRAWINGS



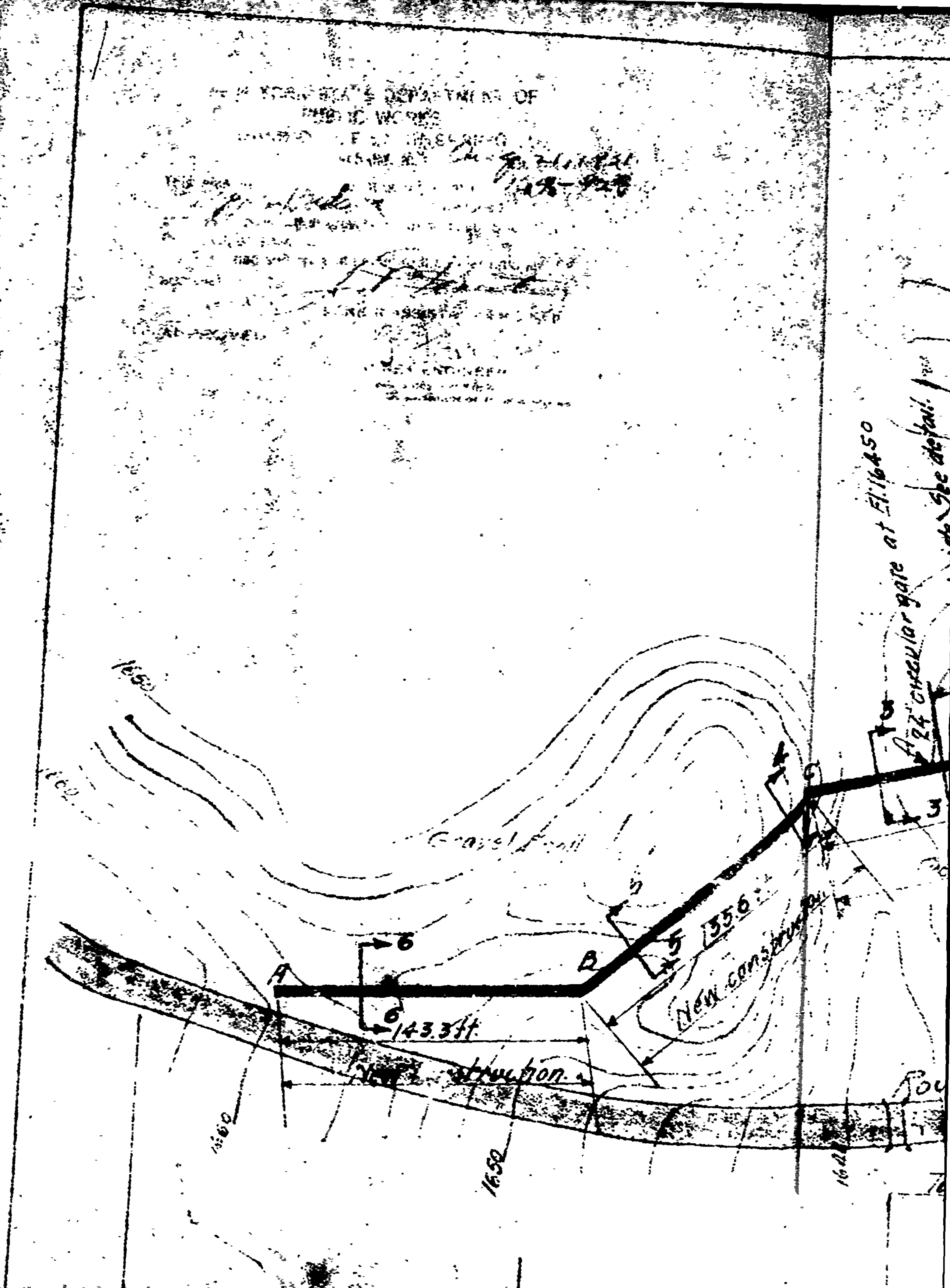
VICINITY MAP

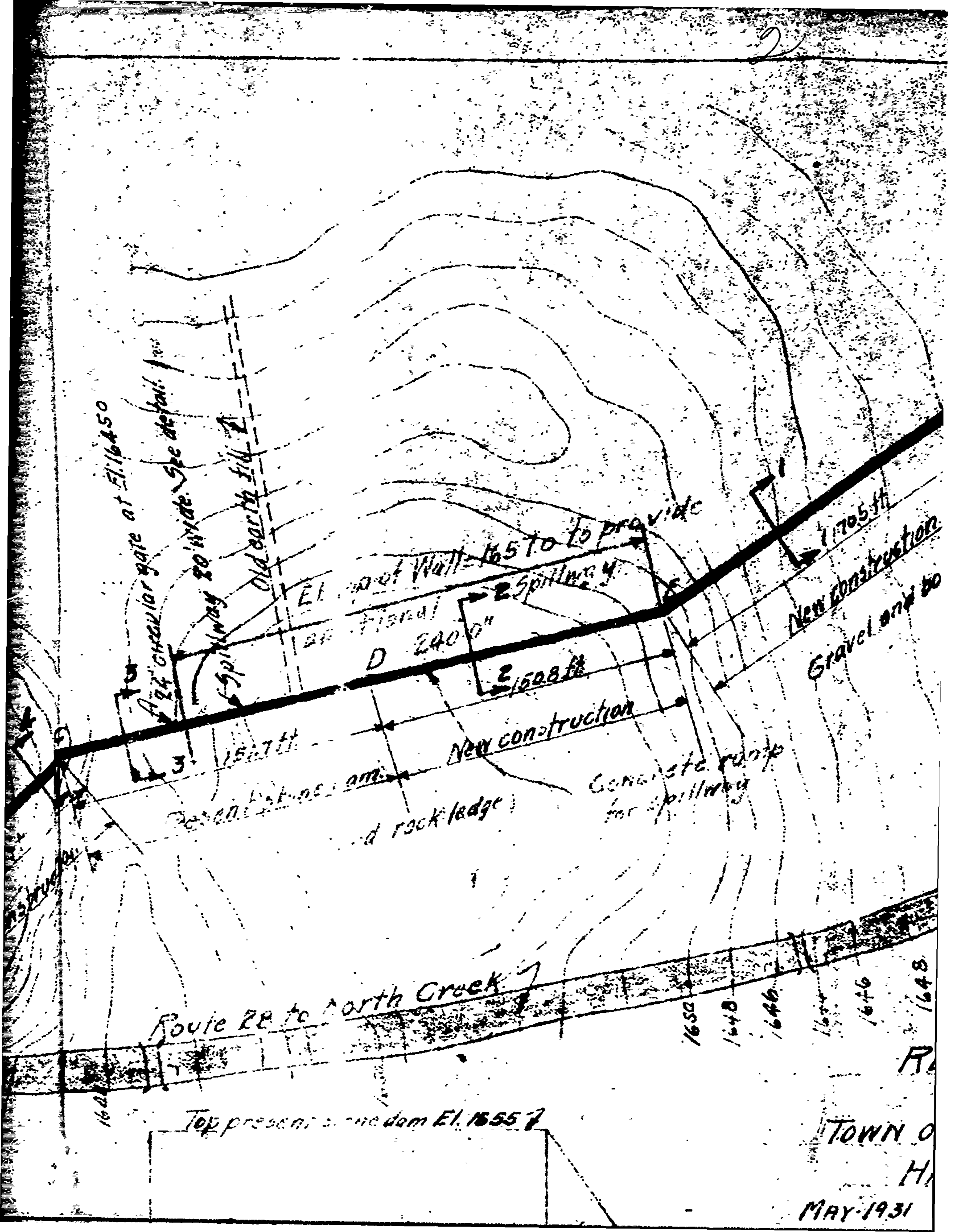
LAKE ADIRONDACK DAM
I.D. No. N.Y. 621

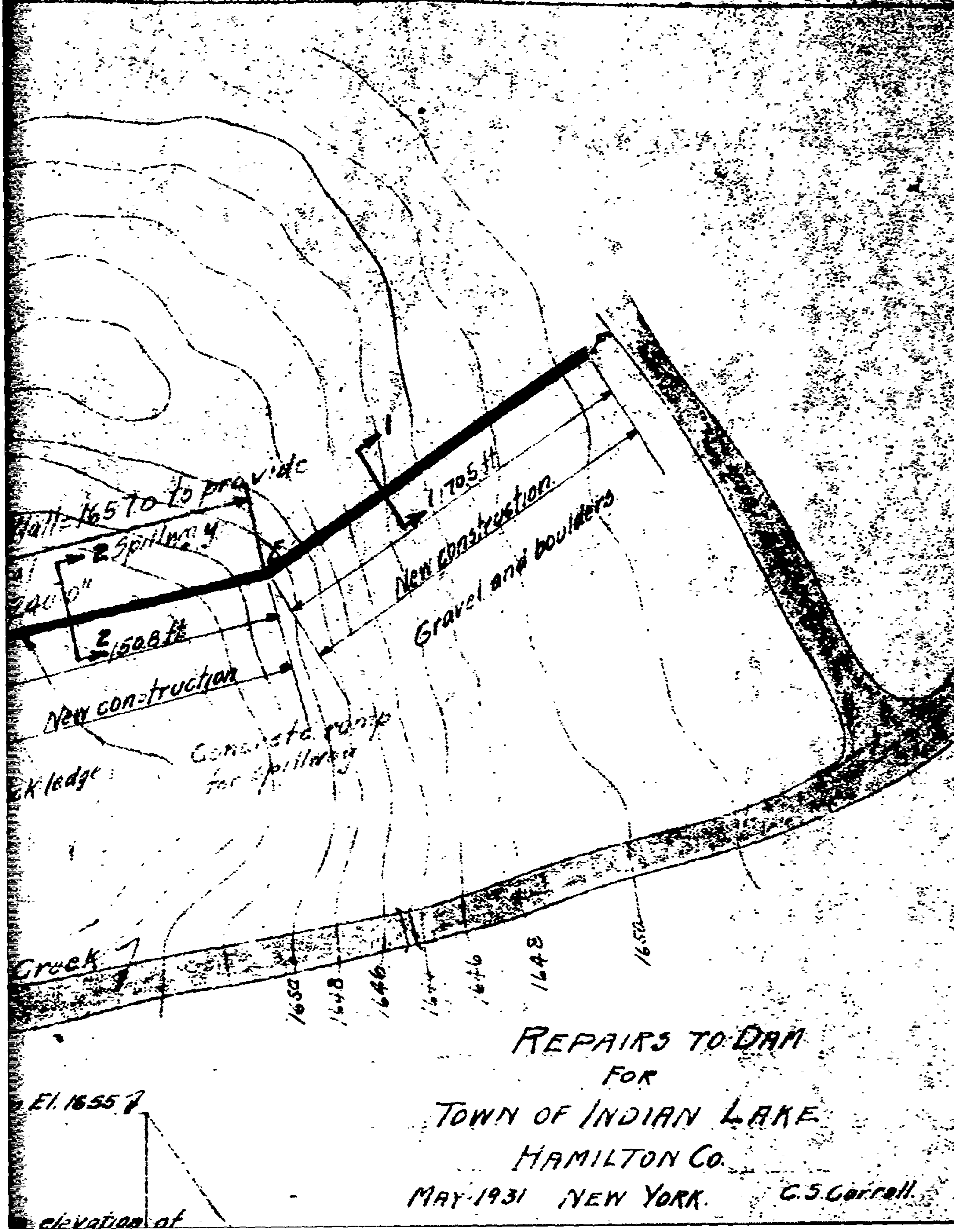


TOPOGRAPHIC MAP

LAKE ADIRONDACK DAM
I.D. NO. NY 621

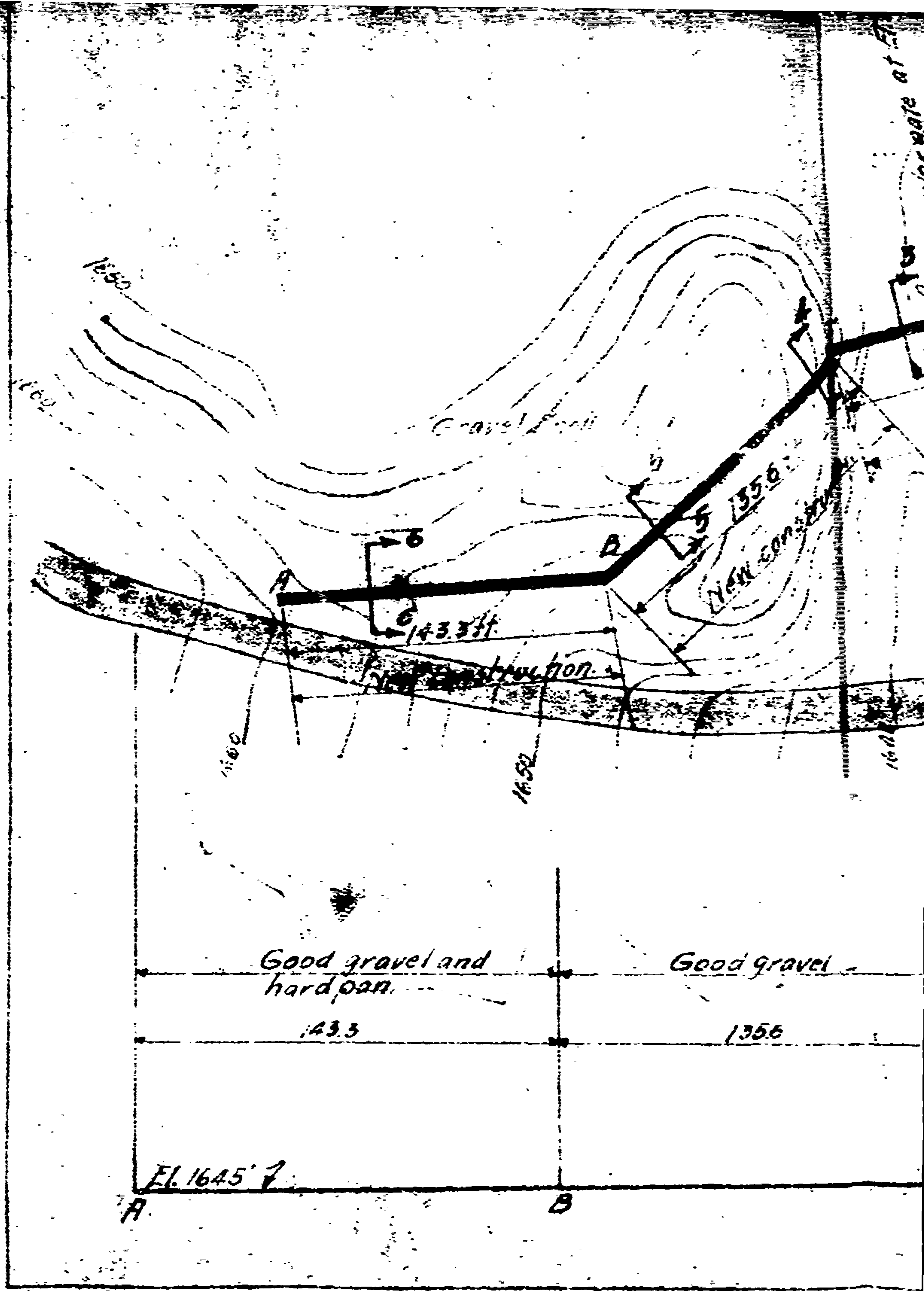

PUBLIC WORKS
A
B
C
143.3 ft.
356
New construction
24" circular gate at El. 1645.0
See detail
1650
1660
1640


2
24" circular gate at El. 1645.0
Spillway 20' wide See detail
Old earth fill
El. top of Wall 1651.0 to provide
2 Spillway
D 240.0"
1508 ft
1705 ft
New construction
Gravel and bo
1527 ft
New construction
rock ledge
Concrete ramp for spillway
Route 28 to North Creek
1650
1648
1646
1646
1648
Top present stone dam El. 1655.7
TOWN O
MAY-1931

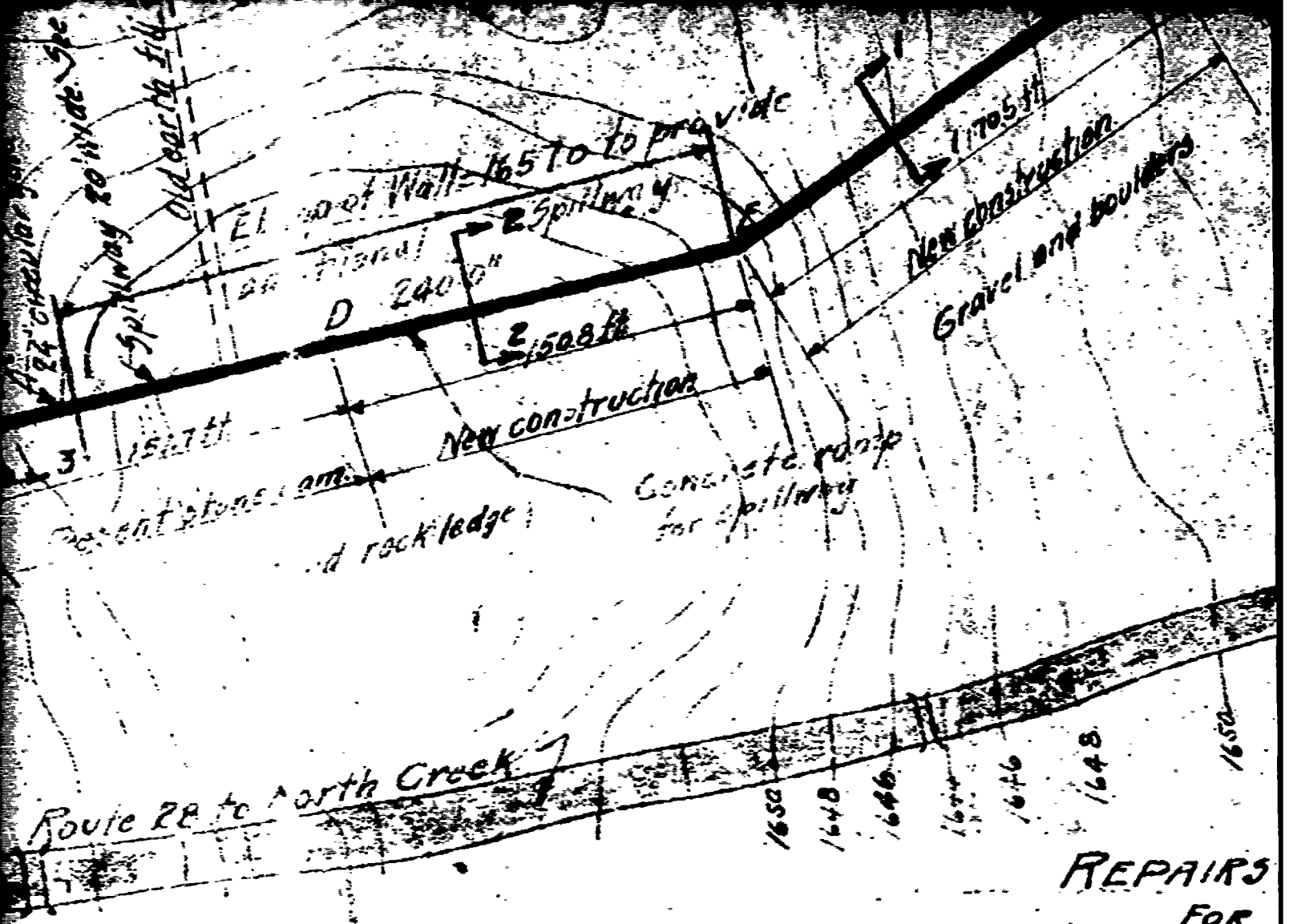


REPAIRS TO DAM
FOR
TOWN OF INDIAN LAKE
HAMILTON CO.
MAY 1931 NEW YORK.

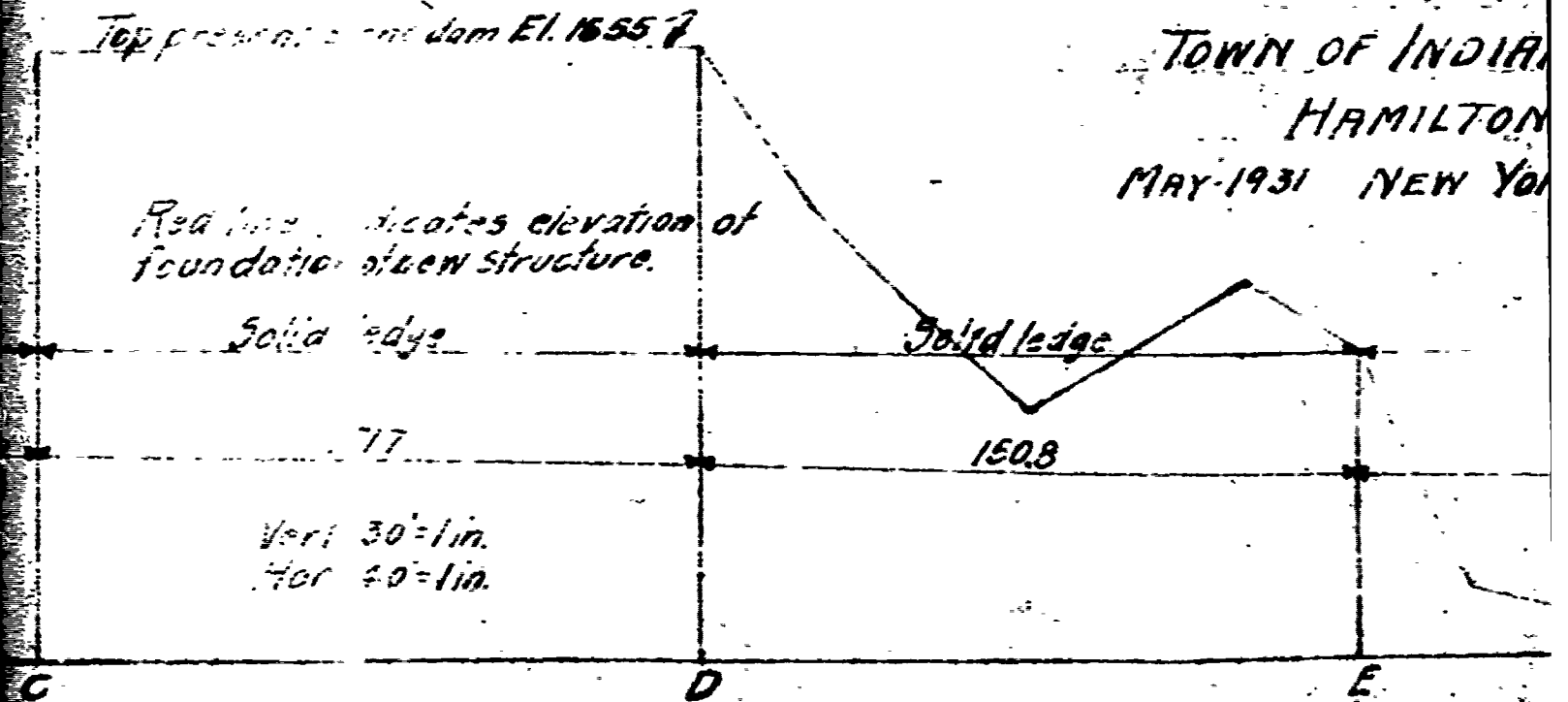
C.S. Carroll.



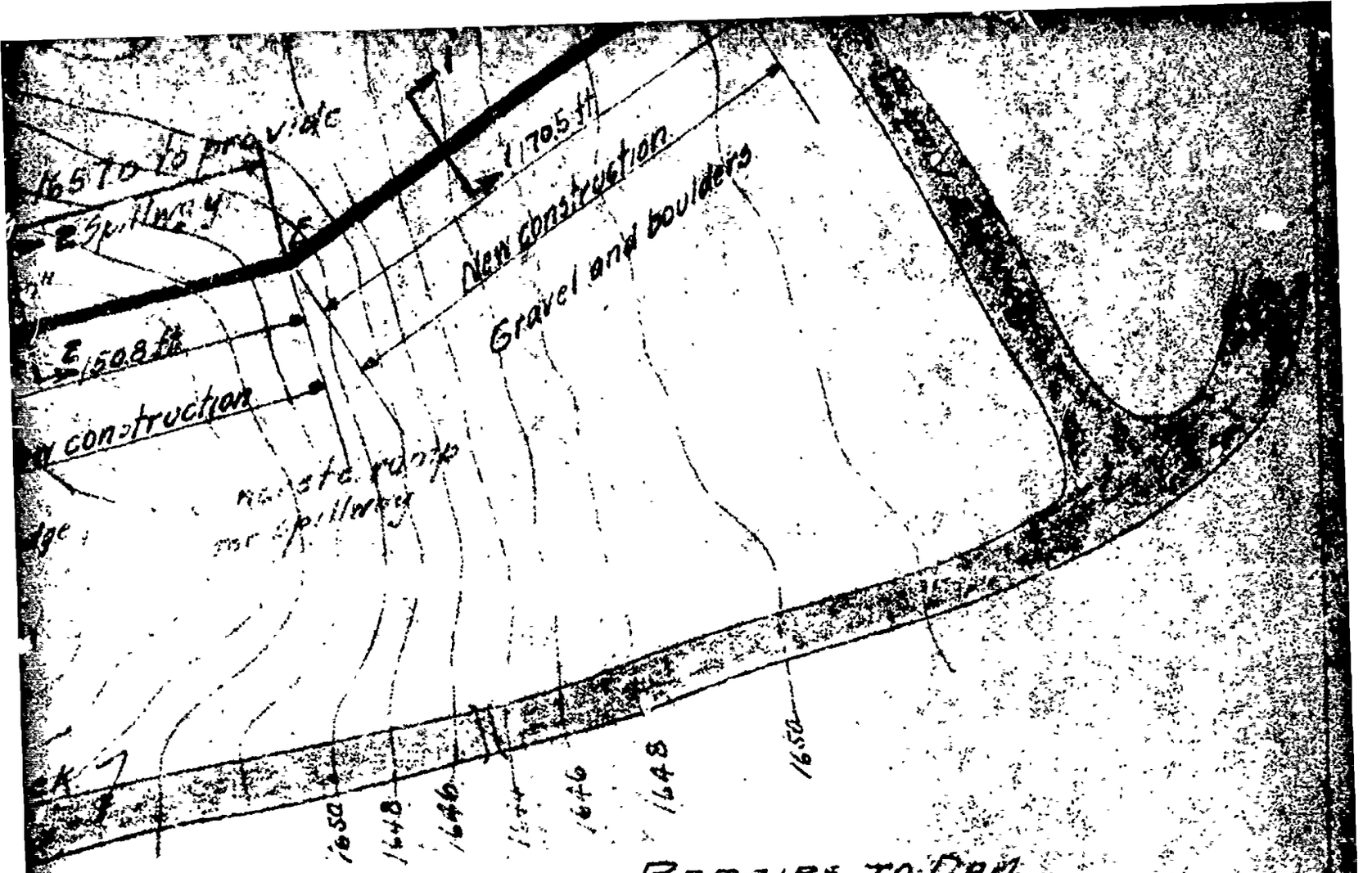
1650
1660
Gravel Fill
143.3 ft.
135.6
New construction
New construction
1660
1650
A
B
5
6
Good gravel and hard pan
Good gravel
143.3
135.6
El. 1645'
A
B



REPAIRS
FOR
TOWN OF INDIA
HAMILTON
MAY-1931 NEW YO

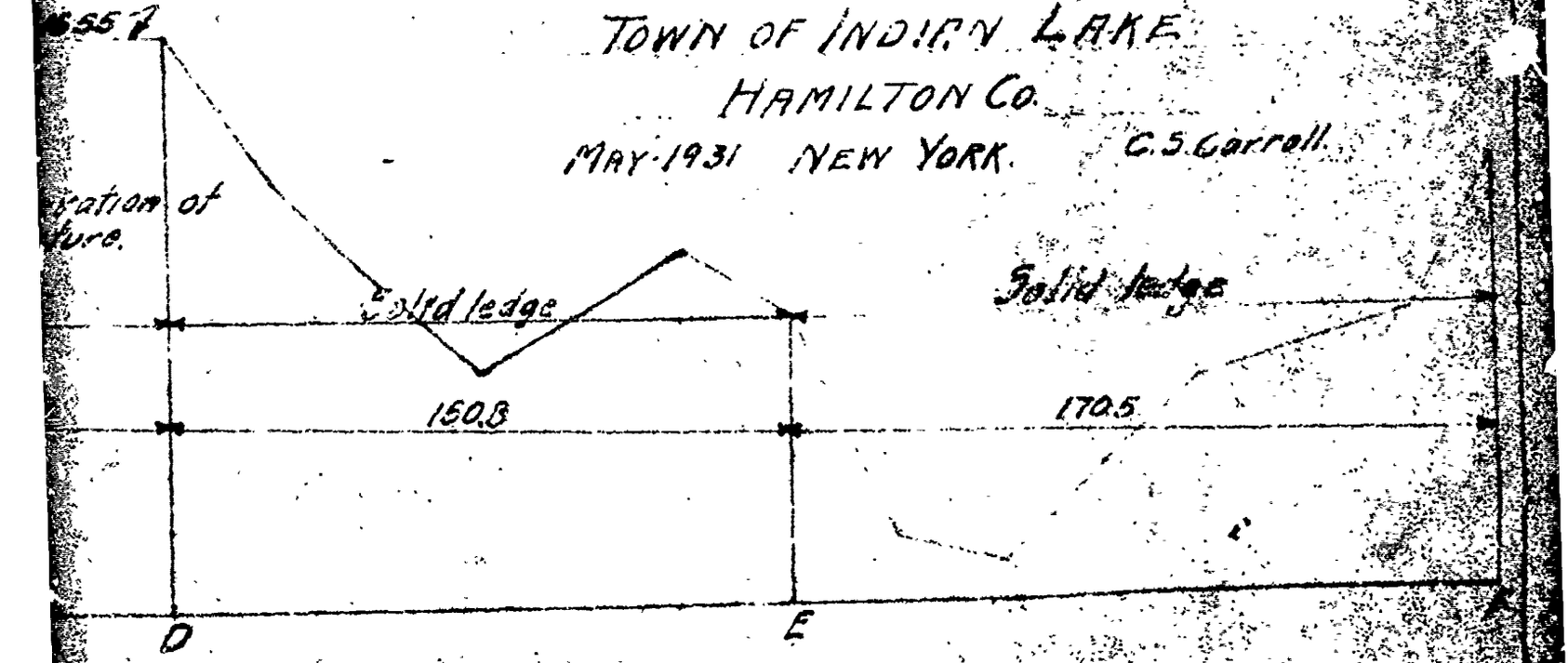


Note:- Present stone dam built in 1910 and in excellent condition.
Elevation top new structure is 1659 ft.



REPAIRS TO DAM
FOR
TOWN OF INDIAN LAKE
HAMILTON CO.
MAY-1931 NEW YORK.

C.S. Carroll.

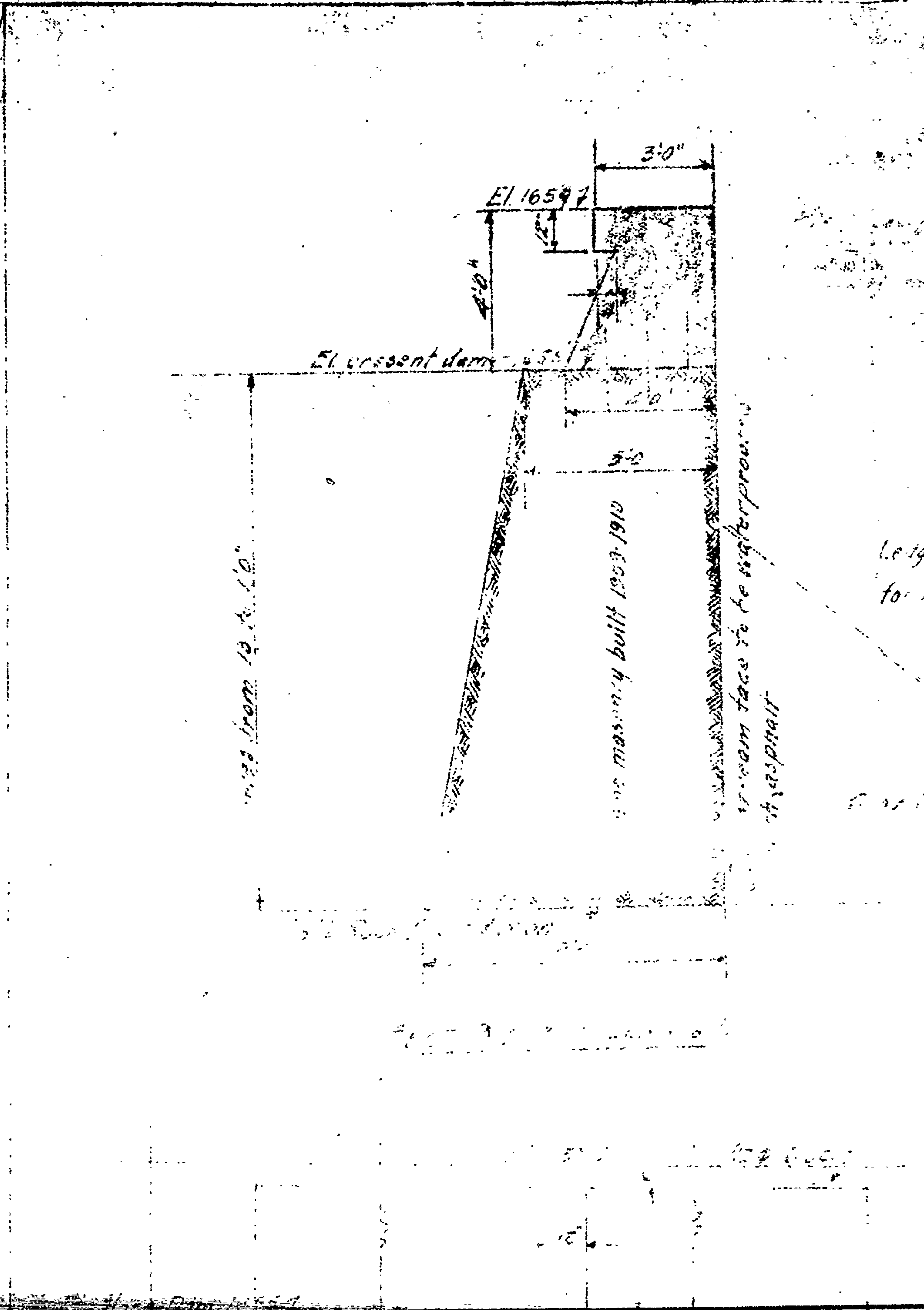


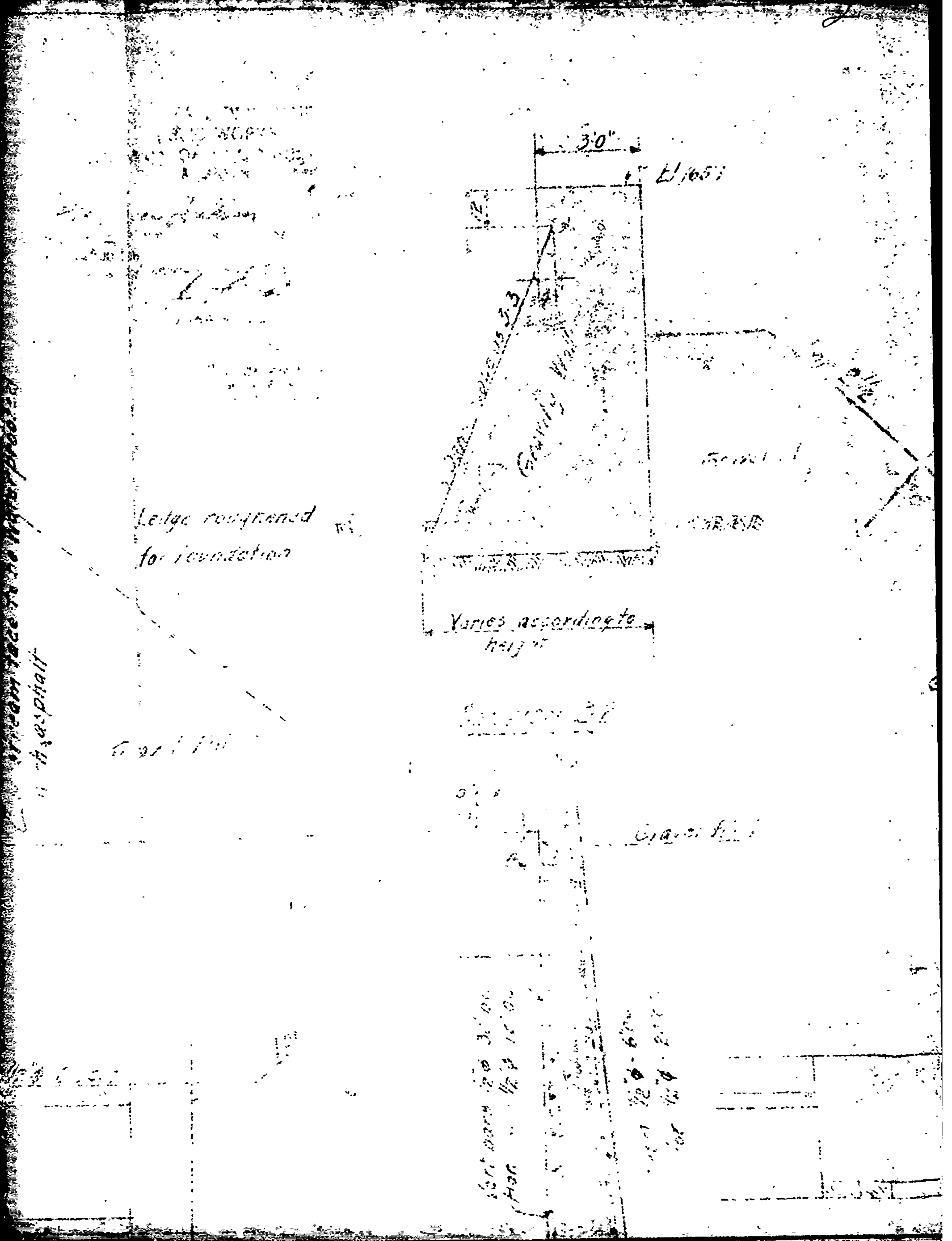
uilt in 10 and in excellent condition.
structure is 1659 ft.

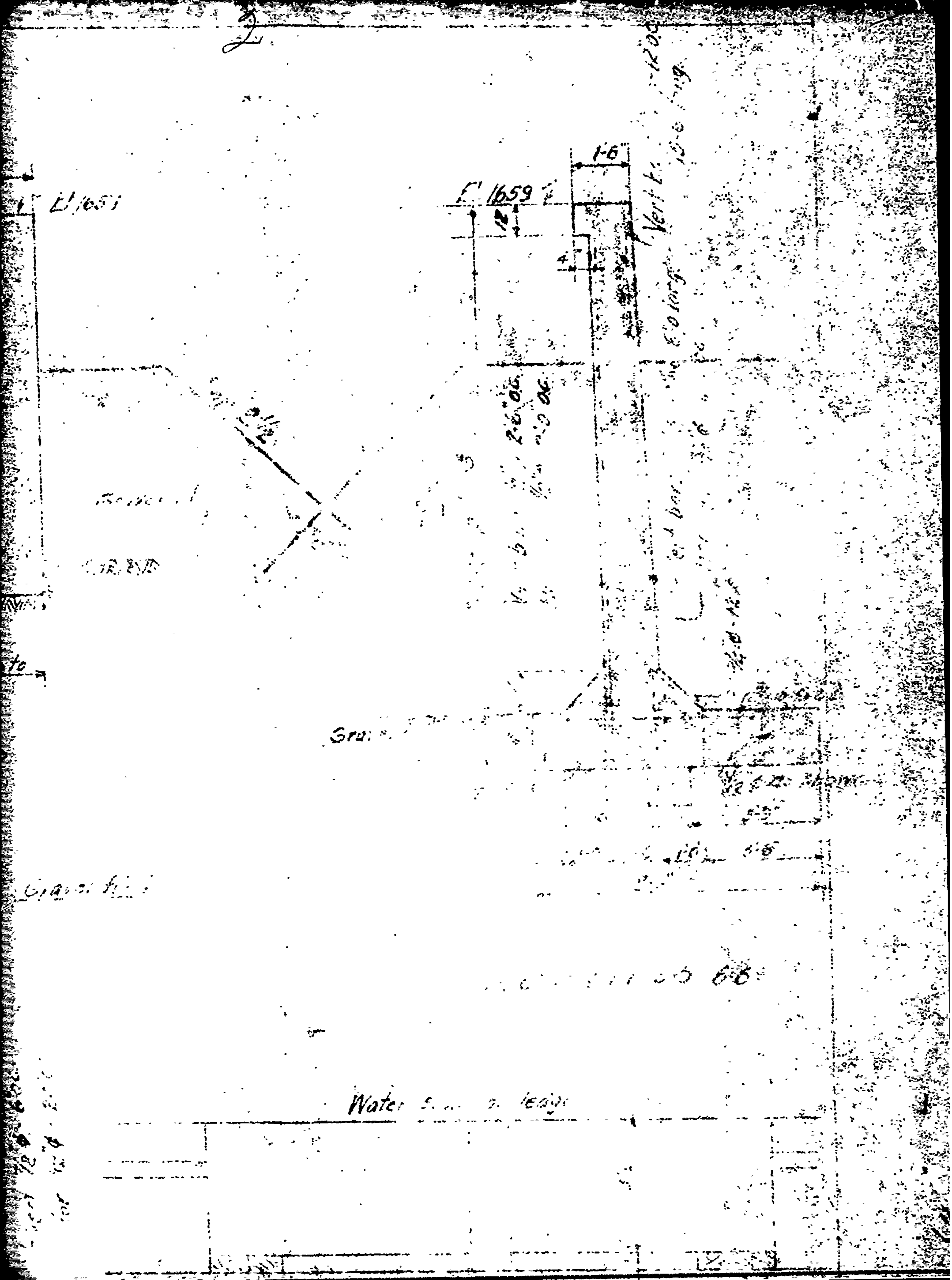
Sheet #2

5

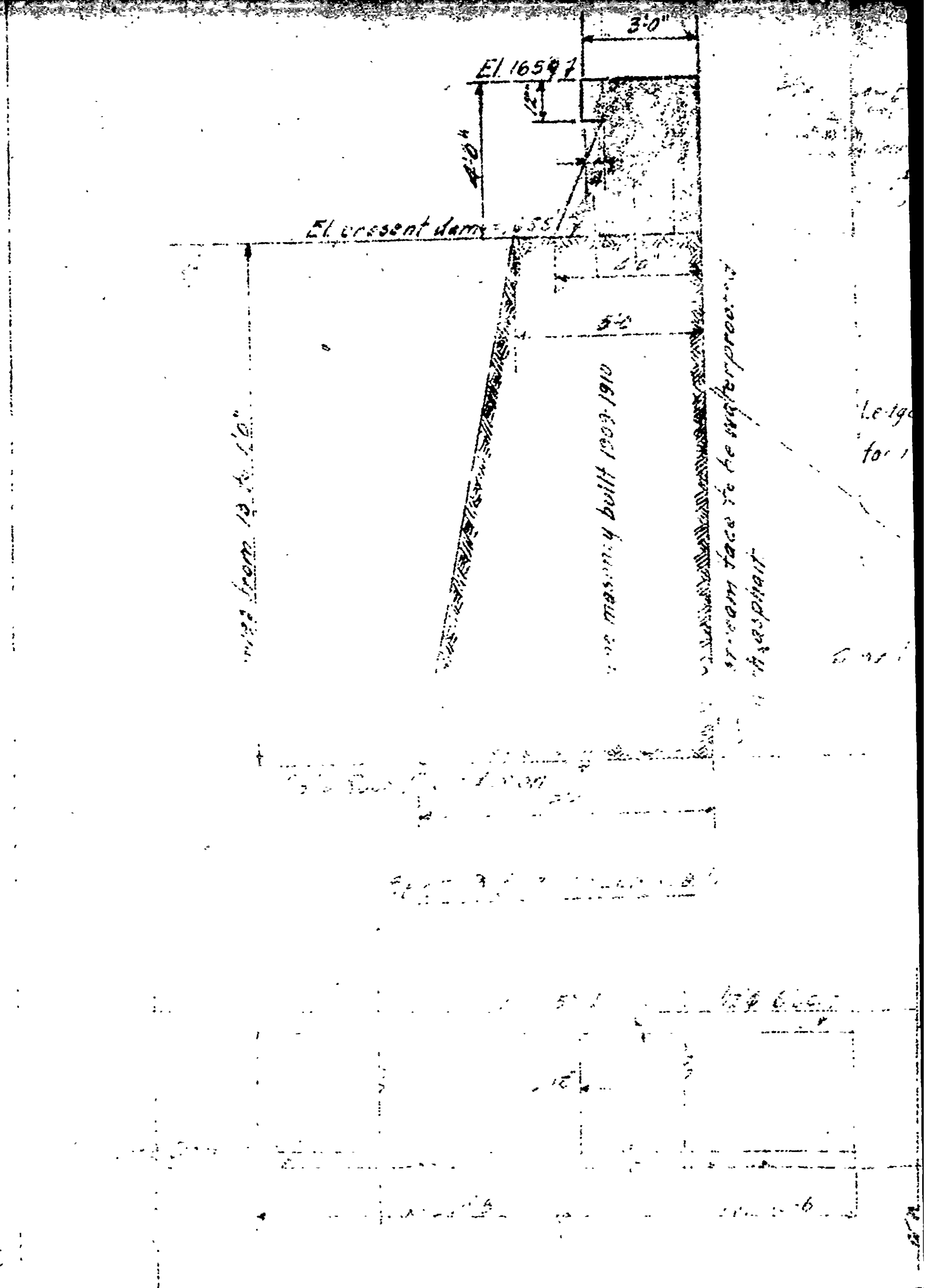
6

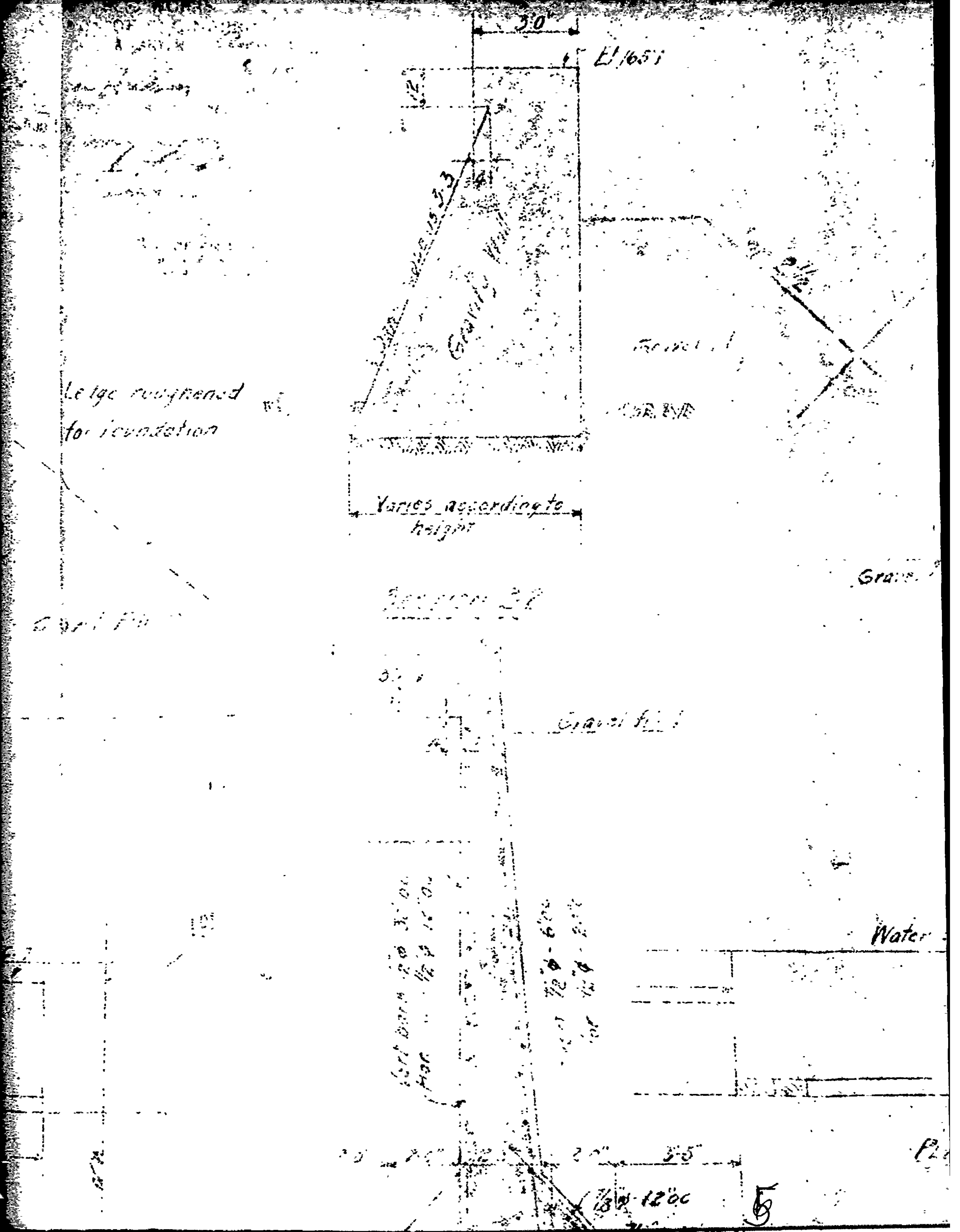

3'0"
El 1659.7
4'0"
2'0"
5'0"
masonry built 1909-1910

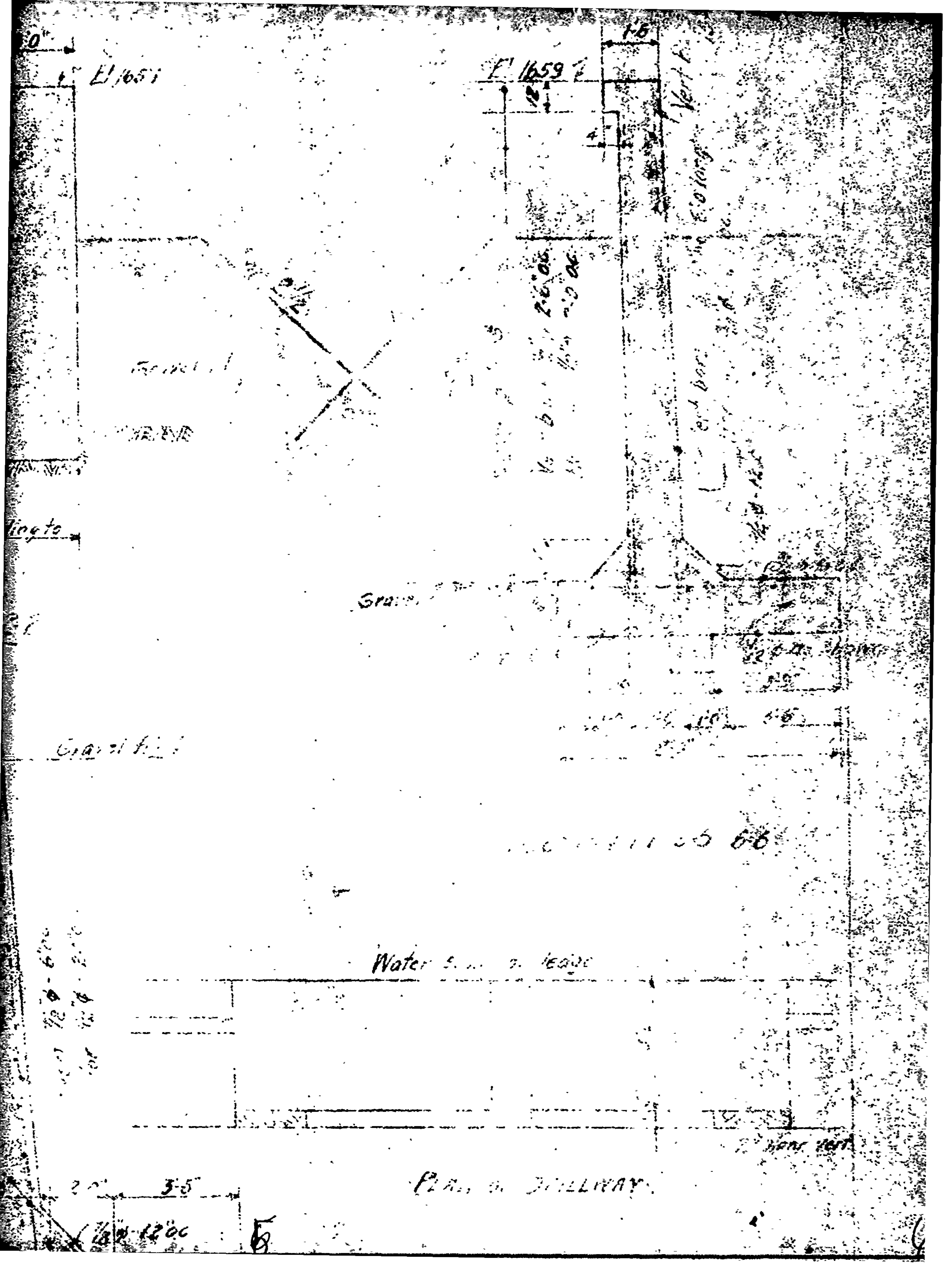

3'0"
Ledge roughened
for foundation
Varies according to
height



2
El 1659
1-6
4
Water


3'-0"
El. 1659.7
4'-0"
5'-0"
masonry built 1909-1910
waterproof
asphalt


3'0"
Ledge roughened
for foundation
Varies according to
height
Gravel fill
Water



El 1651
El 1659
1-6
4
Gravel fill
Gravel fill
Water surface
2'-0"
3'-5"
6-6
PLAN OF SPILLWAY